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PART 1 – GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and be governed by conditions of the *Contract Documents*, including sections of Division 1.

1.2 SECTION INCLUDES

- .1 1.1 General Instructions
- .2 1.2 Section Includes
- .3 1.3 Summary
- .4 1.4 Submittals
- .5 1.5 Delivery, Storage, and Handling
- .6 2.1 Roof Hatches; Ladder Access
- .7 2.2 Fabrication
- .8 3.1 Installation

1.3 SUMMARY

- .1 Section includes:
 - .1 Roof hatches.

1.4 SUBMITTALS

- .1 Submit required submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 *Product* data sheets:
 - .1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this Section.
- .3 Shop Drawings:
 - .1 Show profiles, accessories, locations, and dimensions.
 - .2 Include details of interface with work of other Sections.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Package and brace *Products* to prevent damage in shipment and handling. Protect finish surfaces by sturdy wrappings or covering.

PART 2 - PRODUCTS

2.1 ROOF HATCHES; EQUIPMENT ACCESS

- .1 Description: Preassembled, insulated cover and insulated metal curb, welded corner construction, padlock latch, hinge, handle, and other hardware as required.
- .2 Cover: Break formed, hollow-metal design with concealed insulation, overlapping flange, and internally reinforced live load to meet Ontario Building Code.

- .1 Aluminum: Cover and frame; 2.3 mm (0.09") (11 gauge) aluminum with a 127 mm (5") beaded flange with formed reinforcing members. Interior and exterior surfaces shall be thermally broken.
- .3 Gasket: Extruded Ethylene Propylene Diene Terpolymer (EPDM) rubber gasket permanently adhered to cover.
- .4 Hinges: Heavy-duty pintle hinges with 9.5 mm (3/8") type 316 stainless steel hinge pins.
- .5 Latch: Slam latch with interior and exterior turn handles and padlock hasps.
- .6 Lift Assistance: Compression spring operators enclosed in telescopic tubes. Automatic hold-open arm with grip handle release.
- .7 Hardware:
 - .1 Aluminum: Engineered composite compression spring tubes. Steel compression springs with electrocoated acrylic finish. Type 316 Stainless steel hinges. All other hardware is zinc plated/chromate sealed.
- .8 Size:
 - .1 1200 mm x 1200 mm (48" x 48") size.
- .9 Finish:
 - .1 Aluminum: Mill Finish
- .10 Acceptable *Products*:
 - .1 The Bilco Company model 'Type F-50TB.'
 - .2 Or *Equivalent*.

2.2 FABRICATION

- .1 Fit joints and junctions between components tightly, to prevent entry of water into component voids and interior of building. Cap open ends of sections exposed to view.
- .2 Fabricate work with materials and component sizes, complete with metal gauges, reinforcing, anchors, and fastenings of adequate strength to ensure that it will remain free of warping, buckling, opening of joints and seams, and distortion within limits of intended and specified use. Conceal and weld connections wherever possible.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 *Install* in accordance with manufacturer's written installation requirements.
- .2 Incorporate devices to which roofing, and flashing may be secured, and install work to ensure that roofing and flashings will be properly installed to maintain weather-tight building.
- .3 Verify under work of this Section that installed *Products* function properly.
- .4 Adjust hardware to function smoothly and without binding and to ensure that components fit in a weather-tight fashion.

END OF SECTION

**GEOTECHNICAL INVESTIGATION
WHITCHURCH-STOUFFVILLE AND YORK REGION
COMBINED FIRE STATION / PARAMEDIC
4902 AURORA ROAD
WHITCHURCH-STOUFFVILLE, ONTARIO**

Prepared for:

TOWN OF WHITCHURCH-STOUFFVILLE

**PATRIOT ENGINEERING LTD.
Consulting Engineers**

Project 44144
July 26, 2024

80 Nashdene Road, Unit 62
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**PATRIOT
ENGINEERING LTD.**
Consulting Engineers

Project 44144

July 26, 2024

Town of Whitchurch-Stouffville
Facilities Development & Operations
Community Services
111 Sandiford Drive
Stouffville, Ontario
L4A 0Z8

Attention: Mr. Brian Slater
Manager, Facilities Development & Operations
Community Services

**Geotechnical Investigation
Whitchurch-Stouffville and York Region
Combined Fire Station / Paramedic
4902 Aurora Road
Whitchurch-Stouffville, Ontario**

1.0 INTRODUCTION

It is our understanding that the proposed development will consist of constructing a one storey building, without a basement. The building will serve as a combined fire station and paramedic facility. Construction will generally involve load bearing masonry walls and steel framing. An above grade parking lot will also be constructed.

In light of this, Patriot Engineering Ltd., has carried out a geotechnical investigation at the above project site to determine the soil and groundwater conditions in order to provide geotechnical recommendations for type of foundations, safe soil bearing pressures, earthquake design parameters, earth pressure coefficients, excavation and backfill procedures, slab-on-grade floor construction and pavement thicknesses. Authorization to proceed with this investigation was provided by Ms. Vannary Lyboun from Thomas Brown Architects Inc., on May 21, 2024, on behalf of the Owner.

The site is situated on the north side of Aurora Road and is located approximately 1100m east of the intersection of McCowan Road and Aurora Road, in Whitchurch- Stouffville, Ontario. The terrain is slightly uneven, as the grade gently slopes downward starting from the north end of the property and terminates towards the south end. The site is mostly covered with grass and contains a few trees, with the exception of a small area at the south end, where a gravel covered driveway is present. A vacant one storey residential dwelling, as well as a metal shed are also present at the site.



2.0 FIELDWORK

The fieldwork for this investigation took place on June 18 and 19, 2024, and consisted of drilling a total of ten (10) boreholes using solid stem augers. A summary of the boreholes, their designations and their depths for this investigation is shown below:

- (A) For the Proposed Building
Five (5) boreholes (BH2 to BH6) to a depth of 8.1m each
- (B) For the Proposed Parking Lot and Driveways
Five (5) boreholes (BH1, and BH7 to BH10) to a depth of 2.0m each

A total of three (3) piezometers were also installed inside selected boreholes for recording groundwater levels. They were installed in Boreholes BH2, BH4 and BH6.

The boreholes were backfilled in accordance with Regulation 903.

The approximate borehole locations along with their surface elevations at the time of our drilling activity are shown on the Site Plan, Figure 1.

The boreholes were drilled by using continuous flight solid stem augurs by a specialist drilling contractor under the supervision of Patriot Engineering Ltd. field engineering staff. Samples were obtained at regular depth intervals using a 50mm diameter split spoon sampler that was driven into the soil with a 63.5 kg drop hammer falling 760mm, in accordance with Standard Penetration Test (SPT) procedures (ASTM D1586). During the fieldwork, our staff member also inspected the samples and logged them. The samples were then brought to our laboratory for detailed inspections and laboratory testing. Samples were generally tested for moisture contents and selected a sample was tested for gradation analysis / hydrometer.

Groundwater level readings were obtained during our drilling activity, as well as on July 19, 2024, representing 30 days after the completion of the overall drilling activity, from the boreholes containing wells.

Surveying of the ground surface elevations at the borehole locations were determined by our field engineering personnel and referenced at the following datum:

Top of existing culvert located beneath the existing gravel paved driveway leading into the site from Aurora Road.

The elevation at this reference datum is understood to be at Elev. 335.60m.

The scope of work for the geotechnical investigation for this project is as it is presented in this report, which is being provided on the assumption that the applicable codes and standards will be met. If there are any changes in the design features relevant to the geotechnical analysis, or if there are any apparent deviations of the report from relevant codes and standards, our office should be contacted to review the design.



3.0 SUBSURFACE CONDITIONS

The detailed stratigraphy encountered in the boreholes is presented on the Borehole logs, Drawings 2 to 11, inclusive.

In general, all boreholes with the exception of Boreholes BH3, were drilled from above grass covered areas of the site and initially advanced through a topsoil layer that ranged in thickness from approximately 50mm to 300mm. Below the topsoil layer, these same boreholes encountered fill materials. Borehole BH3 was drilled from above the gravel covered driveway and initially advanced through the granular fill material that was surficially exposed. Some boreholes had more than one fill layers. The following fill layers were encountered:

Fill - Sandy Silt

This sandy silt fill material was the most predominant fill layer and was present in all Boreholes with the exception of Boreholes BH2, BH3 and BH7. It was brown and moist to very moist. It contained some topsoil, traces to some clay, plus traces of rootlets, gravel and wood pieces. The "N" values (blows/foot) that were recorded within this layer ranged from 2 to 8 indicating relative densities that were very loose to loose. The moisture contents varied from 13% to 23%.

Fill - Clayey Silt

This clayey silt fill layer was encountered in Boreholes BH2, BH3, BH6 and BH7. It was firm to very stiff, brown and slightly moist to moist. Traces to some topsoil, plus traces of sand, gravel and rootlets were also present within this material. The moisture contents varied from 6% to 15%.

FILL - SAND

The sand fill layer was present below the topsoil layer in Borehole BH2, as well surficially present in Borehole BH3, where it formed part of the granular components of the existing roadway. It was brown and slightly moist to moist. This material was largely fine grained and also contained some topsoil, plus traces of gravel, silt, clay and rootlets. The "N" values that were recorded within this fill material were 3 and 7, displaying relative densities that were very loose to loose. The moisture contents were 5% and 14%.

The depth of the fill layers inside the boreholes which were drilled for the proposed building (BH2 to BH6) varied from approximately 0.8m to 1.6m below existing grade. Similarly, the depth of the fill layers inside the remaining boreholes that were drilled for the asphalt paved parking lot and driveway areas, ranged from approximately 0.3m to 0.9m below existing grade.



Beneath the earth fill materials, native soils were next encountered in all boreholes. In Borehole BH8, the native soil consisted of a relatively thin layer that was composed of brown, very moist, sandy silt. This layer also contained traces of gravel and clay. The “N” value that was obtained from this layer was 5, revealing a relative density that was loose. The moisture content from a single sample that was obtained from this material was 21%.

Below the sandy silt layer in Borehole BH8 and below the fill materials in the remaining boreholes, the material that was encountered next consisted of native, brown, slightly moist to moist, sand. This sand layer was largely fine grained and also contained traces of silt, clay and gravel. The “N” values that were recorded within this layer ranged from 1 to well over 50, demonstrating relative densities that were very loose to very dense. The moisture contents varied from 2% to 18%. Figure 12, shows the grain size distribution test results from a sample that was obtained from this sand material. Local variations of the composition of the material can occur at the sampling locations.

All boreholes were dry upon the completion of drilling of each individual borehole.

The overall drilling activity for all boreholes was completed on June 19, 2024. Therefore, groundwater level readings were also obtained from the three boreholes containing wells (BH2, BH4 and BH6) on July 19, 2024, representing 30 days after the completion of the overall drilling activity. These short term groundwater levels are provided below on Table 1.

Table 1 Measured Short Term Groundwater Levels Obtained on July 19, 2024, Representing 30 Days After the Completion of the Overall Drilling Activity				
Borehole No.	Depth of Borehole (m)	Borehole Surface Elevation (m)	Approximate Depth of Groundwater Level Below Existing Ground (m)	Approximate Groundwater Elevation (m)
BH2	8.1	335.1	7.3	327.8
BH4	8.1	334.2	6.5	327.7
BH6	8.1	335.1	7.2	327.9

Some seasonal fluctuations and higher water levels should be anticipated.

All groundwater level readings are also shown on the individual borehole logs.



The soil and groundwater conditions presented in this report have been deducted from soil sampling that was noncontinuous and therefore, should not be taken to represent exact planes of geological change. Furthermore, the geotechnical recommendations and comments provided in this report have been based on boreholes that were widely spaced. Therefore, the soil and groundwater conditions between the boreholes could vary significantly. The interpretation between boreholes and the recommendations in this report must therefore be checked through field inspections, provided by our office during the construction stages, to validate the information for use.

3.1 Scan for Detecting Methane Gas

All soil samples were field-screened for combustible soil vapours (CSVs), for the purpose of detecting methane gas. The instrument used was a Gastechtor 1238ME organic vapour meter. Our concentration readings are shown on the individual borehole logs. They were extremely low and insignificant. These values do not display a concern.

4.0 GEOTECHNICAL RECOMMENDATIONS

The comments provided in this report are intended only for the guidance of design engineers. The amount of boreholes required to determine the localized underground conditions between boreholes that would affect construction costs, sequencing, equipment, scheduling construction techniques, and the like, would be much greater than that which was carried out for design purposes. Contractors and/or subcontractors bidding on or undertaking the work should, in this light, decide on their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them and their scope of work.

4.1 Foundations: Conventional Spread Footings Founded on Engineered Fill

It is our understanding that the proposed finished ground floor elevation of the building has now been established and is at Elev. 336.75m. At the footprint of the proposed building, the terrain is rather variable and based on our borehole elevations, some surface areas, such as at the location of Borehole BH4, are situated as low as Elev. 334.2m. The difference in elevation is in the order of 2.55m. Therefore, in light of the relatively low terrain elevations when compared to the proposed ground floor elevation, engineered fill can be placed at the above site to raise the grade and also support conventional spread footings.

The engineered fill must consist of approved OPSS Granular B Type I (sand and gravel) materials. The recommended soil pressures for the design of conventional spread footings placed on certified engineered fill, is shown below:

Serviceability Limit State (kPa)	Factored Bearing Capacity at Ultimate Limit State (kPa)
150	225



Foundations designed using the soil pressures pertaining to the Serviceability Limit State (SLS) condition shown above, should not exceed the total and differential settlements of 25mm (1 inch) and 20mm (3/4 inch), respectively, provided that the foundation bases are not disturbed by excavation, surface water inflow, or freezing and thawing action.

The following Guide Lines shall be followed in order for us to certify the engineered fill for the structure:

1. All existing topsoil layers and all fill layers shall be excavated and removed to the native, subgrade consisting of compact to very dense, sand. The exposed native subgrade must be inspected and approved by a geotechnical engineer. If any weak spots, deleterious materials, organic materials or any fill materials are encountered on the exposed native subgrade they must be sub-excavated and removed. The exposed subgrade must be thoroughly proofrolled under our geotechnical supervision. It must also be surveyed by obtaining various elevation points to establish the depth of the subgrade. The subgrade shall then be raised to the design subgrade level using approved OPSS Granular B Type I (sand and gravel) materials placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 98% Standard Proctor maximum dry density.
2. The engineered fill must extend beyond the envelope of the proposed structure to be supported. After the envelope is set, the structure cannot be moved out of that envelope without consulting the soils engineer. Similarly, no excavations shall encroach on the engineered fill envelope without consultation with the soils consultant. All engineered fill shall extend laterally a minimum of 1.5m beyond the limits of the structure at the top grade surface so that a 45 degrees line drawn from the edge of any footing will be located entirely within the engineered fill.
3. Further to Item 2, the outer limits for the engineered fill envelope shall be carefully laid out by surveyors. Also, the elevations of "bottom" of engineered fill and "top" of engineered fill shall be established by the surveyor and a copy submitted to Patriot Engineering Ltd.
4. In order to control settlement, the stress zone beneath the footings shall contain a considerable amount of engineered fill material. Therefore, the engineered fill shall be at least 0.5m thick beneath all footings. This 0.5m minimum depth must be maintained throughout the footprint of the engineered fill pad, including below the proposed floor slab. Nominal reinforcement will be required in footings and foundation walls placed on the engineered fill. This is a precautionary measure to ensure that soft subgrade areas, if any, are adequately bridged with the reinforcement of foundations.



5. A heavy smooth-drum roller shall be used for granular soils. Also, a heavy vibratory sheepsfoot roller shall be used for cohesive soils. The use of vibrations during compaction will be controlled by the supervising technician. Do not compact closer than 2.0m from the exterior walls of any existing and/or neighbouring structures with heavy equipment. Use hand controlled light compaction equipment within 2.0m of any existing and/or neighbouring exterior walls. The contractor will be advised when the specified compaction has been achieved. Fulltime supervision from a technician is required for the engineered fill activity.
6. Continuous compaction testing will be performed on each layer of fill material placed using nuclear gauge equipment. Material will be placed in uniform and controlled lifts with maximum thickness of 300mm, depending on the size of the compactor, and approved only if a minimum of 100% Standard Proctor maximum dry density (SPMDD) is obtained.
7. The on-site compaction test results will then be typed, formalized and submitted to all relevant parties.
8. It is preferred that engineered fill should not be carried out during late November to early April, when freezing ambient temperatures occur, either persistently or intermittently. This is to ensure that the fill material is free of frozen soils, ice and snow.
9. In general, fills are more susceptible to the effects of weather than are natural soils. After they have been placed and approved, they must be protected from excessive wetting, drying and erosion.
10. A minimum depth of 1.2m of soil cover, or equivalent, is recommended for frost protection for foundations founded on engineered fill.
11. In cases where the fill is to be placed on a ground sloped steeper than 1 vertical to 2.5 horizontal, the slope within the fill envelope shall be properly terraced.
12. The engineered fill should be extended above the underside of the footing level to reach the top surface of the design subgrade. Excavations for all footings can then commence. For the basecourse details see Section 4.2 below.
13. All founding bases must be inspected and approved by a soils engineer prior to placement of concrete and to ensure that foundations are placed within the structural fill envelope. The soil bearing pressure will also be assessed at this time.
14. It is recommended that the foundation drawings be reviewed by our office for general conformance with our geotechnical recommendations.

Figure 13, shows in general, the engineered fill recommendations.



4.2 Slab-On-Grade Floor Using the Engineered Fill Foundation Method

The top surface of the subgrade will be composed of approved OPSS Granular B Type I (sand and gravel) engineered fill, compacted to 100% Standard Proctor maximum dry density.

A basecourse consisting of at least 200mm (8 inch) thick of 20mm (3/4 inch) of approved OPSS Granular A crusher run limestone must be provided under the proposed floor slab. It shall be compacted to at least 100% Standard Proctor maximum dry density. This is also shown on Figure 13.

The proposed concrete floor may then be constructed by conventional slab-on-grade techniques directly above the compacted basecourse.

A Modulus of Subgrade Reaction (k_s) of 32,500 kN/m³ (120 pci) is suggested for designing the floor slab.

4.3 Earthquake Design Parameters

In accordance to the Ontario Building Code, the site's classification for Seismic Response would be Class C.

4.4 Earth Pressure Coefficients

For this site, the following parameters may be used to assess the earth pressure:

Soil	γ (kN/m ³)	ϕ degrees	K_a	K_o	K_p
Onsite Compacted Fill or Compacted Granular Fill - OPSS Granular B	21	32	0.31	0.47	3.25
Native Subsoil	21	32	0.31	0.47	3.25

Where

- γ = bulk unit weight of soil, kN/m³
- ϕ = internal angle of friction, degrees
- K_a = coefficient of active earth pressure
- K_o = coefficient of earth pressure at rest
- K_p = coefficient of passive earth pressure

The above "K" values are based on the condition that the walls will not be subjected to inclined loads. If this is not the case, then our office must be notified so that we may adjust the above "K" values.



4.5 Excavation and Backfill

In general, no significant groundwater issues are expected with excavations on this site. Any flow from surface water and any minor seepage from perched water levels should be controlled with properly filtered sumps with pumps.

Provisions should be made by the contractor during the excavations for handling possible oversized concrete chunks, construction rubble and obstructions in the fill materials, plus cobbles and boulders in the underlying native soils.

All temporary shallow excavations may be cut at 1 vertical to 1.5 horizontal. If some sloughing occurs at the upper fill zones, or if wet conditions are encountered then shallower slopes may be required in localized areas. All excavations must be made to conform to regulations set out in the Occupational Health and Safety Act. Using the classification system described in the Occupational Health and Safety Act, the fill soils on site can be classified as Type 3. The native soils can also be considered as Type 3. Any wet and saturated soils, or soils located below the groundwater level are classified as Type 4.

Excavations shall not be cut below an imaginary line drawn downward from existing foundations and/or underground services at 7 vertical to 10 horizontal. If this cannot be achieved then adequate temporary shoring and/or underpinning will be required.

A perimeter weeping tile shall be placed at the exterior face of the foundation walls, adjacent to the footing, leading to a positive outlet. It should consist of a 100mm diameter PVC perforated weeping tile surrounded with a layer of 20mm Clear Stone, 150mm thick at the top and sides of the drain, and 50mm thick at the bottom. The stone should then be wrapped with an approved geotextile cloth, type Terrafix 270R, or equivalent.

The exterior face of the foundations shall be backfilled with approved OPSS Granular B Type I (sand and gravel) material, placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 98% Standard Proctor maximum dry density.

The interior face of the foundations plus underslab interior excavations shall be backfilled with approved OPSS Granular B Type I (sand and gravel) material, placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 100% Standard Proctor maximum dry density.

Service trenches under proposed pavement areas shall be backfilled using approved onsite soils and/or OPSS approved Granular B Type I (sand and gravel) material placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 95% Standard Proctor maximum dry density. The upper 1.2m (4 ft.) zone of backfill material shall be compacted to a minimum of 98% Standard Proctor maximum dry density.

The suitability for reuse of the onsite material as backfill should be inspected and evaluated during the initial stages of construction. Materials that have been approved for reuse should be maintained within 2% of their optimum moisture content. Tarps may be required to cover and protect the approved material.



4.6 Impact of Soil on Buried Concrete Structures

In order to assess the potential of sulphate attacking buried concrete structures and chloride attacking the reinforcing steel within, three soil samples were submitted to Agat Laboratories Ltd. (Mississauga) to carry out this testing. The laboratory test results are listed below on Table 2:

Table 2 Chemical Results of Sulphate and Chloride Testing of Soil Samples			
Source	pH	Sulphate (µg/g)	Chloride (µg/g)
BH2 SS1 (0.0m to 0.61m)	6.8	6	6
BH4 SS2 (0.76m to 1.22m)	6.57	6	6
BH6 SS3 (1.52m to 1.98m)	6.57	10	6

The above results reveal low concentrations and therefore, the potential for sulphate attack of the buried concrete structures and chloride attack of the reinforcing steel within is expected to be negligible and insignificant. In this regard, normal type Portland cement may be used for the buried concrete structures.

5.0 PAVEMENT STRUCTURES

It is our understanding that the proposed development will require the construction of flexible pavement areas with light duty and heavy duty applications.

The pavement areas may be constructed on an adequately prepared subgrade, inspected and approved by a geotechnical engineer. The subgrade may consist of fill materials composed of compact, sandy silt, and/or stiff, clayey silt. The exposed subgrade must be stripped of all topsoil, vegetation, loose, wet and deleterious materials. The exposed subgrade shall be proofrolled and compacted under geotechnical supervision to a minimum of 98% Standard Proctor maximum dry density. If any weak or soft areas are encountered at the exposed subgrade surface they must be further sub-excavated and removed. The grade must then be raised to the design subgrade level using approved onsite materials and/or approved OPSS Granular B Type I (sand and gravel) material, placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 98% Standard Proctor maximum dry density. Stringent construction control procedures must be maintained to ensure uniform subgrade moisture and density conditions are achieved.



In Borehole BH1, an “N” value of only 2 was recorded at the depth of approximately 0.3m below the existing surface, indicating the presence of a weak zone within the fill material. It is recommended that this region to be excavated and removed to minimize the risk of above normal settlement from taking place in the future. It is suggested that the extent of excavations to be carried by the contractor to remove this area at Borehole BH1 is 2.0m long by 2.0m wide by 1.0m deep. The extent of these excavations are subject to local variation and should be performed under our geotechnical supervision. This area must then be backfilled using approved onsite soils and/or approved OPSS Granular B Type I (sand and gravel) material, placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 98% Standard Proctor maximum dry density.

Based on the subgrade conditions encountered and normal anticipated traffic loading, the pavement structures indicated below in Table 3 are recommended:

Table 3 Recommended Pavement Structures and Thicknesses		
Material	Light Duty	Heavy Duty
HL 3 Surface Asphalt	30mm	40mm
HL 8 Binder Asphalt	40mm	80mm
Granular Basecourse OPSS Granular “A” Consisting of 20mm Crusher Run Limestone	150mm	150mm
Granular Subbase OPSS Granular “B” Type II 50mm Crusher Run Limestone	200mm	350mm
Total Combined Thickness	420mm	620mm
Granular Base Equivalents (GBE)	425mm	625mm

Grading of the final subgrade should be shaped and crowned to allow drainage to adequately spaced catch basins installed with subdrains leading to a positive outlet. Figure 14, shows a typical subdrain detail. We emphasize the need for adequate drainage. Catch basins must contain subdrains for drainage infiltration from the granular basecourse leading into these drainage structures. Subdrains may also be installed along the driveway areas plus be installed to extend between catch basins.

It is recommended that all granular components to be placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum 98% Standard Proctor maximum dry density. The asphalt components to be placed and compacted to be within the acceptable compaction requirements of 92.0% to 96.5% Maximum Relative Density.



The completed pavement surface must not contain any depressions and must be adequately sloped to provide effective surface drainage toward the catch basins. Additionally, surface water shall not be allowed to accumulate adjacent to the outside edges of the pavement areas. Subdrains shall be installed to collect the excess subsurface moisture and prevent the subgrade from softening.

In order to minimize the adverse affects of settlement, it is recommended that the surface asphalt course be delayed for approximately one year after the binder asphalt course is placed, where practical.

Frost action can often result in differential movement taking place between the pavement and catch basins and/or manholes. As a result, it is recommended that these structures be backfilled with granular materials which are not as susceptible to frost, such as, approved OPSS Granular B Type I (sand and gravel), placed in loose lifts with a maximum thickness of 300mm and compacted to a minimum of 98% Standard Proctor maximum dry density. Hand controlled light compaction equipment shall be used when backfilling these structures to avoid damaging them.

The quality, performance and life expectancy of the finished product is highly dependent upon adequate subgrade preparation work, the quality and proper placement of the pavement components and the compaction level achieved. Therefore, it is important that geotechnical inspections be carried out during the construction period to ensure construction practice is in conformance with design requirements.

We trust that the information contained in this report will assist you with your proposed development. Should you have any questions, please do not hesitate to contact our office.

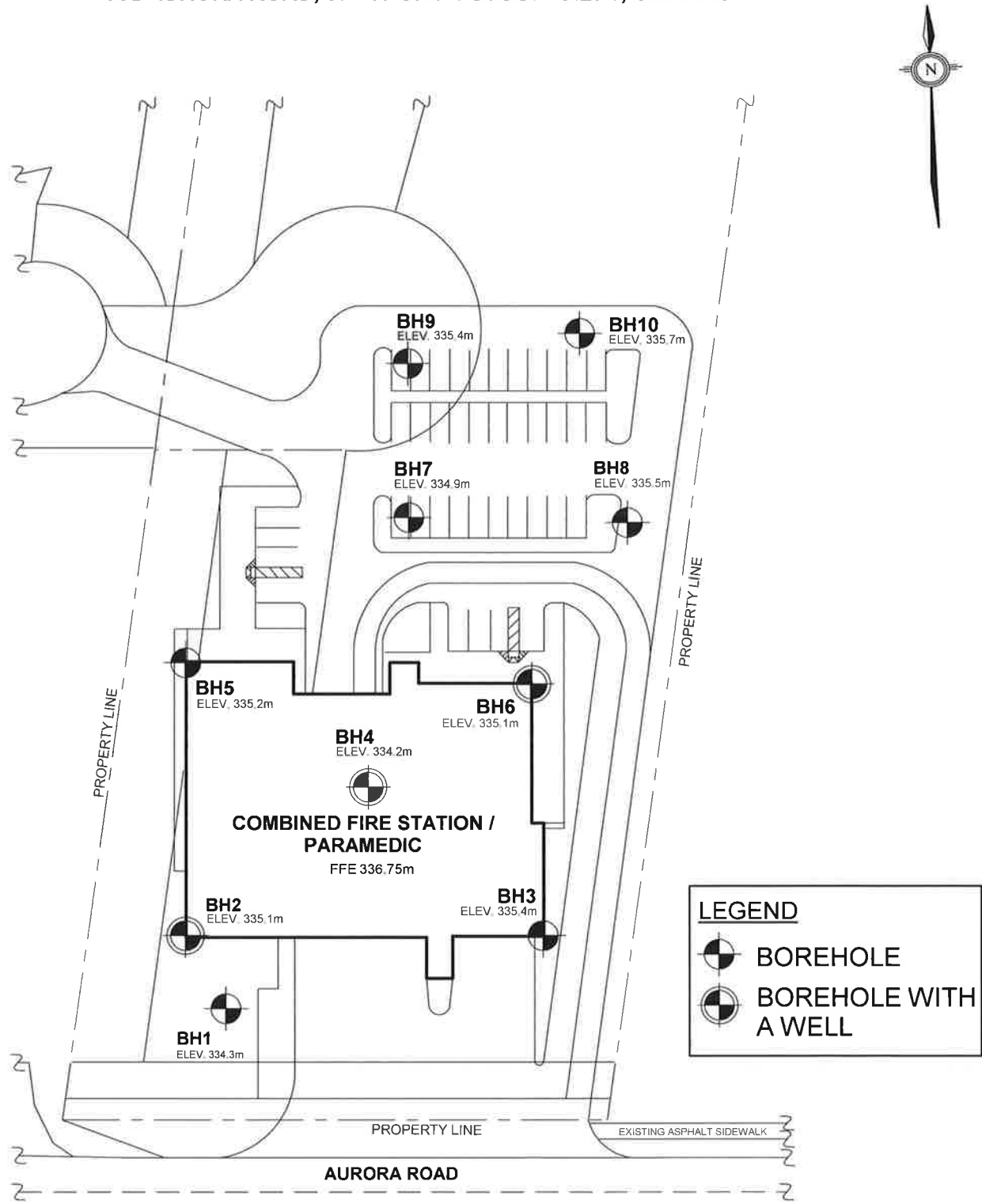
Yours truly,
PATRIOT ENGINEERING LTD.

Larry Galimanis, P.Eng.
Principal / Consulting Engineer



Distribution: Mr. Brian Slater, Town of Whitchurch-Stouffville (1)
Mr. Chris Kubbinga, Thomas Brown Architects Inc. (4)

**FIGURE 1: SITE PLAN SHOWING THE APPROXIMATE BOREHOLE LOCATIONS
COMBINED FIRE STATION/PARAMEDIC
4902 AURORA ROAD, WITCHURCH-STOUFFVILLE, ONTARIO**



Drawn By	Name	Date		PATRIOT ENGINEERING LTD. Consulting Engineers	
	R.A.	Jul '24			
Checked By	L.G.	Jul '24		Project: 44144	
Revisions					
Scale	Reduced From Original				

Project No: 44144

Borehole #: BH1

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 2



SUBSURFACE PROFILE				SAMPLE											
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	- SPT Blows/300mm				▲ Penetrometer ▲			
								20	40	60	80	50	100	150	200
0		Ground Surface	334.3												
		TOPSOIL - 100mm	334.2												
		FILL - SANDY SILT very loose, brown, moist, trace gravel, trace clay, some topsoil, trace rootlets	333.7	SS1	2	85	20								
1		SAND compact, brown, moist to slightly moist, largely fine grained, trace silt, trace clay, trace gravel, isolated pockets of silt		SS2	19	80	20								
				SS3	15	100	10								
2		END OF BOREHOLE Notes: 1. Borehole advanced using solid stem augers to 2.0m depth on June 19, 2024. 2. Borehole was found to be dry upon completion of drilling.	332.3												
3															
4															

Drill Method: S/S Auger

Drill Date: June 19, 2024

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Datum: Geodetic

Checked by: L.G.

Project No.: 44144

Borehole #: BH2

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 3



SUBSURFACE PROFILE				SAMPLE				Standard Penetration 'N'		Moisture x Moisture% x	Piezometer Data	Remarks
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	U Wt. (kg/m ³)	Shear Str. Cu kPa Penetrometer			
0		Ground Surface	335.1						20 40 60 80	50 100 150 200		
0		TOPSOIL - 100mm										Stick Up
0		FILL - SAND										
0		very loose, brown, moist, largely	334.3	SS1	3	85	25					
1		fine grained, trace clay, trace										
1		silt, trace gravel, some topsoil,	333.7	SS2	14	65	20					
1		trace rootlets										
2		FILL - CLAYEY SILT										
2		stiff, brown, slightly moist, trace		SS3	10	80	10					
2		sand, trace gravel, trace topsoil,										
2		trace rootlets										
3		SAND										
3		loose to very dense, brown,		SS4	4	80	10					
3		slightly moist to moist, largely										
3		fine grained, trace gravel, trace										
3		silt, trace clay, isolated pockets		SS5	18	100	0					
3		of silt										
4												PVC Pipe - 50mm
5				SS6	45	100	0					Bentonite - 4.6m
6												Silica Sand - 3.5m
7												PVC Pipe - 50mm Screen
8				SS7	40	100	5					
8												
8			327.0	SS8	50	100	0					PVC End Cap
8		END OF BOREHOLE										
8		See next page for notes.										
9												
10												

Drill Method: S/S Auger

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Checked by: L.G.

Project No.: 44144

Borehole #: BH2

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 3



SUBSURFACE PROFILE				SAMPLE								Piezometer Data	Remarks			
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	U. Wt. (kg/m3)	Standard Penetration 'N' SPT Blows/300mm					Moisture x Moisture% x		
									20	40	60				80	10
									Shear Str. Cu kPa Penetrometer							
									50	100	150	200	10	20	30	
11		Notes: 1. Borehole advanced using solid stem augers to 8.1m depth on June 18, 2024. 2. Borehole was found to be dry upon completion of drilling. 3. Short term groundwater level measured at 7.3m depth on July 19, 2024, 30 days after the completion of the overall drilling activity.														
12																
13																
14																
15																
16																
17																
18																
19																
20																

Drill Method: S/S Auger

Drill Date: June 18, 2024

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Checked by: L.G.

Project No: 44144

Borehole #: BH3

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 4



SUBSURFACE PROFILE				SAMPLE															
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	- SPT Blows/300mm				▲ Penetrometer ▲				Moisture x Moisture% x			
								20	40	60	80	50	100	150	200	10	20	30	
0		Ground Surface	335.4																
		FILL - SAND loose, brown, slightly moist, largely fine grained, trace silt, trace clay, trace gravel, trace rootlets	334.6	SS1	7	65	20	○								×			
1		FILL - CLAYEY SILT firm, brown, slightly moist, trace sand, trace gravel	333.8	SS2	11	80	25	○								×			
2		SAND compact to very dense, brown, moist to slightly moist, largely fine grained, trace gravel, trace silt, trace clay, isolated pockets of silt, isolated pockets of clay		SS3	24	60	20	○								×			
3				SS4	23	90	10	○								×			
4				SS5	22	100	10	○								×			
5				SS6	37	100	0	○								×			
6				SS7	34	100	0	○								×			
7																			
8			327.3	SS8	55	100	0	○								×			
9		END OF BOREHOLE Notes: 1. Borehole advanced using solid stem augers to 8.1m depth on June 18, 2024. 2. Borehole was found to be dry upon completion of drilling.																	
10																			

Drill Method: S/S Auger

Drill Date: June 18, 2024

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Checked by: L.G.

Project No.: 44144

Borehole #: BH4

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 5



SUBSURFACE PROFILE			SAMPLE				Standard Penetration 'N'		Moisture x Moisture% x	Piezometer Data	Remarks
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	U Wt. (kg/m ³)			
0		Ground Surface	334.2								
0		TOPSOIL - 100mm									
0		FILL - SANDY SILT									
0		very loose, brown, moist, trace clay, trace gravel, some topsoil, trace rootlets, trace wood pieces	333.4	SS1	3	75	20				Stick Up
1				SS2	7	85	25				
2		SAND									
2		loose to very dense, brown, moist to slightly moist, largely fine grained, trace gravel, trace silt, trace clay, isolated pockets of silt		SS3	13	95	20				
3				SS4	17	80	10				
4				SS5	22	100	10				PVC Pipe - 50mm
5				SS6	62	100	10				Bentonite - 4.6m
6				SS7	55	100	0				Silica Sand - 3.5m
7											PVC Pipe - 50mm Screen
8			326.1	SS8	62	90	0				PVC End Cap
8		END OF BOREHOLE See next page for notes.									
9											
10											

Drill Method: S/S Auger

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Datum: Geodetic

Drill Date: June 18, 2024

Checked by: L.G.

Project No.: 44144

Borehole #: BH4

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 5



SUBSURFACE PROFILE				SAMPLE				Standard Penetration 'N' SPT Blows/300mm 20 40 60 80				Moisture x Moisture% x 10 20 30				Piezometer Data	Remarks
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)										
11		Notes: 1. Borehole advanced using solid stem augers to 8.1m depth on June 18, 2024. 2. Borehole was found to be dry upon completion of drilling. 3. Short term groundwater level measured at 6.5m depth on July 19, 2024, 30 days after the completion of the overall drilling activity.															
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Drill Method: S/S Auger

Drill Date: June 18, 2024

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Checked by: L.G.

Project No: 44144

Borehole #: BH5

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 6



SUBSURFACE PROFILE				SAMPLE											
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	○ - SPT Blows/300mm 20 40 60 80				▲ Penetrometer ▲ 50 100 150 200			
0		Ground Surface	335.2												
		TOPSOIL - 100mm													
		FILL - SANDY SILT													
		very loose, brown, moist, trace clay, trace gravel, some topsoil, trace rootlets	334.4	SS1	2	75	10	○							×
1				SS2	17	80	10	○							×
		SAND													
		compact to very dense, brown, slightly moist to moist, largely fine grained, trace gravel, trace silt, trace clay		SS3	30	100	10	○							×
2				SS4	35	100	5	○							×
3				SS5	24	100	0	○							×
4															
5				SS6	28	100	0	○							×
6															
7				SS7	44	100	0	○							×
8				SS8	66	100	0	○							×
		END OF BOREHOLE	327.1												
		Notes: 1. Borehole advanced using solid stem augers to of 8.1m depth on June 18, 2024. 2. Borehole was found to be dry upon completion of drilling.													
9															
10															

Drill Method: S/S Auger

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Datum: Geodetic

Drill Date: June 18, 2024

Checked by: L.G.

Project No.: 44144

Borehole #: BH6

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 7



SUBSURFACE PROFILE			SAMPLE				Standard Penetration 'N'		Moisture x Moisture% x	Piezometer Data	Remarks
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	U Wt. (kg/m ³)			
0		Ground Surface	335.1								
0		TOPSOIL - 200mm	334.9								Stick Up
0		FILL - SANDY SILT	334.4	SS1	7	65	20				
1		loose, brown, moist, trace clay, trace gravel, some topsoil, trace rootlets	334.1	SS2	17	65	10				
1		FILL - CLAYEY SILT									
1		very stiff, brown, moist, trace gravel, trace sand		SS3	25	100	10				
2		SAND									
2		compact to very dense, brown, moist to slightly moist, largely fine grained, trace gravel, trace silt, trace clay, isolated pockets of silt, isolated pockets of clay		SS4	18	65	10				
3				SS5	24	100	10				PVC Pipe - 50mm
4											Bentonite - 4.6m
5				SS6	34	90	10				Silica Sand - 3.5m
6											PVC Pipe - 50mm Screen
7				SS7	39	100	10				
8			327.1	SS8	74	55	10				PVC End Cap
8		END OF BOREHOLE See next page for notes.									
9											
10											

Drill Method: S/S Auger

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Datum: Geodetic

Drill Date: June 19, 2024

Checked by: L.G.

Project No.: 44144

Borehole #: BH6

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 7



SUBSURFACE PROFILE				SAMPLE				Standard Penetration 'N' SPT Blows/300mm 20 40 60 80	Shear Str. Cu kPa Penetrometer 50 100 150 200	Moisture x Moisture% x 10 20 30	Piezometer Data	Remarks
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)					
11		Notes: 1. Borehole advanced using solid stem augers to 8.1m depth on June 19, 2024. 2. Borehole was found to be dry upon completion of drilling. 3. Short term groundwater level measured at 7.2m depth on July 19, 2024, 30 days after the completion of the overall drilling activity.										
12												
13												
14												
15												
16												
17												
18												
19												
20												

Drill Method: S/S Auger

Drill Date: June 19, 2024

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e-mail: patrioteng@info.ca

Datum: Geodetic

Checked by: L.G.

Project No: 44144

Borehole #: BH7

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 8



SUBSURFACE PROFILE				SAMPLE											
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)	- SPT Blows/300mm 20 40 60 80				▲ Penetrometer ▲ 50 100 150 200			
0		Ground Surface	334.9												
		TOPSOIL - 50mm													
		FILL - CLAYEY SILT firm, brown, moist, trace gravel, trace sand, some topsoil, trace rootlets	334.6	SS1	5	85	20	○							×
		SAND loose to compact, brown, moist to slightly moist, largely fine grained, trace silt, trace clay, trace gravel, isolated pockets of silt													
1				SS2	24	70	10	○							×
				SS3	14	100	10	○							×
2		END OF BOREHOLE Notes: 1. Borehole advanced using solid stem augers to 2.0m depth on June 19, 2024. 2. Borehole was found to be dry upon completion of drilling.	332.9												
3															
4															

Drill Method: S/S Auger

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Datum: Geodetic

Drill Date: June 19, 2024

Checked by: L.G.

Project No: 44144

Borehole #: BH8

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 9



SUBSURFACE PROFILE				SAMPLE						
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)			
0		Ground Surface	335.5							
		TOPSOIL - 200mm	335.3							
		FILL - SANDY SILT loose, brown, very moist, some clay, trace gravel, some topsoil, trace rootlets		SS1	6	75	10	○		×
			334.6							
1		SANDY SILT loose, brown, very moist, trace gravel, trace clay		SS2	5	40	10	○		×
			334.1							
		SAND very loose, brown, slightly moist, largely fine grained, trace silt, trace gravel, trace clay, isolated pockets of silt		SS3	1	100	0	○		×
			333.5							
2		END OF BOREHOLE Notes: 1. Borehole advanced using solid stem augers to 2.0m depth on June 19, 2024. 2. Borehole was found to be dry upon completion of drilling.								
3										
4										

Drill Method: S/S Auger

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Datum: Geodetic

Drill Date: June 19, 2024

Checked by: L.G.

Project No: 44144

Borehole #: BH9

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 10



SUBSURFACE PROFILE				SAMPLE						
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)			
0		Ground Surface	335.4							
		TOPSOIL - 250mm	335.1							
		FILL - SANDY SILT loose, brown, moist, trace gravel, trace clay, some topsoil, trace rootlets, isolated pockets of topsoil	334.6	SS1	6	85	10	○		×
1		SAND compact, brown, slightly moist, largely fine grained, trace silt, trace gravel, trace clay, isolated pockets of silt		SS2	19	65	10	○		×
				SS3	14	100	10	○		×
2		END OF BOREHOLE Notes: 1. Borehole advanced using solid stem augers to 2.0m depth on June 19, 2024. 2. Borehole was found to be dry upon completion of drilling.	333.4							
3										
4										

Drill Method: S/S Auger

Drill Date: June 19, 2024

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Datum: Geodetic

Checked by: L.G.

Project No: 44144

Borehole #: BH10

Project: Combined Fire Station / Paramedic

Borehole Location: See Figure 1

Location: 4902 Aurora Road, Whitchurch-Stouffville, Ontario

Project Engineer: L.G.

Client: Town of Whitchurch-Stouffville

Drawing No.: 11



SUBSURFACE PROFILE				SAMPLE						
Depth (m)	Symbol	Description	Elevation (m)	Type	N = Blows/300mm	Recovery (%)	OVC (ppm)			
0		Ground Surface	335.7							
		TOPSOIL - 300mm	335.4							
		FILL - SANDY SILT loose, brown, moist, trace gravel, trace clay, some topsoil	334.9	SS1	8	75	10	○		×
1		SAND compact, brown, moist to slightly moist, largely fine grained, trace silt, trace gravel, trace clay, isolated pockets of clay		SS2	15	65	10	○		×
				SS3	22	100	0	○		×
2		END OF BOREHOLE Notes: 1. Borehole advanced using solid stem augers to 2.0m depth on June 19, 2024. 2. Borehole was found to be dry upon completion of drilling.	333.7							
3										
4										

Drill Method: S/S Auger

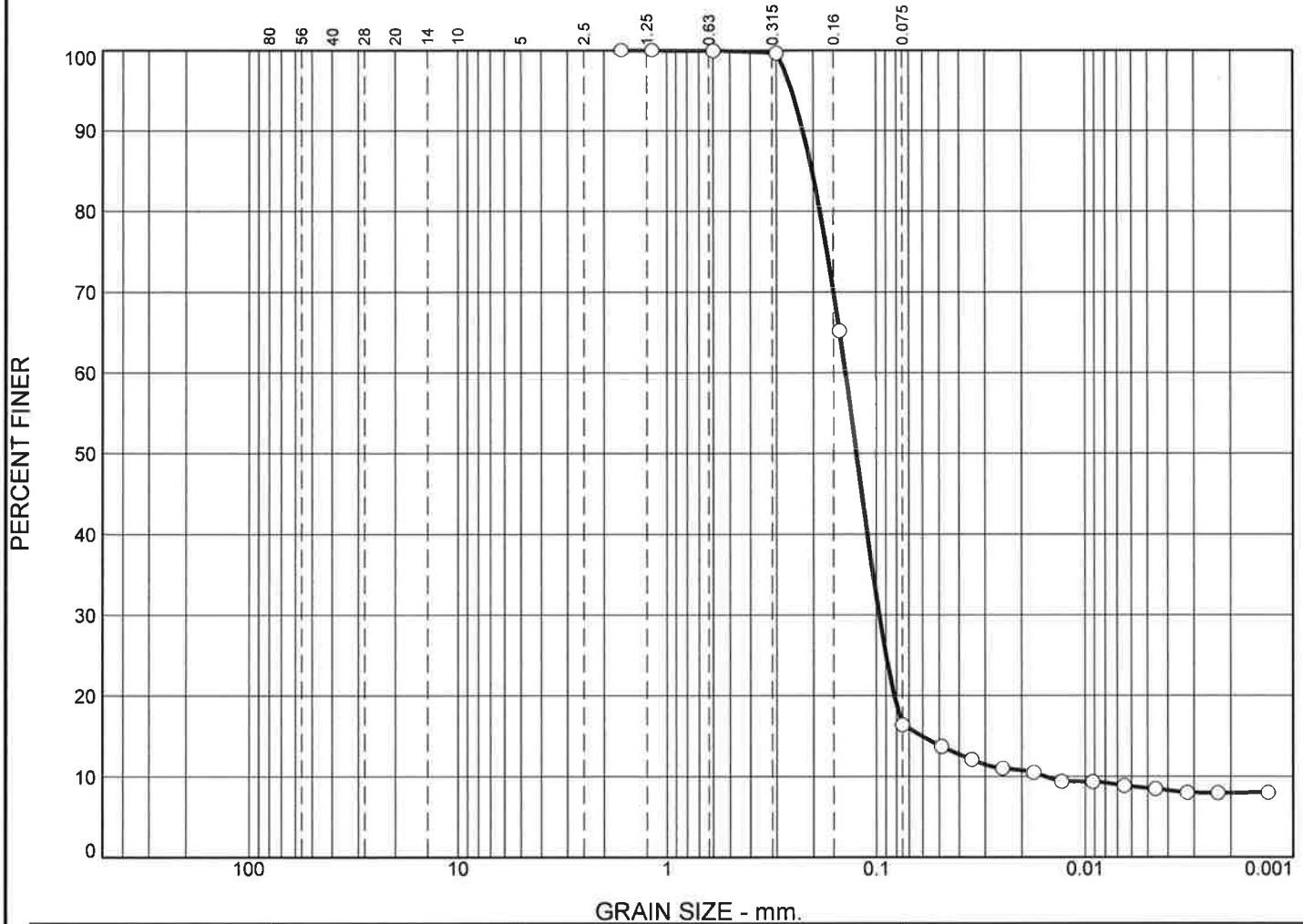
PATRIOT ENGINEERING LTD.
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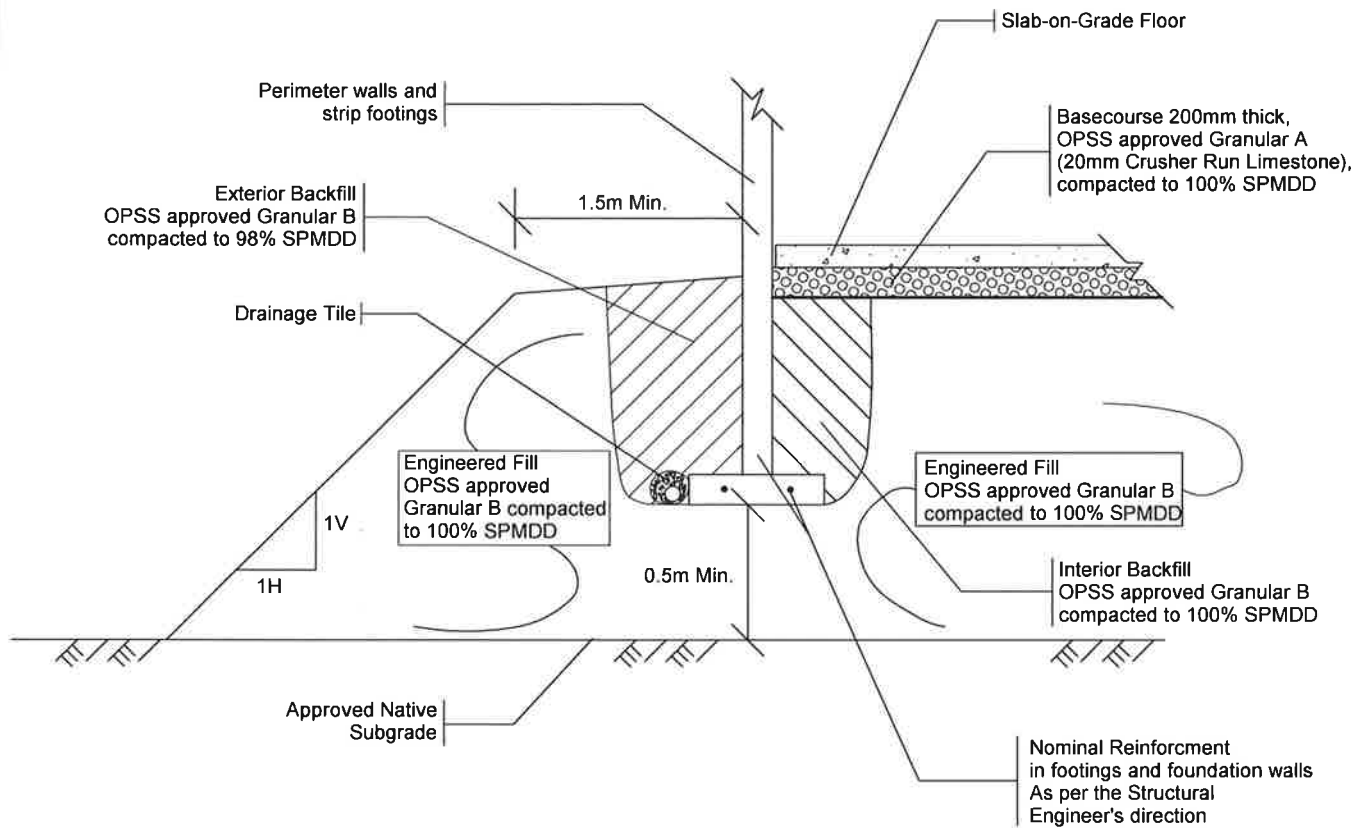
Datum: Geodetic

Drill Date: June 19, 2024

Checked by: L.G.

Particle Size Distribution Report





Notes:

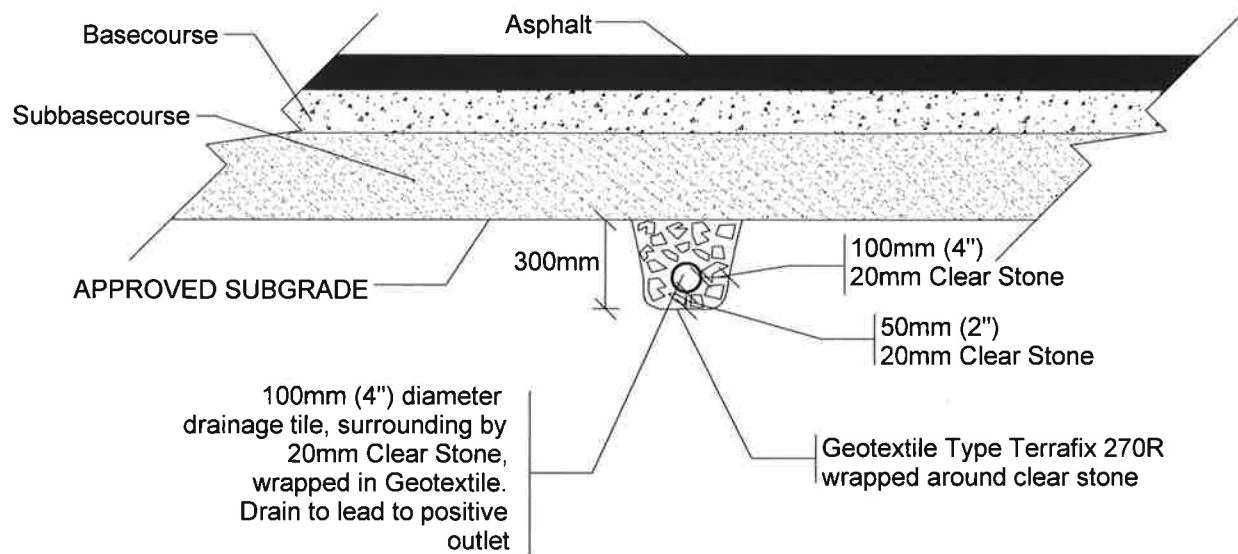
1. Drainage tile to consist of 100mm (4") dia. Weeping tile or equivalent perforated pipe leading to a positive sump or outlet. It should be surrounded with a layer of 150mm (6") thick 20mm Clear Stone at the top and sides of the drain and 50mm at the bottom. The stone should then be wrapped with an approved geotextile cloth, Terrafix 270R or equivalent.
2. Do not compact closer than 2m (6.5') from the wall with heavy construction equipment. Use hand controlled light compaction equipment within 2m (6.5') of the wall. Fill must be placed on both sides simultaneously, to avoid imbalanced loading.
3. Basecourse to be at least 200mm thick of 20mm of OPSS approved Granular A crusher run limestone compacted to at least 100% Standard Proctor maximum dry density (SPMDD).
4. Slab-on-grade should not be connected structurally to the wall or the footing.
5. Minimum thickness of the engineered fill below the footings to be at least 0.5m.
6. Exterior grade to slope away from wall.

SKETCH FOR ENGINEERED FILL FOR FOUNDATIONS

Not to Scale

Drawn By Checked By Revisions Scale	Name	Date		PATRIOT ENGINEERING LTD. Consulting Engineers	
				Project: 44144	Figure: 13

TYPICAL SUBDRAIN DETAIL



Drawn By	Name	Date		PATRIOT ENGINEERING LTD.	
Checked By				Consulting Engineers	
Revisions				Project: 44144	Figure: 14
Scale	N.T.S.				



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Consulting Engineers

EXPLANATION OF TERMS

1. SAMPLING PROCEDURES

AS	Auger Sample	GS	Grab Sample
SS	Split Spoon	ST	Shelby Tube

2. PENETRATION RESISTANCE

Standard Penetration Resistance 'N'

The number of blows that are required to advance a standard split spoon sampler 0.3 m into the subsurface soil, that is driven by means of a 63.5 kg hammer falling freely for a distance of 0.76 m.

Dynamic Penetration Resistance:

The number of blows that are required to advance a 51 mm diameter, 60 degree cone, fitted to the end of drill rods, 0.3m into subsurface soil. The driving energy is 475 J per blow.

3. DESCRIPTION OF SOIL

The description of the soil is based on visual examination of the samples obtained and laboratory testing. Each layer is described according to the following classification and terminology:

<u>Classification*</u>	<u>Particle Size</u>
Clay	less than 0.002 mm
Silt	from 0.002 to 0.075 mm
Sand	from 0.075 to 4.75 mm
Gravel	from 4.75 to 75 mm
Cobbles	from 75 to 200 mm
Boulders	larger than 200 mm

* Unified Soil Classification System (ASTM D2487-75).

<u>Terminology</u>	<u>Proportion</u>
Trace, or occasional	Less than 10%
Some	10 to 20%
Adjective (e.g. silty or sandy)	20 to 35%
And (e.g. sand and gravel)	35 to 50%

The relative density of the cohesionless soils and the consistency of cohesive soils are defined below:

<u>Cohesionless Soils</u>		<u>Cohesive Soils</u>		
<u>Relative Density</u>	<u>Penetration Resistance "N" Blows/0.3 m or Blows/foot</u>	<u>Consistency</u>	<u>Underdrained Shear Strength**</u>	
			<u>kPa</u>	<u>psf</u>
Very loose	0 to 4	Very soft	0 to 12	0 to 250
Loose	4 to 10	Soft	12 to 25	250 to 500
Compact	10 to 30	Firm	25 to 50	500 to 1000
Dense	30 to 50	Stiff	50 to 100	1000 to 2000
Very dense	over 50	Very Stiff	100 to 200	2000 to 4000
		Hard	over 200	over 4000

** The compressive strength obtained from the quick (Q) triaxial test is equal to twice the shear strength of the clay tested.



Soil Engineers Ltd.

CONSULTING ENGINEERS

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**A REPORT TO
TOWN OF WHITCHURCH-STOUFFVILLE**

**A GEOTECHNICAL INVESTIGATION FOR
PROPOSED LAND ACQUISITION**

4902 AURORA ROAD

TOWN OF WHITCHURCH-STOUFFVILLE

REFERENCE NO. 2308-S043

NOVEMBER 2023

DISTRIBUTION

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ENCLOSURES

Borehole Logs	Figures 1 to 8
Grain Size Distribution Graphs	Figures 9 and 10
Borehole Location Plan	Drawing No. 1
Subsurface Profile	Drawing No. 2



1.0 **INTRODUCTION**

In accordance with written authorization dated August 4, 2023, from Mr. Brian Slater of Town of Whitchurch-Stouffville, a geotechnical investigation was carried out at a parcel of land located at 4902 Aurora Road, in Town of Whitchurch-Stouffville, for a proposed Land Acquisition.

The purpose of the investigation was to reveal the subsurface conditions and to determine the engineering properties of the disclosed soils for the proposed project.

The findings and resulting geotechnical recommendations are presented in this Report.

2.0 **SITE AND PROJECT DESCRIPTION**

The site is located on Markham till plain where glacial drift predominates the soil stratigraphy. In places, the drift has been modified by the depositing of lacustrine clay, silt, sand and water-laid till by the water action of Peel Ponding (glacial lake).

The investigated site is located at the northwest sector of Aurora Road and Highway 48, in the Town of Whitchurch-Stouffville. The site is occupied by a residential building and the area is generally weed or grass covered, with some trees.

3.0 **FIELD WORK**

The field work, consisting of 8 boreholes to a depths of 6.5 m and 6.6 m, was performed on August 29 and 30, 2023, at the locations shown on the Borehole Location Plan, Drawing No. 1.

The holes were advanced at intervals to the sampling depths by a track-mounted, continuous-flight power-auger machine equipped for soil sampling. Standard Penetration Tests, using the procedures described on the enclosed “List of Abbreviations and Terms”, were performed at the sampling depths. The test results are recorded as the Standard Penetration Resistance (or ‘N’ values) of the subsoil. The relative density of the granular strata and the consistency of the cohesive strata are inferred from the ‘N’ values. Split-spoon samples were recovered for soil classification and laboratory testing.

The field work was supervised and the findings recorded by a geotechnical technician.



The geodetic elevation at each of the borehole locations was obtained by Soil Engineers Ltd. using the Global Navigation Satellite System (GNSS).

4.0 **SUBSURFACE CONDITIONS**

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs, comprising Figures 1 to 8, inclusive. The revealed stratigraphy is plotted on the Subsurface Profile, Drawing No. 2, and the engineering properties of the disclosed soils are discussed herein.

This investigation has disclosed that beneath a veneer of topsoil and a layer of disturbed soil, the site is underlain by strata of silty clay, sandy silt and sand.

4.1 **Topsoil** (All Boreholes)

The revealed topsoil is 25 cm to 38 cm thick. It is dark brown in colour, indicating that it contains appreciable amounts of roots and humus. These materials are unstable and compressible under loads; therefore, the topsoil is considered to be void of engineering value. Due to its humus content, it may produce volatile gases and generate an offensive odour under anaerobic conditions. Therefore, the topsoil must not be buried below any structures or deeper than 1.2 m below the finished grade, so that it will not have an adverse impact on the environmental well-being of the developed areas.

Since the topsoil is considered void of engineering value, it can only be used for general landscaping and landscape contouring purposes.

4.2 **Disturbed Soil** (All Boreholes)

The disturbed soil was found extending to depths from 0.7 to 1.4 m below the prevailing ground surface. It consists of silty clay and sandy silt, with occasional topsoil inclusions.

The obtained 'N' values range from 4 to 11, with a median of 5 blows per 30 cm of penetration. This indicates that the soil was weathered/loosened by weathering or manmade activities.

The natural water content values range from 12% to 28%, with a median of 21%, indicating that the soil is in a moist to wet condition, which has been confirmed by the sample examinations.



Due to its loose and non uniform density, the disturbed soil is considered unsuitable for supporting structures. For structural use, it must be subexcavated, sorted free of any organics and deleterious material and properly compacted. If it is impractical to sort the soil, then it must be wasted.

4.3 **Silty Clay** (Borehole 8)

The silty clay was encountered below a layer of sandy silt and it is laminated with sand and silt seams and layers, showing it is a lacustrine deposit.

The obtained 'N' value is 14 blows per 30 cm of penetration, indicating that the consistency of the clay is stiff.

The Atterberg Limits of the clay sample and the water content value of the sample were determined. The result is plotted on the Borehole Log and summarized below:

Liquid Limit	32%
Plastic Limit	18%
Natural Water Content	26%

The above results show that the clay is a cohesive material with low plasticity. The natural water content value lies above its plastic limit and below its liquid limit, confirming the consistency of the clay determined from the 'N' value.

A grain size analysis was performed on the silty clay sample; the result is plotted on Figure 9.

Based on the above findings, the soil engineering properties pertaining to the project are listed below:

- High frost susceptibility and high soil-adfreezing potential.
- Low permeability, with an estimated coefficient of permeability of 10^{-7} cm/sec, an estimated percolation rate of over 80 min/cm, and runoff coefficients of:

Slope	
0% - 2%	0.15
2% - 6%	0.20
6% +	0.28



- A cohesive-frictional soil, its shear strength is derived from consistency and augmented by the internal friction of the silt. Its shear strength is moisture dependent.
- In steep cuts, the cut face in the sound clay may collapse, as the wet silt slowly sloughs.
- A very poor pavement-supportive material, with an estimated California Bearing Ratio (CBR) value of 3% or less.
- Moderately high corrosivity to buried metal, with an estimated electrical resistivity of 2500 ohm-cm.

4.4 **Sandy Silt** (Borehole 8)

The sandy silt layer was encountered below the disturbed soil overlying a layer of silty clay. Occasional silty fine sand and silt seams and layers were found laminated in the sandy silt. The laminated structure shows that the sandy silt is a lacustrine deposit. The sandy silt layer is weathered.

The obtained 'N' value is 6 blows per 30 cm of penetration, showing the relative density of the sandy silt is loose.

The natural water content value is 23% and the result is plotted on the Borehole Log; showing the sandy silt deposit is in a wet condition.

Accordingly, the following engineering properties are deduced:

- Highly frost susceptible with high soil-adfreezing potential.
- Highly water erodible.
- A soil of high capillarity and water retention capability.
- Relatively pervious, with an estimated coefficient of permeability of 10^{-4} cm/sec, an estimated percolation rate of 15 min/cm, and runoff coefficients of:

Slope

0% - 2%	0.07
2% - 6%	0.12
6% +	0.18

- A frictional soil, its shear strength is derived from internal friction and is density dependent. Due to its dilatancy, the shear strength of the wet sandy silt is susceptible to impact disturbance; i.e., the disturbance will induce a build-up of pore pressure within the soil mantle, resulting in soil dilation and a reduction of shear strength.



- In relatively steep cuts, the sandy silt will slough if it is wet, run with water seepage and boil with a piezometric head of 0.3 m.
- A poor pavement-supportive material, with an estimated CBR value of 6%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 5000 ohm·cm.

4.5 **Sand** (All Boreholes)

The sand deposits were encountered below either the disturbed soil or a layer of silty clay and extend to the maximum investigated depth at all boreholes. It consists of fine sand with a trace of silt to being silty.

The obtained 'N' values range from 2 to more than 85, with a median of 30 blows per 30 cm of penetration, indicating that the relative density of the sand is from very loose to very dense, being generally compact.

The natural water content values of the samples were determined, and the results are plotted on the Borehole Logs; the values range from 2% to 15%, with a median of 5%, showing the sand is in damp to wet condition. Due to the pervious nature of the sand, some of the water may have drained during sampling, and the determined values may not represent the actual water content of the deposit.

Grain size analyses were performed on the sand samples; the results are plotted on Figure 10.

The deduced engineering properties pertaining to the project are given below:

- Low frost susceptibility and high water erodibility.
- Pervious, with an estimated coefficient of permeability of 10^{-2} to 10^{-3} cm/sec, an estimated percolation rate of about 5 to 10 min/cm, and runoff coefficients of:

Slope

0% - 2%	0.04
2% - 6%	0.09
6% +	0.13

- A frictional soil, its shear strength is derived from internal friction and is soil density dependent.
- In relatively steep cuts, the sand will be stable in a damp to moist condition, but will slough if it is wet and run with water seepage. The bottom will boil under a piezometric head of 0.3 m.



- A fair to good pavement-supportive material, with an estimated CBR value of 20% to 30%.
- Low corrosivity to buried metal, with an estimated electrical resistivity of 6500 ohm·cm.

4.6 **Compaction Characteristics of the Revealed Soils**

The obtainable degree of compaction is primarily dependent on the soil moisture and, to a lesser extent, on the type of compactor used and the effort applied.

As a general guide, the typical water content values of the revealed soils for Standard Proctor compaction are presented in Table 1.

Table 1 - Estimated Water Content for Compaction

Soil Type	Determined Natural Water Content (%)	Water Content (%) for Standard Proctor Compaction	
		100% (optimum)	Range for 95% or +
Disturbed Soil	12 to 28 (median 21)	12 to 18	8 to 23
Silty Clay	26	18	14 to 23
Sandy Silt	23	12	8 to 16
Sand	2 to 15 (median 5)	11	5 to 16

Based on the above findings, the sand is generally suitable for a 95% or + Standard Proctor compaction. However, the silty clay and sandy silt are too wet and will require aeration or mixing with dry soils prior to structural compaction. The disturbed soil must be carefully inspected and sorted free of topsoil and any deleterious materials, if encountered, prior to its use as structural backfill. Otherwise, it must be wasted.

The clay soils should be compacted using a heavy-weight, kneading-type roller. The sandy silt and sand can be compacted by a smooth roller with or without vibration, depending on the water content of the soil being compacted. The lifts for compaction should be limited to 20 cm, or to a suitable thickness as assessed by test strips performed by the equipment which will be used at the time of construction.

It is difficult to monitor the lifts of backfill placed in deep trenches; therefore, it is preferable that the compaction of backfill at depths over 1.0 m below the pavement



subgrade be carried out on the wet side of the optimum. This would allow a wider latitude of lift thickness.

One should be aware that with considerable effort, a 90%± Standard Proctor compaction of the wet silt and sand is achievable. Further densification is prevented by the pore pressure induced by the compactive effort; however, large random voids will have been expelled, and with time the pore pressure will dissipate and the percentage of compaction will increase. There are many cases on record where after a few months of rest, the density of the compacted mantle has increased to over 95% of its maximum Standard Proctor dry density.

If the compaction of the soils is carried out with the water content within the range for 95% Standard Proctor dry density but on the wet side of the optimum, the surface of the compacted soil mantle will roll under the dynamic compactive load. This is unsuitable for pavement construction since each component of the pavement structure is to be placed under dynamic conditions which will induce the rolling action of the subgrade surface and cause structural failure of the new pavement. The foundation or bedding of the sewer and slab-on-grade will be placed on a subgrade which will not be subjected to impact loads. Therefore, the structurally compacted soil mantle with the water content on the wet side or dry side of the optimum will provide an adequate subgrade for the construction.

5.0 **GROUNDWATER CONDITIONS**

No groundwater was detected and all boreholes remained dry upon completion of field work.

The groundwater yield from the silty clay, due to its low permeability, is expected to be small and limited, whereas, in the sandy silt and sand, the yield, if encountered, is expected to be moderate to appreciable.

6.0 **DISCUSSION AND RECOMMENDATIONS**

The investigation has disclosed that beneath a veneer of topsoil and the disturbed soil, the site is underlain by strata of stiff silty clay, loose sandy silt and very loose to very dense, generally compact sand.

No groundwater was detected and all boreholes remained dry upon completion of field work.



The geotechnical findings which warrant special consideration are presented below:

1. The topsoil is void of engineering value and can be used for landscaping purposes only. It should not be buried within any building envelope or deeper than 1.2 m below the exterior finished grade.
2. The disturbed soil contains organics and is generally in a loose condition, rendering it unsuitable for supporting foundations. For structural use, it must be subexcavated, inspected, sorted free of topsoil and any deleterious material and properly recompacted. If it is impractical to sort the soil, it must be wasted.
3. The sound natural soils are suitable for normal spread and strip footing construction. Due to the presence of topsoil and disturbed soil, the footing subgrade must be inspected by either a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer, to ensure that its condition is compatible with the design of the foundation.
4. For slab-on-grade construction, any weathered, soft or loose soils should be subexcavated, aerated and properly compacted. Any new material for raising the grade should consist of organic-free soil compacted to at least 98% of its maximum Standard Proctor dry density. The slab should be constructed on a granular base, 20 cm thick, consisting of 19-mm Crusher-Run Limestone, or equivalent, compacted to its maximum Standard Proctor dry density.
5. A Class 'B' bedding, consisting of compacted 19-mm Crusher-Run Limestone, is recommended for the construction of the underground services. The sewer joints should be leak-proof, or wrapped with an appropriate waterproof membrane to prevent subgrade migration. In water bearing soils, a Class 'A' bedding should be considered.
6. Some of the soils are highly frost susceptible, with high soil-adfreezing potential. Where these soils are used to backfill against foundation walls, special measures must be incorporated into the building construction to prevent serious damage due to soil-adfreezing.

The recommendations appropriate for the project described in Section 2.0 are presented herein. One must be aware that the subsurface conditions may vary between boreholes. Should this become apparent during construction, a geotechnical engineer must be consulted to determine whether the following recommendations require revision.



6.1 **Foundations**

Based on the borehole findings, the recommended soil pressures and suitable founding levels are presented in Table 2.

Table 2 - Founding Levels

Borehole No.	Recommended Maximum Allowable Soil Pressure (SLS)/ Factored Ultimate Soil Bearing Pressure (ULS) and Corresponding Founding Level					
	30 kPa (SLS)/ 48 kPa (ULS)		150 kPa (SLS) 250 kPa (ULS)		250 kPa (SLS) 400 kPa (ULS)	
	Depth (m)	El. (m)	Depth (m)	El. (m)	Depth (m)	El. (m)
1	-	-	1.2 or +	333.3 or -	3.0 or +	331.5 or -
2	1.2 or +	333.5 or -	-	-	6.2 or +	328.5 or -
3	1.6 or +	333.8 or -	-	-	4.6 or +	330.8 or -
4	-	-	1.2 or +	334.5 or -	3.2 or +	332.5 or -
5	1.6 or +	334.7 or -	-	-	4.6 or +	331.7 or -
6	-	-	1.2 or +	335.5 or -	2.4 or +	334.3 or -
7	-	-	-	-	1.6 or +	335.0 or -
8	-	-	1.6 or +	335.6 or -	2.4 or +	334.8 or -

The total and differential settlements of the footings designed using the SLS values are estimated to be 25 mm and 15 mm, respectively.

The foundations exposed to weathering and in unheated areas should have at least 1.2 m of earth cover for protection against frost action or must be properly insulated.

Due to the depth of weak soil condition encountered in boreholes 2, 3 and 5, ground improvement techniques can be considered for these areas which will improve the soil bearing capacity to allow for normal footing design. Additional investigation may be necessary under the direction of ground improvement design consultants.

The footing subgrade should be inspected by a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer, to ensure that the revealed conditions are compatible with the foundation design requirements.



The foundations must meet the requirements specified by the latest Ontario Building Code, and the buildings must be designed to resist a minimum earthquake force using Site Classification 'D' (stiff soil).

6.2 **Slab-On-Grade**

Slab-on-grade should be placed on well compacted inorganic earth fill or sound natural soils. After fine grading, the subgrade should be inspected and assessed by proof-rolling prior to slab-on-grade construction. Soft or loose subgrade and any weathered soil should be subexcavated, sorted free of any deleterious material, aerated and uniformly compacted to 98% or + of its maximum Standard Proctor dry density.

The slab should be constructed on a granular base, 20 cm thick, consisting of 19-mm Crusher-Run Limestone, or equivalent, compacted to its maximum Standard Proctor dry density.

A Modulus of Subgrade Reaction of 25 MPa/m can be used for the design of the floor slab on sound natural soils.

The exterior grading must be such that water is directed away from the building envelope.

6.3 **Underground Services**

The subgrade for the underground services should consist of sound natural soils or compacted organic-free earth fill. Where weathered, loose or soft soils are encountered, these materials must be subexcavated and replaced with properly compacted inorganic soils or bedding material.

A Class 'B' bedding, consisting of compacted 19-mm Crusher-Run Limestone, is recommended for the construction of the underground services. In water bearing soils, a Class 'A' bedding should be considered. The sewer joints should be leak-proof or wrapped with an appropriate waterproof membrane to prevent subgrade migration.

In order to prevent pipe floatation when the sewer trench is deluged with water, a soil cover with a thickness equal to the diameter of the pipe should be in place at all times after completion of the pipe installation.



Openings to subdrains and catch basins should be shielded with a fabric filter to prevent blockage by silting.

6.4 **Backfilling in Trenches and Excavated Areas**

The on site inorganic soils are suitable for trench backfill. The backfill in the trenches should be compacted to at least 95% of its maximum Standard Proctor dry density, and increased to 98% or + below the floor slab. In the zone within 1.0 m below the pavement subgrade, the material should be compacted with the water content 2% or 3% drier than the optimum, and the compaction should be increased to 98% of the respective maximum Standard Proctor dry density. This is to provide the required stiffness for pavement construction. In the lower zone, the compaction should be carried out on the wet side of the optimum; this allows a wider latitude of lift thickness.

In normal construction practice, the problem areas of settlement largely occur adjacent to manholes, catch basins, services crossings, columns and foundation walls. In areas which are inaccessible to a heavy compactor, sand backfill should be used. Unless compaction of the backfill is carefully performed, the interface of the natural soils and sand backfill will have to be flooded for a period of several days.

The narrow trenches for services crossings should be cut at 1 vertical:2 or + horizontal so that the backfill can be effectively compacted. Otherwise, soil arching in the trenches will prevent achievement of the proper compaction. The lift of each backfill layer should either be limited to a thickness of 20 cm, or the thickness should be determined by test strips.

One must be aware of possible consequences during trench backfilling and exercise caution as described below:

- When construction is carried out in freezing winter weather, allowance should be made for these following conditions. Despite stringent backfill monitoring, frozen soil layers may inadvertently be mixed with the structural trench backfill. Should the in situ soil have water content on the dry side of the optimum, it would be impossible to wet the soil due to the freezing condition, rendering difficulties in obtaining uniform and proper compaction. Furthermore, the freezing condition will prevent flooding of the backfill when it is required, such as when the trench box is removed. The above will invariably cause backfill settlement that may become evident within 1 to several years, depending on the depth of the trench which has been backfilled.



- In areas where the underground service construction is carried out during the winter months, prolonged exposure of the trench walls will result in frost heave within the soil mantle of the walls. This may result in some settlement as the frost recedes, and repair costs will be incurred prior to the final surfacing of the new pavement.
- To backfill a deep trench, one must be aware that future settlement is to be expected, unless the side of the cut is flattened to at least 1 vertical:1.5+ horizontal, and the lifts of the fill and its moisture content are stringently controlled; i.e., lifts should be no more than 20 cm (or less if the backfilling conditions dictate) and uniformly compacted to achieve at least 95% of the maximum Standard Proctor dry density, with the moisture content on the wet site of the optimum.
- It is often difficult to achieve uniform compaction of the backfill in the lower vertical section of a trench which is an open cut or is stabilized by a trench box, particularly in the sector close to the trench walls or the sides of the box. These sectors must be backfilled with sand. In a trench stabilized by a trench box, the void left after the removal of the box will be filled by the backfill. It is necessary to backfill this sector with sand, and the compacted backfill must be flooded for 1 day, prior to the placement of the backfill above this sector, i.e., in the upper sloped trench section. This measure is necessary in order to prevent consolidation of inadvertent voids and loose backfill, which will compromise the compaction of the backfill in the upper section. In areas where groundwater movement is expected in the sand fill mantle, anti-seepage collars should be provided.

6.5 **Pavement Design**

Based on the borehole findings, the recommended pavement design is presented in Table 3.

Table 3 - Pavement Design

Course	Thickness (mm)	OPS Specifications
Asphalt Surface	40	HL-3
Asphalt Binder	50	HL-8
Granular Base	150	19-mm Crusher-Run Limestone or equivalent
Granular Sub-base Light-Duty Heavy-Duty	200 300	50-mm Crusher-Run Limestone or equivalent



In preparation of the subgrade, all the loose material must be removed, and the subgrade surface should be proof-rolled; any soft subgrade, organics and deleterious materials within 1.0 m below the underside of the granular sub-base should be subexcavated and replaced by properly compacted organic-free earth fill or granular material.

All the granular bases should be compacted to their maximum Standard Proctor dry density.

Earth fill to raise the grade for pavement construction should consist of organic-free soil uniformly compacted to 98% or + of its maximum Standard Proctor dry density.

The subgrade in the zone within 1.0 m below the underside of the granular sub-base should be compacted to at least 98% of its maximum Standard Proctor dry density, with a moisture content 2% to 3% drier than its optimum.

Along the perimeter and at ramp-down driveways where surface runoff may drain onto the pavement, or water may seep into the granular bases, a swale or an intercept subdrain system should be installed. Subdrains, consisting of filter-sleeved weepers, should also be installed 0.3 m below the granular sub-base, and they should be connected to the catch basins and storm manholes in the paved areas and backfilled with free-draining granular material.

6.6 **Soil Parameters**

The recommended soil parameters for the project design are given in Table 4.

Table 4 - Soil Parameters

<u>Unit Weight and Bulk Factor</u>			
	<u>Unit Weight (kN/m³)</u>	<u>Estimated Bulk Factor</u>	
	Bulk	Loose	Compacted
Disturbed Soil	20.5	1.20	1.00
Silty Clay	20.5	1.30	1.00
Silt and Sand	20.5	1.25	1.00

**Table 4 - Soil Parameters (cont'd)**

<u>Lateral Earth Pressure Coefficients</u>			
	Active K_a	At Rest K_o	Passive K_p
Disturbed Soil and Silty Clay	0.40	0.56	2.56
Silt	0.33	0.50	3.00
Sand	0.30	0.46	3.39

6.7 **Excavation**

Excavation should be carried out in accordance with Ontario Regulation 213/91.

For excavation purposes, the types of soils are classified in Table 5.

Table 5 - Classification of Soils for Excavation

Material	Type
Disturbed Soil, Silty Clay, weathered Soil, Silt and Sand above groundwater	3
Silt and Sand below groundwater	4

The groundwater yield from the silty clay, due to its low permeability, will be small and limited and can be controlled by pumping from sumps. The groundwater yield, if encountered from the silt and sand is expected to be moderate to appreciable. Further hydrogeological study may be necessary for excavations extending below the groundwater level.


Prospective contractors must be asked to assess the in situ subsurface conditions for soil cuts by digging test pits to at least 0.5 m below the intended bottom of excavation. These test pits should be allowed to remain open for a period of at least 4 hours to assess the trenching conditions.




7.0 **LIMITATIONS OF REPORT**

This report was prepared by Soil Engineers Ltd. for the account of Town of Whitchurch-Stouffville, and for review by their designated agents, financial institutions, and government agencies. Use of the report is subject to the conditions and limitations of the contractual agreement. The material in the report reflects the judgment of Frank Lee, P.Eng., and Bernard Lee, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, and/or any reliance on decisions to be made based on it are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

SOIL ENGINEERS LTD.


P.P.
Frank Lee, P.Eng.


Bernard Lee, P.Eng.
FL/BL



LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS	Auger sample
CS	Chunk sample
DO	Drive open (split spoon)
DS	Denison type sample
FS	Foil sample
RC	Rock core (with size and percentage recovery)
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows per each 30 cm of penetration of a 51 mm diameter, 90° point cone driven by a 63.5 kg hammer falling from a height of 76 cm.

Plotted as '—●—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 63.5 kg hammer falling from a height of 76 cm required to advance a 51 mm outer diameter drive open sampler 30 cm into undisturbed soil, after an initial penetration of 15 cm.

Plotted as '○'

WH	Sampler advanced by static weight
PH	Sampler advanced by hydraulic pressure
PM	Sampler advanced by manual pressure
NP	No penetration

SOIL DESCRIPTION

Cohesionless Soils:

<u>'N' (blows/30 cm)</u>	<u>Relative Density</u>
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

Cohesive Soils:

<u>Undrained Shear Strength (kPa)</u>	<u>'N' (blows/30 cm)</u>	<u>Consistency</u>
less than 12	less than 2	very soft
12 to 25	2 to 4	soft
25 to 50	4 to 8	firm
50 to 100	8 to 15	stiff
100 to 200	15 to 30	very stiff
over 200	over 30	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0	Field vane test in borehole; the number denotes the sensitivity to remoulding
△	Laboratory vane test

METRIC CONVERSION FACTORS

1 ft	= 0.3048 m
1 inch	= 25.4 mm
1 lb	= 0.454 kg
1 ksf	= 47.88 kPa



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JOB NO.: 2308-S043

LOG OF BOREHOLE: 1

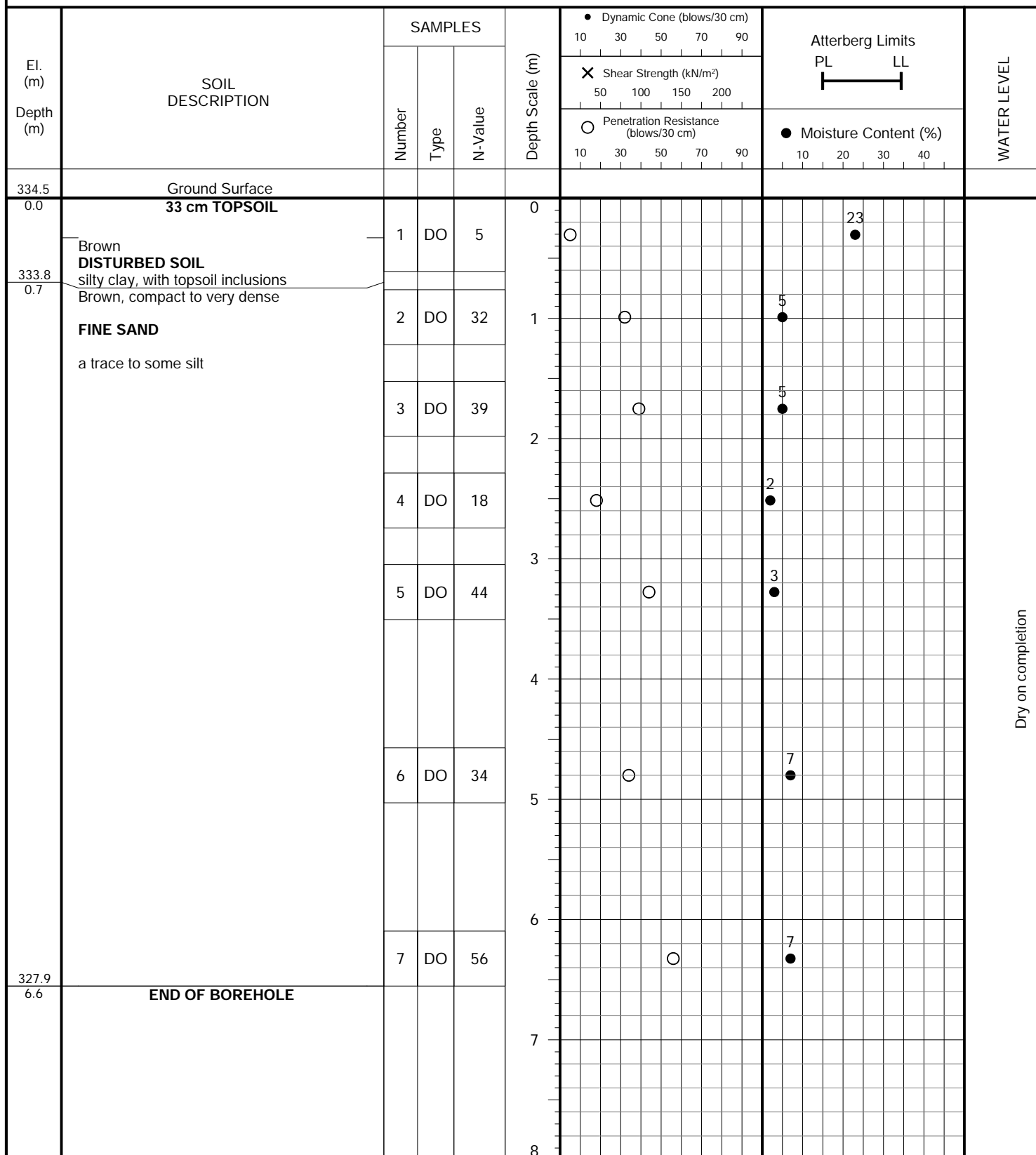
FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Land Acquisition

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 4902 Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: August 29, 2023

**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 2

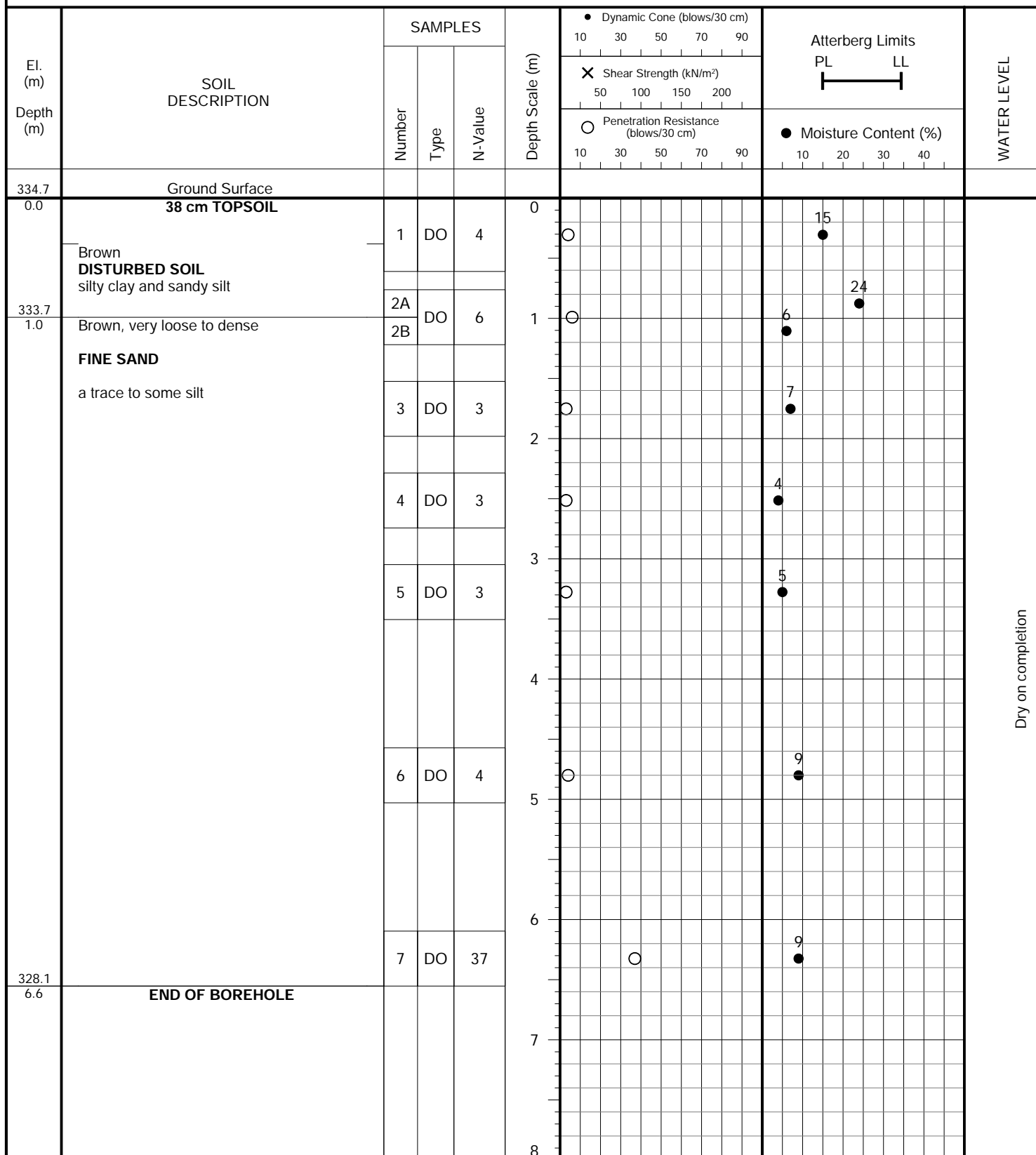
FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Land Acquisition

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 4902 Aurora Road
Town of Whitchurch-Stouffville

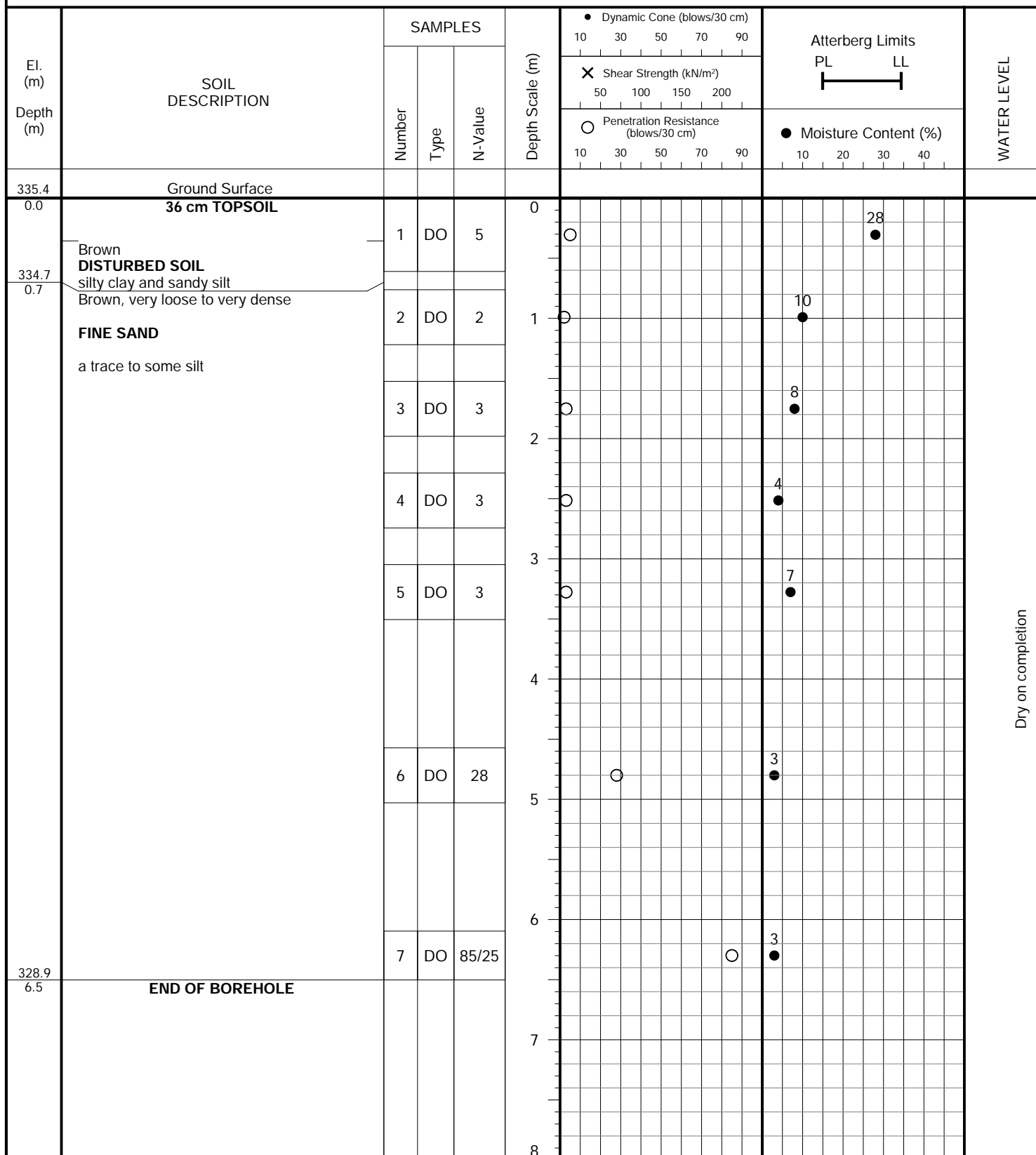
DRILLING DATE: August 30, 2023

**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 3

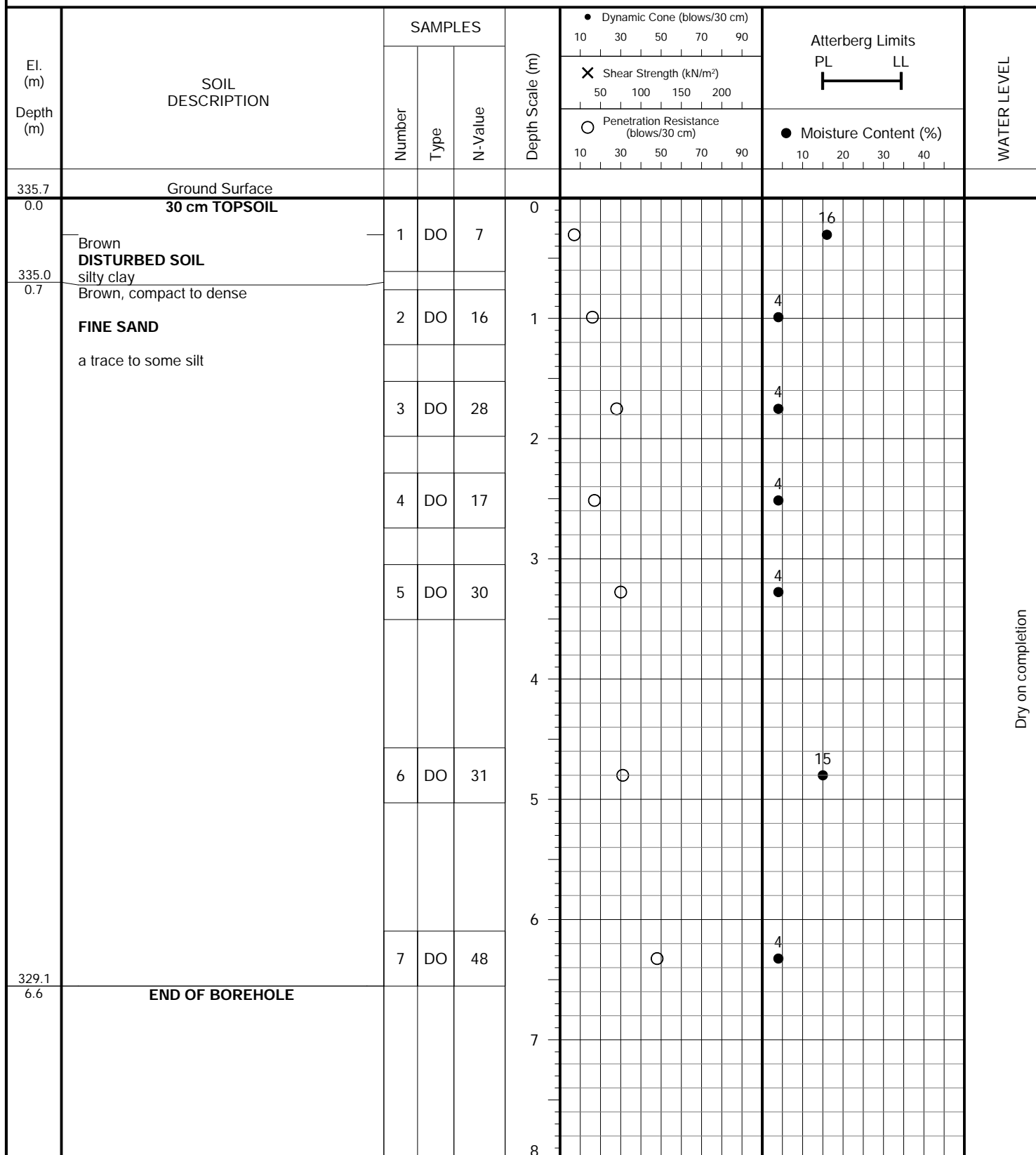
FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Land Acquisition**METHOD OF BORING:** Solid Stem Augers**PROJECT LOCATION:** 4902 Aurora Road
Town of Whitchurch-Stouffville**DRILLING DATE:** August 29, 2023**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 4

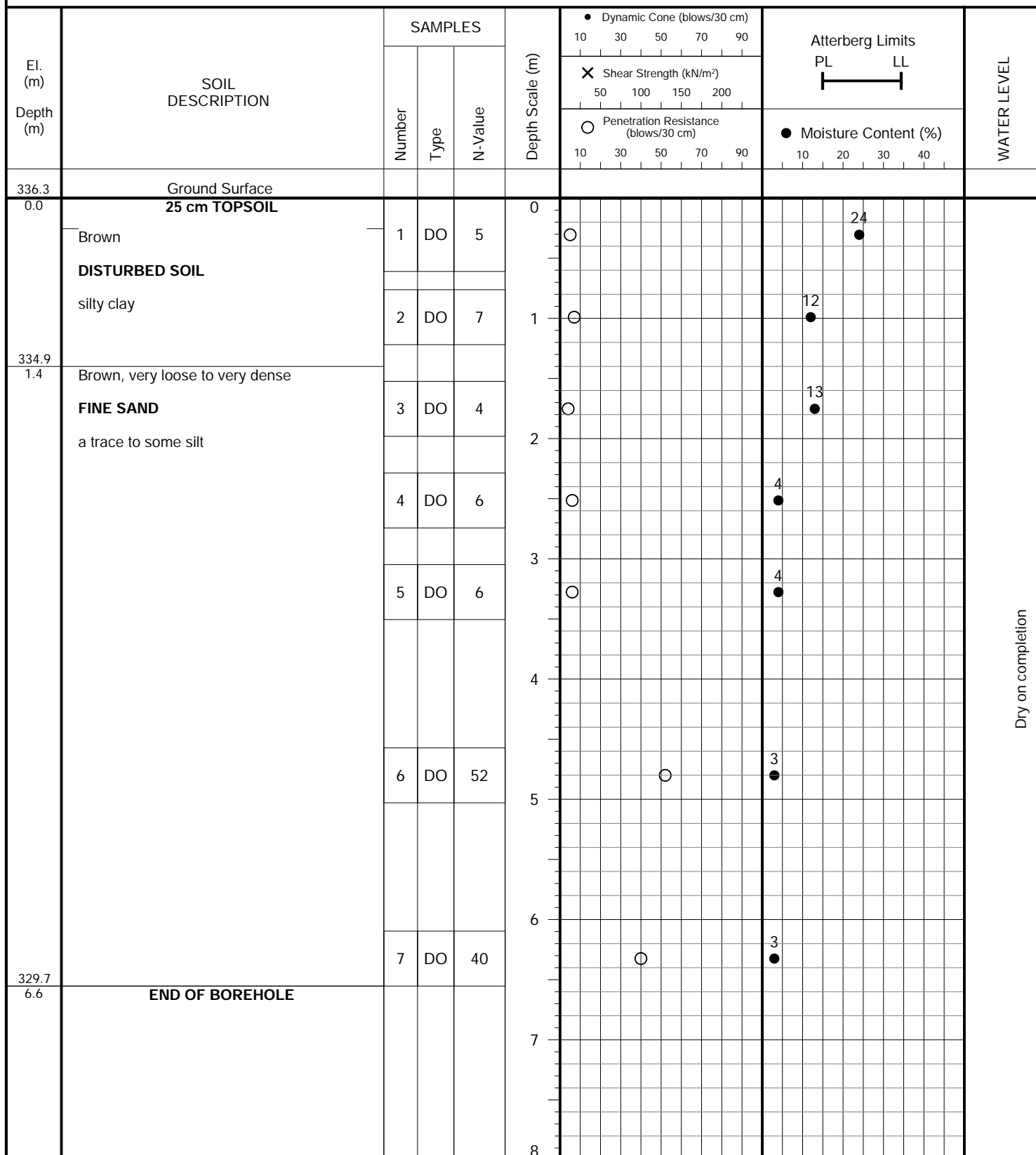
FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Land Acquisition**METHOD OF BORING:** Solid Stem Augers**PROJECT LOCATION:** 4902 Aurora Road
Town of Whitchurch-Stouffville**DRILLING DATE:** August 30, 2023**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 5

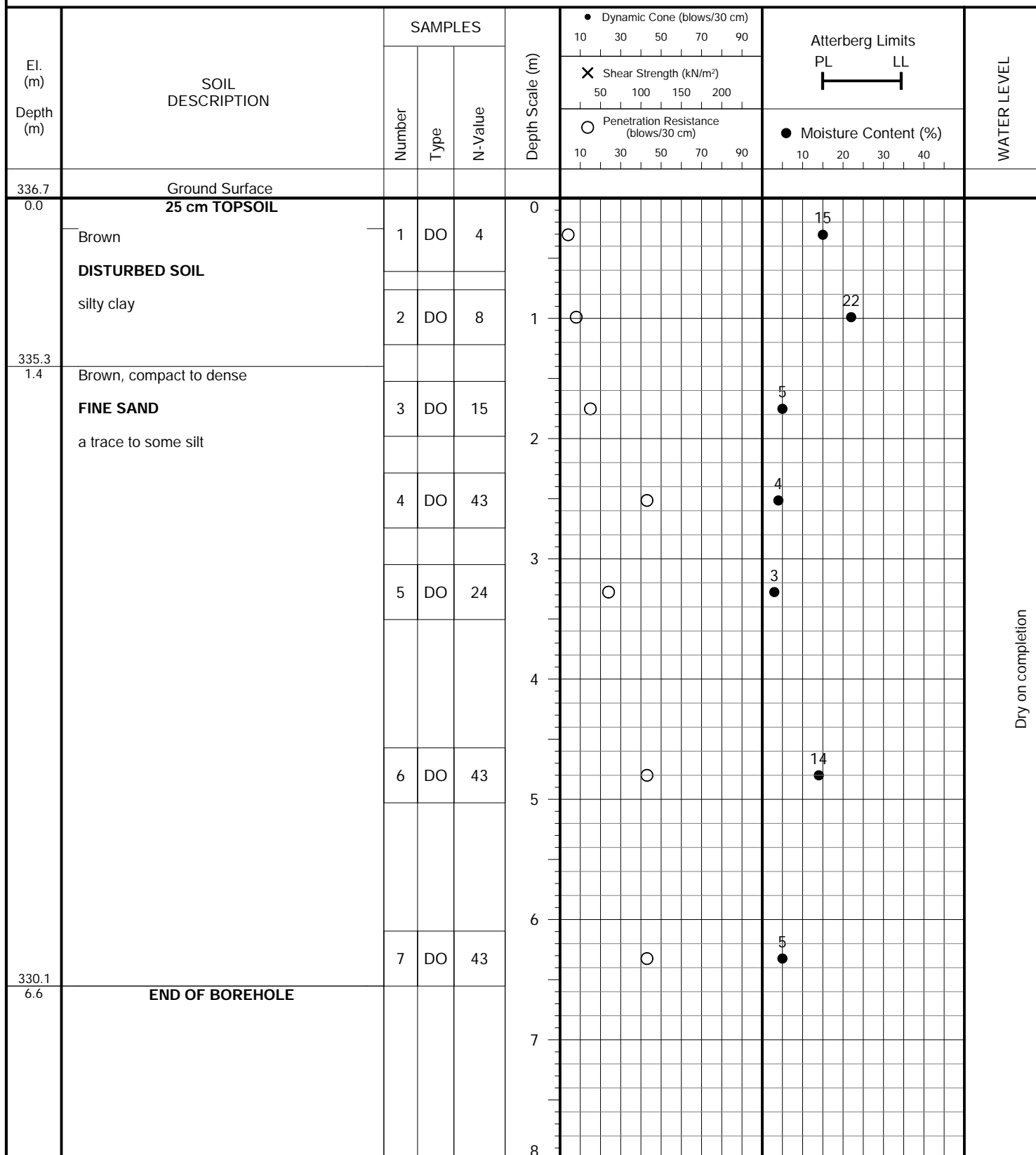
FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Land Acquisition**METHOD OF BORING:** Solid Stem Augers**PROJECT LOCATION:** 4902 Aurora Road
Town of Whitchurch-Stouffville**DRILLING DATE:** August 29, 2023**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 6

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Land Acquisition**METHOD OF BORING:** Solid Stem Augers**PROJECT LOCATION:** 4902 Aurora Road
Town of Whitchurch-Stouffville**DRILLING DATE:** August 30, 2023**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 7

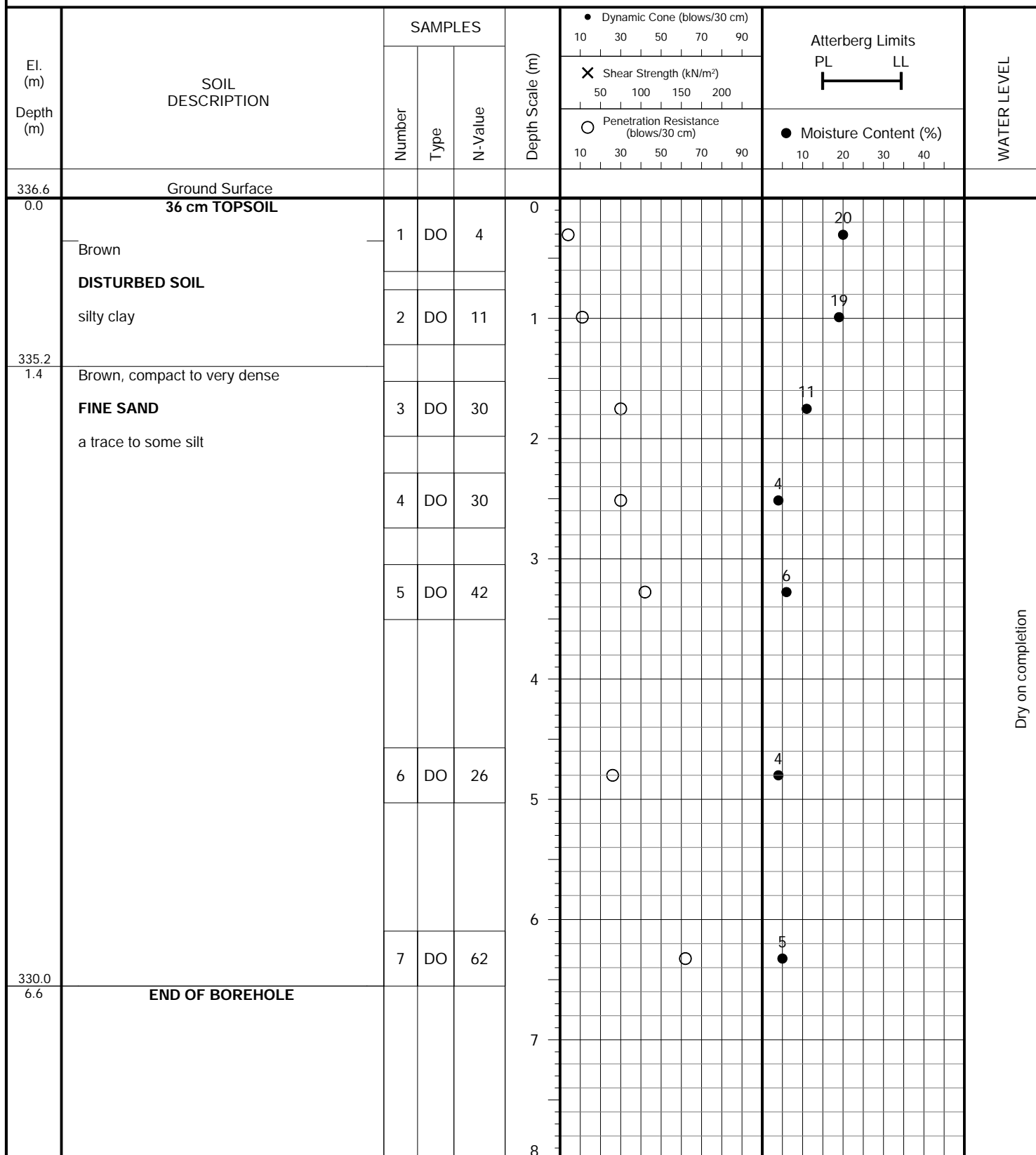
FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Land Acquisition

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 4902 Aurora Road
Town of Whitchurch-Stouffville

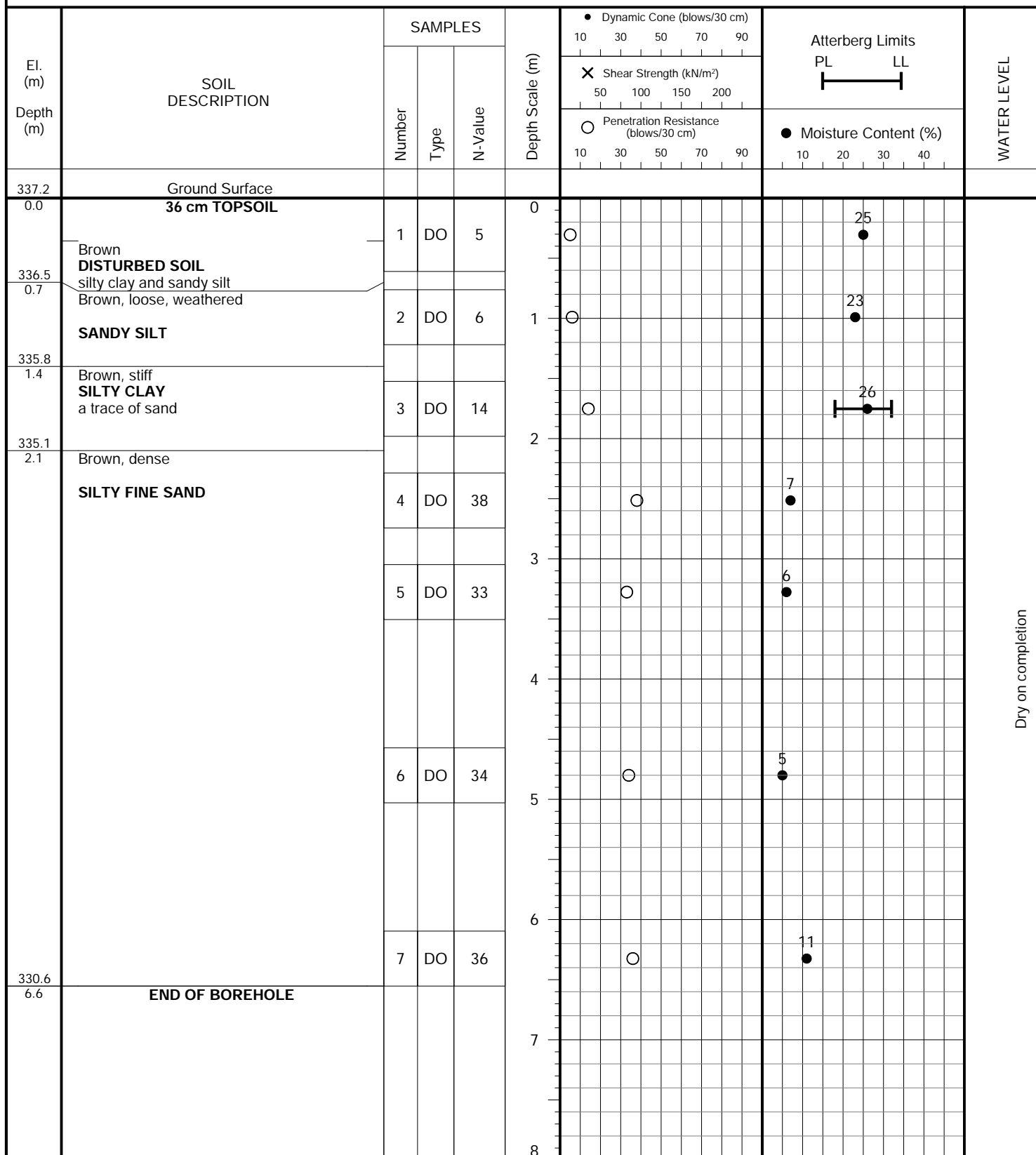
DRILLING DATE: August 29, 2023

**Soil Engineers Ltd.**

JOB NO.: 2308-S043

LOG OF BOREHOLE: 8

FIGURE NO.: 8

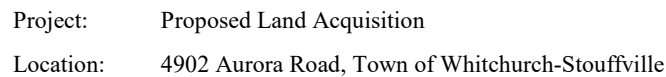
PROJECT DESCRIPTION: Proposed Land Acquisition**METHOD OF BORING:** Solid Stem Augers**PROJECT LOCATION:** 4902 Aurora Road
Town of Whitchurch-Stouffville**DRILLING DATE:** August 29, 2023**Soil Engineers Ltd.**



Reference No: 2308-S043

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Liquid Limit (%) =	32
Plastic Limit (%) =	18
Plasticity Index (%) =	14
Moisture Content (%) =	26
Estimated Permeability (cm./sec.) =	10^{-7}

Figure: 9



Soil Engineers Ltd. GRAIN SIZE DISTRIBUTION

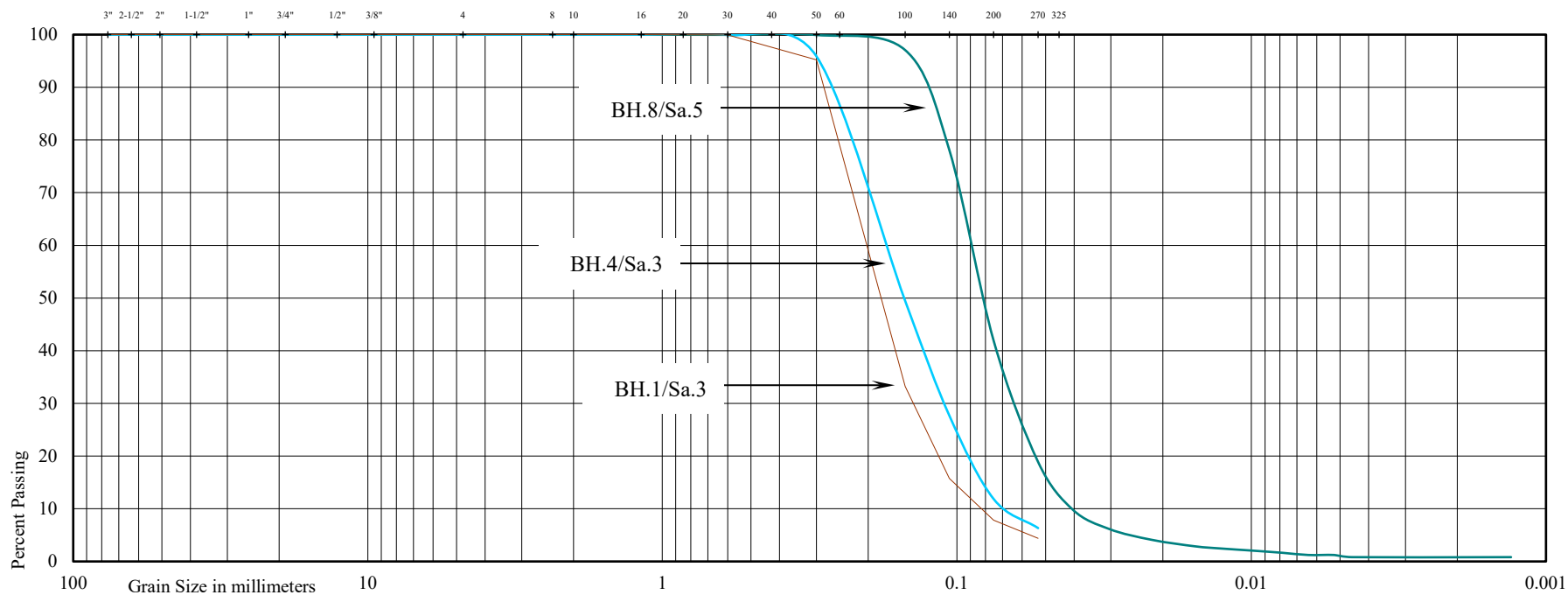
Reference No: 2308-S043

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL			SAND				SILT	CLAY
COARSE		FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Land Acquisition

Location: 4902 Aurora Road, Town of Whitchurch-Stouffville

Borehole No: 1 4 8
Sample No: 3 3 5
Depth (m): 1.7 1.7 3.3
Elevation (m): - - -

BH./Sa.	1/3	4/3	8/5
Liquid Limit (%) =	-	-	-
Plastic Limit (%) =	-	-	-
Plasticity Index (%) =	-	-	-
Moisture Content (%) =	5	4	6
Estimated Permeability (cm./sec.) =	10^{-2}	10^{-2}	10^{-3}

Classification of Sample [& Group Symbol]: BH.1/Sa.3 and BH4/Sa.3 - FINE SAND, a trace of silt
BH8/Sa.5 - SILTY FINE SAND, a trace of clay

Figure: 10

BH Location Plan

Soil Engineers Ltd
Reference No. 2308-S043
Drawing No. 1

Legend

- 4902 Aurora Rd
- BH
- Path Measure





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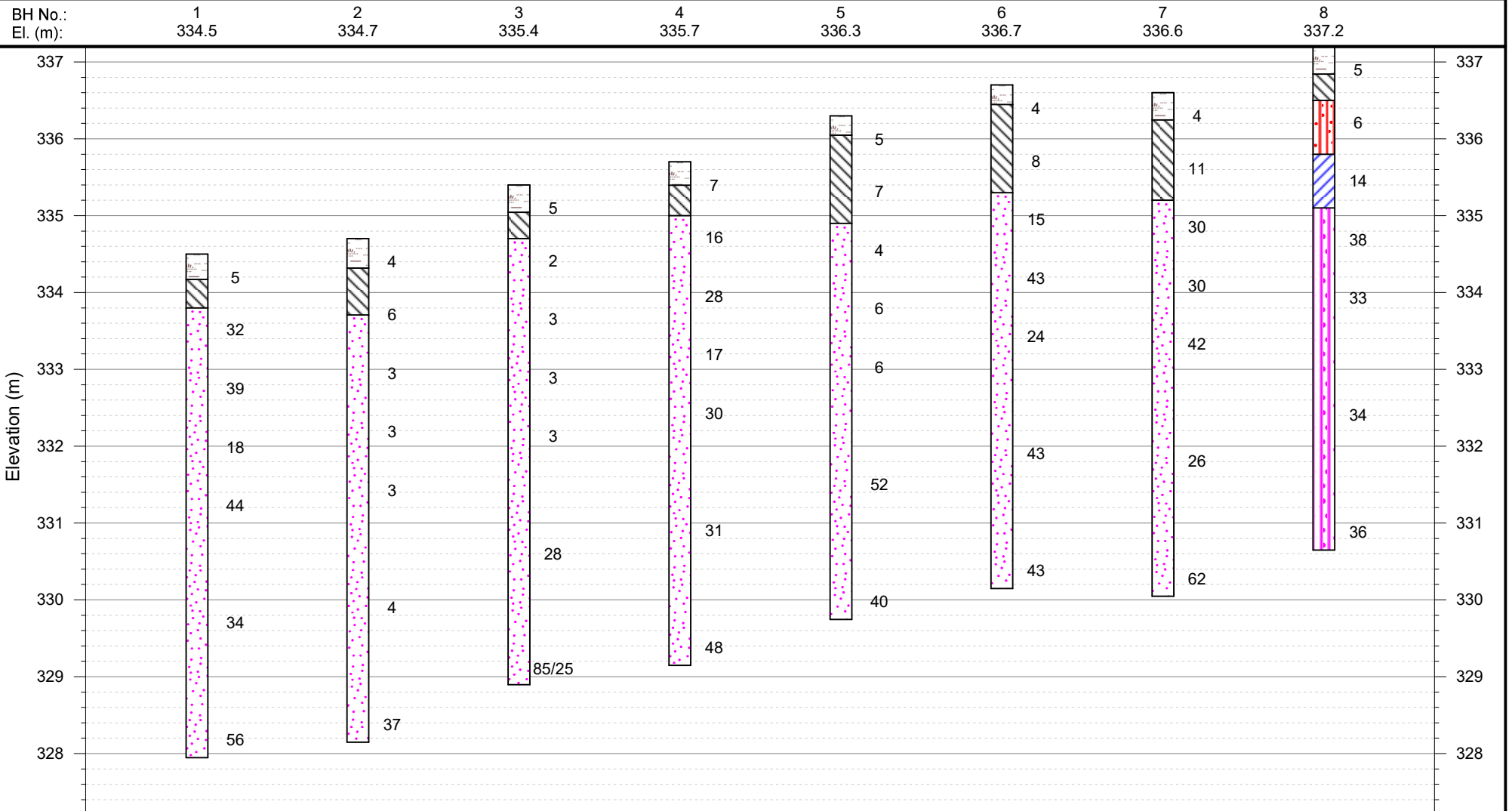
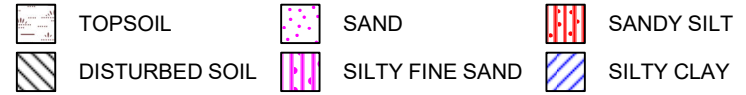
SUBSURFACE PROFILE

DRAWING NO. 2

SCALE: AS SHOWN

JOB NO.: 2308-S043
REPORT DATE: November 2023
PROJECT DESCRIPTION: Proposed Land Acquisition
PROJECT LOCATION: 4902 Aurora Road
Town of Whitchurch-Stouffville

LEGEND



To:

Chris Kubbinga

Thomas Brown Architects Inc.

197 Spadina Ave – Suite 500, Toronto, ON, M5T 2C8

Re: Fire and Paramedic Station Construction on 4902 Aurora Road - Butternut Assessment

This report describes the assessment and findings of seventeen Butternut trees at 4902 Aurora Road the Township of Whitchurch-Stouffville, that are within the potential disturbance area of the proposed construction of a fire and paramedic station. The location of the property is shown in Figure 1 and the proposed building development, construction zone and butternut locations are shown in Attachment 2. The Butternut Health Expert's Report and Butternut Data Collection Forms are attached.

Of the seventeen trees assessed, two were determined to be butternut hybrids based on field assessments. Thirteen of the assessed trees were determined to be Category 1 trees. A Category 1 tree is "affected by Butternut Canker to such an advanced degree that retaining the tree would not support the protection or recovery of Butternut trees in the area in which the tree is located". One of the assessed trees was determined to be a Category 2 tree. A Category 2 tree is "is not affected by Butternut Canker or the Butternut tree is affected by Butternut Canker but the degree to which it is affected is not as advanced as a Category 1 Butternut tree and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located". The remaining tree was determined to be a Category 3 tree. A Category 3 tree "may be useful in determining sources of resistance to Butternut canker". Trees were tagged using aluminum tree tags. A summary of the assessed trees is included in the attached Butternut Health Expert's report (KAS001) and Butternut Health Assessment Map.

Eight of the fifteen butternuts will be killed for the purposes of constructing the proposed fire and paramedic station and associated infrastructure. Of these eight trees, six were assessed as Category 1, one was assessed as Category 2, and one was assessed as Category 3. Additionally, two hybrid butternuts will be killed as a result of construction.

As less than five Category 3 and less than fifteen Category 2 butternut trees will be killed as result of construction, no replacement planting will be required, as outlined in Ontario Regulation 830/21 Section 25(3).

Sincerely,



Luke Kastelic, R.P.F.,
Consulting Forester



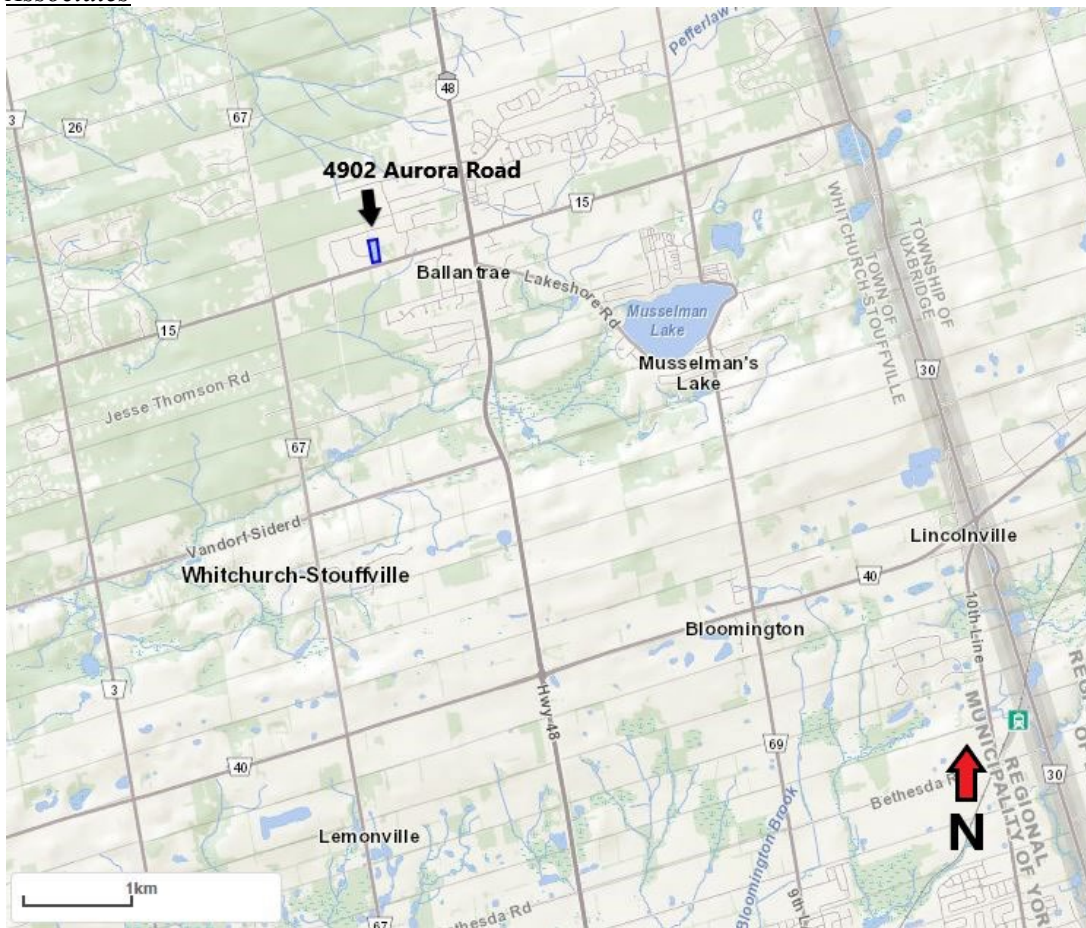


Figure 1: Property Location Map

ATTACHED:

Attachment 1: BHE Report – KAS001

Attachment 2: 4902 Aurora Road Butternut Health Assessment Map

Instructions to Butternut Health Experts (BHEs):

Please enter the 6-character BHE Report number: [KAS001](#) _____

BHE Report numbering format:

BHE Report numbers are to be assigned by the BHE using the first 3 letters of BHE's last name, followed by BHE's own 3-digit report numbering system. If the BHE's last name has fewer than 3 letters, use the full last name and numbers for the remaining characters.

Cover letter to client:

Insert your cover letter to your client here and include the below list of enclosures.

To:

Chris Kubbinga, landowner's representative

Thomas Brown Architects Inc.

197 Spadina Ave – Suite 500, Toronto, ON, M5T 2C8

Re: Fire and Paramedic Station Construction on 4902 Aurora Road - Butternut Assessment

This report describes the assessment and findings of seventeen Butternut trees at 4902 Aurora Road the Township of Whitchurch-Stouffville, that are within the potential disturbance area of the proposed construction of a fire and paramedic station. The location of the property is shown in Figure 1 and the proposed building development, construction zone and butternut locations are shown in Figure 2. The Butternut Health Expert's Report and Butternut Data Collection Forms are attached.

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As less than five Category 3 and less than fifteen Category 2 butternut trees will be killed as result of construction, no replacement planting will be required, as outlined in Ontario Regulation 830/21 Section 25(3).

Sincerely,

Luke Kastelic, R.P.F.

Consulting Forester

Enclosures:

1. Information from the Ministry of the Environment, Conservation and Parks about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Expert's Report, including the completed Butternut Data Collection Form

Species at Risk Branch
40 St. Clair Avenue West
14th Floor
Toronto ON M4V 1M2

Direction des espèces en péril
40, avenue St. Clair Ouest
14^e étage
Toronto ON M4V 1M2

Information for the Property Owner (or person(s) who requested the enclosed Butternut Health Expert's Report):

The enclosed Butternut Health Expert's Report (BHE Report) documents the results of the Butternut health assessment that was conducted by the Butternut Health Expert (BHE) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be impacted by a proposed activity that are not identified in the enclosed BHE Report, they too must be assessed by a BHE before commencing any actions that may impact those Butternut trees or their habitat.

Butternut (*Juglans cinerea*) is listed as an endangered species in Schedule 2 of Ontario Regulation (O. Reg.) 230/08 "the Species at Risk in Ontario List". As an endangered species, the *Endangered Species Act, 2007* (ESA) prohibits adversely impacting Butternut and its habitat. A permit or agreement under the ESA is required before engaging in an activity that is otherwise prohibited under the ESA. The activity may be eligible for the Butternut conditional exemption in Part V of O. Reg. 830/21, provided the requirements of the regulation are met.

If the proposed activity is eligible for the conditional exemption in Part V of O. Reg. 830/21, the next step is to submit the BHE Report and the Butternut Data Collection Form enclosed in this package to the Ministry of the Environment, Conservation and Parks (MECP).

If the enclosed BHE Report does not identify which Butternut tree(s) are proposed to be killed, harmed or taken and the reasons for doing so (e.g., if "unknown" is indicated in Table 1) or if the information in the last two columns of Table 1 has changed since the date this BHE Report was produced, **do not edit the BHE Report to update this information**. Instead, the report must be submitted together with a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed or taken (by referencing the tree identification numbers) when you submit the BHE Report to MECP.

The BHE Report must be submitted to MECP at least 30 days before registering an activity in respect of the Butternut conditional exemption. MECP may need to examine the Butternut trees subject to the report during this 30-day period. **Adversely impacting Butternut trees during this 30-day period or before registration is completed is prohibited by the ESA**. Further, the conditional exemption for Butternut does not apply unless the requirements of Part V of O. Reg. 830/21 are being followed.

If the proposed activity is eligible for the Butternut conditional exemption, you may register the proposed activity using the “**Notice of Butternut Impact**” form after the 30-day period has elapsed.

If the proposed activity is not eligible for a regulatory exemption, please contact MECP to determine whether the proposed activity would require a permit or agreement under the ESA in order to proceed.

Please retain this information and a copy of the BHE Report for your records, along with any other documentation you may receive from MECP should an examination of the trees occur.

This information should not be relied upon to determine legal obligations. To determine your legal obligations, consult the *Endangered Species Act, 2007* and the relevant regulations made thereunder. These may be found at www.ontario.ca/laws. If legal advice is required, consult a legal professional. In the event of an error on this template or a conflict between this template and any applicable law, the law prevails.

If you have any questions, please contact MECP at SAROntario@ontario.ca.

Butternut Health Expert's Report (BHE Report)

BHE Report Number: KAS001

Butternut Health Expert Contact Information

Name of Butternut Health Expert

Last Name

Kastelic

First Name

Luke

Mailing Address

Unit Number

Street Number

5369

Street Name

Wellington Road 27

PO Box

City/Town

Rockwood

Province

Ontario

Postal Code

N0B 2K0

Telephone Number

519-856-1286

Email Address

lukekastelic@gmail.com

Summary of qualifications as a Butternut Health Expert

a) expertise in relation to butternut

Attended FGCA Butternut Health Assessment Course in 2024

Assisted in several Butternut Health Assessments 2022-2024

b) expertise, education, training and experience necessary to assess the health of butternut trees

Registered Professional Forester

Bsc Forestry, University of New Brunswick

Forest Technician Diploma, Sir Sandford Fleming College

Property Owner Contact Information

Name of Property Owner (or representative)

Last Name

Kubbinga

First Name

Chris

Mailing Address

Unit Number

500

Street Number

197

Street Name

Spadina Avenue

PO Box

Lot Number

Concession

Township

Rural Route

City/Town

Toronto

Province

Ontario

Postal Code

M5T 2C8

Telephone Number

416-364-5710

Email Address

chris@tbrownarch.com

Site Location

Unit Number

Street Number

4902

Street Name

Aurora Road

PO Box

Lot Number

Concession

Township

Rural Route

City/Town

Whitchurch-Stouffville

Province

Ontario

Postal Code

L4A 7X4

Additional Site Location Information

Date(s) of Butternut health assessment

Start Date (yyyy/mm/dd) 2024/08/14

End Date (yyyy/mm/dd) 2024/08/14

Date BHE Report prepared (yyyy/mm/dd) 2024/08/14

Map datum used: ☐ NAD83 ☒ WGS84

Total number of trees assessed in this BHE Report 17

The assessed trees were numbered on site using Aluminum tree tags

The numbers at the site correspond to the tree identification numbers referenced in this report.

This BHE Report includes the following tables:

- Table 1: Butternut trees assessed by the BHE
- Table 2: Trees determined by the BHE to be Butternut hybrids
- Table 3: Summary of Butternut health assessment results

Table 1: Butternut trees assessed by the BHE

Tree ID #	UTM coordinates	Accuracy (+/-)	Category ¹ (1, 2 or 3)	Tree stem diameter ² (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown ³)	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
752	635505 mE, 4877223 mN	5 m	1	4	Yes	No	killed	
753	635499 mE, 4877243 mN	5 m	2	17	No	No	killed	
754	635504 mE, 4877258 mN	5 m	3	21	No	No	killed	
755	635489 mE, 4877352 mN	5 m	1	2	Yes	No		
756	635474 mE, 4877375 mN	5 m	1	16	No	No		
757	635473 mE, 4877391 mN	5 m	1	30	No	No		
758	635473 mE, 4877398 mN	5 m	1	52	No	No		
759	635534 mE, 4877427 mN	5 m	1	22	No	No		
760	635540 mE, 4877404 mN	5 m	1	7	No	No		
761	635547 mE, 4877409 mN	5 m	1	40	No	No		

Tree ID #	UTM coordinates	Accuracy (+/-)	Category ¹ (1, 2 or 3)	Tree stem diameter ² (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown ³)	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
762	635537 mE 4877379 mN	5 m	1	4	No	No	killed	
763	635560 mE, 4877313 mN	5 m	1	35	No	No	killed	
765	635559 mE, 4877303 mN	5 m	1	5	Yes	No	killed	
766	635518 mE, 4877288 mN	5 m	1	14	No	No	killed	
767	635520 mE, 4877364 mN	5 m	1	50	No	No	killed	

¹ Details regarding the extent to which the tree is affected by Butternut Canker is presented in the Butternut Data Collection Form that accompanies this BHE Report.

² Diameter of the tree stem rounded to nearest cm, measured in accordance with the Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*

³ In this column, “unknown” indicates that at the time of assessment and reporting, there are no proposals to kill, harm or take this tree that are known to the BHE.

Table 2: Trees determined by the BHE to be Butternut hybrids

Tree ID #	UTM coordinates	Method used (genetic testing or field identification)	Additional Comments on Method Used
751	635505mE, 4877209 mN	field identification	
764	635557 mE, 4877314 mN	field identification	

Table 3: Summary of Butternut health assessment results

Result	Total number of trees in this category	Information for persons planning activities that may impact Butternut
Category 1	13	<ul style="list-style-type: none"> Category 1 Butternut tree — the Butternut tree is affected by Butternut Canker to such an advanced degree that retaining the tree would not support the protection or recovery of Butternut trees in the area in which the tree is located. If the proposed activity will kill, harm or take one or more Butternut trees of any category (including Category 1), the BHE Report must be submitted to MECP at SARontario@ontario.ca.

Result	Total number of trees in this category	Information for persons planning activities that may impact Butternut
Category 2	1	<ul style="list-style-type: none"> Category 2 Butternut tree — the Butternut tree is not affected by Butternut Canker or the Butternut tree is affected by Butternut Canker but the degree to which it is affected is not as advanced as a Category 1 Butternut tree and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located. Activities that may kill, harm or take up to a maximum of fifteen (15) Category 2 trees may be eligible for the conditional exemption in Part V of Ontario Regulation 830/21. Refer to the regulation for eligibility conditions and requirements that must be fulfilled. If the proposed activity will kill, harm or take more than fifteen (15) Category 2 trees, contact MECP for information on how to seek an ESA authorization (e.g., a permit).
Category 3	1	<ul style="list-style-type: none"> Category 3 Butternut tree — the Butternut tree may be useful in determining sources of resistance to Butternut Canker. Activities that may kill, harm or take up to a maximum of five (5) Category 3 trees may be eligible for the conditional exemption in Part V of Ontario Regulation 830/21. Refer to the regulation for eligibility conditions and requirements that must be fulfilled. If the proposed activity will kill, harm or take more than five (5) Category 3 trees, contact MECP for information on how to seek an ESA authorization (e.g., a permit).
Cultivated	0	<ul style="list-style-type: none"> An activity that will kill, harm or take a cultivated Butternut tree that was required to be planted to fulfil a condition of an ESA permit or agreement, or a conditional exemption, is not eligible for the exemption for cultivated trees that is provided by subsection 25 (5) of O. Reg. 830/21. Refer to the regulation for eligibility conditions.
Hybrid	2	<ul style="list-style-type: none"> Hybrid Butternut trees are not protected under the ESA but impacts to these trees may be subject to local municipal by-laws and other legislation.

Additional Information on Cultivated Tree Determination

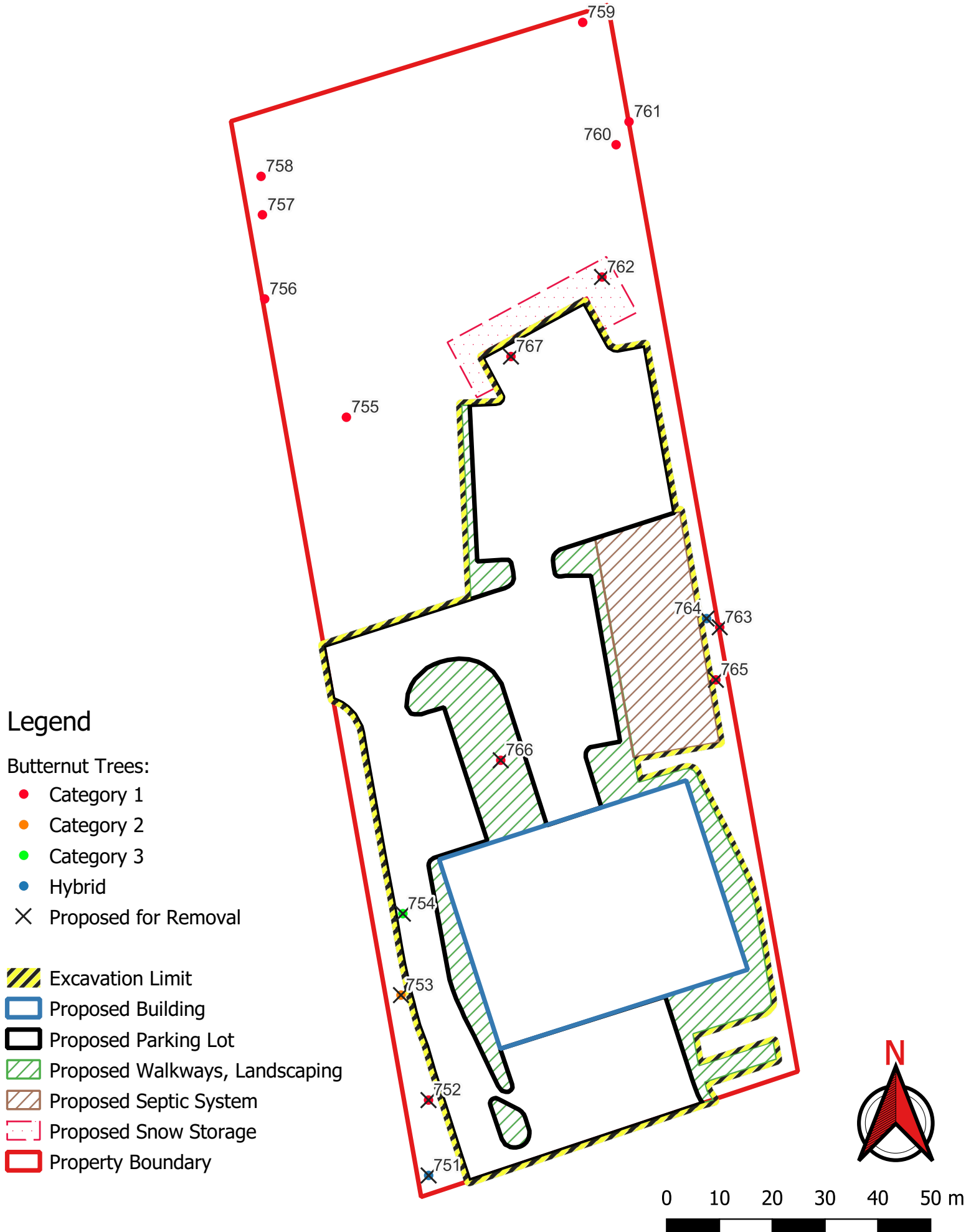
Please note:

- A BHE Report that is submitted to MECP must include the completed Butternut Data Collection Form. As appropriate, please also ensure additional relevant documentation to support the assessment (e.g., completed Data Sheets for Field Identification of Butternut Hybrids, evidence that the Butternut was cultivated) and all relevant maps and photographs are provided.
- During the 30-day period that follows the submission of this BHE Report to MECP, no Butternut trees (of any category) may be killed, harmed or taken. MECP may need to examine the Butternut trees subject to the report during this 30-day period.

Butternut Health Expert's Comments

Note to BHEs: use this space to provide general comments.

4902 Aurora Road - Butternut Health Assessment Map



**STORMWATER MANAGEMENT BRIEF
FOR A PROPOSED FIRE STATION AND YORK REGION PRS STATION
4902 AURORA ROAD, WHITCHURCH-STOUFFVILLE, ONTARIO**

March 2025

Prepared for:
Township of Whitchurch-Stouffville
111 Sandiford Drive
Stouffville, Ontario, L4A 0Z8

Prepared by:
Politis Engineering Ltd.
981 Greenwood Avenue
Toronto, Ontario, M4J 4C7
Tel (416) 429-8645 Fax (416) 429 -8951

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Drawing No. 101	Site Servicing Plan, prepared by PEL, dated March 31, 2025
Drawing No. 102	Site Grading Plan, prepared by PEL, dated March 31, 2025
Drawing No. 103	Storm Drainage Plan, prepared by PEL, dated March 31, 2025
Drawing No. 104	Erosion & Sedimentation Control Plan, prepared by PEL, dated March 31, 2025

REFERENCES

- Town of WS Fire Station & York Region PRS Site Plan, prepared by Thomas Brown Architect Inc., dated March 3, 2025
- Geotechnical Investigation, Whitchurch-Stouffville and York Region Combined Fire Station / Paramedic, 4902 Aurora Road, Whitchurch-Stouffville, Ontario, prepared by Patriot Engineering Ltd., dated July 26, 2024
- Surveyor's Real Property Report Part 1 – Plan of Survey of Part of Lot 21 Concession 7, Town of Whitchurch-Stouffville, Regional Municipality of York, prepared by Mandarin Surveyors Ltd., dated December 26, 2023

1.0 INTRODUCTION

Politis Engineering Ltd. (“PEL”) has been retained by Thomas Brown Architects (“the Architect”) to prepare a Stormwater Management (SWM) Brief for the proposed development located at 4902 Aurora Road, within the Township of Whitchurch-Stouffville (“the Town”). The proposed development consists of the construction of a municipal fire station and York Region Paramedic Response Station (“PRS”). This report addresses the stormwater management requirements for the site, including quantity and quality controls, water balance, and erosion control.

1.1 Site Description

The subject site has a total area of 1.536 hectares and is located on the north side of Aurora Road and is situated to the east of McCowan Road and west of Highway 48. It is bordered by residential estate dwellings to the north and west, while to the east there is a residential dwelling and a large swath of undeveloped land. The site has frontage on Aurora Road to the south and the cul-de-sac end of Ballyview Court abuts to the west. The site location can be seen in **Figure 1** below.

The property is occupied by an existing 1-storey residential dwelling with an asphalt driveway and a metal and a wooden shed. The topography of the subject property generally drains from northeast to southwest with an elevation difference ranging from approximately 339.0 m at the northeast to approximately 333.4 m at the southwest.

Aurora Road is a rural road and there is currently a ditch running along the north shoulder which conveys storm drainage. Additionally, it is estimated that an external area of 5.4 ha currently drains through the property and to the existing ditch on Aurora Road. All this runoff enters an existing 400 mm CSP culvert located in the road allowance just south of the site, which conveys water to the South side of Aurora Road, where it drains uncontrolled further south.

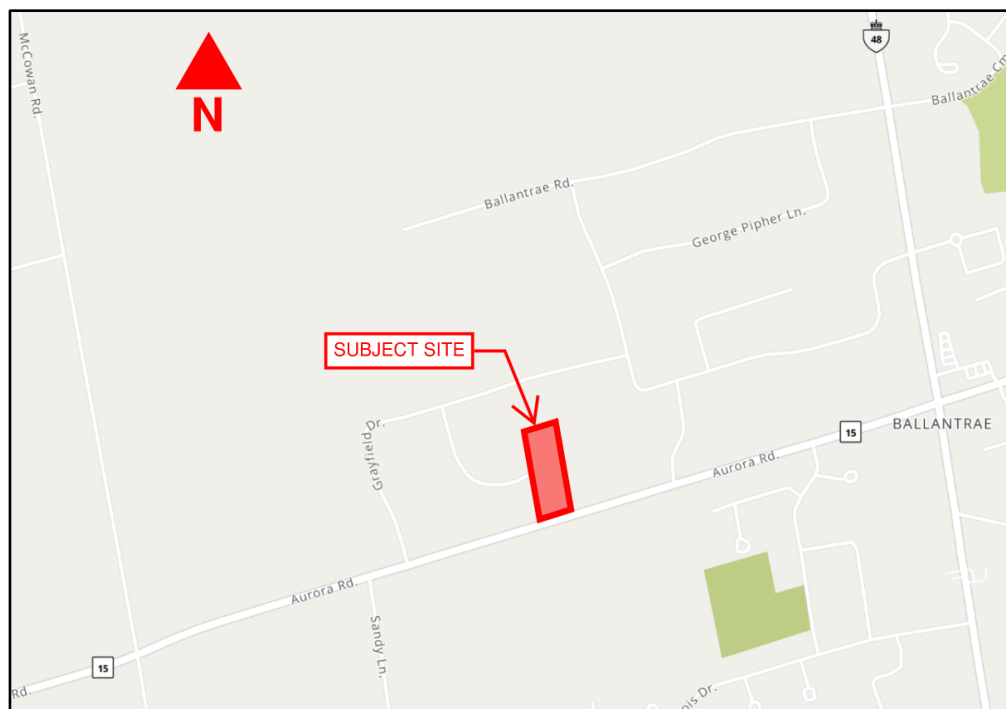


Figure 1 – Key Plan (Not to Scale)

1.2 Proposed Development

The proposed development consists of the construction of a slab-on-grade Fire Hall and PRS building with a footprint area of 1730.7 sq.m., including at-grade paved areas for parking. There will be driveway entrances to the site from Aurora Road to the south and Ballyview Court to the west.

Further site details can be found in the architectural plans prepared by Thomas Brown Architects Inc., dated March 3a, 2025.

2.0 EXISTING MUNICIPAL INFRASTRUCTURE

According to Town and York Region (the “Region”) records, there is no existing storm sewer system in the vicinity of the subject site. There are existing roadside ditches along the municipal rights-of-way (ROWs) flanking the property which convey storm discharge to the appropriate outlet locations. There is an existing 400 mm diameter CSP culvert with a slope of 1.0% that conveys drainage from the site under Aurora Road and outlets to the south of Aurora Road.

The Region has indicated that the existing 400 mm diameter CSP culvert will be replaced by a 750 mm diameter HDPE culvert in the future.

3.0 STORMWATER REQUIREMENTS

The subject site is located within the jurisdiction of the Lake Simcoe Region Conservation Authority (LSRCA). As such, the stormwater management design for the proposed development will comply with the Town of Whitchurch-Stouffville Design Guidelines and Standard Drawings (January 2023), the LSRCA Technical Guidelines for Stormwater Management Submissions (April 2022), Region of York Design Criteria and the latest Ontario Building Code (OBC).

The stormwater management criteria that are met by the proposed development is summarized below:

Quantity Control:	The post-development peak flow rates are not to exceed the corresponding pre-development peak flow rates for the 2- to 100-year design storm event.
Quality Control:	Provide 80% Total Suspended Solids (TSS) removal based on MOE (2003) Guidelines.
Erosion Control:	Capture, retain, or detain the 25 mm rainfall event from all new and/or fully reconstructed impervious surfaces.
Water Balance:	Retention, detention, or infiltration of the first 5 mm of runoff from impervious surfaces.

4.0 PRE-DEVELOPMENT SITE CONDITIONS

There is no existing private storm infrastructure on or surrounding the site. All existing drainage from the site drains to the existing 400 mm diameter CSP culvert within the road allowance directly to the south. There is a total of 5.4 ha of external area that traverses the site which is also conveyed through the existing culvert and outlets on the south side of Aurora Road.

4.1 Pre-Development Runoff Coefficient

The pre-development runoff coefficient for the site has been calculated in **Table 1**, based on existing surface delineations from the topographic survey (prepared by Mandarin Surveyors Limited, dated December 26, 2023) and aerial photography (orthophoto mapping) from FirstBase Solutions Inc. A Pre-Development Figure illustrating the existing surfaces is provided as **Figure 2**.

Table 1 – Pre-Development Runoff Coefficient

Description	Area (ha)	Runoff Coeff.	C x A
Impervious Roof	0.024	0.90	0.022
Impervious At-Grade	0.052	0.90	0.046
Landscape	1.460	0.20	0.292
Totals =	1.536		0.360
Composite Runoff Coefficient =		0.23	

The existing 1.536 ha site has a pre-development runoff coefficient of 0.23.

4.2 Pre-Development Peak Flows

The pre-development peak flows for site have been calculated using the Modified Rational Method equation:

$$Q = 2.78 \times A \times I \times R$$

where,

Q = Flow (L/s)

A = Area (ha)

I = rainfall intensity (mm/hr)

R = Runoff Coefficient (-)

The allowable release rates based on the Rational Method for the 2- through 100-year storm events for the subject site are summarized in **Table 2** below.

Table 2 – Pre-Development Peak Flows

Storm Return Period	Intensity i (mm/hr)	Area A (ha)	Runoff C Coeff. (-)	Peak Flow Q (L/s)
2	77.67	1.536	0.23	77.7
5	107.00	1.536	0.23	107.0
10	126.19	1.536	0.23	126.2
25	150.60	1.536	0.26	165.7
50	169.09	1.536	0.28	203.0
100	186.74	1.536	0.29	233.5

Post-Development flows will be controlled to the allowable release rates for the 2- through 100-year storm events.

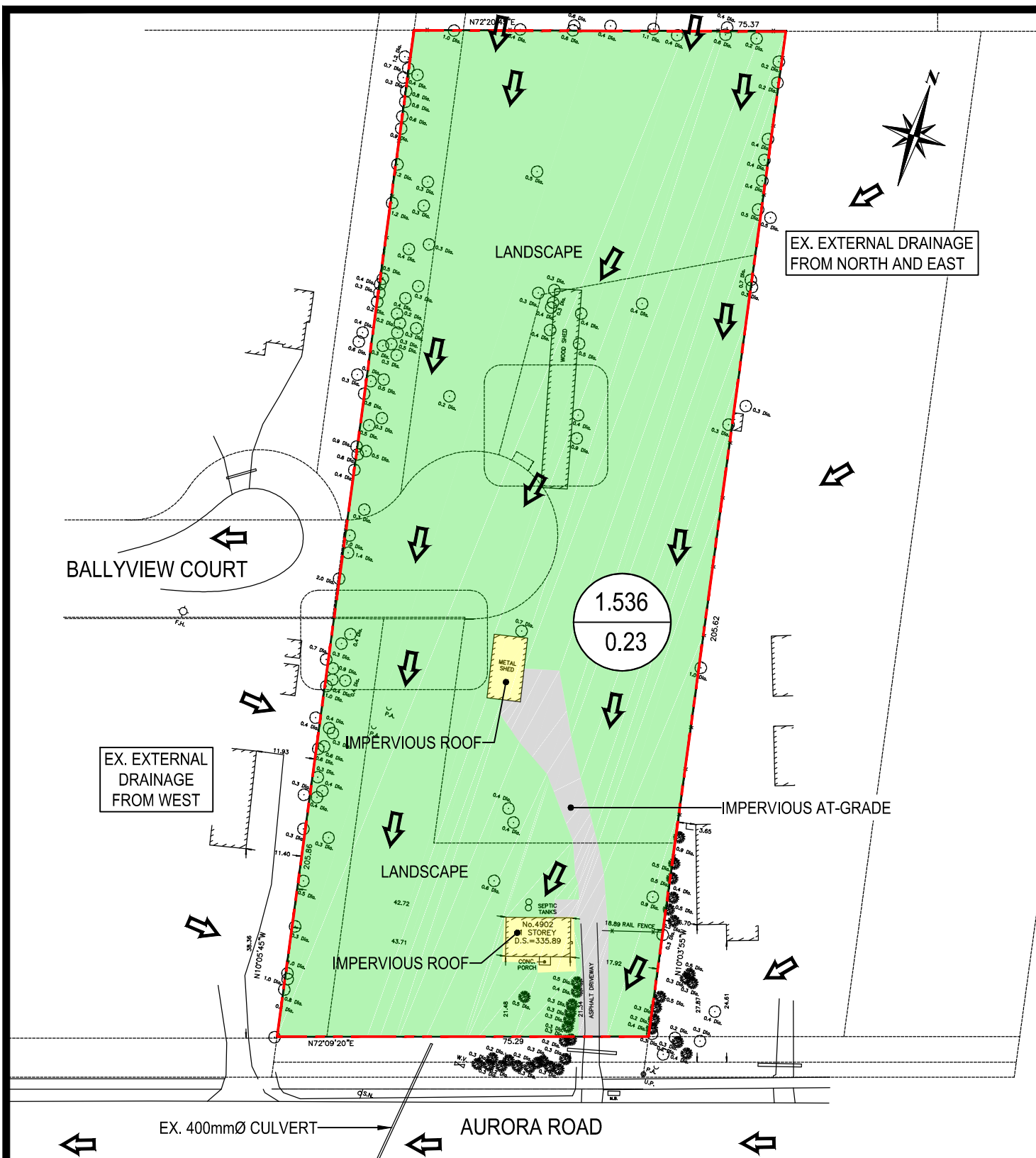


FIGURE 2 - PRE-DEVELOPMENT SURFACES
(NOT TO SCALE)

LEGEND

- IMPERVIOUS SURFACE (ROOF)
- IMPERVIOUS SURFACE (AT-GRADE)
- LANDSCAPE SURFACE

- DEVELOPMENT BOUNDARY
- 1.010
0.50 DRAINAGE AREA (ha)
RUNOFF COEFFICIENT

- OVERLAND FLOW DIRECTION

4.3 External Drainage

In the existing condition the subject property is low lying compared to Aurora Road and the adjacent properties and therefore temporary stormwater detention is provided through on-site ponding which manages (controls) peak flows before discharging through the existing 400 mm diameter CSP culvert, located south of the subject site. The external drainage area is 5.4 ha, and when combined with the subject property, the total contributing area to the culvert is 7.536 ha.

To assess peak flow contributions, Valdor Engineering Inc. was retained to modeled the drainage area using Visual OTTHYMO, evaluating the 2-year through 100-year and Regional (Hurricane Hazel) storm events, and determining the corresponding peak flows, temporary detention storage requirements and high-water levels.

The results indicate that under the 100-year storm event, ponding remains fully contained within the subject property (elevation 334.80). However, during the Hurricane Hazel (Regional) storm, ponding reaches an elevation of 335.71 m, which based on the existing topography resulting in spillover (encroachment) into the neighbouring property to the east at 4932 Aurora Road.

A Pre-Development Ponding Extents Figure has been prepared as **Figure 3**, illustrating the limits of ponding during both the 100-year and Regional storm events. Full modeling results are available in **Appendix 1** for reference.

Table 3 below is a summary of the Valdor modelling:

Table 3 – Pre-Development Peak Flow Summary (Modelled)

Storm	Peak Inflow (cms)	Peak Outflow (cms)	Stoarge Used (m ³)	Water Level (m)
2 Year 24-hr SCS	0.103	0.101	19.0	333.72
5 Year 24-hr SCS	0.181	0.147	84.0	334.02
10 Year 24-hr SCS	0.241	0.168	173.0	334.23
25 Year 24-hr SCS	0.327	0.188	333.0	334.48
50 Year 24-hr SCS	0.396	0.203	484.0	334.64
100 Year 24-hr SCS	0.470	0.213	659.0	334.80
Regional (Hurricane Hazel)	0.785	0.272	3714.0	335.71

5.0 POST-DEVELOPMENT STORM SYSTEM

The proposed development will be graded to ensure all stormwater generated on-site, including contributions from the external drainage area, is self-contained within the property up to the 100-year storm event. For the Regional storm (Hurricane Hazel), the proposed storm system has been designed to not exceed the pre-development high water levels, ensuring that no adverse impacts or increases in flooding occur on adjacent lands.

A Post-Development Drainage Plan has been prepared as **Figure 4**, based on the Site Plan, prepared by Thomas Brown Architect Inc., dated March 3, 2025, to illustrate the proposed surface types and their drainage patterns. The post-development composite runoff coefficient for the proposed development has been calculated and is summarized in **Table 4** on the following page.

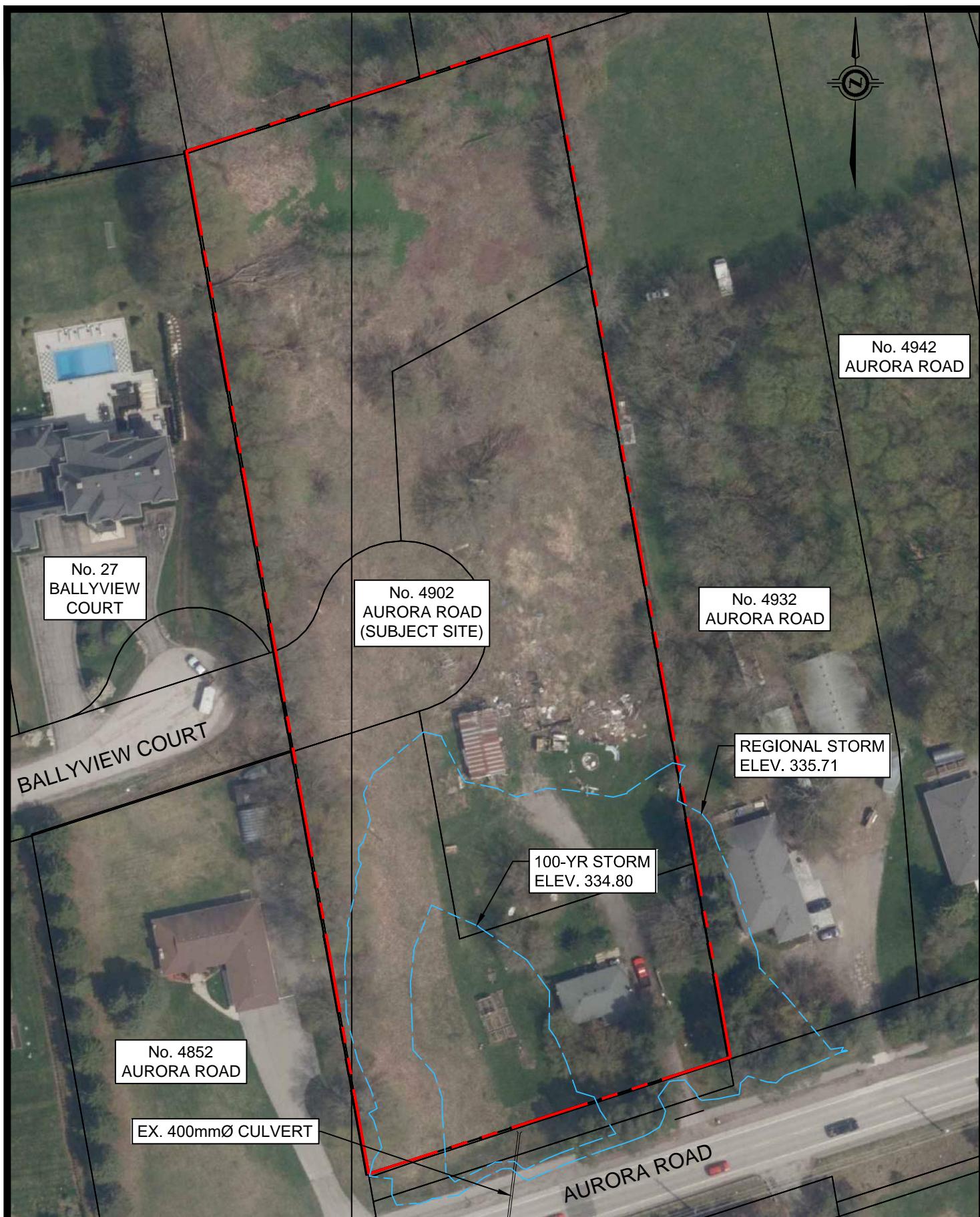


FIGURE 3 - PRE-DEVELOPMENT PONDING EXTENTS
(SCALE = 1:1000)

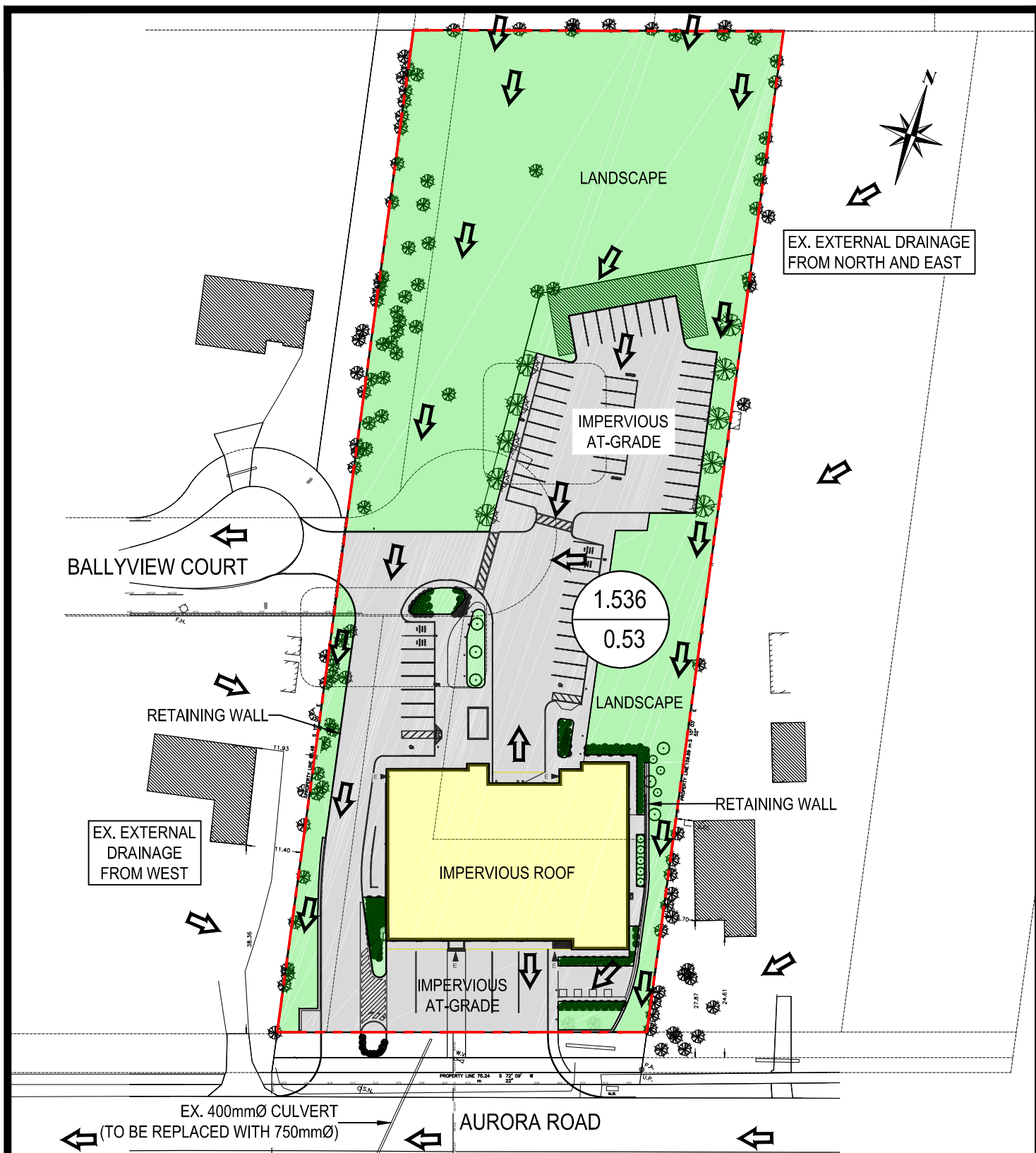


FIGURE 4 - POST-DEVELOPMENT SURFACES
(NOT TO SCALE)

LEGEND

- IMPERVIOUS SURFACE (ROOF)
- IMPERVIOUS SURFACE (AT-GRADE)
- LANDSCAPE SURFACE

- DEVELOPMENT BOUNDARY
- 1.010
0.50 DRAINAGE AREA (ha)
RUNOFF COEFFICIENT

➡ OVERLAND FLOW DIRECTION

Table 4 – Post-Development Runoff Coefficient

Description	Area (ha)	Runoff Coeff.	C x A
Impervious Roof	0.176	0.90	0.158
Impervious At-Grade	0.540	0.90	0.486
Landscape	0.820	0.20	0.164
Totals =	1.536		0.809
Composite Runoff Coefficient =		0.53	

The proposed 1.536 ha development has a post-development runoff coefficient of 0.53.

5.1 Post-Development Peak Flows

While the typical stormwater management requirement is to ensure post-development peak flows do not exceed pre-development levels for the 2- through 100-year storm events, the subject site presents a unique condition. The presence of a culvert under Aurora Road and the site's low-lying topography result in it functioning as a dry pond during larger storm events as it receives runoff from a significant external drainage area that requires consideration to not adversely affect the neighbouring properties.

5.2 Proposed Flow Control

To control the 100-year peak flow to the allowable release rate, a 250 mm diameter DR-35 PVC orifice tube, with an inner diameter of 251.46 mm, will be installed upstream of Storm MH 1. The orifice invert will be set at 333.40 m, and the regional storm high water level is 335.71 m. The orifice equation is used to determine the peak discharge through the tube, and is calculated as follows:

$$Q = C A \sqrt{2gh}$$

where,

- Q = Flow (cu.m/sec)
- C = Orifice coefficient (0.80 for orifice tube)
- A = Cross sectional area of orifice (sq.m)
- g = Acceleration due to gravity (9.81 m/sec²)
- h = Head acting on orifice (m)

for the proposed 250 mm orifice tube,

$$Q = 0.80 \times \left(\frac{\pi \left(\frac{251.46}{1000} \right)^2}{4} \right) \sqrt{2 \times 9.81 \times \left(335.71 - 333.40 - \left(\frac{251.46}{2000} \right) \right)} = 0.2601 \text{ cu. m./s}$$

$$Q = 0.260 \text{ cu.m./s or } 260 \text{ L/s}$$

The pre-development Regional peak flow through the existing culvert was calculated to be 272 L/s. The proposed orifice is designed to convey a maximum flow of 260 L/s, which is less than the pre-development peak, thereby providing overcontrol of the post development peak flow.

5.3 Inlet Efficiency

The proposed catchbasin grates will be OPSD 400.020, with an open area of approximately 0.131 sq.m., while area drains will be fitted with Nyloplast 8" (200 mm) drop-in grates, each with an opening area of 0.0125 sq.m. Both the catchbasins and area drains will function as orifices with a discharge coefficient of 0.60.

Table 5 summarizes the maximum depth of storage at each inlet and confirms their capacity to convey twice the 100-year peak flow from the site, as well as twice the 100 year peak flow from the external drainage areas.

The proposed drainage layout is illustrated on **Drawing No. 103 – Post-Development Drainage Plan**.

Table 5 – Inlet Efficiency Calculations

INLET	IMP. AREA (Sq.m.)	PERV. AREA (Sq.m.)	TOTAL AREA (Sq.m.)	COMP. C	100-YR FLOW (L/s)	EXT. 100 YR FLOW (L/s)	MAX DEPTH (m)	CAPTURED FLOW (L/s)	EXCEEDS 2X FLOW?
CB 1	405.1	101.0	506.0	0.76	26.8	0.0	0.09	104.4	>2X
CB 2	411.1	4.0	415.1	0.89	25.8	0.0	0.05	77.8	>2X
CB 3	422.9	56.8	479.7	0.82	27.3	0.0	0.14	130.2	>2X
CB 4	0.0	363.1	363.1	0.20	5.0	84.0	0.30	190.6	>2X
CB 5	211.1	0.0	211.1	0.90	13.2	0.0	0.08	98.5	>2X
CB 6	722.1	0.0	722.1	0.90	45.2	0.0	0.20	155.7	>2X
CB 7	0.0	66.7	66.7	0.20	0.9	0.0	0.15	134.8	>2X
CB 8	836.2	185.0	1021.2	0.77	54.9	0.0	0.13	125.5	>2X
CB 9	0.0	597.5	597.5	0.20	8.3	33.0	0.20	155.7	>2X
CB 10	645.6	71.4	717.0	0.83	41.4	0.0	0.20	155.7	>2X
CB 11	0.0	314.4	314.4	0.20	4.4	0.0	0.10	110.1	>2X
CB 12	0.0	523.1	523.1	0.20	7.3	0.0	0.18	147.7	>2X
DCB 1	1805.2	147.2	1952.4	0.85	115.0	0.0	0.20	311.3	>2X
DCB 2	0.0	4634.0	4634.0	0.20	64.4	81.0	0.23	333.9	>2X
AD 1	29.1	36.4	65.4	0.51	2.3	0.0	0.20	14.9	>2X
CBMH 1	55.6	719.3	774.9	0.25	13.5	0.0	0.06	85.3	>2X
CB Frame & Grate: OPSD 400.020 AD Frame & Grate: Nyloplast 8" (Drop-In) Opening Area (m ²) = 0.1310 Opening Area (m ²) = 0.0125 IMP. C = 0.90 Orifice Coefficient = 0.6 Orifice Coefficient = 0.6 PERV. C = 0.20									

5.4 Underground Detention Storage

The required detention storage volume to mitigate the 100-year peak flow from the site, in combination with the 100-year peak flow from the external drainage areas, will be provided through two underground detention and retention galleries integrated into the proposed storm system. These galleries, along with additional volume within upstream pipes and storm structures, will collectively manage post-development flows and control discharge through the proposed orifice.

Each gallery will be constructed using GreenStorm ST* underground storage modules in a “3.5 stack” configuration, consisting of 3 full-size modules with 1 half-size module stacked on top. The galleries will be constructed on top of a 100 mm thick layer of clear stone and located at least 5 m from the proposed building foundation and 1 m above the seasonal high water level in order to provide retention and infiltration of runoff from the modules below the outlet invert.

The full-size modules provide a storage volume of 406 litres per module, with a footprint of 0.8 m by 0.8 m and a height of 0.66 metres, while the half-size modules provide 212 litres per module, with the same footprint and a height of 0.35 metres.

The 2 galleries will have a total footprint area of 1690.24 sq.m. and provide a detention storage volume of 3716.3 cu.m.

An additional 12.2 cu.m. of storage will be available within the pipes and structures upstream of the orifice, bringing the total detention storage volume to 3,728.5 cu.m., which meets the quantity control requirements.

All modules are to be installed in accordance with manufacturer recommendations, with product specifications and detailed storage calculations provided in **Appendix 2**.

5.5 Erosion Control

To satisfy erosion control requirements, the development must provide for the retention, detention, or infiltration of the first 25 mm of runoff from all impervious surfaces. The proposed development includes a total impervious area of 0.716 hectares, which translates to a retention volume requirement of 179 cu.m.

To meet this requirement, the two proposed underground storage galleries have been designed to provide 81.2 cu.m. of retention storage below the outlet within the storage modules, along with an additional 104.6 cu.m. of retention storage within the 150 mm thick clear stone layer beneath the galleries (contact area = 1742.8 sq.m.).

Therefore, the total available retention storage volume is 185.8 cu.m., which satisfies the erosion control requirement.

Percolation testing has not been conducted however the geotechnical report prepared by Patriot Engineering includes a grain size analysis for the native sandy soil. By referencing SG-6 “Percolation Time and Soil Descriptions” from the Supplementary Guidelines to the Ontario Building Code 1997, the native sandy soil displays a grain size distribution with less than 9% of fines which puts the soil somewhere between a SP and SM soil but closer to a SP and therefore a percolation time of 10 minutes per cm or 60 mm per hour. Applying a safety factor of 2.5 yields a design rate of 24 mm per hour.

Using the design infiltration rate, it is determined that the gallery can infiltrate the retained volume within approximately 11.1 hours.

Refer to **Appendix 3** for detailed retention and infiltration calculations, as well as excerpts from SG-6 of the Ontario Building Code 1997.

5.6 Water Balance

To satisfy water balance requirements, the development must provide for the retention, detention, or infiltration of the first 5 mm of runoff from all impervious surfaces. The proposed development includes a total impervious area of 0.716 hectares, which translates to a retention volume requirement of 35.8 cu.m.

As described in Section 5.5, the proposed underground storage system provides a total retention storage volume of 185.8 cu.m., which exceeds the volume required for water balance and therefore satisfies this requirement.

5.7 Water Quality

The stormwater discharge discharged from the proposed infill development has been designed to achieve an enhanced level of protection or 80% of TSS removal.

As outlined in the “Low Impact Development Stormwater Management Planning and Design Guide” prepared by the Ministry of the Environment (now MECP) dated 2010, infiltration systems provide for water balance, volumetric runoff reduction and water quality benefits. Table 3.4 of Guide provides summaries on the effectiveness of infiltration systems and concludes that TSS removal between 70-90% is achieved.

The total impervious area is equal to 0.716 ha, resulting in an imperviousness of approximately 46.6%

The detention and retention gallery will have the capacity to infiltrate 401.5 cu.m. or approximately 261 cu.m./ha over 24 hours.

Table 3.2 of the “Stormwater Management Planning and Design Manual (MOE, 2003)” provides protection levels based on imperviousness and volume retained – see the excerpt provided in **Appendix 4**.

Using the Enhanced 80% long-term S.S. removal level of protection, a total volume of 30 cu.m./ha is required for an imperviousness of 50%. As the site is approximately 50% impervious and provides more than 30 cu.m./ha of infiltration, it can be concluded that 80% TSS removal is achieved.

Pretreatment for the paved areas will be required which will be provided by providing goss traps and CB Shield devices in each of the catchbasins. CB Shield is a Canadian ETV Certified device designed to provide water quality treatment. Refer to **Appendix 5** for details.

6.0 TEMPORARY EROSION AND SEDIMENT CONTROL

It would be prudent to make provisions to provide “good housekeeping” measures to mitigate the transportation of silt from the site during the construction phases. These measures include, but are not limited to the following:

- Provide silt fences/silt socks around the perimeter of the site to reduce silt from leaving the site.
- Provide silt filters at catchbasins upon their installation to reduce the amount of silt entering the sewer system during construction.

- Use of a “mud mat” or temporary tracking control at the entrance of the site to minimize mud tracking from the site.
- Stabilize the site as soon as possible, that is, re-establish vegetative ground cover and avoid bare soil areas.

All the above erosion and siltation control measures should be monitored and maintained on a regular basis to ensure maximum benefit and minimum silt migration off-site and shall be in accordance with the Erosion & Sediment Control Guidelines for Urban Construction (TRCA, 2019).

7.0 SUMMARY

The 1.536 ha site is located north of Aurora Road, between McCowan Road and Highway 48, and is bordered by residential dwellings and undeveloped land.

The property is occupied by an existing 1-storey residential dwelling with an asphalt driveway and a metal and a wooden shed

Aurora Road is a rural road and there is currently a ditch running along the north shoulder to convey overland storm drainage. There is no nearby storm sewer system.

A 5.4 ha of external area currently drains through the property to the existing ditch on Aurora Road where water outlets through an existing 400 mm CSP culvert located in the road allowance.

The proposed development consists of a joint Fire Hall and Paramedic Response Station with at-grade parking. Driveway access will be from Aurora Road and Balleyview Court.

The pre-development coefficient for the site is 0.23, and the peak 100-year flow is 233.5 L/s based on the Rational Method.

There is an external drainage area is 5.4 ha, and when combined with the subject property, the total contributing area to the culvert is 7.536 ha. In order to assess the pre-development peak flows, Valdor Engineering was retained to model the flows using Visual OTTHYMO, evaluating the 2-year through 100-year and Regional (Hurricane Hazel) storm events

Currently stormwater runoff from the 7.536 ha drainage area is controlled by the 400 mm culvert with temporary detention taking place on-site before discharging downstream. While 100-year storm ponding is fully contained on-site, the Regional (Hurricane Hazel) storm causes ponding to reach 335.71 m, resulting in spillover onto the neighbouring property at 4932 Aurora Road.

The site will be graded to contain all flows up to the 100-year storm event, and although Regional storm ponding reaches neighbouring lands, the post-development design maintains existing high-water levels, ensuring no adverse impacts to adjacent properties.

A total volume of 659.0 cu.m. of detention storage is required to maintain existing peak flows up to the 100 year event and 3,714.0 cu.m. for the Regional storm.

A 250 mm diameter orifice will be installed upstream of Storm MH 1 to control post-development peak flows, with an invert set at 333.40 m and designed to convey a maximum of 260 L/s, which is less than the pre-development Regional peak flow of 272 L/s, confirming compliance with quantity control requirements.

All proposed inlets will have the capacity to convey twice the calculated 100-year flow.

Two underground detention and retention galleries will provide a total detention volume of 3,716.3 cu.m. An additional 12.2 cu.m. is available in the structures and pipes upstream of the orifice. Therefore, there is a total detention storage volume of 3,728.5 cu.m. available to manage the post-development 100-year on-site and external Regional storm flows.

The underground galleries will be installed on 150 mm of clear stone, set back 5 m from the building and 1 m above the seasonal high water table, and will be constructed in accordance with manufacturer specifications.

The retention volume needed to meet erosion control requirements is 179 cu.m.

The underground galleries can provide a total of 185.8 cu.m. of retention storage and therefore satisfy erosion control requirements.

The retention volume needed to meet water balance requirements is 35.8 cu.m., which is met by the proposed underground galleries.

The site's imperviousness is approximately 46.6% and the infiltration capacity of the proposed storm system is 261 cu.m./ha over 24, which exceeds the 30 cu.m./ha needed to achieve 80% TSS removal. Therefore, the design meets quality control requirements. Pretreatment will be provided by using CB Shield devices and goss traps in the catchbasins.

Temporary erosion and sediment control measures will be provided in accordance with the Erosion & Sediment Control Guidelines for Urban Construction (TRCA, 2019), as part of the detailed design.

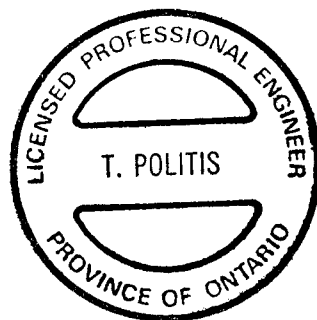
Based on the proposed design, the stormwater management system will effectively meet all applicable quality, quantity, water balance and erosion control requirements, ensuring the development functions as intended without adverse impacts.

Respectfully submitted,

Politis Engineering Ltd.



Per: Tim Politis, P.Eng.



APPENDIX 1

Table 1: Storage Used and Water Level Upstream of Culvert

Storm	Peak Inflow (cms)	Peak Outflow (cms)	Storage used (m³)	Water Level (m)
2-yr 24-hr SCS	0.103	0.101	19.0	333.73
5-yr 24-hr SCS	0.181	0.147	84.0	334.02
10-yr 24-hr SCS	0.241	0.168	173.0	334.24
25-yr 24-hr SCS	0.327	0.188	333.0	334.48
50-yr 24-hr SCS	0.396	0.203	484.0	334.65
100-yr 24-hr SCS	0.470	0.213	659.0	334.80
Hurricane Hazel	0.785	0.272	3714.0	335.71

Table 2: Summary of Peak Flows

Storm	Catchment 100 (cms)	Catchment 101 (cms)	Catchment 102 (cms)	Catchment 103 (cms)	Catchment 104 (cms)	Catchment 105 (cms)	Catchment 106 (cms)	Peak Flow at Aurora Rd Culvert Inlet (cms)
2-yr 24-hr SCS	0.007	0.018	0.046	0.003	0.010	0.013	0.022	0.103
5-yr 24-hr SCS	0.012	0.032	0.082	0.006	0.018	0.018	0.039	0.181
10-yr 24-hr SCS	0.017	0.042	0.109	0.008	0.023	0.022	0.052	0.241
25-yr 24-hr SCS	0.023	0.056	0.148	0.011	0.031	0.026	0.071	0.327
50-yr 24-hr SCS	0.028	0.068	0.179	0.013	0.038	0.029	0.086	0.396
100-yr 24-hr SCS	0.033	0.081	0.212	0.015	0.044	0.033	0.103	0.470
Hurricane Hazel	0.063	0.104	0.372	0.017	0.050	0.017	0.172	0.785

Figure 1
Drainage Map
4902 Aurora Road



VALDOR ENGINEERING INC.

File: 09133-H

Date: Mar 2025

Table 3: Floodplain Analysis - Summary of VO Model Parameters

Catchment ID	Area (ha)	VO5 Routine	TIMP	XIMP	CN II	IA (mm)	Tpeak (hr)
100	0.59	NasHyd	-	-	49	6.31	0.42
101	0.84	NasHyd	-	-	56	5.33	0.26
102	3.31	NasHyd	-	-	55	6.81	0.44
103	0.13	NasHyd	-	-	58	6.32	0.22
104	0.40	NasHyd	-	-	56	4.68	0.21
105	0.13	StandHyd	0.55	0.55	49	5.00	-
106	1.54	NasHyd	-	-	51	5.93	0.36
Total	6.93						

File : 09133-H
Date : March 2025

[illegible]

VALDOR ENGINEERING INC.

File : 09133-H

Date : Mar 2025

Table 5 : Floodplain Analysis - Calculation of Time to Peak

Subcatchment	A Area (ha)	C Runoff Coefficient (Area Weighted)	L (m) Catchment Length	Highest Elevation (m)	Lowest Elevation (m)	S (%) Catchment Slope	^{1,2} T _c Method	T _c (min)	³ Adjusted T _c (min)	^{1,2} T _p (hr)
100	0.59	0.17	229.8	340.20	335.90	1.87	Airport	37.4	37.4	0.42
101	0.84	0.27	124.4	340.00	337.30	2.17	Airport	23.4	23.4	0.26
102	3.31	0.29	315.9	341.00	335.50	1.74	Airport	39.1	39.1	0.44
103	0.13	0.33	58.2	336.20	335.70	0.86	Airport	20.1	20.1	0.22
104	0.40	0.26	86.4	337.70	335.50	2.55	Airport	18.7	18.7	0.21
106	1.54	0.20	215.4	339.00	333.60	2.51	Airport	31.8	31.8	0.36

Notes:

1) T_p calculation for catchments with C < 0.40 is based on the Airport Formula:

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

2) T_p calculation for catchments with C > 0.40 is based on the Bransby-Williams Formula:

$$T_c = \frac{(0.057)(L)}{(S_w)^{0.2}(A)^{0.1}}$$

$$T_p = 0.67T_c$$

3) For the pre-development condition, a minimum time of concentration of 15 mins (Adjusted T_c) is to be used in the modelling.

Active coordinate

44° 2' 15" N, 79° 18' 14" W (44.037500,-79.304167)

Retrieved: Tue, 25 Feb 2025 14:31:03 GMT



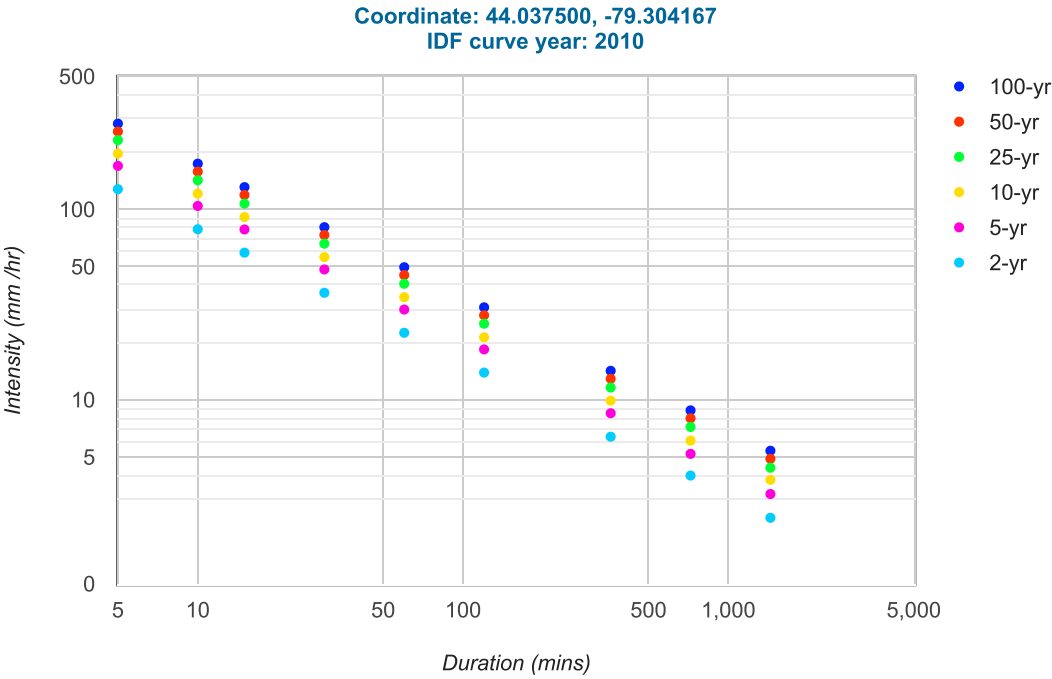
Location summary

These are the locations in the selection.

IDF Curve: 44° 2' 15" N, 79° 18' 14" W (44.037500,-79.304167)

Results

An IDF curve was found.



Coefficient summary

IDF Curve: 44° 2' 15" N, 79° 18' 14" W (44.037500,-79.304167)

Retrieved: Tue, 25 Feb 2025 14:31:03 GMT

Data year: 2010

IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	22.5	29.8	34.6	40.7	45.2	49.7
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	127.8	78.7	59.3	36.5	22.5	13.9	6.4	4.0	2.4
5-yr	169.3	104.3	78.5	48.4	29.8	18.4	8.5	5.2	3.2
10-yr	196.5	121.1	91.2	56.2	34.6	21.3	9.9	6.1	3.8
25-yr	231.2	142.4	107.3	66.1	40.7	25.1	11.6	7.2	4.4
50-yr	256.7	158.1	119.1	73.4	45.2	27.8	12.9	8.0	4.9
100-yr	282.3	173.9	131.0	80.7	49.7	30.6	14.2	8.8	5.4

Rainfall depth (mm)

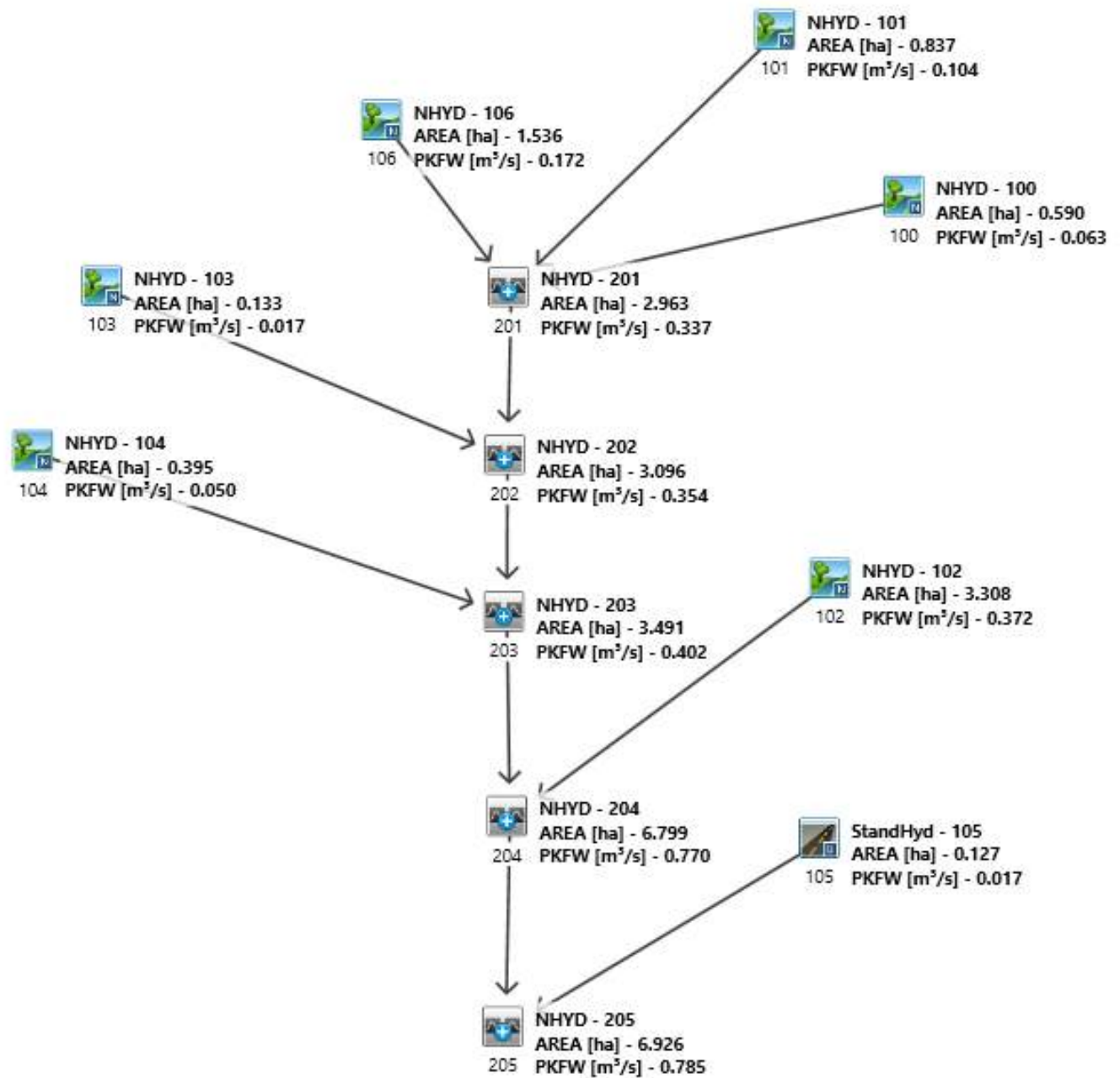
Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.6	13.1	14.8	18.3	22.5	27.7	38.6	47.5	58.6
5-yr	14.1	17.4	19.6	24.2	29.8	36.7	51.1	63.0	77.6
10-yr	16.4	20.2	22.8	28.1	34.6	42.6	59.3	73.1	90.1
25-yr	19.3	23.7	26.8	33.0	40.7	50.1	69.8	86.0	105.9
50-yr	21.4	26.4	29.8	36.7	45.2	55.7	77.5	95.5	117.6
100-yr	23.5	29.0	32.7	40.3	49.7	61.2	85.2	105.0	129.4

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Last Modified: September 2016



 ** SIMULATION:10 Year 24 Hour SCS **

READ STORM	Filename: C:\Users\ABaten\AppData\Local\Temp\23d527d8-1fdf-4bae-ba37-ff6a857440d4\eca63b48
Ptotal= 90.06 mm	Comments: 10 Year 24 Hour SCS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.80	12.50	12.97	18.75	1.62
0.25	0.90	6.50	1.80	12.75	6.67	19.00	1.62
0.50	0.90	6.75	1.80	13.00	6.67	19.25	1.62
0.75	0.90	7.00	1.80	13.25	1.26	19.50	1.62
1.00	0.90	7.25	1.80	13.50	1.26	19.75	1.62
1.25	0.90	7.50	1.80	13.75	7.39	20.00	1.62
1.50	0.90	7.75	1.80	14.00	7.39	20.25	1.08
1.75	0.90	8.00	1.80	14.25	2.70	20.50	1.08
2.00	1.62	8.25	2.43	14.50	2.70	20.75	1.08
2.25	1.17	8.50	2.43	14.75	2.70	21.00	1.08
2.50	1.17	8.75	2.43	15.00	2.70	21.25	1.08
2.75	1.17	9.00	2.43	15.25	2.70	21.50	1.08
3.00	1.17	9.25	2.88	15.50	2.70	21.75	1.08
3.25	1.17	9.50	2.88	15.75	2.70	22.00	1.08
3.50	1.17	9.75	3.24	16.00	2.70	22.25	1.08
3.75	1.17	10.00	3.24	16.25	1.62	22.50	1.08
4.00	1.17	10.25	4.14	16.50	1.62	22.75	1.08
4.25	1.44	10.50	4.14	16.75	1.62	23.00	1.08
4.50	1.44	10.75	5.59	17.00	1.62	23.25	1.08
4.75	1.44	11.00	5.59	17.25	1.62	23.50	1.08
5.00	1.44	11.25	8.65	17.50	1.62	23.75	1.08
5.25	1.44	11.50	8.65	17.75	1.62	24.00	1.08
5.50	1.44	11.75	37.48	18.00	1.62		
5.75	1.44	12.00	99.47	18.25	1.62		
6.00	1.44	12.25	12.97	18.50	1.62		

CALIB	Area (ha)= 0.84	Curve Number (CN)= 56.0
NASHYD (0101)	Ia (mm)= 5.33	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)= 0.26	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.44	12.250	99.47	18.33	1.62
0.167	0.00	6.250	1.44	12.333	12.98	18.42	1.62
0.250	0.00	6.333	1.80	12.417	12.97	18.50	1.62
0.333	0.90	6.417	1.80	12.500	12.97	18.58	1.62
0.417	0.90	6.500	1.80	12.583	12.97	18.67	1.62
0.500	0.90	6.583	1.80	12.667	12.97	18.75	1.62
0.583	0.90	6.667	1.80	12.750	12.97	18.83	1.62
0.667	0.90	6.750	1.80	12.833	6.67	18.92	1.62
0.750	0.90	6.833	1.80	12.917	6.67	19.00	1.62
0.833	0.90	6.917	1.80	13.000	6.67	19.08	1.62
0.917	0.90	7.000	1.80	13.083	6.67	19.17	1.62
1.000	0.90	7.083	1.80	13.167	6.67	19.25	1.62
1.083	0.90	7.167	1.80	13.250	6.67	19.33	1.62
1.167	0.90	7.250	1.80	13.333	1.26	19.42	1.62
1.250	0.90	7.333	1.80	13.417	1.26	19.50	1.62
1.333	0.90	7.417	1.80	13.500	1.26	19.58	1.62
1.417	0.90	7.500	1.80	13.583	1.26	19.67	1.62
1.500	0.90	7.583	1.80	13.667	1.26	19.75	1.62
1.583	0.90	7.667	1.80	13.750	1.26	19.83	1.62
1.667	0.90	7.750	1.80	13.833	7.39	19.92	1.62
1.750	0.90	7.833	1.80	13.917	7.39	20.00	1.62
1.833	0.90	7.917	1.80	14.000	7.39	20.08	1.62
1.917	0.90	8.000	1.80	14.083	7.39	20.17	1.62
2.000	0.90	8.083	1.80	14.167	7.39	20.25	1.62
2.083	1.62	8.167	1.80	14.250	7.39	20.33	1.08
2.167	1.62	8.250	1.80	14.333	2.70	20.42	1.08
2.250	1.62	8.333	2.43	14.417	2.70	20.50	1.08
2.333	1.17	8.417	2.43	14.500	2.70	20.58	1.08
2.417	1.17	8.500	2.43	14.583	2.70	20.67	1.08
2.500	1.17	8.583	2.43	14.667	2.70	20.75	1.08
2.583	1.17	8.667	2.43	14.750	2.70	20.83	1.08
2.667	1.17	8.750	2.43	14.833	2.70	20.92	1.08

2.750	1.17	8.833	2.43	14.917	2.70	21.00	1.08
2.833	1.17	8.917	2.43	15.000	2.70	21.08	1.08
2.917	1.17	9.000	2.43	15.083	2.70	21.17	1.08
3.000	1.17	9.083	2.43	15.167	2.70	21.25	1.08
3.083	1.17	9.167	2.43	15.250	2.70	21.33	1.08
3.167	1.17	9.250	2.43	15.333	2.70	21.42	1.08
3.250	1.17	9.333	2.88	15.417	2.70	21.50	1.08
3.333	1.17	9.417	2.88	15.500	2.70	21.58	1.08
3.417	1.17	9.500	2.88	15.583	2.70	21.67	1.08
3.500	1.17	9.583	2.88	15.667	2.70	21.75	1.08
3.583	1.17	9.667	2.88	15.750	2.70	21.83	1.08
3.667	1.17	9.750	2.88	15.833	2.70	21.92	1.08
3.750	1.17	9.833	3.24	15.917	2.70	22.00	1.08
3.833	1.17	9.917	3.24	16.000	2.70	22.08	1.08
3.917	1.17	10.000	3.24	16.083	2.70	22.17	1.08
4.000	1.17	10.083	3.24	16.167	2.70	22.25	1.08
4.083	1.17	10.167	3.24	16.250	2.70	22.33	1.08
4.167	1.17	10.250	3.24	16.333	1.62	22.42	1.08
4.250	1.17	10.333	4.14	16.417	1.62	22.50	1.08
4.333	1.44	10.417	4.14	16.500	1.62	22.58	1.08
4.417	1.44	10.500	4.14	16.583	1.62	22.67	1.08
4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08
4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.042 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 25.236
TOTAL RAINFALL (mm)= 90.063
RUNOFF COEFFICIENT = 0.280

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

CALIB			
NASHYD (0106)	Area (ha)=	1.54	Curve Number (CN)= 51.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.36	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.44	12.250	99.47	18.33	1.62
0.167	0.00	6.250	1.44	12.333	12.98	18.42	1.62
0.250	0.00	6.333	1.80	12.417	12.97	18.50	1.62
0.333	0.90	6.417	1.80	12.500	12.97	18.58	1.62
0.417	0.90	6.500	1.80	12.583	12.97	18.67	1.62
0.500	0.90	6.583	1.80	12.667	12.97	18.75	1.62
0.583	0.90	6.667	1.80	12.750	12.97	18.83	1.62
0.667	0.90	6.750	1.80	12.833	6.67	18.92	1.62
0.750	0.90	6.833	1.80	12.917	6.67	19.00	1.62
0.833	0.90	6.917	1.80	13.000	6.67	19.08	1.62
0.917	0.90	7.000	1.80	13.083	6.67	19.17	1.62
1.000	0.90	7.083	1.80	13.167	6.67	19.25	1.62
1.083	0.90	7.167	1.80	13.250	6.67	19.33	1.62
1.167	0.90	7.250	1.80	13.333	1.26	19.42	1.62
1.250	0.90	7.333	1.80	13.417	1.26	19.50	1.62
1.333	0.90	7.417	1.80	13.500	1.26	19.58	1.62
1.417	0.90	7.500	1.80	13.583	1.26	19.67	1.62
1.500	0.90	7.583	1.80	13.667	1.26	19.75	1.62
1.583	0.90	7.667	1.80	13.750	1.26	19.83	1.62

1.667	0.90	7.750	1.80	13.833	7.39	19.92	1.62
1.750	0.90	7.833	1.80	13.917	7.39	20.00	1.62
1.833	0.90	7.917	1.80	14.000	7.39	20.08	1.62
1.917	0.90	8.000	1.80	14.083	7.39	20.17	1.62
2.000	0.90	8.083	1.80	14.167	7.39	20.25	1.62
2.083	1.62	8.167	1.80	14.250	7.39	20.33	1.08
2.167	1.62	8.250	1.80	14.333	2.70	20.42	1.08
2.250	1.62	8.333	2.43	14.417	2.70	20.50	1.08
2.333	1.17	8.417	2.43	14.500	2.70	20.58	1.08
2.417	1.17	8.500	2.43	14.583	2.70	20.67	1.08
2.500	1.17	8.583	2.43	14.667	2.70	20.75	1.08
2.583	1.17	8.667	2.43	14.750	2.70	20.83	1.08
2.667	1.17	8.750	2.43	14.833	2.70	20.92	1.08
2.750	1.17	8.833	2.43	14.917	2.70	21.00	1.08
2.833	1.17	8.917	2.43	15.000	2.70	21.08	1.08
2.917	1.17	9.000	2.43	15.083	2.70	21.17	1.08
3.000	1.17	9.083	2.43	15.167	2.70	21.25	1.08
3.083	1.17	9.167	2.43	15.250	2.70	21.33	1.08
3.167	1.17	9.250	2.43	15.333	2.70	21.42	1.08
3.250	1.17	9.333	2.88	15.417	2.70	21.50	1.08
3.333	1.17	9.417	2.88	15.500	2.70	21.58	1.08
3.417	1.17	9.500	2.88	15.583	2.70	21.67	1.08
3.500	1.17	9.583	2.88	15.667	2.70	21.75	1.08
3.583	1.17	9.667	2.88	15.750	2.70	21.83	1.08
3.667	1.17	9.750	2.88	15.833	2.70	21.92	1.08
3.750	1.17	9.833	3.24	15.917	2.70	22.00	1.08
3.833	1.17	9.917	3.24	16.000	2.70	22.08	1.08
3.917	1.17	10.000	3.24	16.083	2.70	22.17	1.08
4.000	1.17	10.083	3.24	16.167	2.70	22.25	1.08
4.083	1.17	10.167	3.24	16.250	2.70	22.33	1.08
4.167	1.17	10.250	3.24	16.333	1.62	22.42	1.08
4.250	1.17	10.333	4.14	16.417	1.62	22.50	1.08
4.333	1.44	10.417	4.14	16.500	1.62	22.58	1.08
4.417	1.44	10.500	4.14	16.583	1.62	22.67	1.08
4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08
4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.052 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 21.564
TOTAL RAINFALL (mm)= 90.063
RUNOFF COEFFICIENT = 0.239

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

CALIB			
NASHYD (0100)	Area (ha)=	0.59	Curve Number (CN)= 49.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.31	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.42	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.44	12.250	99.47	18.33	1.62
0.167	0.00	6.250	1.44	12.333	12.98	18.42	1.62
0.250	0.00	6.333	1.80	12.417	12.97	18.50	1.62
0.333	0.90	6.417	1.80	12.500	12.97	18.58	1.62
0.417	0.90	6.500	1.80	12.583	12.97	18.67	1.62
0.500	0.90	6.583	1.80	12.667	12.97	18.75	1.62

0.583	0.90	6.667	1.80	12.750	12.97	18.83	1.62
0.667	0.90	6.750	1.80	12.833	6.67	18.92	1.62
0.750	0.90	6.833	1.80	12.917	6.67	19.00	1.62
0.833	0.90	6.917	1.80	13.000	6.67	19.08	1.62
0.917	0.90	7.000	1.80	13.083	6.67	19.17	1.62
1.000	0.90	7.083	1.80	13.167	6.67	19.25	1.62
1.083	0.90	7.167	1.80	13.250	6.67	19.33	1.62
1.167	0.90	7.250	1.80	13.333	1.26	19.42	1.62
1.250	0.90	7.333	1.80	13.417	1.26	19.50	1.62
1.333	0.90	7.417	1.80	13.500	1.26	19.58	1.62
1.417	0.90	7.500	1.80	13.583	1.26	19.67	1.62
1.500	0.90	7.583	1.80	13.667	1.26	19.75	1.62
1.583	0.90	7.667	1.80	13.750	1.26	19.83	1.62
1.667	0.90	7.750	1.80	13.833	7.39	19.92	1.62
1.750	0.90	7.833	1.80	13.917	7.39	20.00	1.62
1.833	0.90	7.917	1.80	14.000	7.39	20.08	1.62
1.917	0.90	8.000	1.80	14.083	7.39	20.17	1.62
2.000	0.90	8.083	1.80	14.167	7.39	20.25	1.62
2.083	1.62	8.167	1.80	14.250	7.39	20.33	1.08
2.167	1.62	8.250	1.80	14.333	2.70	20.42	1.08
2.250	1.62	8.333	2.43	14.417	2.70	20.50	1.08
2.333	1.17	8.417	2.43	14.500	2.70	20.58	1.08
2.417	1.17	8.500	2.43	14.583	2.70	20.67	1.08
2.500	1.17	8.583	2.43	14.667	2.70	20.75	1.08
2.583	1.17	8.667	2.43	14.750	2.70	20.83	1.08
2.667	1.17	8.750	2.43	14.833	2.70	20.92	1.08
2.750	1.17	8.833	2.43	14.917	2.70	21.00	1.08
2.833	1.17	8.917	2.43	15.000	2.70	21.08	1.08
2.917	1.17	9.000	2.43	15.083	2.70	21.17	1.08
3.000	1.17	9.083	2.43	15.167	2.70	21.25	1.08
3.083	1.17	9.167	2.43	15.250	2.70	21.33	1.08
3.167	1.17	9.250	2.43	15.333	2.70	21.42	1.08
3.250	1.17	9.333	2.88	15.417	2.70	21.50	1.08
3.333	1.17	9.417	2.88	15.500	2.70	21.58	1.08
3.417	1.17	9.500	2.88	15.583	2.70	21.67	1.08
3.500	1.17	9.583	2.88	15.667	2.70	21.75	1.08
3.583	1.17	9.667	2.88	15.750	2.70	21.83	1.08
3.667	1.17	9.750	2.88	15.833	2.70	21.92	1.08
3.750	1.17	9.833	3.24	15.917	2.70	22.00	1.08
3.833	1.17	9.917	3.24	16.000	2.70	22.08	1.08
3.917	1.17	10.000	3.24	16.083	2.70	22.17	1.08
4.000	1.17	10.083	3.24	16.167	2.70	22.25	1.08
4.083	1.17	10.167	3.24	16.250	2.70	22.33	1.08
4.167	1.17	10.250	3.24	16.333	1.62	22.42	1.08
4.250	1.17	10.333	4.14	16.417	1.62	22.50	1.08
4.333	1.44	10.417	4.14	16.500	1.62	22.58	1.08
4.417	1.44	10.500	4.14	16.583	1.62	22.67	1.08
4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08
4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 20.146
TOTAL RAINFALL (mm)= 90.063
RUNOFF COEFFICIENT = 0.224

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

ADD HYD (0201)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)

```

ID1= 1 ( 0100):    0.59   0.017   12.58   20.15
+ ID2= 2 ( 0101):    0.84   0.042   12.33   25.24
=====
ID = 3 ( 0201):    1.43   0.057   12.42   23.13

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| ADD HYD ( 0201) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 3 ( 0201):    1.43   0.057   12.42   23.13
+ ID2= 2 ( 0106):    1.54   0.052   12.50   21.56
=====
ID = 1 ( 0201):    2.96   0.109   12.42   22.32

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| CALIB |
| NASHYD ( 0103) |
| ID= 1 DT= 5.0 min |
-----
Area      (ha)= 0.13   Curve Number (CN)= 58.0
Ia        (mm)= 6.32   # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN    TIME    RAIN    TIME    RAIN    TIME    RAIN
hrs      mm/hr   hrs      mm/hr   hrs      mm/hr   hrs      mm/hr
0.083    0.00    6.167    1.44    12.250    99.47    18.33    1.62
0.167    0.00    6.250    1.44    12.333    12.98    18.42    1.62
0.250    0.00    6.333    1.80    12.417    12.97    18.50    1.62
0.333    0.90    6.417    1.80    12.500    12.97    18.58    1.62
0.417    0.90    6.500    1.80    12.583    12.97    18.67    1.62
0.500    0.90    6.583    1.80    12.667    12.97    18.75    1.62
0.583    0.90    6.667    1.80    12.750    12.97    18.83    1.62
0.667    0.90    6.750    1.80    12.833    6.67    18.92    1.62
0.750    0.90    6.833    1.80    12.917    6.67    19.00    1.62
0.833    0.90    6.917    1.80    13.000    6.67    19.08    1.62
0.917    0.90    7.000    1.80    13.083    6.67    19.17    1.62
1.000    0.90    7.083    1.80    13.167    6.67    19.25    1.62
1.083    0.90    7.167    1.80    13.250    6.67    19.33    1.62
1.167    0.90    7.250    1.80    13.333    1.26    19.42    1.62
1.250    0.90    7.333    1.80    13.417    1.26    19.50    1.62
1.333    0.90    7.417    1.80    13.500    1.26    19.58    1.62
1.417    0.90    7.500    1.80    13.583    1.26    19.67    1.62
1.500    0.90    7.583    1.80    13.667    1.26    19.75    1.62
1.583    0.90    7.667    1.80    13.750    1.26    19.83    1.62
1.667    0.90    7.750    1.80    13.833    7.39    19.92    1.62
1.750    0.90    7.833    1.80    13.917    7.39    20.00    1.62
1.833    0.90    7.917    1.80    14.000    7.39    20.08    1.62
1.917    0.90    8.000    1.80    14.083    7.39    20.17    1.62
2.000    0.90    8.083    1.80    14.167    7.39    20.25    1.62
2.083    1.62    8.167    1.80    14.250    7.39    20.33    1.08
2.167    1.62    8.250    1.80    14.333    2.70    20.42    1.08
2.250    1.62    8.333    2.43    14.417    2.70    20.50    1.08
2.333    1.17    8.417    2.43    14.500    2.70    20.58    1.08
2.417    1.17    8.500    2.43    14.583    2.70    20.67    1.08
2.500    1.17    8.583    2.43    14.667    2.70    20.75    1.08
2.583    1.17    8.667    2.43    14.750    2.70    20.83    1.08
2.667    1.17    8.750    2.43    14.833    2.70    20.92    1.08
2.750    1.17    8.833    2.43    14.917    2.70    21.00    1.08
2.833    1.17    8.917    2.43    15.000    2.70    21.08    1.08
2.917    1.17    9.000    2.43    15.083    2.70    21.17    1.08
3.000    1.17    9.083    2.43    15.167    2.70    21.25    1.08
3.083    1.17    9.167    2.43    15.250    2.70    21.33    1.08
3.167    1.17    9.250    2.43    15.333    2.70    21.42    1.08
3.250    1.17    9.333    2.88    15.417    2.70    21.50    1.08
3.333    1.17    9.417    2.88    15.500    2.70    21.58    1.08
3.417    1.17    9.500    2.88    15.583    2.70    21.67    1.08
3.500    1.17    9.583    2.88    15.667    2.70    21.75    1.08
3.583    1.17    9.667    2.88    15.750    2.70    21.83    1.08
3.667    1.17    9.750    2.88    15.833    2.70    21.92    1.08
3.750    1.17    9.833    3.24    15.917    2.70    22.00    1.08
3.833    1.17    9.917    3.24    16.000    2.70    22.08    1.08
3.917    1.17    10.000    3.24    16.083    2.70    22.17    1.08
4.000    1.17    10.083    3.24    16.167    2.70    22.25    1.08
4.083    1.17    10.167    3.24    16.250    2.70    22.33    1.08
4.167    1.17    10.250    3.24    16.333    1.62    22.42    1.08
4.250    1.17    10.333    4.14    16.417    1.62    22.50    1.08
4.333    1.44    10.417    4.14    16.500    1.62    22.58    1.08
4.417    1.44    10.500    4.14    16.583    1.62    22.67    1.08

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4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08
4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 26.160
TOTAL RAINFALL (mm)= 90.063
RUNOFF COEFFICIENT = 0.290

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

ADD HYD (0202)				
1	+	2	=	3
ID1= 1 (0103):		AREA (ha)	QPEAK (cms)	TPEAK (hrs)
+ ID2= 2 (0201):				R.V. (mm)
ID = 3 (0202):		3.10	0.116	12.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0104)	Area (ha)=	0.40	Curve Number (CN)=	56.0
ID= 1 DT= 5.0 min	Ia (mm)=	4.68	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.21		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.44	12.250	99.47	18.33	1.62
0.167	0.00	6.250	1.44	12.333	12.98	18.42	1.62
0.250	0.00	6.333	1.80	12.417	12.97	18.50	1.62
0.333	0.90	6.417	1.80	12.500	12.97	18.58	1.62
0.417	0.90	6.500	1.80	12.583	12.97	18.67	1.62
0.500	0.90	6.583	1.80	12.667	12.97	18.75	1.62
0.583	0.90	6.667	1.80	12.750	12.97	18.83	1.62
0.667	0.90	6.750	1.80	12.833	6.67	18.92	1.62
0.750	0.90	6.833	1.80	12.917	6.67	19.00	1.62
0.833	0.90	6.917	1.80	13.000	6.67	19.08	1.62
0.917	0.90	7.000	1.80	13.083	6.67	19.17	1.62
1.000	0.90	7.083	1.80	13.167	6.67	19.25	1.62
1.083	0.90	7.167	1.80	13.250	6.67	19.33	1.62
1.167	0.90	7.250	1.80	13.333	1.26	19.42	1.62
1.250	0.90	7.333	1.80	13.417	1.26	19.50	1.62
1.333	0.90	7.417	1.80	13.500	1.26	19.58	1.62
1.417	0.90	7.500	1.80	13.583	1.26	19.67	1.62
1.500	0.90	7.583	1.80	13.667	1.26	19.75	1.62
1.583	0.90	7.667	1.80	13.750	1.26	19.83	1.62
1.667	0.90	7.750	1.80	13.833	7.39	19.92	1.62
1.750	0.90	7.833	1.80	13.917	7.39	20.00	1.62
1.833	0.90	7.917	1.80	14.000	7.39	20.08	1.62
1.917	0.90	8.000	1.80	14.083	7.39	20.17	1.62
2.000	0.90	8.083	1.80	14.167	7.39	20.25	1.62
2.083	1.62	8.167	1.80	14.250	7.39	20.33	1.08
2.167	1.62	8.250	1.80	14.333	2.70	20.42	1.08
2.250	1.62	8.333	2.43	14.417	2.70	20.50	1.08
2.333	1.17	8.417	2.43	14.500	2.70	20.58	1.08

2.417	1.17	8.500	2.43	14.583	2.70	20.67	1.08
2.500	1.17	8.583	2.43	14.667	2.70	20.75	1.08
2.583	1.17	8.667	2.43	14.750	2.70	20.83	1.08
2.667	1.17	8.750	2.43	14.833	2.70	20.92	1.08
2.750	1.17	8.833	2.43	14.917	2.70	21.00	1.08
2.833	1.17	8.917	2.43	15.000	2.70	21.08	1.08
2.917	1.17	9.000	2.43	15.083	2.70	21.17	1.08
3.000	1.17	9.083	2.43	15.167	2.70	21.25	1.08
3.083	1.17	9.167	2.43	15.250	2.70	21.33	1.08
3.167	1.17	9.250	2.43	15.333	2.70	21.42	1.08
3.250	1.17	9.333	2.88	15.417	2.70	21.50	1.08
3.333	1.17	9.417	2.88	15.500	2.70	21.58	1.08
3.417	1.17	9.500	2.88	15.583	2.70	21.67	1.08
3.500	1.17	9.583	2.88	15.667	2.70	21.75	1.08
3.583	1.17	9.667	2.88	15.750	2.70	21.83	1.08
3.667	1.17	9.750	2.88	15.833	2.70	21.92	1.08
3.750	1.17	9.833	3.24	15.917	2.70	22.00	1.08
3.833	1.17	9.917	3.24	16.000	2.70	22.08	1.08
3.917	1.17	10.000	3.24	16.083	2.70	22.17	1.08
4.000	1.17	10.083	3.24	16.167	2.70	22.25	1.08
4.083	1.17	10.167	3.24	16.250	2.70	22.33	1.08
4.167	1.17	10.250	3.24	16.333	1.62	22.42	1.08
4.250	1.17	10.333	4.14	16.417	1.62	22.50	1.08
4.333	1.44	10.417	4.14	16.500	1.62	22.58	1.08
4.417	1.44	10.500	4.14	16.583	1.62	22.67	1.08
4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08
4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.023 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 25.543
TOTAL RAINFALL (mm)= 90.063
RUNOFF COEFFICIENT = 0.284

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

ADD HYD (0203)				
1 + 2 = 3				
ID1= 1 (0104):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0202):	0.40	0.023	12.33	25.54
	3.10	0.116	12.42	22.48
ID = 3 (0203):	3.49	0.137	12.42	22.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)=	3.31	Curve Number (CN)= 55.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.81	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.44	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.44	12.250	99.47	18.33	1.62
0.167	0.00	6.250	1.44	12.333	12.98	18.42	1.62
0.250	0.00	6.333	1.80	12.417	12.97	18.50	1.62

0.333	0.90	6.417	1.80	12.500	12.97	18.58	1.62
0.417	0.90	6.500	1.80	12.583	12.97	18.67	1.62
0.500	0.90	6.583	1.80	12.667	12.97	18.75	1.62
0.583	0.90	6.667	1.80	12.750	12.97	18.83	1.62
0.667	0.90	6.750	1.80	12.833	6.67	18.92	1.62
0.750	0.90	6.833	1.80	12.917	6.67	19.00	1.62
0.833	0.90	6.917	1.80	13.000	6.67	19.08	1.62
0.917	0.90	7.000	1.80	13.083	6.67	19.17	1.62
1.000	0.90	7.083	1.80	13.167	6.67	19.25	1.62
1.083	0.90	7.167	1.80	13.250	6.67	19.33	1.62
1.167	0.90	7.250	1.80	13.333	1.26	19.42	1.62
1.250	0.90	7.333	1.80	13.417	1.26	19.50	1.62
1.333	0.90	7.417	1.80	13.500	1.26	19.58	1.62
1.417	0.90	7.500	1.80	13.583	1.26	19.67	1.62
1.500	0.90	7.583	1.80	13.667	1.26	19.75	1.62
1.583	0.90	7.667	1.80	13.750	1.26	19.83	1.62
1.667	0.90	7.750	1.80	13.833	7.39	19.92	1.62
1.750	0.90	7.833	1.80	13.917	7.39	20.00	1.62
1.833	0.90	7.917	1.80	14.000	7.39	20.08	1.62
1.917	0.90	8.000	1.80	14.083	7.39	20.17	1.62
2.000	0.90	8.083	1.80	14.167	7.39	20.25	1.62
2.083	1.62	8.167	1.80	14.250	7.39	20.33	1.08
2.167	1.62	8.250	1.80	14.333	2.70	20.42	1.08
2.250	1.62	8.333	2.43	14.417	2.70	20.50	1.08
2.333	1.17	8.417	2.43	14.500	2.70	20.58	1.08
2.417	1.17	8.500	2.43	14.583	2.70	20.67	1.08
2.500	1.17	8.583	2.43	14.667	2.70	20.75	1.08
2.583	1.17	8.667	2.43	14.750	2.70	20.83	1.08
2.667	1.17	8.750	2.43	14.833	2.70	20.92	1.08
2.750	1.17	8.833	2.43	14.917	2.70	21.00	1.08
2.833	1.17	8.917	2.43	15.000	2.70	21.08	1.08
2.917	1.17	9.000	2.43	15.083	2.70	21.17	1.08
3.000	1.17	9.083	2.43	15.167	2.70	21.25	1.08
3.083	1.17	9.167	2.43	15.250	2.70	21.33	1.08
3.167	1.17	9.250	2.43	15.333	2.70	21.42	1.08
3.250	1.17	9.333	2.88	15.417	2.70	21.50	1.08
3.333	1.17	9.417	2.88	15.500	2.70	21.58	1.08
3.417	1.17	9.500	2.88	15.583	2.70	21.67	1.08
3.500	1.17	9.583	2.88	15.667	2.70	21.75	1.08
3.583	1.17	9.667	2.88	15.750	2.70	21.83	1.08
3.667	1.17	9.750	2.88	15.833	2.70	21.92	1.08
3.750	1.17	9.833	3.24	15.917	2.70	22.00	1.08
3.833	1.17	9.917	3.24	16.000	2.70	22.08	1.08
3.917	1.17	10.000	3.24	16.083	2.70	22.17	1.08
4.000	1.17	10.083	3.24	16.167	2.70	22.25	1.08
4.083	1.17	10.167	3.24	16.250	2.70	22.33	1.08
4.167	1.17	10.250	3.24	16.333	1.62	22.42	1.08
4.250	1.17	10.333	4.14	16.417	1.62	22.50	1.08
4.333	1.44	10.417	4.14	16.500	1.62	22.58	1.08
4.417	1.44	10.500	4.14	16.583	1.62	22.67	1.08
4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08
4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.109 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 23.810
TOTAL RAINFALL (mm)= 90.063
RUNOFF COEFFICIENT = 0.264

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

ADD HYD (0204)				
1 + 2 = 3				
ID1= 1 (0102):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0203):	3.31	0.109	12.58	23.81
	3.49	0.137	12.42	22.83
ID = 3 (0204):	6.80	0.237	12.50	23.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0105)	Area (ha)= 0.13		
ID= 1 DT= 5.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.06
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	29.10	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.44	12.250	99.47	18.33	1.62
0.167	0.00	6.250	1.44	12.333	12.98	18.42	1.62
0.250	0.00	6.333	1.80	12.417	12.97	18.50	1.62
0.333	0.90	6.417	1.80	12.500	12.97	18.58	1.62
0.417	0.90	6.500	1.80	12.583	12.97	18.67	1.62
0.500	0.90	6.583	1.80	12.667	12.97	18.75	1.62
0.583	0.90	6.667	1.80	12.750	12.97	18.83	1.62
0.667	0.90	6.750	1.80	12.833	6.67	18.92	1.62
0.750	0.90	6.833	1.80	12.917	6.67	19.00	1.62
0.833	0.90	6.917	1.80	13.000	6.67	19.08	1.62
0.917	0.90	7.000	1.80	13.083	6.67	19.17	1.62
1.000	0.90	7.083	1.80	13.167	6.67	19.25	1.62
1.083	0.90	7.167	1.80	13.250	6.67	19.33	1.62
1.167	0.90	7.250	1.80	13.333	1.26	19.42	1.62
1.250	0.90	7.333	1.80	13.417	1.26	19.50	1.62
1.333	0.90	7.417	1.80	13.500	1.26	19.58	1.62
1.417	0.90	7.500	1.80	13.583	1.26	19.67	1.62
1.500	0.90	7.583	1.80	13.667	1.26	19.75	1.62
1.583	0.90	7.667	1.80	13.750	1.26	19.83	1.62
1.667	0.90	7.750	1.80	13.833	7.39	19.92	1.62
1.750	0.90	7.833	1.80	13.917	7.39	20.00	1.62
1.833	0.90	7.917	1.80	14.000	7.39	20.08	1.62
1.917	0.90	8.000	1.80	14.083	7.39	20.17	1.62
2.000	0.90	8.083	1.80	14.167	7.39	20.25	1.62
2.083	1.62	8.167	1.80	14.250	7.39	20.33	1.08
2.167	1.62	8.250	1.80	14.333	2.70	20.42	1.08
2.250	1.62	8.333	2.43	14.417	2.70	20.50	1.08
2.333	1.17	8.417	2.43	14.500	2.70	20.58	1.08
2.417	1.17	8.500	2.43	14.583	2.70	20.67	1.08
2.500	1.17	8.583	2.43	14.667	2.70	20.75	1.08
2.583	1.17	8.667	2.43	14.750	2.70	20.83	1.08
2.667	1.17	8.750	2.43	14.833	2.70	20.92	1.08
2.750	1.17	8.833	2.43	14.917	2.70	21.00	1.08
2.833	1.17	8.917	2.43	15.000	2.70	21.08	1.08
2.917	1.17	9.000	2.43	15.083	2.70	21.17	1.08
3.000	1.17	9.083	2.43	15.167	2.70	21.25	1.08
3.083	1.17	9.167	2.43	15.250	2.70	21.33	1.08
3.167	1.17	9.250	2.43	15.333	2.70	21.42	1.08
3.250	1.17	9.333	2.88	15.417	2.70	21.50	1.08
3.333	1.17	9.417	2.88	15.500	2.70	21.58	1.08
3.417	1.17	9.500	2.88	15.583	2.70	21.67	1.08
3.500	1.17	9.583	2.88	15.667	2.70	21.75	1.08
3.583	1.17	9.667	2.88	15.750	2.70	21.83	1.08
3.667	1.17	9.750	2.88	15.833	2.70	21.92	1.08
3.750	1.17	9.833	3.24	15.917	2.70	22.00	1.08
3.833	1.17	9.917	3.24	16.000	2.70	22.08	1.08
3.917	1.17	10.000	3.24	16.083	2.70	22.17	1.08
4.000	1.17	10.083	3.24	16.167	2.70	22.25	1.08
4.083	1.17	10.167	3.24	16.250	2.70	22.33	1.08
4.167	1.17	10.250	3.24	16.333	1.62	22.42	1.08
4.250	1.17	10.333	4.14	16.417	1.62	22.50	1.08
4.333	1.44	10.417	4.14	16.500	1.62	22.58	1.08
4.417	1.44	10.500	4.14	16.583	1.62	22.67	1.08
4.500	1.44	10.583	4.14	16.667	1.62	22.75	1.08
4.583	1.44	10.667	4.14	16.750	1.62	22.83	1.08
4.667	1.44	10.750	4.14	16.833	1.62	22.92	1.08

4.750	1.44	10.833	5.59	16.917	1.62	23.00	1.08
4.833	1.44	10.917	5.59	17.000	1.62	23.08	1.08
4.917	1.44	11.000	5.59	17.083	1.62	23.17	1.08
5.000	1.44	11.083	5.59	17.167	1.62	23.25	1.08
5.083	1.44	11.167	5.59	17.250	1.62	23.33	1.08
5.167	1.44	11.250	5.59	17.333	1.62	23.42	1.08
5.250	1.44	11.333	8.65	17.417	1.62	23.50	1.08
5.333	1.44	11.417	8.65	17.500	1.62	23.58	1.08
5.417	1.44	11.500	8.65	17.583	1.62	23.67	1.08
5.500	1.44	11.583	8.65	17.667	1.62	23.75	1.08
5.583	1.44	11.667	8.65	17.750	1.62	23.83	1.08
5.667	1.44	11.750	8.65	17.833	1.62	23.92	1.08
5.750	1.44	11.833	37.48	17.917	1.62	24.00	1.08
5.833	1.44	11.917	37.48	18.000	1.62	24.08	1.08
5.917	1.44	12.000	37.48	18.083	1.62	24.17	1.08
6.000	1.44	12.083	99.46	18.167	1.62	24.25	1.08
6.083	1.44	12.167	99.47	18.250	1.62		

Max.Eff.Inten.(mm/hr)= 99.47 25.42
over (min) 5.00 15.00
Storage Coeff. (min)= 1.22 (ii) 13.43 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.08

TOTALS

PEAK FLOW (cms)= 0.02 0.00 0.022 (iii)
TIME TO PEAK (hrs)= 12.25 12.33 12.25
RUNOFF VOLUME (mm)= 89.06 20.71 58.24
TOTAL RAINFALL (mm)= 90.06 90.06 90.06
RUNOFF COEFFICIENT = 0.99 0.23 0.65

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0105):	0.13	0.022	12.25	58.24
+ ID2= 2 (0204):	6.80	0.237	12.50	23.31
=====				
ID = 3 (0205):	6.93	0.241	12.42	23.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:100 Year 24 Hour SCS **

READ STORM	Filename: C:\Users\ABaten\AppData ata\Local\Temp\ 23d527d8-1fdf-4bae-ba37-ff6a857440d4\7ca0ad5b
Ptotal=129.37 mm	Comments: 100 Year 24 Hour SCS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	2.59	12.50	18.63	18.75	2.33
0.25	1.29	6.50	2.59	12.75	9.58	19.00	2.33
0.50	1.29	6.75	2.59	13.00	9.58	19.25	2.33
0.75	1.29	7.00	2.59	13.25	1.81	19.50	2.33
1.00	1.29	7.25	2.59	13.50	1.81	19.75	2.33
1.25	1.29	7.50	2.59	13.75	10.61	20.00	2.33
1.50	1.29	7.75	2.59	14.00	10.61	20.25	1.55
1.75	1.29	8.00	2.59	14.25	3.88	20.50	1.55
2.00	2.33	8.25	3.49	14.50	3.88	20.75	1.55
2.25	1.68	8.50	3.49	14.75	3.88	21.00	1.55
2.50	1.68	8.75	3.49	15.00	3.88	21.25	1.55
2.75	1.68	9.00	3.49	15.25	3.88	21.50	1.55
3.00	1.68	9.25	4.14	15.50	3.88	21.75	1.55
3.25	1.68	9.50	4.14	15.75	3.88	22.00	1.55
3.50	1.68	9.75	4.66	16.00	3.88	22.25	1.55
3.75	1.68	10.00	4.66	16.25	2.33	22.50	1.55
4.00	1.68	10.25	5.95	16.50	2.33	22.75	1.55
4.25	2.07	10.50	5.95	16.75	2.33	23.00	1.55
4.50	2.07	10.75	8.02	17.00	2.33	23.25	1.55
4.75	2.07	11.00	8.02	17.25	2.33	23.50	1.55
5.00	2.07	11.25	12.42	17.50	2.33	23.75	1.55

5.25	2.07	11.50	12.42	17.75	2.33	24.00	1.55
5.50	2.07	11.75	53.83	18.00	2.33		
5.75	2.07	12.00	142.86	18.25	2.33		
6.00	2.07	12.25	18.63	18.50	2.33		

CALIB			
NASHYD (0101)	Area (ha)=	0.84	Curve Number (CN)= 56.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.33	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.26	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33
0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33
0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55
3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55
3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55
4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55
5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55

5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.081 (i)
 TIME TO PEAK (hrs)= 12.333
 RUNOFF VOLUME (mm)= 47.513
 TOTAL RAINFALL (mm)= 129.373
 RUNOFF COEFFICIENT = 0.367

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

CALIB			
NASHYD (0106)	Area (ha)=	1.54	Curve Number (CN)= 51.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.36	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33
0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33
0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55
3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55
3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55

4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55
5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55
5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.103 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 41.458
TOTAL RAINFALL (mm)= 129.373
RUNOFF COEFFICIENT = 0.320

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

CALIB			
NASHYD (0100)	Area (ha)=	0.59	Curve Number (CN)= 49.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.31	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.42	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33
0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33
0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55
3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55

3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55
4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55
5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55
5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 39.084
TOTAL RAINFALL (mm)= 129.373
RUNOFF COEFFICIENT = 0.302

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

ADD HYD (0201)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		0.59	0.033	12.50	39.08
+ ID2= 2 (0101):		0.84	0.081	12.33	47.51
=====					
ID = 3 (0201):		1.43	0.111	12.42	44.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0201)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0201):		1.43	0.111	12.42	44.03
+ ID2= 2 (0106):		1.54	0.103	12.50	41.46
=====					
ID = 1 (0201):		2.96	0.212	12.42	42.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		Area	(ha)=	0.13	Curve Number (CN)=	58.0
NASHYD (0103)		Ia	(mm)=	6.32	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min		U.H. Tp	(hrs)=	0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33

0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33
0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55
3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55
3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55
4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55
5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55
5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.015 (i)

TIME TO PEAK (hrs)= 12.333

RUNOFF VOLUME (mm)= 49.255

TOTAL RAINFALL (mm)= 129.373

RUNOFF COEFFICIENT = 0.381

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

ADD HYD (0202)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):	0.13	0.015	12.33	49.26
+ ID2= 2 (0201):	2.96	0.212	12.42	42.70
=====				
ID = 3 (0202):	3.10	0.226	12.42	42.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.40	Curve Number (CN)= 56.0
NASHYD (0104)	Ia (mm)=	4.68	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.21	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33
0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33
0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55
3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55
3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55
4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55

5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55
5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.044 (i)
 TIME TO PEAK (hrs)= 12.333
 RUNOFF VOLUME (mm)= 47.873
 TOTAL RAINFALL (mm)= 129.373
 RUNOFF COEFFICIENT = 0.370

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

ADD HYD (0203)				
1 + 2 = 3				
ID1= 1 (0104):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0202):	0.40	0.044	12.33	47.87
	3.10	0.226	12.42	42.98
=====				
ID = 3 (0203):	3.49	0.265	12.42	43.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)			
ID= 1 DT= 5.0 min	Area (ha)=	3.31	Curve Number (CN)= 55.0
	Ia (mm)=	6.81	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.44	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33
0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33
0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55

3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55
3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55
4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55
5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55
5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.212 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 45.463
TOTAL RAINFALL (mm)= 129.373
RUNOFF COEFFICIENT = 0.351

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

ADD HYD (0204)				
1 + 2 = 3				
ID1= 1 (0102):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0203):	3.31	0.212	12.58	45.46
	3.49	0.265	12.42	43.53
ID = 3 (0204):	6.80	0.461	12.42	44.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0105)	Area (ha)= 0.13		
ID= 1 DT= 5.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.06
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	29.10	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	2.07	12.250	142.86	18.33	2.33
0.167	0.00	6.250	2.07	12.333	18.65	18.42	2.33
0.250	0.00	6.333	2.59	12.417	18.63	18.50	2.33
0.333	1.29	6.417	2.59	12.500	18.63	18.58	2.33
0.417	1.29	6.500	2.59	12.583	18.63	18.67	2.33

0.500	1.29	6.583	2.59	12.667	18.63	18.75	2.33
0.583	1.29	6.667	2.59	12.750	18.63	18.83	2.33
0.667	1.29	6.750	2.59	12.833	9.58	18.92	2.33
0.750	1.29	6.833	2.59	12.917	9.58	19.00	2.33
0.833	1.29	6.917	2.59	13.000	9.58	19.08	2.33
0.917	1.29	7.000	2.59	13.083	9.58	19.17	2.33
1.000	1.29	7.083	2.59	13.167	9.58	19.25	2.33
1.083	1.29	7.167	2.59	13.250	9.58	19.33	2.33
1.167	1.29	7.250	2.59	13.333	1.81	19.42	2.33
1.250	1.29	7.333	2.59	13.417	1.81	19.50	2.33
1.333	1.29	7.417	2.59	13.500	1.81	19.58	2.33
1.417	1.29	7.500	2.59	13.583	1.81	19.67	2.33
1.500	1.29	7.583	2.59	13.667	1.81	19.75	2.33
1.583	1.29	7.667	2.59	13.750	1.81	19.83	2.33
1.667	1.29	7.750	2.59	13.833	10.61	19.92	2.33
1.750	1.29	7.833	2.59	13.917	10.61	20.00	2.33
1.833	1.29	7.917	2.59	14.000	10.61	20.08	2.33
1.917	1.29	8.000	2.59	14.083	10.61	20.17	2.33
2.000	1.29	8.083	2.59	14.167	10.61	20.25	2.33
2.083	2.33	8.167	2.59	14.250	10.61	20.33	1.55
2.167	2.33	8.250	2.59	14.333	3.88	20.42	1.55
2.250	2.33	8.333	3.49	14.417	3.88	20.50	1.55
2.333	1.68	8.417	3.49	14.500	3.88	20.58	1.55
2.417	1.68	8.500	3.49	14.583	3.88	20.67	1.55
2.500	1.68	8.583	3.49	14.667	3.88	20.75	1.55
2.583	1.68	8.667	3.49	14.750	3.88	20.83	1.55
2.667	1.68	8.750	3.49	14.833	3.88	20.92	1.55
2.750	1.68	8.833	3.49	14.917	3.88	21.00	1.55
2.833	1.68	8.917	3.49	15.000	3.88	21.08	1.55
2.917	1.68	9.000	3.49	15.083	3.88	21.17	1.55
3.000	1.68	9.083	3.49	15.167	3.88	21.25	1.55
3.083	1.68	9.167	3.49	15.250	3.88	21.33	1.55
3.167	1.68	9.250	3.49	15.333	3.88	21.42	1.55
3.250	1.68	9.333	4.14	15.417	3.88	21.50	1.55
3.333	1.68	9.417	4.14	15.500	3.88	21.58	1.55
3.417	1.68	9.500	4.14	15.583	3.88	21.67	1.55
3.500	1.68	9.583	4.14	15.667	3.88	21.75	1.55
3.583	1.68	9.667	4.14	15.750	3.88	21.83	1.55
3.667	1.68	9.750	4.14	15.833	3.88	21.92	1.55
3.750	1.68	9.833	4.66	15.917	3.88	22.00	1.55
3.833	1.68	9.917	4.66	16.000	3.88	22.08	1.55
3.917	1.68	10.000	4.66	16.083	3.88	22.17	1.55
4.000	1.68	10.083	4.66	16.167	3.88	22.25	1.55
4.083	1.68	10.167	4.66	16.250	3.88	22.33	1.55
4.167	1.68	10.250	4.66	16.333	2.33	22.42	1.55
4.250	1.68	10.333	5.95	16.417	2.33	22.50	1.55
4.333	2.07	10.417	5.95	16.500	2.33	22.58	1.55
4.417	2.07	10.500	5.95	16.583	2.33	22.67	1.55
4.500	2.07	10.583	5.95	16.667	2.33	22.75	1.55
4.583	2.07	10.667	5.95	16.750	2.33	22.83	1.55
4.667	2.07	10.750	5.95	16.833	2.33	22.92	1.55
4.750	2.07	10.833	8.02	16.917	2.33	23.00	1.55
4.833	2.07	10.917	8.02	17.000	2.33	23.08	1.55
4.917	2.07	11.000	8.02	17.083	2.33	23.17	1.55
5.000	2.07	11.083	8.02	17.167	2.33	23.25	1.55
5.083	2.07	11.167	8.02	17.250	2.33	23.33	1.55
5.167	2.07	11.250	8.02	17.333	2.33	23.42	1.55
5.250	2.07	11.333	12.42	17.417	2.33	23.50	1.55
5.333	2.07	11.417	12.42	17.500	2.33	23.58	1.55
5.417	2.07	11.500	12.42	17.583	2.33	23.67	1.55
5.500	2.07	11.583	12.42	17.667	2.33	23.75	1.55
5.583	2.07	11.667	12.42	17.750	2.33	23.83	1.55
5.667	2.07	11.750	12.42	17.833	2.33	23.92	1.55
5.750	2.07	11.833	53.83	17.917	2.33	24.00	1.55
5.833	2.07	11.917	53.83	18.000	2.33	24.08	1.55
5.917	2.07	12.000	53.83	18.083	2.33	24.17	1.55
6.000	2.07	12.083	142.85	18.167	2.33	24.25	1.55
6.083	2.07	12.167	142.86	18.250	2.33		

Max.Eff.Inten.(mm/hr)= 142.86 52.83
over (min) 5.00 15.00
Storage Coeff. (min)= 1.06 (ii) 10.17 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.10

PEAK FLOW (cms)= 0.03 0.01 *TOTALS*
TIME TO PEAK (hrs)= 12.25 12.33 0.033 (iii)
RUNOFF VOLUME (mm)= 128.37 39.79 88.45
TOTAL RAINFALL (mm)= 129.37 129.37 129.37
RUNOFF COEFFICIENT = 0.99 0.31 0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

- CN* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0105):		0.13	0.033	12.25	88.45
+ ID2= 2 (0204):		6.80	0.461	12.42	44.47
=====		=====			
ID = 3 (0205):		6.93	0.470	12.42	45.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:2 Year 24 Hour SCS **

READ STORM	Filename: C:\Users\ABaten\AppData Local\Temp\ 23d527d8-1fdf-4bae-ba37-ff6a857440d4\b376fe6d
Ptotal= 58.58 mm	Comments: 2 Year 24 Hour SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	6.25	1.17	12.50	8.44	18.75	1.05
0.25	0.59	6.50	1.17	12.75	4.34	19.00	1.05
0.50	0.59	6.75	1.17	13.00	4.34	19.25	1.05
0.75	0.59	7.00	1.17	13.25	0.82	19.50	1.05
1.00	0.59	7.25	1.17	13.50	0.82	19.75	1.05
1.25	0.59	7.50	1.17	13.75	4.81	20.00	1.05
1.50	0.59	7.75	1.17	14.00	4.81	20.25	0.70
1.75	0.59	8.00	1.17	14.25	1.76	20.50	0.70
2.00	1.05	8.25	1.58	14.50	1.76	20.75	0.70
2.25	0.76	8.50	1.58	14.75	1.76	21.00	0.70
2.50	0.76	8.75	1.58	15.00	1.76	21.25	0.70
2.75	0.76	9.00	1.58	15.25	1.76	21.50	0.70
3.00	0.76	9.25	1.88	15.50	1.76	21.75	0.70
3.25	0.76	9.50	1.88	15.75	1.76	22.00	0.70
3.50	0.76	9.75	2.11	16.00	1.76	22.25	0.70
3.75	0.76	10.00	2.11	16.25	1.05	22.50	0.70
4.00	0.76	10.25	2.70	16.50	1.05	22.75	0.70
4.25	0.94	10.50	2.70	16.75	1.05	23.00	0.70
4.50	0.94	10.75	3.63	17.00	1.05	23.25	0.70
4.75	0.94	11.00	3.63	17.25	1.05	23.50	0.70
5.00	0.94	11.25	5.63	17.50	1.05	23.75	0.70
5.25	0.94	11.50	5.63	17.75	1.05	24.00	0.70
5.50	0.94	11.75	24.38	18.00	1.05		
5.75	0.94	12.00	64.69	18.25	1.05		
6.00	0.94	12.25	8.44	18.50	1.05		

CALIB	Area	(ha)=	0.84	Curve Number	(CN)=	56.0
NASHYD (0101)	Ia	(mm)=	5.33	# of Linear Res.(N)=	3.00	
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.26				

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05
0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05
0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05

1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70
3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70
3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70
5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70
6.083	0.94	12.167	64.69	18.250	1.05		

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 11.208
TOTAL RAINFALL (mm)= 58.583
RUNOFF COEFFICIENT = 0.191

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

CALIB			
NASHYD (0106)	Area (ha)=	1.54	Curve Number (CN)= 51.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.36	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05

0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05
0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05
1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70
3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70
3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70
5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70
6.083	0.94	12.167	64.69	18.250	1.05		

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 9.342
TOTAL RAINFALL (mm)= 58.583
RUNOFF COEFFICIENT = 0.159

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

CALIB
NASHYD (0100)
ID= 1 DT= 5.0 min

Area (ha)= 0.59 Curve Number (CN)= 49.0
Ia (mm)= 6.31 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.42

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05
0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05
0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05
1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70
3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70
3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70
5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70

6.083 0.94 | 12.167 64.69 | 18.250 1.05 |

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.007 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 8.627
 TOTAL RAINFALL (mm)= 58.583
 RUNOFF COEFFICIENT = 0.147

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

ADD HYD (0201)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		0.59	0.007	12.58	8.63
+ ID2= 2 (0101):		0.84	0.018	12.42	11.21
=====					
ID = 3 (0201):		1.43	0.025	12.42	10.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0201)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0201):		1.43	0.025	12.42	10.14
+ ID2= 2 (0106):		1.54	0.022	12.50	9.34
=====					
ID = 1 (0201):		2.96	0.046	12.42	9.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0103)	Area (ha)=	0.13	Curve Number (CN)=	58.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.32	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05
0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05
0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05
1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70

3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70
3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70
5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70
6.083	0.94	12.167	64.69	18.250	1.05		

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 11.545
TOTAL RAINFALL (mm)= 58.583
RUNOFF COEFFICIENT = 0.197

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

ADD HYD (0202)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):		0.13	0.003	12.33	11.54
+ ID2= 2 (0201):		2.96	0.046	12.42	9.73
=====		=====			
ID = 3 (0202):		3.10	0.049	12.42	9.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		Area	(ha)=	Curve Number	(CN)=
NASHYD (0104)		Ia	(mm)=	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min		U.H. Tp(hrs)=	0.21		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05
0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05

0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05
1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70
3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70
3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70
5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70
6.083	0.94	12.167	64.69	18.250	1.05		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 11.444
TOTAL RAINFALL (mm)= 58.583
RUNOFF COEFFICIENT = 0.195

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

ADD HYD (0203)				
1 + 2 = 3				

ID1= 1 (0104):	0.40	0.010	12.33	11.44
+ ID2= 2 (0202):	3.10	0.049	12.42	9.81
=====				
ID = 3 (0203):	3.49	0.059	12.42	9.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)=	3.31	Curve Number (CN)= 55.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.81	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.44	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05
0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05
0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05
1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70
3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70
3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70

5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70
6.083	0.94	12.167	64.69	18.250	1.05		

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.046 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 10.324
 TOTAL RAINFALL (mm)= 58.583
 RUNOFF COEFFICIENT = 0.176

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

ADD HYD (0204)				
1 + 2 = 3				
ID1= 1 (0102):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0203):	3.31	0.046	12.58	10.32
	3.49	0.059	12.42	9.99
=====				
ID = 3 (0204):	6.80	0.101	12.50	10.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0105)		Area (ha)= 0.13
ID= 1 DT= 5.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.06
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	29.10	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.94	12.250	64.69	18.33	1.05
0.167	0.00	6.250	0.94	12.333	8.45	18.42	1.05
0.250	0.00	6.333	1.17	12.417	8.44	18.50	1.05
0.333	0.59	6.417	1.17	12.500	8.44	18.58	1.05
0.417	0.59	6.500	1.17	12.583	8.44	18.67	1.05
0.500	0.59	6.583	1.17	12.667	8.44	18.75	1.05
0.583	0.59	6.667	1.17	12.750	8.44	18.83	1.05
0.667	0.59	6.750	1.17	12.833	4.34	18.92	1.05
0.750	0.59	6.833	1.17	12.917	4.34	19.00	1.05
0.833	0.59	6.917	1.17	13.000	4.34	19.08	1.05
0.917	0.59	7.000	1.17	13.083	4.34	19.17	1.05
1.000	0.59	7.083	1.17	13.167	4.34	19.25	1.05
1.083	0.59	7.167	1.17	13.250	4.34	19.33	1.05
1.167	0.59	7.250	1.17	13.333	0.82	19.42	1.05
1.250	0.59	7.333	1.17	13.417	0.82	19.50	1.05
1.333	0.59	7.417	1.17	13.500	0.82	19.58	1.05
1.417	0.59	7.500	1.17	13.583	0.82	19.67	1.05
1.500	0.59	7.583	1.17	13.667	0.82	19.75	1.05
1.583	0.59	7.667	1.17	13.750	0.82	19.83	1.05
1.667	0.59	7.750	1.17	13.833	4.81	19.92	1.05
1.750	0.59	7.833	1.17	13.917	4.81	20.00	1.05
1.833	0.59	7.917	1.17	14.000	4.81	20.08	1.05
1.917	0.59	8.000	1.17	14.083	4.81	20.17	1.05
2.000	0.59	8.083	1.17	14.167	4.81	20.25	1.05
2.083	1.05	8.167	1.17	14.250	4.81	20.33	0.70
2.167	1.05	8.250	1.17	14.333	1.76	20.42	0.70
2.250	1.05	8.333	1.58	14.417	1.76	20.50	0.70
2.333	0.76	8.417	1.58	14.500	1.76	20.58	0.70
2.417	0.76	8.500	1.58	14.583	1.76	20.67	0.70
2.500	0.76	8.583	1.58	14.667	1.76	20.75	0.70
2.583	0.76	8.667	1.58	14.750	1.76	20.83	0.70
2.667	0.76	8.750	1.58	14.833	1.76	20.92	0.70
2.750	0.76	8.833	1.58	14.917	1.76	21.00	0.70
2.833	0.76	8.917	1.58	15.000	1.76	21.08	0.70
2.917	0.76	9.000	1.58	15.083	1.76	21.17	0.70
3.000	0.76	9.083	1.58	15.167	1.76	21.25	0.70
3.083	0.76	9.167	1.58	15.250	1.76	21.33	0.70
3.167	0.76	9.250	1.58	15.333	1.76	21.42	0.70

3.250	0.76	9.333	1.88	15.417	1.76	21.50	0.70
3.333	0.76	9.417	1.88	15.500	1.76	21.58	0.70
3.417	0.76	9.500	1.88	15.583	1.76	21.67	0.70
3.500	0.76	9.583	1.88	15.667	1.76	21.75	0.70
3.583	0.76	9.667	1.88	15.750	1.76	21.83	0.70
3.667	0.76	9.750	1.88	15.833	1.76	21.92	0.70
3.750	0.76	9.833	2.11	15.917	1.76	22.00	0.70
3.833	0.76	9.917	2.11	16.000	1.76	22.08	0.70
3.917	0.76	10.000	2.11	16.083	1.76	22.17	0.70
4.000	0.76	10.083	2.11	16.167	1.76	22.25	0.70
4.083	0.76	10.167	2.11	16.250	1.76	22.33	0.70
4.167	0.76	10.250	2.11	16.333	1.05	22.42	0.70
4.250	0.76	10.333	2.70	16.417	1.05	22.50	0.70
4.333	0.94	10.417	2.70	16.500	1.05	22.58	0.70
4.417	0.94	10.500	2.70	16.583	1.05	22.67	0.70
4.500	0.94	10.583	2.70	16.667	1.05	22.75	0.70
4.583	0.94	10.667	2.70	16.750	1.05	22.83	0.70
4.667	0.94	10.750	2.70	16.833	1.05	22.92	0.70
4.750	0.94	10.833	3.63	16.917	1.05	23.00	0.70
4.833	0.94	10.917	3.63	17.000	1.05	23.08	0.70
4.917	0.94	11.000	3.63	17.083	1.05	23.17	0.70
5.000	0.94	11.083	3.63	17.167	1.05	23.25	0.70
5.083	0.94	11.167	3.63	17.250	1.05	23.33	0.70
5.167	0.94	11.250	3.63	17.333	1.05	23.42	0.70
5.250	0.94	11.333	5.63	17.417	1.05	23.50	0.70
5.333	0.94	11.417	5.63	17.500	1.05	23.58	0.70
5.417	0.94	11.500	5.63	17.583	1.05	23.67	0.70
5.500	0.94	11.583	5.63	17.667	1.05	23.75	0.70
5.583	0.94	11.667	5.63	17.750	1.05	23.83	0.70
5.667	0.94	11.750	5.63	17.833	1.05	23.92	0.70
5.750	0.94	11.833	24.38	17.917	1.05	24.00	0.70
5.833	0.94	11.917	24.38	18.000	1.05	24.08	0.70
5.917	0.94	12.000	24.38	18.083	1.05	24.17	0.70
6.000	0.94	12.083	64.69	18.167	1.05	24.25	0.70
6.083	0.94	12.167	64.69	18.250	1.05		

Max.Eff.Inten.(mm/hr)=	64.69	8.91	
over (min)	5.00	25.00	
Storage Coeff. (min)=	1.45 (ii)	20.02 (ii)	
Unit Hyd. Tpeak (min)=	5.00	25.00	
Unit Hyd. peak (cms)=	0.33	0.05	
			TOTALS
PEAK FLOW (cms)=	0.01	0.00	0.013 (iii)
TIME TO PEAK (hrs)=	12.25	12.50	12.25
RUNOFF VOLUME (mm)=	57.58	9.03	35.69
TOTAL RAINFALL (mm)=	58.58	58.58	58.58
RUNOFF COEFFICIENT =	0.98	0.15	0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)				
1 + 2 = 3				
ID1= 1 (0105):	0.13	0.013	12.25	35.69
+ ID2= 2 (0204):	6.80	0.101	12.50	10.15
ID = 3 (0205):	6.93	0.103	12.50	10.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:25 Year 24 Hour SCS **

READ STORM		Filename: C:\Users\ABaten\AppData					
Ptotal=105.92 mm		ata\Local\Temp\					
		23d527d8-1fdf-4bae-ba37-ff6a857440d4\012d5812					
		Comments: 25 Year 24 Hour SCS					
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	6.25	2.12	12.50	15.25	18.75	1.91
0.25	1.06	6.50	2.12	12.75	7.84	19.00	1.91
0.50	1.06	6.75	2.12	13.00	7.84	19.25	1.91

0.75	1.06	7.00	2.12	13.25	1.48	19.50	1.91
1.00	1.06	7.25	2.12	13.50	1.48	19.75	1.91
1.25	1.06	7.50	2.12	13.75	8.68	20.00	1.91
1.50	1.06	7.75	2.12	14.00	8.68	20.25	1.27
1.75	1.06	8.00	2.12	14.25	3.18	20.50	1.27
2.00	1.91	8.25	2.86	14.50	3.18	20.75	1.27
2.25	1.38	8.50	2.86	14.75	3.18	21.00	1.27
2.50	1.38	8.75	2.86	15.00	3.18	21.25	1.27
2.75	1.38	9.00	2.86	15.25	3.18	21.50	1.27
3.00	1.38	9.25	3.39	15.50	3.18	21.75	1.27
3.25	1.38	9.50	3.39	15.75	3.18	22.00	1.27
3.50	1.38	9.75	3.81	16.00	3.18	22.25	1.27
3.75	1.38	10.00	3.81	16.25	1.91	22.50	1.27
4.00	1.38	10.25	4.87	16.50	1.91	22.75	1.27
4.25	1.69	10.50	4.87	16.75	1.91	23.00	1.27
4.50	1.69	10.75	6.57	17.00	1.91	23.25	1.27
4.75	1.69	11.00	6.57	17.25	1.91	23.50	1.27
5.00	1.69	11.25	10.17	17.50	1.91	23.75	1.27
5.25	1.69	11.50	10.17	17.75	1.91	24.00	1.27
5.50	1.69	11.75	44.05	18.00	1.91		
5.75	1.69	12.00	116.91	18.25	1.91		
6.00	1.69	12.25	15.25	18.50	1.91		

CALIB							
NASHYD	(0101)	Area	(ha)= 0.84	Curve Number	(CN)= 56.0		
ID= 1 DT= 5.0 min		Ia	(mm)= 5.33	# of Linear Res.	(N)= 3.00		
		U.H. Tp	(hrs)= 0.26				

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91
1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91
1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27
2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27
3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27

4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27
5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27
6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 33.687
TOTAL RAINFALL (mm)= 105.923
RUNOFF COEFFICIENT = 0.318

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

CALIB			
NASHYD (0106)	Area (ha)= 1.54	Curve Number (CN)= 51.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.93	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.36		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91
1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91
1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27

2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27
3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27
4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27
5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27
6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.071 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 29.057
TOTAL RAINFALL (mm)= 105.923
RUNOFF COEFFICIENT = 0.274

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

CALIB			
NASHYD (0100)	Area (ha)=	0.59	Curve Number (CN)= 49.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.31	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.42	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91
1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91

1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27
2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27
3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27
4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27
5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27
6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.023 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 27.257
TOTAL RAINFALL (mm)= 105.923
RUNOFF COEFFICIENT = 0.257

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

ADD HYD (0201)				
1 + 2 = 3				
ID1= 1 (0100):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0101):	0.59	0.023	12.58	27.26
	0.84	0.056	12.33	33.69
=====				
ID = 3 (0201):	1.43	0.077	12.42	31.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0201)				
3 + 2 = 1				
ID1= 3 (0201):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0106):	1.43	0.077	12.42	31.03
	1.54	0.071	12.50	29.06
=====				

ID = 1 (0201): 2.96 0.147 12.42 30.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0103)	Area (ha)=	0.13	Curve Number (CN)= 58.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.32	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91
1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91
1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27
2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27
3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27
4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27

5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27
6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 34.940
TOTAL RAINFALL (mm)= 105.923
RUNOFF COEFFICIENT = 0.330

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

ADD HYD (0202)				
1 + 2 = 3				

ID1= 1 (0103):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0201):	0.13	0.011	12.33	34.94
	2.96	0.147	12.42	30.01
=====				
ID = 3 (0202):	3.10	0.157	12.42	30.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0104)			
ID= 1 DT= 5.0 min			

Area (ha)=	0.40	Curve Number (CN)=	56.0
Ia (mm)=	4.68	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=	0.21		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91
1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91
1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27
2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27

3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27
4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27
5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27
6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.031 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 34.019
TOTAL RAINFALL (mm)= 105.923
RUNOFF COEFFICIENT = 0.321

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

ADD HYD (0203)				
1 + 2 = 3				
ID1= 1 (0104):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0202):	0.40	0.031	12.33	34.02
	3.10	0.157	12.42	30.22
ID = 3 (0203):	3.49	0.185	12.42	30.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)=	3.31	Curve Number (CN)= 55.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.81	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.44	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91

1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91
1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27
2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27
3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27
4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27
5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27
6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.148 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 32.002
TOTAL RAINFALL (mm)= 105.923
RUNOFF COEFFICIENT = 0.302

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

ADD HYD (0204)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	3.31	0.148	12.58	32.00
+ ID2= 2 (0203):	3.49	0.185	12.42	30.65
=====				
ID = 3 (0204):	6.80	0.320	12.42	31.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0105)	Area (ha)=		
ID= 1 DT= 5.0 min	0.13	Total Imp(%)=	55.00
		Dir. Conn.(%)=	55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.07	0.06
Dep. Storage	(mm)=	1.00	5.00
Average slope	(%)=	1.00	2.00
Length	(m)=	29.10	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.69	12.250	116.91	18.33	1.91
0.167	0.00	6.250	1.69	12.333	15.26	18.42	1.91
0.250	0.00	6.333	2.12	12.417	15.25	18.50	1.91
0.333	1.06	6.417	2.12	12.500	15.25	18.58	1.91
0.417	1.06	6.500	2.12	12.583	15.25	18.67	1.91
0.500	1.06	6.583	2.12	12.667	15.25	18.75	1.91
0.583	1.06	6.667	2.12	12.750	15.25	18.83	1.91
0.667	1.06	6.750	2.12	12.833	7.84	18.92	1.91
0.750	1.06	6.833	2.12	12.917	7.84	19.00	1.91
0.833	1.06	6.917	2.12	13.000	7.84	19.08	1.91
0.917	1.06	7.000	2.12	13.083	7.84	19.17	1.91
1.000	1.06	7.083	2.12	13.167	7.84	19.25	1.91
1.083	1.06	7.167	2.12	13.250	7.84	19.33	1.91
1.167	1.06	7.250	2.12	13.333	1.48	19.42	1.91
1.250	1.06	7.333	2.12	13.417	1.48	19.50	1.91
1.333	1.06	7.417	2.12	13.500	1.48	19.58	1.91
1.417	1.06	7.500	2.12	13.583	1.48	19.67	1.91
1.500	1.06	7.583	2.12	13.667	1.48	19.75	1.91
1.583	1.06	7.667	2.12	13.750	1.48	19.83	1.91
1.667	1.06	7.750	2.12	13.833	8.68	19.92	1.91
1.750	1.06	7.833	2.12	13.917	8.68	20.00	1.91
1.833	1.06	7.917	2.12	14.000	8.68	20.08	1.91
1.917	1.06	8.000	2.12	14.083	8.68	20.17	1.91
2.000	1.06	8.083	2.12	14.167	8.68	20.25	1.91
2.083	1.91	8.167	2.12	14.250	8.68	20.33	1.27
2.167	1.91	8.250	2.12	14.333	3.18	20.42	1.27
2.250	1.91	8.333	2.86	14.417	3.18	20.50	1.27
2.333	1.38	8.417	2.86	14.500	3.18	20.58	1.27
2.417	1.38	8.500	2.86	14.583	3.18	20.67	1.27
2.500	1.38	8.583	2.86	14.667	3.18	20.75	1.27
2.583	1.38	8.667	2.86	14.750	3.18	20.83	1.27
2.667	1.38	8.750	2.86	14.833	3.18	20.92	1.27
2.750	1.38	8.833	2.86	14.917	3.18	21.00	1.27
2.833	1.38	8.917	2.86	15.000	3.18	21.08	1.27
2.917	1.38	9.000	2.86	15.083	3.18	21.17	1.27
3.000	1.38	9.083	2.86	15.167	3.18	21.25	1.27
3.083	1.38	9.167	2.86	15.250	3.18	21.33	1.27
3.167	1.38	9.250	2.86	15.333	3.18	21.42	1.27
3.250	1.38	9.333	3.39	15.417	3.18	21.50	1.27
3.333	1.38	9.417	3.39	15.500	3.18	21.58	1.27
3.417	1.38	9.500	3.39	15.583	3.18	21.67	1.27
3.500	1.38	9.583	3.39	15.667	3.18	21.75	1.27
3.583	1.38	9.667	3.39	15.750	3.18	21.83	1.27
3.667	1.38	9.750	3.39	15.833	3.18	21.92	1.27
3.750	1.38	9.833	3.81	15.917	3.18	22.00	1.27
3.833	1.38	9.917	3.81	16.000	3.18	22.08	1.27
3.917	1.38	10.000	3.81	16.083	3.18	22.17	1.27
4.000	1.38	10.083	3.81	16.167	3.18	22.25	1.27
4.083	1.38	10.167	3.81	16.250	3.18	22.33	1.27
4.167	1.38	10.250	3.81	16.333	1.91	22.42	1.27
4.250	1.38	10.333	4.87	16.417	1.91	22.50	1.27
4.333	1.69	10.417	4.87	16.500	1.91	22.58	1.27
4.417	1.69	10.500	4.87	16.583	1.91	22.67	1.27
4.500	1.69	10.583	4.87	16.667	1.91	22.75	1.27
4.583	1.69	10.667	4.87	16.750	1.91	22.83	1.27
4.667	1.69	10.750	4.87	16.833	1.91	22.92	1.27
4.750	1.69	10.833	6.57	16.917	1.91	23.00	1.27
4.833	1.69	10.917	6.57	17.000	1.91	23.08	1.27
4.917	1.69	11.000	6.57	17.083	1.91	23.17	1.27
5.000	1.69	11.083	6.57	17.167	1.91	23.25	1.27
5.083	1.69	11.167	6.57	17.250	1.91	23.33	1.27
5.167	1.69	11.250	6.57	17.333	1.91	23.42	1.27
5.250	1.69	11.333	10.17	17.417	1.91	23.50	1.27
5.333	1.69	11.417	10.17	17.500	1.91	23.58	1.27
5.417	1.69	11.500	10.17	17.583	1.91	23.67	1.27
5.500	1.69	11.583	10.17	17.667	1.91	23.75	1.27
5.583	1.69	11.667	10.17	17.750	1.91	23.83	1.27
5.667	1.69	11.750	10.17	17.833	1.91	23.92	1.27
5.750	1.69	11.833	44.05	17.917	1.91	24.00	1.27
5.833	1.69	11.917	44.05	18.000	1.91	24.08	1.27
5.917	1.69	12.000	44.05	18.083	1.91	24.17	1.27

6.000	1.69	12.083	116.90	18.167	1.91	24.25	1.27
6.083	1.69	12.167	116.91	18.250	1.91		

Max.Eff.Inten.(mm/hr)= 116.91 34.37
over (min) 5.00 15.00
Storage Coeff. (min)= 1.14 (ii) 11.96 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.09

TOTALS

PEAK FLOW (cms)= 0.02 0.00 0.026 (iii)
TIME TO PEAK (hrs)= 12.25 12.33 12.25
RUNOFF VOLUME (mm)= 104.92 27.88 70.18
TOTAL RAINFALL (mm)= 105.92 105.92 105.92
RUNOFF COEFFICIENT = 0.99 0.26 0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)				
1 + 2 = 3				
ID1= 1 (0105):	0.13	0.026	12.25	70.18
+ ID2= 2 (0204):	6.80	0.320	12.42	31.31
ID = 3 (0205):	6.93	0.327	12.42	32.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:5 Year 24 Hour SCS **

READ STORM	Filename: C:\Users\ABaten\AppData\Local\Temp\23d527d8-1fdf-4bae-ba37-ff6a857440d4\b7a11fde
Ptotal= 77.61 mm	Comments: 5 Year 24 Hour SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	6.25	1.55	12.50	11.17	18.75	1.40
0.25	0.78	6.50	1.55	12.75	5.74	19.00	1.40
0.50	0.78	6.75	1.55	13.00	5.74	19.25	1.40
0.75	0.78	7.00	1.55	13.25	1.09	19.50	1.40
1.00	0.78	7.25	1.55	13.50	1.09	19.75	1.40
1.25	0.78	7.50	1.55	13.75	6.36	20.00	1.40
1.50	0.78	7.75	1.55	14.00	6.36	20.25	0.93
1.75	0.78	8.00	1.55	14.25	2.33	20.50	0.93
2.00	1.40	8.25	2.10	14.50	2.33	20.75	0.93
2.25	1.01	8.50	2.10	14.75	2.33	21.00	0.93
2.50	1.01	8.75	2.10	15.00	2.33	21.25	0.93
2.75	1.01	9.00	2.10	15.25	2.33	21.50	0.93
3.00	1.01	9.25	2.48	15.50	2.33	21.75	0.93
3.25	1.01	9.50	2.48	15.75	2.33	22.00	0.93
3.50	1.01	9.75	2.79	16.00	2.33	22.25	0.93
3.75	1.01	10.00	2.79	16.25	1.40	22.50	0.93
4.00	1.01	10.25	3.57	16.50	1.40	22.75	0.93
4.25	1.24	10.50	3.57	16.75	1.40	23.00	0.93
4.50	1.24	10.75	4.81	17.00	1.40	23.25	0.93
4.75	1.24	11.00	4.81	17.25	1.40	23.50	0.93
5.00	1.24	11.25	7.45	17.50	1.40	23.75	0.93
5.25	1.24	11.50	7.45	17.75	1.40	24.00	0.93
5.50	1.24	11.75	32.28	18.00	1.40		
5.75	1.24	12.00	85.67	18.25	1.40		
6.00	1.24	12.25	11.17	18.50	1.40		

CALIB	Area (ha)= 0.84	Curve Number (CN)= 56.0
NASHYD (0101)	Ia (mm)= 5.33	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)= 0.26	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40
1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40
1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93
4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93
4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.032 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 19.205
TOTAL RAINFALL (mm)= 77.613

RUNOFF COEFFICIENT = 0.247

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

CALIB			
NASHYD (0106)	Area (ha)=	1.54	Curve Number (CN)= 51.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.36	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40
1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40
1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93
4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93
4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93

5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.039 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 16.271
 TOTAL RAINFALL (mm)= 77.613
 RUNOFF COEFFICIENT = 0.210

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

CALIB			
NASHYD (0100)	Area (ha)=	0.59	Curve Number (CN)= 49.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.31	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.42	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40
1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40
1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93
4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93

4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.012 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 15.143
 TOTAL RAINFALL (mm)= 77.613
 RUNOFF COEFFICIENT = 0.195

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

ADD HYD (0201)					
1 + 2 = 3					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0100):		0.59	0.012	12.58	15.14
+ ID2= 2 (0101):		0.84	0.032	12.33	19.21
=====					
ID = 3 (0201):		1.43	0.043	12.42	17.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0201)					
3 + 2 = 1					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0201):		1.43	0.043	12.42	17.53
+ ID2= 2 (0106):		1.54	0.039	12.50	16.27
=====					
ID = 1 (0201):		2.96	0.082	12.42	16.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0103)					
ID= 1 DT= 5.0 min					
	Area	(ha)=	0.13	Curve Number (CN)=	58.0
	Ia	(mm)=	6.32	# of Linear Res.(N)=	3.00
	U.H. Tp	(hrs)=	0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40

1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40
1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93
4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93
4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 19.885
TOTAL RAINFALL (mm)= 77.613
RUNOFF COEFFICIENT = 0.256

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

ADD HYD (0202)				
1 + 2 = 3				
ID1= 1 (0103):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0201):	2.96	0.082	12.42	16.88
=====				
ID = 3 (0202):	3.10	0.087	12.42	17.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0104)				
ID= 1 DT= 5.0 min	Area (ha)=	0.40	Curve Number (CN)=	56.0
	Ia (mm)=	4.68	# of Linear Res.(N)=	3.00

U.H. Tp(hrs)= 0.21

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40
1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40
1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93
4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93
4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.018 (i)
 TIME TO PEAK (hrs)= 12.333
 RUNOFF VOLUME (mm)= 19.487
 TOTAL RAINFALL (mm)= 77.613
 RUNOFF COEFFICIENT = 0.251

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

ADD HYD (0203)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0104):	0.40	0.018	12.33	19.49
+ ID2= 2 (0202):	3.10	0.087	12.42	17.01
=====				
ID = 3 (0203):	3.49	0.103	12.42	17.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	Curve Number (CN)=
NASHYD (0102)	3.31	55.0
ID= 1 DT= 5.0 min	Ia (mm)= 6.81	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.44	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40
1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40
1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93

4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93
4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.082 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 17.990
TOTAL RAINFALL (mm)= 77.613
RUNOFF COEFFICIENT = 0.232

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

ADD HYD (0204)				
1 + 2 = 3				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	3.31	0.082	12.58	17.99
+ ID2= 2 (0203):	3.49	0.103	12.42	17.29
=====				
ID = 3 (0204):	6.80	0.177	12.50	17.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0105)				
ID= 1 DT= 5.0 min				
	Area (ha)=	0.13		
	Total Imp(%)=	55.00	Dir. Conn.(%)=	55.00
	IMPERVIOUS	PERVIOUS (i)		
Surface Area (ha)=	0.07	0.06		
Dep. Storage (mm)=	1.00	5.00		
Average Slope (%)=	1.00	2.00		
Length (m)=	29.10	40.00		
Mannings n =	0.013	0.250		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.24	12.250	85.67	18.33	1.40
0.167	0.00	6.250	1.24	12.333	11.18	18.42	1.40
0.250	0.00	6.333	1.55	12.417	11.17	18.50	1.40
0.333	0.78	6.417	1.55	12.500	11.17	18.58	1.40
0.417	0.78	6.500	1.55	12.583	11.17	18.67	1.40
0.500	0.78	6.583	1.55	12.667	11.17	18.75	1.40
0.583	0.78	6.667	1.55	12.750	11.17	18.83	1.40
0.667	0.78	6.750	1.55	12.833	5.74	18.92	1.40
0.750	0.78	6.833	1.55	12.917	5.74	19.00	1.40
0.833	0.78	6.917	1.55	13.000	5.74	19.08	1.40
0.917	0.78	7.000	1.55	13.083	5.74	19.17	1.40
1.000	0.78	7.083	1.55	13.167	5.74	19.25	1.40
1.083	0.78	7.167	1.55	13.250	5.74	19.33	1.40
1.167	0.78	7.250	1.55	13.333	1.09	19.42	1.40
1.250	0.78	7.333	1.55	13.417	1.09	19.50	1.40
1.333	0.78	7.417	1.55	13.500	1.09	19.58	1.40
1.417	0.78	7.500	1.55	13.583	1.09	19.67	1.40
1.500	0.78	7.583	1.55	13.667	1.09	19.75	1.40
1.583	0.78	7.667	1.55	13.750	1.09	19.83	1.40
1.667	0.78	7.750	1.55	13.833	6.36	19.92	1.40

1.750	0.78	7.833	1.55	13.917	6.36	20.00	1.40
1.833	0.78	7.917	1.55	14.000	6.36	20.08	1.40
1.917	0.78	8.000	1.55	14.083	6.36	20.17	1.40
2.000	0.78	8.083	1.55	14.167	6.36	20.25	1.40
2.083	1.40	8.167	1.55	14.250	6.36	20.33	0.93
2.167	1.40	8.250	1.55	14.333	2.33	20.42	0.93
2.250	1.40	8.333	2.10	14.417	2.33	20.50	0.93
2.333	1.01	8.417	2.10	14.500	2.33	20.58	0.93
2.417	1.01	8.500	2.10	14.583	2.33	20.67	0.93
2.500	1.01	8.583	2.10	14.667	2.33	20.75	0.93
2.583	1.01	8.667	2.10	14.750	2.33	20.83	0.93
2.667	1.01	8.750	2.10	14.833	2.33	20.92	0.93
2.750	1.01	8.833	2.10	14.917	2.33	21.00	0.93
2.833	1.01	8.917	2.10	15.000	2.33	21.08	0.93
2.917	1.01	9.000	2.10	15.083	2.33	21.17	0.93
3.000	1.01	9.083	2.10	15.167	2.33	21.25	0.93
3.083	1.01	9.167	2.10	15.250	2.33	21.33	0.93
3.167	1.01	9.250	2.10	15.333	2.33	21.42	0.93
3.250	1.01	9.333	2.48	15.417	2.33	21.50	0.93
3.333	1.01	9.417	2.48	15.500	2.33	21.58	0.93
3.417	1.01	9.500	2.48	15.583	2.33	21.67	0.93
3.500	1.01	9.583	2.48	15.667	2.33	21.75	0.93
3.583	1.01	9.667	2.48	15.750	2.33	21.83	0.93
3.667	1.01	9.750	2.48	15.833	2.33	21.92	0.93
3.750	1.01	9.833	2.79	15.917	2.33	22.00	0.93
3.833	1.01	9.917	2.79	16.000	2.33	22.08	0.93
3.917	1.01	10.000	2.79	16.083	2.33	22.17	0.93
4.000	1.01	10.083	2.79	16.167	2.33	22.25	0.93
4.083	1.01	10.167	2.79	16.250	2.33	22.33	0.93
4.167	1.01	10.250	2.79	16.333	1.40	22.42	0.93
4.250	1.01	10.333	3.57	16.417	1.40	22.50	0.93
4.333	1.24	10.417	3.57	16.500	1.40	22.58	0.93
4.417	1.24	10.500	3.57	16.583	1.40	22.67	0.93
4.500	1.24	10.583	3.57	16.667	1.40	22.75	0.93
4.583	1.24	10.667	3.57	16.750	1.40	22.83	0.93
4.667	1.24	10.750	3.57	16.833	1.40	22.92	0.93
4.750	1.24	10.833	4.81	16.917	1.40	23.00	0.93
4.833	1.24	10.917	4.81	17.000	1.40	23.08	0.93
4.917	1.24	11.000	4.81	17.083	1.40	23.17	0.93
5.000	1.24	11.083	4.81	17.167	1.40	23.25	0.93
5.083	1.24	11.167	4.81	17.250	1.40	23.33	0.93
5.167	1.24	11.250	4.81	17.333	1.40	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.40	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.40	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.40	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.40	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.40	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.40	23.92	0.93
5.750	1.24	11.833	32.28	17.917	1.40	24.00	0.93
5.833	1.24	11.917	32.28	18.000	1.40	24.08	0.93
5.917	1.24	12.000	32.28	18.083	1.40	24.17	0.93
6.000	1.24	12.083	85.66	18.167	1.40	24.25	0.93
6.083	1.24	12.167	85.67	18.250	1.40		

Max.Eff.Inten.(mm/hr)=	85.67	19.11
over (min)	5.00	15.00
Storage Coeff. (min)=	1.30 (ii)	14.98 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08

TOTALS

PEAK FLOW (cms)=	0.02	0.00	0.018 (iii)
TIME TO PEAK (hrs)=	12.25	12.33	12.25
RUNOFF VOLUME (mm)=	76.61	15.65	49.13
TOTAL RAINFALL (mm)=	77.61	77.61	77.61
RUNOFF COEFFICIENT =	0.99	0.20	0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)				
1 + 2 = 3				

ID1= 1 (0105):	0.13	0.018	12.25	49.13
+ ID2= 2 (0204):	6.80	0.177	12.50	17.63
=====				
ID = 3 (0205):	6.93	0.181	12.50	18.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:50 Year 24 Hour SCS **

READ STORM	Filename: C:\Users\ABaten\AppData\Local\Temp\23d527d8-1fdf-4bae-ba37-ff6a857440d4\8f4911d3
Ptotal=117.61 mm	Comments: 50 Year 24 Hour SCS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	2.35	12.50	16.93	18.75	2.12
0.25	1.18	6.50	2.35	12.75	8.70	19.00	2.12
0.50	1.18	6.75	2.35	13.00	8.70	19.25	2.12
0.75	1.18	7.00	2.35	13.25	1.65	19.50	2.12
1.00	1.18	7.25	2.35	13.50	1.65	19.75	2.12
1.25	1.18	7.50	2.35	13.75	9.64	20.00	2.12
1.50	1.18	7.75	2.35	14.00	9.64	20.25	1.41
1.75	1.18	8.00	2.35	14.25	3.53	20.50	1.41
2.00	2.12	8.25	3.18	14.50	3.53	20.75	1.41
2.25	1.53	8.50	3.18	14.75	3.53	21.00	1.41
2.50	1.53	8.75	3.18	15.00	3.53	21.25	1.41
2.75	1.53	9.00	3.18	15.25	3.53	21.50	1.41
3.00	1.53	9.25	3.76	15.50	3.53	21.75	1.41
3.25	1.53	9.50	3.76	15.75	3.53	22.00	1.41
3.50	1.53	9.75	4.23	16.00	3.53	22.25	1.41
3.75	1.53	10.00	4.23	16.25	2.12	22.50	1.41
4.00	1.53	10.25	5.41	16.50	2.12	22.75	1.41
4.25	1.88	10.50	5.41	16.75	2.12	23.00	1.41
4.50	1.88	10.75	7.29	17.00	2.12	23.25	1.41
4.75	1.88	11.00	7.29	17.25	2.12	23.50	1.41
5.00	1.88	11.25	11.29	17.50	2.12	23.75	1.41
5.25	1.88	11.50	11.29	17.75	2.12	24.00	1.41
5.50	1.88	11.75	48.92	18.00	2.12		
5.75	1.88	12.00	129.83	18.25	2.12		
6.00	1.88	12.25	16.93	18.50	2.12		

CALIB			
NASHYD (0101)	Area (ha)=	0.84	Curve Number (CN)= 56.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.33	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.26	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12
0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12
1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41
2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41

2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41
4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41
4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.068 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 40.399
TOTAL RAINFALL (mm)= 117.613
RUNOFF COEFFICIENT = 0.343

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

CALIB			
NASHYD (0106)	Area (ha)=	1.54	Curve Number (CN)= 51.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.36	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12
0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12

1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41
2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41
2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41
4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41
4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.086 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 35.057
TOTAL RAINFALL (mm)= 117.613
RUNOFF COEFFICIENT = 0.298

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

CALIB			
NASHYD (0100)	Area (ha)=	0.59	Curve Number (CN)= 49.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.31	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.42	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12

0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12
1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41
2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41
2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41
4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41
4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 32.972
TOTAL RAINFALL (mm)= 117.613
RUNOFF COEFFICIENT = 0.280

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

ADD HYD (0201)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		0.59	0.028	12.58	32.97
+ ID2= 2 (0101):		0.84	0.068	12.33	40.40
=====					
ID = 3 (0201):		1.43	0.093	12.42	37.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0201)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0201):		1.43	0.093	12.42	37.33
+ ID2= 2 (0106):		1.54	0.086	12.50	35.06
=====					
ID = 1 (0201):		2.96	0.179	12.42	36.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		Area	(ha)=	0.13	Curve Number (CN)=	58.0
NASHYD (0103)		Ia	(mm)=	6.32	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min		U.H. Tp(hrs)=	0.22			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12
0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12
1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41
2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41
2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41

4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41
4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 41.895
TOTAL RAINFALL (mm)= 117.613
RUNOFF COEFFICIENT = 0.356

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

ADD HYD (0202)					
1 + 2 = 3					

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):		0.13	0.013	12.33	41.90
+ ID2= 2 (0201):		2.96	0.179	12.42	36.15
=====					
ID = 3 (0202):		3.10	0.190	12.42	36.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0104)					
ID= 1 DT= 5.0 min					

	Area	(ha)=	0.40	Curve Number (CN)=	56.0
	Ia	(mm)=	4.68	# of Linear Res.(N)=	3.00
	U.H. Tp	(hrs)=	0.21		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12
0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12
1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41

2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41
2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41
4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41
4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.038 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 40.746
TOTAL RAINFALL (mm)= 117.613
RUNOFF COEFFICIENT = 0.346

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

ADD HYD (0203)				
1 + 2 = 3				
		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
ID1= 1 (0104):		0.40	0.038	12.33
+ ID2= 2 (0202):		3.10	0.190	12.42
ID = 3 (0203):		3.49	0.224	12.42
				36.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)			
ID= 1 DT= 5.0 min		Area (ha)=	3.31
		Ia (mm)=	6.81
		U.H. Tp(hrs)=	0.44
		Curve Number (CN)=	55.0
		# of Linear Res.(N)=	3.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr

0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12
0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12
1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41
2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41
2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41
4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41
4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.179 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 38.529
TOTAL RAINFALL (mm)= 117.613
RUNOFF COEFFICIENT = 0.328

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

ADD HYD (0204)				
1 + 2 = 3				
ID1= 1 (0102):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0203):	3.31	0.179	12.58	38.53
	3.49	0.224	12.42	36.89
=====				
ID = 3 (0204):	6.80	0.388	12.42	37.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
STANDHYD (0105)				
ID= 1 DT= 5.0 min	Area (ha)=	0.13		
	Total Imp(%)=	55.00	Dir. Conn.(%)=	55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.07	0.06
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	29.10	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.88	12.250	129.83	18.33	2.12
0.167	0.00	6.250	1.88	12.333	16.94	18.42	2.12
0.250	0.00	6.333	2.35	12.417	16.93	18.50	2.12
0.333	1.18	6.417	2.35	12.500	16.93	18.58	2.12
0.417	1.18	6.500	2.35	12.583	16.93	18.67	2.12
0.500	1.18	6.583	2.35	12.667	16.93	18.75	2.12
0.583	1.18	6.667	2.35	12.750	16.93	18.83	2.12
0.667	1.18	6.750	2.35	12.833	8.70	18.92	2.12
0.750	1.18	6.833	2.35	12.917	8.70	19.00	2.12
0.833	1.18	6.917	2.35	13.000	8.70	19.08	2.12
0.917	1.18	7.000	2.35	13.083	8.70	19.17	2.12
1.000	1.18	7.083	2.35	13.167	8.70	19.25	2.12
1.083	1.18	7.167	2.35	13.250	8.70	19.33	2.12
1.167	1.18	7.250	2.35	13.333	1.65	19.42	2.12
1.250	1.18	7.333	2.35	13.417	1.65	19.50	2.12
1.333	1.18	7.417	2.35	13.500	1.65	19.58	2.12
1.417	1.18	7.500	2.35	13.583	1.65	19.67	2.12
1.500	1.18	7.583	2.35	13.667	1.65	19.75	2.12
1.583	1.18	7.667	2.35	13.750	1.65	19.83	2.12
1.667	1.18	7.750	2.35	13.833	9.64	19.92	2.12
1.750	1.18	7.833	2.35	13.917	9.64	20.00	2.12
1.833	1.18	7.917	2.35	14.000	9.64	20.08	2.12
1.917	1.18	8.000	2.35	14.083	9.64	20.17	2.12
2.000	1.18	8.083	2.35	14.167	9.64	20.25	2.12
2.083	2.12	8.167	2.35	14.250	9.64	20.33	1.41
2.167	2.12	8.250	2.35	14.333	3.53	20.42	1.41
2.250	2.12	8.333	3.18	14.417	3.53	20.50	1.41
2.333	1.53	8.417	3.18	14.500	3.53	20.58	1.41
2.417	1.53	8.500	3.18	14.583	3.53	20.67	1.41
2.500	1.53	8.583	3.18	14.667	3.53	20.75	1.41
2.583	1.53	8.667	3.18	14.750	3.53	20.83	1.41
2.667	1.53	8.750	3.18	14.833	3.53	20.92	1.41
2.750	1.53	8.833	3.18	14.917	3.53	21.00	1.41
2.833	1.53	8.917	3.18	15.000	3.53	21.08	1.41
2.917	1.53	9.000	3.18	15.083	3.53	21.17	1.41
3.000	1.53	9.083	3.18	15.167	3.53	21.25	1.41
3.083	1.53	9.167	3.18	15.250	3.53	21.33	1.41
3.167	1.53	9.250	3.18	15.333	3.53	21.42	1.41
3.250	1.53	9.333	3.76	15.417	3.53	21.50	1.41
3.333	1.53	9.417	3.76	15.500	3.53	21.58	1.41
3.417	1.53	9.500	3.76	15.583	3.53	21.67	1.41
3.500	1.53	9.583	3.76	15.667	3.53	21.75	1.41
3.583	1.53	9.667	3.76	15.750	3.53	21.83	1.41
3.667	1.53	9.750	3.76	15.833	3.53	21.92	1.41
3.750	1.53	9.833	4.23	15.917	3.53	22.00	1.41
3.833	1.53	9.917	4.23	16.000	3.53	22.08	1.41
3.917	1.53	10.000	4.23	16.083	3.53	22.17	1.41
4.000	1.53	10.083	4.23	16.167	3.53	22.25	1.41
4.083	1.53	10.167	4.23	16.250	3.53	22.33	1.41
4.167	1.53	10.250	4.23	16.333	2.12	22.42	1.41
4.250	1.53	10.333	5.41	16.417	2.12	22.50	1.41
4.333	1.88	10.417	5.41	16.500	2.12	22.58	1.41
4.417	1.88	10.500	5.41	16.583	2.12	22.67	1.41

4.500	1.88	10.583	5.41	16.667	2.12	22.75	1.41
4.583	1.88	10.667	5.41	16.750	2.12	22.83	1.41
4.667	1.88	10.750	5.41	16.833	2.12	22.92	1.41
4.750	1.88	10.833	7.29	16.917	2.12	23.00	1.41
4.833	1.88	10.917	7.29	17.000	2.12	23.08	1.41
4.917	1.88	11.000	7.29	17.083	2.12	23.17	1.41
5.000	1.88	11.083	7.29	17.167	2.12	23.25	1.41
5.083	1.88	11.167	7.29	17.250	2.12	23.33	1.41
5.167	1.88	11.250	7.29	17.333	2.12	23.42	1.41
5.250	1.88	11.333	11.29	17.417	2.12	23.50	1.41
5.333	1.88	11.417	11.29	17.500	2.12	23.58	1.41
5.417	1.88	11.500	11.29	17.583	2.12	23.67	1.41
5.500	1.88	11.583	11.29	17.667	2.12	23.75	1.41
5.583	1.88	11.667	11.29	17.750	2.12	23.83	1.41
5.667	1.88	11.750	11.29	17.833	2.12	23.92	1.41
5.750	1.88	11.833	48.92	17.917	2.12	24.00	1.41
5.833	1.88	11.917	48.92	18.000	2.12	24.08	1.41
5.917	1.88	12.000	48.92	18.083	2.12	24.17	1.41
6.000	1.88	12.083	129.82	18.167	2.12	24.25	1.41
6.083	1.88	12.167	129.83	18.250	2.12		

Max.Eff.Inten.(mm/hr)= 129.83 44.63
over (min) 5.00 15.00
Storage Coeff. (min)= 1.10 (ii) 10.84 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.09

TOTALS
0.029 (iii)
12.25
79.22
117.61
0.67

PEAK FLOW (cms)= 0.03 0.00
TIME TO PEAK (hrs)= 12.25 12.33
RUNOFF VOLUME (mm)= 116.61 33.64
TOTAL RAINFALL (mm)= 117.61 117.61
RUNOFF COEFFICIENT = 0.99 0.29

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0105):		0.13	0.029	12.25	79.22
+ ID2= 2 (0204):		6.80	0.388	12.42	37.69
=====					
ID = 3 (0205):		6.93	0.396	12.42	38.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:Haze1 **

READ STORM	Filename: C:\Users\ABaten\AppData\Local\Temp\ f413aeab-7cac-43c9-bde6-e6735c0d8010\751a4051
Ptotal=212.00 mm	Comments: Haze1

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.00	3.00	13.00	6.00	23.00	9.00	53.00
1.00	4.00	4.00	17.00	7.00	13.00	10.00	38.00
2.00	6.00	5.00	13.00	8.00	13.00	11.00	13.00

CALIB NASHYD (0101) ID= 1 DT= 5.0 min	Area (ha)= 0.84 Ia (mm)= 5.33 U.H. Tp(hrs)= 0.26	Curve Number (CN)= 75.0 # of Linear Res.(N)= 3.00
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.123

PEAK FLOW (cms)= 0.104 (i)
 TIME TO PEAK (hrs)= 10.000
 RUNOFF VOLUME (mm)= 146.508
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.691

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

CALIB NASHYD (0106) ID= 1 DT= 5.0 min	Area (ha)= 1.54 Ia (mm)= 5.93 U.H. Tp(hrs)= 0.36	Curve Number (CN)= 70.0 # of Linear Res.(N)= 3.00
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.163

PEAK FLOW (cms)= 0.172 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 134.814
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.636

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

CALIB			
NASHYD (0100)	Area (ha)=	0.59	Curve Number (CN)= 69.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.31	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.42	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00

1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.054

PEAK FLOW (cms)= 0.063 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 132.279
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.624

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

ADD HYD (0201)					
1 + 2 = 3					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0100):		0.59	0.063	10.17	132.28
+ ID2= 2 (0101):		0.84	0.104	10.00	146.51
=====					
ID = 3 (0201):		1.43	0.165	10.08	140.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0201)					
3 + 2 = 1					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0201):		1.43	0.165	10.08	140.63
+ ID2= 2 (0106):		1.54	0.172	10.08	134.81
=====					
ID = 1 (0201):		2.96	0.337	10.08	137.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0103)					
ID= 1 DT= 5.0 min					
		Area (ha)=	0.13	Curve Number (CN)=	76.0
		Ia (mm)=	6.32	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00

1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.023

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 147.773
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.697

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

ADD HYD (0202)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):		0.13	0.017	10.00	147.77
+ ID2= 2 (0201):		2.96	0.337	10.08	137.61
=====		=====			
ID = 3 (0202):		3.10	0.354	10.08	138.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		Area	(ha)=	Curve Number	(CN)=
NASHYD (0104)		Ia	(mm)=	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min		U.H. Tp(hrs)=	0.21		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00

2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.050 (i)
 TIME TO PEAK (hrs)= 10.000
 RUNOFF VOLUME (mm)= 146.972
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.693

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

ADD HYD (0203)				
1 + 2 = 3				
ID1= 1 (0104):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	0.40	0.050	10.00	146.97
+ ID2= 2 (0202):	3.10	0.354	10.08	138.05
ID = 3 (0203):	3.49	0.402	10.08	139.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)=	3.31	Curve Number (CN)= 74.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.81	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.44	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.287

PEAK FLOW (cms)= 0.372 (i)
 TIME TO PEAK (hrs)= 10.167
 RUNOFF VOLUME (mm)= 142.984

TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.674

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

ADD HYD (0204)				
1 + 2 = 3				
ID1= 1 (0102):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	3.31	0.372	10.17	142.98
+ ID2= 2 (0203):	3.49	0.402	10.08	139.06
=====				
ID = 3 (0204):	6.80	0.770	10.08	140.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0105)			
ID= 1 DT= 1.0 min	Area (ha)= 0.13		
	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.06
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	29.10	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.017	6.00	3.017	13.00	6.017	23.00	9.02	53.00
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.050	6.00	3.050	13.00	6.050	23.00	9.05	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.117	6.00	3.117	13.00	6.117	23.00	9.12	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.150	6.00	3.150	13.00	6.150	23.00	9.15	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.183	6.00	3.183	13.00	6.183	23.00	9.18	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.217	6.00	3.217	13.00	6.217	23.00	9.22	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.283	6.00	3.283	13.00	6.283	23.00	9.28	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.317	6.00	3.317	13.00	6.317	23.00	9.32	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.350	6.00	3.350	13.00	6.350	23.00	9.35	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.383	6.00	3.383	13.00	6.383	23.00	9.38	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.450	6.00	3.450	13.00	6.450	23.00	9.45	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.483	6.00	3.483	13.00	6.483	23.00	9.48	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.517	6.00	3.517	13.00	6.517	23.00	9.52	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.550	6.00	3.550	13.00	6.550	23.00	9.55	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.617	6.00	3.617	13.00	6.617	23.00	9.62	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.650	6.00	3.650	13.00	6.650	23.00	9.65	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.683	6.00	3.683	13.00	6.683	23.00	9.68	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.717	6.00	3.717	13.00	6.717	23.00	9.72	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.783	6.00	3.783	13.00	6.783	23.00	9.78	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00

0.817	6.00	3.817	13.00	6.817	23.00	9.82	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.850	6.00	3.850	13.00	6.850	23.00	9.85	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.883	6.00	3.883	13.00	6.883	23.00	9.88	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.950	6.00	3.950	13.00	6.950	23.00	9.95	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
0.983	6.00	3.983	13.00	6.983	23.00	9.98	53.00
1.000	6.00	4.000	13.00	7.000	22.98	10.00	52.98
1.017	4.00	4.017	17.00	7.017	13.00	10.02	38.00
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.050	4.00	4.050	17.00	7.050	13.00	10.05	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.117	4.00	4.117	17.00	7.117	13.00	10.12	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.150	4.00	4.150	17.00	7.150	13.00	10.15	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.183	4.00	4.183	17.00	7.183	13.00	10.18	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.217	4.00	4.217	17.00	7.217	13.00	10.22	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.283	4.00	4.283	17.00	7.283	13.00	10.28	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.317	4.00	4.317	17.00	7.317	13.00	10.32	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.350	4.00	4.350	17.00	7.350	13.00	10.35	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.383	4.00	4.383	17.00	7.383	13.00	10.38	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.450	4.00	4.450	17.00	7.450	13.00	10.45	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.483	4.00	4.483	17.00	7.483	13.00	10.48	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.517	4.00	4.517	17.00	7.517	13.00	10.52	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.550	4.00	4.550	17.00	7.550	13.00	10.55	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.617	4.00	4.617	17.00	7.617	13.00	10.62	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.650	4.00	4.650	17.00	7.650	13.00	10.65	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.683	4.00	4.683	17.00	7.683	13.00	10.68	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.717	4.00	4.717	17.00	7.717	13.00	10.72	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.783	4.00	4.783	17.00	7.783	13.00	10.78	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.817	4.00	4.817	17.00	7.817	13.00	10.82	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.850	4.00	4.850	17.00	7.850	13.00	10.85	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.883	4.00	4.883	17.00	7.883	13.00	10.88	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.950	4.00	4.950	17.00	7.950	13.00	10.95	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
1.983	4.00	4.983	17.00	7.983	13.00	10.98	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.99
2.017	6.00	5.017	13.00	8.017	13.00	11.02	13.00
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.050	6.00	5.050	13.00	8.050	13.00	11.05	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.117	6.00	5.117	13.00	8.117	13.00	11.12	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.150	6.00	5.150	13.00	8.150	13.00	11.15	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.183	6.00	5.183	13.00	8.183	13.00	11.18	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00

2.217	6.00	5.217	13.00	8.217	13.00	11.22	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.283	6.00	5.283	13.00	8.283	13.00	11.28	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.317	6.00	5.317	13.00	8.317	13.00	11.32	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.350	6.00	5.350	13.00	8.350	13.00	11.35	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.383	6.00	5.383	13.00	8.383	13.00	11.38	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.450	6.00	5.450	13.00	8.450	13.00	11.45	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.483	6.00	5.483	13.00	8.483	13.00	11.48	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.517	6.00	5.517	13.00	8.517	13.00	11.52	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.550	6.00	5.550	13.00	8.550	13.00	11.55	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.617	6.00	5.617	13.00	8.617	13.00	11.62	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.650	6.00	5.650	13.00	8.650	13.00	11.65	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.683	6.00	5.683	13.00	8.683	13.00	11.68	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.717	6.00	5.717	13.00	8.717	13.00	11.72	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.783	6.00	5.783	13.00	8.783	13.00	11.78	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.817	6.00	5.817	13.00	8.817	13.00	11.82	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.850	6.00	5.850	13.00	8.850	13.00	11.85	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.883	6.00	5.883	13.00	8.883	13.00	11.88	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.950	6.00	5.950	13.00	8.950	13.00	11.95	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
2.983	6.00	5.983	13.00	8.983	13.00	11.98	13.00
3.000	6.00	6.000	13.01	9.000	13.08	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 43.22
over (min) 5.00 10.00
Storage Coeff. (min)= 1.57 (ii) 9.97 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.41 0.11

TOTALS
PEAK FLOW (cms)= 0.01 0.01 0.017 (iii)
TIME TO PEAK (hrs)= 9.37 10.02 10.00
RUNOFF VOLUME (mm)= 211.00 133.43 176.05
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 1.00 0.63 0.83

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0205)				
1 + 2 = 3				

ID1= 1 (0105):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0204):	0.13	0.017	10.00	176.05
	6.80	0.770	10.08	140.97
=====				
ID = 3 (0205):	6.93	0.785	10.08	141.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

APPENDIX 2

UNDERGROUND INFRASTRUCTURE: STAGE- STORAGE SUMMARY							
WATER SURFACE ELEVATION	PIPES & MH'S STORAGE (cu.m.)	GREENSTORM MODULES				AVAILABLE STORAGE	
		UNDERSTONE (cu.m.)	FULL MODS (cu.m.)	HALF MODS (cu.m.)	TOP STONE (cu.m.)	RETENTION (cu.m.)	DETENTION (cu.m.)
333.25	0.00	0.00	0.00		0.00	0.0	0.0
333.35	0.00	104.57	0.0		0.00	104.6	0.0
333.40	0.00	104.57	81.2		0.00	185.8	0.0
333.45	0.00	104.57	162.5		0.00	185.8	81.2
333.55	0.06	104.57	324.9		0.00	185.8	243.8
333.65	0.37	104.57	487.4		0.00	185.8	406.5
333.75	0.81	104.57	649.8		0.00	185.8	569.4
333.85	1.09	104.57	812.3		0.00	185.8	732.2
333.95	1.35	104.57	974.8		0.00	185.8	894.9
334.05	1.88	104.57	1137.2		0.00	185.8	1057.9
334.15	2.54	104.57	1299.7		0.00	185.8	1221.0
334.22	2.86	104.57	1413.4		0.00	185.8	1335.0
334.25	3.00	104.57	1462.2		0.00	185.8	1383.9
334.35	3.31	104.57	1624.6		0.00	185.8	1546.7
334.43	3.56	104.57	1754.6		0.00	185.8	1676.9
334.45	3.62	104.57	1787.1		0.00	185.8	1709.5
334.55	3.89	104.57	1949.5		0.00	185.8	1872.2
334.60	4.04	104.57	2030.8		0.00	185.8	1953.6
334.65	4.19	104.57	2112.0		0.00	185.8	2035.0
334.67	4.26	104.57	2144.5		0.00	185.8	2067.5
334.75	4.52	104.57	2274.5		0.00	185.8	2197.8
334.77	4.64	104.57	2307.0		0.00	185.8	2230.4
334.84	5.03	104.57	2420.7		0.00	185.8	2344.5
334.85	5.09	104.57	2436.9		0.00	185.8	2360.8
334.95	6.13	104.57	2599.4		0.00	185.8	2524.3
334.99	6.53	104.57	2664.4		0.00	185.8	2589.7
335.05	7.14	104.57	2761.8		0.00	185.8	2687.8
335.15	7.80	104.57	2924.3		0.00	185.8	2850.9
335.25	8.66	104.57	3086.8		0.00	185.8	3014.2
335.33	9.42	104.57	3216.7		0.00	185.8	3144.9
335.35	9.61	104.57	3216.7	31.99	0.00	185.8	3145.1
335.45	10.57	104.57	3216.7	191.96	0.00	185.8	3146.1
335.55	11.28	104.57	3216.7	351.93	0.00	185.8	3146.8
335.65	11.86	104.57	3216.7	511.90	0.00	185.8	3147.4
335.68	12.03	104.57	3216.7	559.89	0.00	185.8	3147.5
335.71	12.20	104.57	3216.7	559.89	20.91	185.8	3728.5
GREENSTORM MODULE DATA							
OUTLET INV =			333.40 MASL				
U/S STONE =			333.20 MASL				
STONE THICKNESS =			0.15 m				
STONE BED AREA =			1742.80 m ²				
U/S MODULES =			333.35 MASL				
NO. MODS PER LAYER =			2641				
AREA =			1690.24 m ²				
U/S STONE VOL. =			104.57 m ³				
NO. OF FULL LAYERS =			3.00				
NO. OF HALF LAYERS =			1.00				
TOP OF FULL MODS =			335.33 MASL				
TOP OF HALF MODS =			335.68				

UNDERGROUND INFRASTRUCTURE																																					
STAGE-STORAGE			CB1 MODS 1.1 30.00% 200	CB1 0.36 336.82 335.42	CB2 MODS 1.2 22.50% 200	CB2 0.36 336.76 335.36	CB3 MODS 0.9 18.89% 200	CB3 0.36 336.66 335.26	CB4 MODS 6.0 2.00% 200	CB4 0.36 335.03 333.63	CB5 MODS 1.1 22.73% 200	CB5 0.36 336.74 335.34	CB6 MODS 1.3 8.46% 200	CB6 0.36 336.6 335.2	CB7 MODS 6.4 2.34% 200	CB7 0.36 336.26 334.86	CB8 MODS 2.2 8.18% 200	CB8 0.36 336.67 335.27	CB9 CBMH1 44.1 2.00% 200	CB9 0.36 336.25 334.85	CBMH1 MODS 27.3 1.72% 300	CBMH1 1200 335.5 333.92	CB10 MODS 1.4 7.86% 200	CB10 0.36 336.6 335.2	CB11 MODS 10.7 3.64% 200	CB11 0.36 336.5 335.1	CB12 MODS 6.5 4.46% 200	CB12 0.36 336.5 335.1	DCB1 MODS 18.1 2.71% 300	DCB1 0.87 336.6 335.2	DCB2 MODS 6.5 4.46% 300	DCB2 0.87 336.4 335	HEADWALL MODS 4.6 9.78% 375	HWL ELEV			
HWL	SUM	SIZE																																			
ELEV	(cu.m.)	TOP INVERT																																			
333.25	0.00		0.00	-0.78 0.00	0.00	-0.76 0.00	0.00	-0.72 0.00	0.00	-0.14 0.00	0.00	-0.75 0.00	0.00	-0.70 0.00	0.00	-0.58 0.00	0.00	-0.73 0.00	0.00	0.00	-0.58 0.00	0.00	-0.76 0.00	0.00	-0.70 0.00	0.00	-0.67 0.00	0.00	-0.67 0.00	0.00	-1.70 0.00	0.00	-1.52 0.00	0.00	0.00	333.25	
333.35	0.00		0.00	-0.75 0.00	0.00	-0.72 0.00	0.00	-0.69 0.00	0.00	-0.10 0.00	0.00	-0.72 0.00	0.00	-0.67 0.00	0.00	-0.54 0.00	0.00	-0.69 0.00	0.00	0.00	-0.54 0.00	0.00	-0.64 0.00	0.00	-0.67 0.00	0.00	-0.63 0.00	0.00	-0.63 0.00	0.00	-1.61 0.00	0.00	-1.44 0.00	0.00	0.00	333.35	
333.45	0.00		0.00	-0.71 0.00	0.00	-0.69 0.00	0.00	-0.65 0.00	0.00	-0.06 0.00	0.00	-0.68 0.00	0.00	-0.63 0.00	0.00	-0.51 0.00	0.00	-0.66 0.00	0.00	0.00	-0.50 0.00	0.00	-0.53 0.00	0.00	-0.63 0.00	0.00	-0.59 0.00	0.00	-0.59 0.00	0.00	-1.52 0.00	0.00	-1.35 0.00	0.00	0.00	333.45	
333.55	0.06		0.00	-0.67 0.00	0.00	-0.65 0.00	0.00	-0.62 0.00	0.00	-0.03 0.00	0.00	-0.64 0.00	0.00	-0.59 0.00	0.00	-0.47 0.00	0.00	-0.62 0.00	0.00	0.00	-0.47 0.00	0.00	0.06	-0.42 0.00	0.00	-0.59 0.00	0.00	-0.56 0.00	0.00	-0.56 0.00	0.00	-1.44 0.00	0.00	-1.26 0.00	0.00	0.00	333.55
333.65	0.37		0.00	-0.64 0.00	0.00	-0.62 0.00	0.00	-0.58 0.00	0.08	0.01 0.01	0.00	-0.61 0.00	0.00	-0.56 0.00	0.00	-0.44 0.00	0.00	-0.58 0.00	0.00	0.00	-0.43 0.00	0.00	0.29	-0.31 0.00	0.00	-0.56 0.00	0.00	-0.52 0.00	0.00	-0.52 0.00	0.00	-1.35 0.00	0.00	-1.17 0.00	0.00	0.00	333.65
333.75	0.81		0.00	-0.60 0.00	0.00	-0.58 0.00	0.00	-0.54 0.00	0.15	0.04 0.04	0.00	-0.57 0.00	0.00	-0.52 0.00	0.00	-0.40 0.00	0.00	-0.55 0.00	0.00	0.00	-0.40 0.00	0.00	0.62	-0.19 0.00	0.00	-0.52 0.00	0.00	-0.49 0.00	0.00	-0.49 0.00	0.00	-1.26 0.00	0.00	-1.09 0.00	0.00	0.00	333.75
333.85	1.09		0.00	-0.57 0.00	0.00	-0.54 0.00	0.00	-0.51 0.00	0.19	0.08 0.08	0.00	-0.54 0.00	0.00	-0.49 0.00	0.00	-0.36 0.00	0.00	-0.51 0.00	0.00	0.00	-0.36 0.00	0.00	0.82	-0.08 0.00	0.00	-0.49 0.00	0.00	-0.45 0.00	0.00	-0.45 0.00	0.00	-1.17 0.00	0.00	-1.00 0.00	0.00	0.00	333.85
333.95	1.35		0.00	-0.53 0.00	0.00	-0.51 0.00	0.00	-0.47 0.00	0.19	0.12 0.12	0.00	-0.50 0.00	0.00	-0.45 0.00	0.00	-0.33 0.00	0.00	-0.48 0.00	0.00	0.00	-0.32 0.00	0.00	1.02	0.03 0.03	0.00	-0.45 0.00	0.00	-0.41 0.00	0.00	-0.41 0.00	0.00	-1.09 0.00	0.00	-0.91 0.00	0.00	0.00	333.95
334.05	1.88		0.00	-0.49 0.00	0.00	-0.47 0.00	0.00	-0.44 0.00	0.19	0.15 0.15	0.00	-0.46 0.00	0.00	-0.41 0.00	0.00	-0.29 0.00	0.00	-0.44 0.00	0.00	0.02	-0.29 0.00	0.00	1.37	0.15 0.15	0.00	-0.41 0.00	0.00	-0.38 0.00	0.00	-0.38 0.00	0.00	-1.00 0.00	0.00	-0.83 0.00	0.00	0.00	334.05
334.15	2.54		0.00	-0.46 0.00	0.00	-0.44 0.00	0.00	-0.40 0.00	0.19	0.19 0.19	0.00	-0.43 0.00	0.00	-0.38 0.00	0.00	-0.26 0.00	0.00	-0.40 0.00	0.13	-0.25 0.00	0.00	1.76	0.26 0.26	0.00	-0.38 0.00	0.00	-0.34 0.00	0.00	-0.34 0.00	0.00	-0.91 0.00	0.00	-0.74 0.00	0.00	0.01	334.15	
334.25	3.00		0.00	-0.42 0.00	0.00	-0.40 0.00	0.00	-0.36 0.00	0.19	0.22 0.22	0.00	-0.39 0.00	0.00	-0.34 0.00	0.00	-0.22 0.00	0.00	-0.37 0.00	0.00	0.22	-0.22 0.00	0.00	1.93	0.37 0.37	0.00	-0.34 0.00	0.00	-0.31 0.00	0.00	-0.31 0.00	0.00	-0.83 0.00	0.00	-0.65 0.00	0.06	0.00	334.25
334.35	3.31		0.00	-0.39 0.00	0.00	-0.36 0.00	0.00	-0.33 0.00	0.19	0.26 0.26	0.00	-0.36 0.00	0.00	-0.31 0.00	0.00	-0.18 0.00	0.00	-0.33 0.00	0.00	0.30	-0.18 0.00	0.00	1.93	0.49 0.49	0.00	-0.31 0.00	0.00	-0.27 0.00	0.00	-0.27 0.00	0.00	-0.74 0.00	0.00	-0.57 0.00	0.15	0.00	334.35
334.45	3.62		0.00	-0.35 0.00	0.00	-0.33 0.00	0.00	-0.29 0.00	0.19	0.30 0.30	0.00	-0.32 0.00	0.00	-0.27 0.00	0.00	-0.15 0.00	0.00	-0.30 0.00	0.00	0.38	-0.14 0.00	0.00	1.93	0.60 0.60	0.00	-0.27 0.00	0.00	-0.23 0.00	0.00	-0.23 0.00	0.00	-0.65 0.00	0.00	-0.48 0.00	0.23	0.00	334.45
334.55	3.89		0.00	-0.31 0.00	0.00	-0.29 0.00	0.00	-0.26 0.00	0.19	0.33 0.33	0.00	-0.28 0.00	0.00	-0.23 0.00	0.00	-0.11 0.00	0.00	-0.26 0.00	0.00	0.46	-0.11 0.00	0.00	1.93	0.71 0.71	0.00	-0.23 0.00	0.00	-0.20 0.00	0.00	-0.20 0.00	0.00	-0.57 0.00	0.00	-0.39 0.00	0.27	0.00	334.55
334.65	4.19		0.00	-0.28 0.00	0.00	-0.26 0.00	0.00	-0.22 0.00	0.19	0.37 0.37	0.00	-0.25 0.00	0.00	-0.20 0.00	0.00	-0.08 0.00	0.00	-0.22 0.00	0.00	0.53	-0.07 0.00	0.00	1.93	0.83 0.83	0.00	-0.20 0.00	0.00	-0.16 0.00	0.00	-0.16 0.00	0.00	-0.48 0.00	0.00	-0.30 0.00	0.35	0.00	334.65
334.75	4.52		0.00	-0.24 0.00	0.00	-0.22 0.00	0.00	-0.18 0.00	0.19	0.40 0.40	0.00	-0.21 0.00	0.00	-0.16 0.00	0.00	-0.04 0.00	0.00	-0.19 0.00	0.00	0.61	-0.04 0.00	0.00	1.93	0.94 0.94	0.00	-0.16 0.00	0.00	-0.13 0.00	0.00	-0.13 0.00	0.00	-0.39 0.00	0.00	-0.22 0.00	0.43	0.00	334.75
334.85	5.09		0.00	-0.21 0.00	0.00	-0.18 0.00	0.00	-0.15 0.00	0.19	0.44 0.44	0.00	-0.18 0.00	0.00	-0.13 0.00	0.07	0.00 0.00	0.00	-0.15 0.00	0.00	0.69	0.00 0.00	0.00	1.93	1.05 1.05	0.00	-0.13 0.00	0.05	-0.09 0.00	0.04	-0.09 0.00	0.08	-0.30 0.00	0.05	-0.13 0.00	0.50	0.00	334.85
334.95	6.13		0.00	-0.17 0.00	0.00	-0.15 0.00	0.00	-0.11 0.00	0.19	0.48 0.48	0.00	-0.14 0.00	0.00	-0.09 0.00	0.14	0.03 0.03	0.00	-0.12 0.00	0.00	1.03	0.04 0.04	0.00	1.93	1.16 1.16	0.00	-0.09 0.00	0.10	-0.05 0.00	0.08	-0.05 0.00	0.27	-0.22 0.00	0.16	-0.04 0.00	0.51	0.00	334.95
335.05	7.14		0.00	-0.13 0.00	0.00	-0.11 0.00	0.00	-0.08 0.00	0.19	0.50 0.50	0.00	-0.10 0.00	0.00	-0.05 0.00	0.20	0.07 0.07	0.00	-0.08 0.00	0.00	1.38	0.07 0.07	0.00	1.93	1.28 1.28	0.00	-0.05 0.00	0.15	-0.02 0.00	0.12	-0.02 0.00	0.44	-0.13 0.00	0.25	0.04 0.04	0.51	0.00	335.05
335.15	7.80		0.00	-0.10 0.00	0.00	-0.08 0.00	0.00	-0.04 0.00	0.19	0.50 0.50	0.00	-0.07 0.00	0.00	-0.02 0.00	0.20	0.10 0.10	0.00	-0.04 0.00	0.00	1.39	0.11 0.11	0.00	1.93	1.39 1.39	0.00	-0.02 0.00	0.20	0.02 0.02	0.18	0.02 0.02	0.57	-0.04 0.00	0.34	0.13 0.13	0.51	0.00	335.15
335.25	8.66		0.01	-0.06 0.00	0.01	-0.04 0.00	0.01	0.00 0.00	0.19	0.50 0.50	0.01	-0.03 0.00	0.02	0.02 0.02	0.20	0.14 0.14	0.03	-0.01 0.00	1.39	0.14 0.14	0.00	1.93	1.50 1.50	0.02	0.02 0.02	0.30	0.05 0.05	0.20	0.05 0.05	0.71	0.04 0.04	0.43	0.22 0.22	0.51	0.00	335.25	
335.35	9.61		0.01	-0.03 0.00	0.02	0.00 0.00	0.02	0.03 0.03	0.19	0.50 0.50	0.02	0.00 0.00	0.04	0.05 0.05	0.20	0.18 0.18	0.05	0.03 0.03	1.39	0.18 0.18	0.00	1.93	1.62 1.62	0.04	0.05 0.05	0.34	0.09 0.09	0.20	0.09 0.09	0.96	0.13 0.13	0.46	0.30 0.30	0.51	0.00	335.35	
335.45	10.57		0.02	0.01 0.01	0.03	0.03 0.03	0.03	0.07 0.07	0.19	0.50 0.50	0.03	0.04 0.04	0.04	0.09 0.09	0.20	0.21 0.21	0.07	0.06 0.06	1.39	0.22 0.22	0.00	1.93	1.73 1.73	0.04	0.09 0.09	0.34	0.13 0.13	0.20	0.13 0.13	1.21	0.22 0.22	0.46	0.39 0.39	0.51	0.00	335.45	
335.55	11.28		0.03	0.05 0.05	0.04	0.07 0.07	0.03																														

SIZE =
RADIUS =
SLOPE =
LENGTH =
DS INV =
US INV =

CB1
200
0.1
30%
1.1
335.09
335.42

TO

MODS
START ELEVATION =
INTERVAL =

333.25
0.1

	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
HWL ELEVATION	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.20	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0008
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	0.53	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0072
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	0.87	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0136
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	1.10	YES	NO	YES	1.5908	0.0030	0.0000	0.0030	0.0189
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	1.10	YES	NO	YES	3.7510	0.0216	0.0000	0.0216	0.0292
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	1.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0346
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	1.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0346

SIZE = 200
RADIUS = 0.1
SLOPE = 22.50%
LENGTH = 1.2
DS INV = 335.09
US INV = 335.36

CB2 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.27	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0011
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	0.71	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0096
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	1.16	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0182
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	1.20	YES	NO	YES	2.9413	0.0137	0.0000	0.0137	0.0271
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	1.20	YES	NO	YES	5.3811	0.0308	0.0000	0.0308	0.0373
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	1.20	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0377
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	1.20	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0377

SIZE = 200
RADIUS = 0.1
SLOPE = 18.89%
LENGTH = 0.9
DS INV = 335.09
US INV = 335.26

CB3 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.32	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0013
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	0.85	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0114
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	0.90	YES	NO	YES	2.9411	0.0137	0.0000	0.0137	0.0203
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	0.90	YES	NO	YES	5.3807	0.0308	0.0000	0.0308	0.0280
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	0.90	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0283
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	0.90	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0283
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	0.90	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0283

SIZE = 200
RADIUS = 0.1
SLOPE = 2.00%
LENGTH = 6.0
DS INV = 333.51
US INV = 333.63

CB4

TO

MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	NO	NO	YES	1.8546	0.0045	0.0000	0.00	0.04	2.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0045
333.65	NO	NO	YES	3.9646	0.0235	0.0000	0.02	0.14	6.00	YES	NO	YES	1.2870	0.0016	0.0000	0.0016	0.0754
333.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.24	6.00	YES	NO	YES	3.5443	0.0197	0.0000	0.0197	0.1533
333.85	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.34	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
333.95	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.44	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.05	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.54	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.15	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.64	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.74	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.84	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.94	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.04	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.14	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.24	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.85	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.34	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
334.95	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.44	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.05	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.54	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.15	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.64	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.74	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.84	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.94	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	2.04	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	2.14	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	2.24	6.00	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.1885

SIZE = 200
RADIUS = 0.1
SLOPE = 22.73%
LENGTH = 1.1
DS INV = 335.09
US INV = 335.34

CB5

TO

MODS

	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
HWL ELEVATION	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.26	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0010
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	0.70	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0095
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	1.10	YES	NO	YES	0.9007	0.0006	0.0000	0.0006	0.0176
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	1.10	YES	NO	YES	3.3413	0.0177	0.0000	0.0177	0.0270
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	1.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0346
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	1.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0346
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	1.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0346

SIZE = 200
RADIUS = 0.1
SLOPE = 8.46%
LENGTH = 1.3
DS INV = 335.09
US INV = 335.20

CB6

TO

MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.71	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0028
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	1.30	YES	NO	YES	2.0949	0.0061	0.0000	0.0061	0.0215
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	1.30	YES	NO	YES	4.1893	0.0253	0.0000	0.0253	0.0369
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	1.30	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0408
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	1.30	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0408
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	1.30	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0408
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	1.30	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0408

SIZE = 200
RADIUS = 0.1
SLOPE = 2.34%
LENGTH = 6.4
DS INV = 334.71
US INV = 334.86

CB7 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	NO	NO	YES	1.8546	0.0045	0.0000	0.00	0.04	1.71	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0038
334.85	NO	NO	YES	3.9646	0.0235	0.0000	0.02	0.14	5.98	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0703
334.95	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.24	6.40	YES	NO	YES	2.9461	0.0138	0.0000	0.0138	0.1446
335.05	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.34	6.40	YES	NO	YES	5.3922	0.0308	0.0000	0.0308	0.1992
335.15	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.44	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011
335.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.54	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.64	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.74	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.84	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.94	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.04	6.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2011

SIZE = 200
RADIUS = 0.1
SLOPE = 8.18%
LENGTH = 2.2
DS INV = 335.09
US INV = 335.27

CB8 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.73	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0029
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	1.96	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0264
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	2.20	YES	NO	YES	2.7397	0.0117	0.0000	0.0117	0.0475
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	2.20	YES	NO	YES	4.9975	0.0298	0.0000	0.0298	0.0673
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	2.20	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0691
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	2.20	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0691
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	2.20	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0691

CB9TOCBMH1

SIZE = 200

RADIUS = 0.1

SLOPE = 2.00%

LENGTH = 44.1

DS INV = 333.97

US INV = 334.85

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	NO	NO	YES	2.7389	0.0117	0.0000	0.01	0.08	4.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0235
334.15	NO	NO	YES	4.9962	0.0298	0.0000	0.03	0.18	9.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.1340
334.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.28	14.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.2199
334.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.38	19.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.2985
334.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.48	24.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.3770
334.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.58	29.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.4555
334.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.68	34.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.5341
334.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.78	39.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.6126
334.85	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.88	44.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.6912
334.95	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.98	44.10	YES	NO	YES	3.1016	0.0153	0.0000	0.0153	1.0303
335.05	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.08	44.10	YES	NO	YES	5.8825	0.0314	0.0000	0.0314	1.3843
335.15	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.18	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854
335.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.28	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.38	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.48	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.58	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.68	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.78	44.10	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	1.3854

SIZE = 300
RADIUS = 0.15
SLOPE = 1.72%
LENGTH = 27.3
DS INV = 333.45
US INV = 333.92

CBMH1

TO

MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	NO	NO	YES	2.4619	0.0206	0.0000	0.02	0.10	5.81	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0600
333.65	NO	NO	YES	3.8213	0.0501	0.0000	0.05	0.20	11.63	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.2910
333.75	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.30	17.44	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.6164
333.85	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.40	23.26	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.8219
333.95	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.50	27.30	YES	NO	YES	1.2967	0.0038	0.0000	0.0038	1.0162
334.05	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.60	27.30	YES	NO	YES	2.8800	0.0295	0.0000	0.0295	1.3674
334.15	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.70	27.30	YES	NO	YES	4.2736	0.0583	0.0000	0.0583	1.7601
334.25	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.80	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.35	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.90	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.45	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.00	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.55	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.10	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.65	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.20	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.75	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.30	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.85	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.40	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
334.95	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.50	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.05	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.60	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.15	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.70	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.25	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.80	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.35	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.90	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.45	NO	YES	NO	0.0000	0.0000	0.0707	0.07	2.00	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.55	NO	YES	NO	0.0000	0.0000	0.0707	0.07	2.10	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.65	NO	YES	NO	0.0000	0.0000	0.0707	0.07	2.20	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297
335.75	NO	YES	NO	0.0000	0.0000	0.0707	0.07	2.30	27.30	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.9297

SIZE = 200
RADIUS = 0.1
SLOPE = 7.86%
LENGTH = 1.4
DS INV = 335.09
US INV = 335.20

CB10 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
335.15	NO	NO	YES	2.3186	0.0079	0.0000	0.01	0.06	0.76	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0030
335.25	NO	NO	YES	4.4286	0.0269	0.0000	0.03	0.16	1.40	YES	NO	YES	2.0935	0.0061	0.0000	0.0061	0.0232
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.26	1.40	YES	NO	YES	4.1879	0.0253	0.0000	0.0253	0.0397
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.36	1.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0440
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.46	1.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0440
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.56	1.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0440
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.66	1.40	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.0440

SIZE = 200
RADIUS = 0.1
SLOPE = 3.64%
LENGTH = 10.7
DS INV = 334.71
US INV = 335.10

CB11

TO

MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	NO	NO	YES	1.8546	0.0045	0.0000	0.00	0.04	1.10	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0025
334.85	NO	NO	YES	3.9646	0.0235	0.0000	0.02	0.14	3.85	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0452
334.95	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.24	6.59	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.1036
335.05	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.34	9.34	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.1467
335.15	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.44	10.70	YES	NO	YES	2.1064	0.0062	0.0000	0.0062	0.2014
335.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.54	10.70	YES	NO	YES	4.2008	0.0254	0.0000	0.0254	0.3038
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.64	10.70	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.3362
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.74	10.70	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.3362
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.84	10.70	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.3362
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.94	10.70	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.3362
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.04	10.70	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.3362

SIZE = 200
RADIUS = 0.1
SLOPE = 4.46%
LENGTH = 6.5
DS INV = 334.71
US INV = 335.00

CB12 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	NO	NO	YES	1.8546	0.0045	0.0000	0.00	0.04	0.90	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0020
334.85	NO	NO	YES	3.9646	0.0235	0.0000	0.02	0.14	3.14	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0369
334.95	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.24	5.38	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0845
335.05	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.34	6.50	YES	NO	YES	2.0967	0.0062	0.0000	0.0062	0.1221
335.15	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.44	6.50	YES	NO	YES	4.1911	0.0253	0.0000	0.0253	0.1843
335.25	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.54	6.50	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2042
335.35	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.64	6.50	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2042
335.45	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.74	6.50	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2042
335.55	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.84	6.50	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2042
335.65	NO	YES	NO	0.0000	0.0000	0.0314	0.03	0.94	6.50	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2042
335.75	NO	YES	NO	0.0000	0.0000	0.0314	0.03	1.04	6.50	YES	YES	NO	0.0000	0.0000	0.0314	0.0314	0.2042

SIZE = 300
RADIUS = 0.15
SLOPE = 2.71%
LENGTH = 18.1
DS INV = 334.71
US INV = 335.20

DCB1 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	NO	NO	YES	1.4952	0.0056	0.0000	0.01	0.04	1.48	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0041
334.85	NO	NO	YES	3.0082	0.0323	0.0000	0.03	0.14	5.17	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0835
334.95	NO	NO	YES	4.4286	0.0606	0.0000	0.06	0.24	8.86	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.2684
335.05	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.34	12.55	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.4434
335.15	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.44	16.24	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.5738
335.25	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.54	18.10	YES	NO	YES	1.6730	0.0076	0.0000	0.0076	0.7088
335.35	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.64	18.10	YES	NO	YES	3.1348	0.0352	0.0000	0.0352	0.9582
335.45	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.74	18.10	YES	NO	YES	4.5919	0.0628	0.0000	0.0628	1.2083
335.55	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.84	18.10	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.2794
335.65	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.94	18.10	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.2794
335.75	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.04	18.10	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	1.2794

SIZE = 300
RADIUS = 0.15
SLOPE = 4.46%
LENGTH = 6.5
DS INV = 334.71
US INV = 335.00

DCB2 TO MODS

HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.75	NO	NO	YES	1.4952	0.0056	0.0000	0.01	0.04	0.90	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0025
334.85	NO	NO	YES	3.0082	0.0323	0.0000	0.03	0.14	3.14	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0508
334.95	NO	NO	YES	4.4286	0.0606	0.0000	0.06	0.24	5.38	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.1631
335.05	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.34	6.50	YES	NO	YES	1.6839	0.0078	0.0000	0.0078	0.2550
335.15	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.44	6.50	YES	NO	YES	3.1429	0.0354	0.0000	0.0354	0.3447
335.25	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.54	6.50	YES	NO	YES	4.6028	0.0630	0.0000	0.0630	0.4344
335.35	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.64	6.50	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	0.4595
335.45	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.74	6.50	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	0.4595
335.55	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.84	6.50	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	0.4595
335.65	NO	YES	NO	0.0000	0.0000	0.0707	0.07	0.94	6.50	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	0.4595
335.75	NO	YES	NO	0.0000	0.0000	0.0707	0.07	1.04	6.50	YES	YES	NO	0.0000	0.0000	0.0707	0.0707	0.4595

HEADWALL TO MODS

SIZE = 375

RADIUS = 0.1875

SLOPE = 9.78%

LENGTH = 4.6

DS INV = 334.05

US INV = 334.50

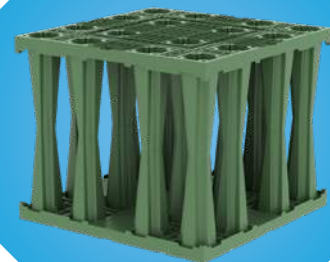
HWL ELEVATION	DOWNSTREAM							PIPE		UPSTREAM							TOTAL
	BELOW DS INV?	ABOVE DS OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	DEPTH WATER	DISTANCE WSL	ABOVE US INV?	ABOVE US OBV?	PARTIAL PIPE?	SEG. ANGLE (RAD)	SEGMENT AREA	FULL PIPE	END AREA	VOLUME (cu.m.)
333.25	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.35	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.45	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.55	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.65	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.75	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.85	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
333.95	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.05	YES	NO	NO	0.0000	0.0000	0.0000	0.00	0.00	0.00	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0000
334.15	NO	NO	YES	2.1706	0.0236	0.0000	0.02	0.10	1.02	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0121
334.25	NO	NO	YES	3.2750	0.0599	0.0000	0.06	0.20	2.04	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.0613
334.35	NO	NO	YES	4.4286	0.0947	0.0000	0.09	0.30	3.07	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.1453
334.45	NO	YES	NO	0.0000	0.0000	0.1104	0.11	0.40	4.09	NO	NO	NO	0.0000	0.0000	0.0000	0.0000	0.2259
334.55	NO	YES	NO	0.0000	0.0000	0.1104	0.11	0.50	4.60	YES	NO	YES	1.4971	0.0088	0.0000	0.0088	0.2742
334.65	NO	YES	NO	0.0000	0.0000	0.1104	0.11	0.60	4.60	YES	NO	YES	2.7402	0.0413	0.0000	0.0413	0.3490
334.75	NO	YES	NO	0.0000	0.0000	0.1104	0.11	0.70	4.60	YES	NO	YES	3.8226	0.0783	0.0000	0.0783	0.4340
334.85	NO	YES	NO	0.0000	0.0000	0.1104	0.11	0.80	4.60	YES	NO	YES	5.2411	0.1073	0.0000	0.1073	0.5008
334.95	NO	YES	NO	0.0000	0.0000	0.1104	0.11	0.90	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.05	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.00	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.15	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.10	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.25	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.20	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.35	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.30	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.45	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.40	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.55	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.50	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.65	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.60	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081
335.75	NO	YES	NO	0.0000	0.0000	0.1104	0.11	1.70	4.60	YES	YES	NO	0.0000	0.0000	0.1104	0.1104	0.5081



GreenStorm ST

Rigofill ST product by **FRÄNKISCHE**

**Underground storage
infiltration modules**



www.stormcon.ca

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Storing stormwater with storage/infiltration systems

Basic element for underground water storage facilities

GreenStorm ST* are plastic tanks to be installed underground (storage/infiltration modules) in which water is collected and stored. Storage/infiltration systems temporarily collect stormwater and discharge it later. In addition to infiltration using underdrained swale systems, pipe swales, and gravel swales common in the past, increasingly more storage/infiltration systems are being built today.

The storage space of the storage/infiltration system consists of numerous GreenStorm ST* modules which can be combined three-dimensionally to form large systems.

The advantage of this method is that the void ratio is up to three times larger in these infiltration systems than in gravel swales which saves space and excavation work.

GreenStorm ST* is a modular system which is characterised by high flexibility, rapid installation and a high level of user-friendliness.



Application – infiltration

Stormwater infiltration – giving back to nature

Large amounts of stormwater can reduce the performance of wastewater treatment systems. Infiltrating unpolluted stormwater nearby has therefore several advantages.

A constant growth in built-up areas and increase in impervious surfaces prevent natural infiltration of stormwater into the soil. Special infiltration systems are used in order to discharge it to the water cycle. In addition to infiltration using pipe swales, increasingly more storage/infiltration systems are being built.

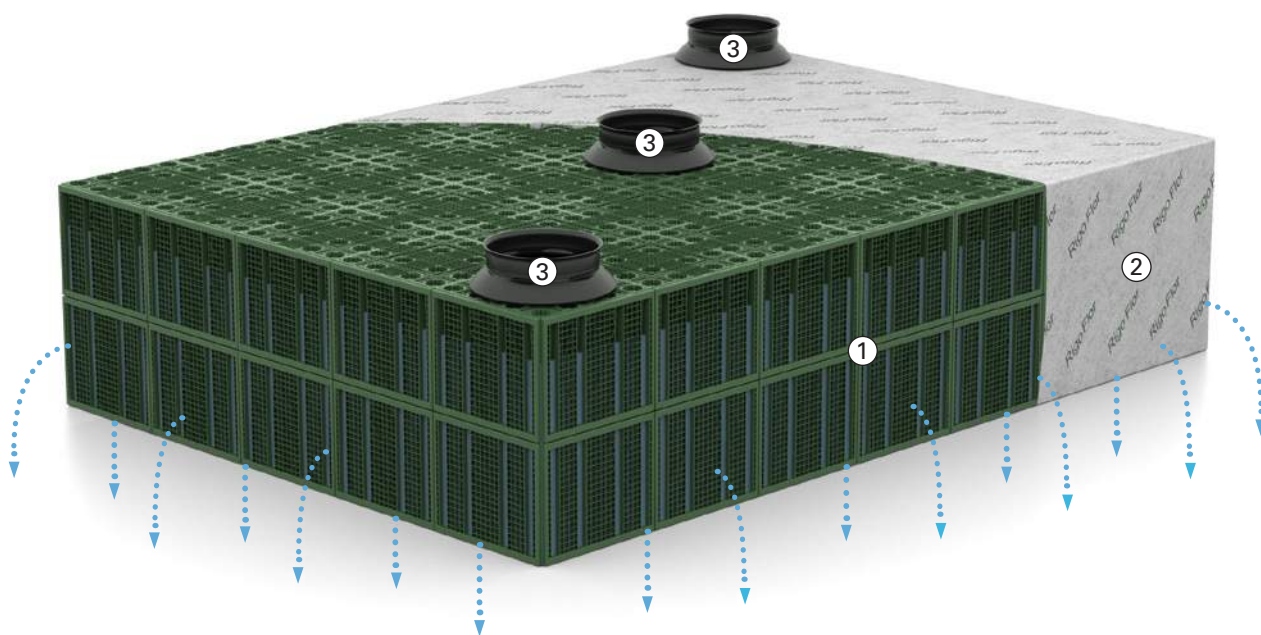
The advantage of this method is that the storage volume of the infiltration system is increased, and space and excavation are saved as compared to gravel swales. Stormwater is thus returned to the natural water cycle and can contribute to producing new groundwater. Infiltration systems are subject to very high requirements. Consequently, they have become an important component of urban drainage.

Storage/infiltration systems considerably increase the underground storage volume. High-performance storage/infiltration systems can be installed even in confined space.

In particular in urban construction no additional space is required and precious building ground is saved.

Légende

- ① GreenStorm ST* storage /infiltration module
- ② Geotextile
- ③ QuadroControl ST system shaft



Application – retention

Retaining stormwater – instead of flooding

If subsoil conditions are unfavourable to infiltration, the goal is to retain the stormwater and ensure a retarded, timelagged discharge. Exposure to impulsive stress can be eliminated or reduced in sewer networks, wastewater treatment systems and waterbodies.

Stormwater retention systems retard the infiltration of stormwater. They are comprised of a watertight retaining element, an inlet and a vortex outlet.

The stormwater distributes evenly in the system where it can be stored and is then discharged in a controlled manner through throttle shafts. If infiltration must be avoided or to prevent unintended

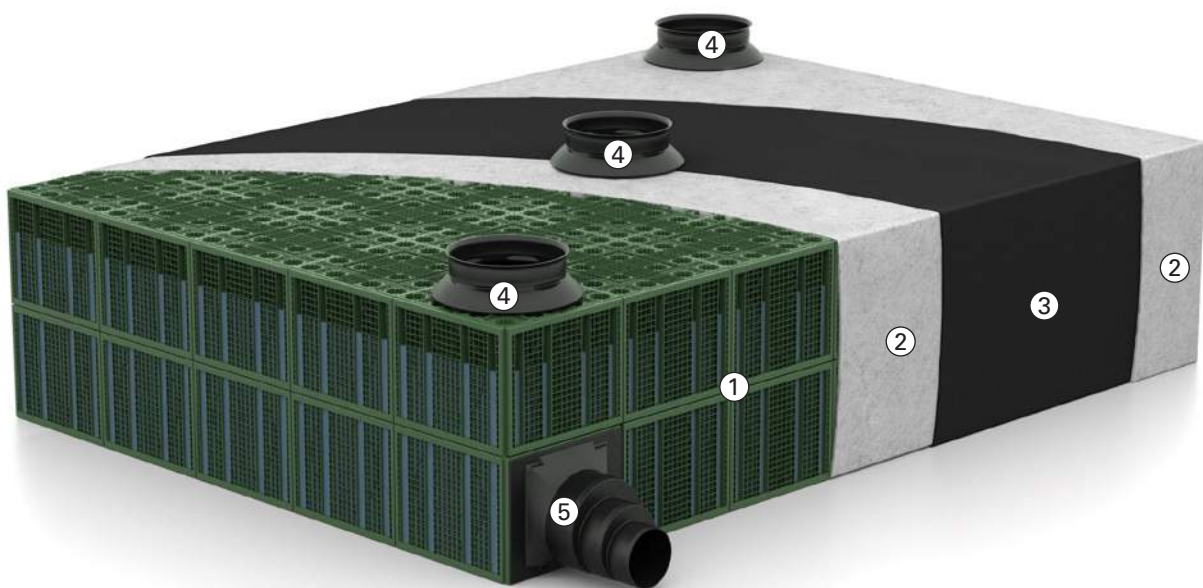
discharge of groundwater or strata water (e.g., in case of contaminated soil), it is necessary to waterproof the retention system.

Stormwater runoff from impervious surfaces that cannot infiltrate naturally leads to peak loads in sewer systems.

Stormwater retention facilities collect stormwater in an underground storage tank and discharge it in a retarded manner but continuously. Their very short construction times make storage/infiltration systems an inexpensive alternative to conventional retention facilities such as retention channels or underground concrete tanks.

Légende

- ① GreenStorm ST* storage /infiltration module
- ② Geotextile
- ③ Impermeable membrane
- ④ QuadroControl ST system shaft
- ⑤ Adapter



Application – harvesting / fire water storage

Harvesting stormwater – saving drinking water

Water – particularly drinking water – is a priceless resource which should be treated responsibly and used sparingly. It is therefore wise to collect, store and use stormwater if the water must not necessarily be suitable for drinking purposes, instead of allowing the water to infiltrate into the soil unused or diverting it into the sewer system.

There are many examples: irrigation for greens, car wash, use in toilets, etc.

Water is diverted into a waterproof storage/infiltration system and can be supplied for use via a pumping system.

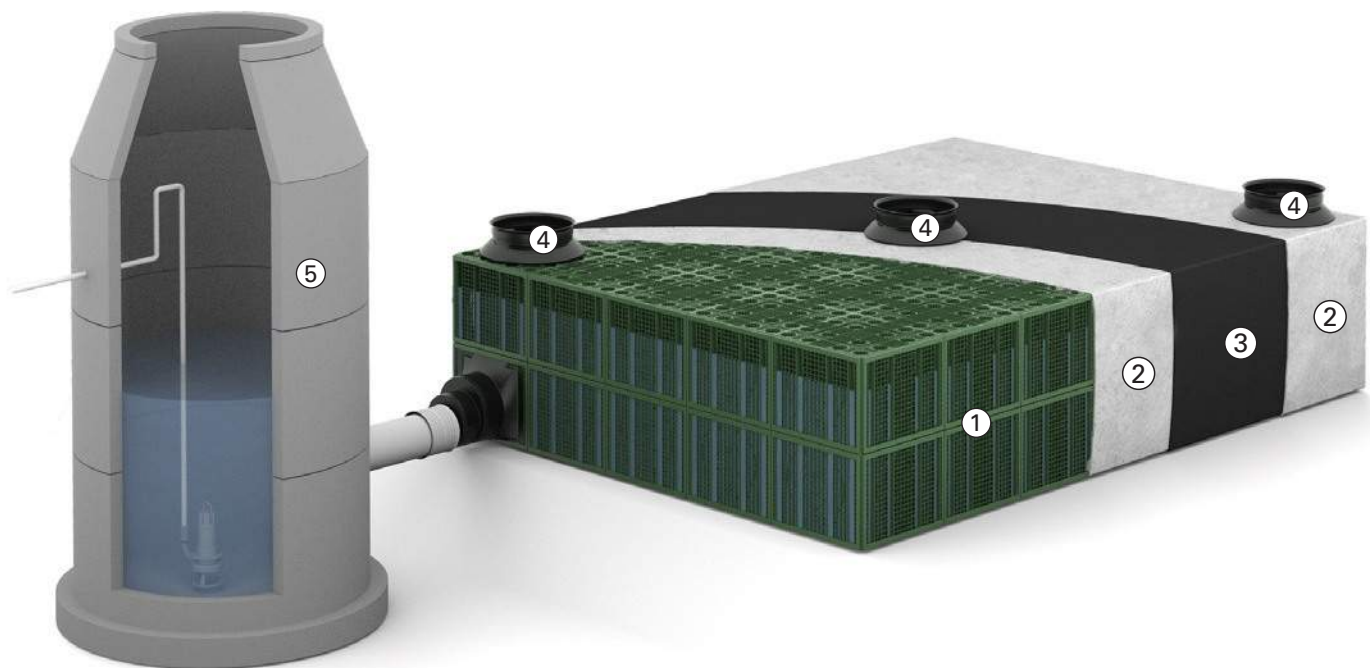
The use of the GreenStorm inspect system allows for finding solutions that fit project-specific requirements – even under the most difficult conditions such as very tight space, narrow conditions, low cover, high groundwater level, etc.

Stormwater harvesting systems provide water for different domestic and industrial water uses. They comprise a watertight retaining element, an inlet with upstream stormwater treatment system, a pump shaft and a system control.

Using GreenStorm ST* for fire water storage also saves water, since system checks can be made in a filled state and water does not have to be pumped out as is the case with conventional concrete tanks.

Légende

- ① GreenStorm ST* storage/infiltration module
- ② Geotextile
- ③ Impermeable membrane
- ④ QuadroControl ST system shaft
- ⑤ Tapping shaft (on-site)



Modular design

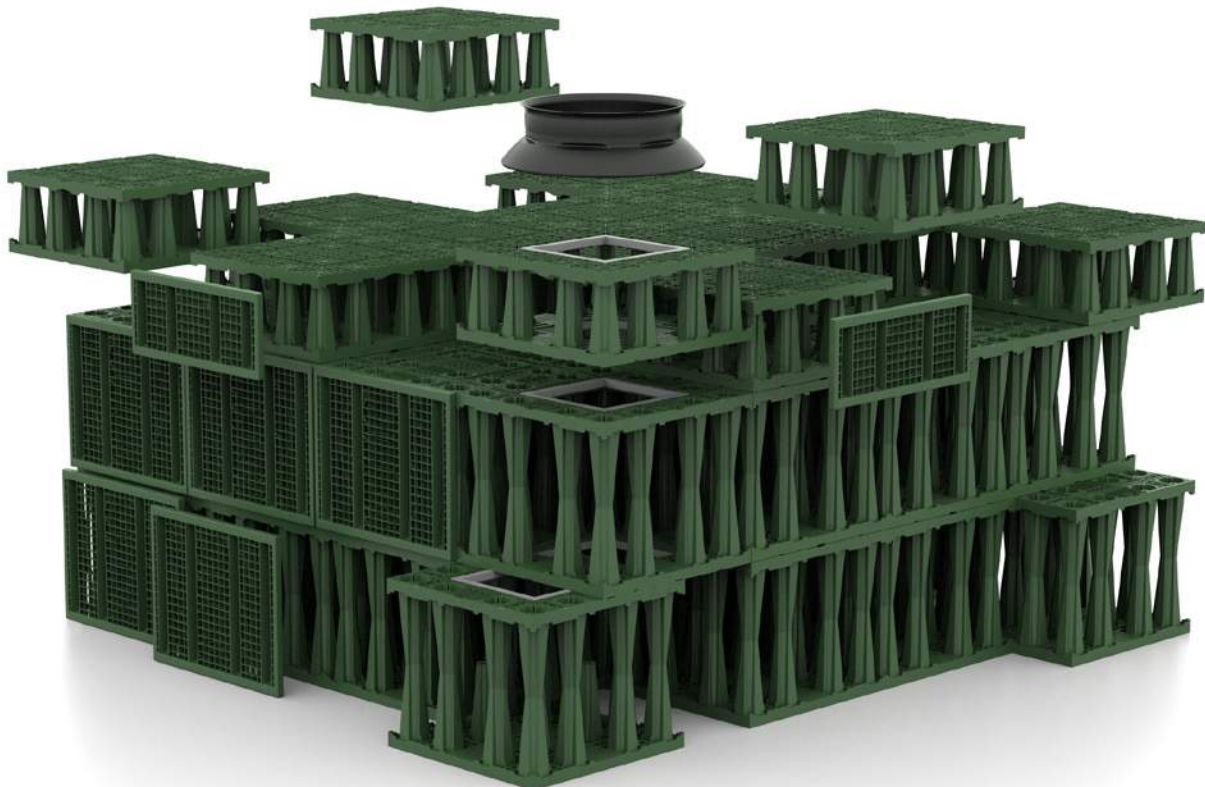
Individual system geometries due to modular design

Sizes (length and width) of GreenStorm ST*orage/infiltration systems can be freely designed with hardly any limitations. The 800 mm cellular block type structure can easily be adapted to fit nearly any layout.

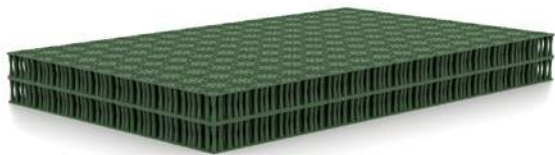
With heights of 660 mm (full block) and 350 mm (half block), systems can be built in various sizes to accommodate any

single- or multi-layer combination. Therefore, the system can very easily be adapted to on-site requirements. Under high groundwater conditions or low permeability of backfill soil, for example, rather shallow depth systems are to be preferred.

For soils with good permeability, however, high and compact systems are favourable and may be built accordingly. The maximum space available is used.



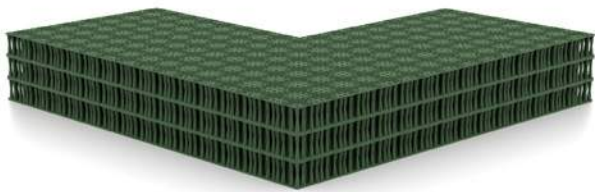
Possible system geometries



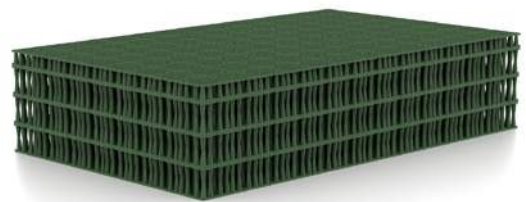
GreenStorm ST*
2-layer



GreenStorm ST*
1-layer



GreenStorm ST*
3-layer



GreenStorm ST*
3 1/2-layer

Storage volume

Extremely high volume

The GreenStorm ST* full block provides a storage volume of 406 litres with a gross volume of 422 litres. With a storage volume of more than 96 %, it stores three times as much water as gravel swales.

The half block has a height of 350 mm and is used if shallow systems are required, e.g., in case of high groundwater levels. With a gross volume of 224 litres, it offers a storage volume of 212 litres.

Column void

The column void of the storage/infiltration module is 100 % available as storage space. Large openings at the column base and at the column connection allow unrestricted filling and emptying of the columns.



Storage/infiltration systems as compared to gravel swales

Pipe and gravel swales only use approx. 30 % of their volume to store water. Therefore, three times the required water storage volume must be provided by excavation. This requires lots of space which is frequently not available in urban areas.

GreenStorm ST* storage/infiltration systems save an enormous amount of space and excavation work. Thus, subsoil storage spaces for stormwater can be built in a very efficient and cost-saving way.

Storage/infiltration systems considerably increase the storage space. High-performance storage/infiltration systems can be installed even in confined space.



Installation

Easy construction site handling



Requires little space for storage

The storage/infiltration modules are delivered in compact, stacked units with 17 modules per pallet.

The easy stackability of the GreenStorm ST* and ST-B modules allows them to be stored even in confined construction space, even outside the excavation pit. This facilitates installation, since no additional storage space must be provided in the excavation pit. Installation is neither impeded nor constrained.

Pre-assembly

Depending on the requirements, GreenStorm ST and GreenStorm ST*-B modules can be pre-assembled in no time at all, both outside and inside the excavation pit with just one easy move. Easy high tensile strength snap connections allow for combining two half elements to create a reliable unit in only a short period of time. This can easily be done by one person alone without requiring any additional tools. The moveable parts of the snap connection are recessed and thus protected from damage.

Easy assembly

There is no need to adhere to any complex installation pattern – the pre-assembled modules or half blocks can just as well be connected to create a single unit.

The low weight allows this to be done by one person only. Connectors establish firm connections between the individual modules. The surface can be accessed immediately without any risk of accidents, since the hole size of the columns is dimensioned respectively (< 100 mm). Thus, no additional covers of column holes are required.



Montage dans la fouille

Up to

88 %

storage space saved as compared to unstackable storage/infiltration modules

Inspection

CCTV inspection even when filled

Storage/infiltration systems are durable structures for urban drainage; they must work reliably for decades. Durability and reliability are essential requirements. The best way to inspect the state of a system using state-of-the-art technology

is CCTV inspection. Thus, a storage/infiltration system can be inspected excellently – for final acceptance or later. This provides safety for authorities, engineers, construction companies, customers, and operators.

Cross-shaped inspection tunnel

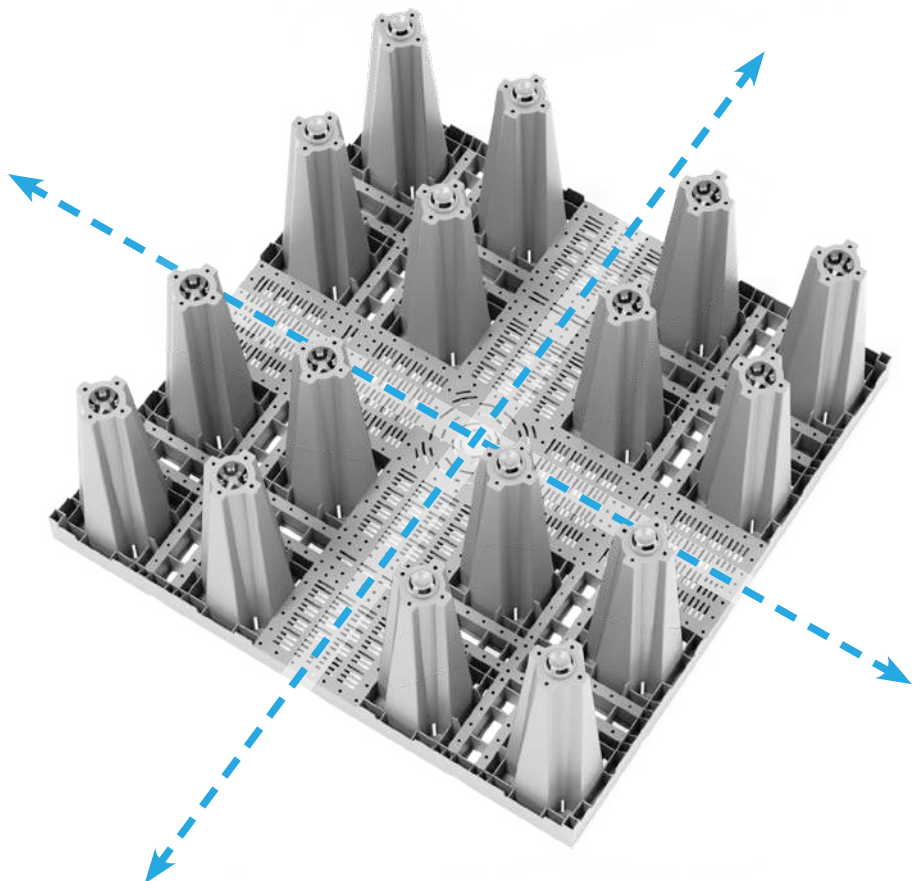
GreenStorm ST* modules have a cross-shaped tunnel which makes the storage/infiltration system camera-accessible and flushable in two axes and thus in four dimensions.

The special and open design of the inspection tunnel allows for an unobstructed view of the entire interior and not only the inspection tunnel.

The ideal, level and vibration-free running surface and the slim column structure allow for an unobstructed view of the entire module volume. The Quadro Control ST shaft for GreenStorm ST*, which can be integrated, allows for easy access of the automotive dolly for both professional final acceptance inspection and flushing technology.

For example, the statically relevant load-bearing elements, the condition of the geotextile and the entire soil area can be viewed. GreenStorm ST* and GreenStorm ST*-B thus provide excellent options to control the “inner life” of a storage/infiltration system at any time.

100 %
inspectable



Inspection

Recommended camera equipment

A standard sewer camera is sufficient for camera inspection.

A rotatable and height-adjustable camera head allows for an optimal view of the lateral soil area, a controllable carriage ensures a centred positioning, and high-performance optics together with lighting allow for a perfect picture.



Certified CCTV accessibility

GreenStorm ST* has been designed for the use of modern CCTV inspection technology.

The inspectability of the GreenStorm ST* and QuadroControl ST system unit has been tested and confirmed by leading manufacturers of pipe CCTV inspection technology!



Recommended: tender invitation for final acceptance inspection

Final acceptance of sewers using camera inspection has long since become a matter of course in sewer construction.

Also in the construction of storage/infiltration systems, the final acceptance inspection is important! Planning engineers should absolutely include this in their tender documents. For instructions on the professional system configuration of the CCTV inspection technology, please refer to www.fraenkische.com



Loading

GreenStorm ST* Heavy traffic

Storage/infiltration systems are subsoil structures and must have sufficient load-carrying capacity against impacting soil and traffic loads.

GreenStorm ST* storage/ infiltration systems are extremely strong and have been designed with various applications in mind:
While GreenStorm ST* has been designed in particular for traffic loads of up to 13 tons axle load.



Certification CSTB



High resistance

When installed under traffic areas, relevant national guidelines must be observed.

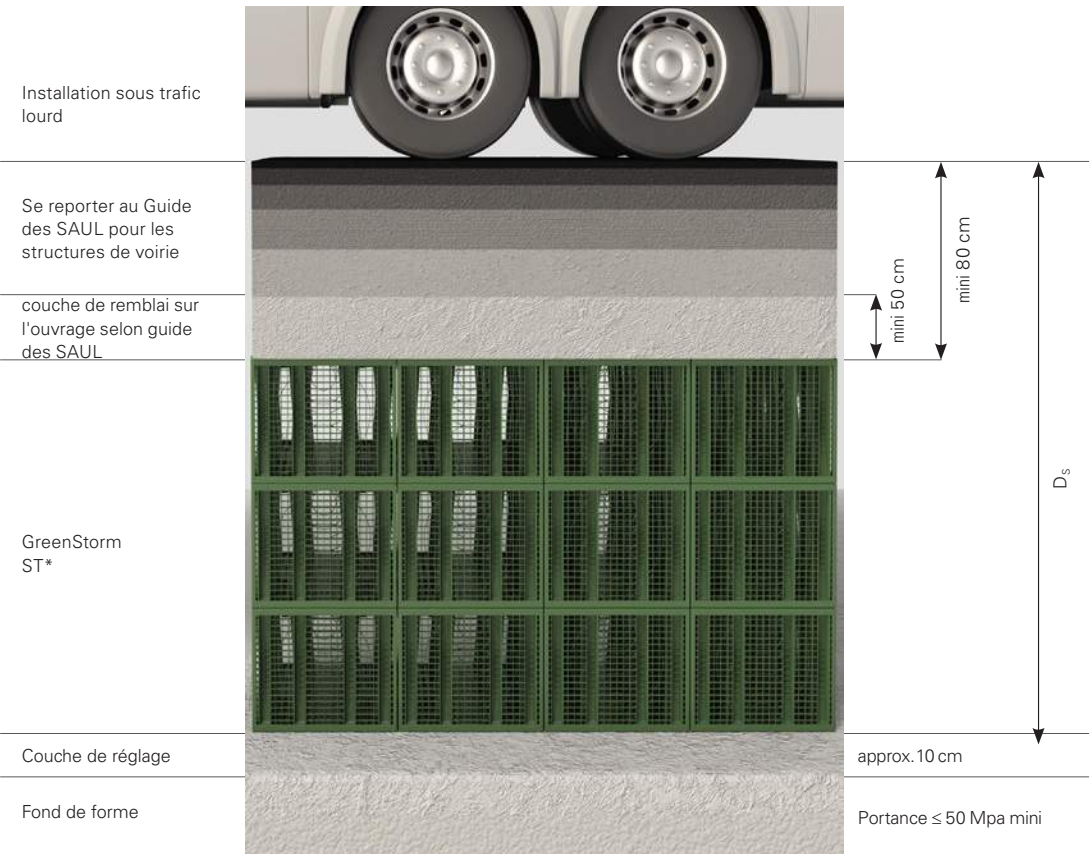
To build the planum for the road construction, an upper levelling layer must be provided. It should preferably be built as a gravel sub-base with a thickness of at least 350 mm, other materials usually result in larger covers.

Generally, a uniform modulus of deformation $EV2 \geq 45 \text{ MN/m}^2$ must be proven on the planum.

Installation under traffic area

The subsoil structures must have sufficient load-carrying capacity against impacting soil and traffic loads to ensure reliable stability.

This is why GreenStorm ST* is suitable for traffic loads of up to 15 tons axle load (20 tons possible, please refer to our technical department).



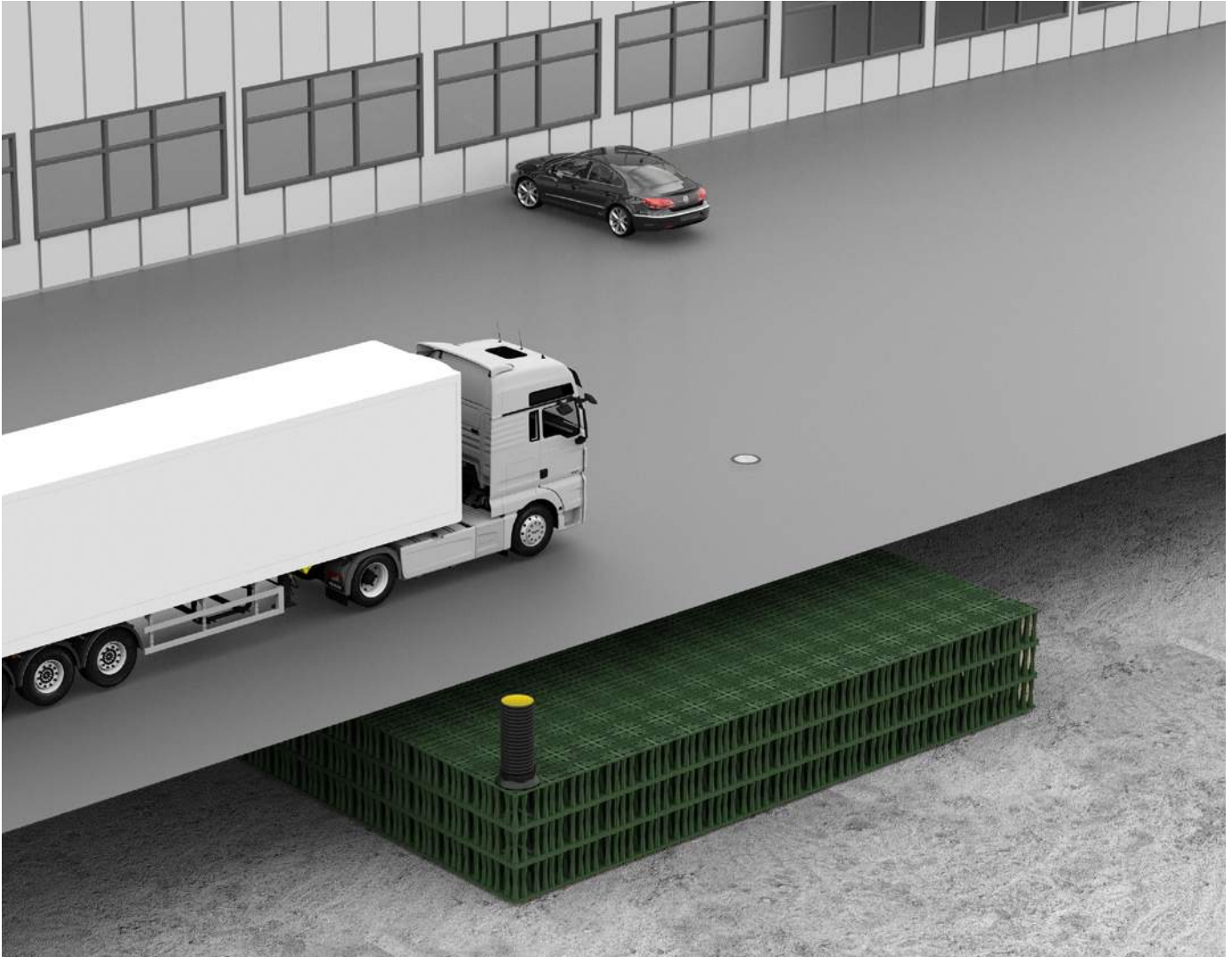
With conventional installation parameters*, depths of cover of DC 4 m and soil depths DS of 6 m are possible for infiltration systems. A project-specific stability analysis can be prepared by STORMCON.

*specific weight of soil 18 kN/m^3
Mean soil temperature max. 23°C ,
6 m soil depth, $= 0.3, 4\text{-laye}$

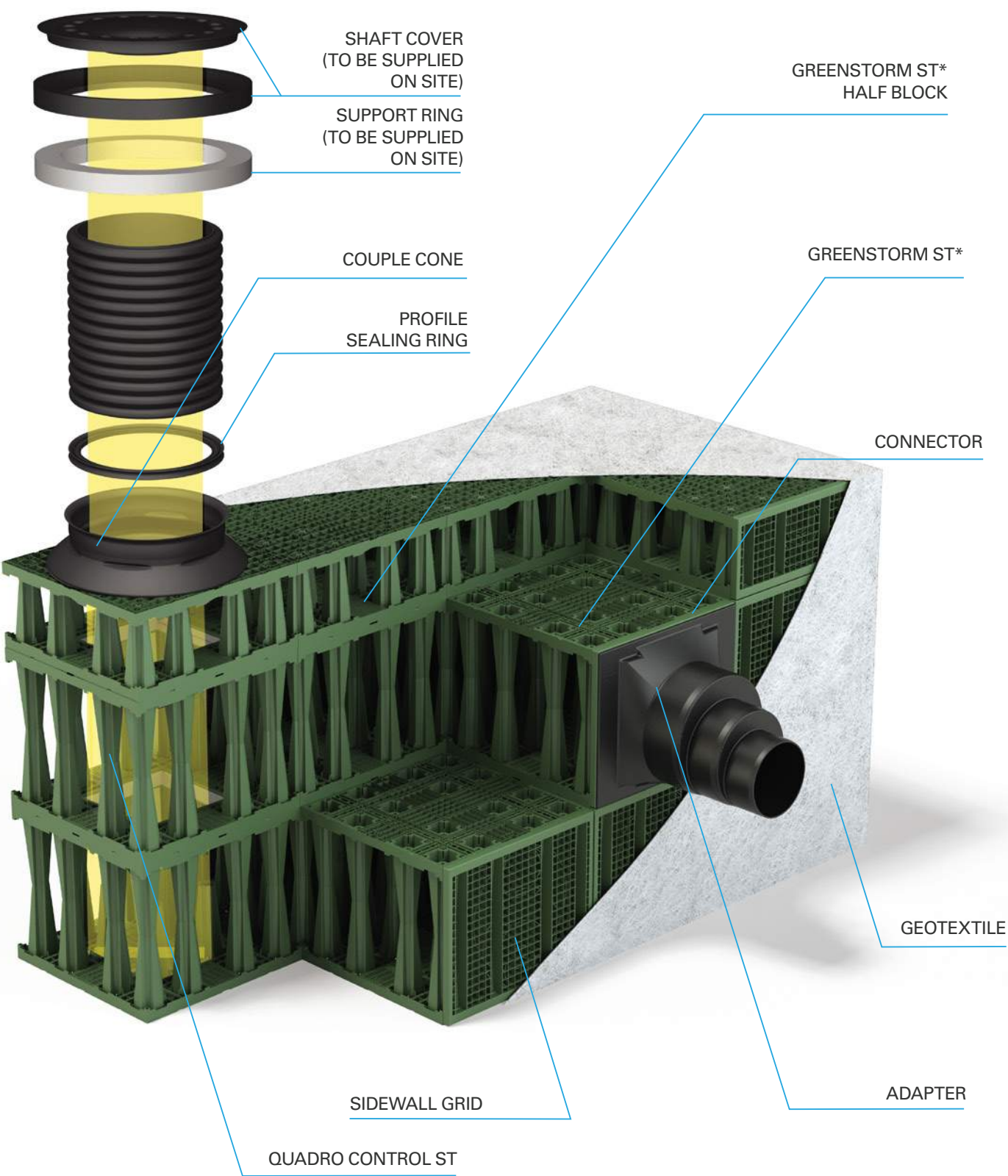
*Rigofill ST product by FRÄNKISCHE

Example

GreenStorm ST* Heavy traffic



Quadro® Control ST – system shaft



*Rigofill ST product by FRÄNKISCHE

Quadro® Control ST – system shaft

Integrated inspection shafts

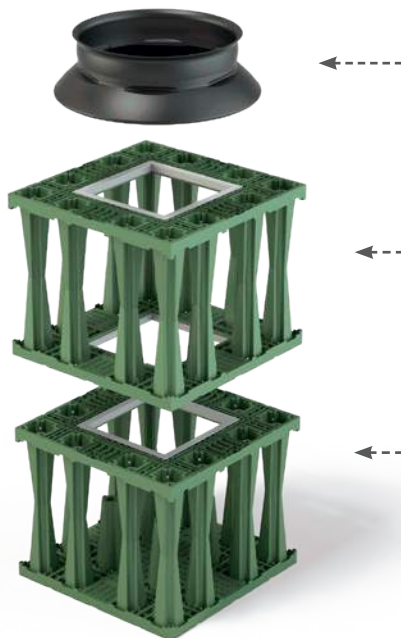
Quadro® Control ST is a polypropylene inspection shaft which can be integrated in the storage/infiltration system.

It is square with a base of 800 x 800 mm and can be used in any position of the layout.

Its height results from the number of layers of the connected storage/infiltration system. The shaft allows for comfortable access to the inspection tunnel from aboveground. High-performance inspection and flushing equipment can easily be inserted into the inspection

tunnel. The shaft is integrated in the storage/infiltration system and grows layer by layer as construction progresses. QuadroControl ST is delivered with all required components and will be assembled on site.

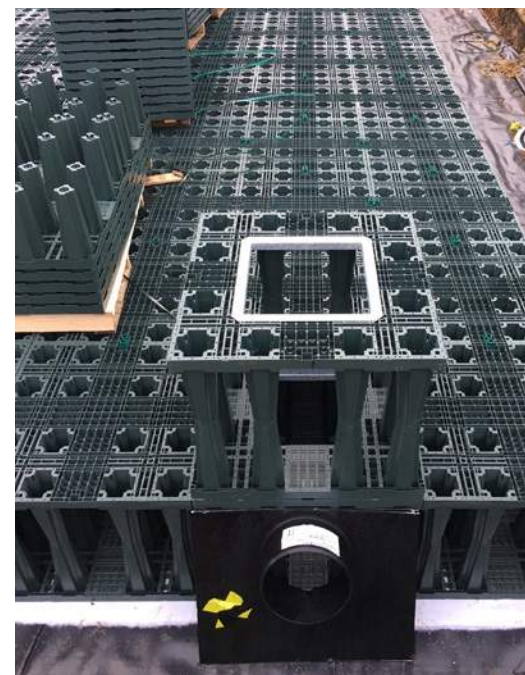
Structure



←----- The shaft cone is the transition to the extension pipe. The length of the extension pipe is chosen depending on the installation depth.

←--- The shaft is integrated in the storage/infiltration system and grows layer by layer as construction progresses.

←--- The shaft components are stackable and delivery includes the cone with all required components as shaft package.



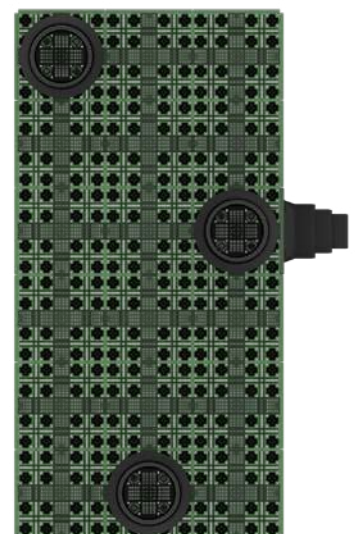
Arrangement of inspection shafts

Number of and position in the system are above all determined by the size of the system, access, pipe connections and design of the outdoor facilities.

In order to ensure that flushing of the complete system is possible, each module should comprise at least one inspection shaft. In addition, the shafts should be positioned such that the shaft covers do

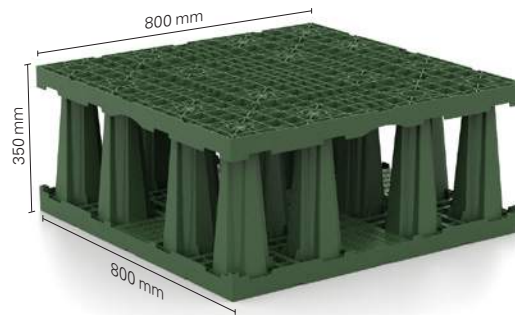
not interfere with the design of the outdoor facilities, but can easily be accessed by vehicles for maintenance purposes.

Adjacent shafts should be staggered in the layout.



GreenStorm ST* – Design-relevant dimensions

Dimensions



Sidewall grid connection options

Full block connection options

Dia 100 mm, 135 mm, 150 mm, 200 mm, 250 mm, 300 mm, 375 mm et 450 mm



This allows all available nominal diameters to be realised both at the top and the bottom of the module.



GreenStorm ST* – Design-relevant dimensions

Sidewall grid connection options

Half block connection options

Dia 100 mm, 135 mm, 150 mm, 200 mm
et 250 mm



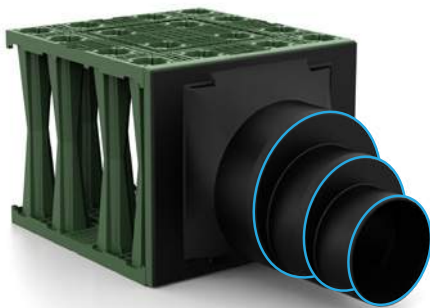
The side plates can be drilled to the height and desired position within the frame.



Adapter connection options

Connections:

Dia 300 mm, 450 mm
et 525 mm



Outside diameter 315 mm
for a pipe diameter
300 mm PVC



Outside diameter 400 mm for
a pipe diameter 450 mm PVC.
A flexible sleeve off center
is required.



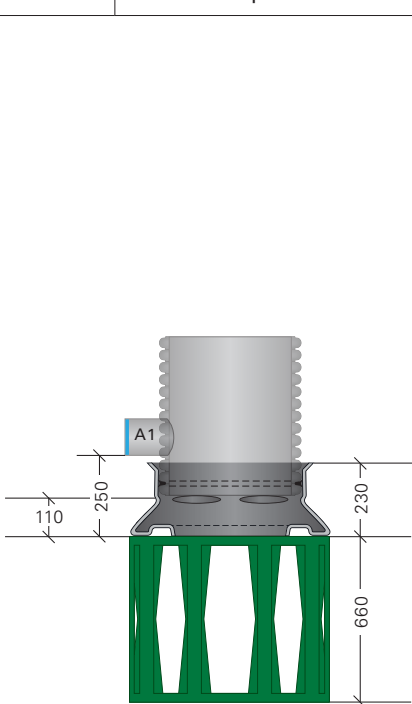
Outside diameter 500 mm for
a pipe of diameter 525 mm.
A flexible sleeve off center
is required



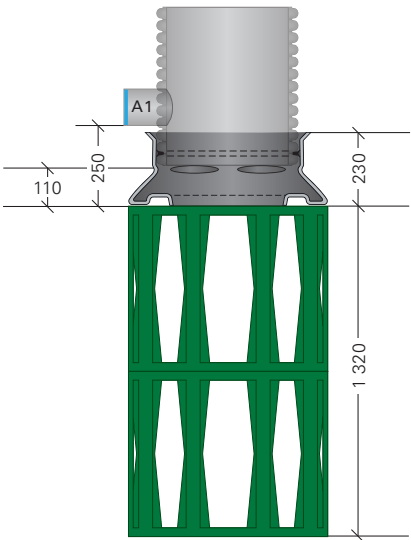
Quadro® Control ST – Design-relevant dimensions

Dimensions of Quadro® Control ST

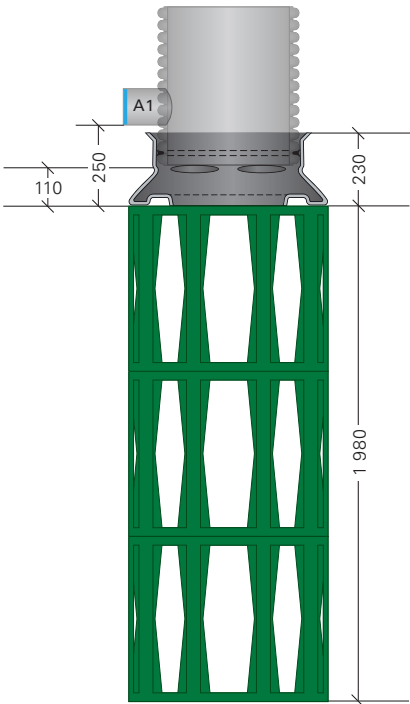
Connection options	
A1	DN/OD 200 or DN/OD 315 connection possible



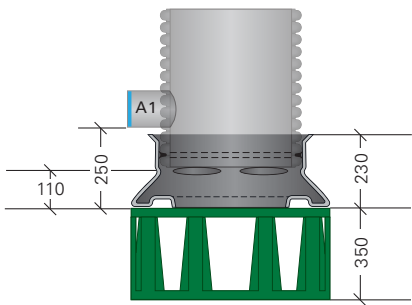
1-layer



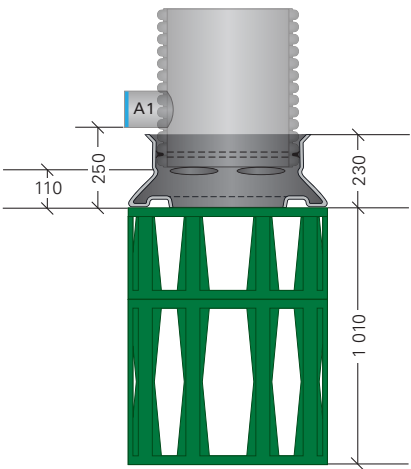
2-layer



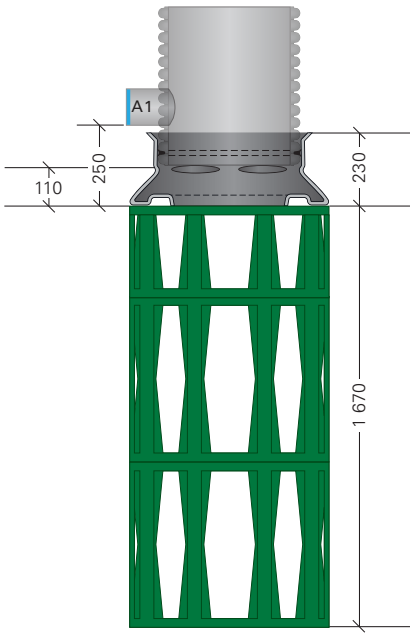
3-layer



1/2-layer



1 1/2-layer



2 1/2-layer

Quadro® Control ST – Design-relevant dimensions

Shaft design of Quadro® Control ST

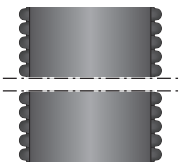
Structure of inspection shaft



Class B or D
shaft cover acc. to DIN EN 124,
CW 610



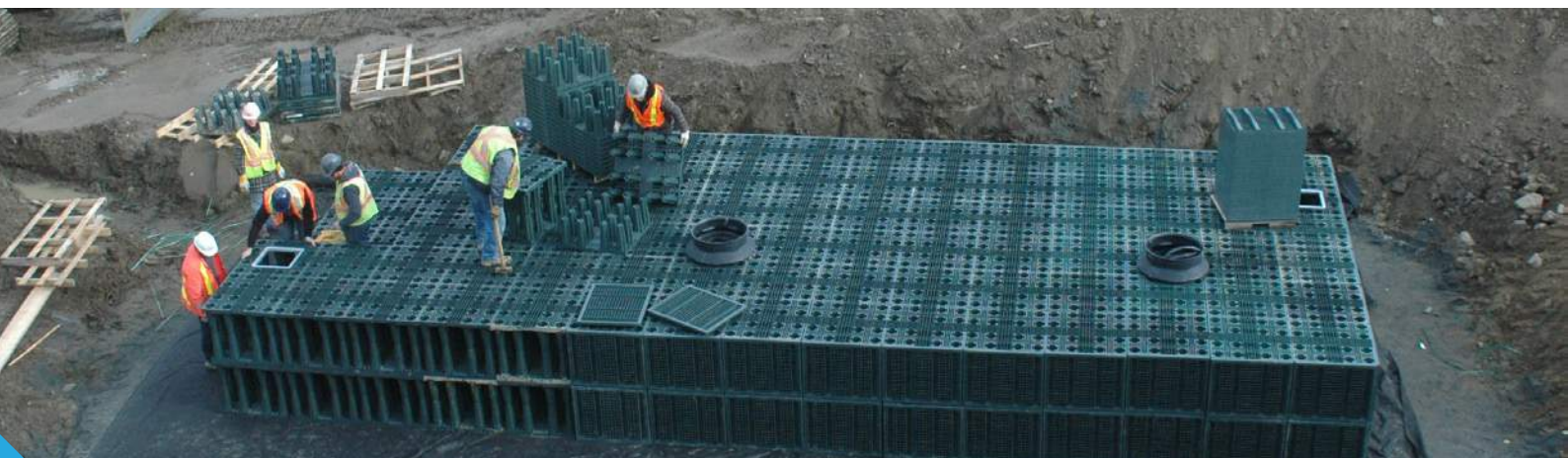
Support ring acc. to DIN 4034,
 $D_1 = 625 \text{ mm}$



Extension pipe
 $D_o 600$



Sealing ring



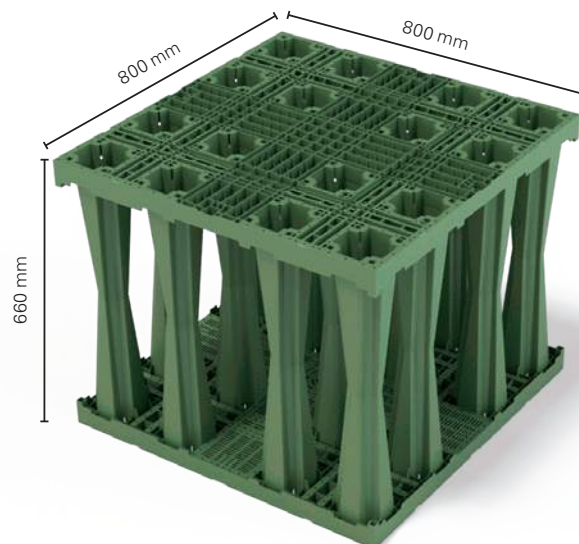
GreenStorm ST*

GreenStorm ST*

GreenStorm ST* IS highly durable and hard-wearing storage/infiltration module with a base of 800 x 800 mm and a height of 660 mm full blocks.

The polypropylene full block consists of two half elements to be installed on site and has a void ratio of more than 96 %. Water can flow through the module three-dimensionally almost without any obstacles. GreenStorm ST* allows for virtually any size and geometry of the systems.

The cross-shaped inspection tunnel in the storage/infiltration modules has been designed for the use of automotive dollies. This allows the effective drainage surface and the entire system volume with all statically relevant bearing-type fixtures to be inspected.

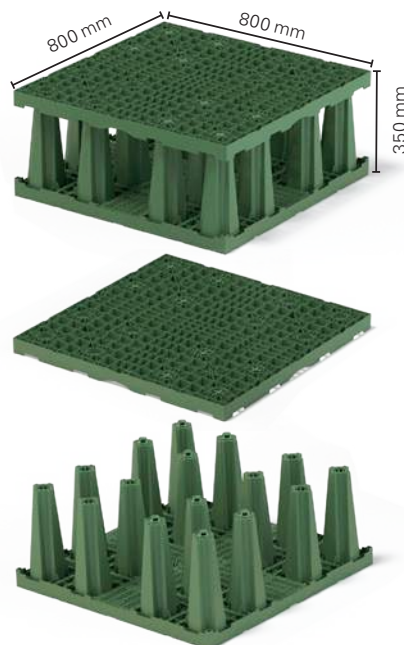


GreenStorm ST* – half block

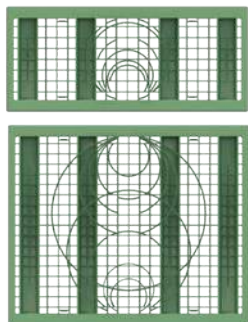
The GreenStorm ST* half block has a base of 800 x 800 mm and a height of 350 mm.

It consists of only one half element which must be assembled with a roof slab on site. This roof slab is only required for the half block. The GreenStorm ST* half block is used in particular for systems with shallow installation depths, e.g., in case of high groundwater levels.

Systems in various heights can be realised in 35 cm steps and adjusted to almost any layout in combination with the full block.



GreenStorm ST* – Accessories



Différentes hauteurs de connexion (indépendamment du diamètre nominal) sont requises au-dessus du fond selon le nombre d'étages :

Nombre d'étages	Hauteur de raccord
0.5-layer	40 mm
1-layer	40 mm
1.5-layer	700 mm
2-layer	700 mm
2.5-layer	1 360 mm
3-layer	1 360 mm

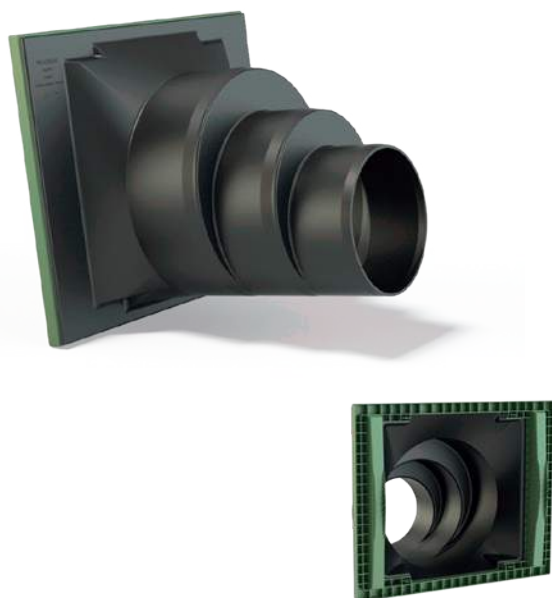
Sidewall grid

The sidewall grids serve as external boundary.

They can be assembled easily using snap connections. The predefined position of the connections at the sidewall grids guarantees that the connections of inlet pipe and outlet pipe and the tunnel are same level. The sidewall grids can be assembled easily also outside the excavation pit.

The sidewall grid for the full block and Quadro® Control ST has a size of W x D x H = 800 x 30 x 660 mm and is suited for connecting lateral solid wall pipes DN 110, 125, 160, 200, 225, 250, 315, 400 and 500.

The sidewall grid for the half block or the half-layer shaft has a size of W x D x H = 800 x 30 x 350 mm and is suited for connecting lateral solid wall pipes DN 110, 125, 160, 200, 225 and 250. In storage/infiltration designs with inside corners, shortened sidewall grids are used at one side.



Adapter

The adapter for GreenStorm ST* has a length of 800 mm and a height of 660 mm and serves as an inlet and outlet connection.

It provides an inlet connection with an optimised flow design with diffusor effect for solid wall pipes DN 315, 400 and 500. It can be connected to GreenStorm ST* easily and quickly thanks to the snap connection.

The predefined position of the snap connection at the module guarantees that inlet pipe and outlet pipe and tunnel connect same level.

The adapter ensures a connection with the same crown, as it is installed turned by 180°.





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Tel. +1 647 463 9803 | sales@stormcon.ca | www.stormcon.ca



APPENDIX 3

DETAILED RETENTION AND INFILTRATION CALCULATIONS

Design Assumptions:

1. A geotechnical investigation conducted by Patriot Engineering Ltd., dated July 26, 2024, the native soil located in the vicinity of the bottom of the proposed Detention and Retention Galleries is interpreted to fall between a sily sand (SM) and a poorly graded sand (SP).
2. The native material is expected to behave closer to SP soil. Per OBC SG-6, SP soils generally exhibit percolation rates ranging from 8 to 20 min/cm. Given the observed gradation and lower fines, the lower range value of 10 min/cm was selected.
 - A percolation time of 10 min/cm is equivalent to 60 mm/hr.
3. Applying a factor of safety equal to 2.5 yields a design infiltration 24 mm/hr.
4. Total Area of Retention and Detention Gallery Modules = 1690.24 sq.m.
5. Modules to be constructed on top of 150 mm thick layer of clear stone. Total Area of Stone Bed = 1742.80 sq.m.
6. Outlet of Gallery is set 0.05 m above the bottom of the modules.
7. Porosity (n) for the full size modules = 0.961.
8. Refer to GreenStorm ST* Manufacturer Brochure for module details.
9. The soakaway system draw down time is calculated by using the following equation from the 2003 MECP SWMPDM:

$$\Delta t = 1000V / PnA$$

Where,

- A = bottom area (sq.m)
- V = runoff volume to be infiltrated (cu.m)
- P = percolation of surrounding native soil (mm/h)
- n = porosity of the storage media (0.4 for clear stone)
- Δt = draw down time (hours)

10. The retention volume provided below the outlet is calculated using the following equation:

$$V = ndA$$

Where,

- V = runoff volume (cu.m)
- d = depth of storage media (m)
- A = bottom area (sq.m)
- n = porosity of storage media (0.4 for clear stone)

TOTAL RETENTION VOLUME

Modules: $V = 0.961 \times 0.05\text{m} \times 1690.24 = \underline{81.216 \text{ cu.m.}}$

Stone: $V = 0.40 \times 0.15 \times 1742.8 = \underline{104.568 \text{ cu.m.}}$

TOTAL:

$$V = 81.2 + 104.6$$

$$\underline{V = 185.8 \text{ cu.m.}}$$

INFILTRATION (DRAW DOWN) TIME

$$\Delta t = 1000V / PnA$$

$$\Delta t = (1000 \times 185.8) / (24 \times 0.4 \times 1742.8) = 11.105$$

$$\underline{\Delta t = 11.1 \text{ hours}}$$

Therefore, the Retention and Detention Gallery can retain a total of 185.8 cu.m. below the outlet and will drain completely within 11.1 hours.

SG-6 Percolation Time and Soil Descriptions

ESTIMATION OF PERCOLATION TIME (Referenced in Article 8.2.1.2.)

- (a) The purpose of this Section and the associated Tables and Charts is to provide assistance to those who must decide on the percolation time(s) to be used in design. Suggested relationships between percolation time, coefficient of permeability and soils of various types are given. **IT MUST BE EMPHASIZED THAT, PARTICULARLY FOR FINE GRAINED SOILS, THERE IS NO CONSISTENT RELATIONSHIP DUE TO THE MANY FACTORS INVOLVED.** The following guidance is presented for the soil types outlined in the Unified Soil Classification System (Table 1). In order to assess a particular soil.
- (i) Table 2 and Table 3 - Approximate relationship of soil types to permeability and percolation time.
 - (ii) Charts 1 to 14 - Typical grain size distribution curves for soil types in the Unified Soil Classification System.
- (b) In Table 2 and Table 3, a range of values of "K" and of "T" are given for various soil descriptions. The principal modifiers which will influence selection of a "T" value within the range given are:
- (i) The structure - "massive" fine-grained soils have high values of "T".
 - (ii) The density - For a given soil higher density produces a higher value of "T".
 - (iii) The percentage of clay - the higher the percentage the higher the value of "T".
 - (iv) The mineralogy of the clay portion - The more it "swells" the higher the value of "T".
 - (v) The plasticity of the soil - The higher the plasticity index the higher the value of "T".
 - (vi) Liquid Limit - the higher the liquid limit the higher the value of "T".
 - (vii) Organic content - The presence of fine organic particles, detectable by colouration and odour, can significantly reduce the permeability and raise the value of "T".

TABLE 1
Unified Soil Classification

Coarse - Grained Soils		Fine - Grained Soils	
Group Symbols	Typical Names	Group Symbols	Typical Names
GW	Well-graded gravels, gravel-sand mixtures, little or no fines	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
GM	Silty gravels, gravel-sand-silt mixtures	OL	Organic silts and organic silty clays of low plasticity
GC	Clayey gravels, gravel-sand-clay mixtures	MH	Inorganic silts, micaceous or diatomaceous fine sand, or silty soils, elastic silts
SW	Well-graded sands, gravelly sands, little or no fines	CH	Inorganic clays of high plasticity, fat clays
SP	Poorly-graded sands, gravelly sands, little or no fines	OH	Organic clays of medium to high plasticity, organic silts
SM	Silty sands, sand-silt mixtures		
SC	Clayey sands, sand-clay mixtures	PT (highly organic soils)	Peat and other highly organic soils

**TABLE 2
APPROXIMATE RELATIONSHIP OF SOIL TYPES
TO PERMEABILITY AND PERCOLATION TIME**

SOIL TYPE (unified soil classification)	Coefficient of Permeability K - cm/sec.	Percolation Time- T mins/cm.	Comment
COARSE GRAINED - MORE THAN 50% LARGER THAN #200			
G.W. - Well graded gravels, gravel-sand mixtures, little or fines.	10^{-1}	< 1	very permeable unacceptable
G.P. - Poorly graded gravels, gravel-sand mixtures, little or no fines.	10^{-1}	< 1	very permeable unacceptable
G.M. - Silty gravels, gravel sand-silt mixtures.	$10^{-2} - 10^{-4}$	4 - 12	Permeable to medium permeable depending on amount of silt.
G.C. - Clayey gravels, gravel- sand-clay mixtures.	$10^{-4} - 10^{-6}$	12 - 50	Important to estimate amount of silt and clay
S.W. - Well graded sands, gravelly sands little or no fines.	$10^{-1} - 10^{-4}$	2 - 12	medium permeability
S.P. - Poorly graded sands gravelly sand, little or no fines.	$10^{-1} - 10^{-3}$	2 - 8	medium permeability
S.M. - Silty sands, sand- silt mixtures.	$10^{-3} - 10^{-5}$	8 - 20	medium to low permeability
S.C. - Clayey sands, sand- clay mixtures.	$10^{-4} - 10^{-6}$	12 - 50	medium to low permeability (depends on amount of clay)

**TABLE 3
APPROXIMATE RELATIONSHIP OF SOIL TYPES
TO PERMEABILITY AND PERCOLATION TIME**

SOIL TYPE (unified soil classification)	Coefficient of Permeability K - cm/sec.	Percolation Time- T mins/cm.	Comment
FINE GRAINED - MORE THAN 50% PASSING #200			
M.L. - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, clayey silts with slight plasticity	$10^{-5} - 10^{-6}$	20 - 50	medium to low permeability
C.L. - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	10^{-6} and less	over 50	unacceptable
O.L. - Organic silts, organic silty clays of low plasticity; liquid limit less than 50	10^{-5} and less	20 - over 50	acceptable depends on clay content.
M.H. - Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	10^{-6} and less	over 50	unacceptable
C.H. - Inorganic clays of medium to high plasticity, organic silts	10^{-7} and less	over 50	unacceptable
O.H. - Organic clays of medium to high plasticity-organic silt; liquid limit over 50	10^{-6} and less	over 50	unacceptable

SELECTION OF "T" TIME FROM THE ABOVE TABULATION

A range of "T" times for each soil type is shown above. Select from within this range by determining if the soil is within the low, middle or high part of the range considering the soil identifiers and soil characteristics. Consider structure, density, colour, prevalence of organics, the clay content and mineralogy, the plasticity index and liquid limit and the functioning of existing systems in similar soils in the area.

Note: The following Ministry of the Environment Reports provide further information on the relationship between grain size, coefficient of permeability and percolative time.

- "Study on the Feasibility of Correlating Percolation Time with Laboratory Permeability" - 1975 - Research Report No. S56 by H. T. Chan, PhD., P.Eng.
- "Study of Conventional Tile Fields in Fine-Grained Soils" - 1979 Research Report 74 by H. T. Chan, PhD., P.Eng.

UNIFIED SOIL CLASSIFICATION SYSTEM

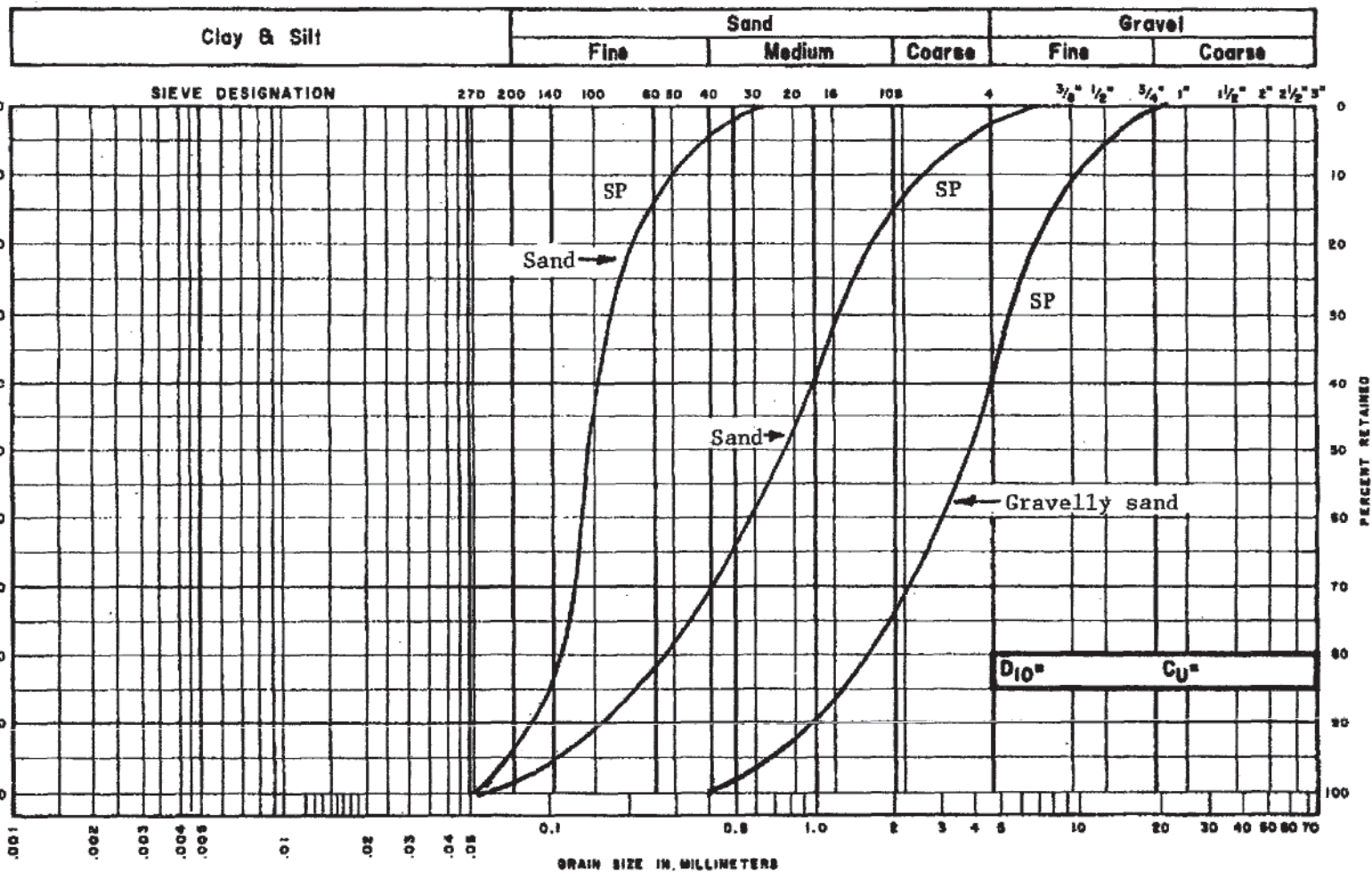
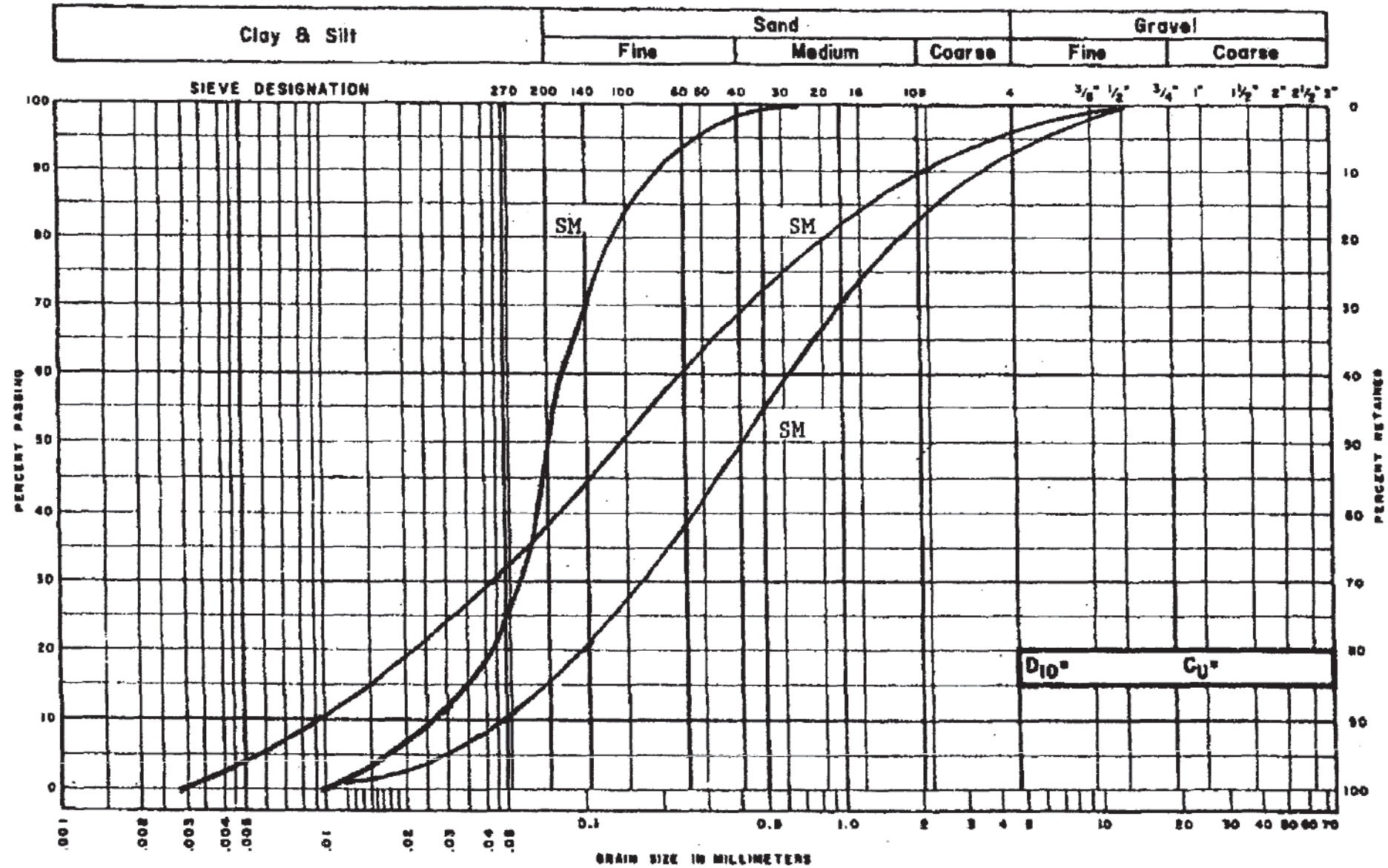


Chart 6 - SP

Poorly-graded sands & gravelly sands

UNIFIED SOIL CLASSIFICATION SYSTEM



- Chart 7 - SM
- Silty sands, sand-silt mixtures
 - More than 12% finer than 0.074 mm
 - Plasticity Index (Ip) less than 4
 - Plots below "A" line on plasticity chart

APPENDIX 4

3.3.2 Water Quality Sizing Criteria

The volumetric water quality criteria are presented in Table 3.2. The values are based on a 24 hour drawdown time and a design which conforms to the guidance provided in this manual. Requirements differ with SWMP type to reflect differences in removal efficiencies. Of the specified storage volume for wet facilities, 40 m³/ha is extended detention, while the remainder represents the permanent pool.

Table 3.2 Water Quality Storage Requirements based on Receiving Waters^{1, 2}

Protection Level	SWMP Type	Storage Volume (m ³ /ha) for Impervious Level			
		35%	55%	70%	85%
<i>Enhanced</i> 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
<i>Normal</i> 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
<i>Basic</i> 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

¹Table 3.2 does not include every available SWMP type. Any SWMP type that can be demonstrated to the approval agencies to meet the required long-term suspended solids removal for the selected protection levels under the conditions of the site is acceptable for water quality objectives. The sizing for these SWMP types is to be determined based on performance results that have been peer-reviewed. The designer and those who review the design should be fully aware of the assumptions and sampling methodologies used in formulating performance predictions and their implications for the design.

²Hybrid Wet Pond/Wetland systems have 50-60% of their permanent pool volume in deeper portions of the facility (e.g., forebay, wet pond).

APPENDIX 5



CB SHIELD: OPERATIONS INFO

REMOVING AND INSTALLING A SHIELD

CBSHIELD.COM/MAINTENANCE OR 226-802-1749



CB Shield is a Canadian owned and operated company aimed at improving stormwater quality. CB shields are a catch basin insert used to maintain sediment and improve water quality. Shields are put to work as water flows off the “slope” and into the basin wall opposite to the outlet pipe; grates allow sediment from the slowed water to pass to the sump below. See below on steps for removing and installing these.

You open a catch basin and **you see this device**



What you need is one these specialized sticks we provide called a “Gandalf stick.” These can be provided beforehand or are sometimes left with cb shields after the unit has been installed. Please contact us if these are needed.

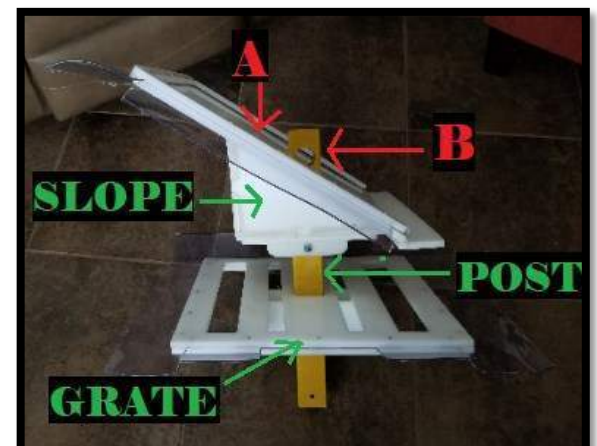


What you will need to do next depends on the type of shield you find. They have changed over time.

For a **one piece unit**: pull the unit up by the rope in the middle post



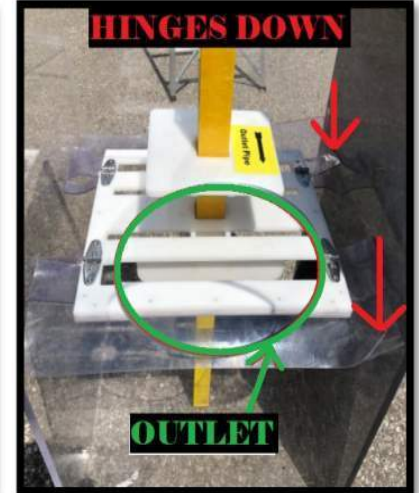
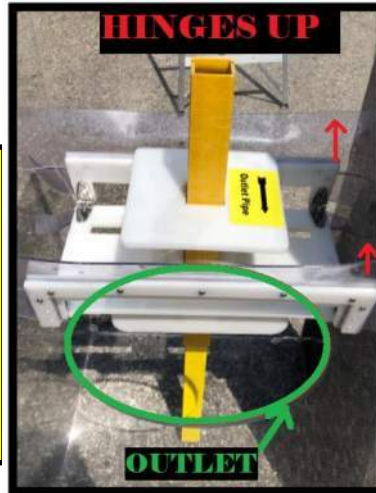
For a **two piece unit**, the top slope can slide off the post. The slope will have a rope (a), the post has an eye hole (b). Sometimes these will have to be removed separately.



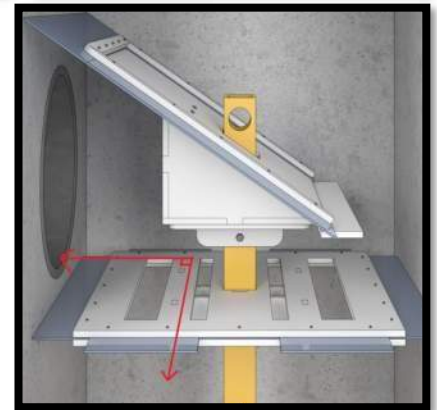


CB SHIELD: OPERATIONS INFO

Some two piece units have **hinges**. Follow the same steps a standard two piece unit, except pull up both hinges to remove unit, and fully extend them when reinstalling it.



Once the unit is removed and the sediment is cleaned out, you can reinstall the unit. Clean off the grates of debris and **ensure the grate slots are perpendicular to the lowest outlet pipe.**



We have several variations of “spacers” used to keep shields propped in place for double catch basins. Reinstall these as you find



Tips and Facts:

- 1) Try to reinstall units the way you found them. Taking a photo of how they were before you start can help save time and confusion.
- 2) When in doubt, use the lowest outlet pipe as the reference point: the grate should be at the same height as it, and the slope should be headed down from it.
- 3) For videos and more information go to cbshield.com/maintenance
- 4) Let's improve water quality together. Please call if you have any questions at **226-802-1749**

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

CB Shield[®] Stormwater Quality Device


Developed by CB Shield Inc.
Oakville, Ontario, Canada

Registration: **GPS-ETV_VR2019-10-31**

In accordance with

ISO 14034:2016

**Environmental Management —
Environmental Technology Verification (ETV)**



John D. Wiebe, PhD
Executive Chairman
GLOBE Performance Solutions

October 31, 2019
Vancouver, BC, Canada



Verification Body
GLOBE Performance Solutions
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Technology description and application

The CB Shield® technology provides an environmental benefit of controlling sediment wash off at upstream locations. A standard catch basin has a 1.2 m waterfall inflow that churns up sediment in the sump below causing a very poor rate of sediment retention. The CB Shield is a flow deflection device that is inserted into a standard catch basin. It contains a sloped plate to direct runoff to the back wall of the catch basin, thereby dissipating the energy of stormwater inflows. The dissipation of inflow energy allows time for settling of sediment in stormwater runoff, increasing capture and reducing scour/ re-suspension of previously deposited sediment. Installation involves lowering the unit into a standard sized catch basin, and adjusting the height of the unit to the height of the permanent pool in the sump. The unit is manufactured with durable fiberglass requiring little maintenance and is estimated to be operated on the same cleanout schedule set for the catch basin. Due to high rates of scour in a standard catch basin, they are seldom filled beyond 40% of sump capacity. Clean out routines and expenses are optimized when the CB Shield captures and retains more sediment within the sump.

In an urban setting, there are typically approximately 5 catch basins installed per hectare. Assuming an equal distribution of overland flow, the tested flow rates for the scour and capture tests are meaningful in the context of 78 L/s per hectare and 42 L/s per hectare, respectively. The CB Shield's scour prevention performance has been evaluated in a laboratory setting relative to a standard unshielded catch basin for flows of 1.2 to 15.6 L/s. The device's sediment capture performance was evaluated for flows of 0.24 to 8.4 L/s. Hydraulically, the CB Shield has been tested to pass flows up to 60 L/s without any negative impacts (i.e., surcharging).

Performance conditions

Claim 1: Capture test

The capture test is carried out in a laboratory with a constructed simulated street scape (1 % slope along its 2.4 m (96 inch) length, 2 % slope along its 1.2 m (48 inch) width). The catch basin was clean of any litter or debris. Capture performance was tested by comparing the mass of retained sediment with the influent sediment mass for each of six inflow rates: 0.24, 0.48, 1.20, 2.40, 6.00, and 8.40 L/s. The test sediment consisted of ground silica (1 – 1000 micron) with a specific gravity of 2.65, uniformly mixed to meet the particle size distribution specified in the *Procedure for Laboratory Testing of Oil Grit Separators (TRCA, 2014)*. Sediment was injected onto the street scape at a point just upstream of the catch basin to allow mixing prior to discharge while avoiding excessive buildup of sediment on the street scape. The sediment feed rate was adjusted for each flow rate to keep the influent concentrations consistent at 200 mg/L. The tests were conducted with a false floor set at 300 mm below the outlet invert simulating a catch basin that is filled to 50% of the manufacturer's recommended maximum sediment storage.

Claim 2: Scour test

The scour test was carried out in a laboratory on catch basins with and without the CB Shield® insert with a constructed simulated street scape (1 % slope along its 2.4 m (96 inch) length, 2 % slope along its 1.2 m (48 inch) width) and the catch basins clean of any litter or debris. A false floor was set in the catch basins at 254 mm below the outlet invert and preloaded with the test sediment (1- 1000 micron silica blend) test up to 150 mm below the outlet invert simulating a catch basin that is ¾ full of sediment. Water was filled to the effluent pipe and sediments were allowed to settle for 12-24 hours. Flows of 1.2, 4.8, 8.4, 12, and 15.6 L/s were tested on a continuous run with flow rates maintained at 5 minutes and a one minute transition time between flow rates. A minimum effluent grab sample of 500 mL was collected in 1000 mL jars by holding it under the entire effluent stream. A sample was taken at 30 seconds during the flow transitions to account for scour during the transition. Background samples were also taken at least once

every flow rate and effluent concentrations were corrected accordingly. Effluent flow was filtered using a 10µm filter and was recycled during the continuous 30 min test.

Performance claim(s)

Claim 1: Capture test

During the sediment capture test, for a catch basin with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent sediment concentration of 200 mg/L, the catch basin with a CB Shield® insert removed 64, 59.9, 52.4, 42.6, 25.2, and 26.7 percent of influent test sediment by mass at inflow rates of 0.24, 0.48, 1.20, 2.40, 6.00, and 8.40 L/s, respectively.

Claim 2: Scour test

For a catch basin filled to three quarters of the manufacturer's recommended maximum sediment storage depth, with the CB Shield® insert, scouring of test sediment is at most 8% of the control catch basin during a continuous 30 minute scour test run with 5 minute duration inflows of 1.2, 4.8, 8.4, 12.0, and 15.6 L/s.

Performance results

The test sediment used to evaluate the CB Shield® technology was the same as that required by CETV for the evaluation of Oil Grit Separators. The comparison of the average test sediment PSD to the CETV specified PSD in Figure 1 indicates that the test sediment was finer than the specified PSD, with a median particle size of approximately 50 microns.

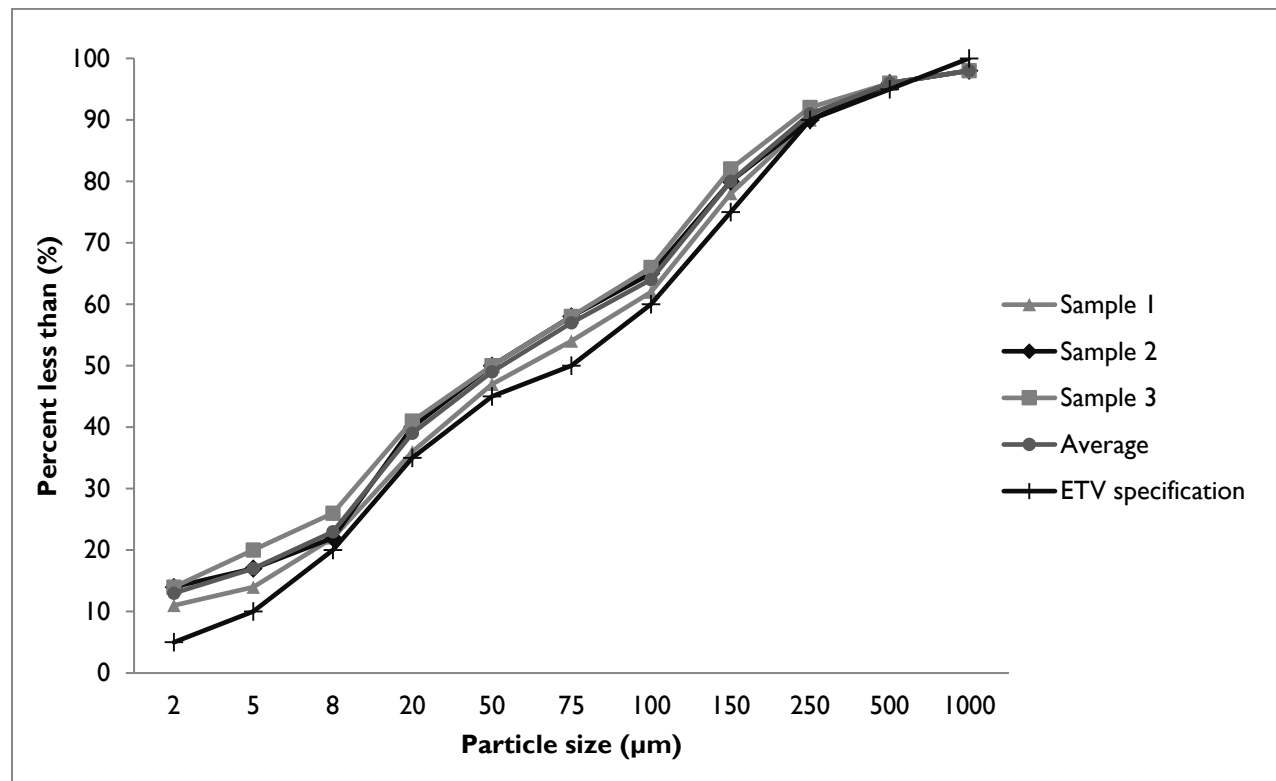


Figure 1. Test sediment particle size distribution (PSD) in relation to specified PSD.

The capacity of the device to retain sediment was determined at six surface loading rates using the modified mass balance method (see TRCA, 2014). During each of the tested flow rates, a known quantity

of sediment was injected at a constant rate onto a simulated street scape just upstream of the catch basin containing the CB Shield® technology. Based on these results, removal efficiencies were determined for each of the tested surface loading rates (Table 1).

Table 1. Removal efficiencies (%) based on modified mass balance results at specified surface loading rates.

Flow rate	(L/s)	0.24	0.48	1.20	2.40	6.00	8.40
Surface loading rate	(L/min/m²)	40	80	200	400	1000	1400
Total mass added	(kg)	1.217	2.302	5.072	5.150	4.921	4.812
Total mass captured	(kg)	0.778	1.378	2.659	2.196	1.238	1.287
Removal efficiency	(%)	64.0	59.9	52.4	42.6	25.2	26.7

Table 2 shows the results of the sediment scour and re-suspension test. This test involved preloading fresh test sediment into the sedimentation area of two catch basins with and without the CB Shield technology, as described in Performance Conditions section above. Effluent samples were collected at one-minute sampling intervals and analyzed for Suspended Sediment Concentration (SSC). The mean sediment scour load of the catch basin with the CB shield insert was shown to be only 5% that of the control catch basin.

Table 2. Scour test effluent sediment concentration and loads.

Run	Flow rates (L/sec)	Surface loading rate (L/min/m ²)	CB Shield®			Control			
			Run time (min)	Effluent suspended sediment concentration (mg/L)	Sediment load (g)	Run time (min)	Effluent suspended sediment concentration (mg/L)	Sediment load (g)	
1	1.2	200	1:00	17.7	1.3	1:00	129.2	9.7	
			2:00	6.5	0.47	2:00	185.3	13.9	
			3:00	2.7	0.19	3:00	206.0	15.5	
			4:00	3.1	0.22	4:00	176.0	13.2	
			5:00	4.6	0.33	5:00	523.6	39.4	
			6:00	0.6	0.04	6:00	495.7	41.8	
			Sum			2.6	Sum		
2	4.8	800	7:00	8.2	2.4	7:00	7164.0	2069.0	
			8:00	4	1.2	8:00	8094.0	2338.0	
			9:00	0.6	0.2	9:00	6762.0	1950.0	
			10:00	0.6	0.2	10:00	4842.0	1393.0	
			11:00	1.7	0.5	11:00	5266.0	1517.0	
			12:00	0.6	0.2	12:00	4768.0	1457.0	
			Sum			4.7	Sum		
3	8.4	1400	13:00	5.4	2.7	13:00	5429.0	2725.0	
			14:00	10.0	5.0	14:00	6648.0	3332.0	
			15:00	9.5	4.8	15:00	5025.0	2528.0	
			16:00	10.0	5.0	16:00	5859.0	2939.0	
			17:00	8.4	4.2	17:00	5019.0	2515.0	
			18:00	8.2	4.1	18:00	3249.0	1628.0	
			Sum			25.8	Sum		
4	12	2000	19:00	38.4	27.6	25:30	1886.0	1347.0	
			20:00	79.4	57.2	26:30	1432.0	1027.0	
			21:00	113.0	81.3	27:30	1167.0	844.0	
			22:00	103.0	74.2	28:30	1508.0	1089.0	
			23:00	114.0	82.1	29:30	1100.0	795.0	
			24:00	92.3	66.5	30:30	708.0	512.0	
			Sum			388.9	Sum		
5	15.6	2600	25:00	117.4	166.0	52:30	386.9	364.8	
			26:00	211.6	198.1	53:30	252.7	237.8	
			27:00	220.3	206.2	54:30	372.5	349.6	
			28:00	187.8	175.8	55:30	332.4	311.7	
			29:00	224.4	210.0	56:30	279.8	262.6	
			30:00	199.2	186.5	57:30	310.2	290.9	
			Sum			1142.6	Sum		
Total load					1564.6				33956.0

Potential sources of error

1. Background concentrations during the scour test were measured to be generally under 5 mg/L for both CB Shield® and Control treatments. However, background concentrations for the Control treatment at flow rates of 12.0 L/s and 15.6 L/s were substantially higher than the expected threshold of 20 mg/L as a result of inefficient recycling of water in the laboratory. Effluent samples were corrected based on the measured background concentrations since it was assumed that background sediments consisted of fine particles that were not captured in the device and flowed through as effluent concentration. If instead, some of the background sediments settled, the correction for all background sediments would bias against the relative performance of the CB Shield and therefore result in a more conservative evaluation of the CB Shield technology performance.
2. The reduction in scour at higher flow rates for the Control treatment suggested that the amount of preloaded sediment (10.2 cm depth) may have been insufficient to provide a continuous supply of fine particles for scour throughout the test. A similar decrease in scour at high flow rates was not observed for the CB Shield® treatment. This interpretation of the data implies that preloading both catch basins with additional sediment would likely have shown increased relative scour for the Control treatment, particularly at high flow rates. Although further testing would be required to verify this interpretation, it is reasonable to suggest that the test as conducted may have produced a smaller relative difference, resulting in a more conservative claim for the CB Shield technology.

Verification

This verification was first completed in October, 2016 and is considered valid for subsequent renewal periods every three (3) years thereafter. Data and information provided by CB Shield Inc. to support the performance claim included the following: Performance test report prepared by Good Harbour Laboratories of Mississauga, Ontario, dated 24 August 2016; the report was based on testing completed in accordance with the Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014).

The original verification was completed by the Toronto and Region Conservation Authority, contracted by GLOBE Performance Solutions, using the Canadian ETV Program's General Verification Protocol (June 2012) and taking into account ISO/FDIS 14034:2015(E). This ETV renewal is considered to meet the equivalency of an ETV verification completed using the International Standard **ISO 14034:2016 Environmental management – Environmental technology verification (ETV)**.

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

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

**For more information on the CB Shield®
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Limitation of verification - Registration: GPS-ETV_VR2019-10-31

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