Block 14
Claridge Homes Inc.

Stormwater Management Report

BLOCK 14 (BRIDLEWOOD TRAILS – PHASE 2)

STORMWATER MANAGEMENT REPORT

Prepared For:

Claridge Homes Inc.

Prepared By:

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Submitted: September 17, 2014

Novatech File: 114013
Ref: R-2014-147

NOVATECH
Engineers, Planners & Landscape Architects

September 17, 2014

City of Ottawa
Planning and Infrastructure Approvals Branch
Infrastructure Approvals Division
110 Laurier Street West, 4th Floor
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Attention: **Mr. Damien Whittaker, P.Eng.**
Senior Engineer, Infrastructure Applications

Reference: **Block 14 (Bridlewood Trails – Phase 2 Subdivision)**
Stormwater Management Report
Our File No. 114013

Please find enclosed six (6) copies of the Stormwater Management Study for the Block 14 (Bridlewood Trails – Phase 2) development, issued is support of the application for Draft Plan Approval. Please contact the undersigned should you have any questions or comments pertaining to the enclosed report.

Sincerely,

NOVATECH

Michael Petepiece, P.Eng.
Project Manager

cc Shawn Malhotra, Claridge Homes

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1.0 INTRODUCTION

1.1 Background

Novatech has been retained by Claridge Homes to prepare the storm drainage and stormwater management design for Block 14 of the Bridlewood Trails Phase 2 development, in the City of Ottawa. The site is bounded by Tulum Crescent, Overberg Way, and Terry Fox Drive as shown on **Figure 1** – Key Plan.

The legal description of the property is designated as part of Plan of Subdivision of Part of Lot 30 and Part of the Road Allowance between Lots 30 and 31, Concession 9, Geographic Township of Goulbourn, and Blocks 6 and 10 Registered Plan 4M-1330 City of Ottawa.

1.2 Proposed Development

The 0.94 hectare site is proposed to be developed as a residential site as shown on **Figure 2** – Concept Plan. The site is proposed to consist of 6 low-rise apartment buildings with a total of 72 apartment units.

1.3 Additional Reports

This Stormwater Management Report provides information on the considerations and approach by which Novatech has designed and evaluated the proposed storm drainage system for the Block 14 lands. This report should be read in conjunction with the following:

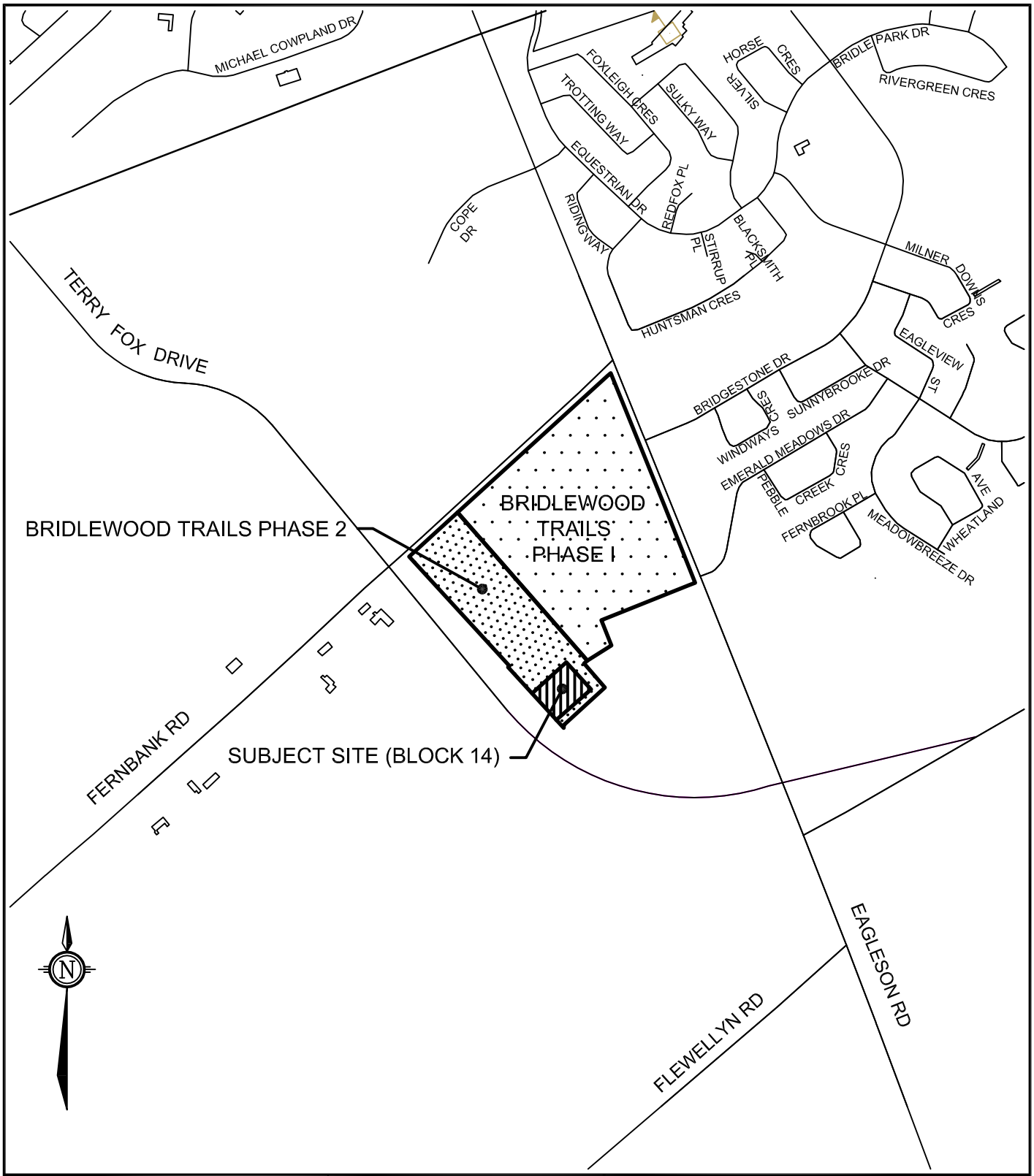
- *Bridlewood Trails Phase 2 Stormwater Management Report* prepared by Novatech, dated October 1, 2013 (R-2011-118).
- *Block 14 (Bridlewood Trails – Phase 2) Servicing Design Brief* prepared by Novatech, dated September 17, 2014 (R-2014-148)
- *Bridlewood Trails Phase 2 Design Brief* prepared by Novatech, dated September 26, 2013 (R-2011-113).
- *Geotechnical Investigation – Proposed Residential Development, Fernbank Road and Terry Fox Drive, Kanata, Ontario* prepared by Golder Associates, dated March 2011 (Report No. 07-1121-0037).

2.0 STORMWATER MANAGEMENT CRITERIA

The stormwater management criteria used in the design of the Block 14 lands are taken from the *Bridlewood Trails Phase 2 Stormwater Management Report* (Novatech, October 2013) and the City of Ottawa Sewer Design Guidelines (October 2012).

2.1 Minor System (Storm Sewers)

- Storm sewers are to be designed using the Rational Method for a 1:5 year return period;
- The allowable release rate to the downstream storm system is 120 L/s/ha;
- Ensure that the 100-year hydraulic grade line in the storm sewer is at least 0.3 m below the underside of footing (USF) elevations for both existing and proposed development.



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CITY OF OTTAWA

BLOCK 14
(BRIDLEWOOD TRAILS PHASE 2)

KEY PLAN

NTS	SEPT 2014	114013	FIGURE 1

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FUTURE
COMMERCIAL
(DIR LANDS)

FUTURE
COMMERCIAL
(CLARIDGE LANDS)

ARRITA STREET

BRIDLEWOOD TRAILS
PHASE 2

BLOCK 14
(BRIDLEWOOD TRAILS
PHASE 2)

OVERBERG WAY

TULUM CRESCENT

BLOCK 3

BLOCK A

BLOCK B

BLOCK C

BLOCK D

BLOCK E

BLOCK F

1.8m CONCRETE SIDEWALK

MOUNTABLE CURB

BARRIER CURB

CENTRELINE OF DITCH

EDGE OF PAVEMENT

PAVED SHOULDER

SOLID WHITE LINE

ASPHALT PATHWAY

TERRY FOX DRIVE

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CITY OF OTTAWA

BLOCK 14
(BRIDLEWOOD TRAILS PHASE 2)

CONCEPT PLAN

NTS	SEPT 2014	114013	FIGURE 2

SHT11X17.DWG - 279mmX432mm

2.2 Major System

- Provide sufficient storage to control runoff for all storms up to the 100-year event to the allowable minor system release rate;
- Ponding depths are not to exceed 0.30m (static + dynamic), and are not to be within 0.30m (vertical) to the nearest building opening;
- Ensure the existing storm drainage system has sufficient capacity to account for uncontrolled runoff from the perimeter of the site.

2.3 Water Quality / Quantity Control

- Storm runoff from Block 14 will be directed to Cell 2 of the Monahan Drain Constructed Wetlands, which has been designed to provide quantity control for the proposed development.
- Quality control will be provided by the Vortechnics units located at the storm outfalls to Cell 2 of the Monahan Drain Constructed Wetlands.

2.4 Erosion and Sediment Control

- A qualified inspector should conduct daily visits during construction to ensure that the contractor is working in accord with the design drawings and that mitigation measures are being implemented as specified;
- Rock flow check dams are to be installed at the outlets to roadside ditches;
- Inserts are to be placed under the grates of all proposed and existing catchbasins and structures;
- After complete build-out, all sewers are to be inspected and cleaned and all sediment and construction fencing is to be removed.

3.0 EXISTING CONDITIONS

3.1 Topography & Drainage

The proposed site is currently undeveloped and consists of former agricultural lands that are currently fallow. Access to the site is provided via Tulum Crescent and Overberg Way, in Phase 2 of the Bridlewood Trails subdivision.

The site is relatively flat with sheet drainage to existing ditches along Terry Fox Drive and Fernbank Road, or to the northeast of the site across Overberg Way. Refer to **Figure 3** – Existing Conditions Plan for details.

3.2 Subsurface Conditions

For Bridlewood Trails – Phase 2, Golder Associates Ltd. conducted a geotechnical investigation in support of a proposed development at this site with the details outlined in the final report *Geotechnical Investigation Proposed Residential Development Fernbank Road and Terry Fox Drive Kanata, Ontario, dated March 2011 (Report No. 07-1121-0037).* The field work for this investigation was carried out in two phases. The first phase consisted of advancing three (3) boreholes (Numbered 07-1 to 07-3) to depths ranging from 6.4 to 8.5m below ground surface. The second phase consisted of advancing three (3) boreholes (Numbered 10-1 to 10-3) to

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NTS

CITY OF OTTAWA

BLOCK 14
(BRIDLEWOOD TRAILS PHASE 2)

EXISTING CONDITIONS

SEPT 2014	114013	FIGURE 3

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depths ranging from 14.0 to 35.0m below ground surface. The principal findings of the Geotechnical investigation are as follows:

- A surficial layer of topsoil of thickness from 0.15m to 0.37m for all boreholes except borehole 07-2 and 10-3. Boreholes 07-2 and 10-3 had a layer of fill of thickness 0.12m and 0.13m respectively consisting of silty clay and sandy silt.
- A clayey silt, sandy silt and silty sand layer of thickness 1.5m to 3.4m was encountered below the topsoil.
- The clayey silt, sandy silt and silty sand layer are underlain by a thick deposit of sensitive silty clay of thickness 6.4m to 35.0m. Further lab testing indicates an apparent over consolidation of the silty clay deposit.
- Based on geological mapping, the bedrock in this area consists of limestone and the Gull River formation.
- Groundwater inflow was observed in test pits 07-2, 10-1 and 10-3 at depths of between 0.5m and 0.6m below ground surface.

The report provides engineering guidelines based on Golder Associates interpretation of the bore hole information and project requirements. Refer to the final Geotechnical Report dated March 2011 by Golder Associates (Report No. 07-1121-0037) for complete details.

4.0 PROPOSED DEVELOPMENT

Storm servicing for the Block 14 development will be provided using a dual drainage system: Runoff from frequent events will be conveyed by storm sewers (minor system), while flows from large storm events which exceed the capacity of the minor system will be conveyed overland along defined overland flow routes (major system).

4.1 Storm Sewer Design (Minor System)

The proposed storm sewers have been designed using the Rational Method to convey peak flows associated with a 5-year return period. The storm sewer design sheet is provided in **Appendix A**. The corresponding Storm Drainage Area Plan (Drawing 114013-STM) is provided in **Appendix C**.

The design criteria used to size the storm sewers are summarized in **Table 4.1**.

Table 4.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local and Collector Roads	5 Year Return Period
Storm Sewer Design	Rational Method/Modeling
IDF Rainfall Data	Ottawa Sewer Design Guidelines (Oct. 2012)
Initial Time of Concentration (T_c)	15 minutes (rearyards) / 10 minutes (roads)
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

4.1.1 Allowable Release Rate

The Block 14 development will outlet into a temporary ditch south of the community park and then into the existing Bridlewood Trails (Phase 1) storm sewer system. The allowable release rate to the Phase 1 storm sewers were updated based on as-built conditions for Phase 1, additional modeling of the Monahan Drain, and the revised storm drainage design for Phase 2, as outlined in the *Bridlewood Trails Phase 2 Stormwater Management Report* (October, 2013).

The release rate from Block 14 (0.94 ha) has been calculated based on an allowable per hectare release rate of 120 L/s/ha, as identified in the Phase 2 SWM report.

$$Q_{allowable} = 0.94 \text{ ha} \times 120 \text{ L/s/ha}$$
$$= 112.8 \text{ L/s}$$

4.1.2 Inlet Control Devices

Inflows to the storm sewers will be controlled using inlet control devices (ICDs). The proposed ICDs will consist of removable 83mm diameter orifice plates, which will control inflows to approximately 18-20 L/s per inlet. The ICDs specified at each inlet are indicated on the General Plan of Services (114013-GP).

4.1.3 Overland Flow Path (Major System)

The parking areas have been designed to store runoff from storms that exceed the capacity of the ICDs at each catchbasin inlet. Block 14 has been graded to ensure that ponding is confined within the parking areas at a maximum depth of 0.30 m (static ponding + cascading flow). An overland flow path has been provided to ensure that runoff from extreme storms events that exceed the available storage can be safely directed onto the surrounding roadways.

5.0 HYDROLOGIC & HYDRAULIC MODELING

The *City of Ottawa Sewer Design Guidelines* (October 2012) requires hydrologic modeling for all dual drainage systems. The performance of the proposed storm drainage system for Phase 2 of the Bridlewood Trails subdivision was evaluated using the *Autodesk Storm and Sanitary Analysis* (SSA) hydrologic/hydraulic model.

5.1 Design Storms

The hydrologic analysis was completed using the following synthetic design storms and historical storms. The IDF parameters used to generate the design storms were taken from the *Ottawa Design Guidelines - Sewer* (November 2004).

<u>*4 Hour Chicago Storms*</u>:
5-year 4hr Chicago storm
100-year 4hr Chicago storm

<u>*24 Hour Chicago Storms*</u>:
5-year 24hr Chicago storm
100-year 24hr Chicago storm

<u>*12 Hour SCS Type II Storms*</u>:
5-year 12 hour SCS Type II storm
100-year 12 hour SCS Type II storm

The 4-hour Chicago distribution generates the highest peak flows for both the minor and major systems and was determined to be the critical storm distribution for the design of the storm drainage system.

The proposed drainage system has also been stress tested using a 4-hour Chicago design storm that has a 20% higher intensity and total volume compared to the 100-year event.

Model results from all storm distributions are provided on the enclosed CD.

5.2 Model Development

The 'Storm and Sanitary Analysis' model has been developed to account for both minor and major system flows from Block 14, and ensure no adverse impacts on the downstream drainage system. The results of the analysis were used to:

- Determine the total major and minor system runoff from the site.
- Calculate the storm sewer hydraulic grade line for the 100-year storm event;
- Evaluate overland flow depths and ponding volumes during the 100-year event; and
- Ensure no ponding in the right-of-ways (external to Block 14) remains at the end of all storm events;

5.2.1 Storm Drainage Areas

For modeling purposes, the Block 14 lands have been divided into subcatchments based on the drainage areas tributary to each inlet of the proposed storm sewer system. The catchment areas are shown on the Grading Plan (114013-GR) in **Appendix C**.

5.2.2 Subcatchment Model Parameters

The hydrologic parameters for each subcatchment were developed based on the Concept Plan (Figure 2) and the Stormwater Management Plans specified above. An overview of the modeling parameters is provided in **Table 5.1**.

Table 5.1: Hydrologic Modeling Parameters

Area ID	Catchment Area (ha)	Runoff Coefficient (c)	Percent Impervious (%)	Flow Path Length (m)	Equivalent Width (m)	Average Slope (%)
01	0.09	0.84	79%	40	22.5	1.0%
02	0.14	0.81	77%	34	41.2	1.0%
03	0.12	0.74	72%	30	40.0	1.0%
04	0.11	0.81	77%	39	28.2	1.0%
05	0.14	0.80	76%	35	40.0	1.0%
06	0.03	0.54	58%	16	18.8	1.0%
07	0.03	0.66	66%	15	20.0	1.0%
08	0.02	0.43	50%	8	25.0	1.0%
09	0.04	0.63	64%	20	20.0	1.0%
10	0.06	0.57	60%	17	35.3	1.0%
11	0.06	0.62	63%	17	35.3	1.0%
12	0.05	0.58	61%	16	31.3	1.0%
13	0.05	0.32	42%	10	50.0	1.0%
TOTAL:	**0.94**					

The Block 14 model has been developed within the Autodesk SSA model originally created as part of the overall Phase 2 design. Pipe inverts have been updated to reflect as-built conditions.

Infiltration

Infiltration losses for all catchment areas were modeled using Horton's infiltration equation, which defines the infiltration capacity of the soil over the duration of a precipitation event using a decay function that ranges from an initial maximum infiltration rate to a minimum rate as the storm progresses. The default values for the City of Ottawa were used for all catchments.

Horton's Equation:
$f(t) = f_c + (f_o - f_c)e^{-k(t)}$

Initial infiltration rate: f_o = 76.2 mm/hr
Final infiltration rate: f_c = 13.2 mm/hr
Decay Coefficient: k = 4.14/hr

Depression Storage

The default values for depression storage in the City of Ottawa were used for all catchments.

- Depression Storage (pervious areas): 4.67 mm
- Depression Storage (impervious areas): 1.57 mm

Residential rooftops are assumed to provide no depression storage and all rainfall is converted to runoff.

Equivalent Width

'Equivalent Width' refers to the width of the sub-catchment flow path. This parameter (Table 5.1) is calculated as described in the *Sewer Design Guidelines, October 2012, Section 5.4.5.6*.

Impervious Values

Percent Impervious values for each subcatchment area were calculated based on the concept plan (Figure 2). The impervious values correspond to the Runoff Coefficients used in the Rational Method calculations.

5.2.3 Minor System

Inflows to the storm sewer were modeled based on the characteristics of each inlet. All the catchbasins in Block 14 are located at low points. Inflows to the storm sewer are based on the ICD specified for the inlet and the maximum depth of ponding. ICDs have been sized to limit the outlet peak flows. The ICD parameter table can be found in **Appendix B**.

5.2.4 Major System

Catchbasins were modeled as storage nodes to account for the surface storage provided by the parking areas of the Block 14 development. The storage nodes are interconnected using short rectangular open channels to simulate flows cascading over high points when the available static storage is exceeded.

The stage-storage curves for each inlet were calculated using Autodesk Civil 3D software, based on the proposed surface shown on the Grading Plan (114013-GR). The Cut/Fill Report from the Civil 3D model is provided in **Appendix A**.

5.2.5 Modeling Files / Schematic

The 'Storm and Sanitary Analysis' model schematics and 100-year model output data are provided in **Appendix B**. Digital copies of the modeling files and model output for all storm events are provided on the enclosed CD.

5.3 Results of Hydrologic Analysis

The 'Autodesk Storm and Sanitary Analysis' hydrologic/hydraulic model was used to evaluate the performance of the proposed storm drainage system for Block 14 as well as the remaining the Phase 2 lands.

5.3.1 Minor System

The performance of the Block 14 storm sewer system has been evaluated using various storm distributions and historical storms. The 4-hour Chicago distribution was found to generate the highest peak flows in the storm sewers and was selected as the critical storm distribution. The results are summarized in Table 5.2.

The 100-year 4-hour Chicago storm was also increased by 20% (intensity + total precipitation) to evaluate the impact of an extreme event on the performance of the minor system. The results of this analysis indicate there is no significant impact on the minor system peak flows, due to the fact that inflows to the storm sewer system will be controlled using ICDs.

Table 5.2: Minor System Peak Flows at Outlets

Storm Distribution->		**4hr Chicago**			**Allowable***
Return Period->		**1:5yr**	**1:100yr**	**1:100yr (+20%)**	
Phase 1 – Bridlewood Trails (Block 14 Outlet to Interim Ditch through Phase 1)					
BLOCK14 – HEADWALL		90	96	97	113
Phase 2 - Bridlewood Trails (Existing Storm Sewers at Outlets to Phase 1)					
EX.MH 104 – EX.MH 102	*Existing*	378	456	470	485
	Proposed (Block14)	378	465	475	
EX.MH 110 – EX.MH 602	*Existing*	208	289	292	291
	Proposed (Block14)	228	292	294	
Terry Fox Drive (Runoff to Terry Fox Drive Roadside Ditch)					
DITCH		6	14	18	-

** Allowable flows are taken from the Bridlewood Trails Phase 2 SWM Report (Novatech, October 2013).*

5.3.2 Major System

The major system network was evaluated using the 'Autodesk Storm and Sanitary Analysis' model to ensure that the ponding depths conform to City standards. A summary of ponding depths and volumes for the 100-year event is provided in **Table 5.3**. Ponding volumes and depths for all storm events are provided in **Appendix B**.

Table 5.3: Ponding Depths at Catchbasins (100yr Event)

Structure	T/G	Max. Ponding Data		100-yr Event				
		Elev.	Depth	Peak Inflow	ICD Release Rate	Elev.	Depth	Volume
	(m)	(m)	(m)	(L/s)	(L/s)	(m)	(m)	(m^3)
CB100	97.87	97.97	0.10	35.24	19.35	97.94	0.07	8.40
CB101	97.89	98.01	0.12	53.44	19.67	97.99	0.10	22.58
CB102	97.85	98.04	0.19	42.84	18.79	97.98	0.13	15.81
CB103	97.84	98.07	0.23	52.75	19.61	97.96	0.12	22.08
CB104	97.59	97.81	0.22	41.98	18.76	97.79	0.20	14.37
						Total Volume:		**83.23**

5.3.3 Hydraulic Grade Line

The results of the analysis were used to ensure that a minimum freeboard of 0.30m is provided between the 100-year HGL and the designed underside of footing elevations. The 100-year HGL is indicated on the Plan and Profile Drawings (114013-P1, P2). The 100-year HGL elevations at each storm manhole are listed in the "Node Depth Summary" of the 100-year model output provided in **Appendix B**.

The HGL analysis confirms that all dwellings within Block 14 will have at least 0.30m of freeboard between the modeled hydraulic grade line and the underside of footing elevation.

Table 5.4 provides a summary of the 100-year HGL elevation at each storm manhole within the proposed development, as well as a summary of the HGL elevations for a 20% increase (rainfall intensity and total precipitation) in the 100-year design event. The results of this stress testing indicates that, even under this scenario, the hydraulic grade line in the sewers will only slightly increase (max increase of 0.03m), ensuring that the HGL will remain below the undersides of footing of the proposed units.

Table 5.4: Storm Sewer Hydraulic Grade Line – Block 14 (4hr Chicago Distribution)

Manhole ID	MH Invert* Elevation	T/G Elevation	Design USF	100yr		100yr +20%	
				HGL Elevation	Clearance	HGL Elevation	Clearance
	(m)	(m)	(m)	(m)	(m)	(m)	(m)
200 (STM)	94.98	97.96	96.00	95.42	0.58	95.42	0.58
202 (STM)	94.77	98.03	96.00	95.27	0.73	95.28	0.72
204 (STM)	94.46	98.03	96.03	95.11	0.92	95.11	0.92
206 (STM)	94.38	98.00	96.03	95.05	0.98	95.05	0.98
208 (STM)	94.34	97.90	96.03	95.01	1.02	95.02	1.01
210 (STM)	94.81	97.77	95.97	95.25	0.72	95.25	0.72

**Invert includes manhole sump of 0.30m*

6.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures will be implemented during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987). Details are provided on the Erosion and Sediment Control Plan (108180-ESC) provided in **Appendix D**.

Typical erosion and sediment control measures recommended include, but are not limited to, the use of silt fences around perimeter of site (OPSD 219.110), filter fabric or inserts under catch basin/maintenance hole lids, heavy duty silt fence barrier (OPSD 219.130), straw bale check dams (OPSD 219.180), rock check dams (219.210 or OPSD 219.211), turbidity curtain (OPSD 219.260), dewatering trap (OPSD 219.240), temporary water passage system (OPSD 221.030), riprap (OPSS 511), mud mats, silt bags for dewatering operations, topsoil and sod to disturbed areas and natural grassed waterways. Dewatering and sediment control techniques will be developed for the individual situations based on the above guidelines and utilizing typical measures to ensure erosion and sediment control is controlled in an acceptable manner and there is no negative impact to adjacent lands, water bodies or water treatment/conveyance facilities.

It will be the responsibility of the Contractor to submit a detailed construction schedule and appropriate staging, dewatering and erosion and sediment control plans to the Contract Administrator for review and approval prior to the commencement of work. A copy of the City of Ottawa Special Provision F-1004 is included in the Appendix which will become part of any contract and which outlines the contractual requirements which includes preparation of a detailed erosion and sediment control plan.

- All erosion and sediment control measures are to be installed to the satisfaction of the engineer, the municipality and the conservation authority prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and remain present during all phases of site preparation and construction.
- A qualified inspector should conduct daily visits during construction to ensure that the contractor is working in accord with the design drawings and that mitigation measures are being implemented as specified.
    - A light duty silt fence barrier is to be installed in the locations shown on the Erosion and Sediment Control Plan.
    - Straw bale barriers are to be installed in drainage ditches that will remain open as part of Phase 1 development.
    - Inserts are to be placed under the grates of all proposed and existing catchbasins and structures.
    - After complete build-out, all sewers are to be inspected and cleaned and all sediment and construction fencing is to be removed.
- The contractor shall ensure that proper dust control is provided with the application of water (and if required, calcium chloride) during dry periods.
- The contractor shall immediately report to the engineer or inspector any accidental discharges of sediment material into any ditch or sewer system. Appropriate response measures shall be carried out by the contractor without delay.
- The contractor acknowledges that failure to implement erosion and sediment control measures may result in penalties imposed by any applicable regulatory agency.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The stormwater management design for the Block 14 (Bridlewood Trails Phase 2) development conforms to the criteria established as part of this report. Criteria have been adapted from those in the Bridlewood Trails – Phase 2 Stormwater Management Report.

The conclusions based on the results of the stormwater management analysis are as follows:

Storm Drainage / Conveyance

- Storm sewers (minor system) have been designed to convey the uncontrolled 5-year peak flow using the Rational Method.
- Inflows to the minor system will be controlled using inlet control devices (ICDs). All proposed ICDs will consist of round 83mm orifice plates (18-20 L/s).
- The site has been graded to provide surface storage at low points within the parking areas.
- Ponding depths will not exceed 0.30m for all storms up to and including the 100-year event.
- The post-development peak flows from Block 14 site will have no adverse impact on the existing Bridlewood Trails Phase 1 and Phase 2 developments.
- A minimum clearance of 0.30m will be provided between the 100-year hydraulic grade line (HGL) and the designed underside of footing elevations.

Stormwater Management

- Water quality control for the proposed development will be provided by the Vortechnics units located at the outfalls to Cell 2 of the Monahan Drain Constructed Wetlands.
- On-site quantity control storage will be provided at low points within the roadways and parking areas. Additional quantity control will be provided by the Monahan Drain Constructed Wetlands.

Erosion and Sediment control

- Erosion and sediment control measures (i.e. filter fabric, silt fences, etc.) will be implemented prior to construction and are to remain in place until vegetation is established.

The preceding report is respectfully submitted for review and approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:

Kallie Auld

Kallie Auld, E.I.T.

Reviewed by:

Michael Petepiece, P.Eng.
Project Manager

Appendix A

SWM Calculations

Storm Sewer Design Sheet
Cut/Fill Report – Volume Summary
Allowable Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT #: 114013
DESIGNED BY : SAZ
CHECKED BY : DDB

STORM SEWER DESIGN SHEET

5yr Design Event

PROJECT: **Block 14 (Bridlewood Trails Phase 2)**
DEVELOPER: **CLARIDGE HOMES**

LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
100122737
Sept. 17/2014
PROVINCE OF ONTARIO

DATE: 17-Sep-14

LOCATION					INDIV	INDIV	INDIV	ACCUM	TIME OF	RAINFALL	UNCONTROLLED	PROPOSED SEWER								RATIONAL METHOD	SWMHYMO MODEL
STREET	FROM M.H.	TO M.H.	Block 14 Area #	*Bridlewood Area #	AREA (ha)	R	2.78 AR	2.78 AR	CONC (min)	INTENSITY (mm/hr)	**PEAK FLOW (Q) (l/s)**	TYPE OF PIPE	PIPE SIZE (mm)	PIPE ID (mm)	GRADE %	LENGTH (m)	**CAPACITY (L/s)**	FULL FLOW VELOCITY	TIME OF FLOW (min)	% FULL	% FULL
BLOCK 14																					
Block 14 Private Drive	200	202	1		0.09	0.84	0.21	0.21	10.00	104	**21.9**	DR 35	300	305	0.34	38.5	**58.8**	0.81	0.80	37%	37%
Block 14 Private Drive	202	204	2		0.14	0.81	0.32	0.53	10.80	100	**77.4**	DR 35	375	381	0.25	62.3	**91.5**	0.80	1.29	85%	50%
			3		0.12	0.74	0.25	0.77	**12.09**												
Block 14 Private Drive	210	204	4		0.11	0.81	0.25	0.25	10.00	104	**25.8**	DR 35	300	305	0.34	35.6	**58.8**	0.81	0.74	44%	37%
									10.74												
Block 14 Private Drive	204	206	5		0.14	0.80	0.31	1.33	12.09	94	**125.6**	CONC	525	533	0.16	33.0	**179.5**	0.80	0.68	70%	64%
Block 14 Private Drive	206	208						1.33	12.78	92	**121.8**	CONC	525	533	0.16	8.1	**179.5**	0.80	0.17	68%	70%
Block 14 Private Drive	208	136						1.33	12.94	91	**121.0**	CONC	525	533	0.16	21.0	**179.5**	0.80	0.44	67%	65%
Block 14 Private Drive	136	Ditch Outlet						1.33	13.38	89	**118.7**	CONC	525	533	0.16	8.7	**179.5**	0.80	0.18	66%	73%
									13.56												
Bridlewood Trails Phase 2																					
Overberg Way	140	138		17	0.17	0.66	0.31	0.31	10.00	104	**42.9**	DR 35	375	381	0.25	68.5	**91.5**	0.80	1.42	47%	36%
Block 14			6		0.03	0.54	0.05	0.36													
Block 14			7		0.03	0.66	0.06	0.41													
Overberg Way	138	134		18	0.10	0.68	0.19	0.60	11.42	97	**60.8**	CONC	450	457	0.20	71.2	**133.0**	0.81	1.46	46%	29%
Block 14			8		0.02	0.43	0.02	0.62													
Overberg Way	134	132		19	0.15	0.44	0.18	0.81	12.89	91	**80.0**	CONC	525	533	0.17	34.6	**185.0**	0.83	0.70	43%	26%
Block 14			9		0.04	0.63	0.07	0.88													
									13.58												
Tulum Crescent	144	142		20	0.23	0.69	0.44	0.44	10.00	104	**65.0**	DR 35	375	381	0.23	85.7	**87.7**	0.77	1.86	74%	21%
Block 14			10		0.05	0.57	0.08	0.52													
Block 14			11		0.06	0.62	0.10	0.62													
Tulum Crescent	142	132		21	0.07	0.71	0.14	0.76	11.86	95	**72.6**	DR 35	375	381	0.26	11.7	**93.3**	0.82	0.24	78%	38%
									12.09												
Overberg Way	132	130						1.64	13.58	88	**145.1**	CONC	525	533	0.14	21.8	**167.9**	0.75	0.48	86%	55%
Overberg Way	130	128		22	0.13	0.55	0.20	1.84	14.07	87	**202.0**	CONC	525	533	0.21	52.9	**205.6**	0.92	0.96	98%	60%
Overberg Way				23	0.19	0.30	0.16	2.00													
Overberg Way				24	0.23	0.52	0.33	2.33													
									15.03												
Tulum Crescent	150	148		25	0.11	0.50	0.15	0.15	10.00	104	**15.9**	DR 35	375	381	0.39	33.7	**114.2**	1.00	0.56	14%	11%
Tulum Crescent	148	146						0.15	10.56	101	**15.5**	DR 35	375	381	0.46	11.0	**124.1**	1.09	0.17	12%	10%
Tulum Crescent	146	128		26	0.36	0.62	0.62	0.77	10.73	100	**77.7**	DR 35	375	381	0.30	97.5	**100.2**	0.88	1.85	78%	19%
									12.58												
Overberg Way	128	126		27	0.16	0.71	0.32	3.42	15.03	83	**285.4**	CONC	525	533	0.43	41.7	**294.2**	1.32	0.53	97%	62%
Arrita Terrace	126	EX 110		28	0.25	0.55	0.38	3.80	15.55	82	**311.0**	CONC	525	533	0.41	80.0	**287.3**	1.29	1.04	108%	69%
									16.59												

* Areas taken from Bridlewood Trails Phase 2 storm drainage area plan, refer to drawing 106121-STM (Rev#8, dated october 31, 2013)

Notes:

1) The Block 14 storm sewers are sized for the 5 Yr uncontrolled flow using the Rational Method. Some of the downstream sewer flows in Bridlewood Trails Phase 2 were increased due to the Block 14 contribution. However these are theoretical uncontrolled flows calculated with the Rational Method. The SWMHYMO model simulates controlled flows which verify that there is adequate capacity in the existing storm sewer system within the Bridlewood Trails Phase 2 development in order to accommodate the additional flow from a portion of Block 14.

Cut/Fill Report

Generated: 2014-09-12 14:55:17

By user: rgrayton

Drawing: M:\2014\114013\CAD\Design\M:\2014\114013\CAD\Design\114013-GR.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (sq.m)	Cut (Cu. M.)	Fill (Cu. M.)	Net (Cu. M.)
CB 101 - VOL	full	1.00	1.00	451.53	0.00	29.57	29.57<Fill>
CB 102 - VOL	full	1.00	1.00	377.95	0.00	30.75	30.75<Fill>
CB 103 - VOL	full	1.00	1.00	578.14	0.00	83.21	83.21<Fill>
CB 100 - VOL	full	1.00	1.00	384.94	0.00	13.20	13.20<Fill>
CB 104 - VOL	full	1.00	1.00	225.92	0.00	16.31	16.31<Fill>

Totals

	2d Area (sq.m)	Cut (Cu. M.)	Fill (Cu. M.)	Net (Cu. M.)
Total	2018.48	0.00	173.05	173.05<Fill>

* Value adjusted by cut or fill factor other than 1.0

Block 14 – Allowable flow calculations (based on attached email)

Based on the following calculations, the allowable flow rate from the 0.94ha Block 14 development area is 112.8 L/s

The storm sewer in Phase 1 that Block 14 outlets to is:

- 54.1m long 975x1535mm elliptical pipe @0.25% – equivalent to 1200mm pipe. (From as-built drawing 103121-P4)
- Pipe capacity = 2032.8L/s (from storm sewer design sheet),
- 90% pipe capacity = 1829.52 L/s

Existing Conditions:

- Original future development area = 17ha (allowable flow = 108L/s/ha)
- Subtracting the area accounted for in Phase 2 -> 17ha – 1.77ha = 15.23ha
- Allowable flow for 15.23ha = 120L/s/ha
- Therefore, the allowable flow for 0.94ha = 112.8L/s

Kallie Auld

From: Kallie Banks
Sent: December-03-13 9:54 AM
To: Drew Blair
Subject: 106121 - flow rate from future development area

Hi Drew,

Based on the following calculations, I've determined that the allowable flow rate from the 0.93ha future development area is 112 L/s

54.1m long 975x1535mm elliptical pipe @0.25% – equivalent to 1200mm pipe. (from as-built drawing 103121-P4)
Pipe capacity = 2032.8L/s (from storm sewer design sheet),
90% pipe capacity = 1829.52 L/s

Original future development area = 17ha (allowable flow = 108L/s/ha)
Subtracting the area accounted for in Phase 2 -> 17ha – 1.77ha = 15.23ha
Allowable flow for 15.23ha = 120L/s/ha
Therefore, the allowable flow for 0.93ha = 112L/s

Let me know if you need anything else from me, or have any questions.

Kallie Banks, B.Eng.

EIT
****
Novatech Engineering Consultants Ltd
200-240 Michael Cowpland Drive
Ottawa, Ontario K2M 1P6

Office: 613-254-9643 x 294
Fax: 613-254-5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

Appendix B

Autodesk Storm and Sanitary Analysis Model

Modeling Parameters & Input Data:

- *Subcatchment Data*
- *Catchbasin Inlet Curves*
- *Inlet Control Device Data*
- *R.O.W. Ponding Volumes*

Schematics:

- *Overall Model Schematic*
- *Model Schematic 1*
- *Model Schematic 2*

Design Storms:

- *Chicago Design Storms*

Model Results:

- *Chicago 100yr-4hr Design Storm Output Results*

Block 14 (Bridlewood Trails Phase 2)

Post-Development Subcatchment Modeling Parameters

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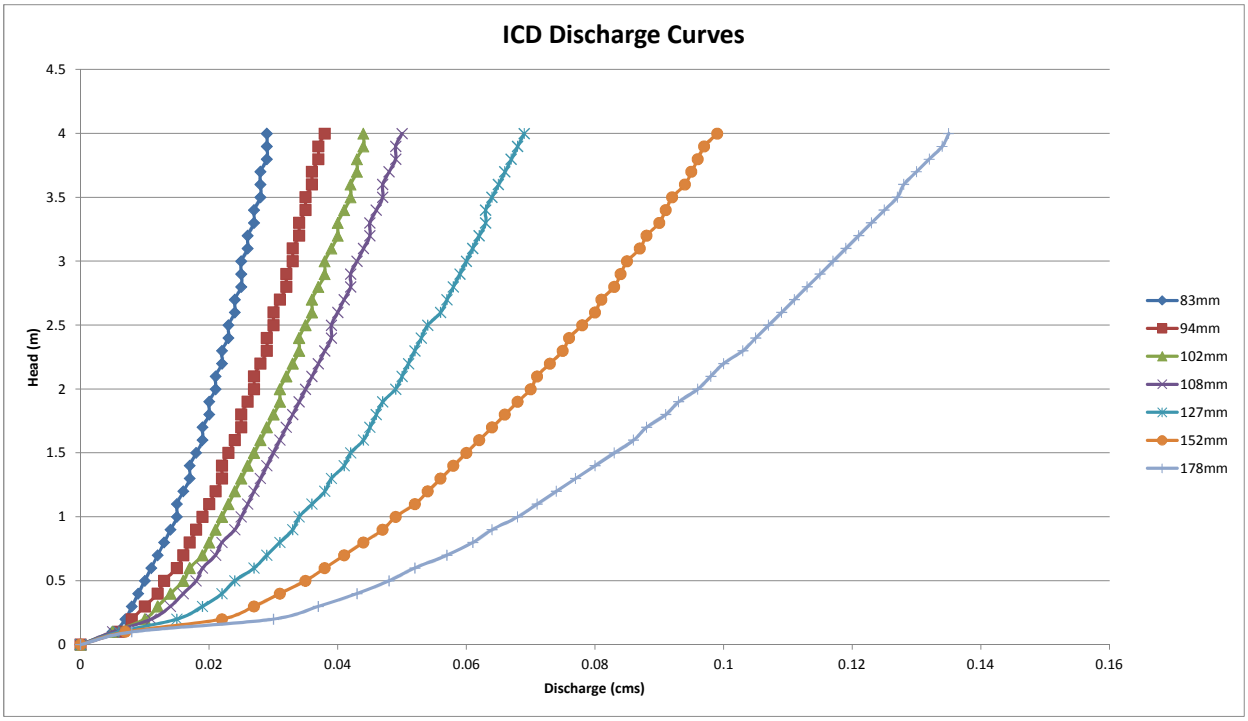
Area ID	Catchment Area (ha)	Runoff Coefficient c	Percent Impervious (%)	No Depression (%)	Flow Path Length (m)	Equivalent Width (m)	Average Slope (%)
01	0.09	0.84	79%	32%	40	22.5	1.00%
02	0.14	0.81	77%	31%	34	41.2	1.00%
03	0.12	0.74	72%	29%	30	40.0	1.00%
04	0.11	0.81	77%	31%	39	28.2	1.00%
05	0.14	0.80	76%	30%	35	40.0	1.00%
06	0.03	0.54	58%	23%	16	18.8	1.00%
07	0.03	0.66	66%	26%	15	20.0	1.00%
08	0.02	0.43	50%	20%	8	25.0	1.00%
09	0.04	0.63	64%	26%	20	20.0	1.00%
10	0.06	0.57	60%	24%	17	35.3	1.00%
11	0.06	0.62	63%	25%	17	35.3	1.00%
12	0.05	0.58	61%	24%	16	31.3	1.00%
13	0.05	0.32	42%	17%	10	50.0	1.00%
TOTAL:	0.94						

Block 14 (Bridlewood Trails - Phase 2)
Inlet Control Device Curves



Block 14 (Bridlewood Trails Phase 2)
Inlet Control Device Parameters

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Area ID	Structure	ICD Size & Inlet Rate						5-year Peak Flow** (L/s)
		Diameter (mm)	T/G (m)	Invert (m)	Max Head (m)	5-year Inlet Capture (L/s)	5-year Capture Rate (L/s)	
BLOCK14-01	CB100	83	97.87	96.17	1.66	19.14	17.91	20.53
BLOCK14-02	CB101	83	97.89	96.16	1.69	19.31	19.25	31.16
BLOCK14-03	CB102	83	97.85	96.31	1.50	18.19	18.25	24.99
BLOCK14-05	CB103	83	97.84	96.14	1.66	19.14	19.22	30.75
BLOCK14-04	CB104	83	97.59	96.12	1.43	17.76	17.96	24.47

***From SSA Model, 5-year 4-hour Chicago storm distribution*

Block 14 (Bridlewood Trails Phase 2)
Ponding in Road Calculations

Structure	T/G (m)	Max. Static Ponding Data		5-yr Event				100-yr Event						100-yr Event (+20%)			
		Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth m	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Flow (L/s)	Volume* (m^3)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth m
CB100	97.87	97.97	0.10	97.69	0.00	N	0.00	97.94	0.07	N	0.00	35.24	8.40	97.96	0.09	N	0.00
CB101	97.89	98.01	0.12	97.91	0.02	N	0.00	97.99	0.10	N	0.00	53.44	22.58	98.02	0.13	Y	0.01
CB102	97.85	98.04	0.19	97.89	0.04	N	0.00	97.98	0.13	N	0.00	42.84	15.81	98.02	0.17	N	0.00
CB103	97.84	98.07	0.23	97.89	0.05	N	0.00	97.96	0.12	N	0.00	52.75	22.08	97.98	0.14	N	0.00
CB104	97.59	97.81	0.22	97.65	0.06	N	0.00	97.79	0.20	N	0.00	41.98	14.37	97.82	0.23	Y	0.01

**From AutoDesk SSA*

Block 14 (Bridlewood Trails Phase 2)
Overall SSA Model Schematic

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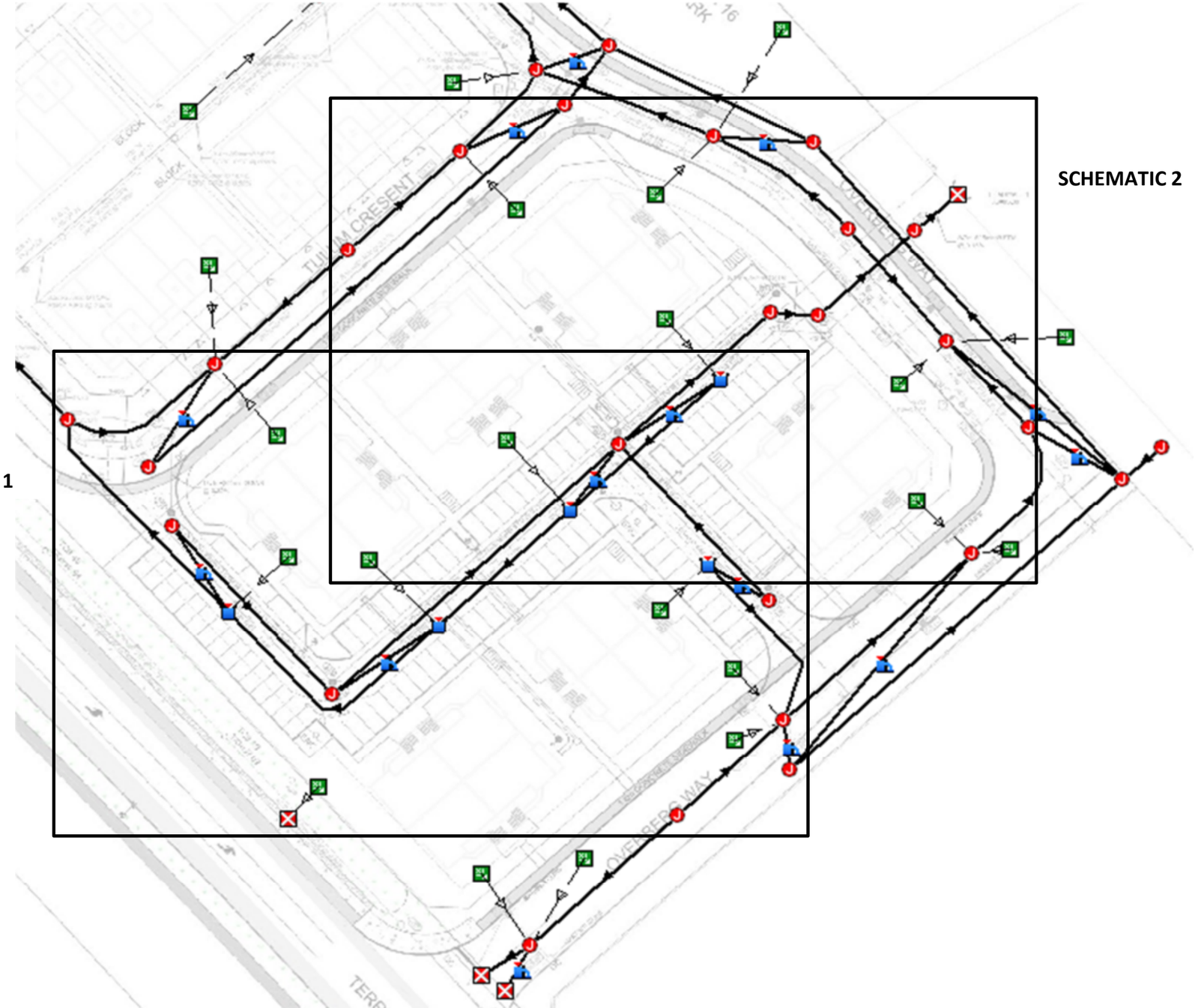
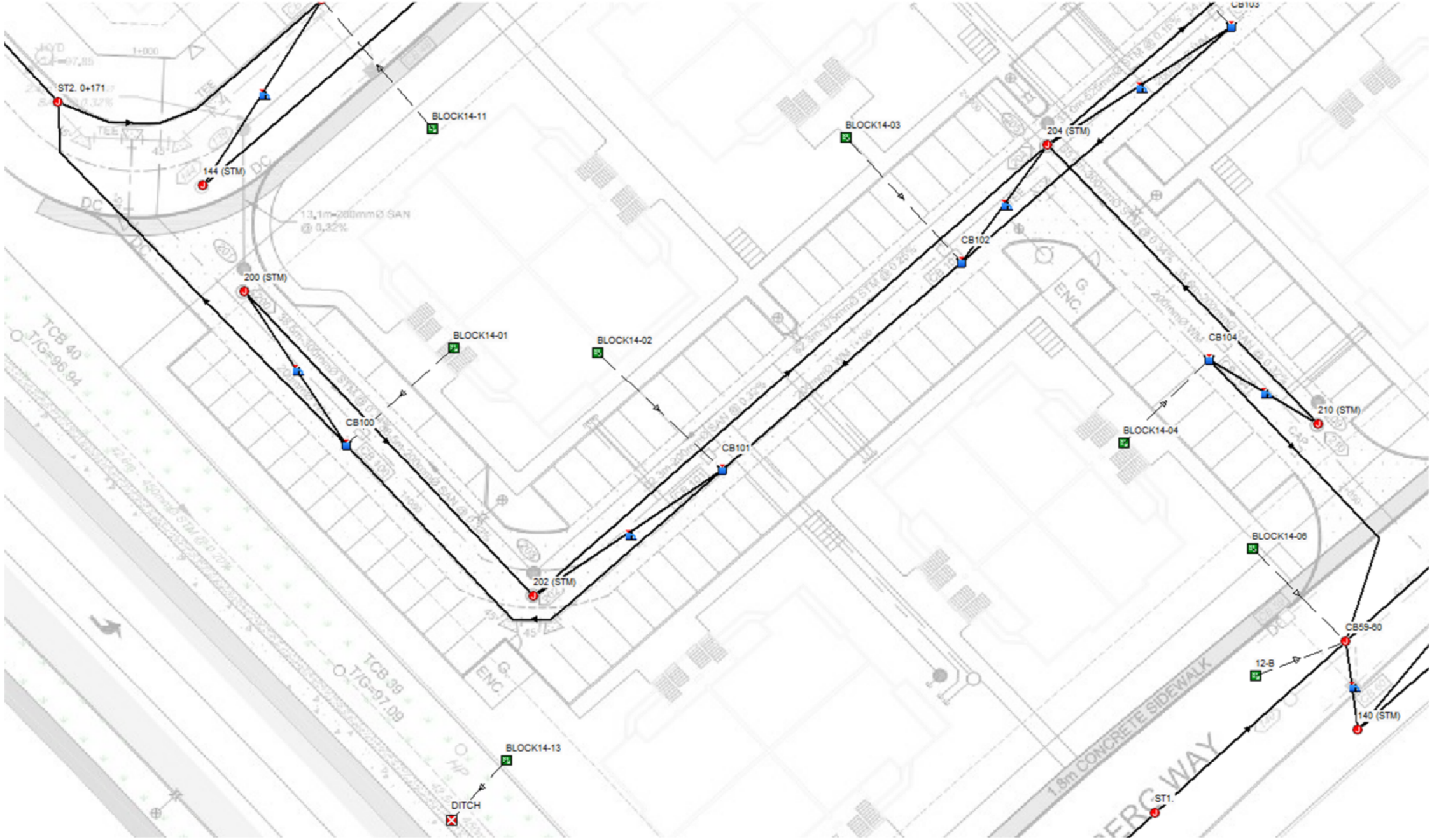


Block 14 (Bridlewood Trails Phase 2)

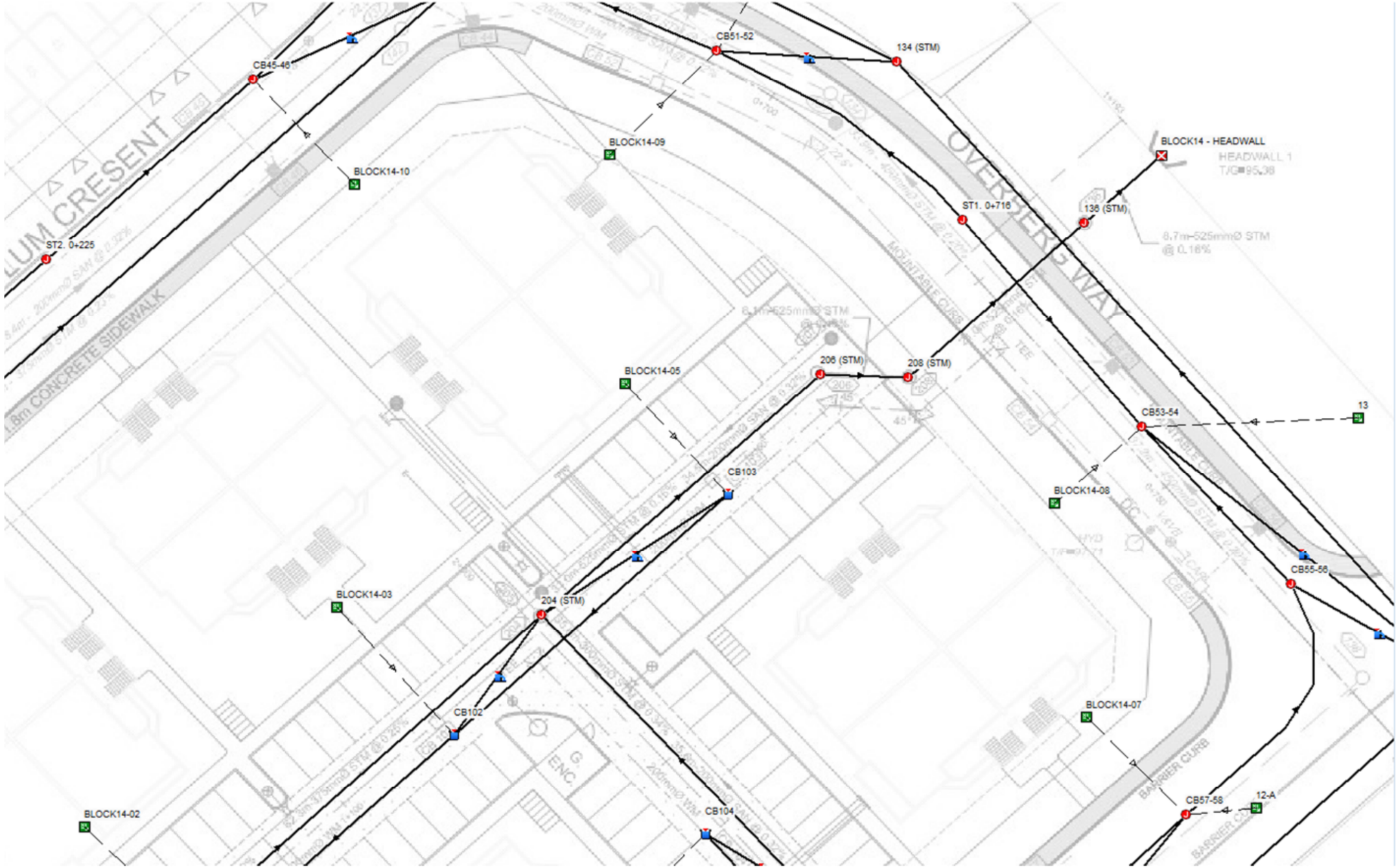
SSA Model Schematic 1

NOVATECH
Engineers, Planners & Landscape Architects



PREPARED BY: NOVATECH
DATE: 15/09/2014

Block 14 (Bridlewood Trails Phase 2)
SSA Model Schematic 2



PREPARED BY: NOVATECH
DATE: 15/09/2014

[M:\2014\114013\DATA\Calculations\Sewer Calcs\SWM\20140910 - 114013 Block 14 Model Parameters.xlsx

Block 14 (Bridlewood Trails Phase 2)

Design Storm Time Series Data

Chicago Design Storms

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C2-4.stm

Duration min	Intensity mm
0:00	0
0:10	1.976
0:20	2.233
0:30	2.576
0:40	3.063
0:50	3.806
1:00	5.096
1:10	7.907
1:20	19.041
1:30	76.805
1:40	23.64
1:50	11.913
2:00	7.98
2:10	6.031
2:20	4.871
2:30	4.101
2:40	3.553
2:50	3.141
3:00	2.821
3:10	2.565
3:20	2.354
3:30	2.178
3:40	2.029
3:50	1.9
4:00	1.789

C5-4.stm

Duration min	Intensity mm
0:00	0
0:10	2.49
0:20	2.77
0:30	3.14
0:40	3.62
0:50	4.31
1:00	5.37
1:10	7.19
1:20	11.14
1:30	26.25
1:40	104.19
1:50	30.86
2:00	15.15
2:10	10.07
2:20	7.58
2:30	6.11
2:40	5.14
2:50	4.45
3:00	3.93
3:10	3.53
3:20	3.21
3:30	2.94
3:40	2.72
3:50	2.53
4:00	2.37

C100-4.stm

Duration min	Intensity mm
0:00	0
0:10	4.07
0:20	4.54
0:30	5.14
0:40	5.95
0:50	7.09
1:00	8.85
1:10	11.9
1:20	18.54
1:30	44.19
1:40	178.56
1:50	52.04
2:00	25.31
2:10	16.73
2:20	12.56
2:30	10.09
2:40	8.47
2:50	7.32
3:00	6.46
3:10	5.79
3:20	5.25
3:30	4.82
3:40	4.45
3:50	4.14
4:00	3.88

C25mm-4.stm

Duration min	Intensity mm
0:00	0
0:12	1.552
0:24	1.795
0:36	2.207
0:48	2.913
1:00	4.437
1:12	10.796
1:24	52.623
1:36	14.258
1:48	7.35
2:00	5.026
2:12	3.858
2:24	3.153
2:36	2.68
2:48	2.339
3:00	2.081
3:12	1.878
3:24	1.715
3:36	1.58
3:48	1.467
4:00	1.371

C100-24.stm

Duration min	Intensity mm
0:00	0
0:10	0.832
0:20	0.847
0:30	0.863
0:40	0.879
0:50	0.897
1:00	0.914
1:10	0.933
1:20	0.953
1:30	0.973
1:40	0.995
1:50	1.017
2:00	1.041
2:10	1.066
2:20	1.093
2:30	1.121
2:40	1.15
2:50	1.182
3:00	1.215
3:10	1.25
3:20	1.288
3:30	1.329
3:40	1.372
3:50	1.419
4:00	1.469
4:10	1.524
4:20	1.583

C100-24+20%.stm

Duration min	Intensity mm
0:00	0
0:10	0.9984
0:20	1.0164
0:30	1.0356
0:40	1.0548
0:50	1.0764
1:00	1.0968
1:10	1.1196
1:20	1.1436
1:30	1.1676
1:40	1.194
1:50	1.2204
2:00	1.2492
2:10	1.2792
2:20	1.3116
2:30	1.3452
2:40	1.38
2:50	1.4184
3:00	1.458
3:10	1.5
3:20	1.5456
3:30	1.5948
3:40	1.6464
3:50	1.7028
4:00	1.7628
4:10	1.8288
4:20	1.8996

Block 14 (Bridlewood Trails Phase 2)

Design Storm Time Series Data

Chicago Design Storms

Engineers, Planners & Landscape Architects

4:30	1.648	4:30	1.9776
4:40	1.718	4:40	2.0616
4:50	1.796	4:50	2.1552
5:00	1.882	5:00	2.2584
5:10	1.978	5:10	2.3736
5:20	2.085	5:20	2.502
5:30	2.206	5:30	2.6472
5:40	2.344	5:40	2.8128
5:50	2.502	5:50	3.0024
6:00	2.687	6:00	3.2244
6:10	2.903	6:10	3.4836
6:20	3.163	6:20	3.7956
6:30	3.48	6:30	4.176
6:40	3.876	6:40	4.6512
6:50	4.387	6:50	5.2644
7:00	5.073	7:00	6.0876
7:10	6.046	7:10	7.2552
7:20	7.542	7:20	9.0504
7:30	10.159	7:30	12.1908
7:40	15.969	7:40	19.1628
7:50	40.655	7:50	48.786
8:00	178.559	8:00	214.271
8:10	54.049	8:10	64.8588
8:20	27.319	8:20	32.7828
8:30	18.24	8:30	21.888
8:40	13.737	8:40	16.4844
8:50	11.059	8:50	13.2708
9:00	9.285	9:00	11.142
9:10	8.024	9:10	9.6288
9:20	7.08	9:20	8.496
9:30	6.347	9:30	7.6164
9:40	5.76	9:40	6.912
9:50	5.28	9:50	6.336
10:00	4.879	10:00	5.8548
10:10	4.539	10:10	5.4468
10:20	4.246	10:20	5.0952
10:30	3.992	10:30	4.7904
10:40	3.77	10:40	4.524
10:50	3.572	10:50	4.2864
11:00	3.396	11:00	4.0752
11:10	3.238	11:10	3.8856
11:20	3.096	11:20	3.7152
11:30	2.966	11:30	3.5592
11:40	2.848	11:40	3.4176
11:50	2.74	11:50	3.288
12:00	2.64	12:00	3.168
12:10	2.548	12:10	3.0576
12:20	2.463	12:20	2.9556
12:30	2.384	12:30	2.8608
12:40	2.31	12:40	2.772
12:50	2.241	12:50	2.6892
13:00	2.177	13:00	2.6124
13:10	2.116	13:10	2.5392
13:20	2.06	13:20	2.472
13:30	2.006	13:30	2.4072
13:40	1.955	13:40	2.346
13:50	1.907	13:50	2.2884
14:00	1.862	14:00	2.2344
14:10	1.819	14:10	2.1828
14:20	1.778	14:20	2.1336

Block 14 (Bridlewood Trails Phase 2)

Design Storm Time Series Data

Chicago Design Storms

Engineers, Planners & Landscape Architects

14:30	1.739	14:30	2.0868
14:40	1.702	14:40	2.0424
14:50	1.667	14:50	2.0004
15:00	1.633	15:00	1.9596
15:10	1.601	15:10	1.9212
15:20	1.57	15:20	1.884
15:30	1.54	15:30	1.848
15:40	1.512	15:40	1.8144
15:50	1.484	15:50	1.7808
16:00	1.458	16:00	1.7496
16:10	1.433	16:10	1.7196
16:20	1.409	16:20	1.6908
16:30	1.385	16:30	1.662
16:40	1.363	16:40	1.6356
16:50	1.341	16:50	1.6092
17:00	1.32	17:00	1.584
17:10	1.3	17:10	1.56
17:20	1.28	17:20	1.536
17:30	1.261	17:30	1.5132
17:40	1.243	17:40	1.4916
17:50	1.225	17:50	1.47
18:00	1.208	18:00	1.4496
18:10	1.191	18:10	1.4292
18:20	1.175	18:20	1.41
18:30	1.159	18:30	1.3908
18:40	1.144	18:40	1.3728
18:50	1.129	18:50	1.3548
19:00	1.115	19:00	1.338
19:10	1.101	19:10	1.3212
19:20	1.087	19:20	1.3044
19:30	1.074	19:30	1.2888
19:40	1.061	19:40	1.2732
19:50	1.049	19:50	1.2588
20:00	1.036	20:00	1.2432
20:10	1.024	20:10	1.2288
20:20	1.013	20:20	1.2156
20:30	1.002	20:30	1.2024
20:40	0.99	20:40	1.188
20:50	0.98	20:50	1.176
21:00	0.969	21:00	1.1628
21:10	0.959	21:10	1.1508
21:20	0.949	21:20	1.1388
21:30	0.939	21:30	1.1268
21:40	0.93	21:40	1.116
21:50	0.92	21:50	1.104
22:00	0.911	22:00	1.0932
22:10	0.902	22:10	1.0824
22:20	0.893	22:20	1.0716
22:30	0.885	22:30	1.062
22:40	0.876	22:40	1.0512
22:50	0.868	22:50	1.0416
23:00	0.86	23:00	1.032
23:10	0.852	23:10	1.0224
23:20	0.844	23:20	1.0128
23:30	0.837	23:30	1.0044
23:40	0.829	23:40	0.9948
23:50	0.822	23:50	0.9864
24:00:00	0.815	24:00:00	0.978

SN	Element ID	Invert Elevation (m)	Ground/Rim (Max) Elevation (m)	Ground/Rim (Max) Offset (m)	Initial Water Elevation (m)	Initial Water Depth (m)	Surcharge Elevation (m)	Surcharge Depth (m)	Ponded Area (m^2)	Minimum Pipe Cover (mm)	Peak Inflow (lps)	Peak Lateral Inflow (lps)	Maximum HGL Elevation Attained (m)	Maximum HGL Depth Attained (m)	Maximum Surcharge Depth Attained (m)	Minimum Freeboard Attained (m)	Average HGL Elevation Attained (m)	Average HGL Depth Attained (m)	Time of Maximum HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ha-mm)	Total Time Flooded (minutes)
Block 14 Junctions																						
33	200 (STM)	94.98	97.96	2.98	94.98	0.00	97.96	0.00	0.00	0.00	19.35	0.00	95.42	0.44	0.00	2.54	95.32	0.34	0 01:59	0 00:00	0.00	0.00
34	202 (STM)	94.77	98.03	3.26	94.77	0.00	98.03	0.00	0.00	0.00	39.00	0.00	95.27	0.50	0.00	2.76	95.14	0.37	0 01:48	0 00:00	0.00	0.00
35	204 (STM)	94.46	98.03	3.57	94.46	0.00	98.03	0.00	0.00	0.00	96.16	0.00	95.11	0.65	0.00	2.92	94.87	0.41	0 02:04	0 00:00	0.00	0.00
36	206 (STM)	94.38	98.00	3.62	94.38	0.00	98.00	0.00	0.00	2765.00	96.15	0.00	95.05	0.67	0.00	2.95	94.79	0.41	0 02:04	0 00:00	0.00	0.00
37	208 (STM)	94.34	97.90	3.56	94.34	0.00	97.90	0.00	0.00	2705.00	96.15	0.00	95.01	0.67	0.00	2.89	94.75	0.41	0 02:04	0 00:00	0.00	0.00
38	210 (STM)	94.81	97.77	2.96	94.81	0.00	97.77	0.00	0.00	0.00	18.76	0.00	95.25	0.44	0.00	2.52	95.15	0.34	0 02:17	0 00:00	0.00	0.00
24	136 (STM)	94.31	97.52	3.21	94.31	0.00	97.52	0.00	0.00	2385.00	96.15	0.00	94.97	0.66	0.00	2.55	94.72	0.41	0 02:04	0 00:00	0.00	0.00
Bridelwood Trails - Phase 2 Junctions																						
1	100 (STM)	94.80	97.44	2.64	94.80	0.00	97.44	0.00	0.00	0.00	26.80	0.00	95.47	0.67	0.00	1.97	95.32	0.52	0 02:17	0 00:00	0.00	0.00
2	100a	94.72	97.45	2.73	94.72	0.00	97.45	0.00	0.00	0.00	54.31	0.00	95.46	0.74	0.00	1.99	95.23	0.51	0 02:17	0 00:00	0.00	0.00
3	102 (STM)	94.52	97.46	2.94	94.52	0.00	97.46	0.00	0.00	0.00	73.57	0.00	95.45	0.93	0.00	2.01	95.18	0.66	0 02:16	0 00:00	0.00	0.00
4	104 (STM)	94.28	97.25	2.97	94.28	0.00	97.25	0.00	0.00	0.00	102.18	0.00	95.42	1.14	0.00	1.83	95.11	0.83	0 02:16	0 00:00	0.00	0.00
5	106 (STM)	94.40	97.21	2.81	94.40	0.00	97.21	0.00	0.00	0.00	129.79	0.00	95.40	1.00	0.00	1.81	95.11	0.71	0 02:15	0 00:00	0.00	0.00
6	106a	94.18	97.18	3.00	94.18	0.00	97.18	0.00	0.00	0.00	158.93	0.00	95.40	1.22	0.00	1.78	95.10	0.92	0 02:15	0 00:00	0.00	0.00
7	108 (STM)	94.76	97.03	2.27	94.76	0.00	97.03	0.00	0.00	1559.00	19.56	0.00	95.41	0.65	0.00	1.62	95.17	0.41	0 02:15	0 00:00	0.00	0.00
8	110	97.18	97.48	0.30	97.18	0.00	97.18	-0.30	0.00	99.00	50.30	0.00	97.24	0.06	0.00	0.24	97.19	0.01	0 02:11	0 00:00	0.00	0.00
9	110 (STM)	94.82	96.99	2.17	94.82	0.00	96.99	0.00	0.00	1469.00	18.54	0.00	95.41	0.59	0.00	1.58	95.18	0.36	0 02:15	0 00:00	0.00	0.00
10	112 (STM)	94.61	96.96	2.35	94.61	0.00	96.96	0.00	0.00	0.00	17.80	0.00	95.42	0.81	0.00	1.54	95.27	0.66	0 02:15	0 00:00	0.00	0.00
11	114 (STM)	94.78	97.23	2.45	94.78	0.00	97.23	0.00	0.00	0.00	8.39	0.00	95.38	0.60	0.00	1.85	95.25	0.47	0 02:15	0 00:00	0.00	0.00
12	116 (STM)	94.58	97.14	2.56	94.58	0.00	97.14	0.00	0.00	1759.00	10.34	0.00	95.38	0.80	0.00	1.76	95.11	0.53	0 02:15	0 00:00	0.00	0.00
13	118 (STM)	94.34	97.07	2.73	94.34	0.00	97.07	0.00	0.00	0.00	31.00	0.00	95.38	1.04	0.00	1.69	95.10	0.76	0 02:14	0 00:00	0.00	0.00
14	120 (STM)	94.16	97.10	2.94	94.16	0.00	97.10	0.00	0.00	0.00	208.35	0.00	95.37	1.21	0.00	1.73	95.10	0.94	0 02:14	0 00:00	0.00	0.00
15	122 (STM)	94.06	97.08	3.02	94.06	0.00	97.08	0.00	0.00	0.00	348.37	0.00	95.35	1.29	0.00	1.73	95.09	1.03	0 02:14	0 00:00	0.00	0.00
16	124 (STM)	94.31	97.10	2.79	94.31	0.00	97.10	0.00	0.00	0.00	111.92	0.00	95.38	1.07	0.00	1.72	95.10	0.79	0 02:13	0 00:00	0.00	0.00
17	124a	94.52	97.23	2.71	94.52	0.00	97.23	0.00	0.00	0.00	74.62	0.00	95.40	0.88	0.00	1.83	95.10	0.58	0 02:10	0 00:00	0.00	0.00
18	126 (STM)	94.69	97.30	2.61	94.69	0.00	97.30	0.00	0.00	0.00	267.57	0.00	95.49	0.80	0.00	1.81	95.20	0.51	0 02:09	0 00:00	0.00	0.00
19	126a (STM)	94.68	97.28	2.60	94.68	0.00	97.28	0.00	0.00	0.00	57.33	0.00	95.41	0.73	0.00	1.87	95.10	0.42	0 02:10	0 00:00	0.00	0.00
20	128 (STM)	94.95	97.34	2.39	94.95	0.00	97.34	0.00	0.00	0.00	249.05	0.00	95.66	0.71	0.00	1.68	95.32	0.37	0 02:09	0 00:00	0.00	0.00
21	130 (STM)	95.03	97.40	2.37	95.03	0.00	97.40	0.00	0.00	0.00	170.89	0.00	95.77	0.74	0.00	1.63	95.45	0.42	0 02:09	0 00:00	0.00	0.00
22	132 (STM)	95.06	97.70	2.64	95.06	0.00	97.70	0.00	0.00	0.00	135.46	0.00	95.80	0.74	0.00	1.90	95.48	0.42	0 02:08	0 00:00	0.00	0.00
23	134 (STM)	94.83	97.65	2.82	94.83	0.00	97.65	0.00	0.00	0.00	80.75	0.00	95.82	0.99	0.00	1.83	95.51	0.68	0 02:08	0 00:00	0.00	0.00
25	138 (STM)	95.34	97.84	2.50	95.34	0.00	97.84	0.00	0.00	0.00	63.05	0.00	95.90	0.56	0.00	1.94	95.72	0.38	0 02:07	0 00:00	0.00	0.00
26	140 (STM)	95.59	97.85	2.26	95.59	0.00	97.85	0.00	0.00	0.00	36.24	0.00	96.08	0.49	0.00	1.77	95.95	0.36	0 01:53	0 00:00	0.00	0.00
27	142 (STM)	94.94	97.57	2.63	94.94	0.00	97.57	0.00	0.00	0.00	37.42	0.00	95.82	0.88	0.00	1.75	95.60	0.66	0 02:09	0 00:00	0.00	0.00
28	144 (STM)	95.22	97.73	2.51	95.22	0.00	97.73	0.00	0.00	0.00	18.86	0.00	95.84	0.62	0.00	1.89	95.76	0.54	0 02:03	0 00:00	0.00	0.00
29	146 (STM)	95.19	97.36	2.17	95.19	0.00	97.36	0.00	0.00	0.00	24.74	0.00	95.73	0.54	0.00	1.63	95.63	0.44	0 02:09	0 00:00	0.00	0.00
30	146a	95.03	97.35	2.32	95.03	0.00	97.35	0.00	0.00	0.00	43.34	0.00	95.68	0.65	0.00	1.67	95.47	0.44	0 02:10	0 00:00	0.00	0.00
31	148 (STM)	95.25	97.49	2.24	95.25	0.00	97.49	0.00	0.00	1409.00	17.44	0.00	95.78	0.53	0.00	1.71	95.69	0.44	0 02:09	0 00:00	0.00	0.00
32	150 (STM)	95.09	97.55	2.46	95.09	0.00	97.55	0.00	0.00	0.00	17.44	0.00	95.94	0.85	0.00	1.61	95.86	0.77	0 02:08	0 00:00	0.00	0.00
39	CAP (STM)	92.70	97.66	4.96	92.70	0.00	97.66	0.00	0.00	1525.00	1.17	0.00	95.90	3.20	0.00	1.76	95.77	3.07	0 02:07	0 00:00	0.00	0.00
40	CB01-02	95.25	96.80	1.55	95.25	0.00	97.10	0.30	0.00	0.00	133.56	23.53	97.02	1.77	0.00	0.08	95.87	0.62	0 02:21	0 00:00	0.00	0.00
41	CB03-04	95.43	96.92	1.49	95.43	0.00	97.22	0.30	0.00	0.00	100.86	33.98	97.02	1.59	0.00	0.10	95.90	0.47	0 02:20	0 00:00	0.00	0.00
42	CB05-06	95.33	96.83	1.50	95.33	0.00	97.13	0.30	0.00	0.00	117.78	45.14	97.02	1.69	0.00	0.03	95.88	0.55	0 02:20	0 00:00	0.00	0.00
43	CB05-06a	96.88	97.18	0.30	96.88	0.00	97.18	0.00	0.00	99.00	101.42	0.00	97.02	0.14	0.00	0.16	96.91	0.03	0 02:20	0 00:00	0.00	0.00
44	CB07-08	95.36	96.85	1.49	95.36	0.00	97.15	0.30	0.00	0.00	105.15	57.94	97.02	1.66	0.00	0.13	95.85	0.49	0 02:21	0 00:00	0.00	0.00

SN	Element ID	Invert Elevation (m)	Ground/Rim (Max) Elevation (m)	Ground/Rim (Max) Offset (m)	Initial Water Elevation (m)	Initial Water Depth (m)	Surcharge Elevation (m)	Surcharge Depth (m)	Ponded Area (m^2)	Minimum Pipe Cover (mm)	Peak Inflow (lps)	Peak Lateral Inflow (lps)	Maximum HGL Elevation Attained (m)	Maximum HGL Depth Attained (m)	Maximum Surcharge Depth Attained (m)	Minimum Freeboard Attained (m)	Average HGL Elevation Attained (m)	Average HGL Depth Attained (m)	Time of Maximum HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ha-mm)	Total Time Flooded (minutes)
45	CB09-10	95.44	96.94	1.50	95.44	0.00	97.24	0.30	0.00	0.00	56.19	56.19	97.15	1.71	0.01	0.00	96.28	0.84	0 02:33	0 00:00	0.00	0.00
46	CB11-12	95.53	96.82	1.29	95.53	0.00	97.12	0.30	0.00	0.00	57.03	41.04	97.03	1.50	0.01	0.00	96.03	0.50	0 02:37	0 00:00	0.00	0.00
47	CB13-14	95.80	97.02	1.22	95.80	0.00	97.32	0.30	0.00	0.00	85.04	41.70	97.17	1.37	0.00	0.19	96.20	0.40	0 02:11	0 00:00	0.00	0.00
48	CB15-16	95.40	96.80	1.40	95.40	0.00	97.10	0.30	0.00	0.00	122.60	37.80	97.02	1.62	0.00	0.02	95.90	0.50	0 02:20	0 00:00	0.00	0.00
49	CB17-18	95.61	97.11	1.50	95.61	0.00	97.41	0.30	0.00	0.00	95.83	62.89	97.32	1.71	0.01	0.00	96.07	0.46	0 02:09	0 00:00	0.00	0.00
50	CB19-20	95.69	97.19	1.50	95.69	0.00	97.49	0.30	0.00	0.00	88.73	88.72	97.38	1.69	0.00	0.01	96.15	0.46	0 02:08	0 00:00	0.00	0.00
51	CB21-22	95.69	97.24	1.55	95.69	0.00	97.54	0.30	0.00	0.00	79.74	64.68	97.43	1.74	0.00	0.01	96.15	0.46	0 02:10	0 00:00	0.00	0.00
52	CB23-24	95.78	97.33	1.55	95.78	0.00	97.63	0.30	0.00	0.00	55.20	55.20	97.48	1.70	0.00	0.05	96.15	0.37	0 02:04	0 00:00	0.00	0.00
53	CB25-26	95.87	97.32	1.45	95.87	0.00	97.62	0.30	0.00	0.00	11.23	11.23	97.36	1.49	0.00	0.19	96.08	0.21	0 02:03	0 00:00	0.00	0.00
54	CB27-28	95.59	97.04	1.45	95.59	0.00	97.34	0.30	0.00	0.00	121.23	58.48	97.28	1.69	0.04	0.00	96.10	0.51	0 02:19	0 00:00	0.00	0.00
55	CB29-30	95.86	97.12	1.26	95.86	0.00	97.42	0.30	0.00	0.00	108.98	0.00	97.28	1.42	0.00	0.04	96.23	0.37	0 02:19	0 00:00	0.00	0.00
56	CB31-32	95.73	97.10	1.37	95.73	0.00	97.40	0.30	0.00	0.00	61.32	58.90	97.28	1.55	0.00	0.02	96.18	0.45	0 02:18	0 00:00	0.00	0.00
57	CB33-34	95.60	97.04	1.44	95.60	0.00	97.34	0.30	0.00	0.00	92.20	40.30	97.24	1.64	0.00	0.20	96.09	0.49	0 02:11	0 00:00	0.00	0.00
58	CB35-36	95.70	97.01	1.31	95.70	0.00	97.31	0.30	0.00	0.00	49.64	49.64	97.16	1.46	0.00	0.05	96.02	0.32	0 02:05	0 00:00	0.00	0.00
59	CB37-38	95.50	96.93	1.43	95.50	0.00	97.23	0.30	0.00	0.00	73.56	69.12	97.11	1.61	0.00	0.02	95.93	0.43	0 02:09	0 00:00	0.00	0.00
60	CB39-40	95.31	96.86	1.55	95.31	0.00	97.16	0.30	0.00	0.00	76.31	61.81	97.05	1.74	0.00	0.01	95.78	0.47	0 02:13	0 00:00	0.00	0.00
61	CB41-42	95.89	97.08	1.19	95.89	0.00	97.38	0.30	0.00	0.00	153.09	48.78	97.28	1.39	0.00	0.10	96.30	0.41	0 02:19	0 00:00	0.00	0.00
62	CB43-44	96.02	97.46	1.44	96.02	0.00	97.76	0.30	0.00	0.00	94.20	27.11	97.52	1.50	0.00	0.14	96.25	0.23	0 02:03	0 00:00	0.00	0.00
63	CB45-46	95.90	97.40	1.50	95.90	0.00	97.70	0.30	0.00	0.00	84.99	17.85	97.53	1.63	0.00	0.07	96.20	0.30	0 02:04	0 00:00	0.00	0.00
64	CB47-48	96.07	97.57	1.50	96.07	0.00	97.87	0.30	0.00	0.00	106.37	106.37	97.75	1.68	0.00	0.02	96.53	0.46	0 02:02	0 00:00	0.00	0.00
65	CB49-50	96.10	97.44	1.34	96.10	0.00	97.74	0.30	0.00	0.00	30.16	30.16	97.55	1.45	0.00	0.10	96.35	0.25	0 02:08	0 00:00	0.00	0.00
66	CB51-52	96.03	97.53	1.50	96.03	0.00	97.83	0.30	0.00	0.00	36.72	36.72	97.57	1.54	0.00	0.16	96.26	0.23	0 01:57	0 00:00	0.00	0.00
67	CB53-54	95.94	97.44	1.50	95.94	0.00	97.74	0.30	0.00	0.00	46.20	40.17	97.58	1.64	0.00	0.06	96.28	0.34	0 02:07	0 00:00	0.00	0.00
68	CB55-56	95.96	97.54	1.58	95.96	0.00	97.84	0.30	0.00	0.00	19.90	0.00	97.58	1.62	0.00	0.24	96.14	0.18	0 02:09	0 00:00	0.00	0.00
69	CB57-58	94.14	97.59	3.45	94.14	0.00	97.89	0.30	0.00	0.00	40.45	37.26	97.64	3.50	0.00	0.23	96.19	2.05	0 02:01	0 00:00	0.00	0.00
70	CB59-60	96.23	97.72	1.49	96.23	0.00	98.02	0.30	0.00	0.00	22.07	22.07	97.74	1.51	0.00	0.28	96.40	0.17	0 02:00	0 00:00	0.00	0.00
71	CB61-62	96.06	97.42	1.36	96.06	0.00	97.72	0.30	0.00	0.00	50.78	50.78	97.55	1.49	0.00	0.15	96.38	0.32	0 02:00	0 00:00	0.00	0.00
72	CB63-64	96.06	97.25	1.19	96.06	0.00	97.55	0.30	0.00	0.00	73.74	16.87	97.36	1.30	0.00	0.09	96.36	0.30	0 02:08	0 00:00	0.00	0.00
73	CBMH	95.06	97.20	2.14	95.06	0.00	97.50	0.30	0.00	0.00	89.84	89.84	97.28	2.22	0.00	0.22	95.44	0.38	0 01:50	0 00:00	0.00	0.00
74	C-Romina	97.00	97.30	0.30	97.00	0.00	97.30	0.00	0.00	0.00	126.17	0.00	97.19	0.19	0.00	0.12	97.06	0.06	0 02:16	0 00:00	0.00	0.00
75	ECB9	95.84	96.96	1.12	95.84	0.00	97.26	0.30	0.00	0.00	12.69	0.00	97.06	1.22	0.00	0.20	96.97	1.13	0 02:19	0 00:00	0.00	0.00
76	EX.100 (STM)	94.35	96.86	2.51	94.35	0.00	97.16	0.30	0.00	0.00	17.92	0.00	95.10	0.75	0.00	1.76	95.04	0.69	0 02:06	0 00:00	0.00	0.00
77	EX.102 (STM)	93.57	96.90	3.33	93.98	0.41	96.90	0.00	0.00	0.00	494.10	0.00	95.08	1.51	0.00	1.82	95.03	1.46	0 02:09	0 00:00	0.00	0.00
78	EX.104 (STM)	93.78	96.99	3.21	93.78	0.00	96.99	0.00	0.00	0.00	465.12	0.00	95.26	1.48	0.00	1.73	95.07	1.29	0 02:13	0 00:00	0.00	0.00
79	EX.106 (STM)	93.97	97.07	3.10	93.97	0.00	97.07	0.00	0.00	0.00	60.94	0.00	95.27	1.30	0.00	1.80	95.08	1.11	0 02:13	0 00:00	0.00	0.00
80	EX.106A (STM)	94.24	97.04	2.80	94.24	0.00	97.34	0.30	0.00	0.00	79.51	0.00	95.27	1.03	0.00	1.77	95.08	0.84	0 02:13	0 00:00	0.00	0.00
81	EX.108 (STM)	94.62	97.15	2.53	94.62	0.00	97.15	0.00	0.00	0.00	35.09	0.00	95.31	0.69	0.00	1.84	95.08	0.46	0 02:13	0 00:00	0.00	0.00
82	EX.110 (STM)	94.17	97.23	3.06	94.17	0.00	97.23	0.00	0.00	2107.00	291.69	0.00	95.30	1.13	0.00	1.93	95.16	0.99	0 02:08	0 00:00	0.00	0.00
83	EX.112 (STM)	94.86	97.10	2.24	94.86	0.00	97.10	0.00	0.00	1859.00	83.13	0.00	95.39	0.53	0.00	1.71	95.17	0.31	0 02:03	0 00:00	0.00	0.00
84	EX.114 (STM)	94.95	97.15	2.20	94.95	0.00	97.15	0.00	0.00	0.00	83.13	0.00	95.47	0.52	0.00	1.68	95.18	0.23	0 02:01	0 00:00	0.00	0.00
85	EX.CB11-12	95.90	97.10	1.20	95.90	0.00	97.40	0.30	0.00	0.00	118.99	95.66	97.20	1.30	0.00	0.20	96.25	0.35	0 01:59	0 00:00	0.00	0.00
86	EX.CB1-2	95.48	96.98	1.50	95.48	0.00	97.28	0.30	0.00	0.00	26.03	26.03	97.00	1.52	0.00	0.26	95.65	0.17	0 02:00	0 00:00	0.00	0.00
87	EX.CB3-4	95.16	96.66	1.50	95.16	0.00	96.96	0.30	0.00	0.00	184.43	138.70	96.87	1.71	0.00	0.07	95.68	0.52	0 02:07	0 00:00	0.00	0.00
88	EX.CB5-6	95.27	96.77	1.50	95.27	0.00	97.07	0.30	0.00	0.00	104.37	47.92	96.91	1.64	0.00	0.14	95.74	0.47	0 02:19	0 00:00	0.00	0.00
89	EX.CB65-66	95.25	96.74	1.49	95.25	0.00	97.04	0.30	0.00	0.00	144.18	27.02	96.91	1.66	0.00	0.11	95.68	0.43	0 02:19	0 00:00	0.00	0.00
90	EX.CB7-8	95.54	97.04	1.50	95.54	0.00	97.34	0.30	0.00	0.00	77.94	77.94	97.10	1.56	0.00	0.22	95.94	0.40	0 02:01	0 00:00	0.00	0.00

SN	Element ID	Invert Elevation (m)	Ground/Rim (Max) Elevation (m)	Ground/Rim (Max) Offset (m)	Initial Water Elevation (m)	Initial Water Depth (m)	Surcharge Elevation (m)	Surcharge Depth (m)	Ponded Area (m^2)	Minimum Pipe Cover (mm)	Peak Inflow (lps)	Peak Lateral Inflow (lps)	Maximum HGL Elevation Attained (m)	Maximum HGL Depth Attained (m)	Maximum Surcharge Depth Attained (m)	Minimum Freeboard Attained (m)	Average HGL Elevation Attained (m)	Average HGL Depth Attained (m)	Time of Maximum HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ha-mm)	Total Time Flooded (minutes)
91	EX.CB7A-8A	95.49	96.99	1.50	95.49	0.00	97.29	0.30	0.00	0.00	85.35	0.00	97.19	1.70	0.00	0.08	95.95	0.46	0 02:17	0 00:00	0.00	0.00
92	Romina1	97.23	97.53	0.30	97.23	0.00	97.53	0.00	0.00	20.00	0.00	0.00	97.23	0.00	0.00	0.30	97.23	0.00	0 00:00	0 00:00	0.00	0.00
93	Romina2	96.82	97.12	0.30	96.82	0.00	97.12	0.00	0.00	20.00	123.75	0.00	96.90	0.08	0.00	0.22	96.83	0.01	0 02:19	0 00:00	0.00	0.00
94	Romina-Brigitta	96.77	97.07	0.30	96.77	0.00	97.07	0.00	0.00	0.00	185.77	0.00	96.86	0.09	0.00	0.21	96.79	0.02	0 02:07	0 00:00	0.00	0.00
95	RYCB 1	95.57	97.08	1.51	95.57	0.00	97.38	0.30	0.00	0.00	32.08	32.08	97.32	1.75	0.00	0.06	96.15	0.58	0 02:27	0 00:00	0.00	0.00
96	RYCB 2	95.37	96.96	1.59	95.37	0.00	97.26	0.30	0.00	0.00	42.84	26.10	97.32	1.95	0.06	0.00	96.05	0.68	0 02:27	0 00:00	0.00	0.00
97	RYCB 3	95.26	96.77	1.51	95.26	0.00	97.07	0.30	0.00	0.00	58.11	58.11	97.20	1.94	0.13	0.00	95.77	0.51	0 02:00	0 00:00	0.00	0.00
98	RYCB 4	95.07	96.71	1.64	95.07	0.00	97.01	0.30	0.00	0.00	60.52	60.52	97.05	1.98	0.00	0.07	95.65	0.58	0 02:19	0 00:00	0.00	0.00
99	RYCB 5	95.20	96.77	1.57	95.20	0.00	97.07	0.30	0.00	0.00	70.17	61.41	97.06	1.86	0.00	0.01	95.75	0.55	0 02:19	0 00:00	0.00	0.00
100	RYCB 6	95.67	97.00	1.33	95.67	0.00	97.30	0.30	0.00	0.00	56.64	56.64	97.41	1.74	0.11	0.00	95.99	0.32	0 02:00	0 00:00	0.00	0.00
101	RYCB08	95.50	97.00	1.50	95.50	0.00	97.30	0.30	0.00	0.00	29.90	29.90	96.78	1.28	0.00	0.22	95.69	0.19	0 02:00	0 00:00	0.00	0.00
102	RYCB16	95.60	96.80	1.20	95.60	0.00	97.10	0.30	0.00	0.00	46.70	46.70	97.03	1.43	0.00	0.12	96.07	0.47	0 02:16	0 00:00	0.00	0.00
103	RYCB2_HP	97.25	97.55	0.30	97.25	0.00	97.55	0.00	0.00	0.00	10.61	0.00	97.32	0.07	0.00	0.23	97.26	0.01	0 02:27	0 00:00	0.00	0.00
104	RYCB3_HP	97.06	97.36	0.30	97.06	0.00	97.36	0.00	0.00	0.00	49.15	0.00	97.18	0.12	0.00	0.18	97.08	0.02	0 02:00	0 00:00	0.00	0.00
105	RYCB4_HP	96.97	97.27	0.30	96.97	0.00	97.27	0.00	0.00	0.00	28.10	0.00	97.03	0.06	0.00	0.24	96.98	0.01	0 02:20	0 00:00	0.00	0.00
106	RYCB6_HP	97.26	97.56	0.30	97.26	0.00	97.56	0.00	0.00	0.00	37.66	0.00	97.38	0.12	0.00	0.18	97.27	0.01	0 02:00	0 00:00	0.00	0.00
107	RYCBMH 1	95.91	97.37	1.46	95.91	0.00	97.37	0.00	0.00	0.00	61.30	61.30	97.41	1.50	0.00	0.22	96.35	0.44	0 02:00	0 00:00	0.00	0.00
108	RYCBMH07	95.20	96.85	1.65	95.20	0.00	96.85	0.00	0.00	0.00	47.36	47.36	96.99	1.79	0.00	0.16	95.59	0.39	0 02:00	0 00:00	0.00	0.00
109	ST1.	97.85	98.15	0.30	97.85	0.00	98.15	0.00	0.00	20.00	0.00	0.00	97.85	0.00	0.00	0.30	97.85	0.00	0 00:00	0 00:00	0.00	0.00
110	ST1. 0+082	97.11	97.41	0.30	97.11	0.00	97.41	0.00	0.00	99.00	74.00	0.00	97.16	0.05	0.00	0.25	97.12	0.01	0 02:13	0 00:00	0.00	0.00
111	ST1. 0+173	97.22	97.52	0.30	97.22	0.00	97.52	0.00	0.00	99.00	0.00	0.00	97.22	0.00	0.00	0.30	97.22	0.00	0 00:00	0 00:00	0.00	0.00
112	ST1. 0+260	97.13	97.43	0.30	97.13	0.00	97.43	0.00	0.00	99.00	9.04	0.00	97.15	0.02	0.00	0.28	97.13	0.00	0 02:32	0 00:00	0.00	0.00
113	ST1. 0+373	97.00	97.30	0.30	97.00	0.00	97.30	0.00	0.00	99.00	43.29	0.00	97.05	0.05	0.00	0.25	97.01	0.01	0 02:13	0 00:00	0.00	0.00
114	ST1. 0+434	97.06	97.36	0.30	97.06	0.00	97.36	0.00	0.00	99.00	38.54	0.00	97.11	0.05	0.00	0.25	97.07	0.01	0 02:09	0 00:00	0.00	0.00
115	ST1. 0+494	97.12	97.42	0.30	97.12	0.00	97.42	0.00	0.00	99.00	17.59	0.00	97.16	0.04	0.00	0.26	97.12	0.00	0 02:06	0 00:00	0.00	0.00
116	ST1. 0+538	97.29	97.59	0.30	97.29	0.00	97.59	0.00	0.00	99.00	0.00	0.00	97.29	0.00	0.00	0.30	97.29	0.00	0 00:00	0 00:00	0.00	0.00
117	ST1. 0+551	97.22	97.52	0.30	97.22	0.00	97.52	0.00	0.00	99.00	9.92	0.00	97.28	0.06	0.00	0.24	97.23	0.01	0 02:19	0 00:00	0.00	0.00
118	ST1. 0+716	97.69	97.99	0.30	97.69	0.00	97.99	0.00	0.00	99.00	0.00	0.00	97.69	0.00	0.00	0.30	97.69	0.00	0 00:00	0 00:00	0.00	0.00
119	ST1. 1+050	96.94	97.24	0.30	96.94	0.00	97.24	0.00	0.00	99.00	111.39	0.00	97.02	0.08	0.00	0.22	96.95	0.01	0 02:21	0 00:00	0.00	0.00
120	ST2. 0+119	97.55	97.85	0.30	97.55	0.00	97.85	0.00	0.00	99.00	0.00	0.00	97.55	0.00	0.00	0.30	97.55	0.00	0 00:00	0 00:00	0.00	0.00
121	ST2. 0+171	97.75	98.05	0.30	97.75	0.00	98.05	0.00	0.00	0.00	4.37	0.00	97.75	0.00	0.00	0.30	97.75	0.00	0 02:01	0 00:00	0.00	0.00
122	ST2. 0+225	97.69	97.99	0.30	97.69	0.00	97.99	0.00	0.00	99.00	73.79	0.00	97.74	0.05	0.00	0.25	97.70	0.01	0 02:02	0 00:00	0.00	0.00
123	ST3. 0+024	97.48	97.78	0.30	97.48	0.00	97.78	0.00	0.00	99.00	1.59	0.00	97.48	0.00	0.00	0.30	97.48	0.00	0 02:04	0 00:00	0.00	0.00
124	ST3. 0+068	97.44	97.74	0.30	97.44	0.00	97.74	0.00	0.00	99.00	25.73	0.00	97.48	0.04	0.00	0.26	97.44	0.00	0 02:04	0 00:00	0.00	0.00
125	ST3. 0+125	97.38	97.68	0.30	97.38	0.00	97.68	0.00	0.00	99.00	33.25	0.00	97.42	0.04	0.00	0.26	97.39	0.01	0 02:10	0 00:00	0.00	0.00
126	ST3. 0+180	97.32	97.62	0.30	97.32	0.00	97.62	0.00	0.00	99.00	54.38	0.00	97.37	0.05	0.00	0.25	97.33	0.01	0 02:09	0 00:00	0.00	0.00
127	ST3. 0+234	97.26	97.56	0.30	97.26	0.00	97.56	0.00	0.00	99.00	69.61	0.00	97.32	0.06	0.00	0.24	97.27	0.01	0 02:10	0 00:00	0.00	0.00

Block 14 (Bridlewood Trails - Phase 2)
Pipes

Autodesk Storm and Sanitary Analysis
100-year 4-hour Chicago Storm Model Output

NOVATECH
Engineers, Planners & Landscape Architects

SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (m)	Inlet Invert Elevation (m)	Inlet Invert Offset (m)	Outlet Invert Elevation (m)	Outlet Invert Offset (m)	Total Drop (m)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (mm)	Pipe Width (mm)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (lps)	Flap Gate	Peak Flow (lps)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (m/sec)	Travel Time (min)	Design Flow Capacity (lps)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (m)	Froude Number	Reported Condition
Block 14 Storm Sewers																														
41	STM 136-HEADWALL	136 (STM)	BLOCK14 - HEADWALL	8.71	94.61	0.30	94.60	0.00	0.01	0.1100	CIRCULAR	530.000	530.00	0.0150	0.5000	0.5000	0.0000	0.00	NO	96.140	0 02:04	0.62	0.23	126.30	0.76	0.67	0.00	0.35	0.33	Calculated
42	STM 200-202	200 (STM)	202 (STM)	38.48	95.28	0.30	95.15	0.38	0.13	0.3400	CIRCULAR	300.000	300.00	0.0150	0.5000	0.8000	0.0000	0.00	NO	19.350	0 01:59	0.63	1.02	48.71	0.40	0.45	0.00	0.13	0.54	Calculated
43	STM 202-204	202 (STM)	204 (STM)	62.31	95.07	0.30	94.92	0.46	0.15	0.2400	CIRCULAR	380.000	380.00	0.0150	0.5000	0.5000	0.0000	0.00	NO	39.010	0 02:01	0.69	1.51	74.56	0.52	0.52	0.00	0.20	0.50	Calculated
44	STM 204-206	204 (STM)	206 (STM)	33.03	94.76	0.30	94.71	0.33	0.05	0.1500	CIRCULAR	530.000	530.00	0.0150	0.5000	0.6000	0.0000	0.00	NO	96.150	0 02:03	0.66	0.83	145.02	0.66	0.65	0.00	0.34	0.43	Calculated
45	STM 206-208	206 (STM)	208 (STM)	8.08	94.68	0.30	94.67	0.33	0.01	0.1200	CIRCULAR	530.000	530.00	0.0150	0.5000	0.6000	0.0000	0.00	NO	96.150	0 02:03	0.62	0.22	131.13	0.73	0.67	0.00	0.35	0.45	Calculated
46	STM 208-136	208 (STM)	136 (STM)	20.98	94.64	0.30	94.61	0.30	0.03	0.1400	CIRCULAR	530.000	530.00	0.0150	0.5000	0.5000	0.0000	0.00	NO	96.150	0 02:04	0.59	0.59	140.95	0.68	0.70	0.00	0.37	0.33	Calculated
47	STM 210-204	210 (STM)	204 (STM)	35.61	95.11	0.30	94.99	0.53	0.12	0.3400	CIRCULAR	300.000	300.00	0.0150	0.5000	0.5000	0.0000	0.00	NO	18.760	0 02:02	0.69	0.86	48.65	0.39	0.43	0.00	0.13	0.57	Calculated
Bridlewood Trails - Phase 2 Storm Sewers																														
1	{STM}.102-104	102 (STM)	104 (STM)	71.91	95.08	0.56	94.97	0.69	0.11	0.1500	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	74.340	0 02:20	0.66	1.82	175.14	0.42	0.77	0.00	0.41	0.16	Calculated
2	{STM}.106-106A	EX.106 (STM)	EX.106A (STM)	31.49	94.27	0.30	94.24	0.00	0.03	0.1000	CIRCULAR	610.000	610.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	60.930	0 02:08	0.21	2.50	198.07	0.31	1.00	480.00	0.61	0.00	SURCHARGED
3	{STM}.108-106	EX.108 (STM)	EX.106 (STM)	90.20	94.92	0.30	94.55	0.58	0.37	0.4100	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	35.030	0 02:08	0.31	4.85	117.16	0.30	1.00	10.00	0.38	0.03	SURCHARGED
4	{STM}.110-108	110 (STM)	108 (STM)	11.05	95.10	0.28	95.09	0.33	0.01	0.0900	CIRCULAR	380.000	380.00	0.0130	0.2000	0.6000	0.0000	0.00	NO	19.620	0 02:31	0.51	0.36	55.03	0.36	0.82	0.00	0.31	0.17	Calculated
5	{STM}.116-118	116 (STM)	118 (STM)	12.20	94.98	0.40	94.95	0.61	0.03	0.2500	CIRCULAR	380.000	380.00	0.0130	0.2000	0.6000	0.0000	0.00	NO	12.410	0 03:12	0.50	0.41	90.71	0.14	1.00	17.00	0.38	0.15	SURCHARGED
6	{STM}.120-122	120 (STM)	122 (STM)	34.19	94.54	0.38	94.49	0.43	0.05	0.1500	CIRCULAR	760.000	760.00	0.0130	0.2000	0.9000	0.0000	0.00	NO	209.060	0 02:31	0.46	1.24	444.17	0.47	1.00	35.00	0.76	0.02	SURCHARGED
7	{STM}.124-122	124 (STM)	122 (STM)	69.00	94.62	0.31	94.52	0.46	0.10	0.1400	CIRCULAR	610.000	610.00	0.0130	0.2000	0.9000	0.0000	0.00	NO	111.880	0 02:09	0.38	3.03	244.30	0.46	1.00	58.00	0.61	0.00	SURCHARGED
8	{STM}.126-110	126 (STM)	EX.110 (STM)	80.00	94.92	0.23	94.59	0.42	0.33	0.4100	CIRCULAR	530.000	530.00	0.0130	0.2000	0.0000	0.0000	0.00	NO	214.190	0 02:20	0.96	1.39	287.60	0.74	1.00	32.00	0.53	0.06	SURCHARGED
9	{STM}.128-126	128 (STM)	126 (STM)	41.68	95.20	0.25	95.02	0.33	0.18	0.4300	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	248.970	0 02:09	1.23	0.56	294.27	0.85	0.87	0.00	0.46	0.32	Calculated
10	{STM}.130-128	130 (STM)	128 (STM)	52.91	95.33	0.30	95.22	0.27	0.11	0.2100	CIRCULAR	530.000	530.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	170.810	0 02:08	0.91	0.97	204.17	0.84	0.82	0.00	0.44	0.50	Calculated
11	{STM}.130-CAP	CAP (STM)	138 (STM)	10.00	95.75	3.05	95.71	0.37	0.04	0.4000	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	1.170	0 01:46	0.09	1.85	115.69	0.01	0.44	0.00	0.16	0.00	Calculated
12	{STM}.132-130	132 (STM)	130 (STM)	21.82	95.36	0.30	95.33	0.30	0.03	0.1400	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	135.380	0 02:08	0.69	0.53	166.04	0.82	0.83	0.00	0.44	0.30	Calculated
13	{STM}.134-132	134 (STM)	132 (STM)	34.56	95.42	0.59	95.36	0.30	0.06	0.1700	CIRCULAR	530.000	530.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	80.490	0 02:07	0.43	1.34	186.58	0.43	0.79	0.00	0.42	0.24	Calculated
14	{STM}.138-136	138 (STM)	134 (STM)	71.16	95.66	0.32	95.52	0.69	0.14	0.2000	CIRCULAR	460.000	460.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	62.770	0 02:04	0.68	1.74	131.78	0.48	0.59	0.00	0.27	0.47	Calculated
15	{STM}.140-124	142 (STM)	132 (STM)	11.69	95.52	0.58	95.49	0.43	0.03	0.2600	CIRCULAR	380.000	380.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	39.410	0 02:25	0.74	0.26	92.67	0.43	0.80	0.00	0.30	0.51	Calculated
16	{STM}.EX.104-102	EX.104 (STM)	EX.102 (STM)	72.15	94.08	0.30	93.98	0.41	0.10	0.1400	CIRCULAR	760.000	760.00	0.0130	0.2000	0.9000	0.0000	0.00	NO	465.130	0 02:14	1.02	1.18	432.41	1.08	1.00	480.00	0.76	0.00	SURCHARGED
17	100-100a	100 (STM)	100a	70.00	95.28	0.48	95.16	0.44	0.13	0.1800	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	26.740	0 02:18	0.41	2.85	189.22	0.14	0.47	0.00	0.25	0.10	Calculated
18	100-102EXT	EX.100 (STM)	EX.102 (STM)	28.56	94.52	0.17	94.43	0.86	0.09	0.3200	CIRCULAR	300.000	300.00	0.0130	0.2000	0.9000	0.0000	0.00	NO	17.920	0 02:00	0.25	1.90	56.73	0.32	1.00	480.00	0.31	0.00	SURCHARGED
19	100a-102	100a	102 (STM)	37.50	95.16	0.44	95.09	0.57	0.07	0.1800	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	54.750	0 02:19	0.58	1.08	192.08	0.29	0.63	0.00	0.33	0.23	Calculated
20	102A-104	104 (STM)	106 (STM)	69.04	94.89	0.61	94.78	0.38	0.11	0.1600	CIRCULAR	610.000	610.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	103.460	0 02:22	0.42	2.74	256.15	0.40	0.94	0.00	0.57	0.07	Calculated
21	102-OUT EXT	EX.102 (STM)	Min-Brigitta	25.00	93.87	0.30	93.83	0.00	0.04	0.1600	CIRCULAR	840.000	840.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	494.090	0 02:10	0.90	0.46	598.66	0.83	1.00	480.00	0.84	0.00	SURCHARGED
22	106-106a	106 (STM)	106a	23.00	94.70	0.30	94.67	0.49	0.03	0.1300	CIRCULAR	690.000	690.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	131.910	0 02:31	0.36	1.06	315.75	0.42	1.00	18.00	0.69	0.03	SURCHARGED
23	106A-104	EX.106A (STM)	EX.104 (STM)	42.53	94.24	0.00	94.19	0.41	0.05	0.1200	CIRCULAR	610.000	610.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	79.500	0 02:08	0.27	2.63	220.03	0.36	1.00	480.00	0.61	0.00	SURCHARGED
24	106a-120	106a	120 (STM)	53.00	94.67	0.49	94.60	0.44	0.07	0.1300	CIRCULAR	690.000	690.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	160.120	0 02:31	0.44	2.01	317.73	0.50	1.00	26.00	0.69	0.03	SURCHARGED
25	108-106	108 (STM)	106 (STM)	22.24	95.09	0.33	95.03	0.63	0.06	0.2700	CIRCULAR	380.000	380.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	20.400	0 02:30	0.67	0.55	95.01	0.21	0.91	0.00	0.34	0.28	Calculated
26	110-out	EX.110 (STM)	Min-STR.C	71.35	94.47	0.30	94.37	0.00	0.10	0.1400	CIRCULAR	610.000	610.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	291.690	0 02:09	1.00	1.19	240.24	1.21	1.00	480.00	0.61	0.00	SURCHARGED
27	112-110	112 (STM)	110 (STM)	33.68	95.21	0.60	95.14	0.32	0.07	0.2100	CIRCULAR	380.000	380.00	0.0130	0.2000	0.6000	0.0000	0.00	NO	18.560	0 02:31	0.61	0.92	83.39	0.22	0.62	0.00	0.23	0.28	Calculated
28	112-110 EXT	EX.112 (STM)	EX.110 (STM)	34.80	94.86	0.00	94.69	0.52	0.17	0.4900	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	83.150	0 01:50	0.73	0.79	127.85	0.65	1.00	50.00	0.38	0.01	SURCHARGED
29	114-112	EX.114 (STM)	EX.112 (STM)	27.70	94.95	0.00	94.86	0.00	0.09	0.3200	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	83.130	0 01:50	0.73	0.63	104.27	0.80	1.00	38.00	0.38	0.03	SURCHARGED
30	114-116	114 (STM)	116 (STM)	89.54	95.19	0.41	95.00	0.42	0.19	0.2100	CIRCULAR	380.000	380.00	0.0130	0.2000	0.6000	0.0000	0.00	NO	10.350	0 02:31	0.51	2.93	84.26	0.12	0.75	0.00	0.28	0.21	Calculated
31	114-EX.104	122 (STM)	EX.104 (STM)	81.36	94.36	0.30	94.14	0.36	0.22	0.2700	CIRCULAR	760.000	760.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	348.400	0 02:14	0.76	1.78	603.97	0.58	1.00	88.00	0.76	0.01	SURCHARGED
32	118-120	118 (STM)	120 (STM)	63.36	94.89	0.55	94.77	0.61	0.12	0.1900	CIRCULAR	460.000	460.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	34.000	0 03:12	0.28	3.77	129.30	0.26	1.00	23.00	0.46	0.04	SURCHARGED
33	124a-124	124a	124 (STM)	69.00	94.81	0.29	94.67	0.36	0.14	0.2000	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	74.540	0 02:09	0.33	3.48	198.07	0.38	1.00	27.00	0.53	0.01	SURCHARGED
34	140-138	140 (STM)	138 (STM)	68.50	95.90	0.31	95.73	0.39	0.17	0.2500	CIRCULAR	380.000	380.00	0.0130	0.2000	0.8000	0.0000	0.00	NO	36.400	0 01:58	0.79	1.45	91.13	0.40	0.45	0.00	0.17	0.54	Calculated
35	144-142	144 (STM)	142 (STM)	85.69	95.72	0.50	95.52	0.58	0.20	0.2300	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	18.850	0 02:03	0.58	2.46	88.37	0.21	0.54	0.00	0.21	0.30	Calculated
36	146-146a	146 (STM)	146a	67.00	95.60	0.41	95.40	0.37	0.20	0.3000	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	24.740	0 02:09	0.52	2.15	99.94	0.25	0.53	0.00	0.20	0.16	Calculated
37	146a-128	146a	128 (STM)	30.47	95.40	0.37	95.31	0.36	0.09	0.3000	CIRCULAR	380.000	380.00	0.0130	0.2000	0.7000	0.0000	0.00	NO	44.880	0 02:27	0.71	0.72	99.41	0.45	0.82	0.00	0.31	0.35	Calculated
38	148-146	148 (STM)	146 (STM)	10.98	95.67	0.42	95.62	0.43	0.05	0.4600	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	17.440	0 02:09	0.66	0.28	123.44	0.14	0.28	0.00	0.11	0.44	Calculated
39	150-148	150 (STM)	148 (STM)	33.73	95.83	0.74	95.70	0.45	0.13	0.3900	CIRCULAR	380.000	380.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	17.440	0 02:08	0.73	0.77	113.56	0.15	0.26	0.00	0.10	0.46	Calculated
40	Link-216	126a (STM)	124a	42.68	94.89	0.21	94.81	0.29	0.08	0.2000	CIRCULAR	530.000	530.00	0.0130	0.2000	0.5000	0.0000	0.00	NO	57.120	0 02:09	0.26	2.74	199.83	0.29	0.99	0.00	0.53	0.01	Calculated

Block 14 (Bridlewood Trails - Phase 2)
Channels

Autodesk Storm and Sanitary Analysis
100-year 4-hour Chicago Storm Model Output

NOVATECH
Engineers, Planners & Landscape Architects

SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (m)	Inlet Invert Elevation (m)	Inlet Invert Offset (m)	Outlet Invert Elevation (m)	Outlet Invert Offset (m)	Total Drop (m)	Average Slope (%)	Channel Type	Channel Height (m)	Channel Width (m)	Left Overbank Manning's Roughness	Channel Manning's Roughness	Right Overbank Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (lps)	Flap Gate	Peak Flow (lps)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (m/sec)	Travel Time (min)	Design Flow Capacity (lps)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (m)	Froude Number	Reported Condition
Block 14 Roadway Links																																
1	B14 1+024	CB100	ST2. 0+171	5.00	97.97	1.80	97.75	0.00	0.22	4.4000	Rectangular	0.300	5.00	0.0000	0.0320	0.0000	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		4085.98	0.00	0.01	0.00	0.00	0.00	Calculated
2	B14 1+060	CB101	CB100	5.00	98.01	1.85	98.01	1.84	0.00	0.0000	Rectangular	0.300	5.00	0.0000	0.0320	0.0000	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		152.09	0.00	0.00	0.00	0.00	0.00	Calculated
3	B14 1+096	CB102	CB101	5.00	98.04	1.73	98.04	1.88	0.00	0.0000	Rectangular	0.300	5.00	0.0000	0.0320	0.0000	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		152.09	0.00	0.00	0.00	0.00	0.00	Calculated
4	B14 1+124	CB103	CB102	5.00	98.07	1.93	98.07	1.76	0.00	0.0000	Rectangular	0.300	5.00	0.0000	0.0320	0.0000	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		152.09	0.00	0.00	0.00	0.00	0.00	Calculated
5	B14 2+050	CB104	CB59-60	5.00	97.81	1.69	97.72	1.49	0.09	1.8000	Rectangular	0.300	5.00	0.0000	0.0320	0.0000	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		2613.40	0.00	0.04	0.00	0.01	0.00	Calculated
Bridlewood Trails - Phase 2 Roadway Links & Channels																																
6	Brigitta1	Romina-Brigitta	Maj-Brigitta	18.00	96.77	0.00	96.64	0.00	0.13	0.7200	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	185.600	0 02:07	0.78	0.38	4860.88	0.04	0.31	0.00	0.09	0.73	Calculated
7	CB05-06 LINK-Maj.	CB05-06	CB05-06a	6.00	96.95	1.62	96.94	0.06	0.01	0.1700	Rectangular	0.100	6.00	0.0350	0.0130	0.0350	0.0000	0.0000	0.0000	0.00	NO	101.510	0 02:18	0.32	0.31	397.19	0.26	0.78	0.00	0.08	0.06	Calculated
8	HP_to_CB07-08	RYCB3_HP	CB07-08	30.00	97.06	0.00	96.85	1.49	0.21	0.7000	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	47.900	0 02:00	0.42	1.19	314.36	0.15	0.45	0.00	0.13	0.09	Calculated
9	HP_to_CB13-14	RYCB2_HP	CB13-14	60.00	97.25	0.00	97.06	1.26	0.19	0.3200	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	10.150	0 02:27	0.17	5.88	211.44	0.05	0.28	0.00	0.08	0.10	Calculated
10	HP_to_CB15-16	RYCB4_HP	CB15-16	5.00	96.97	0.00	96.74	1.34	0.23	4.6000	Trapezoidal	0.300	2.55	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	39.430	0 02:20	0.19	0.44	991.90	0.04	0.57	0.00	0.17	0.07	Calculated
11	HP_to_CB41-42	RYCB6_HP	CB41-42	4.00	97.26	0.00	97.08	1.19	0.18	4.5000	Triangular	0.300	1.80	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	37.550	0 02:00	0.85	0.08	446.07	0.08	0.44	0.00	0.13	0.09	Calculated
12	Link-217	CBMH	EX.CB11-12	18.99	97.20	2.14	97.10	1.20	0.10	0.5300	Rectangular	0.300	1.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	23.750	0 01:52	0.34	0.93	203.78	0.12	0.28	0.00	0.08	0.02	Calculated
13	Link-225	ECB9	RYCB 5	115.00	96.96	1.12	96.77	1.57	0.19	0.1700	Trapezoidal	0.300	2.55	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	12.620	0 02:07	0.07	27.38	187.98	0.07	0.64	0.00	0.19	0.09	Calculated
14	Romina0	EX.CB11-12	C-Romina	55.02	97.10	1.20	97.03	0.03	0.07	0.1300	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	106.270	0 01:59	0.38	2.41	2040.18	0.05	0.43	0.00	0.12	0.05	Calculated
15	Romina1	C-Romina	EX.CB7A-8A	10.20	97.03	0.03	96.99	1.50	0.04	0.3900	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	84.170	0 02:06	0.47	0.36	3581.86	0.02	0.63	0.00	0.18	0.60	Calculated
16	Romina2	EX.CB7A-8A	Romina1	33.80	96.99	1.50	97.23	0.00	-0.24	-0.7100	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		4819.77	0.00	0.35	0.00	0.10	0.00	Calculated
17	Romina3	Romina1	EX.CB7-8	33.72	97.23	0.00	97.04	1.50	0.19	0.5600	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		4293.51	0.00	0.11	0.00	0.03	0.00	Calculated
18	Romina4	EX.CB7-8	EX.CB5-6	69.49	97.04	1.50	96.77	1.50	0.27	0.3900	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	56.240	0 02:01	0.30	3.86	3565.33	0.02	0.34	0.00	0.10	0.05	Calculated
19	Romina5	EX.CB5-6	EX.CB65-66	18.54	96.77	1.50	96.74	1.49	0.03	0.1600	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	59.920	0 02:01	0.25	1.24	2300.83	0.03	0.57	0.00	0.16	0.02	Calculated
20	Romina6	Romina2	EX.CB65-66	10.00	96.82	0.00	96.74	1.49	0.08	0.8000	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	123.800	0 02:18	0.24	0.69	5115.92	0.02	0.45	0.00	0.13	0.64	Calculated
21	Romina7	Romina2	EX.CB3-4	37.67	96.82	0.00	96.66	1.50	0.16	0.4200	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	123.650	0 02:19	0.18	3.49	3727.70	0.03	0.52	0.00	0.15	0.39	Calculated
22	Romina8	Romina-Brigitta	EX.CB3-4	28.71	96.77	0.00	96.66	1.50	0.11	0.3800	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	164.180	0 02:08	0.23	2.08	3540.45	0.05	0.53	0.00	0.15	0.60	Calculated
23	Romina9	EX.CB1-2	Romina-Brigitta	17.51	96.98	1.50	96.77	0.00	0.21	1.2000	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	7.880	0 02:00	0.10	2.92	6263.91	0.00	0.18	0.00	0.05	0.01	Calculated
24	RYCB08 SWALE	RYCB08	Maj-EX.RYCB8	35.00	96.70	1.20	96.65	0.00	0.05	0.1400	Trapezoidal	0.300	2.55	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	12.530	0 02:00	0.17	3.43	174.80	0.07	0.26	0.00	0.08	0.02	Calculated
25	RYCB1 SWALE	RYCB 1	RYCB 2	118.00	97.08	1.51	96.96	1.59	0.12	0.1000	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	18.320	0 02:02	0.12	16.39	119.82	0.15	0.90	0.00	0.27	0.01	Calculated
26	RYCB16 SWALE	RYCB16	CB01-02	40.00	96.85	1.25	96.80	1.55	0.05	0.1200	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	42.660	0 02:00	0.28	2.38	132.84	0.32	0.66	0.00	0.20	0.04	Calculated
27	RYCB2SWALE_to_HP	RYCB 2	RYCB2_HP	20.00	96.96	1.59	97.25	0.00	-0.29	-1.4500	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	10.540	0 02:24	0.06	5.56	452.45	0.02	0.61	0.00	0.18	0.14	Calculated
28	RYCB3SWALE_to_HP	RYCB 3	RYCB3_HP	20.00	96.77	1.51	97.06	0.00	-0.29	-1.4500	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	49.140	0 02:00	0.21	1.59	452.45	0.11	0.70	0.00	0.21	0.09	Calculated
29	RYCB4 SWALE_to_HP	RYCB 4	RYCB4_HP	39.00	96.82	1.75	96.97	0.00	-0.15	-0.3800	Trapezoidal	0.300	2.55	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	28.160	0 02:19	0.17	3.82	286.82	0.10	0.48	0.00	0.14	0.04	Calculated
30	RYCB5SWALE	RYCB 5	RYCB 4	80.00	96.77	1.57	96.71	1.64	0.06	0.0800	Trapezoidal	0.300	2.55	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	20.450	0 02:22	0.06	22.22	126.65	0.16	0.98	0.00	0.29	0.01	Calculated
31	RYCB6 SWALE_to_HP	RYCB 6	RYCB6_HP	7.00	97.00	1.33	97.26	0.00	-0.26	-3.7100	Triangular	0.300	1.80	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	37.660	0 02:00	0.29	0.40	405.26	0.09	0.70	0.00	0.21	0.08	Calculated
32	RYCBMH07 SWALE	RYCBMH07	Romina-Brigitta	40.00	96.85	1.65	96.77	0.00	0.08	0.2000	Trapezoidal	0.300	2.30	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	26.950	0 02:01	0.30	2.22	168.03	0.16	0.37	0.00	0.11	0.04	Calculated
33	RYCBMH1 SWALE	RYCBMH 1	CB33-34	100.00	97.23	1.32	97.04	1.44	0.19	0.1900	Trapezoidal	0.400	2.90	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	53.840	0 02:02	0.30	5.56	312.78	0.17	0.45	0.00	0.18	0.05	Calculated
34	ST1-01	CB03-04	CB15-16	24.00	96.92	1.49	96.80	1.40	0.12	0.5000	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	74.100	0 02:03	0.22	1.82	2193.97	0.03	0.76	0.00	0.15	0.03	Calculated
35	ST1-02	ST1. 0+082	CB15-16	46.22	97.11	0.00	96.80	1.40	0.31	0.6700	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	39.050	0 02:13	0.09	8.56	2541.05	0.02	0.62	0.00	0.12	0.46	Calculated
36	ST1-03	ST1. 0+082	CB11-12	59.00	97.11	0.00	96.82	1.29	0.29	0.4900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	33.430	0 02:13	0.12	8.19	2175.30	0.02	0.60	0.00	0.12	0.36	Calculated
37	ST1-04	ST1. 0+173	CB11-12	32.00	97.22	0.00	96.82	1.29	0.40	1.2500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		3468.98	0.00	0.50	0.00	0.10	0.00	Calculated
38	ST1-05	ST1. 0+173	CB09-10	48.00	97.22	0.00	96.94	1.50	0.28	0.5800	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		2369.76	0.00	0.50	0.00	0.10	0.00	Calculated
39	ST1-06	ST1. 0+260	CB09-10	39.00	97.13	0.00	96.94	1.50	0.19	0.4900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	9.050	0 02:14	0.03	21.67	2165.66	0.00	0.56	0.00	0.11	0.33	Calculated
40	ST1-07	ST1. 0+260	CB07-08	39.00	97.13	0.00	96.85	1.49	0.28	0.7200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	5.730	0 02:32	0.13	5.00	2629.02	0.00	0.48	0.00	0.10	0.59	Calculated
41	ST1-08	CB03-04	CB07-08	33.00	96.92	1.49	96.85	1.49	0.07	0.2100	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	70.550	0 02:03	0.17	3.24	1429.02	0.05	0.69	0.00	0.14	0.02	Calculated
42	ST1-09	CB03-04	CB05-06	16.00	96.92	1.49	96.83	1.50	0.09	0.5600	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	85.000	0 03:20	0.40	0.67	2327.06	0.04	0.74	0.00	0.15	0.02	Calculated
43	ST1-11	ST1. 0+373	CB05-06	24.00	97.00	0.00	96.83	1.50	0.17	0.7100	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	42.560	0 02:13	0.08	5.00	2611.35	0.02	0.60	0.00	0.12	0.35	Calculated
44	ST1-12	ST1. 0+373	CB39-40	29.00	97.00	0.00	96.86	1.55	0.14	0.4800	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	43.290	0 02:12	0.08	6.04	2155.82	0.02	0.60	0.00	0.12	0.29	Calculated
45	ST1-13	ST1. 0+434	CB39-40	32.00	97.06	0.00	96.86	1.55	0.20	0.6300	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	37.390	0 02:09	0.07	7.62	2452.94	0.02	0.59	0.00	0.12	0.31	Calculated
46	ST1-14	ST1. 0+434	CB37-38	21.00	97.06	0.00	96.93	1.43	0.13	0.6200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	38.540	0 02:07	0.08	4.38	2441.23	0.02	0.57	0.00	0.11	0.31	Calculated
47	ST1-15	ST1. 0+494	CB37-38	39.00	97.12	0.00	96.93	1.43	0.19	0.4900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	15.420	0 02:06	0.04	16.25	2165.66	0.01	0.54	0.00	0.11	0.34	Calculated
48	ST1-16	ST1. 0+494	CB35-36	22.00	97.12	0.00	97.01	1.31	0.11	0.5000	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	17.590	0 02:03	0.10	3.67	2193.97	0.01	0.46	0.00	0.09	0.39	Calculated
49	ST1-17	ST1. 0+538	CB35-36	22.00	97.29	0.00	97.01	1.31	0.28	1.2700	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		3500.37	0.00	0.37	0.00	0.07	0.00	Calculated
50	ST1-18	ST1. 0+538	ST1. 0+551	13.00	97.29	0.00	97.22	0.00	0.07	0.5400	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		2276.80	0.00	0.14	0.00	0.03	0.00	Calculated
51	ST1-19	ST1. 0+551	CB31-32	25.00	97.22	0.00	97.10	1.37	0.12	0.4800	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	9.910	0 02:09	0.08	5.21	2149.65	0.00	0.58	0.00	0.12	0.39	Calculated
52	ST1-20	CB29-30	CB31-32	20.00	97.12	1.26	97.10	1.37	0.02	0.1000	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	27.890	0 01:58	0.18	1.85	981.18	0.03	0.83	0.00	0.17	0.02	Calculated
53	ST1-21	CB29-30	CB41-42	37.00	97.12	1.26	97.08	1.19	0.04	0.1100	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	100.170	0 02:02	0.18	3.43	1020.18	0.10	0.88	0.00	0.18	0.02	Calculated
54	ST1-22	CB43-44	CB41-42	35.00	97.46	1.44	97.08	1.19	0.38	1.0900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	75.830	0 02:03	0.20	2.92	3232.99	0.02	0.57	0.00	0.11	0.02	Calculated
55	ST1-23	CB51-52	CB43-44	22.00	97.53	1.50	97.46	1.44	0.07	0.3200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	19.480	0 01:58	0.35	1.05	1750.19	0.01	0.24	0.00	0.05	0.06	Calculated
56	ST1-24	ST1. 0+716	CB51-52	26.00	97.69	0.00	97.53	1.50	0.16	0.6200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		2434.00	0.00	0.11	0.00	0.02	0.00	Calculated
57	ST1-25	ST1. 0+716	CB53-54	23.00	97.69	0.00	97.44	1.50	0.25	1.0900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		3234.84	0.00	0.36	0.00	0.07	0.00	Calculated
58	ST1-26	CB55-56	CB53-54	29.00	97.54	1.58	97.44	1.50	0.10	0.3400	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	21.610	0 02:27	0.13	3.72	1822.00	0.01	0.46	0.00	0.09	0.00	Calculated
59	ST1-26a	CB57-58	CB55-56	24.48	97.59	3.45	97.54	1.58	0.05	0.2000	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	19.930	0 02:01	0.32	1.27	2384.99	0.01	0.16	0.00	0.04	0.06	Calculated
60	ST1-27	CB59-60	CB57-58	38.67	97.72	1.49	97.59	3.45	0.13	0.3400	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	3.340	0 02:00	0.08	8.06	3059.79	0.00	0.13	0.00	0.04	0.01	Calculated
61	ST1-28	ST1.	CB59-60	21.85	97.85	0.00	97.72	1.49	0.13	0.5900	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		4411.89	0.00	0.04	0.00	0.01	0.00	Calculated
62	ST1-29	ST1.	CB61-62	29.66	97.85	0.00	97.42	1.36	0.43	1.4500	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		6886.96	0.00	0.23	0.00	0.06	0.00	Calculated
63	ST1-30	CB61-62	Maj-TFD	8.56	97.42	1.36	97.50	0.00	-0.08	-0.9300	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	31.420	0 02:00	0.14	1.02	5529.52	0.01	0.30	0.00	0.08	1.06	Calculated

SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (m)	Inlet Invert Elevation (m)	Inlet Invert Offset (m)	Outlet Invert Elevation (m)	Outlet Invert Offset (m)	Total Drop (m)	Average Slope (%)	Channel Type	Channel Height (m)	Channel Width (m)	Left Overbank Manning's Roughness	Channel Manning's Roughness	Right Overbank Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (lps)	Flap Gate	Peak Flow (lps)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (m/sec)	Travel Time (min)	Design Flow Capacity (lps)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (m)	Froude Number	Reported Condition
64	ST2-01	CB29-30	CB27-28	20.14	97.12	1.26	97.04	1.45	0.08	0.4000	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	85.940	0 01:53	0.41	0.82	1955.52	0.04	0.89	0.00	0.18	0.01	Calculated
65	ST2-02	CB25-26	CB27-28	37.41	97.35	1.48	97.04	1.45	0.31	0.8300	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.920	0 02:03	0.00		2824.45	0.00	0.53	0.00	0.11	0.00	Calculated
66	ST2-03	CB25-26	CB63-64	29.31	97.35	1.48	97.25	1.19	0.10	0.3400	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	76.740	0 02:24	0.32	1.53	1812.34	0.04	0.43	0.00	0.06	0.00	Calculated
67	ST2-04	ST2. 0+119	CB63-64	13.33	97.55	0.00	97.25	1.19	0.30	2.2500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		4654.71	0.00	0.28	0.00	0.06	0.00	Calculated
68	ST2-05	ST2. 0+119	CB49-50	25.46	97.55	0.00	97.44	1.34	0.11	0.4300	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		2039.45	0.00	0.26	0.00	0.05	0.00	Calculated
69	ST2-06	ST2. 0+171	CB49-50	24.76	97.75	0.00	97.44	1.34	0.31	1.2500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.060	0 02:01	0.07	5.90	3471.78	0.00	0.27	0.00	0.05	0.76	Calculated
70	ST2-07	ST2. 0+171	CB47-48	27.01	97.75	0.00	97.57	1.50	0.18	0.6700	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	4.370	0 02:01	0.01	45.02	2532.91	0.00	0.46	0.00	0.09	0.40	Calculated
71	ST2-08	ST2. 0+225	CB47-48	26.84	97.69	0.00	97.57	1.50	0.12	0.4500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	73.800	0 02:00	0.13	3.44	2074.66	0.04	0.59	0.00	0.12	0.21	Calculated
72	ST2-09	ST2. 0+225	CB45-46	23.12	97.69	0.00	97.40	1.50	0.29	1.2500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	73.010	0 02:02	0.35	1.10	3474.98	0.02	0.46	0.00	0.09	0.53	Calculated
73	ST2-10	CB43-44	CB45-46	17.28	97.46	1.44	97.40	1.50	0.06	0.3500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	60.660	0 02:04	0.25	1.15	1828.31	0.03	0.48	0.00	0.09	0.04	Calculated
74	ST3-01	ST3. 0+024	CB25-26	9.76	97.48	0.00	97.32	1.45	0.16	1.6400	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.090	0 02:04	0.02	8.13	3972.66	0.00	0.11	0.00	0.02	0.27	Calculated
75	ST3-02	ST3. 0+024	CB23-24	13.93	97.48	0.00	97.33	1.55	0.15	1.0800	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	1.580	0 02:01	0.01	23.22	3219.71	0.00	0.39	0.00	0.08	0.10	Calculated
76	ST3-03	ST3. 0+068	CB23-24	21.03	97.44	0.00	97.33	1.55	0.11	0.5200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	25.730	0 02:01	0.12	2.92	2244.00	0.01	0.49	0.00	0.09	0.36	Calculated
77	ST3-04	ST3. 0+068	CB21-22	36.55	97.44	0.00	97.24	1.55	0.20	0.5500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	23.790	0 02:04	0.06	10.15	2295.19	0.01	0.56	0.00	0.11	0.33	Calculated
78	ST3-05	ST3. 0+125	CB21-22	27.36	97.38	0.00	97.24	1.55	0.14	0.5100	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	33.250	0 02:08	0.08	5.70	2219.49	0.01	0.58	0.00	0.12	0.31	Calculated
79	ST3-06	ST3. 0+125	CB19-20	29.80	97.38	0.00	97.19	1.50	0.19	0.6400	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	31.570	0 02:10	0.09	5.52	2477.51	0.01	0.57	0.00	0.12	0.37	Calculated
80	ST3-07	ST3. 0+180	CB19-20	28.98	97.32	0.00	97.19	1.50	0.13	0.4500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	54.380	0 02:07	0.10	4.83	2078.11	0.03	0.59	0.00	0.12	0.27	Calculated
81	ST3-08	ST3. 0+180	CB17-18	24.51	97.32	0.00	97.11	1.50	0.21	0.8600	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	53.730	0 02:09	0.08	5.11	2872.00	0.02	0.63	0.00	0.13	0.40	Calculated
82	ST3-09	ST3. 0+234	CB17-18	26.66	97.26	0.00	97.11	1.50	0.15	0.5600	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	69.620	0 02:09	0.10	4.44	2327.35	0.03	0.64	0.00	0.13	0.28	Calculated
83	ST3-10	ST3. 0+234	CB13-14	26.90	97.26	0.00	97.02	1.22	0.24	0.8900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	68.290	0 02:10	0.17	2.64	2930.73	0.02	0.52	0.00	0.10	0.38	Calculated
84	ST3-11	ST1. 0+082	CB13-14	10.30	97.11	0.00	97.02	1.22	0.09	0.8700	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	74.000	0 02:11	0.20	0.86	2900.34	0.03	0.50	0.00	0.10	0.65	Calculated
85	STA-01	ST1. 1+050	EX.CB65-66	35.00	96.94	0.00	96.77	1.52	0.17	0.4900	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	111.020	0 02:21	0.24	2.43	2162.41	0.05	0.54	0.00	0.11	0.37	Calculated
86	STA-02	ST1. 1+050	CB01-02	18.61	96.94	0.00	96.80	1.55	0.14	0.7500	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	111.450	0 02:20	0.14	2.22	2691.15	0.04	0.69	0.00	0.14	0.37	Calculated
87	STA-03	CB05-06a	CB01-02	35.67	96.88	0.00	96.80	1.55	0.08	0.2200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	99.560	0 02:19	0.09	6.61	1469.40	0.07	0.85	0.00	0.17	0.31	Calculated
88	STC-01	ST1. 0+538	CB33-34	30.63	97.29	0.00	97.04	1.44	0.25	0.8200	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	0.000	0 00:00	0.00		2803.13	0.00	0.49	0.00	0.10	0.00	Calculated
89	STC-02	110	CB33-34	21.03	97.18	0.00	97.04	1.44	0.14	0.6700	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	50.280	0 02:09	0.09	3.89	2531.58	0.02	0.63	0.00	0.13	0.45	Calculated
90	STC-03	110	C-Romina	38.97	97.18	0.00	97.00	0.00	0.18	0.4600	User-Defined	0.200	18.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	49.320	0 02:12	0.09	7.22	2108.71	0.02	0.60	0.00	0.12	0.02	Calculated
91	STC-04	Maj-STR.C	C-Romina	18.34	97.12	0.00	97.03	0.03	0.09	0.4900	User-Defined	0.280	20.00	0.0350	0.0350	0.0350	0.0000	0.0000	0.0000	0.00	NO	56.530	0 02:16	0.15	2.04	4006.83	0.01	0.38	0.00	0.11	0.31	Calculated

SN	Element ID	From (Inlet) Node	To (Outlet) Node	From (Inlet) Node Invert Elevation (m)	To (Outlet) Node Invert Elevation (m)	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (mm)	Orifice Invert Elevation (m)	Orifice Invert Offset (m)	Orifice Coefficient	Peak Flow (lps)	Time of Peak Flow Occurrence (days hh:mm)
Block 14 Orifices														
13	OCB100	CB100	200 (STM)	96.17	94.98	SIDE	CIRCULAR	NO	83.00	96.17	0.00	0.6140	19.350	0 01:58
14	OCB101	CB101	202 (STM)	96.16	94.77	SIDE	CIRCULAR	NO	83.00	96.16	0.00	0.6140	19.670	0 02:04
15	OCB102	CB102	204 (STM)	96.31	94.46	SIDE	CIRCULAR	NO	83.00	96.31	0.00	0.6140	18.790	0 02:04
16	OCB103	CB103	204 (STM)	96.14	94.46	SIDE	CIRCULAR	NO	83.00	96.14	0.00	0.6140	19.610	0 02:04
17	OCB104	CB104	210 (STM)	96.12	94.81	SIDE	CIRCULAR	NO	83.00	96.12	0.00	0.6140	18.760	0 02:01
Bridlewood Trails - Phase 2 Orifices														
1	EX.OCB01-02	EX.CB1-2	EX.100 (STM)	95.48	94.35	SIDE	CIRCULAR	NO	83.00	95.48	0.00	0.6140	17.920	0 02:00
2	EX.OCB03-04	EX.CB3-4	EX.104 (STM)	95.16	93.78	SIDE	CIRCULAR	NO	83.00	95.16	0.00	0.6140	18.890	0 02:36
3	EX.OCB05-06	EX.CB5-6	EX.106A (STM)	95.27	94.24	SIDE	CIRCULAR	NO	83.00	95.27	0.00	0.6140	18.630	0 02:19
4	EX.OCB07-08	EX.CB7-8	EX.106 (STM)	95.54	93.97	SIDE	CIRCULAR	NO	83.00	95.54	0.00	0.6140	18.150	0 02:01
5	EX.OCB07A-08A	EX.CB7A-8A	EX.108 (STM)	95.49	94.62	SIDE	CIRCULAR	NO	83.00	95.49	0.00	0.6140	18.950	0 02:17
6	EX.OCB11-12	EX.CB11-12	EX.114 (STM)	95.90	94.95	SIDE	CIRCULAR	NO	83.00	95.90	0.00	0.6140	16.490	0 01:59
7	EX.OCB65-66	EX.CB65-66	EX.104 (STM)	95.25	93.78	SIDE	CIRCULAR	NO	83.00	95.25	0.00	0.6140	18.740	0 02:19
8	OCB01-02	CB01-02	122 (STM)	95.25	94.06	SIDE	CIRCULAR	NO	55.00	95.25	0.00	0.6140	8.510	0 02:35
9	OCB03-04	CB03-04	120 (STM)	95.43	94.16	SIDE	CIRCULAR	NO	55.00	95.43	0.00	0.6140	8.090	0 02:20
10	OCB05-06	CB05-06	120 (STM)	95.33	94.16	SIDE	CIRCULAR	NO	55.00	95.33	0.00	0.6140	8.340	0 02:22
11	OCB07-08	CB07-08	118 (STM)	95.36	94.34	SIDE	CIRCULAR	NO	83.00	95.36	0.00	0.6140	18.740	0 02:21
12	OCB09-10	CB09-10	114 (STM)	95.44	94.78	SIDE	CIRCULAR	NO	55.00	95.44	0.00	0.6140	8.390	0 02:33
18	OCB11-12	CB11-12	112 (STM)	95.53	94.61	SIDE	CIRCULAR	NO	83.00	95.53	0.00	0.6140	17.800	0 02:37
19	OCB13-14	CB13-14	106 (STM)	95.80	94.40	SIDE	CIRCULAR	NO	55.00	95.80	0.00	0.6140	7.500	0 02:11
20	OCB15-16	CB15-16	106a	95.40	94.18	SIDE	CIRCULAR	NO	83.00	95.25	-0.15	0.6140	18.510	0 02:20
21	OCB17-18	CB17-18	104 (STM)	95.61	94.28	SIDE	CIRCULAR	NO	83.00	95.61	0.00	0.6140	19.020	0 02:09
22	OCB19-20	CB19-20	102 (STM)	95.69	94.52	SIDE	CIRCULAR	NO	83.00	95.69	0.00	0.6140	18.880	0 02:08
23	OCB21-22	CB21-22	100a	95.69	94.72	SIDE	CIRCULAR	NO	83.00	95.69	0.00	0.6140	19.160	0 02:10
24	OCB23-24	CB23-24	100 (STM)	95.78	94.80	SIDE	CIRCULAR	NO	83.00	95.78	0.00	0.6140	18.980	0 02:04
25	OCB25-26	CB25-26	100 (STM)	95.87	94.80	SIDE	CIRCULAR	NO	55.00	95.87	0.00	0.6140	7.820	0 02:03
26	OCB27-28	CB27-28	146a	95.59	95.03	SIDE	CIRCULAR	NO	83.00	95.59	0.00	0.6140	18.860	0 02:27
27	OCB29-30	CB29-30	128 (STM)	95.86	94.95	SIDE	CIRCULAR	NO	83.00	95.86	0.00	0.6140	17.260	0 02:19
28	OCB31-32	CB31-32	128 (STM)	95.73	94.95	SIDE	CIRCULAR	NO	83.00	95.73	0.00	0.6140	18.060	0 02:18
29	OCB33-34	CB33-34	126 (STM)	95.60	94.69	SIDE	CIRCULAR	NO	83.00	95.60	0.00	0.6140	18.600	0 02:11
30	OCB35-36	CB35-36	124a	95.70	94.52	SIDE	CIRCULAR	NO	83.00	95.70	0.00	0.6140	17.510	0 02:05
31	OCB37-38	CB37-38	124 (STM)	95.50	94.31	SIDE	CIRCULAR	NO	83.00	95.50	0.00	0.6140	18.440	0 02:09
32	OCB39-40	CB39-40	122 (STM)	95.31	94.06	SIDE	CIRCULAR	NO	83.00	95.31	0.00	0.6140	19.190	0 02:12
33	OCB41-42	CB41-42	130 (STM)	95.89	95.03	SIDE	CIRCULAR	NO	83.00	95.89	0.00	0.6140	17.070	0 02:19
34	OCB43-44	CB43-44	132 (STM)	96.02	95.06	SIDE	CIRCULAR	NO	83.00	96.02	0.00	0.6140	17.750	0 02:03
35	OCB45-46	CB45-46	142 (STM)	95.90	94.94	SIDE	CIRCULAR	NO	83.00	95.90	0.00	0.6140	18.570	0 02:04
36	OCB47-48	CB47-48	144 (STM)	96.07	95.22	SIDE	CIRCULAR	NO	83.00	96.07	0.00	0.6140	18.860	0 02:02
37	OCB49-50	CB49-50	150 (STM)	96.10	95.09	SIDE	CIRCULAR	NO	83.00	96.10	0.00	0.6140	17.440	0 02:08

SN	Element ID	From (Inlet) Node	To (Outlet) Node	From (Inlet) Node Invert Elevation (m)	To (Outlet) Node Invert Elevation (m)	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (mm)	Orifice Invert Elevation (m)	Orifice Invert Offset (m)	Orifice Coefficient	Peak Flow (lps)	Time of Peak Flow Occurrence (days hh:mm)
38	OCB51-52	CB51-52	134 (STM)	96.03	94.83	SIDE	CIRCULAR	NO	83.00	96.03	0.00	0.6140	18.030	0 01:57
39	OCB53-54	CB53-54	138 (STM)	95.94	95.34	SIDE	CIRCULAR	NO	83.00	95.94	0.00	0.6140	18.620	0 02:07
40	OCB55-56	CB55-56	138 (STM)	95.96	95.34	SIDE	CIRCULAR	NO	55.00	95.96	0.00	0.6140	8.170	0 02:09
41	OCB57-58	CB57-58	140 (STM)	94.14	95.59	SIDE	CIRCULAR	NO	83.00	94.06	-0.08	0.6140	18.390	0 02:01
42	OCB59-60	CB59-60	140 (STM)	96.23	95.59	SIDE	CIRCULAR	NO	83.00	96.23	0.00	0.6140	17.850	0 02:00
43	OCB61-62	CB61-62	Min-CB61-62	96.06	96.11	SIDE	CIRCULAR	NO	83.00	96.06	0.00	0.6140	17.650	0 02:00
44	OCB63-64	CB63-64	146 (STM)	96.06	95.19	SIDE	CIRCULAR	NO	55.00	96.06	0.00	0.6140	7.300	0 02:08
45	OCBMH-Park	CBMH	EX.114 (STM)	95.06	94.95	SIDE	CIRCULAR	NO	152.00	95.06	0.00	0.6140	66.910	0 01:50
46	ORYCB01	RYCB 1	100a	95.57	94.72	SIDE	CIRCULAR	NO	55.00	95.57	0.00	0.6140	8.480	0 02:27
47	ORYCB02	RYCB 2	104 (STM)	95.37	94.28	SIDE	CIRCULAR	NO	55.00	95.37	0.00	0.6140	8.960	0 02:27
48	ORYCB03	RYCB 3	106a	95.26	94.18	SIDE	CIRCULAR	NO	55.00	95.26	0.00	0.6140	8.910	0 01:56
49	ORYCB04	RYCB 4	122 (STM)	95.07	94.06	SIDE	CIRCULAR	NO	83.00	95.07	0.00	0.6140	19.520	0 02:50
50	ORYCB05	RYCB 5	124 (STM)	95.20	94.31	SIDE	CIRCULAR	NO	83.00	95.20	0.00	0.6140	19.500	0 02:48
51	ORYCB06	RYCB 6	130 (STM)	95.67	95.03	SIDE	CIRCULAR	NO	83.00	95.67	0.00	0.6140	19.010	0 01:53
52	ORYCB08	RYCB08	EX.108 (STM)	95.50	94.62	SIDE	CIRCULAR	NO	83.00	95.50	0.00	0.6140	16.360	0 02:00
53	ORYCB16	RYCB16	EX.CB5-6	95.60	95.27	SIDE	CIRCULAR	NO	55.00	95.60	0.00	0.6140	7.300	0 03:30
54	ORYCBMH01	RYCBMH 1	EX.106 (STM)	95.91	93.97	SIDE	CIRCULAR	NO	55.00	95.91	0.00	0.6140	7.840	0 02:00
55	ORYCBMH07	RYCBMH07	EX.102 (STM)	95.20	93.57	SIDE	CIRCULAR	NO	83.00	95.20	0.00	0.6140	19.460	0 02:00

SN	Element ID	From (Inlet) Node	To (Outlet) Node	From (Inlet) Node Invert Elevation (m)	To (Outlet) Node Invert Elevation (m)	Type	Flap Gate	Crest Elevation (m)	Crest Offset (m)	Length (m)	Weir Total Height (m)	Discharge Coefficient	Peak Flow (lps)
1	126-124a	126 (STM)	126a (STM)	94.69	94.68	RECTANGULAR	NO	95.40	0.71	1.20	1.00	1.84	57.33

SN	Element ID	Invert Elevation (m)	Max (Rim) Elevation (m)	Max (Rim) Offset (m)	Initial Water Elevation (m)	Initial Water Depth (m)	Ponded Area (m^2)	Evaporation Loss	Peak Inflow (lps)	Peak Lateral Inflow (lps)	Peak Outflow (lps)	Peak Exfiltration Flow Rate (cmm)	Maximum HGL Elevation Attained (m)	Maximum HGL Depth Attained (m)	Average HGL Elevation Attained (m)	Average HGL Depth Attained (m)	Time of Maximum HGL Occurrence (days hh:mm)	Total Exfiltration Volume (1000-m^3)	Total Flooded Volume (ha-mm)	Total Time Flooded (minutes)	Total Retention Time (seconds)
Block 14 Catchbasins																					
1	CB100	96.17	98.17	2.00	96.17	0.00	0.00	0.00	35.23	35.23	19.35	0.00	97.94	1.77	96.42	0.25	0 01:58	0.00	0.00	0.00	0.00
2	CB101	96.16	98.16	2.00	96.16	0.00	0.00	0.00	53.43	53.43	19.67	0.00	97.99	1.83	96.59	0.43	0 02:04	0.00	0.00	0.00	0.00
3	CB102	96.31	98.15	1.84	96.31	0.00	0.00	0.00	42.83	42.83	18.79	0.00	97.98	1.67	96.65	0.34	0 02:03	0.00	0.00	0.00	0.00
4	CB103	96.14	98.14	2.00	96.14	0.00	0.00	0.00	52.74	52.74	19.61	0.00	97.96	1.82	96.57	0.43	0 02:04	0.00	0.00	0.00	0.00
5	CB104	96.12	97.89	1.77	96.12	0.00	0.00	0.00	41.98	41.98	18.76	0.00	97.79	1.67	96.43	0.31	0 02:01	0.00	0.00	0.00	0.00

SN	Element ID	Description	Invert Elevation	Boundary Type	Flap Gate	Fixed Water Elevation	Peak Inflow	Peak Lateral Inflow	Maximum HGL Depth Attained	Maximum HGL Elevation Attained
			(m)			(m)	(lps)	(lps)	(m)	(m)
1	BLOCK14 - HEADWALL		94.60	NORMAL	NO		96.14	0.00	0.34	94.94
2	DITCH		0.00	NORMAL	NO		14.27	14.27	0.00	0.00
3	Maj-Brigitta		96.64	NORMAL	NO		185.64	0.00	0.09	96.73
4	Maj-EX.RYCB8		96.65	NORMAL	NO		12.53	0.00	0.08	96.73
5	Maj-STR.C		97.12	NORMAL	NO		56.59	0.00	0.06	97.18
6	Maj-TFD		97.50	NORMAL	NO		31.42	0.00	0.04	97.54
7	Min-Brigitta	100yr=95.02	93.83	FIXED	NO	95.02	494.09	0.00	1.19	95.02
8	Min-CB61-62		96.11	NORMAL	NO		17.65	0.00	0.00	96.11
9	Min-STR.C	100yr=95.12	94.37	FIXED	NO	95.12	291.69	0.00	0.75	95.12

SN	Element ID	Data Source	Data Source ID	Rainfall Type	Rain Units	Return Period (years)	Rainfall Depth (mm)	Rainfall Distribution
1	1	Time Series	C100-4	Cumulative	mm		0	

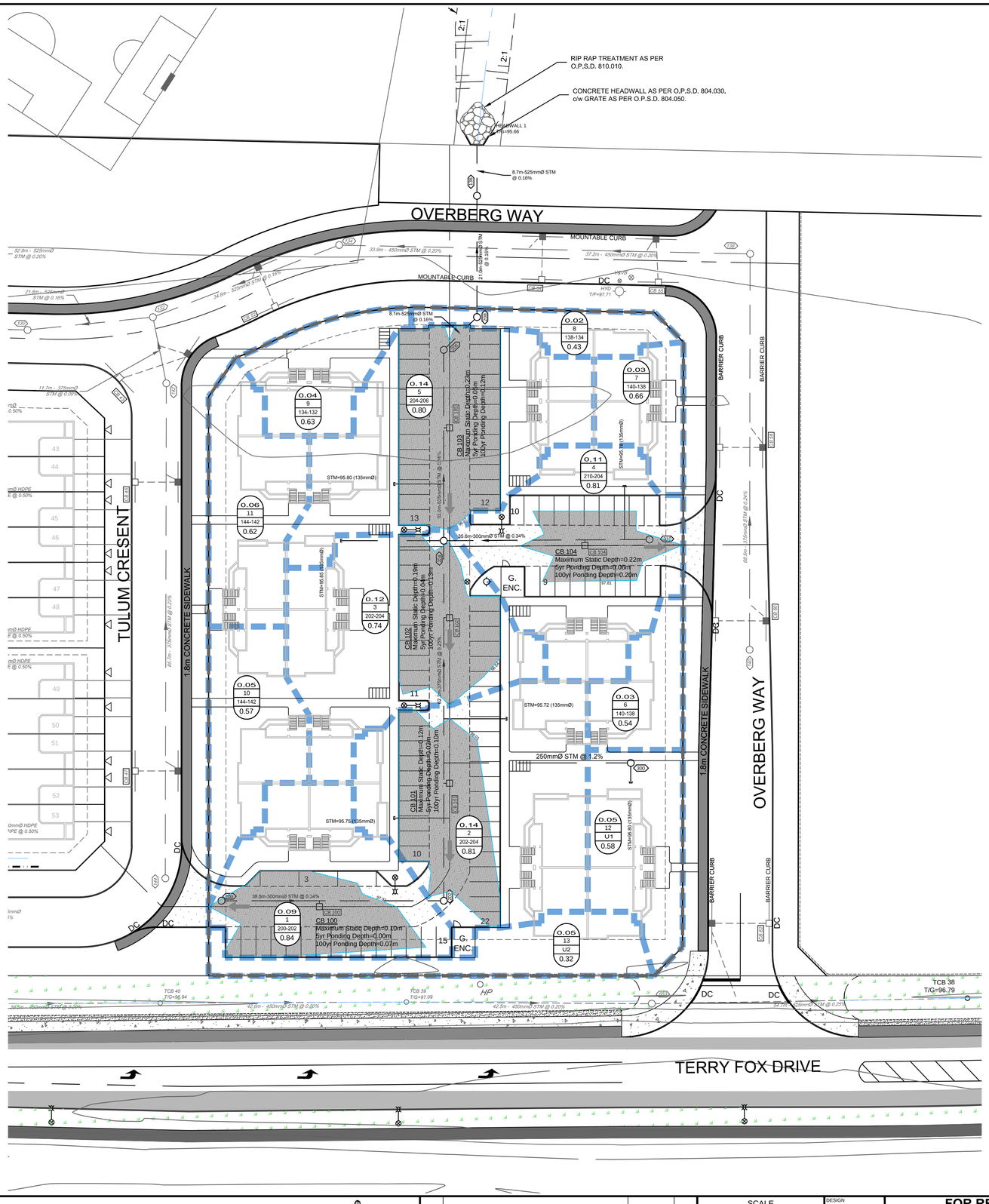
SN	Element ID	Area (ha)	Drainage Node ID	Max Infiltration Rate (mm/hr)	Min Infiltration Rate (mm/hr)	Drying Time (days)	Decay Constant (1/hrs)	Average Slope (%)	Equivalent Width (m)	Impervious Area (%)	Impervious Area No Depression (%)	Impervious Area Depression Depth (mm)	Impervious Area Manning's Roughness	Pervious Area Depression Depth (mm)	Pervious Area Manning's Roughness	Rain Gage ID	Total Precipitation (mm)	Total Runon (mm)	Total Evaporation (mm)	Total Infiltration (mm)	Total Runoff (mm)	Peak Runoff (lps)	Time of Concentration (days hh:mm:ss)
Block 14 Subbasins																							
37	BLOCK14-01	0.09	CB100	76.2000	13.2000	7.00	4.1400	1.0000	22.50	79.00	32.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	9.8320	66.47	35.25	0 00:18:24
38	BLOCK14-02	0.14	CB101	76.2000	13.2000	7.00	4.1400	1.0000	41.20	77.00	31.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	10.7470	65.63	53.46	0 00:17:18
39	BLOCK14-03	0.12	CB102	76.2000	13.2000	7.00	4.1400	1.0000	41.00	72.00	29.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	13.1000	63.49	42.85	0 00:17:07
40	BLOCK14-04	0.11	CB104	76.2000	13.2000	7.00	4.1400	1.0000	28.20	77.00	31.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	10.7890	65.58	42.00	0 00:18:47
41	BLOCK14-05	0.14	CB103	76.2000	13.2000	7.00	4.1400	1.0000	40.00	76.00	30.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	11.2370	65.17	52.77	0 00:17:54
42	BLOCK14-06	0.03	CB59-60	76.2000	13.2000	7.00	4.1400	1.0000	18.80	58.00	23.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	19.5540	57.78	8.63	0 00:14:05
43	BLOCK14-07	0.03	CB57-58	76.2000	13.2000	7.00	4.1400	1.0000	20.00	66.00	26.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	15.7480	61.19	9.82	0 00:12:25
44	BLOCK14-08	0.02	CB53-54	76.2000	13.2000	7.00	4.1400	1.0000	25.00	50.00	20.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	23.1100	54.67	5.55	0 00:10:01
45	BLOCK14-09	0.04	CB51-52	76.2000	13.2000	7.00	4.1400	1.0000	20.00	64.00	26.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	16.7880	60.22	12.70	0 00:15:07
46	BLOCK14-10	0.06	CB45-46	76.2000	13.2000	7.00	4.1400	1.0000	35.30	60.00	24.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	18.6290	58.60	17.86	0 00:14:20
47	BLOCK14-11	0.06	CB47-48	76.2000	13.2000	7.00	4.1400	1.0000	35.30	63.00	25.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	17.2030	59.88	18.75	0 00:13:52
48	BLOCK14-12	0.05	CB61-62	76.2000	13.2000	7.00	4.1400	1.0000	31.30	61.00	24.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	18.1290	59.06	15.13	0 00:13:39
49	BLOCK14-13	0.05	DITCH	76.2000	13.2000	7.00	4.1400	1.0000	50.00	42.00	17.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	26.9240	51.29	14.27	0 00:12:12
Bridlewood Trails - Phase 2 Subbasins																							
1	0	0.11	CB49-50	76.2000	13.2000	7.00	4.1400	1.1000	21.40	50.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	30.0660	46.77	30.16	0 00:29:45
2	01-A	0.24	CB21-22	76.2000	13.2000	7.00	4.1400	0.5000	42.90	55.00	35.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.3370	48.60	64.68	0 00:37:54
3	01-B	0.19	CB23-24	76.2000	13.2000	7.00	4.1400	0.5000	43.20	56.00	35.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	27.5160	49.47	55.20	0 00:32:30
4	01-C	0.22	RYCB 1	76.2000	13.2000	7.00	4.1400	0.5000	16.20	47.00	27.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	34.9640	41.57	32.08	0 01:09:12
5	2	0.24	CB19-20	76.2000	13.2000	7.00	4.1400	0.5000	43.20	73.00	33.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	18.5480	58.24	88.72	0 00:30:30
6	03-A	0.23	CB17-18	76.2000	13.2000	7.00	4.1400	0.5000	43.40	55.00	34.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.2550	48.68	62.90	0 00:36:42
7	03-B	0.16	RYCB 2	76.2000	13.2000	7.00	4.1400	0.5000	15.80	44.00	46.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	35.4870	41.20	26.10	0 00:59:24
8	4	0.18	CB11-12	76.2000	13.2000	7.00	4.1400	0.5000	25.30	51.00	7.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	30.7420	45.88	41.04	0 00:45:24
9	05-A	0.24	RYCB 3	76.2000	13.2000	7.00	4.1400	1.5000	27.20	48.00	48.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	31.7010	45.32	58.11	0 00:38:07
10	05-B	0.08	CB03-04	76.2000	13.2000	7.00	4.1400	0.6700	22.20	82.00	45.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	12.7970	63.27	33.98	0 00:18:21
11	05-C	0.13	CB15-16	76.2000	13.2000	7.00	4.1400	0.5000	36.10	54.00	6.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.2170	48.59	37.80	0 00:29:22
12	05-D	0.13	CB13-14	76.2000	13.2000	7.00	4.1400	1.5000	37.10	57.00	27.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	26.4420	50.52	41.70	0 00:20:12
13	6	0.25	CB09-10	76.2000	13.2000	7.00	4.1400	0.5000	28.90	54.00	24.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	29.6520	47.07	56.19	0 00:49:42
14	7	0.27	CB07-08	76.2000	13.2000	7.00	4.1400	0.5000	34.60	50.00	19.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	31.4860	45.17	57.94	0 00:48:25
15	8	0.11	CB05-06	76.2000	13.2000	7.00	4.1400	0.5000	30.00	79.00	35.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	14.7290	61.54	45.15	0 00:21:30
16	09-A	0.27	CB37-38	76.2000	13.2000	7.00	4.1400	0.5000	43.50	54.00	35.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	29.0250	47.88	69.12	0 00:40:44
17	09-B	0.16	CB35-36	76.2000	13.2000	7.00	4.1400	0.5000	40.00	59.00	36.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	25.9120	51.08	49.65	0 00:29:48
18	09-C	0.41	RYCB 5	76.2000	13.2000	7.00	4.1400	0.5000	30.10	48.00	48.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	34.4830	42.23	61.41	0 01:08:46
19	10-A	0.23	CB39-40	76.2000	13.2000	7.00	4.1400	0.6500	38.30	54.00	33.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.7540	48.17	61.81	0 00:36:54
20	10-B	0.29	RYCB 4	76.2000	13.2000	7.00	4.1400	0.6500	30.50	50.00	50.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	31.7710	45.10	60.52	0 00:50:23
21	11-A	0.12	EX.CB65-66	76.2000	13.2000	7.00	4.1400	0.5200	26.70	42.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	34.0430	42.73	27.02	0 00:36:36
22	11-B	0.09	CB01-02	76.2000	13.2000	7.00	4.1400	0.5200	25.70	47.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	31.3880	45.48	23.53	0 00:30:19
23	12-A	0.12	CB57-58	76.2000	13.2000	7.00	4.1400	0.5000	18.80	54.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.9710	47.65	30.35	0 00:41:25
24	12-B	0.05	CB59-60	76.2000	13.2000	7.00	4.1400	0.5000	21.40	52.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.7880	48.09	14.84	0 00:23:04
25	12-C	0.12	CB61-62	76.2000	13.2000	7.00	4.1400	0.5000	24.00	64.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	23.3530	53.27	38.94	0 00:32:15
26	13	0.10	CB53-54	76.2000	13.2000	7.00	4.1400	0.5000	17.80	69.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	20.7450	55.85	34.61	0 00:32:30
27	14	0.11	CB51-52	76.2000	13.2000	7.00	4.1400	0.5000	41.60	42.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	33.2240	43.85	27.73	0 00:26:56
28	15	0.24	CB47-48	76.2000	13.2000	7.00	4.1400	0.5000	28.90	79.00	25.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	15.1550	61.70	92.47	0 00:35:07
29	16	0.07	CB43-44	76.2000	13.2000	7.00	4.1400	0.5000	27.90	73.00	11.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	18.0480	57.98	27.11	0 00:18:56
30	17-A	0.39	CB41-42	76.2000	13.2000	7.00	4.1400	0.5000	45.10	29.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	42.4720	33.94	48.78	0 00:59:43
31	17-B	0.23	RYCB 6	76.2000	13.2000	7.00	4.1400	1.5900	30.70	46.00	46.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	32.2910	44.81	56.65	0 00:34:30
32	18-A	0.25	CB27-28	76.2000	13.2000	7.00	4.1400	0.7100	35.20	49.00	16.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	31.3910	45.33	58.49	0 00:41:32

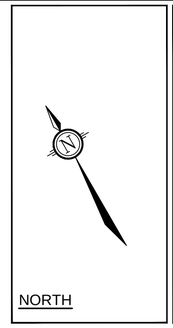
SN	Element ID	Area (ha)	Drainage Node ID	Max Infiltration Rate (mm/hr)	Min Infiltration Rate (mm/hr)	Drying Time (days)	Decay Constant (1/hrs)	Average Slope (%)	Equivalent Width (m)	Impervious Area (%)	Impervious Area No Depression (%)	Impervious Area Depression Depth (mm)	Impervious Area Manning's Roughness	Pervious Area Depression Depth (mm)	Pervious Area Manning's Roughness	Rain Gage ID	Total Precipitation (mm)	Total Runon (mm)	Total Evaporation (mm)	Total Infiltration (mm)	Total Runoff (mm)	Peak Runoff (lps)	Time of Concentration (days hh:mm:ss)
33	18-B	0.06	CB63-64	76.2000	13.2000	7.00	4.1400	0.7100	22.20	48.00	23.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	30.6060	46.55	16.87	0 00:23:27
34	18-C	0.05	CB25-26	76.2000	13.2000	7.00	4.1400	0.7100	14.30	36.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	35.9390	41.21	11.23	0 00:29:54
35	19	0.16	CB31-32	76.2000	13.2000	7.00	4.1400	0.5000	27.80	73.00	33.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	18.5750	58.24	58.90	0 00:31:10
36	20	0.25	CB33-34	76.2000	13.2000	7.00	4.1400	0.5000	31.30	38.00	5.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	37.6080	38.87	40.30	0 00:53:48
50	PH1-A	0.08	EX.CB1-2	76.2000	13.2000	7.00	4.1400	0.5000	41.20	58.00	11.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	25.8610	50.87	26.03	0 00:19:30
51	PH1-B	0.54	EX.CB3-4	76.2000	13.2000	7.00	4.1400	0.5000	88.50	54.00	7.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.9110	47.77	138.71	0 00:40:19
52	PH1-C	0.30	RYCBMH07	76.2000	13.2000	7.00	4.1400	0.5000	34.50	39.00	36.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	37.5010	39.13	47.36	0 00:56:13
53	PH1-D	0.18	EX.CB5-6	76.2000	13.2000	7.00	4.1400	0.5000	33.30	54.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	28.6940	47.96	47.92	0 00:37:29
54	PH1-E	0.22	RYCB16	76.2000	13.2000	7.00	4.1400	0.5000	39.30	43.00	44.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	34.2210	42.69	46.71	0 00:41:56
55	PH1-F	0.13	RYCB08	76.2000	13.2000	7.00	4.1400	0.5000	27.70	44.00	45.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	33.3810	43.63	29.91	0 00:37:27
56	PH1-G	0.39	EX.CB7-8	76.2000	13.2000	7.00	4.1400	0.5000	41.10	51.00	15.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	31.4640	45.13	77.95	0 00:53:58
57	PH1-H	0.36	RYCBMH 1	76.2000	13.2000	7.00	4.1400	0.5000	40.00	43.00	43.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	35.5730	41.12	61.30	0 00:55:46
58	PH1-I	0.39	EX.CB11-12	76.2000	13.2000	7.00	4.1400	0.5000	47.00	57.00	16.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	27.8860	48.83	95.66	0 00:47:07
59	PH1-PARK	0.73	CBMH	76.2000	13.2000	7.00	4.1400	0.5000	196.90	7.00	0.00	1.5700	0.0130	4.6700	0.2500	1	76.02	0.00	0.0000	48.7410	28.54	89.84	0 00:39:49

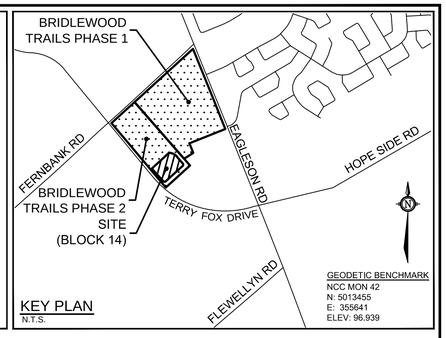
Appendix C

Drawings

Storm Drainage Area Plan	*114013-STM*
Stormwater Management & Ponding Plan	*114013-SWM*
Plan & Profile Drawings	*114013-PR1* *114013-PR2*
Offsite Plan & Profile	*114013-PR-OS*
General Plan of Services	*114013-GP*
Grading Plan	*114013-GR*
Notes and Legends Drawing	*114013-NL*







KEY PLAN
N.T.S.

LEGEND

- PROPOSED STORM MH & SEWER WITH DIRECTION OF FLOW
- PROPOSED CATCH BASIN
- PROPERTY LINE
- DRAINAGE AREA BOUNDARY
- MAJOR OVERLAND FLOW ROUTE
- PONDING - 1:100 YEAR & 1:5 YEAR EVENT
- DRAINAGE AREA (hectares)
- AREA IDENTIFICATION
- MANHOLE TO MANHOLE
- RUN-OFF COEFFICIENT

REFER TO 114013-NL FOR ADDITIONAL NOTES

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

CLARIDGE CONDOS
210 Gladstone Avenue, Suite 2001
Ottawa, Ontario K2P OY6
Tel : (613) 233 6030
Fax : (613) 233 8290

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	SEPT 17/14	JAG

SCALE
1:400
1:400
0 4 8 12 16

DESIGN JAG/SAZ
CHECKED DDB
DRAWN RBG
CHECKED JAG
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D.D. BLAIR
100122737
Sept. 17/2014
PROVINCE OF ONTARIO

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

LOCATION
CITY of OTTAWA
BLOCK 14 (BRIDLEWOOD TRAILS PHASE 2)

DRAWING NAME
STORM DRAINAGE AREAS PLAN

PROJECT No. 114013
REV REV # 1
DRAWING No. 114013-STM

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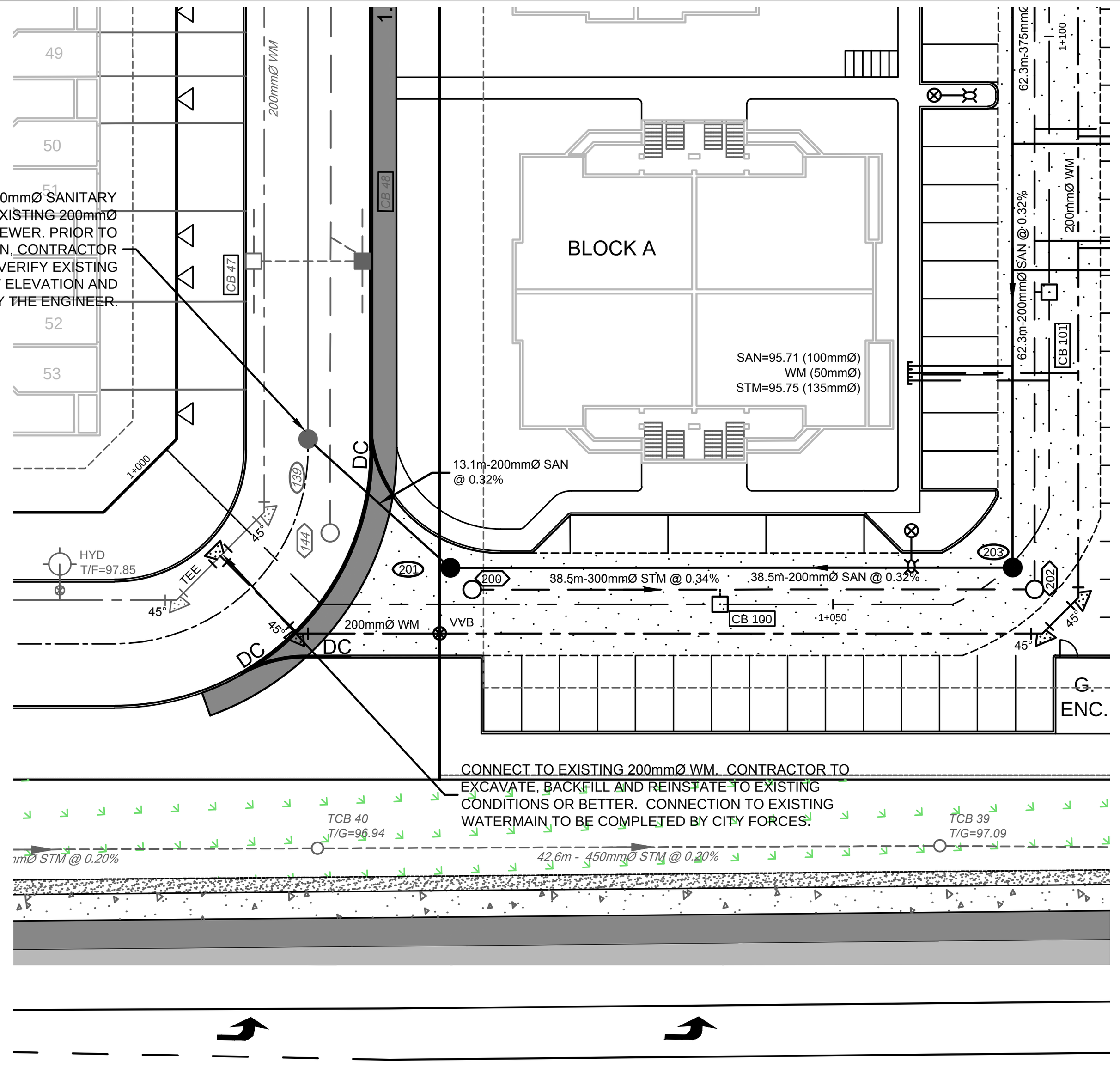
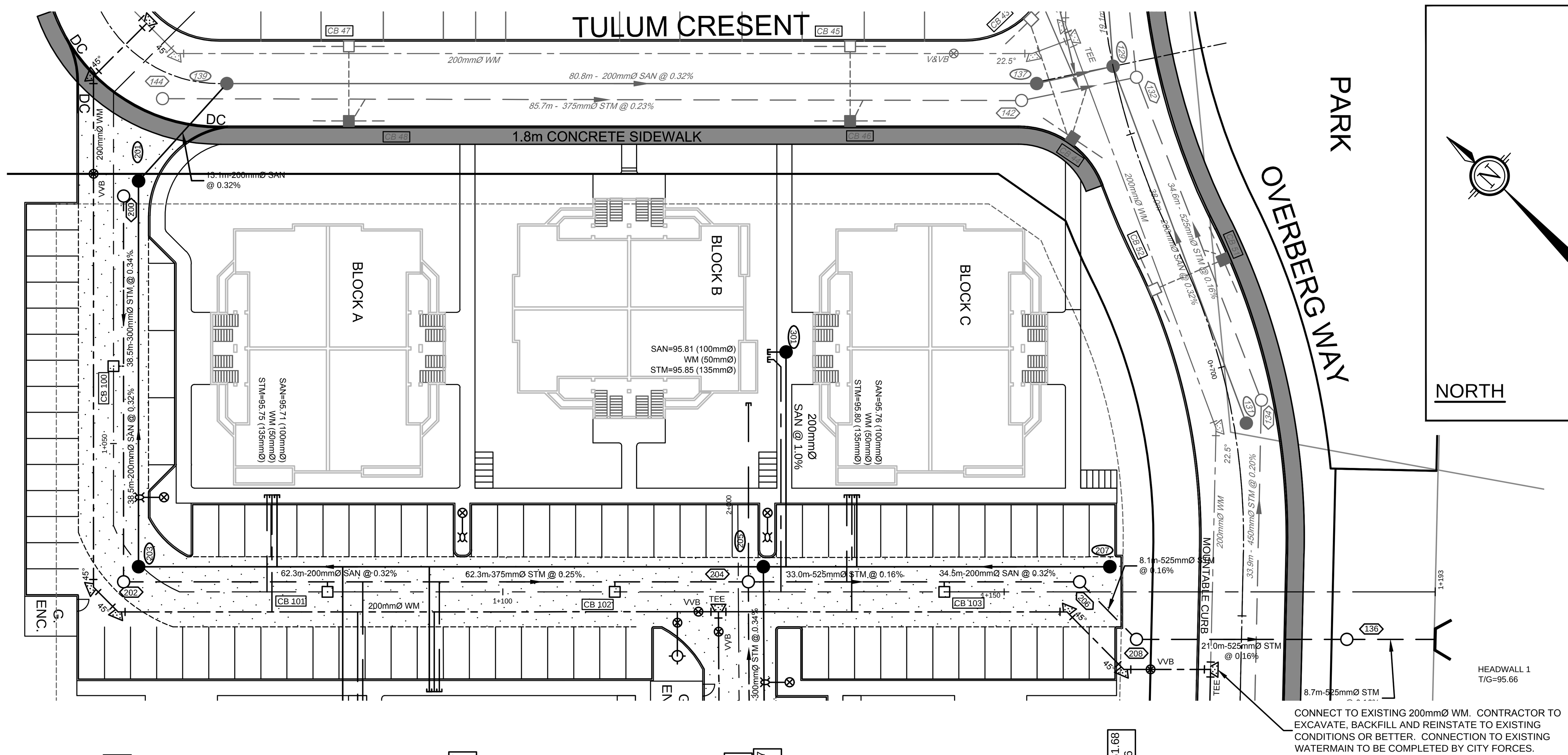
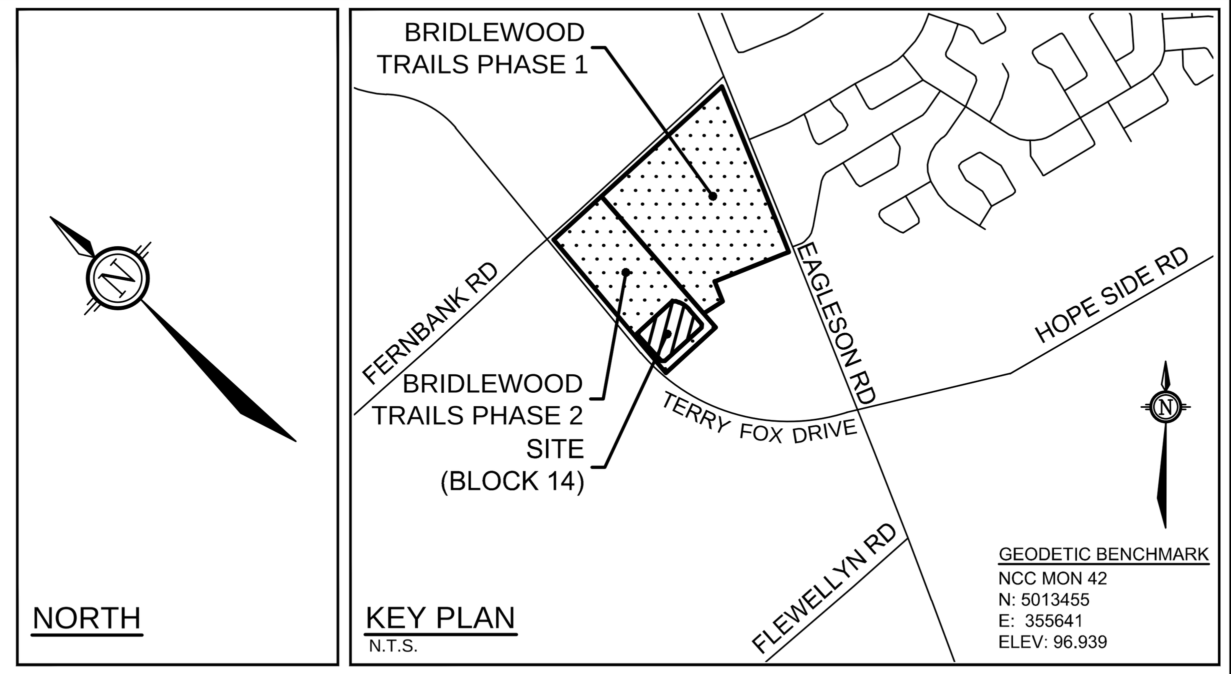
PLAN1.DWG - 841mmx594mm

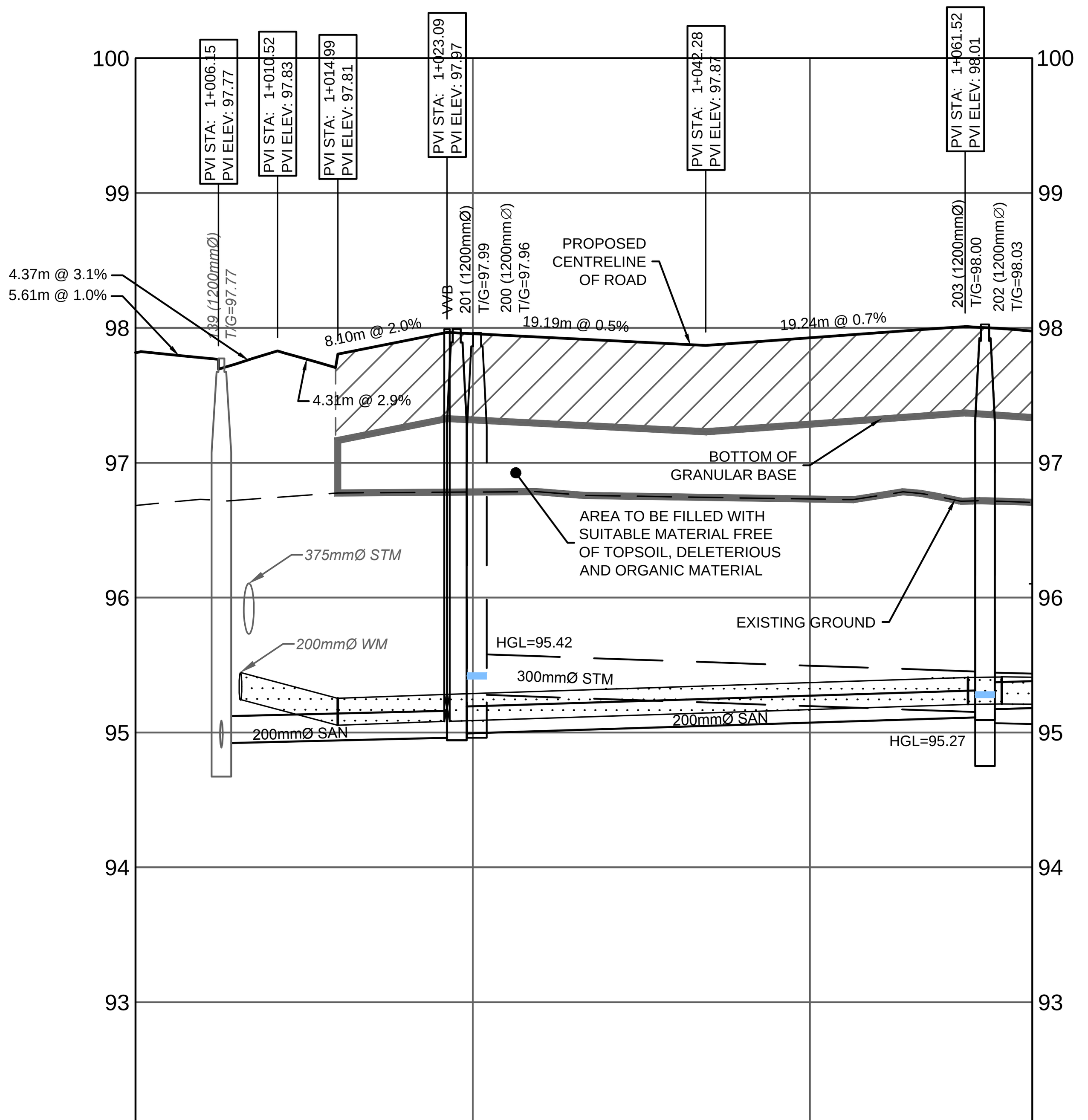




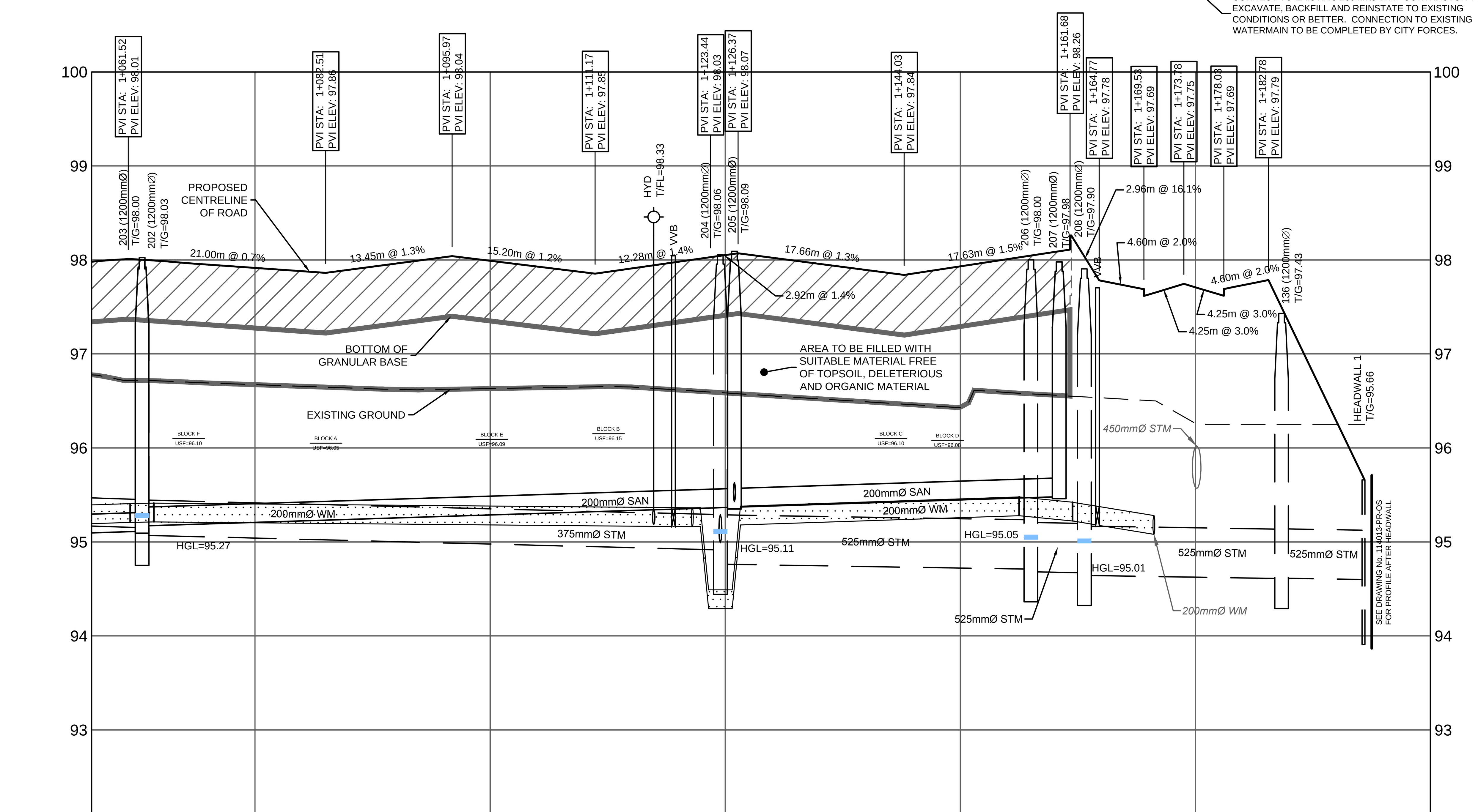


LEGEND

200mmØ	PROPOSED WATERMAIN AND DIAMETER
	PROPOSED VALVE LOCATION
V&VB	VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F=98.45	PROPOSED TOP OF BOTTOM FLANGE
RED	PROPOSED 50mm TO 19mm WATER SERVICE REDUCER
BEND	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE (SEE PLAN AND PROFILES)
101	PROPOSED SANITARY MH & SEWER
100	PROPOSED STORM MH & SEWER
CB 100	PROPOSED ROAD CATCHBASIN
	DIRECTION OF FLOW
DC	PROPOSED DEPRESSED CURB
	CLAY DYKE AS PER CITY OF OTTAWA DETAIL S8.
200mmØ WM	*EXISTING WATERMAIN*
HYD	*EXISTING HYDRANT C/W VALVE & LEAD*
T/F=97.71	*EXISTING TOP OF FLANGE*
MH 101	*EXISTING SANITARY MH & SEWER*
MH 102	*EXISTING STORM MH & SEWER*
CB 59	*EXISTING ROADSIDE CATCH BASIN WITH 3.0m SUBDRAIN IN TWO DIRECTIONS (PARALLEL WITH CURB FACE)*
CB 60	*EXISTING ROADSIDE CATCH BASIN WITH INLET CONTROL DEVICE*



EXISTING ELEVATION	96.68; 96.78; 96.73	PROPOSED ELEVATION
PROPOSED ELEVATION	97.97; 97.96; 97.87; 97.93	EXISTING ELEVATION
TOP OF WM ELEVATION	95.44; 95.25; 95.28; 95.29; 95.37; 95.41; 95.41	TOP OF WM ELEVATION
SANITARY SEWER INVERTS	NE=94.89 S=94.92; 13.1m - 200mmØ PVC DR-35 SAN @ 0.32%; N=94.96 SE=94.99; 38.5m - 200mmØ PVC DR-35 SAN @ 0.32%; NW=95.11 NE=95.17	SANITARY SEWER INVERTS
STORM SEWER INVERTS	SE=95.28; 38.5m - 300mmØ PVC DR-35 STM @ 0.34%; NW=95.15 NE=95.07	STORM SEWER INVERTS
CHAINAGE	1+000; 1+006.36; 1+014.99; 1+023.09 1+023.82 1+025 1+025.32; 1+050; 1+061.73 1+062.98 1+062.99 1+064.23	CHAINAGE
DESCRIPTION	SANMH 139; 45° H.BEND; VVB SANMH 201; STMMH 200; 45° H.BEND SANMH 203 STMMH 202 45° H.BEND	DESCRIPTION



PROPOSED ELEVATION	96.67; 96.63; 96.58; 96.43; 96.26	PROPOSED ELEVATION
EXISTING ELEVATION	97.97; 97.92; 98.04; 97.99; 97.94; 97.97; 98.03 98.05; 97.93; 98.11; 97.81; 97.71; 95.66	EXISTING ELEVATION
TOP OF WM ELEVATION	95.41; 95.41; 95.40; 95.38; 95.32; 95.36; 95.36 95.37 94.49 94.49 94.49 95.38; 95.46; 95.48; 95.42; 95.38; 95.28	TOP OF WM ELEVATION
SANITARY SEWER INVERTS	NW=95.11 NE=95.17; 62.3m - 200mmØ PVC DR-35 SAN @ 0.32%; SW=95.37 NE=95.37 SE=95.43; 34.5m - 200mmØ PVC DR-35 SAN @ 0.32%; SW=95.48	SANITARY SEWER INVERTS
STORM SEWER INVERTS	NW=95.15 NE=95.07; 62.3m - 375mmØ PVC DR-35 STM @ 0.25%; SW=94.92 NE=94.76 SE=94.99; 33.0m - 525mmØ CONC. 50-D STM @ 0.16%; SW=94.71 E=94.68; 8.1m - 525mmØ CONC. 50-D STM @ 0.16%; W=94.67 NE=94.64; 21.0m - 525mmØ CONC. 50-D STM @ 0.16%; SW=94.61 NE=94.61; 8.7m - 525mmØ CONC. 50-D STM @ 0.16%; SW=94.60	STORM SEWER INVERTS
CHAINAGE	1+061.73 1+062.98 1+062.99 1+064.23; 1+075; 1+100; 1+117.40; 1+119.50; 1+122.36 1+123.24 1+124.49 1+125 1+125.74 1+125.98 1+126.63; 1+150; 1+156.26 1+157.52; 1+160.52 1+161.94 1+163.19 1+164.60; 1+175; 1+184.17; 1+192.89; 1+200	CHAINAGE
DESCRIPTION	45° H.BEND SANMH 203 STMMH 202 45° H.BEND; HYD; VVB; 45° V.BEND 45° V.BEND STMMH 204; 45° V.BEND SANMH 205 45° V.BEND; 45° H.BEND STMMH 206; SANMH 207 45° H.BEND STMMH 208 VVB; STMMH 136; HEADWALL 1	DESCRIPTION

REFER TO 114013-NL FOR ADDITIONAL NOTES

NOTE:
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CLARIDGE CONDOS
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Ottawa, Ontario K2P OY6
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Fax : (613) 233 8290

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	SEPT 17/14	JAG

SCALE 1:400 — 0 4 8 12 16 — HORIZONTAL

DESIGN	JAG/SAZ
CHECKED	DDB
DRAWN	RBG
CHECKED	JAG
APPROVED	DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER D.D. BLAIR 100122737 Sept. 17/2014 PROVINCE OF ONTARIO

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

LOCATION
CITY of OTTAWA
BLOCK 14 (BRIDLEWOOD TRAILS PHASE 2)

DRAWING NAME
PLAN AND PROFILE
STATION 1+000 to 1+200

PROJECT No. 114013
REV # 1
DRAWING No. 114013-PR1

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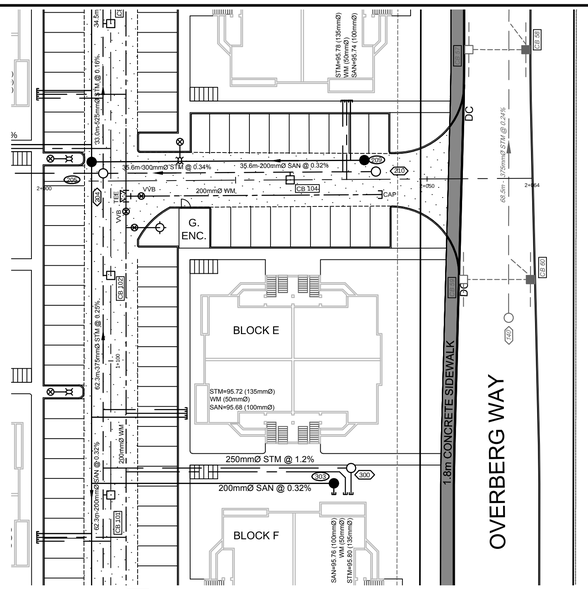
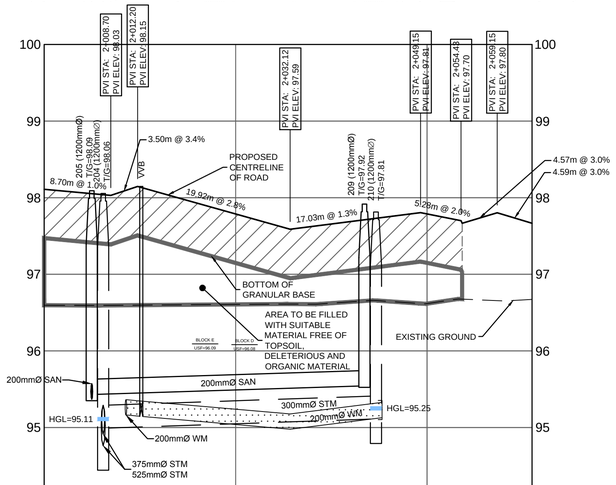
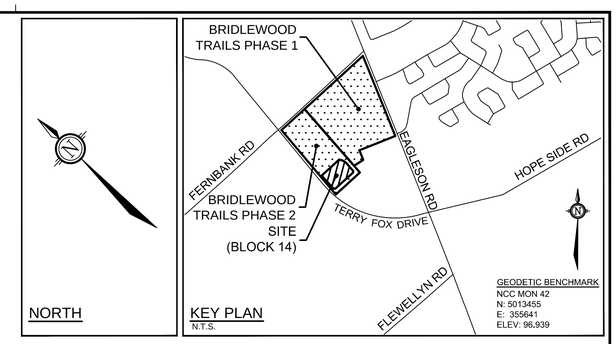
PLANA1.DWG - 841mmx594mm





EXISTING ELEVATION	96.62			96.61			96.62		96.67	PROPOSED ELEVATION
PROPOSED ELEVATION		98.10	98.13	97.79	97.59	97.74	97.79	97.78		EXISTING ELEVATION
TOP OF WM ELEVATION		95.36	95.35	95.24	95.18	95.33				TOP OF WM ELEVATION
SANITARY SEWER INVERTS		SW=95.37 NE=95.37 SE=95.43		35.6m - 200mmØ PVC DR-35 SAN @ 0.32%		NW=95.54				SANITARY SEWER INVERTS
STORM SEWER INVERTS		SW=94.92 NE=94.76 SE=94.99		35.6m - 300mmØ PVC DR-35 STM @ 0.34%		NW=95.11				STORM SEWER INVERTS
CHAINAGE	2+000	2+006.21	2+007.71	2+012.68	2+025	2+041.82 2+043.32 2+044.11	2+050		2+063.72	CHAINAGE
DESCRIPTION		SANMH 205 STMMH 204	VVB			SANMH 209 STMMH 210 WM CAP				DESCRIPTION



LEGEND

200mmØ	PROPOSED WATERMAIN AND DIAMETER	200mmØ WM	EXISTING WATERMAIN
	PROPOSED VALVE LOCATION	HYD	EXISTING HYDRANT C/W VALVE & LEAD
V&VB	VALVE & VALVE BOX	T/F=97.71	EXISTING TOP OF FLANGE
HYD	PROPOSED HYDRANT C/W VALVE & LEAD	MH 101	EXISTING SANITARY MH & SEWER
T/F=98.45	PROPOSED TOP OF BOTTOM FLANGE	MH 102	EXISTING STORM MH & SEWER
RED	PROPOSED 50mm TO 19mm WATER SERVICE REDUCER	CB 59	EXISTING ROADSIDE CATCH BASIN WITH 3.0m SUBDRAIN IN TWO DIRECTIONS (PARALLEL WITH CURB FACE)
BEND	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE (SEE PLAN AND PROFILES)	CB 60	EXISTING ROADSIDE CATCH BASIN WITH INLET CONTROL DEVICE
101	PROPOSED SANITARY MH & SEWER		
100	PROPOSED STORM MH & SEWER		
CB 100	PROPOSED ROAD CATCHBASIN		
	DIRECTION OF FLOW		
DC	PROPOSED DEPRESSED CURB		
	CLAY DYKE AS PER CITY OF OTTAWA DETAIL S8.		

REFER TO 114013-NL FOR ADDITIONAL NOTES

NOTE:
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No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	SEPT 17/14	JAG

SCALE
1:400
0 4 8 12 16
HORIZONTAL

DESIGN: JAG/SAZ
CHECKED: DDB
DRAWN: RBG
CHECKED: JAG
APPROVED: DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D.D. BLAIR
100122737
Sept. 17/2014
PROVINCE OF ONTARIO

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LOCATION
CITY of OTTAWA
BLOCK 14 (BRIDLEWOOD TRAILS PHASE 2)

DRAWING NAME
PLAN AND PROFILE
STATION 2+000 to 2+063.72

PROJECT No. 114013
REV # 1
DRAWING No. 114013-PR2

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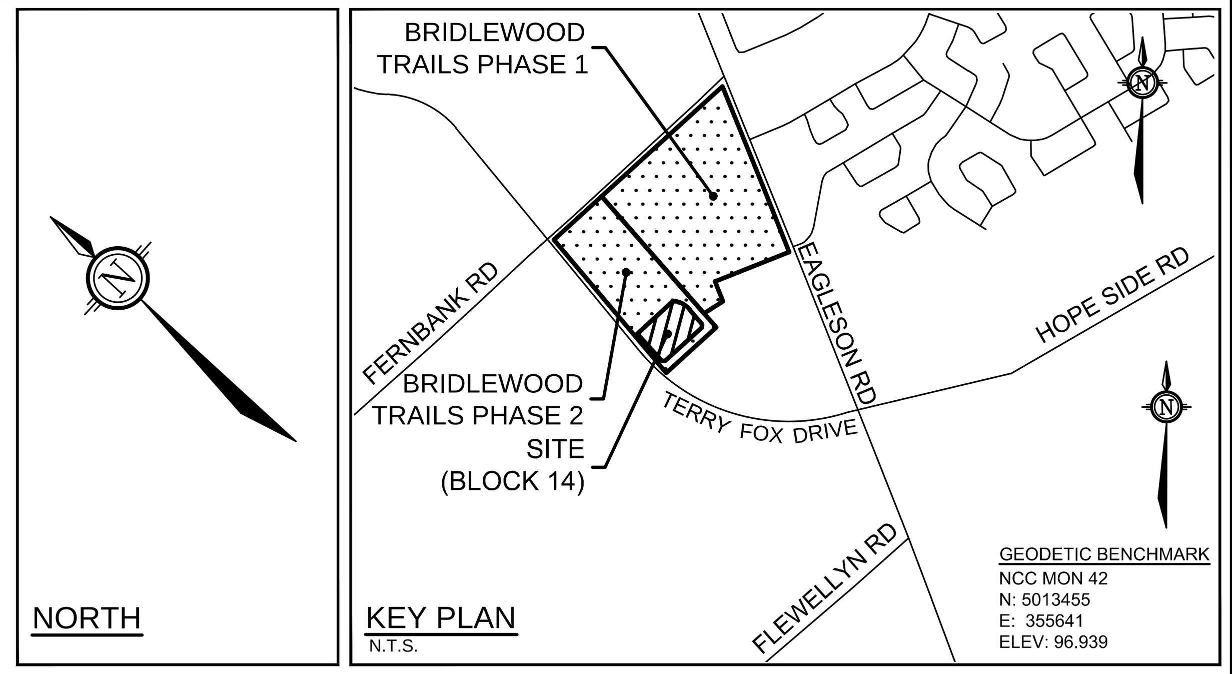
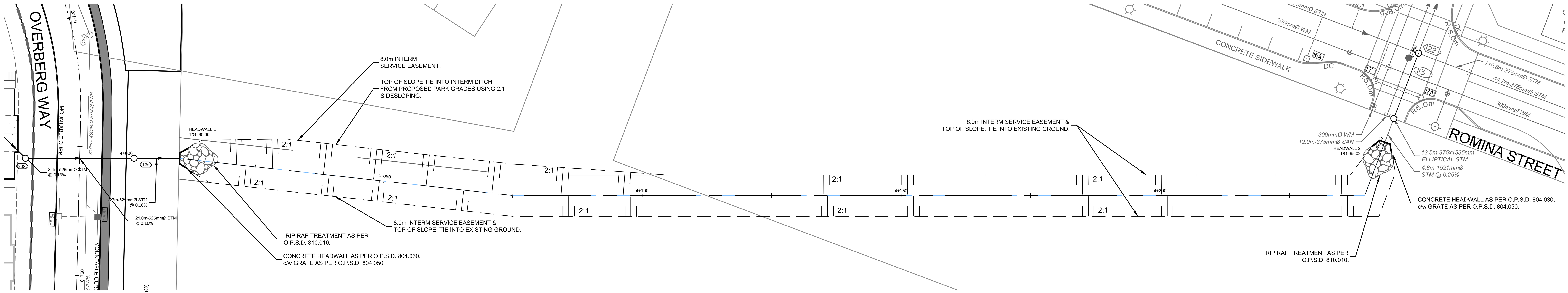
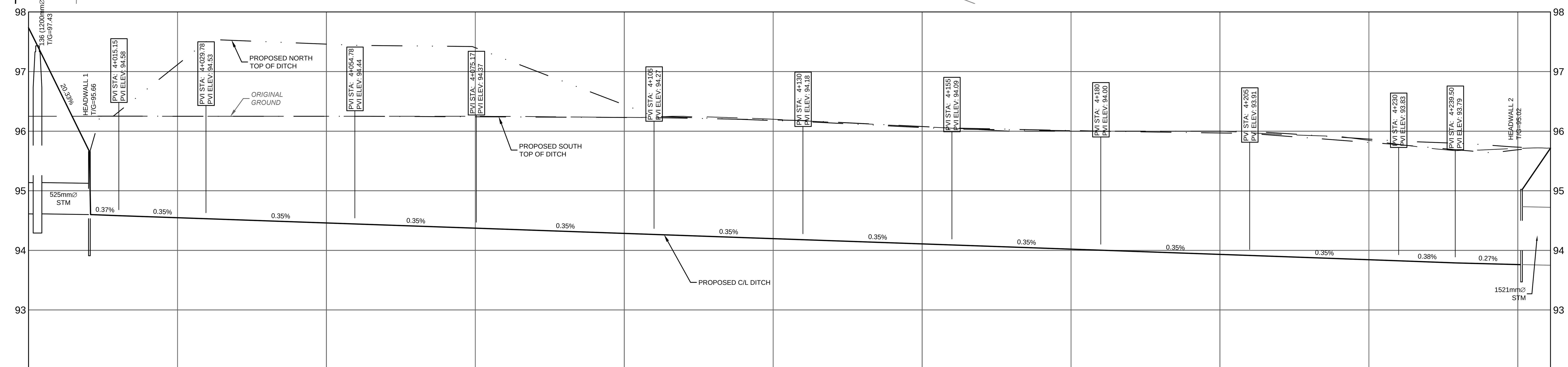
PLAN&T.DWG - 841mmx594mm

REFER TO 114013-NL FOR ADDITIONAL NOTES







EXISTING ELEVATION	96.25						96.25		96.25		96.25	96.23		96.20		96.07		96.00			96.00		95.85					95.71		95.72	EXISTING ELEVATION
PROPOSED NORTH SIDE TOP OF SLOPE								97.54	97.46	97.44	97.40	96.44	96.25	96.18	96.16	96.06	96.04	96.01		96.00	96.00		95.87	95.83		95.79		95.74 95.73			PROPOSED NORTH SIDE TOP OF SLOPE
PROPOSED C/L DITCH ELEVATION							94.55	94.53	94.46		94.37	94.28	94.27	94.20	94.18	94.11		94.02	94.00		93.93	93.91	93.84		93.79			93.76			PROPOSED C/L DITCH ELEVATION
PROPOSED SOUTH SIDE TOP OF SLOPE					96.25	96.25	96.25	96.25	96.25	96.25	96.24	96.23	96.23	96.19	96.18	96.08	96.05	96.01	96.00		95.97	95.96	95.81	95.77			95.76	95.69			PROPOSED SOUTH SIDE TOP OF SLOPE
STORM SEWER INVERTS		SW=94.61 NE=94.61	8.71m - 525mmØ STM @ 0.16%	SW=94.60																								N=93.76	4.8m - 1521mmØ STM @ 0.25%		STORM SEWER INVERTS
CHAINAGE	4+000	4+001.50		4+010.22			4+025		4+050		4+075	4+100		4+125		4+150		4+175			4+200		4+225					4+250	4+250.63	4+255	CHAINAGE
DESCRIPTION		STMMH 136		HEADWALL 1																									HEADWALL 2		DESCRIPTION

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No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	SEPT. 17/14	JAG

SCALE
1:400
0 4 8 12 16
HORIZONTAL

DESIGN JAG/SAZ
CHECKED DDB
DRAWN RBG
CHECKED JAG
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D.D. BLAIR
100122737
Sept. 17/2014
PROVINCE OF ONTARIO

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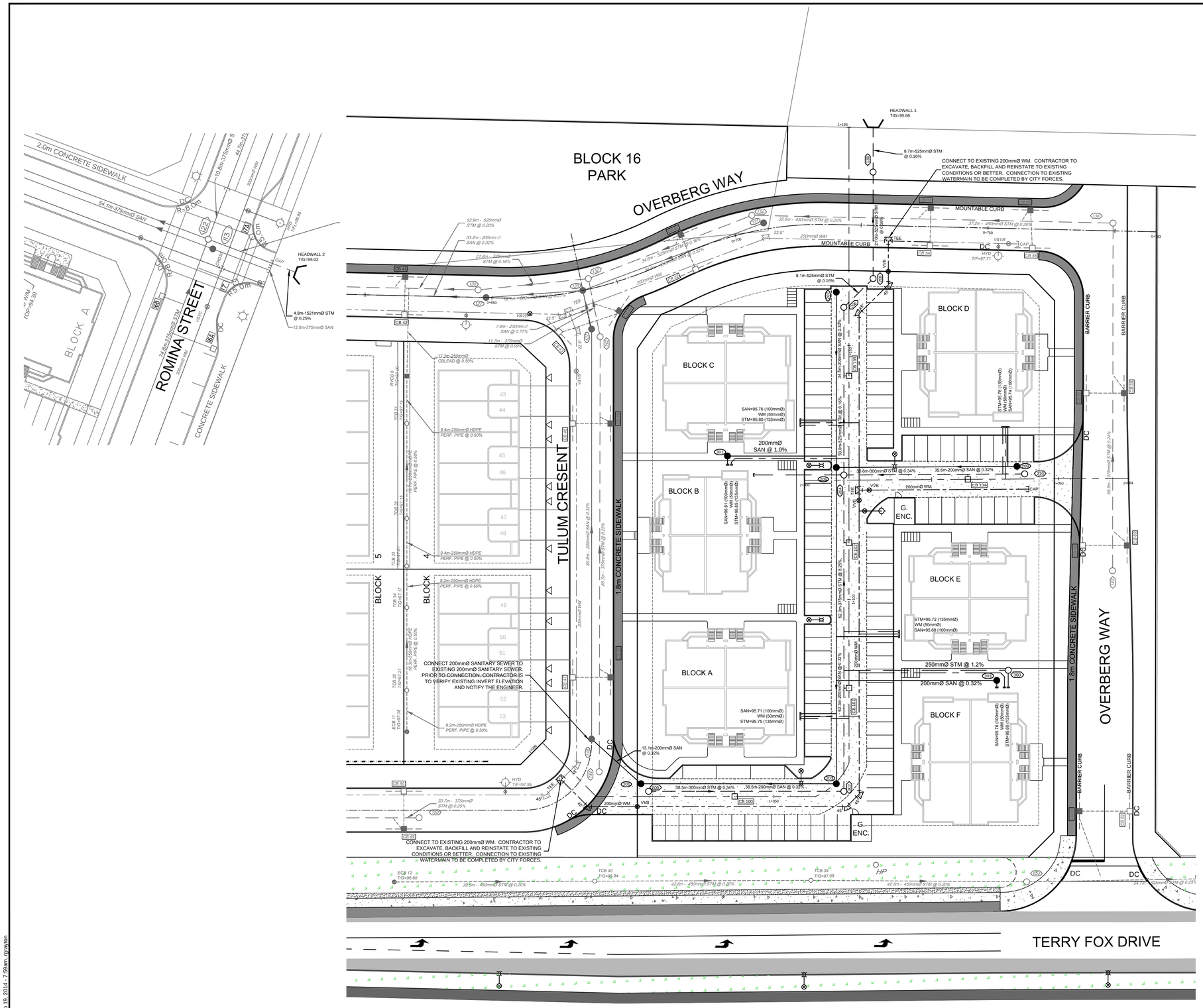
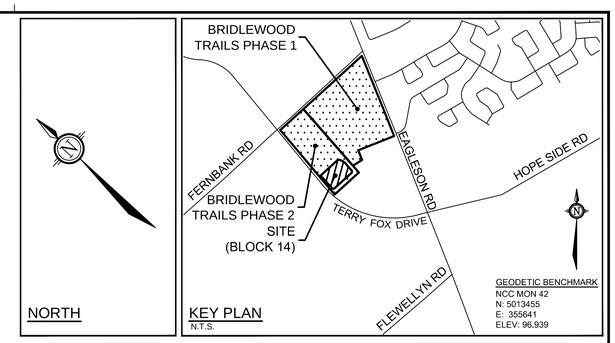
LOCATION
CITY of OTTAWA
BLOCK 14 (BRIDLEWOOD TRAILS PHASE 2)

DRAWING NAME
OFFSITE PROFILE OF STORM OUTLET SWALE STATION 4+000 TO 4+255

PROJECT No. 114013
REV REV # 1
DRAWING No. 114013-PR-OS

PLANA1.DWG - 841mmx594mm





LEGEND

- 200mmØ — PROPOSED WATERMAIN AND DIAMETER
- PROPOSED VALVE LOCATION
- V&VB — VALVE & VALVE BOX
- HYD — PROPOSED HYDRANT C/W VALVE & LEAD
- T/F=98.45 — PROPOSED TOP OF BOTTOM FLANGE
- RED — PROPOSED 50mm TO 19mm WATER SERVICE REDUCER
- BEND — PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE (SEE PLAN AND PROFILES)
- MH — PROPOSED SANITARY MH & SEWER
- MH — PROPOSED STORM MH & SEWER
- PROPOSED HEADWALL
- CB 100 — PROPOSED ROAD CATCHBASIN
- DIRECTION OF FLOW
- DC — PROPOSED DEPRESSED CURB
- CLAY DYKE AS PER CITY OF OTTAWA DETAIL S8.

- 200mmØ WM — EXISTING WATERMAIN
- HYD — EXISTING HYDRANT C/W VALVE & LEAD
- T/F=97.71 — EXISTING TOP OF FLANGE
- MH 101 — EXISTING SANITARY MH & SEWER
- MH 102 — EXISTING STORM MH & SEWER
- CB 59 — EXISTING ROADSIDE CATCH BASIN WITH 3.0m SUBDRAIN IN TWO DIRECTIONS (PARALLEL WITH CURB FACE)
- CB 60 — EXISTING ROADSIDE CATCH BASIN WITH INLET CONTROL DEVICE

SERVICE MANHOLE TABLE

SERVICE	MH No.	SERVICE LOCATION	T/G ELEVATION	INVERT
SAN	301	BLOCK B	98.17	E. = 95.72 S. = 95.78
SAN	303	BLOCK F	98.19	W. = 95.67 S. = 95.73
STM	300	BLOCK F	98.18	W. = 95.60 S. = 95.75

CATCHBASIN TABLE

CB No.	STREET	STATION	T/G ELEVATION	INVERT	ICD DIA.
CB 100	TULUM ENTRANCE	1+042.28	97.87	96.17	83mm
CB 101	TULUM ENTRANCE	1+082.51	97.86	96.16	83mm
CB 102	TULUM ENTRANCE	1+111.17	97.85	96.31	83mm
CB 103	TULUM ENTRANCE	1+144.03	97.84	96.14	83mm
CB 104	OVERBERG ENTRANCE	2+032.12	97.59	96.12	83mm

REFER TO 114013-NL FOR ADDITIONAL NOTES

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No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	SEPT 17/14	JAG

SCALE 1:400
1:400 HORIZONTAL 0 4 8 12 16

DESIGN JAG/SAZ
CHECKED DDB
DRAWN RBG
CHECKED JAG
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER D.D. BLAIR 100122737 Sept. 17/2014 PROVINCE OF ONTARIO

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LOCATION
CITY of OTTAWA
BLOCK 14 (BRIDLEWOOD TRAILS PHASE 2)

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 114013
REV REV # 1
DRAWING No. 114013-GP

PLAN&T_DWG - 8x11mmx35dmm

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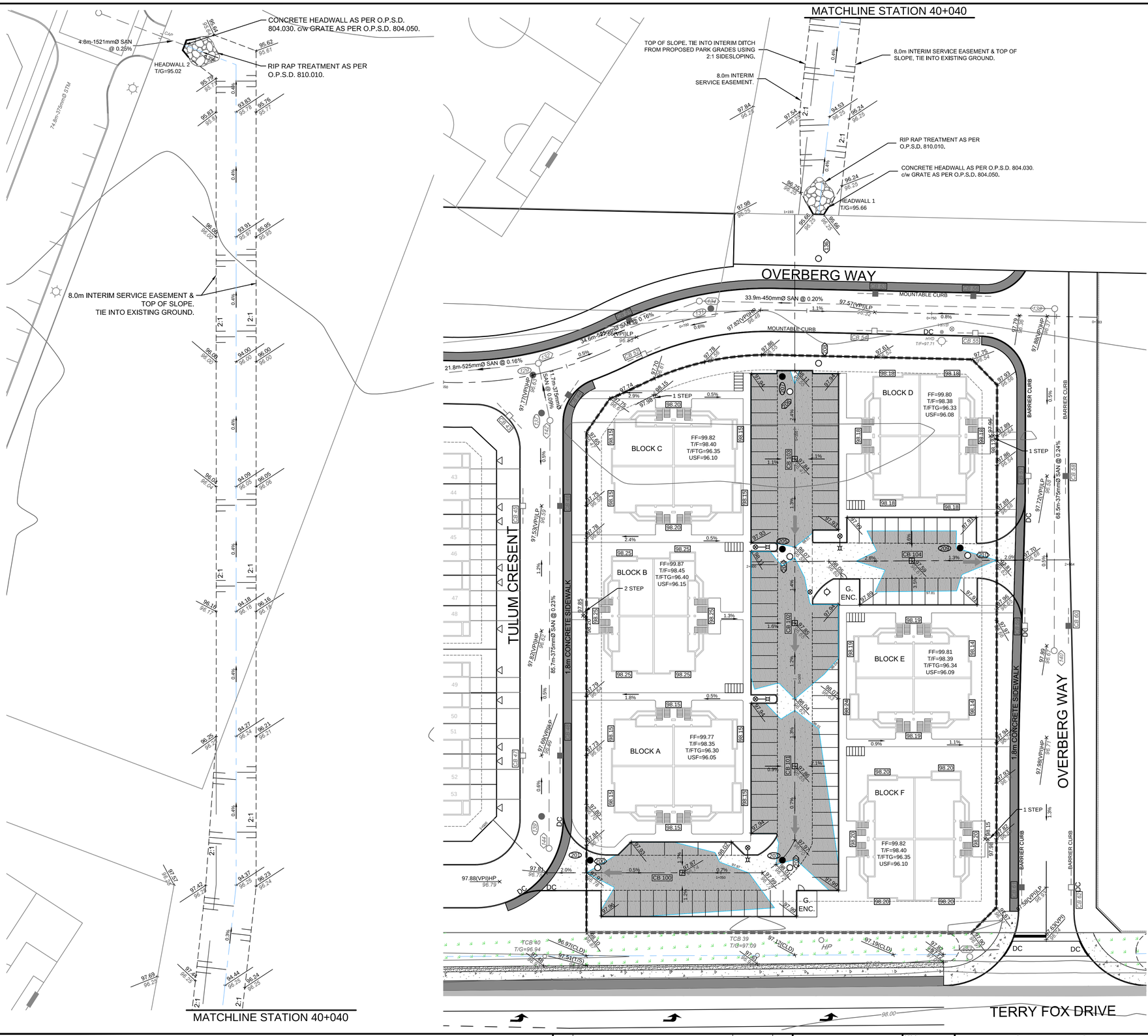

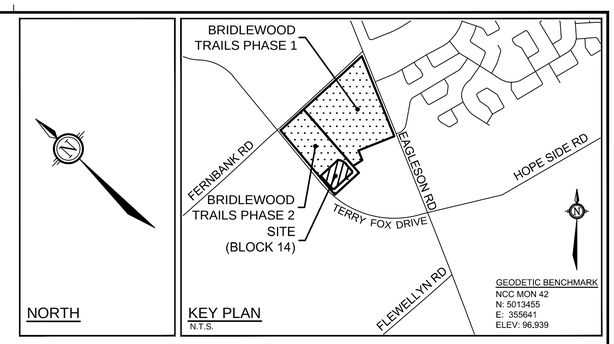

LEGEND

- PROPOSED ELEVATION / EXISTING ELEVATION (AS BUILT)
- PROPOSED POINT OF VERTICAL INFLECTION
- PROPOSED POINT OF VERTICAL INFLECTION (HIGH POINT)
- PROPOSED POINT OF VERTICAL INFLECTION (LOW POINT)
- PROPOSED CENTRELINE OF DITCH
- PROPOSED TOP OF SLOPE
- PROPOSED TOP OF CURB
- PROPOSED TOP OF NOISE BARRIER
- FF= FINISHED FLOOR ELEVATION
- T/F= TOP OF FOUNDATION ELEVATION
- USF= UNDERSIDE OF FOOTING ELEVATION
- MUSF= MINIMUM UNDERSIDE OF FOOTING ELEVATION
- PROPOSED TERRACE ELEVATION
- MAXIMUM 3:1 SIDESLOPE
- PROPOSED CENTRELINE SWALE
- PROPOSED GRADE AND DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED HYDRANT LOCATION
- T/F=127.55 PROPOSED TOP OF BOTTOM FLANGE
- PROPOSED VALVE AND VALVE BOX
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED SERVICE LOCATION (REFER TO DETAIL)
- PROPOSED COMMUNITY MAIL BOX
- PROPOSED STREET LIGHT
- PROPOSED SILT FENCE
- PONDING AREA WITH SPILLWAY ELEVATION
- *EXISTING CONTOUR LINE AND CONTOUR ELEVATION*
- *EXISTING OVERHEAD HYDRO*
- *EXISTING FIRE HYDRANT*
- *EXISTING SANITARY MANHOLE*
- *EXISTING STORMMANHOLE*
- *EXISTING VALVE*
- *EXISTING HYDRO POLE*
- *EXISTING ROADSIDE CATCH BASIN WITH 3.0m SUBDRAIN IN TWO DIRECTIONS (PARALLEL WITH CURB FACE)*
- *EXISTING ROADSIDE CATCH BASIN WITH INLET CONTROL DEVICE*

REFER TO 114013-NL DRAWING FOR ADDITIONAL NOTES

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SCALE 1:400 (1:400 0 4 8 12 16)

DESIGN JAG/SAZ
CHECKED DDB
DRAWN RBG
CHECKED JAG
APPROVED DDB

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LOCATION
CITY or TOWNSHIP
NAME OF DEVELOPMENT

DRAWING NAME
GRADING & EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 114013
REV REV # 1
DRAWING No. 114013-GR

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PLAN47.DWG - 841mmx594mm

GENERAL NOTES:

1. DIMENSIONS AND LAYOUT INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. THE ORIGINAL TOPOGRAPHY AND GROUND ELEVATIONS, SERVICING AND SURVEY INFORMATION SHOWN ON THIS PLAN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF ALL INFORMATION OBTAINED FROM THIS PLAN.
3. CO-ORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
4. BEFORE COMMENCING CONSTRUCTION, PROVIDE PROOF OF COMPREHENSIVE ALL RISK AND OPERATIONAL LIABILITY INSURANCE INCLUDING BLASTING. INSURANCE POLICY TO NAME THE OWNER, ENGINEER AND THE CITY AS CO-INSURED. AMOUNT OF INSURANCE TO BE SPECIFIED BY OWNER'S AGENT.
5. CONNECT TO EXISTING SYSTEMS AS DETAILED, INCLUDING ALL RESTORATION WORK NECESSARY TO REINSTATE SURFACES TO EXISTING CONDITIONS OR BETTER.
6. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS.
7. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
8. RESTORE ALL TRENCHES AND SURFACE FEATURES TO EXISTING CONDITIONS OR BETTER AND TO THE SATISFACTION OF CITY OF OTTAWA AUTHORITIES. REINSTATE TULUM CRESCENT AND OVERBERG WAY TO EXISTING CONDITIONS OR BETTER AS PER CITY OF OTTAWA STANDARD R-10.
   - ASPHALT RESTORATION SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA R-10.
   - THICKNESS OF GRANULAR MATERIAL AND ASPHALT LAYERS SHALL BE IN ACCORDANCE WITH PAVEMENT STRUCTURE NOTES.
   - BOULEVARDS SHALL BE REINSTATED WITH 150mm OF TOPSOIL, SEED AND MULCH.
9. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ALL ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER.
10. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
11. ALL FENCING TO BE LOCATED 0.15m INSIDE PROPERTY LINE.
12. CONCRETE SIDEWALK TO BE CONSTRUCTED AS PER CITY STANDARD SC-3, SC-5, SC-7 AND SC-8. SIDEWALK WIDTHS ARE AS PER STANDARD CROSS-SECTIONS ON 109119-D1.
13. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
14. REFER TO SERVICING DESIGN BRIEF (R-2014-148, DATED SEPTEMBER 17, 2014) AND STORMWATER MANAGEMENT REPORT (R-2014-147, DATED SEPTEMBER 17, 2014) PREPARED BY NOVATECH.
15. REFER TO GEOTECHNICAL REPORT (NO. 07-1121-0037, DATED MARCH 2014) , PREPARED BY GOLDER ASSOCIATES FOR SUBSURFACE CONDITIONS AND CONSTRUCTION RECOMMENDATIONS.
16. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
17. PROVIDE LINE / PARKING PAINTING.
18. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING THE AS-BUILT ELEVATION OF EVERY DESIGN GRADE SHOWN ON THIS PLAN.
19. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. ONTARIO PROVINCIAL STANDARDS APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.
20. PERFORATED PIPE SUB-DRAINS TO BE PROVIDED AT SUBGRADE LEVEL EXTENDING FROM THE ROADSIDE CATCHBASIN FOR A DISTANCE OF 3.0m, PARALLEL TO THE CURB IN TWO DIRECTIONS
21. ALL PRIVATE APPROACHES MUST BE CONSTRUCTED AS PER CITY SPECIFICATIONS SC13.
22. CURRENT / LATEST CITY STANDARDS HAVE BEEN USED IN THIS PROJECT.

GRADING NOTES:

1. REMOVE ALL ORGANIC MATTER AND TOPSOIL FROM AREAS THAT ARE TO BE PAVED.
2. GRADE AND/OR FILL WHERE REQUIRED.
3. MATCH EXISTING ELEVATIONS AT ALL PROPERTY LINES.
4. ENSURE POSITIVE DRAINAGE WHETHER INDICATED OR NOT.
5. MINIMUM OF 2% AND MAXIMUM OF 5% GRADE FOR GRASSED AREAS UNLESS OTHERWISE NOTED. SIDEWALK CROSSFALL NOT TO EXCEED 2%.
6. MAXIMUM TERRACING GRADE IS 3:1.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. MINIMUM REARYARD SWALE GRADE IS 1.5%. MINIMUM REARYARD SWALE GRADE WITH THE INSTALLATION OF A SUBDRAIN SYSTEM IS 1.0%. (UNLESS OTHERWISE NOTED)
9. CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
10. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
2. TO PREVENT SURFACE EROSION FROM ENTERING THE STORM SYSTEM DURING CONSTRUCTION, FILTER CLOTH WILL BE PLACED UNDER ALL PROPOSED AND SURROUNDING CATCHBASINS AND MANHOLES. THE FILTER CLOTH WILL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN ESTABLISHED AND CONSTRUCTION COMPLETE.
3. ANY ON-SITE STOCKPILES SHALL BE LOCATED IN AREAS TO BE DESIGNATED BY THE ENGINEER AND WELL AWAY FROM DRAINAGE SWALES, OUTLET DITCHES AND REAR YARD CATCHBASINS.
4. CONTRACTOR IS TO INSTALL LIGHT DUTY SILT FENCE AS PER OPSD 219.110 AROUND PERIMETER OF SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. SILT FENCE TO BE INSTALLED ON THE PROPERTY LINE. CONTRACTOR SHALL MAINTAIN SILT FENCE FOR THE DURATION OF THE CONTRACT.
5. CONTRACTOR IS TO INSTALL STRAW BALES AS PER OPSD 219.180 AS INDICATED AND DIRECTED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
6. ALL AREAS DISTURBED BY CONSTRUCTION ARE TO BE TREATED WITH IMPORTED TOPSOIL, SEED AND MULCH.
7. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

NOTES: PAVEMENT STRUCTURE

1. SUBGRADE MATERIAL SHALL BE PLACED IN MAXIMUM 300mm LIFTS AND COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
2. ROADWAY GRANULAR MATERIAL SHALL BE PLACED IN MAXIMUM 300mm LIFTS AND COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
3. ASPHALTIC CONCRETE TO BE COMPACTED TO AT LEAST 97% OF MARSHALL DENSITY.
4. ALL ROADWAYS TO HAVE 3% CROSSFALL INCLUDING SUBGRADE AND GRANULAR BASE, UNLESS OTHERWISE NOTED.
5. ROADWAY SUBGRADE TO BE INSPECTED BY THE GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION TO REVIEW THE GRANULAR 'B' DEPTH AND FOR THE NECESSITY OF A WOVEN GEOTEXTILE BELOW THE GRANULAR MATERIALS.
6. PRIOR TO THE PLACEMENT OF TOPLIFT, CONTRACTOR IS TO ADJUST ALL STRUCTURES AS PER CITY OF OTTAWA STANDARD R-2.

PAVEMENT STRUCTURE DETAILS

DRIVING AISLES

- 40mm HL3
- 50mm HL8
- 150mm GRANULAR 'A'
- 450mm GRANULAR 'B' TYPE II
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

PARKING STALLS

- 50mm HL8
- 150mm GRANULAR 'A'
- 375mm GRANULAR 'B' TYPE II
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

ASPHALT PATHWAY

- 50mm HL3
- 150mm GRANULAR 'A'
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200Ø)	701.010	OPSD
CB, FRAME & COVER	S19.1, 400.020	CITY OF OTTAWA / OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
SEWER TRENCH - BEDDING (GRANULAR A)	S6, S7	CITY OF OTTAWA / OPSD
COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE = 25mm)	S6, S7	CITY OF OTTAWA / OPSD
CATCHBASIN LEAD	PVC DR 35	
STORM SEWER	PVC DR 35 (UP TO 375mmØ) OR 50-D CONCRETE (450mmØ AND LARGER)	
SANITARY SEWER	PVC DR 35	

2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.5m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICE ARE TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, AT A MINIMUM SLOPE OF 1.0% UNLESS OTHERWISE INDICATED.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
7. ALL CATCHBASINS AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED. STORM SEWER MAINTENANCE HOLES HAVING SEWERS LESS THAN 900mmØ SHALL BE CONSTRUCTED WITH A 300mm SUMP. STORM SEWER MAINTENANCE HOLE HAVING STORM SEWERS 900mmØ AND OVER ARE TO BE BENCHED AS PER OPSD 701.021.
8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH, CLEAN AND RE-TELEVISE ALL SEWERS & APPURTENANCES.
9. FULL PORT BACKWATER VALVES ARE REQUIRED ON THE SANITARY SERVICES. INSTALLED AS PER THE MANUFACTURERS RECOMMENDATIONS AND A BACKWATER VALVE IS REQUIRED ON THE STORM SERVICES / FOUNDATION DRAINS FOR EACH BUILDING; INSTALLED AS PER STD. DWG S14.
10. WATERTIGHT COVERS TO BE LOCATED WITHIN STORMWATER MANAGEMENT PONDING AREAS.

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN (200mm)	PVC DR 18	
WATERMAIN (50mm)	TYPE K COPPER COMPLETE WITH PRESSURE REDUCING VALVE	
50mm WATER SERVICE CONNECTIONS	W33	CITY OF OTTAWA

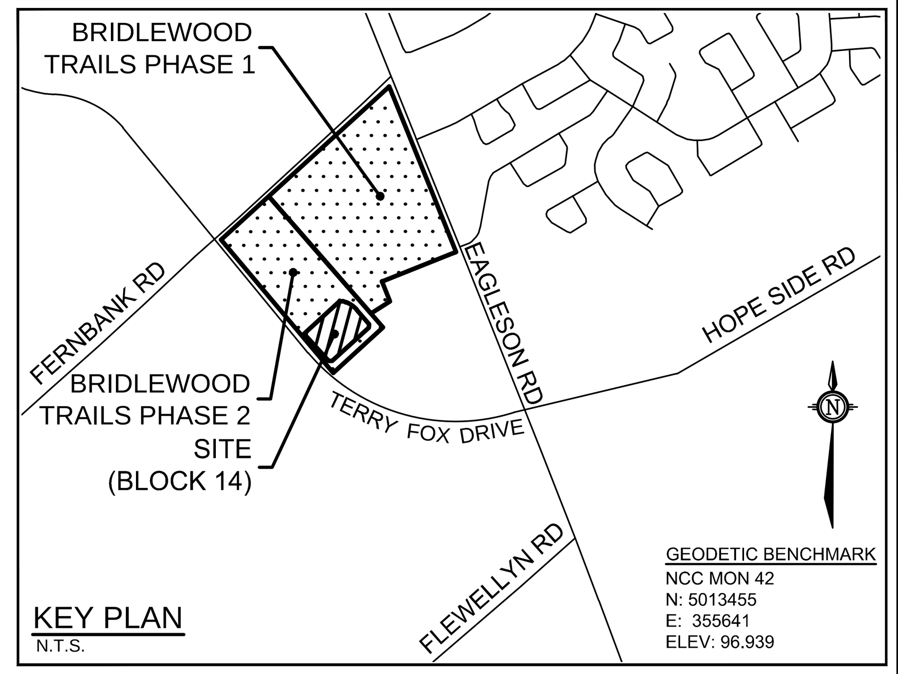
2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE THERMAL INSULATION FOR ALL WATERMAIN WITH LESS THAN 2.4m COVER.
5. PROVIDE MINIMUM 0.50m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS WHEN WATERMAIN IS BELOW AND MINIMUM 0.25m CLEARANCE WHEN WATERMAIN IS ABOVE.
6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

UTILITY NOTES:

1. CONTRACTOR TO CONTACT RESPECTIVE UTILITY COMPANIES TO DETERMINE EXACT LOCATION OF EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR TO ASSUME ALL LIABILITY FOR DAMAGE TO EXISTING UTILITIES.
2. EXTEND ENCASED DUCT CROSSINGS 2.5m FROM PROPERY LINE ON EACH SIDE.
3. CONTRACTOR SHALL EXCAVATE, BACKFILL, AND RESTORE ALL SURFACES TO EXISTING CONDITIONS FOR HYDRO PRIMARY, BELL, AND CABLEVISION CABLES.
4. CONTRACTOR SHALL SUPPLY AND INSTALL ALL DUCT WORK AND TRANSFORMER PAD. SINGLE PHASE TRANSFORMER PAD PER HYDRO OTTAWA DETAIL UCS0003.
5. TEMPORARILY COIL ALL SERVICE WIRES ON A 76mm X 76mm X 2.4m WOODEN POST FOR EACH UNIT WITH ENOUGH CONDUCTOR TO ALLOW FOR COMPLETION OF TRENCHING AND BUILDING CONNECTION.
6. MINIMUM 1.5m CLEARANCE TO BE PROVIDED FROM WATER SERVICES TO ALL PEDESTALS, TRANSFORMER PADS, ROAD DUCT CROSSINGS, AND STREET LIGHTS.
7. MINIMUM 3.0m CLEARANCE TO BE PROVIDED FROM HYDRANT TO ALL ABOVE GROUND STRUCTURES INCLUDING STREETLIGHTS, BELL PEDESTALS, CABLE PEDESTALS, TRANSFORMERS, SECTIONALIZERS, ETC.

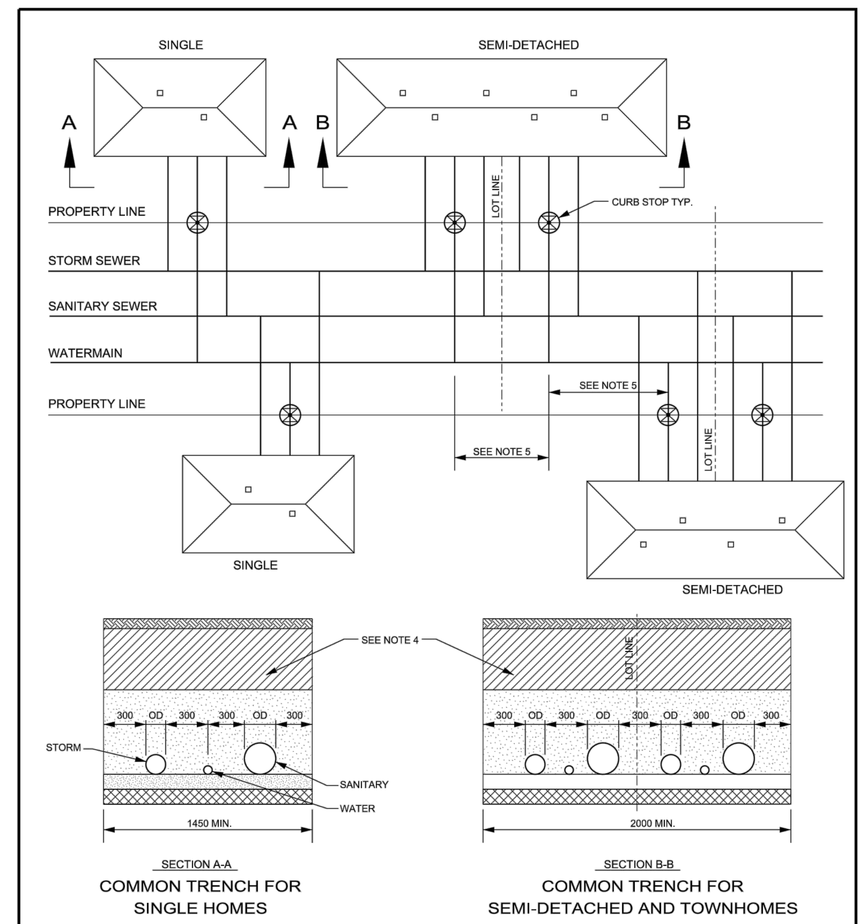
LEGEND

SYMBOL	DESCRIPTION
200mmØ	PROPOSED WATERMAIN AND DIAMETER
	PROPOSED VALVE LOCATION
V&VB	VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F=98.45	PROPOSED TOP OF BOTTOM FLANGE
RED	PROPOSED 50mm TO 19mm WATER SERVICE REDUCER
BEND	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE (SEE PLAN AND PROFILES)
101	PROPOSED SANITARY MH & SEWER
100	PROPOSED STORM MH & SEWER
	PROPOSED HEADWALL
CB 100	PROPOSED ROAD CATCHBASIN
	DIRECTION OF FLOW
DC	PROPOSED DEPRESSED CURB
	CLAY DYKE AS PER CITY OF OTTAWA DETAIL S8.
97.32 / 96.52(ASB)	PROPOSED ELEVATION / EXISTING ELEVATION (AS BUILT)
97.75(VPI)	PROPOSED POINT OF VERTICAL INFLECTION
97.75(VPI)HP	PROPOSED POINT OF VERTICAL INFLECTION (HIGH POINT)
97.75(VPI)LP	PROPOSED POINT OF VERTICAL INFLECTION (LOW POINT)
97.75(CLD)	PROPOSED CENTRELINE OF DITCH
97.75(T/S)	PROPOSED TOP OF SLOPE
97.75(TC)	PROPOSED TOP OF CURB
97.75(T/B)	PROPOSED TOP OF NOISE BARRIER
FF=	FINISHED FLOOR ELEVATION
T/F=	TOP OF FOUNDATION ELEVATION
USF=	UNDERSIDE OF FOOTING ELEVATION
MUSF=	MINIMUM UNDERSIDE OF FOOTING ELEVATION
127.55	PROPOSED TERRACE ELEVATION
	MAXIMUM 3:1 SIDESLOPE
	PROPOSED CENTRELINE SWALE
2.0%	PROPOSED GRADE AND DIRECTION
	MAJOR OVERLAND FLOW ROUTE
HYD	PROPOSED HYDRANT LOCATION
T/F=127.55	PROPOSED TOP OF BOTTOM FLANGE
V&VB	PROPOSED VALVE AND VALVE BOX
819	PROPOSED SANITARY MANHOLE
820	PROPOSED STORM MANHOLE
	PROPOSED SERVICE LOCATION (REFER TO DETAIL)
CMB	PROPOSED COMMUNITY MAIL BOX
	PROPOSED STREET LIGHT
	PROPOSED SILT FENCE
92.08	PONDING AREA WITH SPILLWAY ELEVATION
98.00 / 97.50 / 97.00	*EXISTING* CONTOUR LINE AND CONTOUR ELEVATION
200mmØ WM	*EXISTING WATERMAIN*
HYD	*EXISTING HYDRANT C/W VALVE & LEAD*
T/F=97.71	*EXISTING TOP OF FLANGE*
MH 101	*EXISTING SANITARY MH & SEWER*
MH 102	*EXISTING STORM MH & SEWER*
CB 59	*EXISTING ROADSIDE CATCH BASIN WITH 3.0m SUBDRAIN IN TWO DIRECTIONS (PARALLEL WITH CURB FACE)*
CB 60	*EXISTING ROADSIDE CATCH BASIN WITH INLET CONTROL DEVICE*
OH-H	*EXISTING OVERHEAD HYDRO*
	EXISTING FIRE HYDRANT
109	*EXISTING SANITARY MANHOLE*
110	*EXISTING STORM MANHOLE*
	EXISTING VALVE
HP	*EXISTING HYDRO POLE*
CB 59	*EXISTING ROADSIDE CATCH BASIN WITH 3.0m SUBDRAIN IN TWO DIRECTIONS (PARALLEL WITH CURB FACE)*
CB 60	*EXISTING ROADSIDE CATCH BASIN WITH INLET CONTROL DEVICE*



KEY PLAN
N.T.S.

GEODETIC BENCHMARK
NCC MON 42
N: 5013455
E: 355641
ELEV: 96.939



NOTES:
1. NO HORIZONTAL BENDS IN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED BY THE CITY. MAXIMUM OF TWO 22.5° HORIZONTAL BENDS FOR SANITARY AND STORM SERVICES.
2. 1% MINIMUM SANITARY AND STORM SERVICE GRADIENT WITH 2% PREFERRED.
3. STORM SERVICE LATERAL SHALL BE LOCATED TO THE LEFT OF SANITARY SERVICE LATERAL WHEN LOOKING AT THE STRUCTURE FROM THE STREET. SERVICE SIZES IN CONFORMANCE WITH S11.
4. SEE S7 FOR PIPE FOUNDATION, EMBEDMENT AND FINAL BACKFILL REQUIREMENTS.
5. MULTIPLE TAPS WITH SADDLES IN PVC WATERMAIN SHALL BE STAGGARED AND MINIMUM 600mm APART.
6. ELEVATION OF SERVICES VARIABLE DEPENDING ON GRADIENT AND/OR DEPTH OF COVER.
7. ALL DIMENSIONS ARE IN MILLIMETRES.

N.T.S.

Ottawa — TYPICAL SINGLE, SEMI-DETACHED AND TOWNHOUSE LOT SERVICING

DATE: MARCH 2011 | REV DATE: | DWG. No.: S11.3

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

CLARIDGE CONDOS
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Ottawa, Ontario K2P OY6
Tel : (613) 233 6030
Fax : (613) 233 8290

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	SEPT 17/14	JAG

SCALE

DESIGN	JAG/SAZ
CHECKED	DDB
DRAWN	RBG
CHECKED	JAG
APPROVED	DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D.D. BLAIR
100122737
Sept. 17/2014
PROVINCE OF ONTARIO

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LOCATION
CITY of OTTAWA
BLOCK 14 (BRIDLEWOOD TRAILS PHASE 2)

DRAWING NAME
NOTES AND LEGENDS

PROJECT No. 114013
REV: REV # 1
DRAWING No. 114013-NL

PLANA1.DWG - 841mmx594mm

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