HOUNSLOW HOLDINGS INC.

26-38 HOUNSLOW AVENUE

EXTERNAL SANITARY SEWER ANALYSIS

MARCH 27, 2024

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EXTERNAL SANITARY SEWER ANALYSIS

HOUNSLOW HOLDINGS INC.

VERSION 2.0

PROJECT NO.: CA0003234.0568 CA
DATE: MARCH 2024

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Project number	19M-01493	19M-01493	19M-01493	CA0003234.0568 CA	CA0003234.0568 CA

SIGNATURES

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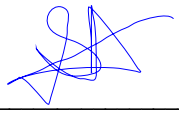

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FIGURES

TABLES

APPENDICES

1 INTRODUCTION

WSP Canada Inc. (WSP) has been retained by Hounslow Holdings Inc. to prepare an External Sanitary Sewer Study in support of a zoning by-law amendment application for the proposed residential re-development located at 26, 28, 36, and 38 Hounslow Avenue, in the City of Toronto (the "City"). Using the InfoWorks ICM model provided by the City, this report provides an assessment of the sanitary sewer network capacity under the existing and post-redevelopment conditions to ensure compliance with the requirements stipulated within the City of Toronto's Sanitary Sewer Surcharge Approval Guideline for Development Applications.

The existing conditions include the wastewater generated from the existing site located at 26-38 Hounslow Avenue (see Section 1.2), several sewer improvements in the City's Basement Flooding Study Area 26 (see Section 2.4.1) and additional flows generated from other developments located within the same sewershed (see Section 2.4.2).

The post-development conditions include the wastewater generated from the proposed development at 26-38 Hounslow Avenue (see Section 1.2) and the same additional flows from other developments (see Section 2.4.2).

1.1 SITE DESCRIPTION

The location of the proposed development is depicted in the map below:

Figure 1-1: Site Location

The site is a 0.24 ha section of land including four parcels known municipally as 26, 28, 36, and 38 Hounslow Avenue (the "Subject Site"). The Subject Site is bounded by a public walkway to the north and east, existing residential houses to the west, and Hounslow Avenue to the south. The site is currently occupied by four detached homes (2-storey) with addresses 26, 28, 36, and 38 Hounslow Avenue.

Redevelopment of the Subject Site (the "Proposed Development") will consist of a high-rise residential development comprising a total of 305 residential units as summarized below in Section 1.2.

1.2 DEVELOPMENT STATISTICS

Development statistics for the Subject Site are summarized in the tables below. Population equivalents, peaking factors, infiltration rates, and residential flow rates were all calculated as per the 2nd edition of Toronto Design Criteria for Sewers and Watermains, January 2021.

The design criteria utilized to calculate the development statistics are listed as follows:

- Existing equivalent population based on 170 persons/ha for townhouse type developments.
- Future equivalent population based on the table titled "Table: Persons per unit" found on page 47 of Toronto Design Criteria for Sewers and Watermains, January 2021.
- Residential wastewater generation rate of 240 L/cap/d
- Residential peaking factor calculated using the Harmon equation: $PF=1+(14(4+(P/1000)^{1/2}))$ where P=population in thousands
- Infiltration rate of 0.26 L/ha/s. No infiltration allowance for new development as pipes are installed with underground parking.

Table 1-1 shows that the peak sanitary flow rate from the existing site is calculated as 0.50 L/s.

Table 1-1: Existing Sanitary Flow from Site

EXISTING SITE	SITE AREA	EQUIVALENT POPULATION	AVERAGE RESIDENTIAL FLOW		PEAKING FACTOR	GROUNDWATER INFILTRATION	TOTAL PEAK FLOW
	(ha)		(L/s)	(m^3/day)		(L/s)	(L/s)
Detached Homes	0.22	37	0.10	8.8	4.3	0.06	0.50

Table 1-2 shows that the proposed development will have an equivalent population of 521, which amounts to a total population increase of 485 due to the proposed developments.

Table 1-2: Equivalent Population from the Proposed Site

UNIT TYPE	POPULATION PER UNIT	TOTAL UNITS	TOTAL EQUIVALENT POPULATION
Suite/Studio	1.4	15	21
1B/1B+D	1.4	199	279
2B/2B+D	2.1	61	128
3B	3.1	30	93
	Total	305	521

Table 1-3 shows that the peak sanitary flow rate from the proposed development site is estimated to be 6.40 L/s, which amounts to a total increase in flow of 5.90 L/s from the existing site.

Table 1-3: Proposed Sanitary Flow from Site

PROPOSED SITE	SITE AREA (ha)	EQUIVALENT POPULATION	AVERAGE RESIDENTIAL FLOW (L/s)	AVERAGE RESIDENTIAL FLOW (m^3/day)	PEAKING FACTOR	GROUNDWATER PUMPING (L/s)	TOTAL PEAK FLOW (L/s)
Residential Apartments	0.22	521	1.45	125	3.96	0.63	6.40

1.3 PERMANENT GROUNDWATER DISCHARGE

A hydrogeological investigation has been completed by B.I.G Consulting, whereby it was determined that groundwater collected via the perimeter footing drains shall discharge to the sanitary sewer system.

2 SANITARY SEWER ANALYSIS

To satisfy the City of Toronto's requirements, a downstream sanitary sewer analysis was performed from the sanitary discharge point of the proposed development at 26-38 Hounslow Avenue to the connection into the existing 1050 mm diameter sanitary trunk sewer along the Glendora Park Trail, south of Sheppard Avenue. This section provides background information on the existing model and the relevant network. Error! Reference source not found. shows a screenshot of the entire InfoWorks model used for this analysis with the primary alignment highlighted in teal.

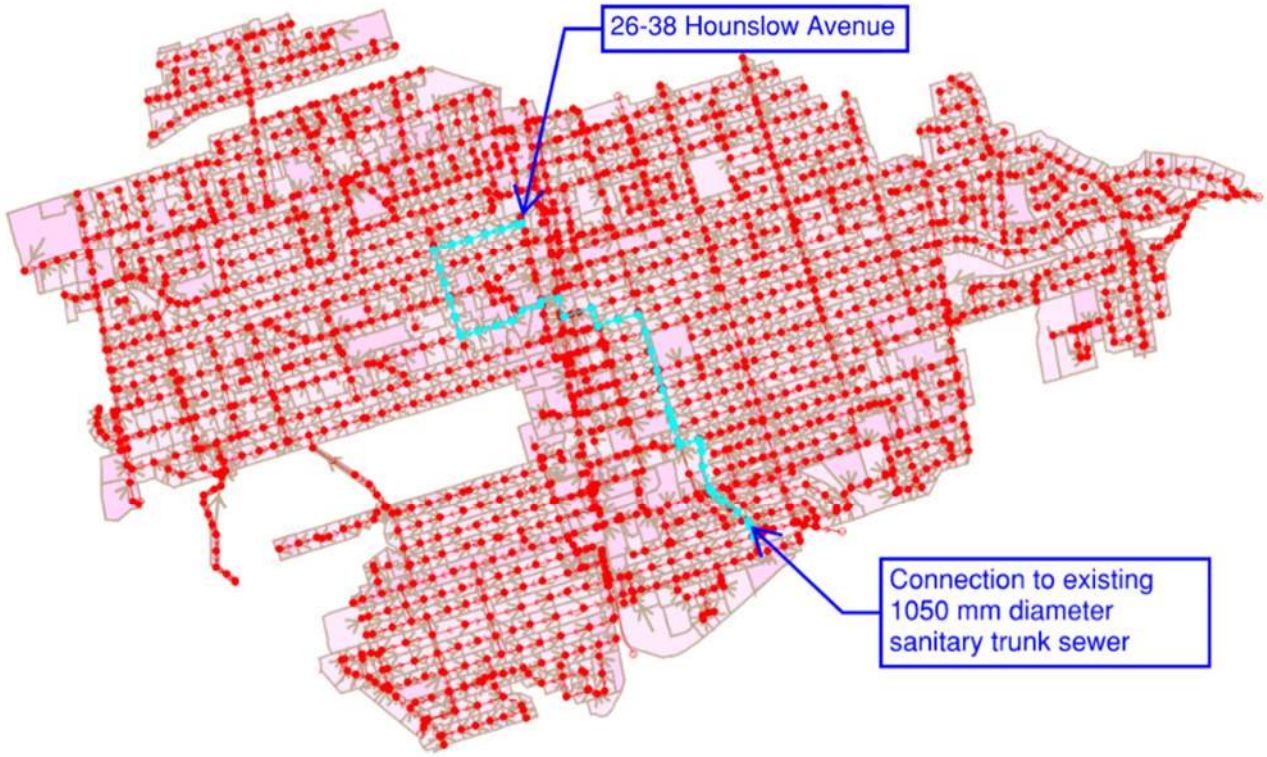

Figure 2-1: InfoWorks Model

2.1 DESIGN CRITERIA

The design criteria used for this analysis is based on the City of Toronto's Sanitary Sewer Surcharge Approval Guideline for Development Applications. The following Level of Service (LOS) criteria must be satisfied during the Dry and Extreme Wet Weather Flow events (discussed in Section 2.1.1):

Dry Weather Flow:

- No surcharging of existing or proposed sewers (discussed in Section 2.1.2);
- Minimum flow velocity of 0.60 m/s in proposed sewers or existing sewers where flow is reduced;
- Flow velocity is maintained or improved in existing low velocity sections; and

Wet Weather Flow:

- Minimum hydraulic grade line (HGL) depth of 1.8 m below the road grade for both existing and proposed sewers (discussed in Section 2.1.3).

2.1.1 DRY AND WET WEATHER FLOW CONDITIONS

The City of Toronto has outlined two flow conditions that need to be considered for the design and analysis of the sewer systems: Dry and Wet Weather flow.

DRY WEATHER FLOW

The design condition for sanitary systems is classified as the peak daily wastewater operation level of service that the City offers. This is named the Dry Weather Flow (DWF) event. The event comprises of domestic wastewater flow generation in addition to groundwater infiltration, which is usually attributed to groundwater ingress through joints, cracks, etc.

WET WEATHER FLOW

Wet weather flow conditions include domestic wastewater flow generation, similar to DWF, with the addition of rainfall derived inflow and infiltration. The extreme wet weather event is classified as an emergency event. This event is rare and is attributed with severe flooding and property damage. In order to protect the public from frequent damages, and as it is reasonable to ensure excess public spending does not occur, an upper limit has been defined as the May 12, 2000 storm event as gauged at the City's Oriole Yard located at Sheppard Avenue and Leslie Street. This event resulted in more than 2,000 flooding and property damage complaints when it occurred and has been used as a design standard to provide an enhanced level of protection against basement flooding from sanitary sewer backup for a storm event with a return frequency between one in 25 to one in 50 years.

Additionally, a Chicago distribution design storm with a return period of 2-years was considered in this analysis to analyze the performance of the sanitary system under wet weather flow conditions that are more likely to occur and are less extreme than the May 12, 2000 storm event.

2.1.2 SURCHARGED CONDITIONS

During Dry Weather Flow, the City of Toronto requires all existing and proposed sewers to operate without surcharging, a flow condition where the HGL is at or below the obvert of the pipe. The City of Toronto's Sewer and Watermain Design Criteria stipulates that this can be achieved by ensuring that the actual volumetric flow rate through a pipe is within 80% of its full flow capacity. However, this simplification is not an appropriate measure for the hydraulic analysis performed as part of this study.

Through the HGL analysis, it is possible to identify sewer sections where the HGL slope is steeper than the pipe slope. A schematic representation of this condition is given in Error! Reference source not found.. This condition results in a higher volumetric flow rate than the full flow capacity of the pipe (i.e. an actual flow to full flow ratio greater than 100%), even while the HGL elevation is entirely contained within the pipe. Therefore, the City's 80% metric will falsely identify such sewers as being surcharged.

A suitable alternative for the analysis performed is to consider the ratio of the flow depth to the pipe diameter. This method will identify sewer legs where the HGL elevation is higher than the pipe's obvert (i.e. surcharged), while eliminating the false "positives" of the scenario above. The "Surcharge State" column in summary tables of this report's appendices reports the ratio of flow depths to the pipe's diameter, following the guidelines below:

— Values less than 100% indicate the average flow depth as a percentage of the pipe diameter, i.e. not surcharged;

— 100% indicates a surcharged condition were the HGL slope is less than the pipe slope, and therefore, backwater effects are present; and

— 200% indicates a surcharged condition were the HGL slope is greater than the pipe slope, and therefore, no backwater effects are present.

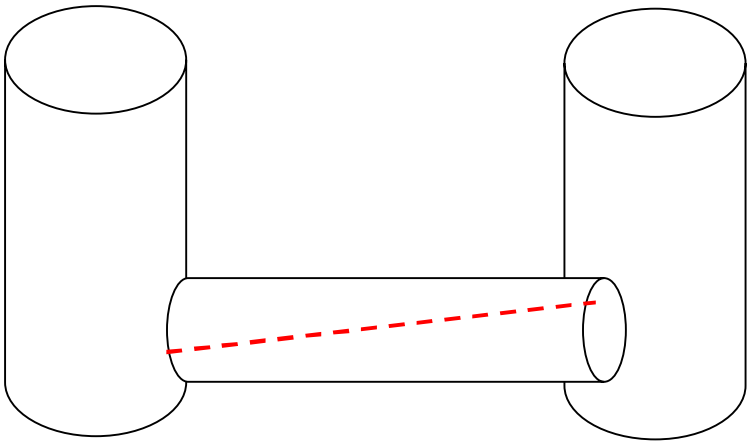

Figure 2-2: Sewers with High HGL Slope

2.1.3 CLARIFICATIONS FOR HYDRAULIC GRADE LINE DEPTH CRITERIA

During extreme Wet Weather Flow events, the sewer system must perform in a manner that ensures that all surrounding properties are adequately safeguarded from flooding. During such rare and severe events, the requirement above has been translated by the City of Toronto into a minimum hydraulic grade line (HGL) depth requirement of 1.8 m below the road grade for both existing and proposed sewers. Maintaining this depth will prevent property damage as a result of sewer backups that may be caused by the high flow rates experienced by the overall sewer system during these events. However, for sewers located in an area where there are no service connections, such as ravines and parks, this requirement is waived as there are no service connections to protect.

2.1.4 PROCEDURE F-5-5 COMPLIANCE

This location is serviced by separated storm and sanitary sewers throughout the entirety of the sewershed. Given that there are no combined sewers and no overflows in the study area, it is deemed compliant with Ontario's procedure F-5-5.

2.2 LIMITS OF ANALYSIS

The limit of analysis for the External Sanitary Sewer Study is along the primary alignment between the Proposed redevelopment located at 26-38 Hounslow Avenue to the connection into the existing 1050 mm diameter sanitary trunk sewer located along the Glendora Park Trail, south of Sheppard Avenue. The subject sewer network traverses the following route:

- West along Hounslow Avenue for 425 m via 250 mm diameter sewers;
- South along Tamworth Road for 455 m via 525 mm and 600 mm diameter sewers;
- East along Ellerslie Avenue for 550 m via 900 mm diameter sewers;
- South along Yonge Street for 99 m via 750 mm x 1200 mm rectangular sewers;
- East along Parkview Avenue for 148 m via 900 mm diameter sewers;
- South along Doris Avenue for 96 m via 900 mm diameter sewers;
- East along Kingsdale Avenue for 210 m via 900 mm diameter sewers;
- South Along Kenneth Avenue for 695 m via 675 mm, 750 mm, 900 mm, and 1950 mm diameter sewers;
- East along Spring Garden Avenue for 99 m via 750 mm diameter sewers;
- South through the southward easement located east of Kenneth Avenue for 269 m via 750 mm sewers;
- South through the southward easement located along Glendora Park Trail for 253 m via 750 mm sewers;
- Connection into the existing 1050 mm sanitary trunk sewer located along Glendora Park Trail, south of Anndale Drive and north of Glendora Avenue at MH4661912712.

The existing sewers along this downstream alignment comprise of circular pipes with diameters ranging between 250 mm to 1950 mm and rectangular pipes sized at 750 mm x 1200 mm.

Figure 2-1 also shows the downstream flow path from the Proposed Development to the connection into the existing 1050 mm diameter sanitary trunk sewer.

2.3 BASE MODEL

The Proposed Development is located within the City's Basement Flooding Study Area 26 ("Area 26"), for which WSP completed a Stormwater Runoff Quality and Investigation of Chronic Basement Flooding, Municipal Class Environmental Assessment – Project File (Area 26 EA Project File) in August 2016. A digital copy of this InfoWorks model was provided by the City and converted from InfoWorks CS to InfoWorks ICM version 10.5. Study Area 26 is approximately 700 hectares (ha) and is bordered by Drewry Avenue to the north, Highway 401 to the south, Bayview Avenue to the east and Bathurst Street and Senlac Road to the west.

A preliminary review of the model was conducted to understand the behaviour of the existing sewershed. For the updated capacity analysis with the increase in the proposed development density for 26 to 36 Hounslow Avenue, the model database was updated from ICM v10.5 to ICM v2023.2. Before proceeding with the capacity analysis, the model results from the original study completed using v10.5 were compared to the updated database in v2023.2 and found to be unchanged.

Updates were made as outlined in Section 2.4. These updates were considered in the analysis. The analysis was performed to identify the impacts of proposed development to the existing sanitary sewer network, while considering the additional flows generated by other developments in the sewershed, and the sewer improvements representing the basement flooding area solutions.

2.4 MODEL UPDATES

2.4.1 BASEMENT FLOODING AREA 26 SOLUTIONS

The solutions in the Area 26 EA Project File were developed to relieve basement flooding issues in the study area by upgrading the existing sanitary sewers to provide additional capacity to the sanitary sewer network and installing diversion sewers to utilize available capacity in the sewer network. These solution works have been constructed, and hence, they are considered as built in the pre-development scenario.

The updates to the sanitary network consists of:

- Upgrade 244 m of the existing 250 mm diameter sanitary sewer with 300 mm and 275 mm diameter sanitary sewers along Tefley Road;
- Upgrade 234 m of the existing 250 mm diameter sanitary sewer with a 450 mm diameter sanitary sewer along Finch Avenue West;
- Upgrade 69 m of the existing 250 mm diameter sanitary sewer with a 300 mm diameter sanitary sewer along Finch Avenue West;
- Upgrade 456 m of the existing 525 mm to 600 mm diameter sanitary sewer with a 675 mm diameter sanitary sewer along Tamworth Road;
- Upgrade 197 m of the existing 250 mm diameter sanitary sewer with a 300 mm diameter sanitary sewer along Ellerslie Avenue;
- Upgrade 87 m of the existing 250 mm diameter sanitary sewer with a 300 mm diameter sanitary sewer along Park Home Avenue;
- Install a new 11 m long 300 mm diameter diversion sewer at Empress Avenue and Doris Avenue, connecting the local sanitary network to the trunk sewer; and
- Install a new 8 m long 900 mm diameter diversion sewer at Spring Garden Avenue and Kenneth Avenue, connecting the local sanitary network to the trunk sewer.

2.4.2 OTHER DEVELOPMENTS

The City of Toronto Development Applications website was used to search for developments within the sewershed that are under-process by the City since 2021 when the previous Functional Servicing Report (FSR) by WSP was submitted. It is assumed that these development applications are further along in the approval process than 26-38 Hounslow and thus would have completed construction before the subject development.

As a result of the search, eight (8) developments were found. The FSRs of the developments were reviewed for information regarding the existing and proposed peak sanitary design flows. In the absence of FSRs, design flows were calculated using the available information, including number of proposed units and ground floor areas, as per the Toronto Design Criteria for Sewers and Watermains, January 2021. All these developments were incorporated into the pre-and post-development condition scenarios. Table 2-1 shows a summary of the other developments, the total increase in sanitary design flows, and the asset ID of the nearest existing sanitary manhole at which they are loaded to in the model.

Table 2-1: Design Flows of Added Developments

DEVELOPMENT APPLICATION ADDRESS	ADDITIONAL SANITARY PEAK FLOW (L/s)*	CONNECTING SANITARY MH ASSET ID
40 Hendon Ave (updated)	0.00	4875511223
68 Churchill Ave (new)	2.80	4780711301
11 Churchill Ave (new)	20.2	4795511612
172 Finch Ave W (new)	15.9	4826910279
52 Finch Ave W (new)	0.20	4855411259
221 Finch Ave W (updated)	5.60	4815910014
5400 Yonge St (updated)	2.60	4810611580
36 Churchill Ave(updated)	0.05	4787411441
Total	47.40	

*Peak flows obtained from FSRs or calculated using unit or ground floor area information provided on the City's Development Applications website

The peak sanitary flows from the developments shown in Table 2-1 were loaded to the respective sanitary node as a constant inflow. This is a conservative approach as it does not follow a diurnal pattern and assumes peak discharge throughout the entirety of each simulation and rainfall event. These flows were incorporated to both pre- and post-development conditions.

3 PRE-DEVELOPMENT ANALYSIS

Pre-development (or baseline) conditions were simulated using the updated model as described in Section 2.4. This simulation determined the baseline state for the sanitary sewer network to compare against the impacts of the proposed development.

Pre-development conditions considered the following:

— 0.50 L/s of wastewater generated from the existing site at 26-38 Hounslow Avenue, as described in Section 1.2.
— Inclusion of eight (8) other developments within the sewershed, as described in Section 2.4.2.

3.1 DRY WEATHER FLOW

Simulation results of the pre-development condition under dry weather flow indicate that the existing sanitary sewer system operates within the City of Toronto's required level of service, except for the following manholes that do not meet the HGL freeboard requirement of 1.80 m:

— MH 4815211563 located at 26 Hounslow Avenue has an HGL freeboard of 1.27 m; however, the connecting sewer is classified as a shallow sewer (obvert less than 1.80 m below ground) and does not surcharge with the pipe being only 10% full.
— MH 4669012650 located along the Glendora Park trail south of Sheppard Ave has an HGL freeboard of 1.47 m; however, it is noted that this is a shallow sewer which does not surcharge and is shown to only be 27% full. Additionally, this manhole is along a park trail that does not have any service connections to the nearby properties, and therefore does not pose a basement flooding risk.

Additionally, the existing 250 mm sewers on Hounslow Avenue, up to Tamworth Road, do not meet the minimum cleansing velocity of 0.6 m/s.

Dry weather flow modelling results for the baseline state analysis are summarized, and detailed profile alignments are provided in Appendix A-1.

3.2 WET WEATHER FLOW

The performance of the sanitary sewer system under wet weather flow conditions was modelled using two rainfall events: The Chicago distribution design storm with a 2-year return period, and the May 12, 2000 storm as gauged at the City's Oriole Yard located at Sheppard Avenue and Leslie Street.

3.2.1 2-YEAR CHICAGO STORM

Simulation results of the pre-development scenario under wet weather flow conditions using the 2-year design storm indicate that several sewers along the primary alignment surcharge; however, the HGL freeboard criteria is met except for the following locations:

— MH 4815211563 located at 26 Hounslow Avenue has an HGL freeboard of 1.27 m; however, the connecting sewer is classified as a shallow sewer that does not surcharge and is shown as being only 10% full.
— MH 4669012650 located along the Glendora Park trail south of Sheppard Ave has an HGL freeboard of 1.30 m. However, its upstream and downstream sewers do not surcharge.

Wet weather flow modelling results of the 2-year Chicago storm for the pre-development analysis are summarized, and detailed profile alignments are given in Appendix A-2.

3.2.2 MAY 12, 2000 STORM EVENT

Simulation results of the pre-development scenario under wet weather flow conditions using the May 12, 2000 storm event indicate that several sewers along the primary alignment surcharge and that the HGL freeboard criteria is met except for of the following locations:

— MH 4815211563 located at 26 Hounslow Avenue has an HGL freeboard of 1.27 m; however, the connecting sewer is classified as a shallow sewer that does not surcharge and is shown as being only 10% full;

— MH 4669012650 located along the Glendora Park trail south of Sheppard Ave has HGL freeboard of 1.24 m. Its upstream and downstream sewers do not surcharge.

Wet weather flow modelling results for the baseline state analysis are summarized, and detailed profile alignments are given in Appendix A-3.

4 POST-DEVELOPMENT ANALYSIS

To simulate the impact of the proposed development on the existing sanitary sewer network, the pre-development condition model was updated with the increased wastewater generated from the proposed development. This scenario is referred to as the Post-Development condition.

To summarize, post-development conditions considered the following:

— 6.45 L/s of wastewater generated from the proposed development at 26-38 Hounslow Avenue, as described in Section 1.2;
— The Subject Site connects to the proposed maintenance hole MH1A, located directly south of 36 Hounslow Avenue, which then drains westward via the existing 250 mm sanitary sewer;
— Inclusion of eight (8) other (new and updated) developments within the sewershed, as described in Section 2.4.2; and
— Inclusion of sewer improvements proposed in the City's Basement Flooding Study Area 26, as described in Section 2.4.1.

4.1 DRY WEATHER FLOW

Similar to the pre-development condition, simulation results of the post-development scenario under dry weather flow conditions indicate that the sanitary sewer system operates within the City of Toronto's required level of service with the exception of two same locations seen in the pre-development condition:

— MH 4815211563 located at 26 Hounslow Avenue has an HGL freeboard of 1.27 m; however, the connecting sewer is classified as a shallow sewer (obvert less than 1.8m below ground) and is shown to not experience any flows since the proposed development will connect to MH1A which is located downstream of this maintenance hole.
— MH 4669012650 located along the Glendora Park trail south of Sheppard Ave has an HGL freeboard of 1.47 m; however, it is noted that the connecting sewers are classified as shallow sewers that do not surcharge. Additionally, this manhole is located along a park trail and does not have any service connections to the nearby properties, and therefore does not pose a basement flooding risk.

Additionally, the existing 250 mm sewers on Hounslow Avenue, up to Tamworth Road, now meet the minimum cleansing velocity of 0.6 m/s.

Overall, the pre-developmental level of service has been maintained or improved in the post-development condition along the primary alignment. Dry weather flow modelling results for the post-development condition are summarized, and detailed profile alignments are provided in Appendix B-1.

4.2 WET WEATHER FLOW

4.2.1 2-YEAR CHICAGO STORM

Simulation results of the post-development scenario under wet weather flow conditions using the 2-year design storm indicate that several sewers along the primary alignment surcharge; however, the HGL freeboard criteria is met except for the following two locations that were also noted in the pre-development condition:

- MH 4815211563 located at 26 Hounslow Avenue has an HGL freeboard of 1.27 m; however, the connecting sewer is classified as a shallow sewer (obvert less than 1.8m below ground) and is shown to not experience any flows since the proposed development will connect to MH1A which is located downstream of this maintenance hole.
- MH 4669012650 located along the Glendora Park trail south of Sheppard Ave has an HGL freeboard of 1.30 m; however, it is noted that the connecting sewers are classified as shallow sewers that do not surcharge. Additionally, being that this manhole is located along a park trail, it does not have any service connections to the nearby properties, and therefore does not pose a basement flooding risk.

Overall, the pre-developmental level of service has been maintained or improved in the post-development condition along the primary alignment. Wet weather flow modelling results under the 2-year design storm for the post-development condition are summarized, and detailed profile alignments are provided in Appendix B-2.

4.2.2 MAY 12, 2000 STORM EVENT

Simulation of the post-development scenario under wet weather flow conditions using the May 12, 2000 storm event show that the same number of manholes violate the HGL freeboard criteria and surcharge compared to the pre-development scenario. HGL freeboard criteria is met along the primary alignment except for the following locations:

- MH 4815211563 located at 26 Hounslow Avenue has an HGL freeboard of 1.27 m; however, the connecting sewer is classified as a shallow sewer (obvert less than 1.8m below ground) and is shown to not experience any flows since the proposed development will connect to MH1A located downstream of this maintenance hole.
- MH 4669012650 located along the Glendora Park trail south of Sheppard Ave has an HGL freeboard of 1.24 m, and both upstream and downstream sewers no longer surcharge; however, this manhole is located along a park trail that does not have any service connections to the nearby properties, and therefore do not pose a basement flooding risk.

Overall, the pre-developmental level of service has been maintained or improved in the post-development condition along the primary alignment. Wet weather flow modelling results under this storm event for the post-development condition are summarized, and detailed profile alignments are provided in Appendix B-3.

5 CONCLUSION

A hydraulic analysis of the sanitary sewer system using a dynamic InfoWorks ICM model has revealed that the proposed updated development application has no adverse impacts on the sanitary system.

The pre-developmental level of service has been maintained or improved in the post-development scenario under dry weather flow conditions. The required cleansing velocity of 0.6 m/s is not met along the existing 250 mm sanitary sewers located on Hounslow Avenue for the pre-development condition. It is also noted that no sewers surcharge under dry weather flow conditions.

Under wet weather flow conditions, the post-development scenario shows two locations that continue to violate the HGL freeboard requirements. They are considered as exceptions: MH 4815211563 located at 26 Hounslow is connected to a shallow sewer that does not surcharge, and MH 4669012650 is located along a park trail that does not have any service connections to the nearby properties. As such, the post-development conditions meet the level of service criteria under extreme wet weather flow conditions.

As the pre-developmental level of service is maintained or improved in the post-development condition, it is recommended that the sanitary connection to the system, without any remediation measures to the external system, be endorsed by the City.

6 BIBLIOGRAPHY

— City of Toronto. (January 2021). Design Criteria for Sewers and Watermains.

— City of Toronto. (n.d.). City of Toronto's Sanitary Sewer Surcharge Approval Guideline for Development Applications.

STANDARD LIMITATIONS

This report was prepared by WSP Canada Inc (WSP) for the client, Hounslow Holdings Inc., in accordance with the professional services agreement between WSP and the client. This report is based on information provided to WSP which has not been independently verified.

The disclosure of any information contained in this report is the sole responsibility of the client. The material in this report, accompanying spreadsheets and all information relating to this activity reflect WSP's judgment in light of the information available to us at the time of preparation of this report. With the exception of the City of Toronto who can rely on this report for permitting and approvals, any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

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APPENDIX

A BASELINE STATE ANALYSIS RESULTS

APPENDIX

APPENDIX

A-1 BASELINE STATE ANALYSIS – DRY WEATHER FLOW

Define Fields

Title: 26 Hounslow Avenue External Sanitary Sewer Study

Type Baseline/Pre-Development Condition

Weather Event: Dry

Project No: CA0003234.0568 CA

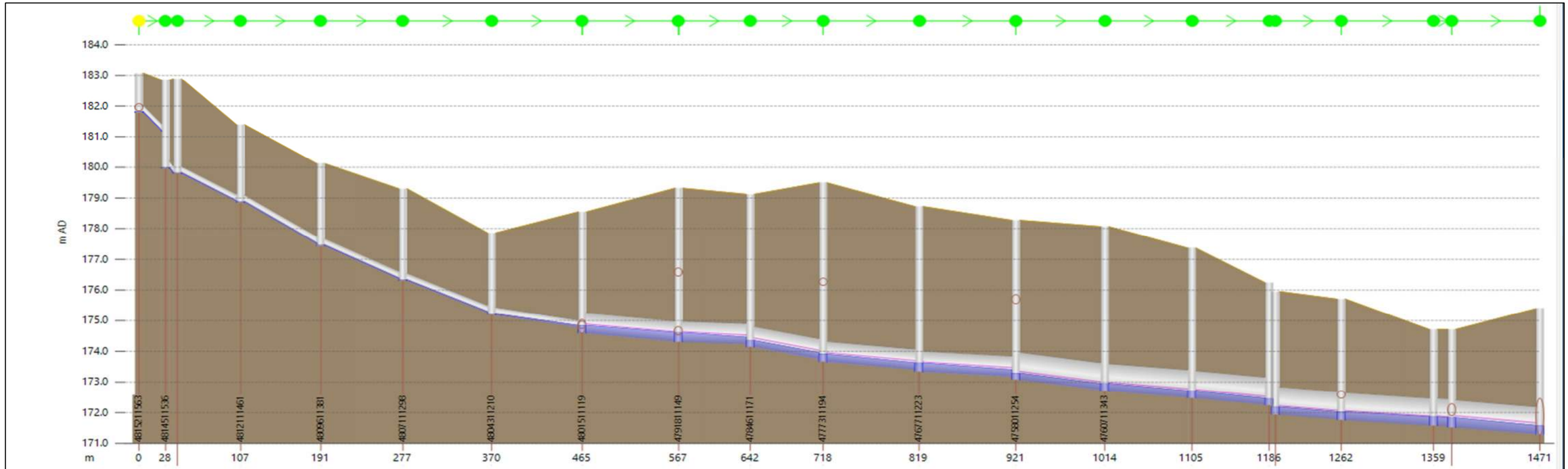
Drawn By SA

Checked By SD

Date October 2023

Appendix: A-1

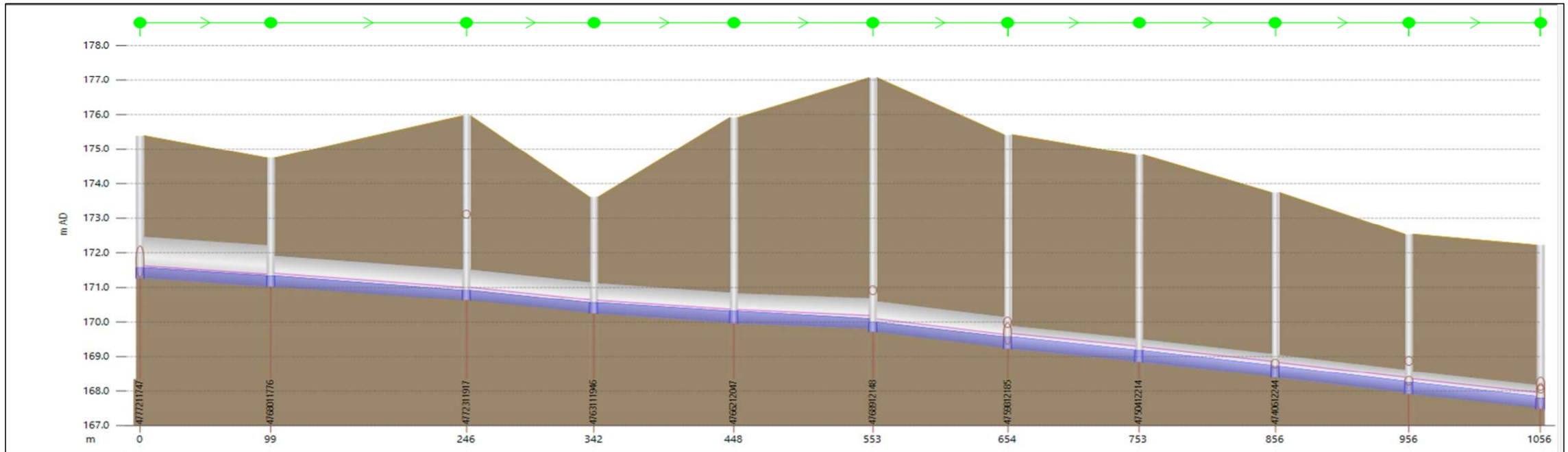
1. Primary Alignment



Link	-	-	MH1A.1	4812111461.1	4809611381.1	4807111298.1	4804311210.1	4801511119.1	-	-	4777311194.1	4767711223.1	4758011254.1	4760711343.1	4763411430.1	-	4770411561.1	-	4775711659.1
System type	foul	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	-	foul
Asset ID	-	-	4031718	4031719	4031720	4031721	4031722	4034282	4032429	4032430	4032431	4033564	4033561	4033562	4033563	4166911	4032555	-	4032320
length (m)	27.9	-	66.6	84.1	86.2	93.0	95.2	101.3	75.2	76.3	100.8	101.7	93.3	91.5	81.0	69.1	96.9	-	92.5
Shape ID	-	-	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	-	CIRC
width (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
height (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
us inv (m AD)	-	-	179.791	178.850	177.430	176.300	175.190	174.589	174.308	174.136	173.653	173.333	173.070	172.703	172.470	171.940	171.760	-	171.515
ds inv (m AD)	-	-	178.880	177.500	176.360	175.260	174.780	174.318	174.236	173.743	173.403	173.175	172.730	172.500	172.260	171.790	171.577	-	171.298
grad (m/m)	-	-	0.01369	0.01605	0.01241	0.01118	0.00431	0.00268	0.00096	0.00515	0.00248	0.00155	0.00364	0.00222	0.00259	0.00217	0.00189	-	0.00235
r.pfc (m3/s)	-	-	0.070	0.075	0.066	0.063	0.039	0.435	0.260	0.603	0.419	0.331	1.093	0.853	0.922	0.844	0.787	-	0.877
surc	0.10	-	0.10	0.10	0.11	0.11	0.24	0.43	0.45	0.31	0.38	0.42	0.24	0.26	0.25	0.27	0.31	-	0.35
DS flow (m3/s)	-	-	0.00009	0.00015	0.00020	0.00029	0.00035	0.12399	0.12486	0.12488	0.12553	0.12557	0.12757	0.12759	0.12787	0.12813	0.13943	-	0.23005
DS velocity (m/s)	-	-	0.033	0.056	0.073	0.097	0.129	0.841	1.238	1.307	1.235	1.238	1.125	1.158	1.156	0.990	0.829	-	1.378

Node	-	-	-	4809611381	4807111298	4804311210	4801511119	4791811149	-	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
Node ID	-	-	-	4809611381	4807111298	4804311210	4801511119	4791811149	-	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
System type	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	-	-	181.384	180.118	179.301	177.862	178.546	179.315	179.122	179.494	178.722	178.276	178.068	177.365	-	-	175.706	174.710	174.716	-
level (m AD)	-	-	178.876	177.457	176.327	175.216	174.839	174.609	174.347	173.908	173.618	173.282	172.941	172.699	-	-	172.021	171.857	171.830	-
expr:HGL Freeboard	-	-	2.508	2.661	2.974	2.646	3.707	4.706	4.775	5.586	5.104	4.994	5.127	4.666	3.787	-	3.685	2.853	2.886	3.821

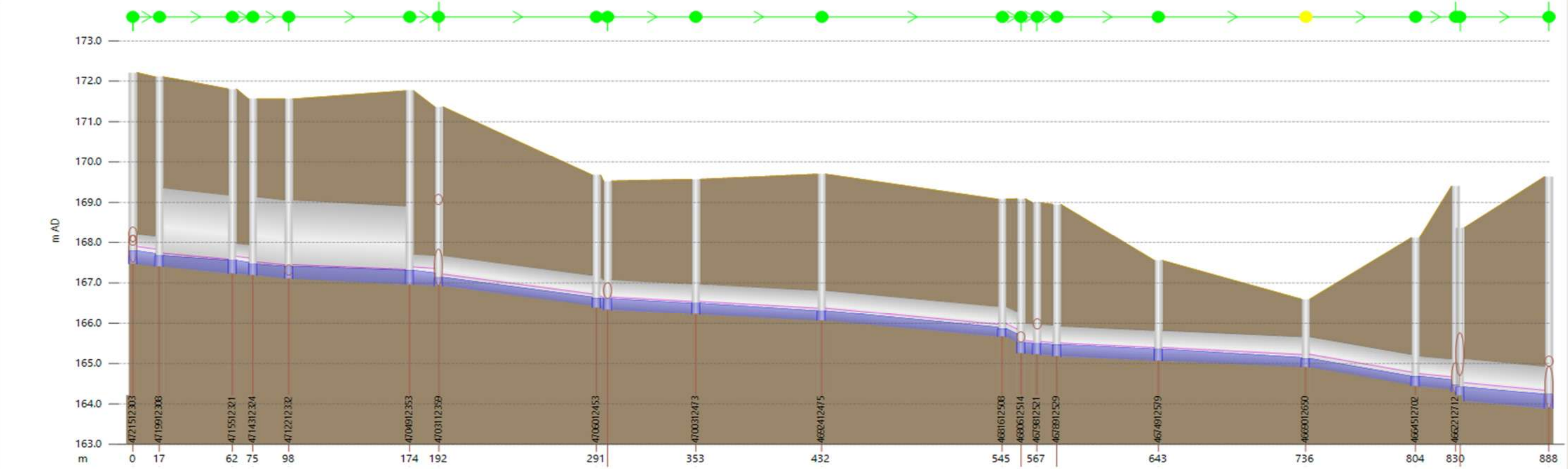
26 Hounslow Avenue External Sanitary Sewer Study	WSP	
Baseline/Pre-Development Condition Dry Weather Flow	Checked: SD	Drawn: SA
	Date: October 2023	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: A-1.1



Link	4777211747.1	4768011776.1	4772311917.1	4763111946.1	4766212047.1	4768912148.1	4759812185.1	4750412214.1	4740612244.1	4730912273.1
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
Asset ID	4031994	4032319	4032318	4032317	4031993	4031992	4032316	4032315	4032314	4032313
length (m)	98.5	147.7	95.8	105.5	105.1	101.7	98.7	103.0	100.4	99.1
Shape ID	RECT	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	900	900	900	900	900	675	675	675	675
height (mm)	1200	900	900	900	900	900	675	675	675	675
us inv (m AD)	171.273	171.029	170.634	170.241	169.954	169.710	169.223	168.839	168.385	167.908
ds inv (m AD)	171.029	170.634	170.271	169.979	169.810	169.263	168.869	168.425	167.958	167.519
grad (m/m)	0.00248	0.00267	0.00379	0.00248	0.00137	0.00440	0.00359	0.00402	0.00425	0.00393
r.pfc (m3/s)	1.296	0.936	1.115	0.902	0.670	1.200	0.504	0.533	0.548	0.527
surc	0.26	0.34	0.32	0.37	0.39	0.34	0.51	0.49	0.49	0.50
DS flow (m3/s)	0.23078	0.23121	0.23176	0.23179	0.23200	0.23501	0.25875	0.25874	0.25969	0.26092
DS velocity (m/s)	1.000	1.356	1.339	1.097	1.386	1.250	1.546	1.545	1.547	1.550

Node	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
Node ID	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	175.389	174.742	175.965	173.608	175.914	177.061	175.422	174.833	173.738	172.529	172.217
level (m AD)	171.568	171.337	170.916	170.556	170.309	169.984	169.567	169.172	168.714	168.245	167.790
expr:HGL Freeboard	3.821	3.405	5.049	3.052	5.605	7.077	5.855	5.661	5.024	4.284	4.427

26 Hounslow Avenue External Sanitary Sewer Study	WSP	
Baseline/Pre-Development Condition Dry Weather Flow	Checked: SD	Drawn: SA
	Date: October 2023	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: A-1.2



Link	-	-	-	-	4712212332.1	-	4703112359.1	-	4705712460.1	4700312473.1	4692412475.1	-	-	-	4678912529.1	4674912579.1	4669012650.1	-	4661912712.1
System type	foul	foul	-	foul	foul	foul	foul	-	foul	foul	foul	-	-	-	foul	foul	foul	foul	foul
Asset ID	-	4054074	-	-	4054077	-	4033349	-	4033347	4033346	4033345	-	-	-	4033455	4033454	4033453	-	4031345
length (m)	16.5	45.9	-	22.6	75.7	18.4	98.8	-	55.4	78.8	113.2	-	-	-	63.9	92.2	68.9	25.2	55.5
Shape ID	-	CIRC	-	CIRC	CIRC	CIRC	CIRC	-	CIRC	CIRC	CIRC	-	-	-	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
height (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
us inv (m AD)	-	167.410	-	-	167.110	-	166.930	-	166.331	166.223	166.070	-	-	-	165.180	165.073	164.920	-	164.077
ds inv (m AD)	-	167.230	-	-	166.960	-	166.441	-	166.223	166.070	165.670	-	-	-	165.074	164.920	164.482	-	163.891
grad (m/m)	-	0.00392	-	-	0.00198	-	0.00495	-	0.00195	0.00194	0.00353	-	-	-	0.00166	0.00166	0.00636	-	0.00336
r.pfc (m3/s)	-	8.912	-	8.467	6.335	-	0.783	-	0.492	0.491	0.662	-	-	-	0.454	0.454	0.888	0.595	1.583
surc	0.43	0.17	-	0.15	0.18	0.46	0.27	-	0.37	0.36	0.31	-	-	-	0.38	0.38	0.27	0.33	0.33
DS flow (m3/s)	-	0.26218	-	-	0.26292	-	0.12380	-	0.13902	0.13901	0.13900	-	-	-	0.14120	0.14119	0.14119	-	0.36069
DS velocity (m/s)	-	0.805	-	0.917	0.728	-	1.267	-	0.962	1.167	1.237	-	-	-	0.926	1.249	1.439	1.245	1.454

Node	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
Node ID	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
System type	foul	foul	-	foul	foul	foul	foul	foul	foul	foul	foul			foul	foul	foul	foul	-	foul	foul
ground (m AD)	-	-	-	171.559	171.764	171.367	169.674	-	169.570	169.697	169.076			168.949	167.553	166.599	168.118	-	-	-
level (m AD)	-	-	-	167.406	167.308	167.135	166.622	-	166.495	166.306	165.860			165.468	165.357	165.125	164.686	-	-	-
expr:HGL Freeboard	4.442	4.253	-	4.153	4.456	4.232	3.052	2.922	3.075	3.391	3.216			3.481	2.196	1.474	3.432	-	3.949	5.398

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Baseline/Pre-Development Condition Dry Weather Flow	Checked SD	Drawn SA
	Date October 2023	Project No CA0003234.0568 CA
	Scale NTS	Figure No A-1.3

APPENDIX

APPENDIX

A-2 BASELINE STATE ANALYSIS – WET WEATHER FLOW – 2-YEAR 6 HOUR CHICAGO EVENT

Define Fields

Title: 26 Hounslow Avenue External Sanitary Sewer Study

Type Baseline/Pre-Development Condition

Weather Event: Wet Weather Flow - 2-year 6-hour Chicago Storm

Project No: CA0003234.0568 CA

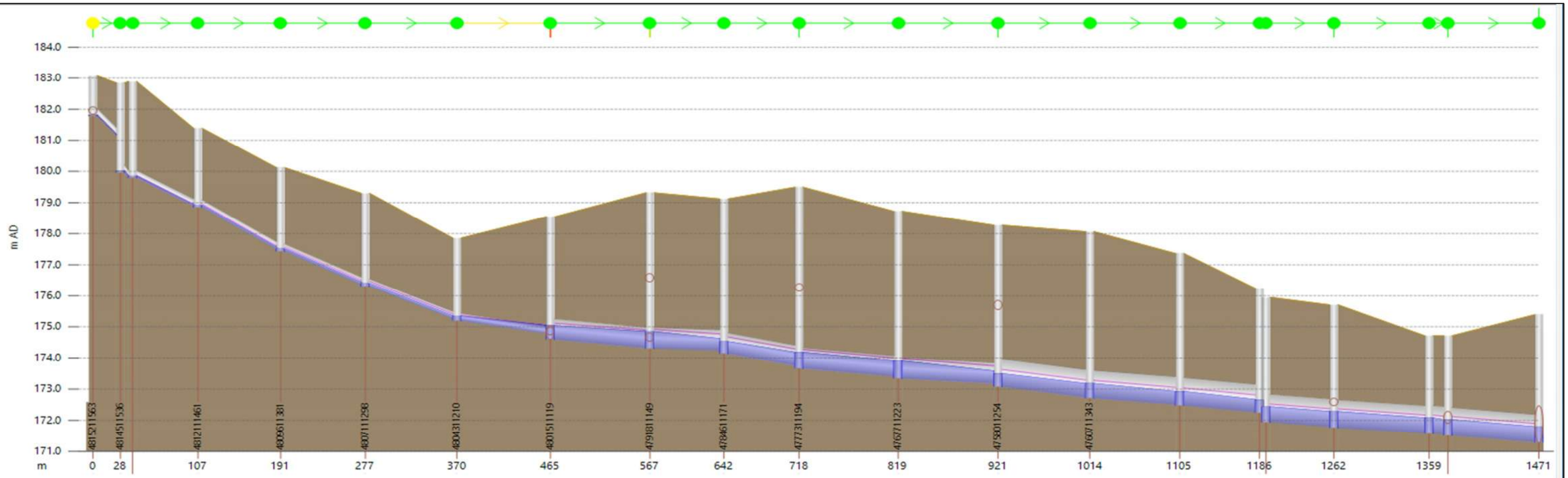
Drawn By SA

Checked By SD

Date October 2023

Appendix: A-2

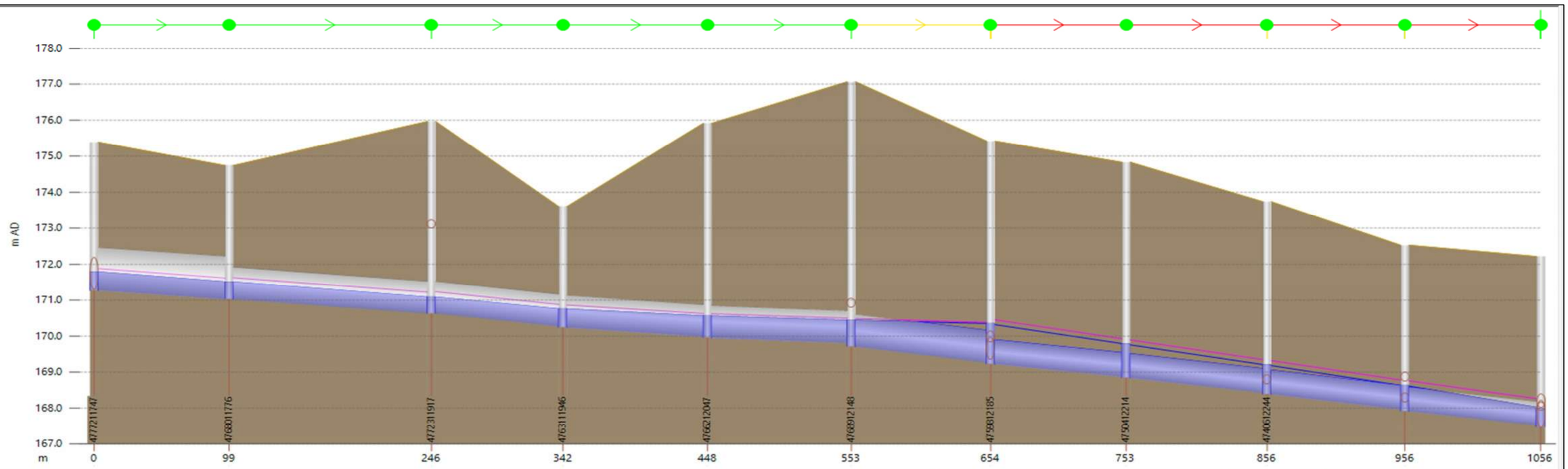
1. Primary Alignment



Link	-	-	MH1A.1	4812111461.1	4809611381.1	4807111298.1	4804311210.1	4801511119.1	-	-	4777311194.1	4767711223.1	4758011254.1	4760711343.1	4763411430.1	-	4770411561.1	-	4775711659.1
System type	foul	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	-	foul
Asset ID	-	-	4031718	4031719	4031720	4031721	4031722	4034282	4032429	4032430	4032431	4033564	4033561	4033562	4033563	4166911	4032555	-	4032320
length (m)	27.9	-	66.6	84.1	86.2	93.0	95.2	101.3	75.2	76.3	100.8	101.7	93.3	91.5	81.0	69.1	96.9	-	92.5
Shape ID	-	-	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	-	CIRC
width (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
height (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
us inv (m AD)	-	-	179.791	178.850	177.430	176.300	175.190	174.589	174.308	174.136	173.653	173.333	173.070	172.703	172.470	171.940	171.760	-	171.515
ds inv (m AD)	-	-	178.880	177.500	176.360	175.260	174.780	174.318	174.236	173.743	173.403	173.175	172.730	172.500	172.260	171.790	171.577	-	171.298
grad (m/m)	-	-	0.01369	0.01605	0.01241	0.01118	0.00431	0.00268	0.00096	0.00515	0.00248	0.00155	0.00364	0.00222	0.00259	0.00217	0.00189	-	0.00235
r.pfc (m3/s)	-	-	0.070	0.075	0.066	0.063	0.039	0.435	0.260	0.603	0.419	0.331	1.093	0.853	0.922	0.844	0.787	-	0.877
surc	0.10	-	0.21	0.27	0.34	0.40	1.00	0.79	0.79	0.65	0.77	0.84	0.49	0.52	0.50	0.54	0.58	-	0.56
DS flow (m3/s)	-	-	0.00508	0.01010	0.01489	0.02023	0.02313	0.31501	0.36468	0.36562	0.39927	0.40035	0.47121	0.47288	0.47708	0.47948	0.50501	-	0.52742
DS velocity (m/s)	-	-	0.692	0.964	1.022	1.090	0.837	1.059	1.744	1.644	1.423	1.805	1.512	1.622	1.725	1.356	1.407	-	1.497

Node	-	-	-	4809611381	4807111298	4804311210	4801511119	4791811149	-	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
Node ID	-	-	-	4809611381	4807111298	4804311210	4801511119	4791811149	-	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
System type	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	-	-	181.384	180.118	179.301	177.862	178.546	179.315	179.122	179.494	178.722	178.276	178.068	177.365	-	-	175.706	174.710	174.716	-
level (m AD)	-	-	178.917	177.515	176.401	175.335	175.039	174.848	174.525	174.180	173.904	173.488	173.173	172.921	-	-	172.280	172.073	172.020	-
expr:HGL Freeboard	-	-	2.467	2.603	2.900	2.527	3.507	4.467	4.597	5.314	4.818	4.788	4.895	4.444	3.589	-	3.426	2.637	2.696	3.598

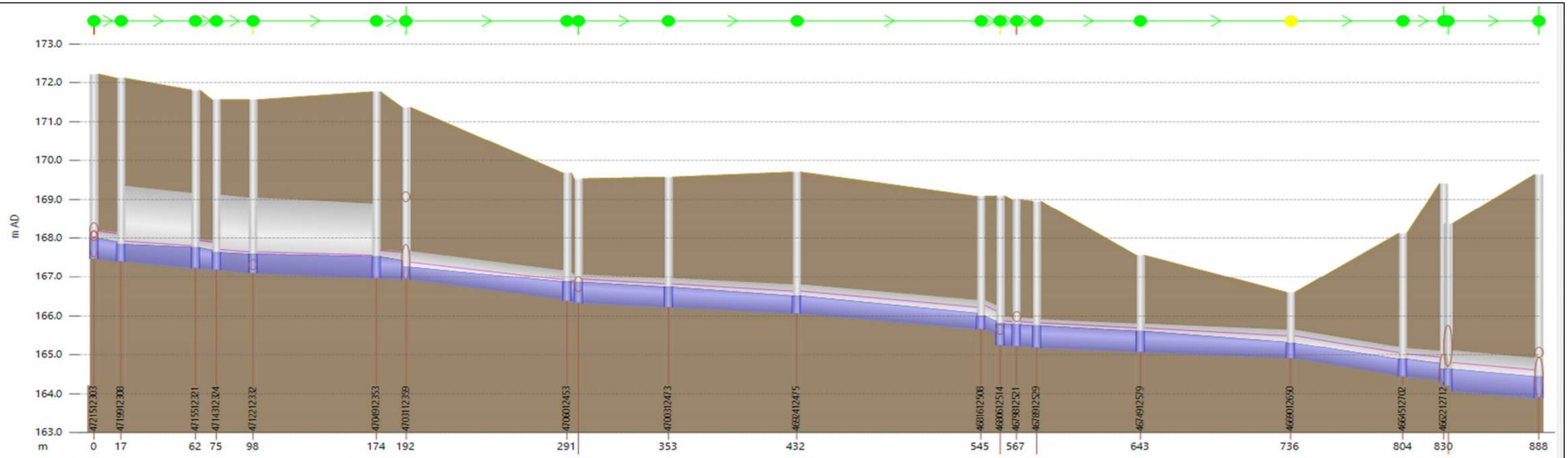
26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Baseline/Pre-Development Condition Wet Weather Flow - 2-year 6-hour Chicago Storm	Checked SD	Drawn SA
	Date October 2023	Project No CA0003234.0568 CA
	Scale NTS	Figure No A-2.1



Link	4777211747.1	4768011776.1	4772311917.1	4763111946.1	4766212047.1	4768912148.1	4759812185.1	4750412214.1	4740612244.1	4730912273.1
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
Asset ID	4031994	4032319	4032318	4032317	4031993	4031992	4032316	4032315	4032314	4032313
length (m)	98.5	147.7	95.8	105.5	105.1	101.7	98.7	103.0	100.4	99.1
Shape ID	RECT	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	900	900	900	900	900	675	675	675	675
height (mm)	1200	900	900	900	900	900	675	675	675	675
us inv (m AD)	171.273	171.029	170.634	170.241	169.954	169.710	169.223	168.839	168.385	167.908
ds inv (m AD)	171.029	170.634	170.271	169.979	169.810	169.263	168.869	168.425	167.958	167.519
grad (m/m)	0.00248	0.00267	0.00379	0.00248	0.00137	0.00440	0.00359	0.00402	0.00425	0.00393
r.pfc (m3/s)	1.296	0.936	1.115	0.902	0.670	1.200	0.504	0.533	0.548	0.527
surc	0.43	0.54	0.54	0.65	0.70	1.00	2.00	2.00	2.00	2.00
DS flow (m3/s)	0.52765	0.52805	0.55060	0.54715	0.53260	0.52216	0.61099	0.61084	0.61732	0.62292
DS velocity (m/s)	1.450	1.644	1.579	1.386	1.791	1.251	1.814	1.826	1.830	2.176

Node	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
Node ID	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	175.389	174.742	175.965	173.608	175.914	177.061	175.422	174.833	173.738	172.529	172.217
level (m AD)	171.791	171.515	171.087	170.758	170.563	170.443	170.352	169.791	169.207	168.631	167.995
expr:HGL Freeboard	3.598	3.227	4.878	2.850	5.351	6.618	5.070	5.042	4.531	3.898	4.222

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Baseline/Pre-Development Condition Wet Weather Flow - 2-year 6-hour Chicago Storm	Checked: SD	Drawn: SA
	Date: October 2023	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: A-2.2



Link	-	-	-	-	4712212332.1	-	4703112359.1	-	4705712460.1	4700312473.1	4692412475.1	-	-	-	4678912529.1	4674912579.1	4669012650.1	-	4661912712.1
System type	foul	foul	-	foul	foul	foul	foul	-	foul	foul	foul	-	-	-	foul	foul	foul	foul	foul
Asset ID	-	4054074	-	-	4054077	-	4033349	-	4033347	4033346	4033345	-	-	-	4033455	4033454	4033453	-	4031345
length (m)	16.5	45.9	-	22.6	75.7	18.4	98.8	-	55.4	78.8	113.2	-	-	-	63.9	92.2	68.9	25.2	55.5
Shape ID	-	CIRC	-	CIRC	CIRC	CIRC	CIRC	-	CIRC	CIRC	CIRC	-	-	-	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
height (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
us inv (m AD)	-	167.410	-	-	167.110	-	166.930	-	166.331	166.223	166.070	-	-	-	165.180	165.073	164.920	-	164.077
ds inv (m AD)	-	167.230	-	-	166.960	-	166.441	-	166.223	166.070	165.670	-	-	-	165.074	164.920	164.482	-	163.891
grad (m/m)	-	0.00392	-	-	0.00198	-	0.00495	-	0.00195	0.00194	0.00353	-	-	-	0.00166	0.00166	0.00636	-	0.00336
r.pfc (m3/s)	-	8.912	-	8.467	6.335	-	0.783	-	0.492	0.491	0.662	-	-	-	0.454	0.454	0.888	0.595	1.583
surc	0.69	0.27	-	0.24	0.29	0.74	0.57	-	0.69	0.67	0.58	-	-	-	0.75	0.71	0.54	0.59	0.52
DS flow (m3/s)	-	0.63034	-	-	0.63332	-	0.29049	-	0.42035	0.42016	0.41999	-	-	-	0.44573	0.44572	0.44570	-	0.85451
DS velocity (m/s)	-	0.970	-	1.129	0.889	-	1.333	-	1.325	1.576	1.757	-	-	-	1.317	1.797	1.815	1.796	1.868

Node	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
Node ID	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
System type	foul	foul	-	foul	foul	foul	foul	foul	foul	foul	foul			foul	foul	foul	foul	-	foul	foul
ground (m AD)	-	-	-	171.559	171.764	171.367	169.674	-	169.570	169.697	169.076			168.949	167.553	166.599	168.118	-	-	-
level (m AD)	-	-	-	167.584	167.522	167.251	166.865	-	166.729	166.506	165.992			165.749	165.611	165.300	164.890	-	-	-
expr:HGL Freeboard	4.281	4.051	-	3.975	4.242	4.116	2.809	2.673	2.841	3.191	3.084			3.200	1.942	1.299	3.228	-	3.742	5.195

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Baseline/Pre-Development Condition Wet Weather Flow - 2-year 6-hour Chicago Storm	Checked SD	Drawn SA
	Date October 2023	Project No CA0003234.0568 CA
	Scale NTS	Figure No A-2.3

APPENDIX

APPENDIX

A-3 BASELINE STATE ANALYSIS – WET WEATHER FLOW – MAY 12, 2000 ASSESSMENT EVENT

Define Fields

Title: 26 Hounslow Avenue External Sanitary Sewer Study

Type Baseline/Pre-Development Condition

Weather Event: Wet Weather Flow - May 12, 2000 Storm

Project No: CA0003234.0568 CA

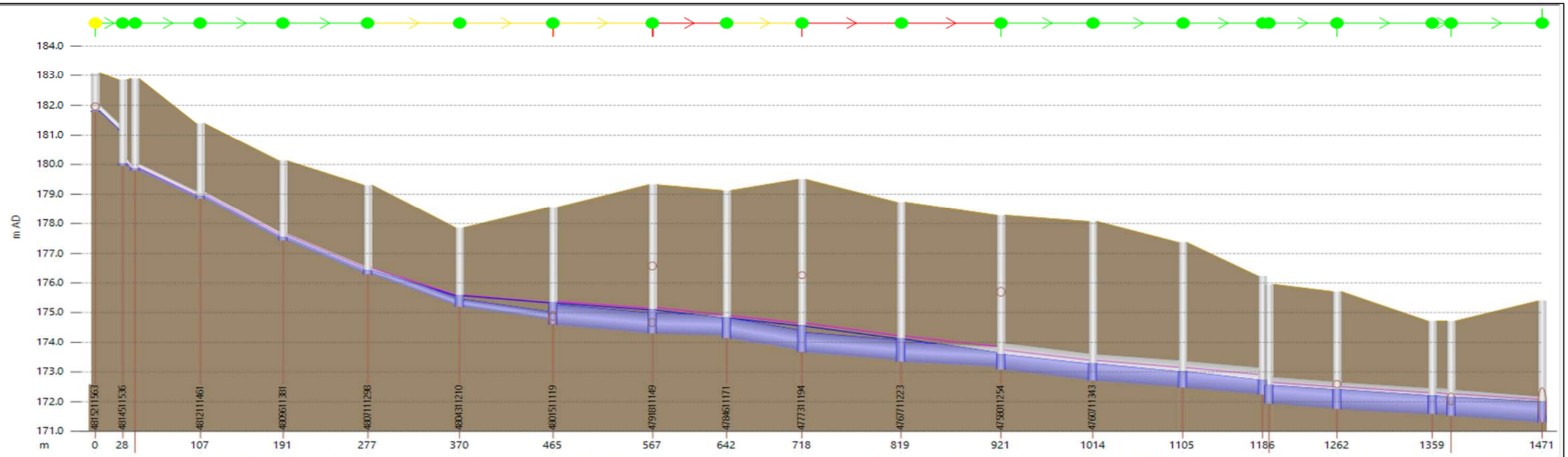
Drawn By SA

Checked By SD

Date October 2023

Appendix: A-3

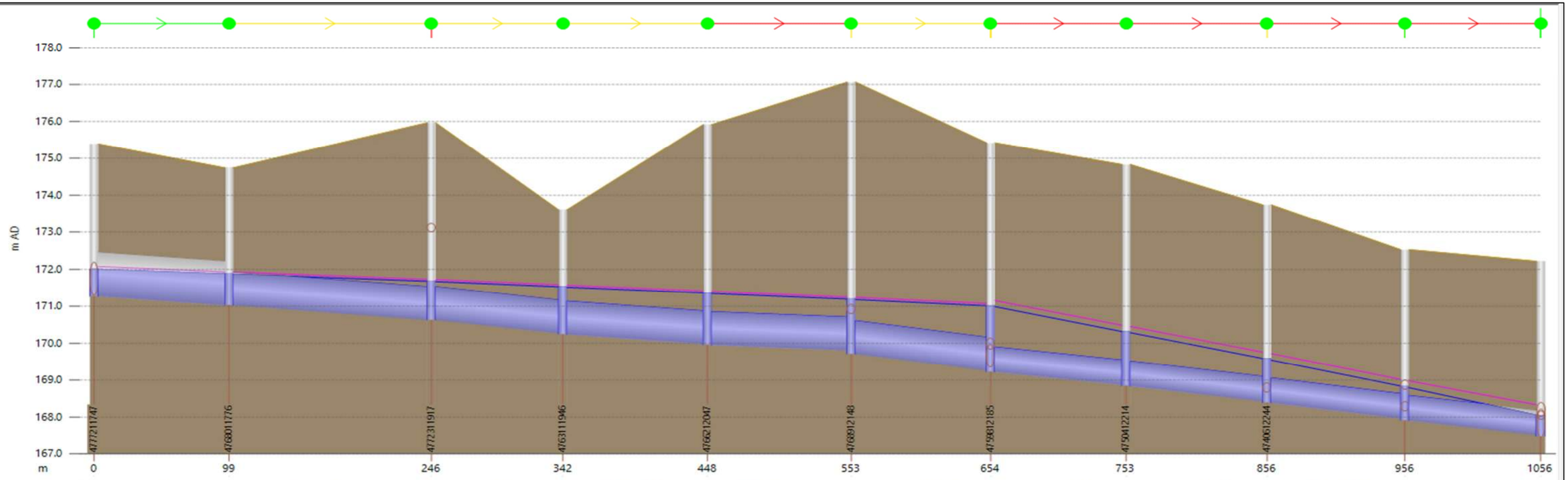
1. Primary Alignment



Link	-	-	MH1A.1	4812111461.1	4809611381.1	4807111298.1	4804311210.1	4801511119.1	-	-	4777311194.1	4767711223.1	4758011254.1	4760711343.1	4763411430.1	-	4770411561.1	-	4775711659.1
System type	foul	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	-	foul
Asset ID	-	-	4031718	4031719	4031720	4031721	4031722	4034282	4032429	4032430	4032431	4033564	4033561	4033562	4033563	4166911	4032555	-	4032320
length (m)	27.9	-	66.6	84.1	86.2	93.0	95.2	101.3	75.2	76.3	100.8	101.7	93.3	91.5	81.0	69.1	96.9	-	92.5
Shape ID	-	-	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	-	CIRC
width (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
height (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
us inv (m AD)	-	-	179.791	178.850	177.430	176.300	175.190	174.589	174.308	174.136	173.653	173.333	173.070	172.703	172.470	171.940	171.760	-	171.515
ds inv (m AD)	-	-	178.880	177.500	176.360	175.260	174.780	174.318	174.236	173.743	173.403	173.175	172.730	172.500	172.260	171.790	171.577	-	171.298
grad (m/m)	-	-	0.01369	0.01605	0.01241	0.01118	0.00431	0.00268	0.00096	0.00515	0.00248	0.00155	0.00364	0.00222	0.00259	0.00217	0.00189	-	0.00235
r.pfc (m3/s)	-	-	0.070	0.075	0.066	0.063	0.039	0.435	0.260	0.603	0.419	0.331	1.093	0.853	0.922	0.844	0.787	-	0.877
surc	0.10	-	0.25	0.33	0.43	1.00	1.00	1.00	2.00	1.00	2.00	2.00	0.60	0.62	0.59	0.68	0.71	-	0.79
DS flow (m3/s)	-	-	0.00828	0.01645	0.02424	0.03149	0.03662	0.40153	0.47450	0.47679	0.53402	0.53621	0.62969	0.63276	0.63973	0.64391	0.68378	-	0.72830
DS velocity (m/s)	-	-	0.850	1.150	1.195	1.222	0.763	1.147	1.904	1.627	1.446	2.031	1.595	1.722	1.902	1.399	1.453	-	1.533

Node	-	-	-	4809611381	4807111298	4804311210	4801511119	4791811149	-	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
Node ID	-	-	-	4809611381	4807111298	4804311210	4801511119	4791811149	-	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
System type	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	-	-	181.384	180.118	179.301	177.862	178.546	179.315	179.122	179.494	178.722	178.276	178.068	177.365	-	-	175.706	174.710	174.716	-
level (m AD)	-	-	178.933	177.538	176.432	175.574	175.330	175.097	174.822	174.565	174.128	173.570	173.266	173.005	-	-	172.405	172.202	172.152	-
expr:HGL Freeboard	-	-	2.451	2.580	2.869	2.288	3.216	4.218	4.300	4.929	4.594	4.706	4.802	4.360	3.520	-	3.301	2.508	2.564	3.384

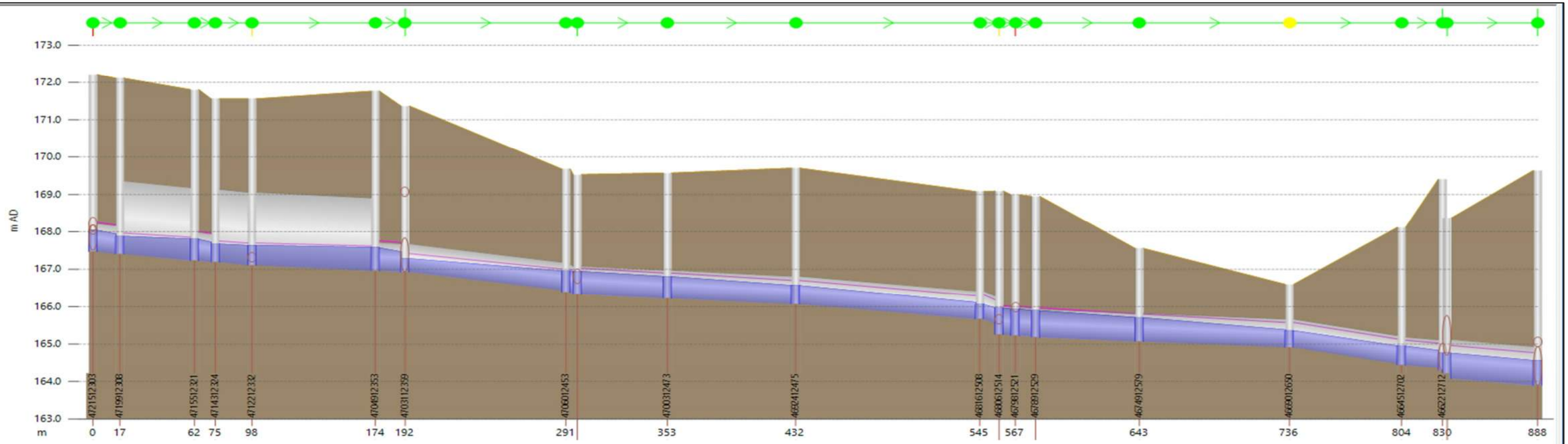
26 Hounslow Avenue External Sanitary Sewer	wsp	
Baseline/Pre-Development Condition Wet Weather Flow - May 12, 2000 Storm	Checked SD	Drawn SA
	Date October 2023	Project No CA0003234.0568 CA
	Scale NTS	Figure No A-3.1



Link	4777211747.1	4768011776.1	4772311917.1	4763111946.1	4766212047.1	4768912148.1	4759812185.1	4750412214.1	4740612244.1	4730912273.1
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
Asset ID	4031994	4032319	4032318	4032317	4031993	4031992	4032316	4032315	4032314	4032313
length (m)	98.5	147.7	95.8	105.5	105.1	101.7	98.7	103.0	100.4	99.1
Shape ID	RECT	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	900	900	900	900	900	675	675	675	675
height (mm)	1200	900	900	900	900	900	675	675	675	675
us inv (m AD)	171.273	171.029	170.634	170.241	169.954	169.710	169.223	168.839	168.385	167.908
ds inv (m AD)	171.029	170.634	170.271	169.979	169.810	169.263	168.869	168.425	167.958	167.519
grad (m/m)	0.00248	0.00267	0.00379	0.00248	0.00137	0.00440	0.00359	0.00402	0.00425	0.00393
r.pfc (m3/s)	1.296	0.936	1.115	0.902	0.670	1.200	0.504	0.533	0.548	0.527
surc	0.71	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00	2.00
DS flow (m3/s)	0.72529	0.69623	0.70114	0.68717	0.68924	0.72612	0.69081	0.69096	0.70038	0.71070
DS velocity (m/s)	1.613	1.696	1.635	1.427	1.776	1.250	1.814	1.847	1.877	2.332

Node	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
Node ID	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	175.389	174.742	175.965	173.608	175.914	177.061	175.422	174.833	173.738	172.529	172.217
level (m AD)	172.005	171.878	171.680	171.531	171.364	171.197	171.015	170.315	169.583	168.837	168.045
expr:HGL Freeboard	3.384	2.864	4.285	2.077	4.550	5.864	4.407	4.518	4.155	3.692	4.172

26 Hounslow Avenue External Sanitary Sewer	WSP	
Baseline/Pre-Development Condition Wet Weather Flow - May 12, 2000 Storm	Checked: SD	Drawn: SA
	Date: October 2023	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: A-3.2



Link	-	-	-	-	4712212332.1	-	4703112359.1	-	4705712460.1	4700312473.1	4692412475.1	-	-	-	4678912529.1	4674912579.1	4669012650.1	-	4661912712.1
System type	foul	foul	-	foul	foul	foul	foul	-	foul	foul	foul	-	-	-	foul	foul	foul	foul	foul
Asset ID	-	4054074	-	-	4054077	-	4033349	-	4033347	4033346	4033345	-	-	-	4033455	4033454	4033453	-	4031345
length (m)	16.5	45.9	-	22.6	75.7	18.4	98.8	-	55.4	78.8	113.2	-	-	-	63.9	92.2	68.9	25.2	55.5
Shape ID	-	CIRC	-	CIRC	CIRC	CIRC	CIRC	-	CIRC	CIRC	CIRC	-	-	-	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
height (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
us inv (m AD)	-	167.410	-	-	167.110	-	166.930	-	166.331	166.223	166.070	-	-	-	165.180	165.073	164.920	-	164.077
ds inv (m AD)	-	167.230	-	-	166.960	-	166.441	-	166.223	166.070	165.670	-	-	-	165.074	164.920	164.482	-	163.891
grad (m/m)	-	0.00392	-	-	0.00198	-	0.00495	-	0.00195	0.00194	0.00353	-	-	-	0.00166	0.00166	0.00636	-	0.00336
r.pfc (m3/s)	-	8.912	-	8.467	6.335	-	0.783	-	0.492	0.491	0.662	-	-	-	0.454	0.454	0.888	0.595	1.583
surc	0.75	0.29	-	0.27	0.32	0.81	0.68	-	0.81	0.77	0.66	-	-	-	0.94	0.83	0.63	0.67	0.65
DS flow (m3/s)	-	0.73090	-	-	0.74055	-	0.33451	-	0.51142	0.51117	0.51102	-	-	-	0.55807	0.55813	0.55806	-	1.19918
DS velocity (m/s)	-	0.993	-	1.138	0.909	-	1.381	-	1.393	1.644	1.886	-	-	-	1.407	1.953	1.906	1.953	2.035

Node		-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
Node ID		-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
System type		foul	foul	-	foul	foul	foul	foul	foul	foul	foul	foul			foul	foul	foul	foul	-	foul	foul
ground (m AD)		-	-	-	171.559	171.764	171.367	169.674	-	169.570	169.697	169.076			168.949	167.553	166.599	168.118	-	-	-
level (m AD)		-	-	-	167.633	167.579	167.283	166.952	-	166.804	166.567	166.056			165.893	165.705	165.361	164.953	-	-	-
expr:HGL Freeboard		4.239	4.002	-	3.926	4.185	4.084	2.722	2.585	2.766	3.130	3.020			3.056	1.848	1.238	3.165	-	3.605	5.068

26 Hounslow Avenue External Sanitary Sewer	wsp	
Baseline/Pre-Development Condition Wet Weather Flow - May 12, 2000 Storm	Checked SD	Drawn SA
	Date October 2023	Project No CA0003234.0568 CA
	Scale NTS	Figure No A-3.3

APPENDIX

APPENDIX

B POST-DEVELOPMENT CONDITION ANALYSIS RESULTS

APPENDIX

APPENDIX

B-1 POST-DEVELOPMENT CONDITION ANALYSIS – DRY WEATHER FLOW

Define Fields

Title: 26 Hounslow Avenue External Sanitary Sewer Study

Type Post-Development Do-Nothing Condition

Weather Event: Dry

Project No: CA0003234.0568 CA

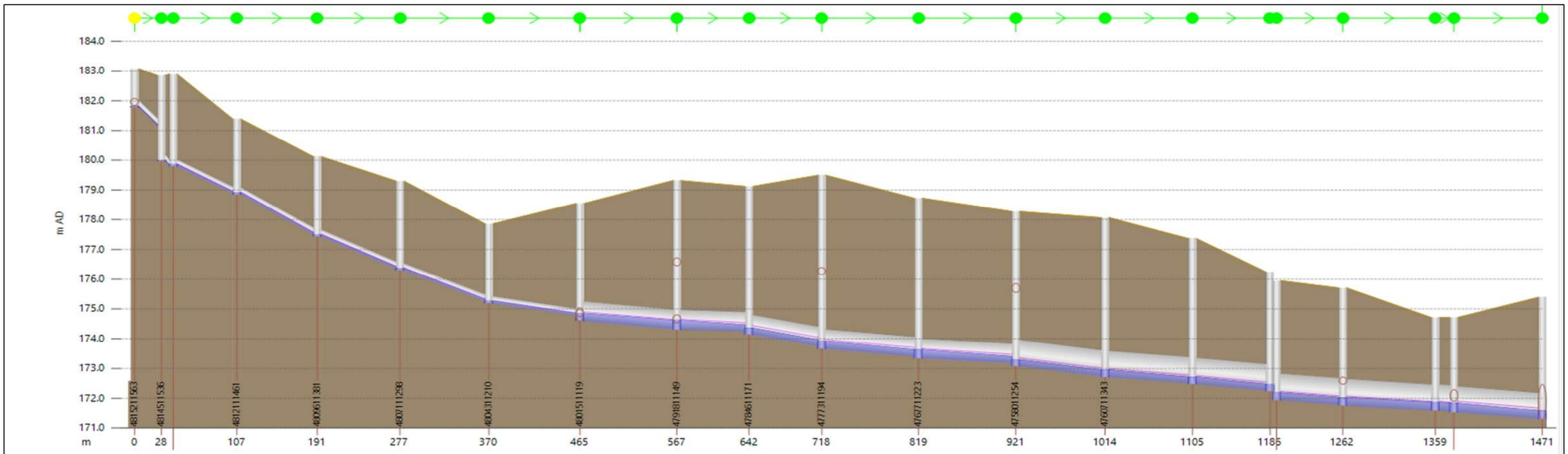
Drawn By SA

Checked By SD

Date March 2024

Appendix: B-1

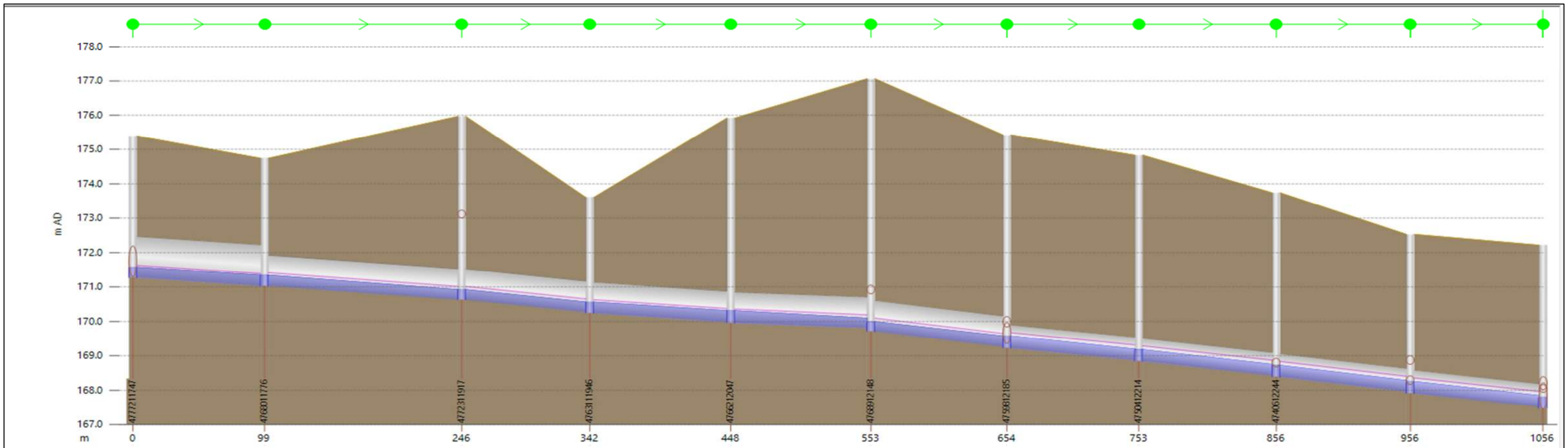
1. Primary Alignment



Link	-	-	MH1A.1	4812111461.1	4809611381.1	4807111298.1	4804311210.1	4801511119.1	4791811149.1	4784611171.1	4777311194.1	4767711223.1	4758011254.1	4760711343.1	4763411430.1	-	4770411561.1	-	4775711659.1
System type	foul	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	-	foul
Asset ID	-	-	4031718	4031719	4031720	4031721	4031722	4034282	4032429	4032430	4032431	4033564	4033561	4033562	4033563	4166911	4032555	-	4032320
length (m)	27.9	-	66.6	84.1	86.2	93.0	95.2	101.3	75.2	76.3	100.8	101.7	93.3	91.5	81.0	69.1	96.9	-	92.5
Shape ID	CIRC	-	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	-	CIRC
width (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
height (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
us inv (m AD)	-	-	179.791	178.850	177.430	176.300	175.190	174.589	174.308	174.136	173.653	173.333	173.070	172.703	172.470	171.940	171.760	-	171.515
ds inv (m AD)	-	-	178.880	177.500	176.360	175.260	174.780	174.318	174.236	173.743	173.403	173.175	172.730	172.500	172.260	171.790	171.577	-	171.298
grad (m/m)	-	-	0.01369	0.01605	0.01241	0.01118	0.00431	0.00268	0.00096	0.00515	0.00248	0.00155	0.00364	0.00222	0.00259	0.00217	0.00189	-	0.00235
r.pfc (m3/s)	-	-	0.070	0.075	0.066	0.063	0.039	0.435	0.260	0.603	0.419	0.331	1.093	0.853	0.922	0.844	0.787	-	0.877
surc	0.10	-	0.23	0.22	0.24	0.24	0.29	0.44	0.46	0.32	0.39	0.43	0.24	0.27	0.26	0.27	0.32	-	0.35
DS flow (m3/s)	-	-	0.00654	0.00660	0.00665	0.00673	0.00680	0.13044	0.13131	0.13133	0.13198	0.13202	0.13402	0.13404	0.13432	0.13458	0.14589	-	0.23654
DS velocity (m/s)	-	-	0.772	0.812	0.756	0.737	0.638	0.855	1.257	1.327	1.254	1.256	1.138	1.175	1.173	1.003	0.846	-	1.389

Node	-	-	4812111461	4809611381	4807111298	4804311210	4801511119	4791811149	4784611171	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
Node ID	-	-	4812111461	4809611381	4807111298	4804311210	4801511119	4791811149	4784611171	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
System type	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	-	-	181.384	180.118	179.301	177.862	178.546	179.315	179.122	179.494	178.722	178.276	178.068	177.365	-	-	175.706	174.710	174.716	-
level (m AD)	-	-	178.906	177.489	176.360	175.263	174.846	174.616	174.352	173.915	173.625	173.287	172.947	172.705	-	-	172.027	171.862	171.834	-
expr:HGL Freeboard	-	3.041	2.478	2.629	2.941	2.599	3.700	4.699	4.770	5.579	5.097	4.989	5.121	4.660	3.782	-	3.679	2.848	2.882	3.815

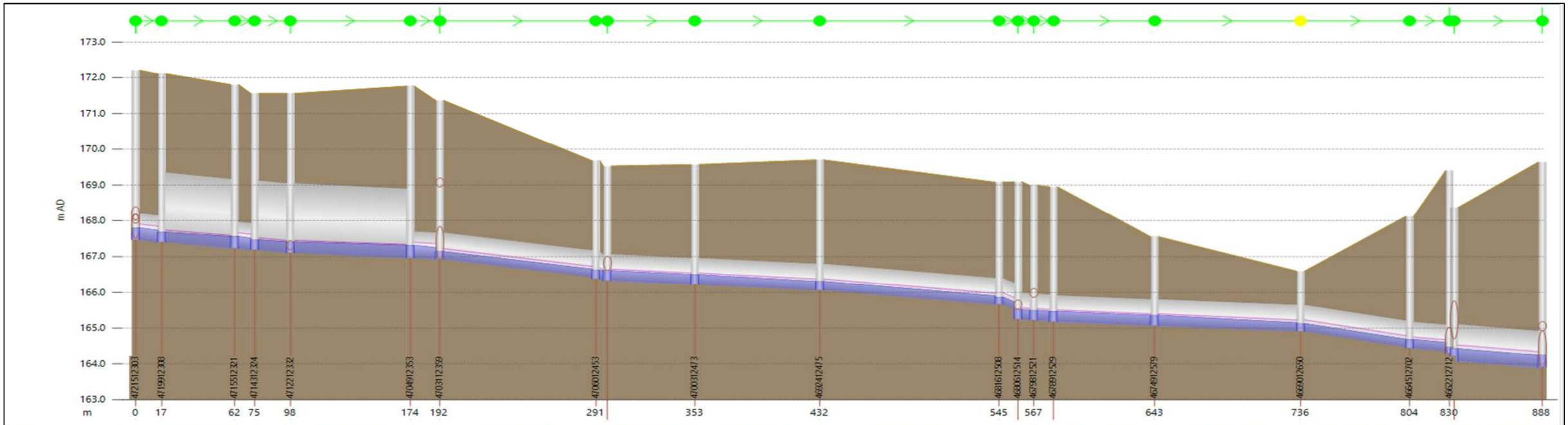
26 Hounslow Avenue External Sanitary Sewer Study	wsp
Post-Development Do-Nothing Condition Dry Weather Flow	Checked: SD; Drawn: SA; Date: March 2024; Project No: CA0003234.0568 CA; Scale: NTS; Figure No: B-1.1



Link	4777211747.1	4768011776.1	4772311917.1	4763111946.1	4766212047.1	4768912148.1	4759812185.1	4750412214.1	4740612244.1	4730912273.1
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
Asset ID	4031994	4032319	4032318	4032317	4031993	4031992	4032316	4032315	4032314	4032313
length (m)	98.5	147.7	95.8	105.5	105.1	101.7	98.7	103.0	100.4	99.1
Shape ID	RECT	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	900	900	900	900	900	675	675	675	675
height (mm)	1200	900	900	900	900	900	675	675	675	675
us inv (m AD)	171.273	171.029	170.634	170.241	169.954	169.710	169.223	168.839	168.385	167.908
ds inv (m AD)	171.029	170.634	170.271	169.979	169.810	169.263	168.869	168.425	167.958	167.519
grad (m/m)	0.00248	0.00267	0.00379	0.00248	0.00137	0.00440	0.00359	0.00402	0.00425	0.00393
r.pfc (m3/s)	1.296	0.936	1.115	0.902	0.670	1.200	0.504	0.533	0.548	0.527
surc	0.26	0.35	0.32	0.37	0.40	0.34	0.52	0.50	0.49	0.51
DS flow (m3/s)	0.23727	0.23770	0.23825	0.23828	0.23849	0.24150	0.26523	0.26522	0.26618	0.26741
DS velocity (m/s)	1.014	1.367	1.347	1.105	1.397	1.256	1.559	1.558	1.560	1.562

Node	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
Node ID	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	175.389	174.742	175.965	173.608	175.914	177.061	175.422	174.833	173.738	172.529	172.217
level (m AD)	171.574	171.341	170.920	170.561	170.314	169.988	169.572	169.177	168.719	168.250	167.794
expr:HGL Freeboard	3.815	3.401	5.045	3.047	5.600	7.073	5.850	5.656	5.019	4.279	4.423

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Post-Development Do-Nothing Condition Dry Weather Flow	Checked: SD	Drawn: SA
	Date: March 2024	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: B-1.2



Link	-	4719912308.1	-	-	4712212332.1	-	4703112359.1	-	4705712460.1	4700312473.1	4692412475.1	-	-	-	4678912529.1	4674912579.1	4669012650.1	-	4661912712.1	
System type	foul	foul	-	foul	foul	foul	foul	-	foul	foul	foul	-	-	-	foul	foul	foul	foul	foul	
Asset ID	-	4054074	-	-	4054077	-	4033349	-	4033347	4033346	4033345	-	-	-	4033455	4033454	4033453	-	4031345	
length (m)	16.5	45.9	-	22.6	75.7	18.4	98.8	-	55.4	78.8	113.2	-	-	-	63.9	92.2	68.9	25.2	55.5	
Shape ID	-	CIRC	-	CIRC	CIRC	CIRC	CIRC	-	CIRC	CIRC	CIRC	-	-	-	CIRC	CIRC	CIRC	CIRC	CIRC	
width (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050	
height (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050	
us inv (m AD)	-	167.410	-	-	167.110	-	166.930	-	166.331	166.223	166.070	-	-	-	165.180	165.073	164.920	-	164.077	
ds inv (m AD)	-	167.230	-	-	166.960	-	166.441	-	166.223	166.070	165.670	-	-	-	165.074	164.920	164.482	-	163.891	
grad (m/m)	-	0.00392	-	-	0.00198	-	0.00495	-	0.00195	0.00194	0.00353	-	-	-	0.00166	0.00166	0.00636	-	0.00336	
r.pfc (m3/s)	-	8.912	-	8.467	6.335	-	0.783	-	0.492	0.491	0.662	-	-	-	0.454	0.454	0.888	0.595	1.583	
surc	0.43	0.17	-	0.15	0.18	0.47	0.28	-	0.37	0.37	0.32	-	-	-	0.39	0.38	0.28	0.33	0.33	
DS flow (m3/s)	-	0.26867	-	-	0.26941	-	0.12678	-	0.14199	0.14198	0.14197	-	-	-	0.14418	0.14416	0.14416	-	0.36568	
DS velocity (m/s)	-	0.810	-	0.924	0.733	-	1.276	-	0.968	1.174	1.245	-	-	-	0.932	1.257	1.448	1.252	1.460	

Node	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
Node ID	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
System type	foul	foul	-	foul	foul	foul	foul	foul	foul	foul	foul			foul	foul	foul	foul	-	foul	foul
ground (m AD)	-	-	-	171.559	171.764	171.367	169.674	-	169.570	169.697	169.076			168.949	167.553	166.599	168.118	-	-	-
level (m AD)	-	-	-	167.409	167.312	167.137	166.625	-	166.498	166.309	165.862			165.471	165.360	165.128	164.689	-	-	-
expr:HGL Freeboard	4.439	4.249	-	4.150	4.452	4.230	3.049	2.919	3.072	3.388	3.214			3.478	2.193	1.471	3.429	-	3.947	5.396

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Post-Development Do-Nothing Condition Dry Weather Flow	Checked: SD	Drawn: SA
	Date: March 2024	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: B-1.3

APPENDIX

APPENDIX

B-2 POST-DEVELOPMENT CONDITION ANALYSIS – WET WEATHER FLOW – 2-YEAR 6 HOUR CHICAGO EVENT

Define Fields

Title: 26 Hounslow Avenue External Sanitary Sewer Study

Type Post-Development Do-Nothing Condition

Weather Event: Wet Weather Flow - 2-year 6-hour Chicago Storm

Project No: CA0003234.0568 CA

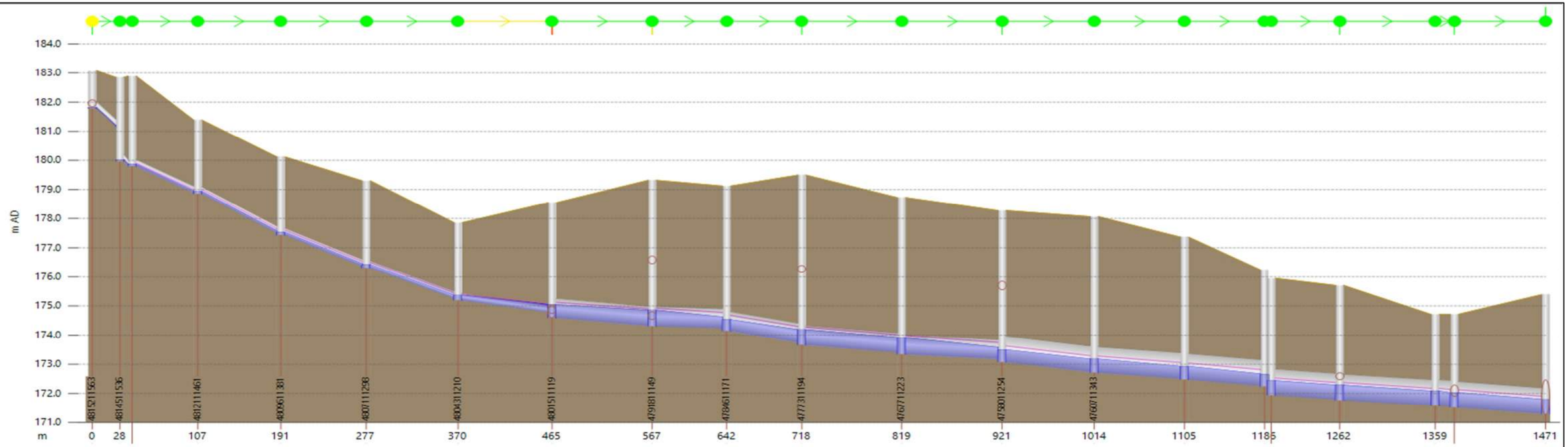
Drawn By SA

Checked By SD

Date March 2024

Appendix: B-2

1. Primary Alignment



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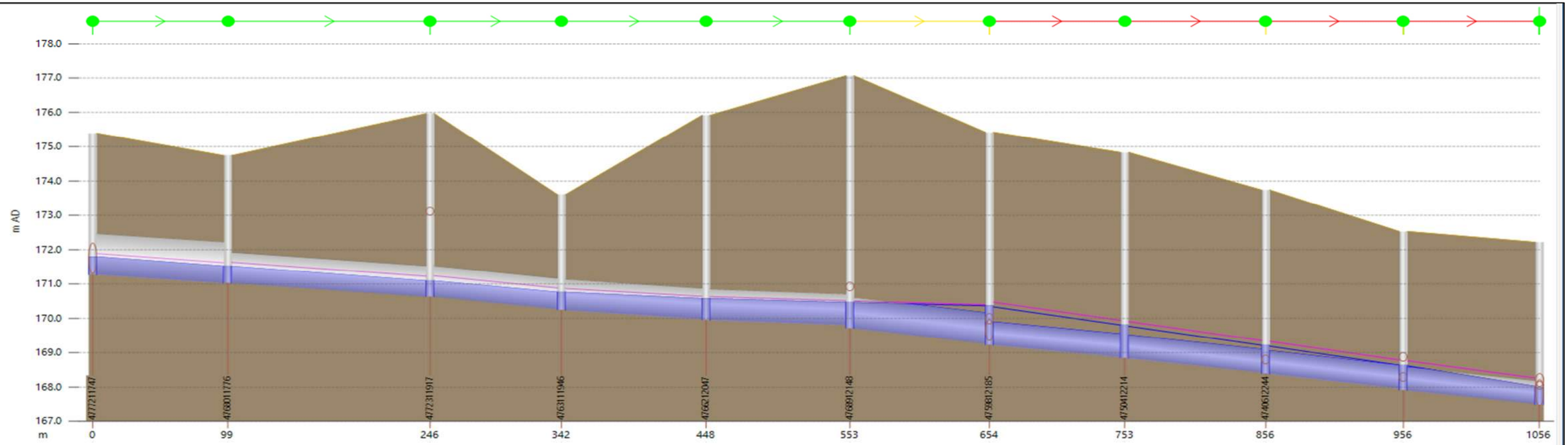
System type	foul	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	-	foul
Asset ID	-	-	4031718	4031719	4031720	4031721	4031722	4034282	4032429	4032430	4032431	4033564	4033561	4033562	4033563	4166911	4032555	-	4032320
length (m)	27.9	-	66.6	84.1	86.2	93.0	95.2	101.3	75.2	76.3	100.8	101.7	93.3	91.5	81.0	69.1	96.9	-	92.5
Shape ID	CIRC	-	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	-	CIRC
width (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
height (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900
us inv (m AD)	-	-	179.791	178.850	177.430	176.300	175.190	174.589	174.308	174.136	173.653	173.333	173.070	172.703	172.470	171.940	171.760	-	171.515
ds inv (m AD)	-	-	178.880	177.500	176.360	175.260	174.780	174.318	174.236	173.743	173.403	173.175	172.730	172.500	172.260	171.790	171.577	-	171.298
grad (m/m)	-	-	0.01369	0.01605	0.01241	0.01118	0.00431	0.00268	0.00096	0.00515	0.00248	0.00155	0.00364	0.00222	0.00259	0.00217	0.00189	-	0.00235
r.pfc (m3/s)	-	-	0.070	0.075	0.066	0.063	0.039	0.435	0.260	0.603	0.419	0.331	1.093	0.853	0.922	0.844	0.787	-	0.877
surc	0.10	-	0.29	0.33	0.40	0.47	1.00	0.79	0.80	0.66	0.78	0.85	0.50	0.53	0.50	0.55	0.58	-	0.56
DS flow (m3/s)	-	-	0.01153	0.01656	0.02136	0.02674	0.02960	0.32094	0.37045	0.37136	0.40490	0.40599	0.47680	0.47844	0.48266	0.48505	0.51061	-	0.53305
DS velocity (m/s)	-	-	0.964	1.153	1.149	1.186	0.977	1.067	1.754	1.650	1.425	1.814	1.516	1.626	1.731	1.359	1.410	-	1.497

Node		-	-	4812111461	4809611381	4807111298	4804311210	4801511119	4791811149	4784611171	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
Node ID		-	-	4812111461	4809611381	4807111298	4804311210	4801511119	4791811149	4784611171	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-
System type		-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)		-	-	181.384	180.118	179.301	177.862	178.546	179.315	179.122	179.494	178.722	178.276	178.068	177.365	-	-	175.706	174.710	174.716	-
level (m AD)		-	-	178.934	177.531	176.417	175.361	175.045	174.854	174.529	174.187	173.912	173.491	173.177	172.924	-	-	172.284	172.077	172.023	-
expr:HGL Freeboard		-	3.026	2.450	2.587	2.884	2.501	3.501	4.461	4.593	5.307	4.810	4.785	4.891	4.441	3.586	-	3.422	2.633	2.693	3.594

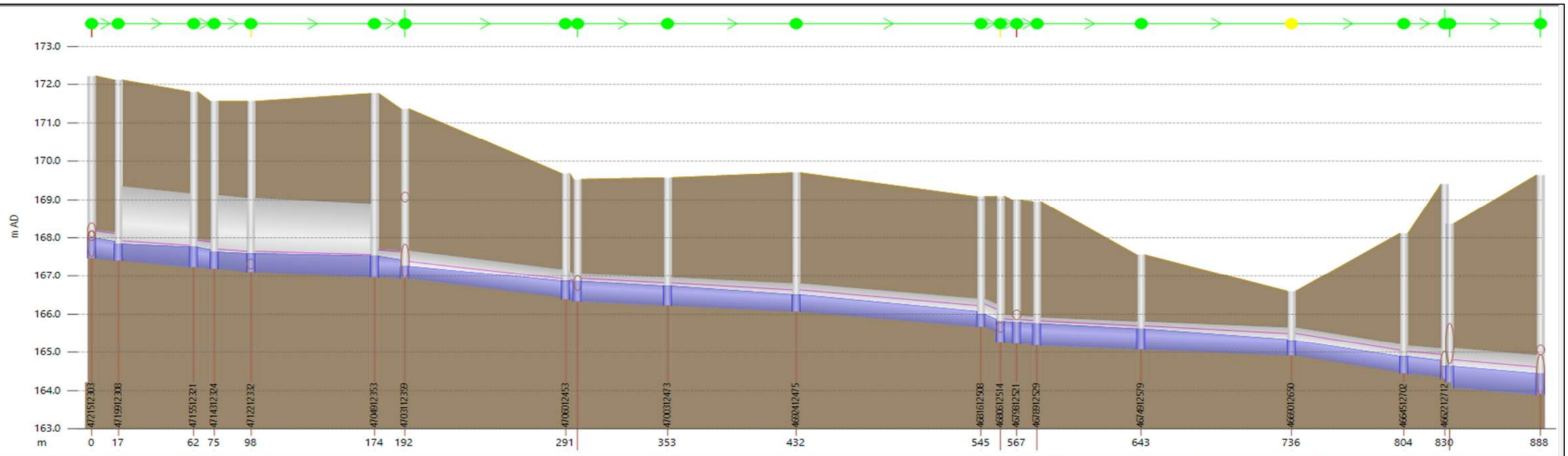
26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Post-Development Do-Nothing Condition Wet Weather Flow - 2-year 6-hour Chicago Storm	Checked: SD	Drawn: SA
	Date: March 2024	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: B-2.1



Link	4777211747.1	4768011776.1	4772311917.1	4763111946.1	4766212047.1	4768912148.1	4759812185.1	4750412214.1	4740612244.1	4730912273.1
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
Asset ID	4031994	4032319	4032318	4032317	4031993	4031992	4032316	4032315	4032314	4032313
length (m)	98.5	147.7	95.8	105.5	105.1	101.7	98.7	103.0	100.4	99.1
Shape ID	RECT	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	900	900	900	900	900	675	675	675	675
height (mm)	1200	900	900	900	900	900	675	675	675	675
us inv (m AD)	171.273	171.029	170.634	170.241	169.954	169.710	169.223	168.839	168.385	167.908
ds inv (m AD)	171.029	170.634	170.271	169.979	169.810	169.263	168.869	168.425	167.958	167.519
grad (m/m)	0.00248	0.00267	0.00379	0.00248	0.00137	0.00440	0.00359	0.00402	0.00425	0.00393
r.pfc (m3/s)	1.296	0.936	1.115	0.902	0.670	1.200	0.504	0.533	0.548	0.527
surc	0.44	0.54	0.55	0.66	0.72	1.00	2.00	2.00	2.00	2.00
DS flow (m3/s)	0.53330	0.53372	0.55626	0.55208	0.53890	0.52844	0.61272	0.61260	0.61915	0.62485
DS velocity (m/s)	1.456	1.648	1.581	1.390	1.797	1.257	1.815	1.832	1.832	2.180

Node	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
Node ID	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	175.389	174.742	175.965	173.608	175.914	177.061	175.422	174.833	173.738	172.529	172.217
level (m AD)	171.795	171.518	171.090	170.762	170.576	170.461	170.368	169.803	169.216	168.636	167.996
expr:HGL Freeboard	3.594	3.224	4.875	2.846	5.338	6.600	5.054	5.030	4.522	3.893	4.221

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Post-Development Do-Nothing Condition Wet Weather Flow - 2-year 6-hour Chicago Storm	Checked: SD	Drawn: SA
	Date: March 2024	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: B-2.2



Link	-	4719912308.1	-	-	4712212332.1	-	4703112359.1	-	4705712460.1	4700312473.1	4692412475.1	-	-	-	4678912529.1	4674912579.1	4669012650.1	-	4661912712.1
System type	foul	foul	-	foul	foul	foul	foul	-	foul	foul	foul	-	-	-	foul	foul	foul	foul	foul
Asset ID	-	4054074	-	-	4054077	-	4033349	-	4033347	4033346	4033345	-	-	-	4033455	4033454	4033453	-	4031345
length (m)	16.5	45.9	-	22.6	75.7	18.4	98.8	-	55.4	78.8	113.2	-	-	-	63.9	92.2	68.9	25.2	55.5
Shape ID	-	CIRC	-	CIRC	CIRC	CIRC	CIRC	-	CIRC	CIRC	CIRC	-	-	-	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
height (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
us inv (m AD)	-	167.410	-	-	167.110	-	166.930	-	166.331	166.223	166.070	-	-	-	165.180	165.073	164.920	-	164.077
ds inv (m AD)	-	167.230	-	-	166.960	-	166.441	-	166.223	166.070	165.670	-	-	-	165.074	164.920	164.482	-	163.891
grad (m/m)	-	0.00392	-	-	0.00198	-	0.00495	-	0.00195	0.00194	0.00353	-	-	-	0.00166	0.00166	0.00636	-	0.00336
r.pfc (m3/s)	-	8.912	-	8.467	6.335	-	0.783	-	0.492	0.491	0.662	-	-	-	0.454	0.454	0.888	0.595	1.583
surc	0.69	0.27	-	0.24	0.29	0.74	0.57	-	0.70	0.67	0.58	-	-	-	0.76	0.71	0.55	0.59	0.53
DS flow (m3/s)	-	0.63238	-	-	0.63541	-	0.29138	-	0.42174	0.42151	0.42132	-	-	-	0.44725	0.44729	0.44723	-	0.85711
DS velocity (m/s)	-	0.970	-	1.129	0.890	-	1.337	-	1.326	1.577	1.759	-	-	-	1.318	1.799	1.816	1.799	1.869

Node	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
Node ID	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
System type	foul	foul	-	foul	foul	foul	foul	foul	foul	foul	foul			foul	foul	foul	foul	-	foul	foul
ground (m AD)	-	-	-	171.559	171.764	171.367	169.674	-	169.570	169.697	169.076			168.949	167.553	166.599	168.118	-	-	-
level (m AD)	-	-	-	167.585	167.523	167.252	166.866	-	166.730	166.507	165.993			165.751	165.612	165.301	164.891	-	-	-
expr:HGL Freeboard	4.280	4.050	-	3.974	4.241	4.115	2.808	2.671	2.840	3.190	3.083			3.198	1.941	1.298	3.227	-	3.741	5.194

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Post-Development Do-Nothing Condition Wet Weather Flow - 2-year 6-hour Chicago Storm	Checked: SD	Drawn: SA
	Date: March 2024	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: B-2.3

APPENDIX

APPENDIX

B-3 POST-DEVELOPMENT CONDITION ANALYSIS – WET WEATHER FLOW – MAY 12, 2000 ASSESSMENT EVENT

Define Fields

Title: 26 Hounslow Avenue External Sanitary Sewer Study

Type Post-Development Do-Nothing Condition

Weather Event: Wet Weather Flow - May 12, 2000 Storm

Project No: CA0003234.0568 CA

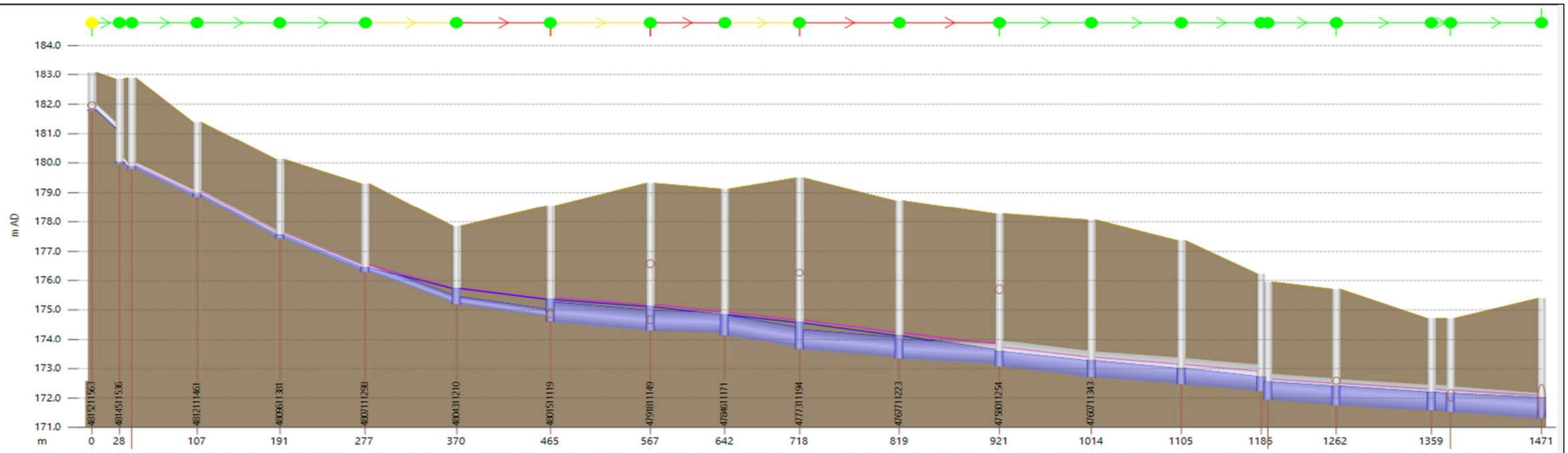
Drawn By SA

Checked By SD

Date March 2024

Appendix: B-3

1. Primary Alignment



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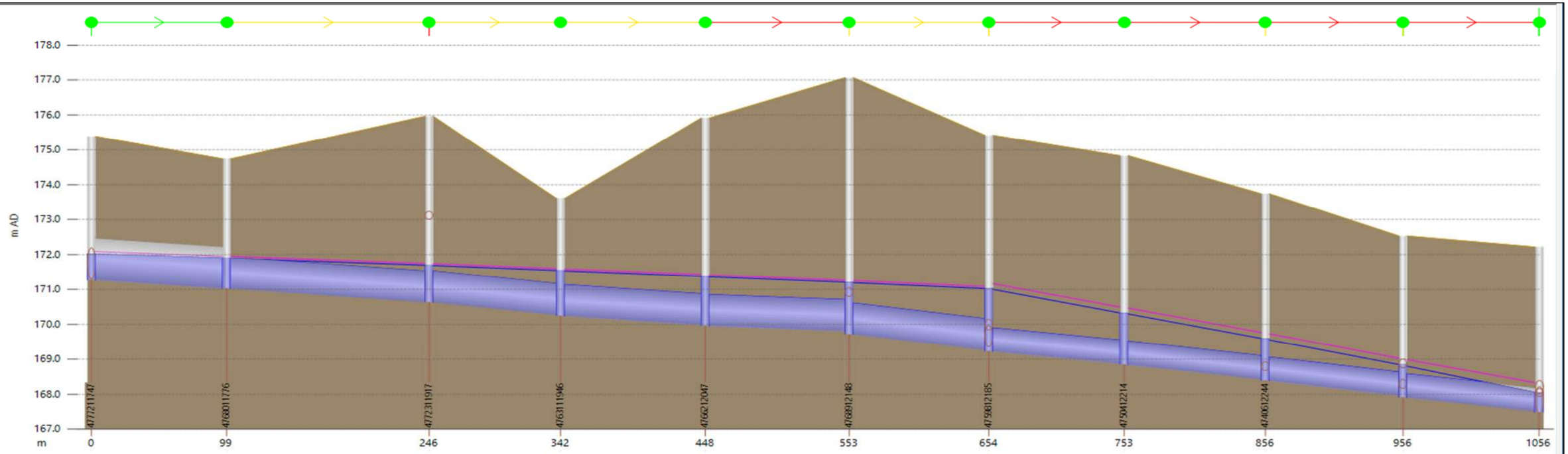
System type	foul	-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	-	foul						
Asset ID	-	-	4031718	4031719	4031720	4031721	4031722	4034282	4032429	4032430	4032431	4033564	4033561	4033562	4033563	4166911	4032555	-	4032320						
length (m)	27.9	-	66.6	84.1	86.2	93.0	95.2	101.3	75.2	76.3	100.8	101.7	93.3	91.5	81.0	69.1	96.9	-	92.5						
Shape ID	CIRC	-	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	-	CIRC						
width (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900						
height (mm)	250	-	250	250	250	250	250	675	675	675	675	675	900	900	900	900	900	-	900						
us inv (m AD)	-	-	179.791	178.850	177.430	176.300	175.190	174.589	174.308	174.136	173.653	173.333	173.070	172.703	172.470	171.940	171.760	-	171.515						
ds inv (m AD)	-	-	178.880	177.500	176.360	175.260	174.780	174.318	174.236	173.743	173.403	173.175	172.730	172.500	172.260	171.790	171.577	-	171.298						
grad (m/m)	-	-	0.01369	0.01605	0.01241	0.01118	0.00431	0.00268	0.00096	0.00515	0.00248	0.00155	0.00364	0.00222	0.00259	0.00217	0.00189	-	0.00235						
r.pfc (m3/s)	-	-	0.070	0.075	0.066	0.063	0.039	0.435	0.260	0.603	0.419	0.331	1.093	0.853	0.922	0.844	0.787	-	0.877						
surc	0.10	-	0.33	0.39	0.49	1.00	2.00	1.00	2.00	1.00	2.00	2.00	0.60	0.63	0.59	0.69	0.72	-	0.80						
DS flow (m3/s)	-	-	0.01473	0.02290	0.03072	0.03766	0.04309	0.40622	0.47883	0.48096	0.53846	0.54060	0.63435	0.63746	0.64452	0.64859	0.68838	-	0.73281						
DS velocity (m/s)	-	-	1.051	1.283	1.281	1.249	0.903	1.153	1.913	1.634	1.455	2.039	1.597	1.725	1.907	1.400	1.454	-	1.535						
Node		-	-	4812111461	4809611381	4807111298	4804311210	4801511119	4791811149	4784611171	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-					
Node ID		-	-	4812111461	4809611381	4807111298	4804311210	4801511119	4791811149	4784611171	4777311194	4767711223	4758011254	4760711343	4763411430	-	-	4770411561	-	-	-					
System type		-	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul				
ground (m AD)		-	-	181.384	180.118	179.301	177.862	178.546	179.315	179.122	179.494	178.722	178.276	178.068	177.365	-	-	175.706	174.710	174.716	-				
level (m AD)		-	-	178.948	177.553	176.448	175.725	175.359	175.119	174.845	174.582	174.137	173.572	173.269	173.007	-	-	172.408	172.205	172.161	-				
expr:HGL Freeboard		-	3.017	2.436	2.565	2.853	2.137	3.187	4.196	4.277	4.912	4.585	4.704	4.799	4.358	3.518	-	3.298	2.505	2.555	3.368				

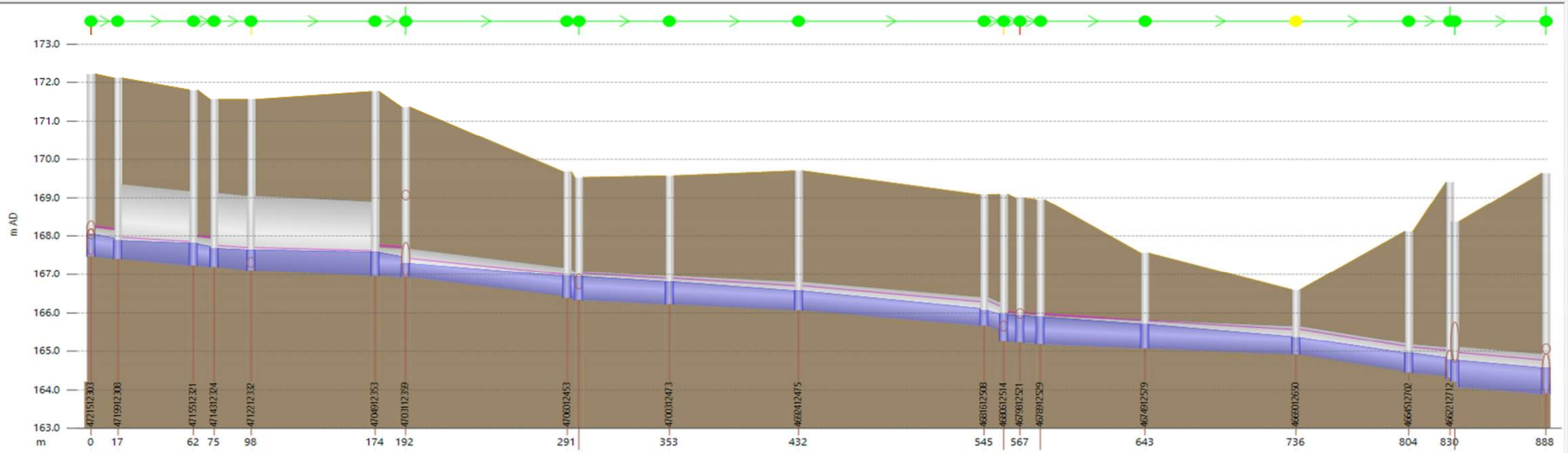
26 Hounslow Avenue External Sanitary Sewer Study		
Post-Development Do-Nothing Condition Wet Weather Flow - May 12, 2000 Storm	Checked SD	Drawn SA
	Date March 2024	Project No CA0003234.0568 CA
	Scale NTS	Figure No B-3.1



Link	4777211747.1	4768011776.1	4772311917.1	4763111946.1	4766212047.1	4768912148.1	4759812185.1	4750412214.1	4740612244.1	4730912273.1
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
Asset ID	4031994	4032319	4032318	4032317	4031993	4031992	4032316	4032315	4032314	4032313
length (m)	98.5	147.7	95.8	105.5	105.1	101.7	98.7	103.0	100.4	99.1
Shape ID	RECT	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	900	900	900	900	900	675	675	675	675
height (mm)	1200	900	900	900	900	900	675	675	675	675
us inv (m AD)	171.273	171.029	170.634	170.241	169.954	169.710	169.223	168.839	168.385	167.908
ds inv (m AD)	171.029	170.634	170.271	169.979	169.810	169.263	168.869	168.425	167.958	167.519
grad (m/m)	0.00248	0.00267	0.00379	0.00248	0.00137	0.00440	0.00359	0.00402	0.00425	0.00393
r.pfc (m3/s)	1.296	0.936	1.115	0.902	0.670	1.200	0.504	0.533	0.548	0.527
surc	0.73	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00	2.00
DS flow (m3/s)	0.72950	0.69818	0.70401	0.69035	0.69244	0.72965	0.69225	0.69241	0.70191	0.71233
DS velocity (m/s)	1.615	1.697	1.635	1.428	1.785	1.256	1.818	1.847	1.881	2.335

Node	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
Node ID	-	4768011776	4772311917	4763111946	4766212047	4768912148	4759812185	4750412214	4740612244	4730912273	-
System type	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul	foul
ground (m AD)	175.389	174.742	175.965	173.608	175.914	177.061	175.422	174.833	173.738	172.529	172.217
level (m AD)	172.021	171.900	171.699	171.548	171.380	171.211	171.028	170.324	169.590	168.841	168.046
expr:HGL Freeboard	3.368	2.842	4.266	2.060	4.534	5.850	4.394	4.509	4.148	3.688	4.171

26 Hounslow Avenue External Sanitary Sewer Study	wsp	
Post-Development Do-Nothing Condition Wet Weather Flow - May 12, 2000 Storm	Checked: SD	Drawn: SA
	Date: March 2024	Project No: CA0003234.0568 CA
	Scale: NTS	Figure No: B-3.2



Link	-	4719912308.1	-	-	4712212332.1	-	4703112359.1	-	4705712460.1	4700312473.1	4692412475.1	-	-	-	4678912529.1	4674912579.1	4669012650.1	-	4661912712.1
System type	foul	foul	-	foul	foul	foul	foul	-	foul	foul	foul	-	-	-	foul	foul	foul	foul	foul
Asset ID	-	4054074	-	-	4054077	-	4033349	-	4033347	4033346	4033345	-	-	-	4033455	4033454	4033453	-	4031345
length (m)	16.5	45.9	-	22.6	75.7	18.4	98.8	-	55.4	78.8	113.2	-	-	-	63.9	92.2	68.9	25.2	55.5
Shape ID	-	CIRC	-	CIRC	CIRC	CIRC	CIRC	-	CIRC	CIRC	CIRC	-	-	-	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
height (mm)	750	1950	-	1950	1950	750	750	-	750	750	750	-	-	-	750	750	750	750	1050
us inv (m AD)	-	167.410	-	-	167.110	-	166.930	-	166.331	166.223	166.070	-	-	-	165.180	165.073	164.920	-	164.077
ds inv (m AD)	-	167.230	-	-	166.960	-	166.441	-	166.223	166.070	165.670	-	-	-	165.074	164.920	164.482	-	163.891
grad (m/m)	-	0.00392	-	-	0.00198	-	0.00495	-	0.00195	0.00194	0.00353	-	-	-	0.00166	0.00166	0.00636	-	0.00336
r.pfc (m3/s)	-	8.912	-	8.467	6.335	-	0.783	-	0.492	0.491	0.662	-	-	-	0.454	0.454	0.888	0.595	1.583
surc	0.75	0.30	-	0.27	0.32	0.81	0.68	-	0.81	0.77	0.66	-	-	-	0.94	0.83	0.63	0.67	0.65
DS flow (m3/s)	-	0.73277	-	-	0.74255	-	0.33532	-	0.51233	0.51207	0.51191	-	-	-	0.55903	0.55911	0.55903	-	1.20219
DS velocity (m/s)	-	0.994	-	1.139	0.909	-	1.384	-	1.393	1.644	1.887	-	-	-	1.407	1.954	1.907	1.955	2.036

Node	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
Node ID	-	-	-	4712212332	4704912353	4703112359	4706012453	-	4700312473	4692412475	4681612508			-	4674912579	4669012650	4664512702	-	-	-
System type	foul	foul	-	foul	foul	foul	foul	foul	foul	foul	foul			foul	foul	foul	foul	-	foul	foul
ground (m AD)	-	-	-	171.559	171.764	171.367	169.674	-	169.570	169.697	169.076			168.949	167.553	166.599	168.118	-	-	-
level (m AD)	-	-	-	167.634	167.580	167.284	166.953	-	166.805	166.568	166.058			165.894	165.706	165.362	164.954	-	-	-
expr:HGL Freeboard	4.238	4.001	-	3.925	4.184	4.083	2.721	2.584	2.765	3.129	3.018			3.055	1.847	1.237	3.164	-	3.604	5.067

26 Hounslow Avenue External
Sanitary Sewer Study

Post-Development Do-
Nothing Condition
Wet Weather Flow - May 12,
2000 Storm

wsp

Checked SD	Drawn SA
Date March 2024	Project No CA0003234.0568 CA
Scale NTS	Figure No B-3.3