

Hydrock

Proposed Development

Rail Central, Northamptonshire

Flood Risk Assessment, Hydraulic Modelling and Drainage Strategy Report (Part 1: Main SRFI Site)

Final Report

Ashfield Land Management Ltd

February 2018 Hydrock Ref: C151171-FRA001

DOCUMENT CONTROL SHEET

Issued by:	Hydrock Consultants Limited Over Court Barns Over Lane Almondsbury
	Bristol BS32 4DF
	Tel: 01454 619533 Fax: 01454 614125 www.hydrock.com
Client:	Ashfield Land Management Ltd
Project:	Proposed Development - Rail Central, Northamptonshire
Title:	Flood Risk Assessment, Hydraulic Modelling and Drainage Strategy Report
Status:	Final Report
Date:	February 2018

Document Production Record

Issue Number:	1	Name	Signature
Prepared		Simon Mirams BSc, MCIWEM, C.WEM, CSci Senior Flood Risk Consultant	Jonion Miamy
Checked		David Lloyd BSc, PhD Technical Director – Flood Risk	Dew (e,)
Approved		David Lloyd BSc, PhD Technical Director – Flood Risk	Dew (e,)

Document Revision Record

Issue number	Date	Revision Details
1	18 th July 2017	Final Report for review
2	2 nd February 2018	Final Report

Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

CONTENTS

1.0	INTRODUCTION	2
2.0	SITE INFORMATION	3
2.1	Existing Situation	3
2.2	Proposed Development	3
3.0	ASSESSMENT OF FLOOD RISK	6
3.1	Fluvial and Tidal Flooding	6
3.2	Surface Water Flooding	7
3.3	Groundwater Flooding	9
3.4	Infrastructure Failure Flooding	9
3.5	Flooding from Artificial Sources	9
3.6	Summary	10
4.0	HYDROLOGICAL & HYDRAULIC ASSESSMENT (BASELINE)	11
4.1	Background	11
4.2	Hydrological Modelling	12
4.3	Hydraulic Assessment	19
4.4	2D – TUFLOW Model	19
7.1	Results	21
8.0	NN NPS & NPPF REQUIREMENTS	25
8.1	Sequential Test	25
8.2	Exception Test	25
9.0	SURFACE WATER MANAGEMENT	27
9.1	Pre-Development	31
9.2	Post-Development	31
10.0	FOUL WATER MANAGEMENT	31
10.1	Pre-Development	31
10.2	Post-Development	31
11.0	CONCLUSIONS	32

APPENDICES

APPENDIX A	Site Information
APPENDIX B	Hydraulic Modelling Study
APPENDIX C	Drainage Strategy

1.0 INTRODUCTION

This report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of our client Ashfield Land Management Ltd in support of an application for Development Consent under the Planning Act 2008, to be submitted to the Examining Authority, for the proposed development of 'Rail Central', a Strategic Rail Freight Interchange (SRFI) in Northamptonshire.

This report forms an appendix to the PEIR for the proposed development (Appendix 14.1).

The proposed development of the main site (the 'Main SRFI Site') is located within the administrative area of South Northamptonshire. Proposed highways works are situated at locations within South Northamptonshire and Northampton Borough, and are needed in order to mitigate relevant significant effects on the highway network arising for the development of the Main SRFI Site.

The Flood Risk Section of the National Networks National Policy Statement (NN NPS) has been reviewed and addressed within this report.

Local Planning Authorities are advised by the Government's *National Planning Policy Framework* (*NPPF*) to consult the Environment Agency (EA) on development proposals in areas at risk of flooding and/or for sites greater than 1ha in area.

This report has been prepared to satisfy any potential concerns the EA may have with the proposed development and to meet the requirements of NN NPS and NPPF through:

- Providing an assessment of whether the site is likely to be affected by flooding; and,
- Detailing the measures necessary to mitigate any flood risk identified, to ensure that the proposed development and end use would be safe, and that flood risk would not be increased elsewhere.

The report considers the requirements for undertaking a FRA as stipulated in NN NPS and NPPF. Only those requirements that are appropriate to a development of this nature have been considered in the compilation of this report.

This report has been prepared in accordance with current EA Policy and the requirements of the LLFA.

The Proposed Development can be considered as comprising the following main groupings of elements. FRA reports have been/will be provided for each element

• FRA Part 1 - the 'Main SFRI Site' on which the SRFI will be delivered (including A43 access and all rail infrastructure);

• FRA Part 2 - J.15a works including summary of Other Minor Highways works

2.0 SITE INFORMATION

2.1 Existing Situation (Main SRFI Site)

2.1.1 Location

Table.1: Site Referencing Information

Site Address	Rail Central, Northamptonshire
Grid Reference	472641, 254048 SP726540

2.1.2 Existing Land Use

The site is currently undeveloped and in agricultural use. The only built form within the site are farm storage buildings and gravelled access routes.

The site is located to the north of Blisworth and south of Milton Malsor with Northampton being beyond Milton Malsor to the north.

The overall site area is bordered by existing railway lines to the east and south, and by the A43 road to the west. To the north, and beyond the railway lines and A43 road is a mixture of undeveloped agricultural land with a number of small residential villages.

Two watercourses have been identified within the Main SFRI Site and these are the Milton Malsor Brook and the Unnamed Watercourse. The Unnamed Watercourse has its source on the southern site boundary and flows in a north westerly direction, under the Towcester Road, and into the Milton Malsor Brook. The Milton Malsor Brook is located within the western limit of the site and flows in a northerly direction.

2.2 Proposed Development

The Proposed Development is for a Strategic Rail Freight Interchange (SFRI) with associated highways works and ancillary development on land within the proposed 'Order Limits' in Northamptonshire in the East Midlands region of England, approximately 20km northwest of Milton Keynes and approximately 6km south of Northampton.

An application for Development Consent is required because the proposal is considered to comprise a Nationally Significant Infrastructure Project (NSIP) under the terms of subsections 26(3) to (7) of the PA2008.

The proposed development comprises the following key elements:

• A Road to Rail intermodal facility, including connections to the Northampton Loop Line, new rail sidings, gantry cranes, a container storage area, a train maintenance depot and facilities to transfer containers to Heavy Goods Vehicles (HGV);

• An Express Freight Terminal, including connections to the West Coast Main Line, a freight platform with associated loading and unloading facilities;

- Up to 740,000 sq.ft. (GIA)) of rail served logistics development;
- A new grade separated access point on the A43;
- Improvements to J15a of the M1;
- Other off site highways works;
- A lorry park;
- Control building/centre;
- Strategic open space and landscaping;

• Infrastructure to serve the development, including roads, an underpass, bus terminal and utilities infrastructure.

The Proposed Development can be considered as comprising the following main groupings of elements:

- The 'Main SFRI Site' on which the SRFI will be delivered (including A43 access and all rail infrastructure);
- J.15a works
- Other minor highways works

This part of the FRA (Part 1) considers the Main SRFI Site including the A43 access and all rail infrastructure. The key features of the proposed development of the Main SRFI Site are as follows:

• Demolition of existing buildings and structures;

• An intermodal freight terminal with direct connections to the Northampton Loop Line, capable of accommodating trains of up to 775m long, including up to 3 gantry cranes, container storage, a train maintenance depot and facilities to transfer containers to Heavy Goods Vehicles (HGV);

• An express freight terminal with direct connections to the West Coast Main Line, capable of accommodating trains of up to 240m long, a freight platform with associated loading and unloading facilities;

• Up to 702, 097 sq m (Gross External Area) of rail connected and rail served warehousing and ancillary service buildings including a lorry park, terminal control building and bus terminal;

• New road infrastructure including a new separated access point on the A34 (T), an internal site underpass (under Northampton Road) and necessary utilities infrastructure; and

• Strategic landscaping and open space including alterations to public rights of way, the creation of new ecological enhancement areas and publicly accessible open areas, flood attenuation, and the partial diversion of the Milton Malsor brook.

The extent of the Proposed Development for which consent is being sought is defined by a series of parameters. A masterplan has also been prepared which illustrates how the Proposed Development could be delivered within those parameters.

Construction of the Proposed Development will be phased over a number of years. Within the framework of the parameters, flexibility is required to enable floorspace to be delivered that meets specific occupier requirements that will only be known after Development Consent has been granted.

In order to effectively meet the demand which has been identified, it is necessary that that the DCO provides enough flexibility for the Applicant to accommodate changing occupier requirements and to give certainty to occupiers that they will be able to operate competitively without undue constraints imposed by the DCO during occupation.

The assessment work in this FRA has been undertaken to assess the reasonable worst-case on the basis of the fixed parameters which set out the location, extent and scale of the Proposed Development for which consent is sought.

3.0 ASSESSMENT OF FLOOD RISK

3.1 Fluvial and Tidal Flooding

The Main SFRI is shown by the EA's Flood Zone Mapping to be predominantly within Flood Zone 1 (land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%)). However, small areas of the Site immediately adjacent to the Milton Malsor Brook and the Unnamed Watercourse are shown to be at a potentially increased risk of flooding with some land categorised as being at medium and high risk. High risk is Flood Zone 3, which is considered to have a greater than 1 in 100 annual probability of river flooding (>1%) in any year. Medium risk is Flood Zone 2 which is land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%) in any year.

A plan locating both watercourses, along with other key features has been included within Appendix A.

Following discussions with the EA, modelling to produce the current Flood Zone mapping (Figure 1 below) was confirmed as having been produced using JFLOW modelling. The original JFLOW modelling used relatively coarse spatial data and considers flood risk over a wide area with a low resolution and as such is typically not suitable for determining site specific flood risk.

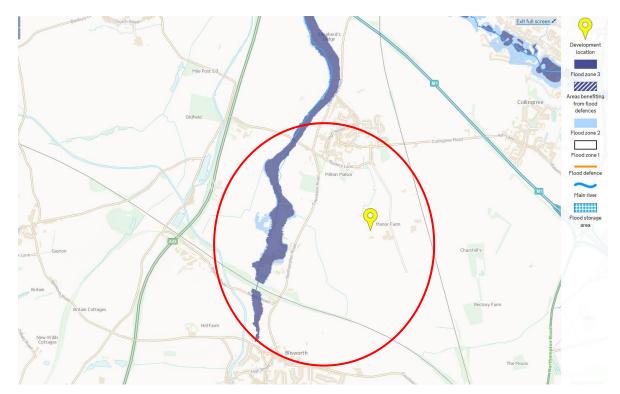


Figure 1: EA Flood Zone Mapping (approximate site location shown)

Two watercourses flow through the site. The largest is the Milton Malsor Brook which flows in a northerly direction through the western parcel of the site. There is also an Unnamed Watercourse that has its source within the approximate centre of the southern boundary and flows in a north westerly direction under Towcester Road before flowing into the Milton Malsor Brook a short distance beyond.

Both watercourses are rural and are crossed/ within culverts in a number of places. The Unnamed Watercourse is crossed by Towcester Road and a farm access culvert whilst the only formal structure on the Milton Malsor Brook is where it flows under Rectory Lane.

The EA have confirmed that they hold no information relating to historic flood events on the site. In addition, Northamptonshire County Council's (the LLFA) Strategic Flood Risk Assessment also makes no reference to any recorded historic incidents of fluvial flooding within the general Main SFRI site or immediately surrounding area.

However, anecdotal records provided by local residents indicate that the Main SFRI Site has previously experienced localised flooding and evidence has been provided in the form of photographs. These photographs confirm that flooding has occurred on the site is areas limited to lower lying areas that immediately border the watercourses. The information provided supports EA flood outlines in terms of general extents and mechanisms (i.e. location of out of bank flows and general flow routes).

Based on the current EA Flood Zone mapping, the majority of the site is shown to be within Flood Zone 1 and at low risk from fluvial flooding. However, the lower elevated sections of the site immediately adjacent to Milton Malsor Brook are currently within Flood Zone 3 and at high risk.

The northern section of the site is shown to be within Flood Zone 3 and potentially at high risk of fluvial flooding. The more elevated sections of the site to the south are shown to be at low risk and within Flood Zone 1. Following discussions with the EA it has been confirmed that site specific modelling is required to reliably assess existing levels of flood risk. This is detailed further in section 4.0.

Owing to the location of the site relative to tidally influenced areas the risk from this source is considered negligible and as such no further assessment will be required. The watercourses within the Study Area drain into the River Nene. The River Nene is not shown as being tidally influenced until around 65km north east of the downstream limit of the study area.

3.2 Surface Water Flooding

The Local Authority Strategic Flood risk Assessment (SFRA) identifies surface water flooding occurs as a result of overland flow from adjacent land and intense rainfall that is unable to soak into the ground (in the event that soil storage capacity is exceeded) or enter watercourses or engineered drainage systems. Any generated overland flows either drain into existing land drainage features or follow the general topography which can increase the potential of localised flooding in lower lying areas. The SFRA does not make reference to any known incidents of surface water flooding at the site or wider Milton Malsor area.

However, anecdotal records provided by local residents indicate that the site has previously experienced localised flooding and evidence has been provided in the form of photographs. These photographs confirm that historic flooding through the site has occurred but that it has not been extensive and, from the information provided, has been limited to lower lying areas of the Study Area.

Whilst the SFRA does not highlight any previously recorded surface water flooding within the site, the EA's Flooding from Surface Water mapping predicts areas at potential risk from this source through the western section of the site that closely match, but extended further, than the EA's fluvial flood map. Two additional flow routes through the eastern sections of the site are also shown. The first is from the high section of land to the west with potential surface flows in an easterly direction towards the Milton Malsor Brook. The second route is within the east of the site where flows are predicted to be directed by the topography in a northerly direction away from the site.

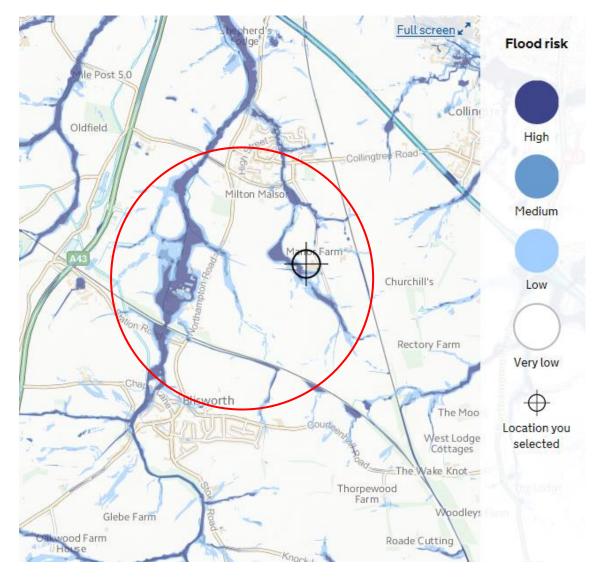


Figure 2: EA Flooding from Surface Water Mapping (approximate site location shown)

Whilst localised areas within the site are shown to be potentially at risk from surface water flooding, it is recognised that this mapping does not take account of existing sewer networks and/or land drainage ditches. The topographical survey has identified a number of small field ditches (width <2m) through the Study Area and as such these are considered likely to intercept a significant volume of potential surface water overland flows. Therefore, the outlines included in the EA's mapping are considered as being 'worst case' and to represent the event of a complete failure of the existing sewer and drainage network.

The topography of the site is such that any surface water flows generated within the site will flow in a generally northerly direction and drain away from the site.

It is therefore concluded that the site is at a lower risk of surface water flooding than is currently indicated by the EA's mapping owing to the presence of an existing field ditch network that will intercept and convey flows. However, the localised low points and valleys through the site will be at risk from surface water flooding in the event of blockage to this network.

3.3 Groundwater Flooding

Groundwater flooding is described by the SFRA as when water levels below ground rise above surface levels. This can be as a result of the water table rising after unusuallyprolonged rainfall. Flooding is most likely to occur in low lying areas underlain by permeable rocks (aquifers).

The British Geological Survey mapping, and a separate detailed Site Investigation Report (Report Ref: R/151171/001), indicates that the Site is predominantly underlain by the Dyrham Formation and the Whitby Mudstone formation and these are both considered as being low in permeability. As such, and given the Milton Malsor Brook and Unnamed Watercourse flow through the site, it is considered that groundwater levels would be in hydraulic connectivity with normal channel water levels but not to vary significantly over time. In order to adopt a conservative approach, the 1 in 1000 year fluvial outline from the modelling study is considered as being representative of the 'worst case' groundwater flooding scenario. The lower elevated sections of the Site that immediately border the watercourse are therefore considered to be at an increased risk from this source.

3.4 Infrastructure Failure Flooding

The SFRA does not make reference to any previously recorded incidents of infrastructure flooding within the site or surrounding area.

The site consists of mainly arable farmland with some smaller scale pastoral fields. As such, it is considered that there is only a limited engineered sewer network serving, or running through the site.

From the review of sewer records it is concluded that in the event of a failure (as a result of a blockage or collapse of the sewer) any generated overland flows would follow the existing topography and drain towards the two watercourse or other land drainage features within the site (i.e. field ditches) and drain towards the north. Any flooding as a result of an infrastructure failure would increase the flood risk but it is expected that this would only affect lower areas of the site before draining into existing land drainage features or watercourses. As such, and given that this is only considered to be a risk during exceedance event.

3.5 Flooding from Artificial Sources

The EA's Flooding from Reservoir Mapping shows that the Main SFRI Site is not within an area considered as being within the maximum extent of predicted flooding from artificial sources.

The Grand Union Canal abuts the site to the west and is shown by Ordnance Survey contour mapping to be a level above sections of the site and therefore there is the potential for

inundation of the Main SFRI Site in the event of a failure or breach of the Grand Union Canal embankment. The risk of such a failure is considered to be low owing to the level of ongoing inspections and maintenance undertaken by the Canal & River Trust. The risk for this source is therefore considered as minimal and residual only.

3.6 Summary

The existing EA flood risk data shows that the lower lying areas within the western section of the site and those areas immediately adjacent to the Milton Malsor Brook to be at an increased risk of fluvial flooding and Flood Zone 3. The remainder of the site is shown as being within Flood Zone 1. The EA have also confirmed that the Flood Zone map is based on relatively coarse modelling and this requires confirmation in order to assess site specific flood risk.

Much of the site has been shown by the EA's Surface Water flood risk mapping as being at high risk from this source. However, the mapping to determine the predicted surface water extents is unlikely to make an allowance for drainage ditches and as such is considered to be a 'worst case' prediction. Nevertheless, these areas of the site are considered to remain at risk for surface water in localised areas particularly in the event of a failure of the local drainage network.

The area in the western parcel of the site is also considered to be at risk of flooding from infrastructure failure and also the 'worst case' groundwater flooding extent. The remainder of the site is concluded to be at low risk from all assessed sources.

4.0 HYDROLOGICAL & HYDRAULIC ASSESSMENT (BASELINE)

4.1 Background

The existing flood mapping within the Milton Malsor area is based on JFLOW modelling. This identifies a potential fluvial flood risk from the Milton Malsor Brook which is the main watercourse that flows in a northerly direction through the Study Area and between Blisworth to the south and Milton Malsor to the north. From a review, and from provided historical flooding information, it is considered that the flooding mechanisms/extents may differ from those currently shown on the EA's mapping. A second Unnamed watercourse flows in a north westerly direction through the Study Area and is a tributary of the Milton Malsor Brook.

The Environment Agency (EA) have raised concerns that the existing flood mapping does not suitably represent the mechanisms and therefore the type of flooding events, such as the anecdotal information, and it has been agreed that a more detailed 1D/2D modelling study be undertaken to assess the existing fluvial flood risk to the site and its immediate environs. The aim of this more detailed modelling will be to better represent the range of potential flooding mechanisms to the site and wider area, allow comparison to known flood events, and to provide a clearer understanding of the potential future flood risk to the site and wider area for given design events. The second watercourse through the site has not currently been modelled and, as such, there is a requirement to include this within the assessment.

The design fluvial events considered are:

- 1 in 20 year,
- 1 in 100 year,
- 1 in 100year plus 35% allowance for climate change.
- 1 in 200 year.
- The 1 in 1000 year event

These fluvial flows consider the 1 in 20 year fluvial event as it is commonly used to define the functional floodplain (Flood Zone 3b), the 100 and 1000 year events as these are used to define the Zone 3a (High Risk) and Zone 1 (Medium Risk) limits respectively, and an allowance for a 35% increase in the 100 year flows to take account of the potential impact of climate change on fluvial flows based on the Higher Central value for a design life of 100 years for less vulnerable development in accordance with current guidance. In addition the 1 in 200 year event it to be assessed to meet the local requirement of Northamptonshire County Council.

In addition to assessing the existing 'baseline' risks to the site for fluvial this modelling study also considers the post-development conditions to assess the potential impact of the proposed mitigation measures on local and wider area flood risk. These measures include the realignment and redesigning of both watercourses to accommodate the proposed development. The modelling of the post- development conditions are to ensure that the proposed works have no detrimental impact on flood risk either at the site or to properties elsewhere, and to identify any potential factors detrimentally impacting on flood risk within the wider area. Any mitigation

measures identified have been modelled to investigate if they have any detrimental impact elsewhere.

The area of study has been discussed with the Environment Agency and has been defined so as to include the whole area that has the potential to impact on the site along with an area extending downstream sufficiently to demonstrate no detrimental impact elsewhere or boundary effects. The modelling includes two separate watercourses;

- the Milton Malsor Brook, and;
- the Unnamed Watercourse.

The Milton Malsor Brook is defined as a 'Main River' and flows in a predominantly northerly direction through the west section of the Study Area and ultimately drains into the River Nene.

The Unnamed Watercourse is an 'Ordinary Watercourse' and drains only a small catchment. This watercourse flows in a generally north westerly direction through the Study Area before joining the Milton Malsor Brook as it flows through the western section of the site.

4.2 Hydrological Modelling

The software used to assess return period flows is considered industry standard and, at the time of writing, is the most up-to-date version available. The software and versions used are detailed below:

- FEH CD-ROM Version 3 Using the 2013 Rainfall Data
- WINFAP FEH Version 3.0.003 referencing HiFlows databased version 5 (to include years up to 2015)
- ReFH2 Version 2.2.

4.2.1.1 Milton Malsor Brook

The Flood Estimation Handbook (FEH) (2013) approach has been used to obtain the relevent descriptors for the Milton Malsor catchment. This has been defined to a point at the downstream limit of the site. The catchment area to this point has been confirmed as 12.04km² (grid reference 472073, 253393). From a review of LiDAR Data and comparison with the FEH catchment outline, it was evident that the FEH data omits an area beyond the Grand Union Canal which would in fact drain into the Milton Malsor Brook. As such, the catchment area was increased to make an allowance for this area and this results in a revised area of 12.55km².

A manual check of the SPR and BFIHOST values has also been undertaken using the methodology suggested within the EA's Flood Estimation Guidance (Document Number 197_08). This involved overlaying the site-specific catchment (including the additional area) onto the soils map and determining the percentage of each HOST Class within the additional area added to the original FEH Catchment area.

The soil maps show that the additional area is underlain by HOST CLASS 18 (Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils). The HOST Class was taken from

Table 5.1 within Volume 5 of the Flood Estimation Handbook which provided associated SPR and BFI values for this HOST class of 30.8 and 0.589 respectively. Both of these values are less conservative (SPR is lower and BFI is higher) than those taken from the FEH Catchment Descriptors and included within Table 1 below. As such, it is considered that the SPR and BFI values originally generated are more conservative and these are therefore left unchanged.

The Catchment Descriptors generated are shown in Table 2 below.

Descriptor	Value	Descriptor	Value	Descriptor	Value
AREA	12.55	RMED-2D	38.8	C(1 km)	-0.026
ALTBAR	113	SAAR	625	D1(1 km)	0.333
ASPBAR	41	SAAR4170	648	D2(1 km)	0.303
ASPVAR	0.39	SPRHOST	30.8	D3(1 km)	0.241
BFIHOST	0.589	URBCONC1990	-99999	E(1 km)	0.302
DPLBAR	3.42	URBEXT1990	0.0047	F(1 km)	2.498
DPSBAR	34.9	URBLOC1990	-99999		
FARL	1	D1	-0.02488		
LDP	6.54	D2	0.31202		
PROPWET	0.3	D3	0.30353		
RMED-1H	11.8	E	0.29991		
RMED-1D	29	F	2.51872		
PROPWET	0.52	С	-0.2585		

Table 2: FEH (2013) The Milton Malsor Brook Catchment Descriptors

In line with best practice for a catchment of this nature, and noting that gauged data is not available for the watercourse itself, a Statistical analysis approach has been adopted, utilising WINFAP-FEH.

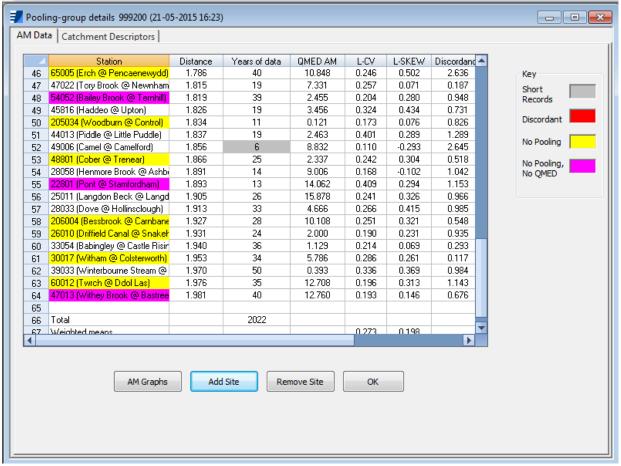
A pooling group has been compiled, comprising 554 years of data, with those stations indicated as being unsuitable for pooling removed, along with those with high discordancy values. Stations that were shown as having significantly different values for key attributes (AREA, SAAR, BFIHOST, URBEXT, and FARL) have also been removed in line with guidance within the WINFAP manual. Using this approach, a further seven donor stations were indicated as being unacceptable and were therefore removed from the pooling group. The seven stations removed have been listed below.

Station 25011 – Langdon Beck @ Langdon– Removed as SAAR = 1463 (compared to 625 for study catchment). Also removed as BFI < 0.25 (compared to 0.589 for study catchment)

- Station 49006 Camel @ Camelford– Removed as SAAR = 1418 (compared to 625 for study catchment)
- Station 47022 Tory Brook @ Newnham Park Removed as SAAR = 1403 (compared to 625 for study catchment)
- Station 28033 Dove @ Hollinsclough Removed as SAAR = 1346 (compared to 625 for study catchment)
- Station 26803 Water Forlornes @ Driffield Removed as BFI >0.8 (compared to 0.589 for study catchment)
- Station 33054 Babingley @ Castle Rising Removed as BFI >0.8 (compared to 0.589 for study catchment) and removed as FARL <0.95 (compared to 1 for study catchment)
- Station 47022 Tory Brook @ Newnham Park Removed as FARL < 0.95 (compared to 1 for study catchment)

A copy of the initial WINFAP-FEH generated, and the final amended pooling groups are shown in Figures 3 and 4 below respectively.





4	Station	Distance	Years of data	QMED AM	L-CV	L-SKEW	Discordand 🔺	
1	20002 (West Peffer Burn @ Luff	1.033	41	3.299	0.292	0.015	2.014	Key
2	25019 (Leven @ Easby)	1.094	37	4.989	0.342	0.390	0.641	Short
3	36010 (Bumpstead Brook @ Bro	1.275	48	7.545	0.370	0.178	1.353	Records
4	27051 (Crimple @ Burn Bridge)	1.299	43	4.514	0.219	0.154	0.170	_
5	203046 (Rathmore Burn @ Rath	1.315	33	10.770	0.136	0.104	1.293	Discordant
6	27010 (Hodge Beck @ Bransda	1.462	41	9.420	0.224	0.293	0.774	
7	44008 (South Winterbourne @ V	1.490	36	0.434	0.418	0.344	1.606	No Pooling
8	41020 (Bevern Stream @ Clappe	1.624	46	13.780	0.208	0.178	0.839	No Pooling,
9	22003 (Usway Burn @ Shillmoor	1.655	13	16.170	0.282	0.311	1.722	No QMED
10	27073 (Brompton Beck @ Snain	1.664	34	0.816	0.198	0.056	0.343	
11	72014 (Conder @ Galgate)	1.711	48	17.595	0.196	0.060	0.253	
12	73015 (Keer @ High Keer Weir)	1.729	25	12.135	0.162	0.022	0.511	
13	47022 (Tory Brook @ Newnham	1.815	22	7.227	0.262	0.093	0.471	
14	45816 (Haddeo @ Upton)	1.826	22	3.489	0.314	0.415	0.966	
15	28058 (Henmore Brook @ Ashb	1.891	12	9.006	0.155	-0.064	1.418	
16	39033 (Winterbourne Stream @	1.970	53	0.399	0.348	0.389	1.625	
17								
18	Total		554					
19	Weighted means		554		0.260	0.188		
							*	
	AM Graphs	Add	Site Rer	nove Site	OK			

The Generalised Logistic and Generalised Extreme Value distribution are both shown to offer an acceptable growth curve and have been applied accordingly.

QMED has been estimated based on donor station 32029– Flore at Experimental Catchment. This donor station has been selected based on having the closest 'centroid distance' to the study catchment, whilst being classified as suitable for QMED estimation and having a catchment area most similar to the study catchment. The QMED donor value (1.528m³/s) calculated was greater than the QMED value (1.226m³/s)obtained by using for the catchment descriptor method.

The impact of climate change on flows has been calculated based on a 35% increase in the 1 in 100 year flow event in line with current guidance.

A manual check of the Urban Adjustment Factor has also been undertaken. Whilst this is an automated process within WINFAP this manual check applies the equations detailed with the EA's Flood Estimation Guidelines (Report no. 197_08) to ensure that an appropriate Urban Adjustment factor is used. This manual check provided an UAF value that was only marginally greater than calculated using the automated process. The manually updated UAF value obtained was 1.03 as compared to the automated value of 1.01. The higher value has therefore been used in the assessment.

The resulting flows, with a summary of their method of derivation are included in Table 3 below.

Flood Event (Year)	WINFAP-FEH (m³/s)
1 in 100	4.499 ¹
1 in 100 + 35%	6.074 ²
1 in 200%	4.987 ¹
1 in 1,000	7.290 ¹

¹ WINFAP-FEH calculated flows.

² 1 in 100 year WINFAP-FEH calculated flow multiplied by 1.35.

In line with standard guidance, and as requested by the EA, a check of the calculated flows has been undertaken using ReFH2 to allow a comparison of flows to ensure that, where appropriate, a conservative approach has been adopted and the highest calculated flows used within the model. Using the updated catchment descriptors (area increased to 12.55km²) ReFH2 provided flows that were similar to those using WINFAP. As such, and given that WINFAP was using recorded values from a donor station, it was considered that these were the most appropriate.

4.2.1.2 Unnamed Watercourse

As for the Milton Malsor Brook, the Flood Estimation Handbook (FEH) (2013) has been used to derive the descriptors for the Unnamed Watercourse catchment. This has been defined to a point at the confluence with the Milton Malsor Brook. The catchment area to this point is 0.92km² (at grid reference 472850, 255050). A check of available ordnance survey contour mapping and LiDAR data confirms that no significant additional areas drain into this catchment and, as such, the generated catchment descriptors are deemed appropriate. These are summarise in Table 4 below.

Descriptor	Value	Descriptor	Value	Descriptor	Value
AREA	0.92	RMED-1H	11.5	D1	031909
ALTBAR	95	RMED-1D	28.7	D2	0.3011
ASPBAR	338	RMED-2D	38.4	D3	0.24061
ASPVAR	0.59	SAAR	614	E	0.30125
BFIHOST	0.465	SAAR4170	641	F	2.49763
DPLBAR	1.31	SPRHOST	38.18	C(1 km)	-0.025
DPSBAR	24.1	URBCONC1990	-99999	D1(1 km)	0.319
FARL	1	URBEXT1990	0.0041	D2(1 km)	0.308
FPEXT	0.1359	URBLOC1990	-99999	D3(1 km)	0.23
FPDBAR	0.584	URBCONC2000	-99999	E(1 km)	0.3
FPLOC	0.607	URBEXT2000	0	F(1 km)	2.506

Table 4: FEH (2013) The Unnamed Watercourses Catchment Descriptors

LDP	2.57	URBLOC2000	-99999
PROPWET	0.3	С	-0.02539

In line with best practice for a catchment of this nature, and noting that gauged data is not available for the watercourse itself, a Statistical analysis approach has been adopted, utilising WINFAP-FEH.

A pooling group has been compiled, comprising 508 years of data, with those stations indicated as being unsuitable for pooling removed, along with those with high discordancy values. The initial WINFAP-FEH generated data set and the final pooling group used are shown in Figures 5 and 6 below respectively.



	Station	Distance	Years of data	QMED AM	L·CV	L-SKEW	Discordand	
27	31023 (West Glen @ Easton Wo	1.513	42	1.878	0.408	0.311	0.658	Key
28	45013 (Tale @ Fairmile)	1.618	35	9.581	0.207	0.255	1.283	Short
29	22003 (Usway Burn @ Shillmoor	1.637	13	16.170	-0.282	-0.311	8.412	Records
30	50009 (Lew @ Norley Bridge)	1.640	26	18.955	0.155	-0.180	2.312	
31	41020 (Bevern Stream @ Clappe	1.662	45	13.660	0.210	0.189	0.517	Discordant
32	26803 (Water Forlornes @ Driffie	1.665	15	0.437	0.288	0.146	0.758	
33	203049 (Clady @ Clady Bridge)	1.670	32	23.242	0.184	0.093	0.309	No Pooling
34	52025 (Hillfarrance Brook @ Milv	1.685	22	10.674	0.182	-0.002	0.576	No Pooling,
35	33030 (Clipstone Brook @ Clipst	1.704	6	12.691	0.185	-0.194	4.424	No QMED
36	45818 (Withiel Florey Stream @	1.704	22	4.262	0.344	0.298	1.173	
37	27073 (Brompton Beck @ Snain	1.709	33	0.820	0.192	0.052	0.191	
38	72014 (Conder @ Galgate)	1.741	47	17.703	0.196	0.049	0.129	
39	73015 (Keer @ High Keer Weir)	1.758	24	12.187	0.164	0.008	0.278	
40	45816 (Haddeo @ Upton)	1.758	21	3.522	0.313	0.404	0.970	
41	29009 (Ancholme @ Toft Newto	1.767	40	1.834	0.366	0.370	1.423	
42	205034 (Woodburn @ Control)	1.777	11	0.121	0.173	0.076	0.794	
43	47022 (Tory Brook @ Newnham	1.783	21	7.331	0.255	0.072	0.128	
44	30015 (Cringle Brook @ Stoke F	1.784	38	1.314	0.248	0.182	0.111	
45								
46	Total		1480					
47	Weighted means		1480		0.266	0.162		
	AM Crasha		Site	nove Site	ОК			
	AM Graphs	Add	Rer	nove site	UK			

Figure 6: WINFAP-FEH Final Pooling	Group
------------------------------------	-------

	Station	Distance	Years of data	QMED AM	L-CV	L-SKEW	Discordanc 📥	
1	26802 (Gypsey Race @ Kirby Gi	0.893	15	0.109	0.284	0.270	0.257	Кеу
2	25019 (Leven @ Easby)	1.050	36	5.538	0.345	0.383	0.802	Short
3	20002 (West Peffer Burn @ Luff	1.154	41	3.299	0.292	0.015	2.417	Records
4	27051 (Crimple @ Burn Bridge)	1.218	42	4.539	0.221	0.149	0.318	
5	36010 (Bumpstead Brook @ Bro	1.293	47	7.500	0.375	0.186	1.031	Discordant
6	203046 (Rathmore Burn @ Rath	1.334	32	10.821	0.133	0.100	0.433	No Dealing
7	27010 (Hodge Beck @ Bransda	1.436	41	9.420	0.224	0.293	0.766	No Pooling
8	44008 (South Winterbourne @ V	1.471	35	0.448	0.414	0.336	0.530	No Pooling,
9	22003 (Usway Burn @ Shillmoor	1.637	13	16.170	-0.282	-0.311	3.805	No QMED
10	41020 (Bevern Stream @ Clappe	1.662	45	13.660	0.210	0.189	0.644	
11	26803 (Water Forlornes @ Driffie	1.665	15	0.437	0.288	0.146	2.396	
12	27073 (Brompton Beck @ Snain	1.709	33	0.820	0.192	0.052	0.421	
13	72014 (Conder @ Galgate)	1.741	47	17.703	0.196	0.049	0.216	
14	73015 (Keer @ High Keer Weir)	1.758	24	12.187	0.164	0.008	0.353	
15	45816 (Haddeo @ Upton)	1.758	21	3.522	0.313	0.404	1.207	
16	47022 (Tory Brook @ Newnham	1.783	21	7.331	0.255	0.072	0.404	
17								
18	Total		508					
19	Weighted means		508		0.234	0.154		
(▼	
	AM Graphs	Add	Site	move Site	ОК			

The Generalised Logistic distribution is shown to offer an acceptable growth curve and has therefore been applied accordingly.

QMED has been estimated based on donor station 33018 – Tove at Cappenham Bridge. This donor station has been selected based on having the closest 'centroid distance' to the study catchment, whilst being classified as suitable for QMED estimation and having a catchment area most similar to the study catchment.

The impact of climate change on flows has been calculated by multiplying the 1 in 100 year calculated flow by 1.35 to take account of the 35% revised allowance on flows in line with current guidance.

The initial pooling group included sites that were discordant. Whilst this is not reason enough to remove a station the impact of both including and removing the identified discordant stations has been assessed. Including the discordant station returned high flower estimates. To maintain a conservative assessment, approach including discordant stations was chosen as the preferred method for calculating the flows for the Unnamed Watercourse.

A manual check of the Urban Adjustment Factor has been undertaken. This provided a UAF value the same as that calculated using the automated process so no adjustment was required.

The resulting flows, with a summary of their method of derivation, are included in Table 5 below.

Table 5: Flow Calculations

Flood Event (Year)	WINFAP-FEH (m³/s)
--------------------	-------------------

1 in 100	0.831
1 in 100 + 35%	1.13 ²
1 in 200	0.99 ¹
1 in 1,000	1.44 ¹

¹ WINFAP-FEH calculated flows.

² 1 in 100 year WINFAP-FEH calculated flow multiplied by 1.35.

4.3 Hydraulic Assessment

4.3.1 Model Type

Based on discussions with the EA, and the identified need to consider overland flow routes, a linked 1D-2D model has been developed using Flood Modeller Pro 4.2.605.22474 and TUFLOW v2013-12-AB-w64.

4.3.2 1D Model

The 1D model developed includes the two watercourses described. These watercourse are linked by junctions. All river sections and structures are defined using information derived through the site specific topographical survey, with interpolates used between the surveyed sections where appropriate. For each river cross section those parts of each section beyond bank tops were deactivated (i.e. 1D model of the channel only) so as to provide the link to TUFLOW with consistent channel widths throughout each watercourse. A summary of the model nodes used is included in Table 6.

Tuble 0 10 Summary		
	Milton Malsor Brook	Unnamed Watercourse
Upstream Node	MMW1157	MME0773
Downstream Node	MMWM050	MME0000D
Cross Section Spacing (based on Samuels, 1989)	Varies but typically 80m	-
River Sections	14	11
Interpolates	0	3
Structures	1x Rectangular Conduit	2 x Circular Conduit

Table 6 1D Summary

4.4 2D – TUFLOW Model

4.4.1 Baseline Model

The 2D model is based on LiDAR data at a 1m horizontal resolution. This data was captured in 2010 and there is no more recent LiDAR data available. However, it is considered that little is likely to have changed within the site boundary or general Study Area since this data was obtained and therefore it remains a suitably accurate representation of the wider area topography and site levels. A Hillshade model of the LiDAR surface model was produced to

enable easy comparison with Ordnance Survey mapping and a review of both data sets confirms no significant changes in developed area has taken place since the LiDAR was flown.

The LiDAR height data was used to define the watersheds in the area and using this information the 2D domain area was defined. The domain followed the line of higher ground to both the west, east, and south of the site. No obvious higher ground was identified at the southern and downstream limit of the modelling study – which is around 200m downstream of the eastern site boundary. The model domain was therefore extended a significant distance downstream of the site to limit the potential for any backwater effects from the downstream boundary impacting on the modelled fluvial regime in the area of the site.

4.4.2 Boundary Conditions

The 1D model includes two upstream boundaries and one downstream boundary.

All upstream boundaries were modelled using ReFH units scaled to the peak flows as outlined in section 2.0.

The downstream boundary condition was assumed normal depth based on the average gradient through the downstream sections of modelled watercourse. All of these are significantly downstream of the downstream limit of the study area at Rectory Lane to avoid any impact on flood levels at the site. The gradient has been based on measurements taken from the LiDAR data and applied within the 'normal depth'.

4.4.3 Roughness Coefficients

Manning's n roughness coefficients used in the 1D Cross Sections and TUFLOW materials file are given in Table 7. Assigning Manning's values is subjective, but those used are considered appropriate for each of the identified land uses observed in the area during the survey, walkover, and review of available aerial photographs.

Table 7 Manning's n roughness coefficients (Open-Channel Hydraulics, Chow 1959).

Feature	Manning's n
Concrete	0.020
Roads	0.022
Gravel channel bed	0.035
Grass	0.040
Vegetation	0.065
Light woodland	0.070
Dense woodland	0.085

Reference V.T. Chow 'Open Channel Hydraulics'.

4.4.4 Structures

All details of the structures included in the 1D model are outlined in Table 8. The dimensions of each are based on measurements taken during the river channel survey specifically for this purpose.

Model Node(s) Type		Comment	Key Parameters
	Rectangular		Width – 1m
MMW0000	Culvert	Box Culvert under Rectory Lane	Height – 2.8m
MME0451CU	Circular Culvert	Farm Access Culvert	Diameter – 0.45m
MME0363	Circular Culvert	Towcester Road culvert crossing	Diameter – 0.9m

Table 8 Structures- Summary of structure details used in the model

7.1 Results

The baseline modelling results confirm that the current EA Flood Zone overestimates flood extents within the site with a significantly reduced outline predicted by the detailed linked 1D/2D model of both watercourses. Within this section the 1 in 1,000 year results are those that have been reviewed for both the pre and post development conditions in order to review the 'worst case' scenario. This approach was discussed with the EA as adopting a conservative approach given that this event has the highest predicted peak flows and is recognised as the extreme event. Whilst the extent of the modelling is reduced through the modelled reach there are consistencies with the EA's modelling and these are detailed below:

- Within the southern limits of the Study Area the watercourse is perched above the base on the valley. As such, and as demonstrated by the modelling, any out of bank flows would flow to the west and into the currently lower elevated areas and result in a significant area of flooding. The modelled results show that predicted depths within these sections of the site at a lower elevation than the watercourse would be around 0.1m with some isolated areas reaching maximum depths of 0.4m.
- Both the EA mapping and the modelled results suggest that the culverts under Rectory Lane have insufficient capacity for the 1 in 1,000 year event resulting in flows backing up behind the culverts and locally increasing the risk of flooding. The level of the road limits

the extent and depth of flooding immediately upstream of each structure as once reached flows overtop. The baseline results predict maximum depths within the site of up to a maximum depth of 1.5m upstream of Rectory Lane. Whilst the mechanisms is consistent with current mapping, then extend of flooding upstream is significantly reduced when compared to the EA's mapping.

Whilst there are the above similarities between the two modelling approaches, differences have also been observed and these are explained below:

- The EA's current wider area modelling focusses only on the Milton Malsor Brook due to this being a 'Main River' and does not appear to make any allowance for the Unnamed Watercourse. As such, the EA's mapping does not show that the culvert under Towcester Road and the farm access culvert. The detailed modelling confirms that these are undersized for the predicted peak flows and would restrict flows and result in an increased risk with out of bank flows predicted to extend around 120m upstream of the culvert and reach depths of up to 0.7m.
- The detailed modelling also predicts out of bank flows at the point of the confluence of the Unnamed Watercourse and Milton Malsor Brook. Whilst the EA mapping shows an area of increased risk at this location, it isn't based on detailed modelling of the two watercourses. The detailed modelling shows that these flow extend from the confluence upstream to Towcester Road with depths reaching a maximum of around 0.17m.

In general the detailed modelling shows that a significantly reduced area of the site is at risk from the 1 in 1,000 year event when compared to the existing EA Flood Zone map. The baseline modelling therefore confirms that a the majority of the site is within Flood Zone 1 with only localised areas at either a lower elevation to or immediately bordering the watercourse as being at an increased risk and within Flood Zone 2 and 3.

In terms of off-site flooding the modelled outlines are shown to be fairly consistent with the provided EA floodplain extents with only the immediate river corridor shown to be at an increased risk and within Flood Zones 2 and 3.

Whilst the modelling has confirmed that the level of risk to the site is reduced when compared to the EA's mapping, the proposed development requires either the culverting of sections or the realignment of both watercourses owing to the location of buildings and proposed post development ground levels. Given the potential future issues in relation to culverts blocking/collapsing, and from discussions with the EA, the diverting of the watercourses was preferred with any culverting being kept to an absolute minimum – i.e. only for roads crossings. The diverting of the watercourses also allows for the redesigning of the channels to ensure that the channel ties into the proposed ground levels whilst also providing appropriate capacity and suitably agreeable easements through the site.

The realigned watercourses will comprise a two staged channel with all flows up to and including the 1 in 100year event being contained within the 'first stage' channel. This channel will have a 1m wide channel base with bank slopes typically of 1 in 3 and 1 in 4. The second stage channel, which has been designed to provide capacity for the more extreme events such as the locally required 1 in 200 year and the 1 in 1,000year events.

The second stage channel will extend from the first stage channel by 8m from top of each bank for the Milton Malsor Brook and 5m from top of bank for the Unnamed Watercourse. This area will be level before then tying back into post development ground levels with these banks also being at a gradient of between 1 in 3 and 1 in 4. Sloping banks are only considered as not being possible through one section of the realigned watercourse and this is towards the north of the site. At this location it is considered that a retaining wall will be required. These lengths would provide the required easements for both Main River and Ordinary Watercourses to facilitate ongoing management and maintenance.

Based on the bank gradients and channel widths detailed above, the river corridor for both watercourses does not exceed 20m. A typical cross section of the diverted and redesigned watercourse has been included within Appendix C.

The proposals include new road crossings with one over the Milton Malsor Brook and one over the Unnamed Watercourse through the construction of an internal site access road. In addition to the construction of two new crossings the existing farm access culvert on the Unnamed Watercourse is to be removed. As the culverts under Towcester Road and Rectory Lane are outside of the site boundary there is no option for the upsizing of these culverts and proposals have had to accommodate the upstream flood risk as a result of these being undersized. However, the new culvert crossings have been sized appropriately to ensure these provide suitable capacity for all events up to an including the 1 in 1,000 year event and have been modelled as 1.8m high and 3m wide rectangular culverts.

In order to assess the potential impact on flood risk a further modelling scenario was run based on the proposed post development conditions. This included 'stamping' the proposed building slab levels, proposed internal access roads (including proposed culverts), post development ground levels, and details (location, width) of the diverted and redesigned watercourses onto the baseline LiDAR for use as the 2D domain. In order to assess the impact of the revised channel dimensions (two-staged channel) a new 1D model was developed to include all channel dimensions and the proposed new road crossings.

The modelling results for the post development scenario shows the two staged channel provides sufficient capacity for all events with no out of bank flows being predicted through these sections. The two staged channel is also shown to provide sufficient capacity to contain flows upstream of the restriction caused by the Towcester Road and therefore predicts no out of bank flows upstream of this culvert. The modelling confirms that the post development scenario results in all units and proposals being at low risk of flooding and within Flood Zone 1 and a signicant betterment when compared to the baseline scenario.

Whilst all of the development is shown to be within Flood Zone 1 with the relocation and construction of the new two staged channels, the culvert under Rectory Lane remains as not providing suitably capacity and would continue to provide a restriction with out of bank flows predicted to extend into the north western limit of the site. From the layout plans the area affected by these out of bank flows is proposed as being soft landscaping and, as such, no further mitigation is required.

In addition to the proposed development being shown to be at acceptable risk following the modelling of the post development conditions, the modelling has also confirmed that the proposed two staged diverted channel results in no detrimental impact to third party land.

Relevant outputs from the modelling study for both the pre and post development conditions are included within Appendix B.

8.0 <u>NN NPS & NPPF REQUIREMENTS</u>

8.1 Sequential Test

The NN NPS Flood Risk Section provided guidance that mirrors that of the NPPF but is extended to include specific guidance on climate change. Both of these documents have been reviewed and used to inform this section of the report.

The modelling study undertaken has confirmed that the fluvial flood risk to the site is less than is currently shown on the EA's Flood Zone Map. The proposed ditch diversion and construction of a two staged channel results in all development being within Flood Zone 1 and at low risk. Whilst the modelled risk to the site is lower, a small area to the north of the western parcel remain as being at risk and is affected during the modelled 1 in 1,000 year event.

However, the proposed land reprofiling and ditch diversion works is shown to ensure of the built form (proposed slabs, working yards, access roads and buildings) being elevated outside the floodplain and located within Flood Zone 1. Based on the proposed post development ground levels and proposed two-stage channel, the site effectively adopts a Sequential approach to development with only areas of soft landscaping being located within areas designated as being within Flood Zone 3 based on the post development modelling scenarios. All of the access routes from each unit have been confirmed as being within Flood Zone 1.

The allocation of proposed uses to appropriate Flood Zones is considered to meet the requirements of the Sequential Test advocated within the *NPPF*. However, it is recommended that such an approach be confirmed to be acceptable by the EA and Local Authority in meeting the requirements of the Sequential Test.

It should be noted that further elements of site selection are detailed within the separate Alternative Site Assessment Report.

8.2 Exception Test

Whilst an Exception Test is not explicitly required under the NPPF, assuming the site is accepted to pass the Sequential Test, the following section details any measures necessary to mitigate any residual flood risks, to ensure that the proposed development and occupants will be safe and that flood risk will not be increased elsewhere, akin to the requirements of second requirement of the Exception Test.

8.2.1 Resistance and Resilience of Site

Whilst all development has been confirmed as being located within the post development Flood Zone 1, it would be recommended for regular inspection and maintenance to be carried out of the proposed two stage channel and all crossings of each watercourse.

A number of surface water flow routes are predicted through the site based on the EA's mapping. Given that these are all shown to be generated within the site (i.e. no flow routes from off-site) it is considered that the surface water drainage strategy detailed within Section 9 will intercept and safely convey these flow through the site and manage any discharge to ensure that there is no detrimental impact to third party land and also reduce the potential risks to the

site from this source. Given the importance of this system it would be recommended for a management and maintenance schedule to be provided.

8.2.2 Access and Egress

Based on the proposed road levels, dry access (in a 1 in 1,000 year fluvial flood event) is shown to be feasible, based on site specific modelling, from the site onto the adjacent highway network.

9.0 SURFACE WATER MANAGEMENT

9.1 Pre-Development

The area is currently undeveloped and served by a number of watercourses which cross the site, including the Milton Malsor Brook, which is classed as 'Main River' by the Environment Agency. Rain falling on the land will naturally infiltrate the ground until the capacity of the underlying soils is reached, after which runoff will shed off into the local ditches and watercourses.

The watercourses generally flow from south to north through the site with various culverts located in order to allow field access.

A number of culverts discharge into the watercourses along the southern boundary of the site conveying flows from the upstream catchments under the railway line and the canal. These flows will need to be maintained through the site.

The topographic survey indicates a number of piped drainage systems, generally around the perimeter of the site. These can be summarised as follows;

- A 450mm diameter pipe in the western part of the site which appears to be coming from the disused petrol filling station adjacent to the A43. The drain is shown discharging to one of the internal ditches within the site boundary.
- A 2225mm diameter pipe to the north-west quadrant of the site. This appears to link one of the internal ditches to the Malsor Brook.
- A 450mm diameter drain on the extreme northern boundary of the site, to the west of the Malsor Brook and immediately adjacent to the Gayton Road. Although not proven it is likely that this drain serves the Milton Business Park to the west.
- 3 no. 100mm diameter drains on the northern and western boundaries of Willow Lodge and the plant hire depot on the eastern side of Northampton Road. All of these drains flow into the ditch surrounding this area. There are no obvious sources for the drainage and therefore it is assumed that given the small sizes of the pipes that this is part of a land drainage system.
- A 600mm diameter drain entering the site in the north-east corner of the site via a vehicle tunnel under the railway line. This drain discharges into a ditch on the northern boundary of the site. There is no obvious source for any flows in this pipe but they must be considered to be of a reasonable quantity given the size of the pipe.
- In the south-east quadrant of the site there is a 225mm dimeter pipe linking two internal ditches.
- Also in the south-east quadrant, the topographic survey notes that 'local knowledge' indicates a drain running from a culvert under the railway line on the southern boundary flowing north into one of the internal ditches. This drain, if present, will need to be accommodated within the future development.

In all of the above cases, it will be necessary for the post-development proposals to maintain existing flows across the site in order to ensure that no upstream or downstream third party areas are affected.

Drawing no. C151171-C005 showing the locations of existing sewers and drains is included in Appendix C.

Drawing no. C151171-C006 showing the locations of existing watercourses and ditches and is included in Appendix C.

9.2 Post-Development

The proposed development of the site will inevitably lead to an increase in surface water runoff rates and volumes due to the provision of buildings, highways and other hardstanding areas. This increase in generated water will be managed within the proposed development infrastructure drainage systems such that there will be no detrimental impact to third parties downstream of the site.

In line with the NPPF, and other relevant guidance, initial consideration has been given to the use of Sustainable Drainage System (SUDS) methods of surface water disposal. The preferred hierarchy for dealing with surface water run-off is:

- Infiltration to ground via soakaways.
- Discharge to a watercourse.
- Discharge to a public surface water sewer.

Soil investigations have shown that there is no meaningful ability to infiltrate surface water runoff to ground and therefore the proposed drainage will be via positive systems which will ultimately discharge to the existing ditches and watercourses.

An initial assessment has been undertaken to determine the magnitude of surface water storage volumes that will be required in order to limit post-development runoff rates to values that are no greater than the existing greenfield situation.

The greenfield QBAR value has been calculated using the ICP SuDS Method within the industry standard Micro Drainage software. This indicates an undeveloped QBAR value of 4.1 litres/ha/sec which will be applied to the post-development impermeable areas in order to derive a maximum allowable discharge rate from the site.

At this stage of the design process it is assumed that, generally, each building unit and its associated hardstanding areas will contain storage features which will deal with their own attenuation requirements with restricted discharge rates. In the majority of cases, because of the land use, the storage is likely to be provided in underground tanks beneath car park areas and other hardstandings.

A petrol interceptor will be located downstream of each flow control prior to water being discharged from each parcel and being discharged to the relevant ditch or sewer.

In a number of locations there should be the opportunity to include attenuation ponds/basins which will be able to provide additional storage and deliver the ability to improve water quality before discharging to the existing watercourses within the site. At present these features are located to the west of Unit 2 and the north of Unit 9.

It is also intended to include swales, ditches or similar features as conveyance systems and to provide water treatment benefits where there are areas within the layout that will permit.

It is proposed that any discharge from the site be restricted to mimic the existing greenfield QBAR runoff rate, as described above, with attenuation being provided to cater for the 1 in 200 year plus 40% allowance for climate change storm event. This ensures that the proposal meets the criteria set out by Northamptonshire County Council in their role as the Lead Local Flood Authority.

The storage volumes required for each unit have been calculated in accordance with the criteria set out above and the calculations for each unit are included in Appendix C.

The locations of the storage features and their respective sizes together with the overall proposed surface water drainage layout are shown on drawing nos. C151171-C007, C008, C009 and C010 contained in Appendix C.

Due to the scale of the development, a number of watercourses will need to be diverted. The proposed scheme will include the rerouting of such watercourses in order to maintain the current flows from one side of the site to the other.

These proposals will also include the provision of culverts to accommodate road crossings and landscape features.

The Malsor Brook is classed as 'Main River' and therefore the diversion of this feature requires the approval of the Environment Agency (EA). Discussions have been held with the EA to agree the form of the proposed works and ensure that the flood plain requirements can be met within the proposed layout.

The proposals for diversion, removal and retention of existing watercourses/ditches, and the creation of new watercourses, are summarized on drawing no. C151171-C004.

The main infrastructure highway swill be served by a traditional gulley and pipe conveyance system. The runoff from the highways will be restricted to the equivalent greenfield QBAR rate via a flow control and discharged to the nearest appropriate watercourse/ditch/swale.

A petrol interceptor will be located immediately downstream of the flow control and prior the outfall to an open drainage feature.

10.0 FOUL WATER MANAGEMENT

10.1 Pre-Development

As the existing site is undeveloped, it is unlikely that there are any foul drainage systems directly serving the land to be developed. However, it is known that there is an existing 300mm dimeter foul public sewer, owned by Anglian Water, running in a south to north direction immediately parallel to the Milton Malsor Brook.

Copies of the Anglian Water sewer record plans have been obtained and compared with the manholes shown on the topographic survey. This has enabled an accurate check of the route of the public sewer to be established.

There are no recorded or known connections within the site boundary into the main foul sewer.

The layout of the proposed development will impinge upon the route of the existing foul sewer and therefore the sewer will be need to be diverted in a number of locations. This will require a Section 185 application to be made to Anglian Water in due course. The principle of diverting the sewer has been discussed with Anglian Water who have confirmed that they currently have no objections to the proposals.

A plan showing the proposed diversion route is shown on drawing no. C151171-C003 in Appendix C.

10.2 Post-Development

The provision of the development will generate new foul flows and it is proposed to discharge these flows to the existing public sewer. Due to the topography of the site it will be necessary to pump from a number of points around the site.

At the time of the preparation of this report, the exact population across the proposed development is not known. An estimate has therefore been made assuming an average figure of $95m^2$ per employee for a national distribution centre, as advised by the Planning Consultant. The total floor area is currently $696,772m^2$ and therefore the predicted total population is 7,334.

Reference has been made to the British Water publications, 'Flows and Loads – 4', which recommends an allowance of 50 litres/person/day as a dry weather flow. For a population of 7,334 this equates to a flow rate of 10.2 l/s.

Standard practice for commercial developments is to apply a peaking factor of x3 thus giving a peak flow rate of 30.6 l/s.

As an approximate check, reference has also been made to the recommendations in Sewers for Adoption 7th Edition which recommends a design flow for 'normal' industry of 0.5 l/s/ha. This results in a peak flow rate of 34.8 l/s and is a reasonable approximation to the Flows and Loads method.

Anglian Water has been consulted about the connection of additional flows to the existing foul sewer and a Pre-Development Enquiry has been submitted to the Company. The resulting report indicated that there is likely to be insufficient capacity in the system to cater for the new development and that upgrading works may be required. Following this, Anglian Water was requested to carry out a Drainage Impact Assessment to determine the potential works required. This assessment recommended that additional offline storage of 102m³ be provided to the north of Unit 9 as a mitigation strategy. This proposal has been included in the final drainage strategy design.

Copies of both the Pre-Planning Assessment and the Drainage Impact Assessment are included in Appendix C.

A schematic layout of the main foul drainage required to serve the site has been prepared, showing connections to the existing Anglian Water public foul sewer at appropriate locations. A copy of drawing no. C151171-C002 is included in Appendix C.

11.0 CONCLUSIONS

This report has considered the flood risk posed to the proposal site from a variety of sources of flooding, as defined by the *NPPF*.

Current EA data shows that the low lying areas in the western section of the site that immediately border the Milton Malsor Brook are at high risk of flooding and within Flood Zone 3. The remainder of the site is shown as being more elevated and located within Flood Zone 1. The EA have confirmed that the Flood Zone map is based on coarse data at a low resolution and is therefore not suitable for accurately determining site specific flood risk.

The EA's Flooding from Surface Water mapping predicts outlines through the western section of the site that closely match, but extended further, the EA's fluvial flood map. Two additional flow routes through the eastern sections of the site are also shown. The first is from the high section of land to the west with potential surface flows in an easterly direction towards the Milton Malsor Brook. The second route is within the east of the site where flows are predicted to be directed by the topography in a northerly direction away from the site. It should be noted that the EA's surface water mapping does not make an allowance for any existing drainage network or small drainage ditches and, as such, is considered as being representative of the 'worst case' scenario.

The areas identified as being at increased risk from surface water flooding have also been assessed as being at an increased risk from infrastructure failure flooding. Channel levels are considered to be representative of groundwater levels and as such the lower lying areas within the western section of the site are also considered to be at risk during a 'worst case' groundwater flood scenario.

Following discussions with the EA, a site specific detailed linked 1D/2D modelling study has been developed for the site. This demonstrates that whilst the northern and northeastern sections of the site remain in Flood Zone 3, the depths and extents are less than those shown on the EA's mapping and therefore more of the site can be concluded to be at low risk from fluvial flooding.

In addition to assessing the existing fluvial flood risk to the site, the modelling study has been extended to assess the impacts of the post development conditions (construction and diversion of a two staged channel, post development ground levels etc.). This modelling has demonstrated that the proposed two stage channel provides adequate capacity and results in all of the proposed buildings, access routes, working yards being set at a level above the 1 in 1,000 year flood level and therefore within 'Post Development Flood Zone 1'. The proposed ground works and watercourse works results in no worsening of flood risk at the site or to third party land.

Based on the post development modelling, it is shown that all of the proposed units are set at an elevation that ensures they are within Flood Zone 1. The only areas of the site that are within a Flood Zone 2 or 3 are areas of soft landscaping on the northern site boundary and within the western section of the site. As such, based on the proposed use and locations of the buildings, the proposed development is considered to meet the requirements of, and pass the Sequential Test.

In order to ensure that the proposed realigned watercourse, new culvert structures, and surface water drainage system operate efficiently, it is strongly recommended that a detailed

management and maintainance plan is prepared to ensure regular clearance works and, if required, maintenance is undertaken to limit the risk of any blockages or failure of any of the proposed system.

This report therefore demonstrates that, provided an approved SUDS is employed, the proposed scheme will:

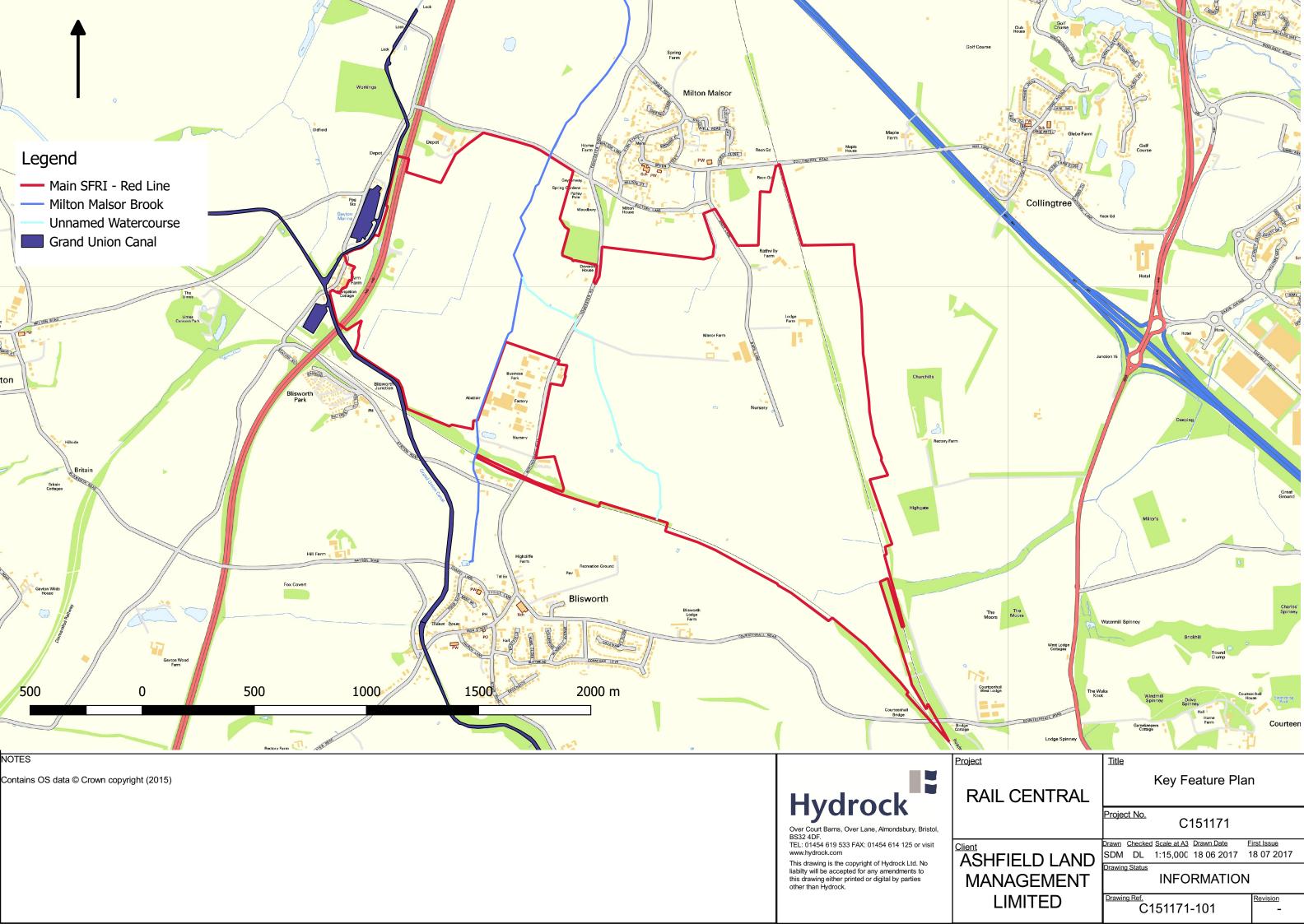
- Be safe and resilient to flooding in the critical design flood event with an acceptable level of residual risk.
- Not increase flood risk through loss of floodplain storage, impedance of flood flows or increase in surface water run-off.

As such, the proposed development is concluded to meet the flood risk requirements of the *NNNPS* and the *NPPF*.

Hydrock Consultants Limited

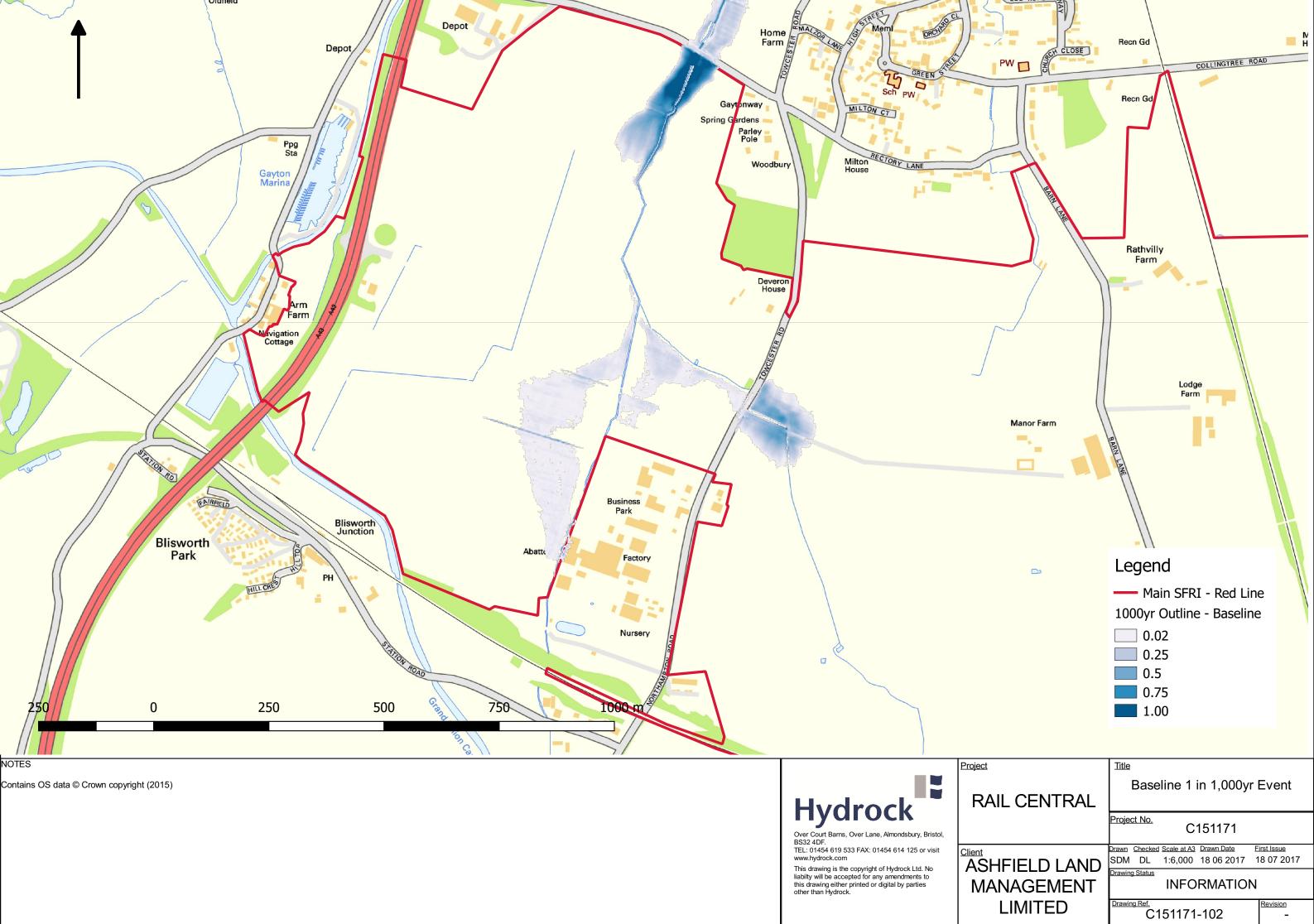
APPENDIX A – KEY FEATURES PLAN

Drawing No.	Title
Drawing Ref: C151171-C101	Key Features Plan



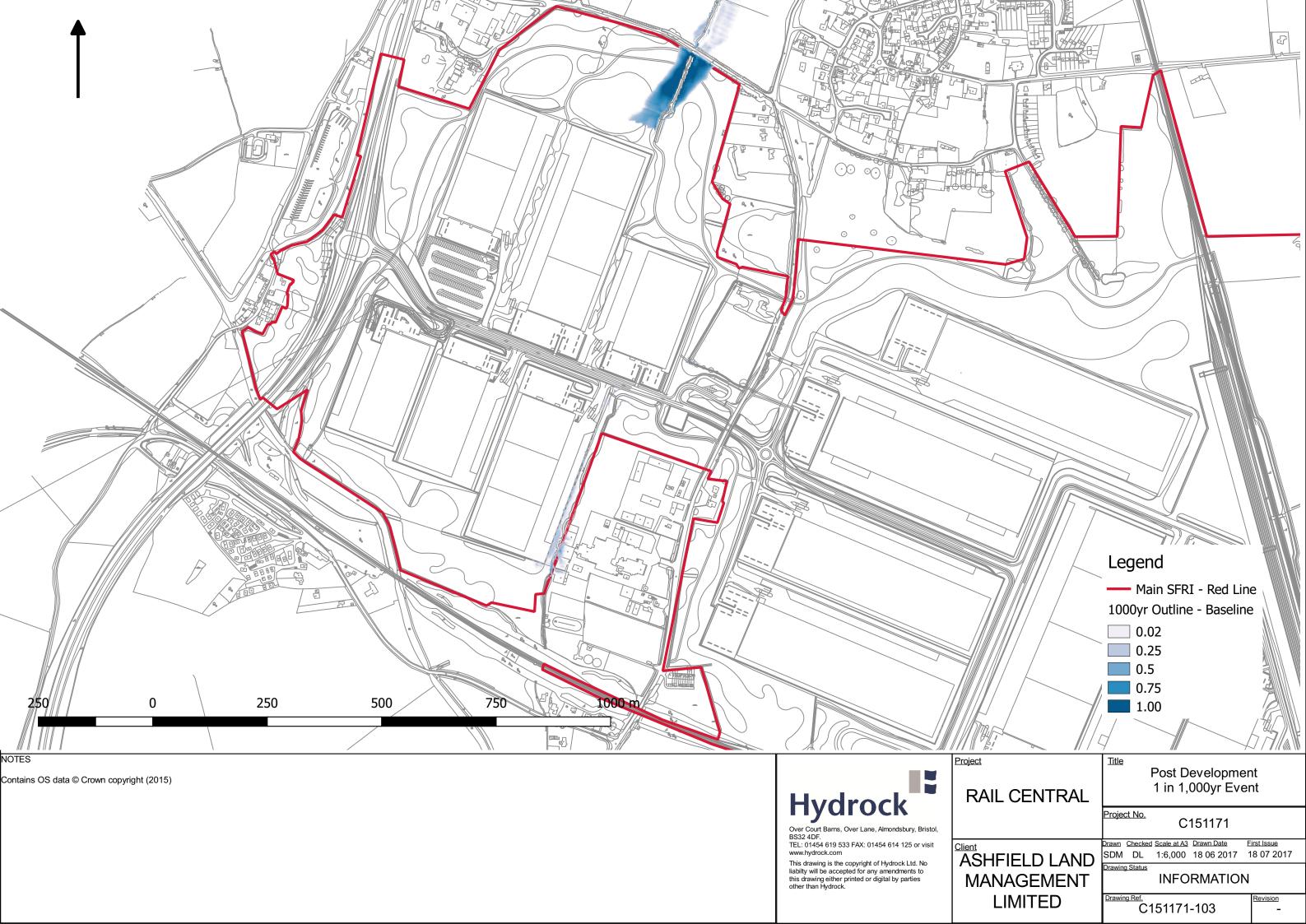
APPENDIX B – HYDRAULIC MODELLING RESULTS

Drawing No.	Title
Drawing Ref: C151171-C102	Baseline 1 in 1,000 year Outline
Drawing Ref: C151171-C103	Post Development 1 in 1,000 year Outline











APPENDIX C – DRAINAGE STRATEGY

Drawing No.	Title
Drawing Ref: C151171-C002C	Foul Drainage Strategy
Drawing Ref: C151171-C003C	Foul Drainage Diversion
Drawing Ref: C151171-C004B	Watercourse Works Strategy
Drawing Ref: C151171-C005C	Existing Sewer
Drawing Ref: C151171-C006C	Existing Watercourse
Drawing Ref: C151171-C007A	Drainage Strategy – Sheet 1
Drawing Ref: C151171-C008A	Drainage Strategy – Sheet 2
Drawing Ref: C151171-C009A	Drainage Strategy – Sheet 3
Drawing Ref: C151171-C0010A	Drainage Strategy – Sheet 4
Drawing Ref: NO REF	Supporting Calculations
Drawing Ref: NO REF	Anglian Water Pre-Planning Assessment
Drawing Ref: NO REF	Anglian Water Drainage Impact Assessment



Key

3.0 l/s

('C' 4.3 l/s

Existing Anglian Water public foul sewer

Proposed Diversion Route of Anglian Water public foul sewer

Proposed foul sewer

Estimated peak foul design flow from Unit

Total estimated peak foul design flow at connection point to existing public sewer

С	13/02/18	Redrawn.	RJH
В	18/01/18	Proposed foul storage tank added.	RJH
A	16/12/16	Redrawn	RJH
Rev	Date	Description	By Ckd



Over Court Barns, Over Lane, Almondsbury, Bristol, BS32 4DF. TEL: 01454 619 533 FAX: 01454 614 125 or visit www.hydrock.com

. This drawing is the copyright of Hydrock Ltd. No liability will be accepted for any amendments to this drawing either printed or digital by parties other than Hydrock. Client:

ASHFIELD LAND LIMITED

Project:

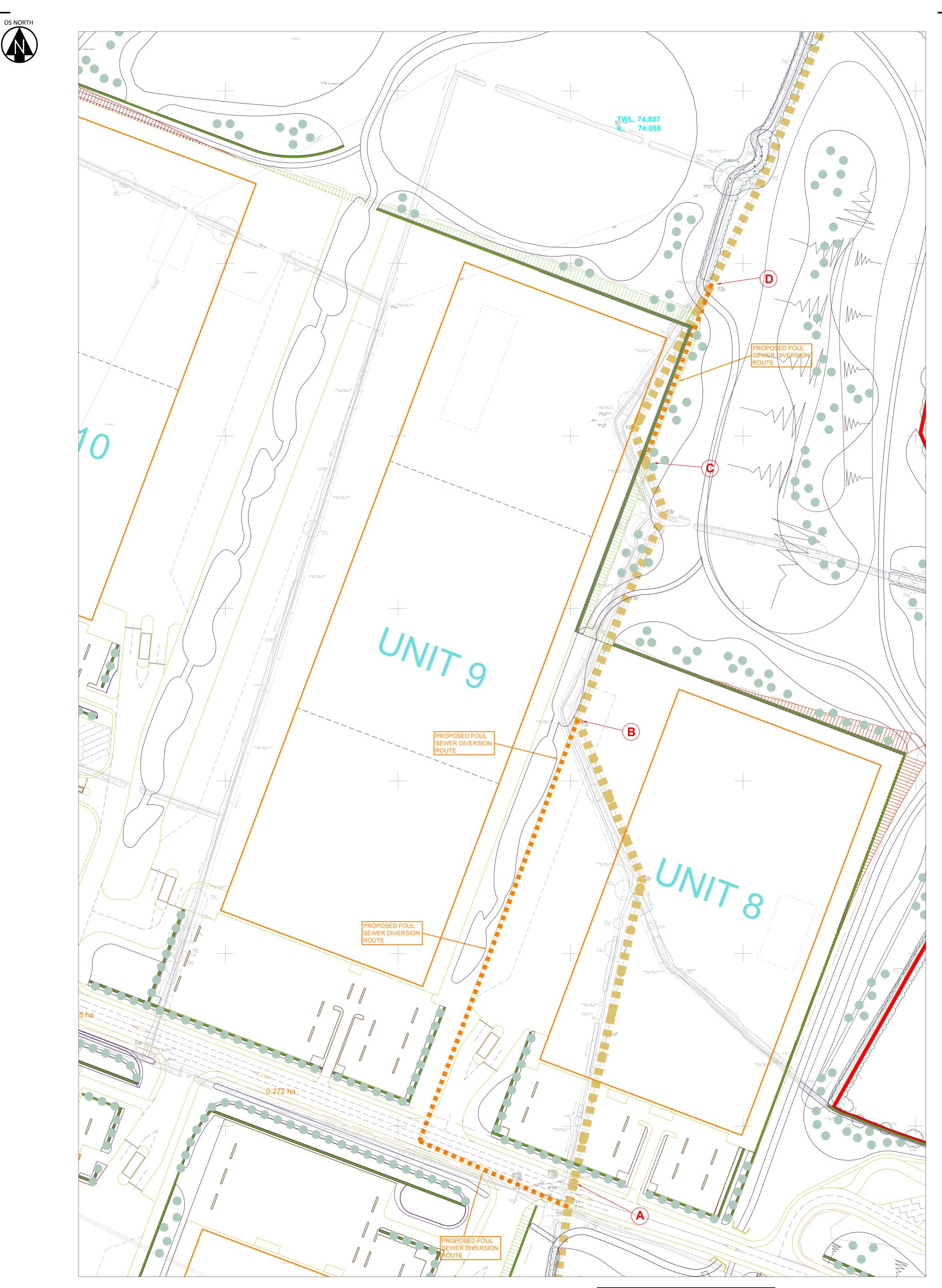
RAIL CENTRAL NORTHAMPTONSHIRE

Project Number: C151171

Drawing Title:

PROPOSED FOUL DRAINAGE STRATEGY

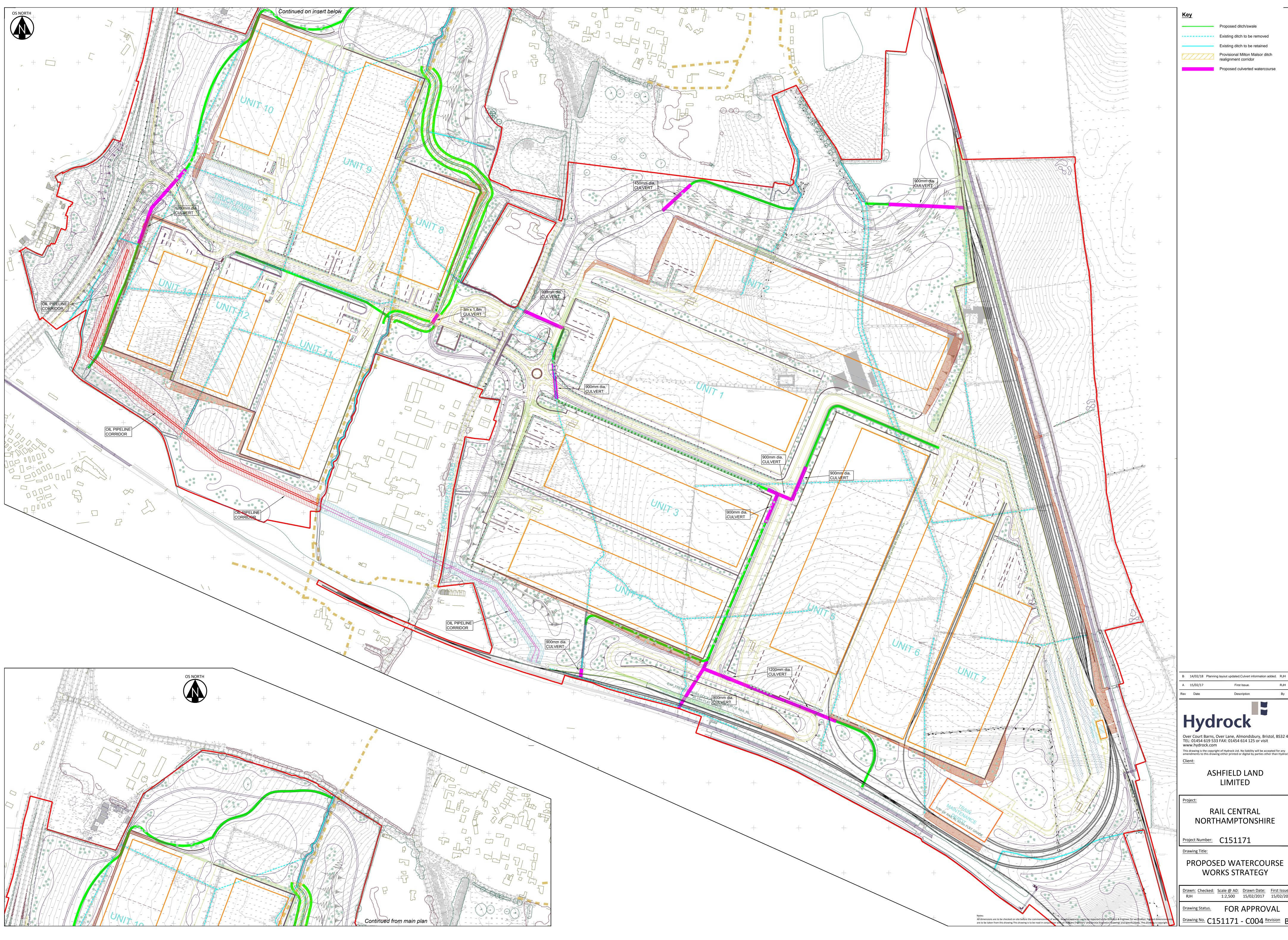
Drawn: EAG	<u>Checked:</u> RJH	Scale @ A1: 1:5,000	Drawn Date: 16/12/2016	First Issue: 16/12/2016		
Drawing Status. FOR APPROVAL						
Drawing No. C151171 - C002 Revision C						



Key	

- Existing Anglian Water public foul sewer
- Existing Anglian Water public foul sewer to be abandoned
- Proposed Diversion Route of Anglian Water public foul sewer

				Over Court Barns, Over Lane, Almondsbury, Bristol, BS32 4DF.	Project: RAIL CENTRAL NORTHAMPTONSHIRE	Drawing Title: PROPOSED DIVERSION OF EXISTING PUBLIC FOUL SEWER Project Number: C151171
				TEL: 01454 619 533 FAX: 01454 614 125 or visit www.hydrock.com	Client:	
С	13/02/18 Revise	d planning layout.	RJH	This drawing is the copyright of Hydrock Ltd. No liability will be accepted for any amendments to this drawing either printed or digital by parties other than Hydrock.		Drawn: Checked: Scale @ A1: Drawn Date: First Issue: RJH 1:1,000 16/12/2016 16/12/2016
В	15/08/17 Revise	d planning layout.	RJH	Notes:	ASHFIELD LAND	
A	16/12/16	First Issue	RJH	All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for	LIMITED	Drawing Status. FOR APPROVAL
Rev	Date	Description	By Ckd	verification. Figured dimensions only are to be taken from this drawing. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications. This drawing is copyright.		Drawing No. 151171 - C003 Revision C



Provisional Milton Malsor ditch realignment corridor

By Ckd

Over Court Barns, Over Lane, Almondsbury, Bristol, BS32 4DF. TEL: 01454 619 533 FAX: 01454 614 125 or visit This drawing is the copyright of Hydrock Ltd. No liability will be accepted for any amendments to this drawing either printed or digital by parties other than Hydrock.

ASHFIELD LAND

<u>ojecti</u>	
	RAIL CENTRAL
NC	ORTHAMPTONSHIRE

PROPOSED WATERCOURSE WORKS STRATEGY

Drawn: Checked: RJH	Scale @ A0: 1:2,500	<u>Drawn Date:</u> 15/02/2017	First Issue: 15/02/201	
Drawing Status. FOR APPROVAL				
Drawing No. C151171 - C004 Revision B				



Existing surface water drain

Proposed development boundary

First Issue.

Over Court Barns, Over Lane, Almondsbury, Bristol, BS32 4DF. TEL: 01454 619 533 FAX: 01454 614 125 or visit www.hydrock.com This drawing is the copyright of Hydrock Ltd. No liability will be accepted for any amendments to this drawing either printed or digital by parties other than Hydrock.

> ASHFIELD LAND LIMITED

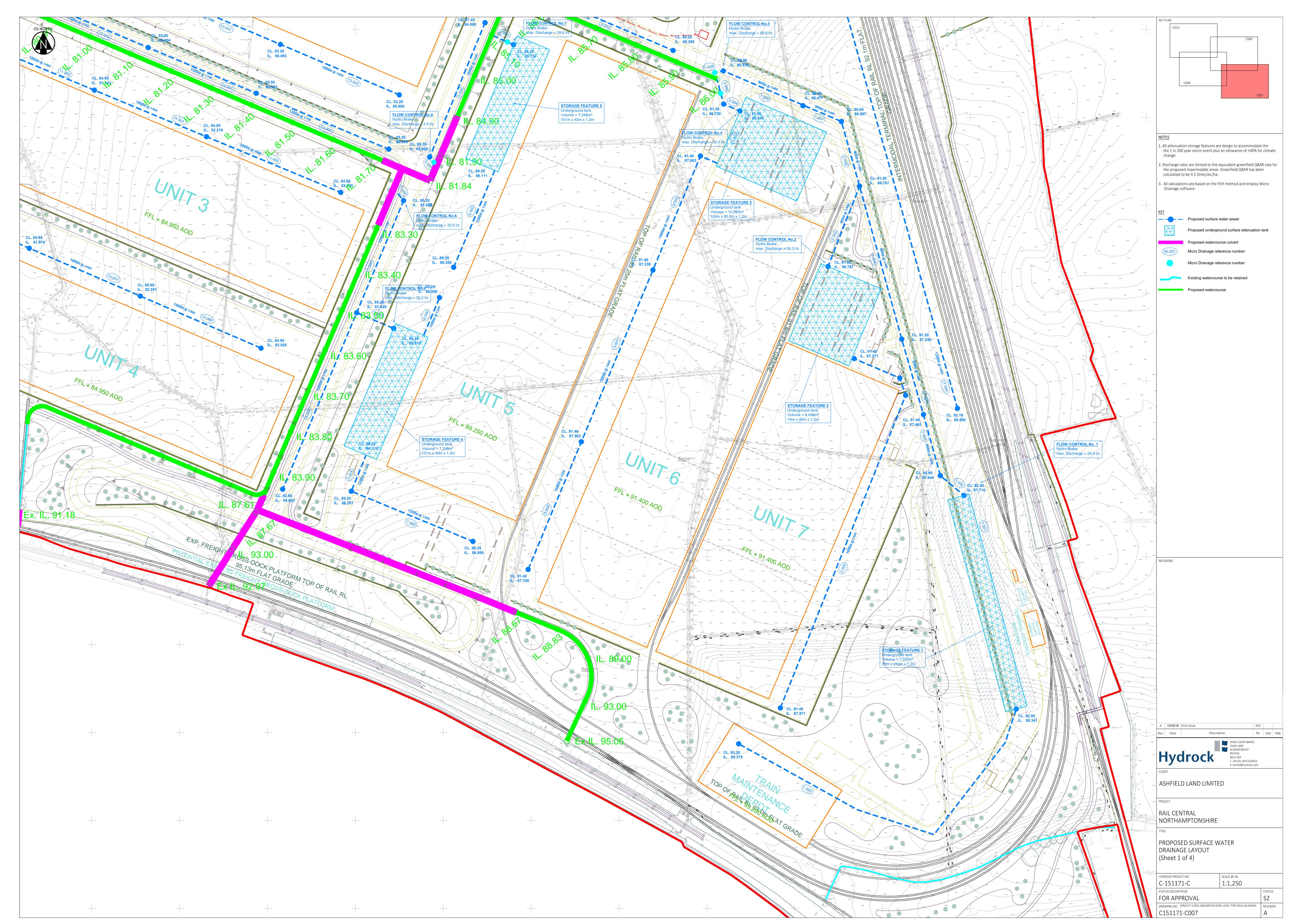
RAIL CENTRAL
NORTHAMPTONSHIRE

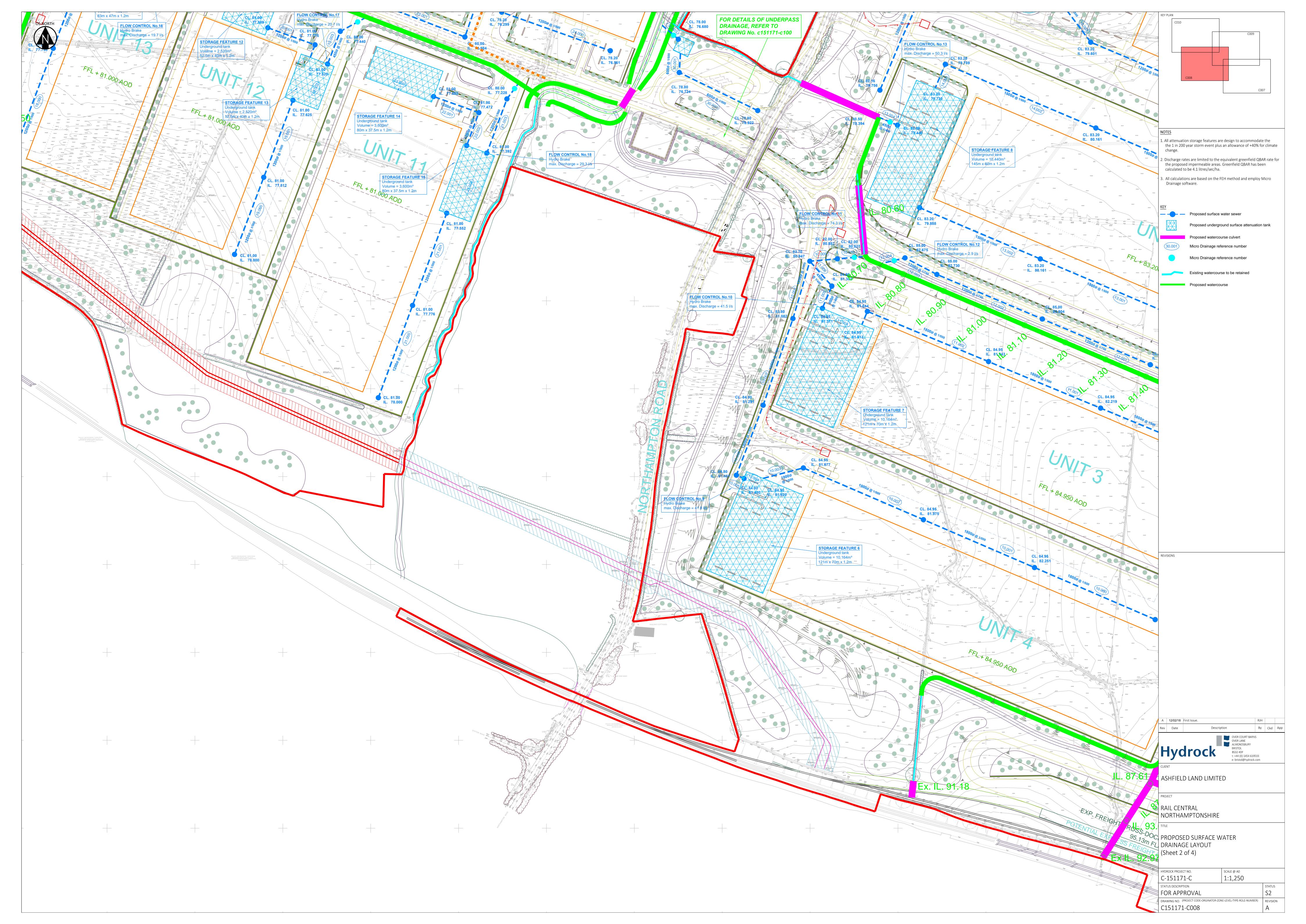
Project Number: C151171

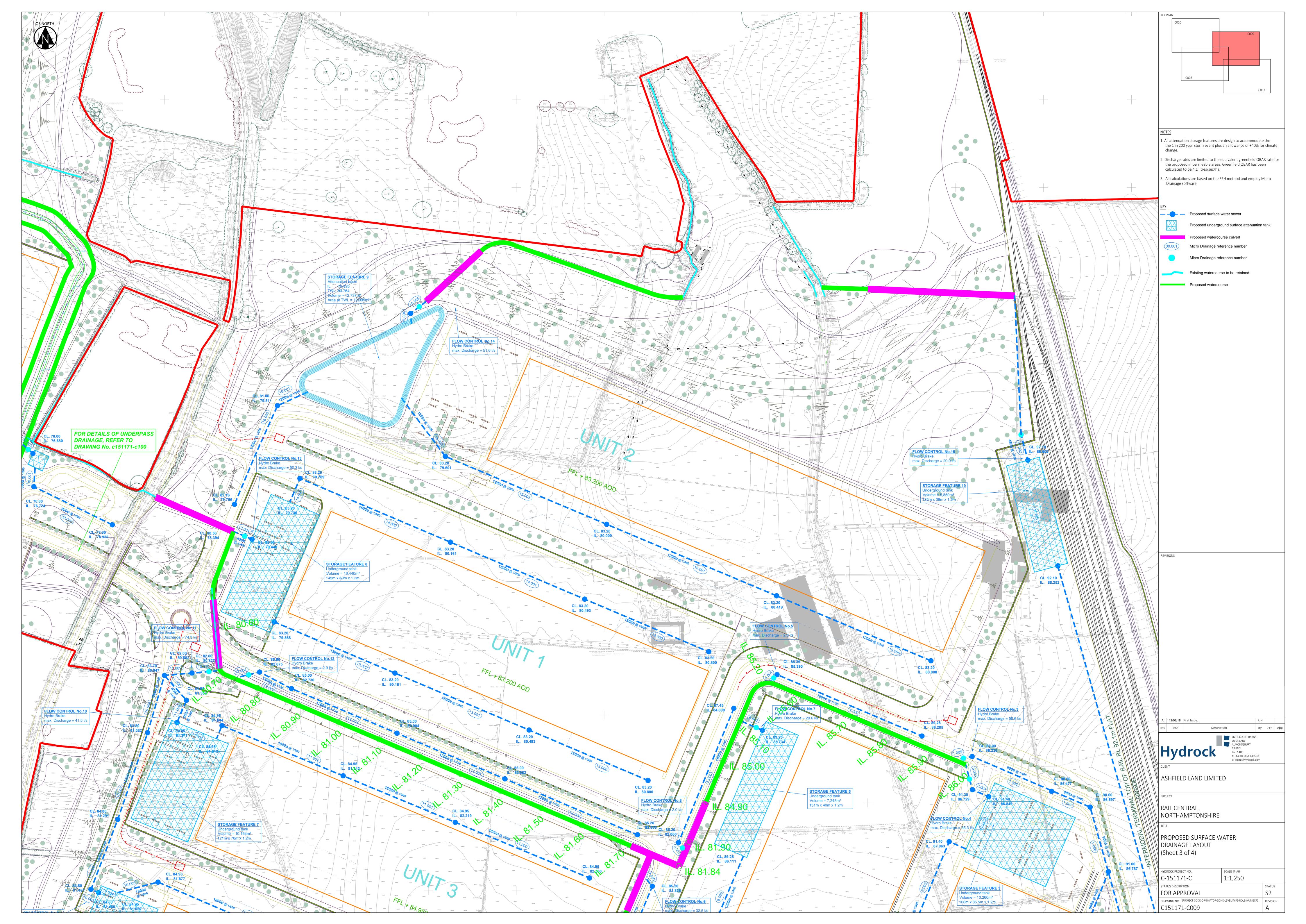
EXISTING UNDERGROUND DRAINAGE SYSTEMS

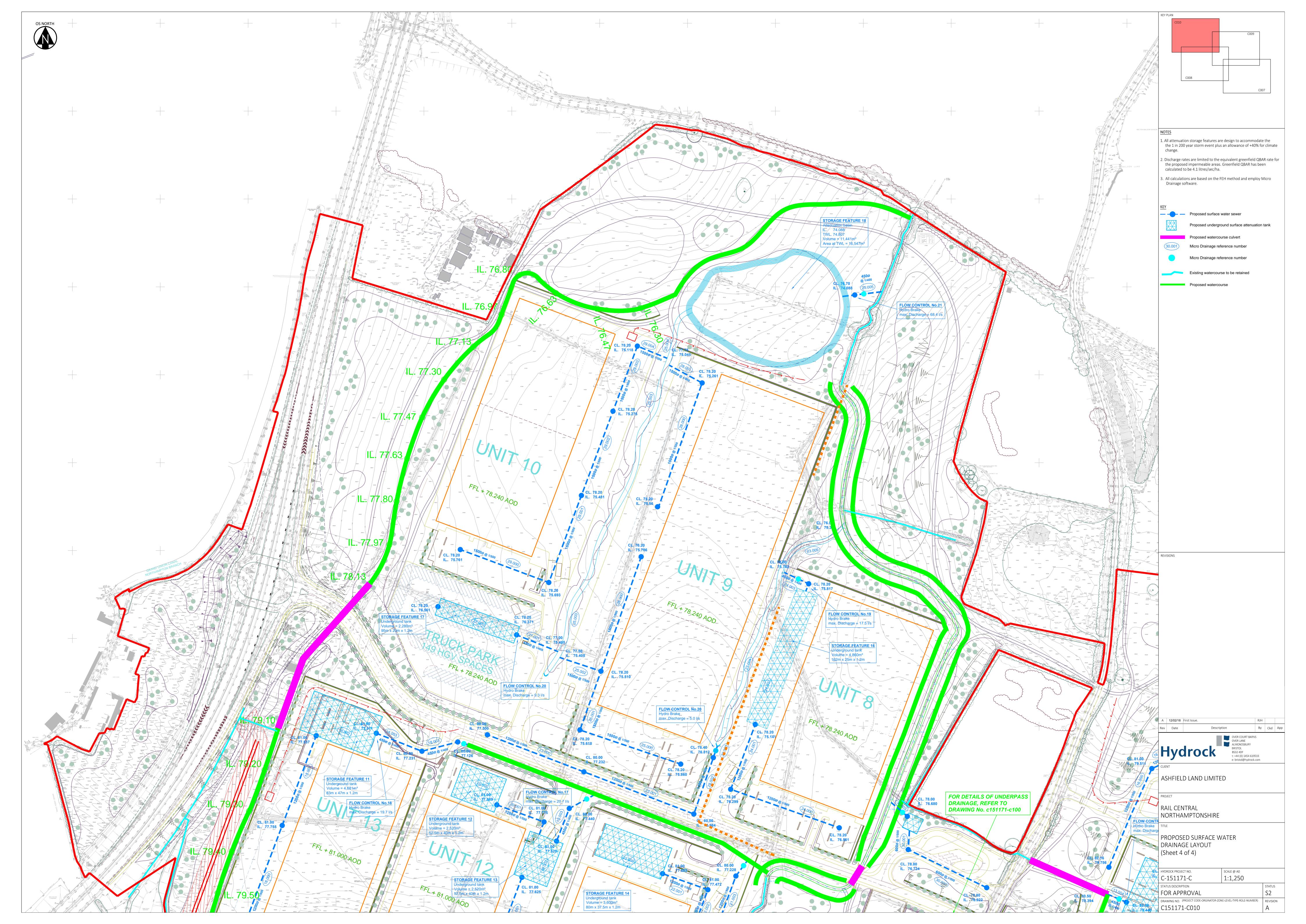
Drawn: Checked:	Scale @ A0:	Drawn Date:	First Issue:
RJH	1:2,500	30/06/2017	30/06/2017
Drawing Status.	INFC	ORMATI	ON











Hydrock Consultants Ltd	Page 1	
• • •	Rail Central Unit 1	Micco
Date 6th February 2018	Designed by RJH	Drainage
File Unit 1.MDX	Checked by	Diamaye
XP Solutions	Network 2016.1	ŀ

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	3.463	4-8	7.793	8-12	1.015
Total	Area C	Contribu	ting (ha) = 12	2.271

Total Pipe Volume (m³) = 12206.547

Hydrock C	onsulta	ints Lto	1										Page	2
•					F	Rail Ce	entral	L						
•					Ŭ	Jnit 1							4	~
•													Mi	CLO
Date 6th		y 2018				Designe	-	RJH						ainage
File Unit						Checked		- 1						
XP Soluti	ons				Ν	Jetwork	2016	>.⊥						
			Ex	istind	g Netw	ork De	tails	for	Exist	ing				
	PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)		ise (1/s)	k (mm)	HYD SECT		Section	Туре	
		147.000			1.753				0.600			Pipe/Con		
		166.000							0.600			Pipe/Con		
		149.800 145.000							0.600			Pipe/Con		
	EI3.003	145.000	0.444	326.6	1.753	0.00		0.0	0.600	[]	-6	Pipe/Con	auit	
	E14.000	153.600	0.307	500.3	1.753	5.00		0.0	0.600			Pipe/Con		
		165.900							0.600			Pipe/Con		
		185.800							0.600			Pipe/Con		
	E14.003	29.500	0.059	500.0	0.000	0.00		0.0	0.600	0	1500	Pipe/Con	duit	
	E13.004	22.900	1.336	17.1	0.000	0.00		0.0	0.600	0	450	Pipe/Con	duit	
					<u>Netwo</u>	rk Res	ults	Table	<u> </u>					
									_					
			PN	US/ (m		.Area ha) F	Σ Bas low (1		Vel m/s)	Cap (1/s)				
				-		-								
				00 80.8		1.753		0.0		3452.				
				01 80.4 02 80.1		3.506 5.259		0.0		3377. 3223.				
				03 79.8		7.012			3.12 2					
											_			
				00 80.8 01 80.4		1.753 3.506		0.0	1.91 1.91	3376. 3378.				
				02 80.1		5.259			1.91	3379.				
				03 79.7		5.259		0.0		3377.				
			E13.0	04 79.7	⁷ 30 1	2.271		0.0	4.93	783.	.9			
			220.0							,				
				<u>Conc</u>	<u>luit S</u>	ection	<u>s for</u>	Exis	sting					
		NOTE: D									-			
						s are m		-	-					
		culver	st, \/	open ci	hannel,	oo dua	l pipe	, 000	triple	e pipe	, 0 e	egg.		
		S	Section	number	rs < 0	are tak	en fro	m usei	r condu	uit ta	ble			
		Se	ction	Condui	-	Minor				-	Sect			
		N	umber	Туре	Dimn. (mm)	Dimn. (mm)	Slope (Deg)	Spla (mm)			rea m²)			
			6				-		-					
			-6	L] 60000) 1200	90.0		2.3	353 72	.000			

Hydrock Consultant	s Ltd							Page 3
				Rail Cen	itral			
				Unit 1				4
								1 mm
Date 6th February	2018			Designed	l by RJH	I		Micro
File Unit 1.MDX	2010			Checked	-			Drainage
XP Solutions				Network				
				INCOMOLY.	2010.1			
		Ī	PIPELINE	SCHEDULE	S for E	xisting		
			<u>U</u> 1	<u>pstream N</u>	<u>Manhole</u>			
PN	Hyd	Diam	MH C.Leve	el I.Level	D.Depth	МН	MH DIAM., L*W	
	Sect	(mm) N	lame (m)	(m)	(m)	Connection	(mm)	
E13.00)() ()	1500	E1 83.20	00 80.800	0.900	Open Manhole	2100	
				00 80.493		Open Manhole		
				00 80.161		Open Manhole		
E13.00	13 []	-6	E4 83.20	00 79.888	2.112	Open Manhole	60725	
E14.00)0 0	1500	E5 83 20	00 80.800	0 900	Open Manhole	2100	
)1 o			00 80.493		Open Manhole		
E14.00		1500		00 80.161	1.539	Open Manhole	2100	
E14.00)3 0	1500	E8 83.20	00 79.789	1.911	Open Manhole	2100	
E13.00)4 o	450	E9 82.00	00 79.730	1.820	Open Manhole	2100	
			Do	<u>wnstream</u>	Manhole	2		
PN	Length (m)			evel I.Lev m) (m)		th MH Connection	MH DIAM., L n (mm)	*₩
E13.000	147 000	1 478 8	E2 83	.200 80.4	93 1 20	07 Open Manho	le 21	0.0
E13.001						39 Open Manho.		
E13.002						12 Open Manho		
E13.003	145.000	326.6	E9 <mark>82</mark>	.000 79.4	44 1.35	56 Open Manho	le 21	00
E14.000	153 600	500 3	E6 83	200 80 4	93 1 20	07 Open Manho	le 21	0.0
E14.001						39 Open Manho		
E14.002	185.800	499.5	E8 <mark>83</mark>	.200 79.7		11 Open Manho		00
E14.003	29.500	500.0	E9 <mark>82</mark>	.000 79.7	30 0.77	70 Open Manho	le 21	00
E13.004	22.900	17.1	E 80	.500 78.3	94 1.65	56 Open Manho	le	0
		Free B	Flowing C	Dutfall D	etails	for Existin	Iq	
			-				-	
		tfall Numbor		C. Level I (m)		Min D,L I. Level (mm)		
	Pipe	Number	r Name	(111)	(111)	(m)	(1111)	
			4	00 500	70.204			
	1	E13.004	± Ľ	80.500	/0.394	0.000 0) 0	
		<u>S</u>	imulatio	n Criteri	<u>ia for E</u>	<u>Existing</u>		
7	Volumet:	ric Run	off Coeff	0.750 A	dditional	L Flow - % of	Total Flow 0.0	000
			on Factor		MADD F		/ha Storage 2.0	
			rt (mins)	0			peffiecient 0.8	
Manhala			Level (mm) E (Global)		w per Per		(l/per/day) 0.0 Time (mins))00 60
			are (l/s)			Output Inter	· ,	1
Number of Input Number of Onl							of Time/Area Di of Real Time Co	
	2 001							
			<u>Synthe</u>	tic Rainf	fall Det	<u>cails</u>		

 Rainfall Model FEH
 C
 (1km)
 -0.026
 D3
 (1km)
 0.243

 Return Period (years)
 2
 D1
 (1km)
 0.319
 E
 (1km)
 0.302

 Site Location
 D2
 (1km)
 0.300
 F
 (1km)
 2.496

Hydrock Consultants Ltd		Page 4
•	Rail Central	
	Unit 1	
•	Destruction D 77	- Micro
Date 6th February 2018	Designed by RJH	– Micro Drainage
File Unit 1.MDX XP Solutions	Checked by Network 2016.1	
	NECWOLK ZOIO.I	
Synth	netic Rainfall Details	
Cummon Storme Ver Gr	(Summer) 0.750 Storm Duration (mins) 30	
Winter Storms No Cv	(Winter) 0.840	

Hydrock Consultant	3 110						Pag	ge 5	
			Rail Cent	ral					
			Unit 1					1.	
								Z	سر
Date 6th February	2018		Designed	hy P.TH			N	/IC(O	
_	2010		-	-)raina	חח
File Unit 1.MDX			Checked k	-					-JC
KP Solutions			Network 2	2016.1					
	<u>0</u>	nline (Controls :	for Exis	sting				
<u>Hydro-Bra</u>	ake Optimum® 1	Manhole	e: E9, DS/	PN: E13	.004, Vo	lume (m³)	: 8234.6	<u>.</u>	
		Uni	t Reference	MD-SHE-()289-5030-	1500-5030			
			gn Head (m)			1.500			
			Flow (l/s)			50.3			
			Flush-Flo [™]		С	alculated			
			Objective	Minimis	se upstrea	m storage			
			Application			Surface			
			p Available			Yes			
			ameter (mm)			289			
			t Level (m)			79.730			
	Minimum Outlet	-				375			
	Suggested Mar	nhole Di	ameter (mm)			2100			
Control Po	oints Head	(m) Flo	ow (l/s)	Contro	ol Points	Head	(m) Flow	(l/s)	
Design Point (C	alculated) 1	.500	50.3		Kick-	-Flo® 1.	065	42.7	
	Flush-Flo™ 0	.502	50.2 Mea	an Flow o	ver Head I	Range	-	42.4	
		heen ha	sed on the i	upad (Diag	harge rela	tionchin f	or the Hv	dro-Bra	ke
The hydrological ca Optimum® as specific utilised then these	ed. Should anot storage routing	her type calcula	e of contro ations will	l device be inval	other than idated	n a Hydro-B	rake Optin		
Optimum® as specific utilised then these	ed. Should anot storage routing	her type calcula	e of contro ations will	l device be inval	other than idated	n a Hydro-B	rake Optin		
Optimum® as specific utilised then these epth (m) Flow (1/s) 0.100 9.0	ed. Should anot storage routing Depth (m) Flow 0.800	ther type calcula (1/s) De 48.5	e of contro. ations will ppth (m) Flo 2.000	l device be inval bw (l/s) 57.8	other than idated Depth (m) 4.000	n a Hydro-B Flow (l/s) 80.8	Depth (m) Flow 0	(1/ 106
Optimum® as specific utilised then these epth (m) Flow (1/s) 0.100 9.0 0.200 29.8	ed. Should anot storage routing Depth (m) Flow 0.800 1.000	ther type (1/s) De 48.5 45.1	e of control ations will epth (m) Flo 2.000 2.200	l device be inval >w (l/s) 57.8 60.5	other than idated Depth (m) 4.000 4.500	n a Hydro-B Flow (l/s) 80.8 85.6	Depth (m 7.00 7.50	0 0	(1/ 106 109
Optimum® as specific utilised then these epth (m) Flow (1/s) 0.100 9.0 0.200 29.8 0.300 48.0	ed. Should anot storage routing Depth (m) Flow 0.800 1.000 1.200	calcula (l/s) De 48.5 45.1 45.2	e of contro. ations will 2.000 2.200 2.400	l device be inval bw (l/s) 57.8 60.5 63.1	other than idated Depth (m) 4.000 4.500 5.000	n a Hydro-B Flow (1/s) 80.8 85.6 90.1	Depth (m 7.00 7.50 8.00	0 0 0	(1/ 106 109 113
Optimum® as specific utilised then these epth (m) Flow (1/s) 0.100 9.0 0.200 29.8 0.300 48.0 0.400 49.8	ed. Should anot storage routing Depth (m) Flow 0.800 1.000 1.200 1.400	(1/s) De 48.5 45.1 45.2 48.6	e of control ations will epth (m) Flo 2.000 2.200 2.400 2.600	l device be inval 57.8 60.5 63.1 65.6	other than idated Depth (m) 4.000 4.500 5.000 5.500	h a Hydro-B Flow (1/s) 80.8 85.6 90.1 94.4	Depth (m 7.00 7.50 8.00 8.50	0 0 0 0	(1/ 106 109 113 116
Optimum® as specifi- utilised then these Oppth (m) Flow (1/s) 0.100 9.0 0.200 29.8 0.300 48.0	ed. Should anot storage routing Depth (m) Flow 0.800 1.000 1.200	calcula (l/s) De 48.5 45.1 45.2	e of contro. ations will 2.000 2.200 2.400	l device be inval bw (l/s) 57.8 60.5 63.1	other than idated Depth (m) 4.000 4.500 5.000	n a Hydro-B Flow (1/s) 80.8 85.6 90.1	Take Optin Depth (m 7.00 7.50 8.00 8.50 9.00) Flow 0 0 0 0 0	

lydrock	Const	ltants Ltd	1						Pac	ge 6
					Rail Centr	al			۲ ۲	
					Unit 1					Ly .
										Nicro
		uary 2018			Designed k	y RJH				rainag
ile Un	lt 1.N	IDX			Checked by	7				יום וומע
P Solut	cions				Network 20	16.1				
year_	Retur	<u>n Period S</u>	ummary c	of Crit	ical Result	s by Max:	imum Leve	<u>l (Rank</u>	1) for	<u>r Existi</u>
					Simulation Cri					
		Areal			1.000 Addi					
		Hot	Start Le				Inlet Coe			
		nhole Headlo Foul Sewage			0.500 Flow <u>p</u> 0.000	ber Person	per Day (1	/per/day) 0.000	
					er of Offline of Storage St					
					hetic Rainfal					
		Rainfall Mo Site Locat			km) 0.319 km) 0.300			inter) O	.840	
					cm) 0.300 cm) 0.243 Cv					
		Margin 1	for Flood	Risk Wa	rning (mm)			300.0)	
				Analysi	s Timestep 2.	5 Second I	ncrement (
					DTS Status DVD Status			OFE ON		
					tia Status			ON ON		
	R	eturn Period Climate	(s) (year Change (1	, 30, 10 0, 0,		
	US/MH		Return C	limato	First (X)	First (Y)	First (7)	Overflow		Surcharg Depth
PN	Name	Storm	Period C			Flood	Overflow	Act.	(m)	(m)
E13.000	E1	15 Winter			200/15 Winter				81.098	-1.2
E13.001	E2 E3	15 Winter 15 Winter			200/15 Summer				80.860	-1.1
E13.002 E13.003		15 Winter 1440 Winter		+0%] +0%	.00/15 Winter				80.599 79.968	-1.0
E14.000	E5	15 Winter			200/15 Winter				81.090	-1.2
E14.001	E6	15 Winter	1		200/15 Summer				80.855	-1.1
E14.002	E7				200/15 Summer				80.578	-1.0
E14.003 E13.004	E8 E9	15 Winter 1440 Winter			200/15 Summer 80/360 Winter				80.261 79.966	-1.0 -0.2
				Flooded		Pipe	-	-		
		PN		(m ³)	Flow / Overi Cap. (1/		L Status Exc	evel ceeded		
		E13.(238.3	OK			
		E13.(E13.(377.9 527.8	OK OK			
		E13.0 E13.0		0.000		527.8	OK OK			
		E14.0				221.4	OK			
		E14.0		0.000		371.3	OK			
		E14.(488.1	OK			
		E14.(E13.(0.000		456.9 37.8	OK OK			
		ET2.(.u- 19	0.000	0.00	57.0	UI/			
					2-2016 XP S					

lydrock	Consu	ltants Lt	td							Pā	age 7
					-	l Centr	al			l l	
					Uni	t 1					L
											Micco
ate 6th	n Febr	uary 2018	3		Des	igned b	y RJH				Micro
ile Uni		-				cked by	-				Drainag
P Solut						work 20					
I SOLU	.10115				nec	WOIK 20	10.1				
<u>0 year</u>	Retur	n Period	Summar	<u>y of Cr</u>	itical	. Result	s by Ma	<u>ximum Lev</u>	el (Ran)	<u>x 1) f</u>	<u>or Existi</u>
					Simula	ation Cri	teria				
		Area	al Reduct	ion Fact				low - % of	Total Flo	w 0.000	
				art (min	,		MADD Fac	tor * 10m³/	2		
	Man			Level (m		0	Domoo		effiecien [.]		
		oul Sewage				-	er Perso	n per Day (1/per/day) 0.000	
	L	our bewage	per nee	Curc (1/	5) 0.00						
								0 Number c 0 Number c		-	
				Sv	nthetic	Rainfal	l Details				
		Rainfall M	Model					0.302 Cv (Winter) 0	.840	
		Site Loca			(1km) 0		F (1km)		, -		
		С	(1km) -0	.026 D3	(1km) 0	.243 Cv	(Summer)	0.750			
			6 71	1 5 1 1		<i>(</i>)			200.0		
		Margin	for Flo	od Risk	-		E Cocord	Tagagenet	300.0		
				Analy	DTS S	-	5 Second	Increment	(Excended) OFF		
					DIS S				ON		
				In	ertia S				ON		
	Re	turn Peric Climat	od(s) (ye ce Change	,					1, 30, 10 0, 0,		
											Surcharge
PN	US/MH Name	Storm		Climate Change		t (X) : harge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
E12 000	1	15 Winto		-	200/15	Winton				01 246	0.05
E13.000 E13.001		15 Winte: 15 Winte:				Winter Summer				81.346 81.191	
E13.002		15 Winter				Winter				80.990	
E13.003		720 Winte:		+0%	,					80.246	
E14.000	E5	15 Winte:	r 30	+0%	200/15	Winter				81.332	-0.96
E14.001	E6	15 Winte:	r 30	+0%	200/15	Summer				81.171	-0.82
E14.002	E7	15 Winte:	r 30	+0%	200/15	Summer				80.942	-0.71
E14.003		15 Winte:				Summer				80.686	
E13.004	E9	720 Winte:	r 30	+0%	30/360	Winter				80.233	0.05
				Flooded			Pipe				
			US/MH		Flow /	Overflow			Level		
		PN	Name	(m³)	Cap.	(l/s)	(1/s)	Status	Exceeded		
		E13.00	00 E1	0.000	0.25		741.5	OK			
		E13.00		0.000			1198.4	OK			
		E13.00	D2 E3	0.000	0.59		1650.2	OK			
		E13.00	D3 E4	0.000	0.00		119.9	OK			
		E14.00		0.000			692.5	OK			
		E14.00		0.000	0.39		1158.8	OK			
		E14.00					1502.8	OK			
		E14.00		0.000			1399.1	OK			
		E13.00	D4 E9	0.000	0.08		50.2	SURCHARGED			

Uudro a'-	Conce	ltants Ltd								Dor	
_	Const	IILANUS LUA			Poi	l Centr	- 1			Pag	e 8
•					-	t Centr t 1	aı				
•					Uni	ιı					m m
· Date 6+1	h Eahr	uary 2018			Doo	igned b	NT D TU			— N	licro
		-				-	-				rainage
File Un:		IDX				cked by					
XP Solut	tions				Net	work 20	16.1				
100	vear	Return Per	iod Su	ummarv	of Cri	tical H	Results	bv Maximu	m Level	(Rank 1) for
				1		xisting					
		Areal	Reducti	ion Fact		<u>ation Cri</u> 10 Addi		Low - % of 1	rotal Flow	0 000	
		mear						or * 10m³/ł			
			Start I	Level (m	m)	0		Inlet Coe	effiecient	0.800	
		nhole Headlos				-	per Person	n per Day (1	/per/day)	0.000	
		Foul Sewage p	per nect	care (1/	s) 0.00	0					
Nu	mber o	f Input Hydro	graphs	0 Num	ber of	Offline	Controls	0 Number of	f Time/Are	a Diagra	ams O
	Number	of Online Co	ontrols	1 Numbe	r of St	orage St	ructures	0 Number of	f Real Tim	e Contro	ols O
				9.07	nthetic	Rainfal	l Details				
		Rainfall Mo	del	FEH D1 ((1km) 0	.319	E (1km)	0.302 Cv (M	linter) 0.	840	
		Site Locat					F (1km)				
		C (1	km) −0.	026 D3 ((1km) 0	.243 Cv	(Summer)	0.750			
		Margin f	or Floo	d Risk W	Varning	(mm)			300.0		
					-		5 Second	Increment (Extended)		
					DTS St				OFF		
				The	DVD St ertia St				ON ON		
				T116	ertia S	Latus			ON		
		Duratio	Profile	. ,	i. 30. f	50. 120.	180, 240,	Sur , 360, 480,	nmer and W 600, 720,		
		Duración	1(5) (111	1115) 15	, 30, 0	, 120,	100, 210,	300, 400,	000, 720,	1440	
	R	eturn Period	-					-	L, 30, 100		
		Climate	Change	(응)					0, 0, 4	0, 40	
	TTC / MT		Detrom	<u>Olimete</u>	Time	- (Y)	Dimet (M)	First (Z)	0 f1		Surcharged
PN	US/MH Name	Storm		Climate Change		st (X) charge	First (1) Flood	Overflow	Act.	Level (m)	Depth (m)
		0001		0	5420	ye				()	(/
E13.000	E1	15 Winter	100			Winter				81.925	-0.375
E13.001 E13.002	E2 E3	15 Winter 15 Winter	100 100		, .	Summer				81.850 81.679	-0.143 0.018
E13.003	E4	960 Winter	100	+40%		MINCOL				80.780	-0.308
E14.000	E5	15 Winter	100			Winter				81.765	-0.535
E14.001	E6	15 Winter	100			Summer				81.710	-0.283
E14.002 E14.003	E7 E8	15 Winter 15 Winter	100 100			Summer				81.579 81.289	-0.082 0.000
E14.003		1440 Winter	100) Winter				80.746	0.566
				Flooded			Pipe				
					Flow /	Overflo	-		Level		
		PN	Name	(m ³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		E12 000	T 1	0 000	0 50		1 6 6 7 4	077			
		E13.000 E13.001	E1 E2	0.000	0.52 0.75		1553.4 2228.0	OK OK			
		E13.002	E3	0.000	1.14			SURCHARGED			
		E13.003	E4	0.000	0.00		155.1	OK			
		E14.000	E5	0.000	0.49		1455.6	OK			
		E14.001 E14.002	E6	0.000	0.75		2250.8	OK			
		EL4.UUZ	E: /	0.000	() 95		2869.8	OK			
		E14.002 E14.003	E7 E8	0.000 0.000	0.95 1.32		2869.8 2761.7	OK OK			

Hydrock	Consi	ıltan	ts Ltd								Pag	ge 9
•						Rai	l Centr	cal			۲ ۲	
•						Uni	t 1					1
•												Airco
Date 6t	h Febi	ruary	2018			Des	igned k	by RJH				
File Un		-					cked by	-				Jrainage
XP Solu							work 20					
	010110					Nee	WOIN 20					
<u>200</u>	year	Retu	irn Per	iod Su	ummary		tical H xisting		by Maximu	m Level	(Rank	<u>1) for</u>
			Arcal	Poduct	ion Foot		tion Cri		low - % of '	Total Elon	. 0 000	
			nicai		art (min				tor * 10m³/1			
			Hot		Level (m					effiecient		
							-	per Perso	n per Day (l/per/day)	0.000	
		Foul	Sewage p	per hect	tare (l/	s) 0.00	0					
Nu	umber o	f Inp	ut Hydro	ographs	0 Num	ber of	Offline	Controls	0 Number o	f Time/Are	ea Diagr	ams O
		-	-						0 Number o		-	
					_							
		Pain	fall Mo	dol				l Details	<u>8</u> 0.302 Cv (1	Vintor) 0	840	
			e Locat					E (1km) F (1km)		vincer) o.	040	
								(Summer)				
		1	Aargin f	for Floc	d Risk W	-				300.0		
					Analys	sis Time DTS St	-	5 Second	Increment (Extended) OFF		
						DIS SI DVD St				OPP		
					Ine	ertia St				ON		
				D (1)	<i>/ \</i>				0	1 -	.	
			Duratio	Profil	. ,	30 6	0 120	190 240	Su: , 360, 480,	mmer and V		
			Duració	11(5) (111.	1115) 1.	, so, e) 0, 120,	100, 240	, 300, 400,	000, 720,	1440	
	F	leturn	Period	(s) (ye	ars)					1, 30, 100		
			Climate	Change	(응)					0, 0, 4	10, 40	
	US/MH			Return	Climate	Firs	t (X)	First (Y) First (Z)	Overflow		Surcharged Depth
PN	Name		torm		Change		harge	Flood	Overflow	Act.	(m)	(m)
E13.000	E1	15	Winter	200	±10%	200/15	Winter				82.545	0.245
E13.000			Winter	200			Summer				82.418	0.245
E13.002			Winter	200			Winter				82.007	0.346
E13.003	E4	1440	Winter	200	+40%						81.060	-0.028
E14.000			Winter	200			Winter				82.394	0.094
E14.001			Winter	200			Summer				82.301	0.308
E14.002 E14.003			Winter Winter	200 200			Summer Summer				82.088 81.499	0.427
E13.004			Winter	200			Winter				80.993	0.210
						,						
					Flooded			Pipe				
						Flow /	Overflo	-		Level		
			PN	Name	(m ³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
			-10.53			-						
			E13.000	E1 E2	0.000	0.63			SURCHARGED			
			E13.001 E13.002	E2 E3	0.000	0.99			SURCHARGED SURCHARGED			
			E13.002		0.000	0.00		131.7	OK			
			E14.000	E5	0.000	0.62			SURCHARGED			
			E14.001	E6	0.000	0.94			SURCHARGED			
			E14.002	E7	0.000	1.22			SURCHARGED			
			E14.003		0.000	1.73			SURCHARGED			
			E13.004	E9	0.000	0.08		50.2	SURCHARGED			

Hydrock Consultants Ltd		Page 1
	Rail Central	
•	Unit 2 + Access Road	
•		Micro
Date 6th February 2018	Designed by RJH	
File Unit 2 + Access Road.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

Time Area Diagram for Existing

Time
(mins)Area
(ha)Time
(mins)Area
(mins)Time
(mins)Area
(mins)0-43.4484-87.5918-121.544TotalArea
Contributing(ha) = 12.583

Total Pipe Volume (m^3) = 1941.015

Hydrock Consulta	ints Lto	1										Page	2
•				R	ail Ce	ntra	1						
•				U	nit 2	+ Aco	cess]	Road					~m
Date 6th Februar	y 2018			D	esigne	d by	RJH						
File Unit 2 + Ac	cess Ro	ad.MD	X	С	hecked	by							ainage
XP Solutions				N	letwork	201	6.1						
PN	Length (m)				ork De [.] T.E. (mins)	Ва	ase	k	inq HYD SECT		Section	Туре	
	-	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Ba Flow	ase (l/s)	k	HYD SECT	(mm)	Section Pipe/Con		
E15.000	(m)	Fall (m) 0.381	Slope (1:X) 500.0	I.Area (ha) 3.060	T.E. (mins) 4.00	Ba Flow	ase (1/s) 0.0	k (mm)	HYD SECT O	(mm) 1800		nduit	
E15.000 E15.001	(m) 190.500	Fall (m) 0.381 0.419	Slope (1:X) 500.0 500.5	I.Area (ha) 3.060 3.060	T.E. (mins) 4.00 0.00	Ba Flow	ase (1/s) 0.0 0.0	k (mm) 0.600	HYD SECT 0 0	(mm) 1800 1800 1800	Pipe/Con Pipe/Con Pipe/Con	nduit nduit nduit	
E15.000 E15.001 E15.002	(m) 190.500 209.700 199.200	Fall (m) 0.381 0.419 0.399	Slope (1:X) 500.0 500.5 499.2	I.Area (ha) 3.060 3.060	T.E. (mins) 4.00 0.00 0.00	Ba Flow	ase (1/s) 0.0 0.0 0.0	k (mm) 0.600 0.600	HYD SECT 0 0	(mm) 1800 1800 1800	Pipe/Con Pipe/Con	nduit nduit nduit	
E15.000 E15.001 E15.002 E15.003	(m) 190.500 209.700 199.200	Fall (m) 0.381 0.419 0.399 0.166 0.245	Slope (1:X) 500.0 500.5 499.2 500.6 499.6	I.Area (ha) 3.060 3.060 3.060	T.E. (mins) 4.00 0.00 0.00 0.00	Ba Flow	ase (1/s) 0.0 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600	HYD SECT 0 0 0	(mm) 1800 1800 1800 1800	Pipe/Con Pipe/Con Pipe/Con	nduit nduit nduit nduit	

E15.004 18.000 0.036 500.0 0.000 0.00 0.0 0.600 o 1200 Pipe/Conduit E15.005 15.000 0.037 405.4 0.000 0.00 0.00 0.600 o 450 Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (1/s)
E15.000 E15.001 E15.002 E15.003	80.419 80.000	3.060 6.120 9.180 12.240	0.0 0.0 0.0 0.0	2.14 2.14	5438.4 5435.8 5442.5 5435.1
E16.000 E16.001	79.511	0.270 0.343	0.0	1.66	1885.3 1882.0
E15.004 E15.005		12.583 12.583	0.0	1.67 1.00	1884.5 159.6

	1								
Hydrock Consultant	ts Ltd								Page 3
•				Ra	il Cent	ral			
				Ur	nit 2 +	Access	Road		4
									- Cm
Date 6th February	2018			De	signed	hu DIU			- Micro
-					-	-			Drainage
File Unit 2 + Acce	ess Roa	ad.MDX			ecked b				Brainage
XP Solutions				Ne	etwork 2	016.1			
		E	PIPEI	LINE SC	HEDULES	for Ex	<u>xistinq</u>		
				<u>Upst</u>	ream Ma	nhole			
PN	Hyd	Diam	мн с	C.Level	I.Level I	D.Depth	MH	MH DIAM., L*	۲W
	Sect	(mm) N	lame	(m)	(m)	(m)	Connectio	n (mm)	
E15.0		1800			80.800	0.600	Open Manho	le 270	
E15.0					80.419	1 400	Open Manho	le 270	
E15.0		1800			80.000 79.601		Open Manho		
E15.0	JS 0	1800	上4	83.200	/9.001	1.799	Open Manho	le 270	10
E16.0	10 0	1200	ъS	82 160	79.756	1 204	Open Manho	le 210	10
E16.0		1200			79.511		Open Manho Open Manho		
	0	1200		20.200		2.105		21(
E15.0	04 o	1200	E7	81.500	79.435	0.865	Open Manho	le 210	00
E15.0		450			79.390		Open Manho		
							1		
				Downs	stream M	lanhole	<u>1</u>		
							-		
PN	Length	Slope	MH	C.Leve	l I.Level	D.Dept	h MH	MH DIAM.,	L*W
	(m)	(1:X)	Name	e (m)	(m)	(m)	Connect	ion (mm)	
E15.000					0 80.419		1 Open Man		2700
E15.001							0 Open Man		2700
E15.002							9 Open Man		2700
E15.003	83.100	500.6	Ε'	81.50	0 79.435	0.26	5 Open Man	hole 2	2100
E16.000	100 400) 199 G	E 6	93.20	0 70 511	2 / 9	9 Open Man	holo	2100
E16.001				81.50			55 Open Man 55 Open Man		2100
	30.100	5 501.5	ц,	01.00	0 10.100	0.00	o open nan		.100
E15.004	18.000	500.0	ΕS	81.50	0 79.399	0.90	1 Open Man	hole 2	2100
E15.005	15.000	405.4	E	81.50	0 79.353	3 1.69	7 Open Man	hole	0
	-	Free E	flowi	ng Out	fall Det	tails :	<u>for Exist</u>	ing	
	Ou	tfall	Out	fall C.	Level I.	Level	Min D	,L W	
	Pipe	Number	: Na	me	(m)	(m) 1	I. Level (m	nm) (mm)	
							(m)		
		E15.005	Ď	E 8	1.500	79.353	0.000	0 0	
		<u>S</u>	imul	ation (Criteria	for E	<u>xisting</u>		
				Coeff 0.				of Total Flow O	
				actor 1.		MADD F		m³/ha Storage 2	
		Hot Sta			0			Coeffiecient 0	
		Start L				per Per		y (l/per/day) 0	
Manhole								n Time (mins)	60
FOULS	ewage pe	er nect	are ((1/s) 0.	000		Output In	terval (mins)	1
Number of Inpu	t Hydrod	rranhs	0 1	Jumber o	f Offline	Contro	ls () Numbe	r of Time/Area	Diagrams 0
								r of Real Time	
					2				
			Sv	nthetic	<u>c Rainfa</u>	ll Det	ails		
			<u>~ _</u>						
	Rainfal	1 Model		FEH	D2 (1km)	0 300	tat i	nter Storms	No
Return	Period				D3 (1km)			Cv (Summer) 0.	
ince all in		ocatior		-	E (1km)			Cv (Winter) 0.	
		C (1km)		026				ation (mins)	30
					ner Storms			. ,	

©1982-2016 XP Solutions

ydrock Consultants	Ltd					Page 4	
		Rail Cer	ntral				
		Unit 2 +	Access	Road		4	
							Jun
ate 6th February 20	018	Designed	l by RJH				
ile Unit 2 + Access		Checked	-			Drai	nage
? Solutions		Network					
		NCCWOIN	2010.1				
	Onli	ne Controls	for Exis	sting			
<u>Hydro-Bra</u>	<u>ake Optimum® Mar</u>	nhole: E8, D	S/PN: E1	5.005, Volum	ie (m³):	25.3	
				0294-5160-1400-			
		Design Head (m sign Flow (1/s		-	1.400 51.6		
	De	Flush-Flc		Calcul			
				se upstream sto			
		Applicatic		-	rface		
		Sump Availabl			Yes		
		Diameter (mm	ı)		294		
	I	nvert Level (m	1)	79	9.390		
Ν	Minimum Outlet Pip	e Diameter (mm	1)		375		
	Suggested Manhol	e Diameter (mm	1)		2100		
Control Poi	nts Head (m)	Flow (l/s)	Contr	ol Points	Head (m)	Flow (l/s	;)
Design Point (Cal	lculated) 1.400	51.6		Kick-Flo®	1.013	44.	2
-	lush-Flo™ 0.492		ean Flow c	over Head Range		44.	
11	10311 F10 0.492		ean riow c	over nead nange		-J.	2
The hydrological calc	ulations have been	n based on the	Head/Disc	charge relation	ship for	the Hydro-I	Brake
Optimum® as specified					ydro-Brak	e Optimum®	be
utilised then these s	torage routing cal	lculations wil	l be inval	lidated			
pth (m) Flow (l/s) De	pth (m) Flow (l/s) Depth (m) Fi	Low (1/s)	Depth (m) Flow	7 (1/s) De	pth (m) Fl	Low (1/
0.100 9.1	0.800 49.	5 2.000	61.3	4.000	85.8	7.000	112
0.200 30.2	1.000 44.		64.2	4.500	90.8	7.500	116
	1.200 47.	9 2.400	66.9	5.000	95.6	8.000	120
0.300 49.5	1.400 51.	6 2.600	69.6	5.500	100.2	8.500	123
0.300 49.5 0.400 51.2	1.400 51.	1	74.6	6.000	104.5	9.000	127
	1.600 55.		, 1.0				
0.400 51.2			80.4	6.500	108.7	9.500	130
0.400 51.2 0.500 51.6	1.600 55.					9.500	130
0.400 51.2 0.500 51.6	1.600 55.					9.500	130
0.400 51.2 0.500 51.6	1.600 55.					9.500	130

Hydrock Consultants Ltd	Page 5	
•	Rail Central	
•	Unit 2 + Access Road	Micco
Date 6th February 2018	Designed by RJH	
File Unit 2 + Access Road.MDX	Checked by	Digiliada
XP Solutions	Network 2016.1	

Storage Structures for Existing

Tank or Pond Manhole: E4, DS/PN: E15.003

Invert Level (m) 79.601

Depth (m)	Area (m²)								
0.000	8656.0	1.200	10772.0	2.400	11139.0	3.600	11139.0	4.800	11139.0
0.200	8998.0	1.400	11139.0	2.600	11139.0	3.800	11139.0	5.000	11139.0
0.400	9345.0	1.600	11139.0	2.800	11139.0	4.000	11139.0		
0.600	9696.0	1.800	11139.0	3.000	11139.0	4.200	11139.0		
0.800	10051.0	2.000	11139.0	3.200	11139.0	4.400	11139.0		
1.000	10410.0	2.200	11139.0	3.400	11139.0	4.600	11139.0		

Hydrock	Consu	ltants Lt	d							Pa	ge 6
•					Rail	Centr	al				
•					Unit	2 + A	ccess Ro	ad			1.
•											Aicro
		uary 2018				gned b	-)rainage
		Access R	oad.MD>	K		ked by					Janage
XP Solut	cions				Netwo	ork 20	16.1				
Nu	Ma: mber o:	Hot nhole Headlo Foul Sewage f Input Hydr of Online C Rainfall Mo Site Loca C (1	L Reduct Hot St Start per hec cographs Controls bodel tion 1km) -0.	ion Fact art (mir Level (n f (Globa tare (1/ 0 Nur 1 Numbe <u>Sy</u> FEH D1 D2 026 D3 cd Risk	Simulat: cor 1.000 hs) 0 hs) 0 hs) 0 hs) 0 hs) 0.500 hs) 0.500 hser of Offer of Store hthetic R (1km) 0.3 (1km) 0.2 Warning (ion Cri Addi Flow p ffline rage St ainfal 19 00 43 Cv mm)	teria tional Fl MADD Fact er Person Controls ructures L Details E (1km) (F (1km) 2 (Summer) (ow - % of or * 10m ³ / Inlet Cc per Day (0 Number o 1 Number o 0.302 Cv (2.496 0.750	Total Flow ha Storage effiecient l/per/day) of Time/Are of Real Tim	7 0.000 2 2.000 2 0.800 0.000 ea Diagr ne Contr 840	ams O
	R	eturn Period		In e(s) iins) 1 ars)	DTS Sta DVD Sta ertia Sta	tus tus tus		Su	OFF ON ON 600, 720, 1, 30, 100 0, 0, 4	Jinter 960, 1440 0, 200	
PN	US/MH Name	Storm		Climate Change	First Surcha		First (Y) Flood	First (Z) Overflow	Overflow Act.		Surcharged Depth (m)
E15.000	E1	15 Winter	1	+0%	200/15 1	Winter				81.173	-1.427
E15.001	E2		1	+0%						80.872	-1.347
E15.002	E3		1	+0%	100/15 0	Winter				80.521	-1.279
E15.003 E16.000		720 Winter 15 Winter	1	+0% +0%						79.794 79.879	-1.60 ⁻
E16.001	E6	720 Winter	1		200/480 0	Winter				79.753	-0.958
E15.004		720 Winter	1		200/240					79.753	-0.882
E15.005	E8	720 Winter	1	+0%	30/15 1	Winter				79.746	-0.094
			<u>тте /</u> 1	Flood		/ Overf	Pipe low Flow		Level		
		PI						Status E			
					-						
		E15. E15.		E1 0.0 E2 0.0	000 0.08 000 0.13		402.7 636.0				
		E15.		E3 0.0			881.5				
		E15.		E4 0.0			49.7				
		E16. E16.		E5 0.0 E6 0.0			35.8 3.9	OK OK			
		E16. E15.		E6 0.0 E7 0.0			50.3				
		E15.			0.48		50.3				

©1982-2016 XP Solutions

Hydrock	Consi	ultants Lto	d							Pa	ge 7
•					Rai	l Centi	al				
•					Unit	t 2 + A	Access Ro	bad		7	1.
											Aicco
Date 6th	ı Febi	ruary 2018			Des	igned k	by RJH				
		- + Access Ro	oad.MD	Х		cked by	-				Irainago
KP Solut						work 20					
						-					
<u>30 year</u>	Retui	n Period :	Summar	y of Cr	<u>itical</u>	Result	ts by Max	ximum Lev	el (Rank	<u>1) fo</u>	<u>r Existi</u>
			Hot St Start ss Coei	tart (mir Level (n ff (Globa	tor 1.00 ns) nm) al) 0.50	0 0 0 Flow p	itional Fl MADD Fact		na Storage effiecient	2.000	
		f Input Hydr of Online C								-	
				Sy	nthetic	Rainfal	<u>l Details</u>				
		Rainfall Mo Site Locat	cion	D2	(1km) 0.	300	F (1km) 2	2.496	Vinter) 0.	840	
					. ,		(Summer)	0.750			
		Margin	for Flc	od Risk	-		5 Cocord -	Increment (300.0		
				Analy	DTS St	-	s second .	Increment (OFF		
					DVD St				ON		
				In	ertia St	atus			ON		
	R	eturn Perioc Climate						:	1, 30, 100 0, 0, 4		
PN	US/MH Name			Climate Change		: (X) harge	First (Y) Flood	First (Z) Overflow	Overflow Act.		Surcharge Depth (m)
	Hame	0 COLIM	101104	onunge	542.01	urge	11000	0101110#	1000	()	
E15.000		15 Winter	30		200/15					81.476	-1.12
E15.001 E15.002	E2 E3	15 Winter 15 Winter	30 30	+0% +0%		Summer Winter				81.277 80.981	-0.94 -0.81
E15.002		720 Winter	30	+0%	100/13	WINCEL				80.100	-1.30
E16.000		600 Winter	30	+0%						80.086	-0.87
E16.001		600 Winter	30		200/480					80.086	
E15.004		600 Winter	30		200/240					80.085	
E15.005	E8	600 Winter	30	+0%	30/15	Winter				80.077	0.23
				Flooded			Dine				
			IIS/MH	Volume		Overflo	Pipe w Flow		Level		
		PN	Name	(m ³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		E15.000) E1	0.000	0.27		1266.7	OK			
		E15.001					2005.3	OK			
		E15.002					2756.8	OK			
		E15.003					54.2	OK			
		E16.000 E16.001					9.0 7.1	OK OK			
		E15.004					52.3	OK			
		E15.005						SURCHARGED			

©1982-2016 XP Solutions

Hydrock	Const	ltants Lt	d							Pa	ge 8
•					Rai	l Centr	al				5
					Uni	t 2 + A	ccess Re	oad		7	٦.
											~~~
Date 6t	n Febr	uary 2018			Des	igned b	v RJH				NICrO
		- Access R		x		cked by	-				)rainage
XP Solut		11000000 11	044.112	21		work 20					<u> </u>
XI SOLU	CIONS				Net	WOIK 20					
<u>100</u>	year	Return Pe	riod S	ummary	of Cri	tical F	Results	by Maximu	m Level	(Rank	1) for
					<u>E</u>	xisting	1				
					Gimula	tion Cri	torio				
		Area	l Reduct	tion Fact				Low - % of '	Total Flow	, 0.000	
				tart (min				cor * 10m³/1			
				Level (m			_		effiecient		
		nhole Headlo Foul Sewage				-	ber Persor	n per Day (	l/per/day)	0.000	
		rour bewage	per net	00010 (1)	5, 0.00						
		f Input Hydi								-	
	Number	of Online (	Controls	s 1 Numbe	er of St	orage St	ructures	1 Number o	f Real Tir	ne Contr	ols O
				Sv	<u>nthet</u> ic	<u>Rain</u> fal	l Details				
		Rainfall M	odel	FEH D1	(1km) 0	.319	E (1km)	0.302 Cv (1	Vinter) 0.	840	
		Site Loca					F (1km)				
		С (	1 km) -0	.U26 D3	(⊥km) 0	.243 Cv	(Summer)	U./5U			
		Margin	for Flo	od Risk	Warning	(mm)			300.0		
				Analy		-	5 Second	Increment (	Extended)		
					DTS St				OFF		
				Tn	DVD Si ertia Si				ON ON		
				111	CICIC D	cucub			014		
			Profi					C 11	mmer and W	lintor	
		Durati		. ,	5, 30, 6	50, 120,	180, 240,	, 360, 480,			
										1440	
	R	eturn Perio							1, 30, 100		
		Climate	e Chang	e (%)					0, 0, 4	40, 40	
			Determ	<b>01</b> i		. (77)	<b>T</b> imet (11)		0		Surcharged
PN	US/MH Name	Storm		Climate Change		t (X) harge	First (1) Flood	) First (Z) Overflow	Act.	Level (m)	Depth (m)
	Hume	0 colim	reriou	change	bure	narge	11004	OVELLIOW	nee.	(111)	(111)
E15.000	E1	15 Winter	100	+40%		Winter				82.098	-0.502
E15.001 E15.002	E2 E3	15 Winter 15 Winter	100 100	+40% +40%		Summer Winter				82.038 81.836	-0.181 0.036
E15.002 E15.003		960 Winter	100	+40% +40%	T00/T3	, wincer				80.597	-0.804
E16.000		960 Winter	100	+40%						80.576	-0.380
E16.001		960 Winter	100			Winter				80.575	-0.136
E15.004 E15.005		960 Winter 960 Winter	100 100	+40% +40%		Winter Winter				80.575 80.543	-0.060 0.703
113.003	011	200 WINCEL	100	000	50715	, MITHCET				00.010	0.705
			110 /2	Flooded		0	Pipe		T e 1		
		PN	US/MH Name	Volume (m³)	Flow / Cap.	Overflo (1/s)	w Flow (l/s)	Status	Level Exceeded		
			e	( )	Sab.	(1) 5)	(-, 5)	- 54 548			
		E15.00					2645.1	OK			
		E15.00 E15.00			0.79		3787.8	OK SURCHARGED			
		E15.00 E15.00					117.6	OK			
		E16.00			0.01		11.5	OK			
		E16.00			0.01		15.9	OK			
		E15.00			0.08		71.4	OK			
		E15.00	5 E8	0.000	0.49		51 6	SURCHARGED			

Hvdrock	Consi	ultants Lt	d							Pa	qe 9
					Rai	l Centi	ral				<u> </u>
					-		Access R	oad		7	۹.
						-					~~~
Date 6th	n Febi	ruary 2018			Des	igned b	ov RJH				Micro
		+ Access F		X		cked by	-				Drainage
XP Solut		100000 1				work 20					<b>_</b>
MI DOIU	10115				Nee	WOIK 20	510.1				
200	year	Return Pe	eriod S	ummary	of Cri	tical	Results	by Maximu	m Level	(Rank	<u>1) for</u>
					E	<u>xistin</u>	<u>a</u>				
					C i mu l a	tion Cm	itania				
		Area	l Reduct	tion Fact		ation Cr: 00 Add		Low - % of !	Fotal Flow	0.000	
								cor * 10m³/1			
				Level (m		0	_		effiecient		
		nhole Headl Foul Sewage				-	per Persor	n per Day (.	L/per/day)	0.000	
		rour bewage	per net	ccure (1)	5) 0.00	,0					
		f Input Hyd								-	
	Number	of Online	Controls	s 1 Numbe	er of St	corage St	tructures	1 Number o	f Real Tim	ne Contr	cols O
				Sy	nthetic	Rainfal	l Details				
		Rainfall M	lodel	FEH D1	(1km) 0	.319	E (1km)	0.302 Cv (V	Winter) 0.	840	
		Site Loca			. ,		F (1km)				
		C (	1 km) -0	.026 D3	(1 km) 0	.243 Cv	(Summer)	0.750			
		Margin	for Flo	od Risk	Warning	(mm)			300.0		
				Analy		-	5 Second	Increment (			
					DTS S DVD S				OFF ON		
				In	ertia S				ON		
			Profi	le(s)				Su	mmer and W	linter	
		Durati		. ,	5, 30, 6	60, 120,	180, 240,	, 360, 480,			
										1440	
	R	eturn Perio	d(s) (y e Chang						1, 30, 100 0, 0, 4		
		CI IIId C	e chang	C (0)					0, 0, 1	10, 10	
	US/MH		Peturn	Climate	Fire	t (X)	First (V)	) First (Z)	Overflow		Surcharged Depth
PN	Name	Storm		Change		harge	Flood	Overflow	Act.	(m)	(m)
				<b>j</b> -		<b>y</b> -					()
E15.000	E1			+40%		0 Winter				82.918	0.318
E15.001 E15.002	E2 E3		200 200	+40% +40%		5 Summer 5 Winter				82.826 82.287	0.607 0.487
E15.003		960 Winter		+40%						80.773	-0.628
E16.000		960 Winter		+40%	000/100					80.754	-0.202
E16.001 E15.004		960 Winter 960 Winter				) Winter ) Winter				80.754 80.752	0.043 0.117
E15.004		960 Winter	200	+40%		ð Winter				80.764	0.924
				Flooded			Dire				
			US/MH	Volume		Overflo	Pipe w Flow		Level		
		PN	Name	(m ³ )	Cap.	(1/s)	(1/s)	Status	Exceeded		
		<b>515</b> 00	0	0 000	0.00		2005 1				
		E15.00 E15.00			0.69 1.02			FLOOD RISK SURCHARGED			
		E15.00						SURCHARGED			
		E15.00					124.1	OK			
		E16.00			0.01		13.6	OK			
		E16.00 E15.00			0.01			SURCHARGED SURCHARGED			
		E15.00			0.49			SURCHARGED			

Hydrock Consultants Ltd	Page 1		
•	Rail Central Units 1+3 Access Road	Micco	
Date 6th February 2018	Designed by RJH		
File Units 1+3 Access Road.MDX	Checked by	Drainage	
XP Solutions	Network 2016.1	L	

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.161	4-8	0.455	8-12	0.086
Total	Area (	Contribu	uting (	ha) = 0	.701

Total Pipe Volume (m³) = 832.838

Hydrock Consultants Ltd		Page 2
•	Rail Central	
• •	Units 1+3 Access Road	Micco
Date 6th February 2018	Designed by RJH	
File Units 1+3 Access Road.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

## Existing Network Details for Existing

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	ase (l/s)	k (mm)	HYD SECT		Section Type
E12.001	164.000 133.400 130.200 40.900 31.000	0.178 0.174 0.055	749.4 748.3 743.6	0.290 0.180 0.176 0.055 0.000	4.00 0.00 0.00 0.00 0.00	0.0 0.0 0.0	0.600 0.600 0.600 0.600 0.600	0 0 0	1500 1500 1500	Pipe/Conduit Pipe/Conduit Pipe/Conduit Pipe/Conduit Pipe/Conduit

### Network Results Table

PN	US/IL (m)		Σ Base Flow (l/s)		Cap (1/s)
E12.000 E12.001 E12.002 E12.003 E12.004	82.082 81.904 81.730	0.290 0.470 0.646 0.701 0.701	0.0 0.0 0.0	1.56 1.56 1.57	2749.6 2754.9 2757.1 2765.7 478.1

Hydrock Consultants	s Ltd								Page 3
•					Centr s 1+3		ss Road		4
•									— Micro
Date 6th February 2 File Units 1+3 Acce			v		gned bj ked by	-			Drainage
XP Solutions	ess Ro	ad.MD			ork 20				
		<u>]</u>	PIPELIN	<u>e sched</u>	ULES 1	for Ex	<u>xistinq</u>		
				<u>Upstrea</u>	am Man	<u>hole</u>			
PN	-	Diam (mm) 1	MH C.Le Name (n		evel D. m)	Depth (m)	MH Connection	MH DIAM., (mm)	L*W
E12.000 E12.001		1500 1500		.200 82 .000 82			Open Manhole Open Manhole		700 700
E12.002				.000 81			Open Manhole		700
E12.003		1500		.000 81			Open Manhole		700
E12.004	0	450	E5 <mark>85</mark> .	.000 81	.675	2.875	Open Manhole	1	800
			<u> </u>	Downstre	eam Ma	nhole	2		
PN	Length (m)	-	e MH C. Name	.Level I (m)	.Level (m)	D.Dept (m)	th MH Connectio	MH DIAM. n (mm)	
E12.000	L64.000	752.3					8 Open Manho		2700
E12.001 1 E12.002 1							96 Open Manho 70 Open Manho		2700 2700
E12.002							25 Open Manho		1800
E12.004	31.000	45.9	) E 8	32.000 8	81.000	0.55	50 Open Manho	le	0
	Ī	Free 1	Flowing	Outfal	l Deta	ails :	for Existir	ng	
	Out	tfall	Outfall	l C. Lev	el I. I	evel	Min D,L	W	
		Numbe		(m)			I. Level (mm)		
	-	710 00	4 1	E 02.0	0.0 0.1	000	(m)	0 0	
	Ľ					.000		) ()	
		5	imulati	lon Crit	teria	for E	<u>Existing</u>		
							Flow - % of		
			lon Facto art (mins		1	MADD F	actor * 10m ³	/ha Storage oeffiecient	
					Flow p	er Per	son per Day	(l/per/day)	
Manhole H			E (Global care (l/s	,			Run ' Output Inte	Time (mins)	60 1
							-		
Number of Input Number of Onl.		-							-
			<u>Synth</u>	netic Ra	ainfal	<u>l Det</u>	ails (		
	ainfall				(1km)			ter Storms	
Return F	eriod Site Lo	· <u>-</u>			(1km) (1km)	0.243		7 (Summer) 0 7 (Winter) 0	.750
	C	C (1km	) -0.026	F	(1km)	2.496	Storm Durati		
	DI	1 (1km	) 0.319	Summer	Storms	Yes			

	Consi	ultant	ts Lto	a										1	Page	e 4	
•							Rail	Centi	ral								
							Unit	s 1+3	Acce	ss Roa	ad				4	<b>A</b> .	
																-7	m
Date 6th	ı Febr	ruarv	2018				Desi	aned k	ov RJH							IC IO	
File Units 1+3 Access Road.MDX							Designed by RJH Checked by								aina	<b>qe</b>	
XP Solut					11071			ork 20	·								
								02.11 20									
					(	Onlin	e Contr	ols fo	or Exi	sting							
	Hy	vdro-E	<u>}rake</u>	<u>Opti</u>	mum®	Manh	nole: E5	5, DS/	PN: E1	2.004	, Vo	olume	(m³)	): 76.	. 8		
						-	Init Defe			0074 0	000	1 - 0 0 /					
							Jnit Refe esign Hea		MD-SHE-	00/4-2	900-		.500				
							lgn Flow					-	2.9				
								n-Flo™				alcula					
							-		Minimi	se ups	tream		-				
						c	Applic Sump Avai					Sur	iace Yes				
							Diameter						74				
						Inv	vert Leve	el (m)				81	.675				
						-	Diameter						100				
			Suc	ggest	ed Ma	inhole	Diameter	: (mm)				-	200				
	Cor	ntrol I	?oints		Head	1 (m)	Flow (1/:	s)	Contr	ol Poi	nts		Head	(m) Fla	ow (1	l/s)	
	sian P	oint (	Calcula	ated)	1	L.500	2	.9		Ţ	(ick-	Flo®	0	662		2.0	
Det	Jign i	orne (	Flush			).325			n Flow				0.	-		2.3	
									- / -								
	-	ical ca	alculat							-			-		-		ke
The hyd			ind c	Chould		uner u	ype or c	OULTOT		other	LIIdii		аго-ы		+ i m	mo ha	
Optimum		specif						will }				a ny		ake op	otimu	ım® be	
Optimum utilise	ed ther	specif: n these	e stora	age ro	outin	g calc	ulations		pe inva	lidated	ł						
Optimum	ed ther	specif: n these	e stora	age ro	outin	g calc	ulations		pe inva	lidated	ł						(l/s)
Optimum utilise Depth (m) 0.100	ed ther	specif: n these (1/s) 2.0	e stora Depth 0.	age rc (m) 1 .800	outin	g calc ( <b>1/s)</b> 2.2	Ulations	<b>n) Flov</b>	oe inva <b>7 (1/s)</b> 3.3	lidated Depth 4.	1 (m) .000		<b>(l/s)</b> 4.6	Depth	(m) .000	Flow	5.9
Optimum utilise Depth (m) 0.100 0.200	ed ther	specif: n these (1/s) 2.0 2.4	Depth 0.	age rc (m) 1 .800 .000	outin	g calc ( <b>l/s)</b> 2.2 2.4	ulations <b>Depth (n</b> 2.00 2.20	<b>n) Flov</b> 00	be inva 7 (l/s) 3.3 3.5	Depth 4.	<b>(m)</b> . 000 . 500		(l/s) 4.6 4.8	Depth 7 7	(m) .000 .500	Flow	5.9 6.1
Optimum utilise Depth (m) 0.100 0.200 0.300	ed ther	specif: n these (1/s) 2.0 2.4 2.5	Depth 0. 1.	age rc (m) 1 .800 .000 .200	outin	g calc ( <b>1/s</b> ) 2.2 2.4 2.6	ulations Depth (m 2.00 2.20 2.40	<b>n) Flov</b> 20 20	oe inva 7 (l/s) 3.3 3.5 3.6	<b>Depth</b> 4. 5.	(m) .000 .500 .000		(1/s) 4.6 4.8 5.1	<b>Depth</b> 7 7 8	(m) .000 .500 .000	Flow	5.9 6.1 6.3
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5	e stora <b>Depth</b> 0. 1. 1. 1.	age ro (m) 1 .800 .000 .200 .400	outin	g calc (1/s) 2.2 2.4 2.6 2.8	ulations <b>Depth (n</b> 2.00 2.20 2.40 2.60	<b>n) Flov</b> 20 20 20 20	oe inva 7 (1/s) 3.3 3.5 3.6 3.7	<b>Depth</b> 4. 5. 5.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3	<b>Depth</b> 7 7 8 8	(m) .000 .500 .000 .500	Flow	5.9 6.1 6.5
Optimum utilise Depth (m) 0.100 0.200 0.300	ed ther	specif: n these (1/s) 2.0 2.4 2.5	e stora Depth 0. 1. 1. 1. 1.	age rc (m) 1 .800 .000 .200	outin	g calc ( <b>1/s</b> ) 2.2 2.4 2.6	ulations Depth (m 2.00 2.20 2.40	n) Flow	oe inva 7 (l/s) 3.3 3.5 3.6	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000		(1/s) 4.6 4.8 5.1	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000	Flow	5.9
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5 6 6 6
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5. 6. 6. 6.
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5. 6. 6. 6.
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5.9 6.2 6.9
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5.9 6.2 6.5 6.5
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5.9 6.1 6.5 6.5
Optimum utilise Depth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5.9 6.1 6.3 6.5
Optimum utilise Oppth (m) 0.100 0.200 0.300 0.400 0.500	ed ther	specif: n these (1/s) 2.0 2.4 2.5 2.5 2.4	e stora Depth 0. 1. 1. 1. 1.	(m) 1 .800 .000 .200 .400 .600	outin	g calc (1/s) 2.2 2.4 2.6 2.8 3.0	Depth (n 2.00 2.20 2.40 2.60 3.00	n) Flow	<pre>ce inva (1/s) 3.3 3.5 3.6 3.7 4.0</pre>	<b>Depth</b> 4. 5. 5. 6.	(m) .000 .500 .000 .500		(1/s) 4.6 4.8 5.1 5.3 5.5	<b>Depth</b> 7 7 8 8 9	(m) .000 .500 .000 .500 .000	Flow	5. 6. 6. 6.

Hydrock Cor	nsulta	ants Ltd							P	age 5
•					Rail Ce	ntral				
•					Units 1	+3 Access	s Road			Y a
•										Micco
Date 6th Fe	ebrua	ry 2018			Designe	ed by RJH				MICIO
File Units	1+3 2	Access R	oad.MD	Х	Checked	by				Drainage
XP Solutior	ns				Network	2016.1			•	
<u>1 year Ret</u> Number	Manho Fou c of Ir per of Ra	Areal Hot le Headlos l Sewage p nput Hydro Online Co infall Moo ite Locati C (1)	Reducti Hot Sta Start L ss Coeff ber hect graphs ntrols del H ion cm) -0.0	on Facto rt (mins evel (mm : (Global are (l/s 0 Number 1 Number <u>Synt</u> FEH D1 (1 D2 (1 D26 D3 (1 d Risk Wa	<u>Simulation</u> r 1.000 ) 0 ) 0.500 Fl ) 0.000 er of Offl of Storage <u>thetic Rair</u> Lkm) 0.319 Lkm) 0.300 Lkm) 0.243 arning (mm)	ults by Ma <u>Criteria</u> Additional F MADD Fac ow per Perso ine Controls e Structures <u>fall Details</u> E (1km) F (1km) Cv (Summer) 0 2.5 Second	<pre>'low - % of ttor * 10m³</pre>	Total Flc /ha Storag oeffiecien (l/per/day of Time/Ar of Real Ti (Winter) 0 300.1	ow 0.000 ge 2.000 nt 0.800 7) 0.000 cea Diad ime Cont 0.840 0 )	) ) ) grams O
	Retu	Duratior rn Period Climate	(s) (yea	e(s) .ns) 15,	DVD Status rtia Status 30, 60, 1			1, 30, 10	Winter 0, 960, 1440 00, 200 40, 40	Surcharged
	S/MH Iame	Storm				First (Y) Flood	First (Z) Overflow	Overflow Act.		Depth (m)
E12.000 E12.001 E12.002	E2	15 Winter 15 Winter 60 Winter	1 1 1	+0%					82.427 82.239 82.226	-1.373 -1.343 -1.178
E12.002 E12.003 E12.004	E4 3	60 Winter 60 Winter	1 1		1/30 Summe	r			82.226 82.226	-1.004 0.101
E12.003	E4 3	60 Winter	1	+0% Flooded		Pipe rflow Flow	Status	Level Exceeded	82.226	-1.004

Hydrock Consultants Ltd				Page 6				
•		Rail Central						
		Units 1+3 Acces	s Road	<u> </u>				
•				– Micro				
Date 6th February 2018		Designed by RJH		Drainage				
File Units 1+3 Access Ro	ad.MDX	Checked by		Diamage				
XP Solutions Network 2016.1								
Hot S Manhole Headloss Foul Sewage pe Number of Input Hydrog Number of Online Cor	<u>Si</u> Reduction Factor Hot Start (mins) Start Level (mm) s Coeff (Global) er hectare (l/s) graphs 0 Number strols 1 Number of <u>Synth</u> el FEH D1 (1kr	<u>mulation Criteria</u> 1.000 Additional I 0 MADD Fac 0 0.500 Flow per Perso 0.000 c of Offline Controls of Storage Structures etic Rainfall Detail	Flow - % of Total Flow ( ctor * 10m³/ha Storage 2 Inlet Coeffiecient ( on per Day (l/per/day) ( s 0 Number of Time/Area s 0 Number of Real Time <u>S</u> 0.302 Cv (Winter) 0.84	0.000 2.000 0.800 0.000 Diagrams 0 Controls 0				
		n) 0.243 Cv (Summer)						
Duration Return Period(s	D D Inert Profile(s) (s) (mins) 15, 3	TS Status VD Status ia Status	I Increment (Extended) OFF ON ON Summer and Wir 0, 360, 480, 600, 720, 9 1, 30, 100, 0, 0, 40,	960, 1440 200				
		First (X) First (Y) Surcharge Flood	First (Z) Overflow Le	ter Surcharged evel Depth m) (m)				
E12.000 E1 600 Winter E12.001 E2 600 Winter E12.002 E3 600 Winter E12.003 E4 600 Winter E12.004 E5 600 Winter		/30 Summer	82. 82. 82.	554       -1.246         554       -1.028         554       -0.850         554       -0.676         554       0.429				
PN		Pipe .ow / Overflow Flow Cap. (l/s) (l/s)	Level Status Exceeded					
E12.000 E12.001 E12.002 E12.003 E12.004	E3 0.000	0.00       9.7         0.01       12.3         0.00       11.5         0.00       4.9         0.01       2.5	OK OK					

Hydrock (	Consul	tants Ltd								P	age 7
•					Rail	Centr	al				
•					Unit	ts 1+3	Access	Road			L'um
Date 6th	Febru	ary 2018			Desi	lgned b	y RJH				MICrO
File Unit	cs 1+3	Access R	oad.MD	Х		cked by	-				Drainage
XP Soluti	Lons					vork 20	·				
<u>100 y</u>	<u>year R</u>	<u>eturn Per</u>	iod Su	mmary c		tical E Kisting		by Maxim	um Level	(Ran)	<u>1) for</u>
	Fc	Hot nole Headlos pul Sewage p	Hot Sta Start L s Coeff per hect	ert (mins evel (mm (Global are (l/s	or 1.000 a) ( b) 0.500 c) 0.000	) ) ) Flow <u>p</u> )	ltional F MADD Fac Der Perso	n per Day	/ha Storag peffiecien (l/per/day	ge 2.00 nt 0.80 y) 0.00	0 0 0
		Input Hydro of Online Co									-
	I	Rainfall Moc Site Locati C (1}	on	FEH D1 ( D2 (	1km) 0. 1km) 0.	319 300	<u>l Details</u> E (1km) F (1km) (Summer)	0.302 Cv 2.496	(Winter) (	0.840	
		Margin f	or Floo	Analys	-	step 2. atus atus	5 Second	Increment	OF	.)	
		Duratior	Profile n(s) (mi	. ,	, 30, 6	0, 120,	180, 240	S1 , 360, 480,	ummer and , 600, 720	0, 960,	
	Ret	curn Period( Climate	-						1, 30, 10 0, 0,	1440 00, 200 40, 40	
	US/MH		Return	Climate	First	. (X) F	'irst (Y)	First (Z)	Overflow		Surcharged Depth
PN	Name	Storm	Period	Change	Surch	arge	Flood	Overflow	Act.	(m)	(m)
E12.000	E1	960 Winter	100	+40%						82.989	-0.811
E12.001	E2	960 Winter	100	+40%						82.989	-0.593
E12.002		960 Winter	100	+40%						82.988	-0.416
E12.003 E12.004		960 Winter 960 Winter	100 100	+40% +40%	1/30 S	ummer				82.988 82.988	-0.242 0.863
				Flooded			Pipe				
			US/MH	Volume			ow Flow		Level		
		PN	Name	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded	L	
		E12.000	E1	0.000	0.01		12.2	OK			
		E12.001		0.000	0.00		11.5	OK			
		E12.002		0.000	0.00		10.9	OK			
		E12.003		0.000	0.00		4.9	OK			
		E12.004	E5	0.000	0.01		2.7	SURCHARGED			

Hydrock (	Consul	tants Ltd								P	age 8
		200			Rail	. Centi	ral			-	
•					_		Access	Road			4
•					01120		1100000				- Com
• Date 6th	Febru	ary 2018			Desi	.gned k	NV R.TH				Micro
		Access R	and MD	v		-	-				Drainage
		ACCESS R	Jad.MD.	Χ		ked by					
XP Soluti	lons				Netw	ork 20	)16.1				
200 7	voar F	Return Per	ind Su	mmary c	f Crit	icall	209111+9	hu Mavimi	um T.eszel	(Rank	(1) for
200	/ear h	Cecurii ier	100 50			<u>kistin</u>		υν Μαλιιιί			<u>. 1) 101</u>
					<u>112</u>	TTOCTIN	1				
						cion Cr					
								low - % of			
							MADD Fac	tor * 10m ³ /		-	
	Manł	HOT nole Headlos		Level (mm E (Global			her Perso		peffiecien (1/per/day		
		oul Sewage p				-	001 10100	in per bay	(1) per/ dd_	y, 0.00	, ,
		Input Hydro									
Nı	umber c	of Online Co	ntrols	1 Number	of Sto	orage St	ructures	0 Number 0	of Real T	ime Con	trols 0
				Syn	thetic	Rainfal	l Details	3			
	I	Rainfall Mod	del F	FEH D1 (1	lkm) O.	319	E (1km)	0.302 Cv (	(Winter) (	0.840	
		Site Locati					F (1km)				
		C (1)	cm) -0.0	)26 D3 (1	lkm) O.	243 Cv	(Summer)	0.750			
		Margin f	or Floo	d Risk W.	arning	(mm)			300.	0	
		nargin i	01 11000		-		5 Second	Increment			
					DTS St	atus			OF	F	
					DVD St					N	
				Ine	rtia St	atus			0	N	
			Profile	. ,					ummer and		
		Duratior	ı(s) (mi	.ns) 15,	30, 6	), 120,	180, 240	, 360, 480,	, 600, 72		
	Rei	turn Period	(s) (vea	arel					1, 30, 1	1440	
	Net	Climate	-							40, 40	
			)-	(-)					-, -,	., .	
											0
	US/MH		Return	Climate	First	(X) F	'irst (Y)	First (Z)	Overflow		Surcharged Depth
PN	Name	Storm		Change	Surch		Flood	Overflow	Act.	(m)	(m)
				2		-					
E12.000		960 Winter		+40%						83.172	-0.628
E12.001 E12.002		960 Winter 960 Winter	200 200	+40% +40%						83.172 83.172	-0.410 -0.232
E12.002		960 Winter		+40%						83.171	-0.059
E12.004		960 Winter			1/30 S	ummer				83.169	
							Dian				
				Flooded Volume	Flow /	Overfl	Pipe		Level		
		PN	Name	(m ³ )	Cap.	(1/s)		Status	Exceeded	L	
		E12.000		0.000	0.01		14.4	OK			
		E12.001 E12.002		0.000 0.000	0.01 0.01		12.7 12.0	OK			
		E12.002 E12.003		0.000	0.01		5.3	OK			
		E12.004		0.000	0.01			SURCHARGED			

Hydrock Consultants Ltd				Page 1
•		entral		
	Units	3 + 4 + Access	Road	
•				- Micro
Date 6th February 2018		ed by RJH		Drainage
File Units 3+4 + Access Road.M				Diamage
XP Solutions	Networ	k 2016.1		
п	lime Anes Diego	om for Erictin	~	
<u>1</u>	ime Area Diagr	am for Existing	1	
Time A	rea Time Area	Time Area Tim	me Area	
	na) (mins) (ha)		ns) (ha)	
0-1 0	215 1-8 9 793	8-12 8.024 12	-16 0 090	
0-4 0.	215 4-0 9.795	0-12 0.024 12	-10 0.090	
Т	otal Area Contrib	uting (ha) = 18.12	23	
	Matal Dina Maluma	$(m_{3}) = 22100,002$		
	Total Pipe Volume	$m^3$ = 23100.982		

Hydrock Consultants Ltd							Page 2
•		Rail Ce	ntral				
		Units 3	+ 4 + Ac	cess F	Road		
	011200 0						
•							——— Micro
Date 6th February 2018		Designe	d by RJH				
File Units 3+4 + Access Road	d.MDX	Checked	by				Drainage
XP Solutions		Network	2016.1				
Ex	isting Net	work De	tails for	Exist	inq		
PN Length Fall	Slope I.Are	a T.E.	Base	k	HYD	DIA	Section Type
(m) (m)	(1:X) (ha)		Flow $(1/s)$	(mm)	SECT		
E10.000 149.500 0.299				0.600			Pipe/Conduit
E10.001 137.600 0.276				0.600			Pipe/Conduit
E10.002 148.800 0.298				0.600			Pipe/Conduit
E10.003 50.000 0.057	877.2 0.00	0.00	0.0	0.600	0	1800	Pipe/Conduit
E10.004 121.000 0.140	864.3 2.52	9 0.00	0.0	0.600	[]	-6	Pipe/Conduit
E10.005 9.500 0.019	500.0 0.00	0.00	0.0	0.600	0	450	Pipe/Conduit
E10.006 85.200 0.170	501.2 0.11	0.00	0.0	0.600	0	1200	Pipe/Conduit
E10.007 104.300 0.209	499.0 0.10	4 0.00	0.0	0.600	0	1200	Pipe/Conduit
E10.008 68.000 0.624	109.0 0.06	0.00	0.0	0.600	0	1200	Pipe/Conduit
E11.000 165.400 0.331				0.600			Pipe/Conduit
E11.001 138.100 0.276				0.600			Pipe/Conduit
E11.002 149.100 0.299				0.600			Pipe/Conduit
E11.003 16.300 0.031				0.600			Pipe/Conduit
E11.004 121.000 0.242	500.0 0.00	0.00	0.0	0.600	[]	-6	Pipe/Conduit
E11.005 27.500 0.069				0.600	0		Pipe/Conduit
E11.006 37.800 0.094	402.1 0.00	0.00	0.0	0.600	0	450	Pipe/Conduit
E10.009 31.500 0.063	500.0 0.07	8 0.00	0.0	0.600	0	1200	Pipe/Conduit
E10.010 28.700 0.072				0.600			Pipe/Conduit

### Network Results Table

PN	US/IL	Σ I.Area	Σ Base	Vel	Cap
	(m)	(ha)	Flow (l/s)	(m/s)	(1/s)
E10.000	82.550	2.529	0.0	2.14	5438.4
E10.001	82.251	5.058		2.14	5446.3
E10.002	81.975	7.587	0.0	2.14	5442.1
E10.003	81.677	7.587		1.61	4098.1
E10.004	81.620	10.116	0.0	1.91	160766.4
E10.005	81.480	10.116		0.90	143.5
E10.006	81.461	10.226	0.0	1.66	1882.2
E10.007	81.291	10.330		1.67	1886.3
E10.008	81.082	10.398	0.0	3.58	4053.1
E11.000	82.550	2.549	0.0	2.14	5440.1
E11.001	82.219	5.098		2.14	5436.4
E11.002	81.943	7.647	0.0	2.14	5445.7
E11.003	81.644	7.647		2.08	5302.5
E11.004	81.613	7.647	0.0	2.52	211703.6
E11.005	81.371	7.647		1.01	161.0
E11.006	81.302	7.647	0.0	1.01	160.3
E10.009	80.458	18.123	0.0	1.67	1884.5
E10.010	80.395	18.123		1.01	161.0

Hydrock Consultants Ltd	1	Page 3
•	Rail Central	
	Units 3 + 4 + Access Road	4
		Micco
Date 6th February 2018	Designed by RJH	
File Units 3+4 + Access Road.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	
Conduit	Sections for Existing	
	66 refer to section numbers of hydraulic	
	ts are marked by the symbols:- [] box , oo dual pipe, ooo triple pipe, O egg.	
	,	
Section numbers < (	) are taken from user conduit table	
Section Conduit Majo	or Minor Side Corner 4*Hyd XSect	
	n. Dimn. Slope Splay Radius Area	
(mr	a) (mm) (Deg) (mm) (m) $(m^2)$	
-6 [] 700	00 1200 90.0 2.360 84.000	

Hydrock Consultants	Ltd								Page 4
				Ra	ail Cent:	ral			
				Ur	nits 3 +	4 + A	ccess Road		4
									- Com
Date 6th February 2	018			De	esigned 1	DV R.TH	[		Micro
-	Tile Units 3+4 + Access Road.MDX						<u> </u>		Drainage
	cess	Road.	, MDX		necked by				
XP Solutions				Ne	etwork 2	016.1			
			PIPE	LINE SC	HEDULES	for E	<u>xistinq</u>		
				Upsi	tream Ma	nhole			
PN					I.Level D			MH DIAM., L*W	1
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)	
E10.000	0	1800	F:1	84 950	82.550	0 600	Open Manhole	2100	
E10.000					82.251		Open Manhole		
					81.975		Open Manhole		
E10.003			E4	84.950	81.677	1.473	Open Manhole		
E10.004					81.620	2.130	Open Manhole	70725	
E10.005		450			81.480	2,870	Open Manhole	1500	
			E7	84.800	81.461	2.139	Open Manhole	2100	
E10.007	0	1200	E8	84.000	81.461 81.291	1.509	Open Manhole	2100	
E10.008		1200			81.082		Open Manhole		
E11.000	0	1800	E10	84.950	82.550		Open Manhole		
E11.001					82.219	0.931	Open Manhole	2100	
E11.002	0	1800	E12	84.950	81.943	1.207	Open Manhole	2100	
E11.003					81.644	1.506	Open Manhole		
E11.004	[]	-6	E14	84.950	81.613	2.137	Open Manhole	70725	
E11.005					81.371		Open Manhole	1500	
E11.006	0	450	E16	84.950	81.302	3.198	Open Manhole	1500	
E10.009					80.458		Open Manhole		
E10.010	0	450	ET8	82.800	80.395	1.955	Open Manhole	2100	
				Down	stream M	anhole	2		
PN	Length	Slop	e MH	C.Leve	l I.Level	D.Dept	th MH	MH DIAM., L	*W
	-	-				-	Connectic		
E10.000 1	49.500	500.	0 E	2 84.95	0 82.251	0.89	99 Open Manho	ole 21	00
E10.001 1	37.600	498.	6 E	3 84.95	0 81.975	1.17	75 Open Manho	le 21	00
E10.002 1	48.800	499.	3 E	4 84.95	0 81.677	1.47	73 Open Manho	ole 21	00
E10.003	50.000	877.	2 E	5 84.95	0 81.620	1.53	30 Open Manho	le 707	25
E10.004 1	21.000	864.	3 E	6 84.80	0 81.480	2.12	20 Open Manho	le 15	00
E10.005	9.500	500.	0 E	7 84.80	0 81.461	2.88	39 Open Manho	ole 21	00
E10.006	85.200	501.	2 E	8 84.00	0 81.291	1.50	)9 Open Manho	ole 21	00
E10.007 1	04.300	499.	0 E	9 83.80	0 81.082	1.51	18 Open Manho	le 21	00
E10.008	68.000	109.	0 E1	7 83.70	0 80.458		12 Open Manho		00
	65 400	100	7 1	1 04 05	0 00 010	0.07	21 Open Mart-		0.0
E11.000 1					0 82.219		31 Open Manho		00
E11.001 1							07 Open Manho		00
					0 81.644		06 Open Manho		00
							37 Open Manho		
E11.004 1							79 Open Manho		00
E11.005 E11.006					0 81.302 0 81 208		98 Open Manho 42 Open Manho		00
E11.000	57.000	102.	т <u>г</u> т	, 05.70	01.200	2.04	iz open maillit	21	00

 E10.009
 31.500
 500.0
 E18
 82.800
 80.395
 1.205
 Open Manhole
 2100

 E10.010
 28.700
 398.6
 E
 82.000
 80.323
 1.227
 Open Manhole
 0

#### Free Flowing Outfall Details for Existing

Outfall Pipe Number		C. Level (m)	I. Level (m)		D,L (mm)	
E10.010	E	82.000	80.323	0.000	0	0

Hydrock Consultants Ltd		Page 5
	Rail Central	
	Units 3 + 4 + Access Road	L' m
		Micro
Date 6th February 2018	Designed by RJH	Desinado
File Units 3+4 + Access Road.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

### Simulation Criteria for Existing

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow 0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins)	0	Inlet Coeffiecient 0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day) 0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins) 60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Controls 0

#### Synthetic Rainfall Details

Rainfall Mode	l FEH	D2 (1km)	0.300	Winter Storms	No
Return Period (years	) 2	D3 (1km)	0.243	Cv (Summer)	0.750
Site Location	n	E (1km)	0.302	Cv (Winter)	0.840
C (1km	-0.026	F (1km)	2.496	Storm Duration (mins)	30
D1 (1km	0.319	Summer Storms	Yes		

ydro	ck (	Consi	uitan	ts Lto	d			- I -			-						Pag	e 6	
										entra 3 + 4	al 1 + Ac	cess	Roa	d				ر icro	سر
ate (	6th	Feb	ruary	2018					2	-	/ RJH								n
ile (	Uni	ts 3-	+4 +	Access	s Roa	ad.MD	Х			d by								raina	iye
P So	lut	ions						Ne	etwor	k 201	16.1								
						<u>0</u>	<u>nlin</u>	e Cor	ntrol	s fo:	r Exis	ting							
		<u>Hyc</u>	dro-B	<u>rake O</u>	<u>ptin</u>	num® N	Manho	ole:	E6, 1	DS/PN	: E10	.005	, Vo	lume	(m³)	: 71	36.4		
								Jnit F esign			D-SHE-(	)267-4	1180-		1180 .500				
								ign Fl							.300 41.8				
									ush-F					alcula					
									bject licat		Minimis	se ups	strea	m stoi Suri	2				
							5	Sump A						0411	Yes				
								Diame		. ,					267				
								vert I		` '				81.	.480				
						outlet ed Mar								1	300 L800				
		Cor	ntrol	Points		Head	(m)	Flow	(1/s)		Contro	ol Poi	Ints		Head	(m) I	[low (	1/s)	
	Des	ign P	oint	(Calcula) Flush			.500 .490		41.8 41.8	Mean	Flow o			-Flo® Range	1.	055		35.3 35.5	
Opti	mum@	as s	specif	alculat ied. s e stora	Shoul	d anot	her t	уре о	f con	trol d	levice	other	thar		-		-		
th	(m)	Flow	(1/a)	Donth	(m)	Flow	$(1/\alpha)$	Donth	· (m)	Flow	$(1/\alpha)$	Donth	(m)	Flow	(1/a)	Dont	-h (m)	Flow	11/
	<b>(m)</b> 100	Flow	(1/s) 8.5	Depth	(m) .800	Flow			<b>m (m)</b>	Flow	(1/s)		(m) .000	Flow	(1/s) 67.1		<b>ch (m)</b>		
0.2		Flow		0.			(1/s) 40.3 37.1	2				4							88
0.2	100 200 300	Flow	8.5 27.5 40.1	0. 1. 1.	.800 .000 .200		40.3 37.1 37.5	2	2.000		48.0 50.2 52.4	4 4 5	.000 .500 .000		67.1 71.0 74.8		7.000 7.500 8.000		88 91 94
0.2	100 200 300 400	Flow	8.5 27.5 40.1 41.5	0. 1. 1.	.800 .000 .200 .400		40.3 37.1 37.5 40.4	2	2.000 2.200 2.400 2.600		48.0 50.2 52.4 54.5	4 4 5 5	.000 .500 .000 .500		67.1 71.0 74.8 78.3		7.000 7.500 8.000 8.500		88 91 94 96
0.2	100 200 300	Flow	8.5 27.5 40.1	0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	.800 .000 .200		40.3 37.1 37.5	22	2.000		48.0 50.2 52.4	4 4 5 5 6	.000 .500 .000		67.1 71.0 74.8		7.000 7.500 8.000		88 91 94 96 99
0.2	100 200 300 400 500		8.5 27.5 40.1 41.5 41.8 41.5	0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	.800 .000 .200 .400 .600 .800		40.3 37.1 37.5 40.4 43.1 45.6		2.000 2.200 2.400 2.600 3.000 3.500		48.0 50.2 52.4 54.5 58.4 62.9	4 4 5 5 6 6	.000 .500 .000 .500 .000 .500		67.1 71.0 74.8 78.3 81.7 84.9		7.000 7.500 8.000 8.500 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500		8.5 27.5 40.1 41.5 41.8 41.5	0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	.800 .000 .200 .400 .600 .800		40.3 37.1 37.5 40.4 43.1 45.6 <u>Canho</u>	le: F Jnit F esign ign F1	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 4.15, 4.25 Head .ow (1 .ush-F bbject	DS/Pl ence M (m) ./s) Tlo™ tive	48.0 50.2 52.4 54.5 58.4 62.9	4 4 5 6 6 0005	.000 .500 .000 .500 .500 .500	<u>olume</u> 1200-4 1. 2 alcula	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated		7.000 7.500 8.000 8.500 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500		8.5 27.5 40.1 41.5 41.8 41.5	0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	.800 .000 .200 .400 .600 .800		40.3 37.1 37.5 40.4 43.1 45.6 (anho) to Des:	le: F Jnit F esign ign F1 C App	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 3.500 4.15, 4.25 Head .ow (1 .ush-F Dbject	DS/Pl ence M (m) /s) lo™ tive tion	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0	4 4 5 6 6 0005	.000 .500 .000 .500 .500 .500	<u>olume</u> 1200-4 1. 2 alcula	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face		7.000 7.500 8.000 8.500 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500		8.5 27.5 40.1 41.5 41.8 41.5	0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	.800 .000 .200 .400 .600 .800		40.3 37.1 37.5 40.4 43.1 45.6 (anho) to Des:	le: F Jnit F esign ign Fl G App Sump A	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 3.500 3.500 4.000 4.000 4.000 4.000 4.000 4.000 3.500 3.500 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.0000 4.00000 4.0000 4.0000 4.0000 4.00000 4.00000 4.00000 4.00000 4.00000000	DS/Pi ence M (m) /s) lo™ tive tion ble	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0	4 4 5 6 6 0005	.000 .500 .000 .500 .500 .500	olume 1200-4 1. alcula m stor	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face Yes		7.000 7.500 8.000 8.500 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500		8.5 27.5 40.1 41.5 41.8 41.5	0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	.800 .000 .200 .400 .600 .800		40.3 37.1 37.5 40.4 43.1 45.6 (anho Des:	le: F Jnit F esign ign F1 F1 C App	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 3.500 3.500 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.500 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.5000 4.50000 4.50000 4.50000 4.50000 4.50000 4.50000 4.50000000000	DS/Pl ence M (m) /s) lo™ ive ion ble mm)	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0	4 4 5 6 6 0005	.000 .500 .000 .500 .500 .500	olume 1200-4 1. alcula m stor Surf	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face		7.000 7.500 8.000 8.500 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500		8.5 27.5 40.1 41.5 41.8 41.5	Minin	.800 .000 .200 .400 .800 ptim		40.3 37.1 37.5 40.4 43.1 45.6 (anho Des: Int Pipe	le: F Jnit F esign ign Fl C App Sump A Diame zert I Diame	2.000 2.200 2.400 2.600 3.000 3.500 3.500 615, 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.400 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.4000 4.40000 4.4000 4.40000 4.40000 4.40000 4.400000000	DS/Pl ence M (m) ./s) lo™ tive tion ble mm) (m) mm)	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0	4 4 5 6 6 0005	.000 .500 .000 .500 .500 .500	olume 1200-4 1. alcula m stor Suri 81.	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face Yes 270		7.000 7.500 8.000 8.500 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500	<u>Hyd</u>	8.5 27.5 40.1 41.5 41.8 41.5 <u>ro-Br</u>	Minin	.800 .000 .200 .400 .800 ptim	<u>um® M</u> Dutlet :ed Mar	40.3 37.1 37.5 40.4 43.1 45.6 anho Des: Inv Pipe	le: F Jnit F esign ign Fl C App Sump A Diame zert I Diame	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.50000 3.50000 3.50000 3.50000000000	DS/Pl ence M (m) ./s) lo™ tive tion ble mm) (m) mm)	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0	4 5 6 6 0270-4	.000 .500 .000 .500 .500 .000 .500 .500	olume 1200-4 alcula m stor Surf 81.	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face Yes 270 .371 300	: 71	7.000 7.500 8.000 9.000 9.500		88 91 94 96 99
0.2	100 200 300 400 500 600	Hyd. Cor	8.5 27.5 40.1 41.5 41.8 41.5 <u>ro-Br</u>	Minin Sud	.800 .000 .200 .400 .800 ptim ggest	um® M Dutlet ced Mar <b>Head</b> 1	40.3 37.1 37.5 40.4 43.1 45.6 anho Des: Inv Pipe	le: F Jnit F esign ign Fl C App Sump A Diame vert I Diame Diame	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.5000 3.50000 3.5000 3.5000 3.50000 3.50000 3.50000 3.50000 3.50000 3.50000 3.50000000000	DS/PI ence M (m) //s) lo™ ive ion ible mm) (m) mm)	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0 Minimis	4 4 5 6 6 0 0005 0270-4 se ups	.000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .5000 .5000 .500 .5000.500 .500.500	olume 1200-4 1. 2 alcula m ston Suri 81. 2 -Flo®	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face Yes 270 .371 300 1800 Head	: 71	7.000 7.500 8.000 9.000 9.500		88 91 94 96 99
0.1 0.2 0.4 0.4 0.4 0.4 0.4 0.4	100 200 300 400 500 600 Des hydr mum@	Hyd. Cor ign P	8.5 27.5 40.1 41.5 41.8 41.5 <b>ro-Br</b> <b>ro-Br</b> <b>ical</b> c	Minin Suc Points (Calcula	.800 .000 .200 .400 .800 ptim ptim ggest ated) -Flo ^m cions Shoul	UUM® M Dutlet Sed Mar Head 1 * 0 have d anot	40.3 37.1 37.5 40.4 43.1 45.6 (anho Des: Des: S Inv Pipe hole (m) .200 .442 been her t	le: F Jnit F esign ign Fl C App Sump A Diame vert I Diame Flow based	2.000 2.200 2.400 2.600 3.000 3.500 2.15, 2.400 3.500 2.15, 2.400 2.400 3.500 2.15, 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.400 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.500 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.5000 2.50000 2.50000 2.50000 2.50000000000	DS/PI ence M (m) /s) lo™ iive iion ible mm) (m) mm) mm) Mean he Heat	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0 Minimis Contro Flow o ad/Disc device	4 4 5 6 6 0005 0270-4 se ups ol Poi ver H harge other	.000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .500 .000 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .5000 .5000 .500 .500 .500 .500.500	olume 1200-4 1. alcula m stoo Suri 81. Flo® Range	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face Yes 270 .371 300 1800 Head 0.	(m) 1 885 - or th	7.000 7.500 8.000 9.000 9.500 .36.9	<b>1/s)</b> 35.9 34.5 ro-Bra	88 91 94 96 99 102
0.1 0.2 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	100 200 300 400 500 600 Des hydr mum@ isec	Hyd Cor ign P colog: as s d ther	8.5 27.5 40.1 41.5 41.8 41.5 <b>ro-Br</b> <b>ro-Br</b> ical c specif h thes	Minin Suc Points (Calculat ied. S	.800 .000 .200 .400 .800 ptim ptim ggest ated) -Flo ^m tions Shoul	UUM® M Outlet Ged Mar Head 1 * 0 have d anot outing	40.3 37.1 37.5 40.4 43.1 45.6 Des: Des: S Inv Pipe hole (m) .200 .442 been her t	le: F Jnit F esign ign Fl C App Sump A Diame vert I Diame Diame Flow	2.000 2.200 2.400 2.600 3.000 3.500 2.15, 3.500 2.15, 3.500 2.15, 3.500 2.15, 3.500 3.500 3.500 3.500 3.500 4.15, 4.15 41.5 41.5 41.5 f con ons w	DS/PI ence M (m) /s) 'lo™ iive iion ble (m) (m) (m) (m) (m) (m) mm) Mean he Hea trol c iill be	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0 Minimis Contro Flow o ad/Disc device e inval	4 4 5 6 6 0270-4 se ups ol Poi ver H harge other idate	.000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .500 .000 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .5000 .5000 .500 .500 .500 .500.500	olume 1200-4 1. alcula m stor Surf 81.	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 4150 .200 41.5 4150 .200 41.5 5 ated cage face Yes 270 .371 300 1800 Head 0. hip f dro-B	(m) J 885 - or th rake	7.000 7.500 8.000 9.000 9.500 .36.9	<b>1/s)</b> 35.9 34.5 ro-Bra um® be	88 91 94 96 99 102
The Optimutil	100 200 300 400 500 600 Des hydr mum@ isec	Hyd Cor ign P colog: as s d ther	8.5 27.5 40.1 41.5 41.8 41.5 <b>ro-Br</b> <b>ro-Br</b> ical c specif h thes	Minin Such Points (Calculat ied. S e stora	.800 .000 .200 .400 .800 ptim ptim ggest ated) -Flo ^m tions Shoul	UUM® M Outlet Ged Mar Head 1 * 0 have d anot outing	40.3 37.1 37.5 40.4 43.1 45.6 Des: Des: S Inv Pipe hole (m) .200 .442 been her t	le: F Jnit F esign Fl C App Sump A Diame Diame Diame Flow based sype o culati	2.000 2.200 2.400 2.600 3.000 3.500 2.15, 3.500 2.15, 3.500 2.15, 3.500 2.15, 3.500 3.500 3.500 3.500 3.500 4.15, 4.15 41.5 41.5 41.5 f con ons w	DS/PI ence M (m) /s) 'lo™ iive iion ble (m) (m) (m) (m) (m) (m) mm) Mean he Hea trol c iill be	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0 Minimis Contro Flow o ad/Disc device e inval	4 4 5 6 6 0270-4 se ups ol Poi other idate Depth	.000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .500 .000 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .500 .5000 .5000 .500 .500 .500 .500.500	olume 1200-4 1. alcula m stor Surf 81.	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 4150 .200 41.5 4150 .200 41.5 5 ated cage face Yes 270 .371 300 1800 Head 0. hip f dro-B	(m) 1 885 - or th rake	7.000 7.500 8.000 9.000 9.500 .36.9	1/s) 35.9 34.5 ro-Bra um® be Flow	88 91 94 96 99 102
0.2 0.2 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.5	100 200 300 400 500 600 Des hydr mum@ isec (m)	Hyd Cor ign P colog: as s d ther	8.5 27.5 40.1 41.5 41.8 41.5 ro-Br oint for the specif ical c specif h thes (1/s)	Minin Such Points (Calculat ied. S e stora Depth 0.0	.800 .000 .200 .400 .800 ptim ggest ated) -Flo ^m tions Shoul age r (m)	UUM® M Outlet Ged Mar Head 1 * 0 have d anot outing	40.3 37.1 37.5 40.4 43.1 45.6 Tes: Des: 100 Des: 100 Pipe hole (m) .200 .442 been her to (alcolor) (l/s)	le: F Jnit F esign Fl C App Sump A Diame Diame Diame Flow based sype o culati	2.000 2.200 2.400 2.600 3.000 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 3.500 41.5 41.5 41.5 41.5 f con ons w a (m)	DS/PI ence M (m) /s) 'lo™ iive iion ble (m) (m) (m) (m) (m) (m) mm) Mean he Hea trol c iill be	48.0 50.2 52.4 54.5 58.4 62.9 N: E11 D-SHE-0 Minimis Contro Flow o ad/Disc device inval (1/s)	4 4 5 6 6 0270-4 se ups ol Poi other idate Depth 1 1	.000 .500 .000 .500 .000 .500 .1150- Costrea dthat that d (m)	olume 1200-4 1. alcula m stor Surf 81.	67.1 71.0 74.8 78.3 81.7 84.9 (m ³ ) 4150 .200 41.5 ated cage face Yes 270 .371 300 1800 Head 0. hip fi dro-B (1/s)	(m) 1 885 - or th rake Dep1	7.000 7.500 8.000 9.000 9.500 .36.9 .36.9 .36.9 .36.9 .36.9 .36.9 .36.9 .500 .36.9 .500 .36.9 .500 .36.9 .500 .36.9 .500 .36.9 .500 .500 .500 .500 .500 .500 .500 .5	1/s) 35.9 34.5 ro-Bra um® be Flow	88 91 94 96 99 102

Hydrock Consulta	nts Ltd						Page	e 7	
•			Rail C	Central					
			Units	3 + 4 + A	ccess Roa	ıd	4	Δ.	
							N AF		m
Date 6th Februar	y 2018		Design	ed by RJH				<u>o</u> jo	
File Units 3+4 +	- Access Roa	d.MDX	Checke	ed bv				aina	<b>qe</b>
XP Solutions			Networ	k 2016.1					
<u>Hydro-B</u>	rake Optimu	m® Manhol	e: E15,	DS/PN: E1	1.005, Vo	olume (m³)	: 7136.9		
Depth (m) Flow (1/s	) Depth (m) F	'low (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow	(l/s)
2.600 60.	3 4.000	74.3	5.500	86.7	7.000	97.5	8.500		107.2
3.000 64.	6 4.500	78.6	6.000	90.5	7.500	100.8	9.000		110.2
3.500 69.	6 5.000	82.8	6.500	94.0	8.000	104.1	9.500		113.2
<u>Hydro-</u>	Brake Optim			DS/PN: E					
		t Reference .qn Head (m)			MD-SH	E-0328-7430	2.500-7430		
		.gn nead (m) . Flow (l/s)					74.3		
		Flush-Flo ^T					Calculated		
		Objective	è		Mini	mise upstre	am storage		
		Application					Surface		
		np Available					Yes		
		ameter (mm)					328		
		t Level (m)					80.458 375		
Minimum (	-			ecific Desid	nn (Contact	Hydro Inte			
	ed Manhole Di			ecific Desig	gn (Contact	Hydro Inte			
	ed Manhole Di		Site Spe		gn (Contact rol Points	-		L/s)	
Suggest	ed Manhole Di Points	ameter (mm)	Site Spe	Cont	rol Points	Head	rnational) (m) Flow (2	<b>L/s)</b> 60.3	

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m) Fl	Low (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.7	0.800	74.2	2.000	66.6	4.000	93.2	7.000	122.4
0.200	33.5	1.000	73.2	2.200	69.8	4.500	98.7	7.500	126.6
0.300	59.7	1.200	71.4	2.400	72.8	5.000	103.9	8.000	130.7
0.400	69.6	1.400	68.2	2.600	75.6	5.500	108.9	8.500	134.6
0.500	72.3	1.600	61.8	3.000	81.1	6.000	113.6	9.000	138.4
0.600	73.7	1.800	63.3	3.500	87.4	6.500	118.1	9.500	142.1

Hydrock	Const	iltants Lt	d						Pac	re 8
•					Rail Cent	ral				
•					Units 3 +	4 + Acce	ss Road		2	
•									N	licco
Date 6th	n Febr	ruary 2018			Designed	oy RJH				
File Un:	its 3+	4 + Acces	s Road	.MDX	Checked b	y				rainage
XP Solut	tions				Network 2	016.1				
		n Period :	Summary	y of Crit	ical Result		imum Leve	l (Rank	1) for	Existing
	mber o	Ho nhole Headl Foul Sewage f Input Hyd: of Online ( Rainfall M Site Loca C (	Hot St t Start oss Coef per heo rographs Controls todel tion 1km) -0	tion Factor tart (mins) Level (mm) of (Global) tare (1/s) s 0 Number s 3 Number <u>Synt</u> FEH D1 (1 D2 (1 .026 D3 (1 od Risk Wa Analysi	0.500 Flow 0.000 er of Offline of Storage S <u>Chetic Rainfal</u> km) 0.319	itional Flo MADD Facto per Person Controls ( tructures ( <u>l Details</u> E (1km) 0 F (1km) 2 (Summer) 0	or * 10m ³ /r Inlet Coe per Day (1 ) Number of ) Number of .302 Cv (W .496 .750	a Storage effiecient /per/day) E Time/Are E Real Tim inter) 0. 300.0	2.000 0.800 0.000 a Diagra	
	R US/MH	eturn Perio	d(s) (ye e Change	nins) 15, ears)	30, 60, 120, First (X)	180, 240, First (Y)	360, 480, 1440, 21	.60, 2880, , 30, 100 0, 0, 4	960, 4320 , 200 0, 40	Surcharged Depth
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
E10.000	E1	15 Winter	1	+0%	200/15 Winter				82.894	-1.456
E10.001	E2	15 Winter	1		200/15 Summer				82.679	-1.372
E10.002 E10.003	E3 E4	15 Winter 15 Winter	1 1		200/15 Summer 200/15 Summer				82.474 82.288	-1.301 -1.189
E10.003		960 Winter	1	+0%	200713 Summer				81.778	-1.042
E10.005	E6	960 Winter	1	+0%	30/180 Winter				81.772	-0.158
E10.006	E7	960 Winter	1	+0%					81.568	-1.093
E10.007		960 Winter	1	+0%					81.390	-1.101
E10.008	E9	15 Winter	1	+0% +0%	200/15 11				81.137	-1.145 -1.470
E11.000 E11.001	E10 E11	15 Winter 15 Winter	1 1		200/15 Winter 200/15 Summer				82.880 82.643	-1.470
E11.001	E12	15 Winter	1		200/15 Summer 200/15 Summer				82.453	-1.290
E11.003	E13	15 Winter	1		100/15 Winter				82.334	-1.110
E11.004		720 Winter	1	+0%					81.653	-1.160
	E15	720 Winter	1		30/480 Winter				81.650	-0.171
E11.005		720 17			00/120 Winter				81.440	-0.312
E11.006	E16	720 Winter 720 Winter	1						80.891	-0.767
	E16 E17	720 Winter 720 Winter 720 Winter	1 1 1		00/120 Summer				80.891 80.598	-0.767 -0.247
E11.006 E10.009	E16 E17	720 Winter 720 Winter	1 1	+0% 1 +0% Flooded	00/120 Summer i Flow / Over	Pipe flow Flow	I Status Exc	evel ceeded		
E11.006 E10.009	E16 E17	720 Winter 720 Winter P	1 1 US/ N Nar	+0% 1 +0% Flooded MH Volume me (m ³ )	00/120 Summer i Flow / Over Cap. (1/	Pipe flow Flow 's) (1/s)	Status Ex			
E11.006 E10.009	E16 E17	720 Winter 720 Winter <b>P</b> E10.	1 1 US/ N Na .000	+0% 1 +0% Flooded	00/120 Summer i Flow / Over Cap. (1/ ) 0.08	Pipe flow Flow				
E11.006 E10.009	E16 E17	720 Winter 720 Winter <b>P</b> E10. E10.	1 1 <b>US/</b> N Nau .000 .001	+0% 1 +0% Flooded (MH Volume me (m ³ ) E1 0.000	00/120 Summer flow / Over Cap. (1/ 0 0.08 0 0.12	Pipe flow Flow fs) (1/s) 346.2	Status Exc OK			
E11.006 E10.009	E16 E17	720 Winter 720 Winter P E10. E10. E10. E10. E10.	1 1 <b>US/</b> N Nau .000 .001 .002 .003	+0% 1 +0% Flooded MH Volume me (m ³ ) E1 0.000 E2 0.000 E3 0.000 E4 0.000	<pre>00/120 Summer  Flow / Over Cap. (1/ 0 0.08 0 0.12 0 0.16 0 0.25</pre>	Pipe flow Flow (1/s) 346.2 559.1 759.1 700.6	Status         Ex           OK            OK            OK            OK            OK			
E11.006 E10.009	E16 E17	720 Winter 720 Winter P E10. E10. E10. E10. E10.	1 1 <b>US/</b> <b>N Nau</b> .000 .001 .002 .003	+0% 1 +0% Flooded (MH Volume me (m ³ ) E1 0.000 E2 0.000 E3 0.000 E4 0.000 E5 0.000	<pre>00/120 Summer  Flow / Over Cap. (1/ 0 0.08 0 0.12 0 0.16 0 0.25</pre>	Pipe flow Flow (1/s) 346.2 559.1 759.1 700.6 70.9	Status Exa OK OK OK			

Hydrock Consultants Ltd		Page 9
•	Rail Central	
•	Units 3 + 4 + Access Road	Mar m
•		Mirro
Date 6th February 2018	Designed by RJH	
File Units 3+4 + Access Road.MDX	Checked by	Dialitaye
XP Solutions	Network 2016.1	·

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (1/s)	Status	Level Exceeded
E10.005	E6	0.000	0.35		27.9	OK	
E10.006	E7	0.000	0.02		28.2	OK	
E10.007	E8	0.000	0.02		28.5	OK	
E10.008	E9	0.000	0.01		30.4	OK	
E11.000	E10	0.000	0.07		322.9	OK	
E11.001	E11	0.000	0.12		551.2	OK	
E11.002	E12	0.000	0.15		712.9	OK	
E11.003	E13	0.000	0.33		643.8	OK	
E11.004	E14	0.000	0.00		95.6	OK	
E11.005	E15	0.000	0.21		29.0	OK	
E11.006	E16	0.000	0.21		29.0	OK	
E10.009	E17	0.000	0.04		57.9	OK	
E10.010	E18	0.000	0.42		57.9	OK	

Date off February 2018       Designed by ROH         File Units 3+4 + Access Road.MDX       Checked by         XP Solutions       Network 2016.1         30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for         Simulation Criteria         Areal Reduction Factor 1.000         Additional Flow - % of Total Flow 0.000         Hot Start (mins)       0         MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm)       0         Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (1/per/day)         Number of Input Hydrographs 0       Number of Offline Controls 0       Number of Real Time Control         Synthetic Rainfall Details       Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	s 0
.       Date 6th February 2018       Designed by RJH         File Units 3+4 + Access Road.MDX       Checked by       Checked by         XP Solutions       Network 2016.1         30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for         Simulation Criteria         Areal Reduction Factor 1.000       Additional Flow - % of Total Flow 0.000         Hot Start (mins)       0       MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm)       0       Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (1/per/day)       0.000         Number of Input Hydrographs 0       Number of Offline Controls 0 Number of Time/Area Diagram         Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control         Synthetic Rainfall Details         Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	Existing
Date oth February 2018       Designed by RSH         File Units 3+4 + Access Road.MDX       Checked by         XP Solutions       Network 2016.1         30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for         Simulation Criteria         Areal Reduction Factor 1.000         Additional Flow - % of Total Flow 0.000         Hot Start (mins)       0         MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm)       0         Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (1/per/day)         Number of Input Hydrographs 0       Number of Offline Controls 0       Number of Real Time Control         Synthetic Rainfall Details       Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	Existing
Date oth February 2018       Designed by RSH         File Units 3+4 + Access Road.MDX       Checked by         XP Solutions       Network 2016.1         30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for         Simulation Criteria         Areal Reduction Factor 1.000         Additional Flow - % of Total Flow 0.000         Hot Start (mins)       0         MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm)       0         Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (1/per/day)         Number of Input Hydrographs 0       Number of Offline Controls 0       Number of Real Time Control         Synthetic Rainfall Details       Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	Existing
XP Solutions       Network 2016.1         30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for         Simulation Criteria         Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000         Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm) 0 Inlet Coefficient 0.800         Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000         Foul Sewage per hectare (1/s) 0.000         Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagram         Number of Offline Controls 0 Number of Time/Area Diagram         Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control         Synthetic Rainfall Details         Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location         D2 (1km) 0.300	Existing
30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for         Simulation Criteria         Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800         Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000         Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagram Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control Synthetic Rainfall Details         Rainfall Model       FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	s 0
Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m ³ /ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagram Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control Synthetic Rainfall Details Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	s 0
Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m ³ /ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagram Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control Synthetic Rainfall Details Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	s 0
Areal Reduction Factor 1.000       Additional Flow - % of Total Flow 0.000         Hot Start (mins)       0       MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm)       0       Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (l/per/day)       0.000         Foul Sewage per hectare (l/s)       0.000       0       Number of Time/Area Diagram         Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control       Synthetic Rainfall Details         Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	
Areal Reduction Factor 1.000       Additional Flow - % of Total Flow 0.000         Hot Start (mins)       0       MADD Factor * 10m³/ha Storage 2.000         Hot Start Level (mm)       0       Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (l/per/day)       0.000         Foul Sewage per hectare (l/s)       0.000       0       Number of Time/Area Diagram         Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control       Synthetic Rainfall Details         Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	
Hot Start Level (mm)       0       Inlet Coefficient 0.800         Manhole Headloss Coeff (Global)       0.500 Flow per Person per Day (l/per/day)       0.000         Foul Sewage per hectare (l/s)       0.000         Number of Input Hydrographs       0       Number of Offline Controls       0       Number of Time/Area Diagram         Number of Online Controls       3       Number of Storage Structures       0       Number of Real Time Control         Synthetic Rainfall Details       Rainfall Model       FEH D1 (1km)       0.319       E (1km)       0.302 Cv (Winter)       0.840         Site Location       D2 (1km)       0.300       F (1km)       2.496	
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000         Foul Sewage per hectare (l/s) 0.000         Number of Input Hydrographs 0       Number of Offline Controls 0 Number of Time/Area Diagram         Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control         Synthetic Rainfall Details         Rainfall Model       FEH D1 (1km) 0.319       E (1km) 0.302 Cv (Winter) 0.840         Site Location       D2 (1km) 0.300       F (1km) 2.496	
Foul Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagram Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control <u>Synthetic Rainfall Details</u> Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	
Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control Synthetic Rainfall Details Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	
Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Control Synthetic Rainfall Details Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	
Synthetic Rainfall DetailsRainfall ModelFEH D1 (1km) 0.319E (1km) 0.302 Cv (Winter) 0.840Site LocationD2 (1km) 0.300F (1km) 2.496	5 0
Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496	
Site Location D2 (1km) 0.300 F (1km) 2.496	
C (1km) -0.026 D3 (1km) 0.243 Cv (Summer) 0.750	
Margin for Flood Risk Warning (mm) 300.0	
Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF	
DVD Status ON	
Inertia Status ON	
Profile(s) Summer and Winter	
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,	
1440, 2160, 2880, 4320	
Return Period(s) (years) 1, 30, 100, 200	
Climate Change (%) 0, 0, 40, 40	
Water S	urcharged
US/MH Return Climate First (X) First (Y) First (Z) Overflow Level	Depth
PN Name Storm Period Change Surcharge Flood Overflow Act. (m)	(m)
E10.000 E1 15 Winter 30 +0% 200/15 Winter 83.200	-1.150
E10.001 E2 15 Winter 30 +0% 200/15 Summer 83.070	-0.981
E10.002E315 Winter30+0%200/15 Summer82.948E10.003E415 Winter30+0%200/15 Summer82.836	-0.827 -0.641
E10.004 E5 720 Winter 30 +0% 200713 Schuller 82.030	-0.793
E10.005 E6 720 Winter 30 +0% 30/180 Winter 81.998	0.068
E10.006 E7 600 Winter 30 +0% 81.642	-1.019
E10.007 E8 600 Winter 30 +0% 81.596	-0.895
E10.008 E9 600 Winter 30 +0% 81.576 E11.000 E10 15 Winter 30 +0% 200/15 Winter 83.166	-0.706 -1.184
E11.000 E10 15 Winter 30 +0% 200/15 Winter 83.186 E11.001 E11 15 Winter 30 +0% 200/15 Summer 83.028	-0.991
E11.002 E12 15 Winter 30 +0% 200/15 Summer 82.932	-0.811
E11.003 E13 15 Winter 30 +0% 100/15 Winter 82.838	-0.606
E11.004 E14 600 Winter 30 +0% 81.841	-0.972
E11.005         E15         600         Winter         30         +0%         30/480         Winter         81.824           E11.006         E16         600         Winter         30         +0%         100/120         Winter         81.593	0.003 -0.159
E10.009 E17 600 Winter 30 +0% 100/120 Summer 81.552	-0.106
E10.010 E18 1440 Winter 30 +0% 80.630	-0.215
Flooded Pipe	
US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) (l/s) Status Exceeded	
E10.000 E1 0.000 0.23 1073.3 OK	
E10.001 E2 0.000 0.38 1720.0 OK E10.002 E3 0.000 0.49 2235.6 OK	
E10.002 ES 0.000 0.49 2235.6 OK E10.003 E4 0.000 0.75 2080.4 OK	
E10.004 E5 0.000 0.00 190.2 OK	
©1982-2016 XP Solutions	

Hydrock Consultants Ltd		Page 11
	Rail Central	
	Units 3 + 4 + Access Road	
•		Micco
Date 6th February 2018	Designed by RJH	
File Units 3+4 + Access Road.MDX	Checked by	Diamacje
XP Solutions	Network 2016.1	·

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E10.005	E6	0.000	0.51		40.9	SURCHARGED	
E10.006	E7	0.000	0.03		43.1	OK	
E10.007	E8	0.000	0.03		45.1	OK	
E10.008	E9	0.000	0.01		42.8	OK	
E11.000	E10	0.000	0.22		1010.2	OK	
E11.001	E11	0.000	0.37		1662.5	OK	
E11.002	E12	0.000	0.46		2121.4	OK	
E11.003	E13	0.000	1.02		1984.9	OK	
E11.004	E14	0.000	0.00		167.1	OK	
E11.005	E15	0.000	0.29		39.7	SURCHARGED	
E11.006	E16	0.000	0.28		39.5	OK	
E10.009	E17	0.000	0.06		74.1	OK	
E10.010	E18	0.000	0.54		74.1	OK	

Hydrock	Consi	ultants Lto	ł						Pac	je 12
•					Rail Cent	ral				
					Units 3 +	4 + Acces	ss Road		2	
										~~~
· Doto (+	h Ech	2010			Decimod				N	licro
		ruary 2018			Designed	-				rainage
		+4 + Access	s Road	.MDX	Checked b					ianiage
XP Solu	tions				Network 2	016.1				
100	year	Return Pe:	riod Sı	ummary	of Critical	Results b	y Maximur	n Level	(Rank 1	1) for
					Existin					
		D	Deduct		Simulation Cr				0 000	
		Areal			or 1.000 Add s) 0					
		Hot		Level (m		MADD Facto		ffiecient		
	Ма				1) 0.500 Flow	per Person				
		Foul Sewage				-				
Nı					ber of Offline				-	
	Number	of Online C	ontrols	3 Numbe	er of Storage S	tructures U	Number of	Real Tim	e Contro	ols U
				Sv	nthetic Rainfal	l Details				
		Rainfall Mo	del		(1km) 0.319		.302 Cv (W	inter) 0.	840	
		Site Locat	ion	D2	(1km) 0.300	F (1km) 2	.496			
		C (1	.km) -0.	026 D3	(1km) 0.243 Cv	(Summer) 0	.750			
		Margin	for Flo		Warning (mm) sis Timestep 2	5 Cocord T	aromont (300.0		
				Allaly	DTS Status	5 Second II	icrement (OFF		
					DVD Status			ON		
				Ine	ertia Status			ON		
		Dunatia	Profil	. ,	20 60 120	100 240		mer and W		
		Duratic	on(s) (m	iins) is	5, 30, 60, 120,	180, 240,		600, 720, .60, 2880,		
	F	Return Period	l(s) (ve	ars)				, 30, 100		
		Climate	-							
								0, 0, 4		
				(0)						
									0, 40	Surcharged
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	0, 0, 4	0, 40 Water	Surcharged Depth
PN	US/MH Name	Storm			First (X) Surcharge	First (Y) Flood		0, 0, 4	0, 40 Water	-
	Name		Period	Climate Change	Surcharge	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m)	Depth (m)
E10.000	Name E1	15 Winter	Period	Climate Change +40%	Surcharge	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924	Depth (m) -0.426
E10.000 E10.001	Name E1 E2	15 Winter 15 Winter	Period 100 100	Climate Change +40% +40%	Surcharge 200/15 Winter 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861	Depth (m) -0.426 -0.190
E10.000 E10.001 E10.002	Name E1 E2 E3	15 Winter 15 Winter 15 Winter	Period 100 100 100	Climate Change +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770	Depth (m) -0.426 -0.190 -0.005
E10.000 E10.001	Name E1 E2	15 Winter 15 Winter	Period 100 100	Climate Change +40% +40%	Surcharge 200/15 Winter 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861	Depth (m) -0.426 -0.190
E10.000 E10.001 E10.002 E10.003	Name E1 E2 E3 E4	15 Winter 15 Winter 15 Winter 15 Winter	Period 100 100 100 100	Climate Change +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477	Depth (m) -0.426 -0.190 -0.005 0.000
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006	Name E1 E2 E3 E4 E5 E6 E7	15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044</pre>	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007	E1 E2 E3 E4 E5 E6 E7 E8	15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.004 82.003</pre>	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008	E1 E2 E3 E4 E5 E6 E7 E8 E9	15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter	Flood	First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.004 82.003 81.952</pre>	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000	E1 E2 E3 E4 E5 E6 E7 E8 E9 E10	15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Winter	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Winter 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002	E1 E2 E3 E4 E5 E6 E7 E8 E9 E10	15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter	Period 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Winter 200/15 Summer 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Winter 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Period 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Winter 200/15 Summer 200/15 Summer	Flood	First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459</pre>	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/480 Winter 30/480 Winter	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 1	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 200/15 Summer 30/480 Winter	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/480 Winter 30/480 Winter	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 1	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/480 Winter 30/480 Winter	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 1	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/480 Winter 30/480 Winter	Flood	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/480 Winter 30/480 Winter	Flood Pipe W Flow	First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 100/15 Winter 30/480 Winter 100/120 Summer	Flood	First (Z)	0, 0, 4 Overflow Act.	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 100/15 Winter 30/480 Winter 100/120 Summer Flow / Overflow	Flood Pipe w Flow (1/s)	First (Z) Overflow	0, 0, 4 Overflow Act.	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 100/15 Winter 30/480 Winter 100/120 Summer Flow / Overflo Cap. (1/s) 0.49	Flood Pipe w Flow (1/s) 2244.8	First (Z) Overflow Status	0, 0, 4 Overflow Act.	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 960 Winter 960 Winter 960 Winter	Period 100 100 100 100 100 100 100 10	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surcharge 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 30/180 Winter 200/15 Summer 200/15 Summer 200/15 Summer 100/15 Winter 30/480 Winter 100/120 Summer Flow / Overflow	Flood Pipe w Flow (1/s)	First (Z) Overflow	0, 0, 4 Overflow Act.	0, 40 Water Level (m) 83.924 83.861 83.770 83.477 82.461 82.407 82.044 82.003 81.952 83.942 83.868 83.717 83.459 82.181 82.146 81.920 81.905	Depth (m) -0.426 -0.190 -0.005 0.000 -0.359 0.477 -0.617 -0.488 -0.330 -0.408 -0.151 -0.026 0.015 -0.632 0.325 0.168 0.247

©1982-2016 XP Solutions

Hydrock Consultants Ltd		Page 13
•	Rail Central	
•	Units 3 + 4 + Access Road	
•		Mirco
Date 6th February 2018	Designed by RJH	
File Units 3+4 + Access Road.MDX	Checked by	Diamaye
XP Solutions	Network 2016.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
E10.003	E4	0.000	1.55		4307.7	OK	
E10.004	E5	0.000	0.00		274.2	OK	
E10.005	E6	0.000	0.52		41.5	SURCHARGED	
E10.006	E7	0.000	0.03		45.7	OK	
E10.007	E8	0.000	0.03		47.4	OK	
E10.008	E9	0.000	0.01		47.3	OK	
E11.000	E10	0.000	0.45		2116.3	OK	
E11.001	E11	0.000	0.70		3198.7	OK	
E11.002	E12	0.000	0.91		4201.9	OK	
E11.003	E13	0.000	2.17		4214.1	SURCHARGED	
E11.004	E14	0.000	0.00		209.7	OK	
E11.005	E15	0.000	0.29		39.5	SURCHARGED	
E11.006	E16	0.000	0.28		39.3	SURCHARGED	
E10.009	E17	0.000	0.06		74.2	SURCHARGED	
E10.010	E18	0.000	0.54		74.2	OK	

	Cons	ultants	5 Ltd								Pac	je 14
•						Rai	l Centr	al				
•						Uni	ts 3 +	4 + Acce	ss Road			
•											N	licro
Date 6t	h Feb	ruary 2	2018			Des	igned b	y RJH				rainage
File Un	its 3	+4 + Ac	cess	Road.	. MDX	Che	cked by					lallaye
XP Solu	tions					Net	work 20	16.1				
200	year	Return	n Per	iod Su	ummary				y Maximur	n Level	(Rank 1	<u>1) for</u>
						<u>E</u>	<u>xisting</u>					
Νι	umber c	nhole He Foul Sev f Input	Hot eadlo wage j Hydro	Hot St Start ss Coef per hec ographs	art (min Level (m f (Globa tare (l/ 0 Num	or 1.00 m) 1) 0.50 s) 0.00	0 1 0 0 Flow p 0 0	tional Flo MADD Facto er Person Controls (w - % of] r * 10m³/h Inlet Coe per Day (] Number of Number of	a Storage effiecient /per/day)	2.000 0.800 0.000 a Diagra	
	NUMBEL	OI OIIII		51101015	5 Nullibe	L OI DC	orage be.	Luccures o	ivuniber of		e concre	010 0
				-1 - 1				Details	202 9		2.4.0	
			Locat	ion	D2	(1km) 0	.300	E (1km) 0 F (1km) 2 Summer) 0		inter) 0.8	840	
		Mox	anta f	For Elo	d Dick	Marring	(mm)			300.0		
		Mar	gin i	or Floo	od Risk M Analy	-		Second In	ncrement (
					-	DTS St				OFF		
					Tn	DVD St ertia St				ON ON		
					111	eilla Si	Latus			ON		
					<i>(</i>)							
		Du	ratio	Profil	. ,	5. 30. F	50. 120.	180, 240,	Sur 360, 480,	nmer and W 600, 720,		
		Du	LUCIO		1115/ 13	<i>, 50, 0</i>	, 120,	100, 240,		60, 2880,		
	F		ariod	(~) (~ ~ ~	arc)							
		Return Pe		-					1	, 30, 100		
1				(S) (ye Change					1	, 30, 100 0, 0, 4		
				-					1		0, 40	
	па/мн		imate	Change	(%)	Fire	+ (X)	First (V)		0, 0, 4	0, 40 Water	Surcharged
PN	US/MH Name		imate	Change Return			t (X) harge	First (Y) Flood	First (Z) Overflow	0, 0, 4	0, 40 Water	Surcharged Depth (m)
	Name	Cl: Stor	imate m	Change Return Period	(응) Climate Change	Surc	harge		First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m)	Depth (m)
PN E10.000 E10.001		C1:	imate m nter	Change Return	(୧୨) Climate	Surc 200/1			First (Z)	0, 0, 4 Overflow	0, 40 Water Level	Depth (m) 0.199
E10.000 E10.001 E10.002	Name E1	Cl: Stor 15 Wi 15 Wi 15 Wi	m nter nter nter	Change Return Period 200 200 200	(%) Climate Change +40%	Surc 200/12 200/12 200/12	harge 5 Winter 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272</pre>	Depth (m) 0.199 0.421 0.497
E10.000 E10.001 E10.002 E10.003	Name E1 E2 E3 E4	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi	m nter nter nter nter	Change Return Period 200 200 200 200	(%) Climate Change +40% +40% +40% +40%	Surc 200/12 200/12 200/12	harge 5 Winter 5 Summer		First (Z)	0, 0, 4 Overflow	0, 40 Water Level (m) 84.549 84.472 84.272 83.760	Depth (m) 0.199 0.421 0.497 0.283
E10.000 E10.001 E10.002 E10.003 E10.004	Name E1 E2 E3 E4 E5	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi	m nter nter nter nter nter	Change Return Period 200 200 200 200 200 200	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40%</pre>	Surc 200/19 200/19 200/19 200/19	harge 5 Winter 5 Summer 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005	Name E1 E2 E3 E4 E5 E6	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi	m nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/19 200/19 200/19 200/19	harge 5 Winter 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626
E10.000 E10.001 E10.002 E10.003 E10.004	Name E1 E2 E3 E4 E5	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40%</pre>	Surc 200/19 200/19 200/19 200/19	harge 5 Winter 5 Summer 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006	Name E1 E2 E3 E4 E5 E6 E7	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/19 200/19 200/19 200/19	harge 5 Winter 5 Summer 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007	Name E1 E2 E3 E4 E5 E6 E7 E8	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/1 200/1 200/1 200/1 30/180	harge 5 Winter 5 Summer 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/15 200/15 200/15 30/180 200/15 200/15 200/15 200/15	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 200/12 30/480	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer 5 Summer 5 Summer 5 Winter		First (Z)	0, 0, 4 Overflow	<pre>Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Summer 5 Summer 5 Summer 5 Summer 5 Winter		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059 82.045</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307 0.387
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Summer 5 Summer		First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059 82.045</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307 0.387
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Summer 5 Summer	Flood	First (Z)	0, 0, 4 Overflow	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059 82.045</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307 0.387
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Summer 5 Summer 5 Summer 5 Winter 0 Winter 0 Winter 0 Summer	Flood	First (Z)	0, 0, 4 Overflow Act.	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059 82.045</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307 0.387
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120 100/120 Flow /	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer 5 Summer 0 Winter 0 Winter 0 Winter 0 Winter 0 Winter 0 Winter	Flood Pipe 7 Flow (1/s)	First (Z) Overflow	0, 0, 4 Overflow Act.	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059 82.045</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307 0.387
E10.000 E10.001 E10.002 E10.003 E10.004 E10.005 E10.006 E10.007 E10.008 E11.000 E11.001 E11.002 E11.003 E11.004 E11.005 E11.006 E10.009	Name E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17	Cl: Stor 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 15 Wi 15 Wi 15 Wi 960 Wi 960 Wi 960 Wi 960 Wi 960 Wi 960 Wi 15 Wi 960 W	m nter nter nter nter nter nter nter nter	Change Return Period 200 200 200 200 200 200 200 20	<pre>(%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	Surc 200/12 200/12 200/12 30/180 200/12 200/12 200/12 30/480 100/120 Flow / Cap.	harge 5 Winter 5 Summer 5 Summer 5 Summer 0 Winter 5 Winter 5 Summer 5 Summer 0 Winter 0 Winter 0 Winter 0 Winter 0 Winter 0 Winter	Flood Pipe Flow (1/s) 2754.3 S	First (Z) Overflow	0, 0, 4 Overflow Act.	<pre>0, 40 Water Level (m) 84.549 84.472 84.272 83.760 82.635 82.556 82.249 82.191 82.117 84.388 84.336 84.151 83.721 82.314 82.272 82.059 82.045</pre>	Depth (m) 0.199 0.421 0.497 0.283 -0.185 0.626 -0.412 -0.300 -0.165 0.038 0.317 0.408 0.277 -0.499 0.451 0.307 0.387

Hydrock Consultants Ltd		Page 15
•	Rail Central	
	Units 3 + 4 + Access Road	
		Micro
Date 6th February 2018	Designed by RJH	
File Units 3+4 + Access Road.MDX	Checked by	Diamaye
XP Solutions	Network 2016.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E10.003	E4	0.000	2.08		5785.7	SURCHARGED	
E10.004	E5	0.000	0.00		317.3	OK	
E10.005	E6	0.000	0.51		41.4	SURCHARGED	
E10.006	E7	0.000	0.03		46.6	OK	
E10.007	E8	0.000	0.03		48.7	OK	
E10.008	E9	0.000	0.02		48.1	OK	
E11.000	E10	0.000	0.56		2624.0	SURCHARGED	
E11.001	E11	0.000	0.92		4191.6	SURCHARGED	
E11.002	E12	0.000	1.24		5730.5	SURCHARGED	
E11.003	E13	0.000	2.91		5649.8	SURCHARGED	
E11.004	E14	0.000	0.00		242.2	OK	
E11.005	E15	0.000	0.29		39.6	SURCHARGED	
E11.006	E16	0.000	0.28		39.3	SURCHARGED	
E10.009	E17	0.000	0.06		74.2	SURCHARGED	
E10.010	E18	0.000	0.54		74.2	OK	

Hydrock Consultants Ltd		Page 1
· ·	Rail Central Unit 5	L'un
• Date 6th February 2018	Designed by RJH	
File Unit 5.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	
Existi	ng Network Details for Existing	
	e I.Area T.E. Base k HYD DJ) (ha) (mins) Flow (l/s) (mm) SECT (m	LA Section Type m)
E6.000 119.600 0.239 500 E6.001 151.000 0.377 400 E6.002 27.500 -0.331 -83	5 3.616 0.00 0.0 0.600 []	00 Pipe/Conduit -5 Pipe/Conduit 50 Pipe/Conduit
	Network Results Table	
	/IL ∑ I.Area ∑ Base Vel Cap m) (ha) Flow (l/s) (m/s) (l/s)	
E6.001 86	.3503.6160.01.671883.7.1117.2320.02.80134207.6.7347.2320.00.000.0	
	nduit Sections for Existing	
conduits. Thes culvert, \/ open	ss than 66 refer to section numbers of hy e conduits are marked by the symbols:- [] channel, oo dual pipe, ooo triple pipe, (box) egg.
	pers < 0 are taken from user conduit table	
Section Cond Number Typ	uit Major Minor Side Corner 4*Hyd XSec e Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²)	1
-5	[] 40000 1200 90.0 2.330 48.00	00

Hydrock Consultants Ltd					Page 2
•	Ra	ail Central	-		
	Un	nit 5			4
					Micco
Date 6th February 2018	De	esigned by	RJH		Micro
File Unit 5.MDX	Ch	necked by			Drainage
XP Solutions		etwork 2016	5.1		
	PIPELINE SC	HEDULES fo	<u>r Existinq</u>		
	<u>Upst</u>	tream Manho	ole		
PN Hvd Diam	MH C Lovol 1		oth MH	MH DIAM., L*W	
Sect (mm) 1		-) Connection	(mm)	
			700 Open Manhole		
E6.001 [] -5					
E6.002 o 450	E3 89.250	85.734 3.	066 Open Manhole	1350	
	Downs	stream Manl	nole		
PN Length Slope	MH C.Level	L I.Level D.	Depth MH	MH DIAM., L'	۶W

	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
E6.000	119.600	500.4	E2	89.250	86.111	1.939	Open Manhole	40725
E6.001	151.000	400.5	ЕЗ	89.250	85.734	2.316	Open Manhole	1350
E6.002	27.500	-83.1	Ε	87.500	86.065	0.985	Open Manhole	0

Hydrock Consultants Ltd		Page 3
•	Rail Central	,
•	Unit 5	Mar m
•		— Micro
Date 6th February 2018	Designed by RJH	Drainage
File Unit 5.MDX	Checked by	Brainage
XP Solutions	Network 2016.1	
Area	Summary for Existing	
Pipe PIMP PIMP Number Type Name	PIMP Gross Imp. Pipe Total (%) Area (ha) Area (ha) (ha)	
6.000	100 3.616 3.616 3.616	
6.001		
6.002	100 0.000 0.000 0.000	
	Total Total Total 7.232 7.232 7.232	
Free Flowing	Outfall Details for Existing	
	C. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm)	
Tipe Munder Mane	(m) (m)	
E6.002 F	87.500 86.065 0.000 0 0	
Simulati	<u>on Criteria for Existing</u>	
	<u></u>	
Volumetric Runoff Coef	f 0.750 Additional Flow - % of Total Flo	
Areal Reduction Facto		
Hot Start (mins) 0 Inlet Coeffiecien) 0 Flow per Person per Day (l/per/day	
Manhole Headloss Coeff (Global		
Foul Sewage per hectare (1/s) 0.000 Output Interval (mins	
	er of Offline Controls 0 Number of Time/Ar of Storage Structures 0 Number of Real Ti	
Synth	<u>etic Rainfall Details</u>	
Rainfall Model FEH	D2 (1km) 0.300 Winter Storms	No
Return Period (years) 2	D3 (1km) 0.243 Cv (Summer)	
Site Location	E (1km) 0.302 Cv (Winter)	
	F (1km) 2.496 Storm Duration (mins) Summer Storms Yes	30
UI (IKII) 0.519	Summer Storms 165	

Hydrock Consulta							Page	2 4	
•			Rail Cent	ral					
			Unit 5				4	A .	
								24	m
Date 6th Februar	v 2018		Designed	bv RJH					
File Unit 5.MDX	1 2020		Checked k	-			Dr	raina	10
XP Solutions			Network 2						
			Network 2	2010.1					
		<u>Onlin</u>	e Controls 1	<u>for Existi</u>	ng				
<u>Hydro-</u>	Brake Opti	imum® Manh	ole: E3, DS,	/PN: E6.00	2, Vol	ume (m³):	6243.2		
		τ	Jnit Reference	MD-SHE-023	3-2960-1	1200-2960			
			esign Head (m)			1.200			
		Des	ign Flow (l/s)			29.6			
			Flush-Flo™			alculated			
			-	Minimise (upstrear	-			
			Application			Surface			
		2	Sump Available Diameter (mm)			Yes 233			
		Tn	vert Level (mm)			233 85.734			
	Minimum		Diameter (mm)			300			
		-	Diameter (mm)			1800			
Control	Points	Head (m)	Flow (l/s)	Control 1	Points	Head	(m) Flow (1/s)	
	(Coleviated) 1.200	29.6		Kick-	Flo® 0.8	859	25.2	
Decign Doint				an Flow over				25.0	
Design Point		TM 0.404	29.0IMe						
Design Point	Flush-Flo	тм 0.404	29.0 Mea	all FIOW OVEL	neau n	ange			
The hydrological	Flush-Flo	s have been	based on the H	Head/Dischar	ge rela	tionship fo	or the Hydi		e
The hydrological Optimum® as speci	Flush-Flo calculation fied. Shou	s have been ld another t	based on the I ype of control	Head/Dischar l device oth	ge rela er than	tionship fo	or the Hydi		e
The hydrological Optimum® as speci utilised then the	Flush-Flo calculation fied. Shou se storage	s have been ld another t routing calc	based on the B ype of contro ulations will	Head/Dischar l device oth be invalida	ge rela er than ted	tionship fo a Hydro-Br	or the Hydr cake Optimu	um® be	
The hydrological Optimum® as speci utilised then the	Flush-Flo calculation fied. Shou se storage	s have been ld another t routing calc	based on the B ype of contro ulations will	Head/Dischar l device oth be invalida	ge rela er than ted	tionship fo a Hydro-Br	or the Hydr cake Optimu	um® be	
The hydrological Optimum® as speci utilised then the Pepth (m) Flow (1/s 0.100 7.	Flush-Flo calculation: fied. Shou ese storage :) Depth (m) 7 0.800	s have been ld another t routing calc Flow (l/s) 26.7	based on the M ype of control ulations will Depth (m) Flo 2.000	Head/Dischar l device oth be invalida ow (1/s) Dep 37.8	ge rela er than ted th (m) 4.000	tionship fo a Hydro-Br Flow (1/s) 52.8	pr the Hyds cake Optimu Depth (m) 7.000	um® be Flow	(1/: 69.
The hydrological Optimum® as speci utilised then the pepth (m) Flow (1/s 0.100 7. 0.200 23.	Flush-Flo calculation: fied. Shou ese storage :) Depth (m) 7 0.800 4 1.000	s have been ld another t routing calc Flow (1/s) 26.7 27.1	based on the P ype of control ulations will Depth (m) Flc 2.000 2.200	Head/Dischar l device oth be invalida ow (1/s) Dep 37.8 39.6	ge rela er than ted th (m) 4.000 4.500	tionship fo a Hydro-Br Flow (1/s) 52.8 55.9	Depth (m) 7.000 7.500	um® be Flow	(1/: 69 71
The hydrological Optimum® as speci utilised then the Depth (m) Flow (1/s 0.100 7. 0.200 23. 0.300 29.	Flush-Flo calculations fied. Shou se storage :) Depth (m) 7 0.800 4 1.000 1 1.200	s have been ld another t routing calc Flow (l/s) 26.7 27.1 29.6	based on the P ype of control ulations will Depth (m) Flc 2.000 2.200 2.400	Head/Dischar l device oth be invalida ow (1/s) Dep 37.8 39.6 41.3	ge rela er than ted th (m) 4.000 4.500 5.000	tionship fo a Hydro-Br Flow (1/s) 52.8 55.9 58.9	Depth (m) 7.000 7.500 8.000	um® be	(1/: 69 71 74
The hydrological Optimum® as speci utilised then the Oepth (m) Flow (1/s 0.100 7. 0.200 23. 0.300 29. 0.400 29.	Flush-Flo calculation: fied. Shou ese storage : Depth (m) 7 0.800 4 1.000 1 1.200 6 1.400	s have been ld another t routing calc Flow (1/s) 26.7 27.1 29.6 31.9	based on the I ype of control ulations will Depth (m) Flc 2.000 2.200 2.400 2.600	Head/Dischar l device oth be invalida ow (1/s) Dep 37.8 39.6 41.3 42.9	ge rela er than ted th (m) 4.000 4.500 5.000 5.500	tionship fc a Hydro-Br Flow (1/s) 52.8 55.9 58.9 61.7	Depth (m) 7.000 7.500 8.000 8.500	um® be	(1/: 69 71 74 76
The hydrological Optimum® as speci utilised then the Oepth (m) Flow (1/s 0.100 7. 0.200 23. 0.300 29.	Flush-Flo calculation: fied. Shou ese storage : Depth (m) 7 0.800 4 1.000 1 1.200 6 1.400 4 1.600	s have been ld another t routing calc Flow (1/s) 26.7 27.1 29.6 31.9 34.0	based on the I ype of control ulations will Depth (m) Flc 2.000 2.200 2.400 2.600 3.000	Head/Dischar l device oth be invalida ow (1/s) Dep 37.8 39.6 41.3	ge rela er than ted th (m) 4.000 4.500 5.000	tionship fo a Hydro-Br Flow (1/s) 52.8 55.9 58.9	Depth (m) 7.000 7.500 8.000 8.500 9.000	IM® be	

	Consu	ltants Ltd	L						Pa	ige 5
					Rail Cent	ral			ſ	
					Unit 5					Ч.
ate 6t	h Febr	uary 2018			Designed	by RJH				Micro
	it 5.M				Checked b	-				Drainag
P Solu					Network 2					_
Νυ	Man F umber of	Areal Hot Hole Headlo Coul Sewage Input Hydro of Online Co Rainfall Mo Site Locat C (1	Reduct Hot St Start ss Coef per hec ographs ontrols del ion km) -0.	ion Fact art (min Level (m f (Globa tare (1/ 0 Num 1 Numbe <u>Svi</u> FEH D1 0 D2 0 026 D3 0 Flood Ri	1) 0.500 Flow	riteria ditional F: MADD Fact per Person e Controls Structures <u>11 Details</u> E (1km) F (1km) F (1km) O 300.0 p Fine In	low - % of tor * 10m ³ Inlet C n per Day 0 Number 0 Number 0.302 Cv 2.496 0.750 DVD Sta	Total Flov /ha Storage oeffiecien (l/per/day of Time/Ar of Real Ti (Winter) 0 tus OFF	w 0.000 e 2.000 t 0.800) 0.000 ea Diag me Cont:	rams O
			Profil	e (s)			S	ummer and	Winter	
		eturn Period Climate	(s) (ye Change	ins) 15 ars) (%)	5, 30, 60, 120, 		, 360, 480	1, 30, 10 0, 0,	, 960, 1440 0, 200 40, 40 Water	Surcharge
PN	US/MH	eturn Period Climate	n(s) (m (s) (ye Change Return	ins) 15 ars) (%) Climate	First (X)		, 360, 480 First (Z	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level</pre>	Depth
PN	US/MH Name	eturn Period Climate Storm	n(s) (m (s) (ye Change Return Period	ins) 15 ars) (%) Climate Change	First (X) Surcharge	First (Y) Flood	, 360, 480 First (Z	, 600, 720 1, 30, 10 0, 0,	, 960, 1440 0, 200 40, 40 Water Level (m)	Depth (m)
E6.000	US/MH Name E1	eturn Period Climate Storm 15 Winter	n(s) (m (s) (ye Change Return Period 1	ins) 15 ars) (%) Climate Change +0%	First (X)	First (Y) Flood	, 360, 480 First (Z	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822</pre>	Depth (m) -0.72
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter	n(s) (m (s) (ye Change Return Period 1 1	ins) 15 ars) (%) Climate Change +0% +0%	First (X) Surcharge	First (Y) Flood	, 360, 480 First (Z	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822</pre>	Depth (m) -0.72 -1.08
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter	n(s) (m (s) (ye Change Return Period 1 1	ins) 15 ars) (%) Climate Change +0% +0%	First (X) Surcharge 100/15 Summer	First (Y) Flood	, 360, 480 First (Z	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.03
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter	n(s) (m (s) (ye Change Return Period 1 1	ins) 15 ars) (%) Climate Change +0% +0% +0%	First (X) Surcharge 100/15 Summer 1/600 Winter	First (Y) Flood	, 360, 480 First (Z	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.03
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter	n(s) (m (s) (ye Change Return Period 1 1 1	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded	First (X) Surcharge 100/15 Summer 1/600 Winter	First (Y) Flood Pipe	, 360, 480 First (Z Overflow	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act.</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.7 -1.0
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter	n(s) (m (s) (ye Change Return Period 1 1 1	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl	First (Y) Flood Pipe ow Flow	, 360, 480 First (Z Overflow	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.7 -1.0
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter 1440 Winter PN	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³)	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s)	First (Y) Flood Pipe ow Flow) (1/s)	, 360, 480 First (Z Overflow Status	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.03
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter 1440 Winter PN E6.000	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000	<pre>First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33</pre>	First (Y) Flood Pipe ow Flow (1/s) 540.5	, 360, 480 First (Z Overflow Status OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.03
E6.000 E6.001	US/MH Name E1 E2 1	eturn Period Climate Storm 15 Winter 1440 Winter 1440 Winter PN	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08
E6.000 E6.001	US/MH Name E1 E2 1	Storm 15 Winter 1440 Winter 1440 Winter 1440 Minter PN E6.000 E6.001	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08
E6.000 E6.001	US/MH Name E1 E2 1	Storm 15 Winter 1440 Winter 1440 Winter 1440 Minter PN E6.000 E6.001	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08
	US/MH Name E1 E2 1	Storm 15 Winter 1440 Winter 1440 Winter 1440 Minter PN E6.000 E6.001	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08
E6.000 E6.001	US/MH Name E1 E2 1	Storm 15 Winter 1440 Winter 1440 Winter 1440 Minter PN E6.000 E6.001	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08
E6.000 E6.001	US/MH Name E1 E2 1	Storm 15 Winter 1440 Winter 1440 Winter 1440 Minter PN E6.000 E6.001	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08
E6.000 E6.001	US/MH Name E1 E2 1	Storm 15 Winter 1440 Winter 1440 Winter 1440 Minter PN E6.000 E6.001	n(s) (m (s) (ye Change Return Period 1 1 1 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	First (X) Surcharge 100/15 Summer 1/600 Winter Flow / Overfl Cap. (1/s) 0.33 0.00	First (Y) Flood Pipe ow Flow (1/s) 540.5 55.5	, 360, 480 First (Z Overflow Status OK OK	<pre>, 600, 720 1, 30, 10 0, 0,) Overflow 7 Act. Level Exceeded</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 86.822 86.226</pre>	Depth (m) -0.72 -1.08

		ltants Lto	ב 						Pa	ige 6
					Rail Cent	cral			<u> </u>	
					Unit 5					L
										Micco
ate 6t	h Febr	ruary 2018			Designed	by RJH				Micro
ile Un	nit 5.M	1DX			Checked b	y				Drainag
P Solu	itions				Network 2					
	Ma umber o	Areal Hot nhole Headlo Foul Sewage f Input Hydr of Online C Rainfall Mo Site Locat C (1	Reduct Hot St Start Start per hec cographs Controls odel tion 1km) -0.	ion Fact art (min Level (m f (Globa ttare (1/ a 0 Num f 1 Numbe <u>Syn</u> FEH D1 D2 .026 D3	m) 0 1) 0.500 Flow	<u>riteria</u> ditional F: MADD Fac: per Person e Controls Structures <u>tll Details</u> E (1km) F (1km) 7 (Summer)	low - % of tor * 10m ³ / Inlet Co n per Day (0 Number c 0 Number c 0.302 Cv (2.496 0.750	Total Flow ha Storage efficcient l/per/day) of Time/Arc of Real Tin Winter) 0.	w 0.000 e 2.000 t 0.800 0.000 ea Diag me Cont	rams O
	R	eturn Period		nins) 15 ears)	5, 30, 60, 120	, 180, 240	, 360, 480,	1, 30, 10 0, 0, 4	, 960, 1440 0, 200	
									Water	Surcharge
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow		Surcharge Depth
PN	US/MH Name	Storm		Climate Change		First (Y) Flood		Overflow Act.	Level	Depth
	Name		Period	Change	Surcharge	Flood			Level (m)	Depth (m)
E6.000	Name E1	Storm 15 Winter 1440 Winter	Period 30	Change +0응		Flood			Level	Depth (m) -0.09
E6.000 E6.001	Name E1 E2	15 Winter	Period 30 30	Change +0% +0%	Surcharge	Flood			Level (m) 87.452	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter	Period 30 30	Change +0% +0%	Surcharge	Flood			Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter	Period 30 30 30	Change +୦୫ +୦୫ +୦୫	Surcharge	Flood			Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter	Period 30 30 30	Change +0% +0% Flooded	Surcharge 100/15 Summer 1/600 Winter	Flood		Act.	Level (m) 87.452 86.442	Depth (m) -0.02 -0.8
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter	Period 30 30 30	Change +0% +0% Flooded	Surcharge	Flood Pipe ow Flow	Overflow		Level (m) 87.452 86.442	Depth (m) -0.02 -0.8
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN	Period 30 30 30 US/MH Name	Change +0% +0% +0% Flooded Volume (m ³)	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s)	Flood Pipe ow Flow (1/s)	Overflow Status	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000	Period 30 30 30 US/MH Name E1	Change +0% +0% +0% Flooded Volume (m ³) 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00	Flood Pipe ow Flow (1/s) 1653.1	Overflow Status OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
PN E6.000 E6.001 E6.002	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% Flooded Volume (m ³) 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK	Act.	Level (m) 87.452 86.442	(m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Depth (m) -0.09 -0.86
E6.000 E6.001	Name E1 E2	15 Winter 1440 Winter 1440 Winter PN E6.000 E6.001	Period 30 30 30 US/MH Name E1 E2	Change +0% +0% +0% V0: volume (m ³) 0.000 0.000	Surcharge 100/15 Summer 1/600 Winter Flow / Overflo Cap. (1/s) 1.00 0.00	Flood Pipe ow Flow (1/s) 1653.1 101.1	Overflow Status OK OK	Act.	Level (m) 87.452 86.442	Dept (m) -0 -0

Hydrock	Consi	ıltan	ts Lto	1							Pa	ige 7
•						Rai	l Cent	ral			<u>ر</u>	
						Uni	t 5					4
												Micco
Date 6t	h Febr	ruary	2018			Des	igned	by RJH				
File Un	it 5.1	MDX				Che	cked b	У				Drainage
XP Solu	tions					Net	work 2	016.1				
<u>100</u> Nu	year Ma umber o	nhole Foul S f Inpu of Or Rain	Areal Hot Headlo Sewage at Hydr hline C fall Mc e Locat C (1	Reduct Hot St Start ss Coef per hec ographs ontrols del ion km) -0.	ion Fact art (min Level (m f (Globa tare (l/ 0 Num 1 Numbe <u>Sy</u> FEH D1 D2 026 D3 Flood Ri	Net of Cri E Simula Lor 1.00 um) 1) 0.50 um) 1) 0.50 us) um) 1) 0.50 us) um) 1) 0.50 us) uber of er of St nthetic (1km) 0 (1km) 0 usk Warn alysis	work 2 tical xistin tion Cr 0 Add 0 Add 0 Offline orage S <u>Rainfa</u> .319 .300 .243 Cv ing (mm	016.1 <u>Results</u> <u>G</u> <u>iteria</u> litional F MADD Fac per Perso Controls tructures <u>ll Details</u> <u>E (1km)</u> <u>F (1km)</u> (Summer)) 300.0 p Fine I	on per Day (0 Number c 0 Number c <u>5</u> 0.302 Cv (2.496	Total Flow ha Storage effiecient l/per/day of Time/Ar f Real Tim Winter) 0 us OFF	w 0.000 e 2.000 t 0.800) 0.000 ea Diag me Cont	rams O
	F US/MH	leturn	Period	(s) (ye Change	ins) 15 ars)		50, 120, t (X)), 360, 480,	1, 30, 10	, 960, 1440 0, 200 40, 40	Surcharged Depth
PN	Name	St	orm		Change		harge	Flood	Overflow	Act.	(m)	(m)
E6.000 E6.001 E6.002		1440	Winter Winter Winter		+40%	100/15 1/600 Flow / Cap.	Winter	Pipe w Flow (l/s)	Status	Level Exceeded	88.383 86.906 86.904	
						-						
			E6.000 E6.001	E1 E2	0.000	2.06 0.00		3406.2 181.7	SURCHARGED OK			
			E6.001	E2 E3	0.000	0.00			SURCHARGED			

Hydrock	Const	ıltant	s Ltd	l							Pa	ige 8
•						Rai	l Cent	ral			<u>ر</u>]
						Uni	t 5					4
												Micco
Date 6t	h Febr	ruary	2018			Des	igned	by RJH				
File Un	it 5.N	1DX				Che	cked b	У				Drainage
XP Solu	tions					Net	work 2	016.1				
<u>200</u> Nu	year Ma mber o	nhole 1 Foul So f Input of Oni Rainf	Areal Hot Headlo. ewage j t Hydro line Co all Mo Locat C (1	Reduct Hot St Start ss Coef per hec ographs ontrols del ion km) -0.	ion Fact art (min Level (m f (Globa tare (l/ 0 Num 1 Numbe <u>Sy</u> FEH D1 D2 026 D3 Flood Ri	<u>of Cri</u> <u>F</u> <u>Simula</u> or 1.00 s) m) 1) 0.50 s) 0.00 ber of er of St <u>nthetic</u> (1km) 0 (1km) 0 (1km) 0 sk Warn alysis	tical xistin 0 Add 0 00 Flow 00 0ffline corage S <u>Rainfa</u> .319 .300 .243 Cv ing (mm	Results G Titeria NADD Fac per Persc Controls tructures L1 Details E (1km) F (1km) (Summer)) 300.0 p Fine I	on per Day (0 Number c 0 Number c <u>5</u> 0.302 Cv (2.496	Total Flow ha Storage effiecient l/per/day) f Time/Arc f Real Tim Winter) 0. us OFF	v 0.000 2.000 0.800 0.000 ea Diag	rams O
	R US/MH	eturn	Period limate	(s) (ye Change	ins) 15 ars)		60, 120, t (X)), 360, 480,	1, 30, 100 0, 0, 4	960, 1440 0, 200 40, 40	Surcharged Depth
PN	Name	Sto	rm	Period	Change	Surc	harge	Flood	Overflow	Act.	(m)	(m)
E6.000 E6.001 E6.002		15 W 1440 W 1440 W		200 200 200	+40%		Summer Winter				89.058 87.130 87.126	1.508 -0.181 0.942
					Flooded			Pipe				
					Volume	Flow /	Overflo	-		Level		
			PN	Name	(m ³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		-		E 1	0 000			1010 0	ELOOD DION			
			26.000	E1 E2	0.000	2.55		4216.6	FLOOD RISK OK			
			E6.002	E3	0.000	0.46			SURCHARGED			

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Unit 5 South	
		Micco
Date 6th February 2018	Designed by RJH	
File Unit 5 South.MDX	Checked by	Diginarie
XP Solutions	Network 2016.1	

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins) 4-8	Area (ha)	Time (mins)	Area (ha)
0-4	2.099	4-8	5.456	8-12	0.377
Total	Area (Contribu	uting ((ha) = 7	.931

Total Pipe Volume (m³) = 8751.550

Hydrock Consultants Ltd		Page 2
•	Rail Central	
	Unit 5 South	
		Micro
Date 6th February 2018	Designed by RJH	
File Unit 5 South.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	1

Existing Network Details for Existing

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)		Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
E7.001	149.700 44.900 151.000	0.089	504.5	2.411 0.000 2.411	4.00 0.00 0.00	0.0	0.600 0.600 0.600		1200	Pipe/Conduit Pipe/Conduit Pipe/Conduit
E8.000	46.600	0.190	245.3	2.411	5.00	0.0	0.600	0	1050	Pipe/Conduit
E7.003	45.600	2.150	21.2	0.000	0.00	0.0	0.600	0	450	Pipe/Conduit
E9.000	217.700	7.590	28.7	0.450	5.00	0.0	0.600	0	2100	Pipe/Conduit
E7.004 E7.005	138.300 17.700			0.248 0.000	0.00		0.600 0.600	0 0		Pipe/Conduit Pipe/Conduit

Network Results Table

PN	US/IL (m)		Σ Base Flow (l/s)	Vel (m/s)	Cap (1/s)
E7.000 E7.001 E7.002	86.201	2.411 2.411 4.822	0.0 0.0 0.0		1883.2 1876.0 120053.9
E8.000	86.000	2.411	0.0	2.20	1901.6
E7.003	85.810	7.233	0.0	4.43	704.5
E9.000	89.600	0.450	0.0	9.84	34095.9
E7.004 E7.005		7.931 7.931	0.0	1.91 1.01	6624.5 160.2

Conduit Sections for Existing

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg.

Section numbers < 0 are taken from user conduit table

	Conduit Type	Dimn.	Dimn.	Slope	Radius	
-5	[]	40000	1200	90.0	2.330	48.000

Hydrock Consul	ltant	s Ltd								Page 3
						ail Cer				5
					U	nit 5 S	South			Mr.
										Micro
ate 6th Febru	lary 2	2018			D	esigned	d by RJH	H		Drainad
'ile Unit 5 So	outh.1	MDX				hecked	-			
P Solutions					N	etwork	2016.1			
			T							
			<u>+</u>	<u>'IPEL</u>	INE S	CHEDULE	<u>S IOF E</u>	lxistinq		
					<u>Ups</u>	tream N	Manhole			
	PN	-	Diam l (mm) Na		.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
	E7.000 E7.001		1200 1200			86.500		Open Manhole Open Manhole		
	E7.001		-5			86.112		Open Manhole		
		- []	Ũ	20		00.111	1.000	0,000 110111010	10,20	
	E8.000) 0	1050	E4 8	89.250	86.000	2.200	Open Manhole	1800	
	E7.003	в о	450	E5 8	89.250	85.810	2.990	Open Manhole	1500	
	E9.000		21.0.0	EC.		80 600	0 000	Onen Menhele	2000	
	E9.000) 0	2100	E6	92.600	89.600	0.900	Open Manhole	3000	
	E7.004		2100					Open Manhole		
	E7.005	5 0	450	E8 8	85.200	81.826	2.924	Open Manhole	2100	
					Down	stream	Manhol	e		
								_		
	PN	Length (m)	Slope (1:X)		C.Leve (m)	al I.Leve (m)	el D.Dept (m)		MH DIAM., L' n (mm)	۶W
E7	.000 1	149.700	500.7	E2	89.25	86.20	01 1.84	19 Open Manho	le 210)0
		44.900				86.11		38 Open Manho		
E7	.002 1	151.000	500.0	E5	89.25	85.82	10 2.24	10 Open Manho	le 150)0
E8	.000	46.600	245.3	E5	89.25	0 85.82	10 2.39	90 Open Manho	le 150	0
E7	.003	45.600	21.2	E7	85.20	0 83.66	50 1.09	90 Open Manho	le 300)0
E9	.000 2	217.700	28.7	E7	85.20	0 82.02	10 1.09	90 Open Manho	le 300)0
F 7	004 1	138.300	751 6	FS	85 20	0 81.82	26 1 2	74 Open Manho	le 210	10
		17.700						58 Open Manho		0
			Froo F	iowi	ng ()11	tfall D	otails	for Existi:	na	
				TOMT	iig ou	<u>ciaii D</u>		IOI HAISCI.	<u></u>	
			tfall Number			Level 1 (m)	[. Level (m)	Min D,I I. Level (mm (m)		
			E7 005		F	0E 000	01 700	0.000	0 0	
			E7.005)	Ε	85.000	81.782	0.000	0 0	
			S	imula	ation	Criter	ia for 1	Existing		
				~ ~						
		olumet: Areal 1							Total Flow 0.0 /ha Storage 2.0	
			Hot Sta			0000	. עעאיי		oeffiecient 0.8	
			Start I				w per Pe		(1/per/day) 0.0	
		leadlos							- (-)	60
F	oul Se	wage p	er hect	are (1/s) 0	.000		Output Inte	rval (mins)	1
Number of	Inpu+	Hydro	raphs	0 N	umber (of Offli	ne Contro	ols () Number	of Time/Area Di	iagrams 0
	-								of Real Time Co	-
				S 177	hthati	c Pain	fall Da	taile		

Synthetic Rainfall Details

Rainfall Model FEH Return Period (years) 2 Site Location

Hydrock Consultants Ltd	1 .	Page 4
	Rail Central Unit 5 South	Mirco
Date 6th February 2018	Designed by RJH	Micro Drainage
File Unit 5 South.MDX	Checked by	Diamage
KP Solutions	Network 2016.1	
Synth	netic Rainfall Details	
C (1km) -0.026 D1 (1km) 0.319 D2 (1km) 0.300 Summe:	E (1km) 0.302 Cv (Summer) 0. F (1km) 2.496 Cv (Winter) 0. r Storms Yes Storm Duration (mins)	750 840 30
D3 (1km) 0.243 Winter		

Hydrock	Consu	⊥tan	ts Ltd						-						Page	e 5	
•								entra							.		
						UI	nit 5	Sout	.h						٦	\sim	~
•															M	icro	
Date 6th	Febr	uary	2018			De	esign	ed by	RJH								
File Uni	t 5 S	outh	.MDX			Cł	necke	d by							D	raina	ye
XP Solut	ions					Ne	etwor	k 201	6.1								
					Onlin	e Co	ntrol	s for	Exis	tina							
					011111	000	110101	.0 101		<u>, e 1 1 1 9</u>	-						
	<u>Hyd</u>	lro-B	<u>rake Op</u>	otimum@) Manh	ole:	E5,	DS/P1	<u>і: Е7.</u>	003,	Vol	ume	(m³):	627	9.6		
							Refere Head		O-SHE-()216-2	2500-		2500				
						_	low (1						25.0				
					200	-	lush-F				С	alcula					
							-		4inimis	se ups	strea	m sto	rage				
							plicat					Sur	face				
						-	Availa						Yes				
					Th		eter (Level	, ,				95	216 .810				
			Minimu	um Outle				. ,				0.0	300				
				gested M	-							-	1500				
	Cont	trol 1	Points	Hea	ad (m)	Flow	(1/s)		Contro	ol Poi	ints		Head	(m) F:	Low (1/s)	
Des	ign Po	oint (Calculat Flush-F	,	1.250 0.400		25.0 25.0	Mean	Flow o			-Flo® Range	0.	871 -		21.1 21.3	
-	-		alculati							-			-		-		
			ied. Sh e storag									па Ну	dro-B	rake C	ptim	um® be	
Oepth (m)	Flow	(l/s)	Depth (m) Flow	(1/s)	Dept	h (m)	Flow	(1/s)	Depth	(m)	Flow	(l/s)	Deptl	1 (m)	Flow	(1/s
0.100		7.3	0.8	00	22.6		2.000		31.3	4	.000		43.7		7.000		57.
0.100		7.3 21.1	0.8	00	22.6 22.5		2.000 2.200		31.3 32.8	4 4	.000 .500		43.7 46.3		7.000 7.500		57. 59.
0.100		7.3	0.8 1.0 1.2	800 900 200	22.6		2.000		31.3	4 4 5	.000		43.7		7.000		57. 59. 61.
0.100 0.200 0.300		7.3 21.1 24.6	0.8 1.0 1.2 1.4	800 900 200	22.6 22.5 24.5		2.000 2.200 2.400		31.3 32.8 34.2	4 4 5 5	.000 .500 .000		43.7 46.3 48.7		7.000 7.500 3.000		57. 59. 61. 63.
0.100 0.200 0.300 0.400		7.3 21.1 24.6 25.0	0.8 1.0 1.2 1.4 1.6	800 900 200 800 800	22.6 22.5 24.5 26.4		2.000 2.200 2.400 2.600		31.3 32.8 34.2 35.5	4 4 5 5 6	.000 .500 .000 .500		43.7 46.3 48.7 51.0		7.000 7.500 8.000 8.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8		2.000 2.200 2.400 2.600 3.000 3.500		31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6	.000 .500 .000 .500 .000 .500		43.7 46.3 48.7 51.0 53.2 55.3	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 ® Manł	nole:	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere	DS/P	31.3 32.8 34.2 35.5 38.0 41.0	4 5 5 6 .005,	.000 .500 .500 .500 .500 .500	<u>lume</u> 2700-:	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 ® Manh	nole: Unit Pesign	2.000 2.200 2.400 2.600 3.000 3.500 <u>E8,</u> Refere Head	DS/P ence Mi (m)	31.3 32.8 34.2 35.5 38.0 41.0 N: E7	4 5 5 6 .005,	.000 .500 .500 .500 .500 .500	<u>lume</u> 2700-3 2	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700	8	7.000 7.500 3.000 3.500 9.000 9.500		(1/s 57. 59. 61. 63. 64. 66.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 ® Manh	unit l unit l esign ign F.	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1	DS/P ence Mi (m) /s)	31.3 32.8 34.2 35.5 38.0 41.0 N: E7	4 5 5 6 .005,	.000 .500 .000 .500 .500 .500	lume 2700-: 2	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 ® Manh	nole: Unit 1 esign ign F: F:	2.000 2.200 2.400 2.600 3.000 3.500 <u>E8,</u> Refere Head	_DS/P ence M (m) /s) To™	31.3 32.8 34.2 35.5 38.0 41.0 N: E7	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250-	lume 2700-: 2 alcula	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 ® Manh	unit l unit l esign ign F:	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 Lush-F	_DS/P ence Mi (m) /s) Tlo™ Live I	31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250-	lume 2700-2 2 alcula m stor	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 <u>® Manh</u> Do Des	unit 1 esign ign F: (App Sump 2	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa	DS/P ence Mi (m) /s) 'lo™ ive I ion ble	31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250-	lume 2700-2 2 alcula m stor	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 <u>8 Manl</u> D. Des	Unit I esign ign F: Q App Sump 2 Diame	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa eter (DS/P ence Mi (m) /s) 'lo™ ive I ion ble imm)	31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250-	lume 2700-3 alcula Sur:	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8 3rake O	00 00 00 00 00 00 ptimum	22.6 22.5 24.5 26.4 28.1 29.8 <u>Manh</u> Do Des	Unit I esign ign F: (App Sump 2 Diame	2.000 2.200 2.400 2.600 3.000 3.500 <u>E8,</u> Refere Head low (1 lush-F Dbject plicat Availa eter (Level	DS/P ence Mi (m) ./s) To™ tive I tion ble mm) (m)	31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250-	lume 2700-3 alcula Sur:	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500		7.3 21.1 24.6 25.0 24.8 24.4	0.8 1.0 1.2 1.4 1.6 1.8 <u>Brake O</u>	800 200 200 500 800	22.6 22.5 24.5 26.4 28.1 29.8 Manh Do Des	Unit I esign ign F: (App Sump 2 Diamo vert 2 Diamo	2.000 2.200 2.400 2.600 3.000 3.500 <u>E8,</u> Refere Head low (1 lush-F Dbject plicat Availa eter (Level eter (DS/P ence Mi (m) ./s) Tio™ tive I tion ble mm) (m) mm)	31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250-	lume 2700-2 alcula Sur: 81	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220	8	7.000 7.500 3.000 3.500 9.000 9.500		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500	<u>Нус</u>	7.3 21.1 24.6 25.0 24.8 24.4 dro-F	0.8 1.0 1.2 1.4 1.6 1.8 <u>Brake O</u>	00 00 00 00 00 ptimum m Outle	22.6 22.5 24.5 26.4 28.1 29.8 Manh Do Des	Unit I esign ign F: O Diamo Diamo Diamo	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa eter (Level eter (DS/P ence Mi (m) ./s) To™ tive I tion ble mm) (m) mm) mm)	31.3 32.8 34.2 35.5 38.0 41.0	4 4 5 6 6 .005,	.000 .500 .000 .500 .500 .000 .500 .250- Costrea	lume 2700-2 alcula Sur: 81	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826 300 2100	8	7.000 7.500 3.000 3.500 3.500 9.500 .9		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500 0.600	Hyd	7.3 21.1 24.6 25.0 24.8 24.4 dro-F	0.8 1.0 1.2 1.4 1.6 1.8 3rake O Minimu Sugg	am Outle gested M Hea	22.6 22.5 24.5 26.4 28.1 29.8 Manh Do Des In t Pipe lanhole	Unit I esign ign F: O Diamo Diamo Diamo	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa eter (Level eter ((1/s) 32.4	_DS/P ence Mi (m) //s) lo™ ive I ion ble mm) (m) mm)	31.3 32.8 34.2 35.5 38.0 41.0 N: E7 D-SHE-C	4 5 6 6 005, 0220-3 se ups	.000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .500 .000 .5000 .5000 .500 .500 .500 .500.500	lume 2700-: 2 alcula m stor Sur: 81 2 -Flo®	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826 300 2100 Head	: 481	7.000 7.500 3.500 3.500 3.500 3.500 3.500 .9		57. 59. 61. 63. 64.
0.100 0.200 0.300 0.400 0.500 0.600 Des	<u>Hyd</u> Cont Sign Po rologi ® as sp	7.3 21.1 24.6 25.0 24.8 24.4 dro-F	0.8 1.0 1.2 1.4 1.6 1.8 Brake O Minimu Sugg Points (Calculatt Flush-F alculati ied. Sh	am Outle gested M Flo™ ons have ould an	22.6 22.5 24.5 26.4 28.1 29.8 Manh Dr Des In t Pipe tanhole t Pipe tanhole 2.700 0.781 e been other t	Diame Diame Flow	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa eter (Level eter ((1/s) 32.4 32.3 i on t pf con	DS/P ence Mi (m) /s) lo™ iive I iion ible (mm) (m) (mm) (mm) (mm) (mm) he Heat	31.3 32.8 34.2 35.5 38.0 41.0 N: E7 D-SHE-C 4inimis Contro Flow o d/Disc evice	4 4 5 6 6 0220-3 0220-3 se ups ol Poi ver H harge other	.000 .500 .000 .500 .000 .500 .250- Costrea Kick- ead F relation	lume 2700-: 2 alcula m stor Sur: 81 2 -Flo® Range ations	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826 300 2100 Head 1.	(m) F: 632 or the	7.000 7.500 3.000 3.500 9.000 9.500 .9	1/s) 25.5 28.2 ro-Bra	57. 59. 61. 63. 64. 66.
0.100 0.200 0.300 0.400 0.500 0.600 Des	<u>Hyd</u> Cont Sign Po rologi ® as sp d then	7.3 21.1 24.6 25.0 24.8 24.4 dro-F	0.8 1.0 1.2 1.4 1.6 1.8 Brake O Minimu Sugg Points (Calculatt Flush-F alculati ied. Sh e storag	am Outle gested M Flo™ ons have ould an re routi	22.6 22.5 24.5 26.4 28.1 29.8 Manh Dr Des In t Pipe ianhole ad (m) 2.700 0.781 e been other t ng calc	nole: Unit l esign ign F: Diame vert : Diame Flow based cype contained	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa eter ((1/s) 32.4 32.3 i on t bf con ons w	DS/P mce Mi (m) /s) 'lo™ iive I iion ible (mm) (m) (mm) (mm) (mm) (mm) (mm) he Heat trol d iil be	31.3 32.8 34.2 35.5 38.0 41.0 D-SHE-C 4inimis Contro Flow o d/Disc evice inval	4 4 5 6 6 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-3 0220-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 0200-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 000-4 00-4 00-40	.000 .500 .000 .500 .000 .500 .250- Costrea Kick- ead F rela thar d	lume 2700-: 2 alcula m stor Sur: 81 2 -Flo® Range ations n a Hy	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826 300 2100 Head 1. hip f	(m) F: 632 - or the rake C	7.000 7.500 3.000 3.500 9.000 9.500 .9 .9	1/s) 25.5 28.2 ro-Bra um® be	57. 59. 61. 63. 64. 66.
0.100 0.200 0.300 0.400 0.500 0.600 Des The hydr Optimumo utilised	<u>Hyd</u> Cont Sign Po rologi ® as sp d then	7.3 21.1 24.6 25.0 24.8 24.4 dro-F	0.8 1.0 1.2 1.4 1.6 1.8 Brake O Minimu Sugg Points (Calculatt Flush-F alculati ied. Sh e storag	am Outle gested M Flo™ ons hav ons hav ould an re routi (m) Flow	22.6 22.5 24.5 26.4 28.1 29.8 Manh Dr Des In t Pipe ianhole ad (m) 2.700 0.781 e been other t ng calc	Diame basec cype c best basec basec cype c best best best best best best best best	2.000 2.200 2.400 2.600 3.000 3.500 E8, Refere Head low (1 lush-F Dbject plicat Availa eter ((1/s) 32.4 32.3 i on t bf con ons w	DS/P mce Mi (m) /s) 'lo™ iive I iion ible (mm) (m) (mm) (mm) (mm) (mm) (mm) he Heat trol d iil be	31.3 32.8 34.2 35.5 38.0 41.0 D-SHE-C 4inimis Contro Flow o d/Disc evice inval	4 4 5 6 0 0220-3 se ups ol Poi ver H harge other idate Depth	.000 .500 .000 .500 .000 .500 .250- Costrea Kick- ead F rela thar d	lume 2700-: 2 alcula m stor Sur: 81 2 -Flo® Range ations n a Hy	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826 300 2100 Head 1. hip f	(m) F: 632 - or the rake C Dept1	7.000 7.500 3.000 3.500 9.000 9.500 .9 .9	1/s) 25.5 28.2 ro-Bra um® be Flow	57. 59. 61. 63. 64. 66.
0.100 0.200 0.300 0.400 0.500 0.600 Des The hydr Optimum(utilised Depth (m)	<u>Hyd</u> Cont Sign Po rologi ® as sp d then	7.3 21.1 24.6 25.0 24.8 24.4 dro-F dro-F	0.8 1.0 1.2 1.4 1.6 1.8 Brake O Minimu Sugg Points (Calculati Flush-F alculati ied. Sh e storag Depth (0.4	am Outle gested M Heat teed) Flo™ ons have ould and re routi: (m) Flow 200	22.6 22.5 24.5 26.4 28.1 29.8 (manh Des (manh Des (manh (manh) 2.700 0.781 (manh) (manh) 2.700 0.781 (manh)) (manh) (manh) (manh) (manh) (man	hole: Unit Design ign F: Diamo Diamo Vert : Diamo Flow basec cype c culati	2.000 2.200 2.400 2.600 3.000 3.500 E E8, Refere Head low (1 lush-F Dbject Availa eter (Level eter ((1/s) 32.4 32.3 d on t bf con Lons w h (m)	DS/P mce Mi (m) /s) 'lo™ iive I iion ible (mm) (m) (mm) (mm) (mm) (mm) (mm) he Heat trol d iil be	31.3 32.8 34.2 35.5 38.0 41.0 N: E7 D-SHE-C 4inimis Contro Flow o d/Disc evice inval (1/s)	4 4 5 6 6 0 0220-3 0220-3 se ups ol Poi ver H harge other idate Depth 1	.000 .500 .000 .500 .000 .500 .000 .500 .250- 	lume 2700-: 2 alcula m stor Sur: 81 2 -Flo® Range ations n a Hy	43.7 46.3 48.7 51.0 53.2 55.3 (m ³) 3250 .700 32.5 ated rage face Yes 220 .826 300 2100 Head 1. hip for dro-B (1/s)	(m) F: 632 - or the rake C Dept1	7.000 7.500 3.000 3.500 9.000 9.500 .9 .9	1/s) 25.5 28.2 ro-Bra um® be Flow	57. 59. 61. 63. 64. 66. ke

Hydrock Consultants Ltd		Page 6
•	Rail Central	
	Unit 5 South	L'un
Date 6th February 2018	Designed by RJH	MILIU
File Unit 5 South.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	1

Hydro-Brake Optimum® Manhole: E8, DS/PN: E7.005, Volume (m³): 481.9

Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	
	600		31.8 34.1	4.4.	.000		39.2 41.5		.500		45.7 47.6		.000		51.3 53.1	8. 9.	500		56.4 58.0	
3.	500		36.7	5.	.000		43.6	6	.500		49.5	8.	.000		54.8	9.	500		59.5	

	combe	ltants Lto	1							F C	age 7
						l Centra				ſ	 1
					Uni	t 5 Sout	th				Ly
											Micro
ate 6t	h Febr	uary 2018			Des	igned by	y RJH				
ile Un	it 5 S	South.MDX			Che	cked by					Drainag
P Solu	tions				Net	work 202	16.1				
year	Retur	n Period S	ummary	v of Cr	itical	Results	s by Ma	.ximum Lev	vel (Rank	x 1) fc	or Existi
						ation Crit] _]		
		Areal						low - % of tor * 10m³			
		Hot		Level (n		0			oeffiecier	•	
		nhole Headlc Foul Sewage				-	er Perso	on per Day	(l/per/day	7) 0.000	
Nı		f Input Hydr of Online C									
				Sy	nthetic	Rainfall	Details	5			
		Rainfall Mo		FEH D1	(1km) 0	.319	E (1km)	0.302 Cv	(Winter) O	.840	
		Site Locat C (1				.300 .243 Cv (
		Margin	for Flo	od Risk	-		_	_	300.		
				Analy	sis Time DTS S	-	Second	Increment	(Extended OF)		
					DIS S				0F. 01		
				In	ertia S				01		
		Duratio	Profil on(s) (n	. ,	5, 30, 6	60, 120, 3	180, 240		ummer and , 600, 720		
		Duratio		. ,	5, 30, 6	60, 120, 1	180, 240), 360, 480), 960,	
	R	eturn Perioc	on(s) (n d(s) (ye	nins) 1 ears)	5, 30, 6	60, 120, 1	180, 240), 360, 480	, 600, 720 2160, 2880 1, 30, 10), 960,), 4320)0, 200	
	R		on(s) (n d(s) (ye	nins) 1 ears)	5, 30, 6	60, 120, 1	180, 240), 360, 480	, 600, 720 2160, 2880 1, 30, 10), 960,), 4320	
	R	eturn Perioc	on(s) (n d(s) (ye	nins) 1 ears)	5, 30, 6	60, 120, 3	180, 240), 360, 480	, 600, 720 2160, 2880 1, 30, 10), 960,), 4320)0, 200 40, 40	Surcharge
DN	us/mh	eturn Perioc Climate	on(s) (n d(s) (ye e Change Return	nins) 1 ears) e (%) Climate	First	t (X) F:	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow), 960,), 4320)0, 200 40, 40 Water Level	Depth
PN		eturn Perioc Climate	on(s) (n d(s) (ye e Change Return	nins) 1 ears) e (%) Climate Change	First Surch	t (X) F: barge), 360, 480 1440,	, 600, 720 2160, 2880 1, 30, 10 0, 0,), 960,), 4320)0, 200 40, 40 Water Level (m)	Depth (m)
E7.000	US/MH Name E1	eturn Perioc Climate Storm 15 Winter	on(s) (n d(s) (ye e Change Return Period 1	nins) 1 ears) e (%) Climate Change +0%	First Surch	t (X) F: narge Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	0, 960, 0, 4320 00, 200 40, 40 Water Level (m) 86.874	Depth (m) -0.82
E7.000 E7.001	US/MH Name E1 E2	eturn Perioc Climate Storm 15 Winter 15 Winter	on(s) (n d(s) (ye e Change Return Period 1 1	nins) 1 ears) e (%) Climate Change +0% +0%	First Surch	t (X) F: narge Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	0, 960, 0, 4320 00, 200 40, 40 Water Level (m) 86.874 86.571	Depth (m) -0.82 -0.83
E7.000 E7.001 E7.002	US/MH Name E1 E2 E3	eturn Perioc Climate Storm 15 Winter 15 Winter 600 Winter	on(s) (n d(s) (ye e Change Return Period 1 1 1	nins) 1 ears) e (%) Climate Change +0% +0% +0%	First Surch 100/15 100/15	t (X) F: harge Summer Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144</pre>	Depth (m) -0.82 -0.83 -1.16
E7.000 E7.001 E7.002 E8.000	US/MH Name E1 E2 E3 E4	eturn Perioc Climate Storm 15 Winter 15 Winter 600 Winter 15 Winter	on(s) (n d(s) (ye e Change Return Period 1 1	nins) 1 ears) e (%) Climate Change +0% +0% +0%	First Surch 100/15 100/15 100/15	t (X) F: harge Summer Summer Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	<pre>), 960,), 4320)00, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70
E7.000 E7.001 E7.002	US/MH Name E1 E2 E3 E4 E5	eturn Perioc Climate Storm 15 Winter 15 Winter 600 Winter	on(s) (n d(s) (ye e Change Return Period 1 1 1 1	nins) 1 ears) e (%) Climate Change +0% +0% +0% +0%	First Surch 100/15 100/15 100/15	t (X) F: harge Summer Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11
E7.000 E7.001 E7.002 E8.000 E7.003	US/MH Name E1 E2 E3 E4 E5 E6	eturn Perioc Climate Storm 15 Winter 15 Winter 600 Winter 15 Winter 600 Winter	n(s) (n d(s) (ye change Return Period 1 1 1 1 1	nins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0%	First Surch 100/15 100/15 100/15	t (X) F: harge Summer Summer Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Perioc Climate Storm 15 Winter 15 Winter 600 Winter 15 Winter 600 Winter 15 Winter	n(s) (n d(s) (ye change Return Period 1 1 1 1 1 1	nins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0%	First Surch 100/15 100/15 100/15 30/60	t (X) F: harge Summer Summer Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Perioc Climate Storm 15 Winter 15 Winter 600 Winter 15 Winter 15 Winter 180 Winter	n(s) (n d(s) (ye change Return Period 1 1 1 1 1 1 1	<pre>mins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%</pre>	First Surch 100/15 100/15 100/15 30/60 1/30	t (X) F: harge Summer Summer Summer Summer	irst (Y)), 360, 480 1440, First (Z)	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 600 Winter 15 Winter 15 Winter 180 Winter 180 Winter	on(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow /	t (X) F: harge Summer Summer Summer Winter Overflow	irst (Y) Flood Pipe Flow), 360, 480 1440, First (Z) Overflow	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter	n(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 Name	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³)</pre>	First Surch 100/15 100/15 30/60 1/30 Flow / Cap.	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s)), 360, 480 1440, First (Z)	<pre>, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.</pre>	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 2 1 2 1 2 1 2 1 2	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³) 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Flow Flow (1/s) 319.9), 360, 480 1440, First (Z) Overflow Status	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter	Return Period 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<pre>mins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³) 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Flow (1/s) 319.9 291.9), 360, 480 1440, First (Z) Overflow Status OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 2 5 3	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³) 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Flow Flow (1/s) 319.9), 360, 480 1440, First (Z) Overflow Status	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 Winter	Den(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³) 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Pipe Flow (1/s) 319.9 291.9 71.1), 360, 480 1440, First (Z) Overflow Status OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E8.000	Den(s) (n A(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 5 2 6 4 3 5 5	<pre>mins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³) 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04	t (X) F: harge Summer Summer Summer Winter Overflow (1/s)	Flood Flood Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2), 360, 480 1440, First (Z) Overflow Status OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	-
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5 5 5 5 5 6 4 5 5 5 6 4 5 7	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% *0% 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04 0.00 0.01	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2 45.9), 360, 480 1440, First (Z) Overflow Status OK OK OK OK OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.820 -0.830 -1.168 -0.702 -0.111 -2.079 -1.770
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E7.000 E9.000	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5 5 5 5 5 6 4 5 5 5 6 4 5 7	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% Climate (m³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04 0.00 0.01	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2 45.9), 360, 480 1440, First (Z) Overflow Status OK OK OK OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5 5 5 5 5 6 4 5 5 5 6 4 5 7	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% *0% 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04 0.00 0.01	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2 45.9), 360, 480 1440, First (Z) Overflow Status OK OK OK OK OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5 5 5 5 5 6 4 5 5 5 6 4 5 7	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% *0% 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04 0.00 0.01	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2 45.9), 360, 480 1440, First (Z) Overflow Status OK OK OK OK OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5 5 5 5 5 6 4 5 5 5 6 4 5 7	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% *0% 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04 0.00 0.01	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2 45.9), 360, 480 1440, First (Z) Overflow Status OK OK OK OK OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77
E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	US/MH Name E1 E2 E3 E4 E5 E6 E7	eturn Period Climate Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 180 Winter 180 Winter 180 Winter 180 Winter 180 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000 E7.000	en(s) (n d(s) (ye e Change Return Period 1 1 1 1 1 1 1 1 1 1 1 2 5 2 5 5 5 5 5 6 4 5 5 5 6 4 5 7	<pre>hins) 1 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% *0% 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>	First Surch 100/15 100/15 100/15 30/60 1/30 Flow / Cap. 0.19 0.21 0.00 0.24 0.04 0.04 0.00 0.01	t (X) F: harge Summer Summer Summer Winter Overflow (l/s)	Flood Flood Pipe Flow (1/s) 319.9 291.9 71.1 332.2 24.8 62.2 45.9), 360, 480 1440, First (Z) Overflow Status OK OK OK OK OK OK OK OK	, 600, 720 2160, 2880 1, 30, 10 0, 0, Overflow Act.	<pre>), 960,), 4320)0, 200 40, 40 Water Level (m) 86.874 86.571 86.144 86.349 86.143 89.621 82.334</pre>	Depth (m) -0.82 -0.83 -1.16 -0.70 -0.11 -2.07 -1.77

ydrock	Consu	ltants Lt	d							Pa	ige 8
						l Centr					1
					Uni	t 5 Sou	lth				Ly .
											Micro
ate 6t	h Febr	uary 2018			Des	igned b	y RJH				
le Un	it 5 S	South.MDX			Che	cked by	,				Drainag
Solu	tions				Net	work 20	16.1				
<u> </u>	Detro	n Period	0			Desult	a lass Ma			L 1) E	
	umber o:	Hot nhole Headlo Foul Sewage f Input Hydr of Online C Rainfall Mo Site Loca C (1	Hot Start Start per heo cographs Controls odel tion 1km) -0	tart (min Level (r ff (Globa ctare (l) s 0 Nun s 2 Numb S 2 Numb FEH D1 D2 .026 D3 pod Risk	tor 1.00 hs) hm) al) 0.50 /s) 0.00 mber of er of St <u>mthetic</u> (1km) 0 (1km) 0 (1km) 0 Warning vsis Tim	0 0 0 Flow p 00 0ffline corage St <u>Rainfal:</u> .319 .300 .243 Cv (mm)	tional F. MADD Fac Der Person Controls ructures L Details E (1km) F (1km) (Summer)	0 Number 0 0 Number 0 0 Number 0 0.302 Cv (2.496	<pre>/ha Storag peffiecien (l/per/day of Time/Ar of Real Ti Winter) 0 300.0</pre>	e 2.000 t 0.800) 0.000 me Cont .840	
										-	
				т -	DVD S ertia S	tatus			10 10		
	R	eturn Perioo Climate							1, 30, 10 0, 0,	40, 40	Surcharge
PN	US/MH Name	Storm		Climate Change	First Surcl	t (X) E harge	First (Y) Flood	First (Z) Overflow	Overflow Act.		Depth (m)
E7.000	E1	15 Winter	30	±0%	100/15	Summor				87.221	-0.47
E7.000		15 Winter 15 Winter	30		100/15					86.910	-0.49
E7.002		720 Winter	30	+0%						86.421	-0.892
E8.000		15 Winter	30		100/15					86.690	-0.36
E7.003		720 Winter	30	+0%	30/60	Summer				86.416	0.15
E9.000		15 Winter	30 30	+0% +0%						89.667 82.826	-2.03
E7 004	丘 /			TU6						02.020	
		180 Winter 180 Winter	30	+0%	1/30	Winter				82.811	0.53
E7.004 E7.005				+0%	1/30	Winter				82.811	0.53
			30	Flooded			Pipe			82.811	0.53
		180 Winter	30 US/MH	Flooded Volume	Flow /	Overflow	r Flow	Chatra -	Level	82.811	0.53
			30	Flooded			-	Status	Level Exceeded	82.811	0.53
		180 Winter	30 US/MH Name	Flooded Volume	Flow /	Overflow	r Flow	Status OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001	30 US/MH Name E1 E2	Flooded Volume (m ³) 0.000 0.000	Flow / Cap. 0.59 0.65	Overflow	Flow (1/s) 1006.9 915.7	OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002	30 US/MH Name E1 E2 E3	Flooded Volume (m ³) 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8</pre>	OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000	30 US/MH Name E1 E2 E3 E4	Flooded Volume (m ³) 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2</pre>	OK OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002	30 US/MH Name E1 E2 E3 E4 E5	Flooded Volume (m ³) 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74 0.04	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2 25.0</pre>	OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000 E7.003	30 US/MH Name E1 E2 E3 E4 E5 E6	Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2</pre>	OK OK OK SURCHARGED	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000 E7.003 E9.000	30 US/MH Name E1 E2 E3 E4 E5 E6 E7	Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74 0.04 0.01	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2 25.0 194.5 79.0</pre>	OK OK OK SURCHARGED OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	30 US/MH Name E1 E2 E3 E4 E5 E6 E7	Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74 0.04 0.01 0.01	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2 25.0 194.5 79.0</pre>	OK OK OK SURCHARGED OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	30 US/MH Name E1 E2 E3 E4 E5 E6 E7	Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74 0.04 0.01 0.01	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2 25.0 194.5 79.0</pre>	OK OK OK SURCHARGED OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	30 US/MH Name E1 E2 E3 E4 E5 E6 E7	Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74 0.04 0.01 0.01	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2 25.0 194.5 79.0</pre>	OK OK OK SURCHARGED OK OK	Exceeded	82.811	0.53
		180 Winter PN E7.000 E7.001 E7.002 E8.000 E7.003 E9.000 E7.004	30 US/MH Name E1 E2 E3 E4 E5 E6 E7	Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Flow / Cap. 0.59 0.65 0.00 0.74 0.04 0.01 0.01	Overflow	<pre>r Flow (1/s) 1006.9 915.7 102.8 1041.2 25.0 194.5 79.0</pre>	OK OK OK SURCHARGED OK OK	Exceeded	82.811	0.53

Hydrock	Consu	ltants Lt	d							P	age 9
					Rai	ll Cent	ral				
					_	lt 5 So	-				4
					0111		acii				~~~~
•	. Dalas				Dee						Micro
		ruary 2018				signed	-				Drainage
		South.MDX				ecked b					Diamage
XP Solut	cions				Net	work 2	016.1				
<u>100</u>	year	Return Pe Area			<u>H</u> Simul	<u>Existin</u> ation Cr	l <u>q</u> riteria	by Maximu Tlow - % of			
Nu		Hot nhole Headlo Foul Sewage f Input Hydr	start Start Ss Coei per heo	Level (m ff (Globa ctare (l/	nm) al) 0.5 (s) 0.0	0 00 Flow 00	per Perso	n per Day (beffiecien (l/per/day	t 0.800) 0.000)
	Number	of Online (Controls	s 2 Numbe	er of S	torage S	tructures	0 Number o	of Real Ti	me Cont	trols 0
		Site Loca	tion	FEH D1 D2	(1km) 0 (1km) 0).319).300	ll Details E (1km) F (1km) (Summer)	0.302 Cv (2.496	Winter) O	.840	
		Margin	for Flo	-	sis Tim DTS S	nestep 2 Status Status	.5 Second	Increment	300.0 (Extended) OFF ON ON	1	
		Duratio	Profi on(s) (r	. ,	5, 30,	60, 120,	180, 240	, 360, 480,		, 960,	
	R	eturn Perioo Climate	d(s) (ye e Change					1440, 2	2160, 2880 1, 30, 10 0, 0,	0, 200	
										Water	Surcharged
PN	US/MH Name	Storm		Climate Change		t (X) harge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
E7.000	E1	15 Winter	100	+40%	100/15	Summer				87.956	0.256
E7.001	E2	15 Winter	100	+40%	100/15	Summer				87.522	
E7.002		960 Winter	100	+40%		_				86.903	
E8.000 E7.003	E4	15 Winter 960 Winter	100 100			Summer				87.354 86.883	
E7.003 E9.000			100	+40% +40%	20/00	Summer				89.742	
E7.004		360 Winter	100	+40%						83.574	
E7.005	E8	360 Winter	100	+40%	1/30	Winter				83.549	
				Flooded	/		Pipe				
		DN	•	Volume	•			<u>Chatwa</u>	Level		
		PN	Name	(m³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		E7.000	E1	0.000	1.24		2103.8	SURCHARGED			
		E7.001	E2	0.000	1.39			SURCHARGED			
		E7.002		0.000	0.00		146.2	OK			
		E8.000		0.000	1.57			SURCHARGED			
		E7.003		0.000	0.04			SURCHARGED			
		E9.000 E7.004		0.000	0.01		410.6 82.5	OK OK			
		E7.004		0.000	0.02			SURCHARGED			
		L/.000	10	5.000	0.21		52.2				

	~	7	1								1.0
Hydrock	Const	iltants Lt	a		D.	1 0				P	age 10
•					-	il Cent	-				
•					Uni	lt 5 So	uth				m M
•											Micro
		ruary 2018				signed	-				Drainage
File Un:	it 5 5	South.MDX				ecked b	-				brainage
XP Solu	cions				Net	work 2	016.1				
					6 6					(- 1	
200	year	Return Pe	riod S	ummary				by Maximi	im Level	(Rank	<u>1) for</u>
					1	Existin	<u>ig</u>				
					Simul	ation Cr	iteria				
		Area						low - % of			
				tart (mir			MADD Fac	tor * 10m ³ /	5		
	Ма	nhole Headl		Level (n ff (Globa			ner Perso		effiecien		
		Foul Sewage					per rerbo	in per bay	(1) per/ ddy	, 0.000	<u>,</u>
		f Input Hydi									
	numper	of Online (LUNTTOLS	s ∠ NUMD€	st of S.	corage S	ocructures	U NUMPER (Ji keal 'l'i	lille Cont	TOT2 A
				Sy	nthetic	: Rainfa	ll Details	3			
								0.302 Cv (Winter) 0	.840	
		Site Loca					F (1km) (Summer)				
		C (1 KIII) -0	.020 D3	(IKIII) U	0.245 CV	(Summer)	0.750			
		Margin	for Flo	od Risk	Warning	g (mm)			300.0	0	
				Analy		-	.5 Second	Increment			
						Status Status			OF1 OI		
				Tn	ertia S				01		
			Profi	10(2)				C.	ummer and	Wintor	
		Durati		- (-)	5, 30,	60, 120,	180, 240	, 360, 480,			
									2160, 2880		
	R	eturn Perio	-						1, 30, 10	-	
		Climate	e Chang	e (%)					Ο, Ο,	40, 40	
											Surcharged
DN	US/MH Name			Climate		t (X) heren		First (Z)			-
PN	Name	Storm	Period	Change	Surc.	harge	Flood	Overflow	Act.	(m)	(m)
E7.000	E1	15 Winter	200	+40%	100/15	Summer				88.605	0.905
E7.001	E2	15 Winter	200		100/15	Summer				87.684	0.283
E7.002 E8.000	E3 E4	960 Winter 15 Winter	200 200	+40% +40%	100/15	Summer				87.108 87.683	-0.204 0.633
E7.003		960 Winter	200	+40%		Summer				87.068	
E9.000	E6	15 Winter	200	+40%						89.780	-1.920
E7.004		360 Winter	200	+40%						83.959	
E7.005	E8	480 Winter	200	+40%	1/30	Winter				83.886	1.610
				Flooded			Pipe				
				Volume					Level		
		PN	Name	(m³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		E7.000) E1	0.000	1.56		2638.3	SURCHARGED			
		E7.001		0.000	1.83			SURCHARGED			
		E7.002		0.000	0.00		168.6	OK			
		E8.000 E7.003		0.000	1.98 0.04			SURCHARGED SURCHARGED			
		E7.003 E9.000		0.000	0.04		25.1 519.5	OK			
		E7.004		0.000	0.02		91.2	OK			
		E7.005	5 E8	0.000	0.27		32.2	SURCHARGED			

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Units 6	
•		Micro
Date 6th February 2018	Designed by RJH	
File Unit 6.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	3.307	4-8	5.694	8-12	2.411
Total	Area C	Contribu	ting (ha) = 1	1.412

Total Pipe Volume (m³) = 11168.355

ydrock Consu						<u> </u>		7					Page 2
						Rail C		T					
					t	Jnits	6						1 mg
		0.01.0											- Micro
ate 6th Febr		2018				Design	-	RJH					Draina
ile Unit 6.M	DX					Checke							Didiildi
P Solutions					1	Networ	k 201	6.1					
			۲.v	ristin	n Notw	ork De	atail	s for	Evis	tina			
				TOCTIO	y neew	OIR DO		5 101	DAID	CIIIQ			
PN	N I	Length	Fall	Slope	I.Area	T.E.	Ba	se	k	HYD	DIA	Section	Туре
		(m)	(m)	(1:X)	(ha)	(mins)	Flow	(l/s)	(mm)	SECT	(mm)		
E3.0	000 1	57.500	0.187	842.2	2.853	4.00		0.0	0.600	0	1500	Pipe/Co	nduit
		11.600				0.00			0.600			Pipe/Co	
E3.0	002 1	40.500	0.176	798.3	2.853	0.00			0.600			Pipe/Co	
		85.500							0.600			Pipe/Co	
		20.300							0.600			Pipe/Co	
E3.0	005	29.500	0.499	59.1	0.000	0.00		0.0	0.600	0	450	Pipe/Co	nduit
					Netwo	ork Res	sults	Table	2				
										_			
			PN	US/: (m)		.Area ha) F		;e V ./s) (m		Cap (1/s)			
						-	(_	., _, _,	., .,				
				00 87.7		2.853		0.0 1		2597.			
				01 87.5		5.706		0.0 1		2663.			
				02 <mark>87.2</mark> 03 <mark>87.0</mark>		8.559 1.412		0.0 1 0.0 2		2668.			
				03 87.0 04 86.8		1.412		0.0 1		248.			
				05 86.7		1.412		0.0 2		421.			
				Cond	duit S	Section	ns foi	r Exis	sting				
	Ν			rs less	s than	66 refe	r to s	ection	numbe	ers of	-		
	1	cond	duits.	rs less These	s than conduit	66 refe s are r	r to s marked	ection by the	numbe symb	ers of ols:-	[] bo	х	
	1	conc culve:	duits. rt, \/	rs less These open c	s than conduit hannel,	66 refe s are r oo dua	r to s marked al pipe	by the	numbe symb tripl	ers of ols:- e pipe	[] bo e, 0 e	х	
	1	conc culve:	duits. rt, \/	rs less These open c	s than conduit hannel,	66 refe s are r	r to s marked al pipe	by the	numbe symb tripl	ers of ols:- e pipe	[] bo e, 0 e	х	
	Ν	cond culver Se	duits. rt, \/ Section ction	rs less These open c n numbe Conduit	s than conduit hannel, rs < 0 t Major	66 refe s are r oo dua are tal	r to s marked al pipe ken fro Side	by the by	numbe symb tripl c cond r 4*H	ers of ols:- e pipe uit ta yd X	[] bo e, O e able Sect	х	
	И	cond culver Se	duits. rt, \/ Section	rs less These open c n numbe	s than conduit hannel, rs < 0 t Major Dimn.	66 refe ts are r oo dua are tal Minor Dimn.	r to s marked al pipe ken fro Side Slope	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi	ers of ols:- e pipe uit ta yd X .us A	[] bo e, 0 e able Sect Area	х	
	Ч	cond culver Se	duits. rt, \/ Section ction	rs less These open c n numbe Conduit	s than conduit hannel, rs < 0 t Major	66 refe s are r oo dua are tal	r to s marked al pipe ken fro Side	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H	ers of ols:- e pipe uit ta yd X .us A	[] bo e, O e able Sect	х	
	Υ	cond culver Se	duits. rt, \/ Section ction	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe ts are r oo dua are tal Minor Dimn.	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us A	[] bo able Sect Area (m ²)	ox	
	1	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	ľ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	ľ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	ľ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Ţ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	1	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Τ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	P	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	ľ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	
	Γ	cond culver Se	duits. rt, \/ Section ction umber	These open c n numbe Conduit Type	s than conduit hannel, rs < 0 t Major Dimn. (mm)	66 refe s are r oo dua are tal Minor Dimn. (mm)	r to s marked al pipe ken fro Side Slope (Deg)	bection by the e, ooo om uses Corne: Splay	numbe symb tripl c cond r 4*H Radi (m	ers of ols:- e pipe uit ta yd X .us J	[] bo able Sect Area (m ²)	ox	

Page 3
Micro Drainage
Diamage

PIPELINE SCHEDULES for Existing

<u>Upstream Manhole</u>

PN	Hyd Sect		MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E3.000	0	1500	E1	91.400	87.700	2.200	Open Manhole	2400
E3.001	0	1500	E2	91.400	87.503	2.397	Open Manhole	2400
E3.002	0	1500	E3	91.400	87.239	2.661	Open Manhole	2400
E3.003	[]	-4	E4	91.400	87.063	3.137	Open Manhole	100724
E3.004	0	450	E5	91.400	86.849	4.101	Open Manhole	1350
E3.005	0	450	ΕG	91.300	86.729	4.121	Open Manhole	1350

Downstream Manhole

PN	Length (m)	-	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E3.000	157.500	842.2	E2	91.400	87.513	2.387	Open Manhole	2400
E3.001	211.600	801.5	ЕЗ	91.400	87.239	2.661	Open Manhole	2400
E3.002	140.500	798.3	E4	91.400	87.063	2.837	Open Manhole	100724
E3.003	85.500	399.5	E5	91.400	86.849	3.351	Open Manhole	1350
E3.004	20.300	169.2	E6	91.300	86.729	4.121	Open Manhole	1350
E3.005	29.500	59.1	E	91.200	86.230	4.520	Open Manhole	0

Hydrock Consultants Ltd					Page 4
	Rail (.1		
	Units	6			4
Date 6th February 2018	Design	ned hv	R.TH		- Micro
	-	-	1(011		Drainage
File Unit 6.MDX	Checke	-			
KP Solutions	Netwo	rk 201	6.1		
Area	Summary	/ for i	Existing		
Pipe PIMP PIMP		ross	-	Pipe Total	
Number Type Name	(%) Are	ea (ha)	Area (ha)	(ha)	
3.000	100	2.853	2.853	2.853	
	100		2.853		
	100	2.000	2.853 2.853	2.853	
3.004			0.000		
	100		0.000		
5.000		Total	Total	Total	
		11.412	11.412	11.412	
Simulati	on Crit	eria f	for Exist:	ing	
Volumetric Runoff Coef	f 0.750	Addit.	ional Flow	- % of Total Flow	0.000
Areal Reduction Facto				* 10m ³ /ha Storage	
Hot Start (mins				Inlet Coeffiecient	
Hot Start Level (mm		Flow pe			
Manhole Headloss Coeff (Global	0.500			Run Time (mins)	
Foul Sewage per hectare (l/s) 0.000		Outpu	it Interval (mins)	1
Synth	<u>etic Ra</u>	infall	<u>Details</u>		
Rainfall Model FEH	D2			Winter Storms	No
	D3	(1km) (0.243	Cv (Summer) 0	.750
	E	(1km) ().302	Cv (Winter) 0	
Site Location					
C (1km) -0.026			2.496 Storm	Duration (mins)	
			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		
C (1km) -0.026			2.496 Storm		

ydrock Consultar	its Ltd						Page S	5
			Rail Cen	ıtral				
			Units 6				4	
								Jun
ate 6th February	v 2018		Designed	l bv RJH			— MIC	
ile Unit 6.MDX	1 2020		Checked	-			Drai	nage
				-				
P Solutions			Network	2016.1				
		<u>Online</u>	Controls	for Exis	sting			
<u>Hydro-</u>	<u>Brake Optim</u>	num® Manhol	le: E5, DS	G/PN: E3	.004, Volume	e (m³): 4	142.0	
		Un	it Referenc	e MD-SHE-	0251-3530-120	0-3530		
			ign Head (m			1.200		
		Desig	n Flow (l/s			35.3		
			Flush-Flo			ulated		
			Applicatio		se upstream s	torage urface		
		Suu	mp Availabl		6	Yes		
			iameter (mm			251		
			rt Level (m	,		86.849		
	Minimum O	utlet Pipe D	,	,		300		
		ed Manhole D				1800		
Control	Points	Head (m) Fl	.ow (l/s)	Contr	ol Points	Head (m)	Flow (1/s	3)
Design Point	(Calculated)	1.200	35.3		Kick-Flo	o® 0.867	30	. 2
	Flush-Flo™			ean Flow c	over Head Rand		29	
The hydrological of Optimum® as specific utilised then thes	fied. Should se storage ro	another typ outing calcul	pe of contro Lations will	ol device l be inval	other than a idated	Hydro-Brak	e Optimum®	be
	Depth (m) 1							
	0 000	32.1	2.000	45.1 47.2	4.000 4.500	63.1	7.000	82
0.100 8.1			2 200		4,000	66.8	7.500	85 88
0.100 8.1 0.200 25.7	7 1.000	32.3	2.200			70 2		
0.100 8.1 0.200 25.7 0.300 34.4	7 1.000 4 1.200	32.3 35.3	2.400	49.3	5.000	70.3	8.000	
0.100 8.1 0.200 25.7 0.300 34.4 0.400 35.1	7 1.000 4 1.200 1 1.400	32.3 35.3 38.0	2.400 2.600	49.3 51.2	5.000	73.6	8.500	91
0.200 25.7 0.300 34.4 0.400 35.1 0.500 35.0	7 1.000 4 1.200 1 1.400 0 1.600	32.3 35.3 38.0 40.5	2.400 2.600 3.000	49.3 51.2 54.9	5.000 5.500 6.000	73.6 76.8	8.500 9.000	91 93
0.100 8.1 0.200 25.7 0.300 34.4 0.400 35.1	7 1.000 4 1.200 1 1.400 0 1.600	32.3 35.3 38.0	2.400 2.600 3.000	49.3 51.2	5.000	73.6	8.500	91
0.100 8.1 0.200 25.7 0.300 34.4 0.400 35.1 0.500 35.0	7 1.000 4 1.200 1 1.400 0 1.600	32.3 35.3 38.0 40.5	2.400 2.600 3.000	49.3 51.2 54.9	5.000 5.500 6.000	73.6 76.8	8.500 9.000	91 93
0.100 8.1 0.200 25.7 0.300 34.4 0.400 35.1 0.500 35.0	7 1.000 4 1.200 1 1.400 0 1.600	32.3 35.3 38.0 40.5	2.400 2.600 3.000	49.3 51.2 54.9	5.000 5.500 6.000	73.6 76.8	8.500 9.000	91 93

File Unit 6.MDX Checked by XP Solutions Network 2016.1 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existi Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 Mahole Headloss Coeff (Global) 0 Mumber of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH D1 (Num) 0.319 F (Ikm) 0.302 Cv (Winter) 0.840 Site Location D2 (Ikm) 0.300 F (Ukm) 0.302 Cv (Winter) 0.840 Site Location D2 (Ikm) 0.319 F (Ikm) 0.302 Cv (Winter) 0.840 Site Location D2 (Ikm) 0.319 F (Ikm) 0.310 Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) 1, 30, 100, 200 Climate Change (%) 0, 0, 0, 40, 40 E3,000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter E3,001 E1 5 Winter 1 +0% 100/15 Summer 200/15 Winter E3,002								Page	<u> </u>	
Image: Control of the second by RJH Image: Control of the second by RJH Date 6th February 2018 Designed by RJH Image: Control of the second by RJH Second Barry 2018 Network 2016.1 Image: Control of the second by RJH 1 vear Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing the second by RJH Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing the second by RJH Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing the second by RJH Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing the second by RJH Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing the second by RJH Return Period (Social Start Fering 1) 0 Number of Time/Area Diagrams 0 Number of Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Summer of Time (Area Diagrams 0 Number of Time/Area Diagrams 0 Number of Time/Area Diagrams 0 Number of Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 Stat Location ED (Ikm 0.319 E (Ikm 0.302 Cv (Rinter) 0.640 Site Location ED (Ikm 0.319 E (Ikm 0.302 Cv (Rinter) 0.640 Site Location ED (Ikm 0.319 E (Ikm 0.310 Number 0) Number of Time/Area Diagrams 0 Number of Time/Area Diagrams 0 Number of Storage	•									
Designed by Kon Designed by Kon Pile Unit 6.MDX Checked by XF Solutions Network 2016.1 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existi Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Not Start Level (mm) 0 Number of Topol Readows coeff (Global) 0.500 Number of Input Hydrographs 0 Number of Storige Structures 0 Number of Input Hydrographs 0 Number of Storige Structures 0 Number of Input Hydrographs 0 Number of Storige Structures 0 Static Location D2 (Hm) 0.319 E (Hm) 0.320 Cv (Winter) 0.840 Static Location D2 (Hm) 0.330 F (Hm) 2.436 Cv (Summer) 0.750 Margin for Flood Bisk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Time Inertia Status OFF 1440 Duration(s) (mins) 15, 30, 60, 120, 150, 240, 360, 480, 600, 720, 960, 1440 VS/MS Return Climate First (X) First (Y) First (X) Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 150, 240, 360, 480, 600, 720, 960, 1440 1440 PS/MS R				Units 6				4	~	
Designed by Kon Designed by Kon Pile Unit 6.MDX Checked by XF Solutions Network 2016.1 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existi Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Not Start Level (mm) 0 Number of Topol Readows coeff (Global) 0.500 Number of Input Hydrographs 0 Number of Storige Structures 0 Number of Input Hydrographs 0 Number of Storige Structures 0 Number of Input Hydrographs 0 Number of Storige Structures 0 Static Location D2 (Hm) 0.319 E (Hm) 0.320 Cv (Winter) 0.840 Static Location D2 (Hm) 0.330 F (Hm) 2.436 Cv (Summer) 0.750 Margin for Flood Bisk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Time Inertia Status OFF 1440 Duration(s) (mins) 15, 30, 60, 120, 150, 240, 360, 480, 600, 720, 960, 1440 VS/MS Return Climate First (X) First (Y) First (X) Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 150, 240, 360, 480, 600, 720, 960, 1440 1440 PS/MS R								M		
Provide of the second system Distance of the second system P Solutions Network 2016.1 1 year Return Period Summary of Critical Results by Maximum Level (Rank J) for Existi Solution Pactor 1.000 Additional Flow - 6 of Total Flow 0.000 Evo 7 * 10m*/ha storage 2.000 Inter Coefficient 0.800 Markada Kata Level (mm) 0 Notice Controls 0 Notice Controls 0 Notice Controls 0 Number of Input Hydrographs 0 Synthetic Rainfall Details Rainfall Model Synthetic Rainfall Details Number of Fold Risk Warning (mm) 300.0 DVD Status OFF Difference Difference Difference Summer and Winter </td <td>Date 6th February 2018</td> <td></td> <td></td> <td>Designe</td> <td>d by RJH</td> <td></td> <td></td> <td></td> <td></td>	Date 6th February 2018			Designe	d by RJH					
1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existi Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MAD Stator * 10m /hs Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Mumbel Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per bectare (1/s) 0.000 Flow per Person per Day (1/per/day) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Ares Diagrams 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Swnthetic Rainfall Details Rainfall Model FEH DI (1/m) 0.313 E (1/m) 2.436 C (1/m) -0.026 D3 (1/m) 0.243 CV (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 560, 140 Return Period(s) (years) C lima to Change Surcharge Flood Overflow Act. (m) (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.001 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E4 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E4 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E4 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 200/15 Winter 89.148 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 87.175 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 87.175 -1, 23.003 E6 720 Winter 1 +0% 100/15 Summer 200/15 Heres 180.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.16 357.9 OK	File Unit 6.MDX			Checked	l by				ainage	
Simulation Criteria Anal Reduction Reduction Additional Flow -% of Total Flow 0.000 Not Start (mins) 0 MubD Factor * 10m/ha Storage 2.000 Not Start Level (mm) 0 Inlet Coefficient 0.800 Nanhole Headloss Coeff (Global 10.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Sumber of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Profile(s) Duration (2) (mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1448 Notation (2) (mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1448 Notation (2) Number Colspan= 20/012 Act Notation (2) Number 20/15 Nummer 20/15 Nummer Notation (2) Number 20/15 Nummer Notation (2) Number 20/15 Nummer <th colsp<="" td=""><td>XP Solutions</td><td></td><td></td><td>Network</td><td>2016.1</td><td></td><td></td><td></td><td></td></th>	<td>XP Solutions</td> <td></td> <td></td> <td>Network</td> <td>2016.1</td> <td></td> <td></td> <td></td> <td></td>	XP Solutions			Network	2016.1				
Simulation Criteria Anal Reduction Reduction Additional Flow -% of Total Flow 0.000 Not Start (mins) 0 MubD Factor * 10m/ha Storage 2.000 Not Start Level (mm) 0 Inlet Coefficient 0.800 Nanhole Headloss Coeff (Global 10.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000 Sumber of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Profile(s) Duration (2) (mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1440 C (1em 9-0.026 D3 (1km) 0.243 cv (3ummer) 0.750 Network (1/mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1448 Notation (2) (mins) 15, 30, 60, 120, 180, 240, 300, 480, 600, 720, 960, 1448 Notation (2) Number Colspan= 20/012 Act Notation (2) Number 20/15 Nummer 20/15 Nummer Notation (2) Number 20/15 Nummer Notation (2) Number 20/15 Nummer <th colsp<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m*/ha Storage 2.000 Batter Level (mm) 0 Inlet Coefficient 0.800 Manbole Headloss Coeff (Giobal) 0.500 Flow per Person per Day (L/per/day) 0.000 Fol Sewage per hectare (L/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Strifetic Rainfall Details Rainfall Model FFE D1 (Hm) 0.319 R (Hm) 0.302 Cv (Winter) 0.840 Site Location EPE D1 (Hm) 0.319 R (Hm) 0.300 C VD Status OFF Margin for Floed Risk Warning (mm) 300.0 DVD Status OFF 1440 Return Period(a) (years) 1, 30, 100, 200 1440 Return Period(a) (years) 1, 30, 100, 200 0, 0, 0, 40, 40 E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 20/15 Winter 87.418 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.415 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.415	1 year Return Period Su	mmary o	f Criti	ical Res	ults by Max	imum Le	evel (Ran	k 1) for	Existing	
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m*/ha Storage 2.000 Batter Level (mm) 0 Inlet Coefficient 0.800 Manbole Headloss Coeff (Giobal) 0.500 Flow per Person per Day (L/per/day) 0.000 Fol Sewage per hectare (L/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Strifetic Rainfall Details Rainfall Model FFE D1 (Hm) 0.319 R (Hm) 0.302 Cv (Winter) 0.840 Site Location EPE D1 (Hm) 0.319 R (Hm) 0.300 C VD Status OFF Margin for Floed Risk Warning (mm) 300.0 DVD Status OFF 1440 Return Period(a) (years) 1, 30, 100, 200 1440 Return Period(a) (years) 1, 30, 100, 200 0, 0, 0, 40, 40 E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 20/15 Winter 87.418 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.415 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.415										
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m*/ha Storage 2.000 Batter Level (mm) 0 Inlet Coefficient 0.800 Manbole Headloss Coeff (Giobal) 0.500 Flow per Person per Day (L/per/day) 0.000 Fol Sewage per hectare (L/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Strifetic Rainfall Details Rainfall Model FFE D1 (Hm) 0.319 R (Hm) 0.302 Cv (Winter) 0.840 Site Location EPE D1 (Hm) 0.319 R (Hm) 0.300 C VD Status OFF Margin for Floed Risk Warning (mm) 300.0 DVD Status OFF 1440 Return Period(a) (years) 1, 30, 100, 200 1440 Return Period(a) (years) 1, 30, 100, 200 0, 0, 0, 40, 40 E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 20/15 Winter 87.418 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.415 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.415										
Hot Start (mins) 0 MADD Factor * 10m ³ /ha Storage 2.000 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foil Sewage per hectare (1/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Offline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 C (1km) -0.026 D3 (1km) 0.243 Cv (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period (s) (years) Climate Change (%) 1, 30, 100, 200 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 E3.000 E1 15 Winter 1 +0% 100/15 Summer 87.176 E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 E3.003 E6 720 Winter 1 +0% 100/15 Summer 87.176 E3.000 E1 0 Symber 1 +0% 100/15 Summer 87.176 E3.000 E1 0 Winter 1 +0% 100/15 Summer 87.176 E3.001 E2 15 Winter 1 +0% 100/15 Summer 87.176 E3.	7					0 -	6			
Bot Start Level (um) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Synthetic Rainfall Details Rainfall Model FFH D1 (1km) 0.330 F (1km) 0.302 CV (Winter) 0.840 Site Location D2 (1km) 0.300 F (1km) 2.496 C (1km) -0.026 D3 (1km) 0.2430 CV (Summer) 0.750 Margin for Flood Risk Narning (mm) 300.0 DVD Status OFF Margin for Flood Risk Narning (mm) 300.0 DVD Status OFF Itado Buration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Itado Return Period(a) (years) 1, 30, 100, 200 Itado Climate Change (%) 0, 0, 40, 40 Itado VS/MH Return Climate First (X) First (X) First (X) Vereflow Act: Inperiod E3.000 E1 15 Ninter 1 405 100/15 Summer 87.415 -0. E3.001 E2 IS Ninter 1 405										
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 0 Number of Real Time Controls 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FFH Dl (lMm) 0.319 E (lMm) 0.302 Cv (Winter) 0.840 Site Location D2 (lMm) 0.319 E (lMm) 0.302 Cv (Winter) 0.840 Site Location D2 (lMm) 0.243 Cv (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Ranlysis Timestep Fine Intertia Status OFF Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) Climate Change (S) Profile (S) Summer and Winter US/MH Return Climate First (X) First (Y) First (2) Overflow Level DeptH PN Name Storm Period Change Surcharge Flood US/MH Return Climate 1 +0% 100/15 Summer 200/15 Winter E3.001 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter E3.003 E4 720 Winter 1 +0% 30/60 Winter E3.005 E6 720 Winter 1 +0% 30/60 Winter E3.000 E1 720 Winter 1 +0% 30/60 Winter E3.000 E1 0.500 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK 1 E3.001 E2 0.000 0.21 724.0 OK E3.002 E3 0.000 0.21 724.0 OK E3.003 E4 0.000 0.018 34.7 OK					MADD Fact			5		
Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH D1 (1mm) 0.301 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.303 F (1km) 2.496 C (1km) -0.026 D3 (1km) 0.243 Cv (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) 1, 30, 100, 200 C (limate Change (%) 0, 0, 40, 40 E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 87.176 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 87.176 -1. E3.002 E3 15 Winter 1 +0% 30/60 Winter 87.176 -1. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.005 E6 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.000 E1 0.000 0.16 357.9 OK 1 E3.000 E1 0.000 0.22 532.7 OK 1 E3.001 E2 0.000 0.22 532.7 OK 1 E3.002 E3 0.000 0.21 724.0 OK					ow per Persor					
Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Nainfall Model FH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Sign for Elocation D2 (1km) 0.300 F (1km) 2.496 C (1km) 0.300 F (1km) 2.496 C (1km) 0.300 F (1km) 2.496 C (1km) 0.300 DVD Status OFF Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF DTS Status ON Water Summer and Winter DTS Status ON Water Summer and Winter DTS Status ON Water Summer and Winter Water Summer and Winter DTS Status ON Water Summer and Winter Water Summer Change Surcharge First (X) First (Y) First Summer and Winter Water Storm Profile(s) Summer and Winter US/MH Return Climate First (X) First (Y) First Status ON Profile(s) Surget Surget Surget Surge	Foul Sewage pe	er hectai	re (l/s)	0.000						
Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FFH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Sinfall Model FFH D1 (1km) 0.300 F (1km) 0.302 Cv (Winter) 0.840 C (1km) -0.026 D3 (1km) 0.243 Cv (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Name Return Period(s) (years) 1, 30, 100, 200 Note Profile(s) Summer and Winter US/MR Return Climate First (x) First (y) First (z) Overflow Act. Mon PN Name Storm Period Change Surcharge Storm Result E3.000 E1 15 Winter +0% 100/15 Summer First (y) First (z) Overflow Act. Mon E3.001 E3 First (y) First (z) Overflow Act. Mon 90 D3.00 E1 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>o</td><td>a - 1 (-</td><td></td><td></td></t<>						o	a - 1 (-			
Sunthetic Rainfall Details Mainfall Model FEH D1 (lkm) 0.319 E (lkm) 0.302 CV (Winter) 0.840 Site Location D2 (lkm) 0.300 F (lkm) 2.496 C (lkm) -0.026 D3 (lkm) 0.243 CV (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timesep Fine Inertia Status OFF Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) 1, 30, 100, 200 Climate Change (%) 1, 30, 100, 200 O, 0, 40, 40 0, 0, 40, 40 E3.000 E1 15 Winter +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 87.176 -1. E3.001 E3 720 Winter 1 +0% 100/15 Summer 87.176 -1. E3.002 E3 720 Winter 1 +0% 100/15 Summer 87.176 -1. E3.001 E2 5/20 Winter 1 +0% 100/15 Summer 87.176 -1. E3.002 E3 720 Winter 1 +0% 100/15 Summer 87.176 -1.										
Rainfall Model FEH D1 (1km) 0.313 E (1km) 0.302 Cv (Winter) 0.840 Site Location D2 (1km) 0.026 F (1km) 0.302 Cv (Winter) 0.840 C (1km) 0.026 D2 (1km) 0.024 Cv (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DUD Status OFF Analysis Timestep Summer and Winter The Inertia Status OFF DTS Status ON Profile(s) Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 1, 30, 100, 200 1440 Return Period(s) (years) Climate Change (%) 1, 30, 100, 200 0, 0, 40, 40 1, 30, 100, 200 E3.000 E1 15 Winter 1 + O% 100/15 Summer 200/15 Winter Kater Surchar E3.001 E2 15 Winter 1 + O% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 + O% 100/15 Summer 87.175 -0. E3.002 E3 15 Winter 1 + O% 30/60 Winter 87.175 -0. E3.004 E5 720 Winter	Number of Online Cor	itrois i	Number	or Storage	e Structures	U Numbei	OI REAL 1	ime Control	s u	
Rainfall Model FEH D1 (1km) 0.313 E (1km) 0.302 CV (Winter) 0.840 Site Location D2 (1km) 0.020 F (1km) 0.302 CV (Winter) 0.840 C (1km) 0.026 D2 (1km) 0.243 CV (Winter) 0.750 Margin for Flood Risk Warning (mm) 300.0 DUD Status OFF Analysis Timestep Summer and Winter Time Inertia Status OFF 0N Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) 1, 30, 100, 200 Climate Change (%) 1, 30, 100, 200 VS/MH Return Climate First (X) First (Y) First (Z) Overflow Ket. PN Name Storm Period Change Surcharg Flood Overflow Act. (m) (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 20/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 87.175 -0. E3.002 E4 720 Winter 1 0			<u>Syn</u> tł	<u>netic Ra</u> in	<u>fall Detai</u> ls					
Site Location D2 (1km) 0.300 F (1km) 2.436 C (1km) -0.026 D3 (1km) 0.243 CV (Summer) 0.750 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) 1, 30, 100, 200 Climate Change (%) 0, 0, 40, 40 Water Surchar Water Surchar US/MH Return Climate First (X) First (Y) First (Z) Overflow Aname Storm Period Change Sunder 88.148 -1. E3.000 E1 15 Winter 1 H +0% 100/15 Summer 200/15 Winter 88.148 -0. E3.001 E2 15 Winter 1 +0% 100/15 Summer E3.002 E3 15 30/60 Winter 87.176 -1. E3.004 E4 720 Winter 1 +0% E3.005 E6 720 Winter 1 +0% E3.004 E1 0.000 0.16 357.9 0K 1 E3.003 E1	Rainfall Mod	el FE				0.302 Cv	(Winter)	0.840		
Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Pine Inertia Status OFF DUTS Status ON Profile(s) Summer and Winter 140 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 1440 Return Period(s) (years) 1, 30, 100, 200 0, 0, 0, 40, 40 VS/MH Return Climate First (X) First (Y) First (Z) Overflow Level Depti FN Name Storm Period Change Succharge Flood Overflow Act. (m) (m) (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 87.176 -0. E3.001 E3 2720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 86.822 -0. E3.005 E6 720 Winter 1 +0% 30/60 Winter 86.822 -0. E3.005 E6 720 Winter 1 <td>Site Locati</td> <td>on</td> <td>D2 (1k</td> <td>cm) 0.300</td> <td>F (lkm)</td> <td>2.496</td> <td></td> <td></td> <td></td>	Site Locati	on	D2 (1k	cm) 0.300	F (lkm)	2.496				
Analysis Timestep Fine Inertia Status OFF DTS Status ON Profile(s) Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Analysis Timestep Fine Inertia Status OFF Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) Climate Change (%) 1, 30, 100, 200 1440 Name Storm Period Change Surcharge Flood Overflow Act. Mater Surcharg PN Name Storm Period Change Summer 200/15 Winter 88.148 -1. E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 207.175 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.815 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.815 -0. E3.005 E6 720 Winter 1 +0% 30/60 Winter Evel 86.822 -0. E3.005 E6 720 Winter 1 +0% 20.00 (1/s) Status Exceeded E3.001 E2 0.000	C (1k	m) -0.02	6 D3 (1k	cm) 0.243	Cv (Summer)	0.750				
Analysis Timestep Fine Inertia Status OFF DTS Status ON Profile(s) Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) Climate Change (%) Summer and Winter 1, 30, 100, 200 0, 0, 40, 40 VS/MH Return Climate First (X) First (Y) First (Z) Overflow Level Depti Depti PN Name Storm Period Change Summer 200/15 Winter 88.148 -1. E3.001 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 88.148 -1. E3.003 E4 720 Winter 1 +0% 100/15 Summer 88.148 -1. E3.003 E6 720 Winter 1 +0% 100/15 Summer 88.148 -1. E3.003 E4 720 Winter 1 +0% 100/15 Summer 87.15 <t< td=""><td>Margi</td><td>n for Fl</td><td>od Rick</td><td>Warning</td><td>(mm) 300 0</td><td>רעת +</td><td>atus OFF</td><td></td><td></td></t<>	Margi	n for Fl	od Rick	Warning	(mm) 300 0	רעת +	atus OFF			
DTS Status ON Profile(s) Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) Climate Change (%) 1, 30, 100, 200 VS/MH Return Climate First (X) First (Y) First (Z) Overflow Act. Mate Surchard VS/MH Return Climate First (X) First (Y) First (Z) Overflow Act. Mate Surchard PN Name Storm Period Change Surcharge Flood Overflow Act. (m) (m) (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 87.176 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.176 -0. E3.002 E4 720 Winter 1 +0% 30/60 Winter 87.176 -0. E3.003 E4 Volume Flow / Overflow Flo	Margi	I LOL FIC		-						
Duration (s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Idea of the colspan="2">Idea of the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Note: Surcharge to the colspan="2">Note: Surcha			Initian.	-	-	CICIC DC				
Duration (s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Idea of the colspan="2">Idea of the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Note: Surcharge to the colspan="2">Note: Surcha										
Duration (s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Idea of the colspan="2">Idea of the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Iter the colspan="2">Note: Surcharge to the colspan="2">Note: Surcha										
1440 Return Period (S) (years) Climate Change (%) Pirst (X) First (Y) First (Z) Overflow Mate Surchards VS/MH Return Climate First (X) First (Y) First (Z) Overflow Mate Surchards PN Name Storm Period Change Surcharge Flood Overflow Act. Mate Surchards E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 88.019 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.176 -1. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.004 E5 720 Winter 1 +0% 30/60 Winter Evel 88.128 -0. E3.005 E6 720 Winter 1 +0% 30/60 Winter Evel 88.128 -0. E3.001 E2 0.000 0.16 357.9 0K 1 E3.001 E3.002<		D	-)				Q			
Climate Change (%) 0, 0, 40, 40 US/MH PN Return Climate Storm First (X) Period First (Y) Change First (Y) First (Z) First (Z) Overflow Water Level Act. Surchar Depti Depti (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.019 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.015 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 86.822 -0. E3.005 E6 720 Winter 1 +0% 30/60 Winter Status Exceeded E3.005 E1 0.000 0.16 357.9 0K 1 E3.001 E2 0.000 0.22 532.7 0K 1 E3.001 E2 0.000 0.01 67.9 0K 1 E3.002 E3 0.000 0.01 67.9<			,	30, 60, 1	20, 180, 240,	360, 48				
US/MH Return Climate First (X) First (Y) First (Z) Overflow Act. Depth PN Name Storm Period Change Surcharge Flood Overflow Act. (m) (m) (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 88.019 -0. E3.001 E2 15 Winter 1 +0% 100/15 Summer 87.015 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.015 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% Cap. (1/s) Status Excel Excel Excel Excel <			,	30, 60, 1	20, 180, 240,	360, 48		0, 960,		
US/MH PN Name Storm Return Period Climate Charge First (X) Surcharge First (Y) Flood First (Z) Overflow Overflow Act. Level (m) Depth (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -0. E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 87.175 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% S0/60 Winter Fibe/ Evel 86.822 -0. E3.000 E1 0.000 0.16 357.9 OK 1 E3.002 E3 0.000 0.31 724.0 OK	Duration	(s) (mins	s) 15,	30, 60, 1	20, 180, 240,	360, 48	80, 600, 72	20, 960, 1440		
US/MH PN Name Storm Return Period Climate Charge First (X) Surcharge First (Y) Flood First (Z) Overflow Overflow Act. Level (m) Depth (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -0. E3.001 E2 15 Winter 1 +0% 100/15 Summer 200/15 Winter 87.175 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% S0/60 Winter Fibe/ Evel 86.822 -0. E3.000 E1 0.000 0.16 357.9 OK 1 E3.002 E3 0.000 0.31 724.0 OK	Duration Return Period(:	(s) (mins s) (years	s) 15,	30, 60, 1	20, 180, 240,	360, 48	1, 30, 1	20, 960, 1440 200, 200		
PN Name Storm Period Charge Surcharge Flood Overflow Act. (m) (m) E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 88.019 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.815 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 86.822 -0. E3.005 E6 720 Winter 1 +0% Cap. (1/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 5	Duration Return Period(:	(s) (mins s) (years	s) 15,	30, 60, 1	20, 180, 240,	360, 48	1, 30, 1	20, 960, 1440 200, 200		
E3.000 E1 15 Winter 1 +0% 100/15 Summer 200/15 Winter 88.148 -1. E3.001 E2 15 Winter 1 +0% 100/15 Summer 88.019 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.815 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% 30/60 Winter 86.822 -0. VS/MH Volume Flow / Overflow Flow Level Name (m³) Cap. (1/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK E3.002 E3 0.000 0.31 724.0 OK E3.003 E4 0.000 0.00 67.9 OK 1 E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period(:	(s) (mins s) (years	s) 15,	30, 60, 1	20, 180, 240,	360, 48	1, 30, 1	20, 960, 1440 00, 200 40, 40	Surcharge	
E3.001 E2 15 Winter 1 +0% 100/15 Summer 888.019 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.815 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% Volume Flow / Overflow Flow Level 86.822 -0. Flooded Pipe US/MH Volume Flow / Overflow Flow Level PN Name (m ³) Cap. (1/s) (1/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK E3.002 E3 0.000 0.31 724.0 OK E3.003 E4 0.000 0.00 67.9 OK E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period(: Climate ((s) (mins s) (years Change (S	s) 15, s) %)				30, 600, 72 1, 30, 1 0, 0,	0, 960, 1440 00, 200 40, 40 Water	-	
E3.001 E2 15 Winter 1 +0% 100/15 Summer 888.019 -0. E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.815 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% Volume Flow / Overflow Flow Level 86.822 -0. Flooded Pipe US/MH Volume Flow / Overflow Flow Level PN Name (m ³) Cap. (1/s) (1/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK E3.002 E3 0.000 0.31 724.0 OK E3.003 E4 0.000 0.00 67.9 OK E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period(: Climate (US/MH Retu	(s) (mins s) (years Change (s urn Clim a	s) 15, s) %) ate Fi	rst (X)	First (Y)	First	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	0, 960, 1440 00, 200 40, 40 Water Low Level	Depth	
E3.002 E3 15 Winter 1 +0% 100/15 Summer 87.815 -0. E3.003 E4 720 Winter 1 +0% 30/60 Winter 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% Flow / Overflow Flow Level Flooded Pipe VS/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (1/s) (1/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK E3.002 E3 0.000 0.31 724.0 OK E3.003 E4 0.000 0.00 67.9 OK E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period (Climate o US/MH Retu PN Name Storm Peri	(s) (mins s) (years Change (⁹ urn Clima Lod Chan	s) 15, s) s) ate Fi ge Su	rst (X) rcharge	First (Y) Flood	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	20, 960, 1440 200, 200 40, 40 Water Low Level . (m)	Depth (m)	
E3.003 E4 720 Winter 1 +0% 87.176 -1. E3.004 E5 720 Winter 1 +0% 30/60 Winter 87.175 -0. E3.005 E6 720 Winter 1 +0% E100 Pipe 86.822 -0. Flooded Pipe 86.822 -0. Flooded Pipe 10.000 Correction Flow Level 10.000 Correction 10.0000 Correction 10.000 Correction 1	Duration Return Period (Climate o US/MH Retu PN Name Storm Peri E3.000 E1 15 Winter	(s) (mins s) (years Change (urn Clima iod Chan	s) 15, s) ate Fi ge Su +0% 100/	rst (X) rcharge 15 Summer	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	20, 960, 1440 200, 200 40, 40 Water Low Level . (m) 88.148	Depth (m) -1.05	
E3.005 E6 720 Winter 1 +0% 86.822 -0. $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Duration Return Period (Climate o US/MH Retu PN Name Storm Peri E3.000 E1 15 Winter E3.001 E2 15 Winter	(s) (mins s) (years Change (urn Clima iod Chan 1 - 1 -	s) 15, s) ate Fi ge Su +0% 100/ +0% 100/	rst (X) rcharge 15 Summer 15 Summer	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	<pre>20, 960, 1440 .00, 200 40, 40 Water Low Level . (m) 88.148 88.019</pre>	Depth (m) -1.05 -0.98	
FlodedPipeUS/MHVolumeFlow / OverflowFlowLevelPNName(m³)Cap.(1/s)StatusExceededE3.000E10.0000.16357.9OK1E3.001E20.0000.22532.7OK1E3.002E30.0000.31724.0OK1E3.003E40.0000.1834.7OK1	Duration Return Period (Climate o US/MH Retu PN Name Storm Peri E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter	(s) (mins s) (years Change (urn Clima iod Chan 1 - 1 - 1 -	<pre>s) 15, s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 100/</pre>	rst (X) rcharge 15 Summer 15 Summer	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	<pre>20, 960, 1440 200, 200 40, 40</pre> Water Low Level (m) 88.148 88.019 87.815	Depth (m) -1.05 -0.98 -0.92	
US/MH Volume Flow Overflow Flow Level PN Name (m³) Cap. (l/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK 1 E3.002 E3 0.000 0.31 724.0 OK 1 E3.003 E4 0.000 0.00 67.9 OK 1 E3.004 E5 0.000 0.18 34.7 OK 1	Duration Return Period (Climate of US/MH Return PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter	(s) (mins s) (years Change (^s arn Clima iod Chan 1 - 1 - 1 - 1 - 1 -	s) 15, s) s) *) +0% 100/ +0% 100/ +0% 100/ +0% 100/	rst (X) archarge 15 Summer 15 Summer 15 Summer	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	<pre>20, 960, 1440 .00, 200 40, 40</pre> Water Low Level	Depth (m) -1.05 -0.98 -0.92 -1.08	
US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK 1 E3.002 E3 0.000 0.31 724.0 OK 1 E3.003 E4 0.000 0.018 34.7 OK 1	Duration Return Period (Climate of US/MH Retu PN Name Storm Peri E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter	(s) (mins s) (years Change (^s urn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/	rst (X) archarge 15 Summer 15 Summer 15 Summer	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK 1 E3.002 E3 0.000 0.31 724.0 OK 1 E3.003 E4 0.000 0.018 34.7 OK 1	Duration Return Period (Climate of US/MH Return PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter	(s) (mins s) (years Change (^s urn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/	rst (X) archarge 15 Summer 15 Summer 15 Summer	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth	
PN Name (m ³) Cap. (1/s) (1/s) Status Exceeded E3.000 E1 0.000 0.16 357.9 OK 1 E3.001 E2 0.000 0.22 532.7 OK 1 E3.002 E3 0.000 0.31 724.0 OK E3.003 E4 0.000 0.00 67.9 OK E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period (Climate of US/MH Return PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter	(s) (mins s) (years Change (^s urn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) s) ender Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/ +0% 30/	rst (X) archarge 15 Summer 15 Summer 15 Summer 60 Winter	First (Y) Flood 200/15 Winte	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
E3.000E10.0000.16357.9OK1E3.001E20.0000.22532.7OKE3.002E30.0000.31724.0OKE3.003E40.0000.0067.9OKE3.004E50.0000.1834.7OK	Duration Return Period (Climate of US/MH Return PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter	(s) (mins s) (years Change (^s urn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/ +0% Flooded	rst (X) archarge 15 Summer 15 Summer 15 Summer 60 Winter	First (Y) Flood 200/15 Winte Pipe	First Overf	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act.</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
E3.001E20.0000.22532.7OKE3.002E30.0000.31724.0OKE3.003E40.0000.0067.9OKE3.004E50.0000.1834.7OK	Duration Return Period (Climate of US/MH PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter	(s) (mins s) (years Change (arn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	<pre>s) 15, s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/ +0% 30/ +0%</pre>	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ow	First (Y) Flood 200/15 Winte Pipe Perflow Flow	First Overf	<pre>20, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
E3.002E30.0000.31724.0OKE3.003E40.0000.0067.9OKE3.004E50.0000.1834.7OK	Duration Return Period (Climate of US/MH Retu PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter	(s) (mins s) (years Change (In Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% +0% 30/ +0% Flooded Volume (m ³)	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap.	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Pipe Verflow Flow (1/s) (1/s)	First Overf er Status	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
E3.003 E4 0.000 0.00 67.9 OK E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period (Climate of US/MH Retu PN Name Storm Perion E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter E3.005 E6 720 Winter	(s) (mins s) (years Change (s in Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	<pre>s) 15, s) 15, s) *) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/ +0% Flooded Volume (m³) 0.000</pre>	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap. 0.16	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Pipe Verflow Flow (1/s) (1/s) 357.9	First Overf er Status OK	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
E3.004 E5 0.000 0.18 34.7 OK	Duration Return Period (Climate of US/MH Retu PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter E3.005 E6 720 Winter	(s) (mins s) (years Change (s arn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 30/ +0% Flooded Volume (m ³) 0.000 0.000	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap. 0.16 0.22	First (Y) Flood 200/15 Winte 200/15 Winte Pipe verflow Flow (1/s) (1/s) 357.9 532.7	First Overf er Status OK OK	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
	Duration Return Period (Climate of US/MH Retu PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter E3.000 E1 0.00 E3.000 E3.000	(s) (mins s) (years Change (s arn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/ +0% Flooded Volume (m ³) 0.000 0.000 0.000	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap. 0.16 0.22 0.31	First (Y) Flood 200/15 Winte 200/15 Winte Pipe verflow Flow (1/s) (1/s) 357.9 532.7 724.0	First Overf er Status OK OK OK	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
	Duration Return Period (Climate of US/MH Retu PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter E3.000 E1 0.00 E3.000 E3.000 E3.000	(s) (mins s) (years Change (s arn Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% 30/ +0% Flooded Volume (m ³) 0.000 0.000 0.000 0.000	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap. 0.16 0.22 0.31 0.00	First (Y) Flood 200/15 Winte 200/15 Winte Pipe rerflow Flow (1/s) (1/s) 357.9 532.7 724.0 67.9	First Overf er Status OK OK OK OK	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
	Duration Return Period (Climate of US/MH Retu PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter E3.000 E1 00 E3.000 E3.000 E3.000 E3.000 E3.000	(s) (mins s) (years Change (s in Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% s) Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap. 0.16 0.22 0.31 0.00 0.18	First (Y) Flood 200/15 Winte 200/15 Winte Pipe rerflow Flow (1/s) (1/s) 357.9 532.7 724.0 67.9 34.7	First Overf er Status OK OK OK OK OK	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	
	Duration Return Period (Climate of US/MH Retu PN Name Storm Period E3.000 E1 15 Winter E3.001 E2 15 Winter E3.002 E3 15 Winter E3.003 E4 720 Winter E3.004 E5 720 Winter E3.005 E6 720 Winter E3.000 E6 720 Winter E3.000 E3.000 E3.000 E3.000	(s) (mins s) (years Change (s in Clima iod Chan 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	s) 15, s) 15, s) s) ate Fi ge Su +0% 100/ +0% 100/ +0% 100/ +0% s) Flooded Volume (m ³) 0.000 0.000 0.000 0.000 0.000	rst (X) rcharge 15 Summer 15 Summer 60 Winter Flow / Ov Cap. 0.16 0.22 0.31 0.00 0.18	First (Y) Flood 200/15 Winte 200/15 Winte Pipe rerflow Flow (1/s) (1/s) 357.9 532.7 724.0 67.9 34.7	First Overf er Status OK OK OK OK OK	<pre>30, 600, 72 1, 30, 1 0, 0, (Z) Overfl low Act. Level Exceeded</pre>	<pre>20, 960, 1440 200, 200 40, 40 Water Low Level (m) 88.148 88.019 87.815 87.176 87.175</pre>	Depth (m) -1.05 -0.98 -0.92 -1.08 -0.12	

Hydroc	k Con	sultants	Ltd							Pag	e 7
•					Rai	l Cent	ral				
					Uni	ts 6				4	
•										N	icco
Date 6	th Fe	bruary 20	18		Des	igned	by RJH				
File U	nit 6	.MDX			Che	cked b	У				rainage
XP Sol	ution	S			Net	work 2	016.1				
<u>30 yea</u>	<u>r</u> Ret	urn Perio	d Summa	ary of (imum Leve	el (Rank	1) for	Existing
		Ar	eal Redu	ction Fa		<u>ation Cr</u> 00 Add	<u>iteria</u> litional Flo	ow – % of T	otal Flow	0.000	
		111					MADD Facto				
					(mm)		_		ffiecient		
	1	Manhole Hea Foul Sewa					per Person	per Day (1	/per/day)	0.000	
		rour sewa	ge per n	ectare (1/3/ 0.00						
1		of Input H er of Online									
		,			_		<u>ll Details</u>				
			Model				E (1km) C F (1km) 2		inter) 0.8	340	
							(Summer) (
			·			. ,					
		М	argin fo) 300.0 p Fine Ine				
				-		'S Statu		SILIA SLALL	IS OFF		
			Prof	ile(s)				Sun	mer and Wi	inter	
		Dura	tion(s)	(mins)	15, 30, 6	50, 120,	180, 240,	360, 480,	600, 720,	960,	
		Detump Dem	ind(n) (1	20 100	1440	
		Return Per Clim	ate Chan						, 30, 100, 0, 0, 40		
				5 . ,							
										Water	Surcharged
PN	US/MH Name	Storm	Return		First (Surchar	• •	First (Y) Flood		Overflow Act.		Depth (m)
	Itune	0001	101100	onunge	5 di Cilui	.ge	11000	0101110	1000	(,	
E3.000 E3.001		15 Winter 15 Winter			100/15 Su 100/15 Su		0/15 Winte	r		88.634 88.544	-0.566 -0.459
E3.001		15 Winter 15 Winter			100/15 St 100/15 St					88.408	-0.331
E3.003		720 Winter		+0%						87.429	-0.834
E3.004	E5 E6	720 Winter 60 Winter		+0응 +0응	30/60 Wi	nter				87.428 86.823	0.129 -0.356
E3.005	년 0	oo winter	20	TUS						00.023	-0.330
				-1			_ ·				
				Floode H Volume	d Flow /	Overflo	Pipe w Flow		Level		
		Pl			Cap.	(1/s)		Status	Exceeded		
		E3.(000 E	1 0.00	0 0.49		1119.6	OK	1		
		E3.(1620.0	OK	-		
		E3.(2217.0	OK			
		E3.(E3.(124.8 35.1 S	OK URCHARGED			
		E3.(35.1	OK			

Hydrock Co	~~~1+~~~	Fo Ted							T	Page 8
HYDIOCK CO	nsuitan	LS LLA								age o
•					ail Cei	ntral				
•				U	nits 6					
•										Micro
Date 6th F	ebruary	2018		D	esigne	d by RJ	Η			
File Unit	6.MDX			C	hecked	by				Drainage
XP Solutio	ns			N	etwork	2016.1				
<u>100 ye</u>	ar Retu	rn Perio	d Summa	ary of C	<u>ritica</u> Exist		ts by M	aximum Le	vel (Ran)	<u>k 1) for</u>
	Foul S r of Inpu	Hot Hot Sta Headloss Gewage per t Hydrogra	t Start art Leve Coeff (G hectare aphs 0	Factor 1 (mins) 1 (mm) 10bal) 0 (1/s) 0 Number 0	.000 A 0 .500 Flc .000	MADD w per Pe ne Contr	Al Flow - Factor * In: erson per	% of Total 10m³/ha Sto let Coeffied Day (l/per, nber of Tim	orage 2.00 cient 0.80 (day) 0.00 e/Area Dia	0 0 grams 0
Num	Raint	fall Model e Location	FEH	<u>Synthet</u> D1 (1km) D2 (1km)	<u>ic Rain:</u> 0.319 0.300	<u>fall Deta</u> E (11 F (11	ails			trols 0
		C (1km)	-0.026	D3 (1km)	0.243 (CV (Summe	er) 0./50	1		
		Margin :	for Floo		-	tep Fin) Status OF a Status OF		
	Γ		ofile(s)) (mins)		, 60, 12	20, 180,	240, 360	Summer ; , 480, 600,	and Winter 720, 960, 1440	
		Period(s) Climate Ch	-						, 100, 200 0, 40, 40	
PN	US/MH Name	Storm		Climate Change	First Surcha		First (Y Flood) First (Overflo	Z) Overflo ow Act.	Water ow Level (m)
E3.000 E3.001 E3.002 E3.003	E2 E3 E4 14	15 Winter 15 Winter 15 Winter 40 Winter	100 100 100 100	+40% +40% +40%	100/15 s 100/15 s	ummer Summer	00/15 Win [.]	ter		90.440 90.243 89.440 87.860
E3.004 E3.005		40 Winter 60 Winter	100 100	+40% +40%	30/60 W	linter				87.858 86.823
	PN	Su US/MH Name	Depth (m)	d Flooded Volume (m³)		Overflor (l/s)	Pipe w Flow (l/s)	Status	Level Exceeded	
	E3.000		1.240				2250.7	SURCHARGED	1	
	E3.001		1.240					SURCHARGED		
	E3.002		0.701					SURCHARGED		
	E3.003 E3.004		-0.403				128.8 35.1	OK SURCHARGED		
	E3.005		-0.356				35.1	OK		

Hydrock Co		ata Itd								Page 9
HYULOCK CO.					ail Ce	n+ mo 1				rage 9
•					nits 6	lltal				
•					MILS 0					m m
•		0.01.0				1 1 5 7				Micro
Date 6th F		y 2018			-	d by RJ	H			Drainage
File Unit					hecked	-				Diamage
XP Solution	ns			N	etwork	2016.1				
<u>200 ye</u>	<u>ar Reti</u>	urn Perio	d Summa	ary of C	<u>ritica</u> <u>Exist</u>		ts by Ma	aximum Le [,]	vel (Ran	a <u>k 1) for</u>
	Foul r of Inp	Hot St. Hot St. Headloss Sewage per out Hydrogra	t Start art Leve Coeff (G hectare aphs 0	Factor 1 (mins) 1 (mm) 10bal) 0 (1/s) 0 Number 0	.000 Z 0 .500 Flc .000	MADD ww per Pe ne Contr	I Flow - Factor * Inl erson per ols 0 Num	% of Total 10m³/ha Sto et Coeffico Day (l/per, nber of Timo nber of Rea	cient 0.8 (day) 0.0	00 00 00 agrams 0
	Rair	nfall Model te Location	FEH	<u>Synthet</u> D1 (1km) D2 (1km)	<u>ic Rain</u> 0.319 0.300	<u>fall Deta</u> E (1) F (1)	ails	Cv (Winter		
		Margin	for Floo		-	tep Fin	e Inertia) Status OF A Status OF		
			ofile(s)) (mins)		, 60, 12	20, 180,	240, 360,	Summer a 480, 600,	and Winte 720, 960 144	,
		n Period(s) Climate Ch	-						, 100, 20 0, 40, 4	0
PN	US/MH Name	Storm		Climate Change	First Surcha		First (Y) Flood	First (Overflo	Z) Overfl w Act.	
E3.000 E3.001 E3.002 E3.003 E3.004 E3.005	E1 E2 E3 E4 1 E5 1	15 Winter 15 Winter 15 Winter 440 Winter 960 Summer	200 200 200 200 200 200	+40% +40%		Summer 20 Summer Summer	00/15 Wint			91.430 91.285 90.032 88.018 88.014 86.823
	PN	Su US/MH Name	urcharged Depth (m)	d Flooded Volume (m³)		Overflow (l/s)	Pipe w Flow (l/s)	Status	Level Exceeded	
	E3.00		2.230				2769.8	FLOOD	1	
	E3.00		2.282					FLOOD RISK		
	E3.00 E3.00		1.293 -0.245				6639.0 145.0	SURCHARGED OK		
	E3.00		0.24					SURCHARGED		
	E3.00)5 E6	-0.350	6 0.000			35.1	OK		
1										

Hydrock Consult	ants Lt	d									Page 1
•				1	Rail Ce						
				1	Unit 7		4				
				1	Mainter		Micco				
Date 6th Februa		Designe	ed by RJH					Micro			
File UNIT 7+TM	DEPOT.M	DX			Checked	d by					Drainage
XP Solutions Network 2016.1											
		Ex	istin	g Netv	vork De	tails for	Exis	ting			
PN	Length	Fall	Slope	I.Area	T.E.	Base	k	HYD	DIA	Section T	уре
	(m)	(m)	(1:X)	(ha)	(mins)	Flow (l/s)	(mm)	SECT	(mm)		
E1 00	415.000	1 037	400 2	2.485	4.00	0 0	0.600	0	1200	Pipe/Cond	ui+
	L 250.000			2.485			0.600	[]		Pipe/Cond	
E1.00				0.000			0.600	0		Pipe/Cond	
	3 72.100			0.087			0.600			Pipe/Cond	
E1.00				0.107			0.600			Pipe/Cond	
E1.00	5 180.600	0.453	398.7	0.216			0.600	0		Pipe/Cond	
E2.00	480.000	0.600	800.0	4.300	5.00	0.0	0.600	0	1500	Pipe/Cond	luit
E2.00	L 95.000	0.238	399.2	4.301	0.00	0.0	0.600	[]	-3	Pipe/Cond	luit
E2.00	98.400	0.246	400.0	0.000	0.00	0.0	0.600	0	900	Pipe/Cond	luit
E1.00				0.092			0.600	0		Pipe/Cond	
E1.00				0.057			0.600	0		Pipe/Cond	
E1.00				0.170			0.600	0		Pipe/Cond	
E1.00	9 19.900	0.030	663.3	0.000	0.00	0.0	0.600	0	900	Pipe/Cond	luit

<u>Network Results Table</u>

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (1/s)
E1.000	89.378	2.485	0.0	1.86	2108.1
E1.001	88.341	4.970	0.0	2.77	83057.0
E1.002	87.716	4.970	0.0	1.56	994.4
E1.003	87.644	5.057	0.0	1.56	994.8
E1.004	87.463	5.164	0.0	1.56	992.1
E1.005	87.240	5.380	0.0	1.56	994.4
E2.000	87.871	4.300	0.0	1.51	2665.7
E2.001	87.271	8.601	0.0	2.82	250754.8
E2.002	87.033	8.601	0.0	1.56	992.7
E1.006	86.787	14.073	0.0	1.56	990.7
E1.007	86.597	14.130	0.0	1.57	995.8
E1.008	86.477	14.300	0.0	1.56	992.7
E1.009	86.230	14.300	0.0	1.21	769.1

Conduit Sections for Existing

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, O egg.

Section numbers < 0 are taken from user conduit table

Section Number	Conduit Type	Dimn.	Dimn.	Slope	Radius	
-2 -3			1200 1200			30.000 88.800

Hydrock Consultants	s Ltd								Page 2
•				I	Rail Cer	ntral			
				τ	Jnit 7 +	4			
				м	Aaintena				
• Date 6th February 2	010				Designed		-		Micro
-					2	-	п		Drainage
File UNIT 7+TM DEPC	DT.MD	X		(Checked	by			
XP Solutions				1	Jetwork	2016.1			
						_			
			PIP	ELINE S	CHEDULE	S for E	<u>Existing</u>		
				T.T	N	(
				<u>up:</u>	stream 1	<u>Mannole</u>			
PN	Hyd	Diam	МН	C.Level	I.Level	D.Depth	МН	MH DIAM., L*W	
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)	
E1.000	0	1200	E1	93.200	89.378	2.622	Open Manhole	2100	
E1.001	[]	-2	E2		88.341		Open Manhole		
E1.002	0	900	E4	92.000	87.716	3.384	Open Manhole	1800	
E1.003	0	900	E5	92.000	87.644	3.456	Open Manhole	1800	
E1.004	0	900	E6	91.400	87.463	3.037	Open Manhole	1800	
E1.005	0	900	E7	91.200	87.240	3.060	Open Manhole	1800	
E2.000	0	1500	E.8	91 400	87.871	2 029	Open Manhole	2100	
E2.001		-3			87.271		Open Manhole		
E2.001			E11		87.033		Open Manhole		
							-		
	0	900	E12		86.787		Open Manhole	1800	
E1.006			E13	00 000	86.597	3 103	Open Manhole	1800	
E1.006 E1.007	0	900	EI3	90.600	00.397	5.105	open namore	1000	
			E13 E14		86.477		Open Manhole		

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E1.002 E1.003 E1.004	415.000 250.000 28.700 72.100 89.300 180.600	400.0 398.6 398.3 400.4	E2 E4 E5 E6 E7 E12	92.000 92.000 91.400 91.200 91.000	88.341 87.716 87.644 87.463 87.240 86.787	3.084 3.456 3.037 3.060	Open Manhole Open Manhole Open Manhole Open Manhole Open Manhole	1800 1800 1800 1800
E2.000 E2.001 E2.002	480.000 95.000 98.400	399.2	E9 E11 E12	91.400 91.400 91.000	87.271 87.033 86.787	3.167	Open Manhole Open Manhole Open Manhole	74725 1800 1800
E1.006 E1.007 E1.008 E1.009	76.300 47.700 98.800 19.900	397.5 400.0	E13 E14 E15 E	90.600 90.500 91.200 88.000	86.597 86.477 86.230 86.200	3.123 4.070	Open Manhole Open Manhole Open Manhole Open Manhole	

	td							Page 3				
				Rai	l Centra	1						
				Uni	.t 7 + Tr	4						
				Mai	ntenance							
Date 6th February 201	8				Designed by RJH							
File UNIT 7+TM DEPOT.												
	MDX				Checked by Non Drain							
XP Solutions				Net	work 201	6.1						
			Area	Summ	ary for	Existing						
	-		PIMP Name		Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)					
	1 0 0 0			100	0 405	0 405	2 405					
	1.000		-		2.485							
	1.001			100 100	2.485							
	1.002			100	0.000							
	1.003			100	0.107							
	1.005			100	0.216							
	2.000			100	4.300							
	2.001		-		4.301							
	2.002	-		100	0.000							
	1.006	-	-	100	0.092	0.092	0.092					
	1.007		-	100	0.057	0.057	0.057					
	1.008	-	-	100	0.170	0.170	0.170					
	1.009	-	-	100	0.000							
					Total							
					14.300	14.300	14.300					
		<u>Sim</u> u	lati	on Ci	riteria f	for Exist	ing					
Volur	metric H	Runoff	Coef	E 0.75	50 Addit	ional Flow	- % of Total Flow	0.000				
Area	al Reduc	ction	Factor	r 1.00	00 M	ADD Factor	* 10m³/ha Storage	2.000				
	Hot S	Start	(mins))	0		Inlet Coeffiecient	0.800				
					-	r Person p	er Day (l/per/day)					
Manhole Head							Run Time (mins)					
Foul Sewage	e per he	ectare	(1/s)) 0.00	00	Outp	ut Interval (mins)	1				
Number of Input Hyd Number of Online	2 1						Number of Time/Are Number of Real Tim	2				
		2	Synth	<u>etic</u>	Rainfall	<u>Details</u>						
Rain	fall Mo	del	FEH		D2 (1km) (0.300	Winter Storms	No				
			2		D3 (1km) ().243	Cv (Summer)					
Return Peri	od (yea	rs)	-					0.700				
Return Peri	od (yea e Locat		2				Cv (Winter)					
Return Peri	e Locat C (1	ion km) -	0.026		E (1km)	0.302 2.496 Storm	Cv (Winter) n Duration (mins)	0.840				

Date 6th February 2018 Designed by RJH	
. Maintenance Depot Date 6th February 2018 Designed by RJH	
Date 6th February 2018 Designed by RJH	L.
Date 6th February 2018 Designed by RJH	Micco
File UNIT 7+TM DEPOT.MDX Checked by	Drainage
XP Solutions Network 2016.1	
Online Controls for Existing	
<u>Hydro-Brake Optimum® Manhole: E4, DS/PN: E1.002, Volume (m³): 7098.0</u>	<u>)</u>
Unit Reference MD-SHE-0198-2040-1200-2040	
Design Head (m) 1.200 Design Flow (1/s) 20.4	
Flush-Flo™ (275) Calculated	
Objective Minimise upstream storage	
Application Surface	
Sump Available Yes Diameter (mm) 198	
Invert Level (m) 198	
Minimum Outlet Pipe Diameter (mm) 225	
Suggested Manhole Diameter (mm) 1500	
Control Points Head (m) Flow (1/s) Control Points Head (m) Flow	(1/s)
Design Point (Calculated) 1.200 20.4 Kick-Flo® 0.831 Flush-Flo™ 0.380 20.4 Mean Flow over Head Range -	17.1 17.4
The hydrological calculations have been based on the Head/Discharge relationship for the Hy Optimum® as specified. Should another type of control device other than a Hydro-Brake Opti	
utilised then these storage routing calculations will be invalidated	
Depth (m) Flow (l/s) Depth (m)	n) Flow (1/:
0.100 6.8 0.800 17.8 2.000 26.0 4.000 36.3 7.00 0.200 18.6 1.000 18.7 2.200 27.2 4.500 38.5 7.50	
0.200 18.6 1.000 18.7 2.200 27.2 4.500 58.5 7.50	
0.400 20.4 1.400 22.0 2.600 29.5 5.500 42.4 8.50	
0.000 20.21 1.000 23.41 3.000 31.61 6.000 44.21 9.00	
0.500 20.2 1.600 23.4 3.000 31.6 6.000 44.2 9.00 0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50	4
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251	
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 <u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049.</u> Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300	(1/s)
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m ³): 5049. Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo ^m Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300 Suggested Manhole Diameter (mm) 1800	(1/s) 30.2 29.5
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m ³): 5049. Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo ^m Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300 Suggested Manhole Diameter (mm) 1800 Control Points Head (m) Flow (1/s) Design Point (Calculated) 1.200 35.3 Flush-Flo ^m 0.422 35.1 Mean Flow over Head Range - The hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Head/Discharge relationship for the Hydrological calculations have been based on the Hydrological calculations have been based on the Hydrological calculations have been based on the Hydrological calculations have been hydrological calculat	30.2 29.5 2dro-Brake
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m ³): 5049. Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo ^{me} Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300 Suggested Manhole Diameter (mm) 1800 Control Points Head (m) Flow (1/s) Control Points Head (m) Flow Design Point (Calculated) 1.200 35.3 Flush-Flo ^{me} 0.422 35.1 Mean Flow over Head Range -	30.2 29.5 2dro-Brake
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049. Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo ^m Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300 Suggested Manhole Diameter (mm) 1800 Control Points Head (m) Flow (1/s) Control Points Head (m) Flow Design Point (Calculated) 1.200 35.3 Flush-Flo ^m 0.422 35.1 Mean Flow over Head Range - The hydrological calculations have been based on the Head/Discharge relationship for the Hy Optimum® as specified. Should another type of control device other than a Hydro-Brake Opti utilised then these storage routing calculations will be invalidated Depth (m) Flow (1/s) Depth (m) Flow (1/s) Dept	30.2 29.5 dro-Brake mum® be n) Flow (1/2
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049 Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300 Suggested Manhole Diameter (mm) 1800 Control Points Head (m) Flow (1/s) Control Points Head (m) Flow Design Point (Calculated) 1.200 35.3 Flush-Flo™ 0.422 35.1 Mean Flow over Head Range - The hydrological calculations have been based on the Head/Discharge relationship for the Hy Optimum® as specified. Should another type of control device other than a Hydro-Brake Opti utilised then these storage routing calculations will be invalidated Depth (m) Flow (1/s) Depth (m) Storage Point (1/s) Depth (m) Flow (1/	30.2 29.5 vdro-Brake mum® be m) Flow (1/2 00 45
0.600 19.8 1.800 24.8 3.500 34.1 6.500 45.9 9.50 Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 5049. Unit Reference MD-SHE-0251-3530-1200-3530 Design Head (m) 1.200 Design Flow (1/s) 35.3 Flush-Flo ^m Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 251 Invert Level (m) 87.033 Minimum Outlet Pipe Diameter (mm) 300 Suggested Manhole Diameter (mm) 1800 Control Points Head (m) Flow (1/s) Control Points Head (m) Flow Design Point (Calculated) 1.200 35.3 Flush-Flo ^m 0.422 35.1 Mean Flow over Head Range - The hydrological calculations have been based on the Head/Discharge relationship for the Hy Optimum® as specified. Should another type of control device other than a Hydro-Brake Opti utilised then these storage routing calculations will be invalidated Depth (m) Flow (1/s) Depth (m) Flow (1/s) Dept	30.2 29.5 vdro-Brake mum® be m) Flow (1/2 00 45 00 47

Hydrock	Consul	ltant	ts Ltd								Pa	ige 5	
•					Rail (Central							
•					Unit 7	/ + Tra	in					L	
•					Mainte	enance		Micco	Jun				
Date 6th	Febru	lary	2018		Desigr	ned by I		MICIO					
File UNIT 7+TM DEPOT.MDX Checked by											Draina	ige	
XP Solut	ions				Networ	k 2016	.1						
<u>Hydro-Brake Optimum® Manhole: E11, DS/PN: E2.002, Volume (m³): 504</u>											5049.	4	
Donth (m)	Flow (1/0)	Donth (m)	Flow (l/s)	Donth (m)	Flow (1	(a)	Donth (N Flow	$(1/\alpha)$	Donth (m) Flor	. (1/a)
Depth (m)	FIOM (1/5/	Depth (m)	FIOW (1/5)	Depcii (iii)	F10w (1	./5)	Depcii (ii	I) FIOW	(1/5)	Depcii (III) F10W	(1/5)
2.600		51.2	4.000	63.1	5.500		3.6	7.00		82.8	8.5		91.0
3.000		54.9	4.500	66.8	6.000		6.8	7.50		85.7	9.0		93.6
3.500		59.1	5.000	70.3	6.500	/	9.9	8.00	0	88.4	9.5	00	96.1
	Hvd	lro-B	rake Opt	imum® Manh	ole• E15	. DS/P	न • L	1 009.	Volume	e (m ³)	• 74 4		
	<u>11 y 0</u>	20 2	14/10 000		0101 210	1 20/11		110007	V O L UIII	0 (111)			
			Ur	nit Referend	ce			MD-	SHE-029	1-5860	-2750-58	60	
				sign Head (m							2.7		
			Desig	gn Flow (l/s								.6	
				Flush-Flo							Calculat		
				Objectiv				Mi	nimise	upstre	am stora		
			C -	Applicatio mp Availabl							Surfa	ce es	
				Diameter (mn									
				ert Level (nu	, -								
	Minimu	ım Oilt		Diameter (mn	,	375							
Suggested Manhole Diameter (mm) Site Specific Design (Contact Hydro International)													
	Cont	rol P	oints	Head (m)	Flow (l/s)	c	ontr	ol Point	5	Head	(m) Flow	(1/s)	
Doo	ian Poi	int (Calculated	2.750	58.5			Kir	k-Flo®	1.7	707	46.8	
Des	SIGH POI	LIIC ((Flush-Flo				OW (ver Head		±•,	_	40.0 50.9	
			1 1 4 511 1 10	0.000	50.0	"ean ri		JVGI Head	. nanye			50.9	

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m) Fl	.ow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.0	0.800	58.6	2.000	50.2	4.000	70.2	7.000	92.1
0.200	30.0		58.1	2.200	52.5	4.500	74.3		95.2
0.300	50.1	1.200	56.9	2.400	54.8	5.000	78.2	8.000	98.3
0.400	54.0	1.400	54.8	2.600	57.0	5.500	81.9	8.500	101.2
0.500	56.3	1.600	50.9	3.000	61.0	6.000	85.4	9.000	104.1
0.600	57.7	1.800	47.7	3.500	65.8	6.500	88.8	9.500	106.9

Hydrock	Cons	ultants L	td								Pa	ige 6
•						Rail	Centr	al			۵ ا	
						Unit	7 + T	rain				
•								e Depo	t			Micro
		ruary 201				-		y RJH				Drainage
File UN	IT 7+	TM DEPOT.	MDX				ed by					Diamaye
XP Solu	tions					Netwo	ork 20	16.1				
1 year	Retur	n Period	Summa	ary c	of Cri	tical R	esult	s by Ma	aximum L	evel (Rank	x 1) fo	r Existing
						<u>Simulati</u>	on Cri	teria				
		Area								of Total Flo		
		ц	Hot ot Sta:		t (min:			MADD Fa		m³/ha Storag Coeffiecien		
	Ma					,	Flow p	er Pers		y (l/per/day		
		Foul Sewage										
Nı										r of Time/Ar r of Real Ti	-	
					C	thatic D	ainfal'	l Dotoil	~			
<u>Synthetic Rainfall Details</u> Rainfall Model FEH D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840												
Site Location D2 (1km) 0.300 F (1km) 2.496												
C (1km) -0.026 D3 (1km) 0.243 Cv (Summer) 0.750												
		Margir	n for E	lood	Risk W	Jarning (1	nm)			300.0	0	
Analysis Timestep 2.5 Second Increment (Extended)												
DTS Status OFF DVD Status ON												
DVD Status ON Inertia Status ON												
	Inertia Status UN											
	Profile(s) Summer and Winter											
		Durat			,	, 30, 60,	120,	180, 24	0, 360, 4	80, 600, 720		
											1440	
	F	Return Peri	od(s) te Cha:	-						1, 30, 10	10, 200 40, 40	
		CIIIIa	te tila.	iige (~)					0, 0,	40, 40	
	US/MH		Retur		mato	First (x)	First ()) First	(Z) Overflow		Surcharged Depth
PN	Name	Storm	Perio			Surchar		Flood	Overfl		(m)	(m)
F1 000	- 1	15 53 1		-		100/15 0					00 704	0.054
E1.000 E1.001	E1 E2	15 Winter 15 Winter		1 1	+0응 +0응	100/15 S	ummer				89.724 88.366	-0.854 -1.175
E1.001		480 Winter		1		L00/360 W	inter				88.074	-0.542
E1.003	E5	60 Winter		1	+0%						87.745	-0.799
E1.004	E6	60 Winter		1	+0%	200/15	i m t				87.569	-0.794
E1.005 E2.000	E7 E8	15 Winter 15 Winter		1 1		200/15 W					87.368 88.366	-0.772 -1.005
E2.000		480 Winter		1	+0%	T00/T0 D	annii CT				87.347	-1.124
E2.002	E11	480 Winter		1	+0% 1	L00/360 W					87.341	-0.592
E1.006		600 Winter		1		100/60 W					87.022	-0.665
E1.007 E1.008		600 Winter 600 Winter		1 1		100/30 W					86.986 86.950	-0.511 -0.427
E1.008		600 Winter		1		100/15 W					86.895	-0.235
					Floode	đ		n:-	•			
			U			e Flow /	Overf	Pip low Flo		Level		
				lame	(m ³)	Cap.	(1/s			Exceeded		
		- 1	000	F. 1	0 00	0 0 10		270	0 077			
			.000	E1 E2	0.00			370. 582.				
			.002	E4	0.00			20.				
			.003	E5	0.00			23.				
			.004	E6	0.00			28.				
			.005 .000	E7 E8	0.00			42. 599.				
			.001	E9	0.00			116.				
		E2	.002	E11	0.00	0.04		34.	5 OK			
		E1	.006	E12	0.00			60.				
1						00 00						
					©19	82-2016	XP S	olution	ıs			

Hydrock Consultants Ltd		Page 7
•	Rail Central	
	Unit 7 + Train	
	Maintenance Depot	Micco
Date 6th February 2018	Designed by RJH	
File UNIT 7+TM DEPOT.MDX	Checked by	Digitige
XP Solutions	Network 2016.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)		Status	Level Exceeded
E1.007 E1.008 E1.009	E13 E14 E15	0.000 0.000 0.000	0.07 0.07 0.15		59.3 59.9 57.7	OK OK OK	

ydrock	Cons	uita										ige 8
							Central				٦ ا	
							7 + Tra:					Ly
							enance l	-				Micro
ate 6t			-			-	gned by I	RJH				Drainage
		TM D	EPOT.MD	Х			ked by					Brainage
P Solu	tions					Netwo	ork 2016	.1				
Nu	Ma ımber c	anhol Foul of Inj	Areal Hot e Headlo: Sewage j put Hydro	Reducti Hot Sta Start L ss Coeff per hect ographs	on Facto rt (mins evel (mm (Global are (l/s 0 Numk	<u>Simulati</u> or 1.000 () 0 () 0.500 () 0.500 () 0.000	<u>Ion Criter</u> Additic MAE Flow per	<u>ria</u> Dnal Flo DD Facto Person htrols (ow - % of or * 10m ³ Inlet (per Day) Number	E Total Flo Coeffiecien (l/per/day of Time/Ar of Real Ti	w 0.000 e 2.000 t 0.800) 0.000 ea Diag	
				ion km) -0.0	EH D1 (D2 (26 D3 (d Risk W Analys Ine	1km) 0.3 1km) 0.3 1km) 0.2 arning (n	00 F 43 Cv (Sum mm) tep 2.5 So tus tus	(1km) 0 (1km) 2 mmer) 0	.496 .750 ncrement	(Winter) 0 300.0 (Extended) OFF ON ON Summer and	1	
	т	ot 11r		n(s) (mi	ns) 15,	, 30, 60,	, 120, 180	0, 240,), 600, 720	, 960, 1440	
DN	us/mh		n Period Climate	n(s) (mi (s) (yea Change eturn CJ	ns) 15, rs) (%)	First ((X) Fir	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	, 960, 1440 0, 200 40, 40 Water Level	Surcharged Depth
PN	US/MH Name	s	n Period Climate R torm P	n(s) (mi (s) (yea Change eturn CJ eriod C	ns) 15, rs) (%) Limate hange	First (Surchar	(X) Fir rge F		360, 480), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m)</pre>	Depth (m)
PN E1.000 E1.001	us/mh	s 15	n Period Climate	n(s) (mi (s) (yea Change eturn CJ	ns) 15, rs) (%) Limate hange	First ((X) Fir rge F	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	, 960, 1440 0, 200 40, 40 Water Level	Depth
E1.000 E1.001 E1.002	US/MH Name E1 E2 E4	5 15 15 600	n Period Climate R torm P Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30	<pre>15, 15, rs) (%) Limate hange +0% +0% +0% +0% 1</pre>	First (Surchar	(X) Fir. rge F. ummer	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336</pre>	Depth (m) -0.544 -1.126 -0.280
E1.000 E1.001 E1.002 E1.003	US/MH Name E1 E2 E4 E5	5 15 15 600 15	n Period Climate R torm P Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30	<pre>15, 15, rs) (%) Limate hange +0% +0% +0% +0% 1 +0% 1</pre>	First (Surchar 100/15 S	(X) Fir. rge F. ummer	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793</pre>	Depth (m) -0.544 -1.126 -0.280 -0.751
E1.000 E1.001 E1.002 E1.003 E1.004	US/MH Name E1 E2 E4 E5 E6	5 15 15 600 15 15	n Period Climate R torm P Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30	Limate hange +0% +0% +0% 1 +0% +0%	First (Surchar 100/15 S [.] 00/360 W	(X) Fir. rge F. ummer inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661</pre>	Depth (m) -0.544 -1.126 -0.280 -0.751 -0.702
E1.000 E1.001 E1.002 E1.003	US/MH Name E1 E2 E4 E5	S 15 15 600 15 15 15	n Period Climate R torm P Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30	Limate hange +0% +0% +0% +0% 1 +0% +0% +0%	First (Surchar 100/15 S	(X) Fir. rge F. ummer inter inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793</pre>	Depth (m) -0.544 -1.126 -0.280 -0.751
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9	5 15 15 600 15 15 15 15 15 600	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30	Limate hange +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S	(X) Fir. rge F. ummer inter inter ummer	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602</pre>	Depth (m) -0.544 -1.126 -0.280 -0.751 -0.702 -0.644 -0.525 -0.869
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11	S 15 15 600 15 15 15 15 600 600	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Limate hange +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W	(X) Fir. Ge F. ummer inter inter ummer inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580</pre>	Depth (m) -0.544 -1.126 -0.280 -0.752 -0.702 -0.644 -0.525 -0.869 -0.353
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12	S 15 15 15 15 15 15 600 600 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Limate hange +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W	(X) Fir. rge F. ummer inter inter ummer inter inter inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	s 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Limate hange +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W	(X) Fir. rge F. ummer inter inter ummer inter inter inter inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	s 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Limate hange +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W 100/30 W	(X) Fir. rge F. ummer inter inter ummer inter inter inter inter inter inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Limate hange +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W 100/30 W 100/15 W	(X) Fir. rge F. ummer inter inter ummer inter inter inter inter inter inter	st (Y)	360, 480 First (Z), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Ins) 15, rs) (%) Limate	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W 100/15 S	(X) Fir. rge F. ummer inter inter inter inter inter inter inter inter ummer	Pipe	360, 480 First (Z	 a), 600, 720 a), 30, 10 b), 0, 0, c), 0, 0, <lic< td=""><td><pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre></td><td>Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17</td></lic<>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	Ins) 15, rs) (%) Limate	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W 100/15 S	(X) Fir. rge F. ummer inter inter ummer inter inter inter inter inter inter	Pipe Flow	360, 480 First (Z Overflow), 600, 720 1, 30, 10 0, 0, ;) Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W 100/15 S 100/15 S 100/15 S	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s)	360, 480 First (Z Overflow	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/60 W 100/15 S 100/15 S 100/15 S 100/15 S	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2	360, 480 First (Z Overflow Status 3 OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 W 100/15 S 100/15 S 100/1	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2 1723.8	360, 480 First (Z Overflow Status : OK OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 W 100/15 S 100/15 S 100/1	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2	360, 480 First (Z Overflow Status 3 OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter El.000 E1.000	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 S 100/15 S 100/1	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2 1723.8 20.4	360, 480 First (Z Overflow Status : OK OK OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter El.000 El.000 El.000 El.000 El.000	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image 15, Image 16, Image 10% I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 S 100/15 W 100/15 S Flow / Cap. 0.58 0.02 0.03 0.05 0.09 0.16	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2 1723.8 20.4 42.8 82.6 146.0	360, 480 First (Z Overflow Overflow Status 3 OK OK OK OK OK OK OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	5 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter E1.000 E1.000 E1.000 E1.000 E1.000 E1.000 E1.000 E1.000 E1.000	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 S 00/360 W 100/15 S 100/15 S 100/1	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2 1723.8 20.4 42.8 82.6 146.0 1881.9	360, 480 First (Z Overflow Overflow Status 3 OK OK OK OK OK OK OK OK OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	s 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter E1.00	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 S 00/360 W 100/15 S 100/15 S 100/1	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2 1723.8 20.4 42.8 82.6 146.0 1881.9 155.2	360, 480 First (Z Overflow Overflow Status 3 OK OK OK OK OK OK OK OK OK OK OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.544 -1.122 -0.280 -0.752 -0.702 -0.644 -0.523 -0.869
E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	s 15 15 15 15 15 15 600 600 360 360 360	n Period Climate R torm P Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter E1.000 E1.000 E1.000 E1.000 E1.000 E1.000 E1.000 E1.000 E1.000	n(s) (mi (s) (yea Change eturn CJ eriod C 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>Image (%) Image (%) I</pre>	First (Surchar 100/15 S 00/360 W 200/15 W 100/15 S 00/360 W 100/15 S 00/360 W 100/15 S 100/15 S 100/1	<pre>(X) Fir: rge F. ummer inter inter inter inter inter inter inter ummer</pre>	Pipe Flow (1/s) 1166.2 1723.8 20.4 42.8 82.6 146.0 1881.9	360, 480 First (Z Overflow Overflow Status 3 OK OK OK OK OK OK OK OK OK	<pre>D, 600, 720 1, 30, 10 0, 0, 3) Overflow w Act. Level</pre>	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 90.034 88.415 88.336 87.793 87.661 87.496 88.846 87.602 87.580 87.329 87.268 87.202</pre>	Depth (m) -0.54 -1.12 -0.28 -0.75 -0.70 -0.64 -0.52 -0.86 -0.35 -0.35 -0.22 -0.17

Hydrock Consultants Ltd	Page 9	
•	Rail Central	
	Unit 7 + Train	<u> </u>
	Maintenance Depot	Micco
Date 6th February 2018	Designed by RJH	
File UNIT 7+TM DEPOT.MDX	Checked by	Digiligh
XP Solutions	Network 2016.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)		Status	Level Exceeded
E1.007 E1.008 E1.009	E13 E14 E15	0.000 0.000 0.000	0.08 0.08 0.15		66.3 67.2 58.6	OK OK	

Hydrock	Cons	ultants Lt	d							Pa	ige 10
•					-	l Centr	-				,
•					Uni	.t 7 + I	rain				L.
•					Mai	ntenanc	e Depot	1			Micco
Date 6t	h Feb	ruary 2018			Des	signed b	y RJH				
File UN	IT 7+	TM DEPOT.M	DX		Che	ecked by	,				Drainage
XP Solu	tions					work 20					
100	year	Return Pe	riod S	Summary	of Cri	itical F	Results	by Maximu	ım Level	(Rank	1) for
						Existind					
						_					
						ation Cri					
		Area						low - % of			
		Чо		Level (mi			MADD Fac	tor * 10m ³ /	na Storage effiecient		
	Ma	anhole Headlo					er Perso				
		Foul Sewage				-			_, _, _ , _, , , , , , , , , , , , , ,		
Nu		of Input Hydi								-	
	Number	of Online (Control	s 3 Numb	er of St	torage St	ructures	0 Number o	of Real Tir	ne Cont	rols O
				51	nthetic	Rainfal	l Details				
		Rainfall M	odel						Winter) 0.	840	
		Site Loca	tion	D2	(1km) 0	.300	F (1km)	2.496			
		С (1km) -(0.026 D3	(1km) 0	.243 Cv	(Summer)	0.750			
			6 51	1 5 1		()			200.0		
		Margin	IOT FL	ood Risk Analy	-		5 Second	Increment	300.0 (Extended)		
				Anary		tatus	5 Second	THETEMETIC	OFF		
					DVD S	tatus			ON		
				Ir	nertia S	tatus			ON		
			Profi	le(s)				S1	ummer and V	linter	
		Durati		. ,	5, 30,	60, 120,	180, 240	, 360, 480,			
										1440	
	F	Return Perio	-						1, 30, 100	-	
		Climate	e Chang	re (왕)					0, 0, 4	10, 40	
										Water	Surcharged
	US/MH			Climate				First (Z)		Level	-
PN	Name	Storm	Period	Change	Surc	harge	Flood	Overflow	Act.	(m)	(m)
E1.000	E1	15 Winter	100	+40%	100/15	Summer				91.029	0.451
E1.001	E2	600 Winter	100	+40%						88.689	-0.852
E1.002	E4	960 Winter	100		100/360) Winter				88.664	0.048
E1.003	E5	15 Winter	100	+40%						87.870	-0.674
E1.004		120 Winter	100	+40%	200/15	ToT i an to a co				87.817	
E1.005 E2.000	E / E 8	120 Winter 15 Winter	100 100	+40% +40%		Winter Summer				87.786 90.198	-0.354 0.827
E2.000		960 Winter	100	+40% +40%	100/13	, Ganmer				88.028	-0.443
E2.002		720 Winter	100		100/360) Winter				87.983	0.050
E1.006	E12	120 Winter	100	+40%	100/60	Winter				87.736	0.049
E1.007		480 Winter	100	+40%) Winter				87.732	0.235
E1.008 E1.009		480 Winter 480 Winter	100 100	+40% +40%		Winter Summer				87.732 87.728	0.355 0.598
E1.009	FID	480 Winter	100	+403	100/13	Summer				0/./20	0.598
				Flooded			Pipe				
			US/MH	Volume	Flow /	Overflow	r Flow		Level		
		PN	Name	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded		
		E1.000) E1	0.000	1.04		2005 1	SURCHARGED			
		E1.000			0.00		305.0	OK			
		E1.002			0.03			SURCHARGED			
		E1.003	8 E5	0.000	0.10		85.7	OK			
		E1.004			0.07		63.6	OK			
1		E1.005	5 E7	0.000	0.11		105.8	OK			

105.8

3320.6 SURCHARGED 187.0 OK

E7 0.000 0.11

1.30 0.00

0.000

0.000

E8

Ε9

E1.005

E2.000

E2.001

OK

Hydrock Consultants Ltd		Page 11
	Rail Central	
	Unit 7 + Train	
	Maintenance Depot	Micro
Date 6th February 2018	Designed by RJH	
File UNIT 7+TM DEPOT.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E2.002	E11	0.000	0.04		35.1	SURCHARGED	
E1.006	E12	0.000	0.11		97.3	SURCHARGED	
E1.007	E13	0.000	0.09		71.3	SURCHARGED	
E1.008	E14	0.000	0.08		70.4	SURCHARGED	
E1.009	E15	0.000	0.15		58.6	SURCHARGED	

ydrock	Consu	ltants Lt	d							Pa	age 12
-					Rai	l Centr	al				-
					Uni	.t 7 + 1	'rain				ч
					-	-	e Depot				M.
ata (th	- Fabr	2010									Micro
		uary 2018				igned b	-				Drainac
'ile UNI	IT 7+1	M DEPOT.M	DX			ecked by					
P Solut	tions				Net	work 20	16.1				
200	year	Return Pe	riod S	Summary	of Cri	ltical F	Results	by Maximu	um Level	(Rank	1) for
					<u></u> <u></u>	Existing	1				
					-	ation Cri					
		Areal						.ow - % of			
		IIot		Level (mi)			MADD Fact	tor * 10m ³ /	ha Storage effiecient		
	Ma	nhole Headlo					er Persor				
		Foul Sewage				-	JET TET201	грег вау (т/рет/цау)	0.000	
		f Input Hydr								-	
1	Number	of Online (Control	s 3 Numb	er of St	torage St	ructures	0 Number c	of Real Tir	ne Cont	rols O
				C .	nthotic	Painfal	l Details				
		Rainfall M	odel						Winter) 0.	840	
		Site Loca		D2	(1km) 0	.300	F (1km)	2.496		010	
							(Summer)				
		Margin	for Flo	ood Risk	-				300.0		
				Analy		-	5 Second	Increment			
						tatus			OFF		
				т.,		tatus			ON		
									017		
				⊥r	iertia S	tatus			ON		
				⊥r	iertia S	tatus			ON		
			Profi	lr le(s)	lertia S	tatus		Su	ON mmer and W		
		Duratio		le(s)			180, 240,	Su 360, 480,	mmer and W	Ninter , 960,	
	D		on(s) (le(s) mins) 1			180, 240,	360, 480,	mmer and 1 600, 720,	Vinter , 960, 1440	
	R	eturn Perioo	on(s) (d(s) (y	le(s) mins) 1 ears)			180, 240,	360, 480,	mmer and 0 600, 720, 1, 30, 100	Winter , 960, 1440 0, 200	
	R		on(s) (d(s) (y	le(s) mins) 1 ears)			180, 240,	360, 480,	mmer and 1 600, 720,	Winter , 960, 1440 0, 200	
	R	eturn Perioo	on(s) (d(s) (y	le(s) mins) 1 ears)			180, 240,	360, 480,	mmer and 0 600, 720, 1, 30, 100	Vinter 960, 1440 0, 200 40, 40	
		eturn Perioo Climate	on(s) (d(s) (y e Chang	le(s) mins) 1 ears) e (%)	5, 30,	60, 120,		360, 480,	mmer and T 600, 720, 1, 30, 100 0, 0, 4	Winter , 960, 1440 0, 200 40, 40 Water	
PN	R US/MH Name	eturn Period Climate	on(s) (d(s) (y e Chang Return	le(s) mins) 1 ears)	5, 30, First	60, 120,		360, 480,	mmer and T 600, 720, 1, 30, 100 0, 0, 4	Winter , 960, 1440 0, 200 40, 40 Water	
PN	US/MH Name	eturn Perioo Climate Storm	on(s) (d(s) (y e Chang Return Period	le(s) mins) 1 ears) e (%) Climate Change	5, 30, First Surch	60, 120, t (X) harge	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m)</pre>	Depth (m)
PN E1.000	US/MH Name El	eturn Perioo Climate Storm 15 Winter	on(s) (d(s) (y e Chang Return Period 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40%</pre>	5, 30, First Surch	60, 120, t (X)	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950</pre>	Depth (m) 1.3
PN E1.000 E1.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 600 Winter	on(s) (d(s) (y e Chang Return Period 200 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40%</pre>	5, 30, First Surch 100/15	60, 120, t (X) harge Summer	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831</pre>	Depth (m) 1.3 -0.7
PN E1.000 E1.001 E1.002	US/MH Name E1 E2 E4	eturn Period Climate Storm 15 Winter 600 Winter 960 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40%</pre>	5, 30, First Surch	60, 120, t (X) harge Summer	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792</pre>	Depth (m) 1.3 -0.7 0.1
PN E1.000 E1.001 E1.002 E1.003	US/MH Name E1 E2 E4 E5	eturn Period Climate Storm 15 Winter 600 Winter 960 Winter 120 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40%</pre>	5, 30, First Surch 100/15	60, 120, t (X) harge Summer	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172</pre>	Depth (m) 1.3 -0.7 0.1 -0.3
PN E1.000 E1.001 E1.002 E1.003 E1.004	US/MH Name E1 E2 E4 E5	eturn Period Climate Storm 15 Winter 600 Winter 960 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40%</pre>	5, 30, First Surch 100/15 100/360	60, 120, t (X) harge Summer	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005	US/MH Name E1 E2 E4 E5 E6	eturn Period Climate Storm 15 Winter 600 Winter 960 Winter 120 Winter 120 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40%</pre>	5, 30, First Surch 100/15 100/360 200/15	60, 120, t (X) harge Summer Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000	US/MH Name E1 E2 E4 E5 E6 E7 E8	eturn Period Climate Storm 15 Winter 600 Winter 960 Winter 120 Winter 120 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40%</pre>	5, 30, First Surch 100/15 100/360 200/15	60, 120, t (X) harge Summer Winter Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9	eturn Period Climate Storm 15 Winter 600 Winter 960 Winter 120 Winter 120 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	5, 30, First Surch 100/15 100/360 200/15	60, 120, t (X) harge Summer Winter Winter Summer	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 960 Winter 720 Winter 30 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/360</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.5
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Winter Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.5 0.9 1.3
	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Winter Winter	First (Y)	360, 480, First (Z)	<pre>mmer and 0 600, 720, 1, 30, 100 0, 0, 4 Overflow</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Winter Summer	First (Y) Flood Pipe	360, 480, First (Z)	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act.</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	(m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Summer Overflow	First (Y) Flood Pipe 7 Flow	360, 480, First (Z)	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 720 Winter 30 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Winter Summer	First (Y) Flood Pipe	360, 480, First (Z)	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act.</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15 100/15 100/15</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Summer Overflow	First (Y) Flood Pipe 7 Flow (1/s)	Status	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15 100/15 100/15</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Summer Overflow	First (Y) Flood Pipe Flow (1/s) 2393.8	First (Z) Overflow Status	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15 100/15 100/15 Flow / Cap. 1.18 0.00</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Summer Overflow	First (Y) Flood Pipe 7 Flow (1/s) 2393.8 342.4	Status	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15 100/15 100/15 Flow / Cap. 1.18 0.00 0.03</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Summer Overflow	First (Y) Flood Pipe 7 Flow (1/s) 2393.8 342.4	First (Z) Overflow Status	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.5 0.9 1.3
PN E1.000 E1.001 E1.002 E1.003 E1.004 E1.005 E2.000 E2.001 E2.002 E1.006 E1.007 E1.008	US/MH Name E1 E2 E4 E5 E6 E7 E8 E9 E11 E12 E13 E14	eturn Period Climate Storm 15 Winter 600 Winter 120 Winter 120 Winter 15 Winter	con(s) (d(s) (y e Chang Return Period 200 200 200 200 200 200 200 200 200 20	<pre>le(s) mins) 1 ears) e (%) Climate Change +40% +40% +40% +40% +40% +40% +40% +40%</pre>	<pre>5, 30, First Surch 100/15 100/360 200/15 100/360 100/360 100/30 100/15 100/15 100/15 Flow / Cap. 1.18 0.00</pre>	60, 120, t (X) harge Summer Winter Winter Winter Winter Winter Winter Summer Overflow	First (Y) Flood Pipe 7 Flow (1/s) 2393.8 342.4 20.4	Status SURCHARGED OK SURCHARGED	<pre>mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	<pre>Vinter , 960, 1440 0, 200 40, 40 Water Level (m) 91.950 88.831 88.792 88.172 88.141 88.166 91.076 88.201 88.139 88.261 88.457 88.708</pre>	Depth (m) 1.3 -0.7 0.1 -0.3 -0.2 0.0 1.7 -0.2 0.2 0.2 0.5 0.9 1.3

1.64 0.00

E1.005 E7 0.000 0.40

E8

Е9

0.000

0.000

E2.000

E2.001

375.0 SURCHARGED

OK

4181.0 SURCHARGED

214.3

Hydrock Consultants Ltd		Page 13
•	Rail Central	
	Unit 7 + Train	4
	Maintenance Depot	Micco
Date 6th February 2018	Designed by RJH	
File UNIT 7+TM DEPOT.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	•

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E2.002	E11	0.000	0.04		35.1	SURCHARGED	
E1.006	E12	0.000	0.23		200.2	SURCHARGED	
E1.007	E13	0.000	0.33		266.0	SURCHARGED	
E1.008	E14	0.000	0.34		297.2	SURCHARGED	
E1.009	E15	0.000	0.15		58.6	SURCHARGED	

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Unit 8 + Access Road + Swale	<u> </u>
		Micco
Date 6th February 2018	Designed by RJH	
File Unit 8+Access Road+Swale.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	I

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.181	4-8	3.809	8-12	0.502
Total	Area (Contribu	uting ((ha) = 5	.492

Total Pipe Volume (m³) = 5888.473

Note Nail Central Nail Central Date Date <th>Hydrock Consult</th> <th>ants Lto</th> <th>ł</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Page 2</th> <th></th>	Hydrock Consult	ants Lto	ł										Page 2	
Unit 8 + Access Road + Swale Unit 8 + Access Road + Swale Det 6 th February 2018 Designed by RJ8 Checked by Designed by RJ8 Checked by ZF Solutions Autwrk 2016.1 Designed by RJ8 Checked by Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Notexet 2016.1 Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Notexet 2016.1 Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Notexet 2016.1 Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Notexet 2016.1 Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Notexet 2016.1 Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Notexet 2016.1 Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Designed by RJ8 Checked by Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Designed by RJ8 Checked by Designed by RJ8 Checked by ZF Solutions Designed by RJ8 Checked by Designed by RJ8 Checked by Designed by RJ8 Checked by ZF Solutions Designed b					I	Rail Ce	entra	1						
Date off Packers Road+Swale.NDX Designed by RJH (checked by RF Solutions Designed by RJH (checked by RF Solutions Designed by RJH (checked by RF Solutions Metwork Zol6.1 Designed by RJH (checked by RF Solutions Designed by RJH (checked by RF Solutions Network Zol6.1 Designed by RJH (checked by RF Solutions Network Zol6.1 Designed by RJH (checked by RF Solutions Network Zol6.1 Designed by RJH (checked by RF Solutions Designed by RJH (checked by RF Solutions Designed by RJH (checked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Solutions Designed by RF Rall Slope 1 Acceked by RF Rall Slope 1 Acceked by RF Rall Slope 1 Acceked by RF Rall Slope 1 Accekee by RF Rall Slop									Road	+ Swa	le		Mice	C
Productor induction intervention intervent with the section of the section intervent interven	Date 6th Februa	ry 2018			I	Designe	ed by	RJH						
Existing Network Details for Existing N length Fall Singer Lass T.S. Base k NTD DIA Section Type 23.000 134.000 0.268 500.0 0.345 4.00 0.00 0.600 o 1500 Fig/Conduit 23.001 134.000 0.268 500.0 0.272 0.00 0.00 0.600 o 1500 Fig/Conduit 23.001 134.000 0.268 500.0 0.00 0.00 0.00 0.600 o 1500 Fig/Conduit 23.004 211.000 1.055 200.0 0.000 0.00 0.00 0.000 1200 Fig/Conduit 24.001 78.900 0.158 49.4 1.625 0.00 0.00 0.600 o 1200 Fig/Conduit 24.001 162.000 0.345 0.00 0.00 0.00 0.00 0.00 0.00 1200 Fig/Conduit 24.000 162.000 0.345	File Unit 8+Acc	ess Road	l+Swal	e.MDX	(Checked	d by						Uldli	ldL
PN Length Fail Slope L. Ares T. S. Base k. HXD DLA Section Type C23.000 134.000 0.268 500.0 0.345 4.00 0.00 0.000 0.100 0.100 0.100 0.100 0.000 0.00 0.000 0.100 0.100 0.100 0.100 0.000 0.00 0.000 0.00 0.000 0.00 0.000 0.00 0.000 0.000 0.00 </td <td>XP Solutions</td> <td></td> <td></td> <td></td> <td>1</td> <td>Networ]</td> <td>k 2010</td> <td>6.1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	XP Solutions				1	Networ]	k 2010	6.1						
PN Length Fail Slope L. Ares T. S. Base k. HXD DLA Section Type C23.000 134.000 0.268 500.0 0.345 4.00 0.00 0.000 0.100 0.100 0.100 0.100 0.000 0.00 0.000 0.100 0.100 0.100 0.100 0.000 0.00 0.000 0.00 0.000 0.00 0.000 0.00 0.000 0.000 0.00 </th <th></th>														
<pre> (n) (n) (1:x) (ha) (mins) Flow (1/s) (mm) SECT (mm) E33.000 134.000 0.268 500.0 0.272 0.00 0.00 0.600 o 1500 Pips/Conduit E23.001 134.000 0.268 500.0 0.272 0.00 0.00 0.00 0.600 o 1500 Pips/Conduit E23.003 6.000 0.115 400.0 0.000 0.00 0.00 0.00 0.600 o 1500 Pips/Conduit E23.003 6.000 0.115 400.0 0.000 0.00 0.00 0.00 0.600 v 450 Pips/Conduit E23.004 21.000 1.535 499.4 1.625 5.00 0.00 0.00 0.00 0.00 0.600 v 450 Pips/Conduit E24.000 131.100 0.262 500.4 1.625 0.00 0.00 0.00 0.00 0.600 v 450 Pips/Conduit E24.002 78.000 0.348 499.4 1.625 0.00 0.00 0.00 0.00 0.00 0.600 v 450 Pips/Conduit E24.003 30.500 0.075 406.7 0.000 0.00 0.00 0.00 0.00 0.00 0.00</pre>			<u>Ex</u>	istino	y Netw	ork De	etails	s for	Exist	ting				
E23.001 134.000 0.266 500.0 0.272 0.00 0.0 0.0 0.600 o 1500 Pipe/Conduit E23.003 76.150 0.155 2501.0 0.000 0.00 0.00 0.00 0.600 o 450 Pipe/Conduit E23.004 211.000 1.055 200.0 0.000 0.00 0.0 0.00 0.00 0.00	PN	-		-								Section	Туре	
E23.002 76.150 0.152 501.0 0.000 0.00 0.00 0.0 0.00 0.00 0.0														
E23.003 6.000 0.015 400.0 0.000 0.0														
E23.004 211.000 1.055 200.0 0.000 0.00 0.0 0.000 V -10 Pipe/Conduit E24.000 131.100 0.262 500.4 1.625 0.00 0.0 0.600 o 1200 Pipe/Conduit E24.001 78.900 0.158 499.4 1.625 0.00 0.0 0.600 o 1200 Pipe/Conduit E24.002 162.000 0.324 500.0 1.625 0.00 0.0 0.600 v -10 Pipe/Conduit E24.003 30.500 0.075 406.7 0.000 0.00 0.0 0.600 V -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 V -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 V -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 V -10 Pipe/Conduit E23.001 77.500 0.345 0.0 1.91 3377.8 E23.001 77.500 0.345 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3377.8 E23.003 76.512 0.617 0.0 1.91 3374.4 E23.001 76.299 3.250 0.0 1.67 1883.8 E24.001 76.591 1.625 0.0 1.67 1883.7 E24.001 76.591 1.625 0.0 1.67 1883.7 E24.002 75.11 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, V open channel, oo dual pipe, coo triple pipe, 0 egg. Section conduit Major Minor Side Corner 4*Hyd XSect Number Type Diam. Diam. Slope Spl														
E24.001 78.900 0.158 499.4 1.625 0.00 0.0 0.600 o 1200 Pipe/Conduit E24.003 30.500 0.075 406.7 0.000 0.00 0.00 0.600 (] -2 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 \/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 \/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.0 0.600 \/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.0 0.600 \/ -10 Pipe/Conduit E23.001 77.500 0.345 0.0 1.91 3377.8 E23.001 77.502 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 0.167 1883.8 E24.001 76.299 3.250 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1883.8 E24.003 75.517 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, o dual pipe, coo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table														
E24.001 78.900 0.158 499.4 1.625 0.00 0.0 0.600 o 1200 Pipe/Conduit E24.003 30.500 0.075 406.7 0.000 0.00 0.00 0.600 (] -2 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 \/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 \/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.0 0.600 \/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.0 0.600 \/ -10 Pipe/Conduit E23.001 77.500 0.345 0.0 1.91 3377.8 E23.001 77.502 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 0.167 1883.8 E24.001 76.299 3.250 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1883.8 E24.003 75.517 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, o dual pipe, coo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table												-		
E24.002 162.000 0.324 500.0 1.625 0.00 0.00 0.00 1.00 1.600 [] -2 Pipe/Conduit E24.003 30.500 0.075 406.7 0.000 0.00 0.00 0.0 0.600 v/ -10 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.00 0.0														
E24.003 30.500 0.075 406.7 0.000 0.00 0.0 0.600 o 450 Pipe/Conduit E23.005 84.000 0.420 200.0 0.000 0.00 0.0 0.600 \/ -10 Pipe/Conduit Network Results Table N US/IL E I.Area E Base Vel Cap (m) (ha) Flow (1/s) (m/s) (1/s) E23.000 77.500 0.345 0.0 1.91 3377.8 E23.001 77.232 0.617 0.0 1.91 3374.4 E23.002 76.664 0.617 0.0 1.91 3374.4 E23.002 76.664 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 2.49 1494.8 E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.002 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:-[] box culvert, \/ open channel, oo dual pipe, oo triple pipe, 0 egg. Section conduit Major Minor Side Corner 4Hyd Sect Number Ypp Dimm. Dimor Side Corner 4Hyd Sect Number Ypp Dimm. Siope Splay Radius Area (m) (mm) (Deg) (mm) (m) (m ²)												-		
PN US/LI 2 1. Face 2 Base Vel Cap E23.000 77.500 0.345 0.0 1.91 3377.8 E23.000 77.502 0.617 0.0 1.91 3377.8 E23.000 76.964 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.61 160.7 E24.000 76.561 1.625 0.0 1.67 1883.8 E24.001 76.599 3.250 0.0 1.67 1883.7 E24.002 76.141 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:-[] box culvert, V open channel, oo dual pipe, ooo triple pipe, 0 egg. Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dim., Dim., Slope Splay Radius Ares (m) (m²) Number Type Dim., Dim., Dim., Slope Splay Radius Ares (m) (m²)														
PN US/II E I.Area (m) E Base Flow (l/s) Vel (m/s) Cap (l/s) E23.000 77.500 0.345 0.0 1.91 3377.8 E23.001 77.222 0.617 0.0 1.91 3374.4 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.67 1883.8 E24.000 76.599 3.250 0.0 1.67 1883.8 E24.001 76.599 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols: [] box culvert, \/ open channel, or dual pipe, oor triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table	E23.00	5 84.000	0.420	200.0	0.000	0.00)	0.0	0.600	\/	-10	Pipe/Con	duit	
(m) (ha) Flow (l/s) (m/s) (l/s) E23.000 77.500 0.345 0.0 1.91 3377.8 E23.001 77.232 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.01 160.7 E23.003 76.561 1.625 0.0 1.67 1883.8 E24.000 76.561 1.625 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table					<u>Netwc</u>	ork Res	ults	Table	<u>e</u>					
<pre>E23.000 77.500 0.345 0.0 1.91 3377.8 E23.001 77.232 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 2.49 1494.8 E24.000 76.561 1.625 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 75.817 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>			PN	US/	IL Σ	I.Area	ΣВа	se	Vel	Cap				
E23.001 77.232 0.617 0.0 1.91 3377.8 E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 2.49 1494.8 E24.000 76.561 1.625 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m ²) -2 [] 25000 1200 90.0 2.290 30.000				(1	n)	(ha) 1	Flow (1/s)	(m/s)	(1/s)				
E23.002 76.964 0.617 0.0 1.91 3374.4 E23.003 76.812 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 2.49 1494.8 E24.000 76.561 1.625 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimm. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m ²) -2 [] 25000 1200 90.0 2.290 30.000														
<pre>E23.003 76.812 0.617 0.0 1.01 160.7 E23.004 76.797 0.617 0.0 2.49 1494.8 E24.000 76.561 1.625 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimm. Dimm. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>														
<pre>E23.004 76.797 0.617 0.0 2.49 1494.8 E24.000 76.561 1.625 0.0 1.67 1883.8 E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimm. Dimm. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>														
<pre>E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>								0.0	2.49					
<pre>E24.001 76.299 3.250 0.0 1.67 1885.7 E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>			E24 0		EC1	1 605		0 0	1 67	1002	0			
<pre>E24.002 76.141 4.875 0.0 2.47 74247.9 E24.003 75.817 4.875 0.0 1.00 159.3 E23.005 75.742 5.492 0.0 2.49 1494.8 Conduit Sections for Existing NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>														
E23.005 75.742 5.492 0.0 2.49 1494.8 <u>Conduit Sections for Existing</u> NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table <u>Section Conduit Major Minor Side Corner 4*Hyd XSect</u> <u>Number Type Dimn. Dimn. Slope Splay Radius Area</u> (mm) (mm) (Deg) (mm) (m) (m ²) -2 [] 25000 1200 90.0 2.290 30.000														
Conduit Sections for ExistingNOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg.Section numbers < 0 are taken from user conduit table			E24.0	03 <mark>75</mark> .	817	4.875		0.0	1.00	159.	3			
<pre>NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>			E23.0	05 75.	742	5.492		0.0	2.49	1494.	8			
<pre>conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, O egg. Section numbers < 0 are taken from user conduit table Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m²) -2 [] 25000 1200 90.0 2.290 30.000</pre>				Cond	<u>duit S</u>	Section	<u>ns for</u>	<u>Exi</u>	sting					
Section Conduit Major Minor Side Corner 4*Hyd XSect Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m) (m ²) -2 [] 25000 1200 90.0 2.290 30.000		cond	luits.	These	conduit	ts are m	narked	by th	e symbo	ols:-	[] bo	X		
Number Type Dimn. Dimn. Slope Splay Radius Area (mm) (mm) (Deg) (mm) (m²) -2 [] 25000 1200 90.0 2.290 30.000		S	ection	numbe	rs < 0	are tak	en fro	om use	r condi	uit ta	ble			
					Dimn	. Dimn.	Slope	Spla	y Radi	ius A	rea			
				-	-									

	5 Ltd				1.2					Page 3
					il Cent					
				Un	it 8 +	Access	Road	+ Swal	е	1 m
										Micco
ate 6th February 2	2018			De	signed	by RJH				MICTO
le Unit 8+Access	Road+	Swale	. MDX	Ch	ecked b	V				Draina
Solutions					twork 2					1
		<u> </u>	PIPELI	INE SCH	HEDULES	for Ex	<u>xistir</u>	<u>19</u>		
				<u>Upst</u>	ream Ma	<u>nhole</u>				
PN	Hyd	Diam	мн с.	.Level 1	[.Level [.Depth	м	н м	1H DIAM., L*W	
	Sect	(mm) N	ame	(m)	(m)	(m)	Conne	ction	(mm)	
E23.000	0	1500	E1 8	30.000	77.500	1.000	Open M	lanhole	2400	
E23.001		1500			77.232				2400	
E23.002					76.964					
E23.003		450			76.812					
E23.004	\/	-10	E5 .	78.400	76.797	1.003	Open M	lanhole	1725	
E24.000	0	1200	E6	78.200	76.561	0.439	Open M	lanhole	2100	
E24.001					76.299			lanhole		
E24.002	[]	-2			76.141		-			
E24.003		450			75.817			lanhole	1500	
E23.005		-10	E10	76.700	75.742	0.358	Open M	lanhole	1725	
				Downs	tream M	anhole	<u>.</u>			
PN	Length	Slope	мн	C Level	. I.Level	D Dept	'n	МН	MH DIAM., L	*W
EN	(m)	(1:X)		(m)	(m)	(m)		nection	(mm)	- N
E23.000 1	.34.000	500.0	E2	80.000	77.232	1.26	8 Open	Manhole	24	00
E23.001 1				80.000				Manhole		
E23.002	76.150	501.0	E4	78.400	76.812		-	Manhole		
E23.003	6.000	400.0	E5	78.400	76.797	1.15	3 Open	Manhole	e 17	25
E23.004 2	211.000	200.0	E10	76.700	75.742			Manhole		25
E24.000 1	.31.100	500.4	E7	78.200	76.299	0.70	1 Open	Manhole	21	00
E24.001		499.4	E8	78.200			-	Manhole		
E24.002 1				78.200			-	Manhole		00
E24.003		406.7		76.700				Manhole		25
E23.005	84.000	200.0	E	78.200	75.322	2.27	'8 Open	Manhole	2	0
					fall Det		_			

Outfall Outfall C. Level I. Level Min D,L W Pipe Number Name (m) (m) I. Level (mm) (mm) (m)

E23.005 E 78.200 75.322 0.000 0 0

Simulation Criteria for Existing

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow 0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins)	0	Inlet Coeffiecient 0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day) 0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins) 60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 2 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Return Period (years) 2 Site Location

Hydrock Consultants Ltd		Page 4
	Rail Central Unit 8 + Access Road + Swale	Mirro
Date 6th February 2018	Designed by RJH	— Micro Drainage
File Unit 8+Access Road+Swale.MDX	Checked by Network 2016.1	Brainage
	Network 2010.1	
Synthe	etic Rainfall Details	
D1 (1km) 0.319	E (1km) 0.302 Cv (Summer) 0.750 F (1km) 2.496 Cv (Winter) 0.840 Storms Yes Storm Duration (mins) 30 Storms No	

ayaroc	ск (Jonsi	ı⊥tan	ts Ltd				~	1	1						Pag	е 5	
								ail C nit 8		l cess l	Road	+ S	wale			2	-r	سر
Date 6	Sth	Febr	ruary	2018			De	esign	ed by	RJH							icro caipa	ao
File U	Jnit	t 8+7	Acces	s Road+St	wale.M	DX	Cl	hecke	d by								raina	ye
XP Sol	Lut	ions					Ne	etwor	k 201	6.1								
					<u>0</u>	nline	e Co	ntrol	<u>s for</u>	<u>Exis</u>	<u>ting</u>							
		<u>Hyc</u>	dro-B	<u>rake Opt</u>	imum®	Manh	ole:	E4,	DS/PN	I: E23	.003	, Vc	lume	(m³)	: 13	<u>3.9</u>		
								Refere Head		D-SHE-0	098-5	000-		5000 .500				
						Desi	-	low (l				~		5.0				
								lush-F Object		4inimis	e ups		alcula m stoi					
							Ap	plicat	ion		1 -			face				
						5	-	Availa eter (Yes 98				
						Inv		eter (Level	. ,				76.	.812				
				Minimum		-		,	. ,					150				
				Sugges	sted Mar	nhole	Diam	eter ((mm)				1	L200				
		Con	trol 1	Points	Head	(m)	Flow	(l/s)		Contro	l Poi	nts		Head	(m) F	low	(1/s)	
1	Desi	ign Po	oint (Calculated Flush-Flo		.500 .431		5.0 4.9	Mean	Flow or			-Flo® Range	0.	878 -		3.9 4.3	
	-	-		alculation							-			-		-		
				ied. Shou e storage									га пу	ULO D	Lanc (
utili Depth (ised (m)	l then	(1/s)	e storage	routing	g calc (1/s)	ulati	ions w. h (m)	ill be	inval: (1/s)	idateo D epth	d (m)		(1/s)	Dept	h (m)	Flow	
utili	ised (m) .00	l then	thes	e storage Depth (m) 0.800	routing	f calc	Dept	lons w	ill be Flow	inval	idatec D epth 4.	d	Flow		Dept		Flow	10.
utili Depth (0.1 0.2 0.3	ised (m) 200 200	l then	(1/s) 3.2 4.4 4.8	e storage Depth (m) 0.800 1.000 1.200	routing Flow (g calc (1/s) 4.3 4.1 4.5	Dept	ions w. h (m) 2.000 2.200 2.400	ill be Flow	inval: (1/s) I 5.7 6.0 6.2	idated Depth 4. 4. 5.	(m) .000 .500 .000	Flow	(1/s) 7.9 8.4 8.8	Dept	h (m) 7.000 7.500 8.000	Flow	10. 10. 11.
utili Depth (0.1 0.2 0.3 0.4	ised (m) 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400	routing Flow ())	(l/s) 4.3 4.1 4.5 4.8	Dept	h (m) 2.000 2.200 2.400 2.600	ill be Flow	inval: (1/s) 1 5.7 6.0 6.2 6.5	idated Depth 4. 4. 5. 5.	(m) .000 .500 .000 .500	Flow	(1/s) 7.9 8.4 8.8 9.2	Dept	h (m) 7.000 7.500 8.000 8.500	Flow	10. 10. 11. 11.
utili Depth (0.1 0.2 0.3	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600	routing Flow (g calc (1/s) 4.3 4.1 4.5	Dept	ions w. h (m) 2.000 2.200 2.400	ill be Flow	inval: (1/s) I 5.7 6.0 6.2	idated Depth 4. 4. 5. 5. 6.	(m) .000 .500 .000	Flow	(1/s) 7.9 8.4 8.8	Dept	h (m) 7.000 7.500 8.000	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600	routing Flow ((1/s) 4.3 4.1 4.5 4.8 5.1 5.4	Dept	h (m) 2.000 2.200 2.400 2.600 3.000 3.500	ill be	inval: (1/s) 1 5.7 6.0 6.2 6.5 6.9 7.4	idatec Depth 4. 5. 5. 6. 6.	(m) .000 .500 .000 .500 .000 .500	Flow	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800	routing Flow (g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 <u>Manhc</u> U	Dept	h (m) 2.000 2.200 2.400 2.600 3.000 3.500 E9, 1	Ill be Flow DS/PN Ence M1 (m)	inval: (1/s) 1 5.7 6.0 6.2 6.5 6.9 7.4	idatec Depth 4. 4. 5. 5. 6. 6. .003,	(m) .000 .500 .000 .500 .500 .500	Flow lume 1300-1	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³)	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800	routing Flow (g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 <u>Manhc</u> U	Dept Dept Jnit 1 esign F.	h (m) 2.000 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F	Ill be Flow DS/PN Conce Mi (m) /s) Co™	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0	idatec Depth 4. 4. 5. 6. 6. .003, 183-1	d (m) .500 .500 .500 .500 .500 .750–	Flow	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800	routing Flow (g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 <u>Manhc</u> U	Dept Dept Jnit 1 esign ign F.	<pre>h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object</pre>	Ill be Flow DS/PN Ence Mi (m) ./s) Clo™ Live M	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24.	idatec Depth 4. 4. 5. 5. 6. 6. .003, 183-1	d (m) .500 .500 .500 .500 .500 .750–	Flow	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 1750 17.5 ated cage	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800	routing Flow (g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 <u>Manhc</u> Uesi	Dept	<pre>h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa</pre>	Ill be Flow DS/PN ence Mi (m) /s) lo™ Live N Lion ble	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0	idatec Depth 4. 4. 5. 5. 6. 6. .003, 183-1	d (m) .500 .500 .500 .500 .500 .750–	Flow lume 1300-1 alcula m stor	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800	routing Flow (g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 5.4 <u>Manhc</u> Uesi	Dept Dept Dist Junit 1 Sump J Diamo	h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa eter (<pre>ill be Flow Flow DS/PN ence Mi (m) ./s) lo™ tive N tion ble fmm)</pre>	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0	idatec Depth 4. 4. 5. 5. 6. 6. .003, 183-1	d (m) .500 .500 .500 .500 .500 .750–	Flow lume 1300-1 alcula Surf	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes 183	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800	routing Flow ()) .mum® N	g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 5.4 <u>Manhc</u> Uesi	Dept Dept Dept Diation Diation Diamovert	h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa eter (Level	IDS/PN DS/PN Ence MI (m) ./s) To™ Eive M Eive M Eion ble fmm) (m)	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0	idatec Depth 4. 4. 5. 5. 6. 6. .003, 183-1	d (m) .500 .500 .500 .500 .500 .750–	Flow lume 1300-1 alcula Surf	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	l then	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti	routing Flow ()) .mum® N	g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 Manhc Desi Lesi	Diamovert	h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa eter (Level eter (Ill be Flow Flow DS/PN ence MI (m) ./s) lo™ tive M tion ble mm) (m) mm)	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0	idatec Depth 4. 4. 5. 5. 6. 6. .003, 183-1	d (m) .500 .500 .500 .500 .500 .750–	Flow lume 1300-1 alcula Surf 75.	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes 183 .817	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500	Flow	10. 10. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5	ised (m) 200 200 200 200 200 200	Hyd	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9 4.8 ro-Bi	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti	Cutlet	g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 Manhco Desi Losi Losi Pipe nhole	Diamovert	h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa eter (Level eter (Ill be Flow Flow DS/PN ence MI (m) ./s) lo™ tive M tion ble mm) (m) mm)	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0	idatec Depth 4. 4. 5. 6. 6. .003, 183-1 e ups	d (m) .500 .500 .500 .500 .750- .750- C	Flow lume 1300-1 alcula Surf 75.	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 17.5 ated cage face Yes 183 .817 225 1500	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500 55.8	Flow	10. 10. 11. 11. 11.
utili 0epth (0.1 0.2 0.3 0.4 0.5 0.6	(m) 200 200 800 400 600	then Flow Hyd	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9 4.8 ro-Bi	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti Minimum Sugges	routing Flow ()) .mum® N Outlet sted Mar Head d) 1	g calc (1/s) 4.3 4.1 4.5 4.8 5.1 5.4 Manhco Desi Losi Losi Pipe nhole	Diamovert	<pre>h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa eter (Level eter (Level eter (1/s) 17.5</pre>	<pre>ill be flow flow DS/PN cnce Mi (m) //s) lo™ cion ble cmm) (m) mm)</pre>	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0 4inimis	idated Depth 4. 4. 5. 6. 003, 183-1 183-1 e ups 1 Poi F	(m) .000 .500 .000 .500 .000 .500 .750- C .treat	Flow lume 1300-1 alcula m ston Surf 75.	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes 183 .817 225 1500 Head	Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500 55.8	Flow	10. 10. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5 0.6 1 The h Optim	(m) .000 2000 8000 8000 6000 5000 Des: nydr num@	Hyd Hyd Con ign Po cologi as s	(1/s) 3.2 4.4 4.8 4.9 4.9 4.8 <u>ro-Bi</u> 	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti Minimum Sugges Points Calculated	routing Flow ()) .mum® N .mum® N .mum N	(1/s) 4.3 4.1 4.5 4.8 5.1 5.4 <u>Manhc</u> Uesi Desi S Inv Pipe nhole (m) 300 .390 been cher t	Diame Diame Diame Diame Diame Diame Diame Diame Diame Diame	h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Refere Head low (1 lush-F Object plicat Availa eter (Level eter (17.5 17.5 i on th of con	<pre>ill be Flow Flow DS/PN ence Mi (m) /s) lo™ ive N ion ble fmm) (m) fmm) Mean he Hea trol d</pre>	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0 Ainimis Contro Flow of d/Discher evice of	idated Depth 4. 4. 5. 6. 003, 183-1 183-1 e ups 183-1 r ver He harge other	(m) .000 .500 .000 .500 .000 .500 .750- .750- C treat .nts Kick- ead F relat thar	Flow lume 1300-1 alcula surf 75. Flo® Range	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated rage face Yes 183 .817 225 1500 Head 0. hip f	(m) F 864 or the	h (m) 7.000 7.500 8.000 9.000 9.500 55.8	Flow (1/s) 14.4 15.0 ro-Bra	10. 10. 11. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5 0.6 The h Optim utili	(m) .000 2000 8000 8000 6000 6000 6000 5000 Des: hydr num@ ised	Enterna the flow flow flow flow flow flow flow flow	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9 4.8 ro-Bi 	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti Cake Opti Minimum Sugges Points Calculated Flush-Flo alculation ied. Shou	routing Flow ()) .mum® N .mum® N .mum N	(1/s) 4.3 4.1 4.5 4.8 5.1 5.4 Manhc Uesi Desi S Inv Pipe nhole (m) 300 .390 been calc	Diamovert Spiece	<pre>h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Referee Head low (1 lush-F Object plicat Availa eter (Level eter ((1/s) 17.5 17.5 i on th of contions with </pre>	<pre>ill be Flow Flow DS/PN ence Mi (m) //s) 'lo™ iive N iion ble fmm) (m) fmm) mm) Mean he Hea trol d ill be</pre>	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0 Ainimis Contro Flow of d/Discher evice of inval:	idated Depth 4. 4. 5. 6. 003, 183-1 e ups l Poi ver He harge other idated	d (m) .000 .500 .000 .500 .000 .500 .750- .750- C treat .nts Kick- ead F relat thar d	Flow lume 1300-1 alcula m ston Surf 75. 75. 75. 2 Flo® Range	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes 183 .817 225 1500 Head 0. hip fd dro-B	(m) F 864 - or the rake (h (m) 7.000 7.500 8.000 8.500 9.000 9.500 55.8	Flow (1/s) 14.4 15.0 ro-Bra um® be	10. 10. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5 0.6 The h Optim utili	(m) .000 2000 3000 4000 5000 5000 5000 5000 5000 5000 (m)	Enterna the flow flow flow flow flow flow flow flow	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9 4.8 ro-Bi 	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti Cake Opti Calculated Flush-Flo alculation ied. Shou e storage	routing Flow ()) .mum® M .mum® M .mum® M .mum® M .num® M .num	(1/s) 4.3 4.1 4.5 4.8 5.1 5.4 Manhc Uesi Desi S Inv Pipe nhole (m) 300 .390 been calc	Diamo Diamo Flow	<pre>h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Referee Head low (1 lush-F Object plicat Availa eter (Level eter ((1/s) 17.5 17.5 i on th of contions with </pre>	<pre>ill be Flow Flow DS/PN ence Mi (m) //s) 'lo™ iive N iion ble fmm) (m) fmm) mm) Mean he Hea trol d ill be</pre>	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0 Ainimis Contro Flow of d/Discher evice of inval:	idated Depth 4. 4. 5. 6. 6. 183-1 e ups l Poi ver He barge other idated Depth	d (m) .000 .500 .000 .500 .000 .500 .750- .750- C treat .nts Kick- ead F relat thar d	Flow lume 1300-1 alcula m ston Surf 75. 75. 75. 2 Flo® Range	(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m ³) 1750 .300 17.5 ated cage face Yes 183 .817 225 1500 Head 0. hip fd dro-B	Dept : 445 (m) F 864 - or the rake (Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500 55.8	Flow (1/s) 14.4 15.0 ro-Bra um® be Flow	10. 10. 11. 11. 11. 11.
utili Depth (0.1 0.2 0.3 0.4 0.5 0.6 The h Optim utili Depth (ised (m) 200 300 400 500 500 500 500 500 500 500 500 5	Enterna the flow flow flow flow flow flow flow flow	(1/s) 3.2 4.4 4.8 4.9 4.9 4.9 4.8 mo-Bi (1/s)	e storage Depth (m) 0.800 1.000 1.200 1.400 1.600 1.800 cake Opti Cake Opti Calculated Flush-Flo alculation ied. Shou e storage Depth (m) 0.400 0.500	routing Flow ()) .mum® M .mum® M .mum M .mu	<pre>(1/s) 4.3 4.1 4.5 4.8 5.1 5.4 Manhc Ue Desi Ue Inv Pipe hhole (m) 300 .390 been her t calc (1/s)</pre>	Diamo basec plet Junit 1 esign ign F. Diamo Diamo Flow basec ulati Dept	<pre>h (m) 2.000 2.200 2.200 2.400 2.600 3.000 3.500 E9, 1 Referee Head low (1 lush-F Object low (1 lush-F Object Availa eter (Level eter ((1/s) 17.5 17.5 i on tl of con ions w. h (m)</pre>	<pre>ill be Flow Flow DS/PN ence Mi (m) //s) 'lo™ iive N iion ble fmm) (m) fmm) mm) Mean he Hea trol d ill be</pre>	inval: (1/s) I 5.7 6.0 6.2 6.5 6.9 7.4 : E24. D-SHE-0 4inimis Contro Flow ov d/Discher evice of inval: (1/s) I	idated Depth 4. 4. 5. 5. 6. 6. 183-1 183-1 183-1 e ups 183-1 r ver He barge other idated Depth 1. 1.	d (m) .000 .500 .000 .500 .750- .750- .750- .c. treat .nts Kick- ead F relathar d (m)	Flow lume 1300-1 alcula m ston Surf 75. 75. 75. 2 Flo® Range	<pre>(1/s) 7.9 8.4 8.8 9.2 9.6 10.0 (m³) 1750 .300 17.5 ated cage face Yes 183 .817 225 1500 Head 0. hip fi dro-B (1/s)</pre>	Dept : 445 (m) F 864 - or the rake (Dept	h (m) 7.000 7.500 8.000 8.500 9.000 9.500 55.8 10w h (m)	Flow (1/s) 14.4 15.0 ro-Bra um® be Flow	10. 10. 11. 11. 11. 11. 11.

Hydrock Consultants Ltd		Page 6
•	Rail Central	
	Unit 8 + Access Road + Swale	Mar m
•		Mirro
Date 6th February 2018	Designed by RJH	Desinado
File Unit 8+Access Road+Swale.MDX	Checked by	Dialitaye
XP Solutions	Network 2016.1	

Hydro-Brake Optimum® Manhole: E9, DS/PN: E24.003, Volume (m³): 4455.8

Depth ((m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)
2.6	600		24.4	4	.000		29.9	5	.500		34.9	7.	.000		39.2	8.	500		43.1
3.0	000		26.1	4	.500		31.7	6	.000		36.4	7	.500		40.6	9.	000		44.3
3.5	500		28.1	5	.000		33.3	6	.500		37.9	8	.000		41.9	9.	500		45.5

Hydrock Con	sultan	ts Ltd						Pa	ge 7
•				Ra	il Central				5
				Un	it 8 + Acce	ess Road +	Swale	7	٦.
									Vicco
Date 6th Fe	bruary	2018		De	signed by H	RJH			
File Unit 8	+Acces	s Road+S	wale.MDX	Ch	ecked by				Drainage
XP Solution	IS			Ne	twork 2016	.1			
<u>1 year Ret</u>	urn Per	ciod Summ	mary of C	ritica	l Results b	y Maximum	Level (Ra	<u>nk 1) fo</u>	r Existind
				Simu	lation Criter	ia			
				ctor 1.0	000 Additic	nal Flow -			
			t Start (m art Level		0 MAE		10m³/ha Stor et Coeffieci	2	
	Manhole				500 Flow per				
	Foul S	Sewage per	hectare (l/s) 0.0	000				
Number	of Inpu	it Hydrogra	aphs 0 N	umber of	f Offline Con	trols 0 Num	ber of Time/	Area Diagi	ams 0
					Storage Struc				
			c	Sunthati	<u>c Rainfall D</u> e	ataile			
	Rain	fall Model	FEH D1	(1km)	0.319 E	(1km) 0.302	Cv (Winter)	0.840	
	Site	e Location			0.300 F				
		C (1km)	-0.026 D3	3 (1km)	0.243 Cv (Su	nmer) 0.750			
		Margin	for Flood	Risk War	ning (mm) 30	0.0 DVD	Status OFF		
				-	Timestep F		Status OFF		
				L	DTS Status	ON			
		_							
	I		ofile(s)) (mins)	15, 30,	60, 120, 180	. 240, 360,	Summer an 480, 600, 7		
			, (,	, _,	,,	, , , , , , , , , , , , , , , , , ,	,,	1440	
		Period(s) Climate Ch	-					100, 200, 40, 40	
	(JIIIIate CII	alige (%)				0,0	, 40, 40	
									••• • • • •
	US/MH		Return Cl	imate	First (X)	First (Y)	First (Z)	Overflow	Water Level
PN	Name	Storm	Period Ch	nange	Surcharge	Flood	Overflow	Act.	(m)
E23.000	E1	15 Winter	1	+0%					77.626
E23.001	E2	15 Winter		+0%					77.396
E23.002		20 Winter		+0%					77.324
E23.003		20 Winter		+0%	1/15 Winter				77.324
E23.004	E5	60 Winter		+0%	20/15 2	000/15			76.803
E24.000	E6	15 Winter			00/15 Summer	200/15 Wint	er		76.856
E24.001		15 Winter 15 Winter			00/15 Summer				76.689
E24.002 E24.003		500 Winter		+0% +0% (30/30 Winter				76.164 76.150
E24.005		500 Winter		+0% . +0%	50/30 WINCEL				75.768
		s	Surcharged	Flooded		Pipe			
		US/MH	Depth	Volume	Flow / Over	flow Flow		Level	
	PN	Name	(m)	(m³)	Cap. (1/	's) (l/s)	Status E	xceeded	
	E23.00	00 E1	-1.374	0.000	0.02	50.3	OK		
	E23.00		-1.336	0.000		73.0	OK		
	E23.00		-1.140	0.000	0.01	15.8	OK		
	E23.00	D3 E4	0.062	0.000	0.04	4.9	SURCHARGED		
	E23.00	04 E5	-0.594	0.000	0.00	4.9	OK		
	E24.00	DO E6	-0.905	0.000	0.12	202.7	OK	1	
	E24.00	D1 E7	-0.810	0.000	0.23	362.2	OK		
	E24.00	D2 E8	-1.177	0.000	0.01	507.5	OK		
	E24.00	D3 E9	-0.117	0.000	0.13	17.4	OK		
	E23.00	05 E10	-0.574	0.000	0.02	22.3	OK		

Hydrock Cor	sultant	s Ltd							Pa	ge 8
•				R	ail Cent	ral			ſ	
				U	nit 8 +	Access	s Road +	Swale		
										Micco
Date 6th Fe	ebruary	2018		D	esigned	by RJH	H			
File Unit 8	8+Access	Road+St	wale.MD>	K C	hecked b	ру				Drainage
XP Solutior	IS			N	letwork 2	2016.1				
<u>30 year Ret</u>	urn Per	iod Sum	mary of		cal Resul			n Level (Ra	ank 1) fo	or Existing
		Ho Hot St	t Start (art Level Coeff (Gl	Cactor 1 mins) (mm) .obal) 0	.000 Add 0 0 .500 Flow	ditiona MADD 1	l Flow - Factor * Inl	% of Total F 10m³/ha Stor et Coeffieci Day (l/per/d	age 2.000 ent 0.800	
	-		-					ber of Time/ ber of Real	-	
	Rainfa Site			D1 (1km) D2 (1km)	<u>cic Rainfa</u> 0.319 0.300 0.243 Cv	E (1k F (1k	um) 0.302 um) 2.496	Cv (Winter)	0.840	
		Margin	for Flood		-	ep Fine	e Inertia	Status OFF Status OFF		
	Return 1		(years)	15, 30	, 60, 120	, 180, 1	240, 360,			
	US/MH		Return C	Climate	First ()	X)	First (Y)	First (Z)	Overflow	Water Level
PN	Name	Storm	Period	Change	Surchar	ge	Flood	Overflow	Act.	(m)
E23.000	E1 1	L5 Winter	30	+0%						77.727
E23.001		10 Winter		+0%						77.673
E23.002 E23.003		10 Winter 10 Winter	30 30	+0% +0%	1/15 Wi	nter				77.674 77.674
E23.004		00 Winter		+0%	_,					76.803
E24.000		L5 Winter			100/15 Su		0/15 Wint	er		77.178
E24.001		15 Winter			100/15 Su	mmer				77.067
E24.002 E24.003		20 Winter 20 Winter		+0응 +0응	30/30 Wi	nter				76.434 76.434
E23.005		50 Winter		+0%	00,00					75.768
		S	urcharged	Flooded	d		Pipe			
		US/MH	Depth		Flow /				Level	
	PN	Name	(m)	(m³)	Cap.	(1/s)	(1/s)	Status H	Exceeded	
	E23.000	E1	-1.273	0.00	0 0.05		148.2	OK		
	E23.001		-1.059				36.1	OK		
	E23.002		-0.790				16.9	OK		
	E23.003		0.412					SURCHARGED		
	E23.004		-0.594				4.9 632 4	OK	1	
	E24.000 E24.001		-0.583				632.4 1148.9	OK OK	1	
	E24.001 E24.002		-0.432				126.6	OK		
	E24.003		0.167					SURCHARGED		
	E23.005	E10	-0.574	0.000	0 0.02		22.3	OK		
1										

	<u> </u>								
Hydrock Con	sultant	s Ltd						Pa	ge 9
•					ail Centra				
•				U	nit 8 + Ac	cess Road +	- Swale		1
•									Micco
Date 6th Fe	bruary	2018		De	esigned by	RJH			Micio
File Unit 8	_		wale MDX		hecked by				Drainage
XP Solution		Rouard	ware.nibz		etwork 201	E 1			<u> </u>
XP SOLUCION	.5			ING	etwork 201	0.1			
100 100	r Potur	n Borio	d Gumma	ru of C	ritical Po	culte by M	aximum Leve	l (Papk	1) for
100 yea	I Ketui	II FELIO		IY OI C	<u>Existinq</u>	SUILS DY MA	AXIIIUIII LEVE	I (NAIIK	1) 101
					EXISCING				
				Gimi	lation Crite	orio			
		Areal Re	duction R				% of Total F	10w 0 000	
							10m ³ /ha Stora		
			art Level				et Coeffiecie	-	
	Manhole H	Headloss	Coeff (Gl	Lobal) 0.	500 Flow pe	r Person per	Day (l/per/da	ay) 0.000	
	Foul Se	ewage per	hectare	(l/s) 0.	.000				
							ber of Time/		
Numb	er of Onl	ine Cont	rols 2 Nu	umber of	Storage Stru	uctures 0 Num	ber of Real	Time Cont:	rols O
				Sunthot	ic Rainfall	Detaile			
	Rainf	all Model	няя				Cv (Winter)	0.840	
	Site	Location		D2 (1km)	0.300 F	' (1km) 2.496	J. (MINCCI)	2.010	
	00					(1944) 2.150 (ummer) 0.750			
		Margin	for Flood			300.0 DVE			
				Analysi	s Timestep	Fine Inertia	Status OFF		
					DTS Status	ON			
		Dr	ofile(s)				Summer an	d Wintor	
	Dı		. ,		60, 120, 1	80. 240. 360.	480, 600, 7		
	DI) (111113)	10, 30,	, 00, 120, 1	00, 240, 300,	400, 000, 7	1440	
	Return H	Period(s)	(vears)				1, 30,	100, 200	
		limate Ch	· _ ·					, 40, 40	
			-						
			Deturn	71:	Direct (V)	Timet (V)	Dimet (D)	0 £1	Water
PN	US/MH Name	Storm	Return (Period		First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Act.	Level (m)
EN	Name	SCOTI	Ferrou	change	Surcharge	F1000	Overiiow	ACC.	(111)
E23.000	E1 36	50 Winter	100	+40%					78.133
E23.001	E2 36	50 Winter	100	+40%					78.133
E23.002		50 Winter	100	+40%					78.133
E23.003		0 Winter	100	+40%	1/15 Winte:	r			78.133
E23.004		0 Winter	100	+40%					76.803
E24.000		.5 Winter	100			r 200/15 Wint	er		77.896
E24.001		5 Winter	100		100/15 Summe:	r			77.705
E24.002 E24.003		50 Winter 50 Winter	100 100	+40응 +40응	30/30 Winte:	r			76.912 76.912
E24.003 E23.005		50 Winter 50 Winter	100	+40% +40%	SU/SU WINCE.	L			75.768
120.000	110 90	o wincer	100	1 10 0					, . , . ,
		S	urcharged	l Flooded	L	Pipe			
		US/MH	Depth		Flow / Ove:	-		Level	
	PN	Name	- (m)	(m³)	Cap. (1	/s) (l/s)	Status E	xceeded	
	E23.000		-0.867			32.1	OK		
	E23.001		-0.599			39.1	OK		
	E23.002		-0.331			16.9	OK		
	E23.003		0.871				FLOOD RISK		
	E23.004 E24.000		-0.594			4.9 1320 3	OK SURCHARGED	1	
	E24.000 E24.001		0.135				SURCHARGED SURCHARGED	Ţ	
	E24.001 E24.002		-0.429			181.8	OK		
	E24.003		0.645				SURCHARGED		
	E23.005		-0.574			22.3	OK		

Hydrock Con	sultants	3 Ltd							Pa	ige 10
•	_			Ra	ail Cent	ral	_		1	,]
•				Ur	nit 8 + .	Access I	Road +	Swale		L.
• Date 6th Fe	bruarv 3	2018		De	esigned	bv RJH				Micro
File Unit 8	-		wale.MDX		hecked b	-				Drainage
XP Solution					etwork 2	-				
<u>200 yea</u>	<u>r Return</u>	<u>n Perio</u>	<u>d Summar</u>	y of C:	<u>ritical</u> <u>Existin</u>		by Ma	aximum Leve	el (Rank	<u>1) for</u>
						9				
		Arcal Bo	duction E		ulation Cr		21 011	° of Total T	1	
			duction Fa t Start (m					% of Total F 10m³/ha Stor		
			art Level	,				et Coeffieci	2	
1		eadloss (Coeff (Glo	obal) 0.	500 Flow	per Perso	on per	Day (l/per/d	ay) 0.000	
	Foul Se	wage per	hectare ((l/s) 0.	000					
Number	of Input	Hydrogra	aphs 0 1	Number o	of Offline	Controls	o Num	ber of Time/	Area Diag	rams O
								ber of Real		
				Court + 1			~			
	Rainfa	ll Model			ic Rainfal 0.319		_	Cv (Winter)	0.840	
		Location	D	2 (1km)	0.300	F (1km)	2.496			
		C (1km)	-0.026 D	3 (1km)	0.243 Cv	(Summer)	0.750			
		Manaria	for Flood	Diel We	en in a land	> 200 0		Chatwa OFF		
		margin :			-			Status OFF Status OFF		
				-	DTS Statu	-				
		Pr	ofile(s)					Summer an	d Winter	
	Du		. ,	15, 30,	, 60, 120,	180, 240), 360,	480, 600, 7		
									1440	
		eriod(s)	· _ ·						100, 200	
	CI	imate Cha	ange (≷)					υ, Ο	, 40, 40	
										Water
	US/MH		Return Cl		First (X		rst (Y)		Overflow	Level
PN	Name	Storm	Period C	hange	Surcharg	e 1	Flood	Overflow	Act.	(m)
E23.000		0 Winter	200	+40%						78.343
E23.001		0 Winter	200	+40%						78.343
E23.002 E23.003		0 Winter 0 Winter	200 200	+40응 +40응	1/15 Win	ter				78.343 78.342
E23.004		0 Winter	200	+40%	_, <u>_</u> 0 , <u>,</u> _11					76.803
E24.000	E6 1	5 Winter	200	+40% 1	L00/15 Sum		15 Wint	er		78.212
E24.001		5 Winter	200		L00/15 Sum	mer				77.946
E24.002		0 Winter	200	+40% +40%	30/20 54-	tor				77.113
E24.003 E23.005		0 Winter 0 Winter	200 200	+40% +40%	30/30 Win	ller				77.112 75.768
123.003		- "THCCT	200	. 10.0						, . , , , , , , , , , , , , , , , , , ,
		Sı US/MH	urcharged Depth		l Flow / O	worflow	Pipe Flow		Level	
	PN	Name	(m)	(m ³)	Flow / C Cap.	(1/s)	flow (1/s)	Status I	Level Exceeded	
					-	= /				
	E23.000	E1	-0.657	0.000			38.2	OK		
	E23.001 E23.002	E2 E3	-0.389 -0.121	0.000 0.000			45.1 18.8	OK OK		
	E23.002	ES E4	1.080	0.000				FLOOD RISK		
	E23.004	E5	-0.594	0.000			5.0	OK		
	E24.000	E6	0.451	11.999	1.00		1669.5	FLOOD	1	
	E24.001		0.447	0.000				FLOOD RISK		
	E24.002	E8 F9	-0.228	0.000			210.6	OK		
	E24.003 E23.005		0.845	0.000				SURCHARGED OK		
		210	0.0/1	0.000	0.02		22.7	010		
	E23.005	E10	-0.574	0.000	0.02		22.4	OK		

Hydrock Consultants Ltd		Page 1
•	Rail Central	
•	Units 9 + 10 + Truck Park	
		Micro
Date 6th February 2018	Designed by RJH	
File Units 9 + 10 + Truck Park.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

Time Area Diagram for Existing

Time
(mins)Area
(ha)Time
(mins)Area
(mins)Time
(ha)Area
(mins)Area
(ha)0-41.7114-89.5578-125.415TotalAreaContributing
(ha)= 16.683

Total Pipe Volume $(m^3) = 5338.650$

Hydrock Consult	ants Lt	d								Page 2
•					ail Cer					
					Jnits 9	4				
										Micco
Date 6th February 2018					esigne					
File Units 9 + 10 + Truck Park.MDX					checked	Drainage				
XP Solutions				N	letwork	2016.1				
Existing Network Details for Existing										
PN	Length	Fall	Slope	I.Area	a T.E.	Base	k	HYD	DIA	Section Type
	(m)	(m)	(1:X)	(ha)	(mins)	Flow (l/s)	(mm)	SECT	(mm)	
E25.000	120.900	0.242	499.6	2.890	4.00	0.0	0.600	0	1500	Pipe/Conduit
	54.000						0.600			Pipe/Conduit
706.000	100 000	0 076	F 0 0 0	0 000		0.0	0 600		1 5 0 0	
E26.000	138.000	0.276	500.0	2.890	5.00	0.0	0.600	0	1500	Pipe/Conduit
E25.002	52.600	0.105	501.0	0.000	0.00	0.0	0.600	0	1500	Pipe/Conduit
	95.000			2.273			0.600	[]		Pipe/Conduit
E27.001	50.800	0.266	191.0	0.000	0.00	0.0	0.600	0	450	Pipe/Conduit
E25.003	360.500	0.360	1001.4	0.000	0.00	0.0	0.600	$\backslash/$	-12	Pipe/Conduit
	149.700						0.600			Pipe/Conduit
E28.001	42.500	0.216	196.8	0.000	0.00	0.0	0.600	0	1500	Pipe/Conduit
E29.000	107.500	0.375	286.7	1.435	5.00	0.0	0.600	0	1500	Pipe/Conduit
	105.900						0.600			Pipe/Conduit
	102.400						0.600			Pipe/Conduit
	79.100					0.0	0.600	0	1500	Pipe/Conduit
	36.600						0.600			Pipe/Conduit
E25.004	72.000	0 072	1000 0	0.000	0.00	0 0	0.600	\ /	-12	Pipe/Conduit
E25.004							0.600			Pipe/Conduit
E2J.00J	JT. J00	0.019	550.7	0.000	, 0.00	0.0	0.000	0	-50	

Network Results Table

PN			Σ Base Flow (l/s)		
		2.890 2.890	0.0		
E26.000	75.786	2.890	0.0	1.91	3377.8
E25.002	75.510	5.780	0.0	1.91	3374.5
		2.273 2.273			58988.6 233.4
E25.003	75.405	8.053	0.0	1.80	5386.9
		2.890 2.890	0.0		
E29.001 E29.002	75.693 75.481	1.435 2.870 4.305	0.0	1.91 1.91	3379.4
E29.003 E29.004		5.740 5.740			3375.6 3373.1
E25.004 E25.005		16.683 16.683	0.0		5390.7 160.9

Hydrock Consultants Ltd								Page 3
Rail Central								
				9 + 10	4			
								Micco
Date 6th February 2018	D	esigne	ed by					
File Units 9 + 10 + Truck Pa	C	hecked	d by	Drainage				
P Solutions Network 2016.1								
NOTE: Diamete: conduits. culvert, \/	rs less These co open cha	than 6 onduits annel,	6 refei s are m oo dua	r to se arked l pipe	by the , ooo t	numbers symbols riple p	:- [] box ipe, 0 egg.	
Section	numbers	s < 0 a	are tak	en fro	m user	conduit	table	
Section Number	Conduit Type		Dimn.		Splay	4*Hyd Radius (m)		
-11	[]	20000	1200	90.0		2.264	24.000	
-12		3000	1000	90.0		2.400	3.000	

Hydrock Consultants	Ltd				Page 4	ł
•			Rail Cent	ral		
			Units 9 +	10 + Truck Park		_
					Mico	Jun
Date 6th February 20	18		Designed b	oy RJH		
File Units 9 + 10 +	Truck Pa	ark.MDX	Checked by	y	Ulai	nage
XP Solutions			Network 20			
		PIPELINE	SCHEDULES	for Existing		
				<u></u>		
		U	<u>pstream Ma</u>	nhole		
PN	Hyd Diam	MH C.Leve	el I.Level D	.Depth MH MI	I DIAM., L*W	
	Sect (mm)	Name (m)	(m)	(m) Connection	(mm)	
E25.000	o 1500	F1 79 20	00 75.860	0.840 Open Manhole	2400	
E25.000			00 75.618	-	2400	
220.001	0 2000				2100	
E26.000	o 1500	E3 78.20	00 75.786	0.914 Open Manhole	2400	
E25.002	o 1500	E3 78.20	00 75.510	1.190 Open Manhole	2400	
E27.000	[] -11	E4 78.20	00 76.561	0.439 Open Manhole	20725	
E27.001	o 450		00 76.371	1.379 Open Manhole		
E25.003	\/ -12	E6 78.10	00 75.405	1.695 Open Manhole	1725	
E28.000	o 1500	F8 78 20	00 75.560	1.140 Open Manhole	2400	
E28.001			00 75.261	1.439 Open Manhole	2400	
				1		
E29.000			00 75.761		2400	
			00 75.693		2400	
			00 75.481 00 75.276	1.219 Open Manhole 1.424 Open Manhole	2400 2400	
		E14 78.20		1.582 Open Manhole	2400	
E25.004			45 75.045	-	1725	
E25.005	0 450	EII /6./(00 74.088	2.162 Open Manhole	1500	
		Do	wnstream Ma	anhole		
		<u></u>				
PN Le	ength Slo	pe MH C.L	evel I.Level	D.Depth MH	MH DIAM., L*W	
	-	-	m) (m)	(m) Connection	(mm)	
E25.000 12 E25.001 5				-		
E23.001 3	4.000 500	J.U ES /0	.200 75.510	1.190 Open Mannore	2400	
E26.000 13	8.000 500	D.O E3 78	.200 75.510) 1.190 Open Manhole	2400	
E25.002 5	2.600 503	1.0 E6 <mark>78</mark>	.100 75.405	5 1.195 Open Manhole	1725	
E27.000 9	5 000 500	D.O E5 78	.200 76.371	0.629 Open Manhole	1500	
E27.000 5				-		
E25.003 36	0.500 1003	1.4 E10 77	.745 75.045	5 1.700 Open Manhole	1725	
E20.000.14	0 700 500		200 75 261	1 420 Open Merhele	2400	
E28.000 14 E28.001 4			.200 75.261 .745 75.045	-		
120.001 1				1.200 open namore	1,20	
E29.000 10			.200 75.386	-		
E29.001 10			.200 75.481			
E29.002 10				-		
E29.003 7			.200 75.118	-		
E29.004 3	0.000 30.	1.4 E10 <mark>77</mark>	.745 75.045	5 1.200 Open Manhole	1725	
E25.004 7	2.000 1000	D.O E11 76	.700 74.973	0.727 Open Manhole	1500	
E25.005 3			.500 74.009	-	0	

lydrock	Consul	tants	Ltd									Page	5
						Rail C	entral	1					
						Units	9 + 10) + Truo	ck Par	k		4	~
												Mir	
Date 6th	Febru	ary 20	18			Design	ed by	RJH					
Tile Uni	ts 9 +	10 +	Truck	Park.M	IDX	Checke	d by					DIC	ainage
KP Solut	ions					Networ	k 2016	5.1					
				-	Area S	ummary	<u>for E</u>	lxistinc	1				
			Pipe	PIMP	PIMP P	IMP G	coss	Imp.	Pipe	Total			
			-					Area (ha	-	a)			
			25.00		_	100	2.890	2.89	0	2.890			
			25.00			100	0.000	0.00		0.000			
			26.00			100	2.890	2.89		2.890			
			25.00			100	0.000	0.00		0.000			
			27.00 27.00			100 100	2.273	2.27		2.273 0.000			
			25.00			100	0.000	0.00		0.000			
			28.00			100	2.890	2.89		2.890			
			28.00 29.00			100 100	0.000	0.00		0.000 1.435			
			29.00			100	1.435			1.435			
			29.00	2 -	-	100	1.435	1.43	5	1.435			
			29.00			100	1.435			1.435			
			29.00 25.00			100 100	0.000	0.00		0.000			
			25.00			100	0.000	0.00		0.000			
							Total			Total			
						-	L6.683	16.68	3 I	6.683			
			Sı	urchar	ged Ou	tfall	Detail	s for E	Existin	ng			
			Outfa			C. Level							
			Pipe Nu	mbor	Namo								
			TTPe No	linder	name	(m)	(m)		evel (m	m) (mm)			
			Tipe no	niber	Name	(m)	(m)	I. Le (m	-	m) (mm)			
			-	.005	E	(m) 75.500		(m	-	m) (mm) 0 0			
			-	5.005	E	75.500	74.0	(m	. 000				
			-	5.005	E	75.500	74.0	(m 009 0	. 000				
Time	Depth	Time	E25	5.005	E atum (m	75.500	74.0 Offset	(m 009 0 : (mins)	. 000			Time	Depth
Time (mins)	Depth (m)	Time (mins)	-	5.005 D	E	75.500 a) 0.000	74.0	(m 009 0 : (mins)	. 000	0 0	Depth (m)	Time (mins)	Depth (m)
(mins)	(m)	(mins)	E25 Depth (m)	D D Time (mins)	E atum (m Depth (m)	75.500) 0.000 Time (mins)	74.(Offset Depth (m)	(m 009 0 : (mins) Time (mins)) .000 0 Depth (m)	0 0 Time (mins)	Depth (m)	(mins)	(m)
(mins) 1	-	(mins) 26	E25 Depth (m) 74.770	.005 D Time (mins) 51	E atum (m Depth	75.500) 0.000 Time (mins) 76	74.(Offset Depth (m) 74.770	(m 009 0 : (mins) Time (mins)) 101	 .000 0 Depth 	0 0 Time (mins) 126	Depth	(mins) 151	-
(mins) 1 2 3	(m) 74.770 74.770 74.770	(mins) 26 27 28	E25 Depth (m) 74.770 74.770 74.770	.005 D Time (mins) 51 52 53	E Depth (m) 74.770 74.770 74.770	75.500) 0.000 Time (mins) 76 77 78	74.0 Offset Depth (m) 74.770 74.770 74.770	(m 009 0 c (mins) Time (mins) 101 102 103	<pre>) .000 0 Depth (m) 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128	Depth (m) 74.770 74.770 74.770	(mins) 151 152 153	(m) 74.770 74.770 74.770
(mins) 1 2 3 4	(m) 74.770 74.770 74.770 74.770	(mins) 26 27 28 29	E25 Depth (m) 74.770 74.770 74.770 74.770	.005 D Time (mins) 51 52 53 54	E Depth (m) 74.770 74.770 74.770 74.770 74.770	75.500) 0.000 Time (mins) 76 77 78 79	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770	(m 009 0 c (mins)) Time (mins)) 101 0 102 0 103 0 104	<pre>) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129	Depth (m) 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154	(m) 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5	(m) 74.770 74.770 74.770	(mins) 26 27 28 29 30	E25 Depth (m) 74.770 74.770 74.770	.005 D Time (mins) 51 52 53 54 55	E Depth (m) 74.770 74.770 74.770	75.500) 0.000 Time (mins) 76 77 78 79 80	74.0 Offset Depth (m) 74.770 74.770 74.770	(m 009 0 c (mins)) 101 0 102 0 103 0 104 0 105	<pre>) .000 0 Depth (m) 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130	Depth (m) 74.770 74.770 74.770	(mins) 151 152 153 154 155	(m) 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500) 0.000 Time (mins) 76 77 78 79 80 81 82	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 c (mins)) 101 0 102 0 103 0 104 0 105 0 106 0 107	<pre>) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500) 0.000 Time (mins) 76 77 78 79 80 81 82 83	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) 101 102 103 104 105 106 106 107 108	<pre>) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) 101 102 103 104 105 106 107 108 109	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9 10	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500) 0.000 Time (mins) 76 77 78 79 80 81 82 83 84 85	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) 101 102 103 104 105 106 106 107 108 109 110	<pre>) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) 101 102 103 104 105 106 107 108 109 100 109 110 111 122	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 106 106 107 108 109 100 109 110 111 112 113	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 106 107 108 109 100 109 100 101 102 103 104 105 106 107 108 109 109 101 102 103 104 105 109 101 102 103 104 105 109 109 100 101 102 103 104 105 109 100 101 102 103 104 105 109 100 101 102 103 104 105 109 100 101 102 103 104 105 109 100 107 108 109 109 100 100 100 107 108 109 101 109 101 109 101 102 103 104 105 106 109 101 102 103 104 105 106 109 101 102 103 104 105 106 109 101 102 103 104 105 106 107 108 109 111 112 111 111 111 111 111 11	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 c (mins) Time (mins) 101 102 103 104 105 106 107 108 109 100 107 108 109 100 101 102 103 104 105 106 107 108 109 111 112 111 112 113 114 115 116	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42	E25 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 106 107 108 109 100 107 108 109 100 101 102 103 104 105 106 107 108 109 109 111 112 111 112 111 111 112 111	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167	(m) 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	E Depth (m) 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 0009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 104 105 106 107 108 109 100 107 108 109 100 101 102 103 104 105 106 107 108 109 111 111 112 111 111 111 111 11	b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168	(m) 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	(m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69	E Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94	74.0 Offset Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(m 009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 104 105 106 107 108 109 100 107 108 109 100 101 102 103 104 105 106 107 108 109 111 112 111 112 111 111 112 111 1	<pre>b) .000 0 Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770</pre>	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144	Depth (m) 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169	(m) 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71	E Depth (m) 74.770	75.500) 0.000 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96	74.0 Offset Depth (m) 74.770	(m 009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 104 105 104 105 106 107 108 109 100 107 108 109 100 101 102 103 104 105 106 107 108 109 111 112 111 112 111 112 111 111 112 111 111 112 111 111 111 112 111 111 112 111 111 112 111 1	b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146	Depth (m) 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171	(m) 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72	E Depth (m) 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97	74.0 Offset Depth (m) 74.770	(m 009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 104 105 106 107 108 109 100 107 108 109 100 100 101 102 103 104 105 106 107 108 109 111 112 111 112 111 111 112 111 111 112 111 111 112 111 111 112 111 111 112 111 111 112 111 1	b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147	Depth (m) 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172	(m) 74.770 75.770 74.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 7
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73	E Depth (m) 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98	74.0 Offset Depth (m) 74.770	(m 009 0 (mins) Time (mins) Time (mins) 101 102 103 104 105 104 105 106 107 108 109 100 107 108 109 100 100 107 108 109 100 101 102 103 104 105 106 107 108 109 111 112 111 111 112 111 111 112 111 111 111 112 111 111 112 111 111 112 111 111 112 111 111 112 112 113 114 115 116 117 112 112 112 113 114 115 112 112 112 113 114 115 112 112 112 112 113 114 115 116 117 118 119 122 122 123	b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148	Depth (m) 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173	(m) 74.770
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	E25 Depth (m) 74.770	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74	E Depth (m) 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99	74.0 Offset Depth (m) 74.770	(m 009 0 (mins) (mins) (mins) (mins) (mins) (mins) 101 102 103 104 105 104 105 106 107 108 109 100 107 108 109 100 100 107 108 109 100 100 101 102 103 104 105 106 107 108 109 111 112 112 113 114 115 116 117 112 112 113 114 115 116 117 112 112 112 113 114 115 112 112 112 112 113 114 115 112 112 112 112 112 112 112	b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149	Depth (m) 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174	(m) 74.770 75.770 74.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 7
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	E25 Depth (m) 74.770 75.7500 75.7500 75.7500 75.7500 75.75000 75.75000 75.75000 75.7500000000000000000000000	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74	E Depth (m) 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99	74.0 Offset Depth (m) 74.770	(m 009 0 (mins) (mins) (mins) (mins) (mins) (mins) 101 102 103 104 105 104 105 106 107 108 109 100 107 108 109 100 100 107 108 109 100 100 101 102 103 104 105 106 107 108 109 111 112 112 113 114 115 116 117 112 112 113 114 115 116 117 112 112 112 113 114 115 112 112 112 112 113 114 115 112 112 112 112 112 112 112	b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149	Depth (m) 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174	(m) 74.770 75.770 74.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 7
(mins) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	(m) 74.770	(mins) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	E25 Depth (m) 74.770 75.7500 75.7500 75.7500 75.7500 75.75000 75.75000 75.75000 75.7500000000000000000000000	D Time (mins) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74	E Depth (m) 74.770	75.500 Time (mins) 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99	74.0 Offset Depth (m) 74.770	(m 009 0 (mins) (b) .000 0 Depth (m) 74.770	0 0 Time (mins) 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149	Depth (m) 74.770	(mins) 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174	(m) 74.770 75.770 74.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 75.770 7

Hydrock Consultants Ltd										Page	6		
•					entral								
•						Units	9 + 10		14	~			
												Mi	
Date 6th	Febru	ary 20	18			Design	ed by i	RJH					
File Uni	ts 9 +	10 +	Truck	Park.M	IDX	Checke	d by					DIC	ainage
XP Solut	ions					Networ	k 2016	.1					
			Sı	irchar	ged Ou	tfall I	Details	s for H	Existir	nd			
Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth
(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)
170	74 770	0.05	74 770	204	74 770	252	74 770	410	74 770	471	74 770	500	74 770
	74.770 74.770		74.770 74.770		74.770		74.770		74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
179	74.770	238	74.770	297	74.770	356	74.770	415	74.770	474	74.770		74.770
180	74.770	239	74.770	298	74.770		74.770	416	74.770	475	74.770	534	74.770
	74.770	240	74.770	299	74.770	358	74.770	417	74.770	476	74.770	535	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770	-	74.770	-	74.770		74.770
	74.770 74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770 74.770		74.770		74.770		74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
192	74.770	251	74.770	310	74.770	369	74.770	428	74.770	487	74.770	546	74.770
	74.770	252	74.770	311	74.770	370	74.770	429	74.770		74.770	547	74.770
	74.770		74.770		74.770		74.770		74.770	489	74.770	548	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770 74.770		74.770		74.770 74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770		74.770 74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
203	74.770	262	74.770	321	74.770	380	74.770	439	74.770	498	74.770	557	74.770
204	74.770		74.770	322	74.770	381	74.770	440	74.770	499	74.770	558	74.770
205	74.770		74.770		74.770		74.770		74.770		74.770	559	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770		74.770 74.770		74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770 74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
215	74.770	274	74.770		74.770	392	74.770	451	74.770	510	74.770	569	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
		I		I		I.		I		1		I	
					©1982	-2016 2	KP Solu	utions					
L													

Hydrock Consultants Ltd										Page	7		
. Rail Central													
•						Units	9 + 10		14	~ …			
•												Mi	
Date 6th		-				Design	-	RJH					inage
File Uni		10 +	Truck	Park.M		Checke	_	1					mage
XP Solut	lons					Networ	K 2016	• 1					
			Si	urchard	red Ou	tfall I	Details	s for H	Existir	na			
					,								
Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth
(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770 74.770
	74.770		74.770	-	74.770		74.770		74.770		74.770		74.770
600	74.770		74.770		74.770		74.770		74.770		74.770	954	74.770
	74.770		74.770		74.770	-	74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770	666	74.770	725	74.770	784	74.770	843	74.770	902	74.770	961	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770 74.770		74.770		74.770		74.770 74.770		74.770 74.770		74.770
	74.770 74.770		74.770		74.770		74.770		74.770		74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
613	74.770	672	74.770	731	74.770	790	74.770	849	74.770	908	74.770	967	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
619	74.770	678	74.770	737	74.770	796	74.770	855	74.770	914	74.770	973	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
625	74.770		74.770	743	74.770	802	74.770	861	74.770	920	74.770	979	74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770 74.770		74.770 74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770	749	74.770		74.770	867	74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770	702	74.770	761	74.770	820	74.770	879	74.770	938	74.770		74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770
	74.770		74.770		74.770		74.770		74.770		74.770		74.770
01/			, , , ,		/ / 0	1 321	, , , ,	1 200	, , 0		, , , ,	1 - 00 -	
<u></u>					©1982	-2016 >	KP Solu	utions					

Hydrock	Consul	tants	Ltd					Page 8						
•						Rail C	entral							
•						Units	9 + 10		14	~				
•									Mid					
Date 6th	Febru	ary 20	18			Design	ed by			inage				
File Uni	ts 9 +	10 +	Truck	Park.M	IDX	Checke	d by		DIC	maye				
XP Solut	ions					Networ	k 2016							
			Sı	irchar	ged Ou	tfall I	Details	s for H	Existir	nd				
Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	
(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	
1000		1001		1100		1170		1000		1007	74 770	1050	74 770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
1005	74.770	1064	74.770	1123	74.770	1182	74.770	1241	74.770	1300	74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770	-	74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
1012	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
1031	74.770	1090	74.770	1149	74.770	1208	74.770	1267	74.770	1326	74.770	1385	74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
1037	74.770		74.770		74.770		74.770	1273	74.770	1332	74.770	1391	74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
1043	74.770	1102	74.770		74.770		74.770		74.770	1338	74.770	1397	74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770	1232	74.770	1291	74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
	74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770		74.770 74.770	
	74.770		74.770		74.770		74.770		74.770		74.770		74.770	
		I				I		1		I É		I		
					©1982	-2016 X	KP Solu	utions						

Hydrock Consultants Ltd		Page 9
•	Rail Central	
	Units 9 + 10 + Truck Park	Micro
Date 6th February 2018	Designed by RJH	
File Units 9 + 10 + Truck Park.MDX	Checked by	Dianiaye
XP Solutions	Network 2016.1	

Surcharged Outfall Details for Existing

Time (mins)	Depth (m)												
1415	74.770	1419	74.770	1423	74.770	1427	74.770	1431	74.770	1435	74.770	1439	74.770
1416	74.770	1420	74.770	1424	74.770	1428	74.770	1432	74.770	1436	74.770	1440	74.770
1417	74.770	1421	74.770	1425	74.770	1429	74.770	1433	74.770	1437	74.770		
1418	74.770	1422	74.770	1426	74.770	1430	74.770	1434	74.770	1438	74.770		

Simulation Criteria for Existing

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow 0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins)	0	Inlet Coeffiecient 0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day) 0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins) 60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	D2 (1km)	0.300	Winter Storms	No
Return Period (years)	2	D3 (1km)	0.243	Cv (Summer)	0.750
Site Location		E (1km)	0.302	Cv (Winter)	0.840
C (1km)	-0.026	F (1km)	2.496	Storm Duration (mins)	30
D1 (1km)	0.319	Summer Storms	Yes		

	ck (Consu	littaii	ts Ltd							P	age 10	
• • •						Rail Ce Units	entral 9 + 10 + 1	Fruck	Park			Micco	سر
Date	6th	Febr	ruary	2018		Designe	ed by RJH						
File	Uni	ts 9	+ 10	+ Truck	Park.MDX	Checke						Draina	iye
XP So	lut	ions				Networ	k 2016.1						
					<u>Onlin</u>	<u>e Control</u>	<u>s for Exi</u>	sting					
		<u>Hyd</u>	<u>ro-Br</u>	ake Optir	num® Manho	ole: E5, I	DS/PN: E27	.001,	Volume	(m³):	: 2016	<u>.5</u>	
						Unit Refere esign Head		0138-93		9300 .200			
					Des	ign Flow (l				9.3			
						Flush-F Object	lo™ ive Minimi	se upst	Calcul ream sto				
						Applicat	ion			face			
						Sump Availa				Yes			
					In	Diameter (vert Level	,		76	138 .371			
					Outlet Pipe	Diameter (mm)			225			
				Suggest	ed Manhole	Diameter (mm)			1200			
		Con	trol 1	Points	Head (m)	Flow (l/s)	Contr	ol Poir	nts	Head	(m) Flo	w (l/s)	
	Des	ign Po	oint (Calculated) Flush-Flo ^T		9.3 9.3	Mean Flow (ick-Flo® ad Range		773 -	7.6 8.1	
Opti	.mum@	as s	specif	ied. Shoul	d another t	based on th type of cont culations wi	crol device	other	than a Hy	-		-	
		Flow				Depth (m)							
	100 200		5.0 8.8	0.800	7.7 8.5		11.8 12.4		000 500	16.5 17.4		000 500	21. 22.
			9.2	1.200	9.3		12.9		000	18.3		000	22.
Ο.	500				10 0	0 600							23.
0.	400		9.3	1.400	10.0	2.600	13.4		500	19.2	8.		
0. 0.	400 500		9.1	1.600	10.6	3.000	14.3	6.	000	20.0	9.	000	
0. 0.	400	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3	3.000	14.3 15.4	6. 6.	000 500	20.0 20.8	9. 9.	000 500	
0. 0.	400 500	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3 num® Manho	3.000 3.500 Dle: E11, Unit Refere	14.3 15.4 DS/PN: E2 nce MD-SHE-	6. 6. 2 <u>5.005</u>	000 500 , Volume 340-1200-	20.0 20.8 <u>e (m³)</u> 6840	9. 9.	000 500	
0. 0.	400 500	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3 num® Manho D	3.000 3.500 Dle: E11, Unit Referencesign Head	14.3 15.4 DS/PN: E2 nce MD-SHE- (m)	6. 6. 2 <u>5.005</u>	000 500 Voluma 340-1200- 1	20.0 20.8 <u>e (m³)</u> 6840 .200	9. 9.	000 500	
0. 0.	400 500	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3 num® Manho D	3.000 3.500 Dle: E11, Unit Refere	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s)	6. 6. 2 <u>5.005</u>	000 500 Voluma 340-1200- 1	20.0 20.8 e (m ³) 6840 .200 68.4	9. 9.	000 500	
0. 0.	400 500	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3 num® Manho D	3.000 3.500 Dle: E11, Unit Reference esign Head ign Flow (1 Flush-F Object	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi	6. 6. 2 <u>5.005</u> 0334-68	000 500 340-1200- 1 Calcul cream sto	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage	9. 9.	000 500	24. 24.
0. 0.	400 500	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3 num® Manho Dos Des	3.000 3.500 Dle: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion	6. 6. 2 <u>5.005</u> 0334-68	000 500 340-1200- 1 Calcul cream sto	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage face	9. 9.	000 500	
0. 0.	400 500	<u>Hyd</u>	9.1 8.9	1.600 1.800	10.6 11.3 num® Manho Dos Des	3.000 3.500 Dle: E11, Unit Reference esign Head ign Flow (1 Flush-F Object	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble	6. 6. 2 <u>5.005</u> 0334-68	000 500 340-1200- 1 Calcul cream sto	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage	9. 9.	000 500	
0. 0.	400 500	Hyd	9.1 8.9	1.600 1.800	10.6 11.3 <u>num® Manho</u> Des Des In	3.000 3.500 Dele: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (19 vert Level	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble mm) (m)	6. 6. 2 <u>5.005</u> 0334-68	000 500 840-1200- 1 Calcul cream sto Sur	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage face Yes 334 .088	9. 9.	000 500	
0. 0.	400 500	Hyd	9.1 8.9	1.600 1.800 <u>rake Optir</u> Minimum (10.6 11.3 <u>num® Manho</u> Des Des In Dutlet Pipe	3.000 3.500 Dle: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (1)	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble mm) (m) mm)	6. 6. 2 <u>5.005</u> 0334-68	000 500 840-1200- 1 Calcul cream sto Sur 74	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage face Yes 334	9. 9.	000 500	
0. 0.	400 500		9.1 8.9 <u>ro-Br</u>	1.600 1.800 <u>rake Optir</u> Minimum (10.6 11.3 num® Manho Do Des In Dutlet Pipe ted Manhole	3.000 3.500 Dele: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (19 Diameter (19)	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble mm) (m) mm) mm)	6. 6. 2 <u>5.005</u> 0334-68	000 500 840-1200- 1 Calcul cream sto Sur 74	20.0 20.8 2 (m ³) 6840 .200 68.4 ated rage face Yes 334 .088 375 2100	9. 9. 9: 215	000 500	
0. 0.	400 500 600	Con	9.1 8.9 <u>ro-Br</u>	1.600 1.800 Take Optin Minimum (Suggest	10.6 11.3 num® Manho Des Des In Dutlet Pipe ted Manhole Head (m) 1.200	3.000 3.500 Dele: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (1 Diameter (1 Flow (1/s) 68.4	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble mm) (m) mm) mm)	6. 6. 2 <u>5.005</u> 0334-68 se upst col Poir K	000 500 340-1200- 1 Calcul cream sto Sur 74 ts ick-Flo®	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage face Yes 334 .088 375 2100 Head	9. 9. 9: 215	000 500 <u>.8</u>	
0. 0. 0. The Opti	400 500 600 Des hydr	Con ign Po cologi) as s	9.1 8.9 ro-Br trol 1 point (.cal ca specif:	1.600 1.800 Take Optin Minimum (Suggest Points Calculated) Flush-Flo [#] alculations ied. Shoul	10.6 11.3 num® Manho Des Des In Dutlet Pipe ted Manhole Head (m) 0 1.200 M 0.511 thave been d another t	3.000 3.500 Dele: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (1 Diameter (1 Flow (1/s) 68.4	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble mm) (m) mm) mm) Contr Mean Flow of he Head/Disc crol device	6. 6. 25.005 0334-68 se upst ol Poir K over He charge other	000 500 340-1200- 1 Calcul cream sto Sur 74 ick-Flo® ad Range relations than a Hy	20.0 20.8 e (m ³) 6840 .200 68.4 ated rage face Yes 334 .088 375 2100 Head 0.9 ship fo	9. 9. 9: 215 (m) Flo 925 - or the F	000 500 • 8 • (1/s) 60.3 55.4 Hydro-Bra	24. ake
0. 0. 0. The Opti util	400 500 600 Des hydr mum(isec	Con ign Po cologi) as s d then	9.1 8.9 ro-Br trol 1 oint (.cal ca specif: these	1.600 1.800 Cake Optin Suggest Points Calculated) Flush-Flo ⁿ alculations ied. Shoul e storage r	10.6 11.3 num® Manho Des Des In Dutlet Pipe ted Manhole Head (m) 0 1.200 M 0.511 Chave been d another t	3.000 3.500 Dele: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (1) Diameter (1) Flow (1/s) 68.4 68.3 based on the	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo [™] ive Minimi ble mm) (m) mm) Contr Mean Flow of he Head/Disc crol device ll be invai	6. 6. 25.005 0334-68 se upst other heter lidated	000 500 Ado-1200- 1 Calcul cream sto Sur 74 ts ick-Flo® ad Range relations than a Hy	20.0 20.8 20.8 20.8 6840 .200 68.4 ated rage face Yes 334 .088 375 2100 Head 0.9 ship for ydro-Br	(m) Flo 9: 215 (m) Flo 925 - or the F cake Opt	000 500 <u>.8</u> 60.3 55.4 Hydro-Bra zimum® be	24. ake
0. 0. 0. The Opti util Depth 0.	400 500 600 Des hydr mum(isec (m) 100	Con ign Po cologi) as s d then	9.1 8.9 ro-Br htrol 1 bint (cal ca specif: h these (1/s) 9.8	1.600 1.800 Cake Optin Suggest Points Calculated) Flush-Flo ⁿ alculations ied. Shoul e storage r	10.6 11.3 num® Manho Des Des In Dutlet Pipe ted Manhole Head (m) 0 1.200 M 0.511 have been d another t outing calc Flow (1/s) 67.5	3.000 3.500 Dle: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (1) Diameter (1) Flow (1/s) 68.4 68.3 based on the cype of contents	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo [™] ive Minimi ble mm) (m) mm) Contr Mean Flow of he Head/Disc crol device ll be invai	6. 6. 25.005 0334-68 se upst ol Poir K bver He charge other lidated Depth	000 500 Ado-1200- 1 Calcul cream sto Sur 74 ts ick-Flo® ad Range relations than a Hy	20.0 20.8 20.8 20.8 6840 .200 68.4 ated rage face Yes 334 .088 375 2100 Head 0.9 ship for ydro-Br	9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9	000 500 <u>.8</u> 60.3 55.4 Hydro-Bra zimum® be	ake e 7 (1/s 87.
0. 0. 0. The Opti util Depth 0. 0.	400 500 600 Des hydr mum(isec (m)	Con ign Po cologi) as s d then	9.1 8.9 ro-Br bint (cal ca specif: these (1/s)	1.600 1.800 Cake Optin Minimum (Suggest Points Calculated) Flush-Flo ⁷ alculations ied. Shoul e storage r Depth (m)	10.6 11.3 <u>num® Manho</u> Des Des In Dutlet Pipe ted Manhole Head (m) 0.1.200 M 0.511 have been d another to outing calco Flow (1/s)	3.000 3.500 Dele: E11, Unit Reference esign Head ign Flow (1 Flush-F Object Applicat Sump Availat Diameter (1) Diameter (1) Flow (1/s) 68.4 68.3 based on the culations without the set of the se	14.3 15.4 DS/PN: E2 nce MD-SHE- (m) /s) lo™ ive Minimi ion ble mm) (m) mm) Contr Mean Flow of he Head/Disc crol device ill be invai Flow (1/s)	6. 6. 25.005 0334-68 se upst se upst rol Poir K bver He charge other lidated Depth 1. 1.	000 500 Ado-1200- 1 Calcul cream sto Sur 74 ts ick-Flo® ad Range relations than a Hy (m) Flow	20.0 20.8 20.8 (m ³) 6840 .200 68.4 ated rage face Yes 334 .088 375 2100 Head 0.9 ship fo ydro-Br (1/s)	9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9	000 500 <u>.8</u> w (1/s) 60.3 55.4 Hydro-Bra timum® be (m) Flow	24. ake

©1982-2016 XP Solutions

Hydrock Consultants Ltd		Page 11
•	Rail Central	
	Units 9 + 10 + Truck Park	Micco
Date 6th February 2018	Designed by RJH	
File Units 9 + 10 + Truck Park.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	_1

Hydro-Brake Optimum® Manhole: E11, DS/PN: E25.005, Volume (m³): 215.8

Depth	(m)	Flow	(l/s)																	
2.	.600		99.5	4	.000		122.8	5	.500		143.4	7	.000		161.4	8	.500		177.5	
3.	.000		106.7	4	.500		130.0	6	.000		149.6	7	.500		166.9	9	.000		182.5	
3.	.500		115.0	5	.000		136.9	6	.500		155.6	8	.000		172.3	9	.500		187.4	

Hydrock Consultants Ltd		Page 12
• • •	Rail Central Units 9 + 10 + Truck Park	Micro
Date 6th February 2018	Designed by RJH	
File Units 9 + 10 + Truck Park.MDX	Checked by	Digiligh
XP Solutions	Network 2016.1	

Storage Structures for Existing

Tank or Pond Manhole: E11, DS/PN: E25.005

Invert Level (m) 74.088

Depth (m)	Area (m²)								
0 000	15005 0	1 000	17501 0	0 400	10010 0	2 600	10010 0	1 000	10010 0
0.000	15225.0	1.200	17521.0	2.400	18318.0	3.600	18318.0	4.800	18318.0
0.200	15597.0	1.400	17917.0	2.600	18318.0	3.800	18318.0	5.000	18318.0
0.400	15974.0	1.600	18318.0	2.800	18318.0	4.000	18318.0		
0.600	16355.0	1.800	18318.0	3.000	18318.0	4.200	18318.0		
0.800	16739.0	2.000	18318.0	3.200	18318.0	4.400	18318.0		
1.000	17128.0	2.200	18318.0	3.400	18318.0	4.600	18318.0		

1 1 0		nts Lta							Page 13
ydrock Co				De					
					il Central		m la		
				Un	its 9 + 10	+ тrucк Ра	ĽΚ		
									Micro
ate 6th F	-	-			signed by F	КJН			Drainad
ile Units	9 + 1	0 + Truc	k Park.MI	DX Ch	ecked by				
P Solutio	ns			Ne	twork 2016.	1			
year Ret	<u>urn Pe</u>	eriod Sun	mary of	<u>Critica</u>	l Results b	y Maximum	Level (Rank 1)	for Exist.
				Simul	lation Criter	ia			
				actor 1.0	000 Additio	nal Flow - %			
		Hot S	ot Start (tart Level	mins)	0 MAD			corage 2.0 ecient 0.8	
	Manhole				500 Flow per				
			r hectare		-	1	1 1 1	. 1,	
Number	r of Inr	out Hydroa	raphs 0	Number of	f Offline Con [.]	trols 0 Numb	er of Tir	me/Area D [.]	iagrams 0
	-		-		Storage Struc				-
				Cronth - + '		taila			
	Rai	nfall Mode	1 FEH 1		<u>c Rainfall De</u> 0.319 E (Cv (Winte	er) 0.840	
		te Locatio			0.300 F			, 0.010	
		C (1km	n) -0.026 1	D3 (1km)	0.243 Cv (Sum	umer) 0.750			
		Marain	for Floor	Riel Wa-	mina (mm) 20		Status O	- F	
		Margin	TOT FIOOD		rning (mm) 30 S Timestep Fi				
					TS Status				
		F	rofile(s)				Summer	and Winte	er
			(-)						
		Duration(s) (mins)	15, 30,	60, 120, 180	, 240, 360,	480, 600,	, 720 , 960	Ο,
				15, 30,	60, 120, 180	, 240, 360,		144	40
	Return	n Period(s) (years)	15, 30,	60, 120, 180	, 240, 360,	1, 30	144), 100, 20	40 00
	Return	n Period(s		15, 30,	60, 120, 180	, 240, 360,	1, 30	144	40 00
	Returi	n Period(s) (years)	15, 30,	60, 120, 180	, 240, 360,	1, 30	144), 100, 20	40 00
		n Period(s Climate C) (years) hange (%)				1, 30 0,	144), 100, 20 , 0, 40, 4	40 20 40 Water
PN	Return US/MH Name	n Period(s Climate C) (years) hange (%)	Climate	60, 120, 180 First (X) Surcharge		1, 30 0,	144 0, 100, 20 0, 40, 4 (Z) Overf	40 20 40 Water Elow Level
	US/MH Name	n Period(s Climate C Storm) (years) hange (%) Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 20 40 Water Elow Level t. (m)
PN E25.000 E25.001	US/MH Name El	n Period(s Climate C Storm 15 Winte) (years) hange (%) Return Period er 1	Climate Change +0% 1	First (X)	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Elow Level t. (m) 76.247
E25.000	US/MH Name E1 E2	n Period(s Climate C Storm) (years) hange (%) Return Period er 1 er 1	Climate Change +0% 1 +0% 1	First (X) Surcharge 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 20 40 Water Elow Level t. (m)
E25.000 E25.001	US/MH Name E1 E2 E3	n Period(s Climate C Storm 15 Winte 15 Winte) (years) hange (%) Return Period er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 20 40 Water Level t. (m) 76.247 76.078
E25.000 E25.001 E26.000	US/MH Name E1 E2 E3 E3	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte) (years) hange (%) Return Period er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level t. (m) 76.247 76.078 76.158
E25.000 E25.001 E26.000 E25.002	US/MH Name E1 E2 E3 E3 E4	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return Period er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level t. (m) 76.247 76.078 76.158 76.016
E25.000 E25.001 E26.000 E25.002 E27.000	US/MH Name E1 E2 E3 E3 E4 E5	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte) (years) hange (%) Return Period er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 3 +0% 2	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 0/120 Winter 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level t. (m) 76.247 76.078 76.158 76.158 76.016 76.641
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte) (years) hange (%) Return Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 3 +0% 2 +0% 2	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/120 Winter 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 76.641 75.644 75.930
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte) (years) hange (%) Return Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 3 +0% 2 +0% 2	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 0/120 Winter 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.016 76.641 76.641 75.644
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte) (years) hange (%) Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 3 +0% 2 +0% 2 +0% 2	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/120 Winter 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 76.641 75.644 75.930
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return y Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.016 76.641 76.641 75.644 75.930 75.583
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return y Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Winter	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.016 76.641 76.641 75.644 75.930 75.583 76.070
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return y Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.016 76.641 76.641 75.644 75.930 75.583 76.070 76.030
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.881
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.881 75.731 75.580
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return y Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.881 75.731
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return y Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1 +0% 3	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood 200/15 Winte	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 20 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1 +0% 3 2 0% 3 2 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer	First (Y) Flood 200/15 Winte Pipe	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf	40 00 40 Water Level (m) 76.247 76.078 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.707 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte 15 Winte) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1 +0% 3 2 0% 3 2 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer	First (Y) Flood 200/15 Winte 200/15 Pipe Pipe	1, 30 0, First Overf	144 0, 100, 20 0, 40, 4 (Z) Overf low Act	40 20 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1 +0% 3 ged Flood Volum (m ³)	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer	First (Y) Flood 200/15 Winte 200/15 Pipe Pipe Pipe	1, 3(0, First Overf.	144 0, 100, 20 0, 40, 4 (Z) Overf low Act	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11	n Period(s Climate C Storm 15 Winte 15 Winte 15 Winte 480 Winte 480 Winte 15 Winte) (years) hange (%) Return (Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er 1	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 1 +0% 1 +0% 1 +0% 3 volum (m ³) 113 0.0	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Pipe Pipe Flow Flow 1/s) (1/s)	1, 3(0, First Overf.	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 20 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22	n Period(s Climate C Storm 15 Winte 15 Winte) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 3 +0%	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/16 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Pipe Flow I/s) (1/s) 398.2 316.6 368.9	1, 3(0, First Overf. er Status H OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22 E22 E22	n Period(s Climate C Storm 15 Winte 15) (years) hange (%) Return (Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 2 +0% 2 +0	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Prflow Flow 1/s) (1/s) 398.2 316.6 368.9 604.2	1, 3(0, First Overf. er Status F OK OK OK OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22 E22 E22	n Period(s Climate C Storm 15 Winte 15 Winte 16 Winte 17) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 3 +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 3 +0%	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/10 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Pripe Flow 1/s) 398.2 316.6 368.9 604.2 34.7	1, 3(0, First Overf. er Status F OK OK OK OK OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22 E22 E22	n Period(s Climate C Storm 15 Winte 15 Winte 16 Winte 17) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 3 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 2 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 3 +0% 2 +0% 2 +0% 3 +0%	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/10 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Prflow Flow 1/s) (1/s) 398.2 316.6 368.9 604.2 34.7 9.2	1, 3(0, First Overf. er Status F OK OK OK OK OK OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Elow 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.881 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22 E22 E22	N Period(s Climate C Storm 15 Winte 15) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 3 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 2 +0% 3 +0% 2 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 3 +0% 3 +0% 3 +0% 2 +0% 2 +0% 3 +0%	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/10 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Prflow Flow 1/s) 398.2 316.6 368.9 604.2 34.7 9.2 483.2	1, 3(0, First Overf. er Status F OK OK OK OK OK OK OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Elow 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.881 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22 E22 E22	storm Storm 15 Winter 15 Winter 16 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 10 Winte) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 3 +0% 3 +0% 3 +0% 3 +0% 3 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 2 +0% 3 +0%	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/10 Summe	First (Y) Flood 200/15 Winte 200/15 Winte Pipe Prflow Flow 1/s) 398.2 316.6 368.9 604.2 34.7 9.2 483.2 366.2	1, 3(0, First Overf. er Status F OK OK OK OK OK OK OK OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Elow 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.881 75.731 75.580 75.387
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E22 E22 E22 E22 E22 E22 E22	storm Storm 15 Winter 15 Winter 16 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 10 Winte) (years) hange (%) Return of Period er 1 er 1 er 1 er 1 er 1 er 1 er 1 er	Climate Change +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 2 +0% 1 +0% 1 +0% 1 +0% 1 +0% 3 Contained (m ³) 113 0.0 040 0.0 128 0.0 040 0.0 128 0.0 120 0.0 130 0.0 178 0.0	First (X) Surcharge 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Summer 00/15 Winter 00/15 Winter 00/15 Summer 00/15 Summer 00/10 Summe	First (Y) Flood 200/15 Winte 200/15 Winte 200/15 Winte 200/15 Winte 200/15 Winte 200/15 Winte 200/15 Winte 200/15 Winte	1, 3(0, First Overf. er Status F OK OK OK OK OK OK OK	144 0, 100, 20 , 0, 40, 4 (Z) Overfilow Act low Act Level Exceeded	40 00 40 Water Level (m) 76.247 76.078 76.158 76.158 76.016 76.641 75.644 75.930 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 76.070 75.583 75.731 75.580 75.387

Hydrock Consultants Ltd		Page 14
•	Rail Central	
	Units 9 + 10 + Truck Park	Mar m
•		Mirro
Date 6th February 2018	Designed by RJH	Desinado
File Units 9 + 10 + Truck Park.MDX	Checked by	Dialinatic
XP Solutions	Network 2016.1	

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E29.000	E10	-1.191	0.000	0.05		187.2	OK	
E29.001	E11	-1.163	0.000	0.10		284.2	OK	
E29.002	E12	-1.100	0.000	0.14		391.4	OK	
E29.003	E13	-1.045	0.000	0.18		472.7	OK	
E29.004	E14	-1.038	0.000	0.21		462.0	OK	
E25.004	E10	-0.658	0.000	0.26		958.8	OK	
E25.005	E11	-0.158	0.000	0.42		58.7	OK	

					Rail Central		,		2
				U	Inits 9 + 10	+ Truck P	ark		Tr.
	- 1-	0.01.0			· · · · · · · -				Micro
te 6th Fe		-			esigned by R	JH			Draina
		0 + Truck	Park.MI		checked by				
Solution	ns			N	letwork 2016.	1			
year Ret	<u>turn P</u>	Period Summ	<u>mary of</u>	Critic	cal Results b	y Maximum	Level (R	<u>ank 1) f</u>	or Exis
				Sim	ulation Criteri	-			
				Factor 1	.000 Addition	nal Flow - 9			
		Hot	: Start (art Level	(mins)	0 MADI) Factor * 1	LOm ³ /ha Sto:	rage 2.000	0
	Manhol				.500 Flow per H		et Coeffiec: Day (1/per/o		
		. Sewage per			-				-
Number	r of In	put. Hydrogra	phs 0	Number	of Offline Cont	rols 0 Numl	per of Time	/Area Diad	grams 0
			-		Storage Struct				-
				Synthet	cic Rainfall De	tails			
	Rai	nfall Model	FEH		0.319 E (Cv (Winter)	0.840	
		te Location		D2 (1km)	0.300 F (1km) 2.496			
		C (1km)	-0.026	D3 (1km)	0.243 Cv (Sum	mer) 0.750			
		Margin f	for Flood	d Risk Wa	arning (mm) 300	.0 DVD	Status OFF		
		-			is Timestep Fi	ne Inertia			
					DTS Status	ON			
			ofile(s)		, 60, 120, 180,	240 360		nd Winter	
		Duracron(S)	(mills)	10, 30	, oo, izo, iso,	, 270, 300,	-00, 000,		
								1440	
	Retur	n Period(s)	(years)				1, 30,	100, 200	
	Retur	n Period(s) Climate Cha	-						
	Retur		-					100, 200	
			ange (%)	01			0,	100, 200 0, 40, 40	Water
PN	Retur US/MH Name	Climate Cha	ange (%) Return		First (X) Surcharge		0,	100, 200 0, 40, 40 Z) Overflo	ow Level
	US/MH Name	Climate Cha Storm	Return Period	Change	Surcharge	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	ow Level (m)
PN E25.000 E25.001	US/MH	Climate Cha	Return Period	Change +0응		Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	ow Level
E25.000	US/MH Name E1	Climate Cha Storm 15 Winter	Return Period 30	Change +0 % +0 %	Surcharge	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	76.620 76.546
E25.000 E25.001	US/MH Name E1 E2	Climate Cha Storm 15 Winter 15 Winter	Return Period 30 30	Change +0용 +0용 +0왕	Surcharge 100/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	76.620 76.546
E25.000 E25.001 E26.000	US/MH Name E1 E2 E3	Climate Cha Storm 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30	Change +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Dev Level (m) 76.620 76.546 76.573 76.501 76.915
E25.000 E25.001 E26.000 E25.002	US/MH Name E1 E2 E3 E3	Climate Cha Storm 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30	Change +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Level (m) 76.620 76.546 76.573 76.501
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003	US/MH Name E1 E2 E3 E3 E3 E4	Climate Cha Storm 15 Winter 15 Winter 15 Winter 15 Winter 600 Winter	Return Period 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Dev Level (m) 76.620 76.546 76.573 76.501 76.915
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8	Storm 15 Winter 15 Winter 15 Winter 15 Winter 600 Winter 600 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Dev Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003	US/MH Name E1 E2 E3 E3 E4 E5 E6	Climate Cha Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Winter	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Dev Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8	Storm 15 Winter 15 Winter 15 Winter 15 Winter 600 Winter 600 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Dev Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9	Climate Cha Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Winter	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Dev Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10	Climate Cha Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.408 76.384
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11	Climate Cha Storm 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.408
E25.000 E25.001 E26.000 E25.002 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12	Climate Cha Storm 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 200/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.408 76.384 76.286
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13	Climate Cha Storm 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.384 76.286 76.174 76.030
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Climate Cha Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.408 76.384 76.384 76.286 76.174
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Climate Cha Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer	Flood	0, First (2 Overflo	100, 200 0, 40, 40 Z) Overflo	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Climate Cha Storm 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/600 Winter	Flood 200/15 Wint Pipe	0, First (2 Overflo	100, 200 0, 40, 40 2) Overflo w Act.	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter	Return Period 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Sum	Flood 200/15 Wint Pipe low Flow	0, First (Z Overflo	100, 200 0, 40, 40 Z) Overflo w Act.	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 17 Winter 18 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/120 Winter 200/15 Summer 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/600 Winter 30/600 Winter Cap. (1/s	Flood 200/15 Wint Pipe low Flow) (1/s)	0, First (2 Overflo er Status	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Summer 200/15 Summer 100/15 Sum	Flood 200/15 Wint 200/15 Wint Pipe low Flow (1/s) 1234.9	0, First (2 Overflo er Status OK	100, 200 0, 40, 40 Z) Overflo w Act.	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 10 Winter 10 Winter 10 Winter 10 Winter 11 Winter 12 Winter 13 Winter 1440 Winter 1440 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Sum	Flood 200/15 Wint 200/15 Wint Pipe low Flow) (1/s) 1234.9 966.5	O, First (2 Overflo er Status OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11	Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10 W	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Sum	Flood 200/15 Wint 200/15 Wint Pipe low Flow) (1/s) 1234.9 966.5 1148.9	O, First (2 Overflo er Status OK OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 30/600 Winter d Flow / Overfi Cap. (1/s 0 0.43 0 0.39 0 0.76	Flood 200/15 Wint 200/15 Wint Pipe low Flow (1/s) 1234.9 966.5 1148.9 1864.6	O, First (2 Overflo er Status OK OK OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E12 E13 E14 E15 E14 E15 E15 E14 E15 E15 E14 E15 E14 E15 E14 E15 E16 E16 E17 E17 E17 E17 E17 E17 E17 E17 E17 E17	Climate Cha Storm 15 Winter 15 Winter 10 Winter 10 Winter 10 Winter 10 Winter 10 Winter 11 Winter 12 Winter 13 Winter 14 Winter 14 Winter 14 Winter 15 Winter 14 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 19 Winter 10	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Winter 100/15 Summer 30/600 Winter 00/15 Summer 30/600 Winter 00/15 Summer 100/15 Summe	Flood 200/15 Wint 200/15 Wint Pipe low Flow (1/s) 1234.9 966.5 1148.9 1864.6 64.3	O, First (2 Overflo er Status OK OK OK OK OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E12 E13 E14 E15 E16 E16 E16 E17 E17 E17 E17 E17 E17 E17 E17 E17 E17	Climate Cha Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Sum	Flood 200/15 Wint 200/15 Wint Pipe low Flow (1/s) 1234.9 966.5 1148.9 1864.6 64.3 9.2	O, First (2 Overflo er Status OK OK OK OK OK OK OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E12 E13 E14 E12 E3 E3 E3 E4 E3 E3 E4 E3 E3 E4 E3 E4 E3 E4 E3 E4 E5 E4 E4 E5 E6 E4 E5 E6 E1 E1 E3 E4 E5 E6 E1 E1 E3 E3 E4 E3 E4 E5 E6 E1 E1 E1 E3 E3 E4 E5 E6 E1 E1 E1 E3 E4 E5 E6 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1	Climate Cha Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Summer 100/15 Summer 100/15 Winter 100/15 Summer 100/15 Summer 30/600 Winter 00/15 Summer 100/15 Summ	Flood 200/15 Wint 200/15 Wint Pipe low Flow (1/s) 1234.9 966.5 1148.9 1864.6 64.3 9.2 1458.1	O, First (2 Overflo er Status OK OK OK OK OK OK OK OK OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839
E25.000 E25.001 E26.000 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E12 E13 E14 E15 E16 E16 E16 E17 E17 E17 E17 E17 E17 E17 E17 E17 E17	Climate Cha Storm 15 Winter 15 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%	Surcharge 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 200/15 Summer 200/15 Winter 200/15 Winter 200/15 Winter 200/15 Summer 100/15 Sum	Flood 200/15 Wint 200/15 Wint Pipe low Flow (1/s) 1234.9 966.5 1148.9 1864.6 64.3 9.2	O, First (2 Overflo er Status OK OK OK OK OK OK OK OK	100, 200 0, 40, 40 Z) Overflo w Act. Level Exceeded	De Level (m) 76.620 76.546 76.573 76.501 76.915 76.916 75.967 76.252 75.848 76.384 76.384 76.286 76.174 76.030 75.839

Hydrock Consultants Ltd		Page 16
•	Rail Central	
	Units 9 + 10 + Truck Park	
•		Micro
Date 6th February 2018	Designed by RJH	Desinado
File Units 9 + 10 + Truck Park.MDX	Checked by	Diamaye
XP Solutions	Network 2016.1	

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E29.000	E10	-0.853	0.000	0.16		596.5	OK	
E29.001	E11	-0.809	0.000	0.34		948.9	OK	
E29.002	E12	-0.695	0.000	0.45		1262.8	OK	
E29.003	E13	-0.602	0.000	0.57		1536.8	OK	
E29.004	E14	-0.588	0.000	0.68		1516.2	OK	
E25.004	E10	-0.206	0.000	0.76		2795.1	OK	
E25.005	E11	0.121	0.000	0.49		68.2	SURCHARGED	

Hydrock Con	sultar	nts Ltd							Pa	ge 17
•				R	ail Ce	ntral			Г	
				U	Jnits 9	+ 10	+ Truck F	ark		1.
										Airco
Date 6th Fe	bruary	7 2018		Ľ	esigne	d by R	JH			
File Units	9 + 10) + Truck	Park.M	IDX C	hecked	l by				Jiainage
XP Solution	S			N	letwork	2016.	1			
<u>100 yea</u>	ır Reti	urn Period	d Summa	ry of C	Critica	al Resu	ilts by Ma	aximum Lev	el (Rank	<u>1) for</u>
					<u>Exist</u>	ing				
				Cim	ulation	Criteri				
		Areal Red	luction					% of Total 1	Flow 0.000	
		Hot	: Start	(mins)	0	MADI) Factor *	10m³/ha Sto	rage 2.000	
				1 (mm)				et Coeffiec		
I		Headloss C Sewage per				ow per H	Person per	Day (l/per/o	day) 0.000	
	rour	Sewage per	nectare	(1/3) 0	.000					
Number	of Inp	ut Hydrogra	phs 0	Number	of Offl:	ine Cont	crols 0 Num	ber of Time	/Area Diagr	ams O
Numbe	er of O	nline Contr	ols 2 N	umber of	Storage	e Struct	cures 1 Num	ber of Real	Time Contr	ols O
				Synthet	ic Rain	fall De	tails			
	Rair	nfall Model	FEH					Cv (Winter)	0.840	
		e Location		D2 (1km)	0.300	F (1km) 2.496	,		
		C (1km)	-0.026	D3 (1km)	0.243	Cv (Sum	mer) 0.750			
		Margin f	or Floo	d Risk W	arning	(mm) 300	חעזת ().(Status OFF		
		nargin r	.01 1100		-			Status OFF		
					DTS Sta	atus	ON			
		Pro	ofile(s)					Summer a	nd Winter	
		Duration(s)	(mins)	15, 30	, 60, 1	20, 180,	, 240, 360,	480, 600,	720, 960,	
	Determ		()					1 20	1440	
) Period(s) Climate Cha	-						100, 200 0, 40, 40	
		CIIIIate Clia	inge (%)					0,	0, 10, 10	
	US/MH		Return	Climate	First	· (X)	First (Y)) First ()	2) Overflow	Water
PN	Name	Storm		Change	Surch	• •	Flood	Overflo		(m)
				-		-				
E25.000 E25.001	E1 E2	15 Winter 15 Winter	100 100		100/15		200/15 Wint	ter		77.597 77.449
E25.001	E3	15 Winter	100		100/15					77.532
E25.002	E3	15 Winter			100/15					77.344
E27.000	E4	960 Winter	100	+40%						77.388
E27.001	E5	960 Winter	100		30/120					77.388
E25.003 E28.000	E6 E8	15 Winter 15 Winter	100 100		200/15 200/15					76.393 76.691
E28.000	E9	15 Winter	100		200/15					76.244
E29.000	E10	15 Winter	100	+40%	200/15	Summer				77.188
E29.001	E11	15 Winter	100		200/15					77.160
E29.002 E29.003	E12 E13	15 Winter 15 Winter	100 100		100/15 100/15					77.081 76.897
E29.003	E13 E14	15 Winter 15 Winter			100/15					76.634
E25.004	E10	15 Winter	100		100/15					76.213
E25.005	E11 1	L440 Winter	100	+40%	30/600	Winter				75.015
		Su	rcharge	d Floode	d		Pipe			
		US/MH	Depth			/ Overfi	-		Level	
	PN	Name	(m)	(m³)	Cap.	(1/s) (l/s)	Status	Exceeded	
	E25.0	00 E1	0.23	7 0.00	0 0.8	9	2543.4	SURCHARGED	1	
	E25.0		0.33					SURCHARGED	-	
	E26.0		0.24					SURCHARGED		
		02 E3	0.33				4349.0 81.9	SURCHARGED OK		
	E25.0		-0 27	ζ ∩ ∩∩.	0 0 0					
	E25.0 E27.0 E27.0	00 E4	-0.37					SURCHARGED		
	E27.0	00 E4 01 E5		7 0.00	0.0	4				
	E27.0 E27.0	00 E4 01 E5	0.56	7 0.00	0 0.0	4 2	9.2 3021.0	SURCHARGED		

Hydrock Consultants Ltd		Page 18
•	Rail Central	
•	Units 9 + 10 + Truck Park	1 m
• Date 6th February 2018	Designed by RJH	
File Units 9 + 10 + Truck Park.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

	US/MH	Surcharged Depth	Flooded Volume	Flow /	Overflow	Pipe Flow		Level
PN	Name	(m)	(m³)	Cap.	(1/s)	(l/s)	Status	Exceeded
E28.000	E8	-0.369	0.000	0.83		2434.3	OK	
E28.001	E9	-0.517	0.000	0.67		2315.4	OK	
E29.000	E10	-0.073	0.000	0.33		1245.1	OK	
E29.001	E11	-0.033	0.000	0.68		1905.1	OK	
E29.002	E12	0.100	0.000	0.94		2622.9	SURCHARGED	
E29.003	E13	0.121	0.000	1.24		3320.9	SURCHARGED	
E29.004	E14	0.016	0.000	1.49		3321.4	SURCHARGED	
E25.004	E10	0.168	0.000	2.01		7362.4	SURCHARGED	
E25.005	E11	0.477	0.000	0.49		67.6	SURCHARGED	

		nts Ltd)				Fd	ge 19
					Rail Ce		+ Truck H) a m la		4
					MITS S	, + 10	+ ITUCK H	alK		Ly
+ 0 6+1 7	o h 1917					d br				Micro
te 6th Fe		-	Deil)esigne	-	KUΗ			Draina
		0 + Truck	Park.M		Checked					
Solution	ns			N	letwork	2016.	1			
<u>200 ye</u>	<u>ar Ret</u>	urn Period	l Summa	ry of (<u>Eritica</u> Exist		<u>ilts by Ma</u>	aximum Lev	el (Rank	<u>1) for</u>
				Sim	ulation	Criter	ia			
								% of Total		
				(mins) l (mm)		MAD		10m ³ /ha Sto: et Coeffiec		
	Manhole	e Headloss C				ow per				
	Foul	Sewage per	hectare	(l/s) 0	.000					
Numbou	r of Inr	out Hydrogra	pha 0	Numbor	of Offl	ing Cont	trole O Num	bor of Timo	Aros Disa	rama O
	-	Online Contr	-						-	
					-					
	Do-	nfall Model	ਸ਼ਾਜ਼ਾਜ਼		tic Rair			Cur (Minton)	0 940	
		te Location					(1km) 0.302 (1km) 2.496		, 0.040	
							umer) 0.750			
		Margin f	or Floo					Status OFF Status OFF		
				AIIALYS		step Fi atus		JUALUS UFF		
		Pro	ofile(s)					Summer a	nd Winter	
			. ,		, 60, 1	20, 180	, 240, 360,	480, 600,		
			. ,							
									1440	
	Returi	n Period(s)	· _ ·						100, 200	
	Returi	n Period(s) Climate Cha	· _ ·							
	Keturi		· _ ·						100, 200	Water
	Return US/MH		inge (%)		First	t (X)	First (Y	0,	100, 200	Water V Level
PN			nge (%) Return			t (X) harge	First (Y Flood	0,	100, 200 0, 40, 40 Z) Overflow	
	US/MH Name	Climate Cha	Return Period	Climate Change	Surch	narge	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	v Level (m)
PN E25.000 E25.001	US/MH Name El	Climate Cha	nge (%) Return	Climate Change +40%	Surch	harge Summer) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	• Level
E25.000	US/MH Name El	Climate Cha Storm 15 Winter	Return Period 200	Climate Change +40% +40%	Surch	Summer Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	<pre>x Level (m) 78.200</pre>
E25.000 E25.001	US/MH Name E1 E2 E3	Climate Cha Storm 15 Winter 15 Winter	Return Period 200 200	Climate Change +40% +40% +40%	Surch 100/15 100/15	Summer Summer Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	<pre>v Level (m) 78.200 77.927</pre>
E25.000 E25.001 E26.000	US/MH Name E1 E2 E3 E3	Climate Cha Storm 15 Winter 15 Winter 15 Winter	Return Period 200 200 200	Climate Change +40% +40% +40%	Surch 100/15 100/15 100/15	Summer Summer Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	<pre>v Level (m) 78.200 77.927 78.087</pre>
E25.000 E25.001 E26.000 E25.002	US/MH Name E1 E2 E3 E3 E4	Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 200 200 200 200	Climate Change +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15	Summer Summer Summer Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	<pre>v Level (m) 78.200 77.927 78.087 77.757</pre>
E25.000 E25.001 E26.000 E25.002 E27.000	US/MH Name E1 E2 E3 E3 E4 E5	Storm 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter	Return Period 200 200 200 200 200	Climate Change +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15	Summer Summer Summer Summer Winter	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	Level (m) 78.200 77.927 78.087 77.757 77.569
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001	US/MH Name E1 E2 E3 E3 E4 E5 E6	Storm 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter	Return Period 200 200 200 200 200 200 200 200	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15	Summer Summer Summer Summer Winter Summer Winter	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	<pre>v Level (m) 78.200 77.927 78.087 77.757 77.569 77.569</pre>
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003	US/MH Name E1 E2 E3 E3 E4 E5 E6	Storm 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15	Summer Summer Summer Summer Winter Summer Winter	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 Level (m) 78.200 77.927 78.087 77.757 77.569 77.088 77.088
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9	Storm 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15	Summer Summer Summer Summer Winter Winter Winter	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 r Level (m) 78.200 77.927 78.087 77.757 77.569 77.088 77.094
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10	Storm 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15	Summer Summer Summer Summer Winter Winter Winter Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 Ievel (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11	Storm 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15 200/15	Summer Summer Summer Summer Winter Winter Winter Summer Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 Level (m) 78.200 77.927 78.087 77.757 77.569 77.569 77.088 77.094 76.834 78.089
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12	Storm 5 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15 200/15 200/15	Summer Summer Summer Summer Winter Summer Winter Summer Summer Winter	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 r Level (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.089 78.064
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13	Climate Cha Storm 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15 200/15 200/15 100/15	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 r Level (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.089 78.064 77.982
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14	Climate Cha Storm 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 30/120 200/15 200/15 200/15 200/15 100/15	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 r Level (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.089 78.064 77.982 77.743 77.277
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Storm 5 Winter 15 Winter 15 Winter 15 Winter 15 Winter 960 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 100/15 100/15	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 r Level (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.089 78.064 77.982 77.743
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Climate Cha Storm 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter Summer	Flood) First (2 Overflo	100, 200 0, 40, 40 Z) Overflow	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Climate Cha Storm 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 30/600	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter Summer Winter Summer Winter	Flood 200/15 Win Pipe) First (2 Overflo	100, 200 0, 40, 40 2) Overflow w Act.	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 30/600 d a Flow	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter Summer Winter Vinter	Flood 200/15 Win Pipe low Flow) First (3 Overflo	100, 200 0, 40, 40 Z) Overflow w Act.	 Ievel (m) 78.200 77.927 78.087 77.569 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10	Climate Cha Storm 15 Winter 15 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 30/600	Summer Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter Summer Winter Vinter	Flood 200/15 Win Pipe low Flow) First (2 Overflo	100, 200 0, 40, 40 2) Overflow w Act.	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 PN	Climate Cha Storm 15 Winter 15 Winter 16 Winter 16 Winter 16 Winter 10	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0	Aarge Summer Summer Summer Winter Winter Winter Summer Winter Summer Winter Vinter Vinter 2 000000000000000000000000000000000000	Flood 200/15 Win Pipe low Flow s) (1/s) 3133.2) First (2 Overflo ter Status FLOOD	100, 200 0, 40, 40 Z) Overflow w Act.	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 PN E25.0 E25.0	Climate Cha Storm 15 Winter 15 Winter 16 Winter	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0 0 1.2	Aarge Summer Summer Summer Winter Winter Winter Summer Winter Winter Vinter Vinter Vinter Vinter 9 2	Flood 200/15 Win Pipe low Flow s) (1/s) 3133.2 3001.8) First (2 Overflo ter Status FLOOD FLOOD RISK	<pre>100, 200 0, 40, 40 2) Overflow w Act. Level Exceeded</pre>	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 16 Winter 16 Winter 16 Winter 16 Winter 17 Winter 16 Winter 16 Winter 16 Winter 16 Winter 16 Winter 16 Winter 16 Winter 17 Winter 16 Winter 16 Winter 16 Winter 16 Winter 16 Winter 17 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 10	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0 0 1.2 0 1.2 0 1.0	Aarge Summer Summer Summer Winter Summer Winter Summer Winter Summer Winter Vinter Vinter 9 2 1	Flood 200/15 Win Pipe low Flow s) (1/s) 3133.2 3001.8 2953.0) First (2 Overflo ter Status FLOOD FLOOD RISK FLOOD RISK	<pre>100, 200 0, 40, 40 2) Overflow w Act. Level Exceeded</pre>	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.094 76.834 78.089 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E10 E1 E25 0 E10 E1 E25 E3 E3 E3 E3 E4 E3 E3 E3 E4 E3 E3 E4 E3 E3 E4 E5 E6 E6 E8 E9 E10 E11 E12 E3 E3 E4 E5 E6 E6 E8 E9 E10 E11 E12 E3 E3 E4 E5 E6 E6 E11 E12 E3 E3 E4 E5 E6 E10 E11 E12 E11 E12 E3 E3 E4 E5 E6 E10 E11 E12 E11 E12 E11 E12 E11 E12 E11 E12 E11 E12 E11 E12 E11 E12 E13 E11 E12 E11 E12 E13 E14 E12 E11 E12 E13 E14 E12 E11 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E13 E14 E11 E12 E13 E14 E12 E13 E14 E12 E13 E14 E12 E11 E12 E11 E12 E11 E12 E11 E12 E11 E11	Climate Cha Storm 15 Winter 15 Winter 16 Winter 16 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 19 Winter 10	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0 0 1.2 0 1.0 0 2.3	Aarge Summer Summer Summer Winter Winter Winter Summer Winter Winter Vinter Vinter Vinter Vinter 9 2 1 7	Flood 200/15 Win 200/15 Win Pipe low Flow 3133.2 3001.8 2953.0 5803.1) First (2 Overflo ter Status FLOOD FLOOD RISK FLOOD RISK SURCHARGED	<pre>100, 200 0, 40, 40 2) Overflow w Act. Level Exceeded</pre>	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 10	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0 0 1.2 0 1.0 0 2.3 0 0.0	Aarge Summer Summer Summer Winter Winter Winter Summer Winter Winter Vinter Vinter Vinter Vinter 9 2 1 7 0	Flood 200/15 Win 200/15 Win Pipe low Flow 3133.2 3001.8 2953.0 5803.1 95.8) First (3 Overflo ter Status FLOOD FLOOD RISK FLOOD RISK SURCHARGED OK	<pre>100, 200 0, 40, 40 2) Overflow w Act. Level Exceeded</pre>	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E1 E25 0 E25 0 E25 0 E25 0 E25 0 E25 0 E27 0 E27 0 E27 0 E27 0 E27 0 E27 E27 E27 E27 E27 E27 E27 E27 E27 E27	Climate Cha Storm 15 Winter 15 Winter 16 Winter 15 Winter 16 Winter 16 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 10 Winter 10 Winter 10 Winter 10 E2 10 E3 10 E4 10 E5	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0 0 1.2 0 1.0 0 2.3 0 0.0 0 0.0	Aarge Summer Summer Summer Winter Winter Winter Summer Winter Winter Vinter Vinter Vinter 9 2 1 7 0 4	Flood 200/15 Win 200/15 Win Pipe low Flow 3133.2 3001.8 2953.0 5803.1 95.8 9.3) First (3 Overflo ter Status FLOOD FLOOD RISK FLOOD RISK SURCHARGED OK SURCHARGED	<pre>100, 200 0, 40, 40 2) Overflow w Act. Level Exceeded</pre>	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.064 77.982 77.743 77.277 76.785
E25.000 E25.001 E26.000 E25.002 E27.000 E27.001 E25.003 E28.000 E28.001 E29.000 E29.001 E29.002 E29.003 E29.004 E25.004	US/MH Name E1 E2 E3 E3 E4 E5 E6 E8 E9 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11 E12 E13 E14 E10 E11	Climate Cha Storm 15 Winter 15 Winter 16 Winter 15 Winter 16 Winter 16 Winter 16 Winter 17 Winter 17 Winter 18 Winter 19 Winter 10 Winter 10 Winter 10 Winter 10 E2 10 E3 10 E4 10 E5	Return Period 200 200 200 200 200 200 200 200 200 20	Climate Change +40% +40% +40% +40% +40% +40% +40% +40%	Surch 100/15 100/15 100/15 100/15 200/15 200/15 200/15 200/15 200/15 100/15 100/15 100/15 100/15 30/600 d Flow Cap. 8 1.0 0 1.2 0 1.0 0 2.3 0 0.0 0 0.0	Aarge Summer Summer Summer Winter Winter Winter Summer Winter Winter Vinter Vinter Vinter 9 2 1 7 0 4	Flood 200/15 Win 200/15 Win Pipe low Flow 3133.2 3001.8 2953.0 5803.1 95.8 9.3) First (3 Overflo ter Status FLOOD FLOOD RISK FLOOD RISK SURCHARGED OK	<pre>100, 200 0, 40, 40 2) Overflow w Act. Level Exceeded</pre>	 revel (m) 78.200 77.927 78.087 77.559 77.569 77.088 77.094 76.834 78.064 77.982 77.743 77.277 76.785

Hydrock Consultants Ltd		Page 20
•	Rail Central	
	Units 9 + 10 + Truck Park	My m
·	Deciment her DIU	- Micro
Date 6th February 2018	Designed by RJH	Drainage
File Units 9 + 10 + Truck Park.MDX	Checked by	Diamage
XP Solutions	Network 2016.1	

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
E28.000	E8	0.034	0.000	1.04		3072.4	SURCHARGED	
E28.001	E9	0.073	0.000	0.84		2889.4	SURCHARGED	
E29.000	E10	0.828	0.000	0.40		1497.1	FLOOD RISK	
E29.001	E11	0.871	0.000	0.91		2559.5	FLOOD RISK	
E29.002	E12	1.001	0.000	1.27		3549.7	FLOOD RISK	
E29.003	E13	0.967	0.000	1.67		4472.3	SURCHARGED	
E29.004	E14	0.659	0.000	1.99		4447.2	SURCHARGED	
E25.004	E10	0.740	0.000	2.70		9902.7	SURCHARGED	
E25.005	E11	0.578	0.000	0.47		66.0	SURCHARGED	

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Unit 11	
•		Micco
Date 6th February 2018	Designed by RJH	
File Unit 11.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

Time Area Diagram for Existing

Time
(mins)Area
(ha)Time
(mins)Area
(ha)0-42.2134-84.931

Total Area Contributing (ha) = 7.144

Total Pipe Volume $(m^3) = 7569.743$

Hydrock Consulta	ants Lto	ł										Page 2
•					Rail Ce Unit 11		L					
•												Micro
Date 6th Februar	ry 2018			D	esigne	d by	RJH					
File Unit 11.MDX	<u> </u>			C	hecked	by						Drainage
XP Solutions				N	letwork	2016	5.1					
PN	Length (m)			I.Area	ork De [.] T.E. (mins)	Ba	ise	k	hyd SECT		Section I	'уре
E21.000	112.000	0.224	500.0	1.786	4.00		0.0	0.600	0	1200	Pipe/Cond	luit
E21.001	112.000	0.224	500.0	1.786	0.00		0.0	0.600	0	1200	Pipe/Cond	luit
E21.002	80.000	0.160	500.0	1.786	0.00		0.0	0.600	[]	-9	Pipe/Cond	luit
E22.000	80.000	0.160	500.0	1.786	5.00		0.0	0.600	[]	-9	Pipe/Cond	luit
E22.001	54.500	0.111	491.0	0.000	0.00		0.0	0.600	0	1200	Pipe/Cond	luit
E22.002	39.200	0.080	490.0	0.000	0.00		0.0	0.600	0	1200	Pipe/Cond	luit

Network Results Table

PN	US/IL	Σ I.Area	Σ Base	Vel	Cap
	(m)	(ha)	Flow (l/s)	(m/s)	(l/s)
E21.000	78.000	1.786	0.0	1.67	1884.5
E21.001	77.776	3.572	0.0	1.67	1884.5
E21.002	77.552	5.358	0.0	2.50	112417.9
E22.000	77.743	1.786	0.0	2.50	112417.9
E22.001	77.583	1.786	0.0	1.68	1901.8
E22.002	77.472	1.786	0.0	1.68	1903.8
E21.003	77.392	7.144	0.0	1.01	160.7

Conduit Sections for Existing

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg.

Section numbers < 0 are taken from user conduit table

	Conduit Type	Dimn.	Dimn.	Slope	Radius	
-9	[]	37500	1200	90.0	2.326	45.000

Hydrock Consultant	s Ltd									Page 3
•					ail Cent	ral				
•				U	nit 11					
•										Micco
Date 6th February	2018			D	esigned	by RJH	ł			
File Unit 11.MDX				C	hecked b	ру				Drainage
XP Solutions				N	etwork 2	2016.1				
			PIPE	LINE SC	CHEDULES	for E	xistind	व		
		-						-		
				Ups	tream Ma	<u>anhole</u>				
PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	I	MH DIAM., L*W	,
	Sect	(mm) 1	Name	(m)	(m)	(m)	Connec	tion	(mm)	
E21.00	0	1200	F 1	91 000	78.000	1 900	Open Ma	nholo	2100	
E21.00		1200			77.776		Open Ma Open Ma			
E21.00					77.552		Open Ma		38225	
					77.743		Open Ma			
					77.583 77.472		Open Ma			
E22.00	2 0	TZAA	上り	01.000	11.412	2.328	Open Ma	ппоте	2100	
E21.00	I3 0	450	E7	81.000	77.392	3.158	Open Ma	nhole	1500	
							-			
				<u>Down</u>	stream 1	Manhole	<u>e</u>			
PN	Length	Slope	e MH	C.Leve	el I.Leve	l D.Dep	th	MH	MH DIAM., L	*W
	(m)	(1:X)	Nam	e (m)	(m)	(m)	Conn	ection	(mm)	
E21.000	112 000	500 0	ਸ (2 81 00	00 77.77	6 2 0'	24 Open	Manhol	e 21	00
E21.001					0 77.55		-			
E21.002	80.000	500.0			0 77.39					00
E22.000 E22.001					77.58		17 Open			
E22.001 E22.002					0 77.47 0 77.39		28 Open 08 Open			00
122.002	55.200	100.0	<i>у</i> п	/ 01.00	11.00	2 2.1	oo open	nannor	C 10	00
E21.003	65.600	400.0	C	E 80.00	00 77.22	8 2.3	22 Open	Manhol	e	0
		Free	Flow	<u>ing Out</u>	tfall De	tails	for Ex	isting	1	
	_									
		tfall			Level I.		Min I. Level	D,L	W (mm)	
	Pipe	Numbe	L N	ame	(m)	(111)	1. Level (m)	L (111111)	(1111)	
							(,			
		E21.00	3	Е	80.000	77.228	0.000	0 0	0	
		2	Simul	lation	Criteria	a for H	<u>Existin</u>	<u>iq</u>		
	_									
				Coeff 0. actor 1.					Fotal Flow 0.0	
		lot Sta			0000	MADD 1			na Storage 2.0 effiecient 0.8	
		Start 1				per Pei			l/per/day) 0.0	
Manhole 1						1	. 1	-		60
Foul Se	ewage pe	er hect	tare	(l/s) 0.	.000		Output	Interv	val (mins)	1
			~		C 0 C C 1 I	~ .				
Number of Input									f Time/Area D: f Real Time Co	
Number of on	LINE COI	ICIOIS	I NU	INDEL OI	Storage .	SCIUCCUI	.es 0 Mu	INDEL 0	I Real line Co	JIICIOIS U
			.51	ntheti	<u>c Rainfa</u>	all Det	tails			
			<u>~</u>							
	Rainfal	l Mode	1	FEH	D2 (1km	ı) 0.300		Winte	er Storms N	Io
Return				2	D3 (1km				(Summer) 0.75	
	Site L	-) 0.302			(Winter) 0.84	
		C (1km						Duratic	on (mins) 3	30
	D	1 (1km) 0.	.319 Sum	mer Storm	is Yes				

Hydrock Consultant	ts Ltd						Page	2 4
			Rail Ce	entral				
			Unit 11	-			4	
								~m
Date 6th February	2018		Designe	ed by RJH			MI	CLO
File Unit 11.MDX	2020		Checked	-			Dr	ainage
XP Solutions				2016.1				
KP Solutions			Network	2016.1				
		Onlin	e Control:	s for Exi	sting			
			e concror.	J TOT DAT	SCIIIG			
Hydro-Br	rake Ontimu	um® Manhc	le· E7. D	S/PN· E21	L.003, Volu	me (m ³)•	2754 9	
<u>nyaro br</u>	ake operm			0/110. 121	1.000, 0014		2101.0	
		τ	Jnit Referer	nce MD-SHE-	0232-2930-120	0-2930		
			esign Head			1.200		
		Desi	ign Flow (l,	's)		29.3		
			Flush-Fl	OTM	Calo	culated		
			Objecti	lve Minimi	se upstream s	storage		
			Applicat		<u>,</u>	Surface		
		S	Sump Availab	ole		Yes		
			Diameter (r	,		232		
			vert Level	. ,		77.392		
		-	Diameter (r			300		
	Suggeste	ed Manhole	Diameter (r	nm)		1800		
Control H	Points	Head (m)	Flow (l/s)	Contr	ol Points	Head (m) Flow (l/s)
Design Deint (Coleviated	1 200	29.3		Kick-Fl	o® 0.85	0	25.0
Design Point (Flush-Flo™	1.200 0.404		Mean Flow	over Head Ran			23.0 24.7
	riusii rio	0.101	25.5	Mean riow	over nead han	ge		23.7
The hydrological ca	alculations	have been	based on th	e Head/Dis	charge relati	onship for	the Hydr	o-Brake
Optimum® as specif:	ied. Should	l another t	ype of cont	rol device	other than a	Hydro-Bral	ke Optimu	um® be
utilised then these	e storage ro	outing calc	ulations wi	ll be inva	lidated			
		-1 (1 /-)		1		(1 (-> D		D] (1 (
Depth (m) Flow (l/s)	Deptn (m) F	210W (1/S)	Deptn (m)	FIOW (I/S)	Deptn (m) Fi	.ow (1/s) D	eptn (m)	FIOW (1/S
0.100 7.7	0.800	26.5	2.000	37.4	4.000	52.3	7.000	68.
	1.000	26.9	2.200	39.2	4.500	55.4	7.500	71.
0.200 23.3	1.200	29.3	2.400	40.9	5.000	58.3	8.000	73.
0.200 23.3 0.300 28.8	1.200			42.5	5.500	61.0	8.500	75.
		31.5	2.600	42.5	5.500	01.01	0.000	75.
0.300 28.8	1.400	31.5 33.6	2.600	42.5		63.7	9.000	
0.300 28.8 0.400 29.3	1.400 1.600				6.000			
0.300 28.8 0.400 29.3 0.500 29.1	1.400 1.600	33.6	3.000	45.5	6.000	63.7	9.000	77.

Hydrock	Consu	ltants Lt	d							Pa	.ge 5
•					Rail Ce	entral				<u>с</u>	-
					Unit 11						L
,											Micco
Date 6th	Febr	uary 2018			Designe	ed by F	ŊН				Micro
'ile Uni	.t 11.	MDX			Checked	l by					Drainag
IP Solut	ions				Network	2016.	1				
1 year H	Returi	n Period S	Summary	of Crit	ical Res	ults b	y Max	imum Le	vel (Ran	k 1) fo	r Existi
					Simulation						
		Area.			r 1.000) 0						
		Hot		Level (mm)		1110	Diace		Coeffiecie		
		hole Headlo Toul Sewage				ow per	Person	per Day	(l/per/da	y) 0.000	
		Input Hydi of Online (
				Synt	hetic Rair	<u>nfall D</u> e	tails				
		Rainfall M		FEH D1 (1	km) 0.319	Е	(1km) (.302 Cv	(Winter)	0.840	
		Site Loca	tion	D2 (1	km) 0.300 km) 0.243	F	(1km) 2	2.496			
		U (ע טבט (ב	лш) U.243	Cv (Sun	unet) (
		Mar	gin for i		k Warning						
				Ana	lysis Time: DTS Sta	-		ertia Sta	atus OFF		
					DTS Sta	atus	ON				
			Drofil	(a)						Wintor	
		Durati	Profil on(s) (m	. ,	30, 60, 1	20, 180	, 240,		Summer and), 600, 72		
				,,	,, -	,	,,	,	-,, -	1440	
	Re	eturn Perio	-						1, 30, 1	40, 40	
		CIIMate	e Change	(3)					υ, υ,	40, 40	
										Water	Surcharge
DN	US/MH	Starm			First (X)						-
PN	Name	Storm	Period	Change	Surcharge	÷ []	1000	Overiio	W ACL.	(111)	(111)
E21.000		15 Winter			.00/15 Summ					78.336	-0.86
E21.001 E21.002		15 Winter 480 Winter		+03] +08	.00/15 Sumn	ller				78.185 77.742	-0.79
E22.000		15 Winter		+0%						77.755	-1.18
E22.001	E5	480 Winter	1	+0%						77.744	-1.03
E22.002		480 Winter		+0%	00 (00 m					77.742	-0.93
E21.003	E /	480 Winter	1	+0%	30/30 Summ	ner				77.742	-0.10
				Flooded	ł		Pipe				
			us/1	MH Volume	Flow / O	verflow	-		Level		
		P	N Nam	e (m³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		E21.	000 1	E1 0.00	0.15		243.2	OK			
		E21.		E2 0.00			419.4	OK			
		E21.		E3 0.00			64.5				
		E22.		E4 0.00			224.9				
		E22.		E5 0.00			17.5				
		E22. E21		E6 0.00 E7 0.00			16.8 29.2				
		EZI.			0.20		۷٦.۷	UK			

ydrock	consu	r cur		•								ige 6
						-	l Centr	al			[τ.
						Uni	t 11					Ly .
												Micro
ate 6th	n Febr	uary	2018			Des	igned b	y RJH				Drainag
ile Uni	lt 11.	MDX					cked by					טומוומקי
P Solut	cions					Net	work 20	16.1				
<u>0 year</u>	Retur	n Pe	eriod S	Summary	y of Cr	itical	Result	s by Ma	<u>ximum Lev</u>	el (Rank	<u>x 1) fo</u>	or Existi
						Simula	ation Cri	teria				
			Areal						.ow - % of			
			Hot		art (min Level (m			MADD Fact	tor * 10m³/	ha Storage effiecient		
	Mar	nhole						er Persor	n per Day (
	E	Toul	Sewage]	per hec	tare (l/	s) 0.00	00					
									0 Number o 0 Number o			
					Q	nthetic	Rainfall	Detaile				
		Rair	nfall Mo	del					0.302 Cv (1	Winter) 0	.840	
			e Locat	ion	D2	(1km) 0	.300	F (1km)	2.496			
			C (1	km) −0.	.026 D3	(1km) 0	.243 Cv ((Summer)	0.750			
			Marg	in for	Flood Ri	sk Warn	ing (mm)	300.0	DVD Stat	us OFF		
			11019				-		nertia Stat			
						DT	'S Status	ON				
				Profil	e(s)				Su	mmer and 1	Winter	
			Duratio		. ,	5, 30, 6	60, 120,	180, 240,	Su 360, 480,			
				n(s) (m	ins) 15	5, 30, 6	60, 120,	180, 240,	360, 480,	600, 720	, 960, 1440	
	Re	eturn	Period	n(s) (m (s) (ye	ars) 15	5, 30, 6	50, 120,	180, 240,	360, 480,	600, 720	, 960, 1440 0, 200	
	Re	eturn		n(s) (m (s) (ye	ars) 15	5, 30, 6	60, 120,	180, 240,	360, 480,	600, 720	, 960, 1440 0, 200	
		eturn	Period Climate	n(s) (m (s) (ye Change	nins) 15 ars) ars)				360, 480,	600, 720 1, 30, 10 0, 0,	, 960, 1440 0, 200 40, 40 Water	-
PN	Re US/MH Name	eturn	Period Climate	n(s) (m (s) (ye Change Return	climate	First	t (X) B	First (Y)	360, 480,	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level</pre>	Depth
	US/MH Name	eturn S	Period Climate	n(s) (m (s) (ye Change Return Period	Ains) 15 Pars) e (%) Climate Change	Firs [;] Surcl	t (X) B harge	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	, 960, 1440 0, 200 40, 40 Water Level (m)	Depth (m)
E21.000	US/MH Name E1	eturn s 15	Period Climate torm Winter	n(s) (m (s) (ye Change Return Period 30	<pre>hins) 15 ears) e (%) Climate Change +0%</pre>	First Surcl 100/15	t (X) B harge Summer	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706</pre>	Depth (m) -0.49
E21.000 E21.001	US/MH Name E1 E2	eturn s 15 15	Period Climate	n(s) (m (s) (ye Change Return Period	<pre>hins) 15 ears) e (%) Climate Change +0%</pre>	Firs [;] Surcl	t (X) B harge Summer	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	, 960, 1440 0, 200 40, 40 Water Level (m)	Depth (m) -0.49 -0.36
E21.000 E21.001 E21.002	US/MH Name E1 E2 E3	s 15 15 600	Period Climate torm Winter Winter	n(s) (m (s) (ye Change Return Period 30 30	<pre>hins) 15 ars) a(%) Climate Change +0% +0%</pre>	First Surcl 100/15	t (X) B harge Summer	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615</pre>	Depth (m) -0.49 -0.36 -0.75
E21.000 E21.001 E21.002 E22.000	US/MH Name E1 E2 E3 E4	s 15 15 600 600	Period Climate torm Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30	<pre>hins) 15 ars) ars) ars) climate Change +0% +0% +0% +0%</pre>	First Surcl 100/15	t (X) B harge Summer	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30	<pre>Lins) 15 Lars) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%</pre>	First Surcl 100/15 100/15	t (X) B harge Summer Summer	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.996</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30	<pre>Lins) 15 Lars) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%</pre>	First Surcl 100/15	t (X) B harge Summer Summer	First (Y)	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30	<pre>Lins) 15 Lars) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% +0% +0%</pre>	First Surcl 100/15 100/15 30/30	t (X) B harge Summer Summer	First (Y) Flood	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.996</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30	<pre>hins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% Flooded</pre>	First Surcl 100/15 100/15 30/30	t (X) H harge Summer Summer	First (Y) Flood Pipe	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.996</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30	<pre>hins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0% Flooded</pre>	First Surcl 100/15 100/15 30/30	t (X) B harge Summer Summer	First (Y) Flood Pipe	360, 480, First (Z)	600, 720 1, 30, 10 0, 0, • Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	Torm Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30	<pre>Ains) 15 arss) arss) arss) arss) arcs(%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³)</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap.	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Pipe V Flow (1/s)	Status	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter Winter Winter E21.000	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 20 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arss) arss</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Pipe V Flow (1/s) 758.3	Status	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	Torm Winter Winter Winter Winter Winter Winter Winter Winter	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 20 20 20 20 20 20 20 20 20 20 20 20 20	<pre>Ains) 15 arss) arss) arss) arss) arcs(%) Climate Change +0% +0% +0% +0% +0% +0% +0% Flooded Volume (m³)</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap.	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Pipe V Flow (1/s)	Status	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	torm Winter Winter Winter Winter Winter Winter Winter Winter E21.000 E21.001 E21.002 E22.000	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arrs) arrs) arrs) arrs) arrs) arrs) arrs) arrs, arrs</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1	Status Status OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.001 E21.002 E22.000 E22.001	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 Ains) 1</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0	Status Status OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.000 E22.000 E22.001 E22.002	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arss) arss</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0 16.8	Status Status OK OK OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.001 E21.002 E22.000 E22.001	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 Ains) 1</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0 16.8	Status Status OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
PN E21.000 E21.001 E22.000 E22.001 E22.002 E21.003	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.000 E22.000 E22.001 E22.002	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arss) arss</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0 16.8	Status Status OK OK OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.000 E22.000 E22.001 E22.002	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arss) arss</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0 16.8	Status Status OK OK OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.000 E22.000 E22.001 E22.002	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arss) arss</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0 16.8	Status Status OK OK OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	Depth (m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67
E21.000 E21.001 E21.002 E22.000 E22.001 E22.002	US/MH Name E1 E2 E3 E4 E5 E6	s 15 15 600 600 600 600	A Period Climate torm Winter Winter Winter Winter Winter Winter E21.000 E21.000 E22.000 E22.001 E22.002	n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30 30 30 30 30 50 80 80 80 80 80 80 80 80 80 80 80 80 80	<pre>Ains) 15 arss) arss</pre>	First Surcl 100/15 100/15 30/30 Flow / Cap. 0.46 0.81 0.00 0.00 0.01 0.01	t (X) F harge Summer Summer Summer Overflow (l/s)	First (Y) Flood Flow (1/s) 758.3 1321.6 136.1 44.1 18.0 16.8	Status Status OK OK OK OK OK OK OK	600, 720 1, 30, 10 0, 0, - Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.706 78.615 77.996 77.995 77.995 77.995 77.995</pre>	(m) -0.49 -0.36 -0.75 -0.94 -0.78 -0.67

Hydrock	Consu	ltants Lto	l							Pa	age 7
•					Rai	l Cent:	ral			1	
					Uni	t 11					ч –
•					0111	0 11					~~~~
·	Febr	2010			Dec	imped					Micro
		uary 2018				igned b					Drainage
File Uni	t 11.	MDX			Che	cked b	Y				bianage
XP Solut	ions				Net	work 20	016.1				
<u>100</u> Nurr	year Mar I nber of	Hot hhole Headlo Foul Sewage Input Hydro of Online Co Rainfall Mo Site Locat C (1	Reduct Hot St Start ss Coef per hec ographs ontrols del ion km) -0.	ion Fact art (min Level (m f (Globa tare (l/ 0 Num 1 Numbe <u>Sy</u> FEH D1 D2 .026 D3 Flood Ri	<u>of Cri</u> <u>E</u> or 1.00 s) m) 1) 0.50 s) 0.00 ber of tr of St <u>nthetic</u> (1km) 0 (1km) 0 (1km) 0 sk Warn alysis	tical i xistin 0 Add 0 0 Flow 0 0 Flow 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Results <u>a</u> <u>iteria</u> itional F: MADD Factor per Person Controls tructures <u>1 Details</u> E (1km) F (1km) (Summer) 300.0 p Fine In	low - % of tor * 10m ³ / Inlet Co n per Day (0 Number o 0 Number o 0.302 Cv (1 2.496	Total Flow ha Storage effiecient l/per/day) f Time/Arv f Real Tin Winter) 0. us OFF	▼ 0.000 ≥ 2.000 ⊂ 0.800 ○ 0.000 ea Diag me Cont	rams O
	Re	Duratio eturn Period Climate	(s) (ye	ars) 15	5, 30, 6	50, 120,	180, 240	, 360, 480,	mmer and T 600, 720, 1, 30, 100 0, 0, 4	, 960, 1440 0, 200 40, 40	Surcharged
DN	US/MH	Storm		Climate		t (X)		First (Z) Overflow		Level	Depth
PN	Name	Storm	Period	Change	Surci	harge	Flood	Overiiow	Act.	(m)	(m)
E21.000	E1	15 Winter	100	+40%	100/15	Summer				79.696	0.496
E21.001	E2	15 Winter	100		100/15	Summer				79.440	0.464
E21.002		960 Winter	100	+40%						78.423	-0.329
E22.000		960 Winter	100	+40%						78.421	
E22.001		960 Winter	100	+40%						78.421	
E22.002 E21.003		960 Winter 960 Winter	100 100	+40% +40%	30/30	Summer				78.421 78.421	
EZI.003	E /	900 WINCEL	100	740%	30/30	Summer				/0.421	0.579
				Flooded			Pipe				
			US/MH	Volume	Flow /				Level		
		PN	Name	(m³)	Cap.	(l/s)	(1/s)	Status	Exceeded		
		501 000	- 1	0 000	0 07		1507 4	aupour sons			
		E21.000		0.000	0.97			SURCHARGED			
		E21.001		0.000	1.69		181.9	SURCHARGED			
		E21.002 E22.000		0.000	0.00		181.9 32.4	OK OK			
		E22.000 E22.001		0.000	0.00		32.4 13.1	OK			
		E22.001		0.000	0.01		13.1	OK			
		E21.002		0.000	0.20			SURCHARGED			
					0						

Hydrock (<u>'onsii</u>	ltants Lto	1							Pa	ige 8
					Rai	l Centi	ral				ige e
•					_	t 11	.u.				կ
•					OIII						m
·	Fabra	2010			Dec	igned k					Micro
		uary 2018									Drainage
File Unit		MDX				cked by					brainage
XP Soluti	ons				Net	work 20	016.1				
<u>200 y</u> Numk	Man F	Hot hole Headlo foul Sewage i Input Hydro of Online Co Rainfall Mo Site Locat C (1	Reduct Hot St Start ss Coef per hec ographs ontrols del ion km) -0.	ion Fact art (min Level (m f (Globa tare (l/ 0 Num 1 Numbe <u>Sy</u> FEH D1 D2 026 D3	of Cri <u>E</u> or 1.00 s) m) 1) 0.50 s) 0.00 ber of er of St <u>nthetic</u> (1km) 0 (1km) 0	tical H xisting tion Cr: 0 Add: 0 0 Flow H 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Results d iteria itional F MADD Fac per Person Controls cructures l Details E (1km) F (1km) (Summer)	low - % of tor * 10m³/ Inlet Co n per Day (0 Number o 0 Number o 0.302 Cv (1 2.496	Total Flow ha Storage effiecient l/per/day) f Time/Arc f Real Tin Winter) 0.	v 0.000 e 2.000 c 0.800 o 0.000 ea Diag me Cont	rams O
	Re	Duratio eturn Period Climate	(s) (ye	ars) 15	5, 30, 6	50, 120,	180, 240	, 360, 480,	mmer and 0 600, 720, 1, 30, 100 0, 0, 4	, 960, 1440 0, 200	
	US/MH Name	Storm		Climate Change		t (X) harge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
E21.000	E1	15 Winter	200	+40%	100/15	Summer				80.291	1.091
E21.001	E2	15 Winter	200	+40%	100/15	Summer				79.884	0.908
E21.002		720 Winter	200	+40%						78.589	-0.163
E22.000 E22.001		960 Winter 960 Winter	200 200	+40% +40%						78.585	-0.358 -0.198
E22.001		960 Winter	200	+40%						78.585	-0.087
E21.003		960 Winter	200	+40%	30/30	Summer				78.584	0.742
				Flooded			Pipe				
		DN		Volume				Status	Level		
		PN	Name	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded		
		E21.000	E1	0.000	1.22		2009.6	SURCHARGED			
		E21.001		0.000	2.15			SURCHARGED			
		E21.002		0.000	0.00		267.7	OK			
		E22.000		0.000	0.00		34.4	OK			
		E22.001 E22.002		0.000	0.01 0.01		15.1 15.6	OK OK			
		E22.002 E21.003		0.000	0.01			SURCHARGED			
			<u> </u>				-2.5				

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Unit 12	
•		Micro
Date 6th February 2018	Designed by RJH	
File Unit 12.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	·

Time Area Diagram for Existing

Time
(mins)Area
(ha)Time
(mins)Area
(ha)0-42.0454-82.995

Total Area Contributing (ha) = 5.040

Total Pipe Volume $(m^3) = 5323.127$

Hydrock Consultants Ltd		Page 2
•	Rail Central	
	Unit 12	
•		Micro
Date 6th February 2018	Designed by RJH	
File Unit 12.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	·

Existing Network Details for Existing

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)		k (mm)	HYD SECT		Section Type
E19.000	93.800	0.188	498.9	1.680	4.00	0.0	0.600	0	1200	Pipe/Conduit
E19.001	93.800	0.187	501.6	1.680	0.00	0.0	0.600	0	1200	Pipe/Conduit
E19.002	52.500	0.105	500.0	0.000	0.00	0.0	0.600	[]	-5	Pipe/Conduit
E20.000	52.500	0.105	500.0	1.680	5.00	0.0	0.600	[]	-5	Pipe/Conduit
E20.001	57.100	0.114	500.9	0.000	5.00	0.0	0.600	0	1200	Pipe/Conduit
E19.003	40.100	0.080	501.3	0.000	0.00	0.0	0.600	0	450	Pipe/Conduit

Network Results Table

PN	US/IL	Σ I.Area	Σ Base	Vel	Cap
	(m)	(ha)	Flow (l/s)	(m/s)	(1/s)
E19.000	77.812	1.680	0.0	1.67	1886.5
E19.001		3.360	0.0	1.66	1881.4
E19.002		3.360	0.0	2.50	120053.9
E20.000 E20.001	77.889	1.680 1.680	0.0	1.66	120053.9 1882.8
E19.003	77.520	5.040	0.0	0.90	143.

Conduit Sections for Existing

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, 0 egg.

Section numbers < 0 are taken from user conduit table

Section Number	Conduit Type	Dimn.	Dimn.	Slope	Radius		
-5	[]	40000	1200	90.0	2.330	48.000	

									1
Hydrock Consultant	s Ltd			I					Page 3
•					il Cent	ral			
•				Un	it 12				
•									Mirro
Date 6th February	2018				signed		[Drainage
File Unit 12.MDX					ecked b				Diamage
XP Solutions				Ne	twork 2	016.1			
			וחסדס	TND 00		£			
			PIPEI	JINE SC	HEDULES	IOT E	<u>xistinq</u>		
				<u>Upst</u>	ream Ma	<u>anhole</u>			
PN	Und	Diam	MU		TIOTOL	Donth	МН	MU DTAN TH	
PN	-	(mm)		(m)	I.Level 1 (m)	(m)	MH Connection	MH DIAM., L*W (mm)	
E19.00 E19.00		1200 1200			78.000 77.812		Open Manhole Open Manhole		
E19.00		-5			77.625		Open Manhole		
E20.00 E20.00		-5 1200			77.994 77.889		Open Manhole Open Manhole		
E20.00	1 0	1200	上4	81.000	11.009	1.911	open Mannoie	2100	
E19.00	3 о	450	E5	81.000	77.520	3.030	Open Manhole	1500	
				David		«			
				Downs	stream N	lannole	2		
PN	Length	Slope	MH	C.Level	I.Level	D.Dept	h MH	MH DIAM., L'	۲W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connectior	n (mm)	
E19.000	93.800	498.9) E2	81.000	77.812	1.98	8 Open Manhol	le 210	00
E19.001				81.000			5 Open Manhol		
E19.002	52.500	500.0) E5	81.000	77.520	2.28	0 Open Manhol	Le 150	00
E20.000	52,500	500.0) E4	81.000	77.889	1.91	1 Open Manhol	le 210	00
E20.001				81.000			5 Open Manhol		
E10.002	40 100	E 0 1 0		00 000	77.440	0 11	0 Open Manhol		0
E19.003	40.100	JUI.J		80.000	//.440	2.11	o open Mannos	Le	0
	<u>]</u>	Free	Flow	ing Out	fall De	tails	for Existin	<u>rā</u>	
	Out	tfall	Out	fall C.	Level I.	Level	Min D,L	W	
	Pipe	Numbe			(m)		I. Level (mm)		
							(m)		
	I	E19.00	3	E 8	0.000	77.440	0.000 C	0 0	
		2	Simul	ation (Criteria	a for E	lxisting		
	<i>l</i> olumetr	ic Ru	noff (Coeff 0.	750 Ada	litional	Flow - & of	Total Flow 0.0	200
				actor 1.0				/ha Storage 2.0	
		lot St			0			peffiecient 0.8	
						per Per		(1/per/day) 0.0	
Manhole Manhole Foul Se				(1/s) 0.9			Run ' Output Inte	()	60 1
Number of Input		-						of Time/Area D: of Real Time Co	-
	COI		I IN UI	WET UT :	JUJIAYE S	, cr uc cur	C5 0 MUNDEL (or near time Co	51101010 0
			Sy	nthetic	: Rainfa	all Det	ails_		
			-						
	Rainfali				D2 (1km			er Storms N	
Return	Period Site Lo	· 🔟		2	D3 (1km E (1km			/ (Summer) 0.75 / (Winter) 0.84	
		C (1km		026			Storm Durati		
					ner Storm				

Hydrock Consultants I	Jtd							Pa	.ge 4	
			Rail C	entral				ſ		
			Unit 1	2					Micco	سر
ate 6th February 201	.8		Design	ed by RJH						
Tile Unit 12.MDX			Checke	d by					Draina	IYE
XP Solutions			Networ	k 2016.1						
		<u>Online</u>	Control	<u>s for Exi</u> .	sting					
<u>Hydro-Brake</u>	Optimum®	Manho	le: E5,	DS/PN: El	9.003,	Volume	(m³)	: 1575.	<u>3</u>	
		U	nit Refere	nce MD-SHE-	-0199-20	70-1200-	-2070			
		De	sign Head	(m)		1	.200			
		Desi	gn Flow (l				20.7			
			Flush-F			Calcul				
				ive Minim:	ise upst					
			Applicat			Sur	face			
			ump Availa				Yes			
			Diameter (ert Level	,			199 .520			
M-	nimum Outle			()		/ /	225			
	Suggested M	-					1500			
	suggested M		Diametei				1000			
Control Point	ts Hea	ad (m) F	'low (l/s)	Conti	rol Poin	ts	Head	(m) Flow	(1/s)	
Design Point (Calc	ulated)	1.200	20.7		Ki	lck-Flo®	Ο.	827	17.3	
Flu	sh-Flo™	0.376	20.7	Mean Flow	over Hea	ad Range		-	17.6	
The hydrological calcul	lations have	e heen h	ased on t	he Head/Dis	charge 1	relation	shin f	or the H	/dro-Bra	ke
Optimum® as specified.					-		-	-		
utilised then these sto		-	-				1			
		(1/s)	Depth (m)	Flow (l/s)	Depth	(m) Flow	(l/s)	Depth (m) Flow	(1/
epth (m) Flow (l/s) Dep	th (m) Flow				1				0.0	48
epth (m) Flow (1/s) Dep 0.100 6.9	th (m) Flow 0.800	18.0	2.000	26.4	4.0	000	36.9	7.0	00	40
			2.000 2.200	26.4 27.7			36.9 39.0			
0.100 6.9	0.800	18.0		27.7	4.5	500		7.5	00	50
0.200 18.7	0.800	18.0 19.0	2.200	27.7 28.8	4.5	500	39.0	7.5	00	40 50 51 53
0.100 6.9 0.200 18.7 0.300 20.5 0.400 20.7	0.800 1.000 1.200	18.0 19.0 20.7	2.200 2.400	27.7 28.8 30.0	4.5 5.0 5.5 6.0	500 000 500 000	39.0 41.1	7.5 8.0 8.5 9.0	00 00 00 00	50 51

	001104	ltants Lto	d						Pa	ge 5
•					Rail Cent	ral				
					Unit 12					L
										Micco
Date 6th	1 Febr	uary 2018			Designed	by RJH				
File Uni	it 12.	MDX			Checked b	У				Drainago
KP Solut	cions				Network 2	016.1				
<u>1 year</u>	Returr Man F mber of	Areal Hot hole Headlo Foul Sewage Input Hydr of Online C Rainfall Mo Site Locat C (1 Marg	Profile	ion Factor art (mins) Level (mm) f (Global) tare (l/s) 0 Number 1 Number <u>Synt</u> FEH D1 (1 D2 (1 026 D3 (1 Flood Risk Anal	ical Resul Simulation Cr 1.000 Add 0 0.500 Flow 0.000 er of Offline of Storage S hetic Rainfa km) 0.319 km) 0.319 km) 0.243 Cv c Warning (mm ysis Timeste DTS Statu	ts by Max <u>Siteria</u> NADD Fact per Person Controls tructures <u>11 Details</u> E (1km) F (1km) (Summer)) 300.0 p Fine In s ON	ow - % of or * 10m ³ / Inlet Co per Day o 0 Number o 0 Number o 0.302 Cv (2.496 0.750 DVD Stat ertia Stat	Total Flow Total Flow Defficcient (1/per/day) of Time/Are of Real Tir Winter) 0. Cus OFF Cus OFF Cus OFF	v 0.000 2.000 0.800 0.000 ea Diagn ne Contr 840 Vinter	cams O
		Duratic	on(s) (mi	ins) 15,	30, 60, 120,	180, 240,				
	R€	eturn Perioc Climate	d(s) (yea e Change				500, 400,	1, 30, 100 0, 0, 4	1440 0, 200 40, 40	Surcharged
	us/mh	Climate	e Change Return	(응) Climate	First (X)	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level	Depth
PN		Climate	e Change Return	(%)	• •	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level	Depth
PN E19.000	US/MH Name	Climate	e Change Return	(%) Climate Change	•••	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level	Depth
E19.000 E19.001	US/MH Name E1 E2	Climate Storm 15 Winter 15 Winter	Return Period	(%) Climate Change +0% 1 +0% 1	Surcharge	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level (m) 78.346 78.219	Depth (m) -0.85 -0.79
E19.000 E19.001 E19.002	US/MH Name E1 E2 E3	Climate Storm 15 Winter 15 Winter 600 Winter	Return Period 1 1 1	(%) Climate Change +0% 1 +0% 1 +0% 1	Surcharge	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867	Depth (m) -0.85 -0.79 -0.95
E19.000 E19.001 E19.002 E20.000	US/MH Name E1 E2 E3 E4	Climate Storm 15 Winter 15 Winter 600 Winter 30 Winter	Return Period 1 1 1 1	(%) Climate Change +0% 1 +0% 1 +0% +0%	Surcharge	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029	Depth (m) -0.85 -0.79 -0.95 -1.16
E19.000 E19.001 E19.002	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 600 Winter	Return Period 1 1 1	(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0%	Surcharge	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Storm 15 Winter 15 Winter 600 Winter 30 Winter 30 Winter	Return Period 1 1 1 1 1	(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0%	Surcharge 00/15 Summer 00/15 Summer	First (Y)	First (Z)	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Storm 15 Winter 15 Winter 600 Winter 30 Winter 30 Winter	Return Period 1 1 1 1 1	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% +0% +0%</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer	First (Y) Flood	First (Z) Overflow	1, 30, 100 0, 0, 4 Overflow	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Storm 15 Winter 15 Winter 600 Winter 30 Winter 30 Winter	Return Period 1 1 1 1 1 1 1	(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer	First (Y) Flood Pipe	First (Z) Overflow	1, 30, 100 0, 0, 4 Overflow Act.	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Storm 15 Winter 15 Winter 600 Winter 30 Winter 30 Winter	Return Period 1 1 1 1 1 1 1 1 2 VS/M	(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% +0% Flooded	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer G Flow / Over	First (Y) Flood Pipe flow Flow	First (Z) Overflow	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 30 Winter 30 Winter 600 Winter	Return Period 1 1 1 1 1 1 N WS/N Nam	<pre>(%) Climate Change</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer a Flow / Over Cap. (1	First (Y) Flood Pipe flow Flow /s) (1/s)	First (Z) Overflow Status E	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 600 Winter 30 Winter 600 Winter PP E19.	Return Period 1 1 1 1 1 1 1 1 0 Nam 000 F	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer 30/30 Summer E Flow / Over Cap. (1 0 0.14	First (Y) Flood Pipe flow Flow /s) (1/s) 231.5	First (Z) Overflow Status E	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 600 Winter 30 Winter 600 Winter PP E19. E19.	Return Period 1 1 1 1 1 1 1 0 N Nam 000 H 001 H	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000 E2 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer a Flow / Over Cap. (1 0 0.14 0 0.25	First (Y) Flood Flow Flow Flow Flow (1/s) 231.5 402.1	First (Z) Overflow Status E OK OK	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 30 Winter 30 Winter 600 Winter FI E19. E19. E19.	Return Period 1 1 1 1 1 1 1 0 000 E 001 E 002 E	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000 E2 0.000 E3 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer 4 Flow / Over Cap. (1 0 0.14 0 0.25 0 0.00	First (Y) Flood Flow flow Flow /s) (1/s) 231.5 402.1 21.9	First (Z) Overflow Status E OK OK OK	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 600 Winter 30 Winter 600 Winter PP E19. E19.	Return Period 1 1 1 1 1 1 0 000 E 000 E 000 E	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000 E2 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer 30/30 Summer 4 Flow / Over Cap. (1 0 0.14 0 0.25 0 0.00 0 0.00	First (Y) Flood Flow Flow Flow Flow (1/s) 231.5 402.1	First (Z) Overflow Status E OK OK OK OK	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 30 Winter 30 Winter 600 Winter FI E19. E19. E19. E19. E20.	Return Period 1 1 1 1 1 1 1 0 000 E 000 E 000 E 000 E 000 E 000 E	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000 E2 0.000 E3 0.000 E4 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer 30/30 Summer 4 Flow / Over Cap. (1 0 0.14 0 0.25 0 0.00 0 0.00 0 0.03	First (Y) Flood Flow flow Flow /s) (1/s) 231.5 402.1 21.9 113.5	First (Z) Overflow Status E OK OK OK OK OK	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 600 Winter 30 Winter 600 Winter E19. E19. E19. E19. E20. E20.	Return Period 1 1 1 1 1 1 1 0 000 E 000 E 000 E 000 E 000 E 000 E	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000 E2 0.000 E3 0.000 E4 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer 30/30 Summer 4 Flow / Over Cap. (1 0 0.14 0 0.25 0 0.00 0 0.00 0 0.03	First (Y) Flood Flow flow Flow /s) (1/s) 231.5 402.1 21.9 113.5 47.2	First (Z) Overflow Status E OK OK OK OK OK	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Depth (m) -0.85 -0.79 -0.95 -1.16 -1.06
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4	Climate Storm 15 Winter 15 Winter 600 Winter 30 Winter 600 Winter E19. E19. E19. E19. E20. E20.	Return Period 1 1 1 1 1 1 1 0 000 E 000 E 000 E 000 E 000 E 000 E	<pre>(%) Climate Change +0% 1 +0% 1 +0% +0% +0% +0% Flooded H Volume e (m³) E1 0.000 E2 0.000 E3 0.000 E4 0.000</pre>	Surcharge 00/15 Summer 00/15 Summer 30/30 Summer 30/30 Summer 4 Flow / Over Cap. (1 0 0.14 0 0.25 0 0.00 0 0.00 0 0.03	First (Y) Flood Flow flow Flow /s) (1/s) 231.5 402.1 21.9 113.5 47.2	First (Z) Overflow Status E OK OK OK OK OK	<pre>1, 30, 100 0, 0, 4 Overflow Act. Level</pre>	1440 0, 200 40, 40 Water Level (m) 78.346 78.219 77.867 78.029 78.028	Dept (m) -0. -0. -1.

ydrock	Consu	ltants Lto	1							ra	ige 6
					_	l Centr	al				
					Uni	t 12					4
											J. J. J.
ate 6th	Febr	uary 2018			Des	igned b	V R.TH				MICLO
ile Uni		-				cked by	-				Drainaq
		MDX									
P Solut	ions				Net	work 20	16.1				
<u>0 year</u>	Retur	n Period S	Summar	<u>y of Cr</u>				ximum Lev	el (Ranł	<u>k 1) fo</u>	or Exist
		Areal	Peduct	ion Fact		<u>tion Cri</u>		Low - % of	Total Elo	w 0 000	
		Aleal		art (min				low - 5 01 cor * 10m³/1			
		Hot		Level (m	,	0	11100 1400		effiecien [.]		
	Mar	nhole Headlo					er Persor				
	I	Foul Sewage	per hec	tare (1/	s) 0.00	0					
		Input Hydr of Online C								-	
				Sy	nthetic	Rainfall	L Details				
		Rainfall Mc	del					0.302 Cv (1	Winter) O	.840	
		Site Locat									
		C (1	km) -0.	.026 D3	(1km) 0	.243 Cv	(Summer)	0.750			
									0.55		
		Marg	in for			ing (mm)					
		Marg	in for		alysis	Timestep	Fine Ir	nertia Stat			
		Marg	in for		alysis	-	Fine Ir				
		Marg	in for		alysis	Timestep	Fine Ir				
		Marg	in for Profil	An	alysis	Timestep	Fine Ir	nertia Stat		Winter	
		-	Profil	An .e (s)	alysis DT	Timestep S Status	Fine Ir ON	nertia Stat	us OFF	, 960,	
		Duratio	Profil n(s) (m	An .e(s) nins) 15	alysis DT	Timestep S Status	Fine Ir ON	nertia Stat Su , 360, 480,	us OFF mmer and 1 600, 720	, 960, 1440	
	Re	Duratio eturn Period	Profil n(s) (m (s) (ye	An e(s) hins) 15 ears)	alysis DT	Timestep S Status	Fine Ir ON	nertia Stat Su , 360, 480,	us OFF mmer and 7 600, 720 1, 30, 10	, 960, 1440 0, 200	
	Re	Duratio	Profil n(s) (m (s) (ye	An e(s) hins) 15 ears)	alysis DT	Timestep S Status	Fine Ir ON	nertia Stat Su , 360, 480,	us OFF mmer and 1 600, 720	, 960, 1440 0, 200	
		Duratio eturn Period Climate	Profil n(s) (m (s) (ye Change	An .e(s) .ins) 15 ears) e (%)	alysis DT 5, 30, 6	Timestep S Status	Fine Ir ON 180, 240,	nertia Stat Su , 360, 480,	us OFF mmer and 7 600, 720 1, 30, 10 0, 0,	, 960, 1440 0, 200 40, 40 Water	-
	US/MH	Duratio eturn Period Climate	Profil n(s) (m (s) (ye Change Return	An e(s) hins) 15 ears) e (%) Climate	Jalysis DT 5, 30, 6 Firs	Timestep 28 Status 50, 120, t (X) 1	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	, 960, 1440 0, 200 40, 40 Water Level	Depth
PN		Duratio eturn Period Climate	Profil n(s) (m (s) (ye Change Return	An .e(s) .ins) 15 ears) e (%)	Jalysis DT 5, 30, 6 Firs	Timestep S Status	Fine Ir ON 180, 240,	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	, 960, 1440 0, 200 40, 40 Water Level	Depth
	US/MH Name	Duratio eturn Period Climate Storm	Profil n(s) (m (s) (ye Change Return Period	An e(s) hins) 15 ears) e (%) Climate Change	5, 30, 6 Firs Surcl	Timestep S Status 50, 120, t (X) I harge	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m)</pre>	Depth (m)
E19.000	US/MH Name E1	Duratio eturn Period Climate Storm 15 Winter	Profil n(s) (m (s) (ye Change Return	An e(s) hins) 15 ears) e (%) Climate Change +0%	E Surcl 100/15	Timestep S Status 50, 120, t (X) I harge Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725</pre>	Depth (m) -0.4
E19.000 E19.001	US/MH Name E1 E2	Duratio eturn Period Climate Storm 15 Winter	Profil n(s) (m (s) (ye Change Return Period 30	An e(s) hins) 15 ears) e (%) Climate Change +0%	5, 30, 6 Firs Surcl	Timestep S Status 50, 120, t (X) I harge Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m)</pre>	Depth (m) -0.4 -0.3
E19.000 E19.001 E19.002	US/MH Name E1 E2 E3	Duratio eturn Period Climate Storm 15 Winter 15 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30	An e(s) hins) 15 ears) e (%) Climate Change +0% +0%	Firs: 5, 30, 6 5, 30, 6 100/15 100/15	Timestep S Status 50, 120, t (X) I harge Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641</pre>	Depth (m) -0.4 -0.3 -0.6
E19.000 E19.001 E19.002 E20.000	US/MH Name E1 E2 E3 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30 30	An e(s) bins) 15 ears) e (%) Climate Change +0% +0% +0% +0%	Firs: 5, 30, 6 5, 30, 6 100/15 100/15	Timestep S Status 50, 120, t (X) I harge Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40</pre> Water Level (m) 78.725 78.641 78.168	Depth (m) -0.4 -0.3 -0.6 -1.0
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30 30 30	An e(s) hins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0%	Firs: 5, 30, 6 5, 30, 6 100/15 100/15	Timestep S Status 50, 120, t (X) I harge Summer Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40</pre> Water Level (m) 78.725 78.641 78.168 78.168	Depth (m) -0.4 -0.3 -0.6 -1.0 -0.9
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30	An e(s) hins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0%	Firs 5, 30, 6 Firs Surcl 100/15 100/15	Timestep S Status 50, 120, t (X) I harge Summer Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.6 -1.0 -0.9
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30	An e(s) hins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0%	Firs: 5, 30, 6 5, 30, 7, 6 5, 30, 7, 6 5, 30, 7, 6 5, 30, 7, 6 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5	Timestep S Status 50, 120, t (X) I harge Summer Summer	Fine Ir ON 180, 240, First (Y)	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.6 -1.0 -0.9
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30	An e(s) bins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0%	Firs 5, 30, 6 Firs Surcl 100/15 100/15 30/30	Timestep S Status 50, 120, t (X) I harge Summer Summer	Fine Ir ON 180, 240, First (Y) Flood Pipe	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and 7 600, 720 1, 30, 10 0, 0, Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.6 -1.0 -0.9
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter	Profil n(s) (m (s) (ye Change Return Period 30 30 30 30 30 30	An e(s) bins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% +0% +0%	Firs 5, 30, 6 Firs Surcl 100/15 100/15 30/30	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer	Fine Ir ON 180, 240, First (Y) Flood Pipe	ertia Stat Su , 360, 480, First (Z)	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.6 -1.0 -0.9
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter 480 Winter	Profil n(s) (ye Change Return Period 30 30 30 30 30 30 30 30 30	An .e(s) .ins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% Flooded Volume (m ³)	Firs: 5, 30, 6 Firs: Surcl 100/15 100/15 30/30 Flow / Cap.	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer	Fine Ir ON 180, 240, First (Y) Flood Flood Flow (1/s)	Su Su 360, 480, First (Z) Overflow Status	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.6 -1.0 -0.9
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter 480 Winter 480 Winter 90 Winter	Profil n(s) (ye Change Return Period 30 30 30 30 30 30 30 20 20 20 20 20 20 20 20 20 20 20 20 20	An .e(s) .ins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% Flooded Volume (m ³) 0.000	Firs: 5, 30, 6 Firs: Surcl 100/15 100/15 30/30 Flow / Cap. 0.45	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer	Fine Ir ON 180, 240, First (Y) Flood Flood Flow (1/s) 722.9	Su Su 360, 480, First (Z) Overflow Status OK	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.63 -1.02 -0.92
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter 480 Winter 480 Winter 90 Winter 480 Winter	Profil n(s) (ye Change Return Period 30 30 30 30 30 30 30 20 20 20 20 20 20 20 20 20 20 20 20 20	An .e(s) .ins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% Flooded Volume (m ³) 0.000 0.000	Firs 5, 30, 6 Firs Surcl 100/15 100/15 30/30 Flow / Cap. 0.45 0.80	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer	Fine Ir ON 180, 240, First (Y) Flood Flood Flow (1/s) 722.9 1288.3	Su Su 360, 480, First (Z) Overflow Status OK OK	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.63 -1.02 -0.92
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter 480 Winter 480 Winter 90 Winter	Profil n(s) (ye Change Return Period 30 30 30 30 30 30 30 4 5 8 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	An .e(s) .ins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% Flooded Volume (m ³) 0.000	Firs: 5, 30, 6 Firs: Surcl 100/15 100/15 30/30 Flow / Cap. 0.45 0.80 0.00	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer	Fine Ir ON 180, 240, First (Y) Flood Flood Flow (1/s) 722.9	Su Su 360, 480, First (Z) Overflow Status OK	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.63 -1.02 -0.92
E19.000 E19.001 E19.002 E20.000 E20.001	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter 480 Winter 480 Winter 900 E19.000 E19.000 E19.002	Profil n(s) (ye Change Return Period 30 30 30 30 30 30 30 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	An .e(s) bins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% Flooded Volume (m ³) 0.000 0.000 0.000	Firs 5, 30, 6 5, 30, 7, 7 5, 30, 7, 7 5, 30, 7, 7 5, 30, 7 5, 5, 7 5, 7 5, 7 5, 7 5, 7 5, 7 5,	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer Overflow (1/s)	Fine Ir ON 180, 240, First (Y) Flood Flood 722.9 1288.3 58.3	Su Su Su Si Sirst (Z) Overflow Status OK OK OK	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	-
PN E19.000 E19.001 E19.002 E20.000 E20.001 E19.003	US/MH Name E1 E2 E3 E4 E4 E4	Duratio eturn Period Climate Storm 15 Winter 15 Winter 480 Winter 480 Winter 480 Winter 480 Winter 9000 E19.000 E19.000 E19.000 E19.000 E19.000	Profil n(s) (ye Change Return Period 30 30 30 30 30 30 30 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	An .e(s) bins) 15 ears) e (%) Climate Change +0% +0% +0% +0% +0% +0% Flooded Volume (m ³) 0.000 0.000 0.000 0.000	Firs 5, 30, 6 5, 30, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7,	Timestep S Status 50, 120, t (X) I harge Summer Summer Summer Overflow (1/s)	Fine Ir ON 180, 240, First (Y) Flood Flow (1/s) 722.9 1288.3 58.3 49.9 39.8	Su Su Su Si Sirst (Z) Overflow Status OK OK OK OK	us OFF mmer and V 600, 720 1, 30, 10 0, 0, Overflow Act. Level Exceeded	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 78.725 78.641 78.168 78.168 78.168 78.168</pre>	Depth (m) -0.4 -0.3 -0.65 -1.02 -0.92

Hydrock	Consu	ltants Lto	4							Pa	age 7
nyaroon					Rai	l Cent	ral				.90 ,
•					-	t 12	Lat				ч
•					UIII	L IZ					m
·		2010			Dee	t an a d	by RJH				Micro
		uary 2018				-	-				Drainage
File Uni		MDX				cked b	-				Brainacje
XP Solut	ions				Net	work 2	016.1				
<u>100</u>	year	Return Pe	riod S	ummary				by Maximu	m Level	(Rank	1) for
					<u>E</u>	xistin	a				
					Simula	tion Cr	iteria				
		Areal			or 1.00	0 Add	itional F	low - % of			
		Uet		art (min Level (m			MADD Fac	tor * 10m ³ /	ha Storage effiecient		
	Mar	not hole Headlo					per Perso				
		Foul Sewage					1	1 2 (, 1 - , 1,		
		Input Hydr								-	
1	Number	of Online C	ontrols	1 Numbe	er of St	orage S	tructures	0 Number o	f Real Tin	me Cont	rols O
							<u>ll Details</u>				
		Rainfall Mo Site Locat		FEH D1	(1km) 0	.319	E (1km) F (1km)	0.302 Cv (1	Winter) 0.	.840	
							(Summer)				
					1	. ,			0.77		
		Maro	jin for					DVD Stat nertia Stat			
						S Statu					
			Profil	e(s)				Su	mmer and N	Winter	
		Duratio	on(s) (m	uins) 15	5, 30, 6	50, 120,	180, 240	, 360, 480,	600, 720,		
	Re	eturn Perioo	l(s) (ve	ars)					1, 30, 100	1440	
	110		e Change						0, 0, 4		
			D	61 in a ba		(17)			0		Surcharged
PN	US/MH Name	Storm		Climate Change		t (X) narge	Flood	First (Z) Overflow	Act.	Level (m)	Depth (m)
E19.000	E1	15 Winter	100	+108	100/15	Summer				79.571	0.371
E19.000		15 Winter	100		100/15					79.371	0.359
E19.002		960 Winter	100	+40%	, .					78.568	-0.257
E20.000	E4	960 Winter	100	+40%						78.568	-0.626
E20.001	E4	960 Winter	100	+40%						78.568	-0.521
E19.003	E5	960 Winter	100	+40%	30/30	Summer				78.568	0.598
				Flooded			Pipe				
				Volume				<i>a</i> , .	Level		
		PN	Name	(m³)	Cap.	(1/s)	(1/s)	Status	Exceeded		
		E19.000		0.000	0.95			SURCHARGED			
		E19.001		0.000	1.70			SURCHARGED			
		E19.002		0.000	0.00		91.5	OK			
		E20.000 E20.001		0.000	0.00		36.6 27.9	OK OK			
		E19.001		0.000	0.02			SURCHARGED			
			_ 0		= 0		= 0				

lydrock	Consu	ltants Lt	d							Pa	.ge 8
					Rai	l Centra	al				
					Uni	t. 12					4
											~~~~
	The lase				Dee						Micro
		uary 2018				igned b					Drainag
Tile Uni	t 12.	MDX			Che	cked by					
KP Solut	ions				Net	work 20	16.1				
200	year	<u>Return Pe</u>	riod St	ummary_		tical R xisting		by Maximu	m Level	(Rank	<u>1) for</u>
	I mber of	Ho hhole Headl Foul Sewage Input Hyd	Hot St t Start oss Coef per hec rographs	art (min Level (m f (Globa tare (l/ 0 Num	or 1.00 (s) (m) (1) 0.50 (s) 0.00 (ber of	0 1 0 00 Flow pe 00 Offline (	tional Fi MADD Fact er Person Controls	low - % of tor * 10m³/ Inlet Co n per Day ( 0 Number o 0 Number o	ha Storage effiecient l/per/day) f Time/Are	e 2.000 z 0.800 0 0.000	rams O
		Site Loca C (	tion 1km) -0.	FEH D1 D2 .026 D3	(1km) 0 (1km) 0 (1km) 0	.300 .243 Cv (	E (1km) F (1km) Summer)	0.302 Cv (1 2.496		.840	
	Re	eturn Perio		e(s) mins) 15 ears)	DT	S Status	ON	, 360, 480,	mmer and 1	, 960, 1440 0, 200	
										Water	Surcharge
	US/MH		Return	Climate	Firs	t (X) E	'irst (Y)	First (Z)	Overflow	Level	Depth
PN	Name	Storm	Period	Change	Surc	harge	Flood	Overflow	Act.	(m)	(m)
E19.000	E1	15 Winter	200	+40%	100/15	Summer				80.052	0.85
E19.000	E2	15 Winter			100/15					79.733	0.72
E19.002		960 Winter		+40%						78.721	-0.10
E20.000	E4	960 Winter	200	+40%						78.719	-0.47
E20.001	E4	960 Winter	200	+40%						78.719	-0.37
E19.003	E5	960 Winter	200	+40%	30/30	Summer				78.719	0.74
				<b>5</b> 1 4 - 4			Dias				
				Flooded	<b>1</b> 1 /	0	Pipe		T		
		7467				Overflow		8+2+	Level		
		PN	Name	(m³)	Cap.	(l/s)	(1/s)	Status	Exceeded		
		E19.00	0 E1	0.000	1.20		1934.4	SURCHARGED			
		E19.00		0.000	2.15			SURCHARGED			
		E19.00		0.000	0.00		105.6	OK			
		E20.00		0.000	0.00		37.0	OK			
		E20.00		0.000	0.02		27.5	OK			
			L P.4	U.UUU	0.07		61.0	UK			

E19.003 E5 0.000 0.16 20.7 SURCHARGED

Hydrock Consultants Ltd		Page 1
· ·	Rail Central Unit 13	l'un
Date 6th February 2018	Designed by RJH	MICrO Drainarre
File Unit 13.MDX	Checked by	Diamage
XP Solutions	Network 2016.1	

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.082	4-8	3.754	8-12	0.204
Total	Area (	Contribu	uting (	(ha) = 5	.040

Total Pipe Volume (m³) = 4958.930

lydrock	Consulta	nts Lto	k										Page 2
					I	Rail Ce	entral						
					τ	Jnit 13	3						4
ate 6th	Februar	v 2018			Т	Designe	ed by F	RJH					Micro
Date 6th February 2018 File Unit 13.MDX						Checked	-						Drainag
								1					
P Solut	lons				ſ	Networ]	\$ 2016	. ⊥					
			Ex	istinc	n Netw	ork De	tails	for	Exist	inq			
	PN Length Fall Slope I.Area T.E. Base k HYD DIA Section T												
		(m)	(m)	(1:X)	(ha)	(mins)	Flow (	1/s)	(mm)	SECT	(mm)		
	E18.000	122.700	0.245	500.8	1.680	4.00	I	0.0	0.600	0	1200	Pipe/Con	nduit
	E18.001								0.600			Pipe/Con	
	E18.002	83.000	0.166	500.0	1.680	0.00	1	0.0	0.600			Pipe/Con	
	E18.003	55.800	0.140	398.6	0.000	0.00	I	0.0	0.600	0		Pipe/Con	
	E18.004	42.100	0.105	401.0	0.000	0.00	1					Pipe/Co	
					<u>Netwc</u>	ork Res	ults 1	able	2				
			PN			Area			7el	Cap			
				(m)	) (	(ha) F	'low (1/	s) (n	n/s)	(l/s)			
			E18.0	00 78.0	000	1.680	0	.0 1	1.66	1882.	9		
			E18.0	01 77.7	55	3.360	0	.0 1	1.67	1883.	6		
						5.040 5.040		.0 2	2.51 14	11436.	4		
			E18.0	03 77.3	871	5.040	0	.0 1	1.01	161.	0		
			E18.0	04 77.2	231	5.040	0	.0 1	1.01	160.	5		
				Conc	luit S	Section	s for	Exis	sting				
		NOTE: D	iamoto						-	co of	hudr	, ulic	
		conc	duits.	These o	conduit	s are m oo dua	arked b	y the	e symbo	ls:-	[] bo	х	
		c,	Section	number	cs < 0	are tak	en from	user	condu	it ta	ble		
		Se	ection	Conduit	t Majo	r Minor	Side	Corne	r 4*Hy	d XS	Sect		
		N	umber	Туре		. Dimn.	-		-		rea		
					(mm)	(mm)	(Deg)	(mm)	(m)	(:	m²)		
			-8	[]	] 47000	1200	90.0		2.3	40 56	.400		

Hudrock Concultanta	T + A									- T	a 3
Hydrock Consultants	шια			Rail	Centr	al				P8	age 3
				Unit		~±					ч
•				01110	10						~~~
Date 6th February 2	018			Desia	ned b	v RJH					Micro
File Unit 13.MDX				-	ed by	_					Drainage
XP Solutions	Netwo										
		PIF	PELINE	SCHED	ULES 1	for E	xistir	nd			
						1 7 .					
			<u>U</u> ]	<u>pstrea</u>	<u>m Man</u>	<u>nole</u>					
PN	Hyd Di	am MH	C.Leve	el I.Le	vel D.	Depth	м	ш	MH DIAM., 1	L*W	
	Sect (m	m) Name	e (m)	(п	ı)	(m)	Conne	ction	(mm)		
E18.000	o 12	00 E	1 81.00	00 78.	000	1.800	Open M	Ianhole	2.1	100	
E18.001		00 E2	2 81.00	00 77.	755					100	
E18.002			3 81.00				-	lanhole		725	
	0 4		4 81.00				-	lanhole		500	
E18.004	o 4	50 E:	5 80.50	00 77.	231	2.819	Open M	lanhole	13	500	
			Dor	wnstre	am Ma	nhole	<u>}</u>				
	an ath 0	1		1 T	T		- <b>h</b>		MIL DIAM	T +17	
PN I	ength S (m) (	lope n 1:X) Na		evei I. n)	(m)	D.Dept (m)		MH inection	MH DIAM.	, <b>L</b> *W	
			-	•							
E18.000 1			E2 81		7.755			Manhol		2100	
E18.001 1 E18.002			E3 81 E4 81				-			47725 1500	
E18.003			E5 80					Manhol		1500	
E18.004			E 80					Manhol		0	
	E r	DO Elo	owing C	)))+ f ~ 1	1 Dota		for Ex	vietin	a		
	<u> </u>	ee rit	JWIIIG C	JULIAI	I Deta	1115	IUI EZ	<u>LSCIII</u>	<u>4</u>		
	Outfa		utfall	C. Leve			Min	D,L	W		
	Pipe Nu	mber	Name	(m)	()	<b>m)</b> :	I. Leve (m)	∍l (mm)	(mm)		
							(ш)				
	E18	.004	E	80.00	0 77	.126	0.00	0 0	0		
		Sim	ulatio	n Crit	oria	for F	vieti	na			
		<u>DTIII</u>	uiacio.		erra	101 1	ATSUL	<u>II</u> g			
Vo	lumetric	Runofi	f Coeff	0.750	Addi	tional	Flow	- % of	Total Flow	0.000	
A	real Red				1	MADD F			ha Storage		
			(mins)		Flare m	on Don			effiecient l/per/day)		
Manhole He					FIOM D	er Per	son pe		ime (mins)	60	
Foul Sew							Outpu		val (mins)	1	
Number of Toput		aha 0	Mambo		flime	Contro	1~ 0 11		f Time / Tures	Dies	
Number of Input Number of Onli		-								-	
					5						
		-	Synthe	tic Ra	infal	l Det	ails				
- ת	infall M		FEH	îط	(1km)	0 200		Mint	er Storms	No	
Return Pe			ғын 2		(1 km) (1 km)				(Summer) 0		
	Site Loca		-		(1 km)				(Winter) 0		
		1km) -	0.026				Storm		on (mins)	30	
	D1 (	1km)	0.319 s	ummer S	Storms	Yes					

	Ltd							Page	4	
•			Rail Ce	entral						
			Unit 13	3				م	r	سر
• Date 6th February 2	018		Designe	ed by RJH				MI		
-	010		_	-				Dr	aina	<b>UD</b>
File Unit 13.MDX			Checked	-						5
XP Solutions			Networ	k 2016.1						
		<u>Onlin</u>	e Controls	s for Exi	<u>stinq</u>					
<u>Hydro-Bral</u>	ke Optimum®	Manho	ole: E4, D	S/PN: E18	3.003, Vc	lume (m³)	: 3299	9.5		
		т	Jnit Referer	NCA MD-SHE-	0195-1970-	-1200-1970				
			esign Head		5175 17/0-	1.200				
			iqn Flow (l,	. ,		19.7				
			Flush-Fl		C	Calculated				
			Objecti	ive Minimi	se upstrea	am storage				
			Applicati	ion		Surface				
		5	Sump Availab	ble		Yes				
			Diameter (r	,		195				
			vert Level	· /		77.371				
	Minimum Outle					225				
		lanhole	Diameter (r	mm)		1500				
	Suggested N	1411110 2 0				1000				
Control Poi			Flow (l/s)		ol Points	Head	(m) Fl	ow (1	L/s)	
Control Poi	ints Hea					Head	(m) Fl .827		L <b>/s)</b>	
<b>Control Poi</b> Design Point (Ca	ints Hea	ad (m)	Flow (1/s)		Kick	Head -Flo® 0		. 1		
<b>Control Poi</b> Design Point (Ca F	ints Hea lculated) lush-Flo™	<b>ad (m)</b> 1.200 0.378	Flow (1/s) 19.7 19.7	Contr Mean Flow	Kick over Head	<b>Head</b> -Flo® 0 Range	.827	1	16.5 16.8	
<b>Control Poi</b> Design Point (Ca F The hydrological calo	ints Hea lculated) 'lush-Flo™ culations hav	ad (m) 1.200 0.378	Flow (1/s) 19.7 19.7 based on th	<b>Contr</b> Mean Flow one Head/Disc	Kick over Head charge rel	<b>Head</b> -Flo® 0 Range ationship f	.827 _ for the	1 1 Hydr	16.5 16.8 o-Bral	¢e
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified	ints Hea lculated) 'lush-Flo™ culations hav d. Should an	ad (m) 1.200 0.378 The been other t	Flow (1/s) 19.7 19.7 based on th ype of cont	Contr Mean Flow He Head/Disc crol device	Kick over Head charge rel other tha	<b>Head</b> -Flo® 0 Range ationship f	.827 _ for the	1 1 Hydr	16.5 16.8 o-Bral	ςe
<b>Control Poi</b> Design Point (Ca F The hydrological calo	ints Hea lculated) 'lush-Flo™ culations hav d. Should an	ad (m) 1.200 0.378 The been other t	Flow (1/s) 19.7 19.7 based on th ype of cont	Contr Mean Flow He Head/Disc crol device	Kick over Head charge rel other tha	<b>Head</b> -Flo® 0 Range ationship f	.827 _ for the	1 1 Hydr	16.5 16.8 o-Bral	¢e
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified utilised then these s	ints Hea llculated) 'lush-Flo™ culations hav d. Should an storage routi	ad (m) 1.200 0.378 The been other t ng calc	Flow (1/s) 19.7 19.7 based on th type of cont sulations wi	Contr Mean Flow He Head/Disc crol device 11 be inva	Kick over Head charge rel other tha lidated	Head -Flo® 0 Range ationship f n a Hydro-F	.827 _ for the grake Op	1 1 Hydr otimu	16.5 16.8 o-Bral m® be	
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified utilised then these s	ints Hea llculated) 'lush-Flo™ culations hav d. Should an storage routi	ad (m) 1.200 0.378 The been other t ng calc	Flow (1/s) 19.7 19.7 based on th type of cont sulations wi	Contr Mean Flow He Head/Disc crol device 11 be inva	Kick over Head charge rel other tha lidated	Head -Flo® 0 Range ationship f n a Hydro-F Flow (1/s)	.827 - Gor the grake Op	1 1 Hydr otimu	16.5 16.8 o-Bral m® be	(1/s
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified utilised then these s Depth (m) Flow (1/s)	ints Hea lculated) Tush-Flo™ culations hav d. Should an storage routi epth (m) Flow	ad (m) 1.200 0.378 The been other t ng calc (1/s)	Flow (1/s) 19.7 19.7 based on th type of cont culations wi Depth (m)	Contr Mean Flow o he Head/Disc crol device ll be inva Flow (1/s)	Kick over Head charge rel other tha lidated <b>Depth (m)</b>	Head -Flo® 0 Range ationship f n a Hydro-F Flow (1/s) 35.1	.827  Gor the grake Op  Depth 7	1 Hydr otimu (m)	16.5 16.8 o-Bral m® be	
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified utilised then these s Depth (m) Flow (1/s) Do 0.100 6.8	ints Hea lculated) Tush-Flo™ culations hav d. Should an storage routi epth (m) Flow 0.800	ad (m) 1.200 0.378 The been other t ng calc (1/s) 17.1	Flow (1/s) 19.7 19.7 based on th type of cont culations wi Depth (m) 2.000 2.200	Contr Mean Flow of the Head/Disc trol device 11 be inva Flow (1/s) 25.1	Kick over Head charge rel other tha lidated <b>Depth (m)</b> 4.000 4.500	Head -Flo® 0 Range ationship f n a Hydro-F Flow (1/s) 35.1 37.2	.827 - Gor the grake Op Depth 7 7	1 1 Hydr otimu (m) .000	16.5 16.8 o-Bral m® be	<b>(1/s</b> 45. 47.
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified utilised then these s Depth (m) Flow (1/s) Do 0.100 6.8 0.200 18.1	ints Hea lculated) Tush-Flo™ culations hav d. Should an storage routi epth (m) Flow 0.800 1.000	ad (m) 1.200 0.378 The been other t ng calc (1/s) 17.1 18.1	Flow (1/s) 19.7 19.7 based on th type of cont culations wi Depth (m) 2.000 2.200 2.400	Contr Mean Flow of the Head/Disc Trol device 11 be inva Flow (1/s) 25.1 26.3	Kick over Head charge rel other tha lidated <b>Depth (m)</b> 4.000 4.500 5.000	Head -Flo® 0 Range ationship f n a Hydro-F Flow (1/s) 35.2 37.2 39.0	.827 - Gor the grake Op Depth 7 7 8	1 Hydr otimu (m) .000 .500	6.5 6.8 o-Bral m® be <b>Flow</b>	<b>(1/</b> 45 47 49
Control Poi Design Point (Ca F The hydrological calc Optimum® as specified utilised then these s Depth (m) Flow (1/s) 0.100 6.8 0.200 18.1 0.300 19.5	ints Hea llculated) Tush-Flo™ culations hav d. Should an storage routi epth (m) Flow 0.800 1.000 1.200	ad (m) 1.200 0.378 The been other t ng calco (1/s) 17.1 18.1 19.7	Flow (1/s) 19.7 19.7 based on th type of cont culations wi Depth (m) 2.000 2.200 2.400	Contr Mean Flow of the Head/Disc Trol device 11 be inva Flow (1/s) 25.1 26.3 27.4	Kick over Head charge rel other tha lidated <b>Depth (m)</b> 4.000 4.500 5.000	Head -Flo® 0 Range ationship f n a Hydro-F Flow (1/s) 35.2 37.2 39.0 40.5	.827 - Gor the grake Op Depth 7 7 8 8 8	1 Hydr timu (m) .000 .500 .000	6.5 6.8 o-Bral m® be <b>Flow</b>	<b>(1/s</b> 45.

Hydrock Cor	sultants Lto	d							Pa	ge 5
•				Rail	Central				C	
				Unit 2	13					
										Micro
	ebruary 2018			Design	ned by H	RJH				Drainage
File Unit 1	3.MDX			Checke	ed by					Jianiaye
XP Solution	is			Netwo	rk 2016.	. 1				
<u>l year Ret</u>	urn Period S		<u>S</u>	imulatic	on Criter	<u>ia</u>				r Existing
		Hot Start Start Lev ss Coeff	t (mins) vel (mm) (Global)	0 0 0.500 H	MAD	D Facto	or * 10m³ Inlet C	Total Flo /ha Storag oeffiecien (l/per/day	e 2.000 t 0.800	
	of Input Hydr Der of Online C								-	
	Rainfall Mo Site Locat C (1		H D1 (1k D2 (1k	m) 0.31 m) 0.30	0 F	(1km) 0 (1km) 2	.496	(Winter) O	.840	
	Marc	in for Flo		ysis Tim		ine Ine	DVD Sta ertia Sta			
			s) 15,	30, 60,	120, 180	, 240,		ummer and , 600, 720 1, 30, 10	, 960, 1440	
	Return Perioc Climate	e Change (							40, 40	
									Water	Surcharged
US/ PN Nai		Return Cl Period Cl		First ( Surchar	•	st (Y) Lood		Overflow Act.		Depth (m)
	E1 15 Winter E2 15 Winter	1 1		)0/15 Su )0/15 Su					78.315 78.151	
	E3 480 Winter	1	+0%						77.652	-1.085
	E4 480 Winter E5 480 Winter	1 1	+0% 3( +0%	)/120 Wi	nter				77.652 77.340	
			Flooded		0	Pipe		Tamal		
	PI		(m ³ )	Cap.	Overflow (1/s)		Status E	Level xceeded		
	E18. E18. E18. E18. E18.	001 E2 002 E3 003 E4	0.000 0.000 0.000	0.24 0.00 0.13		228.1 390.0 59.4 19.4 19.4	OK OK OK OK			

Hydrock	Consu	ltants Lto	l							Pa	ge 6
•					Rai	l Centr	al				
•					Uni	t 13				1	1.
											disco.
Date 6th	n Febr	uary 2018			Des	igned k	y RJH				
File Uni	lt 13.	MDX			Che	cked by	7				Drainage
XP Solut	cions				Net	work 20	16.1				
30 year Nu	Retur Mar F	Hot hole Headlo foul Sewage Input Hydr of Online Co Rainfall Mo Site Locat C (1 Marg	Reduct Hot St Start ss Coef per hec ographs ontrols del ion km) -0. in for Profil	ion Fact art (min Level (m f (Globa tare (1/ 0 Num 1 Numbe <u>Syp</u> FEH D1 D2 .026 D3 Flood Ri An	<u>itical</u> or 1.00 s) m) 1) 0.50 s) 0.00 ber of r of St nthetic (1km) 0 (1km) 0 (1km) 0 (1km) 0 sk Warn alysis DT	Result tion Cri 0 Add 0 0 Flow p 0 Offline orage St Rainfal .319 .300 .243 Cv ing (mm) Timestep S Status	teria tional Fl MADD Fact Der Person Controls ructures <u>l Details</u> E (1km) F (1km) (Summer) 300.0 Fine In ON	ow - % of ' or * 10m³/j Inlet Cod per Day () 0 Number o 0 Number o 0.302 Cv (N 2.496 0.750 DVD State mertia State	Total Flow ha Storage efficcient l/per/day) f Time/Ary f Real Tim Winter) 0. us OFF us OFF us OFF	w 0.000 e 2.000 t 0.800 ) 0.000 ea Diagr me Contr .840 Winter	ams 0
	Re	eturn Period Climate	-						1, 30, 100 0, 0, 4	40, 40	Surcharged
	US/MH			Climate				First (Z)			Depth
PN	Name	Storm	Period	Change	Surc	harge	Flood	Overflow	Act.	(m)	(m)
E18.000	E1	15 Winter	30	+0%	100/15	Summer				78.654	-0.546
E18.001		15 Winter	30		100/15	Summer				78.553	-0.402
E18.002 E18.003		600 Winter 600 Winter	30 30	+0% +0%	30/120	Winter				77.919 77.918	-0.81
E18.004		30 Summer	30	+0%	507120	WINCOI				77.341	-0.34
				<b>5</b> 1			Disc				
				Flooded Volume	Flow /	Overflo	Pipe w Flow		Level		
		PN	Name	(m ³ )	Cap.	(1/s)	(1/s)	Status	Exceeded		
				, <i>/</i>	<b>F</b> .	(=,=)	(_/ <b>_</b> /				
		E18.000		0.000	0.43		710.3	OK			
		E18.001 E18.002		0.000	0.77		1261.6	OK			
			EЗ	0.000	0.00		109.6	OK			
			E.4	0.000	0.13		19.6	SURCHARGED			
		E18.002 E18.003 E18.004		0.000 0.000	0.13 0.14		19.6 19.7	SURCHARGED OK			
		E18.003									
		E18.003									
		E18.003									
		E18.003									

lydrock	COIISu		1						Pa	lge 7
<u> </u>					Rail C	Central				
					Unit 1					ч
•						15				~ m
										Micro
		uary 2018			Design	ned by RJH				Drainage
File Uni	t 13.	MDX			Checke	ed by				Diamaye
KP Solut	ions				Networ	rk 2016.1				
<u>100</u>	year	Return Per	ciod Su	ummary		cal Results sting	by Maximu	m Level	(Rank	<u>1) for</u>
	F nber of	Hot hole Headlo Foul Sewage Input Hydr of Online C Rainfall Mc Site Locat	Hot St Start ss Coef per hec ographs ontrols odel cion	art (min Level (m f (Globa tare (l/ 0 Num 1 Numbe <u>Sy</u> FEH D1 D2	or 1.000 s) 0 m) 0 l) 0.500 F s) 0.000 ber of Off r of Stora nthetic Rai (1km) 0.319 (1km) 0.300	<u>on Criteria</u> Additional FI MADD Fact Flow per Person Eline Controls age Structures <u>infall Details</u> 9 E (1km) 0 F (1km) 3 Cv (Summer)	<pre>tor * 10m³/h     Inlet Cog     per Day (:         0 Number o         0 Number o         0.302 Cv (V         2.496</pre>	ha Storage effiecient l/per/day) f Time/Are f Real Tir	e 2.000 0.800 0.000 ea Diagn ne Contr	rams O
		Marg	in for		-	(mm) 300.0				
	Re	Duratic eturn Period	Profil n(s) (m	An e(s) iins) 15 ars)	alysis Time DTS S	r (mm) 300.0 Nestep Fine Ir Status ON 120, 180, 240,	nertia Statu Sun , 360, 480,	us OFF mmer and W	960, 1440 ), 200	
PN	Re US/MH Name	Duratic eturn Period	Profil n(s) (m (s) (ye Change <b>Return</b>	An e(s) iins) 15 ars)	alysis Time DTS S	<pre>Mestep Fine In Status ON 120, 180, 240, X) First (Y)</pre>	nertia Statu Sun , 360, 480,	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4	960, 1440 ), 200 40, 40	Surcharged Depth (m)
	US/MH Name	Duratic eturn Period Climate <b>Storm</b>	Profil n(s) (m (s) (ye Change Return Period	An e(s) ins) 15 ars) c(%) Climate Change	alysis Tim DTS S ⁻ 5, 30, 60, First () Surcharc	Nestep Fine In Status ON 120, 180, 240, X) First (Y) ge Flood	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	960, 1440 0, 200 40, 40 Water Level (m)	Depth (m)
E18.000	US/MH Name E1	Duratic eturn Period Climate <b>Storm</b> 15 Winter	Profil n(s) (m (s) (ye Change Return Period 100	An e(s) ins) 15 ars) : (%) Climate Change +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> Surcharc 100/15 Sum	<pre>hestep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer</pre>	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	960, 1440 0, 200 40, 40 Water Level (m) 79.562	Depth (m) 0.362
E18.000 E18.001	US/MH Name E1 E2	Duratic eturn Period Climate <b>Storm</b> 15 Winter 15 Winter	Profil n(s) (m (s) (ye Change Return Period 100 100	An e(s) ins) 15 ars) : (%) Climate Change +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, First () Surcharc	<pre>hestep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer</pre>	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318	Depth (m) 0.362 0.363
E18.000	US/MH Name E1 E2 E3	Duratic eturn Period Climate <b>Storm</b> 15 Winter	Profil n(s) (m (s) (ye Change Return Period 100	An e(s) ins) 15 ars) c(%) Climate Change +40% +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> Surcharc 100/15 Sum	<pre>hestep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer mmer</pre>	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	960, 1440 0, 200 40, 40 Water Level (m) 79.562	Depth (m) 0.362
E18.000 E18.001 E18.002	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate <b>Storm</b> 15 Winter 15 Winter 960 Winter	Profil n(s) (m (s) (ye Change Return Period 100 100 100	An e(s) ins) 15 ars) c(%) Climate Change +40% +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun	<pre>hestep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer mmer</pre>	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	<pre>960, 1440 0, 200 00, 40 Water Level (m) 79.562 79.318 78.375</pre>	Depth (m) 0.362 0.363 -0.362
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate <b>Storm</b> 15 Winter 15 Winter 960 Winter 960 Winter	Profil n(s) (m (s) (ye Change <b>Return</b> <b>Period</b> 100 100 100 100	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun	<pre>hestep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer mmer</pre>	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate <b>Storm</b> 15 Winter 15 Winter 960 Winter 960 Winter	Profil n(s) (m (s) (ye Change <b>Return</b> <b>Period</b> 100 100 100 100	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun	<pre>hestep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer mmer</pre>	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate <b>Storm</b> 15 Winter 15 Winter 960 Winter 960 Winter	Profil n(s) (m (s) (ye Change <b>Return</b> <b>Period</b> 100 100 100 100	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun	estep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer mmer nter Pipe	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b>	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate <b>Storm</b> 15 Winter 15 Winter 960 Winter 960 Winter	Profil n(s) (m (s) (ye Change <b>Return</b> <b>Period</b> 100 100 100 100	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% +40%	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun 30/120 Wir <b>Flow / Ove</b>	estep Fine In status ON 120, 180, 240, X) First (Y) ge Flood mmer mmer nter Pipe	nertia Statu Sun , 360, 480, First (Z)	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 <b>Overflow</b> Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate Storm 15 Winter 15 Winter 960 Winter 960 Winter 960 Summer	Profil n(s) (m (s) (ye Change Return Period 100 100 100 100 100 100 100	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% Flooded Volume (m ³ )	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun 30/120 Wir <b>Flow / Ove</b> <b>Cap. (</b>	<pre>hestep Fine In status ON 120, 180, 240, 120, 180, 240, x) First (Y) ge Flood mmer mmer nter Pipe erflow Flow (1/s) (1/s)</pre>	Sun Sun 360, 480, First (Z) Overflow Status	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate Storm 15 Winter 15 Winter 960 Winter 960 Winter 960 Summer PN E18.000	Profil n(s) (m Change Return Period 100 100 100 100 100 100 100 100 100 10	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% Flooded Volume (m ³ ) 0.000	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> <b>Surcharg</b> 100/15 Sun 100/15 Sun 30/120 Wir <b>Flow / Ove</b> <b>Cap. (</b> 0.89	<pre>hestep Fine In status ON 120, 180, 240, x) First (Y) ge Flood mmer mmer nter Pipe erflow Flow (1/s) (1/s) 1480.9</pre>	Surcharged	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate Storm 15 Winter 15 Winter 960 Winter 960 Winter 960 Summer PN E18.000 E18.001	Profil n(s) (m (s) (ye Change Return Period 100 100 100 100 100 100 100 100 100	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% Flooded Volume (m ³ ) 0.000 0.000	alysis Tim DTS S ⁻ 5, 30, 60, First () Surcharg 100/15 Sun 100/15 Sun 30/120 Wir Flow / Ove Cap. ( 0.89 1.63	<pre>hestep Fine In status ON 120, 180, 240, x) First (Y) ge Flood mmer mmer nter Pipe erflow Flow (1/s) (1/s) 1480.9 2671.0</pre>	Surcharged SURCHARGED	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate Storm 15 Winter 15 Winter 960 Winter 960 Winter 960 Summer PN E18.000 E18.001 E18.002	Profil n(s) (m (s) (ye Change Return Period 100 100 100 100 100 100 100 100 100 10	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% Flooded Volume (m ³ ) 0.000 0.000 0.000	alysis Tim DTS S ⁻ 5, 30, 60, <b>First ()</b> Surcharg 100/15 Sun 100/15 Sun 30/120 Wir <b>Flow / Ove</b> Cap. ( 0.89 1.63 0.00	<pre>testep Fine In status ON 120, 180, 240, 120, 180, 240, x) First (Y) ge Flood mmer mmer nter nter Pipe erflow Flow (1/s) (1/s) 1480.9 2671.0 135.4</pre>	Surcharged SURCHARGED OK	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553
E18.000 E18.001 E18.002 E18.003	US/MH Name E1 E2 E3 E4	Duratic eturn Period Climate Storm 15 Winter 15 Winter 960 Winter 960 Winter 960 Summer PN E18.000 E18.001	Profil n(s) (m (s) (ye Change Return Period 100 100 100 100 100 100 100 100 100 10	An e(s) ins) 15 ars) (%) Climate Change +40% +40% +40% +40% +40% Flooded Volume (m ³ ) 0.000 0.000	alysis Tim DTS S ⁻ 5, 30, 60, First () Surcharg 100/15 Sun 100/15 Sun 30/120 Wir Flow / Ove Cap. ( 0.89 1.63	<pre>testep Fine In status ON 120, 180, 240, 120, 180, 240, x) First (Y) ge Flood mmer mmer nter nter Pipe erflow Flow (1/s) (1/s) 1480.9 2671.0 135.4</pre>	Surcharged SURCHARGED	us OFF mmer and W 600, 720, 1, 30, 100 0, 0, 4 Overflow Act. Level	<pre>960, 1440 0, 200 40, 40 Water Level (m) 79.562 79.318 78.375 78.374</pre>	Depth (m) 0.362 0.363 -0.362 0.553

Hydrock Consultants Ltd	Page 8
. Rail Central	
. Unit 13	4
	Micco
Date 6th February 2018 Designed by RJH	Micro
File Unit 13.MDX Checked by	Drainage
XP Solutions Network 2016.1	
200 year Return Period Summary of Critical Results by Maximum Level (Ram Existing	<u>nk 1) for</u>
<u>Simulation Criteria</u> Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.0	000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.0	
Hot Start Level (mm) 0 Inlet Coefficient 0.8	
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.0 Foul Sewage per hectare (l/s) 0.000	000
Four Sewage per nectare (1/S) 0.000	
Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Di	-
Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Co	ontrols U
Synthetic Rainfall Details	
Rainfall Model         FEH D1 (1km) 0.319         E (1km) 0.302 Cv (Winter) 0.840           Site Location         D2 (1km) 0.300         F (1km) 2.496	
C (1km) -0.026 D3 (1km) 0.243 Cv (Summer) 0.750	
Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF	
DTS Status ON	
Profile(s) Summer and Winte	er
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960	
144 Return Period(s) (years) 1, 30, 100, 20	
Climate Change (%)	
Wat	er Surcharged
	vel Depth
PN Name Storm Period Change Surcharge Flood Overflow Act. (m	ı) (m)
E18.000 E1 15 Winter 200 +40% 100/15 Summer 80.	
E18.001 E2 15 Winter 200 +40% 100/15 Summer 79.	
E18.002 E3 960 Winter 200 +40% 78.	
E18.003         E4         960 Winter         200         +40% 30/120 Winter         78.1           E18.004         E5         1440 Summer         200         +40%         77.1	
	0.510
Flooded Pipe	
Flooded Pipe US/MH Volume Flow / Overflow Flow Level	
-	
US/MH Volume Flow / Overflow Flow Level	
US/MH Volume Flow / Overflow Flow Level PN Name (m ³ ) Cap. (l/s) (l/s) Status Exceeded	
US/MH         Volume         Flow / Overflow         Flow         Level           PN         Name         (m³)         Cap.         (l/s)         (l/s)         Status         Exceeded           E18.000         E1         0.000         1.13         1879.6         SURCHARGED           E18.001         E2         0.000         2.06         3362.4         SURCHARGED           E18.002         E3         0.000         0.00         156.2         OK	
US/MH Volume Flow / Overflow FlowLevelPNName(m³)Cap.(l/s)(l/s)StatusExceededE18.000E10.0001.131879.6SURCHARGEDE18.001E20.0002.063362.4SURCHARGED	

Hydrock Consultants Ltd		Page 1
•	Rail Central	
•	Road North of Unit 5	Micro
Date 6th February 2018	Designed by RJH	
File Road North of Unit 5.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	1
Existing Net	work Details for Existing	-

PN	Length	Fall	Slope	I.Area	T.E.	Ba	ase	k	HYD	DIA	Section Type
	(m)	(m)	(1:X)	(ha)	(mins)	Flow	(l/s)	(mm)	SECT	(mm)	
E4 000	170 100	0 005	200 1	0 4 2 2	1 00		0 0	0 600		1000	Dina (Canduit

E4.000	1/9.100	0.895	200.1	0.433	4.00	0.0	0.600	0	1800	Pipe/Conduit
E4.001	13.400	0.190	70.5	0.000	0.00	0.0	0.600	0	450	Pipe/Conduit

## Network Results Table

PN	US/IL	Σ I.Area	ΣΕ	Base	Vel	Cap
	(m)	(ha)	Flow	(l/s)	(m/s)	(l/s)
E4.000	86.285	0.433		0.0	3.39	8615.4
E4.001	85.390	0.433		0.0	2.42	385.4

Hydrock Consultants Ltd		Page 2
•	Rail Central	
•	Road North of Unit 5	Micro
Date 6th February 2018	Designed by RJH	
File Road North of Unit 5.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	
	<u>SCHEDULES for Existing</u> pstream Manhole	
PN Hyd Diam MH C.Leve	l I.Level D.Depth MH MH DIAM., L*W	
Sect (mm) Name (m)	(m) (m) Connection (mm)	
E4.000 o 1800 E1 89.28 E4.001 o 450 E2 88.39	1 I	

# Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E4.000	179.100	200.1	E2	88.390	85.390	1.200	Open Manhole	2100
E4.001	13.400	70.5	E	87.790	85.200	2.140	Open Manhole	0

Hydrock Consultants Ltd		Page 3
. Rail C	entral	
. Road N	orth of Unit 5	
		Micco
Date 6th February 2018 Design	ed by RJH	
File Road North of Unit 5.MDX Checke	d by	Drainage
XP Solutions Networ	k 2016.1	
Area Summary	for Existing	
Alea Summary	IOI EXISTING	
1 -	coss Imp. Pipe Total	
Number Type Name (%) Area	h (ha) Area (ha) (ha)	
4.000 100	0.433 0.433 0.433	
4.001 100	0.000 0.000 0.000	
	Total Total Total	
	0.433 0.433 0.433	
Simulation Crite	ria for Existing	
	<u>iiu ioi iniocing</u>	
	Additional Flow - % of Total Flow 0	.000
Areal Reduction Factor 1.000		
Hot Start (mins) 0	Inlet Coefficcient 0	
	low per Person per Day (l/per/day) 0	
Manhole Headloss Coeff (Global) 0.500 Foul Sewage per hectare (1/s) 0.000	Run Time (mins) Output Interval (mins)	60 1
four bewage per neccure (1757 0.000		±
Number of Input Hydrographs 0 Number of Off		-
Number of Online Controls 1 Number of Stora	je Structures O Number of Real Time (	Controls 0
Synthetic Rai	nfall Details	
Rainfall Model FEH D2	1km) 0.300 Winter Storms	No
Return Period (years) 2 D3	Ikm         0.243         Cv         (Summer)         0.7           Ikm         0.243         Cv         (Summer)         0.7	750
Site Location E	IRM) 0.302 CV (Winter) 0.8	
C (1km) -0.026 F D1 (1km) 0.319 Summer St	1km) 2.496 Storm Duration (mins)	30
DI (IKM) U.319 Summer St	OTINS TES	

_	JUIISUICAII	ts Ltd						Page	4
				Rail Cen	tral				
				Road Nor	th of U	nit 5		4	
									~m
)ate 6th	February	2018		Designed	by R.TH			MI	
		of Unit 5.M		Checked	-			Dra	ainage
			IDX	Network					
KP Soluti	LONS			Network	2016.1				
			<u>Online</u>	e Controls	for Exi	sting			
	<u>Hydro-</u> H	<u>Brake Opti</u>	mum® Manh	ole: E2, D	S/PN: E4	4.001, Vol	ume (m³):	460.8	
			T.	nit Referenc	e MD-SHE-	0057-2000-2	000-2000		
				sign Head (m		2000 2000 2	2.000		
			Desi	gn Flow (l/s	)		2.0		
				Flush-Flo			lculated		
				-		se upstream	-		
			S	Applicatio			Surface Yes		
				ump Availabl Diameter (mm			1es 57		
				ert Level (m	,		85.390		
		Minimum O		Diameter (mm	,		75		
		Suggest	ed Manhole	Diameter (mm	)		1200		
	Control 1	Points	Head (m) I	Flow (l/s)	Contr	ol Points	Head (	m) Flow (1	/s)
Desi	ign Point (	(Calculated)		2.0		Kick-H			1.1
		Flush-Flo™	0.247	1.3   Me	ean Flow (	over Head Ra	ange	-	1.5
				based on the ype of contro					
				ulations will			1		
epth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m) Fl	low (1/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (1/s
	1.2		1.3	2.000	2.0	4.000	2.7	7.000	3
0.100		1.000	1.5	2.200	2.1	4.500	2.9	7.500	3
0.200	1.3					5.000	3.0	8.000	
0.200 0.300	1.3	1.200	1.6	2.400	2.2				3
0.200		1.200 1.400	1.6 1.7 1.8	2.400 2.600 3.000	2.2 2.3 2.4	5.500	3.2 3.3	8.500	3 4
0.200 0.300	1.3	1.200					3.2		

		nts Ltd			-				ŀ	Page 5
					Rail Cer					<b>_</b>
					Road Noi	cth of Un	it 5			L.
										Micro
ate 6th F	Pebruar	y 2018			-	d by RJH				Drainag
ile Road	North	of Unit	5.MDX		Checked	by				טומווומע
P Solutio	ons				Network	2016.1				
Numbe	Manhol Foul er of Inj	Areal Hot e Headlo Sewage j put Hydro	Reduct: Hot Sta Start I ss Coef: per hect	ion Facto art (min. Level (m f (Globa tare (1/: 0 Num	<u>Simulation</u> or 1.000 A s) 0 m) 0 1) 0.500 Flo s) 0.000 ber of Offli r of Storage	<u>Criteria</u> dditional MADD Fa w per Pers ne Control.	Flow - % of ctor * 10m [:] Inlet ( on per Day s 0 Number	Total Fl /ha Stora Coeffiecie (l/per/da of Time/A	ow 0.00 ge 2.00 nt 0.80 y) 0.00 rea Dia	0 0 0 0 0 9 9 9 9 9 9 9
1. diff.					-					
		te Locat	ion	FEH D1 ( D2 (	nthetic Rainf (1km) 0.319 (1km) 0.300 (1km) 0.243 (	E (1km) F (1km)	0.302 Cv 2.496	(Winter)	0.840	
		Marg.	in for 1		sk Warning (1 alysis Times [.] DTS Sta [.]					
		Duratio	Profile n(s) (m:	. ,	5, 30, 60, 12	0, 180, 24		Summer and ), 600, 72		
	Retur	n Period	(s) (yea Change					1, 30, 1 0, 0,		
		OTTIMACO								
ប	s/mh		Return	Climate	First (X)	First (Y)	First (Z)	Overflow		-
	•				First (X) Surcharge				Level	Depth
<b>PN N</b> E4.000	Name E1 1	<b>Storm</b> 5 Winter	Period	<b>Change</b> +0응	Surcharge	Flood			Level	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	<b>Storm</b> 5 Winter	Period	<b>Change</b> +0응	Surcharge	Flood			Level (m) 86.359	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	<b>Storm</b> 5 Winter	Period 1 1	Change +0% +0% Flooded	Surcharge	Flood Pipe	Overflow	Act.	Level (m) 86.359	(m) -1.726
<b>PN N</b> E4.000	Name E1 1	<b>Storm</b> 5 Winter 0 Winter	Period 1 1 US/MH	Change +0% +0% Flooded Volume	Surcharge 1/15 Summer Flow / Overs	Flood Pipe Flow Flow	Overflow	Act. Level	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN	Period 1 1 US/MH Name	Change +0% +0% Flooded Volume (m ³ )	Surcharge 1/15 Summer Flow / Overs Cap. (1/	Flood Pipe flow Flow s) (1/s)	Overflow Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name	Change +0% +0% Flooded Volume (m ³ )	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	Overflow Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726
<b>PN N</b> E4.000	Name E1 1	Storm 5 Winter 0 Winter PN E4.000	Period 1 1 US/MH Name E1	Change +0% +0% Flooded Volume (m ³ ) 0.000	Surcharge 1/15 Summer Flow / Overs Cap. (1/ 0.01	Flood Pipe Elow Flow s) (1/s) 60.9	<b>Overflow</b> Status	Act. Level Exceeded	Level (m) 86.359 86.083	<b>Depth</b> (m) -1.726

ydrock Consultants Ltd						F	Page 6
		Rail Cent:	ral				
		Road North	n of Uni	it 5			4
ate 6th February 2018		Designed B	ov RJH				Micro
ile Road North of Unit	5.MDX	Checked by	-				Drainag
P Solutions	•••••	Network 20					
		Simulation Cr. 5 1.000 Add	<u>iteria</u> itional F	rlow - % of	E Total Flo	ow 0.00	0
Hot Manhole Headlos	Start Level (mm) s Coeff (Global) per hectare (l/s)	0 0.500 Flow ; 0.000	per Perso	Inlet C on per Day	Coeffiecies (l/per/dag	nt 0.80 y) 0.00	0 0
Number of Online Co	ntrols 1 Number	of Storage St hetic Rainfal	ructures	8 0 Number <u>s</u>	of Real T	ime Con	
Site Locati		km) 0.300	F (1km)	2.496	(	V	
Margi	n for Flood Risk Anal	Warning (mm) ysis Timestey. DTS Status	Fine I				
Duration	Profile(s) h(s) (mins) 15,	30, 60, 120,	180, 240			0, 960, 1440	
Return Period( Climate	(s) (years) Change (%)				1, 30, 1 0, 0,	00, 200 40, 40	
US/MH	Return Climate	First (X) F	irst (Y)	First (Z)	Overflow		Surcharged Depth
PN Name Storm	Period Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
E4.000 E1 600 Winter E4.001 E2 600 Winter		1/15 Summer				86.510 86.510	-1.575 0.670
PN	Flooded US/MH Volume F Name (m³)	low / Overflo Cap. (l/s)		Status	Level Exceeded		
E4.000	E1 0.000	0.00	14 5	OK	·		
E4.001				SURCHARGED			

Hydrock Consultar	nts Itd						F	Page 7
·			Rail Centr	al				
			Road North	ı of Uni	t 5			m.
Date 6th February	2018		Designed k	y RJH				
File Road North o	of Unit 5.MD	Х	Checked by					Drainage
XP Solutions			Network 20	16.1				
<u>100 year Retu</u> Manhole Foul Number of Inp Number of O Rair	Areal Reduc Hot S Hot Start Headloss Coe Sewage per he ut Hydrograph: nline Control: fall Model ce Location C (1km) -0 Margin for	<u>S</u> tion Factor tart (mins) Level (mm) ff (Global) ctare (l/s) s 0 Number s 0 Number <u>Synth</u> FEH D1 (1k D2 (1k .026 D3 (1k Flood Risk Anal	imulation Cri Existing imulation Cri 1.000 Add: 0 0.500 Flow p 0.000 r of Offline of Storage St metic Rainfal	Results I Lional F MADD Fac Der Perso Controls cructures L Details E (1km) F (1km) (Summer) 300.0 Fine I	low - % of tor * 10m ³ Inlet C n per Day 0 Number 0 Number 0.302 Cv 2.496 0.750 DVD Sta nertia Sta	Total Fl /ha Stora coeffiecie (1/per/da of Time/A of Real T (Winter) (Winter)	ow 0.00 ge 2.00 nt 0.80 y) 0.00 rea Dia 'ime Con 0.840	0 0 0 grams 0 trols 0
Return	Profi Duration(s) ( Period(s) (y Climate Chang	ears)	30, 60, 120,	180, 240		1, 30, 1	0, 960, 1440 00, 200 40, 40	
US/MH PN Name S			First (X) F: Surcharge	irst (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
	Winter 10 Winter 10		/15 Summer				87.106 87.106	-0.979 1.266
	US/MH PN Name		low / Overflo Cap. (l/s)		Status	Level Exceeded		
	E4.000 E1 E4.001 E2		0.00 0.01	18.3 1.9	OK SURCHARGED			

	Consu	ltants Ltd							F	age 8
1					Rail	Central			-	
					Road	North of Un:	it 5			M.
										Micro
		uary 2018	- 1/DI		-	ned by RJH				Drainage
		th of Unit	5.MDX			ed by rk 2016.1				brainage
P Soluti	Lons				Netwo	rk 2016.1				
<u>200 y</u>	year 1	<u>Return Per</u>	<u>iod Su</u>	immary (		<u>cal Results.</u> sting	by Maxim	uum Level	. (Ran)	<u>(1) for</u>
		Areal	Reduct	ion Fact		<u>on Criteria</u> Additional B	Flow - % of	Total Flo	ow 0.00	0
			Hot Sta	art (min:	з) О	MADD Fac	ctor * 10m³	/ha Stora	ge 2.00	0
		Hot hole Headlo: oul Sewage j	ss Coef:	f (Globa		Flow per Perso		oeffiecies (l/per/dag		
						fline Controls age Structures				-
		Rainfall Mo Site Locat		FEH D1 (	1km) 0.31	ainfall Detail 19 E (1km) 00 F (1km)	0.302 Cv	(Winter) (	0.840	
						13 Cv (Summer)				
		Marg	in for i			g (mm) 300.0				
				Ana		mestep Fine 1 Status ON	Inertia Sta	tus OFF		
		Duratio	Profile n(s) (m	. ,	, 30, 60,	120, 180, 240		Summer and ), 600, 72	0, 960,	
	Re	turn Period Climate						1, 30, 1 0, 0,	1440 00, 200 40, 40	
	US/MH					X) First (Y)			Level	Surcharged Depth
PN	Name	Storm	Period	Change	Surchar	ge Flood	Overflow	Act.	(m)	(m)
E4.000		960 Winter			1/15 Sum					
E4.001	ΕZ	960 Winter	200	0011	1/15 Sun	mer			87.397 87.397	-0.688 1.557
E4.001	E2	960 Winter PN		Flooded	Flow / O	Pipe verflow Flow	Status	Level		
E4.001	ĔΖ		US/MH Name	Flooded Volume	Flow / O Cap.	Pipe verflow Flow		Level Exceeded		

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Road West of Unit 5	Micco
Date 6th February 2018	Designed by RJH	
File Road West of Unit 5.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

## Time Area Diagram for Existing

Time<br/>(mins)Area<br/>(ha)Time<br/>(mins)Area<br/>(ha)0-40.3554-80.081

Total Area Contributing (ha) = 0.436

Total Pipe Volume  $(m^3) = 421.512$ 

4	ants Lt	d										Pag	e 2
• •					Rail Ce Road We			t 5				2	
Date 6th Februa	ry 2018				Designe	ed by	RJH						
File Road West	of Unit	5.MDX	X	(	Checke	d by							rainage
XP Solutions				1	Networl	k 201	6.1						
		Ex	istin	g Netv	vork De	etail	s for	Exist	ting				
PN	Length (m)		Slope (1:X)								Section	Туре	
E5.000	(m) 164.800	(m) 2.000	(1:X) 82.4	<b>(ha)</b> 0.436	(mins) 4.00	Flow	(l/s) 0.0	(mm) 0.600	<b>SECT</b>	(mm) 1800	Pipe/Co	nduit	
E5.000	(m)	(m) 2.000	(1:X) 82.4	<b>(ha)</b> 0.436	(mins) 4.00	Flow	(l/s) 0.0	(mm)	<b>SECT</b>	(mm) 1800		nduit	

E5.00084.0000.4360.05.2813444.6E5.00182.0000.4360.01.01161.3

Hydrock Consultants Ltd		Page 3						
•	Rail Central							
	Road West of Unit 5	Micro						
Date 6th February 2018	Designed by RJH							
File Road West of Unit 5.MDX	Drainage							
File Road West of Unit 5.MDXChecked byXP SolutionsNetwork 2016.1								
	<u>SCHEDULES for Existing</u> pstream Manhole							
PN Hyd Diam MH C.Leve	el I.Level D.Depth MH MH DIAM., L*	W						
Sect (mm) Name (m)	(m) (m) Connection (mm)							
E5.000 o 1800 E1 87.45 E5.001 o 450 E2 85.20	1							

<u>Downstream Manhole</u>

PN Length Slope MH C.Level I.Level D.Depth MH MH DIAM., L*W (m) (1:X) Name (m) (m) (m) Connection (mm)

E5.000 164.800 82.4 E2 85.200 82.000 1.400 Open Manhole 2700 E5.001 13.500 397.1 E 85.000 81.966 2.584 Open Manhole 0

### ©1982-2016 XP Solutions

Hydrock Consultants Ltd		Page 4
	Rail Central	
	Road West of Unit 5	L'AL
		Micco
Date 6th February 2018	Designed by RJH	
File Road West of Unit 5.MDX	Checked by	Urainage
XP Solutions	Network 2016.1	
Ar	ea Summary for Existing	
Pipe PIMP PI		
Number Type Na	me (%) Area (ha) Area (ha) (ha)	
5.000 -	- 100 0.436 0.436 0.436	
5.001 -	200 0.000 0.000	
	Total Total Total	
	0.436 0.436 0.436	
Free Flowi	ng Outfall Details for Existing	
<u>1100-110</u>	ng odorari boodrio roi bnioorng	
Outfall Outf	all C. Level I. Level Min D,L W	
Pipe Number Nam	ne (m) (m) I. Level (mm) (mm)	
	(m)	
F5 001	E 85.000 81.966 0.000 0 0	
E3.001	E 05.000 01.900 0.000 0 0	
Simula	ation Criteria for Existing	
<u> </u>	<u> </u>	
Volumetric Runoff Co	peff 0.750 Additional Flow - % of Total 1	Flow 0.000
Areal Reduction Fac		
Hot Start (m.		
Hot Start Level		-
Manhole Headloss Coeff (Glo) Foul Sewage per hectare (1		
four bewage per neocure (.		1110) 1
	umber of Offline Controls 0 Number of Time	-
Number of Online Controls 1 Num	ber of Storage Structures 0 Number of Real	Time Controls 0
<u>Syr</u>	thetic Rainfall Details	
Rainfall Model F	YEH D2 (1km) 0.300 Winter Stor	ms No
	2 D3 (1km) 0.243 Cv (Summe	
Site Location	E (1km) 0.302 Cv (Winte	
C (1km) -0.0		
D1 (1km) 0.3	19 Summer Storms Yes	

	l West o					Rail Road		ral						_		_
Date 6th File Road	l West o					Road										
Date 6th File Road	l West o						West	of Un	it 5					4		
File Road	l West o														A	سر
File Road	l West o					Decia	madi	ATT D TH						Μ	icro	
File Road XP Soluti		f Unit	: 5.M			_		oy RJH						Πr	aina	ЧЛ
XP Soluti	ons			DX		Check										JC.
						Netwo	rk 2	016.1								
				<u>(</u>	<u>Onlin</u>	e Contro	ols f	<u>or Exi</u>	<u>stinq</u>							
	<u>Hydro-</u>	-Brake	<u>Opti</u>	mum®	) Manh	nole: E2	, DS/	PN: E5	5.001,	Vo	lume	(m³)	: 430.	8		
					τ	Unit Refe	rence	MD-SHE-	0052-2	000-	3000-2	2000				
						esign Head						.000				
						ign Flow						2.0				
						Flush-					alcula					
						-		Minimi	se ups	trea		-				
						Applica					Sur	face				
					5	Sump Avail						Yes				
					Tni	Diameter vert Level	. ,				02	52 .000				
		Min	imum (	)11+1e+		Diameter	. ,				02	75				
					-	Diameter						1200				
	Control	Points	ŀ	Head	1 (m)	Flow (l/s	)	Contr	ol Poi	nts		Head	(m) Flo	<b>) w</b> c	l/s)	
Desi	.gn Point	(Calcu	lated)	3	3.000	2.					Flo®	0.	464		0.9	
		Flush	h-Flo™	м (	0.228	1.	1   Mea	n Flow	over He	ad F	ange		-		1.4	
The hydro	ological	calcula	ations	have	been	based on	the H	ead/Dis	charge	rela	tions	hip fo	or the	Hvdr	o-Bra	ke
-	-					ype of co			-			-		-		
						ulations					- 1		1			
)epth (m) H	Flow (l/s	) Depth	ı (m)	Flow	(1/s)	Depth (m	) Flow	w (l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(1/s
0.100	0.	0	0.800		1.1	2.00	0	1.7		000		2.3	7	.000		3.
0.200	1.		L.000		1.1			1.7		500		2.3		.500		3.
0.300	1.		1.200		1.3			1.8		000		2.5	1	.000		3.
0.400	1.		L.400		1.4	2.60		1.9		500		2.6	-	.500		3.
	Ο.	9 1	L.600		1.5	3.00	0	2.0	6.	000		2.8	9.	.000		3.
0.500					1.6	3.50	0	2.1	6.	500		2.9		.500		З.
0.500 0.600	1.	0 1	L.800		1.6	3.50	0	2.1	6.	500		2.9	9.	.500		

	nts Ltd					P	age 6
		Rai	l Central				
		Roa	ad West of Uni	t 5			4
							Micco
ate 6th Februar	y 2018	Des	signed by RJH				Micro
'ile Road West o	f Unit 5.MDX	Che	ecked by				Drainag
XP Solutions			work 2016.1				
Foul Number of Ing Number of C	Areal Reduct Hot St Hot Start e Headloss Coef Sewage per hec out Hydrographs Online Controls nfall Model te Location C (1km) -0	<u>Simula</u> cion Factor 1.00 cart (mins) Level (mm) cf (Global) 0.50 ctare (l/s) 0.00 s 0 Number of St <u>Synthetic</u> FEH D1 (1km) 0 D2 (1km) 0 .026 D3 (1km) 0 Flood Risk Warr Analysis D1	ation Criteria 00 Additional 1 0 MADD Fac 0 00 Flow per Perso	Flow - % of ctor * 10m ³ Inlet C on per Day s 0 Number s 0 Number <u>s</u> 0.302 Cv 2.496 0.750 DVD Sta Inertia Sta	Total Flow /ha Storage oeffiecient (l/per/day) of Time/Are of Real Tim (Winter) 0.3 tus OFF	0.000 2.000 0.800 0.000 a Diag e Cont 840	) ) ) grams 0
Return	Duration(s) (m n Period(s) (ye Climate Change	ears)	60, 120, 180, 24	J, 360, 480	, 600, 720, 1, 30, 100 0, 0, 4	1440 , 200	
	Det	n Climate Firs			Wa	ater	Surcharged
	Storm Period	l Change Surcl	t (X) First (Y) harge Flood		Act.	(m)	(m)
<b>PN Name</b> : E5.000 E1 15	Storm Period		harge Flood		<b>Act.</b>	(m) .048	-

Hydrock Consultants Ltd						F	Page 7
		Rail Centra	 al				
		Road West		t 5			4
			0111				1 mm
• Date 6th February 2018		Designed by	V RJH				Micro
File Road West of Unit 5	MDX	Checked by	-				Drainage
XP Solutions		Network 202					
<u>30 year Return Period Su</u>	.mmary of Crit	cical Result	s by M	aximum Le	vel (Ran	k 1) :	for Existing
H Hot S Manhole Headloss Foul Sewage pe Number of Input Hydrog Number of Online Con Rainfall Mode Site Locatic C (1km Margin	Reduction Factor Hot Start (mins) Start Level (mm) S Coeff (Global) er hectare (l/s) graphs 0 Number trols 1 Number Synt el FEH D1 (1 on D2 (1 m) -0.026 D3 (1 h for Flood Risk Anal	0 P 0 0.500 Flow pe 0.000 er of Offline ( of Storage Str <u>hetic Rainfall</u> km) 0.319 km) 0.300 km) 0.243 Cv (	tional F MADD Fac er Perso Controls cuctures <u>Detail</u> E (1km) F (1km) Summer) 300.0 Fine D	ctor * 10m ³ Inlet C on per Day s 0 Number s 0 Number <u>s</u> 0.302 Cv 2.496 0.750 DVD Sta Inertia Sta	/ha Storag coeffiecier (l/per/day of Time/An of Real Ti (Winter) C tus OFF tus OFF	ge 2.00 ht 0.80 7) 0.00 rea Dia ime Con	0 0 grams 0 trols 0
	Profile(s) (s) (mins) 15,	30, 60, 120,	180, 240		ummer and , 600, 720		
		,, -,	,	.,,		1440	
Return Period(s	-				1, 30, 10	00, 200 40, 40	
	Change (%)				0, 0,	40, 40	
	Return Climate Period Change				Overflow	Level	-
E5.000 E1 15 Winter	30 +0%					84.152	-1.648
E5.001 E2 720 Winter		1/15 Summer				83.663	
	Flooded		Pipe				
,	US/MH Volume F	low / Overflow	-		Level		
		Cap. (1/s)			Exceeded		
<b>FE</b> 000	E1 0.000	0.02	201 2	OIZ			
E5.000 E5.001		0.02		OK SURCHARGED			
20.001	0.000						

Hydrock (	Consu	ltants Lto									Page 8
•					Rai	l Cent	ral				
					Road	d West	c of Uni	t 5			<u>Y</u>
											Micro
		uary 2018				-	by RJH				Drainage
		t of Unit	5.MDX			cked k					Diamage
XP Solut:	ions				Net	work 2	2016.1				
<u>100 -</u>	year I	<u>Return Per</u>	riod Su	immary (		tical xisti		by Ma	ximum Lev	vel (Rai	n <u>k 1) for</u>
	F lber of	Hot hole Headlo oul Sewage : Input Hydro	Hot Start St	art (min Level (m f (Globa tare (1/ 0 Num	or 1.00 s) m) 1) 0.50 s) 0.00 ber of	0 Ad 0 0 Flow 0 0ffline	MADD Fai per Perso e Controls	ctor * 1 Inle on per E s 0 Numk	per of Time	orage 2.0 cient 0.8 (day) 0.0 e/Area Di	00 00 00 agrams 0
N		of Online Co Rainfall Mo Site Locat C (1	del ion	<u>Syr</u> FEH D1 ( D2 (	1thetic (1km) 0.	<u>Rainfa</u> 319 300	<u>ll Detail</u> E (1km)	<u>.s</u> 0.302 2.496			ntrols O
		Marg	in for :		alysis '		ep Fine		Status OFI Status OFI		
	Re	Duratio turn Period Climate	(s) (ye	ins) 15 ars)	, 30, 6	0, 120	, 180, 24	0, 360,	480, 600, 1, 30,	and Winte 720, 960 144 , 100, 20 0, 40, 4	, 0 0
PN	US/MH Name	Storm		Climate Change			First (Y) Flood	First Overfl	(Z) Overfl ow Act.		Surcharged Depth (m)
E5.000 E5.001		960 Winter 960 Winter		+40% +40%	1/15 S	ummer				84.56 84.56	
		PN		Flooded Volume (m³)		Overf] (1/s	Pipe .ow Flow ) (l/s)		Leve s Exceed		
		E5.000 E5.001		0.000 0.000	0.00 0.02		18.8 1.9	SURCHAR	OK GED		

		sul	ltants Lto	l						P	age 9	
Lie Goad West of Unit 5.MDX       Designed by RJH         Lie Goad West of Unit 5.MDX       Checked by         2 Solutions       Network 2016.1         Simulation Criteria         Simulation Criteria         Areal Reduction Factor 1.000         MADD Factor 1.000         Number of Cliput Hydrograph 0         Number of Input Hydrograph 0         Number of Input Hydrograph 0         Statiling         Statiling         Statiling         Number of Controls 0 Number of Time/Area Diagrams 0         Number of Storage Structures 0 Number of Time/Area Diagrams 0											<b>,</b>	
Le Road West of Unit 5.MDX       Designed by Kun       Designed by Kun         2 Solutions       Network 2016.1         Simulation Criteria         Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins)         Mandel Standard (Colspan="2">Simulation Criteria         Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start Level (mm)         Number of Start Level (mm)         Number of Start Level (mm)         Number of Input Hydrographs 0         Number of Starge Structures 0         Number of Input Hydrographs 0         Number of Starge Structures 0         Number of Input Hydrographs 0         Number of Offline Controls 0         Number of Input Hydrographs 0         Number of Starge Structures 0         Number of Input Hydrographs 0         Number of Starge Structures 0         Number of Climber of Inme/Area Diagrams 0         Number of Reinfail Details         Rainfail Model FEH DI (hm) 0.300 P (hm) 0.300 P (hm) 10.300 F         Dristatus OFF         Analysis Timestep Fine Inertis Status OFF         Dristatus ON <td colspa<="" td=""><td></td><td></td><td></td><td></td><td></td><td>Road Wes</td><td>st of Uni</td><td>t 5</td><td></td><td></td><td>My.</td></td>	<td></td> <td></td> <td></td> <td></td> <td></td> <td>Road Wes</td> <td>st of Uni</td> <td>t 5</td> <td></td> <td></td> <td>My.</td>						Road Wes	st of Uni	t 5			My.
Le Road West of Unit 5.MDX       Designed by Rule         2 Solutions       Network 2016.1         200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing       Existing         Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins)         0       MADD Factor * 10m/hastorage 2.000 Hot Start Level (rm)       0         Number of Input Hydrographs 0       Number of Strate Storage 2.000 Hot Start Level (rm)       0         Number of Input Hydrographs 0       Number of Strate Storage 2.000 Hot Start Level (rm)       0         Number of Input Hydrographs 0       Number of Strate Storage 2.000 Hot Start Level (rm)       0         Number of Input Hydrographs 0       Number of Strate Storage Structures 0       Number of Time/Area Diagrams 0         Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0       Synthetic Rainfall Details         Rainfall Model       FEH DI (Imp) 0.300 F (LMm) 2.020 Cv (Winter) 0.840 Site Location D2 (Imp) 0.243 Cv (Summer) 0.750       Summer and Winter DTS Status ON         Profile(s)       Summer and Ninter Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440         Return Period(s) (years)       1, 30, 100, 200         Climate Change (%)       0, 0, 40, 40         Status ON         Status Conseries Storage Storage Storage Flood O											Mirco	
2 Solutions       Network 2016.1         Solutions         Network 2016.1         200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing         Simulation Criteria         Areal Reduction Factor 1.000         Motor * 10m ³ /ha Storage 2.000         Hot Start (mins)         Motor * 10m ³ /ha Storage 2.000         Hot Start Level (mm)         Motor * 10m ³ /ha Storage 2.000         Number of Storage Structures 0 Number of Real Time Controls 0         Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0         Synthetic Rainfall Petails         Rainfall Model FEH DI (Ikm) 0.310 P (Ikm 2.00 (Winter) 0.840         Summer and Ninter         DI (Ikm) 0.210 (D) 0.300 F (Ikm 2.00 (NO (00, 720, 960, 1	te 6th E	Febru	ary 2018			Designed	l by RJH					
200 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing         Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - \$ of Total Flow 0.000 Bot Start Level (mm) 0 MAD Factor * 10m ² /ha Storage 2.000 Hot Start Level (mm) 0 MAD Factor * 10m ² /ha Storage 2.000 Foil Sewage per hectare (1/s) 0.000         Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0 Swythetic Rainfall Details Rainfall Model FEP D1 (1km) 0.319 E (1km) 0.302 Cv (Winter) 0.840 Site Location E2 (1km) 0.300 F (1km) 2.496 C (1km) -0.026 D3 (1km) 0.423 cv (Summer) 0.750         Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON       Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(a) (years) C (limate Change (s)       Summer and Winter Do 400, 400         E5.000       E1 960 Winter 200 +40% FN Name Storm Period Change Surcharge Flood Overflow Act. (m) (m)       Mater Surcharges B5.125 -0.677 B5.125 2.667         Flooded       Eipe US/MH Volume Flow / Overflow Flow       Evel         Flooded       Eipe US/MH Volume Flow / Overflow Flow       Evel	le Road	West	c of Unit	5.MDX		Checked	by					
Existing         Similarian Contrement         A cal Reduction Reduction Additional Flow - % of Total Flow 0.000	Solutio	ons				Network	2016.1					
Duration (s) (mins)       15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440         Return Period (s) (years) Climate Change (%)       1, 30, 100, 200 0, 0, 40, 40         US/MH       Return Climate Change (%)       First (X)       First (Z)       Overflow       Kevel       Depth         PN       Name       Storm       Period       Change       Surcharge       Flood       Overflow       Act.       (m)       (m)         E5.000       E1 960 Winter       200       +40%       1/15 Summer       85.125       -0.67         E5.001       E2 960 Winter       200       +40%       Pipe       Exceeded       Exceeded         Flooded       Pipe       Pipe       Level       Exceeded       Exceeded         E5.000       E1       0.000       0.00       22.0       OK	Numbe	Manl Fo er of nber o	Areal Hot hole Headlo oul Sewage Input Hydro of Online Co Rainfall Mo Site Locat C (1	Reduct: Hot Start 1 ss Coef: oper hect ographs ontrols del ion km) -0.	ion Facta art (min Level (mi f (Globa tare (1/) 0 Num 1 Numbe <u>Svr</u> FEH D1 ( D2 ( 026 D3 ( Flood Ri An	<u>Exist</u> : <u>Simulation</u> or 1.000 A s) 0 m) 0 1) 0.500 Flo s) 0.000 ber of Offli: r of Storage <u>nthetic Rainf</u> 1km) 0.319 1km) 0.300 1km) 0.243 ( sk Warning (r alysis Timest	<u>Criteria</u> dditional MADD Fa w per Pers ne Control: Structure: <u>Call Detail</u> E (1km) F (1km) Cv (Summer) nm) 300.0 cep Fine	Flow - % of ctor * 10m Inlet ( on per Day s 0 Number s 0 Number <u>s</u> 0.302 Cv 2.496 0.750 DVD Sta Inertia Sta	Total Flo /ha Storad Coeffiecier (1/per/da of Time/A of Real T (Winter) ( Atus OFF	ow 0.00 ge 2.00 nt 0.80 y) 0.00 rea Dia ime Con 0.840	0 0 0 grams 0 trols 0	
US/MH PN       Name       Return Storm       Climate Period       First (X) Change       First (Y) Sucharge       First (Z) Plod       Overflow Act.       Level       Depth (m)         E5.000       E1 960 Winter E2 960 Winter       200 200       +40% +40%       1/15 Summer       85.125       -0.67         E5.001       E1 960 Winter E2 960 Winter       200 200       +40% +40%       Jis Summer       Pipe Flow       Pipe Flow       Level         PN       Name       (m³)       Cap.       (1/s)       Status       Exceeded         E5.000       E1 0.000       0.00       22.0       0K		Re	turn Period	(s) (yea	ars)	, 30, 60, 12	0, 180, 24	0, 360, 480		1440		
E5.001 E2 960 Winter 200 +40% 1/15 Summer 85.125 2.67			CIIMate		(~~)					-		
US/MH Volume Flow / Overflow Flow Level PN Name (m ³ ) Cap. (1/s) (1/s) Status Exceeded E5.000 E1 0.000 0.00 22.0 OK				Return	Climate				0, 0, Overflow	40, 40 Water Level	Surcharged Depth	
	<b>PN 1</b> E5.000	Name E1	<b>Storm</b> 960 Winter	Return Period 200	Climate Change +40%	Surcharge	Flood		0, 0, Overflow Act.	40, 40 Water Level (m) 85.125	Surcharged Depth (m) -0.675	
	<b>PN 1</b> E5.000	Name E1	<b>Storm</b> 960 Winter 960 Winter	Return Period 200 200 US/MH	Climate Change +40% +40% Flooded Volume	Surcharge 1/15 Summer Flow / Overf	Flood Pipe Flow Flow	Overflow	0, 0, Overflow Act. Level	40, 40 Water Level (m) 85.125 85.125	Surcharged Depth	

Hydrock Consultants Ltd							Page 1
		C151	.171 R	ail Cen	itral		
		2005	vear+4	0%cc SW	l Stora	lge	4
			n Mai				
• Date 5th February 2018			.gned	— Micro			
_			-	-			Draina
File Train Maintenance Depot	:.SRCX	Chec	ked b	y RJH			Diamia
XP Solutions		Sour	ce Co	ntrol 2	016.1		
Summary of	E Result:	s for 2	200 ye	ar Retu	ırn Pei	riod (+40%)	
4	Storm	Max	Max	Max	Max	Status	
1	Event	Level	Depth	Control	Volume		
		(m)	- (m)	(l/s)	(m³)		
15	min Summe	r 8.136	0.536	20.4	2412.8	ОК	
30	min Summe	r 8.206	0.606	20.4	2728.4	ОК	
60	min Summe	r 8.283	0.683	20.4	3075.4	ОК	
120	min Summe	r 8.366	0.766	20.4	3448.7	O K	
180	min Summe	r 8.416	0.816	20.4	3672.9	O K	
	min Summe				3830.9	O K	
	min Summe				4041.8	0 K	
	min Summe				4175.1		
	min Summe				4263.1		
	min Summe				4321.9		
	min Summe				4355.3		
	min Summe				4305.6	O K	
	min Summe				4126.7		
	min Summe				3955.9		
	min Summe				3480.4	ОК	
	min Summe				3073.0	ОК	
	min Summe				2720.8	ОК	
	min Summe				2409.8	ОК	
10000	min Summe				2135.9 2704.8	ок ок	
	min Minto		υ.ουΙ				
15	min Winte		0 680	20 /	3050 0	$\cap K$	
15 30	min Winte	r 8.280			3059.9		
15 30 60	min Winte min Winte	r 8.280 r 8.367	0.767	20.4	3451.5	0 K	
15 30 60 120	min Winte	r 8.280 r 8.367 r 8.461	0.767 0.861	20.4 20.4		0 K	

	Stor Even		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15	min	Summer	261.584	0.0	1694.3	31
30	min	Summer	148.306	0.0	1721.1	45
60	min	Summer	84.083	0.0	2798.7	74
120	min	Summer	47.672	0.0	3093.2	134
180	min	Summer	34.205	0.0	3220.8	194
240	min	Summer	27.028	0.0	3255.6	252
360	min	Summer	19.393	0.0	3207.1	372
480	min	Summer	15.323	0.0	3146.1	490
600	min	Summer	12.765	0.0	3090.0	610
720	min	Summer	10.995	0.0	3038.5	728
960	min	Summer	8.640	0.0	2945.8	966
1440	min	Summer	6.152	0.0	2777.3	1442
2160	min	Summer	4.380	0.0	5502.0	1864
2880	min	Summer	3.442	0.0	5588.4	2232
4320	min	Summer	2.395	0.0	5328.2	2948
5760	min	Summer	1.852	0.0	6543.4	3704
7200	min	Summer	1.516	0.0	6689.8	4480
8640	min	Summer	1.288	0.0	6799.3	5272
10080	min	Summer	1.122	0.0	6859.8	5960
15	min	Winter	261.584	0.0	1727.9	31
30	min	Winter	148.306	0.0	1714.7	45
60	min	Winter	84.083	0.0	3073.1	74
120	min	Winter	47.672	0.0	3275.9	132
180	min	Winter	34.205	0.0	3270.7	190
240	min	Winter	27.028	0.0	3234.2	248

Hydrock Consultants Ltd		Page 2
•	C151171 Rail Central	
	200year+40%cc SW Storage	
	Train Maintenance Depot	Micro
Date 5th February 2018	Designed by RJH	
File Train Maintenance Depot.SRCX	Checked by RJH	Drainage
XP Solutions	Source Control 2016.1	

# Summary of Results for 200 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Winter	8.611	1.011	20.4	4550.8	ОК
480 min Winter	8.646	1.046	20.4	4706.4	ΟK
600 min Winter	8.669	1.069	20.4	4812.0	ΟK
720 min Winter	8.686	1.086	20.4	4884.9	ΟK
960 min Winter	8.697	1.097	20.4	4937.4	ОК
1440 min Winter	8.692	1.092	20.4	4914.3	ΟK
2160 min Winter	8.652	1.052	20.4	4734.2	ΟK
2880 min Winter	8.601	1.001	20.4	4505.2	ОК
4320 min Winter	8.478	0.878	20.4	3952.3	ОК
5760 min Winter	8.346	0.746	20.4	3359.0	ΟK
7200 min Winter	8.230	0.630	20.4	2834.8	ΟK
8640 min Winter	8.129	0.529	20.4	2379.6	0 K
10080 min Winter	8.042	0.442	20.4	1986.9	O K

	Stor Even		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360	min	Winter	19.393	0.0	3171.0	366
480	min	Winter	15.323	0.0	3120.0	482
600	min	Winter	12.765	0.0	3076.8	598
720	min	Winter	10.995	0.0	3038.5	714
960	min	Winter	8.640	0.0	2968.7	946
1440	min	Winter	6.152	0.0	2843.9	1398
2160	min	Winter	4.380	0.0	5967.8	2040
2880	min	Winter	3.442	0.0	5836.6	2336
4320	min	Winter	2.395	0.0	5324.4	3244
5760	min	Winter	1.852	0.0	7329.6	4088
7200	min	Winter	1.516	0.0	7494.9	4840
8640	min	Winter	1.288	0.0	7624.2	5624
10080	min	Winter	1.122	0.0	7703.8	6352

Hydrock Consulta	nts Lt	d									I	Page 3
·				0	C15117	1 Rai	l Cent	ral				
•							cc SW		ae			4
•							enance					J. J. Mark
Date 5th Februar	v 2018				Design				-			Micro
File Train Maint			. SRCX		Checke	-						Drainage
XP Solutions		20100					rol 20	16.1				
				Rai	infall	Deta	<u>ils</u>					
Retur	n Perio	Locati C (1) D1 (1)	cs) ion (m) -0. (m) 0.	FEH 200 .026 Sur .319 Wir .300 (	E ( F ( nmer St nter St	1km) 2 .orms .orms	.302 Sh .496 L Yes Yes	ongest	Storm Storm	Winter) (mins) (mins) hange %	15 10080	
				<u>Tim</u>	e Area	a Diac	<u>ram</u>					
					l Area							
Time From:		Area (ha)	Time From:	(mins) To:		Time From:		Area (ha)	Time From:	(mins) To:	Area (ha)	
0	4	1.242	4	8	1.242	8	12	1.242	12	16	1.243	
				Ψim	e Area	a Diac	ıram					
					l Area							
					me (mi							
						o: (1						
					0	4 0.	000					

	nsultants	o nea						P	age 4	
				C15117	1 Rail Ce	ntral				
				200yea	r+40%cc S	W Storag	le		4.	
				Train	Maintenan	ice Depot	-			Zm
te 5th F	ebruary 2	2018			ed by RJH	=				
	_	ance Depo	+ SRCX	-	d by RJH	•			Draii	nage
o Solutic					Control	2016 1				
DOIUCIC				bource	CONCLOT	2010.1				
				Model	<u>Details</u>					
			Storage is	Online Co	over Level	(m) 10.000	)			
			<u>Tai</u>	<u>nk or Por</u>	nd Structu	ire				
			I	invert Leve	el (m) 7.60	0				
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m	) Area	a (m²)
0.000	4500.0	1.200	4500.0			3.600	0.0	4.80	0	0.0
0.200	4500.0		0.0			3.800			0	0.0
0.400	4500.0									
0.600 0.800	4500.0 4500.0		0.0							
1.000	4500.0		0.0			4.400				
			τ	Jnit Refere	ence MD-SHE	-0198-2040	)-1200-2040			
			De	esign Head .gn Flow (1	(m) /s)		1.200 20.4			
			De	sign Head gn Flow (l Flush-F	(m) /s)		1.200 20.4 Calculated			
			De Desi	esign Head .gn Flow (1 Flush-F Object Applicat	(m) ./s) Clo™ Live Minim Lion		1.200 20.4 Calculated			
			De Desi	esign Head .gn Flow (1 Flush-F Object Applicat Sump Availa	(m) ./s) Clo ^m cive Minim cion able		1.200 20.4 Calculated am storage Surface Yes			
			De Desi	esign Head .gn Flow (1 Flush-F Object Applicat Sump Availa Diameter (	(m) ./s) Clo™ cive Minim cion able (mm)		1.200 20.4 Calculated eam storage Surface Yes 198			
		Minimum O	De Desi	esign Head .gn Flow (1 Flush-F Object Applicat Sump Availa Diameter ( vert Level	(m) ./s) Clo™ cive Minim cion able (mm) (m)		1.200 20.4 Calculated am storage Surface Yes			
			De Desi S Inv	esign Head .gn Flow (1 Flush-F Object Applicat Gump Availa Diameter ( vert Level Diameter (	(m) ./s) Slo™ sive Minim sion able (mm) (m) (mm)		1.200 20.4 Calculated eam storage Surface Yes 198 7.600			
	Control Po	Suggeste	Desi Desi S Inv itlet Pipe ed Manhole	esign Head .gn Flow (1 Flush-F Object Applicat Gump Availa Diameter ( vert Level Diameter (	(m) ./s) Clo™ tive Minim tion able (mm) (mm) (mm) (mm)		1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500		м (1/s	•)
Desig	<b>Control Pc</b> n Point (Ca	Suggeste	Desi Desi S Inv itlet Pipe ed Manhole	esign Head ogn Flow (1 Flush-F Object Applicat Gump Availa Diameter ( Diameter ( Diameter (	(m) ./s) Clo™ tive Minim tion able (mm) (mm) (mm) (mm)	ise upstre rol Points	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500		<b>w (1/s</b> 17.	
Desig	n Point (Ca	Suggeste	Desi Desi Inv itlet Pipe ed Manhole <b>Head (m)</b> :	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Diameter (1) Flow (1/s) 20.4	(m) ./s) Clo™ tive Minim tion able (mm) (mm) (mm) (mm)	ise upstre rol Points Kic	1.200 20.4 Calculated Surface Yes 198 7.600 225 1500 s Head k-Flo®	d (m) Flo		1
The hydroi	n Point (Ca l logical cal as specifie	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should	Desi Desi Inv tlet Pipe ed Manhole Head (m) 3 1.200 0.380 have been Lanother t	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Diameter (1) Flow (1/s) 20.4 20.4 based on t ype of con	(m) ./s) Clo™ tive Minim tion able (mm) (mm) (mm) (mm) (mm) Mean Flow he Head/Dist trol device	ise upstre rol Points Kic over Head scharge re e other the	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship	<b>d (m) Flo</b> 0.831 - for the F	17. 17. lydro-1	1 4 Brake
The hydro Optimum® a utilised 1	n Point (Ca logical cal as specifie then these	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should storage rc	Desi Desi Inv tlet Pipe ed Manhole Head (m) 3 1.200 0.380 have been another t buting calc	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Diameter (1) Flow (1/s) 20.4 20.4 20.4 based on t ype of con ulations w	(m) ./s) Plo™ tive Minim tion able (mm) (mm) (mm) (mm) (mm) Mean Flow he Head/Dist trol device ill be inva	ise upstre rol Points Kic over Head scharge re e other that lidated	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship an a Hydro-	<b>d (m) Flo</b> 0.831 - for the F -Brake Opt	17. 17. Lydro-H .imum®	1 4 Brake be
The hydro: Optimum® a utilised f pth (m) F	n Point (Ca logical cal as specifie then these Low (l/s)	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should storage rc Depth (m) I	De Desi S Inv Itlet Pipe ed Manhole Head (m) S 1.200 0.380 have been another t buting calc Flow (1/s)	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Piameter (1) Flow (1/s) 20.4 20.4 based on t ype of con ulations w Depth (m)	(m) ./s) Clo™ tive Minim tion able (mm) (mm) (mm) (mm) (mm) (mm) (mm) (mm	ise upstre rol Points Kic over Head scharge re e other th. lidated Depth (m	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship an a Hydro-	d (m) Flor 0.831 - for the H -Brake Opt s) Depth	17. 17. lydro-H .imum® (m) Fl	1 4 Brake be
The hydro: Optimum® a utilised f <b>pth (m) F</b> 0.100	n Point (Ca logical cal as specifie then these Low (1/s) [I 6.8]	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should storage rc Depth (m) I 0.800	De Desi S Inv Itlet Pipe ed Manhole Head (m) S 1.200 0.380 have been another t buting calc Flow (1/s) 17.8	esign Head egn Flow (1 Flush-F Object Applicat Sump Availa Diameter (1) Piameter (1) Elow (1/s) 20.4 20.4 based on t ype of con ulations w Depth (m) 2.000	(m) ./s) tive Minim tion able (mm) (mm) (mm) (mm) (mm) (mm) (mm) Cont Mean Flow he Head/Dist trol device ill be inva Flow (l/s) 26.0	ise upstre rol Points Kic over Head scharge re e other th. lidated Depth (m 4.00	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship an a Hydro- ) Flow (1/2 0 36	d (m) Flor 0.831 - for the H -Brake Opt s) Depth .3 7.0	17. 17. iydro-H imum® (m) F1	1 4 Brake be Low (1
The hydro: Optimum® a utilised f pth (m) F1 0.100 0.200	n Point (Ca logical cal as specific then these Low (1/s) I 6.8 18.6	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should storage rc Depth (m) I 0.800 1.000	De Desi S Inv Itlet Pipe ed Manhole Head (m) S 1.200 0.380 have been another t touting calc Flow (1/s) 17.8 18.7	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Piameter (1) Elow (1/s) 20.4 20.4 based on t ype of con ulations w Depth (m) 2.000 2.200	(m) ./s) tive Minim tion able (mm) (mm) (mm) (mm) (mm) (mm) Cont Mean Flow he Head/Distrol device ill be inva Flow (1/s) 26.0 27.2	rol Points Kic over Head charge re cother thal lidated Depth (m 4.00 4.50	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship an a Hydro- ) Flow (1/s 0 36 0 38	d (m) Flor 0.831 - for the H -Brake Opt s) Depth .3 .5 7.4	17. 17. imum® (m) F1	1 4 Brake be Low (1
The hydro: Optimum® a utilised 1 <b>pth (m) F</b> 0.100 0.200 0.300	n Point (Ca logical cal as specifie then these Low (1/s) I 6.8 18.6 20.2	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should storage rc Depth (m) I 0.800 1.000 1.200	De Desi Inv Itlet Pipe ed Manhole Head (m) 3 1.200 0.380 have been another t buting calc Flow (1/s) 17.8 18.7 20.4	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Piameter (1) Elow (1/s) 20.4 20.4 based on t ype of con ulations w Depth (m) 2.000 2.200 2.400	(m) ./s) Clo™ tive Minim tion able (mm) (mm) (mm) (mm) (mm) (mm) (mm) Cont Mean Flow he Head/Dist trol device ill be inva Flow (1/s) 26.0 27.2 28.4	rol Points Kic over Head charge re cother thal lidated <b>Depth (m</b> 4.00 4.50 5.00	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship an a Hydro- ) Flow (1/: 0 36 0 38 0 40	d (m) Flor 0.831 - for the H -Brake Opt s) Depth .3 .5 .5 .5 .8.0	17. 17. imum® (m) F1 000 500 000	1 4 Brake be Low (1 4 4 5
The hydro: Optimum® a utilised f pth (m) F1 0.100 0.200	n Point (Ca logical cal as specific then these Low (1/s) I 6.8 18.6	Suggeste pints alculated) Flush-Flo™ Lculations ed. Should storage rc Depth (m) I 0.800 1.000	De Desi S Inv Itlet Pipe ed Manhole Head (m) S 1.200 0.380 have been another t touting calc Flow (1/s) 17.8 18.7	esign Head egn Flow (1 Flush-F Object Applicat Gump Availa Diameter (1) Piameter (1) Elow (1/s) 20.4 20.4 based on t ype of con ulations w Depth (m) 2.000 2.200	(m) ./s) tive Minim tion able (mm) (mm) (mm) (mm) (mm) (mm) Cont Mean Flow he Head/Distrol device ill be inva Flow (1/s) 26.0 27.2	rol Points Kic over Head scharge re e other th. lidated Depth (m 4.00 4.50 5.00 5.50	1.200 20.4 Calculated sam storage Surface Yes 198 7.600 225 1500 s Head k-Flo® Range lationship an a Hydro- ) Flow (1/s 0 36 0 38 0 40 0 42	d (m) Flor 0.831 - for the H -Brake Opt s) Depth .3 .5 .5 .8.0 .4 .8	17. 17. imum® (m) F1	1 4 Brake be

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Intermodal Area	
•		Micco
Date 6th February 2018	Designed by RJH	
File Intermodal.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	1

Time Area Diagram for Existing

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	2.403	8-12	2.475
Total	Area (	Contribu	uting (	(ha) = 4	.878

Total Pipe Volume (m³) = 7441.067

Hydrock C	Consulta	nts Lto	1										Page 2
•						ail Ce							
•					I	ntermo	odal <i>i</i>	Area					1 m
•	Februar	2010					ad br						- Micro
Date 6th File Inte		-				esigne hecked	-	RJH					Drainage
XP Soluti		MDA				etworl	-	5 1					
AI SOLUCI	10113				IN	ecwori	1 2010	J•1					
			Ex	istinc	n Netw	ork De	tails	for E	lxisti	nq			
	PN	Length		-				ise				Section	п Туре
		(m)	(m)	(1:X)	(ha)	(mins)	Flow	(l/s)	(mm) :	SECT	(mm)		
		624.000				4.00			0.600			Pipe/Co	
		125.000 20.000							0.600			Pipe/Co Pipe/Co	
	L1,.002	20.000	0.000	100.0	0.000	0.00		0.0		0	100	1 100/00	indui c
					<u>Netwo</u>	rk Res	ults	Table					
			PN	•		.Area				Cap			
				(m)	) (1	ha) F	'low (l	/s) (m/	's) (	1/s)			
				00 89.5				0.0 2.		5438.			
				01 88.2 02 88.0				0.0 2. 0.0 1.					
			E1/.0	02 00.0	02	4.070		0.0 1.	01	100.	/		
				<u>Conc</u>	luit S	ection	s for	Exist	ing				
			uits.	These o	conduit	s are m	narked	ection r by the e, ooo t	symbol	s:-	[] bo	х	
		S	ectior	n number	cs < 0	are tak	en fro	om user	condui	t tak	ole		
			ction	Conduit Type		Dimn.		Corner Splay (mm)		s Ai			
			-7	Ľ	1 39000	1200	90.0		2.32	8 46.	800		
			,	ι.	1 00000	1200	50.0		2.02	0 10.			

Hydrock Consultants Ltd		Page 3
•	Rail Central	
	Intermodal Area	
		– Micro
Date 6th February 2018	Designed by RJH	
File Intermodal.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	
DIDFIINF	SCHEDULES for Existing	
<u>FIFEDINE</u>	SCHEDULES IN EXISTING	
<u>U</u>	<u>pstream Manhole</u>	
PN Hyd Diam MH C.Lev Sect (mm) Name (m)	el I.Level D.Depth MH MH DIAM., L* (m) (m) Connection (mm)	W
E17.000 o 1800 E1 92.1	00 89.500 0.800 Open Manhole 270	0
	00 88.252 2.648 Open Manhole 3972	
E17.002 o 450 E3 92.1	00 88.002 3.648 Open Manhole 150	0
Do	wnstream Manhole	
PN Length Slope MH C.L (m) (1:X) Name (	evel I.Level D.Depth MH MH DIAM., m) (m) (m) Connection (mm)	L*₩
	-	725
	.100 88.002 2.898 Open Manhole 1 .200 87.952 2.798 Open Manhole	500
	Outfall Details for Existing	ŭ
Outfall Outfall Pipe Number Name	C. Level I. Level Min D.L W (m) (m) I. Level (mm) (mm) (m)	
E17.002 E	91.200 87.952 0.000 0 0	
Simulatio	on Criteria for Existing	
Volumetric Runoff Coeff	0.750 Additional Flow - % of Total Flow 0.	.000
Areal Reduction Factor		
Hot Start (mins) Hot Start Level (mm)	0 Inlet Coeffiecient 0. 0 Flow per Person per Day (l/per/day) 0.	
Manhole Headloss Coeff (Global)		60
Foul Sewage per hectare (l/s)	0.000 Output Interval (mins)	1
	r of Offline Controls 0 Number of Time/Area I of Storage Structures 0 Number of Real Time (	-
Synthe	tic Rainfall Details	
	$D_2$ (1m) 0.200 $D_2$	No
Rainfall Model FEH Return Period (years) 2	D2 (1km) 0.300 Winter Storms D3 (1km) 0.243 Cv (Summer) 0.7	No 750
Site Location	E (1km) 0.302 Cv (Winter) 0.8	
C (1km) -0.026	F (1km) 2.496 Storm Duration (mins)	30
D1 (1km) 0.319 S	Summer Storms Yes	

drock Consulta	ants Ltd						Page	4
			Rail Cer	ntral				
			Intermod	dal Area			4	Δ.
							Mic	Jun
te 6th Februar	ry 2018		Designed	d by RJH			— Mic	.ru inage
le Intermodal.	ermodal.MDX Checked by							
Solutions			Network					
SOLUCIOUS			Network	2010.1				
		<u>Onlin</u>	e Controls	for Exi	<u>stinq</u>			
<u>Hydro-</u>	Brake Optim	uum® Manho	ole: E3, DS	/PN: E17	.002, Vol	ume (m³):	4892.6	
		τ	Jnit Referenc	ce MD-SHE-	0196-2000-12	200-2000		
			esign Head (m			1.200		
		Des	ign Flow (1/s		<u> </u>	20.0		
			Flush-Flo		.se upstream	lculated		
			Applicatio		se upscream	Surface		
			Sump Availabl			Yes		
			Diameter (mn			196		
		Inv	vert Level (m	ı)		88.002		
		-	Diameter (mn			225		
	Suggest	ed Manhole	Diameter (mn	n)		1500		
Contro	l Points	Head (m)	Flow (l/s)	Contr	ol Points	Head (n	n) Flow (l/	's)
Design Point	(Calculated)	1.200	20.0		Kick-F	lo® 0.82	27 16	5.8
-	Flush-Flo [™]	0.376	20.0 M	ean Flow	over Head Ra	nge	- 17	1.1
The hydrological Optimum® as spec utilised then the	ified. Should ese storage ro	d another t outing calc	ype of contr ulations wil	ol device l be inva	other than lidated	a Hydro-Bra	ke Optimum	® be
pth (m) Flow (1/a								
	.8 0.800	17.4	2.000	25.5	4.000	35.6	7.000	46
		18.3	2.200	26.7	4.500	37.7	7.500	48
0.200 18		20.0	2.400 2.600	27.8 28.9	5.000 5.500	39.6 41.5	8.000 8.500	49 51
0.200 18 0.300 19		21 5					9.000	
0.200 18 0.300 19 0.400 20	.0 1.400	21.5		31 0	6 000	43 31		
0.200 18 0.300 19 0.400 20 0.500 19	.0 1.400 .7 1.600	22.9	3.000	31.0 33.4	6.000 6.500			54
0.200 18 0.300 19 0.400 20 0.500 19	.0 1.400 .7 1.600		3.000	31.0 33.4	6.000 6.500	43.3		
0.200 18 0.300 19 0.400 20 0.500 19	.0 1.400 .7 1.600	22.9	3.000	31.0 33.4				
0.200 18 0.300 19 0.400 20 0.500 19	.0 1.400 .7 1.600	22.9	3.000	31.0 33.4				

ydrock					D 17 0				Pa	
					Rail Cer					L
					Intermo	dal Area				Ly.
										Micro
		uary 2018			_	d by RJH				Drainaq
ile Int		al.MDX			Checked	-				
? Solut	ions				Network	2016.1				
Nur	Mar F nber of	Areal Hot hole Headlo Toul Sewage Input Hydr of Online C Rainfall Mo Site Locat C (1	Reduction Hot Start Le Start Le Start Le Sont Netter Controls Start Controls Start Controls Start Control F Control F Control Start Control St	<u>S</u> on Factor rt (mins) evel (mm) (Global) are (1/s) 0 Number 1 Number <u>Syntl</u> EH D1 (1) D2 (1) 26 D3 (1)	Simulation 1.000 A 0 0.500 Flc 0.000 er of Offli of Storage hetic Rain; km) 0.319 km) 0.243 (	<u>Criteria</u> <u>dditional Fl</u> <u>MADD Fact</u> w per Person ne Controls <u>Structures</u> <u>fall Details</u> <u>E (1km)</u> <u>F (1km)</u> Cv (Summer) mm) 300.0	ow - % of or * 10m ³ / Inlet Cc per Day ( 0 Number c 0 Number c 0.302 Cv ( 2.496 0.750	Total Flow (ha Storage efficcien( (1/per/day) of Time/Ar of Real Time Winter) 0	w 0.000 e 2.000 t 0.800 ) 0.000 ea Diag: me Cont:	rams O
		-	Profile		-	tep Fine In tus ON			Winter	
	Re	Duratic eturn Perioc		(s) ns) 15, rs)	ysis Times DTS Sta	-	Sı	ummer and M	, 960, 1440 0, 200 40, 40	Surcharge
	Re US/MH	Duratic eturn Perioc	on(s) (min d(s) (yea e Change	(s) ns) 15, rs)	ysis Times DTS Sta 30, 60, 12	tus ON	St 360, 480,	ummer and 1 600, 720 1, 30, 10 0, 0, 9	, 960, 1440 0, 200 40, 40 Water	Surcharge Depth
PN		Duratic eturn Perioc	on(s) (min d(s) (yea. e Change <b>Return C</b>	(s) ns) 15, rs) (%)	ysis Times DTS Sta 30, 60, 12 First (X)	tus ON 20, 180, 240, First (Y)	Su 360, 480, First (Z)	ummer and 1 600, 720 1, 30, 10 0, 0, 9	<pre>, 960, 1440 0, 200 40, 40 Water Level</pre>	Depth
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate	n(s) (min d(s) (yea. e Change Return C Period ( 1 1	(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 2	ysis Times DTS Sta 30, 60, 12 First (X)	tus ON 20, 180, 240, First (Y) Flood er	Su 360, 480, First (Z)	ummer and 1 600, 720 1, 30, 10 0, 0, 4 Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level</pre>	(m) -1.35 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate <b>Storm</b> 15 Winter 600 Winter	n(s) (min d(s) (yea. e Change Return C Period ( 1 1	(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte	tus ON 20, 180, 240, First (Y) Flood er	St 360, 480, First (Z) Overflow	ummer and 1 600, 720 1, 30, 10 0, 0, 4 Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	Depth (m) -1.33 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate <b>Storm</b> 15 Winter 600 Winter	n(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1	(s) ns) 15, rs) (%) Climate Change +0% 2' +0% 3' +0% 3' Flooded	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte	tus ON 20, 180, 240, First (Y) Flood er er Pipe	St 360, 480, First (Z) Overflow	ummer and 1 600, 720 1, 30, 10 0, 0, 4 Overflow	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	Depth (m) -1.3 -1.1
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate <b>Storm</b> 15 Winter 600 Winter	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 1	(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 +0% 3 Flooded H Volume	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow	St 360, 480, First (Z) Overflow	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	Depth (m) -1.3 -1.1
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Mame	(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 +0% 3 Flooded H Volume (m ³ )	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap.	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s)	Su 360, 480, First (Z) Overflow Status E:	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	<b>Depth</b> (m) -1.33 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate <b>Storm</b> 15 Winter 600 Winter 600 Winter	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E:	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow	Status E: OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	Depth (m) -1.33 -1.17
<b>PN</b> E17.000 E17.001 E17.002	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter PR E17.	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E: 001 E2	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000 2 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14 0.00	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s) 731.2	Status E: OK OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	<b>Depth</b> (m) -1.35 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter PR E17. E17.	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E: 001 E2	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000 2 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14 0.00	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s) 731.2 71.5	Status E: OK OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	Depth (m) -1.33 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter PR E17. E17.	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E: 001 E2	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000 2 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14 0.00	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s) 731.2 71.5	Status E: OK OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	Depth (m) -1.33 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter PR E17. E17.	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E: 001 E2	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000 2 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14 0.00	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s) 731.2 71.5	Status E: OK OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	<b>Depth</b> (m) -1.35 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter PR E17. E17.	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E: 001 E2	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000 2 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14 0.00	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s) 731.2 71.5	Status E: OK OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	<b>Depth</b> (m) -1.35 -1.17
E17.000 E17.001	US/MH Name E1 E2	Duratic eturn Perioc Climate Storm 15 Winter 600 Winter 600 Winter PR E17. E17.	on(s) (min d(s) (yea e Change Return C Period ( 1 1 1 1 N Name 000 E: 001 E2	<pre>(s) ns) 15, rs) (%) Climate Change +0% 2 +0% 3 Flooded Flooded Volume (m³) 1 0.000 2 0.000</pre>	ysis Times DTS Sta 30, 60, 12 First (X) Surcharge 00/15 Summe 0/180 Winte Flow / Ov Cap. 0.14 0.00	tus ON 20, 180, 240, First (Y) Flood er er Pipe rerflow Flow (1/s) (1/s) 731.2 71.5	Status E: OK OK	ummer and N 600, 720 1, 30, 10 0, 0, 0 Overflow Act.	<pre>, 960, 1440 0, 200 40, 40 Water Level (m) 89.947 88.276</pre>	<b>Depth</b> (m) -1.33 -1.17

lydrock	Consu	ltants	Ltd	l							Pa	ge 6
						-	l Cent	-				
						Int	ermoda	l Area				L.
												Micro
ate 6th	n Febr	uary 2	018			Des	igned i	oy RJH				
'ile Int	cermod	al.MDX				Che	cked b	Y				Drainag
IP Solut	cions					Net	work 2	016.1				
Nun	Mar I mber of	A hhole He Foul Sew of Onli Rainfal Site L	real Hot adlo: age ] Hydro ne Co .1 Mo .0 cat	Reduct Hot St Start ss Coef per hec ographs ontrols del ion	ion Fact art (min Level (m f (Globa tare (l/ 0 Num 1 Numbe <u>Sy</u> FEH D1 D2	<u>Simula</u> or 1.00 (as) (1) 0.50 (as) 0.00 (aber of er of St (1km) 0 (1km) 0	ation Cr 00 Add 0 00 Flow 00 0ffline corage S <u>Rainfal</u> .319 .300	<u>iteria</u> itional F1 MADD Fact per Persor Controls tructures <u>l Details</u> E (1km)	n per Day ( 0 Number c 0 Number c 0.302 Cv ( 2.496	Total Flow ha Storage effiecient l/per/day f Time/Ar f Real Tim	w 0.000 e 2.000 t 0.800 ) 0.000 ea Diag: me Cont:	rams O
	Re	eturn Pe	riod		e(s) ins) 19 ars)	נס	IS Statu	5 ON	360, 480,	mmer and M	, 960, 1440 0, 200	
PN	US/MH Name	Stor			Climate Change		t (X) harge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level	Surcharge Depth (m)
E17.000	E1	15 Win	ter	30	+0%	200/15	Summer				90.336	-0.96
E17.001		600 Win			+0%		Guillier				88.497	
E17.002	ЕЗ	600 Win	nter	30	+0%	30/180	Winter				88.496	0.04
		1	PN	US/MH Name	Flooded Volume (m³)	Flow /	Overflo (l/s)	Pipe w Flow (l/s)	Status	Level Exceeded		
		<b>F</b> 17	.000	E1	0.000	0.44		2298.3	OK			
			.000		0.000			130.1				
			.002		0.000				SURCHARGED			

Hudrock Con	aultanta It	d							D-	7
Hydrock Con	Sultants Lt	a		Dai	l Cent:				Pa	ige 7
•				_		-				ເ ໄ
•				Int	ermoda	L Area				m
•	0.01.0									Micro
Date 6th Fel	-				igned 1	-				Drainage
File Intermo					cked b	-				bianage
XP Solution:	S			Net	work 2	016.1				
<u>100 yea</u>	<u>r Return Pe</u>	riod S [.]	ummary		<u>tical</u> xistin		by Maximu	m Level	(Rank	<u>1) for</u>
		Hot St Start Dss Coef per hec	art (min Level (m f (Globa tare (l/	or 1.00 s) m) 1) 0.50 s) 0.00	0 0 0 Flow : 0	itional Fl MADD Fact per Persor	n per Day (	ha Storage effiecient l/per/day)	e 2.000 c 0.800 0.000	
	er of Online (								-	
	Site Loca	tion	FEH D1 D2	(1km) 0 (1km) 0	.319 .300	<u>l Details</u> E (1km) F (1km) (Summer)	0.302 Cv (1 2.496	Winter) O.	.840	
	Maro	gin for		alysis	-	> Fine Ir	DVD Stat nertia Stat			
	Duratio	Profil on(s) (m	. ,	5, 30, 6	50, 120,	180, 240	Su , 360, 480,	mmer and W 600, 720,		
	Return Period Climate	d(s) (ye e Change						1, 30, 100 0, 0, 4		
US/I PN Nam			Climate Change		t (X) harge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
E17.000 H	El 15 Winter	100	+40%	200/15	Summer				90.868	-0.432
	E2 960 Winter			,					88.878	
E17.002 H	E3 960 Winter	100	+40%	30/180	Winter				88.877	0.425
	PN	US/MH Name	Flooded Volume (m³)		Overflo (1/s)	Pipe w Flow (l/s)	Status	Level Exceeded		
	E17.00	0 E1	0.000	0.93		4853.7	OK			
	E17.000 E17.000	1 E2	0.000	0.00 0.15		163.1	OK OK SURCHARGED			

Hydrock	Consu	LLANLS LLC	l l							Pa	ige 8
•					Rai	l Centr	al			ſ	
					Int	ermodal	Area				Ч.
Date 6th	n Febr	uary 2018			Des	igned b	y RJH				Micro
File Int		-				cked by	-				Drainage
XP Solut	tions					work 20					
200	year	Return Per	iod Su	ummary	of Cri	tical F	Results	by Maximu	m Level	(Rank	1) for
					<u>E</u>	<u>xistinc</u>	1				
					a.' 1						
		Areal	Reduct	ion Fact		tion Cri 0 Addi		ow - % of	Total Flow	<i>x</i> 0.000	
			Hot St	art (min	s)	0		cor * 10m³/			
				Level (m					effiecient		
		nhole Headlo Foul Sewage				-	er Persor	n per Day (	l/per/day)	0.000	
	1	COUL Sewage	per nec	Laie (1/	5) 0.00	0					
		E Input Hydr	5 1							5	
1	Number	of Online C	ontrols	1 Numbe	er of St	orage St	ructures	0 Number o	f Real Tir	me Cont	rols O
				Sv	nthetic	Rainfal	l Details				
		Rainfall Mo	del						Winter) 0.	840	
		Site Locat	ion	D2	(1km) 0	.300	F (1km)	2.496			
		C (1	km) -0.	026 D3	(1km) 0	.243 Cv	(Summer)	0.750			
		Marq	in for	Flood Ri	sk Warn	ing (mm)	300.0	DVD Stat	us OFF		
		1101 9						nertia Stat			
					DT	S Status	ON				
					DT	S Status	ON				
			Profil	e(s)	DT	S Status	ON	Su	mmer and W	Vinter	
		Duratio		. ,				Su 360, 480,		960,	
	P		n(s) (m	ins) 15				360, 480,	600, 720,	960, 1440	
	R	Duratio eturn Period Climate	n(s) (m (s) (ye	ins) 15 ars)				360, 480,		960, 1440 ), 200	
	R	eturn Period	n(s) (m (s) (ye	ins) 15 ars)				360, 480,	600, 720, 1, 30, 100	960, 1440 ), 200	
	R	eturn Period	n(s) (m (s) (ye	ins) 15 ars)				360, 480,	600, 720, 1, 30, 100	960, 1440 0, 200 40, 40	Surcharged
	Re US/MH	eturn Period Climate	n(s) (m (s) (ye Change	ins) 15 ars)	5, 30, 6	50, 120,	180, 240,	360, 480,	600, 720, 1, 30, 100 0, 0, 4	960, 1440 0, 200 40, 40 Water	2
PN		eturn Period Climate	n(s) (m (s) (ye Change <b>Return</b>	ins) 15 ars) (%)	5, 30, 6 Firs	50, 120,	180, 240,	, 360, 480,	600, 720, 1, 30, 100 0, 0, 4	960, 1440 0, 200 40, 40 Water	2
	US/MH Name	eturn Period Climate <b>Storm</b>	n(s) (m (s) (ye Change Return Period	ins) 15 ars) (%) Climate Change	5, 30, 6 Firs [.] Surcl	50, 120, t (X) harge	180, 240, First (Y)	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow	<pre>960, 1440 0, 200 40, 40 Water Level (m)</pre>	Depth (m)
PN E17.000 E17.001	US/MH Name E1	eturn Period Climate <b>Storm</b>	n(s) (m (s) (ye Change <b>Return</b>	ins) 15 ars) (%) Climate Change	5, 30, 6 Firs	50, 120, t (X) harge	180, 240, First (Y)	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow	960, 1440 0,200 40,40 Water Level	Depth (m) 0.391
E17.000	US/MH Name E1 E2	eturn Period Climate <b>Storm</b> 15 Winter	n(s) (m (s) (ye Change Return Period 200	ins) 15 ars) (%) Climate Change +40% +40%	5, 30, 6 Firs [.] Surcl	50, 120, t (X) harge Summer	180, 240, First (Y)	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691</pre>	Depth (m) 0.391
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate <b>Storm</b> 15 Winter 960 Winter	n(s) (m (s) (ye Change Return Period 200 200	ins) 15 ars) (%) Climate Change +40% +40%	5, 30, 6 Firs Surcl 200/15	50, 120, t (X) harge Summer	180, 240, First (Y)	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate <b>Storm</b> 15 Winter 960 Winter	n(s) (m (s) (ye Change Return Period 200 200	ins) 15 ars) (%) Climate Change +40% +40%	5, 30, 6 Firs Surcl 200/15 30/180	50, 120, t (X) harge Summer	180, 240, First (Y)	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate <b>Storm</b> 15 Winter 960 Winter	n(s) (m (s) (ye Change <b>Return</b> <b>Period</b> 200 200 200	ins) 15 ars) (%) Climate Change +40% +40% +40% Flooded	5, 30, 6 Firs Surcl 200/15 30/180 Flow /	50, 120, t (X) harge Summer Winter Overfloo	180, 240, First (Y) Flood Pipe W Flow	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate <b>Storm</b> 15 Winter 960 Winter	n(s) (m (s) (ye Change <b>Return</b> <b>Period</b> 200 200 200	ins) 15 ars) (%) Climate Change +40% +40% +40% Flooded	5, 30, 6 Firs Surcl 200/15 30/180	50, 120, t (X) harge Summer Winter	180, 240, First (Y) Flood Pipe	, 360, 480, First (Z)	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate <b>Storm</b> 15 Winter 960 Winter 960 Winter	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name	ins) 15 ars) (%) Climate Change +40% +40% +40% Flooded Volume	<pre>5, 30, 6 Firs Surcl 200/15 30/180 Flow / Cap.</pre>	50, 120, t (X) harge Summer Winter Overfloo	180, 240, First (Y) Flood Pipe W Flow (1/s)	First (Z) Overflow	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter 960 Winter	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1	ins) 15 ars) (%) Climate Change +40% +40% +40% Flooded Volume (m ³ )	<pre>5, 30, 6 Firs Surcl 200/15 30/180 Flow / Cap. 1.06</pre>	50, 120, t (X) harge Summer Winter Overfloo	180, 240, First (Y) Flood Pipe W Flow (1/s)	First (Z) Overflow Status	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% +40% Flooded Volume (m ³ ) 0.000	<pre>5, 30, 6 Firs Surcl 200/15 30/180 Flow / Cap. 1.06</pre>	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433
E17.000 E17.001	US/MH Name E1 E2	eturn Period Climate Storm 15 Winter 960 Winter 960 Winter PN E17.000 E17.001	n(s) (m (s) (ye Change Return Period 200 200 200 US/MH Name E1 E2	ins) 15 ars) (%) Climate Change +40% +40% Flooded Volume (m ³ ) 0.000 0.000	Firs Surcl 200/15 30/180 Flow / Cap. 1.06 0.00	50, 120, t (X) harge Summer Winter Overfloo	<pre>180, 240, First (Y) Flood Flow (1/s) 5521.0 188.6</pre>	First (Z) Overflow Status SURCHARGED OK	600, 720, 1, 30, 100 0, 0, 4 Overflow Act.	<pre>960, 1440 0, 200 40, 40 Water Level (m) 91.691 89.019</pre>	Depth (m) 0.391 -0.433

Hydrock Consultants Ltd								
		C151	.171 R	ail Cer	itral			
		200v	vear+4	0%cc SW	Stora	age		
		-				<u> </u>		
2.1.2.5.1.2.2.2.10		Truck Park						
Date 5th February 2018		Designed by RJH						
File Truck Park.SRCX		Chec	Checked by RJH					
XP Solutions		Sour	ce Co	ntrol 2	016.1			
Summary o	of Results	for 2	200 ye	<u>ar Retı</u>	irn Pe	riod (+		
	Storm	Max	Max	Max	Max	Status		
	Event	Level	Depth	Control	Volume			
		(m)	(m)	(l/s)	(m³)			
15	min Summer	8.181	0.581	9.3	1103.2	ОК		
30	min Summer	8.257	0.657	9.3	1247.6			
60	min Summer	8.340	0.740	9.3	1406.2			
	min Summer				1576.6			
180	min Summer	8.483	0.883	9.3	1677.5			
240	min Summer	8.520	0.920	9.3	1747.3			
360	min Summer min Summer	8.568	0.968	9.3	1839.2			
480	min Summer	8.598	0.998	9.3	1896.0			
	min Summer				1932.4			
	min Summer				1955.6	ОК		
960	min Summer	8.634	1.034	9.3	1964.2	ΟK		
	min Summer				1929.6			
2160	min Summer	8.567	0.967	9.3	1837.4	ОК		
	min Summer				1753.3			
	min Summer				1546.2			
	min Summer				1343.7			
	min Summer				1172.2			
	min Summer				1025.7			
10080	min Summer	8 072	0.340	2.5 Q 3	897.2			
	min Winter				1236.9			
	) min Winter ) min Winter				1399.5			
	min Winter				1578.6			
	min Winter				1770.4			
180	min Winter	8.592	0.992	9.3	1885.0			
240	min Winter	8.634	1.034	9.3	1965.2	ОК		
	Storm				harge T			

	Stor	m	Rain	Flooded	Discharge	Time-Peak
	Even	t	(mm/hr)	Volume	Volume	(mins)
				(m³)	(m³)	
			261.584	0.0	782.4	31
30	min	Summer	148.306	0.0	777.7	45
			84.083	0.0	1329.0	76
120	min	Summer	47.672	0.0	1446.4	134
180	min	Summer	34.205	0.0	1469.6	194
240	min	Summer	27.028	0.0	1459.7	252
360	min	Summer	19.393	0.0	1435.5	372
480	min	Summer	15.323	0.0	1413.4	490
600	min	Summer	12.765	0.0	1393.7	608
720	min	Summer	10.995	0.0	1376.0	728
960	min	Summer	8.640	0.0	1343.8	966
1440	min	Summer	6.152	0.0	1285.3	1442
2160	min	Summer	4.380	0.0	2575.0	1844
2880	min	Summer	3.442	0.0	2610.2	2224
4320	min	Summer	2.395	0.0	2400.8	2996
5760	min	Summer	1.852	0.0	3011.8	3752
7200	min	Summer	1.516	0.0	3081.5	4536
8640	min	Summer	1.288	0.0	3136.3	5272
10080	min	Summer	1.122	0.0	3173.2	5960
15	min	Winter	261.584	0.0	781.6	31
30	min	Winter	148.306	0.0	761.3	45
60	min	Winter	84.083	0.0	1440.8	74
120	min	Winter	47.672	0.0	1475.8	132
180	min	Winter	34.205	0.0	1461.4	190
240	min	Winter	27.028	0.0	1447.7	248

Hydrock Consultants Ltd	Page 2	
•	C151171 Rail Central	
	200year+40%cc SW Storage	<u> </u>
	Truck Park	Micro
Date 5th February 2018	Designed by RJH	
File Truck Park.SRCX	Checked by RJH	Drainage
XP Solutions	Source Control 2016.1	

# Summary of Results for 200 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Winte	er 8.691	1.091	9.3	2072.2	ОК
480 min Winte	er 8.726	1.126	9.3	2140.1	ОК
600 min Winte	er 8.750	1.150	9.3	2185.3	ОК
720 min Winte	er 8.766	1.166	9.3	2215.5	ΟK
960 min Winte	er 8.776	1.176	9.3	2233.7	ОК
1440 min Winte	er 8.765	1.165	9.3	2212.7	ΟK
2160 min Winte	er 8.715	1.115	9.3	2117.8	ΟK
2880 min Winte	er 8.657	1.057	9.3	2007.9	ΟK
4320 min Winte	er 8.522	0.922	9.3	1751.3	ΟK
5760 min Winte	er 8.389	0.789	9.3	1499.5	ΟK
7200 min Winte	er 8.248	0.648	9.3	1230.7	ΟK
8640 min Winte	er 8.133	0.533	9.3	1012.1	O K
10080 min Winte	er 8.036	0.436	9.3	828.0	ΟK

	Stor Even		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360	min	Winter	19.393	0.0	1426.6	366
480	min	Winter	15.323	0.0	1411.0	482
600	min	Winter	12.765	0.0	1398.3	598
720	min	Winter	10.995	0.0	1387.5	714
960	min	Winter	8.640	0.0	1367.8	944
1440	min	Winter	6.152	0.0	1339.7	1396
2160	min	Winter	4.380	0.0	2775.4	2032
2880	min	Winter	3.442	0.0	2696.7	2312
4320	min	Winter	2.395	0.0	2461.6	3240
5760	min	Winter	1.852	0.0	3372.7	4160
7200	min	Winter	1.516	0.0	3451.5	4904
8640	min	Winter	1.288	0.0	3514.8	5624
10080	min	Winter	1.122	0.0	3560.1	6352

Hydrock Consultants Ltd	Page 3
•	C151171 Rail Central
	200year+40%cc SW Storage
	Truck Park
Date 5th February 2018	Designed by RJH
File Truck Park.SRCX	Checked by RJH
XP Solutions	Source Control 2016.1
R	Rainfall Details
Rainfall Model FEH Return Period (years) 200 Site Location C (1km) -0.026 S D1 (1km) 0.319 W	
Ti	ime Area Diagram
	otal Area (ha) 2.273
Time (mins) Area Time (mins From: To: (ha) From: To:	
0 4 0.568 4	8 0.568 8 12 0.568 12 16 0.569
<u>Ti</u>	ime Area Diagram
	otal Area (ha) 0.000
	Time (mins) Area
F	From: To: (ha)
	0 4 0.000

drock Co	nsultant	s Lla							Pa	ge 4	
				C151171	Rail Ce	ntral					
				200year+	+40%cc S	W Storag	е		7	٦.	
				Truck Pa	ark					lice	Cm
te 5th F	ebruary 2	2018		Designed	d by RJH					Micia	
	Park.SR			Checked	-					Drain	age
, Solutic					Control	2016 1					
0014010											
				<u>Model De</u>	etails						
			Storage is	Online Cove	er Level	(m) 10.000					
			Tar	nk or Pond	Structu	ire					
			I	invert Level	(m) 7.60	D					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m) A	Area (m²)	Depth (m)	Area (m	²) Dep	oth (m)	Area	(m²)
0.000	1900.0	1.200	1900.0	2.400	0.0	3.600	0	.0	4.800		0.0
0.200					0.0	3.800		.0	5.000		0.0
0.400			0.0			4.000		.0			
0.600 0.800			0.0		0.0	4.200 4.400		.0			
1.000			0.0		0.0	4.400		.0			
1.000	1900.0	2.200	0.0	3.400	0.0	1.000	0	••			
1.000	1900.0	1	Iydro-Bral U	ke Optimum( Jnit Reference esign Head (m	® Outflo	w Contro	1	00			
1.000	1900.0	' <u>H</u> inimum Ou	lydro-Bral U De Desi S Inv utlet Pipe	ke Optimum( Jnit Reference ssign Head (m .gn Flow (1/s Flush-Flo	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m)	<u>w Contrc</u> -0138-9300	<u>1</u> -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6	00 00 .3 ed ge ce es 38 00 25			
1.000	1900.0 Control Pc	' Minimum Ou Suggeste	lydro-Bral U De Desi S Inv itlet Pipe ed Manhole	ke Optimum( Init Reference sign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mm rert Level (n Diameter (mm	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) m) m)	<u>ow Contrc</u> -0138-9300	1 -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6 2 12	00 00 .3 ed ge ce es 38 00 25 00	) Flow	(1/s)	
	Control Pc	' Minimum Ou Suggeste Dints	lydro-Bral U De Desi S Inv itlet Pipe ed Manhole <b>Head (m) 1</b>	ke Optimum( Init Reference esign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mn Diameter (mn Diameter (mn	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) m) m)	ow Contro -0138-9300 ise upstre rol Points	1 -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6 2 12	00 00 .3 ed ge ce es 38 00 25 00		<b>(1/s)</b> 7.6	
	Control Pc m Point (C.	' Minimum Ou Suggeste Dints	lydro-Bral U De Desi S Inv itlet Pipe ed Manhole	ke Optimum( Init Reference esign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mn Diameter (mn Diameter (mn Diameter (mn Flow (1/s) 9.3	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) m) m) Cont:	ow Contro -0138-9300 ise upstre rol Points	<u>1</u> -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6 2 12 He c-Flo®	00 00 .3 ed ge ce es 38 00 25 00 25 00			
Desig The hydro: Optimum® a	<b>Control Pc</b> In Point (C. logical cal as specifie	' Minimum Ou Suggeste bints alculated) Flush-Flo™ Lculations ed. Should	lydro-Bral U De Desi S Inv itlet Pipe ed Manhole <b>Head (m) I</b> 1.200 0.356 have been S another t	ke Optimum( Init Reference esign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mn Diameter (mn Diameter (mn Diameter (mn Flow (1/s) 9.3	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) Cont: Mean Flow e Head/Dis col device	ow Contro -0138-9300 ise upstre rol Points Kick over Head charge rel other that	1 -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6 2 12 He c-Flo® Range Lationshi	00 00 .3 ed ge ce es 38 00 25 00 <b>ead (m</b> 0.77	3 - the Hy	7.6 8.1 dro-B:	rake
Desig The hydro: Optimum® a utilised f	<b>Control Pc</b> In Point (C. logical cal as specific then these	Minimum Ou Suggeste Dints alculated) Flush-Flo™ Lculations ed. Should storage rc	U U De Desi S Inv utlet Pipe ed Manhole Head (m) I 1.200 0.356 have been I another t	ke Optimum( Init Reference esign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mm Diameter (mm Diameter (mm Flow (1/s) 9.3 9.3 M based on the ype of contr	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) Cont: Mean Flow e Head/Dis col device 11 be inva	ow Contro -0138-9300 ise upstre rol Points Kicl over Head charge rel cother tha lidated	1 -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.66 2 12 He c-Flo® Range .ationshi an a Hydr	00 00 .3 ed ge ce es 38 00 25 00 <b>ead (m</b> 0.77 p for co-Bral	3 - the Hy ke Opti	7.6 8.1 dro-B: .mum® }	rake be
Desig The hydro: Optimum® a utilised f	<b>Control Pc</b> In Point (C. logical cal as specific then these	Minimum Ou Suggeste Dints alculated) Flush-Flo™ Lculations ed. Should storage rc	U U De Desi S Inv utlet Pipe ed Manhole Head (m) I 1.200 0.356 have been I another t	ke Optimum( Init Reference esign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mm Diameter (mm Diameter (mm Diameter (mm Flow (1/s) 9.3 9.3 M based on the ype of contr ulations wil	® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) Cont: Mean Flow e Head/Dis col device 11 be inva	ow Contro -0138-9300 ise upstre rol Points Kich over Head charge rel cother tha lidated Depth (m)	1 -1200-93 1.2 9 Calculat am stora Surfa Y. 1 7.6 2 12 He c-Flo® Range Lationshi an a Hydr Flow (1	00 00 .3 ed ge ce es 38 00 25 00 <b>ead (m</b> 0.77 p for co-Bral	3 - the Hy ke Opti	7.6 8.1 dro-B: .mum® } n) Flc	rake be bw (1,
Desig The hydro: Optimum® a utilised f pth (m) F1 0.100 0.200	Control Pc m Point (C logical cal as specific then these low (1/s)  I 5.0 8.8	Minimum Ou Suggeste Dints alculated) Flush-Flo™ Iculations ed. Should storage rc Depth (m) I 0.800 1.000	lydro-Bral U De Desi S Inv itlet Pipe ed Manhole Head (m) 1 1.200 0.356 have been 1 i another t buting calc Flow (1/s) 7.7 8.5	ke Optimum( Init Reference sign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mm Diameter (mm Diameter (mm Flow (1/s) 9.3 9.3 M based on the ype of contr ulations wil Depth (m) F. 2.000 2.200	<pre>® Outflc ce MD-SHE m) s) o[™] ve Minim on le m) m) m) Cont: Mean Flow e Head/Dis col device ll be inva 'low (l/s) 11.8 12.4</pre>	ow Contro -0138-9300 ise upstre rol Points Kicl over Head charge rel other tha lidated Depth (m) 4.000 4.500	<u>l</u> -1200-93 1.2 9 Calculat am stora Surfa Y. 1 7.6 2 12 He c-Flo® Range Lationshi an a Hydr Flow (1 ) 1 ) 1	00 00 .3 ed ge ce es 38 00 25 00 ead (m 0.77 .p for co-Bral L/s) D L6.5 L7.4	3 - ke Opti epth (r 7.00 7.50	7.6 8.1 dro-B: mum® } n) Flc	rake be <b>bw (1</b> , 2: 2:
Desig The hydrol Optimum® a utilised f pth (m) F1 0.100 0.200 0.300	Control Pc m Point (C logical cal as specific then these low (1/s)  I 5.0 8.8 9.2	<pre>Minimum Ou Suggeste oints alculated) Flush-Flo™ Iculations ed. Should storage rc Depth (m) I 0.800 1.000 1.200</pre>	Uydro-Bral U De Desi S Inv itlet Pipe ed Manhole Head (m) I 1.200 0.356 have been I another t buting calc Flow (1/s) 7.7 8.5 9.3	ke Optimum( Init Reference sign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mm Diameter (mm Diameter (mm Flow (1/s) 9.3 9.3 M based on the ype of contr ulations wil Depth (m) F. 2.000 2.200 2.400	<pre>® Outflc ce MD-SHE m) s) o™ ve Minim on le m) m) m) Cont: Mean Flow e Head/Dis col device ll be inva 'low (1/s) 11.8 12.4 12.9</pre>	ow Contro -0138-9300 ise upstre rol Points Kicl over Head charge rel other tha lidated Depth (m) 4.000 4.500 5.000	<u>l</u> -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6 2 12 He c-Flo® Range antionshi an a Hydr Flow (1 ) 1 1 1 1 1 1 1 1 1 1 1 1 1	00 00 .3 ed ge ce es 38 00 25 00 ead (m 0.77	3 - ce Opti epth (r 7.00 7.50 8.00	7.6 8.1 dro-B: mum® } n) Flc 00 00 00	rake be <b>bw (1,</b> 22 22 22
Desig The hydro: Optimum® a utilised f pth (m) F1 0.100 0.200	Control Pc m Point (C logical cal as specific then these low (1/s)  I 5.0 8.8	Minimum Ou Suggeste Dints alculated) Flush-Flo™ Iculations ed. Should storage rc Depth (m) I 0.800 1.000	lydro-Bral U De Desi S Inv itlet Pipe ed Manhole Head (m) 1 1.200 0.356 have been 1 i another t buting calc Flow (1/s) 7.7 8.5	ke Optimum( Init Reference sign Head (n .gn Flow (1/s Flush-Flo Objectiv Applicatic Sump Availabl Diameter (mm Diameter (mm Diameter (mm Flow (1/s) 9.3 9.3 M based on the ype of contr ulations wil Depth (m) F. 2.000 2.200	<pre>® Outflc ce MD-SHE m) s) o[™] ve Minim on le m) m) m) Cont: Mean Flow e Head/Dis col device ll be inva 'low (l/s) 11.8 12.4</pre>	ow Contro -0138-9300 ise upstre rol Points Kicl over Head charge rel other tha lidated Depth (m) 4.000 5.500	<u>l</u> -1200-93 1.2 9 Calculat am stora Surfa Y 1 7.6 2 12 He c-Flo® Range antionshi an a Hydr Flow (]	00 00 .3 ed ge ce es 38 00 25 00 ead (m 0.77 .p for co-Bral L/s) D L6.5 L7.4	3 - ke Opti epth (r 7.00 7.50	7.6 8.1 mum® 1 <b>n) Flc</b> 00 00 00	rake be <b>bw (1,</b> 2: 22

Hydrock Consultants Ltd		Page 1
•	Rail Central	
	Bus Park	L'un
•		Micro
Date 6th February 2018	Designed by RJH	Desinado
File Bus Park.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	

#### Time Area Diagram for Existing

Time<br/>(mins)Area<br/>(ha)Time<br/>(mins)Area<br/>(ha)0-40.2274-80.145

Total Area Contributing (ha) = 0.372

Total Pipe Volume  $(m^3) = 426.833$ 

Hydrock C	Consulta	nts Lt	d										Page 2
•						Rail Ce		1					5
						Bus Pa:	rk						1 L.
													Micro
ate 6th						Designe	-	RJH					Drainad
ile Bus	Park.MD	Х				Checke							Diamay
P Soluti	lons					Networl	k 201	6.1					
			_					6					
			<u>Ex</u>	lstin	g Neti	work De	etails	s ior	EXIS	tinq			
	PN	Length	Fall	Slope	I.Area	T.E.	Ba	se	k	HYD	DIA	Section	Tvpe
		(m)	(m)	(1:X)									-11-
	E30.000	00 200	0 1 0 0	E 0 1 0	0 100	4.00		0 0	0.600		600	Dine /Can	d
	E30.000 E30.001											Pipe/Con Pipe/Con	
	E30.002								0.600			Pipe/Con	
	E30.003	24.200	0.060	403.3	0.000	0.00		0.0	0.600			Pipe/Con	
					<u>Netwo</u>	ork Res	sults	Table	<u>e</u>				
			PN	ı us,	/IL Σ	I.Area	ΣBa	se	Vel	Cap			
				(1	m)	(ha)	Flow (	1/s)	(m/s)	(1/s)			
			E30.	000 76.	922	0.186		0.0	1.08	305.	. 7		
				001 76.		0.186			0.80				
				002 <mark>76</mark> .						39350.			
			E30.0	003 76.	680	0.372		0.0	1.01	160.	. 0		
				Con	dui+ (	Section	e for	- Fvi	atina				
					uuit i		101 61	. <u>nat</u>	JULIIY				
		NOTE: D	liamete	rs less	s than	66 refe	r to s	ectior	n numbe	ers of	hydr	aulic	
						ts are m					-		
		culve	rt, $\setminus$ /	open c	hannel	, oo dua	al pipe	e, ooo	tripl	e pipe	e, O e	egg.	
		:	Section	n numbe	rs < 0	are tak	ten fro	om use	r cond	luit ta	able		
						r Minor							
		N	lumber	Туре	Dimn (mm)	. Dimn. (mm)	-	-	-		Area (m²)		
					(11011)	(11111)	(Deg)	(mun)	) (1	,	()		
			-13	[	] 1800	0 1200	90.0		2.	250 23	1.600		

Hydrock Consultants Ltd		Page 3
•	Rail Central Bus Park	L'un
Date 6th February 2018 File Bus Park.MDX	Designed by RJH Checked by	Micro Drainage
XP Solutions	Network 2016.1	1
<u><u>P</u></u>	IPELINE SCHEDULES for Existing	

#### <u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
	Sect	(11111)	name	(111)	(111)	(111)	Connection	(nun)
E30.000	0	600	E1	78.800	76.922	1.278	Open Manhole	1500
E30.001	0	600	E2	78.000	76.724	0.676	Open Manhole	1500
E30.002	[]	-13	E3	78.000	76.700	0.100	Open Manhole	18725
E30.003	0	450	E4	78.000	76.680	0.870	Open Manhole	1500

#### Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
E30.000	99.200	501.0	E2	78.000	76.724	0.676	Open Manhole	1500
E30.001	21.700	904.2	EЗ	78.000	76.700	0.700	Open Manhole	18725
E30.002	18.000	900.0	E4	78.000	76.680	0.120	Open Manhole	1500
E30.003	24.200	403.3	Ε	78.000	76.620	0.930	Open Manhole	0

Hydrock Consultants Ltd		Page 4
•	Rail Central	
	Bus Park	Mr.
		Micco
Date 6th February 2018	Designed by RJH	
File Bus Park.MDX	Checked by	Drainage
XP Solutions	Network 2016.1	
Area	Summary for Existing	
Pipe PIMP PIMP : Number Tume Name	PIMP Gross Imp. Pipe Total (%) Area (ha) Area (ha) (ha)	
Number Type Name	(%) Alea (lla) Alea (lla) (lla)	
	100 0.186 0.186 0.186	
	100         0.000         0.000         0.000           100         0.186         0.186         0.186	
	100 0.000 0.000 0.000	
	Total         Total         Total           0.372         0.372         0.372	
	0.372 0.372 0.372	
	Outfall Dataile fan Enistian	
Free Flowing	Outfall Details for Existing	
Outfall Outfall	C. Level I. Level Min D,L W	
Pipe Number Name	(m) (m) I. Level (mm) (mm)	
	(m)	
E 30.003 E	78.000 76.620 0.000 0 0	
2001000 2		
Simulatic	on Criteria for Existing	
Volumetric Runoff Coeff Areal Reduction Factor	0.750 Additional Flow - % of Total Flow 0	
Hot Start (mins)		
	0 Flow per Person per Day (l/per/day) 0	
Manhole Headloss Coeff (Global)		
Foul Sewage per hectare (l/s)	0.000 Output Interval (mins)	1
Number of Input Hydrographs 0 Numbe	er of Offline Controls 0 Number of Time/Area 1	Diagrams O
Number of Online Controls 1 Number	of Storage Structures 0 Number of Real Time (	Controls 0
Synthe	etic Rainfall Details	
Rainfall Model FEH	D2 (1km) 0.300 Winter Storms	No
Return Period (years) 2	D3 (1km) 0.243 Cv (Summer) 0.7	750
Site Location	E (1km) 0.302 Cv (Winter) 0.8	
	F (1km) 2.496 Storm Duration (mins) Summer Storms Yes	30

0.2001.71.0001.82.2002.64.5003.77.50040.3001.81.2002.02.4002.75.0003.98.00040.4001.71.4002.12.6002.85.5004.08.5005				Page 5	
Date 6th February 2018       Designed by RJH       Designed by RJH         checked by       Checked by       Checked by         Online Controls for Existing         Metwork 2016.1         Unit Reference MD-SHE-0064-2000-1200-2000         Design Head (m)       1.200         Design Flow (1/s)       2.0         Flush-Flow       Calculated         Objective Minimise upstream storage         Application       Sump Available         Diameter (mm)       64         Invert Level (m)       76.680         Minimum Outlet Pipe Diameter (mm)       1200         Control Points       Head (m) Flow (1/s)         Design Point (Calculated)       1.200       Xick-Flo@       0.573       1.4         Flush-Flo [®] Control Points       Head (m) Flow (1/s)         Diameter (mm)       1.06         Sump Available       Sump Available       Sump Available         Diameter (mm)       1.00         Dister	Rail Central				
Date off rebruary 2018       Designed by Kun       Designed by Kun         Pile Bus Park.MDX       Checked by       Define Controls for Existing         Online Controls for Existing         Metwork 2016.1         Unit Reference MD-SHE-0064-2000-1200-2000         Design Flow (1/s)       2.0         Unit Reference MD-SHE-0064-2000-1200-2000         Design Flow (1/s)       2.0         Flow for Existing         Unit Reference MD-SHE-0064-2000-1200-2000         Design Flow (1/s)       2.0         Design Flow (1/s)       2.0         Diameter (mm)       1.200         Diameter (mm)       64         Invert Level (m)       76.680         Minimum Outlet Pipe Diameter (mm)       100         Suggested Manhole Diameter (mm)       100         Design Point (Calculated)       1.200       2.0         Flow for Oxer Head Range       -       1.6         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         Depth (m) Flow (1/s	Bus Park			L'un	سر
Prile Bus Park.MDX       Checked by       Unit Controls for Existing         Online Controls for Existing         Unit Reference MD-SHE-0064-2000-1200-2000         Design Flow (1/s)       2.0         Flow (1/s)       Calculated         Objective Minimise upstream storage         Application         Suggested Manhole Diameter (mm)       100         Suggested Manhole Diameter (mm)       1200         Control Points       Head (m) Flow (1/s)         Design Point (Calculated)       1.200       2.0         Kick-Flo@       0.573       1.4         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake         Optimum@ as specified. Should another type of control device other than a Hydro-Brake Optimum@ be utilised then these storage routing calculations will be invalidated         Pepth (m) Flow (1/s) </td <td>Designed by DI</td> <td>T</td> <td></td> <td>- Micro</td> <td></td>	Designed by DI	T		- Micro	
Priority         Intervent Ag           PF Solutions         Network 2016.1           Online Controls for Existing           Hydro-Brake Optimum® Manhole: E4, DS/FN: E30.003, Volume (m³): 172.7           Unit Reference MD-SHE-0064-2000-1200-2000           Design Head (m)         1.200           Design Flow (1/s)         2.0           Flush-Flo ^m Calculated           Objective         Minimise upstream storage           Application         Surface           Sump Available         Yes           Diameter (mm)         64           Invert Level (m)         76.680           Minimum Outlet Pipe Diameter (mm)         100           Suggested Manhole Diameter (mm)         100           Suggested Manhole Diameter (mm)         1200           Control Points         Head (m) Flow (l/s)         Control Points         Head (m) Flow (l/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified.         Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated           Utilited In Flow (1/s)         Depth (m) Flow (l/s)         Depth (m		1		Drain	aus
Online Controls for Existing           Hydro-Brake Optimum® Manhole: E4, DS/PN: E30.003, Volume (m³): 172.7           Unit Reference MD-SHE-0064-2000-1200-2000 Design Head (m)           Design Head (m)         1.200           Design Flow (1/s)         2.0           Flush-Flow         Calculated           Objective Minimise upstream storage Application         Surface           Sump Available         Yes           Diameter (mm)         64           Invert Level (m)         76.680           Minimum Outlet Pipe Diameter (mm)         100           Suggested Manhole Diameter (mm)         1200           Control Points         Head (m) Flow (1/s)         Control Points         Head (m) Flow (1/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo@         0.573         1.4           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum@ as specified.         Should another type of control device other than a Hydro-Brake Optimum@ be utilised then these storage routing calculations will be invalidated         Pepth (m) Flow (1/s)         Pepth (m)	-			Brain	عراد
Hydro-Brake Optimum® Manhole: E4, DS/PN: E30.003, Volume (m³): 172.7         Unit Reference MD-SHE-0064-2000-1200-2000 Design Fload (m)         Light Read (m)         Diagram Floation         Diagram Floation         Sump Available         Yes         Diameter (mm)         Optication         Sump Available         Yes         Diameter (mm)         Optication         Sump Available         Yes         Diameter (mm)         100         Sump Available         Yes         Diameter (mm)         100         Sump Available         Yes         Diameter (mm)         100         Sump Control Points         Head (m) Flow (l/s)         Control Points         Head (m) Flow (l/s)         Design Point (Calculated)       1.200       2.0         Kick-Flo®       0.573       1.4         Flush-Floe	Network 2016.1				
Unit Reference MD-SHE-0064-2000-1200-2000 Design Head (m)       1.200 1.200         Design Flow (1/s)       2.0         Flush-Flo ^{ma} Calculated         Objective       Minimise upstream storage         Application       Surface         Sump Available       Yes         Diameter (mm)       64         Invert Level (m)       76.680         Minimum Outlet Pipe Diameter (mm)       100         Suggested Manhole Diameter (mm)       1200         Control Points       Head (m) Flow (1/s)       Control Points         Design Foint (Calculated)       1.200       2.0         Flush-Flo ^{ma} 0.282       1.8       Mean Flow over Head Range       -       1.6         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake       Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         wepth (m) Flow (1/s)       Pepth (m) Flow (1/s)       Pepth (m) Flow (1/s)       Pepth (m) Flow (1/s)         0.100       1.5       0.800       1.7       2.000       2.5       4.000       3.5       7.000       4         0.200       1.7       1.000       1.8       2.200       2.6       4.500	<u>e Controls for Exi</u>	<u>isting</u>			
Design Head (m)       1.200         Design Flow (1/s)       2.0         Flush-Flo ^m Calculated         Objective       Minimise upstream storage         Application       Surface         Sump Available       Yes         Diameter (mm)       64         Invert Level (m)       76.680         Minimum Outlet Pipe Diameter (mm)       100         Suggested Manhole Diameter (mm)       1200         Control Points       Head (m) Flow (1/s)       Kick-Flo®       0.573       1.4         Design Point (Calculated)       1.200       2.0       Kick-Flo®       0.573       1.4         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake       Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated       7.000       4         0.100       1.5       0.800       1.7       2.000       2.5       4.000       3.5       7.000       4         0.200       1.7       1.000       1.8       2.200       2.6       4.500       3.7       7.500       4         0.300       1.8       1.200       2.0       2.6       4.500       3.7       7.500       4 </td <td>ole: E4, DS/PN: E3</td> <td>30.003, Volume</td> <td>(m³): 17</td> <td>2.7</td> <td></td>	ole: E4, DS/PN: E3	30.003, Volume	(m³): 17	2.7	
Design         Flow (1/s)         2.0           Flush-Flo ^m Calculated           Objective         Minimise upstream storage           Application         Surface           Sump Available         Yes           Diameter (mm)         64           Invert Level (m)         76.680           Minimum Outlet Pipe Diameter (mm)         100           Suggested Manhole Diameter (mm)         1200           Control Points         Head (m) Flow (1/s)         Control Points         Head (m) Flow (1/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake         Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated           Pepth (m) Flow (1/s)         Depth (m) Flow (1/s)           0.100         1.5         0.800         1.7         2.000         2.5         4.000         3.5         7.000         4           0.200         1.7         1.000         1.8         2.200         2.6         4.500 <t< td=""><td>Unit Reference MD-SHE</td><td>-0064-2000-1200-</td><td>2000</td><td></td><td></td></t<>	Unit Reference MD-SHE	-0064-2000-1200-	2000		
Flush-Flo ^m Calculated ObjectiveMinimise upstream storage ApplicationSurface Yes Diameter (mm)Sump AvailableYes Diameter (mm)Diameter (mm)64 Invert Level (m)Minimum Outlet Fipe Diameter (mm)100 Suggested Manhole Diameter (mm)Control PointsHead (m) Flow (1/s)Control PointsHead (m) Flow (1/s)Design Point (Calculated)1.2002.0 I.8Kick-Flo®0.5731.4 I.6The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum@ as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidatedPepth (m) Flow (1/s)Depth (m) Flow (1/s)Depth (m) Flow (1/s)Depth (m) Flow (1/s)0.1001.50.8001.7 1.0002.002.6 4.0004.5003.5 3.7 7.5007.0004 	-	1			
Objective       Minimise upstream storage Application       Surface Sump Available         Sump Available       Yes         Diameter (mm)       64         Invert Level (m)       76.680         Minimum Outlet Pipe Diameter (mm)       100         Suggested Manhole Diameter (mm)       1200         Control Points       Head (m) Flow (l/s)       Control Points       Head (m) Flow (l/s)         Design Point (Calculated)       1.200       2.0       Kick-Flo®       0.573       1.4         Flush-Flo ^m 0.282       1.8       Mean Flow over Head Range       -       1.6         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake       Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         wepth (m) Flow (1/s)       Depth (m) Flow (l/s)       Depth (m) Flow (l/s)       Pepth (m) Flow (l/s)         0.100       1.5       0.800       1.7       2.000       2.5       4.000       3.5       7.000       4         0.200       1.7       1.000       1.8       2.200       2.6       4.500       3.7       7.500       4         0.200       1.7       1.400       2.1       2.600       2.7 <td>-</td> <td></td> <td></td> <td></td> <td></td>	-				
Application         Surface           Sump Available         Yes           Diameter (mm)         64           Invert Level (m)         76.680           Minimum Outlet Pipe Diameter (mm)         100           Suggested Manhole Diameter (mm)         1200           Control Points         Head (m) Flow (1/s)         Control Points         Head (m) Flow (1/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           Flush-Flo [™] 0.282         1.8         Mean Flow over Head Range         -         1.6           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake         Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         7.000         4           0.100         1.5         0.800         1.7         2.000         2.5         4.000         3.5         7.000         4           0.200         1.7         1.000         1.8         2.200         2.6         4.500         3.7         7.500         4           0.300         1.8         2.200         2.6         4.500         3.7         7.500         4           0.400					
Sump Available         Yes           Diameter (mm)         64           Invert Level (m)         76.680           Minimum Outlet Pipe Diameter (mm)         100           Suggested Manhole Diameter (mm)         100           Suggested Manhole Diameter (mm)         1200           Control Points         Head (m) Flow (1/s)         Control Points         Head (m) Flow (1/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           Flush-Flo ^{mid} 0.282         1.8         Mean Flow over Head Range         -         1.6           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         Pepth (m) Flow (1/s)         Pepth (m) Flow (1/s)         Pepth (m) Flow (1/s)         Pepth (m) Flow (1/s)           0.100         1.5         0.800         1.7         2.000         2.5         4.000         3.5         7.000         4           0.200         1.7         1.000         1.8         2.200         2.6         4.500         3.7         7.500         4           0.300         1.8         1.200         2.0         2.40	-	-	-		
Invert Level (m)       76.680         Minimum Outlet Pipe Diameter (mm)       100         Suggested Manhole Diameter (mm)       1200         Control Points       Head (m) Flow (1/s)       Control Points       Head (m) Flow (1/s)         Design Point (Calculated)       1.200       2.0       Kick-Flo®       0.573       1.4         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated       Pepth (m) Flow (1/s)         0.100       1.5       0.800       1.7       2.000       2.5       4.000       3.5       7.000       4         0.100       1.8       2.200       2.6       4.500       3.7       7.500       4         0.100       1.8       1.200       2.0		0.01			
Minimum Outlet Pipe Diameter (mm)       100         Suggested Manhole Diameter (mm)       1200         Control Points       Head (m) Flow (1/s)       Control Points       Head (m) Flow (1/s)         Design Point (Calculated)       1.200       2.0       Kick-Flo®       0.573       1.4         Flush-Flo ^m 0.282       1.8       Mean Flow over Head Range       -       1.6         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated       Pepth (m) Flow (1/s)         0.100       1.5       0.800       1.7       2.000       2.5       4.000       3.5       7.000       4         0.200       1.7       1.000       1.8       2.200       2.6       4.500       3.7       7.500       4         0.300       1.8       1.200       2.0       2.400       2.7       5.000       3.9       8.000       4         0.400       1.7       1.400       2.600       2.8       5.500       4.0       8.500       <	Diameter (mm)		64		
Suggested Manhole Diameter (mm)         1200           Control Points         Head (m) Flow (l/s)         Control Points         Head (m) Flow (l/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated           Pepth (m) Flow (l/s)         Pepth (m) Flow		76			
Control Points         Head (m) Flow (l/s)         Control Points         Head (m) Flow (l/s)           Design Point (Calculated)         1.200         2.0         Kick-Flo®         0.573         1.4           Flush-Flo™         0.282         1.8         Mean Flow over Head Range         -         1.6           The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         Pepth (m) Flow (l/s)         Pepth (m) Flow	, ,				
Design Point (Calculated)       1.200       2.0       Kick-Flo®       0.573       1.4         Flush-Flo™       0.282       1.8       Mean Flow over Head Range       -       1.6         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated       Depth (m) Flow (1/s)       D	Diameter (mm)				
Flush-Flo ^{ma} 0.282       1.8       Mean Flow over Head Range       -       1.6         The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         Pepth (m)       Flow (1/s)       Depth (m)       Flow (1/s)       Depth (m)       Flow (1/s)       Depth (m)       Flow (1/s)         0.100       1.5       0.800       1.7       2.000       2.5       4.000       3.5       7.000       4         0.200       1.7       1.000       1.8       2.200       2.6       4.500       3.7       7.500       4         0.300       1.8       1.200       2.0       2.7       5.000       3.9       8.000       4         0.400       1.7       1.400       2.1       2.600       2.8       5.500       4.0       8.500       5         0.500       1.6       1.600       2.3       3.000       3.0       6.000       4.2       9.000       5	Flow (1/s) Cont	rol Points	Head (m) F	'low (l/s)	
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         Pepth (m) Flow (1/s)       Depth (m) Flow (1/s)<			0.573		
Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated         Depth (m) Flow (1/s)         Depth (m) Flow	I	_			
0.1001.50.8001.72.0002.54.0003.57.00040.2001.71.0001.82.2002.64.5003.77.50040.3001.81.2002.02.4002.75.0003.98.00040.4001.71.4002.12.6002.85.5004.08.50050.5001.61.6002.33.0003.06.0004.29.0005	type of control device	e other than a Hy	-	-	
0.2001.71.0001.82.2002.64.5003.77.50040.3001.81.2002.02.4002.75.0003.98.00040.4001.71.4002.12.6002.85.5004.08.50050.5001.61.6002.33.0003.06.0004.29.0005	Depth (m) Flow (l/s)	Depth (m) Flow	(1/s) Dept	h (m) Flow	w (1/s
0.3001.81.2002.02.4002.75.0003.98.00040.4001.71.4002.12.6002.85.5004.08.50050.5001.61.6002.33.0003.06.0004.29.0005	2.000 2.5	4.000	3.5	7.000	4
0.4001.71.4002.12.6002.85.5004.08.50050.5001.61.6002.33.0003.06.0004.29.0005	2.200 2.6	4.500	3.7	7.500	4
0.500 1.6 1.600 2.3 3.000 3.0 6.000 4.2 9.000 5					4
					5
0.600 1.5 1.800 2.4 3.500 3.3 6.500 4.4 9.500 5					5.
	0 500 0 0	6.500	4.4	9.500	5.
	3.500 3.3		I		
	3.500 3.3	1	I		
	3.500 3.3		ſ		
	3.500 3.3				
0.3001.81.2002.00.4001.71.4002.10.5001.61.6002.3		Network 2016.1         e Controls for Exi         ole: E4, DS/PN: E3         Unit Reference MD-SHE         esign Head (m)         ign Flow (1/s)         Flush-Flo™         Objective Minim         Application         Sump Available         Diameter (mm)         vert Level (m)         Diameter (mm)         Flow (1/s)       Cont         2.0         1.8       Mean Flow         based on the Head/Dis         cype of control device         culations will be inval         Depth (m) Flow (1/s)         2.000       2.5	Network 2016.1         e Controls for Existing         ole: E4, DS/PN: E30.003, Volume         Unit Reference MD-SHE-0064-2000-1200-         esign Head (m)       1         ign Flow (1/s)       1         Flush-Flo [™] Calcul.         Objective Minimise upstream sto         Application       Sur         Sump Available       76         Diameter (mm)       76         Log       1.8         Mean Flow over Head Range       8         based on the Head/Discharge relations       9         culations will be invalidated       10         Depth (m) Flow (1/s)       10         Depth (m) Flow       2.000       2.5         4.000       10 <td>Network 2016.1         e Controls for Existing         ole: E4, DS/PN: E30.003, Volume (m³): 17         Unit Reference MD-SHE-0064-2000-1200-2000         esign Head (m)       1.200         ign Flow (1/s)       2.0         Flush-Flo™       Calculated         Objective Minimise upstream storage         Application       Surface         Sump Available       Yes         Diameter (mm)       64         vert Level (m)       76.680         Diameter (mm)       100         Diameter (mm)       1200         Flow (1/s)       Control Points       Head (m) F         2.0       Kick-Flo®       0.573         1.8       Mean Flow over Head Range       -         based on the Head/Discharge relationship for the cype of control device other than a Hydro-Brake or       -         based on the Head/Discharge relationship for the cype of control device other than a Hydro-Brake or       -         Depth (m) Flow (1/s)       Depth (m) Flow (1/s)       Dept         2.000       2.5       4.000       3.5</td> <td>Network 2016.1         e Controls for Existing         Ole: E4, DS/PN: E30.003, Volume (m³): 172.7         Unit Reference MD-SHE-0064-2000-1200-2000         esign Head (m)       1.200         ign Flow (1/s)       2.0         Flush-Flo™       Calculated         Objective Minimise upstream storage         Application       Surface         Sump Available       Yes         Diameter (mm)       64         vert Level (m)       76.680         Diameter (mm)       100         Diameter (mm)       1200         Flow (1/s)       Control Points       Head (m) Flow (1/s)         2.0       Kick-Flo®       0.573       1.4         1.8       Mean Flow over Head Range       -       1.6         based on the Head/Discharge relationship for the Hydro-Br       Expect of control device other than a Hydro-Brake Optimum® b         culations will be invalidated       Depth (m) Flow (1/s)       Depth (m) Flow       Pepth (m) Flow         2.00       2.5       4.000       3.5       7.000</td>	Network 2016.1         e Controls for Existing         ole: E4, DS/PN: E30.003, Volume (m³): 17         Unit Reference MD-SHE-0064-2000-1200-2000         esign Head (m)       1.200         ign Flow (1/s)       2.0         Flush-Flo™       Calculated         Objective Minimise upstream storage         Application       Surface         Sump Available       Yes         Diameter (mm)       64         vert Level (m)       76.680         Diameter (mm)       100         Diameter (mm)       1200         Flow (1/s)       Control Points       Head (m) F         2.0       Kick-Flo®       0.573         1.8       Mean Flow over Head Range       -         based on the Head/Discharge relationship for the cype of control device other than a Hydro-Brake or       -         based on the Head/Discharge relationship for the cype of control device other than a Hydro-Brake or       -         Depth (m) Flow (1/s)       Depth (m) Flow (1/s)       Dept         2.000       2.5       4.000       3.5	Network 2016.1         e Controls for Existing         Ole: E4, DS/PN: E30.003, Volume (m³): 172.7         Unit Reference MD-SHE-0064-2000-1200-2000         esign Head (m)       1.200         ign Flow (1/s)       2.0         Flush-Flo™       Calculated         Objective Minimise upstream storage         Application       Surface         Sump Available       Yes         Diameter (mm)       64         vert Level (m)       76.680         Diameter (mm)       100         Diameter (mm)       1200         Flow (1/s)       Control Points       Head (m) Flow (1/s)         2.0       Kick-Flo®       0.573       1.4         1.8       Mean Flow over Head Range       -       1.6         based on the Head/Discharge relationship for the Hydro-Br       Expect of control device other than a Hydro-Brake Optimum® b         culations will be invalidated       Depth (m) Flow (1/s)       Depth (m) Flow       Pepth (m) Flow         2.00       2.5       4.000       3.5       7.000

Date 6th Feb File Bus Par										-
)ate 6th Feb				Ra	il Cent	ral				<u> </u>
				Bu	s Park					L.
										Micro
ile Bus Par	ruary	2018		De	signed	oy RJH				
	k.MDX	2		Ch	ecked b	У				Drainag
P Solutions	;			Ne	twork 2	016.1				
<u>1 year Retu</u>	<u>rn Pe</u>	Areal Re	duction E	<u>Simu</u> actor 1.0	<u>lation Cr</u> 000 Add	<u>iteria</u> itional	Flow -	% of Total	Flow 0.000	0
	Foul	Hot St Headloss Sewage per	hectare	(mm) .obal) 0.5 (l/s) 0.0	0 500 Flow 000	per Pers	Inl on per	et Coeffie Day (l/per	orage 2.000 cient 0.800 /day) 0.000	о С
	-		-						e/Area Diag l Time Cont	-
		e Location		D1 (1km) D2 (1km)	0.300	E (1km) F (1km)	) 0.302 ) 2.496	Cv (Winter	r) 0.840	
		Margin	for Flood	Analysis	-	p Fine		Status OF Status OF		
	Return	Duration(s Period(s) Climate Ch	(years)	15, 30,	60, 120,	180, 24				
	JS/MH Name	Storm		Climate Change	•	•	irst (Y Flood	•	(Z) Overflo .ow Act.	
	E2 2 E3 2	2880 Summei 2880 Summei 2880 Summei 2880 Summei	r 1	+0% 1 +0% 1 +0% +0% 1	/2880 Sur	nmer	160 Win	ter		77.531 77.531 77.531 77.531
			Surcharge				Pipe		_	
		US/MH	Depth		Flow / (			O hater -	Level	
	PN	Name	(m)	(m³)	cap.	(1/s)	(1/s)	Status	Exceeded	
	E30.0		0.00				1.3	SURCHARGED		
	E30.0		0.20					SURCHARGED		
	E30.0		-0.36	9 0.000 1 28.511			24.6 1.8	OK FLOOD		
	E30.0									

lydrock Co	nsultant	s Ltd						P	age 7
				Ra	il Central	L			5
				Bu	ıs Park				4
									Misco
ate 6th Fe	ebruary	2018		De	signed by	RJH			Micro
le Bus Pa	ark.MDX			Ch	lecked by				Drainac
Solution					twork 2016	5 1			
50140101	.15				CWOIR ZOIR	J•1			
) year Re	<u>turn Per</u>	iod Summ	<u>nary of</u>	Critica	al Results	by Maximu	m Level (	Rank 1) f	for Exist
				-	lation Crite				
					000 Additi				
			Start	(mins) L (mm)	0 MA 0		lom³/ha Sto let Coeffie	2	
	Manhole H			. ,	500 Flow per				
		ewage per			-	roroon por	2017 (17) por	, aa ₂ ,	•
	_	-							
	-		-		f Offline Co Storago Stru				-
Num	ber of Unl	ine contr	OTS I NI	unper of	Storage Stru	ccures U Nu	mber of Kea	T TIME CON	riota (
				<u>Syntheti</u>	.c Rainfall I	<u>Details</u>			
					0.319 E			r) 0.840	
	Site	Location			0.300 F				
		C (1km)	-0.026	D3 (1km)	0.243 Cv (St	ummer) 0.750	)		
		Margin f	or Flood	d Risk War	rning (mm) 3	00.0 DVI	D Status OF	न	
					s Timestep				
				-	DTS Status	ON			
		Dro	ofile(s)				Summor	and Winter	
	Dı		. ,	15, 30,	60, 120, 18	30, 240, 360			
							440, 2160,	2880, 4320	
		Period(s)						, 100, 200	
	C	limate Cha	inge (%)				Ο,	0, 40, 40	
									Water
	US/MH				First (X)	First (Y	•	(Z) Overflo	ow Level
PN	Name	Storm	Period	Change	Surcharge	Flood	Overfl	ow Act.	(m)
E30.000		80 Winter			/2880 Summe:				77.492
E30.001		80 Winter			/2880 Summe:	r			77.492
E30.002		80 Winter		+0%	(0160 Winter	1/01/0 51			77.492
E30.003	E4 28	80 Winter	30	+0% 1	/2160 Winte:	r 1/2160 Wir	iter		77.492
		S1 US/MH	urcharge Depth	d Flooded	Flow / Ove	Pipe rflow Flow		Level	
	PN	Name	(m)	(m ³ )		/s) (1/s)		Exceeded	
	E30.000		-0.03			1.8			
	E30.001 E30.002		0.16			2.6	SURCHARGED OK		
	E30.002		-0.40				SURCHARGED		
	UU.	, 11	0.00	_ 0.000	0.01	т.0	JonomingeD		

Hydrock Con	Surcanco								
		шса		Pat	il Central			F	age 8
				-	s Park				4
				Dua	5 FAIR				
	<u> </u>	010		Dec		<b>T</b> 11			Micro
ate 6th Fe	_	018			signed by R	JH			Drainar
ile Bus Pa	-				ecked by	-			Brainac
P Solution	S			Net	twork 2016.2	1			
<u>100 yea</u>	<u>r Return</u>	Period	Summar		itical Resu Existing	lts by Max	<u>ximum Leve</u>	l (Rank	<u>1) for</u>
Number	Manhole He Foul Sew of Input	Hot Hot Sta adloss C age per Hydrogra ne Contro	Start (m rt Level oeff (Glc hectare ( phs 0 M ols 1 Num	actor 1.0 nins) (mm) obal) 0.5 (1/s) 0.0 Number of mber of S <u>Synthetic</u> 1 (1km) (	00 Flow per P	al Flow - % Factor * 1 Inle Person per D rols 0 Numb ures 0 Numb cails 1km) 0.302	Om ³ /ha Stora t Coeffiecie ay (l/per/da per of Time/A per of Real 1	age 2.000 ent 0.800 ay) 0.000 Area Diag Fime Cont	0 0 0 grams 0
	Site I	C (1km)	D.	3 (1km) (	D.300 F (1 D.243 Cv (Sumn	mer) 0.750			
	Site I	C (1km) Margin f Pro	D. -0.026 D or Flood file(s)	3 (1km) ( Risk Warn Analysis D'		<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360,</pre>	Status OFF Summer and 480, 600, 72	20, 960,	
	Site I Dur Return Pe	C (1km) Margin f Pro ration(s)	D. -0.026 D or Flood file(s) (mins) (years)	3 (1km) ( Risk Warn Analysis D'	0.243 Cv (Sumn ning (mm) 300 Timestep Fi TS Status	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360,</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1	20, 960,	Water
PN	Site I Dur Return Pe Cli <b>US/MH</b>	C (1km) C (1km) Margin f Pro ration(s) Priod(s)	D. -0.026 D or Flood file(s) (mins) (years)	3 (1km) ( Risk Warn Analysis D' 15, 30, 15, 30,	0.243 Cv (Sumn ning (mm) 300 Timestep Fi TS Status	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360,</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1	20, 960, 30, 4320 100, 200 , 40, 40 Overflo	
<b>PN</b> E30.000 E30.001 E30.002 E30.003	Dur Return Pe Cli <b>US/MH</b> Name \$ E1 2160 E2 2160 E3 2160	Docation C (1km) Margin f Pro Cation(s) eriod(s) mate Cha	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C	3 (1km) ( Risk Warn Analysis D' 15, 30, 21imate Change +40% 1/ +40% 1/ +40% 1/ +40%	D.243 Cv (Summ ning (mm) 300 Timestep Fi: TS Status 60, 120, 180, <b>6</b> 0, 120, 180,	mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144 First (Y) Flood	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow	20, 960, 30, 4320 100, 200 , 40, 40 Overflo	w Level
E30.000 E30.001 E30.002	Dur Return Pe Cli <b>US/MH</b> Name \$ E1 2160 E2 2160 E3 2160	Accation C (1km) Margin f Pro ration(s) eriod(s) mate Cha Storm ) Winter ) Winter ) Winter ) Winter ) Winter	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C Period C 100 100 100	3 (1km) ( Risk Warn Analysis D' 15, 30, 15, 30, 21imate Change +40% 1, +40% 1, +40% 1, +40% 1,	<pre>D.243 Cv (Summ ning (mm) 300 Timestep Fi: TS Status 60, 120, 180, 60, 120, 180, First (X) Surcharge /2880 Summer /2880 Summer</pre>	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144 First (Y) Flood 1/2160 Winte</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow	20, 960, 30, 4320 100, 200 , 40, 40 Overflo	<pre>Level    (m)    77.802    77.802    77.802</pre>
E30.000 E30.001 E30.002	Dur Return Pe Cli <b>US/MH</b> Name \$ E1 2160 E2 2160 E3 2160	Accation C (1km) Margin f Pro ration(s) eriod(s) mate Cha Storm ) Winter ) Winter ) Winter ) Winter ) Winter	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C Period C 100 100 100	3 (1km) ( Risk Warn Analysis D' 15, 30, 15, 30, 21imate Change +40% 1, +40% 1, +40% 1, +40% 1, Flooded	<pre>D.243 Cv (Summ ning (mm) 300 Timestep Fi: TS Status 60, 120, 180, 60, 120, 180, First (X) Surcharge /2880 Summer /2880 Summer</pre>	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144 First (Y) Flood 1/2160 Winte Pipe</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow	20, 960, 30, 4320 100, 200 , 40, 40 Overflo	<pre>Level    (m)    77.802    77.802    77.802</pre>
E30.000 E30.001 E30.002	Dur Return Pe Cli <b>US/MH</b> Name \$ E1 2160 E2 2160 E3 2160	Accation C (1km) Margin f Pro Pro ration(s) mate Cha Storm ) Winter ) Winter ) Winter ) Winter ) Winter ) Winter	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C Period C 100 100 100 100	3 (1km) ( Risk Warn Analysis D' 15, 30, 15, 30, 21imate Change +40% 1, +40% 1, +40% 1, +40% 1, Flooded	<pre>D.243 Cv (Summ ning (mm) 300 Timestep Fi: TS Status 60, 120, 180, 60, 120, 180, First (X) Surcharge /2880 Summer /2880 Summer /2160 Winter 3</pre>	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144 First (Y) Flood 1/2160 Winte Pipe low Flow</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow	20, 960, 30, 4320 100, 200 , 40, 40 <b>Overflc</b> Act.	<pre>Level    (m)    77.802    77.802    77.802</pre>
E30.000 E30.001 E30.002	Dur Return Pe Cli US/MH Name S E1 2160 E2 2160 E3 2160 E3 2160 E4 2160	C (1km) C (1km) Margin f Pro ration(s) eriod(s) mate Cha Storm ) Winter ) Winter ) Winter ) Winter ) Winter ) Winter St US/MH Name	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C Period C 100 100 100 100 100 100 100 10	3 (1km) ( Risk Warn Analysis D' 15, 30, 15, 30, 21imate Change +40% 1, +40% 1, +40% 1, Flooded Volume (m ³ )	D.243 Cv (Summ ning (mm) 300 Timestep Fir TS Status 60, 120, 180, 60, 120, 180, 71, 100, 100, 100, 100, 72, 100, 100, 100, 100, 100, 100, 100, 10	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144 First (Y) Flood 1/2160 Winto 1/2160 Winto Pipe low Flow ;) (1/s)</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow er Status Ex	20, 960, 30, 4320 100, 200 , 40, 40 Overflc Act.	<pre>Level    (m)    77.802    77.802    77.802</pre>
E30.000 E30.001 E30.002	Dur Return Pe Cli <b>US/MH</b> Name S E1 2160 E2 2160 E3 2160 E4 2160	Location C (1km) Margin f Pro ration(s) mate Cha Storm ) Winter ) Winter ) Winter ) Winter ) Winter ) Winter	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C Period C 100 100 100 100 100	3 (1km) ( Risk Warn Analysis D' 15, 30, 15, 30, 21imate Change +40% 1, +40% 1, +40% 1, Flooded Volume (m ³ ) 0.000	D.243 Cv (Summ ning (mm) 300 Timestep Fi TS Status 60, 120, 180, 60, 120, 180, First (X) Surcharge /2880 Summer /2880 Summer /2160 Winter : Flow / Overfi	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144  First (Y) Flood 1/2160 Winto 1/2160 Winto 1/2160 Winto Pipe low Flow c) (1/s) 4.1 S</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow er Status Ex URCHARGED	20, 960, 30, 4320 100, 200 , 40, 40 Overflc Act.	<pre>Level    (m)    77.802    77.802    77.802</pre>
E30.000 E30.001 E30.002	Dur Return Pe Cli US/MH Name S E1 2160 E2 2160 E3 2160 E3 2160 E4 2160 PN E30.000	C (1km) C (1km) Margin f Pro ration(s) eriod(s) mate Cha Storm ) Winter ) Winter ) Winter ) Winter ) Winter St US/MH Name E1	D. -0.026 D or Flood file(s) (mins) (years) nge (%) Return C Period C 100 100 100 100 100 100 100 0.280	<pre>3 (1km) 0 Risk Warn Analysis D' 15, 30, 15, 30, 2limate change +40% 1, +40% 1, +40% 1, Flooded Volume (m³) 0.000 0.000</pre>	D.243 Cv (Summ ning (mm) 300 Timestep Fi: TS Status 60, 120, 180, 60, 120, 180, 60, 120, 180, 72880 Summer 72880 Summer 72880 Summer 72160 Winter S Flow / Overfi Cap. (1/s 0.01	<pre>mer) 0.750 .0 DVD ne Inertia ON 240, 360, 144  First (Y) Flood 1/2160 Winte pipe low Flow 5) (1/s) 4.1 S 4.0 F</pre>	Status OFF Summer and 480, 600, 72 0, 2160, 288 1, 30, 1 0, 0, First (Z) Overflow er Status Ex	20, 960, 30, 4320 100, 200 , 40, 40 Overflc Act.	<pre>Level    (m)    77.802    77.802    77.802</pre>

Hydrock Co	nsultants	Ltd								Page 9
•				-	il Cent					
•				Bu	s Park					Mar m
•		0.1.0								Micro
Date 6th Fe	_	018				by RJH				Drainage
File Bus Pa					ecked b					Diamage
XP Solution	ıs			Ne	twork 2	2016.1				
<u>200 ye</u>	ar Return	Period	l Summa:		<u>Existi</u>	ng	s by Ma:	kimum Lev	vel (Rar	n <u>k 1) for</u>
	Manhole He Foul Sev c of Input	Hot Hot Sta eadloss C wage per Hydrogra	Start ( rt Level oeff (Gl hectare phs 0	actor 1.0 mins) (mm) obal) 0.5 (1/s) 0.0	0 0 500 Flow 000 f Offling	ditional MADD Fa per Pers e Control	s O Numk	er of Time	orage 2.0 cient 0.8 (day) 0.0 e/Area Di	00 00 00 agrams 0
	per of Onli									
		Location			0.319 0.300	F (1km	) 0.302 ) 2.496	Cv (Winter	c) 0.840	
		Margin f	or Flood	Analysis	3 Timeste			Status OFI Status OFI		
	Return Pe	ration(s)	(years)	15, 30,	60, 120	, 180, 24		480, 600, 0, 2160, 2 1, 30,		, 0 0
PN	US/MH Name	Storm	Return Period		First Surchar		irst (Y) Flood	First ( Overfl	(Z) Overf ow Act	
E30.000	E1 432	0 Winter	200	+40% 1	/2880 Su	ummer				77.755
E30.001		0 Winter	200		/2880 St					77.755
E30.002		0 Winter	200	+40%	101.00		1 6 0			77.755
E30.003	E4 432	0 Winter	200	+40% 1	/2160 Wi	nter 1/2	160 Wint	er		77.754
		S	-	d Flooded			Pipe			
		US/MH	Depth			Overflow		<u>.</u>	Level	
	PN	Name	(m)	(m³)	Cap.	(1/s)	(1/s)	Status	Exceeded	
	E30.000	E1	0.23					URCHARGED		
	E30.001 E30.002	E2 E3	0.43					LOOD RISK LOOD RISK		
	E30.002	E4	0.62					LOOD RISK		



# Pre-Planning Assessment Report

**Towcester Road, Blisworth** 

#### **Section 1: Proposed Development**

Thank you for submitting a pre-planning enquiry. This has been produced for Hydrock. Your reference number is **00019009**. If you have any questions upon receipt of this report, please contact Mark Rhodes on 01733 414690 or email planningliaison@anglianwater.co.uk.

The response within this report has been based on the following information which was submitted as part of your application:

List of Planned Developments						
Type of Development No. Of Units						
B8 Storage or Dist.	13					

- The grid reference for the site is SP7306754825.
- The site currently does not have planning permission and is located on a greenfield site.

Our records indicate that we have the following types of assets within or overlapping the boundary of your development site as listed in the table below.

Additionally, it is highly recommended that you carry out a thorough investigation of your proposed working area to establish whether any unmapped public or private sewers and lateral drains are in existence. We are unable to permit development either over or within the easement strip without our prior consent. The extent of the easement is provided in the table below. Please be aware that the existing water mains/public sewers should be located in highway or open space and not in private gardens. This is to ensure available access for any future maintenance and repair and this should be taken into consideration when planning your site layout.

Water and Used Water Easement Information							
Asset Type	Pipe Size (mm)	Total Easement Required (m)					
Public Foul Sewer	300	3.0 m either side of the centre line					
Water Mains	125	2.25 m either side of the centre line					
Water Mains	90	2.25 m either side of the centre line					

If it is not possible to avoid our assets then the water main/sewer may need to be diverted in accordance with Section 185 of the Water Industry Act (1991). We have a duty to divert our sewerage infrastructure if requested to do so although this would be at your expense. You will need to make a formal application if you would like a diversion to be considered. A copy of the section 185 diversion application form can be found at www.anglianwater.co.uk/developers

Due to the private sewer transfer in October 2011 many newly adopted public used water assets and their history are not indicated on our records. You also need to be aware that your development site may contain private water mains, drains or other assets not shown on our records. These are private assets and not the responsibility of Anglian Water but that of the landowner.

#### **Section 3: Water Recycling Services**

In examining the used water system we assess the ability for your site to connect to the public sewerage network without causing a detriment to the operation of the system. We also assess the receiving water recycling centre and determine whether the water recycling centre can cope with the increased flow and influent quality arising from your development.

#### Water Recycling Centre

The foul drainage from this development is in the catchment of Great Billing Water Recycling Centre, which currently does not have capacity to treat the flows from your development site. Anglian Water are obligated to accept the foul flows from your development with the benefit of planning consent and would therefore take the necessary steps to ensure that there is sufficient treatment capacity should the planning authority grant planning permission.

#### **Used Water Network**

Anglian Water has assessed your proposals and a desktop study has indicated that a direct connection to the public foul sewerage system is likely to have a detrimental effect on the existing sewerage network. Therefore further hydraulic modelling work is required to enable Anglian Water to provide you with a solution for draining the foul flows from the proposed development. There is no additional charge for this work.

Max Shone, our Senior Growth Planning Engineer for this area, will be responsible for undertaking this additional work. Max will contact you shortly to discuss the timescales and to obtain any further information required. For your reference, Max can be contacted on 07712876139 or at mshone@anglianwater.co.uk.

If this modelling work confirms your development will have a detrimental effect on the existing sewerage network, the drainage strategy will be detailed within the pre-planning addendum report. This will be issued to you under separate cover within the timescales advised by Max. This will include a no detriment foul drainage solution which will encompass a connection point, details of any upgrades or work required and indicative budgetary costs.

If an alternative drainage solution is required following the work undertaken for the preplanning addendum report, any additional hydraulic modelling work will be at the cost of the developer. A cost and timescale is available upon request.

Please note that Anglian Water will request a suitably worded condition at planning application stage to ensure the strategy is implemented to mitigate the risk of flooding.

#### **Surface Water Disposal**

There are no public surface water sewers within the vicinity of the proposed development. Therefore Anglian Water will be unable to provide the site with a feasible solution of surface water disposal within the current assets. Alternative methods of surface water disposal will need to be investigated such as infiltration techniques or a discharge to a watercourse in accordance with the surface water management hierarchy as outlined in Building Regulations Part H.

The alternative is that a new surface water sewer is constructed which is used to convey your surface water to a watercourse or as part of a SuDs scheme, where appropriate. Subject to the sewer being designed in accordance with the current version of Sewers For Adoption, the sewer can be put forward for adoption by Anglian Water under Section 104 of the Water Industry Act 1991. If the outfall is to a watercourse, the applicant will be required to obtain consent to discharge via the appropriate body.

If your site has no means of drainage due to third party land then you may be able to requisition Anglian Water, under Section 98, to provide a connection to the public sewer for domestic drainage purposes. As part of this option, you may wish to enter into a works agreement in accordance with Section 30 of the Anglian Water Authority Act 1977. This will allow you to design and construct the public sewer using Anglian Waters' statutory powers in accordance with Section 159/168 of the Water Industry Act 1991.

As you may be aware, Anglian Water will consider the adoption of SuDs provided that they meet the criteria outline in our SuDs adoption manual. This can be found on our website at <a href="http://www.anglianwater.co.uk/developers/suds.aspx">http://www.anglianwater.co.uk/developers/suds.aspx</a>. We will adopt features located in public open space that are designed and constructed, in conjunction with the Local Authority and Lead Local Flood Authority (LLFA), to the criteria within our SuDs adoption manual. Specifically, developers must be able to demonstrate:

- 1. Effective upstream source control,
- 2. Effective exceedance design, and

3. Effective maintenance schedule demonstrating than the assets can be maintained both now and in the future with adequate access.

If you wish to look at the adoption of any SuDs then an expression of interest form can be found on our website at: <u>http://www.anglianwater.co.uk/developers/suds.aspx</u>

#### **Trade Effluent**

We note that you do not have any trade effluent requirements. Should this be required in the future you will need our written formal consent. This is in accordance with Section 118 of the Water Industry Act (1991).

#### **Used Water Budget Costs**

It has been assumed that the onsite used water network will be provided under a section

104 Water Industry Act application. It is recommended that you also budget for both infrastructure charges and connection costs. The 2016/17 charges are:

Infrastructure Charge £354.00 per connection

Please note that we offer alternative types of connections depending on your needs and these costs are available in our annual charges booklet, which can be downloaded from <u>www.anglianwater.co.uk/developers/charges</u>.

#### **Section 4: Useful Information**

#### Water

Water Industry Act – Key Water Sections:

• Section 41: This provides you with the right to requisition a new water main for domestic purposes to connect your site to the public water network.

• Section 45: This provides you with the right to have a connection for domestic purposes from a building or part of a building to the public water main.

• Section 51A: This provides you with the right to provide the water main or service connection yourself and for us to vest them into our company.

• Section 55: This applies where you request a supply of water for non domestic premises.

• Section 185: This provides you with the right to make a reasonable request to have a public water main, sewer or public lateral drain removed or altered, at your expense. Details on how to make an application and the s185 form is available on our website at <a href="http://www.anglianwater.co.uk20/developers">http://www.anglianwater.co.uk20/developers</a> or via our Developer Services team on 08457 60 66 087.

Details on how you can make a formal application for a new water main, new connection or diversion are available on from our Developer Services team on 08457 60 66 087 or via our website at <u>www.anglianwater.co.uk/developers</u>

If you have any other queries on the rights to requisition or connect your housing to the public water and sewerage infrastructure then please contact our developer services team at: Developer Services, Anglian Water, PO Box 495, Huntingdon, PE29 6YY or Telephone: 0845 60 66 087 or Email: developerservices@anglianwater.co.uk

Water pressure and flow rate: The water pressure and consistency that we must meet for your site is laid out in the Water Industry Act (1991). This states that we must supply a flow rate of 9 litres per minute at a pressure of 10 metres of head to the external stop tap. If your water pressure requirements exceed this then you will need to provide and maintain any booster requirements to the development site.

Self Lay of Water Mains: A list of accredited Self Lay Organisations can be found at <u>www.lloydsregister.co.uk/schemes/WIRS/providers-list.aspx</u>.

#### **Used Water**

#### Water Industry Act – Key Used Water Sections:

• Section 98: This provides you with the right to requisition a new public sewer. The new public sewer can be constructed by Anglian Water on your behalf. Alternatively, you can construct the sewer yourself under section 30 of the Anglian Water Authority Act 1977.

• Section 102: This provides you with the right to have an existing sewerage asset vested by us. It is your responsibility to bring the infrastructure to an adoptable condition ahead of the asset being vested.

• Section 104: This provides you with the right to have a design technically vetted and an agreement reached that will see us adopt your assets following their satisfactory construction and connection to the public sewer.

• Section 106: This provides you with the right to have your constructed sewer connected to the public sewer.

• Section 185: This provides you with the right to have a public sewerage asset diverted.

Details on how to make a formal application for a new sewer, new connection or diversion are available on our website at <u>www.anglianwater.co.uk/developers</u> or via our Developer Services team on 08457 60 66 087.

## Sustainable Drainage Systems:

Many existing urban drainage systems can cause problems of flooding, pollution or damage to the environment and are not resilient to climate change in the long term. Therefore our preferred method of surface water disposal is through the use of Sustainable Drainage Systems (SuDS). SuDS are a range of techniques that aim to mimic the way surface water drains in natural systems within urban areas. For more information on SuDS, please visit our website at <a href="http://www.anglianwater.co.uk/developers/suds.aspx">http://www.anglianwater.co.uk/developers/suds.aspx</a> We also recommend that you contact the Local Authority and Lead Local Flood Authority (LLFA) for the area to discuss your application.

Private Sewer Transfers: Sewers and lateral drains connected to the public sewer on the 1 July 2011 transferred into Water Company ownership on the 1 October 2011. This follows the implementation of the Floods and Water Management Act (FWMA). This included sewers and lateral drains that were subject to an existing Section 104 Adoption Agreement and those that were not. There were exemptions and the main non-transferable assets were as follows:

• Surface water sewers and lateral drains that did not discharge to the public sewer, e.g. those that discharged to a watercourse.

• Foul sewers and lateral drains that discharged to a privately owned sewage treatment/collection facility.

• Pumping stations and rising mains will transfer between 1 October 2011 and 1 October 2016.

The implementation of Section 42 of the FWMA will ensure that future private sewers will not be created. It is anticipated that all new sewer applications will need to have an approved section 104 application ahead of a section 106 connection.

Encroachment: Anglian Water operates a risk based approach to development encroaching close to our used water infrastructure. We assess the issue of encroachment if you are

planning to build within 400 metres of a water recycling centre or, within 15 metres to 100 metres of a pumping station. We have more information available on our website at <a href="http://anglianwater.co.uk/developers/encroachment.aspx">http://anglianwater.co.uk/developers/encroachment.aspx</a>

Locating our assets: Maps detailing the location of our water and used water infrastructure including both underground assets and above ground assets such as pumping stations and recycling centres are available from <u>www.digdat.co.uk</u>. All requests from members of the public or non-statutory bodies for maps showing the location of our assets will be subject to an appropriate administrative charge. We have more information on our website at: <u>www.anglianwater.co.uk/developers/our-assets/</u>

Summary of charges: A summary of this year's water and used water connection and infrastructure charges can be found at <a href="http://www.anglianwater.co.uk/developers/charges/">http://www.anglianwater.co.uk/developers/charges/</a>

Disclaimer: The information provided within this report is based on the best data currently recorded, recorded within the last 12 months or provided by a third party. The position must be regarded as approximate. If there is further development in the area or for other reasons the position may change.

The accuracy of this report is therefore not guaranteed and does not obviate the need to make additional appropriate searches, inspections and enquiries. You are advised therefore to renew your enquiry should there be a delay in submitting your application for water supply/sewer connection to re-confirm the situation.

Any cost calculations provided within the report are estimated only and may be subject to change.

The responses made in this report are based on the presumption that your proposed development obtains planning permission. Whilst this report has been prepared to help assess the viability of your proposal, it must not be considered in isolation. Anglian Water supports the plan led approach to sustainable development that is set out in the National Planning Policy Framework (NPPF). As a spatial planning statutory consultee, we assist planning authorities in the preparation of a sustainable local plan on the basis of capacity within our water and water recycling (formerly referred to as wastewater) infrastructure. Consequently, any infrastructure needs identified in this report must only be considered in the context of up to date, adopted or emerging local plans. Where local plans are absent, silent or out of date these needs should be considered against the definition of sustainability set out in the NPPF as a whole.

No liability whatsoever including liability for negligence is accepted by Anglian Water Services Limited for any error or inaccuracy or omission including the failure to accurately record or record at all, the location of any water main, discharge pipe, sewer, or drain or disposal main or any item of apparatus.



# **Drainage Impact Assessment**

# Project Title:

# Towcester Road, Blisworth (Rail Central)

# **Anglian Water Services contact:**

Max Shone Senior Growth Planning Engineer Thorpe Wood House Thorpe Wood Peterborough PE3 6WT Mobile Number: 07712876139 Our reference number: 19009 20th March 2017

# 1. Summary

This report has been undertaken in response to an enquiry from Hydrock to determine the impact of flows from the site at Towcester Road, Blisworth on the performance of the existing foul sewer network. It should be read in conjunction with the pre-planning report dated 5th January 2017, which indicated that a direct connection to the public foul sewer system is likely to have a detrimental effect on the existing sewerage network. Further hydraulic modelling is required to enable Anglian Water to provide a solution for draining the foul flows from the proposed development.

The analysis has been performed on the foul system only. There has been no consideration of the surface water flows as this is not within the scope of the study.

The additional foul flows from the development site comprising large commercial units employing 6,900 people working in 3 shifts (warehouse 690,000m²) were modelled connecting to manhole reference no. SP72559501 (Grid ref: SP729555562).

The study concludes that the development will cause detriment to the capacity of the sewer system and will result in increased flood risk downstream of the proposed connection point.

In order to mitigate the impact of the proposed development upon the network the following option is recommended:

1. Provide offline storage of 102m³ at proposed connection point of development in green area.

The predicted total capital scheme cost for the required mitigation solution is  $\pm 374,533$  with an indicative developer contribution of  $\pm 31,567$ . The predicted total embodied carbon is  $52tCO_2e$ . The predicted water footprint is  $37m^3H_2Oe$ .

The topography of the site indicates that a pumped regime is required at rate of 29 l/s. Due to the proximity of the site to the connection point it is assumed that the developer will provide the necessary infrastructure to convey flows from the site to the network.

The contents of this report and costs supplied are an estimate based on a solution generated by a desktop hydraulic model. These are estimated figures which are not to be relied upon without further detailed investigations.

# 2. Hydraulic Modelling and Solutions

The proposed development site is located at Towcester Road, Blisworth (also referred to as Rail Central) to the south-west of Northampton (see Figure 1). Foul flows from the site drain to Great Billing Water Recycling Centre (WRC) located to the east of the town. The proposed development comprises a large commercial development site employing up to 6,900 staff working across three shifts.

To enable the analysis to be performed the existing hydraulic model for Great Billing was used.

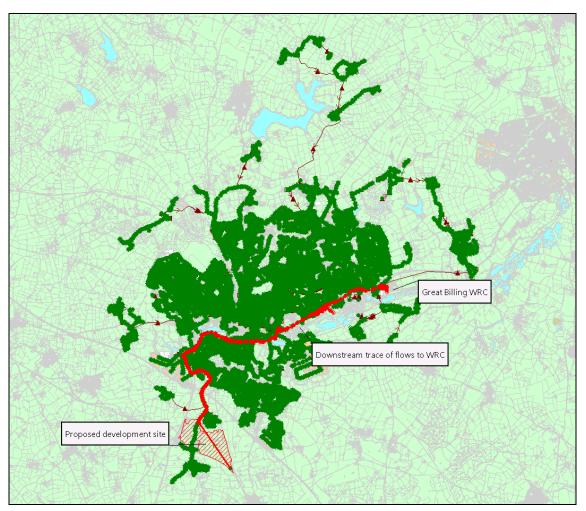


Figure 1: Showing the location of the proposed site and the downstream trace to the WRC

#### **Proposed connection point**

The proposed connection point for the development is manhole SP72559501 (Grid ref: SP729555562) located north of the proposed development (see Figure 2 and Figure 3). The diameter of the sewer to which the proposed development will connect is 300mm. A review of the site topography indicates that a gravity connection is not feasible.

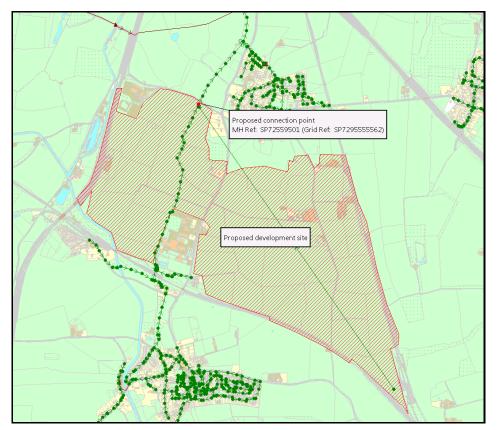


Figure 2: Showing the proposed connection point

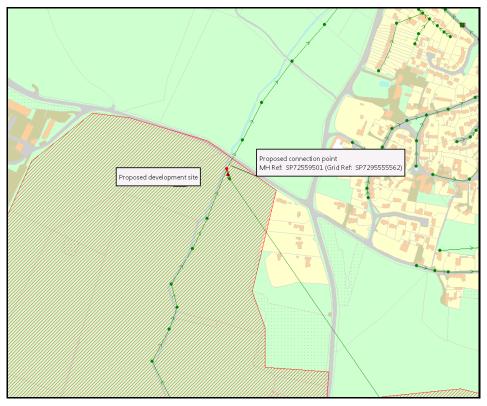


Figure 3: Showing a close-up of the connection point

# Hydraulic modelling

The hydraulic model was run to determine the existing sewer performance during a 1 in 20 year critical duration storm. The model was then re-run with the estimated flows from the site connecting to manhole SP72559501, via a pumped connection.

The model predicts a significant increase in flooding at four manholes of which all are located directly downstream of the proposed development (see Figure 4). Surcharging is also predicted in the network due to the additional flows from the development (see Figure 5). There is also an increase in the spill volume at Abington overflow and the overflow at Bedford Road pumping station.

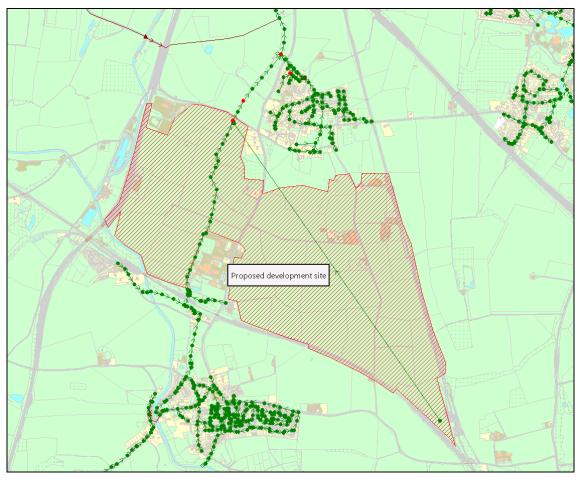


Figure 4: Showing the predicted flooding locations (in red) due to the additional flows from the development

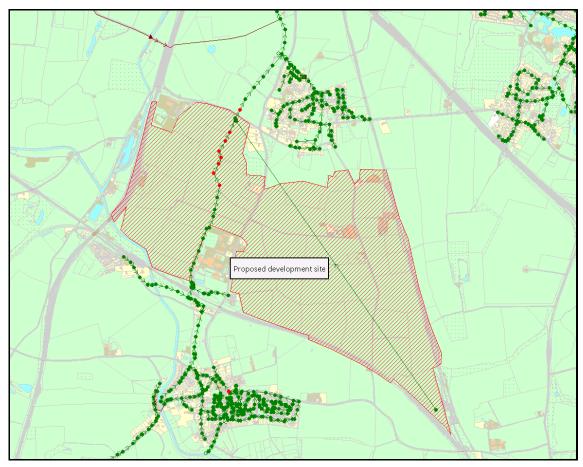


Figure 5: Showing the predicted surcharge locations (in red) due to the increased flow from the development site

The level of detriment predicted due to the additional flows from the development means that a mitigation solution will be required to allow the site to connect to the existing sewerage system.

# Mitigation Solution

Mitigation solutions are designed to prevent detriment to the existing sewerage network performance during a 1 in 30 year critical duration storm event.

The proposed mitigation solution comprises (see Figure 6):

1. 102m³ of off-line storage close to the proposed connection point of the development in the adjacent undeveloped space.

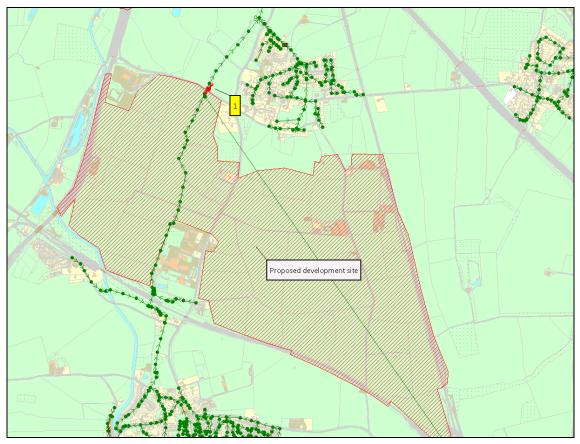


Figure 6: Showing the location of the proposed mitigation solution

This is a feasible solution for planning application purposes. A detailed design would be required to investigate the solution further.

# **Alternative Solutions**

At detailed design stage alternative solutions may also be considered:

• Since a pumped solution is proposed, there may be scope for incorporating the storage into the site and avoiding the offsite reinforcement costs.

# **3. Summary of Cost Estimates**

The estimated cost for the proposed off-site reinforcement solution is £374,533.

The Water Industry Act enables the developer to benefit from any wastewater revenue generated from the houses they have built. In simplified terms, future revenue from the new dwellings is offset from the developer's contribution. Instead of paying the full contribution the developer pays the difference between their capital contribution and the future revenue. This is calculated on an annual basis for 12 years (see Appendix 2). The developer has the option of paying this annually (relevant deficit) or upfront as a commuted sum (discounted aggregate deficit).

The indicative cost chargeable to the developer for the required mitigation following the offsetting of expected future revenue is predicted to be  $\pm$ 31,567. This future revenue has been calculated based on the flows from the site increasing linearly until the maximum is achieved in year 12. 13 meters have been added to represent one meter per building (see Table 1). It has also been assumed at this stage that the site is operating for eight hours per day. This is for indicative purposes only. A more robust figure will be provided once detailed design has been undertaken and build rates are fully understood.

Year	Cumulative Number of Meters	Cumulative Domestic Flows M3 per annum	Revenue Now	Projected Future Revenue	Total Projected Future Revenue	Annual Repayments of the Loan	Projected Relevant Deficit	Discount Factor	Commuted Sum
1	3	8,392	£12,930	£12,930	£12,930	£35,962	£23,031	0.9780	£22,524
2	6	16,784	£25,861	£26,507	£26,507	£35,962	£9,454	0.9565	£9,043
3	9	25,176	£38,791	£40,755	£40,755	£35,962	£0	0.9354	£0
4	12	33,568	£51,722	£55,699	£55,699	£35,962	£0	0.9148	£0
5	13	41,960	£64,558	£71,260	£71,260	£35,962	£0	0.8947	£0
6	13	50,352	£77,347	£87,512	£87,512	£35,962	£0	0.8750	£0
7	13	58,744	£90,137	£104,531	£104,531	£35,962	£0	0.8558	£0
8	13	67,136	£102,926	£122,347	£122,347	£35,962	£0	0.8369	£0
9	13	75,528	£115,716	£140,988	£140,988	£35,962	£0	0.8185	£0
10	13	83,920	£128,505	£160,485	£160,485	£35,962	£0	0.8005	£0
11	13	92,312	£141,294	£180,869	£180,869	£35,962	£0	0.7829	£0
12	13	100,704	£154,084	£202,171	£202,171	£35,962	£0	0.7657	£0
TOTAL							£32,486		£31,567

Table 1: Showing the predicted developer contribution to an estimated capital cost of £374,533

#### Conveyancing costs

The connection point is close to the site boundary. It has been assumed that the developer will provide the infrastructure to convey the flows from the site to the connection point. Consequently, this report does not include any costs for the conveyance of flows.

The contents of this report and costs supplied are an estimate based on a solution generated by a desktop hydraulic model. These are estimated figures which are not to be relied upon without further detailed investigations.

# 4. Summary and recommendation

Assumed flows from the site at Blisworth, Towcester Road, Northampton have been modelled connecting via pump to the existing foul drainage system to manhole reference no. SP72559501 and detriment to the existing performance has been predicted. To mitigate against this, a feasible foul drainage solution is proposed comprising:

1. 102m³ off-line storage at proposed connection point of development in the adjacent undeveloped area.

## **Embodied carbon cost**

The embodied carbon predicted in this solution is 55TCO₂e (see Table 2).

# Water footprinting

The predicted water footprint for this solution is  $37m^{3}H_{2}O$  (see Appendix 3).

## Conveyance of flows

It is assumed that the developer will provide the infrastructure to convey flows to the network.

#### Table 2: Showing a summary of the scheme costs

	Proposed pre- planning solution	Estimated Capital Cost	Predicted Developer Contribution	Predicted Total Embodied Carbon (tCO2e)	Predicted water footprint (m ³ H ₂ O)
•	<ul> <li>102m³ offline</li> <li>storage</li> </ul>	£374,533	£31,567	53	37

This is a feasible solution for planning application purposes.

## 5. Next steps

To proceed with this option, it is recommended that an application is made under Section 98 of the Water Industry Act. This will enable a detailed design and robust cost to be generated and the scheme to be delivered. An application form is available on our web site at <a href="https://www.anglianwater.co.uk/developers/sewer-connection/new-sewer.aspx">www.anglianwater.co.uk/developers/sewer-connection/new-sewer.aspx</a>.

#### Underwriting detailed design

Detailed design commences on receipt of an underwriting agreement. Payment is only sought from the developer if it chooses to abort the work. Otherwise, it is incorporated into the total scheme cost. For this scheme, an underwriting of £26,000 will provide detailed options from which a preferred option may be chosen. A cumulative underwriting of £47,000 will take the preferred option to a level of design where it is ready for construction. Typically this takes an estimated 44-52 weeks but may increase depending on the complexity of the scheme. At this stage a robust cost for the scheme can be provided.

#### Further work required for a section 104 or section 106 application

Please note, it would be deemed premature by Anglian Water to submit a Section 106 or Section 104 application under the Water Industry Act 1991 to Developer Services prior to a Legal Agreement being signed under Section 98 of the same act ensuring the provision of the necessary upgrade works as identified within this report.

#### Anglian Water supports sustainable development as set out in the NPPF

The responses made in this report are based on the presumption that your proposed development obtains planning permission. Whilst this report has been prepared to help assess the viability of your proposal, it must not be considered in isolation. Anglian Water supports the plan led approach to sustainable development that is set out in the National Planning Policy Framework (NPPF). As a spatial planning statutory consultee, we assist planning authorities in the preparation of a sustainable local plan on the basis of capacity within our water and water recycling (formerly referred to as wastewater) infrastructure. Consequently, any infrastructure needs identified in this report must only be considered in the context of up to date, adopted or emerging local plans. Where local plans are absent, silent or out of date these needs should be considered against the definition of sustainability set out in the NPPF as a whole.

# **APPENDIX 1. - Development details**

Prop	osed Connection						
Propose	d connection location	North site	e proposed o	levelopment			
	tion sewer or node reference (incl. X&Y)	GIS ID: SP72559501, MH Ref: SP72559501, Grid Ref: SP7295555562, (X= 472955,Y= 255562)					
Connect	tion sewer diameter	300mm					
	tion relative to the development	North					
	ge regime	Pumped					
	ischarge rate	29 l/s					
	p& Storage						
	eep (5 m ² per property)	0					
	evelopment storage (m ³ )	1580					
	torage volume, m ³	207					
	Point of development (mAOD) Point of development (mAOD)	114.1 73.8					
	Calculations	75.8					
	Attribute	Value	Totals	Unit / Calculation			
	Development size	263		Ha (Digitised Sub-catchment area)			
	Residential						
А	Residential dwellings	0		No.			
В	Residential occupancy	2.35		No.			
С	Residential population (P)	0		No. (A x B)			
D	Residential PCC (G)	125		l/h/d			
E _(avg)	Residential demand - Average		0	l/s (C x D)/86400			
E _(peak)	Residential demand - Peak		0	l/s (E _(avg) x 2.12)			
F	Infiltration		0	l/s (0.25 x E _(avg) )			
	Industrial/Trade						
G	Industrial/trade area	0		На			
H	Industrial/trade discharge per ha	0		l/s/ha			
I	Industrial/trade domestic element per ha	0		l/s			
] _(avg)	Commercial/trade - Average	-	0	//s (GxH+GxI)			
J _(peak)	Commercial/trade- Peak		0	I/s(J _(avg) x 3)			
	Commercial Units						
К	PCC	120		l/h/d			
L	Occupancy	6900		No.			
M _(avg)	demand - Average	0,00	5.58	l/s (K x L)/86400			
$M_{(peak)}$	demand - Peak		28.75	I/s (M _(avg) x 3)			
	Other						
N _(avg)	Other demand - Average		0.00	l/s			
N _(peak)	Other demand - Peak		0.00	1/s			
• •(peak)			0.00				
$O_{(avg)}$	Total Discharge - Average		9.58	$I/s (E_{(avg)}+J_{(avg)}+M_{(avg)}+N_{(avg)})$			
O _(peak)	Total Discharge - Peak		28.75	$I/s (E_{(peak)}+J_{(peak)}+M_{(peak)}+N_{(peak)})$			
	DWF Total - Average		9.58	I/s(O _(avg) + F)			
	DWF Total - Peak		28.75				
	DWF IUlai - Pedk		20.75	$I/s(O_{(peak)} + F)$			

#### **APPENDIX 2.- Calculation of relevant deficit and discounted aggregate deficit.**

The financial propositions that are available in the Water Industry Act (WIA) are:

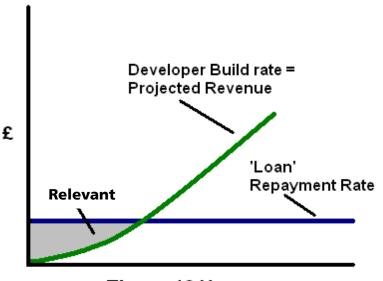
- Relevant Deficit (WIA section 100)
- Discounted Aggregate Deficit (WIA section 100A)

Under each option, the cost of installing the required infrastructure is calculated. This cost is then translated into a notional 'loan' to fund the installation. The revenue is then offset over a period of 12 years, taking into account inflation. If the cost of financing the loan exceeds the revenue in any year, then this deficit is charged to the developer.

#### A2.1 Relevant Deficit

This option takes the actual cost of providing the infrastructure as the basis for a notional loan. On an annual basis (for 12 years) the actual revenue we receive in respect of the infrastructure is then offset against the cost of the annual repayments of the notional loan. The deficit is paid annually by the developer for a period of up to 12 years. This is shown in Figure A2.1 below.

The developer will need to provide an undertaking to pay the deficit each year and also provide security for the estimated annual deficits either in the form of a cash deposit or a bond.



Time = 12 Years

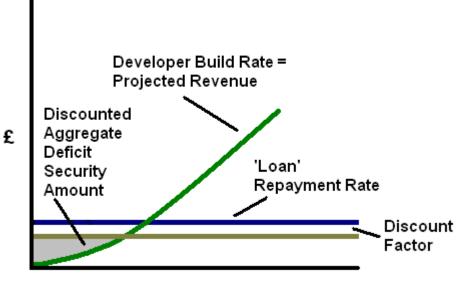
Figure A2.1 – Graphical imagery of a typical Relevant Deficit over 12 years

# A2.2 Discounted Aggregate Deficit

This follows the same principles as the Relevant Deficit payment method, except that the deficit will be paid as a single payment and the revenue is estimated from the build rate rather than from the actual revenue.

The yearly relevant deficit is calculated across the 12 years and a discount factor is applied to bring the deficit to its net present value. The deficit is normally reconciled against the security (see below) within 12 months of completing the infrastructure and is payable as a single commuted sum. This can be seen in Figure A2.2.

The developer will need to provide an undertaking to pay the full deficit after reconciliation and a security amount for the estimated deficit either in the form of a cash deposit or a bond. The deficit itself is payable on completion of the water mains following the reconciliation.



Time = 12 Years

Figure A2.2 – Graphical imagery of a typical Discounted Aggregate Deficit over 12 years

## **APPENDIX 3.- Embodied carbon and water footprinting**

#### Carbon footprint

In 2006 Anglian Water recognised the impacts of changing climate as one of the most significant challenges facing the organisation. In response we have developed and implemented a strategy of measure, manage and reduce our carbon emissions. We have set ourselves goals to halve our overall greenhouse emissions by 2035 (from 2010 levels).

#### Water footprinting

Water is our most precious resource and at present we do not fully understand how sustainable each litre of water we supply to our customers is over our full supply chain. In response, we are implementing a strategy of `water footprinting'.

Primarily water footprinting assesses the impact of human activity on the water environment. The process measures the volumes and scarcity of freshwater consumption including geographical and temporal components in producing a product or service. This is followed by an assessment defining actions required to achieve sustainable and equitable water use especially in water scarcity 'hot spots'.



www.hydrock.com