



# 1095 NORTH TALBOT RESIDENTIAL DEVELOPMENT

CITY OF WINDSOR, ONTARIO

## STORMWATER MANAGEMENT AND FUNCTIONAL SERVICING REPORT

PROJECT NO. 21-021



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## 1. Introduction

Baird AE has been engaged to provide civil engineering design services in support of a conceptual plan for the proposed 1095 North Talbot residential development. The proposed development consists of two lots, with the municipal addresses of 1095 and 1185 on North Talbot Road. These lots are currently vacant with the exception of a residential property located at the Northeast corner of the 1185 lot. The proposed development has a total area of 2.93 Ha and shall consist of 34 single family detached lots with areas exceeding 500 m<sup>2</sup>. This report is intended to define a stormwater management scheme for the proposed development, which shall meet the current approval criteria, as specified by the current Windsor Essex Region Stormwater Management Standards (WERSMS) along with providing a brief overview of the functional servicing study for this site.

## 2. Pre-Development Conditions

The proposed development site is currently vacant, with some overgrowth dispersed throughout the two adjacent lots, 1095 and 1185 North Talbot Road. The lots are predominantly undeveloped, with the exception of the residential property at the North east corner of the 1185 lot. Any runoff from the existing lots is currently discharging via overland flow to the open ditches on North Talbot. However, it was confirmed through pre-consultation with the City of Windsor that both lots 1095 and 1185 were originally assessed to the 1200 mm diameter sewer constructed along the Southwood Lakes Boulevard alignment, located west of the site.



Figure 1: Existing Conditions

### 3. Allowable Release Rate

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Lots 1095 and 1185 were both included in a drainage study, conducted by Dillon Consulting Limited in 2019, assessing the North Talbot Road Corridor from Howard Avenue easterly to the Highway 401 overpass east of the proposed development site. Through consultation with the City of Windsor and Dillon Consulting limited it was determined that the allowable release rate for the proposed development would be defined by the maximum allowable release rates from lots 1095 and 1185 identified in the North Talbot study. Furthermore, the release rates defined in the North Talbot study for lots 1095 and 1185 were 206 L/s and 201 L/s, respectively. Therefore, the total allowable release rate for the proposed development, including both lots, was determined to be 407 L/s.

### 4. Post Development Conditions

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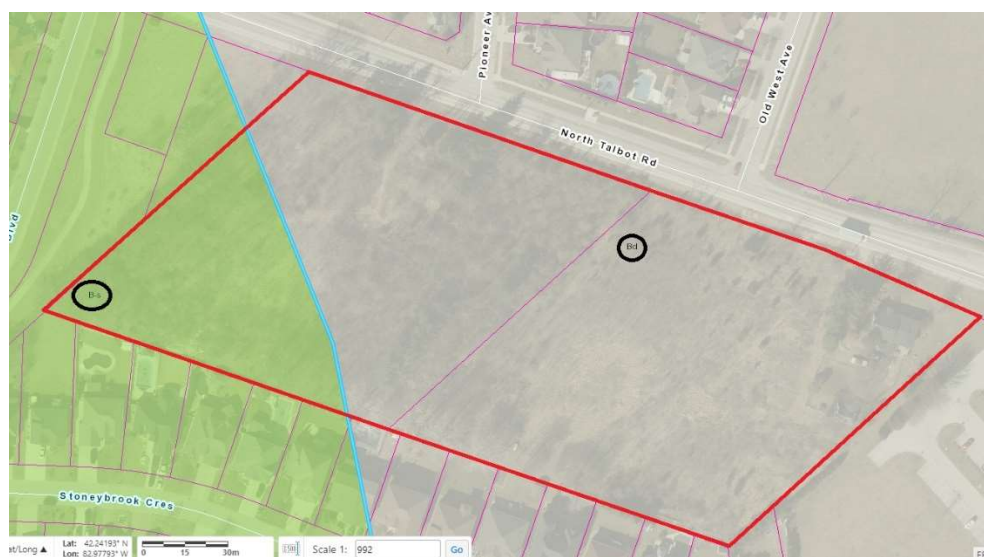
The proposed developed shall have a total area of 2.93 Ha and shall be subdivided into 34 residential lots with areas greater than 500 m<sup>2</sup> (2.07 Ha), a single lot dedicated to a dry pond stormwater management facility (0.105 Ha), and roads/boulevards (0.755 Ha). Drainage on the site shall be achieved via overland and twin inlet catch basins installed as depicted in Appendix A, with the total combined discharge from the site discharging to the existing 1200 mm diameter storm sewer constructed along the Southwood Lakes Boulevard alignment.

The stormwater management scheme for the site was developed using PCSWMM Professional (Version 7.3.3095), applying a dynamic wave routing methodology to the site analysis. The site was subdivided into six sub-catchments based on the grading and servicing designs for the site, for the purpose of analyzing the sites response to given storm events. Table 1, below, provides the sub-catchment parameters, applied to each sub-catchment in the model. Furthermore, a general layout of the model has been provided in Appendix B for reference.

**Table 1: PCSWMM Sub-Catchment Parameters**

Catchment ID	Area (ha)	Gradient %	Impervious %	Manning 'n' Imp	D-store Impervious (mm)	D-store pervious (mm)	Manning 'n' per
S1	0.479	1	60	0.013	2.5	7.5	0.15
S2	0.219	1	60	0.013	2.5	7.5	0.15
S3	0.447	1	60	0.013	2.5	7.5	0.15
S4	0.530	1	60	0.013	2.5	7.5	0.15
S5	0.887	1	60	0.013	2.5	7.5	0.15
S6	0.368	1	60	0.013	2.5	7.5	0.15
Proposed Development = 2.93 Ha							

According to the soil data provided by the Essex Regional Conservation Authority's (ERCA) interactive mapping tool the site consists of two different soil types, Figure 2 below depicts the stratification of the soil types across the surface of the site. The two soil types are Brookstone Clay Loam (shown in grey) and Brookstone Clay Sand (shown in yellow). Both soils are classified as Hydrologic Soil Group D in accordance with the WERSMS and both have very similar infiltration parameters, thus one soil type was used in the PCSWMM analysis of the site to account for infiltration in the stormwater management calculations and that type was selected to provide the most conservative estimate of infiltration in the analysis. The Horton method of infiltration estimation was applied in the PCSWMM model and the parameters for each soil type present on the site are as provided in Table 2 below.



**Figure 2: Site Soil Type Depiction**

**Table 2: Infiltration Parameters**

<b>Attribute</b>		<b>Brookstone Clay Loam</b>	<b>Brookstone Clay Sand</b>
		<b>Hydro Group (D)</b>	<b>Hydro Group (C)</b>
Horton's Infiltration	Max. Infil. Rate (normal) (mm/hr)	50	50
	Min. Infil. Rate (mm/hr)	0.5	0.5
	Decay constant (1/hr)	4	4
	Drying Time (days)	4	4

The soil type selected for application in the model was Brookstone Clay Loam and these parameters were applied to each sub-catchment included in the analysis. This data, along with much more, is presented in the model input/output summaries provided in Appendices C, D, and E to this report.

## 5. Stormwater Management

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The stormwater management criteria for this development are based on the requirements of the City of Windsor and the WERSMS. The requirement includes:

- Restriction of the peak discharge from the site to the allowable release rate, defined in subsection 3 of this report, for storm events with depths up to and including the 100-year event.
- Storm water detention for site runoff in excess of the allowable release rate for a given storm event.
- Water quality controls providing a "Normal Protection level" as per MOE (2003) guidelines.

### 5.1. Storm Quantity Control

In accordance with the WERSMS stormwater quantity controls are to be provided for all given storm events with depths less than or equal to the 100-year event, with discharge from the site being restricted to a release rate agreed upon with the approval authority, in this case the City of Windsor. As such, of the design storm events prescribed in the WERSMS, those selected for further analysis were selected on the basis of having the largest impact on the site in terms of discharge and the resultant hydraulic grade-line within the limits of the site. Table 3, provided below, identifies

**Table 3: Rainfall Intensities used for PCSWMM Modelling**

<b>Storm Event</b>	<b>Storm Duration</b>	<b>Rainfall Depth</b>
Chicago 5-year	4 hours	49.50 mm
100-year Chicago	4 hours	81.6 mm
Urban Stress Test	24 hours	150 mm

The ultimate outlet for stormwater runoff from the site is the existing 1200 mm diameter storm sewer constructed along the Southwood Lakes Boulevard. The tailwater conditions at that outlet were included in the results of the drainage study discussed in Subsection 3 of this report, and as such these tailwater conditions were provided by Dillon Consulting Limited to be included in the model for this site. Tailwater data was applied for each storm event included in the PCSWMM analysis for this site, however the data has been omitted from this report due to the size of the input, although this data can be provided to reviewer upon request.

As noted in Subsection 3 of this report the allowable release rate for this site was estimated to be 407 L/s. Discharge from the site is restricted via a 377 mm diameter orifice plate installed as depicted in Appendix A. Furthermore, Table 4 below provides a summary of the uncontrolled peak discharge from the site for each given storm event and the controlled release rate to the existing 1200 mm sewer downstream of the orifice plate. Review of Table 4 confirms that the allowable release rate is not exceeded in neither the minor (5-year) nor the major (100-year & Urban Stress Test) storm events. It is worthwhile to note here that due to the tailwater condition at the outlet the peak discharge is met with a similar peak in tailwater elevation, resulting in controlled outflow being nearly equal to uncontrolled outflow, which is evident in the results displayed in Table 4.



**Table 4: Peak Discharges**

<b>Storm Event</b>	<b>Peak Inflow (m<sup>3</sup>/s)</b>	<b>Controlled Outflow (m<sup>3</sup>/s)</b>
Chicago 5-year 4hr	0.388	0.389
100-year Chicago 4hr	0.357	0.358
Urban Stress Test	0.407	0.407

The stormwater detention scheme applied on this site is a combination of subsurface storage in pipes and drainage structures and surface storage in the form of a dry pond, located as depicted in Appendix A, and ponding on the road surface in the major storm events. Table 5 below provides a summary of the proposed dry pond stage storage breakdown.

**Table 5: SWM Pond Stage Storage Calculations**

<b>Stage (m)</b>	<b>Elevation (m)</b>	<b>Contour Area (m<sup>2</sup>)</b>	<b>Storage (m<sup>3</sup>)</b>	<b>Levels</b>
0.00	188.34	0.36	0	Top of Grate
0.04	188.38	82.7	1.66	Top of Low Slope (0.5%) Contour
0.70	189.04	286.2	157	5- Year High Water Line
1.48	189.82	714	594	Urban Stress Test High Water Line
1.63	189.97	809.7	712	100-Year High Water Line
1.93	190.27	943.9	994.04	Top of Pond

Review of Table 5 shows that storage required for each storm event, with depths up to and including that of the Urban Stress test can be contained within the proposed dry pond. The critical event governing the size and shape of the pond is the 100-year 4-hour Chicago storm event, as displayed in Table 5. The top elevation of the pond was set at 190.27 m to provide a 0.3 m freeboard from the top of the pond to the 100-year high water elevation.

## 5.2. Minor and Major storm events

Pipes were sized in PCSWMM to provide adequate drainage along with reducing the additional storage in the stormwater drainage system. A rational method analysis was used to verify that minimum pipe velocities could be satisfied by the pipes, as depicted on Sheet 9 of Appendix A. The PCSWMM model was used to assess the hydraulic grade-line across the site for both the minor and major storm events. The tables provided below summarize the hydraulic grade-line results at each node for each storm event, which is intended to convey that the hydraulic grade-line requirements of the WERSMS have been met. It is important to note here that the manhole and catch basin identifiers used here match those provided in the drawings in Appendix A.

**Table 6: 5-year 4-hour Chicago Storm**

<b>STRUCTURE NAME</b>	<b>RIM ELEVATION (m)</b>	<b>5-YEAR WATER ELEVATION (m)</b>	<b>FREEBOARD (m)</b>
MH#1	190.252	189.32	0.932
MH#2	189.972	189.28	0.692
MH#3	189.956	189.25	0.706
MH#4	189.9	189.24	0.66
MH#5	190.237	189.31	0.927
MH#6	189.98	189.26	0.72
MH#7-A	190.34	189.22	1.12
MH#7-B	190.34	187.75	2.59
Pond Basin	188.34	189.2	-
Dry Pond	190.27	189.04	1.23

\* CB nodes and road HP nodes excluded as PCSWMM model reports a depth of zero at these nodes during the minor storm event (as required by WERSMS)

**Table 7: 100 – Year 4- hour Chicago Storm**

<b>STRUCTURE NAME</b>	<b>ROAD ELEVATION (m)</b>	<b>100 YEAR WL (m)</b>	<b>PONDING. DEPTH (m)</b>	<b>LOE (m)</b>	<b>FREE BOARD(m)</b>
<b>CB#1&amp;2</b>	189.746	190.04	0.3	190.4	0.36
<b>CB#3&amp;4</b>	189.768	190.04	0.27	190.4	0.36
<b>CB#5&amp;6</b>	189.784	190.04	0.26	190.4	0.36
<b>CB#7&amp;8</b>	189.804	190.04	0.24	190.4	0.36
<b>CB#9&amp;10</b>	189.804	190.04	0.24	190.4	0.36
<b>HP1</b>	190.35	-	0	190.4	-
<b>HP2</b>	189.943	190.04	0.1	190.4	0.36
<b>HP3</b>	189.943	190.04	0.1	190.4	0.36
<b>HP4</b>	190.05	-	0	190.4	-
<b>HP5</b>	190.441	-	0	190.4	-
<b>HP6</b>	190.426	-	0	190.4	-
<b>Dry Pond</b>	-	189.97	1.63	190.4	0.3

**Table 8: Urban Stress Test Storm**

<b>STRUCTURE NAME</b>	<b>ROAD ELEVATION (m)</b>	<b>UST WL (m)</b>	<b>PONDING DEPTH (m)</b>	<b>LOE (m)</b>	<b>FREE BOARD(m)</b>
<b>CB#1&amp;2</b>	189.746	189.92	0.18	190.4	0.48
<b>CB#3&amp;4</b>	189.768	189.93	0.17	190.4	0.47
<b>CB#5&amp;6</b>	189.784	189.93	0.15	190.4	0.47
<b>CB#7&amp;8</b>	189.804	189.97	0.16	190.4	0.43
<b>CB#9&amp;10</b>	189.804	189.96	0.15	190.4	0.44
<b>HP1</b>	190.35	-	-	190.4	-
<b>HP2</b>	189.943	189.97	0.02	190.4	0.43
<b>HP3</b>	189.943	189.95	0.01	190.4	0.45
<b>HP4</b>	190.05	-	-	190.4	-
<b>HP5</b>	190.441	-	-	190.4	-
<b>HP6</b>	190.426	-	-	190.4	-
<b>Dry Pond</b>	-	189.82	1.48	-	0.45

### 5.3. SWM Findings

- Based on Section 5.2 for minor storm event, the water elevation for 5-year storm event is stored more than 0.3 m below the rim elevations of the manhole, consequently there is no surface ponding in the roadway.
- The ponding depth during the 100-year storm event is less than or equal to 0.3 m in the roadway.
- The proposed Lowest Opening Elevation (LOE) will be set 0.300m more than the water elevation on the road, as shown in Table 7.
- PCSWMM modelling input, output report and profiles are attached in Appendix C, D, and E of this report.

#### **5.4. Water Quality, Erosion and Sediment Control**

The water quality is addressed through a quality unit FD-5HC. The quality unit was sized with rainfall intensity stated in table 3.4.1.5 of WERSMSM and with fine particle size distribution. The quality unit treats 95.9% total runoff volume, while maintaining an overall removal efficiency of 75.1% and it satisfies the MECP and WERSMSM manuals.

The OGS unit is specifically sized only for the proposed subdivision and is installed upstream of the proposed connection to the existing 1200 mm storm sewer constructed along the Southwood Lakes Boulevard alignment. The details of the OGS quality unit are provided on Sheet 11 of Appendix A. The erosion and sediment control measures for the site will be included in tender documents, and will include the following:

- Silt fence is to be erected before grading begins on the property to protect downstream areas from migration of sediment in overland flow;
- Filter fabric will be placed over the drainage grates; and
- All disturbed areas will be stabilized by restoration of vegetative ground cover as soon as possible.

### **6. Functional Servicing Study**

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#### **6.1. Storm Drainage Servicing**

In consultation with the City of Windsor it was determined that the 1095 North Talbot Road was originally assessed to the 1200 mm diameter sewer constructed along the Southwood Lakes Boulevard alignment and 1185 was assessed to the 1200 mm sewer along the North Talbot Road alignment, opposite the site. Furthermore, it was determined in pre-consultation with the City that it would be acceptable to divert all drainage from the proposed development site to the 1200 mm sewer along Southwood Lakes Boulevard, as has been pursued herein.

## 6.2. Sanitary Drainage Servicing

In consultation with the City of Windsor it was determined that the site has been assessed to the existing 600 mm sanitary trunk sewer, constructed along the northern property line, of the site. The City confirmed connection to this sewer would be acceptable for the proposed development's sanitary drainage. Therefore, no further sanitary drainage study was conducted. A sanitary design sheet, detailing the sewer sizing for the proposed development is provided on Sheet 10 in Appendix A.

## 6.3. Potable Water Servicing

In pre-consultation with Enwin it was determined that there are 300 mm diameter water mains located along both the Southwood Lakes Boulevard and the North Talbot Road alignments. Proposed water servicing is as depicted in Appendix A and is pending further review from the Utility Authority.

## 7. Conclusion

Based on the above results, we have determined the following:

1. The proposed development is modelled using new ERCA SWMM guidelines and meets all standard criteria specified therein.
2. Water elevations for 5, 100 and Urban storm events satisfies the new ERCA SWMM guidelines.
3. The proposed subdivision did not have any adverse impacts on existing downstream developments.

All of which is respectfully submitted.

**BAIRD AE INC.**  
**27 PRINCESS STREET,**  
**UNIT 102 LEAMINGTON, ONTARIO N8H 2X8**

Bill Fuerth, P. Eng.





Appendix A

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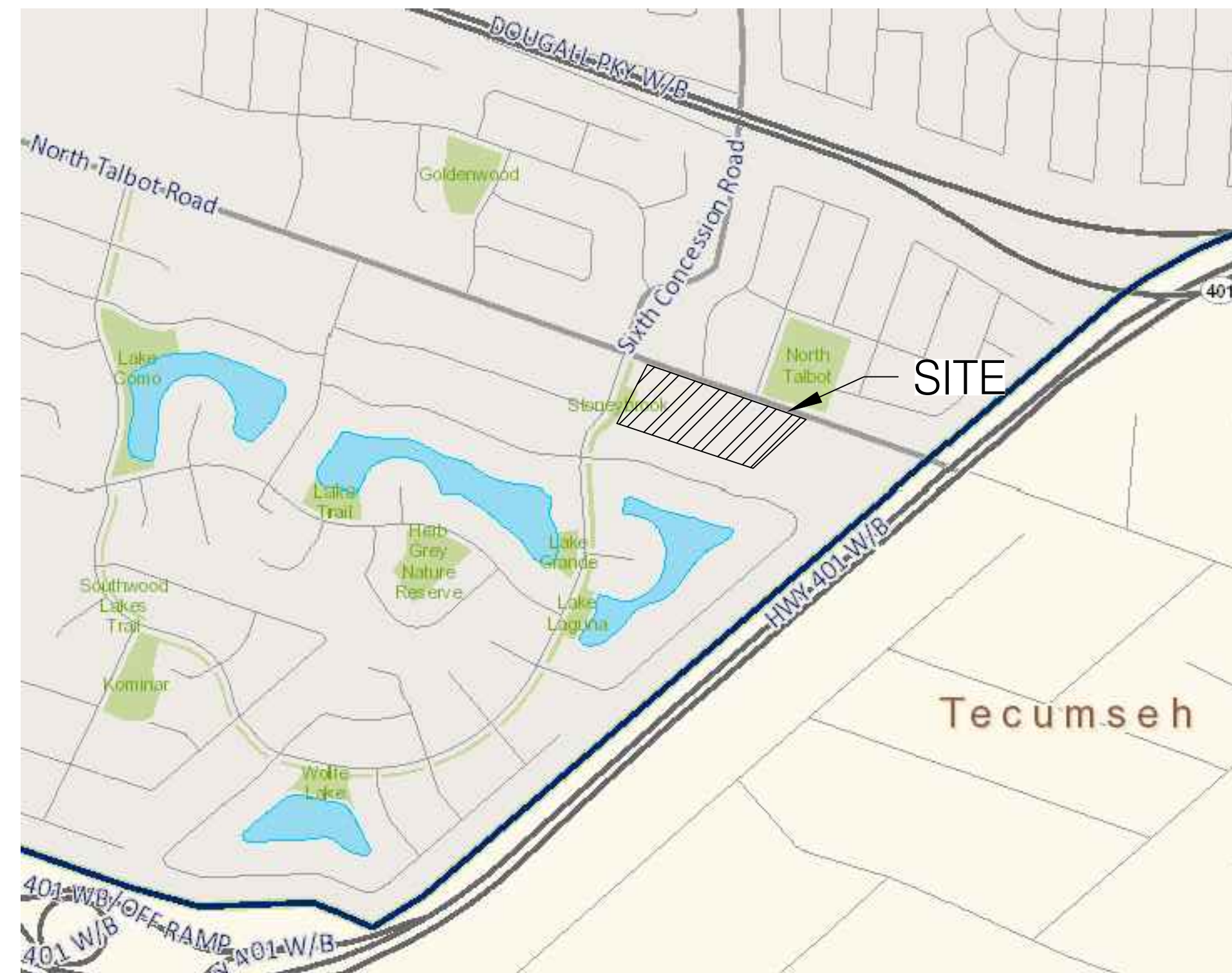
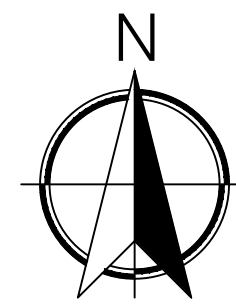
**Design Drawings**



# NORTH TALBOT DEVELOPMENT

1095 NORTH TALBOT ROAD, WINDSOR

LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER	---	---
SANITARY SEWER	---	---
WATER MAIN	---	---
STORM SERVICE		○ STM
SANITARY SERVICE		○ SAN
WATER SERVICE		○ WSV
FIRE HYDRANT & WATER VALVE	⊗	⊗
GAS MAIN	---	---
CATCH BASIN	⊠	⊠
CURB INLET		⊠
STORM MANHOLE	●	●
SANITARY MANHOLE	●	●
WATER VALVE	⊗	⊗
EP ELEVATIONS		▽
STREET LIGHTS		✱



**KEY PLAN**  
N.T.S

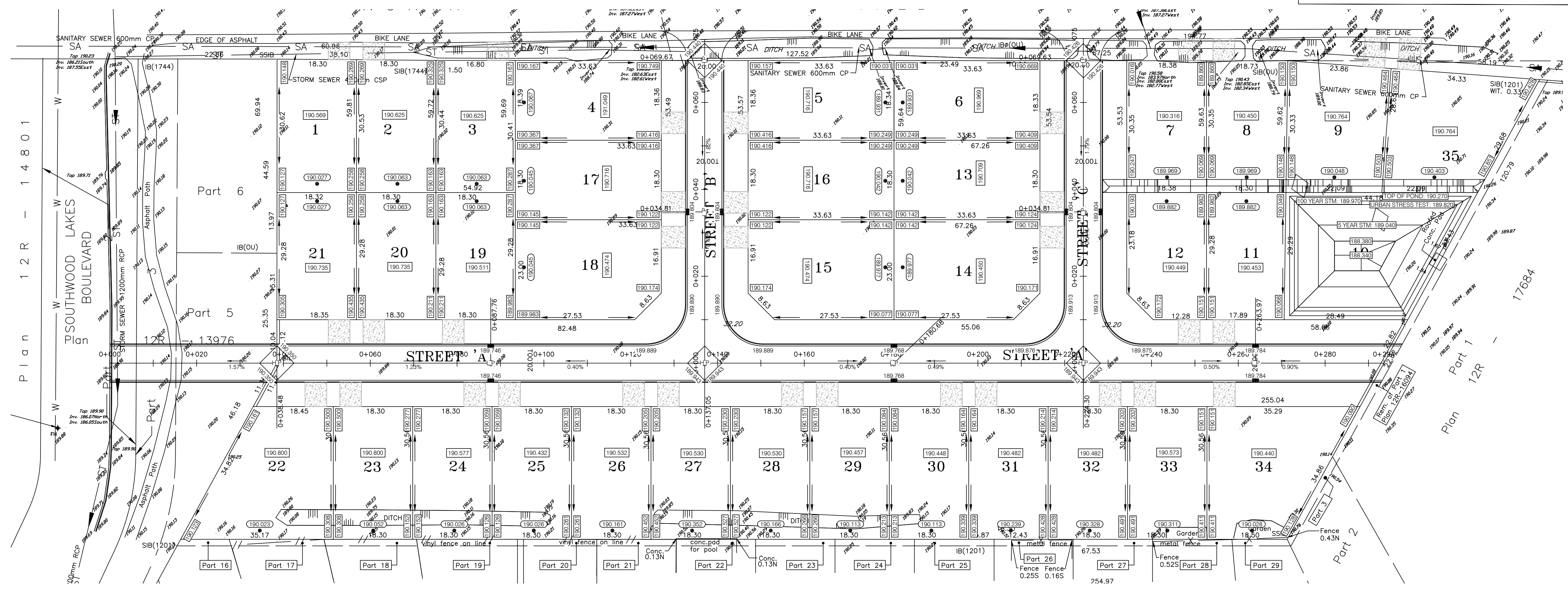
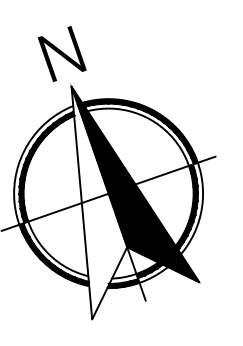
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1	GRADING PLAN
2	OVERLAND FLOW ROUTE
3	SERVICING LAYOUT PLAN
4	STREET 'A' PLAN AND PROFILE 0+000 TO 0+170
5	STREET 'A' PLAN AND PROFILE 0+170 TO 0+310
6	STREET 'B' PLAN AND PROFILE 0+000 TO 0+108
7	STREET 'C' PLAN AND PROFILE 0+000 TO 0+105
8	POND PLAN AND PROFILE 0+000 TO 0+043
9	STORM DRAINAGE AREA PLAN
10	SANITARY DRAINAGE AREA PLAN
11	DETAILS 1
12	DETAILS 2

**NOTE:**  
ENVIRONMENTAL COMPLIANCE APPROVAL  
NUMBER: #####  
ISSUED DATE: #####

**ATTENTION**  
CONTRACTOR IS RESPONSIBLE FOR CONFIRMING  
THE EXACT LOCATION AND PROTECTION OF EXISTING  
UTILITIES DURING CONSTRUCTION.

**BENCH MARK**  
CITY OF WINDSOR BENCH MARK 1083 ELEVATION 191.32  
M.B. 1185 NORTH OF TALBOT ROAD: THE PLATE IS LOCATED ON THE WEST WALL OF THE CHIMNEY, 0.09 METER FROM THE SOUTH WALL OF THE CHIMNEY AND 0.43 METER ABOVE GRADE.  
SITE BENCH MARK #1 ELEVATION 190.79  
TOP OF FIRE HYDRANT AT SOUTHWEST CORNER OF PARCEL.  
SITE BENCH MARK #2 ELEVATION 191.22  
TOP OF FIRE HYDRANT AT NORTHEAST CORNER OF NORTH TALBOT ROAD AND PIONEER AVENUE.

GRADING NOTES	
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Plan 12R - 14801

Plan 12R - 17684

105 NORTH TALBOT ROAD, WINDSOR, ONTARIO

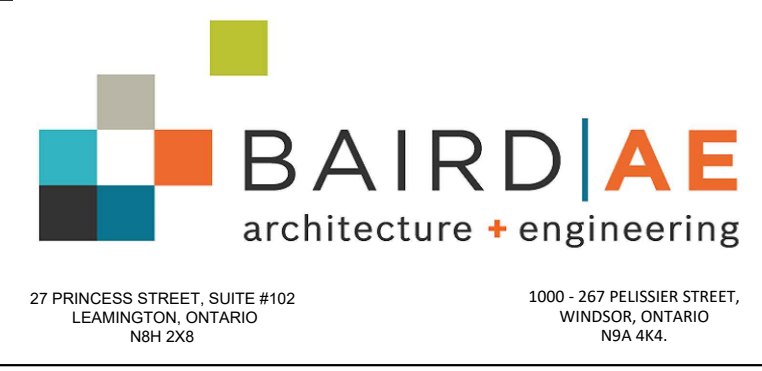


DATE: 05/14/2021

*Bill Fuertth*

BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS

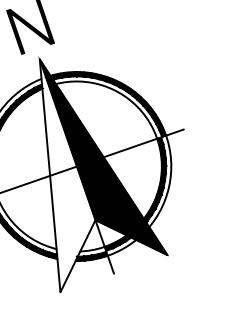


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**NORTH TALBOT DEVELOPMENT**

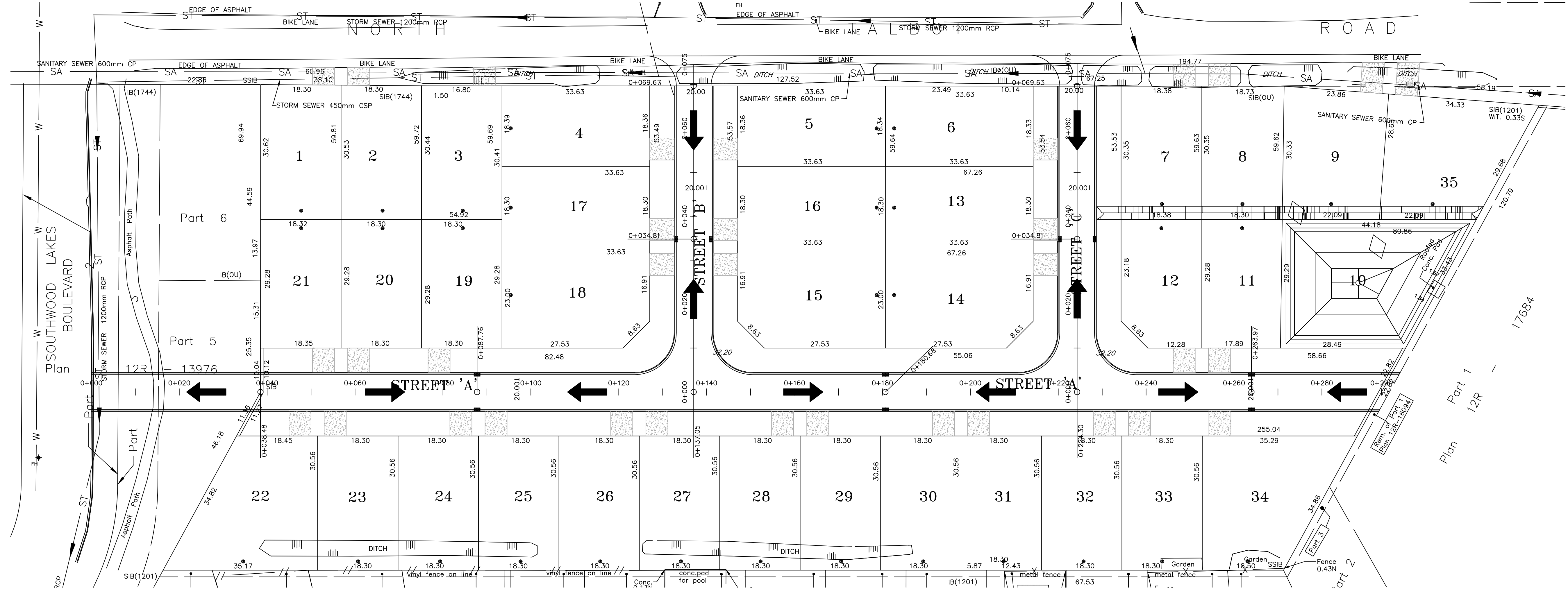
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
**GRADING PLAN**

DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: 1:500	
DRAWN BY: B.T.	SHEET NO: <b>1</b>
CHECKED BY: B.F.	



GRADING NOTES	
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186 NORTH TALBOT ROAD, WINDSOR, ONTARIO N9A 4K4



DATE: 05/14/2021

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DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS

27 PRINCESS STREET, SUITE #102  
LEAMINGTON, ONTARIO  
N8H 2X8

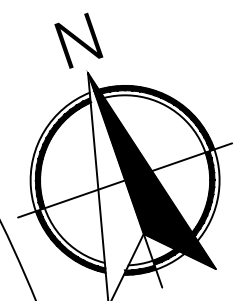
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**NORTH TALBOT DEVELOPMENT**

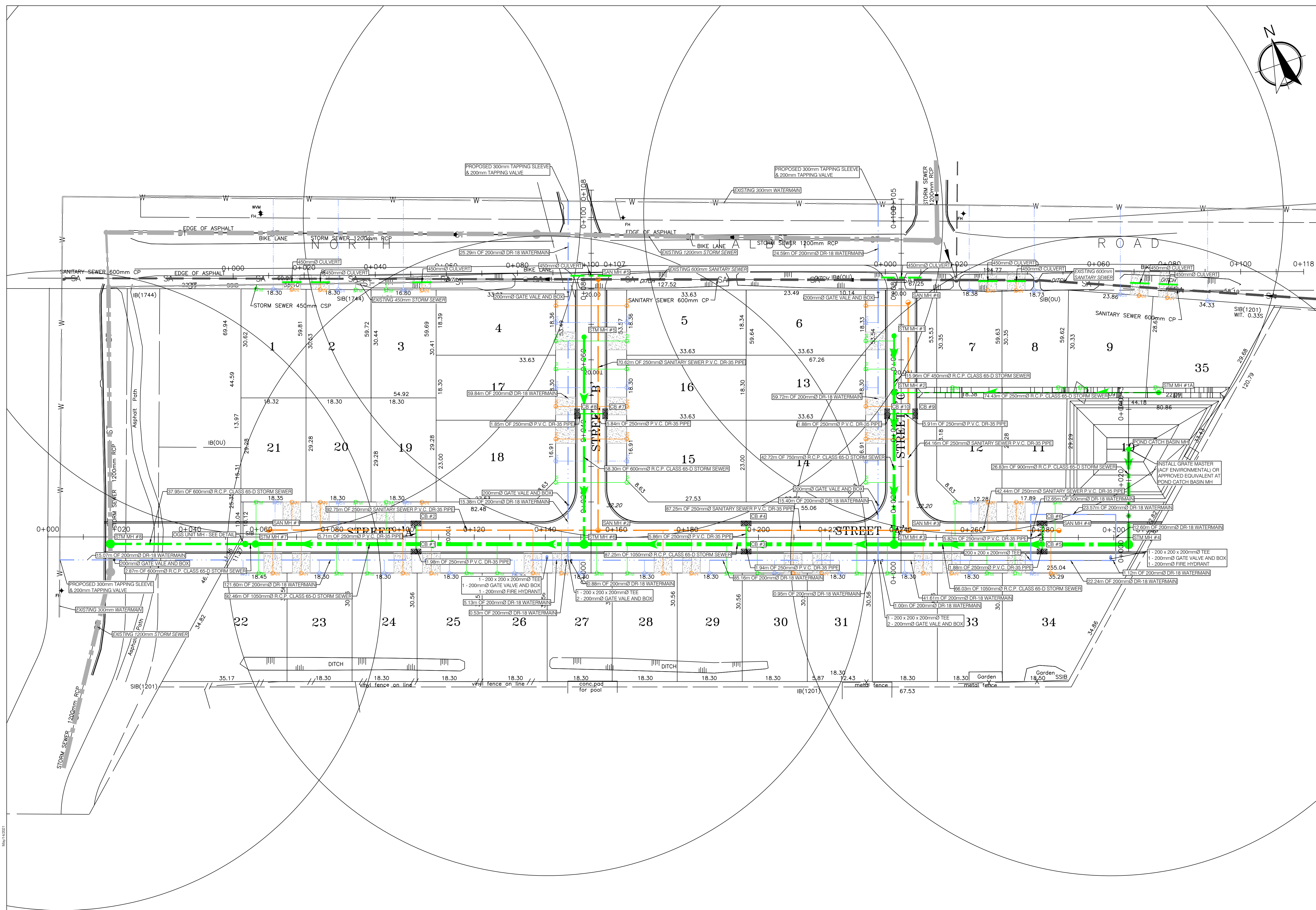
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
**OVERLAND FLOW ROUTE**

DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: 1:500	SHEET NO: <b>2</b>
DRAWN BY: B.T.	CHECKED BY: B.F.



LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER	---	---
SANITARY SEWER	---	---
WATER MAIN	---	---
STORM SERVICE		STM
SANITARY SERVICE		SAN
WATER SERVICE		WSV
FIRE HYDRANT & WATER VALVE		
GAS MAIN		GAS
CATCH BASIN		
CURB INLET		
STORM MANHOLE		
SANITARY MANHOLE		
WATER VALVE		
EP ELEVATIONS		
STREET LIGHTS		



DATE: 05/14/2021

*Bill Fuertth*  
 BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS

**BAIRD | AE**  
 architecture + engineering

27 PRINCESS STREET, SUITE #102  
 LEAMINGTON, ONTARIO N8H 2X8

1000 - 267 PELLISSIER STREET,  
 WINDSOR, ONTARIO N9A 4K4

PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**

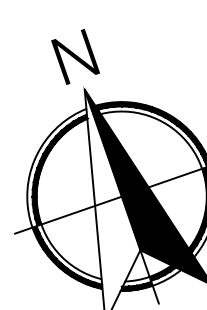
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
**SERVICING LAYOUT PLAN**

DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: 1:500	
DRAWN BY: B.T.	SHEET NO: <b>3</b>
CHECKED BY: B.F.	

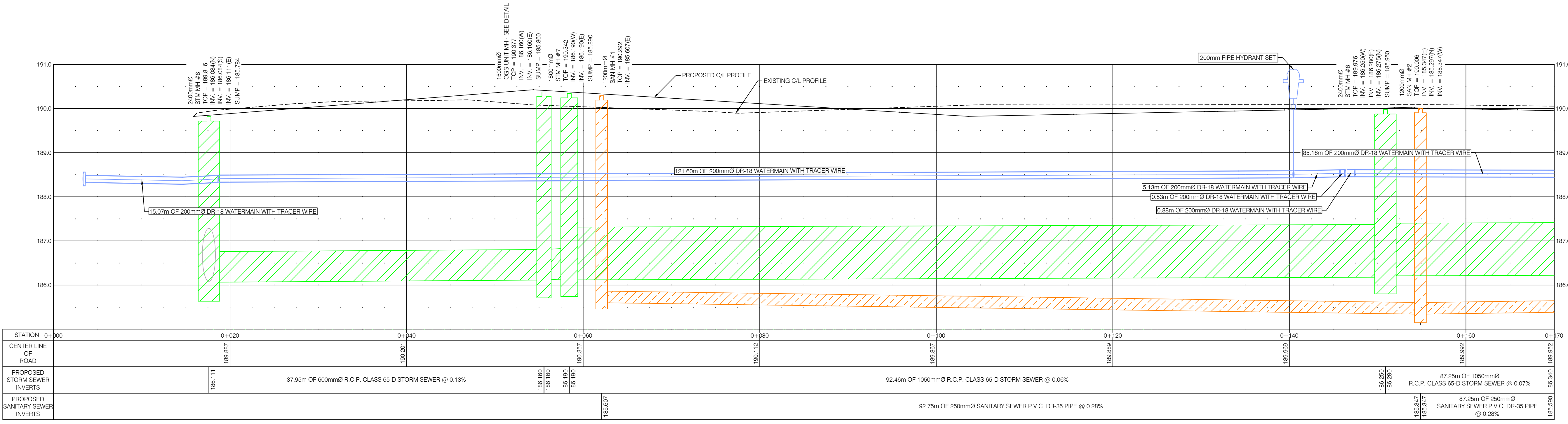
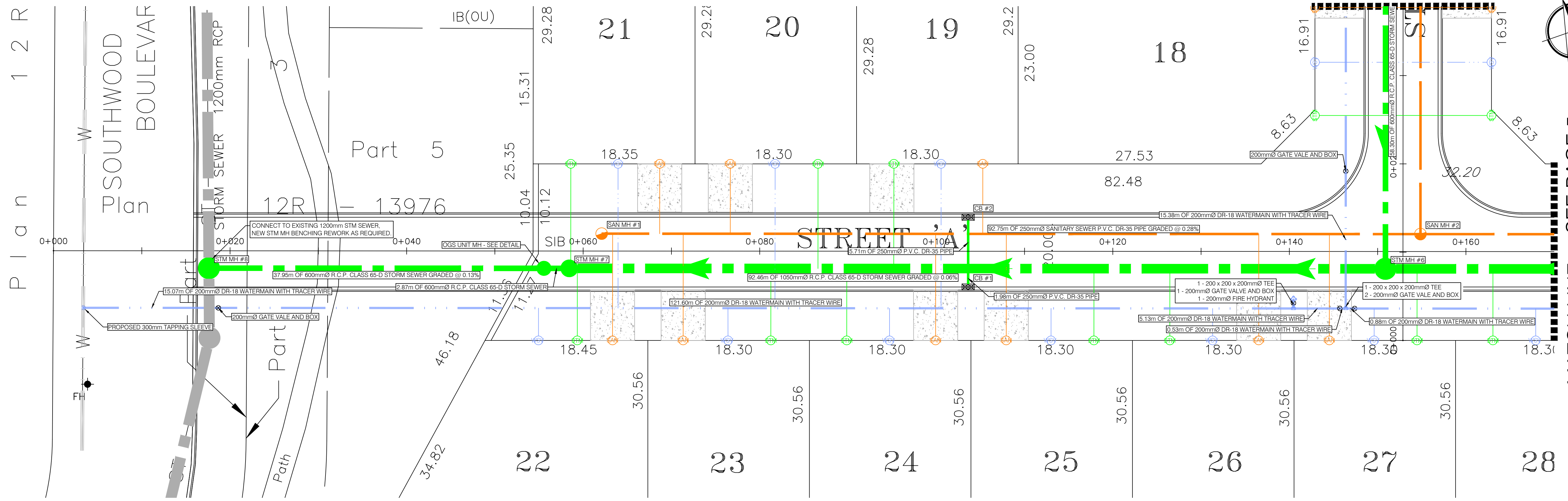
Plan 1 2 R

MATCH LINE SEE PAGE 6

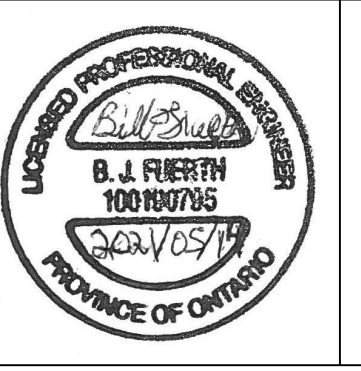


MATCH LINE SEE PAGE 5

DESCRIPTION	LEGEND	
	EXISTING	NEW
STORM SEWER		
SANITARY SEWER		
WATER MAIN		
STORM SERVICE		
SANITARY SERVICE		
WATER SERVICE		
FIRE HYDRANT & WATER VALVE		
GAS MAIN		
CATCH BASIN		
CURB INLET		
STORM MANHOLE		
SANITARY MANHOLE		
WATER VALVE		
EP		
ELEVATIONS		
STREET LIGHTS		



STATION	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+170
CENTER LINE OF ROAD	189.897	189.921	189.937	189.957	189.977	189.999	189.999	189.999	189.992	189.992
PROPOSED STORM SEWER INVERTS	186.111	186.111	186.111	186.111	186.111	186.111	186.111	186.111	186.111	186.111
PROPOSED SANITARY SEWER INVERTS	185.607	185.607	185.607	185.607	185.607	185.607	185.607	185.607	185.607	185.607

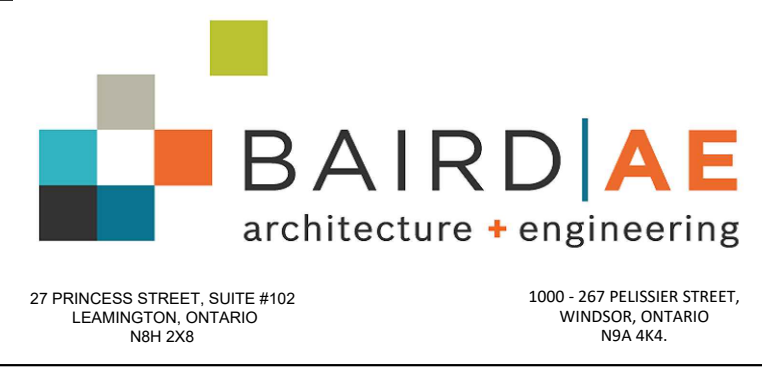


DATE: 05/14/2021

*Bill Fuertth*

BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS



PROJECT TITLE:  
NORTH TALBOT DEVELOPMENT

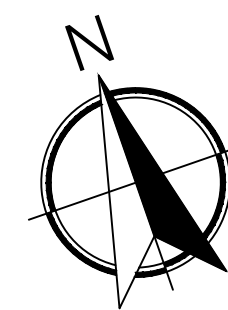
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
STREET 'A' PLAN AND PROFILE 0+000 TO 0+170

DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: HOR: 1:250 VER: 1:50	
DRAWN BY: B.T.	SHEET NO: 4
CHECKED BY: B.F.	

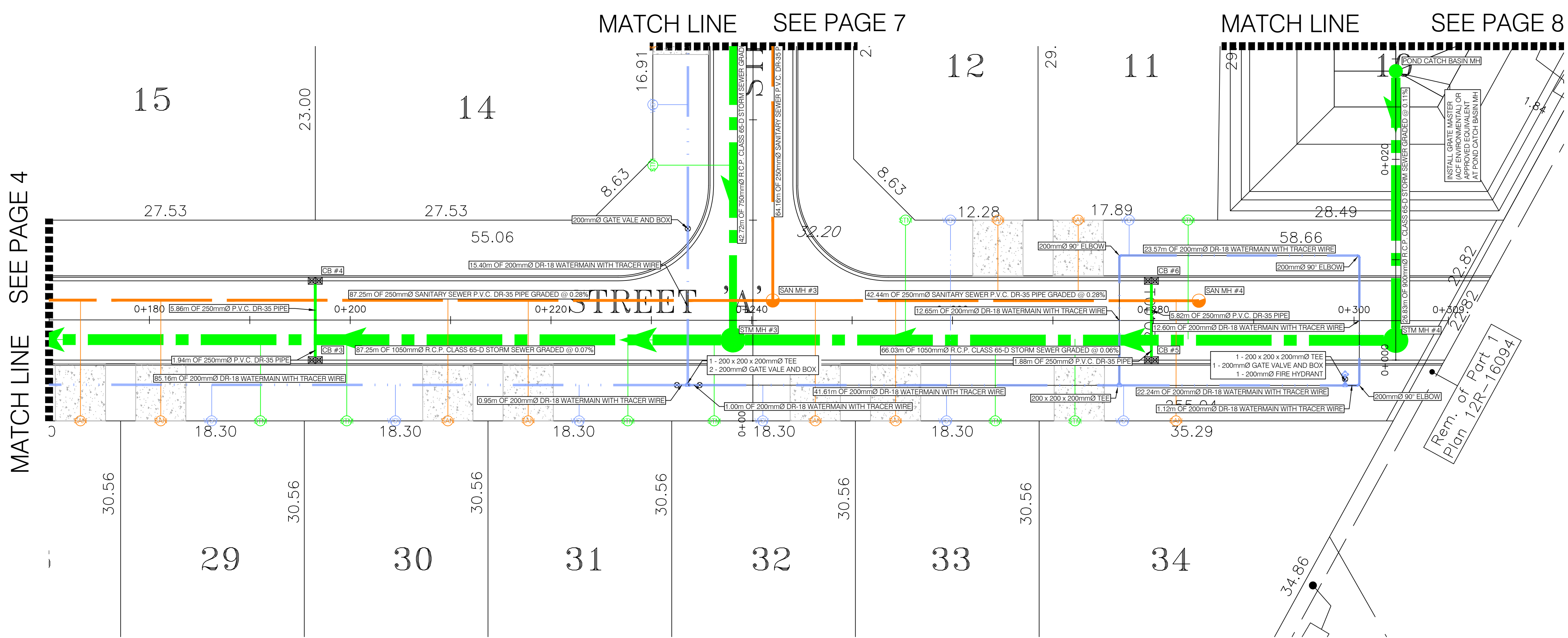
MATCH LINE SEE PAGE 7

MATCH LINE SEE PAGE 8

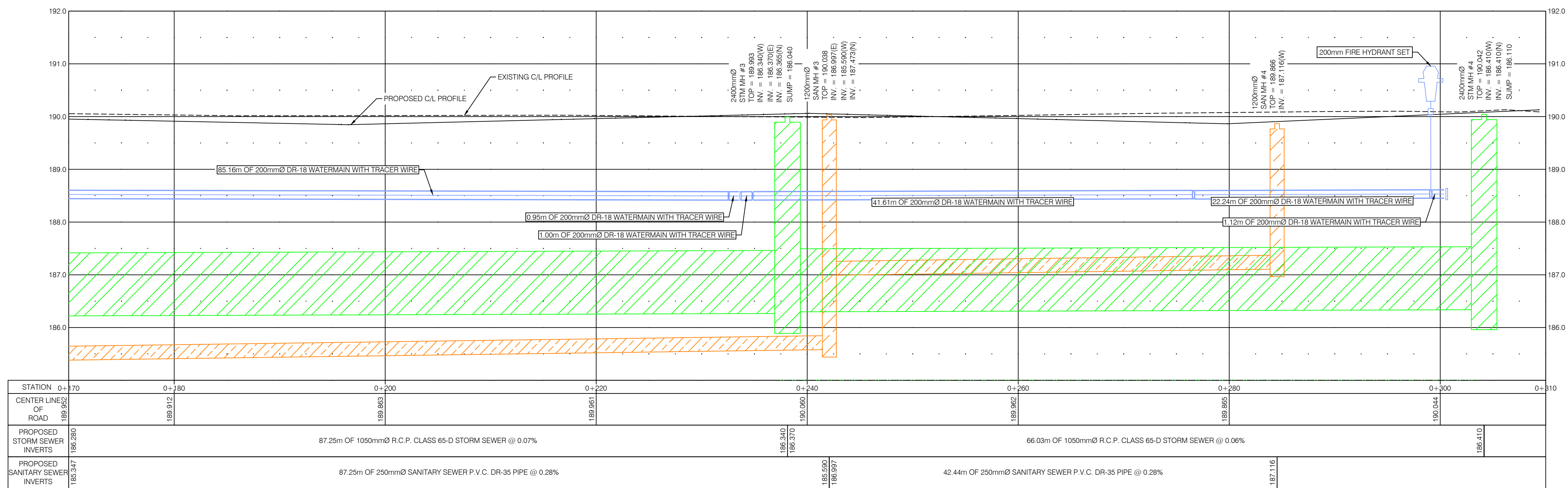


LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER	---	---
SANITARY SEWER	---	---
WATER MAIN	---	---
STORM SERVICE		STM
SANITARY SERVICE		SAN
WATER SERVICE		WSV
FIRE HYDRANT & WATER VALVE		
GAS MAIN		gas
CATCH BASIN	☒	☒
CURB INLET		■
STORM MANHOLE	●	●
SANITARY MANHOLE	●	●
WATER VALVE	⊗	⊗
EP		EP
ELEVATIONS		▲
STREET LIGHTS		☼

MATCH LINE SEE PAGE 4



Rem. of Part 1  
Plan 12R-16094



105 NORTH TALBOT ROAD, WINDSOR, ONTARIO

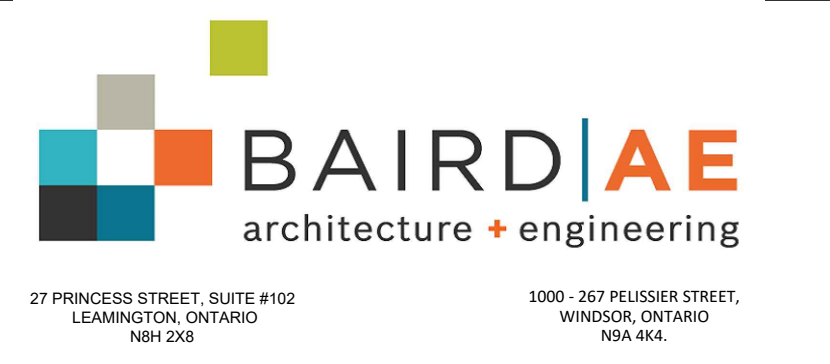


DATE: 05/14/2021

*Bill Fuertth*

BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS
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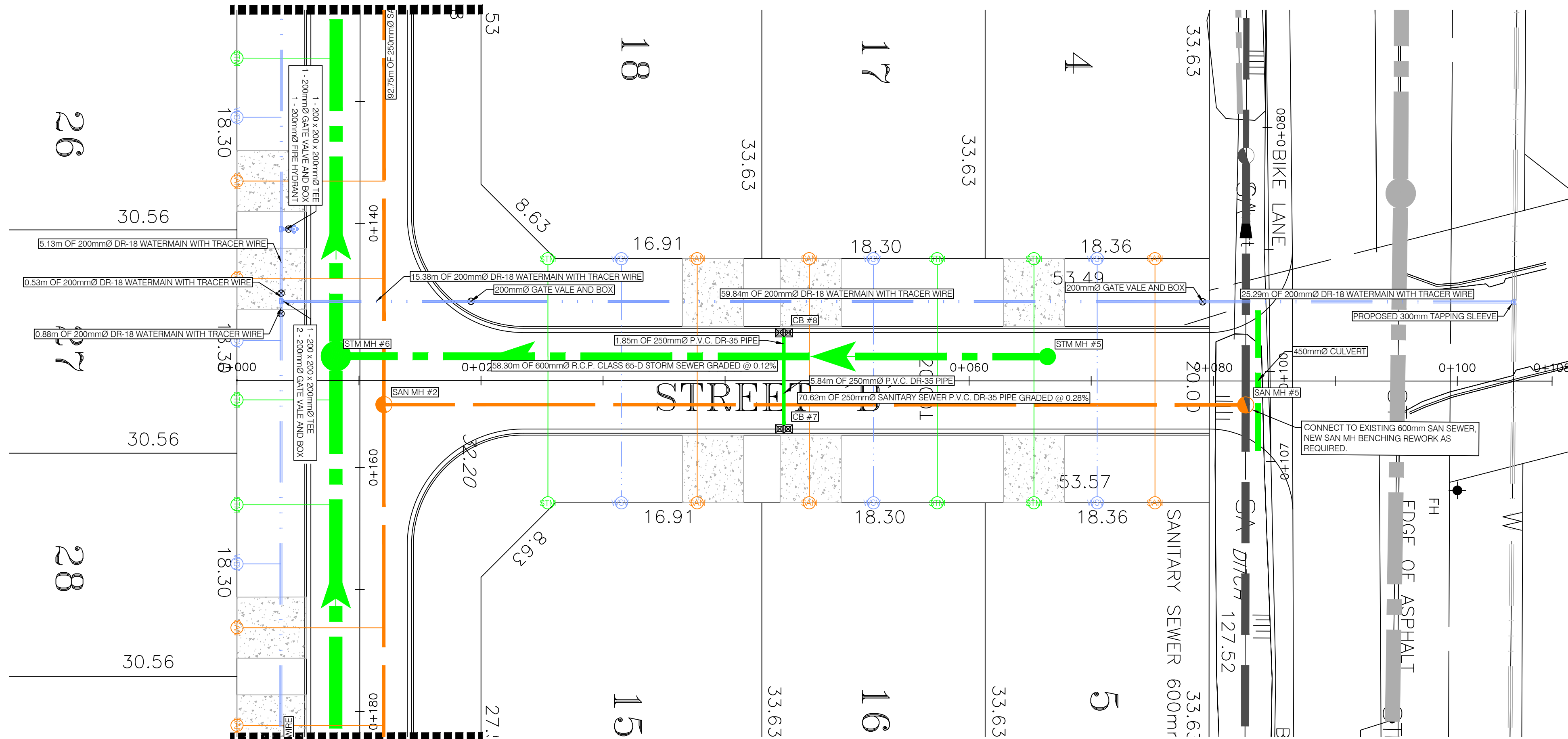
PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**

1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
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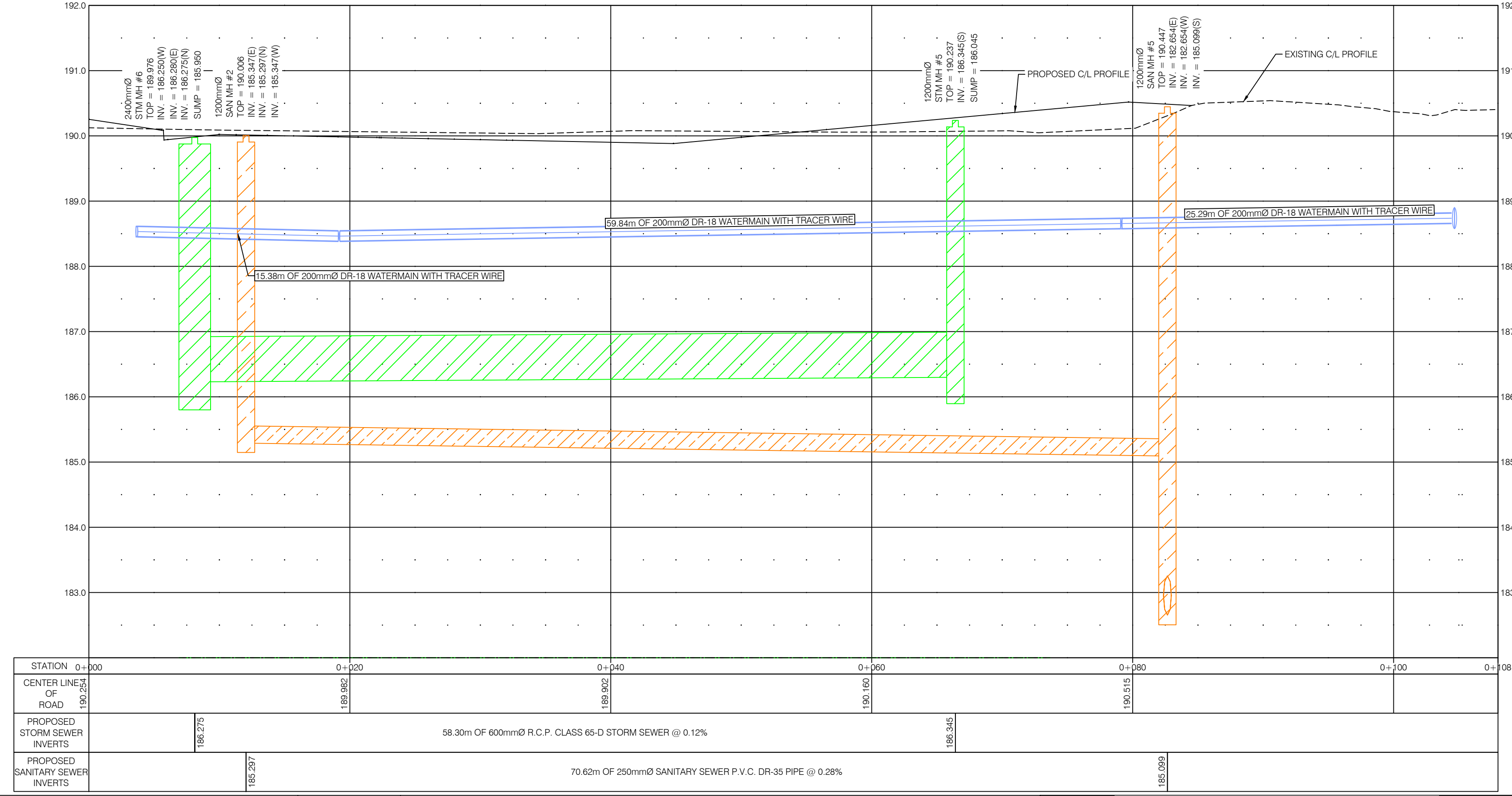
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SCALE: HOR: 1:250 VER: 1:50	
DRAWN BY: B.T.	SHEET NO: <b>5</b>
CHECKED BY: B.F.	

MATCH LINE SEE PAGE 4

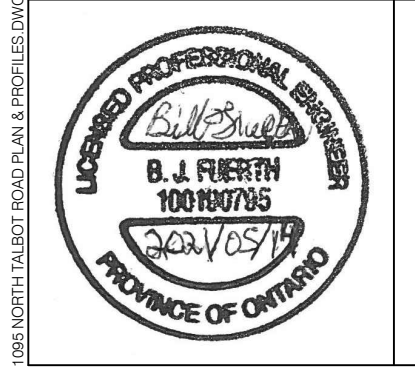


LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER	---	---
SANITARY SEWER	---	---
WATER MAIN	---	---
STORM SERVICE		STM
SANITARY SERVICE		SAN
WATER SERVICE		WSV
FIRE HYDRANT & WATER VALVE		
GAS MAIN		gas
CATCH BASIN	☐	☐
CURB INLET		■
STORM MANHOLE	●	●
SANITARY MANHOLE	●	●
WATER VALVE	⊗	⊗
EP		EP
ELEVATIONS		▲
STREET LIGHTS		★

MATCH LINE SEE PAGE 5



185 NORTH TALBOT DEVELOPMENT, PLAN AND PROFILE ELEVATIONS

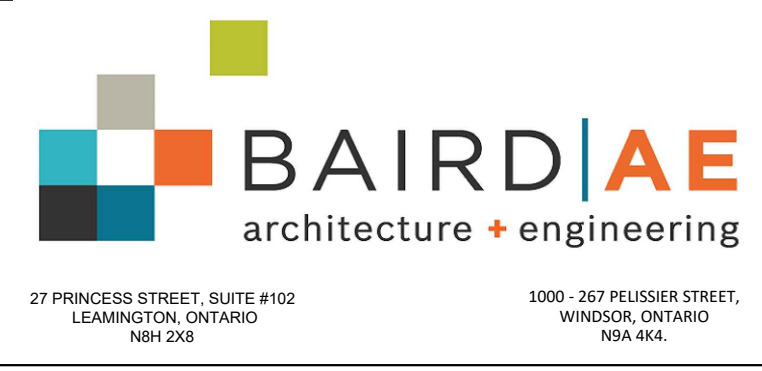


DATE: 05/14/2021

*Bill Fuertth*

BILL FUERTH, P. ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS

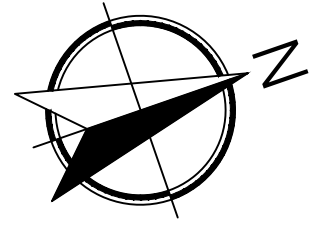


PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**

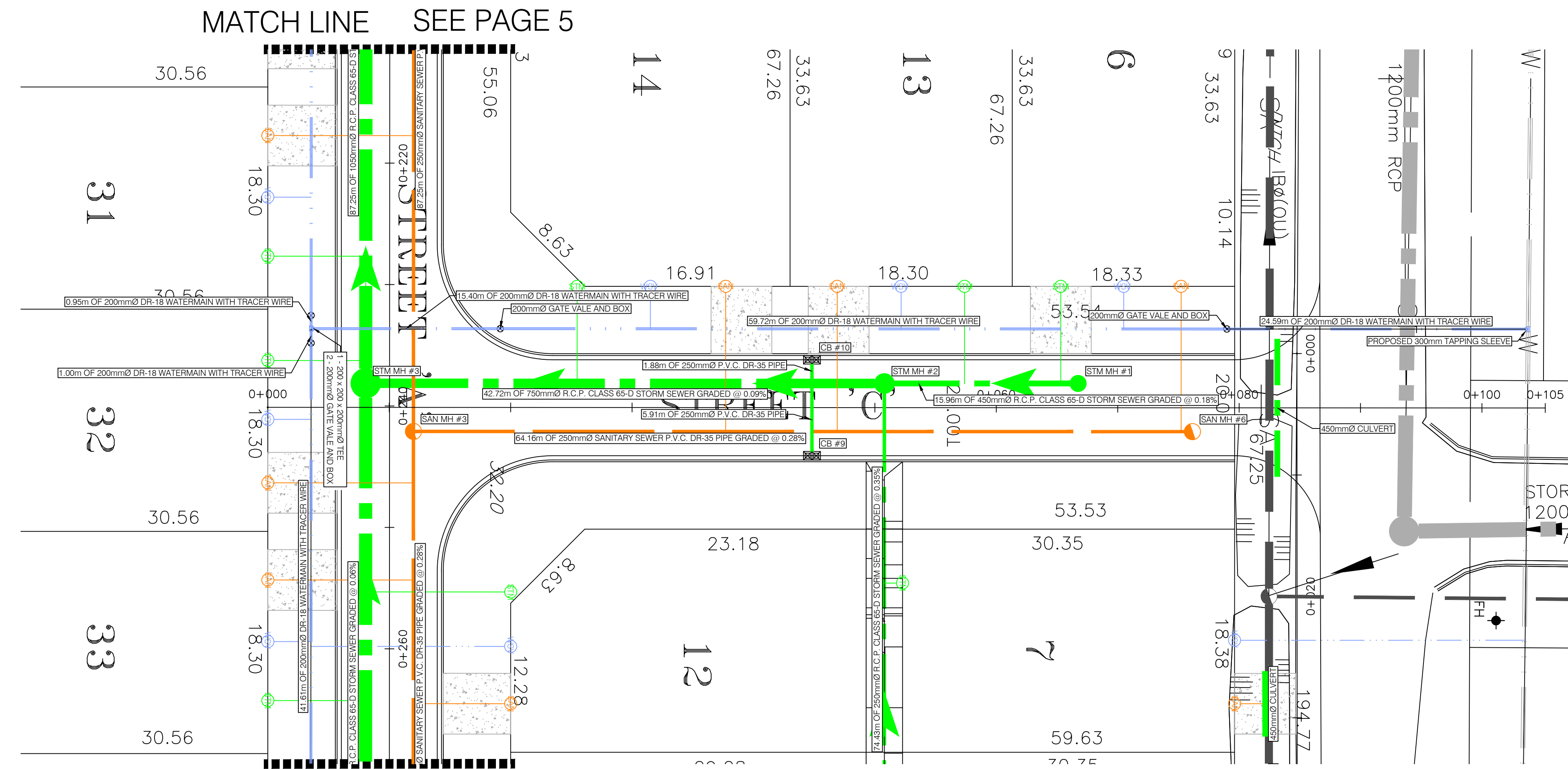
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
**STREET 'B' PLAN AND PROFILE 0+000 TO 0+108**

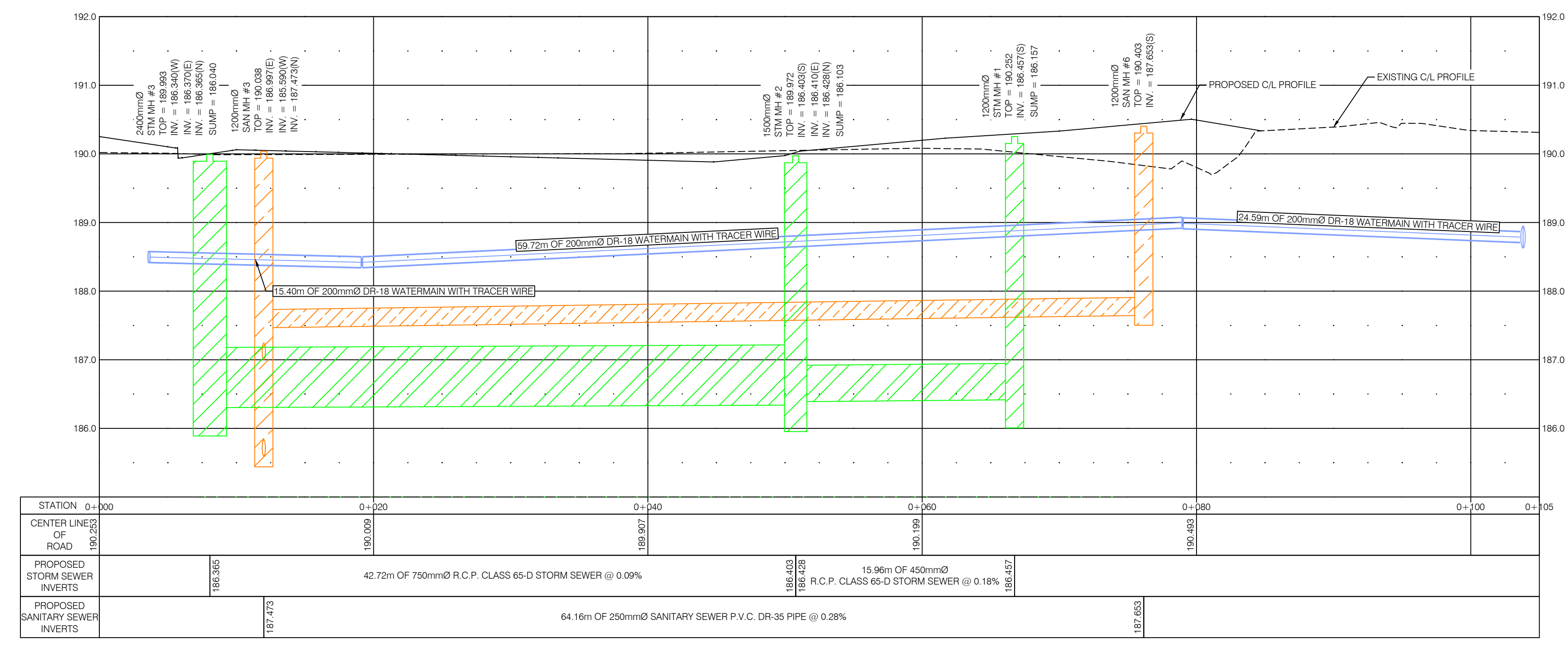
DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: HOR: 1:250 VER: 1:50	
DRAWN BY: B.T.	SHEET NO: <b>6</b>
CHECKED BY: B.F.	



LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER	---	---
SANITARY SEWER	---	---
WATER MAIN	---	---
STORM SERVICE		○ STM
SANITARY SERVICE		○ SAN
WATER SERVICE		○ WSV
FIRE HYDRANT & WATER VALVE	⊗	⊗
GAS MAIN		---
CATCH BASIN	☒	☒
CURB INLET		■
STORM MANHOLE	●	●
SANITARY MANHOLE	●	●
WATER VALVE	⊗	⊗
EP		▽
ELEVATIONS		▽
STREET LIGHTS		☼



MATCH LINE SEE PAGE 5

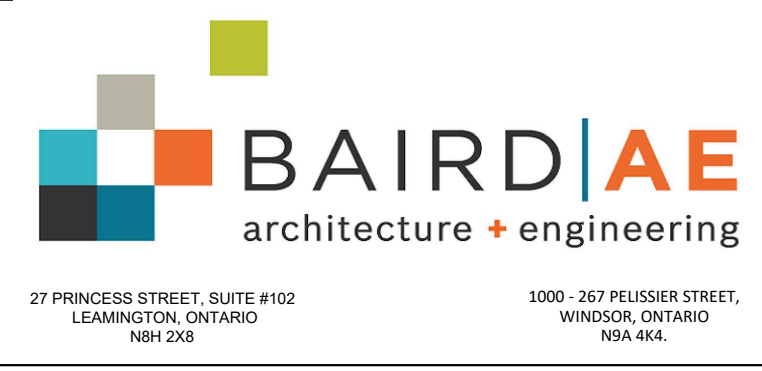


DATE: 05/14/2021

*Bill Fuertth*

BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS
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PROJECT TITLE:  
NORTH TALBOT DEVELOPMENT

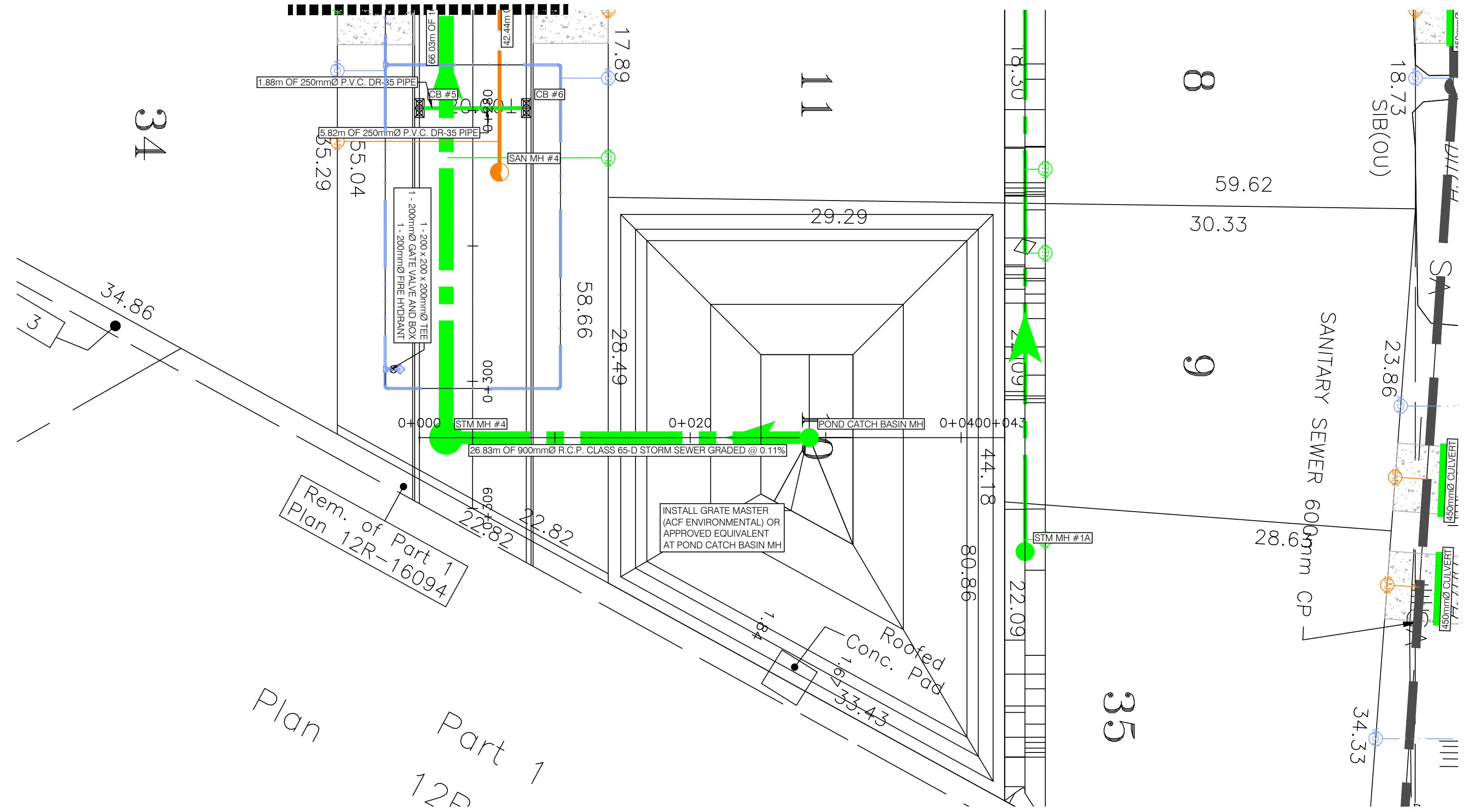
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
STREET 'C' PLAN AND PROFILE 0+000 TO 0+105

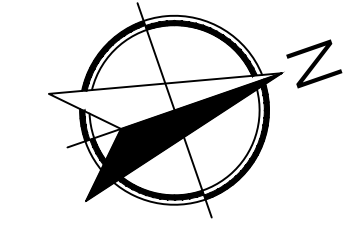
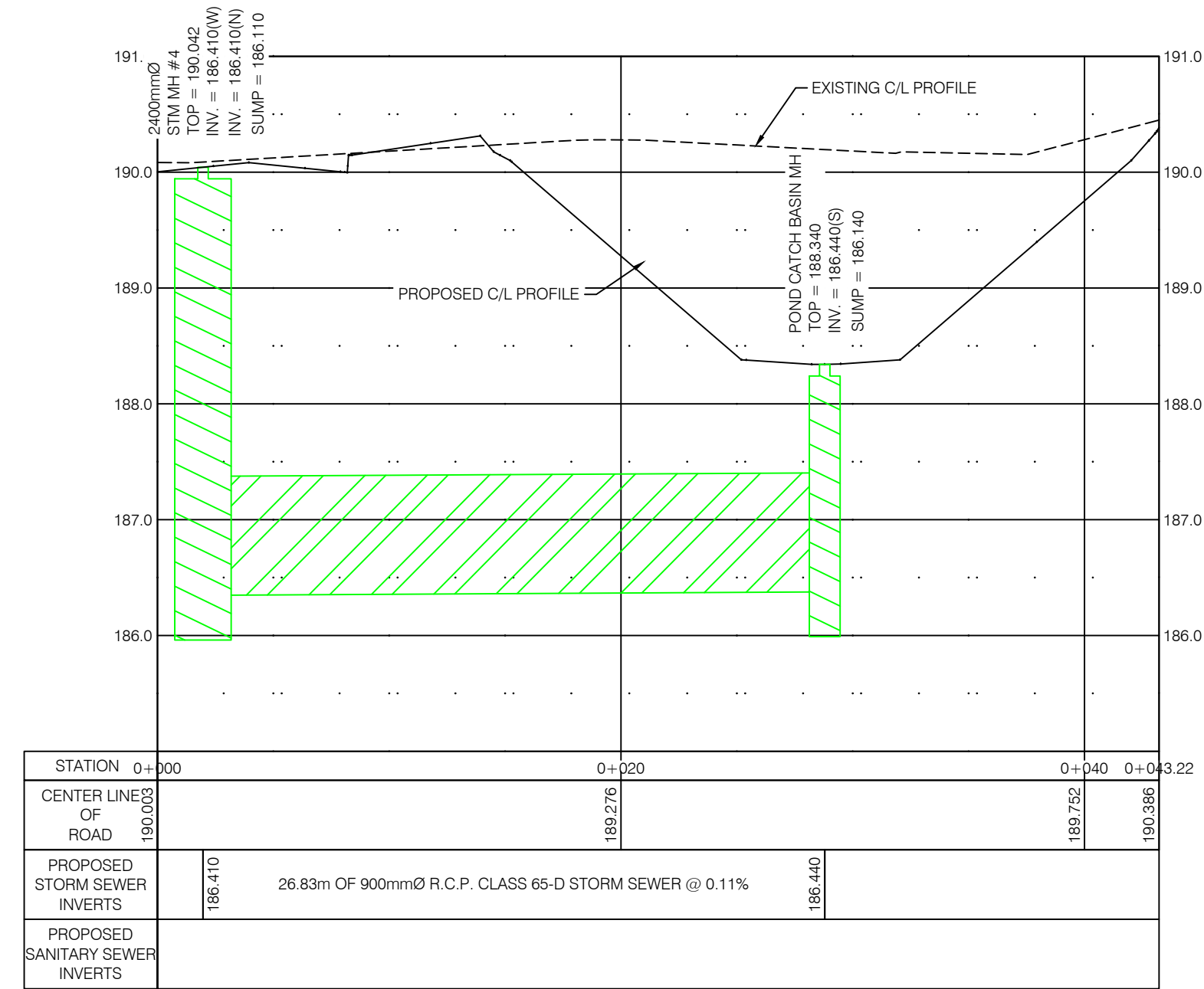
DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: HOR: 1:250 VER: 1:50	
DRAWN BY: B.T.	SHEET NO: 7
CHECKED BY: B.F.	



MATCH LINE SEE PAGE 5

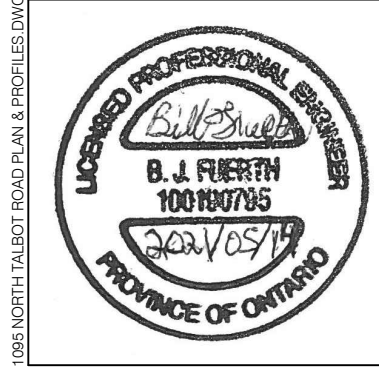


Plan Part 1 12R



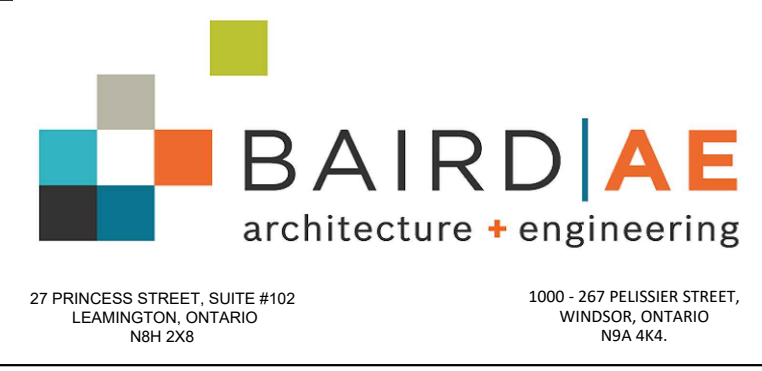
DESCRIPTION	LEGEND	
	EXISTING	NEW
STORM SEWER	---	---
SANITARY SEWER	---	---
WATER MAIN	---	---
STORM SERVICE		○ STM
SANITARY SERVICE		○ SAN
WATER SERVICE		○ WSV
FIRE HYDRANT & WATER VALVE	⊗	⊗
GAS MAIN		— GAS —
CATCH BASIN	⊠	⊠
CURB INLET		⊠
STORM MANHOLE	●	●
SANITARY MANHOLE	◐	◐
WATER VALVE	⊗	⊗
EP		⚡
ELEVATIONS		⚡
STREET LIGHTS		⚡

MAY 14/2021



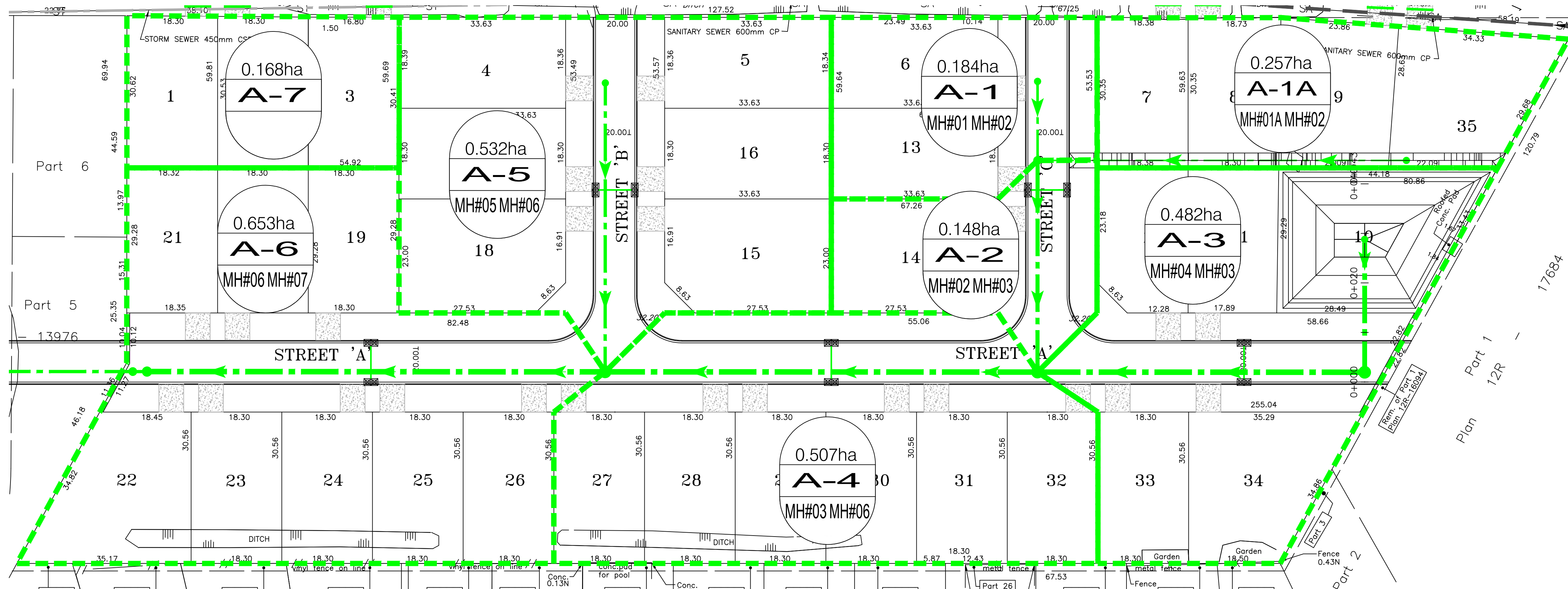
DATE: 05/14/2021  
*Bill Fuertth*  
 BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS



PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**  
 1095 NORTH TALBOT ROAD, WINDSOR  
 SHEET TITLE:  
**POND PLAN AND PROFILE 0+000 TO 0+043**

DATE: 05/14/2021	PROJECT NO: 21-021
SCALE: HOR: 1:250 VER: 1:50	
DRAWN BY: B.T.	SHEET NO: <b>8</b>
CHECKED BY: B.F.	



**1095 NORTH TALBOT ROAD**  
STORM SEWER DESIGN SHEET (5-YEAR EVENT, Computed Tc)

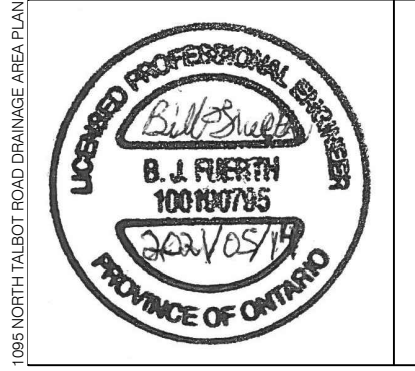
LOCATION				AREA (ha)				FLOW					SEWER DATA							PROFILE						
Area ID	Area Included	From Node	To Node	C=	C=	C=	C=	Indiv 2.78 AC	Accum 5 2.78AC	Time of Conc.	Design Storm	Rainfall Intensity	Peak Flow (L/sec)	Qtotal (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full	Upstream Elevation Invert (m)	Downstream Elevation Invert (m)	
<b>STREET 'C' MH#01 TO MH#02</b>																										
A1	RESIDENTIAL	MH#01	MH#02		0.184			0.31	0.31	20.00	5	75.35	23.12	23.12	0.450	450	R.C.P.	0.18	15.96	120.9	0.76	0.35	19%	186.440	186.411	
<b>STREET 'C' MH#1A TO MH#02</b>																										
A1A	RESIDENTIAL	MH#1A	MH#02		0.257			0.43	0.43	20.00	5	75.35	32.30	32.30	0.250	250	R.C.P.	0.35	74.43	35.1	0.72	1.73	92%	186.671	186.411	
<b>STREET 'C' MH#02 TO MH#03</b>																										
A2	RESIDENTIAL	MH#02	MH#03		0.148			0.25	0.55	20.35	5	74.59	41.30	41.30	0.750	750	R.C.P.	0.18	42.39	472.1	1.07	0.66	9%	186.411	186.335	
<b>STREET 'A' MH POND TO MH#03</b>																										
A3	RESIDENTIAL	MH#04	MH#03		0.482			0.80	0.80	20.47	5	74.32	59.75	59.75	1.050	1050	R.C.P.	0.07	66.03	722.2	0.83	1.32	8%	186.410	186.364	
<b>STREET 'A' MH#03 TO MH#06</b>																										
A4	RESIDENTIAL	MH#03	MH#06		0.507			0.85	2.20	21.79	5	71.63	157.85	157.85	1.050	1050	R.C.P.	0.07	87.25	722.2	0.83	1.74	22%	186.340	186.279	
<b>STREET 'B' MH#05 TO MH#06</b>																										
A5	RESIDENTIAL	MH#05	MH#06		0.532			0.89	0.89	20.00	5	75.35	66.86	66.86	0.600	600	R.C.P.	0.12	58.30	212.6	0.75	1.29	31%	186.320	186.250	
<b>STREET 'A' MH#06 TO MH#07</b>																										
A6	RESIDENTIAL	MH#06	MH#07		0.653			1.09	4.18	23.54	5	68.37	285.83	285.83	1.050	1050	R.C.P.	0.07	92.46	722.2	0.83	1.85	40%	186.250	186.185	

Q = 2.78 AIR, where  
 Q= Peak Flow in Litres per Second (l/s)  
 A= Area in hectares (ha)  
 I= Rainfall Intensity (mm/hr)  
 R= Runoff Coefficient

1) Windsor Rainfall-Intensity Curve  
 2) Min Pipe Velocity = 0.8 m/s  
 3) Max pipe Velocity = 3.0 m/s  
 4) Tc = 10 min (BASED ON 3.2.2.6 WERSMSM)  
 Intensity =  $I = a / (T+b)^c$

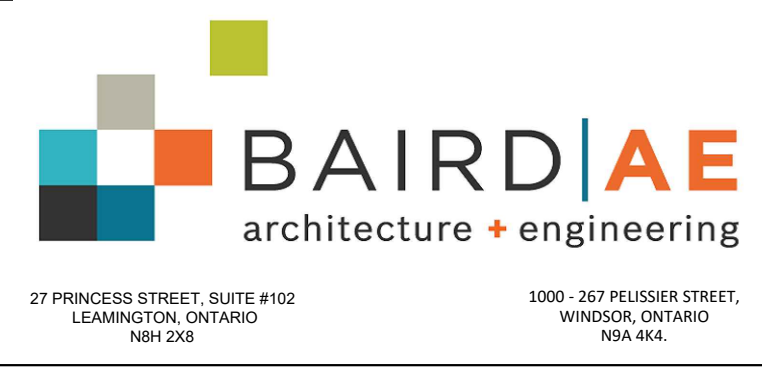
A = 1259  
 B = 8.8  
 C = 0.838

**Consultant: Baird AE - Architects & Engineers**  
 Date: May 14, 2021  
 Design: BILL FUERTH  
 Project No: 21-021 Dwg. Reference: 1095 NORTH TALBOT Stamped: BFUERTH



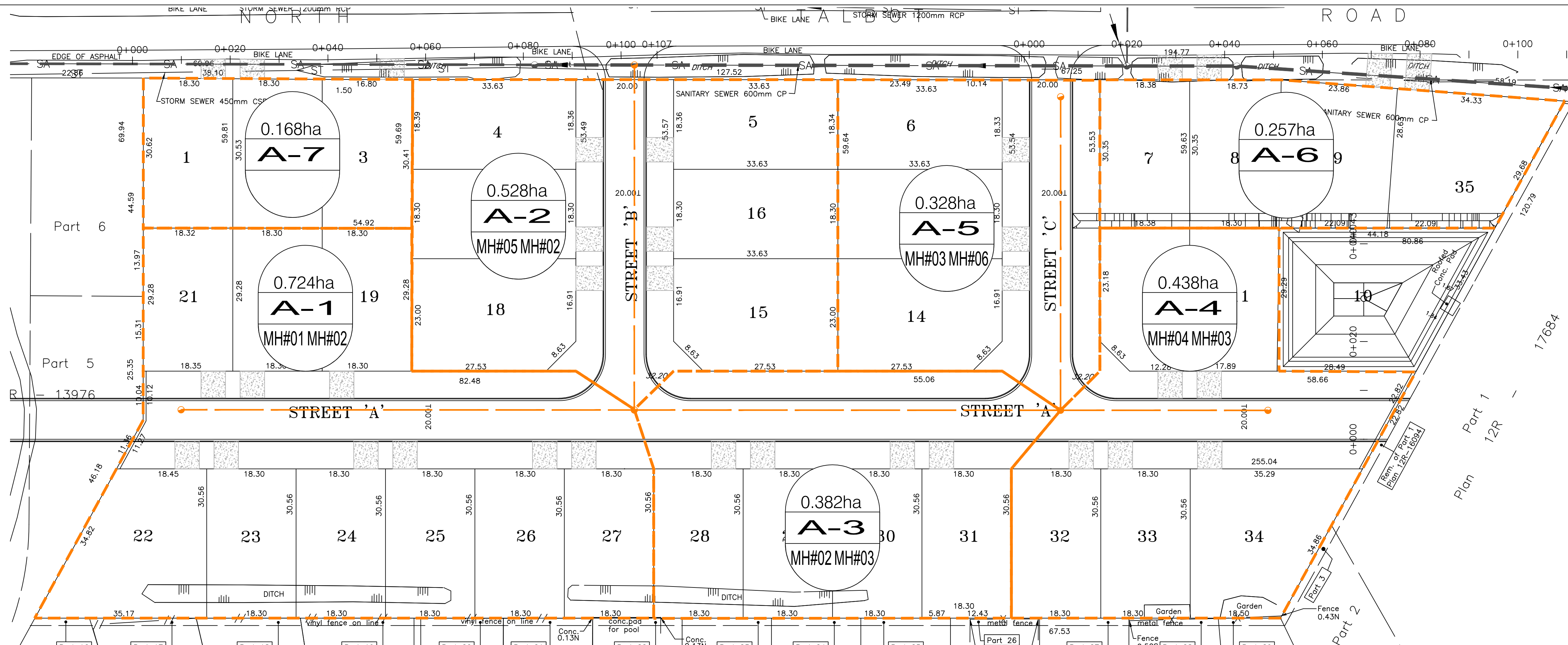
DATE: 05/14/2021  
 Bill Fuertth  
 BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS



PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**  
 1095 NORTH TALBOT ROAD, WINDSOR  
 SHEET TITLE:  
**STORM DRAINAGE AREA PLAN**

DATE: 05/14/2021  
 SCALE: 1:500  
 DRAWN BY: B.T.  
 CHECKED BY: B.F.  
 PROJECT NO: 21-021  
 SHEET NO: **9**




**1095 North Talbot Street  
SANITARY SEWER DESIGN SHEET (Ultimate D.A Design)**

DESIGN CRITERIA FOR APARTMENTS

Residential =	50 persons/ha	AVERAGE DAILY PER CAPITA FLOW	363 L/cap/day	According To City Windsor development manual = 0.0042 L/s/cap = 0.0042x24x60x60 = 363 L/cap/day
Commercial =	74 persons/ha	PEAK EXTRANEIOUS FLOW	0.156 L/s/ha	
Low Density =	3.13 PPU	ULTIMATE FLOW FACTOR	6 for population below 1000 persons	
		VELOCITY RANGE	0.75 m/s to 3 m/s	
		MINIMUM PIPE SIZE	200 mm	

Project : 21-021 1095 NORTH TALBOT STREET  
Client :

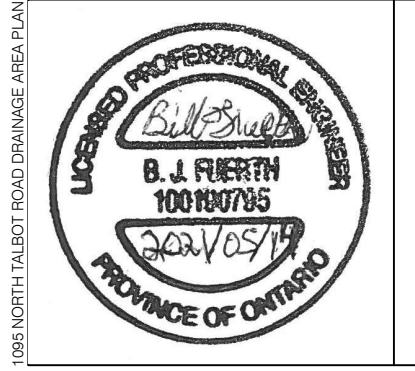
DEVELOPMENT	Area Included	LOCATION		DESIGN AREA SERVED (ha)	DESIGN POPULATION (PERSONS)	ULTIMATE FLOW FACTOR	MAXIMUM FLOW			SEWER DATA							PROFILE			
		From Node	To Node				INTEGRATION (L/s)	SEWAGE (L/S)	TOTAL SEWAGE AND INFILTRATION (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Manning's "n"	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Ratio (%)	Upstream Elevation	Downstream Elevation
<b>SAN MH#1 TO MH#2</b>																				
STREET 'A'	A1	SAN MH 1	SAN MH 2	0.724	36	6	0.113	0.91	1.03	0.250	250	PVC	0.013	0.28%	92.75	31.471	0.64	3.26	185.607	185.347
<b>SAN MH#4 TO MH#3</b>																				
STREET 'A'	A4	SAN MH 4	SAN MH 3	0.438	22	6	0.068	0.55	0.62	0.250	250	PVC	0.013	0.28%	42.44	31.471	0.64	1.97	187.116	186.997
<b>SAN MH#6 TO MH#3</b>																				
STREET 'C'	A5	SAN MH 6	SAN MH 3	0.328	16	6	0.051	0.41	0.46	0.250	250	PVC	0.013	0.28%	64.16	31.471	0.64	1.48	187.653	187.473
<b>SAN MH#3 TO MH#2</b>																				
STREET 'A'	A3	SAN MH 3	SAN MH 2	0.382	19	6	0.179	1.45	1.63	0.250	250	PVC	0.013	0.28%	87.25	31.471	0.64	5.17	185.590	185.347
<b>SAN MH#2 TO MH#5</b>																				
STREET 'B'	A2	SAN MH 2	SAN MH 5	0.528	26	6	0.374	3.03	3.40	0.250	250	PVC	0.013	0.28%	70.62	31.471	0.64	10.80	185.297	185.099



Design By: BILL FUERTH

PROJECT NO: 21-021

Checked and Stamped: BILL FUERTH

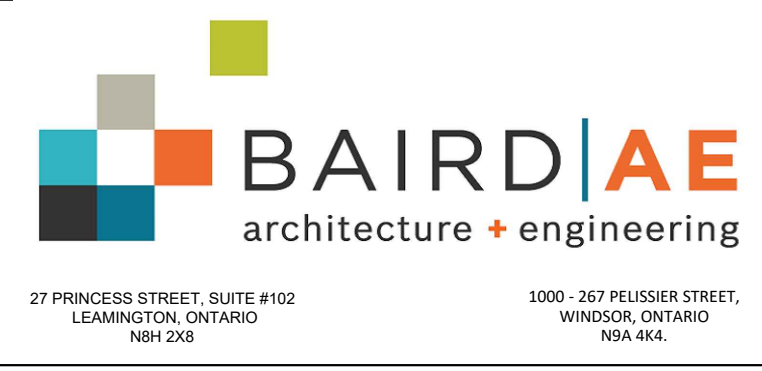


DATE: 05/14/2021

*Bill Fuertth*

BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS

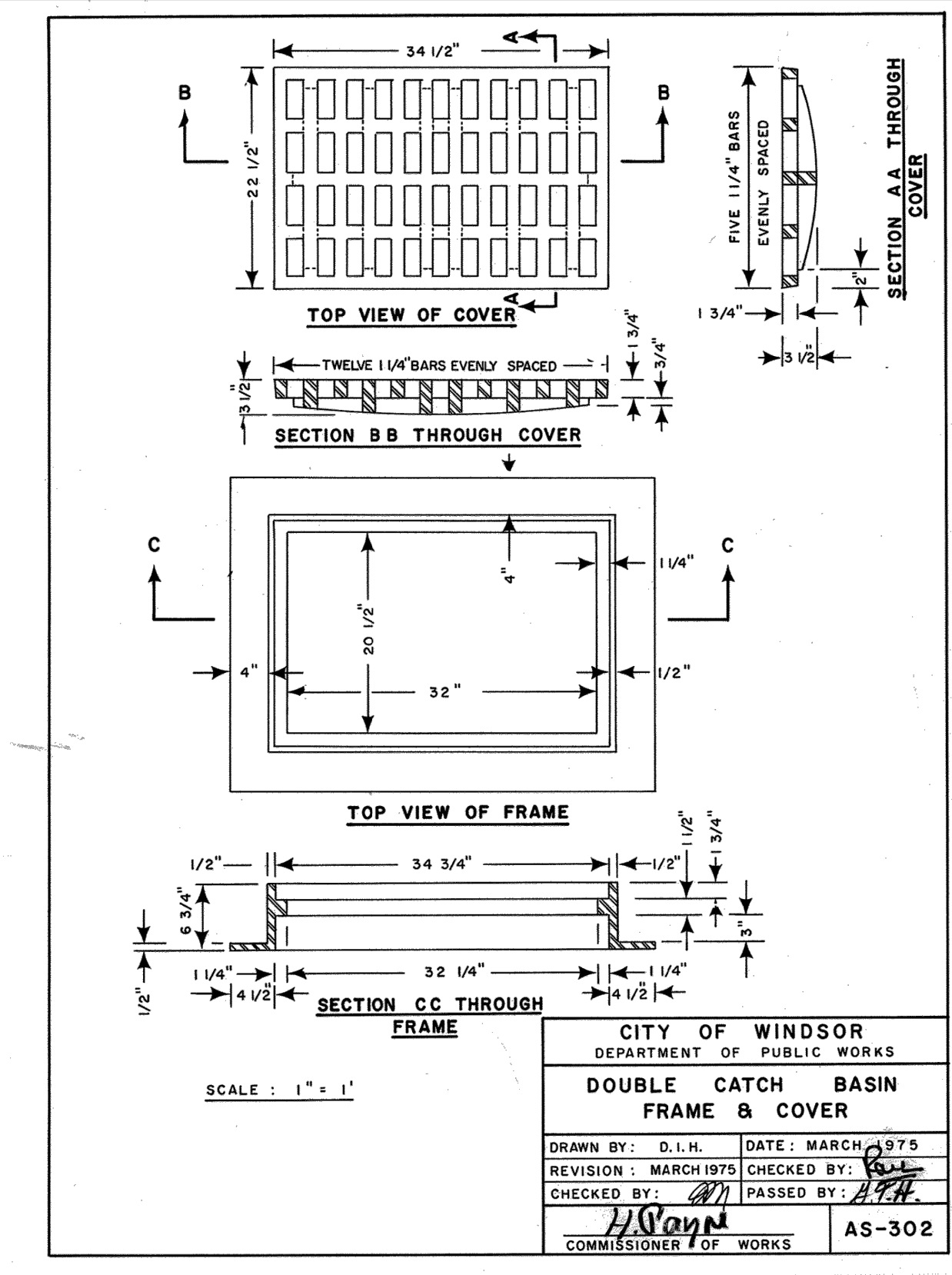
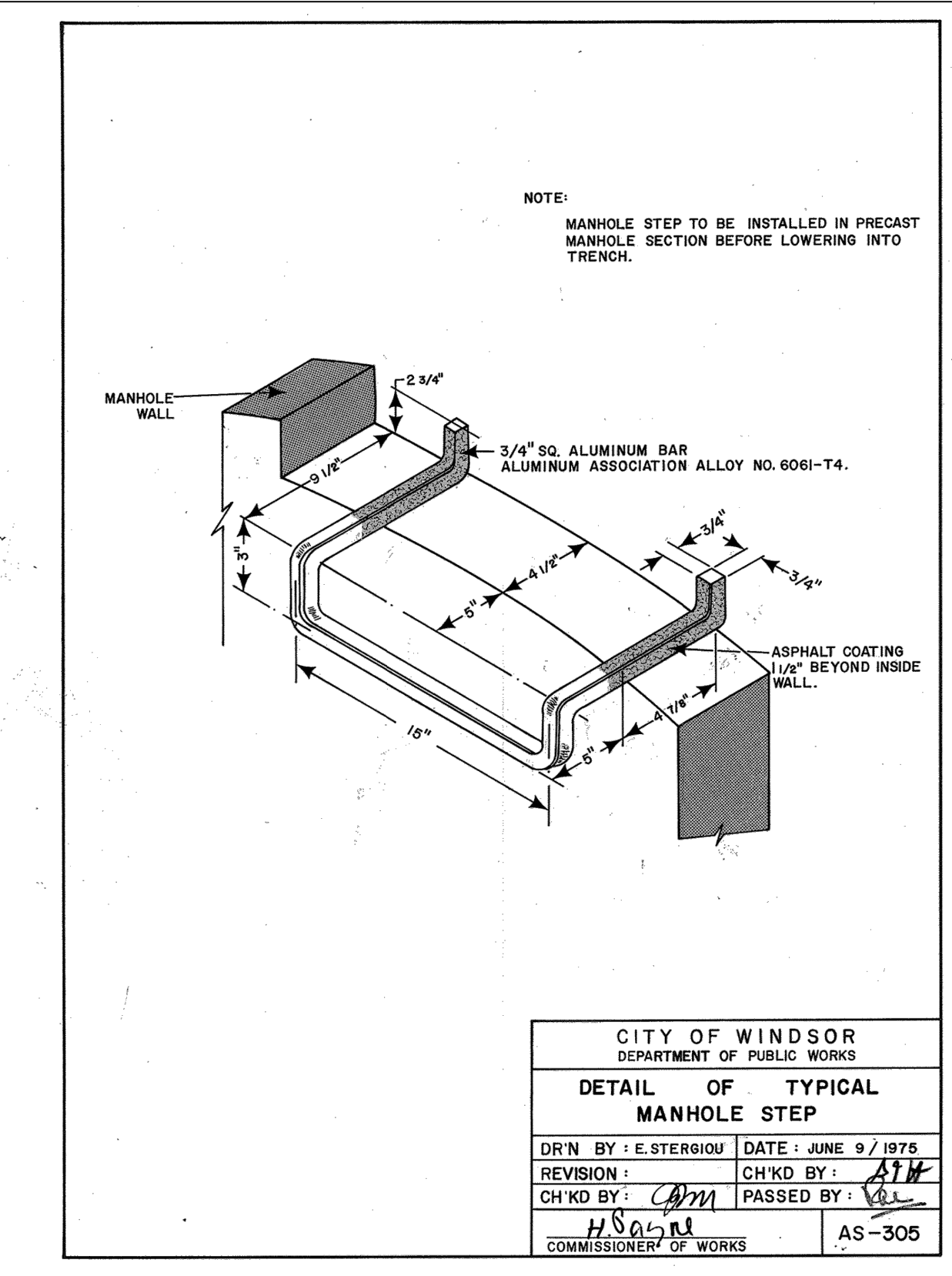
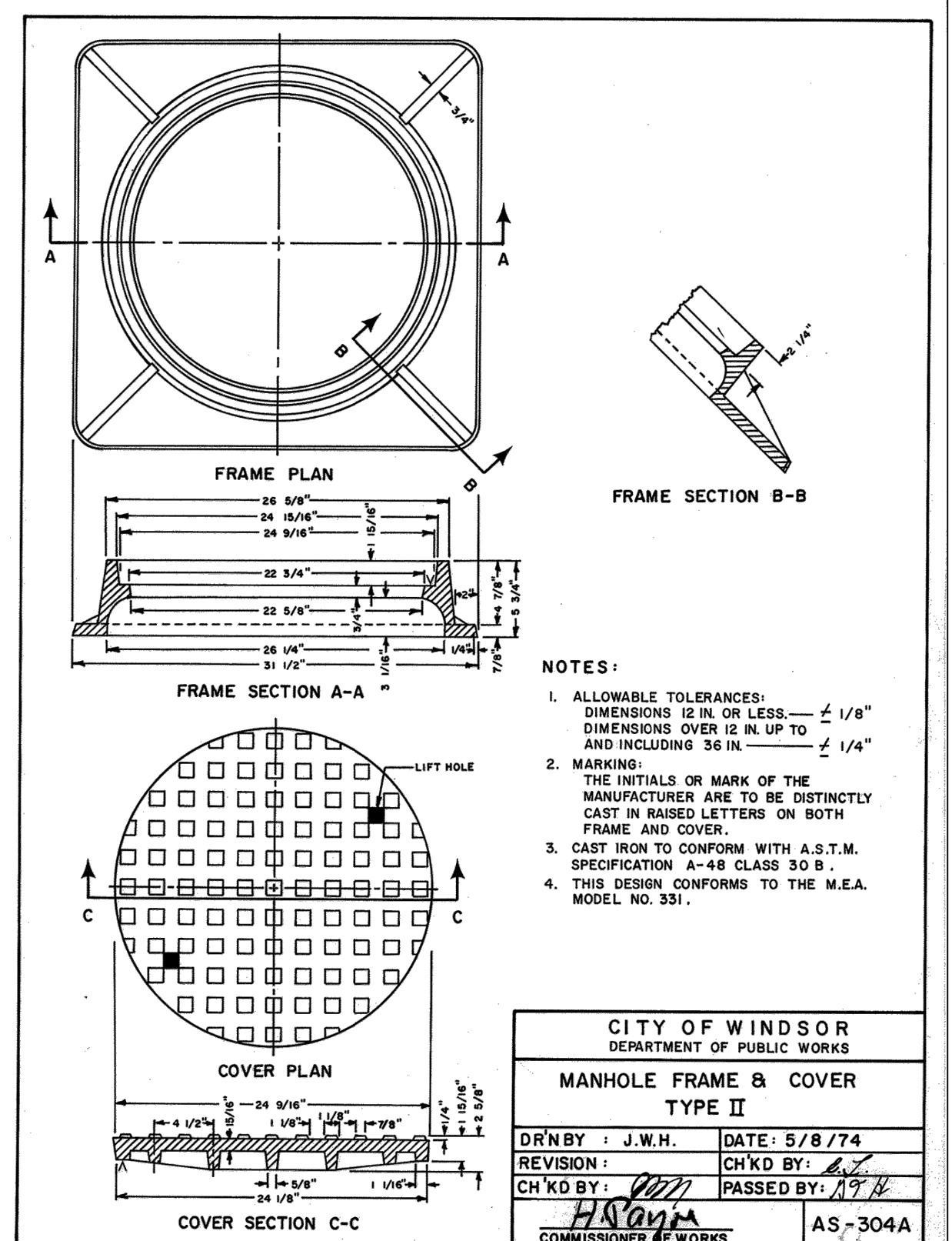
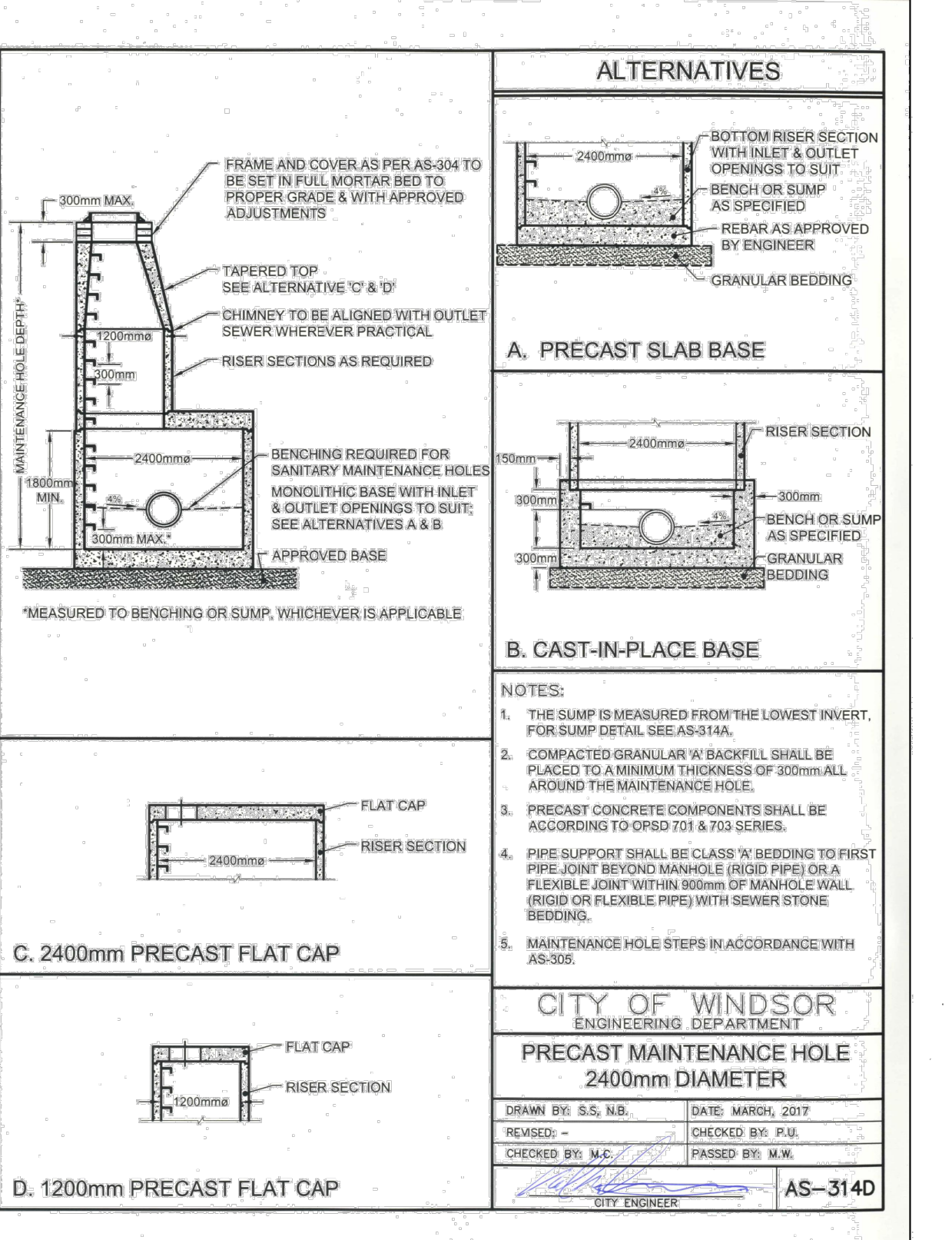
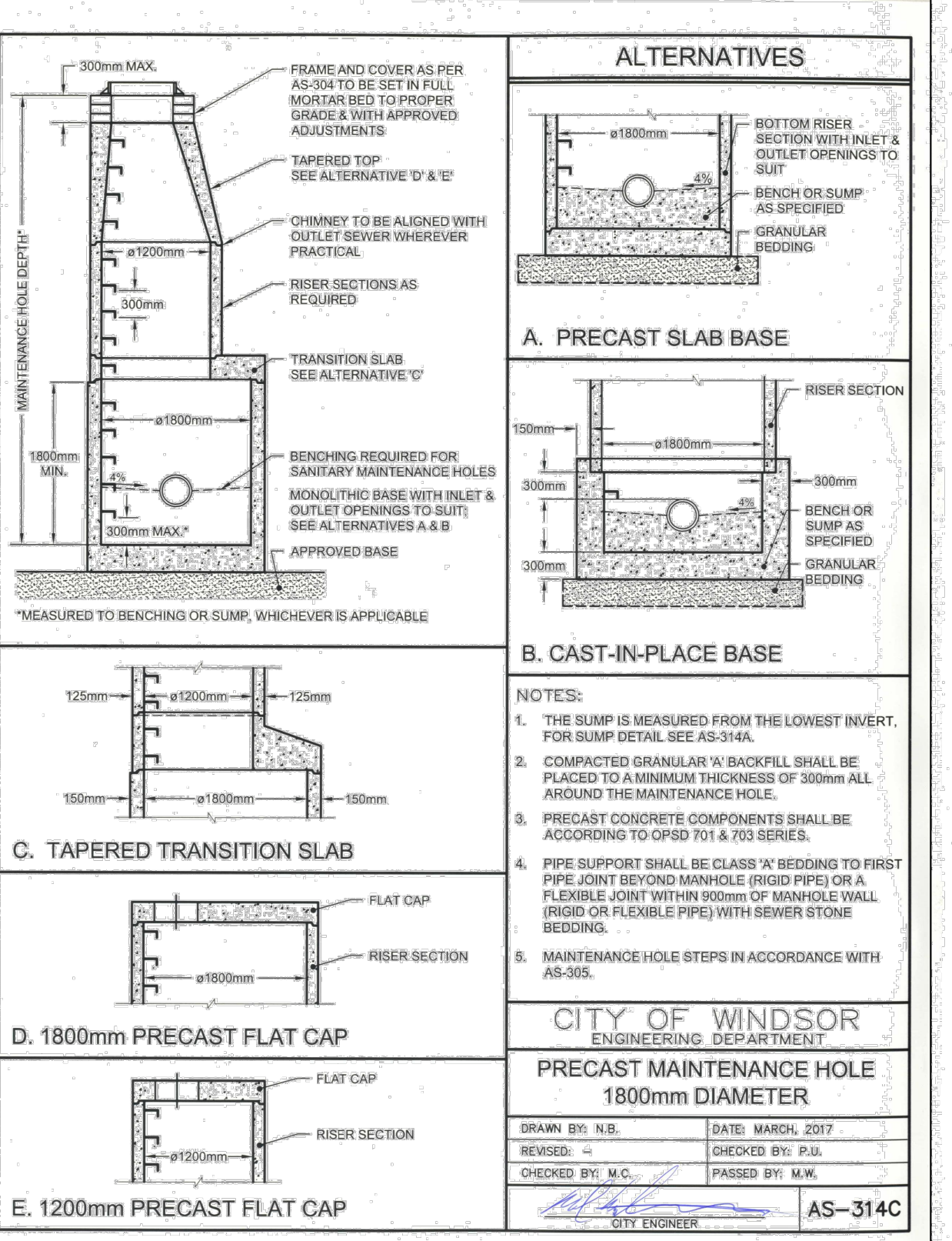
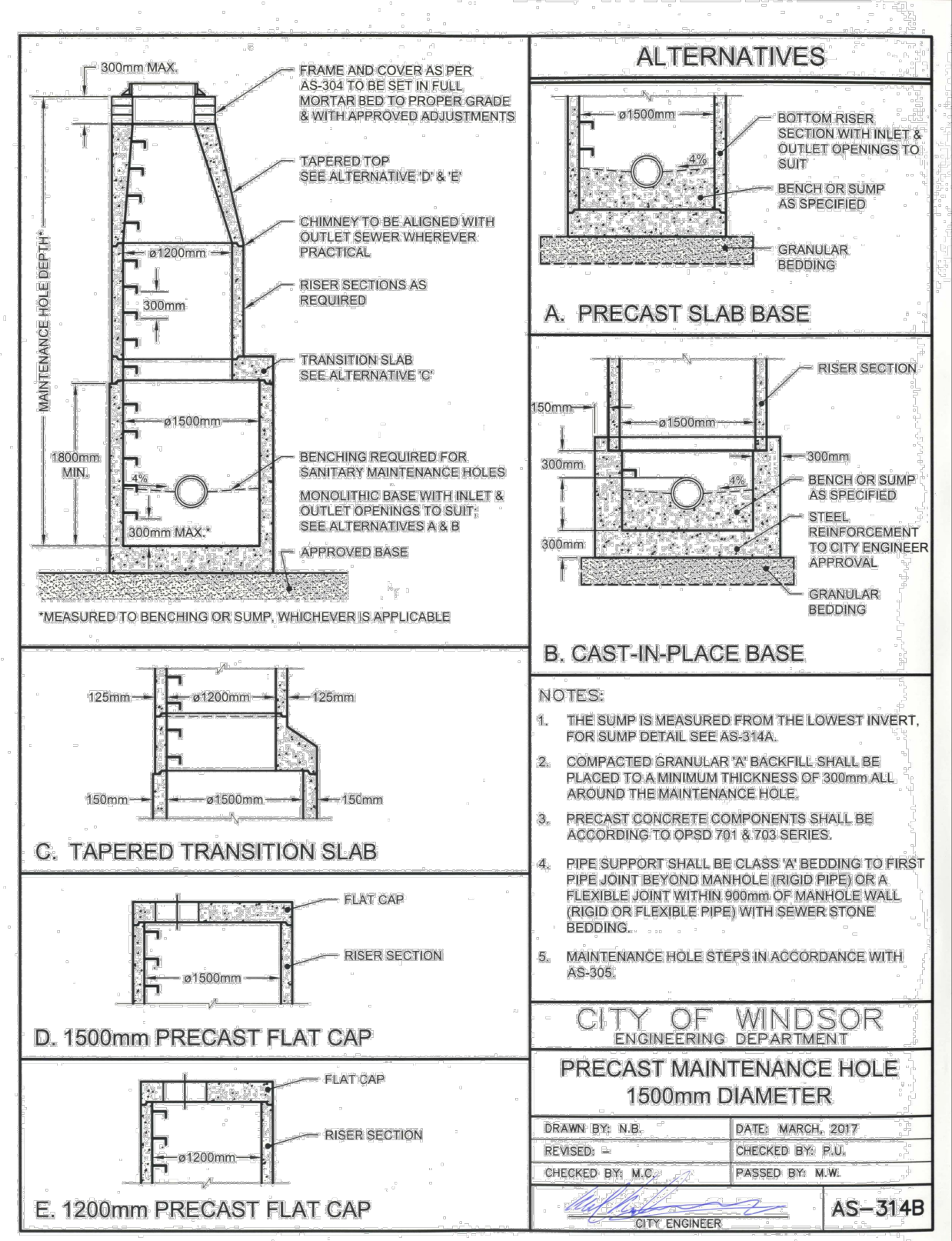
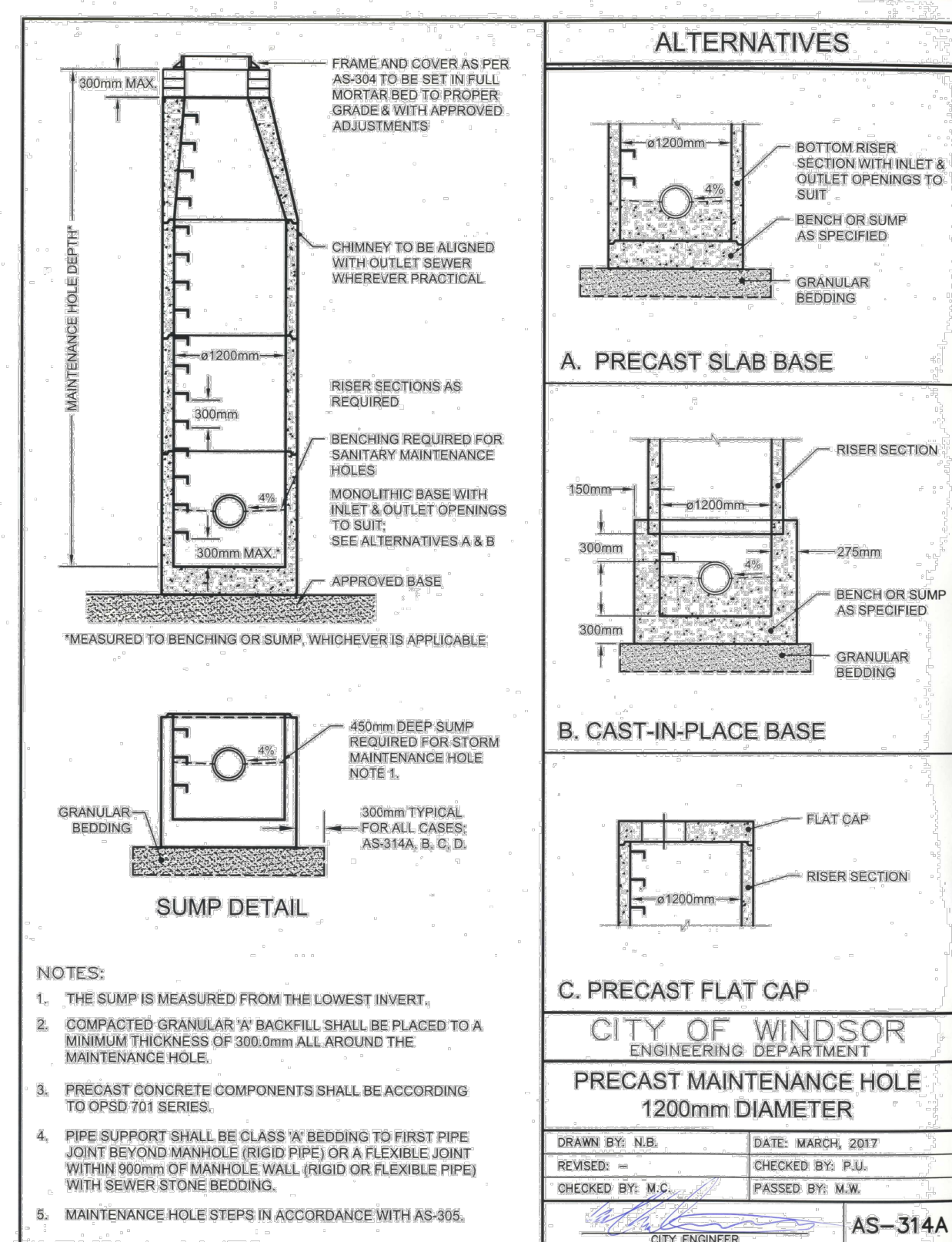


PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**  
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
**SANITARY DRAINAGE AREA PLAN**

DATE: 05/14/2021  
SCALE: 1:500  
DRAWN BY: B.T.  
CHECKED BY: B.F.

PROJECT NO: 21-021  
SHEET NO: **10**



**ADS Canada** ADS OGS Sizing Summary

Project Name: North Talbot Development  
Consulting Engineer: Baird AE  
Location: Windsor, ON  
Sizing Completed By: C. Neath  
Email: cody.neath@ads-pipe.com

Treatment Goal:	Normal (MOE)
Selected Parameters:	70% TSS 90% Volume
Selected Unit:	FD-5HC

Model	TSS Removal	Volume Treated
FD-4HC	71.7%	86.7%
FD-5HC	75.1%	95.9%
FD-6HC	77.3%	99.7%
FD-8HC	81.8%	99.8%

**FD-5HC Specification**

Unit Diameter (A):	1,500 mm
Inlet Pipe Diameter (B):	600 mm
Outlet Pipe Diameter (C):	600 mm
Height, T/G to Outlet Invert (D):	4190 mm
Height, Outlet Invert to Sump (E):	1,500 mm
Sediment Storage Capacity (F):	1.29 m <sup>3</sup>
Oil Storage Capacity (G):	1.135 L
Recommended Sediment Depth for Maintenance:	475 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	566 L/s

Site Elevations:	
Rim Elevation:	190.35
Inlet Pipe Elevation:	186.16
Outlet Pipe Elevation:	186.16

**Notes:**

- Removal efficiencies are based on NIPEP Test Protocols and independently verified.
- All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.

**ADS Canada** Net Annual Removal Efficiency Summary: FD-5HC

Project Name: North Talbot Development  
Consulting Engineer: Baird AE  
Location: Windsor, ON

Rainfall Intensity <sup>(1)</sup>	Fraction of Rainfall <sup>(1)</sup>	FD-5HC Removal Efficiency <sup>(2)</sup>	Weighted Net-Annual Removal Efficiency
3.00	13.2%	84.4%	11.1%
4.00	9.6%	82.2%	7.9%
5.00	7.5%	80.5%	6.0%
6.00	6.0%	79.2%	4.8%
7.00	4.8%	78.0%	3.7%
8.00	4.1%	77.1%	3.2%
9.00	3.6%	76.2%	2.7%
10.00	3.2%	75.5%	2.4%
11.00	2.8%	74.8%	2.1%
12.00	2.5%	74.2%	1.9%
15.00	6.6%	72.7%	4.8%
20.00	8.3%	70.8%	5.9%
25.00	5.8%	69.3%	4.0%
30.00	4.6%	68.2%	3.1%
35.00	3.8%	67.2%	2.6%
40.00	2.9%	66.4%	1.9%
45.00	2.4%	65.6%	1.6%
50.00	1.8%	65.0%	1.2%
65.00	6.6%	63.4%	4.2%
<b>Total Net Annual Removal Efficiency:</b>			<b>75.1%</b>
<b>Total Runoff Volume Treated:</b>			<b>95.9%</b>

**Notes:**

- Based on Windsor/Essex Region Stormwater Manual 2018, Table 3.4.1.5
- Based on third party verified data and approximating the removal of a PSD similar to the STC Fine distribution



DATE: 05/14/2021

Bill Fuertth  
BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS
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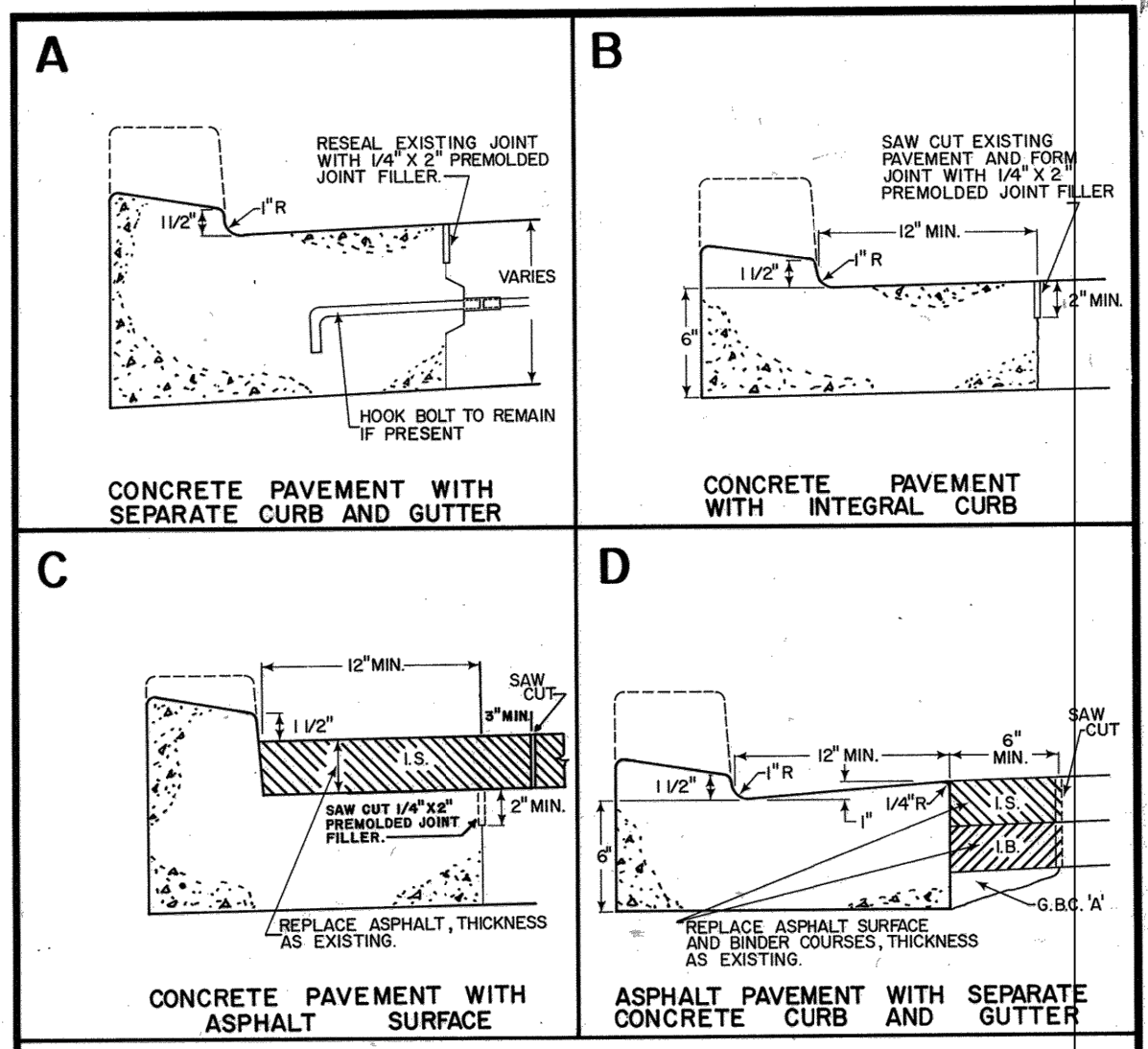


PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**  
1095 NORTH TALBOT ROAD, WINDSOR

SHEET TITLE:  
**DETAILS 1**

DATE: 05/14/2021  
SCALE: N.T.S.  
DRAWN BY: B.T.  
CHECKED BY: B.F.

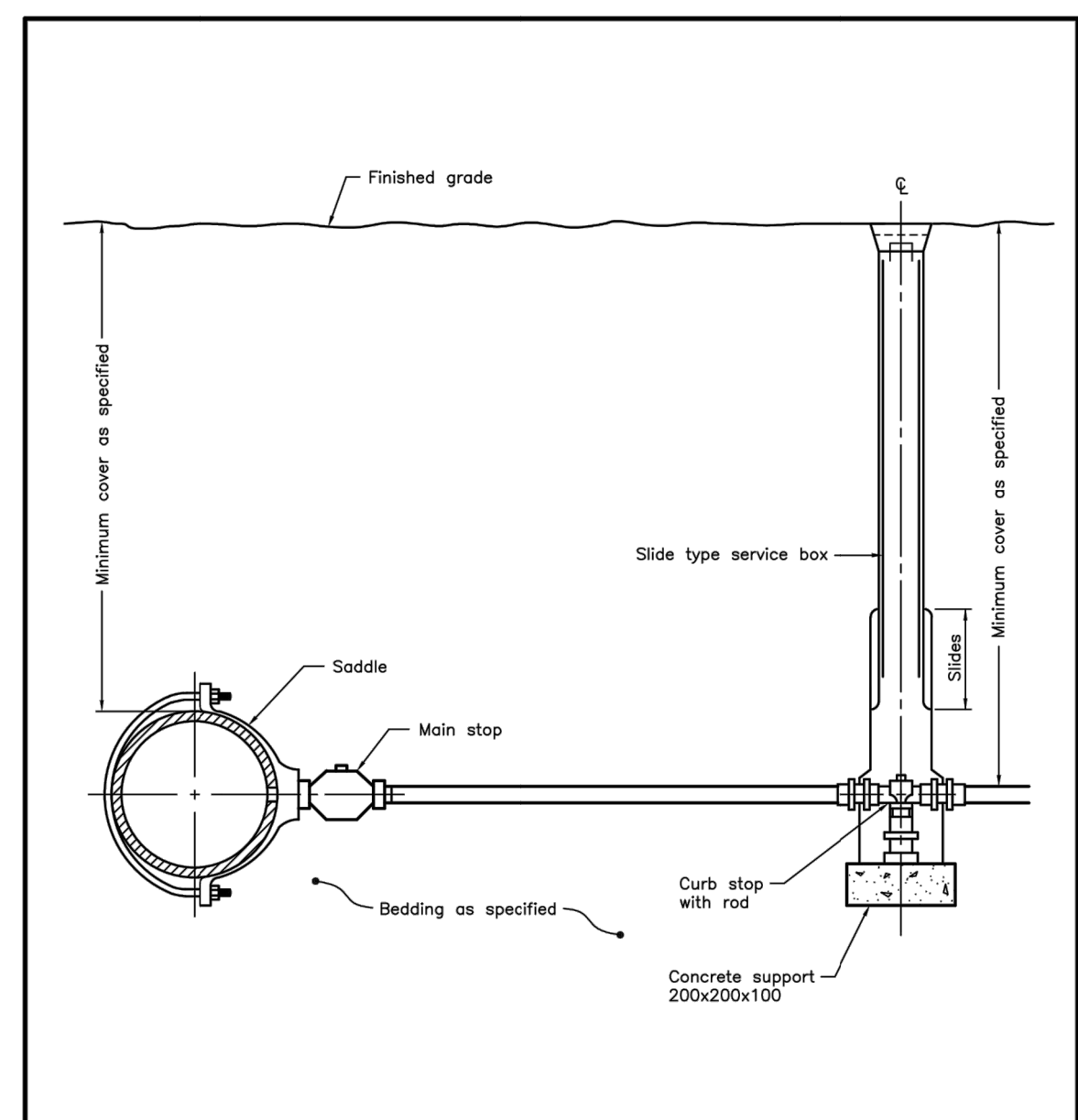
PROJECT NO: 21-021  
SHEET NO: 11



**NOTES:**

- SLOPE AND LENGTH OF DROPPED CURB TO BE DETERMINED BY THE ENGINEER.
- REMOVE EXISTING CURB AND GUTTER TO THE NEAREST JOINTS, REMOVE EXISTING ASPHALT AND GRANULAR BASE WHERE NECESSARY TO FORM GUTTER FACE.
- THICKNESS OF CONCRETE GUTTER IS TO BE THE SAME AS EXISTING ADJOINING GUTTER.
- CLEAN ALL FRACTURED FACES PRIOR TO PLACING OF CONCRETE.
- JOINT SPACING IN CONCRETE SHALL MATCH EXISTING. MAXIMUM SPACING IS 6 FT.
- ALL PREMOULDED JOINT FILLER TO CONFORM TO MTC FORM 508 EXCEPT AS OTHERWISE STATED. ALL JOINT FILLER TO BE 3/4" THICK AND FULL DEPTH.
- ALL WORK SHALL CONFORM TO CITY OF WINDSOR STANDARD SPECIFICATIONS S-4, S-5, S-9 AND S-10.
- CURB CUT TO BE CHAMFERED OUT AS ABOVE OR BY HORIZONTAL SAW CUTTING TO METHOD AS DIRECTED BY THE ENGINEER.

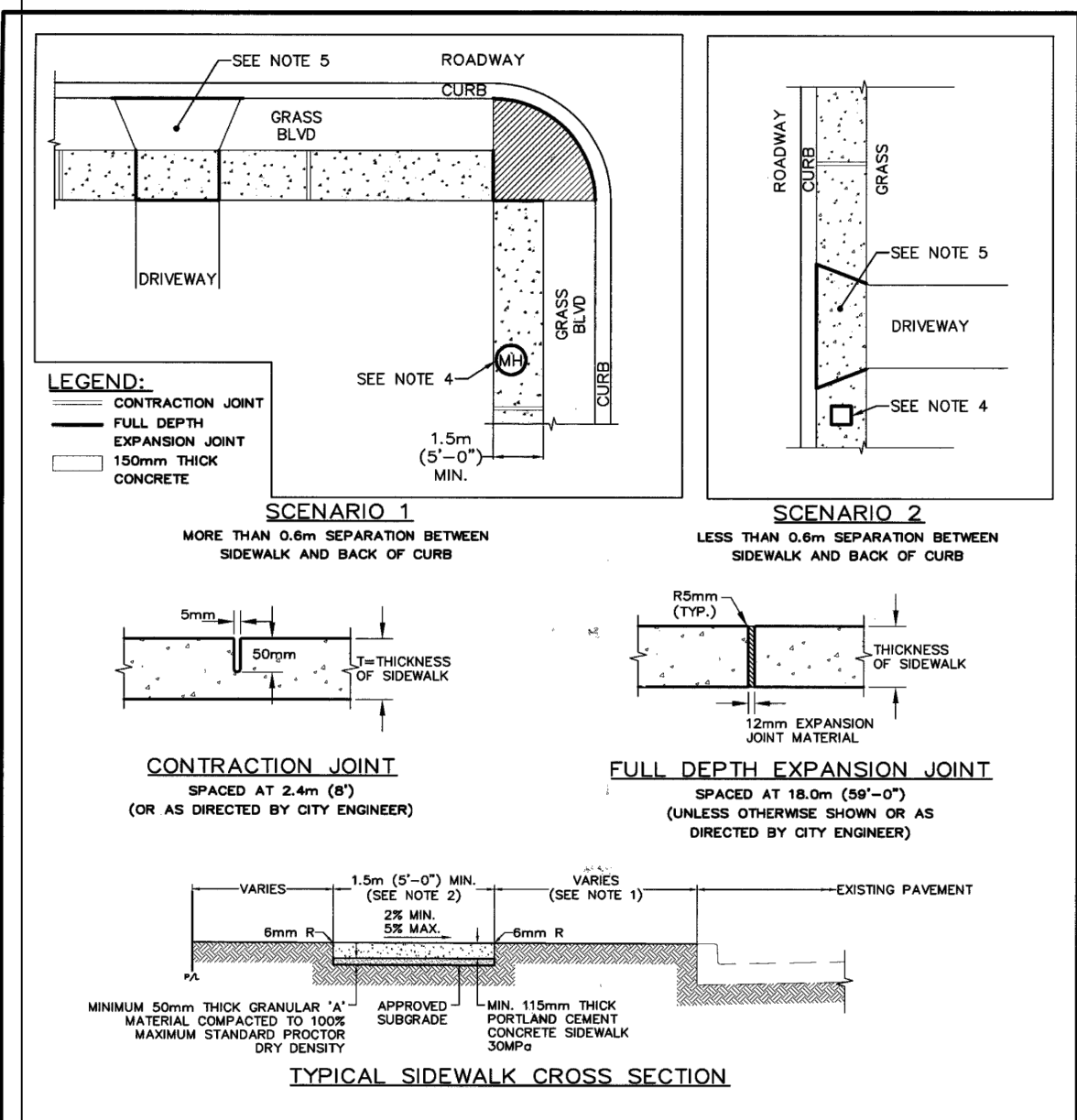
**CITY OF WINDSOR**  
DEPARTMENT OF PUBLIC WORKS  
**CURB CUT REQUIREMENTS FOR VARIOUS PAVEMENTS**  
DRN BY: K.A.J. DATE: 6/23/72  
REVISION: JAN. 1976 CHKD BY: S.S.  
CHKD BY: P.J.U. PASSED BY: H.P.  
AS-216



**NOTES:**

- Couplings shall not be permitted unless the service length exceeds 20m between the main stop and curb stop.
- All water services shall be installed 90° to the longitudinal axis of the watermain.
- Backfill material within 500mm of service box shall be native or imported, as specified.
- All dimensions are in millimetres unless otherwise shown.

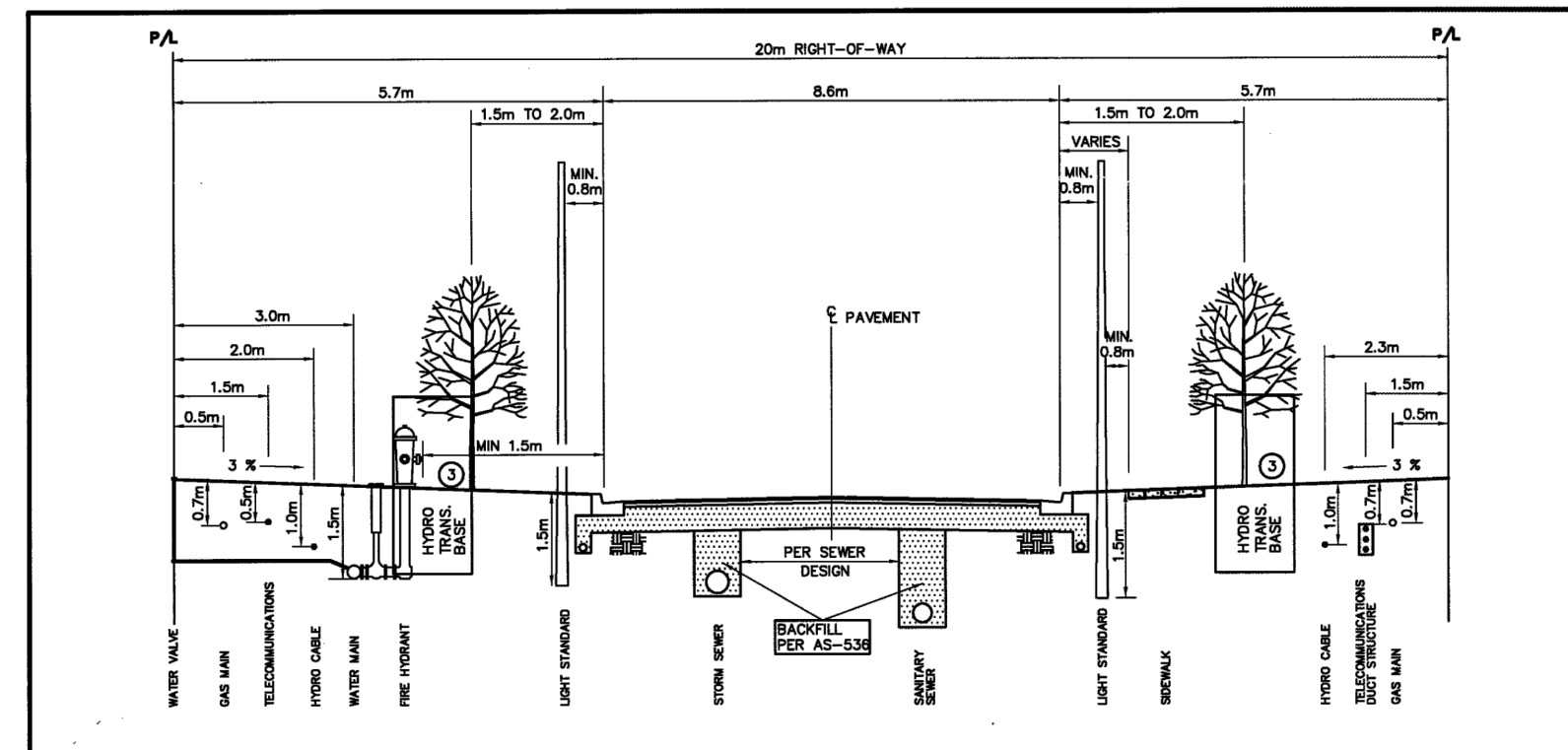
**ONTARIO PROVINCIAL STANDARD DRAWING** Nov 2018 Rev 3  
**WATER SERVICE CONNECTION**  
32, 38, and 50mm DIAMETER SIZES  
**OPSD 1104.020**



**GENERAL NOTES:**

- Unless sidewalk abuts the curb, the distance between sidewalk and back of curb must be 600mm minimum.
- Any sidewalk with exceeding 3m must have a centered longitudinal contraction joint. Maximum spacing between longitudinal contraction joints to be 1.5m.
- Expansion joints are required at all fixed objects (poles, hydrants, manholes, structures, etc) and change in sidewalk direction.
- All manholes, boxes, valves, etc. to match finished grade of sidewalk.
- To be used in conjunction with AS-222, AS-402, AS-404 and S-6.
- All work within public right-of-way to be completed to City of Windsor Standards and to the satisfaction of the City Engineer.

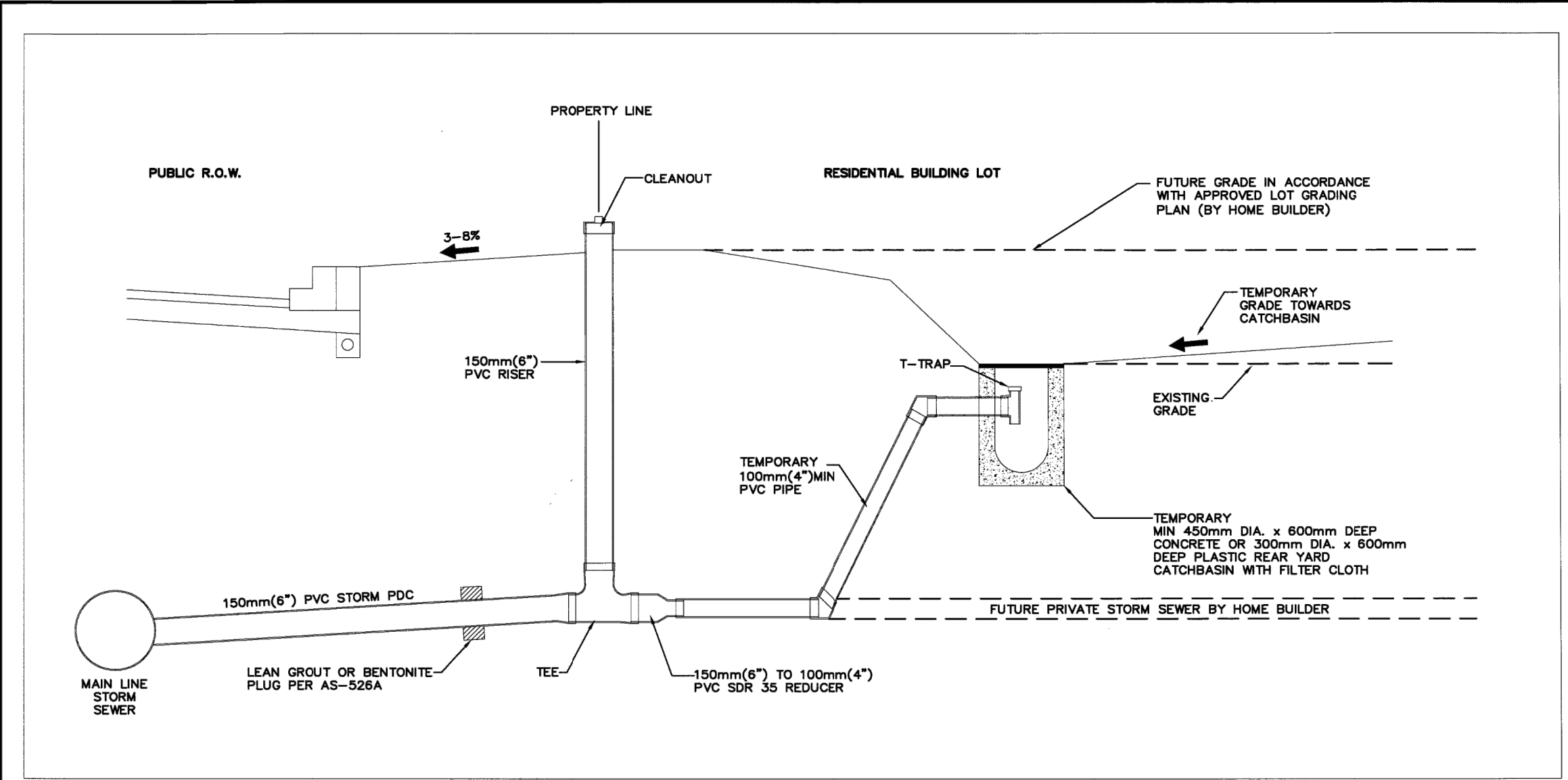
**CITY OF WINDSOR**  
ENGINEERING DEPARTMENT  
**RESIDENTIAL CONCRETE SIDEWALK**  
DRN BY: B.C. N.B. DATE: APRIL 2004  
REVISION: APRIL 2005 CHKD BY: W.B.  
CHKD BY: P.J.U. PASSED BY: T.M.  
AS-401



**NOTES:**

- IT IS NOTED THE ABOVE CROSS-SECTION IS MEANT TO BE A GUIDELINE ONLY AND CANNOT POSSIBLY APPLY IN EVERY INSTANCE. FOR EXAMPLE, NO PROVISION IS SHOWN FOR TELEPHONE MANHOLES AND IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO HAVE ALL UNDERGROUND LOCATIONS APPROVED BY THE UTILITY COMPANIES FOR EACH SUBDIVISION AS SET OUT IN THE CITY OF WINDSOR DEVELOPMENT MANUAL.
- VERTICAL DIMENSIONS TO UTILITY PLANT ARE GUIDELINES ONLY AND SHOULD BE CONFIRMED WITH THE UTILITY COMPANIES BEFORE CONSTRUCTION. THESE DIMENSIONS ARE SHOWN TO TOP OF FINAL GRADE. IT IS THEREFORE ESSENTIAL THAT GRADING BE COMPLETED TO OUTER EDGE OF RIGHT-OF-WAY BEFORE UTILITY INSTALLATION AND TO BE WITHIN TOLERANCE OF FINAL GRADE.
- ABOVE GROUND TRANSFORMERS/PEDESTALS TO BE LOCATED ON PLAN VIEWS BY ENGINEER, NO TWO (2)
- ALL TELECOMMUNICATIONS TO BE IN JOINT USE TRENCH FOR NEW CONSTRUCTION
- SIDEWALKS TO BE IN ACCORDANCE WITH AS-401 TO AS-404 AS APPLICABLE

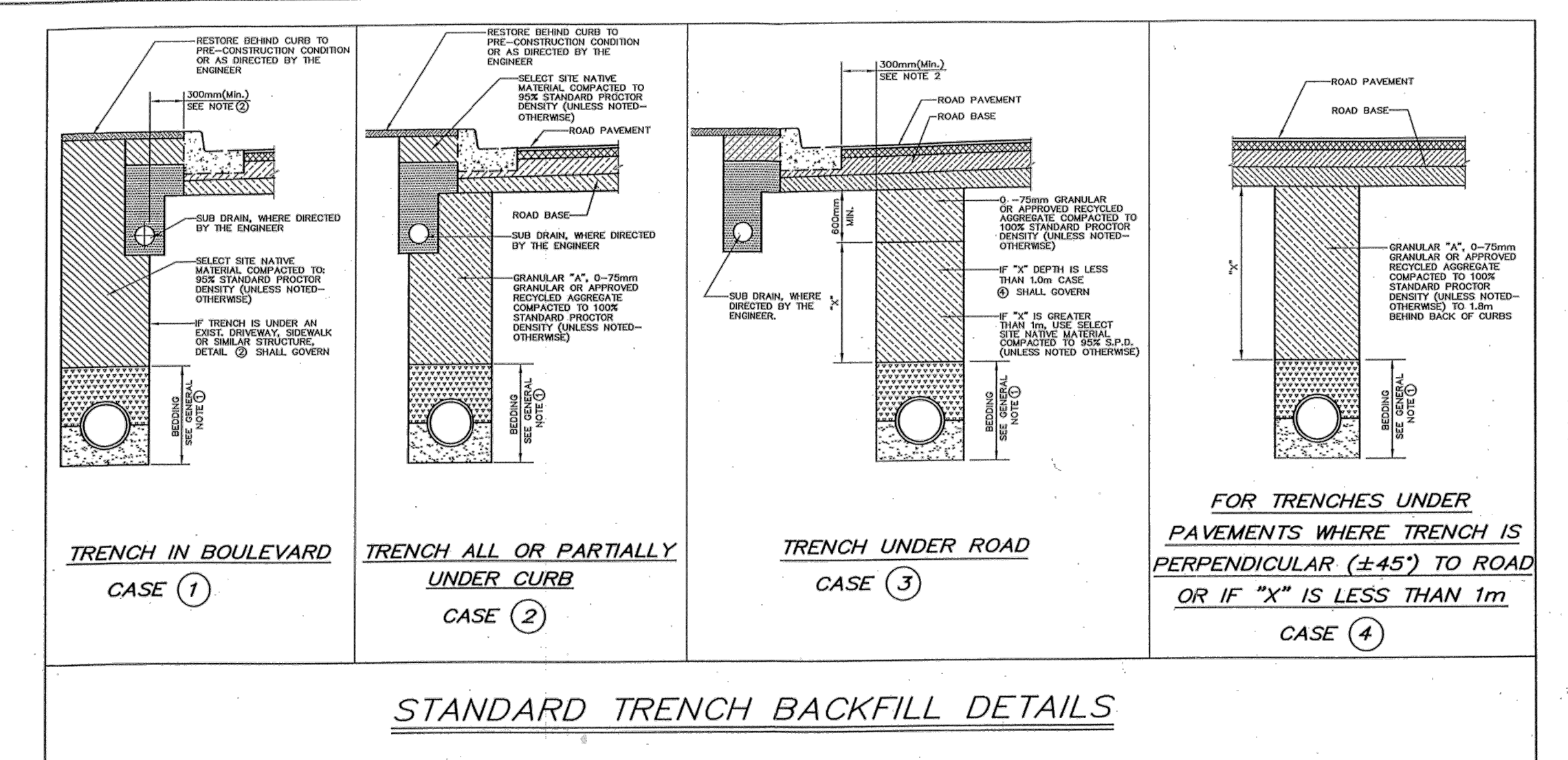
**CITY OF WINDSOR**  
ENGINEERING DEPARTMENT  
**STANDARD UTILITY CROSS-SECTION FOR 20m RIGHT-OF-WAY**  
DRN BY: N.S. DATE: JANUARY, 1980  
REVISION: JULY, 2013 CHKD BY: S.S.  
CHKD BY: P.J.U. PASSED BY: S.S.  
AS-206B



**NOTES:**

- DEVELOPER IS TO CONSTRUCT TEMPORARY LOT DRAINAGE FOR EACH BUILDING LOT AS SHOWN ABOVE AT THE TIME OF SEWER CONSTRUCTION
- HOME BUILDER TO CONNECT PRIVATE STORM SEWER TO EXISTING TEE AT THE PROPERTY LINE AND REMOVE TEMPORARY CATCHBASIN AND PIPES ON PRIVATE PROPERTY.
- DETERMINATION OF WHETHER TEMPORARY LOT DRAINAGE IS REQUIRED SHALL BE AT THE DISCRETION OF THE CITY ENGINEER AND THE CHIEF BUILDING OFFICIAL.

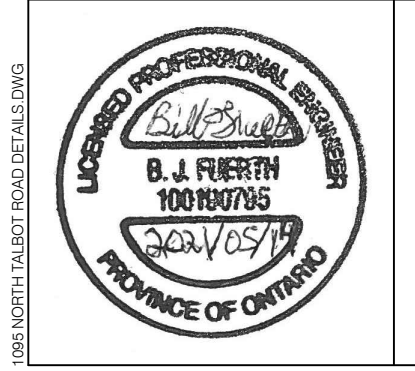
**CITY OF WINDSOR**  
ENGINEERING DEPARTMENT  
**TEMPORARY LOT DRAINAGE**  
DRN BY: J.L. DATE: AUGUST, 2013  
REVISION: CHKD BY: S.S.  
CHKD BY: P.J.U. PASSED BY: H.P.  
AS-550



**GENERAL NOTES:**

- FOR SEWER AND PRIVATE SEWER CONNECTION CONSTRUCTION, ALL WORK TO BE IN ACCORDANCE WITH THE CITY OF WINDSOR STANDARD SPECIFICATIONS S-1 APPLIED TO ALL CASES (1), (2), (3) & (4) OF THIS STANDARD DRAWING.
- FOR ALL CASES, IF TRENCH WALL IS CLOSER THAN 500mm FROM THE BACK OF CURB (FUTURE OR EXISTING) OR EDGE OF PAVEMENT (FUTURE OR EXISTING), IN ANY DIRECTION, THEN CASE (2) SHALL GOVERN.
- FOR CASE (4), WHERE TRENCH CROSSES PERPENDICULAR TO ROADWAY (±45°) AND CROSSES UNDERNEATH AN EXISTING CURB, DRIVEWAY OR SIMILAR STRUCTURE, EXTEND GRANULAR BACKFILL TO 1.0m (MIN.) EITHER SIDE OF STRUCTURE.
- THIS DETAIL ADDRESSES TRENCH BACKFILL ONLY, SURFACE RESTORATION SHALL BE AS OTHERWISE APPROVED BY THE COMMISSIONER OF WORKS.

**CITY OF WINDSOR**  
DEPARTMENT OF PUBLIC WORKS  
**STANDARD TRENCH BACKFILL DETAILS**  
DRN BY: R.C. DATE: OCTOBER, 2002  
REVISION: CHKD BY: S.S.  
CHKD BY: P.J.U. PASSED BY: H.P.  
AS-536



DATE: 05/14/2021  
*Bill Fuertth*  
BILL FUERTH, P.ENG.

DATE	REVISIONS
05/14/2021	SUBMITTED FOR APPROVALS



PROJECT TITLE:  
**NORTH TALBOT DEVELOPMENT**  
1095 NORTH TALBOT ROAD, WINDSOR  
SHEET TITLE:  
**DETAILS 2**

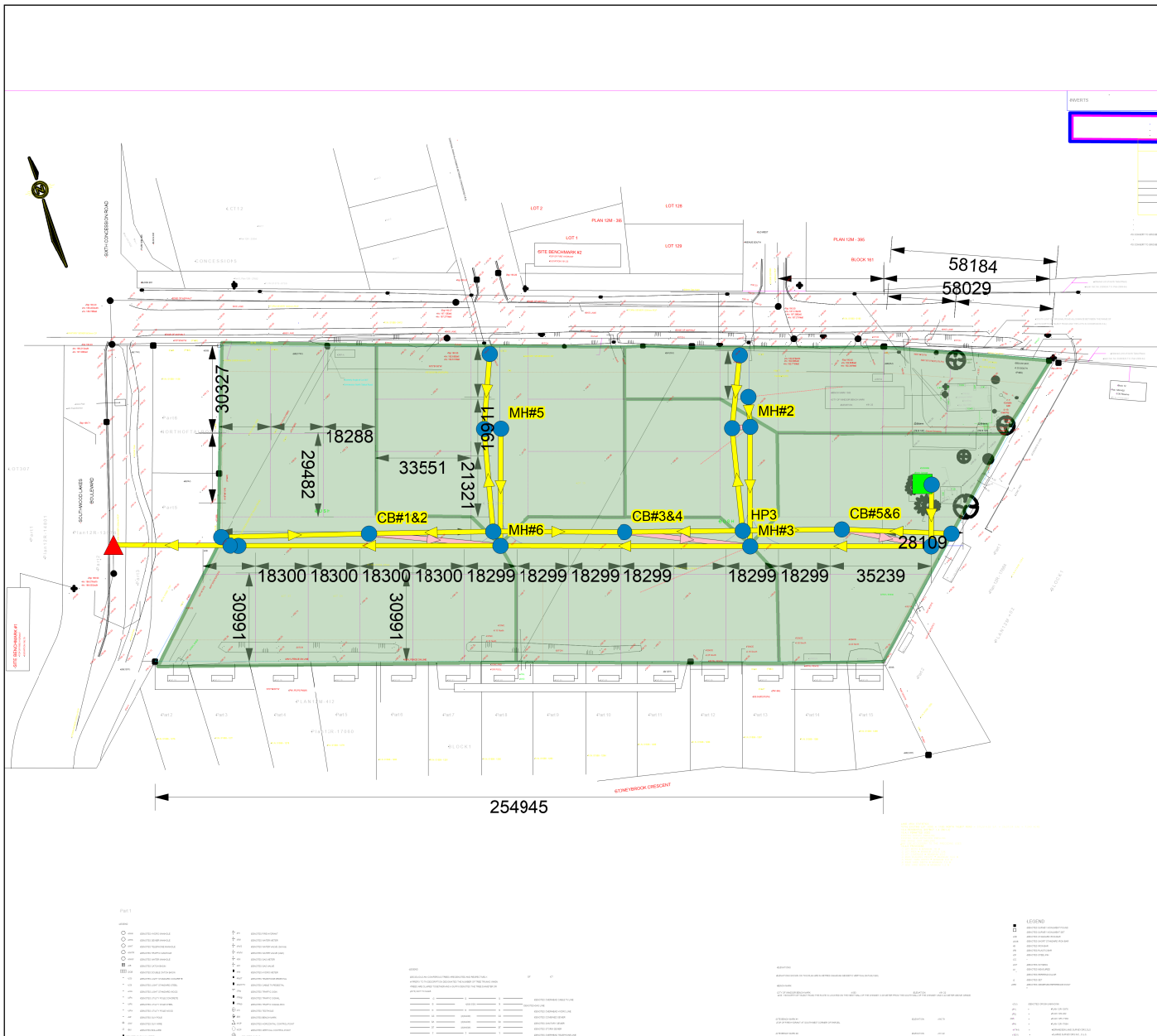
DATE:  
05/14/2021  
SCALE:  
N.T.S.  
DRAWN BY:  
B.T.  
CHECKED BY:  
B.F.

PROJECT NO:  
21-021  
SHEET NO:  
**12**

Appendix B

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**Model Layout**



# Legend

## Junctions

- Visible
- Visible

- ▲ Outfalls
- Storages
- Conduits
- Orifices

## Subcatchments

- 01-March 03-2021 - Metric - SP-Site Plan - To Consultant
- 21-47-019-00



50000

Appendix C

---

**5-Year Storm Event – Input/Output Summary**



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

```

*****
Element Count
*****
Number of rain gages ..... 20
Number of subcatchments ... 6
Number of nodes ..... 22
Number of links ..... 25
Number of pollutants ..... 0
Number of land uses ..... 0
    
```

```

*****
Raingage Summary
*****
    
```

Name	Data Source	Data Type	Recording Interval
100Year-10Min	100Yr-10Min	INTENSITY	10 min.
100Year-15Min	100Yr-15Min	INTENSITY	15 min.
100Year-20Min	100Yr-20Min	INTENSITY	20 min.
100Year-30Min	100Yr-30Min	INTENSITY	30 min.
100Year-5Min	100Yr-5Min	INTENSITY	5 min.
5Year-10Min	5Yr-10Min	INTENSITY	10 min.
5Year-15Min	5Yr-15Min	INTENSITY	15 min.
5Year-20Min	5Yr-20Min	INTENSITY	20 min.
5Year-30Min	5Yr-30Min	INTENSITY	30 min.
5Year-5Min	5Yr-5Min	INTENSITY	5 min.
SCSII-100-Yr	SCSII-100Yr	INTENSITY	120 min.
SCSII-5-Year	SCSII-5-Year	INTENSITY	120 min.
SCSII-RuralStress	SCSII-RST	INTENSITY	120 min.
SCSII-Unit	SCSII-Unit	INTENSITY	120 min.
UrbanStressTest	UrbanStressTest	INTENSITY	15 min.
WaterQualityStorm10MIN	WaterQualityStorm-10MIN	INTENSITY	10 min.
WaterQualityStorm15MIN	WaterQualityStorm-15MIN	INTENSITY	15 min.
WaterQualityStorm20MIN	WaterQualityStorm-20MIN	INTENSITY	20 min.
WaterQualityStorm30MIN	WaterQualityStorm-30MIN	INTENSITY	30 min.
WaterQualityStorm5MIN	WaterQualityStorm-5MIN	INTENSITY	5 min.

```

*****
Subcatchment Summary
    
```

\*\*\*\*\*

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S1	0.48	110.00	60.00	1.0000	5Year-5Min	MH#4
S2	0.22	75.00	60.00	1.0000	5Year-5Min	MH#2
S3	0.45	100.00	60.00	1.0000	5Year-5Min	MH#3
S4	0.53	90.00	60.00	1.0000	5Year-5Min	MH#5
S5	0.89	120.00	60.00	1.0000	5Year-5Min	MH#6
S6	0.37	75.00	60.00	1.0000	5Year-5Min	MH#1

\*\*\*\*\*  
Node Summary  
\*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#1&2	JUNCTION	189.75	0.32	0.0	
CB#3&4	JUNCTION	189.77	0.32	0.0	
CB#5&6	JUNCTION	189.78	0.32	0.0	
CB#7&8	JUNCTION	189.80	0.32	0.0	
CB#9&10	JUNCTION	189.80	0.32	0.0	
HP1	JUNCTION	190.35	0.32	0.0	
HP2	JUNCTION	189.94	0.32	0.0	
HP3	JUNCTION	189.94	0.32	0.0	
HP4	JUNCTION	190.05	0.32	0.0	
HP5	JUNCTION	190.44	0.32	0.0	
HP6	JUNCTION	190.43	0.32	0.0	
MH#1	JUNCTION	186.46	3.79	0.0	
MH#2	JUNCTION	186.40	3.57	0.0	
MH#3	JUNCTION	186.34	3.62	0.0	
MH#4	JUNCTION	186.41	3.49	0.0	
MH#5	JUNCTION	186.34	3.89	0.0	
MH#6	JUNCTION	186.25	3.73	0.0	
MH#7-A	JUNCTION	186.16	4.18	1.0	
MH#7-B	JUNCTION	186.16	4.18	0.0	
PondBasin	JUNCTION	186.44	1.90	0.0	
Southwood1200	OUTFALL	186.09	0.63	0.0	
DryPond	STORAGE	188.34	1.76	0.0	

\*\*\*\*\*  
Link Summary  
\*\*\*\*\*

Name	From Node	To Node	Type	Length	%Slope Roughness
------	-----------	---------	------	--------	------------------

C1	MH#4	MH#3	CONDUIT	69.9	0.0643	0.0130
C10	HP6	CB#9&10	CONDUIT	35.0	1.7774	0.0130
C11	HP3	CB#3&4	CONDUIT	43.6	0.4011	0.0130
C12	HP2	CB#3&4	CONDUIT	43.6	0.4011	0.0130
C13	HP2	CB#7&8	CONDUIT	35.0	0.3971	0.0130
C14	HP5	CB#7&8	CONDUIT	35.0	1.8203	0.0130
C15	HP2	CB#1&2	CONDUIT	49.3	0.3997	0.0130
C16	HP1	CB#1&2	CONDUIT	49.3	1.2256	0.0130
C17	PondBasin	MH#4	CONDUIT	27.0	0.0185	0.0130
C18	MH#1	MH#2	CONDUIT	16.0	0.1817	0.0130
C2	MH#3	MH#6	CONDUIT	87.3	0.0745	0.0130
C3	MH#6	MH#7-A	CONDUIT	94.5	0.0688	0.0130
C4	MH#7-B	Southwood1200	CONDUIT	40.8	0.1202	0.0130
C5	MH#5	MH#6	CONDUIT	58.3	0.1201	0.0130
C6	MH#2	MH#3	CONDUIT	42.7	0.0890	0.0130
C7	HP4	CB#5&6	CONDUIT	29.6	0.8989	0.0130
C8	HP3	CB#5&6	CONDUIT	39.7	0.4009	0.0130
C9	HP3	CB#9&10	CONDUIT	35.0	0.3971	0.0130
CB1/2	CB#1&2	MH#6	ORIFICE			
CB3/4	CB#3&4	MH#3	ORIFICE			
CB5/6	CB#5&6	MH#4	ORIFICE			
CB7/8	CB#7&8	MH#5	ORIFICE			
CB9/10	CB#9&10	MH#2	ORIFICE			
OR6	MH#7-A	MH#7-B	ORIFICE			
OR7	DryPond	PondBasin	ORIFICE			

\*\*\*\*\*  
Cross Section Summary  
\*\*\*\*\*

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	1.05	0.87	0.26	1.05	1	0.69
C10	NTRoad	0.32	3.09	0.14	20.15	1	8.54
C11	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C12	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C13	NTRoad	0.32	3.09	0.14	20.15	1	4.04
C14	NTRoad	0.32	3.09	0.14	20.15	1	8.64
C15	NTRoad	0.32	3.09	0.14	20.15	1	4.05
C16	NTRoad	0.32	3.09	0.14	20.15	1	7.09
C17	CIRCULAR	0.90	0.64	0.23	0.90	1	0.25
C18	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
C2	CIRCULAR	1.05	0.87	0.26	1.05	1	0.75
C3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.72
C4	CIRCULAR	0.60	0.28	0.15	0.60	1	0.21

C5	CIRCULAR	0.60	0.28	0.15	0.60	1	0.21
C6	CIRCULAR	0.75	0.44	0.19	0.75	1	0.33
C7	NTRoad	0.32	3.09	0.14	20.15	1	6.07
C8	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C9	NTRoad	0.32	3.09	0.14	20.15	1	4.04

\*\*\*\*\*  
Transect Summary  
\*\*\*\*\*

Transect NTRoad  
Area:

0.0004	0.0015	0.0034	0.0060	0.0094
0.0136	0.0185	0.0242	0.0306	0.0378
0.0457	0.0544	0.0638	0.0740	0.0850
0.0967	0.1091	0.1224	0.1363	0.1511
0.1665	0.1828	0.1998	0.2178	0.2370
0.2571	0.2780	0.2999	0.3226	0.3461
0.3706	0.3959	0.4220	0.4491	0.4770
0.5058	0.5354	0.5660	0.5973	0.6296
0.6627	0.6967	0.7316	0.7673	0.8039
0.8414	0.8798	0.9190	0.9590	1.0000

Hrad:

0.0221	0.0441	0.0662	0.0882	0.1103
0.1324	0.1544	0.1765	0.1985	0.2206
0.2427	0.2647	0.2868	0.3088	0.3309
0.3530	0.3750	0.3971	0.4192	0.4412
0.4633	0.4853	0.5074	0.5208	0.5622
0.6007	0.6364	0.6694	0.6999	0.7280
0.7541	0.7781	0.8003	0.8207	0.8397
0.8571	0.8733	0.8882	0.9020	0.9147
0.9265	0.9374	0.9475	0.9569	0.9655
0.9735	0.9809	0.9878	0.9941	1.0000

Width:

0.0183	0.0365	0.0548	0.0730	0.0913
0.1095	0.1278	0.1460	0.1643	0.1825
0.2008	0.2190	0.2373	0.2555	0.2738
0.2920	0.3103	0.3285	0.3468	0.3650
0.3833	0.4015	0.4198	0.4540	0.4750
0.4960	0.5170	0.5380	0.5590	0.5800
0.6010	0.6220	0.6430	0.6640	0.6850
0.7060	0.7270	0.7480	0.7690	0.7900
0.8110	0.8320	0.8530	0.8740	0.8950
0.9160	0.9370	0.9580	0.9790	1.0000

Transect PondSpillway1

Area:

0.0005	0.0019	0.0043	0.0076	0.0119
0.0172	0.0234	0.0306	0.0387	0.0477
0.0578	0.0688	0.0807	0.0936	0.1074
0.1222	0.1380	0.1547	0.1724	0.1910
0.2104	0.2304	0.2510	0.2720	0.2935
0.3156	0.3382	0.3613	0.3849	0.4090
0.4337	0.4588	0.4845	0.5107	0.5374
0.5646	0.5924	0.6206	0.6494	0.6787
0.7085	0.7388	0.7697	0.8010	0.8329
0.8653	0.8982	0.9316	0.9655	1.0000

Hrad:

0.0174	0.0348	0.0522	0.0696	0.0870
0.1044	0.1218	0.1392	0.1566	0.1740
0.1914	0.2088	0.2262	0.2436	0.2610
0.2784	0.2958	0.3132	0.3306	0.3480
0.3710	0.3958	0.4203	0.4444	0.4682
0.4917	0.5149	0.5378	0.5605	0.5830
0.6052	0.6273	0.6492	0.6708	0.6924
0.7137	0.7349	0.7560	0.7769	0.7977
0.8184	0.8390	0.8594	0.8798	0.9000
0.9202	0.9403	0.9603	0.9802	1.0000

Width:

0.0275	0.0550	0.0825	0.1100	0.1375
0.1650	0.1926	0.2201	0.2476	0.2751
0.3026	0.3301	0.3576	0.3851	0.4126
0.4401	0.4676	0.4951	0.5227	0.5502
0.5687	0.5836	0.5984	0.6133	0.6282
0.6431	0.6579	0.6728	0.6877	0.7026
0.7174	0.7323	0.7472	0.7620	0.7769
0.7918	0.8067	0.8215	0.8364	0.8513
0.8661	0.8810	0.8959	0.9108	0.9256
0.9405	0.9554	0.9703	0.9851	1.0000

Transect PondSpillway2

Area:

0.0006	0.0023	0.0052	0.0092	0.0144
0.0207	0.0281	0.0367	0.0465	0.0574
0.0695	0.0827	0.0970	0.1125	0.1292
0.1470	0.1659	0.1860	0.2072	0.2291
0.2513	0.2736	0.2963	0.3191	0.3422
0.3656	0.3892	0.4131	0.4372	0.4615
0.4861	0.5109	0.5360	0.5613	0.5869
0.6127	0.6388	0.6651	0.6916	0.7185

	0.7455	0.7728	0.8003	0.8281	0.8562
	0.8844	0.9130	0.9417	0.9707	1.0000
Hrad:					
	0.0147	0.0295	0.0442	0.0590	0.0737
	0.0885	0.1032	0.1179	0.1327	0.1474
	0.1622	0.1769	0.1916	0.2064	0.2211
	0.2359	0.2506	0.2654	0.2808	0.3069
	0.3328	0.3584	0.3838	0.4090	0.4339
	0.4586	0.4831	0.5074	0.5315	0.5553
	0.5790	0.6026	0.6259	0.6491	0.6721
	0.6949	0.7176	0.7401	0.7625	0.7848
	0.8069	0.8288	0.8506	0.8723	0.8939
	0.9154	0.9367	0.9579	0.9790	1.0000
Width:					
	0.0391	0.0781	0.1172	0.1563	0.1954
	0.2344	0.2735	0.3126	0.3517	0.3907
	0.4298	0.4689	0.5080	0.5470	0.5861
	0.6252	0.6643	0.7033	0.7406	0.7489
	0.7573	0.7657	0.7740	0.7824	0.7908
	0.7991	0.8075	0.8159	0.8243	0.8326
	0.8410	0.8494	0.8577	0.8661	0.8745
	0.8828	0.8912	0.8996	0.9079	0.9163
	0.9247	0.9330	0.9414	0.9498	0.9582
	0.9665	0.9749	0.9833	0.9916	1.0000

Transect PondSpillway3

Area:					
	0.0005	0.0019	0.0043	0.0077	0.0120
	0.0172	0.0234	0.0306	0.0387	0.0478
	0.0579	0.0689	0.0808	0.0937	0.1076
	0.1224	0.1382	0.1550	0.1727	0.1913
	0.2109	0.2314	0.2525	0.2741	0.2961
	0.3186	0.3416	0.3650	0.3889	0.4133
	0.4382	0.4635	0.4893	0.5155	0.5423
	0.5695	0.5972	0.6253	0.6540	0.6831
	0.7126	0.7427	0.7732	0.8042	0.8356
	0.8676	0.9000	0.9328	0.9662	1.0000
Hrad:					
	0.0170	0.0341	0.0511	0.0681	0.0851
	0.1022	0.1192	0.1362	0.1532	0.1703
	0.1873	0.2043	0.2213	0.2384	0.2554
	0.2724	0.2894	0.3065	0.3235	0.3405
	0.3575	0.3781	0.4034	0.4283	0.4529
	0.4772	0.5012	0.5250	0.5484	0.5717
	0.5946	0.6174	0.6400	0.6623	0.6845
	0.7065	0.7283	0.7500	0.7715	0.7929

	0.8141	0.8352	0.8562	0.8771	0.8978
	0.9185	0.9390	0.9594	0.9798	1.0000
Width:	0.0281	0.0562	0.0843	0.1124	0.1405
	0.1685	0.1966	0.2247	0.2528	0.2809
	0.3090	0.3371	0.3652	0.3933	0.4214
	0.4495	0.4776	0.5056	0.5337	0.5618
	0.5899	0.6122	0.6260	0.6399	0.6537
	0.6676	0.6814	0.6953	0.7091	0.7230
	0.7368	0.7507	0.7645	0.7784	0.7922
	0.8061	0.8199	0.8338	0.8476	0.8615
	0.8753	0.8892	0.9030	0.9169	0.9307
	0.9446	0.9584	0.9723	0.9861	1.0000

Transect Road  
Area:

	0.0005	0.0019	0.0043	0.0077	0.0120
	0.0173	0.0236	0.0308	0.0390	0.0481
	0.0582	0.0693	0.0813	0.0943	0.1083
	0.1232	0.1393	0.1563	0.1740	0.1922
	0.2109	0.2303	0.2502	0.2706	0.2916
	0.3132	0.3354	0.3581	0.3813	0.4052
	0.4296	0.4545	0.4800	0.5061	0.5328
	0.5600	0.5877	0.6161	0.6450	0.6744
	0.7045	0.7350	0.7662	0.7979	0.8302
	0.8630	0.8964	0.9304	0.9649	1.0000

Hrad:

	0.0205	0.0410	0.0615	0.0820	0.1025
	0.1230	0.1435	0.1640	0.1845	0.2050
	0.2255	0.2460	0.2665	0.2870	0.3075
	0.3280	0.3441	0.3834	0.4208	0.4563
	0.4899	0.5219	0.5522	0.5811	0.6084
	0.6345	0.6592	0.6828	0.7052	0.7266
	0.7469	0.7663	0.7848	0.8024	0.8193
	0.8354	0.8508	0.8655	0.8795	0.8930
	0.9058	0.9181	0.9299	0.9413	0.9521
	0.9625	0.9724	0.9820	0.9912	1.0000

Width:

	0.0272	0.0544	0.0816	0.1089	0.1361
	0.1633	0.1905	0.2177	0.2449	0.2721
	0.2994	0.3266	0.3538	0.3810	0.4082
	0.4354	0.4748	0.4907	0.5066	0.5225
	0.5385	0.5544	0.5703	0.5862	0.6021
	0.6180	0.6340	0.6499	0.6658	0.6817
	0.6976	0.7135	0.7294	0.7454	0.7613
	0.7772	0.7931	0.8090	0.8249	0.8408

0.8568	0.8727	0.8886	0.9045	0.9204
0.9363	0.9523	0.9682	0.9841	1.0000

Transect Road2

Area:

0.0006	0.0023	0.0051	0.0091	0.0142
0.0205	0.0279	0.0364	0.0461	0.0569
0.0689	0.0820	0.0962	0.1116	0.1281
0.1458	0.1646	0.1844	0.2044	0.2248
0.2456	0.2667	0.2881	0.3100	0.3321
0.3546	0.3775	0.4007	0.4243	0.4482
0.4724	0.4971	0.5220	0.5473	0.5730
0.5990	0.6254	0.6521	0.6792	0.7066
0.7343	0.7625	0.7909	0.8197	0.8489
0.8784	0.9083	0.9385	0.9691	1.0000

Hrad:

0.0167	0.0335	0.0502	0.0670	0.0837
0.1004	0.1172	0.1339	0.1507	0.1674
0.1841	0.2009	0.2176	0.2344	0.2511
0.2678	0.2897	0.3213	0.3521	0.3820
0.4111	0.4395	0.4671	0.4939	0.5201
0.5456	0.5704	0.5946	0.6182	0.6411
0.6635	0.6854	0.7067	0.7274	0.7477
0.7675	0.7867	0.8056	0.8240	0.8419
0.8594	0.8765	0.8932	0.9096	0.9255
0.9411	0.9563	0.9712	0.9858	1.0000

Width:

0.0366	0.0732	0.1099	0.1465	0.1831
0.2197	0.2563	0.2930	0.3296	0.3662
0.4028	0.4394	0.4761	0.5127	0.5493
0.5859	0.6282	0.6394	0.6507	0.6620
0.6732	0.6845	0.6958	0.7070	0.7183
0.7296	0.7408	0.7521	0.7634	0.7746
0.7859	0.7972	0.8085	0.8197	0.8310
0.8423	0.8535	0.8648	0.8761	0.8873
0.8986	0.9099	0.9211	0.9324	0.9437
0.9549	0.9662	0.9775	0.9887	1.0000

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

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Flow Units ..... CMS  
 Process Models:  
   Rainfall/Runoff ..... YES  
   RDII ..... NO  
   Snowmelt ..... NO  
   Groundwater ..... NO  
   Flow Routing ..... YES  
   Ponding Allowed ..... YES  
   Water Quality ..... NO  
 Infiltration Method ..... HORTON  
 Flow Routing Method ..... DYNWAVE  
 Surcharge Method ..... EXTRAN  
 Starting Date ..... 06/06/2018 00:00:00  
 Ending Date ..... 06/08/2018 00:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:01:00  
 Wet Time Step ..... 00:01:00  
 Dry Time Step ..... 00:01:00  
 Routing Time Step ..... 5.00 sec  
 Variable Time Step ..... YES  
 Maximum Trials ..... 8  
 Number of Threads ..... 4  
 Head Tolerance ..... 0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation .....	0.145	49.473
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.019	6.399
Surface Runoff .....	0.122	41.602
Final Storage .....	0.004	1.500
Continuity Error (%) .....	-0.056	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.122	1.219
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.012	0.117

External Outflow .....	0.129	1.288
Flooding Loss .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Exfiltration Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.002
Final Stored Volume .....	0.006	0.062
Continuity Error (%) .....	-0.883	

\*\*\*\*\*

Highest Continuity Errors

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Node MH#7-A (2.88%)  
Node MH#7-B (-1.64%)  
Node MH#6 (1.47%)  
Node PondBasin (-1.22%)  
Node MH#3 (1.19%)

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Time-Step Critical Elements

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None

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Highest Flow Instability Indexes

\*\*\*\*\*

Link OR6 (117)  
Link C4 (111)  
Link C3 (2)

\*\*\*\*\*

Routing Time Step Summary

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Minimum Time Step	:	0.49 sec
Average Time Step	:	5.00 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.11
Percent Not Converging	:	0.39
Time Step Frequencies	:	
5.000 - 3.155 sec	:	99.98 %
3.155 - 1.991 sec	:	0.01 %
1.991 - 1.256 sec	:	0.00 %

1.256 - 0.792 sec : 0.00 %  
 0.792 - 0.500 sec : 0.00 %

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

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
S1	49.47	0.00	0.00	6.36	28.20	13.44	41.65	0.20	0.15	0.842
S2	49.47	0.00	0.00	6.30	28.21	13.50	41.71	0.09	0.07	0.843
S3	49.47	0.00	0.00	6.36	28.20	13.44	41.64	0.19	0.14	0.842
S4	49.47	0.00	0.00	6.41	28.20	13.38	41.59	0.22	0.15	0.841
S5	49.47	0.00	0.00	6.46	28.20	13.33	41.53	0.37	0.24	0.839
S6	49.47	0.00	0.00	6.38	28.20	13.42	41.62	0.15	0.11	0.841

\*\*\*\*\*  
 Node Depth Summary  
 \*\*\*\*\*

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CB#1&2	JUNCTION	0.00	0.00	189.75	0 00:00	0.00
CB#3&4	JUNCTION	0.00	0.00	189.77	0 00:00	0.00
CB#5&6	JUNCTION	0.00	0.00	189.78	0 00:00	0.00
CB#7&8	JUNCTION	0.00	0.00	189.80	0 00:00	0.00
CB#9&10	JUNCTION	0.00	0.00	189.80	0 00:00	0.00
HP1	JUNCTION	0.00	0.00	190.35	0 00:00	0.00
HP2	JUNCTION	0.00	0.00	189.94	0 00:00	0.00
HP3	JUNCTION	0.00	0.00	189.94	0 00:00	0.00
HP4	JUNCTION	0.00	0.00	190.05	0 00:00	0.00
HP5	JUNCTION	0.00	0.00	190.44	0 00:00	0.00
HP6	JUNCTION	0.00	0.00	190.43	0 00:00	0.00
MH#1	JUNCTION	0.18	2.87	189.32	0 01:35	2.85
MH#2	JUNCTION	0.23	2.87	189.28	0 01:35	2.86
MH#3	JUNCTION	0.29	2.91	189.25	0 01:35	2.90
MH#4	JUNCTION	0.22	2.83	189.24	0 01:35	2.81
MH#5	JUNCTION	0.29	2.97	189.31	0 01:35	2.95

MH#6	JUNCTION	0.38	3.01	189.26	0	01:35	2.99
MH#7-A	JUNCTION	0.47	3.06	189.22	0	01:35	3.05
MH#7-B	JUNCTION	0.45	1.59	187.75	0	01:31	1.46
PondBasin	JUNCTION	0.19	2.76	189.20	0	01:35	2.73
Southwood1200	OUTFALL	0.53	1.31	187.39	0	01:33	1.31
DryPond	STORAGE	0.01	0.70	189.04	0	01:43	0.70

\*\*\*\*\*  
Node Inflow Summary  
\*\*\*\*\*

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CB#1&2	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
CB#3&4	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
CB#5&6	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
CB#7&8	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
CB#9&10	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP1	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP2	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP3	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP4	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP5	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP6	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
MH#1	JUNCTION	0.110	0.110	0 01:35	0.153	0.154	-0.718
MH#2	JUNCTION	0.072	0.181	0 01:35	0.0915	0.251	0.218
MH#3	JUNCTION	0.136	0.446	0 01:31	0.186	0.811	1.207
MH#4	JUNCTION	0.147	0.470	0 01:35	0.2	0.489	0.334
MH#5	JUNCTION	0.153	0.153	0 01:35	0.22	0.225	1.045
MH#6	JUNCTION	0.245	0.398	0 01:35	0.369	1.34	1.491
MH#7-A	JUNCTION	0.000	0.388	0 01:40	0	1.37	2.970
MH#7-B	JUNCTION	0.000	0.388	0 01:40	0	1.38	-1.618
PondBasin	JUNCTION	0.000	0.468	0 01:35	0	0.325	-1.206
Southwood1200	OUTFALL	0.000	0.389	0 01:40	0	1.41	0.000
DryPond	STORAGE	0.000	0.467	0 01:35	0	0.158	1.548

\*\*\*\*\*  
Node Surcharge Summary  
\*\*\*\*\*

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
MH#1	JUNCTION	3.63	2.417	0.928
MH#2	JUNCTION	0.73	2.073	0.696
MH#3	JUNCTION	0.56	1.840	0.701
MH#4	JUNCTION	0.55	1.777	0.663
MH#5	JUNCTION	0.83	2.165	0.927
MH#6	JUNCTION	0.61	1.931	0.724
MH#7-A	JUNCTION	0.68	1.988	1.117
MH#7-B	JUNCTION	6.40	0.986	2.594
PondBasin	JUNCTION	0.59	1.856	0.000

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

No nodes were flooded.

\*\*\*\*\*  
Storage Volume Summary  
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
DryPond	0.001	0	0	0	0.157	19	0 01:43	0.184

\*\*\*\*\*  
Outfall Loading Summary  
\*\*\*\*\*

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Southwood1200	99.98	0.008	0.389	1.406

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System                    99.98        0.008        0.389        1.406

\*\*\*\*\*  
Link Flow Summary  
\*\*\*\*\*

Link	Type	Maximum  Flow  CMS	Time of Max Occurrence days hr:min	Maximum  Veloc  m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.324	0 01:35	0.37	0.47	1.00
C10	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C11	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C12	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C13	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C14	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C15	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C16	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C17	CONDUIT	0.468	0 01:35	0.74	1.90	1.00
C18	CONDUIT	0.109	0 01:35	0.69	0.90	1.00
C2	CONDUIT	0.265	0 01:57	0.31	0.36	1.00
C3	CONDUIT	0.388	0 01:40	0.45	0.54	1.00
C4	CONDUIT	0.389	0 01:40	1.37	1.83	1.00
C5	CONDUIT	0.153	0 01:35	0.54	0.72	1.00
C6	CONDUIT	0.181	0 01:35	0.41	0.54	1.00
C7	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C8	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C9	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
CB1/2	ORIFICE	0.000	0 00:00			
CB3/4	ORIFICE	0.000	0 00:00			
CB5/6	ORIFICE	0.000	0 00:00			
CB7/8	ORIFICE	0.000	0 00:00			
CB9/10	ORIFICE	0.000	0 00:00			
OR6	ORIFICE	0.388	0 01:40			1.00
OR7	ORIFICE	0.467	0 01:35			

\*\*\*\*\*  
Flow Classification Summary  
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Adjusted        ----- Fraction of Time in Flow Class -----

Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.00	0.01	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C10	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C11	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C12	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C15	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C16	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C18	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	0.00	0.01	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\*\*\*\*  
Conduit Surcharge Summary  
\*\*\*\*\*

Conduit	----- Both Ends	Hours Full Upstream	----- Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.55	0.55	0.56	0.01	0.01
C17	0.59	0.59	0.60	0.08	0.17
C18	3.63	3.63	4.14	0.01	0.07
C2	0.57	0.57	0.61	0.01	0.01
C3	0.62	0.62	0.68	0.01	0.01
C4	6.38	6.38	7.52	0.54	0.57
C5	2.97	2.97	4.19	0.01	0.01
C6	0.81	0.81	0.89	0.01	0.01

Analysis begun on: Fri May 14 17:05:15 2021  
Analysis ended on: Fri May 14 17:05:17 2021  
Total elapsed time: 00:00:02

Appendix D

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**100-Year Storm Event – Input/Output Summary**



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

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*****
Element Count
*****
Number of rain gages ..... 20
Number of subcatchments ... 6
Number of nodes ..... 22
Number of links ..... 25
Number of pollutants ..... 0
Number of land uses ..... 0
    
```

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*****
Raingage Summary
*****
    
```

Name	Data Source	Data Type	Recording Interval
100Year-10Min	100Yr-10Min	INTENSITY	10 min.
100Year-15Min	100Yr-15Min	INTENSITY	15 min.
100Year-20Min	100Yr-20Min	INTENSITY	20 min.
100Year-30Min	100Yr-30Min	INTENSITY	30 min.
100Year-5Min	100Yr-5Min	INTENSITY	5 min.
5Year-10Min	5Yr-10Min	INTENSITY	10 min.
5Year-15Min	5Yr-15Min	INTENSITY	15 min.
5Year-20Min	5Yr-20Min	INTENSITY	20 min.
5Year-30Min	5Yr-30Min	INTENSITY	30 min.
5Year-5Min	5Yr-5Min	INTENSITY	5 min.
SCSII-100-Yr	SCSII-100Yr	INTENSITY	120 min.
SCSII-5-Year	SCSII-5-Year	INTENSITY	120 min.
SCSII-RuralStress	SCSII-RST	INTENSITY	120 min.
SCSII-Unit	SCSII-Unit	INTENSITY	120 min.
UrbanStressTest	UrbanStressTest	INTENSITY	15 min.
WaterQualityStorm10MIN	WaterQualityStorm-10MIN	INTENSITY	10 min.
WaterQualityStorm15MIN	WaterQualityStorm-15MIN	INTENSITY	15 min.
WaterQualityStorm20MIN	WaterQualityStorm-20MIN	INTENSITY	20 min.
WaterQualityStorm30MIN	WaterQualityStorm-30MIN	INTENSITY	30 min.
WaterQualityStorm5MIN	WaterQualityStorm-5MIN	INTENSITY	5 min.

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*****
Subcatchment Summary
    
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Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S1	0.48	110.00	60.00	1.0000	100Year-5Min	MH#4
S2	0.22	75.00	60.00	1.0000	100Year-5Min	MH#2
S3	0.45	100.00	60.00	1.0000	100Year-5Min	MH#3
S4	0.53	90.00	60.00	1.0000	100Year-5Min	MH#5
S5	0.89	120.00	60.00	1.0000	100Year-5Min	MH#6
S6	0.37	75.00	60.00	1.0000	100Year-5Min	MH#1

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Node Summary  
\*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#1&2	JUNCTION	189.75	0.32	0.0	
CB#3&4	JUNCTION	189.77	0.32	0.0	
CB#5&6	JUNCTION	189.78	0.32	0.0	
CB#7&8	JUNCTION	189.80	0.32	0.0	
CB#9&10	JUNCTION	189.80	0.32	0.0	
HP1	JUNCTION	190.35	0.32	0.0	
HP2	JUNCTION	189.94	0.32	0.0	
HP3	JUNCTION	189.94	0.32	0.0	
HP4	JUNCTION	190.05	0.32	0.0	
HP5	JUNCTION	190.44	0.32	0.0	
HP6	JUNCTION	190.43	0.32	0.0	
MH#1	JUNCTION	186.46	3.79	0.0	
MH#2	JUNCTION	186.40	3.57	0.0	
MH#3	JUNCTION	186.34	3.62	0.0	
MH#4	JUNCTION	186.41	3.49	0.0	
MH#5	JUNCTION	186.34	3.89	0.0	
MH#6	JUNCTION	186.25	3.73	0.0	
MH#7-A	JUNCTION	186.16	4.18	1.0	
MH#7-B	JUNCTION	186.16	4.18	0.0	
PondBasin	JUNCTION	186.44	1.90	0.0	
Southwood1200	OUTFALL	186.09	0.63	0.0	
DryPond	STORAGE	188.34	1.76	0.0	

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Link Summary  
\*\*\*\*\*

Name	From Node	To Node	Type	Length	%Slope Roughness
------	-----------	---------	------	--------	------------------

C1	MH#4	MH#3	CONDUIT	69.9	0.0643	0.0130
C10	HP6	CB#9&10	CONDUIT	35.0	1.7774	0.0130
C11	HP3	CB#3&4	CONDUIT	43.6	0.4011	0.0130
C12	HP2	CB#3&4	CONDUIT	43.6	0.4011	0.0130
C13	HP2	CB#7&8	CONDUIT	35.0	0.3971	0.0130
C14	HP5	CB#7&8	CONDUIT	35.0	1.8203	0.0130
C15	HP2	CB#1&2	CONDUIT	49.3	0.3997	0.0130
C16	HP1	CB#1&2	CONDUIT	49.3	1.2256	0.0130
C17	PondBasin	MH#4	CONDUIT	27.0	0.0185	0.0130
C18	MH#1	MH#2	CONDUIT	16.0	0.1817	0.0130
C2	MH#3	MH#6	CONDUIT	87.3	0.0745	0.0130
C3	MH#6	MH#7-A	CONDUIT	94.5	0.0688	0.0130
C4	MH#7-B	Southwood1200	CONDUIT	40.8	0.1202	0.0130
C5	MH#5	MH#6	CONDUIT	58.3	0.1201	0.0130
C6	MH#2	MH#3	CONDUIT	42.7	0.0890	0.0130
C7	HP4	CB#5&6	CONDUIT	29.6	0.8989	0.0130
C8	HP3	CB#5&6	CONDUIT	39.7	0.4009	0.0130
C9	HP3	CB#9&10	CONDUIT	35.0	0.3971	0.0130
CB1/2	CB#1&2	MH#6	ORIFICE			
CB3/4	CB#3&4	MH#3	ORIFICE			
CB5/6	CB#5&6	MH#4	ORIFICE			
CB7/8	CB#7&8	MH#5	ORIFICE			
CB9/10	CB#9&10	MH#2	ORIFICE			
OR6	MH#7-A	MH#7-B	ORIFICE			
OR7	DryPond	PondBasin	ORIFICE			

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Cross Section Summary  
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	1.05	0.87	0.26	1.05	1	0.69
C10	NTRoad	0.32	3.09	0.14	20.15	1	8.54
C11	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C12	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C13	NTRoad	0.32	3.09	0.14	20.15	1	4.04
C14	NTRoad	0.32	3.09	0.14	20.15	1	8.64
C15	NTRoad	0.32	3.09	0.14	20.15	1	4.05
C16	NTRoad	0.32	3.09	0.14	20.15	1	7.09
C17	CIRCULAR	0.90	0.64	0.23	0.90	1	0.25
C18	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
C2	CIRCULAR	1.05	0.87	0.26	1.05	1	0.75
C3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.72
C4	CIRCULAR	0.60	0.28	0.15	0.60	1	0.21

C5	CIRCULAR	0.60	0.28	0.15	0.60	1	0.21
C6	CIRCULAR	0.75	0.44	0.19	0.75	1	0.33
C7	NTRoad	0.32	3.09	0.14	20.15	1	6.07
C8	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C9	NTRoad	0.32	3.09	0.14	20.15	1	4.04

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Transect Summary  
\*\*\*\*\*

Transect NTRoad

Area:

0.0004	0.0015	0.0034	0.0060	0.0094
0.0136	0.0185	0.0242	0.0306	0.0378
0.0457	0.0544	0.0638	0.0740	0.0850
0.0967	0.1091	0.1224	0.1363	0.1511
0.1665	0.1828	0.1998	0.2178	0.2370
0.2571	0.2780	0.2999	0.3226	0.3461
0.3706	0.3959	0.4220	0.4491	0.4770
0.5058	0.5354	0.5660	0.5973	0.6296
0.6627	0.6967	0.7316	0.7673	0.8039
0.8414	0.8798	0.9190	0.9590	1.0000

Hrad:

0.0221	0.0441	0.0662	0.0882	0.1103
0.1324	0.1544	0.1765	0.1985	0.2206
0.2427	0.2647	0.2868	0.3088	0.3309
0.3530	0.3750	0.3971	0.4192	0.4412
0.4633	0.4853	0.5074	0.5208	0.5622
0.6007	0.6364	0.6694	0.6999	0.7280
0.7541	0.7781	0.8003	0.8207	0.8397
0.8571	0.8733	0.8882	0.9020	0.9147
0.9265	0.9374	0.9475	0.9569	0.9655
0.9735	0.9809	0.9878	0.9941	1.0000

Width:

0.0183	0.0365	0.0548	0.0730	0.0913
0.1095	0.1278	0.1460	0.1643	0.1825
0.2008	0.2190	0.2373	0.2555	0.2738
0.2920	0.3103	0.3285	0.3468	0.3650
0.3833	0.4015	0.4198	0.4540	0.4750
0.4960	0.5170	0.5380	0.5590	0.5800
0.6010	0.6220	0.6430	0.6640	0.6850
0.7060	0.7270	0.7480	0.7690	0.7900
0.8110	0.8320	0.8530	0.8740	0.8950
0.9160	0.9370	0.9580	0.9790	1.0000

Transect PondSpillway1

Area:

0.0005	0.0019	0.0043	0.0076	0.0119
0.0172	0.0234	0.0306	0.0387	0.0477
0.0578	0.0688	0.0807	0.0936	0.1074
0.1222	0.1380	0.1547	0.1724	0.1910
0.2104	0.2304	0.2510	0.2720	0.2935
0.3156	0.3382	0.3613	0.3849	0.4090
0.4337	0.4588	0.4845	0.5107	0.5374
0.5646	0.5924	0.6206	0.6494	0.6787
0.7085	0.7388	0.7697	0.8010	0.8329
0.8653	0.8982	0.9316	0.9655	1.0000

Hrad:

0.0174	0.0348	0.0522	0.0696	0.0870
0.1044	0.1218	0.1392	0.1566	0.1740
0.1914	0.2088	0.2262	0.2436	0.2610
0.2784	0.2958	0.3132	0.3306	0.3480
0.3710	0.3958	0.4203	0.4444	0.4682
0.4917	0.5149	0.5378	0.5605	0.5830
0.6052	0.6273	0.6492	0.6708	0.6924
0.7137	0.7349	0.7560	0.7769	0.7977
0.8184	0.8390	0.8594	0.8798	0.9000
0.9202	0.9403	0.9603	0.9802	1.0000

Width:

0.0275	0.0550	0.0825	0.1100	0.1375
0.1650	0.1926	0.2201	0.2476	0.2751
0.3026	0.3301	0.3576	0.3851	0.4126
0.4401	0.4676	0.4951	0.5227	0.5502
0.5687	0.5836	0.5984	0.6133	0.6282
0.6431	0.6579	0.6728	0.6877	0.7026
0.7174	0.7323	0.7472	0.7620	0.7769
0.7918	0.8067	0.8215	0.8364	0.8513
0.8661	0.8810	0.8959	0.9108	0.9256
0.9405	0.9554	0.9703	0.9851	1.0000

Transect PondSpillway2

Area:

0.0006	0.0023	0.0052	0.0092	0.0144
0.0207	0.0281	0.0367	0.0465	0.0574
0.0695	0.0827	0.0970	0.1125	0.1292
0.1470	0.1659	0.1860	0.2072	0.2291
0.2513	0.2736	0.2963	0.3191	0.3422
0.3656	0.3892	0.4131	0.4372	0.4615
0.4861	0.5109	0.5360	0.5613	0.5869
0.6127	0.6388	0.6651	0.6916	0.7185

	0.7455	0.7728	0.8003	0.8281	0.8562
	0.8844	0.9130	0.9417	0.9707	1.0000
Hrad:					
	0.0147	0.0295	0.0442	0.0590	0.0737
	0.0885	0.1032	0.1179	0.1327	0.1474
	0.1622	0.1769	0.1916	0.2064	0.2211
	0.2359	0.2506	0.2654	0.2808	0.3069
	0.3328	0.3584	0.3838	0.4090	0.4339
	0.4586	0.4831	0.5074	0.5315	0.5553
	0.5790	0.6026	0.6259	0.6491	0.6721
	0.6949	0.7176	0.7401	0.7625	0.7848
	0.8069	0.8288	0.8506	0.8723	0.8939
	0.9154	0.9367	0.9579	0.9790	1.0000
Width:					
	0.0391	0.0781	0.1172	0.1563	0.1954
	0.2344	0.2735	0.3126	0.3517	0.3907
	0.4298	0.4689	0.5080	0.5470	0.5861
	0.6252	0.6643	0.7033	0.7406	0.7489
	0.7573	0.7657	0.7740	0.7824	0.7908
	0.7991	0.8075	0.8159	0.8243	0.8326
	0.8410	0.8494	0.8577	0.8661	0.8745
	0.8828	0.8912	0.8996	0.9079	0.9163
	0.9247	0.9330	0.9414	0.9498	0.9582
	0.9665	0.9749	0.9833	0.9916	1.0000

Transect PondSpillway3

Area:

	0.0005	0.0019	0.0043	0.0077	0.0120
	0.0172	0.0234	0.0306	0.0387	0.0478
	0.0579	0.0689	0.0808	0.0937	0.1076
	0.1224	0.1382	0.1550	0.1727	0.1913
	0.2109	0.2314	0.2525	0.2741	0.2961
	0.3186	0.3416	0.3650	0.3889	0.4133
	0.4382	0.4635	0.4893	0.5155	0.5423
	0.5695	0.5972	0.6253	0.6540	0.6831
	0.7126	0.7427	0.7732	0.8042	0.8356
	0.8676	0.9000	0.9328	0.9662	1.0000
Hrad:					
	0.0170	0.0341	0.0511	0.0681	0.0851
	0.1022	0.1192	0.1362	0.1532	0.1703
	0.1873	0.2043	0.2213	0.2384	0.2554
	0.2724	0.2894	0.3065	0.3235	0.3405
	0.3575	0.3781	0.4034	0.4283	0.4529
	0.4772	0.5012	0.5250	0.5484	0.5717
	0.5946	0.6174	0.6400	0.6623	0.6845
	0.7065	0.7283	0.7500	0.7715	0.7929

	0.8141	0.8352	0.8562	0.8771	0.8978
	0.9185	0.9390	0.9594	0.9798	1.0000
Width:	0.0281	0.0562	0.0843	0.1124	0.1405
	0.1685	0.1966	0.2247	0.2528	0.2809
	0.3090	0.3371	0.3652	0.3933	0.4214
	0.4495	0.4776	0.5056	0.5337	0.5618
	0.5899	0.6122	0.6260	0.6399	0.6537
	0.6676	0.6814	0.6953	0.7091	0.7230
	0.7368	0.7507	0.7645	0.7784	0.7922
	0.8061	0.8199	0.8338	0.8476	0.8615
	0.8753	0.8892	0.9030	0.9169	0.9307
	0.9446	0.9584	0.9723	0.9861	1.0000

Transect Road  
Area:

	0.0005	0.0019	0.0043	0.0077	0.0120
	0.0173	0.0236	0.0308	0.0390	0.0481
	0.0582	0.0693	0.0813	0.0943	0.1083
	0.1232	0.1393	0.1563	0.1740	0.1922
	0.2109	0.2303	0.2502	0.2706	0.2916
	0.3132	0.3354	0.3581	0.3813	0.4052
	0.4296	0.4545	0.4800	0.5061	0.5328
	0.5600	0.5877	0.6161	0.6450	0.6744
	0.7045	0.7350	0.7662	0.7979	0.8302
	0.8630	0.8964	0.9304	0.9649	1.0000

Hrad:

	0.0205	0.0410	0.0615	0.0820	0.1025
	0.1230	0.1435	0.1640	0.1845	0.2050
	0.2255	0.2460	0.2665	0.2870	0.3075
	0.3280	0.3441	0.3834	0.4208	0.4563
	0.4899	0.5219	0.5522	0.5811	0.6084
	0.6345	0.6592	0.6828	0.7052	0.7266
	0.7469	0.7663	0.7848	0.8024	0.8193
	0.8354	0.8508	0.8655	0.8795	0.8930
	0.9058	0.9181	0.9299	0.9413	0.9521
	0.9625	0.9724	0.9820	0.9912	1.0000

Width:

	0.0272	0.0544	0.0816	0.1089	0.1361
	0.1633	0.1905	0.2177	0.2449	0.2721
	0.2994	0.3266	0.3538	0.3810	0.4082
	0.4354	0.4748	0.4907	0.5066	0.5225
	0.5385	0.5544	0.5703	0.5862	0.6021
	0.6180	0.6340	0.6499	0.6658	0.6817
	0.6976	0.7135	0.7294	0.7454	0.7613
	0.7772	0.7931	0.8090	0.8249	0.8408

0.8568	0.8727	0.8886	0.9045	0.9204
0.9363	0.9523	0.9682	0.9841	1.0000

Transect Road2

Area:

0.0006	0.0023	0.0051	0.0091	0.0142
0.0205	0.0279	0.0364	0.0461	0.0569
0.0689	0.0820	0.0962	0.1116	0.1281
0.1458	0.1646	0.1844	0.2044	0.2248
0.2456	0.2667	0.2881	0.3100	0.3321
0.3546	0.3775	0.4007	0.4243	0.4482
0.4724	0.4971	0.5220	0.5473	0.5730
0.5990	0.6254	0.6521	0.6792	0.7066
0.7343	0.7625	0.7909	0.8197	0.8489
0.8784	0.9083	0.9385	0.9691	1.0000

Hrad:

0.0167	0.0335	0.0502	0.0670	0.0837
0.1004	0.1172	0.1339	0.1507	0.1674
0.1841	0.2009	0.2176	0.2344	0.2511
0.2678	0.2897	0.3213	0.3521	0.3820
0.4111	0.4395	0.4671	0.4939	0.5201
0.5456	0.5704	0.5946	0.6182	0.6411
0.6635	0.6854	0.7067	0.7274	0.7477
0.7675	0.7867	0.8056	0.8240	0.8419
0.8594	0.8765	0.8932	0.9096	0.9255
0.9411	0.9563	0.9712	0.9858	1.0000

Width:

0.0366	0.0732	0.1099	0.1465	0.1831
0.2197	0.2563	0.2930	0.3296	0.3662
0.4028	0.4394	0.4761	0.5127	0.5493
0.5859	0.6282	0.6394	0.6507	0.6620
0.6732	0.6845	0.6958	0.7070	0.7183
0.7296	0.7408	0.7521	0.7634	0.7746
0.7859	0.7972	0.8085	0.8197	0.8310
0.8423	0.8535	0.8648	0.8761	0.8873
0.8986	0.9099	0.9211	0.9324	0.9437
0.9549	0.9662	0.9775	0.9887	1.0000

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

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Flow Units ..... CMS  
 Process Models:  
   Rainfall/Runoff ..... YES  
   RDII ..... NO  
   Snowmelt ..... NO  
   Groundwater ..... NO  
   Flow Routing ..... YES  
   Ponding Allowed ..... YES  
   Water Quality ..... NO  
 Infiltration Method ..... HORTON  
 Flow Routing Method ..... DYNWAVE  
 Surcharge Method ..... EXTRAN  
 Starting Date ..... 06/06/2018 10:30:00  
 Ending Date ..... 06/08/2018 00:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:01:00  
 Wet Time Step ..... 00:01:00  
 Dry Time Step ..... 00:01:00  
 Routing Time Step ..... 5.00 sec  
 Variable Time Step ..... YES  
 Maximum Trials ..... 8  
 Number of Threads ..... 4  
 Head Tolerance ..... 0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation .....	0.239	81.588
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.019	6.477
Surface Runoff .....	0.216	73.654
Final Storage .....	0.004	1.500
Continuity Error (%) .....	-0.052	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.216	2.158
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.048	0.477

External Outflow .....	0.252	2.517
Flooding Loss .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Exfiltration Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.002
Final Stored Volume .....	0.014	0.141
Continuity Error (%) .....	-0.825	

\*\*\*\*\*

Highest Continuity Errors

\*\*\*\*\*

Node MH#7-A (1.70%)  
Node MH#3 (1.30%)  
Node MH#6 (1.28%)  
Node MH#5 (1.27%)  
Node PondBasin (-1.18%)

\*\*\*\*\*

Time-Step Critical Elements

\*\*\*\*\*

None

\*\*\*\*\*

Highest Flow Instability Indexes

\*\*\*\*\*

Link OR6 (56)  
Link C4 (35)  
Link C5 (29)  
Link C17 (27)  
Link C18 (26)

\*\*\*\*\*

Routing Time Step Summary

\*\*\*\*\*

Minimum Time Step	:	1.44 sec
Average Time Step	:	5.00 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.82
Percent Not Converging	:	5.12
Time Step Frequencies	:	
5.000 - 3.155 sec	:	99.96 %

3.155 - 1.991 sec : 0.03 %  
 1.991 - 1.256 sec : 0.01 %  
 1.256 - 0.792 sec : 0.00 %  
 0.792 - 0.500 sec : 0.00 %

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

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10 <sup>6</sup> ltr	Peak Runoff CMS	Runoff Coeff
S1	81.59	0.00	0.00	6.43	47.48	26.22	73.70	0.35	0.26	0.903
S2	81.59	0.00	0.00	6.37	47.49	26.28	73.77	0.16	0.12	0.904
S3	81.59	0.00	0.00	6.44	47.48	26.21	73.70	0.33	0.24	0.903
S4	81.59	0.00	0.00	6.49	47.48	26.15	73.64	0.39	0.28	0.903
S5	81.59	0.00	0.00	6.55	47.48	26.10	73.58	0.65	0.45	0.902
S6	81.59	0.00	0.00	6.46	47.48	26.19	73.68	0.27	0.20	0.903

\*\*\*\*\*  
 Node Depth Summary  
 \*\*\*\*\*

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CB#1&2	JUNCTION	0.01	0.30	190.04	0 02:01	0.30
CB#3&4	JUNCTION	0.01	0.27	190.04	0 02:03	0.27
CB#5&6	JUNCTION	0.01	0.26	190.04	0 01:57	0.26
CB#7&8	JUNCTION	0.01	0.24	190.04	0 02:01	0.24
CB#9&10	JUNCTION	0.01	0.24	190.04	0 01:57	0.24
HP1	JUNCTION	0.00	0.00	190.35	0 00:00	0.00
HP2	JUNCTION	0.00	0.10	190.04	0 02:02	0.10
HP3	JUNCTION	0.00	0.10	190.04	0 01:58	0.10
HP4	JUNCTION	0.00	0.00	190.05	0 00:00	0.00
HP5	JUNCTION	0.00	0.00	190.44	0 00:00	0.00
HP6	JUNCTION	0.00	0.00	190.43	0 00:00	0.00
MH#1	JUNCTION	0.89	3.80	190.26	0 01:35	3.80
MH#2	JUNCTION	0.94	3.70	190.10	0 01:35	3.70
MH#3	JUNCTION	1.01	3.75	190.09	0 01:35	3.74

MH#4	JUNCTION	0.94	3.68	190.09	0	01:46	3.67
MH#5	JUNCTION	1.00	3.77	190.12	0	01:35	3.77
MH#6	JUNCTION	1.10	3.84	190.09	0	01:35	3.84
MH#7-A	JUNCTION	1.19	3.92	190.08	0	01:35	3.92
MH#7-B	JUNCTION	1.15	3.69	189.85	0	01:30	3.68
PondBasin	JUNCTION	0.91	3.64	190.08	0	01:46	3.64
Southwood1200	OUTFALL	1.22	3.75	189.84	0	01:29	3.75
DryPond	STORAGE	0.08	1.63	189.97	0	02:30	1.63

\*\*\*\*\*  
Node Inflow Summary  
\*\*\*\*\*

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CB#1&2	JUNCTION	0.000	0.203	0 01:35	0	0.106	0.057
CB#3&4	JUNCTION	0.000	0.170	0 01:35	0	0.113	-0.547
CB#5&6	JUNCTION	0.000	0.121	0 01:35	0	0.0765	-0.080
CB#7&8	JUNCTION	0.000	0.159	0 01:35	0	0.106	-0.570
CB#9&10	JUNCTION	0.000	0.145	0 01:35	0	0.0937	-0.439
HP1	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP2	JUNCTION	0.000	0.088	0 01:36	0	0.0602	3.594
HP3	JUNCTION	0.000	0.084	0 01:36	0	0.0563	3.548
HP4	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP5	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP6	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
MH#1	JUNCTION	0.197	0.197	0 01:35	0.271	0.284	-0.622
MH#2	JUNCTION	0.125	0.321	0 01:35	0.162	0.556	0.431
MH#3	JUNCTION	0.242	0.603	0 01:34	0.329	2.57	1.317
MH#4	JUNCTION	0.261	0.697	0 01:34	0.353	1.94	0.462
MH#5	JUNCTION	0.276	0.276	0 01:35	0.39	0.482	1.287
MH#6	JUNCTION	0.445	0.563	0 01:35	0.653	3.22	1.296
MH#7-A	JUNCTION	0.000	0.359	0 02:57	0	2.9	1.728
MH#7-B	JUNCTION	0.000	0.359	0 02:57	0	2.93	-0.374
PondBasin	JUNCTION	0.000	0.645	0 01:28	0	1.48	-1.164
Southwood1200	OUTFALL	0.000	0.360	0 02:56	0	2.99	0.000
DryPond	STORAGE	0.000	0.643	0 01:28	0	0.713	0.529

\*\*\*\*\*  
Node Surchage Summary  
\*\*\*\*\*

\*\*\*\*\*

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
MH#1	JUNCTION	27.29	3.352	0.000
MH#2	JUNCTION	16.56	2.900	0.000
MH#3	JUNCTION	12.04	2.671	0.000
MH#4	JUNCTION	11.25	2.628	0.000
MH#5	JUNCTION	18.09	2.975	0.117
MH#6	JUNCTION	13.85	2.767	0.000
MH#7-A	JUNCTION	15.81	2.848	0.257
MH#7-B	JUNCTION	36.29	3.093	0.487
PondBasin	JUNCTION	13.46	2.745	0.000

\*\*\*\*\*

Node Flooding Summary

\*\*\*\*\*

No nodes were flooded.

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Storage Volume Summary

\*\*\*\*\*

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
DryPond	0.033	4	0	0	0.712	87	0 02:30	0.334

\*\*\*\*\*

Outfall Loading Summary

\*\*\*\*\*

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr

Southwood1200	99.79	0.022	0.360	2.994
System	99.79	0.022	0.360	2.994

\*\*\*\*\*  
Link Flow Summary  
\*\*\*\*\*

Link	Type	Maximum  Flow  CMS	Time of Max Occurrence days hr:min	Maximum  Veloc  m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.542	0 01:28	0.63	0.78	1.00
C10	CHANNEL	0.000	0 00:00	0.00	0.00	0.37
C11	CHANNEL	0.026	0 01:49	0.15	0.01	0.58
C12	CHANNEL	0.024	0 01:48	0.16	0.01	0.58
C13	CHANNEL	0.088	0 01:36	0.23	0.02	0.53
C14	CHANNEL	0.000	0 00:00	0.00	0.00	0.37
C15	CHANNEL	0.037	0 01:38	0.16	0.01	0.62
C16	CHANNEL	0.000	0 00:00	0.00	0.00	0.47
C17	CONDUIT	0.645	0 01:28	1.01	2.62	1.00
C18	CONDUIT	0.196	0 01:35	1.23	1.61	1.00
C2	CONDUIT	0.325	0 01:28	0.38	0.44	1.00
C3	CONDUIT	0.359	0 02:57	0.41	0.50	1.00
C4	CONDUIT	0.360	0 02:56	1.27	1.69	1.00
C5	CONDUIT	0.122	0 01:33	0.43	0.57	1.00
C6	CONDUIT	0.183	0 01:33	0.41	0.55	1.00
C7	CHANNEL	0.000	0 00:00	0.00	0.00	0.40
C8	CHANNEL	0.031	0 01:37	0.18	0.01	0.56
C9	CHANNEL	0.071	0 01:36	0.20	0.02	0.53
CB1/2	ORIFICE	0.200	0 01:35			
CB3/4	ORIFICE	0.167	0 01:35			
CB5/6	ORIFICE	0.120	0 01:35			
CB7/8	ORIFICE	0.159	0 01:35			
CB9/10	ORIFICE	0.145	0 01:35			
OR6	ORIFICE	0.359	0 02:57			1.00
OR7	ORIFICE	0.643	0 01:28			

\*\*\*\*\*  
Flow Classification Summary  
\*\*\*\*\*

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.01	0.01	0.00	0.99	0.00	0.00	0.00	0.01	0.00
C10	1.00	0.91	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C11	1.00	0.04	0.00	0.00	0.90	0.05	0.00	0.00	0.01	0.00
C12	1.00	0.04	0.00	0.00	0.90	0.06	0.00	0.00	0.01	0.00
C13	1.00	0.04	0.00	0.00	0.90	0.06	0.00	0.00	0.01	0.00
C14	1.00	0.90	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C15	1.00	0.04	0.00	0.00	0.90	0.06	0.00	0.00	0.01	0.00
C16	1.00	0.90	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C18	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	0.01	0.01	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.91	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	0.04	0.00	0.00	0.91	0.05	0.00	0.00	0.01	0.00
C9	1.00	0.04	0.00	0.00	0.91	0.05	0.00	0.00	0.01	0.00

\*\*\*\*\*  
Conduit Surcharge Summary  
\*\*\*\*\*

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C1	11.25	11.25	12.04	0.01	0.07
C17	13.46	13.46	13.66	0.71	2.18
C18	27.29	27.29	28.92	0.13	0.24
C2	12.56	12.56	13.85	0.01	0.16
C3	14.36	14.36	15.79	0.01	0.43
C4	36.29	36.29	36.32	0.93	2.84
C5	25.34	25.34	29.09	0.01	0.24
C6	17.89	17.89	19.01	0.01	0.10

Analysis begun on: Fri May 14 17:07:32 2021  
Analysis ended on: Fri May 14 17:07:33 2021

Total elapsed time: 00:00:01



Appendix E

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**Urban Stress Test Storm Event – Input/Output Summary**

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

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*****
Element Count
*****
Number of rain gages ..... 20
Number of subcatchments ... 6
Number of nodes ..... 22
Number of links ..... 25
Number of pollutants ..... 0
Number of land uses ..... 0
    
```

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*****
Raingage Summary
*****
    
```

Name	Data Source	Data Type	Recording Interval
100Year-10Min	100Yr-10Min	INTENSITY	10 min.
100Year-15Min	100Yr-15Min	INTENSITY	15 min.
100Year-20Min	100Yr-20Min	INTENSITY	20 min.
100Year-30Min	100Yr-30Min	INTENSITY	30 min.
100Year-5Min	100Yr-5Min	INTENSITY	5 min.
5Year-10Min	5Yr-10Min	INTENSITY	10 min.
5Year-15Min	5Yr-15Min	INTENSITY	15 min.
5Year-20Min	5Yr-20Min	INTENSITY	20 min.
5Year-30Min	5Yr-30Min	INTENSITY	30 min.
5Year-5Min	5Yr-5Min	INTENSITY	5 min.
SCSII-100-Yr	SCSII-100Yr	INTENSITY	120 min.
SCSII-5-Year	SCSII-5-Year	INTENSITY	120 min.
SCSII-RuralStress	SCSII-RST	INTENSITY	120 min.
SCSII-Unit	SCSII-Unit	INTENSITY	120 min.
UrbanStressTest	UrbanStressTest	INTENSITY	15 min.
WaterQualityStorm10MIN	WaterQualityStorm-10MIN	INTENSITY	10 min.
WaterQualityStorm15MIN	WaterQualityStorm-15MIN	INTENSITY	15 min.
WaterQualityStorm20MIN	WaterQualityStorm-20MIN	INTENSITY	20 min.
WaterQualityStorm30MIN	WaterQualityStorm-30MIN	INTENSITY	30 min.
WaterQualityStorm5MIN	WaterQualityStorm-5MIN	INTENSITY	5 min.

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*****
Subcatchment Summary
    
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Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S1	0.48	110.00	60.00	1.0000	UrbanStressTest	MH#4
S2	0.22	75.00	60.00	1.0000	UrbanStressTest	MH#2
S3	0.45	100.00	60.00	1.0000	UrbanStressTest	MH#3
S4	0.53	90.00	60.00	1.0000	UrbanStressTest	MH#5
S5	0.89	120.00	60.00	1.0000	UrbanStressTest	MH#6
S6	0.37	75.00	60.00	1.0000	UrbanStressTest	MH#1

\*\*\*\*\*  
Node Summary  
\*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#1&2	JUNCTION	189.75	0.32	0.0	
CB#3&4	JUNCTION	189.77	0.32	0.0	
CB#5&6	JUNCTION	189.78	0.32	0.0	
CB#7&8	JUNCTION	189.80	0.32	0.0	
CB#9&10	JUNCTION	189.80	0.32	0.0	
HP1	JUNCTION	190.35	0.32	0.0	
HP2	JUNCTION	189.94	0.32	0.0	
HP3	JUNCTION	189.94	0.32	0.0	
HP4	JUNCTION	190.05	0.32	0.0	
HP5	JUNCTION	190.44	0.32	0.0	
HP6	JUNCTION	190.43	0.32	0.0	
MH#1	JUNCTION	186.46	3.79	0.0	
MH#2	JUNCTION	186.40	3.57	0.0	
MH#3	JUNCTION	186.34	3.62	0.0	
MH#4	JUNCTION	186.41	3.49	0.0	
MH#5	JUNCTION	186.34	3.89	0.0	
MH#6	JUNCTION	186.25	3.73	0.0	
MH#7-A	JUNCTION	186.16	4.18	1.0	
MH#7-B	JUNCTION	186.16	4.18	0.0	
PondBasin	JUNCTION	186.44	1.90	0.0	
Southwood1200	OUTFALL	186.09	0.63	0.0	
DryPond	STORAGE	188.34	1.76	0.0	

\*\*\*\*\*  
Link Summary  
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Name	From Node	To Node	Type	Length	%Slope	Roughness
------	-----------	---------	------	--------	--------	-----------

C1	MH#4	MH#3	CONDUIT	69.9	0.0643	0.0130
C10	HP6	CB#9&10	CONDUIT	35.0	1.7774	0.0130
C11	HP3	CB#3&4	CONDUIT	43.6	0.4011	0.0130
C12	HP2	CB#3&4	CONDUIT	43.6	0.4011	0.0130
C13	HP2	CB#7&8	CONDUIT	35.0	0.3971	0.0130
C14	HP5	CB#7&8	CONDUIT	35.0	1.8203	0.0130
C15	HP2	CB#1&2	CONDUIT	49.3	0.3997	0.0130
C16	HP1	CB#1&2	CONDUIT	49.3	1.2256	0.0130
C17	PondBasin	MH#4	CONDUIT	27.0	0.0185	0.0130
C18	MH#1	MH#2	CONDUIT	16.0	0.1817	0.0130
C2	MH#3	MH#6	CONDUIT	87.3	0.0745	0.0130
C3	MH#6	MH#7-A	CONDUIT	94.5	0.0688	0.0130
C4	MH#7-B	Southwood1200	CONDUIT	40.8	0.1202	0.0130
C5	MH#5	MH#6	CONDUIT	58.3	0.1201	0.0130
C6	MH#2	MH#3	CONDUIT	42.7	0.0890	0.0130
C7	HP4	CB#5&6	CONDUIT	29.6	0.8989	0.0130
C8	HP3	CB#5&6	CONDUIT	39.7	0.4009	0.0130
C9	HP3	CB#9&10	CONDUIT	35.0	0.3971	0.0130
CB1/2	CB#1&2	MH#6	ORIFICE			
CB3/4	CB#3&4	MH#3	ORIFICE			
CB5/6	CB#5&6	MH#4	ORIFICE			
CB7/8	CB#7&8	MH#5	ORIFICE			
CB9/10	CB#9&10	MH#2	ORIFICE			
OR6	MH#7-A	MH#7-B	ORIFICE			
OR7	DryPond	PondBasin	ORIFICE			

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Cross Section Summary  
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	1.05	0.87	0.26	1.05	1	0.69
C10	NTRoad	0.32	3.09	0.14	20.15	1	8.54
C11	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C12	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C13	NTRoad	0.32	3.09	0.14	20.15	1	4.04
C14	NTRoad	0.32	3.09	0.14	20.15	1	8.64
C15	NTRoad	0.32	3.09	0.14	20.15	1	4.05
C16	NTRoad	0.32	3.09	0.14	20.15	1	7.09
C17	CIRCULAR	0.90	0.64	0.23	0.90	1	0.25
C18	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
C2	CIRCULAR	1.05	0.87	0.26	1.05	1	0.75
C3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.72
C4	CIRCULAR	0.60	0.28	0.15	0.60	1	0.21

C5	CIRCULAR	0.60	0.28	0.15	0.60	1	0.21
C6	CIRCULAR	0.75	0.44	0.19	0.75	1	0.33
C7	NTRoad	0.32	3.09	0.14	20.15	1	6.07
C8	NTRoad	0.32	3.09	0.14	20.15	1	4.06
C9	NTRoad	0.32	3.09	0.14	20.15	1	4.04

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Transect Summary  
\*\*\*\*\*

Transect NTRoad

Area:

0.0004	0.0015	0.0034	0.0060	0.0094
0.0136	0.0185	0.0242	0.0306	0.0378
0.0457	0.0544	0.0638	0.0740	0.0850
0.0967	0.1091	0.1224	0.1363	0.1511
0.1665	0.1828	0.1998	0.2178	0.2370
0.2571	0.2780	0.2999	0.3226	0.3461
0.3706	0.3959	0.4220	0.4491	0.4770
0.5058	0.5354	0.5660	0.5973	0.6296
0.6627	0.6967	0.7316	0.7673	0.8039
0.8414	0.8798	0.9190	0.9590	1.0000

Hrad:

0.0221	0.0441	0.0662	0.0882	0.1103
0.1324	0.1544	0.1765	0.1985	0.2206
0.2427	0.2647	0.2868	0.3088	0.3309
0.3530	0.3750	0.3971	0.4192	0.4412
0.4633	0.4853	0.5074	0.5208	0.5622
0.6007	0.6364	0.6694	0.6999	0.7280
0.7541	0.7781	0.8003	0.8207	0.8397
0.8571	0.8733	0.8882	0.9020	0.9147
0.9265	0.9374	0.9475	0.9569	0.9655
0.9735	0.9809	0.9878	0.9941	1.0000

Width:

0.0183	0.0365	0.0548	0.0730	0.0913
0.1095	0.1278	0.1460	0.1643	0.1825
0.2008	0.2190	0.2373	0.2555	0.2738
0.2920	0.3103	0.3285	0.3468	0.3650
0.3833	0.4015	0.4198	0.4540	0.4750
0.4960	0.5170	0.5380	0.5590	0.5800
0.6010	0.6220	0.6430	0.6640	0.6850
0.7060	0.7270	0.7480	0.7690	0.7900
0.8110	0.8320	0.8530	0.8740	0.8950
0.9160	0.9370	0.9580	0.9790	1.0000

Transect PondSpillway1

Area:

0.0005	0.0019	0.0043	0.0076	0.0119
0.0172	0.0234	0.0306	0.0387	0.0477
0.0578	0.0688	0.0807	0.0936	0.1074
0.1222	0.1380	0.1547	0.1724	0.1910
0.2104	0.2304	0.2510	0.2720	0.2935
0.3156	0.3382	0.3613	0.3849	0.4090
0.4337	0.4588	0.4845	0.5107	0.5374
0.5646	0.5924	0.6206	0.6494	0.6787
0.7085	0.7388	0.7697	0.8010	0.8329
0.8653	0.8982	0.9316	0.9655	1.0000

Hrad:

0.0174	0.0348	0.0522	0.0696	0.0870
0.1044	0.1218	0.1392	0.1566	0.1740
0.1914	0.2088	0.2262	0.2436	0.2610
0.2784	0.2958	0.3132	0.3306	0.3480
0.3710	0.3958	0.4203	0.4444	0.4682
0.4917	0.5149	0.5378	0.5605	0.5830
0.6052	0.6273	0.6492	0.6708	0.6924
0.7137	0.7349	0.7560	0.7769	0.7977
0.8184	0.8390	0.8594	0.8798	0.9000
0.9202	0.9403	0.9603	0.9802	1.0000

Width:

0.0275	0.0550	0.0825	0.1100	0.1375
0.1650	0.1926	0.2201	0.2476	0.2751
0.3026	0.3301	0.3576	0.3851	0.4126
0.4401	0.4676	0.4951	0.5227	0.5502
0.5687	0.5836	0.5984	0.6133	0.6282
0.6431	0.6579	0.6728	0.6877	0.7026
0.7174	0.7323	0.7472	0.7620	0.7769
0.7918	0.8067	0.8215	0.8364	0.8513
0.8661	0.8810	0.8959	0.9108	0.9256
0.9405	0.9554	0.9703	0.9851	1.0000

Transect PondSpillway2

Area:

0.0006	0.0023	0.0052	0.0092	0.0144
0.0207	0.0281	0.0367	0.0465	0.0574
0.0695	0.0827	0.0970	0.1125	0.1292
0.1470	0.1659	0.1860	0.2072	0.2291
0.2513	0.2736	0.2963	0.3191	0.3422
0.3656	0.3892	0.4131	0.4372	0.4615
0.4861	0.5109	0.5360	0.5613	0.5869
0.6127	0.6388	0.6651	0.6916	0.7185

	0.7455	0.7728	0.8003	0.8281	0.8562
	0.8844	0.9130	0.9417	0.9707	1.0000
Hrad:					
	0.0147	0.0295	0.0442	0.0590	0.0737
	0.0885	0.1032	0.1179	0.1327	0.1474
	0.1622	0.1769	0.1916	0.2064	0.2211
	0.2359	0.2506	0.2654	0.2808	0.3069
	0.3328	0.3584	0.3838	0.4090	0.4339
	0.4586	0.4831	0.5074	0.5315	0.5553
	0.5790	0.6026	0.6259	0.6491	0.6721
	0.6949	0.7176	0.7401	0.7625	0.7848
	0.8069	0.8288	0.8506	0.8723	0.8939
	0.9154	0.9367	0.9579	0.9790	1.0000
Width:					
	0.0391	0.0781	0.1172	0.1563	0.1954
	0.2344	0.2735	0.3126	0.3517	0.3907
	0.4298	0.4689	0.5080	0.5470	0.5861
	0.6252	0.6643	0.7033	0.7406	0.7489
	0.7573	0.7657	0.7740	0.7824	0.7908
	0.7991	0.8075	0.8159	0.8243	0.8326
	0.8410	0.8494	0.8577	0.8661	0.8745
	0.8828	0.8912	0.8996	0.9079	0.9163
	0.9247	0.9330	0.9414	0.9498	0.9582
	0.9665	0.9749	0.9833	0.9916	1.0000

Transect PondSpillway3

Area:

	0.0005	0.0019	0.0043	0.0077	0.0120
	0.0172	0.0234	0.0306	0.0387	0.0478
	0.0579	0.0689	0.0808	0.0937	0.1076
	0.1224	0.1382	0.1550	0.1727	0.1913
	0.2109	0.2314	0.2525	0.2741	0.2961
	0.3186	0.3416	0.3650	0.3889	0.4133
	0.4382	0.4635	0.4893	0.5155	0.5423
	0.5695	0.5972	0.6253	0.6540	0.6831
	0.7126	0.7427	0.7732	0.8042	0.8356
	0.8676	0.9000	0.9328	0.9662	1.0000
Hrad:					
	0.0170	0.0341	0.0511	0.0681	0.0851
	0.1022	0.1192	0.1362	0.1532	0.1703
	0.1873	0.2043	0.2213	0.2384	0.2554
	0.2724	0.2894	0.3065	0.3235	0.3405
	0.3575	0.3781	0.4034	0.4283	0.4529
	0.4772	0.5012	0.5250	0.5484	0.5717
	0.5946	0.6174	0.6400	0.6623	0.6845
	0.7065	0.7283	0.7500	0.7715	0.7929

	0.8141	0.8352	0.8562	0.8771	0.8978
	0.9185	0.9390	0.9594	0.9798	1.0000
Width:	0.0281	0.0562	0.0843	0.1124	0.1405
	0.1685	0.1966	0.2247	0.2528	0.2809
	0.3090	0.3371	0.3652	0.3933	0.4214
	0.4495	0.4776	0.5056	0.5337	0.5618
	0.5899	0.6122	0.6260	0.6399	0.6537
	0.6676	0.6814	0.6953	0.7091	0.7230
	0.7368	0.7507	0.7645	0.7784	0.7922
	0.8061	0.8199	0.8338	0.8476	0.8615
	0.8753	0.8892	0.9030	0.9169	0.9307
	0.9446	0.9584	0.9723	0.9861	1.0000

Transect Road  
Area:

	0.0005	0.0019	0.0043	0.0077	0.0120
	0.0173	0.0236	0.0308	0.0390	0.0481
	0.0582	0.0693	0.0813	0.0943	0.1083
	0.1232	0.1393	0.1563	0.1740	0.1922
	0.2109	0.2303	0.2502	0.2706	0.2916
	0.3132	0.3354	0.3581	0.3813	0.4052
	0.4296	0.4545	0.4800	0.5061	0.5328
	0.5600	0.5877	0.6161	0.6450	0.6744
	0.7045	0.7350	0.7662	0.7979	0.8302
	0.8630	0.8964	0.9304	0.9649	1.0000

Hrad:

	0.0205	0.0410	0.0615	0.0820	0.1025
	0.1230	0.1435	0.1640	0.1845	0.2050
	0.2255	0.2460	0.2665	0.2870	0.3075
	0.3280	0.3441	0.3834	0.4208	0.4563
	0.4899	0.5219	0.5522	0.5811	0.6084
	0.6345	0.6592	0.6828	0.7052	0.7266
	0.7469	0.7663	0.7848	0.8024	0.8193
	0.8354	0.8508	0.8655	0.8795	0.8930
	0.9058	0.9181	0.9299	0.9413	0.9521
	0.9625	0.9724	0.9820	0.9912	1.0000

Width:

	0.0272	0.0544	0.0816	0.1089	0.1361
	0.1633	0.1905	0.2177	0.2449	0.2721
	0.2994	0.3266	0.3538	0.3810	0.4082
	0.4354	0.4748	0.4907	0.5066	0.5225
	0.5385	0.5544	0.5703	0.5862	0.6021
	0.6180	0.6340	0.6499	0.6658	0.6817
	0.6976	0.7135	0.7294	0.7454	0.7613
	0.7772	0.7931	0.8090	0.8249	0.8408



0.8568	0.8727	0.8886	0.9045	0.9204
0.9363	0.9523	0.9682	0.9841	1.0000

Transect Road2

Area:

0.0006	0.0023	0.0051	0.0091	0.0142
0.0205	0.0279	0.0364	0.0461	0.0569
0.0689	0.0820	0.0962	0.1116	0.1281
0.1458	0.1646	0.1844	0.2044	0.2248
0.2456	0.2667	0.2881	0.3100	0.3321
0.3546	0.3775	0.4007	0.4243	0.4482
0.4724	0.4971	0.5220	0.5473	0.5730
0.5990	0.6254	0.6521	0.6792	0.7066
0.7343	0.7625	0.7909	0.8197	0.8489
0.8784	0.9083	0.9385	0.9691	1.0000

Hrad:

0.0167	0.0335	0.0502	0.0670	0.0837
0.1004	0.1172	0.1339	0.1507	0.1674
0.1841	0.2009	0.2176	0.2344	0.2511
0.2678	0.2897	0.3213	0.3521	0.3820
0.4111	0.4395	0.4671	0.4939	0.5201
0.5456	0.5704	0.5946	0.6182	0.6411
0.6635	0.6854	0.7067	0.7274	0.7477
0.7675	0.7867	0.8056	0.8240	0.8419
0.8594	0.8765	0.8932	0.9096	0.9255
0.9411	0.9563	0.9712	0.9858	1.0000

Width:

0.0366	0.0732	0.1099	0.1465	0.1831
0.2197	0.2563	0.2930	0.3296	0.3662
0.4028	0.4394	0.4761	0.5127	0.5493
0.5859	0.6282	0.6394	0.6507	0.6620
0.6732	0.6845	0.6958	0.7070	0.7183
0.7296	0.7408	0.7521	0.7634	0.7746
0.7859	0.7972	0.8085	0.8197	0.8310
0.8423	0.8535	0.8648	0.8761	0.8873
0.8986	0.9099	0.9211	0.9324	0.9437
0.9549	0.9662	0.9775	0.9887	1.0000

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

\*\*\*\*\*

Flow Units ..... CMS  
 Process Models:  
   Rainfall/Runoff ..... YES  
   RDII ..... NO  
   Snowmelt ..... NO  
   Groundwater ..... NO  
   Flow Routing ..... YES  
   Ponding Allowed ..... YES  
   Water Quality ..... NO  
 Infiltration Method ..... HORTON  
 Flow Routing Method ..... DYNWAVE  
 Surcharge Method ..... EXTRAN  
 Starting Date ..... 06/06/2018 00:00:00  
 Ending Date ..... 06/08/2018 00:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:01:00  
 Wet Time Step ..... 00:01:00  
 Dry Time Step ..... 00:01:00  
 Routing Time Step ..... 5.00 sec  
 Variable Time Step ..... YES  
 Maximum Trials ..... 8  
 Number of Threads ..... 4  
 Head Tolerance ..... 0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation .....	0.439	149.985
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.030	10.189
Surface Runoff .....	0.405	138.331
Final Storage .....	0.004	1.500
Continuity Error (%) .....	-0.024	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.405	4.053
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.032	0.323

External Outflow .....	0.419	4.188
Flooding Loss .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Exfiltration Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.002
Final Stored Volume .....	0.021	0.211
Continuity Error (%) .....	-0.482	

\*\*\*\*\*  
Highest Continuity Errors  
\*\*\*\*\*  
Node MH#3 (1.52%)  
Node MH#6 (1.43%)

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

\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*  
Link OR6 (27)  
Link C17 (17)  
Link C18 (17)  
Link C5 (17)  
Link C4 (15)

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*  
Minimum Time Step : 0.89 sec  
Average Time Step : 4.99 sec  
Maximum Time Step : 5.00 sec  
Percent in Steady State : 0.00  
Average Iterations per Step : 2.44  
Percent Not Converging : 1.83  
Time Step Frequencies :  
5.000 - 3.155 sec : 99.86 %  
3.155 - 1.991 sec : 0.08 %  
1.991 - 1.256 sec : 0.04 %  
1.256 - 0.792 sec : 0.01 %

0.792 - 0.500 sec : 0.00 %

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

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
S1	149.99	0.00	0.00	10.15	88.52	49.85	138.37	0.66	0.19	0.923
S2	149.98	0.00	0.00	10.10	88.53	49.90	138.43	0.30	0.09	0.923
S3	149.99	0.00	0.00	10.16	88.52	49.85	138.37	0.62	0.18	0.923
S4	149.98	0.00	0.00	10.20	88.52	49.80	138.32	0.73	0.21	0.922
S5	149.98	0.00	0.00	10.25	88.51	49.75	138.27	1.23	0.34	0.922
S6	149.98	0.00	0.00	10.17	88.52	49.83	138.35	0.51	0.15	0.922

\*\*\*\*\*  
 Node Depth Summary  
 \*\*\*\*\*

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CB#1&2	JUNCTION	0.00	0.18	189.92	0 09:26	0.18
CB#3&4	JUNCTION	0.00	0.17	189.93	0 09:23	0.17
CB#5&6	JUNCTION	0.00	0.15	189.93	0 09:17	0.15
CB#7&8	JUNCTION	0.00	0.16	189.97	0 09:15	0.16
CB#9&10	JUNCTION	0.00	0.15	189.96	0 09:16	0.15
HP1	JUNCTION	0.00	0.00	190.35	0 00:00	0.00
HP2	JUNCTION	0.00	0.02	189.97	0 09:17	0.02
HP3	JUNCTION	0.00	0.01	189.95	0 09:17	0.01
HP4	JUNCTION	0.00	0.00	190.05	0 00:00	0.00
HP5	JUNCTION	0.00	0.00	190.44	0 00:00	0.00
HP6	JUNCTION	0.00	0.00	190.43	0 00:00	0.00
MH#1	JUNCTION	0.89	3.64	190.10	0 09:15	3.64
MH#2	JUNCTION	0.94	3.62	190.02	0 09:14	3.61
MH#3	JUNCTION	1.00	3.66	190.00	0 09:15	3.66
MH#4	JUNCTION	0.93	3.57	189.98	0 09:14	3.57
MH#5	JUNCTION	1.00	3.70	190.04	0 09:14	3.69
MH#6	JUNCTION	1.09	3.75	190.00	0 09:14	3.75

MH#7-A	JUNCTION	1.18	3.83	189.99	0	09:14	3.83
MH#7-B	JUNCTION	1.14	2.82	188.98	0	09:15	2.81
PondBasin	JUNCTION	0.90	3.50	189.94	0	09:20	3.50
Southwood1200	OUTFALL	1.20	2.73	188.82	0	09:15	2.73
DryPond	STORAGE	0.03	1.48	189.82	0	09:40	1.48

\*\*\*\*\*  
Node Inflow Summary  
\*\*\*\*\*

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CB#1&2	JUNCTION	0.000	0.103	0 09:15	0	0.0356	0.276
CB#3&4	JUNCTION	0.000	0.081	0 09:15	0	0.0278	-0.635
CB#5&6	JUNCTION	0.000	0.061	0 09:14	0	0.0165	-0.190
CB#7&8	JUNCTION	0.000	0.073	0 09:15	0	0.0256	-0.487
CB#9&10	JUNCTION	0.000	0.060	0 09:15	0	0.0189	-0.232
HP1	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP2	JUNCTION	0.000	0.030	0 09:15	0	0.00507	22.647
HP3	JUNCTION	0.000	0.016	0 09:16	0	0.00181	63.575
HP4	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP5	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
HP6	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
MH#1	JUNCTION	0.146	0.146	0 09:15	0.509	0.519	-0.367
MH#2	JUNCTION	0.088	0.234	0 09:15	0.304	0.87	0.569
MH#3	JUNCTION	0.177	0.447	0 09:06	0.618	3.03	1.548
MH#4	JUNCTION	0.190	0.619	0 09:06	0.663	1.89	0.824
MH#5	JUNCTION	0.208	0.208	0 09:15	0.733	0.768	1.005
MH#6	JUNCTION	0.344	0.489	0 09:12	1.23	4.64	1.452
MH#7-A	JUNCTION	0.000	0.407	0 09:06	0	4.47	0.850
MH#7-B	JUNCTION	0.000	0.407	0 09:06	0	4.47	0.299
PondBasin	JUNCTION	0.000	0.617	0 09:06	0	1.24	-0.563
Southwood1200	OUTFALL	0.000	0.407	0 09:06	0	4.51	0.000
DryPond	STORAGE	0.000	0.616	0 09:06	0	0.597	0.661

\*\*\*\*\*  
Node Surcharge Summary  
\*\*\*\*\*

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
MH#1	JUNCTION	39.18	3.193	0.152
MH#2	JUNCTION	29.60	2.817	0.000
MH#3	JUNCTION	21.78	2.585	0.000
MH#4	JUNCTION	20.23	2.525	0.000
MH#5	JUNCTION	32.11	2.897	0.195
MH#6	JUNCTION	24.95	2.678	0.000
MH#7-A	JUNCTION	28.38	2.753	0.352
MH#7-B	JUNCTION	39.34	2.217	1.363
PondBasin	JUNCTION	24.34	2.599	0.000

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

No nodes were flooded.

\*\*\*\*\*  
Storage Volume Summary  
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Storage Unit	Average Volume 1000 m3	Avg Pcmt Full	Evap Pcmt Loss	Exfil Pcmt Loss	Maximum Volume 1000 m3	Max Pcmt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
DryPond	0.012	1	0	0	0.594	73	0 09:40	0.215

\*\*\*\*\*  
Outfall Loading Summary  
\*\*\*\*\*

Outfall Node	Flow Freq Pcmt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Southwood1200	99.89	0.026	0.407	4.511

System                    99.89        0.026        0.407        4.511

\*\*\*\*\*  
 Link Flow Summary  
 \*\*\*\*\*

Link	Type	Maximum  Flow  CMS	Time of Max Occurrence days hr:min	Maximum  Veloc  m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.445	0 09:06	0.51	0.64	1.00
C10	CHANNEL	0.000	0 00:00	0.00	0.00	0.24
C11	CHANNEL	0.001	0 09:18	0.10	0.00	0.28
C12	CHANNEL	0.004	0 09:17	0.13	0.00	0.30
C13	CHANNEL	0.030	0 09:15	0.17	0.01	0.29
C14	CHANNEL	0.000	0 00:00	0.00	0.00	0.26
C15	CHANNEL	0.004	0 09:17	0.12	0.00	0.32
C16	CHANNEL	0.000	0 00:00	0.00	0.00	0.28
C17	CONDUIT	0.617	0 09:06	0.97	2.51	1.00
C18	CONDUIT	0.146	0 09:14	0.92	1.20	1.00
C2	CONDUIT	0.280	0 09:54	0.32	0.38	1.00
C3	CONDUIT	0.407	0 09:06	0.47	0.57	1.00
C4	CONDUIT	0.407	0 09:06	1.44	1.91	1.00
C5	CONDUIT	0.184	0 09:06	0.65	0.86	1.00
C6	CONDUIT	0.216	0 09:07	0.49	0.65	1.00
C7	CHANNEL	0.000	0 00:00	0.00	0.00	0.23
C8	CHANNEL	0.001	0 09:18	0.12	0.00	0.25
C9	CHANNEL	0.016	0 09:16	0.13	0.00	0.25
CB1/2	ORIFICE	0.103	0 09:15			
CB3/4	ORIFICE	0.081	0 09:15			
CB5/6	ORIFICE	0.061	0 09:14			
CB7/8	ORIFICE	0.073	0 09:15			
CB9/10	ORIFICE	0.060	0 09:15			
OR6	ORIFICE	0.407	0 09:06			1.00
OR7	ORIFICE	0.616	0 09:06			

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 Flow Classification Summary  
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Adjusted /Actual	Fraction of Time in Flow Class					
	Up	Down	Sub	Sup	Up	Down Norm Inlet

Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
C1	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.02	0.00
C10	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C11	1.00	0.19	0.00	0.00	0.77	0.04	0.00	0.00	0.01	0.00
C12	1.00	0.19	0.00	0.00	0.76	0.04	0.00	0.00	0.01	0.00
C13	1.00	0.19	0.00	0.00	0.76	0.04	0.00	0.00	0.01	0.00
C14	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C15	1.00	0.19	0.00	0.00	0.76	0.04	0.00	0.00	0.01	0.00
C16	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C18	1.00	0.02	0.00	0.00	0.95	0.00	0.00	0.02	0.01	0.00
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.02	0.00
C7	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	0.19	0.00	0.00	0.77	0.04	0.00	0.00	0.01	0.00
C9	1.00	0.19	0.00	0.00	0.77	0.04	0.00	0.00	0.01	0.00

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 Conduit Surcharge Summary  
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Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C1	20.23	20.23	21.78	0.01	0.01
C17	24.33	24.33	24.57	0.29	1.83
C18	39.18	39.18	39.21	0.18	0.26
C2	22.61	22.61	24.94	0.01	0.01
C3	25.88	25.88	28.37	0.01	0.14
C4	39.34	39.34	39.56	1.55	1.84
C5	39.15	39.15	39.21	0.01	0.03
C6	31.71	31.71	33.36	0.01	0.01

Analysis begun on: Fri May 14 14:28:37 2021  
 Analysis ended on: Fri May 14 14:28:38 2021  
 Total elapsed time: 00:00:01