The Norfolk County Council (Norwich Northern Distributor Road (A1067 to A47(T))) Order

6.2 Environmental Statement: Volume II: Chapter 21. Flood Risk Assessment

Planning Act 2008

Infrastructure Planning

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

PINS Reference Number: *TR010015*

Document Reference: *6.2*

Regulation Number: *5(2)(a)*

Author: *Mott MacDonald*

Revision	Date	Description
0	8th January 2014	Revision For Submission

Mott MacDonald Internal Audit			
Revision	**Originator**	**Checked By**	**Approved By**
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MM filing ref: 233906EN/BSE/NOR/044

This document is submitted in relation to the application for a proposed development by Norfolk County Council to the Planning Inspectorate, under the Planning Act 2008.

The application is for the Norfolk County Council (Norwich Northern Distributor Road (A1067 to A47(T))) Order, to grant development consent for the construction of a new highway running west-east between the A1067 Fakenham Road and the A47 Trunk Road at Postwick, including improvements to the existing highway network to the north and north east of Norwich.

This document comprises part of the application documents and relates to Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.

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A. Flood Risk Assessment

A.1.1 The following report is a copy of the DCO application document 5.2. It has also been included in this chapter because it has been used to support various chapters in both Volume 1 and Volume 2 the ES.

5.2 Flood Risk Assessment

Revision	Date	Description
0	8th January 2014	Revision For Submission

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0	R Day	R Gamble	R Gamble

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MM filing ref: 233906EN/BSE/NOR/037

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1. Executive Summary

1.1.1 Mott MacDonald was commissioned by Norfolk County Council to carry out a Flood Risk Assessment for the proposed Norwich Northern Distributor Road. This report provides the outcome of the assessment which follows the procedures outlined in the National Planning Policy Framework (NPPF) and the accompanying NPPF Technical Guidance (NPPFTG).

1.1.2 At no point does the proposed route of the NDR intersect any active watercourse. The route is largely located in Flood Zone 1 where there is little or no annual probability of fluvial or tidal flooding, and thus is considered to pass the Sequential Test. However, the road alignment crosses the catchment of Dobbs Beck near Rackheath where available surface water mapping indicates some pluvial flood risk. The depth, extent and duration of any flooding in this area is currently minimal, and the road will be built above the maximum flood levels and therefore removed from flood risk. The proposals for the new road are classified as 'Essential Infrastructure' by Table 2 of NPPFTG, and as such are permitted in Flood Zones 1 and 2.

1.1.3 In compliance with the NPPF, the highway drainage for the NDR has been designed in line with sustainable drainage system (SuDS) principles to restrict runoff to Greenfield discharge rates. Therefore flood risk due to surface water runoff will be mitigated to acceptable levels.

1.1.4 In terms of overland flow, the proposed route will bisect 43 natural catchments. Section 4.1.4 assesses the potential runoff from these catchments, as well as the resultant flood extents where natural drainage paths will be severed. At no point do these flood extents indicate any flooding to residential property.

1.1.5 Given the depth of the groundwater table beneath the preliminary road levels, flood risk to the NDR arising from groundwater is likely to be minimal. Any residual risks, due to climate change, for example, would be easily managed by the proposed surface water drainage system.

1.1.6 With the implementation of the recommended flood risk management and drainage proposals included in the Scheme and DCO, as set out in Section 4, the NDR proposals will have no significant impact upon the local flooding regime, neither will they pose any increased flood risk to neighbouring residential properties or infrastructure.

2. Introduction

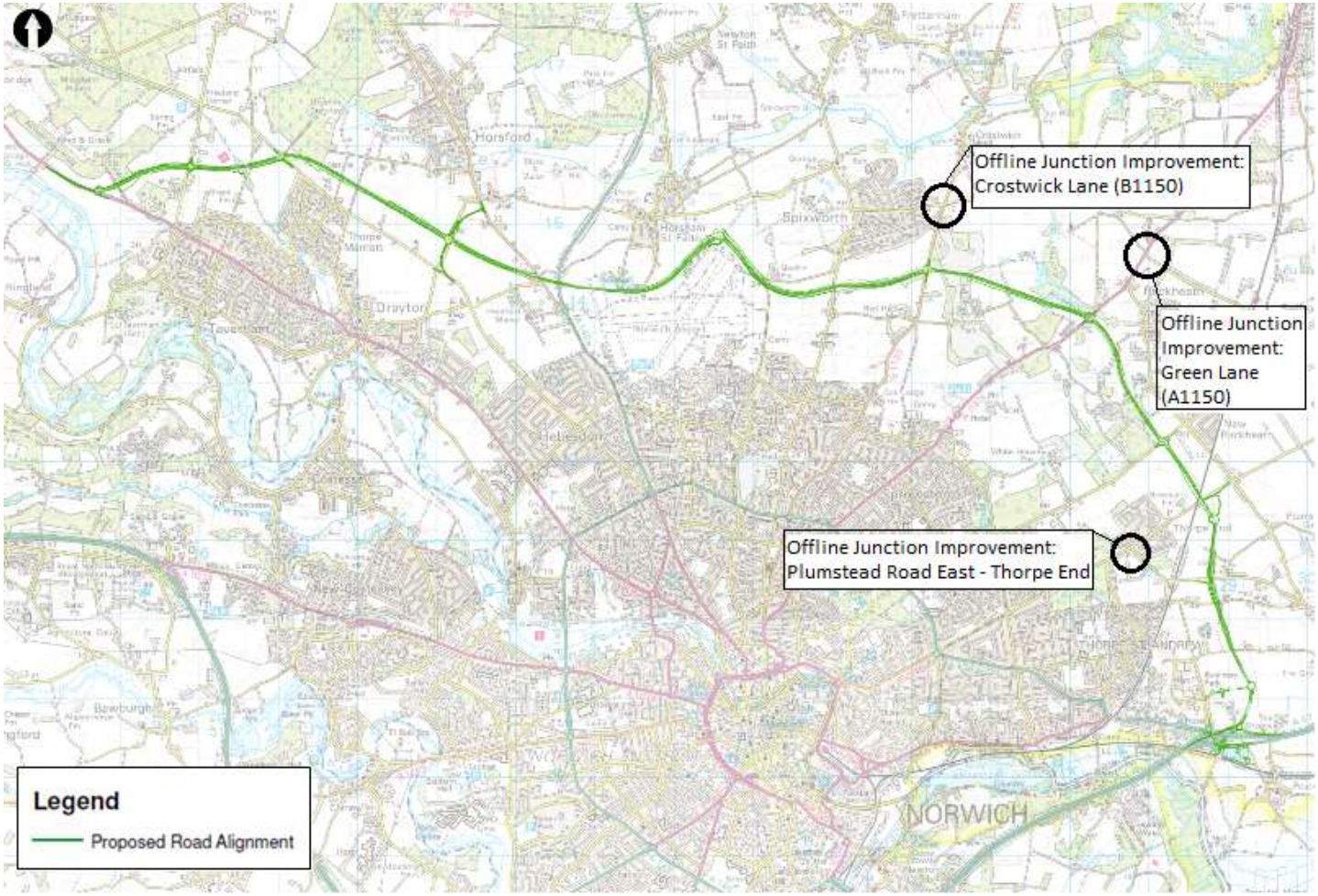
2.1.1 Mott MacDonald has been commissioned by Norfolk County Council to carry out a Flood Risk Assessment (FRA) to support the planning application and Environmental Impact Assessment (EIA) for the proposed Norwich Northern Distributor Road scheme (NDR). This FRA has been produced to support the planning application for the proposed (NDR). In the FRA the term "NDR" is used interchangeably with "the proposed NDR", "the proposed Scheme" and "Scheme".

2.1.2 The Scheme (the Norwich Northern Distributor Road, known as the NDR) is a dual carriageway all-purpose strategic distributor road, which would link the A1067 Fakenham Road, near Attlebridge to the A47 Trunk Road (T) at Postwick. This will be over a length of approximately 20.4km. A full description of the NDR can be found in in the Scheme Description within Chapter 2 : Volume 1 of the Environmental Statement. See also General Arrangement Plans within Appendix 1 : Volume 1 of the Environmental Statement. Figure 2.1 shows the general location of the proposed Scheme and offline junction improvements. Figure 1.1 shows the general location of the proposed Scheme and offline junction improvements.

2.1.3 This assessment has been carried out in accordance with the general requirements of the National Planning Policy Framework (NPPF) 2010 and the accompanying Technical Guidance (NPPFTG) and in compliance with the recent Flood & Water Management Act 2010. The FRA assesses the risk of flooding to the proposed Scheme, the possible effect of the development on flood risk elsewhere and makes allowances for increased flows due to climate change. Fluvial, groundwater, surface water and drainage aspects of flood risks have all been considered in this study. The scale and nature of the FRA is considered appropriate for the proposed Scheme.

2.1.4 This FRA has been informed by the Strategic Flood Risk Assessment (SFRA) Stages 1 and 2 and Broadland Rivers CFMP undertaken for the region and the North East Norwich Water Cycle Study (WCS) for the Rackheath area.

Figure 2.1: Location Map



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3. Background Information

3.1 Proposed Scheme

3.1.1 The Scheme (the Norwich Northern Distributor Road, known as the NDR) is a dual carriageway all-purpose strategic distributor road, which would link the A1067 Fakenham Road, near Attlebridge to the A47 Trunk Road (T) at Postwick. This will be over a length of approximately 20.4km. A full description of the NDR can be found in in the Scheme Description within Chapter 2 : Volume 1 of the Environmental Statement. See also General Arrangement Plans within Appendix 1 : Volume 1 of the Environmental Statement.The entire length of the proposed NDR will be served by SuDS. This system will utilise a combination of swales, wetlands and attenuation lagoons to ensure that the scheme causes minimal impact to local water quality and flood risk. Runoff from the carriageway will be conveyed via shallow, longitudinal grassed swales approximately 3m wide by 0.2m deep. However, at junctions and roundabouts a standard network of kerbs and gullies will drain surface water runoff from the roadway. The swales and standard drainage networks will discharge to a primary lined lagoon, with the purpose of containing accidental spillage from traffic accidents, before discharging to a secondary attenuation lagoon. No primary lagoon is proposed at attenuation lagoons serving to contain overland flows only.

3.1.2 A detailed engineering layout and associated Sustainable Drainage System (SuDS) design of the proposed Scheme is shown in Appendix A (Drawing No. R1C093-R1-5064 to 5087, sheets 1 to 12). As part of the Development Consent Order (DCO) planning application (which this FRA supports), and for reasons unrelated to flood risk, the NDR works could potentially deviate from the current proposed elevations by up to 0.25m higher (earthworks, bunds and banks) or lower (carriageway and adjacent verges). The detailed design of the roundabouts could result in a variation in levels of up to 0.5m higher or lower than the current design. This has been considered within this assessment in relation to groundwater and pluvial flood risk.

3.1.3 Three offline road junction improvements are required to support the proposed NDR at Green Lane West, Plumstead Road East and Crostwick Lane. Aerial plans showing the engineering design are provided in Appendix A.

3.1.4 In terms of flood risk, the proposed development is classified as ‘Essential Infrastructure’ as per Table 2 of NPPF Technical Guidance. With reference to

Table 3 of the NPPF Technical Guidance, developments within this classification are appropriate within Flood Zones 1 and 2 but are required to pass the Exception Test and remain operational during times of flood if they are to be located within Flood Zone 3. All development is still subject to the Sequential Test (refer to Section 4.1.2 for further information).

3.2 Existing site conditions and features

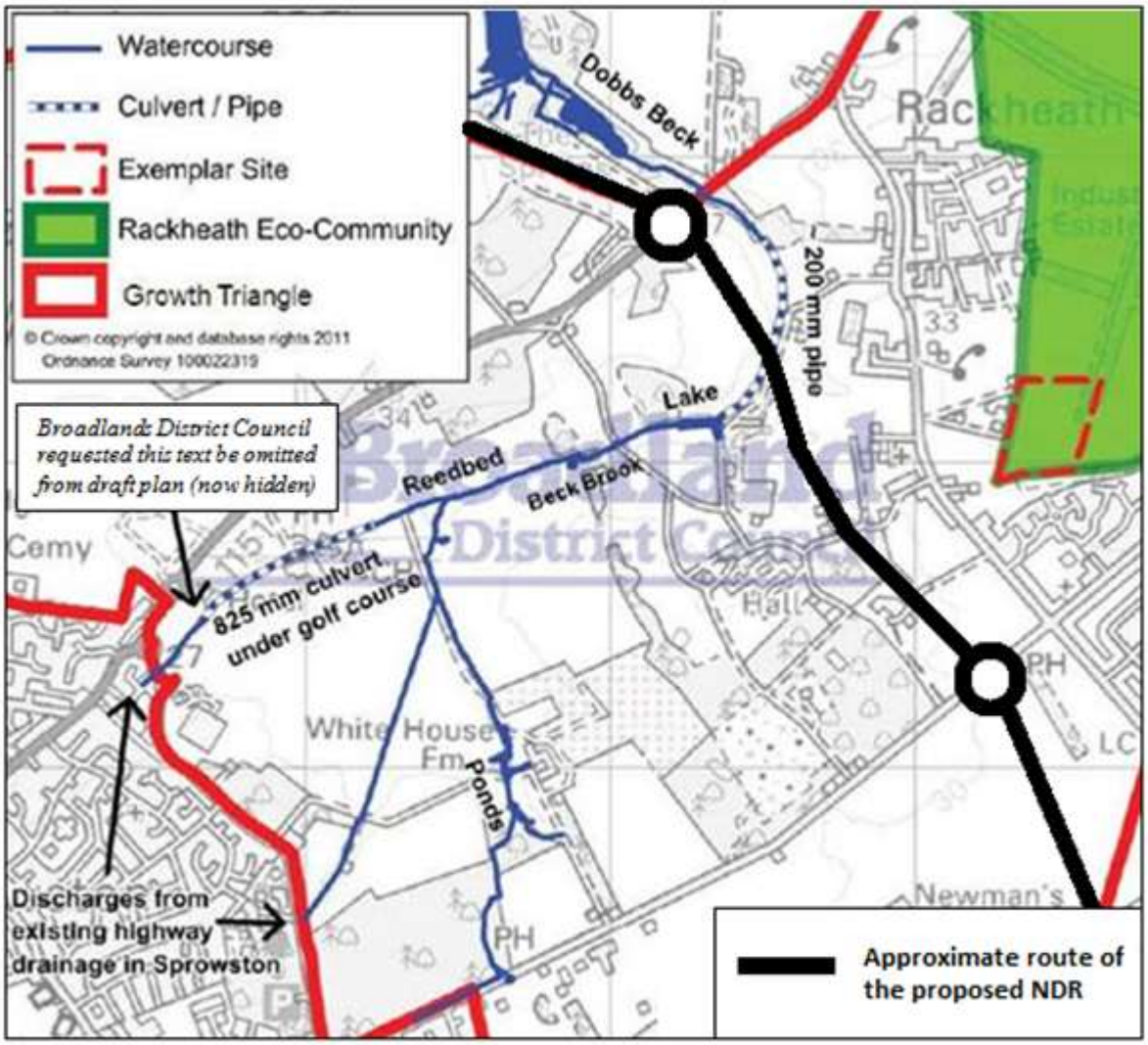
Surface water

3.2.1 The proposed NDR will cross three river catchments: the River Wensum; the River Yare; and the River Bure. However, at no point would the NDR route cross any active watercourse. The River Wensum to the west of the NDR study area flows southwards through Norwich to meet the River Yare. The River Yare is located over 500m away from the Postwick Hub Junction at the eastern end of the route. The River Bure is located to the North of the NDR, but several tributaries in the vicinity of the NDR drain to the River Bure including Horsford Brook and Spixworth Beck.

3.2.2 The junction improvement at Crostwick Lane is approximately 850m south of Spixworth Brook and 1.35km west of Spixworth Beck. The improvements at the Green Lane West junction are located approximately 490m north-east of Dobbs Beck. Plumstead Road East junction improvements are within 1.8km of Witton Run, which is a tributary of the River Yare.

3.2.3 The NDR crosses the catchment of Beck Brook which continues as Dobbs Beck immediately south of Wroxham Road. This is a tributary of Spixworth Beck. Figure 3.1 shows the location of Beck Brook and associated drainage features. According to the draft North East Norwich WCS, the NDR crosses the catchment of Beck Brook at the point where it flows underground through a 200mm (approx.) diameter pipe connecting the ‘Lake’ (also known as the ‘Dry Lake’) to a ditch south of Wroxham Road. Water primarily leaves the Lake via infiltration to ground, and any overflow is via this buried pipe outfalling to the ditch. Flows in this ditch then pass through a 200 mm (approx.) diameter pipe, under Wroxham Road to the Dobbs Beck watercourse. Dobbs Beck is fed by a number of springs and surrounding field drains in the area.

Figure 3.1: Dobbs Beck and associated drainage features (Source: Figure 4-6 extracted from the draft North East Norwich WCS provided by Broadland District Council (June 2013))



3.2.4 A drainage survey of this area was undertaken by Birse in November 2012. A survey of the 200mm pipe between the Lake and Dobbs Beck showed it to be redundant, with sections no longer functioning to convey surface water between these locations.

3.3 Groundwater

3.3.1 The ground along the proposed alignment of the NDR is largely underlain by highly permeable glacial sands and tills draining to the Upper Chalk and Norwich Crag formation. These aquifers support the base flow of the River Wensum, River Yare and River Bure, and their tributaries the River Tud and Horsford Brook. Borehole monitoring since 2007 has assessed groundwater levels on a quarterly basis. This data has been used to inform the assessment of groundwater flood risk in Section 4.1.5. The results of these investigations suggest that the road level is above the maximum groundwater levels along its entire length. However, there is evidence to suggest some minor perched water in lower permeability formations in the higher ground away from the valley near Rackheath.

3.3.2 The proposed alignment of the NDR is located on the relatively higher ground of the glacial Norwich Plateau. This is demonstrated in Figure 3.2 which shows a Digital Terrain Model (DTM) for the area. This DTM was constructed using NextMap Data for the purposes of this assessment. In the vicinity of the proposed NDR, the maximum terrain elevation is 62.5 metres above ordnance datum (mAOD) near the Sand and Gravel Pits in Deighton Hills to the far western extent of the proposed route (road chainage 0 as per the latest design drawing shown in Appendix A). The lowest terrain elevation is 9.5mAOD in the vicinity of The Springs to the west of Rackheath (road chainage 13,200 to 14,100).

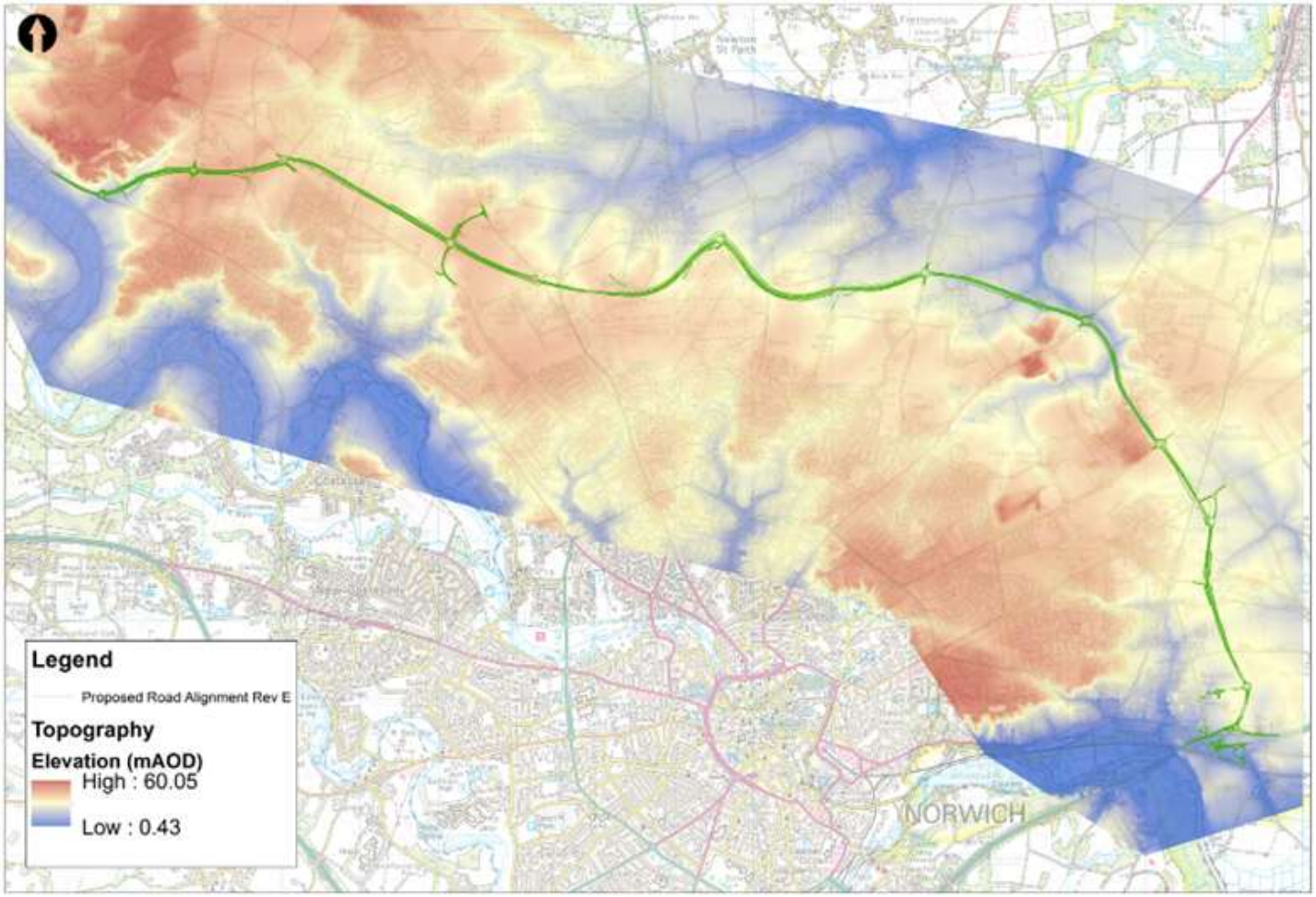
3.3.3 The vertical alignment of the proposed Scheme varies along its route. The maximum elevation which the road will cross is approximately 43 mAOD north of Taverham (road chainage 1,400 to 3,000). The lowest elevation crossed by the road will be 17.9 mAOD near The Springs at chainage 13,300.

3.3.4 The regional hydrogeological map, produced by the British Geological Survey (BGS, 1976) provides groundwater level contours for the areas of the three offline junction improvements. Ground elevation at Crostwick Lane is approximately 20mAOD, located along a 5 mAOD groundwater level contour. At Green Lane West and Plumstead Road East ground elevation is approximately 30mAOD, with predicted groundwater levels of 5mAOD and 10mAOD respectively.

3.3.5 The vertical alignment of the proposed offline junction improvements will be designed to follow the existing road elevation at Crostwick Lane and Plumstead Road East. Road elevation for the new junction at Green Lane

West is likely to be at or above the existing ground elevation, with matching road elevations where it connects to Green Lane West and Wroxham Road. The BGS groundwater level contours above suggest that the proposed road levels would range between 15 and 25m above the groundwater table, therefore there is unlikely to be groundwater flooding issues in this location. Further groundwater level monitoring would be required to inform the final detailed design to ensure there is no risk of groundwater flooding.

Figure 3.2: Topography



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4. Definition of the Flood Hazard and Probability

4.1 The potential sources of flooding

4.1.1 The key potential sources of flooding include:

- Fluvial flooding;
- Surface water;
- Overland flooding; and
- Groundwater flooding.

4.1.2 Overloading of local sewers has been ruled out of this assessment as the proposed route of the NDR follows an alignment which has no significant prior development. Similarly, flooding from artificial sources has been excluded given that there are no known reservoirs, lakes or canals in the vicinity which could impact, or be impacted by the NDR route.

4.1.3 The following outlines the flooding mechanisms for the potential sources of flooding identified above.

Fluvial and tidal flood risk

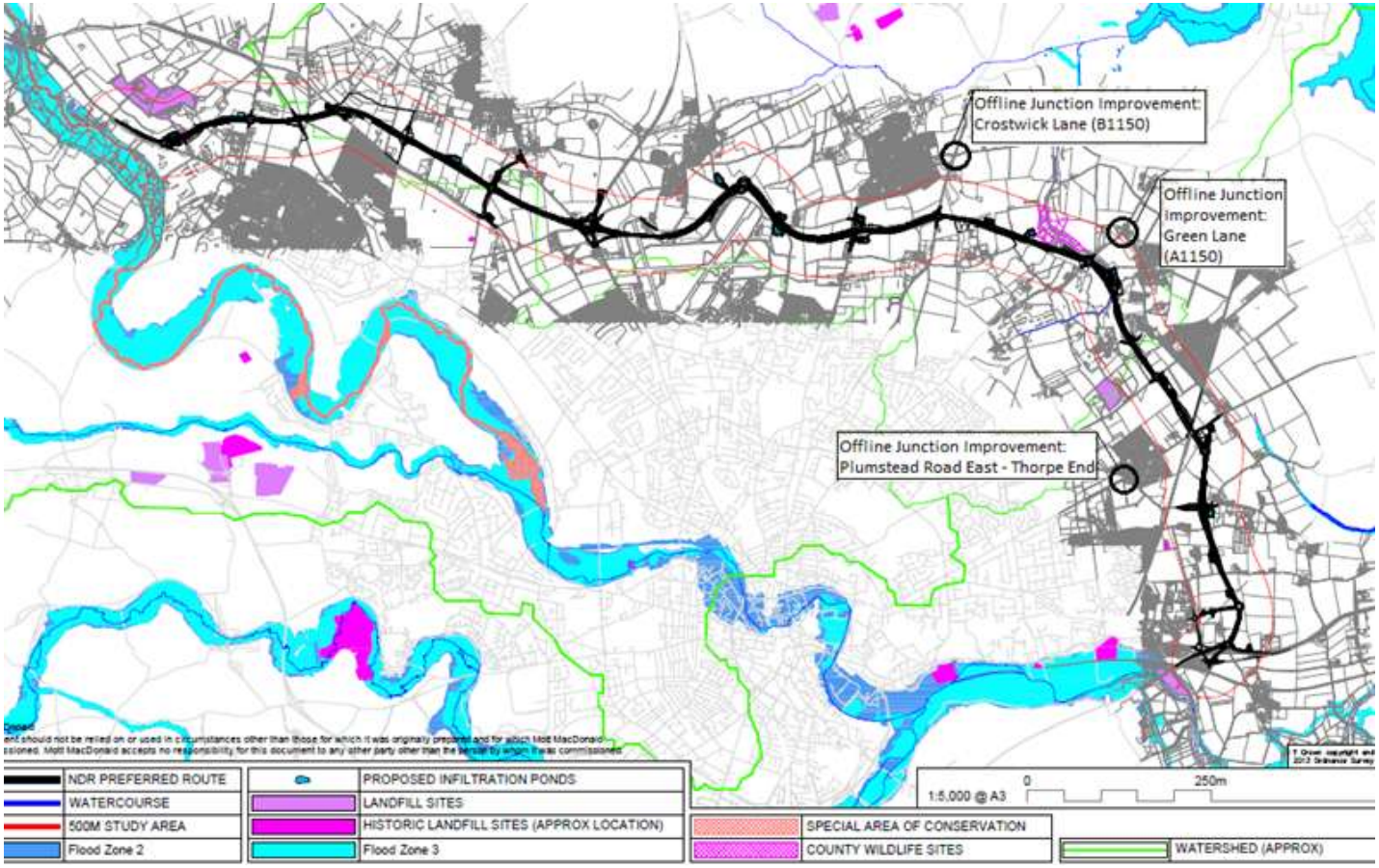
4.1.4 The EA publishes floodplain extents for all significant watercourses throughout England and Wales. These extents are available to the public via the internet and are the primary source of publicly available flood risk information. The Flood Zone Map for the area of interest is shown in Figure 4.1 and in Appendix B. It should be noted that the boundaries given on the flood maps are only indicative and do not take into account any man-made structures such as railway embankments and roads or flood defences. This is an important issue as in many places the influence of man-made structures (particularly flood defences) can substantially reduce the area likely to be affected by flooding.

4.1.5 The EA define three Flood Zones indicating the level of risk from river and tidal flooding.

- Flood Zone 1 (Low Risk): less than 0.1 % annual probability of flooding from rivers or the sea in any given year (less than a 1 in 1000 annual probability of flooding).

- Flood Zone 2 (Medium Risk): greater than 0.1 % but less than 1% annual probability of flooding from rivers or less than 0.5% annual probability of flooding from the sea in any given year (greater than a 1 in 1000 but less than 1 in 100 (1 in 200 from the sea) annual probability of flooding).
- Flood Zone 3 (High Risk): greater than 1 % annual probability of flooding from rivers (a 1 in 100 annual probability of flooding) or 0.5% annual probability of flooding from the sea in any given year (a 1 in 200 annual probability of flooding).

Figure 4.1: Flood Zone Map (Environment Agency 2013).



4.1.6 The EA flood map (Figure 4.1) indicates that the entire Scheme and the offline junction improvements are located in Flood Zone 1 and as such has less than 0.1 per cent annual probability of flooding. The Scheme is not located within an area likely to be affected by coastal flooding. Extreme tidal and surge events may cause some tide-locking of the River Yare raising water levels in the channel inland up to Norwich. However, the eastern end of the NDR (hereafter referred to as 'Postwick Hub') is over 5 m above the predicted levels for the extreme surge events on the River Yare, and therefore is not at risk from tidal flooding.

4.1.7 NPPF states that climate change may have a significant impact on peak river flows, peak rainfall intensity and sea levels in the future, increasing by up to 20%, 30% and 1.2m (NPPFTG Table 4) respectively by 2115. The Strategic Flood Risk Assessment (SFRA) for Greater Norwich (2008) indicates that at no point does any part of the Scheme intercept the predicted levels for the future fluvial or tidal 1% Annual Exceedance Probability (AEP) or extreme 0.1% AEP events.

4.1.8 Analysis of the flood maps and flood level tables (Figure 4.1 and Appendix B) shows that even with the predicted increase in flows and levels due to future climate change, fluvial and tidal flood risk to the Scheme remains low (Flood Zone 1) . Therefore, flood risk to the Scheme from river, coastal and tidal flooding is minimal, both now and in the future.

4.1.9 Historic flooding reports from the EA also suggest there is little fluvial or tidal flood risk to the NDR. The nearest area of historic flooding (see Appendix B) is at Attlebridge which was flooded in 1993 along the River Wensum, however the flood extent boundaries are more than 200m from the western end of the Scheme, along Fakenham Road.

Sequential test

4.1.10 NPPF requires the application of a risk-based approach to determine land uses that are compatible with the level of flood risk at the proposed scheme. The purpose of the sequential test is to ensure that there are no other reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed. Appropriate development should be directed towards Flood Zone 1 where at all possible, and then to Flood Zone 2 and Flood Zone 3 respectively.

4.1.11 Table 2 of NPPFTG identifies and classifies the vulnerability of each type of development. under the following five flood risk vulnerability classes;

- Essential Infrastructure
- Highly vulnerable
- More vulnerable
- Less vulnerable
- Water-compatible development

4.1.12 The proposed road and junctions are considered as “Essential Infrastructure” according to NPPF guidance. Table 3 of NPPFTG considers “Essential Infrastructure” as appropriate in Flood Zone 1 (less than 1 in 1000 annual probability of river or sea flooding).

4.1.13 The entire Proposed Development is located in the zone of lowest flood risk (Flood Zone 1) and therefore, is considered to satisfy the sequential test of the NPPF.

Surface water flood risk from the proposed road

4.1.14 The NDR will reduce the permeability of an area of approximately 630 km², of which a large proportion will be tarmac, generating 80-85% surface water runoff. Without mitigation this has the potential to alter the fluvial and groundwater regimes, as well as water quality in the area.

4.1.15 There no known records of surface water flooding from Norfolk County Council, and no Highways Agency records of any known surface water issues along the proposed route or within its immediate vicinity. However, the SFRA suggests surface water flooding may be a significant issue in some places. The lack of historic evidence may be due to the nature of flooding which typically occurs on agricultural land; often being short and shallow in character which commonly means that it goes unreported.

4.1.16 The EA’s Flood Map for Surface Water (FMfSW) give an indication of the broad areas likely to be at risk of surface water flooding, i.e. areas where surface water would be expected to flow or pond. ‘Surface water’ is defined by the Flood and Water Management Act 2010 as the 'surface runoff' generated by rainwater (including snow and other precipitation) which is (a) on the surface of the ground (whether or not it is moving), and (b) has not yet entered a watercourse, drainage system or public sewer (excludes overflowing watercourses, drainage systems or public sewers caused by catchment-wide rainfall events or river flow).

4.1.17 The EA have provided the Flood Map for Surface Water for the Rackheath area (see Appendix B). The NDR crosses an area of “deeper surface water flooding” (>0.3m deep) for both the 1 in 30 and 1 in 200 year rainfall events within the catchment of Dobbs Beck. The 0.3m threshold is chosen as it represents a typical value for the onset of significant property damages when property flooding may start (above doorstep level) and because it is at around this depth that moving through floodwater (driving or walking) may become more difficult; both of which may lead users to consider the need to close roads or evacuate areas. The Dobbs Beck catchment area at the intersection with the proposed route of the NDR is 6.77km².

4.1.18 Table 4.1 provides an overview of the 31 attenuation lagoons, one large swale and one attenuation ditch which will serve the 20km road and in some cases will intercept a proportion of the overland flow. Four of the designed lagoons serve to contain overland flow only, with no contribution of runoff from the road (Lagoons 1A, 8A and 13A, and the new ditch 18B). The majority of lagoons will drain via infiltration to ground. The exceptions to this are lagoons 17 and 18 which are to be lined to prevent infiltration due to groundwater considerations (refer to Section 4.1.5) and will discharge to surface water. All lagoons have been sized to accommodate a 100-year return period storm event with an additional allowance of 30% for anticipated climate change, plus a minimum 300mm freeboard. Discharges from the lagoons to surface water will be restricted to the Greenfield runoff rate. All of the attenuation lagoons have been designed using the drainage modelling package Micro-Drainage. The Micro-Drainage calculation output files are provided in Appendix C.

4.1.19 Existing road drainage along Plumstead Road East is unlikely to change due to the junction improvement works. The capacity of existing kerbs and gullies along Crostwick Lane and the section of North Walsham Road it connects to will be reviewed during the detailed design stage, and will be upgraded if necessary. Road drainage along the new road between Green Lane West and Wroxham Road will be a traditional system based on kerbs, gullies and a soakaway.

4.1.20 Given that the drainage proposals have been designed in line with the CIRIA SUDS Manual C697, and are capable of managing the 1 in 100-year storm event plus 30% allowance for climate change, plus a minimum 300mm freeboard, it is considered that the risk of surface water flooding to the majority of the scheme is negligible. Only minor risks are considered to remain due to the sections of the drainage system which rely on gullies and pipe work. These elements of the system are designed to manage the 1 in 30-year event and are more vulnerable to blockage than the SuDS based

elements. However, flow routes for runoff exceeding the 1 in 30-year design standard are to be considered within the detailed design and thus the impact of any potential flooding will be negligible.

4.1.21 In consultation with the EA it has been agreed that the period over which the attenuation lagoons empty by half can be extended beyond the normal EA requirement of 24 hours. However, it is calculated that due to poor infiltration rates, some lagoons will take more than seven days to fully empty; giving rise to the risk of overtopping during a follow-on storm event. This risk is further mitigated by designing these lagoons to have sufficient volume to contain a follow-on 10-year return period storm within the freeboard. This residual risk is considered in Section 6.1.

4.1.22 During the construction phases, it is proposed that overflows will be controlled within the highway, and will be directed toward overflow 'outlets', and toward areas where overflows can pond safely. Safe areas of storage are proposed to be located or constructed away from the highway pavement.

Table 4.1: Surface Water Drainage Arrangements

Lagoon/ Ditch Site Reference	Road Chainage (m)	Overland Catchment Draining to Lagoon	Minimum Infiltration Rate (m/hr)	Max. Control Flow (l/s)	Half drain down time (mins)
1	650	NDR – Single/Dual Carriageway & 1 roundabout & OL01A (32ha)	0.432	N/A	148
1a (OL Only)	600	Overland flow catchment only: OL02 (91.4ha), OL02A (15.220ha) & OL02B (3.72ha)	0.432	N/A	153
2	1625	Fir Covert Road Roundabout	0.072	N/A	560
3	2820	NDR – Dual	0.050	N/A	1078

		Carriageway			
4	3125	NDR Dual Carriageway & 1 Roundabout & OL03A (9.73ha)	0.162	N/A	356
5	4200	NDR – Dual Carriageway & OL04 (23.15ha)	0.036	N/A	1707
6	500 Offline	Drayton Lane Roundabout (South) & OL05B (14.37ha)	0.144	N/A	415
6a	500 Offline	Drayton Lane Roundabout (North)	0.09	N/A	448
8	320 Offline	Cromer Road Roundabout (South)	0.028	N/A	2373
8a (OL only)	340 Offline	Cromer Road Junction (South-west) & OL06 (90ha)	0.028	N/A	3438
9	0 Offline	Cromer Road Roundabout (North)	0.021	N/A	2894
12	8900	NDR - Dual Carriageway and 1 Roundabout & OL09 (11.39ha)	0.119	N/A	544
13	9800	NDR – Dual Carriageway	0.005	N/A	Exceeds 7 days
13a (OL only)	9900	Overland flow catchment only - OL11 (39.02ha)	0.005	N/A	Exceeds 7 days
14	180 Offline	NDR – Dual Carriageway & Buxton Road (North)	0.059	N/A	1124

14a	430 Offline	Buxton Road (South) and OL13 (30.89ha)	0.026	N/A	2525
16	12800	NDR – Dual Carriageway & 1 roundabout	0.162	N/A	338
17	13400	NDR – Dual Carriageway and OL16A (3.98ha) and OL16B (3.63ha)	N/A	5	N/A
18	14600	NDR – Dual Carriageway	N/A	10.7	N/A
18a	14450	NDR - Dual Carriageway & Wroxham Road Roundabout	0.003	N/A	9047
18b ditch (OL only)	14780	Overland flow catchments (OL18 and OL20)	N/A	N/A	N/A
19	16200	Salhouse Road Roundabout & OL22 (12.12ha)	0.068	N/A	614
20	16400	NDR – Dual Carriageway	0.013	N/A	3460
21	140 Offline	Plumstead Road and link road	0.027	N/A	1556
22	160 Offline	NDR Dual Carriageway & 1 Roundabout & Plumstead Road Link Road	0.004	N/A	Exceeds 7 days
23	18160	NDR – Dual Carriageway & Toad	0.018	N/A	Exceeds 7 days

		Lane & OL27 (6.98ha)			
24	18760	NDR – Dual Carriageway	0.001	N/A	Exceeds 7 days
25	19350	NDR – Dual Carriageway & OL29 (4.42ha)	0.001	N/A	Exceeds 7 days
26 (Basin 1)	500 offline	Postwick - Dual Carriageway & 2 roundabouts	0.104	N/A	372
27 (large swale)	19600	Postwick - Dual Carriageway	N/A	N/A	N/A (lined)
28 (Basin 3)	100 offline	Postwick - Dual Carriageway, Slip Roads & Roundabout	N/A	N/A	N/A (lined)
29 (Basin 5)	400 offline	Postwick - P&R Signalised Junction & OL35B (2.022ha)	0.112	N/A	547
30 (Basin 6)	300 offline	Postwick - Dual Carriageway & OL32B (2.12ha)	0.031	N/A	2245

Overland flow flooding and cross-drainage design

4.1.23 As noted in section 4.1.3 above, the FMfSW indicates that the NDR will cross an area of “deeper surface water flooding” within the catchment of Dobbs Beck. This is supported by the EA maps of Areas Susceptible to Surface Water Flooding (ASSwF). These maps shows areas that are susceptible to surface water flooding, with three bandings, indicating ‘Less’ to ‘More’ susceptible to surface water flooding. The maps show the NDR crosses just one area ‘more’ susceptible to surface water flooding (see Appendix B). This is where it crosses the catchment of Beck Brook and Dobbs Beck, and the ASSwF therefore indicates similar risk to the FMfSW.

4.1.24 Analysis of the DTM constructed as part of this assessment indicates that the NDR bisects 43 natural catchments over its proposed 20km route. Figure 4.2 illustrates the location of each of these catchments and Table 4.2 summarises their characteristics. Whilst none of the catchments possess an active watercourse at the NDR crossing location, all pose a potential flood risk to the route as a result of overland flow during a storm event. Moreover, topographical changes as part of the proposals have the potential to increase flood risk elsewhere within the catchment if, for example, overland flow were to gather upstream of an embankment.

4.1.25 To reduce this potential increase in flood risk, culverts are proposed at the low points of the overland flow catchments, where flow is not directed and stored within the proposed infiltration lagoons. The culverts convey the overland flow to the other (down gradient) side of the road. In most catchments spreader ditches are also proposed along the road edge or embankment toe to direct flow to these culverts and promote infiltration. No culverts are proposed or considered necessary at the offline road sections (beyond chainage 20,000) at Postwick. No culverts are likely to be required at the three offline junction improvement sites; however the potential need to use culverts will be reviewed during the detailed design stage.

4.1.26 Using the DTM in GIS, catchment areas for overland flow have been defined. Hydrological catchment descriptors were obtained from the Flood Estimation Handbook (FEH). The revitalised method for estimating design-flood hydrographs (ReFH) was utilised, with outputs from FEH and GIS, to generate the rainfall and thence flood hydrographs for each catchment for a 1 in 100-year event, 24 hour storm duration. The level of infiltration was based on the FEH catchment descriptors. A hydrograph for each catchment for the climate change scenario (+30% rainfall depth) was calculated and utilised to estimate the ‘critical volume’ of overland flow which would be generated by each catchment upstream of the road crossings. This was used as the inflow volume to the culvert.

4.1.27 Two scenarios were applied to these calculations; a Blockage Scenario and an Operational Scenario (functioning culvert or where no culvert is proposed). The Blockage Scenario assumes that the proposed culverts are completely blocked and remain so for 24 hours, thus producing a worst-case flood extent. The flood level and flood extent upstream of the culvert was mapped in GIS based on the ‘critical volume’ and levels in the DTM.

4.1.28 The Operational Scenario assumes that the proposed culverts are operating as intended during a 1 in 100-year flood event + 30% for climate change. The

peak value of runoff during any half hour period during the design storm was determined using the ReFH output. The required headloss across the culvert to pass this discharge was identified based on the culvert diameter. The maximum upstream water level during the storm was then taken as the headloss height above the culvert at the upstream inlet. The flood extent upstream of the culvert was mapped in GIS based on this water level and levels in the DTM. The calculation summary sheets are provided in Appendix D and a summary provided in Table 4.2 . The culvert Blockage Scenario is 'not applicable' (N/A) for those catchments where overland flow is directed to and stored within proposed infiltration ponds. The Operation Scenario is not applicable for a catchment where no culvert is proposed. Due to the size of the box culvert for catchment OL20 (2500mm), no blockage scenario is considered.

Table 4.2: Overland Flow Catchments, Volumes and Flood Levels

Catchment Reference	Road Chainage of Catchment Low Point (m)	Catchment Area (km²)		Culvert Blockage or No Culvert Scenario		Culvert Operational Scenario (1:100 yr+30%CC)	
			Receiving Drainage Structure	Flooded Volume (m³)	Maximum Flood Level (mAOD)	Flooded Volume (m³)	Maximum Flood Level (mAOD)
OL01A	600	0.48	Lagoon 1 (32ha) & spreader ditch	N/A	N/A	N/A	N/A
OL01B	1800	0.05	Spreader ditch	2928	15.83	N/A	N/A
OL01C	2250	0.04	Spreader ditch	238	40.21	N/A	N/A
OL02C	1050	0.91	Lagoon 1A	N/A	N/A	N/A	N/A
OL02A	600	0.15	Lagoon 1A	N/A	N/A	N/A	N/A
OL02B	300	0.04	Lagoon 1A	N/A	N/A	N/A	N/A
OL03A	3200	0.10	Lagoon 4	N/A	N/A	N/A	N/A
OL03B	3800	0.09	Spreader ditch & 450mm culvert	1421	33.65	219	33.28

Catchment Reference	Road Chainage of Catchment Low Point (m)	Catchment Area (km²)		Culvert Blockage or No Culvert Scenario		Culvert Operational Scenario (1:100 yr+30%CC)	
			Receiving Drainage Structure	Flooded Volume (m³)	Maximum Flood Level (mAOD)	Flooded Volume (m³)	Maximum Flood Level (mAOD)
OL03C	4100	0.03	Spreader ditch & 450mm culvert	425	33.73	186	33.59
OL04	4650	0.23	Lagoon 5 & 450mm culvert	5300	30.35	1276	29.92
OL05A	600 offline	0.04	Lagoon 6 & 450mm culvert	641	34.91	41	34.31
OL06	300 offline	1.15	Lagoon 8A (90ha) & spreader ditch	6582	28.43	N/A	N/A
OL07B	400 offline	0.11	Spreader ditch	666	24.35	N/A	N/A
OL08	7100	0.18	450mm culvert	1044	30.27	122	29.79
OL09	8400	0.11	Lagoon 12	815	26.46	N/A	N/A
OL10	9200	0.03	450mm culvert	186	28.36	36	28.07

Catchment Reference	Road Chainage of Catchment Low Point (m)	Catchment Area (km²)		Culvert Blockage or No Culvert Scenario		Culvert Operational Scenario (1:100 yr+30%CC)	
			Receiving Drainage Structure	Flooded Volume (m³)	Maximum Flood Level (mAOD)	Flooded Volume (m³)	Maximum Flood Level (mAOD)
OL11	9800	0.39	Lagoon 13A	N/A	N/A	N/A	N/A
OL12	10850	0.55	450mm culvert	5268	23.61	292	22.68
OL13	10950	0.62	Lagoon 14A (30.89ha) & spreader ditch	N/A	N/A	N/A	N/A
OL14	11600	0.06	Spreader ditch	572	26.01	N/A	N/A
OL15A	12050	0.15	450mm culvert	797	25.46	422	25.32
OL15B	12500	0.33	450mm culvert	1781	18.86	211	18.30
OL16	12800	1.05	525mm culvert	5449	16.37	199	14.51
OL16A	13000	0.04	Lagoon 17	N/A	N/A	N/A	N/A
OL16B	13350	0.04	Lagoon 17	N/A	N/A	N/A	N/A

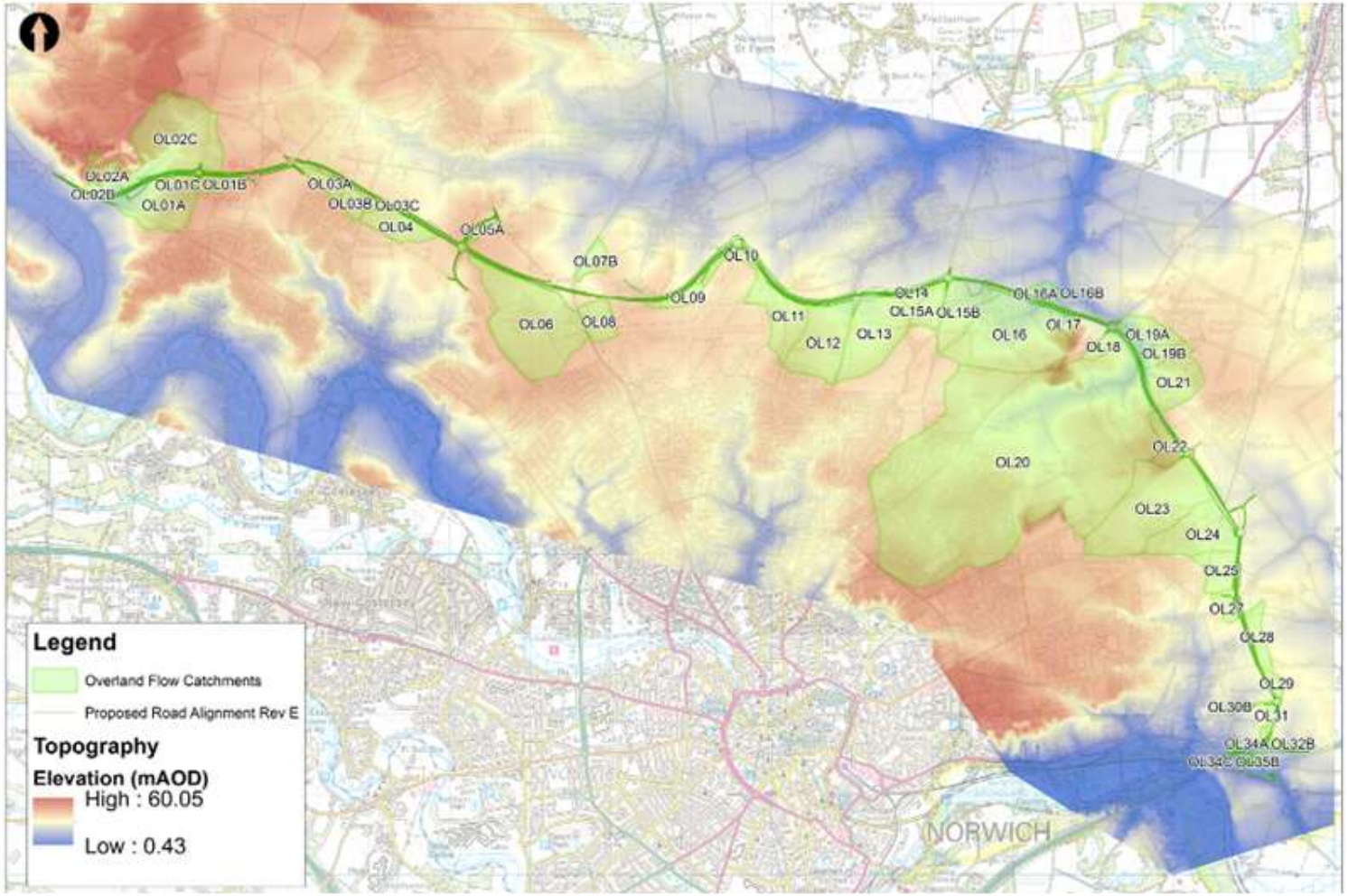
Catchment Reference	Road Chainage of Catchment Low Point (m)	Catchment Area (km²)		Culvert Blockage or No Culvert Scenario		Culvert Operational Scenario (1:100 yr+30%CC)	
			Receiving Drainage Structure	Flooded Volume (m³)	Maximum Flood Level (mAOD)	Flooded Volume (m³)	Maximum Flood Level (mAOD)
OL17	13650	0.08	450mm culvert	470	17.92	47	17.26
OL18	14450	0.09	Draining to OL20 via filter drain	N/A	N/A	N/A	N/A
OL19A	14300	0.22	600mm culvert	1171	16.19	481	13.70
OL19B (& OL21)	14300	0.11	600mm culvert	921	20.27	481	16.24
OL20 (& OL18)	14700	6.77	2500mm culvert	37,819	17.91	N/A	N/A
OL22	16000	0.12	Lagoon 20	N/A	N/A	N/A	N/A
OL23	16400	1.05	450mm culvert	5708	26.09	630	25.63
OL24	16650	0.49	450mm culvert	2693	24.45	153	23.79

Catchment Reference	Road Chainage of Catchment Low Point (m)	Catchment Area (km²)		Culvert Blockage or No Culvert Scenario		Culvert Operational Scenario (1:100 yr+30%CC)	
			Receiving Drainage Structure	Flooded Volume (m³)	Maximum Flood Level (mAOD)	Flooded Volume (m³)	Maximum Flood Level (mAOD)
OL25	17600	0.21	450mm culvert	1185	26.96	26	26.50
OL27	18100	0.07	Lagoon 23 via 450mm culvert	372	25.78	0	25.82
OL28	19300	0.14	450mm culvert	825	25.32	185	25.10
OL29	19375	0.04	Lagoon 25	N/A	N/A	N/A	N/A
OL30	Offline at 20000	0.022	Lagoon 26	N/A	N/A	N/A	N/A
OL31	Offline at 20000	0.022	Swale (27)	N/A	N/A	N/A	N/A
OL32	Offline at 20000	0.016	Lagoon 30 (0.012km^2)	N/A	N/A	N/A	N/A
OL33	Offline at 20000	0.003	Lagoon 28	N/A	N/A	N/A	N/A
OL34	Offline at 20000	0.036	A47 Eastbound Offslip drainage	N/A	N/A	N/A	N/A

Catchment Reference	Road Chainage of Catchment Low Point (m)	Catchment Area (km²)		Culvert Blockage or No Culvert Scenario		Culvert Operational Scenario (1:100 yr+30%CC)	
			Receiving Drainage Structure	Flooded Volume (m³)	Maximum Flood Level (mAOD)	Flooded Volume (m³)	Maximum Flood Level (mAOD)
			system				
OL35	Offline at 20000	0.02	Lagoon 29 (0.016km^2)	N/A	N/A	N/A	N/A

4.1.29 The potential lowering of the carriageway elevation by up to 0.25m (0.5m at roundabouts) has been assessed in relation to the design of the cross drainage structures. For structural reasons there is a requirement for a minimum cover distance from the carriageway surface to the top of each culvert. If this were to require any of the culverts to be depressed significantly below natural ground level at the crossing points, then their effectiveness would be reduced. Provided that this condition can be avoided, then reduction in carriageway design level would cause no increase in flood risk to others from the development. With lowering of the carriageway there may be some increase in the risk of flood water getting on to the road in a culvert blockage scenario (likely at OL01C), but this should be manageable with the proposed road drainage arrangements.

Figure 4.2: Overland Flow Catchments



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4.1.30 The flood extents generated by both scenarios have been mapped and are shown in Appendix E. For the Operational Scenario there was shown to be no significant backing up behind the culverts. For the Blockage Scenario the upstream flood extents produced were in some cases significant, as would be expected for a total blockage. In producing these maps it has been assumed that the flood extents stop at the road edge or embankment toe, the resultant maximum flood levels have then been used to inform the elevation of the road or flood bund.

4.1.31 As shown by the maps in Appendix E, no residential properties will be put directly at risk as a result of the worst-case Blockage Scenario flood extents. The extents for catchment OL12 cross a residential property boundary, but do not pose a risk to the house, only to the garden and an outbuilding.

4.1.32 An Anglian Water pumping station is located within the low point at chainage 14,750, along the track immediately south of Lagoon 18. The pumping station is considered to be 'water compatible infrastructure' in the NPPF Technical Guidance and should be designed and constructed to remain operational and safe for users in times of flood. Anglian Water has confirmed this pumping station has suffered from pluvial flooding in the past. There is a small wall around the wet well and sand bags have been used in the past to prevent the building from flooding but there is no other protection in place.

4.1.33 Three culverts are proposed in this area: (i) 2500mm wide and 2000mm high box culvert beneath the NDR (oversized for ecological mitigation), (ii) 600mm diameter pipe beneath the track connecting the new ditch 18B to Dobbs Beck, and (iii) an approx. 600mm diameter pipe under Wroxham Road. An existing culvert is present under the track leading to the pumping station but has been filled in. No blockage of the 2500mm culvert is expected due to its size, however blockages of all other culverts have been considered (see Appendix E, Drawing numbers MMD-233906-DT-0828 to 0858). During the design flood event 'Culvert for OL19B' (600mm) receives significant volumes of overland flow from catchments OL18, OL20, OL21 and OL19B. The flood extents and levels under the Operational Scenario pose no risk of flooding to the pumping station. Under the Blockage Scenario the elevation of the track was not considered, which will be raised to 15mAOD where the new culvert is proposed as part of the Scheme. As the ground to the north of the track is at a lower elevation than the track itself, it is assumed the track would act as a weir, allowing flood waters to flow over the track and into Dobbs Beck. The depth of water on the track is expected to be ~0.1m, and is therefore unlikely to prevent access to and from the pumping station even for the occurrence of a total culvert blockage during a severe flood event.

4.1.34 The creation of this new above ground flow path under the NDR and along the new ditch is likely to reduce the overall risk of pluvial flooding in the area by improving the conveyance of flood waters towards Dobbs Beck and into 'The Springs' lakes.

Groundwater flooding

4.1.35 Groundwater flooding occurs in areas underlain by significant aquifers where the groundwater levels rise above surface elevations. Groundwater flooding differs to river flooding as it is not necessarily linked to specific rainfall events, is difficult to predict and may persist for a much longer duration.

4.1.36 As part of the design process, a ground investigation has been undertaken by Norfolk Partnership Laboratory on behalf of Norfolk County Council. This work included the drilling of a series of boreholes along the proposed route of the NDR in order to determine the ground conditions; piezometers have subsequently been installed in a number of these boreholes to monitor the groundwater table.

4.1.37 Table 3.3 provides a summary of the groundwater level data collected since monitoring began in March 2007. As shown, the maximum groundwater level varies from 2.05m to 19.64m below ground level (mbgl) (12.39mAOD to 1.44mAOD) within the vicinity of the proposed route. Annual variations in groundwater are typically in the order of one to two metres a year. Increased infiltration from the road runoff could potentially surcharge the local groundwater level and groundwater flows in the immediate vicinity of the infiltration lagoons. However, the use of grass swales, filter drains and spreader ditches will ensure that this risk is minimised by enabling rainfall from the road to infiltrate over a wider area. Thus, it is predicted that there will not be any significant risk of groundwater flooding affecting the road or local area.

4.1.38 In consultation with the EA, it has been specified that the invert levels of the infiltration basins are to be at least 1.2 m above the groundwater table to allow sufficient unsaturated zone to mitigate the risk of groundwater contamination. As shown in Table 4.3, all lagoons satisfy this requirement except Lagoon 17 where the base is 0.6m abovethe highest GW level and Lagoon 18 with a 0.8m unsaturated zone, both of which are intended to be lined and outfall to nearby watercourses. Further ground investigations are proposed at Lagoon 17 to inform the detailed design stage, as the groundwater levels used are from a borehole more than 500m away.

4.1.39 The 1.2m unsaturated zone is also not met at Lagoon 4 (0.4m unsaturated zone), Lagoon 8 (1.1 m unsaturated zone) and Lagoon 9 (1.12m unsaturated zone) requiring deepening due to the fall required on the outfall. It is not possible to line the infiltration pond at Lagoons 4, 8 and 9 as there is no watercourse to receive a positive outfall. The detailed design will be agreed with the Environment Agency, including the potential need to raise lagoon invert levels.

4.1.40 In exceptionally wet winters the groundwater level may rise to cause inundation of the normally dry valley between the lake and Dobbs Beck, although the extent of flooding would be restricted by the valley topography. Ground investigations in the higher ground away from the Dobbs Beck valley floor suggest there may be some minor perched water in the less permeable geological formations. This may cause additional volumes of water requiring storage in this area. However, flows are likely to be minimal and would be routed away from the road to storage locations by the proposed drainage system.

4.1.41 Taking into consideration the data shown in Table 4.3, it can be concluded that flood risk to the NDR arising from groundwater is likely to be minimal since the proposed road level would be above the maximum groundwater level and any seepage from perched water would be managed. Any potential influences on groundwater flood risk in the local area are also considered to be negligible.

Table 4.3: Groundwater Table Levels

Piezometer Reference	Road Chainage (m)	Preliminary Road Level (mAOD)	Borehole Cover Level (mAOD)	Maximum Groundwater Level		Average Groundwater Level		Invert Level of Nearest Lagoon (mAOD)	Unsaturated Zone Thickness (m)
				mBGL	mAOD	mBGL	mAOD		
PW1A (UC)	137	20.94	22.35	13.5	10.0	12.9	9.4		
PW3 (UC)	328	20.49	21.25	13.0	9.9	11.9	9.3		
P0 (UC)	497	16.5	16.51	7.7	9.9	7.1	9.4	13.4 (Lagoon 1) 15.0 (Lagoon 1A) 32.8 (Lagoon 2)	3.5 (Lagoon 1) 5.1 (Lagoon 1A) 22.9 (Lagoon 2)
P12 (GSG)	1,739	38.65	37.51	DRY	DRY	DRY	DRY		
P16 (GSG)	2064	38.37	39.73	DRY	DRY	DRY	DRY		
6P (GSG)	2,402	36.62	39.54	10.6	30.9*	8.8	29.1	32.4 (Lagoon 3) 31.3 (Lagoon	1.5 (Lagoon 3) 0.4 (Lagoon

								4)	4)
6B (UC)	2,412	36.62	39.54	9.4	31.3	8.7	30.8		
P47 (CT)	5,143	32.38	35.88	DRY	DRY	DRY	DRY	26.8 (Lagoon 5)	
P49 (CT)	5,359	33.68	37.49	DRY	DRY	DRY	DRY	26.0 (Lagoon 6) 30.9 (Lagoon 6A)	
P57 (GSG)	6,155	31.83	33.07	5.7	29.2	4.7	28.4		
15P5 (CG/UC)	6,804	24.70	28.57	8.8	21.0	8.2	20.2	22.1 (Lagoon 8) 24.6 (Lagoon 8A) 21.2 (Lagoon 9)	1.11 (Lagoon 8) 3.6 (Lagoon 8A) 1.12 (Lagoon 9)
P87 (UC)	9,126	26.85	27.34	13.0	15.3	12.6	14.7	19.4 (Lagoon 12)	4.1 (Lagoon 12)
P97 (CT)	10,237	28.00	30.93	DRY	DRY	DRY	DRY	20.5 (Lagoon	

								13) 21.2 (Lagoon 13A)	
P101 (CT)	10,611	25.2	26.59	5.3	21.3	5.3	21.3		
22P4 (UC)	10,923	20.0	22.47	9.8	13.3	9.5	13.0		
P8A (UC)	11,010	18.87	18.39	9.6	13.2	5.8	12.6	16.6 (Lagoon 14)	3.4 (Lagoon 14)
P124 (CG)	12,904	18.47	20.77	DRY	DRY	DRY	DRY	14.1 (Lagoon 16)	
GW3A (UC)	13,254	15.69	14.80	2.9	12.6	2.5	12.3	12.0 (Lagoon 17)	-0.6 (Lagoon 17)
GW6 (UC)	14,204	17.90	15.28	3.4	12.4	3. 1	12.2		
GW11A (UC)	14,711	16.43	14.44	2.6	12.4	2.3	12.2	13.2 (Lagoon 18) 14.00 (Lagoon 18A)	0.8 (Lagoon 18) 1.6 (Lagoon 18A)
BH147A	15,150	24.96	29.95	18.1	12.4	17.5	12.2		

(CG)									
BH147B (CG)	15,150	25.09	29.91	DRY	DRY	DRY	DRY		
P153(GSG)	15,769	28.98	31.31	DRY	DRY	DRY	DRY	25.1 (Lagoon 19)	
BH1 (GSG / CTCG)	16,490	24.24	25.86	8.5	18.2	7.6	17.1	25.1 (Lagoon 19) 25.9 (Lagoon 20)	6.9 (Lagoon 19) 7.7 (Lagoon 20)
BH14 (CT/CG)	16,868	33.95	24.22	8.3	18.5	6. 8	17.7		
BH234(CG)	16,917	33.0	24.32	8.7	18.3	6.8	16.4		
BH13 (CG/UC)	16,948	33.46	24.46	7.4	19.7	6.8	17.7		
BH235 (CG)	17,035	31.0	24.98	7.5	18.3	7.0	18.0		
BH18 (CG/UC)	17,035	30.85	24.43	13.9	18.0	8.2	17.3	22.2 (Lagoon 21) 21.6 (Lagoon	4.2 (Lagoon 21) 3.6 (Lagoon

								22) 23.4 (Lagoon 23)	22) 5.4 (Lagoon 23)
BH17 (CT/CG)	17,045	30.85	25.02	7.8	18.6	7.3	17.8		
P190 (CG)	19,469	26.43	26.54	18.2	9.1	17.9	8.8	21.8 (Lagoon 24) 22.8 (Lagoon 25)	12.7 (Lagoon 24) 13.7 (Lagoon 25)
P196 (UC)	20,127	24.22	21.08	20.3	1.4	20.0	1.1	9.4 (Lagoon 29) 15.4 (Lagoon 30)	8.0 (Lagoon 29) 14.0 (Lagoon 30)

** The nearest trial pit to piezometer 15P5 was TP26, with a water strike of 29.6mAOD. Boreholes 227 and 228 have observed similar groundwater levels. The variation observed at P6 has been applied to the water strike of 29.6mAOD due to its closer proximity to Lagoons 3 and 4; giving a more representative maximum groundwater level.*

4.1.42 The potential lowering of the carriageway elevation by 0.25m (0.5m at roundabouts) has been assessed against the maximum groundwater levels observed along the NDR. Provided the distance between the base of the road and the maximum levels is maintained at or more than 1.2m, no change to the risk of groundwater flooding is expected.

4.2 Climate Change Impacts

4.2.1 Given the potential sources of flooding outlined previously, the only aspect of climate change likely to impact the proposed route of the NDR is the variation in rainfall patterns. DEFRA/NPPF guidance suggests an increase of 30% should be expected in peak rainfall intensity by the year 2115 . As outlined within Sections 4.1.3 and 4.1.4, this precautionary increase of 30% has been applied to calculations of surface water runoff from the road and adjacent natural catchments. As a result, the attenuation lagoons have been designed to contain a 100-year event plus 30% allowance for climate change. Where the half drain-down time exceeds 7 days, lagoons have been designed to have the capacity for a follow on 1 in 10 year event within the freeboard. In addition, capacity and flow routing for extreme events (up to the 1 in 1000-year event) have also been incorporated within the system. The capacities and consideration of climate change are shown in the micro drainage calculations for each lagoon in Appendix C.

4.2.2 The proposed Scheme would reduce the permeability within its footprint, due to areas of impermeable concrete and tarmac being constructed.

4.2.3 Considering the increase in rainfall due to climate change there may be a significant increase in surface water runoff. Without mitigation this may alter the fluvial and groundwater regimes and water quality both along the Scheme and in the surrounding area.

4.2.4 The drainage design, outlined in Section 4, has been developed to mitigate this increased runoff as a result of the proposed Scheme and climate change in order to comply with the NPPF.

5. Flood Risk Management Recommendations

5.1.1 This section outlines recommendations for the management of both on- and off-site flood risk identified as part of this FRA. It is intended for these recommendations to inform the ongoing design process for the Scheme. Also identified are areas requiring further assessment once these proposals have been prepared.

5.2 On-site flood management

5.2.1 As discussed within Section 4.1.4, the overland flow from catchments which will be bisected by the proposed route of the NDR will be managed through the use of appropriately sized attenuation lagoons, cross-drainage structures such as spreader ditches and culverts where feasible. Table 4.2 in Section 4.1.4 shows the calculated runoff volumes from these catchments and also estimates the water level to which these volumes would accumulate upstream of the road.

5.2.2 As described in Section 3.1, there is the potential for the NDR works to deviate from the current proposed elevation by +/- 0.5m during the detailed design stage. As described in Sections 4.1.4 and 4.1.5, any variation should maintain road surface elevations at above the estimated maximum flood levels calculated in Table 4.2 and above the maximum groundwater levels in Table 4.3. This assessment assumes there will be no variation to the high and low points of the road, therefore the associated road drainage arrangements remain the same.

5.2.3 A retention bund is required at OL02C (chainage 1,000) the crest level of the bunds is to be specified with reference to the maximum flood levels calculated in Table 3.2 plus a 300mm freeboard. The flood bund will protect the bridleway from the overland flow volume produced during a storm event, maintaining pedestrian access during a flood event.

5.2.4 Where cross-drainage structures are proposed, it will be necessary to consider the erosive potential of flow at the outfall of these pipes given the absence of natural channels to which discharge can be directed. Such calculations should be made with reference to CIRIA C551 . In the case of smaller pipes, it may be sufficient to specify stone blankets or gabion baskets to reduce the velocity (and thus erosive potential) of discharge. However for larger pipes and culverts, more substantial structures may be required such

as simple stilling basins or level spreaders; refer to CIRIA C697 for typical design specifications.

5.3 Maintenance

5.3.1 The culverts, spreader ditches, swales and attenuation lagoons proposed by the drainage design will be maintained in accordance with policies, standards and practices of Norfolk County Council's Transport Asset Management Plan and The SuDS Manual (CIRIA, 2007). Table 5.1 details the maintenance programme proposed.

5.3.2 In order to maintain the efficiency of the SuDS elements of the proposed drainage design, regular maintenance will be required. It is anticipated that swales, filter trenches and detention ponds will require regular inspection, litter and debris removal, and grass cutting, as well as occasional maintenance such as sediment management and vegetation replacement to retain design capacities and functionality. As outlined in the Norfolk's Transport Asset Management Plan, the maintenance of the NDR and its associated drainage is proposed to be the responsibility of Norfolk County Council including the actions outlined in Table 5.1.

Table 5.1: Proposed Drainage Maintenance Plan

Inspection	Safety inspections of carriageway, attention to known problems or specific areas after heavy rainfall as opportunity allows.
Do Minimum	The do minimum activities are the routine activities we carry out in order to ensure the safe passage of highway users. Cleansing activities (inc. gullies, outlets, grips annually. Use individual maintenance plan for systems if available) Drainage Investigation Add new provision grips, ditches, gullies and outlets
Medium Life	Reinforcement of existing system with additional capacity Pipeline repair to return capacity Partial pipeline upgrade Additional gullies

	Additional soakage capacity
Long Life	Significant renewal or enhancement New area provision Pipeline upgrade

6. Residual Risks

6.1 Residual risk of overtopping

6.1.1 As outlined in Section 4.1.3, due to poor infiltration rates, it is calculated that some of the attenuation lagoons will take over seven days to drain down from the design 1 in 100-year plus climate change storm. This could give rise to a residual risk of flooding should a follow-on storm event occur whilst the water level in the lagoon is still of sufficient height to cause overtopping. The magnitude and probability of combinations of storm events cannot be readily quantified, but the probability of a further significant storm event occurring within seven days of another will be extremely small. However, in order to mitigate against such an occurrence, these lagoons have been designed with additional capacity to allow for runoff from a follow-on 1 in 10 year storm event to be accommodated within the freeboard. This allowance has been agreed with the EA.

6.1.2 Taking into consideration the very small probabilities involved, it can be concluded that the residual risk of overtopping due to a follow-on event is negligible.

6.2 Residual risk of flooding from overland flow

6.2.1 The creation of the new above ground flow path under the NDR and along the new ditch in the Rackheath Springs area is likely to reduce the risk of pluvial flooding locally by improving the conveyance of flood waters towards Dobbs Beck and into ‘The Springs’ lakes. There remains a residual risk of pluvial flooding to the AWS pumping station. However, this risk will have been reduced from the existing situation by the NDR proposals.

6.3 Risk management by design

6.3.1 As the surface water storage is to be provided in the form of open basins, consideration for public safety is paramount. Therefore where the storage depth exceeds 1.2m, prohibitive planting will be provided to discourage access to the water. For those basins close to public access, perimeter fencing and lifesaving equipment will also be provided. Moreover, for reasons of maintenance ease as well as safety, all side slopes within the system, including those within the storage basin and swales, have been limited to 1 in 4.

7. Conclusions

7.1.1 As a part of the on-going consultation process with the Environment Agency, comments on the draft FRA were provided to Mott MacDonald on 28 November 2013. Responses to the issues raised can be found in Appendix F; along with supporting data and figures.

7.1.2 In accordance with the requirements of NPPF, the proposals for the development of the NDR have been assessed for flood risk, and consideration has been given both to risk to the proposed development, and to risk elsewhere as a result of the development.

7.1.3 The proposed Scheme and three offline junction improvements are entirely located within Flood Zone 1 where there is little or no annual probability of fluvial or tidal flooding. Table 3 of the NPPF Technical Guidance states all uses of land are appropriate in Flood Zone 1. As such, the proposed Scheme would be permitted within this zone.

7.1.4 The development of the NDR will introduce a significant amount of impermeable area to a previously undeveloped site. In compliance with NPPF, the highway drainage for the NDR has been designed in line with SuDS principals to restrict runoff to Greenfield discharge rates. Therefore flood risk due to surface water runoff will be mitigated to acceptable levels.

7.1.5 The proposed route will bisect 43 natural catchments and an assessment has been made of the potential runoff from these catchments. The resultant flood extents have been mapped upstream of the road where natural drainage paths will be severed within these catchments. Two scenarios were considered, culvert operational, and culverts fully blocked, and the flood extents from both will, at no point, affect any existing property or infrastructure. The exception is the Anglian Water pumping station near Lagoon 18, where there remains a residual risk from pluvial flooding. However, due to the lower elevation of ground upstream of the access track, the track would act as a weir and flood waters will flow towards Dobbs Beck. This, and the creation of a new above ground flow path, will improve the conveyance of pluvial flood flows in this area compared to the existing situation.

7.1.6 Given the depth of the groundwater table beneath the preliminary road levels, flood risk to the NDR and offline junction improvements arising from groundwater is likely to be minimal. Any residual risks, due to climate change

for example, would be easily managed by the proposed surface water drainage system.

7.1.7 With the implementation of the recommended flood risk management and drainage proposals within Section 5, the NDR and associated offline junction improvement proposals are considered to be acceptable in terms of flood risk and meet the requirements of NPPF.

8. References

JBA Consulting. 2006. Broadland, North Norfolk, and South Norfolk District Councils, Norwich City Council and the Broads Authority Strategic Flood Risk Assessment. http://www.northnorfolk.org/files/Flood_Risk_Assessment_Stage_1.pdf

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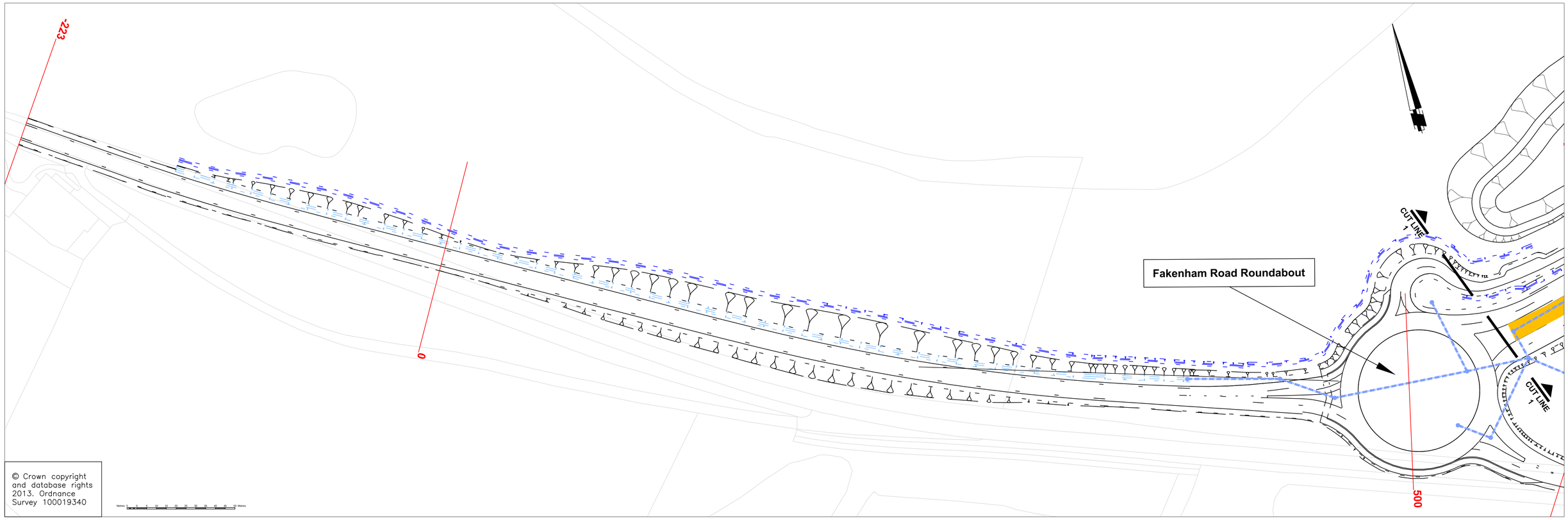
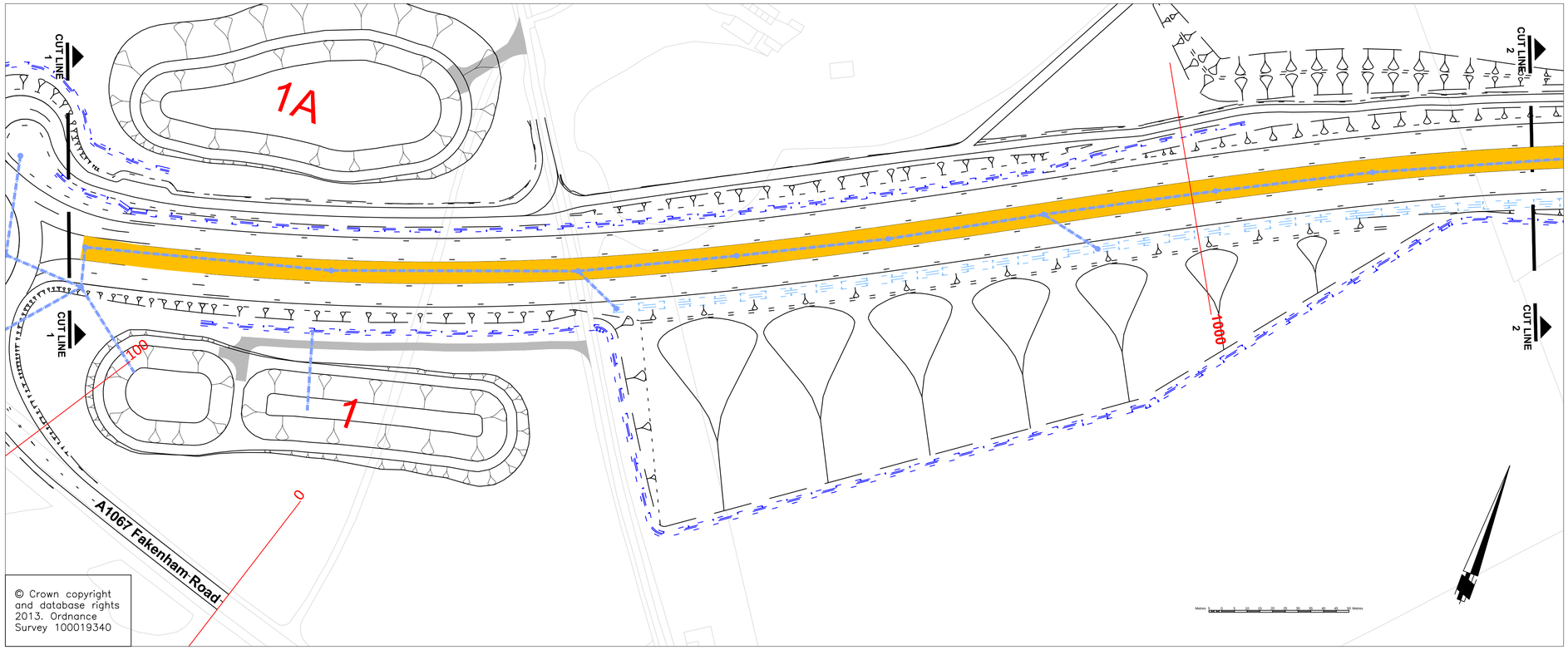
Hyder Consulting, 2013. Broadland District Council North East Norwich Water Cycle Study: Detailed Report. DRAFT June 2013.

Communities and Local Government. 2012. National Planning Policy Framework, Technical Guidance, Table 5.

CIRIA. 2002. Manual on scour at bridges and other hydraulic structures.

Appendix A. Road and Drainage Design Proposals





KEY

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- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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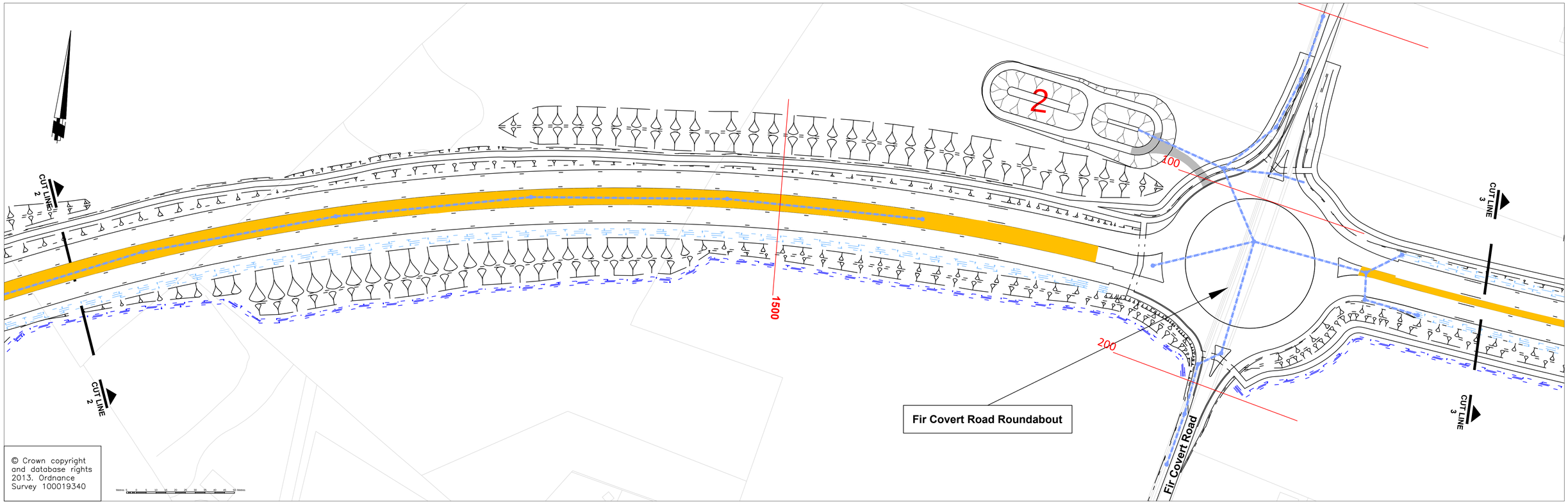

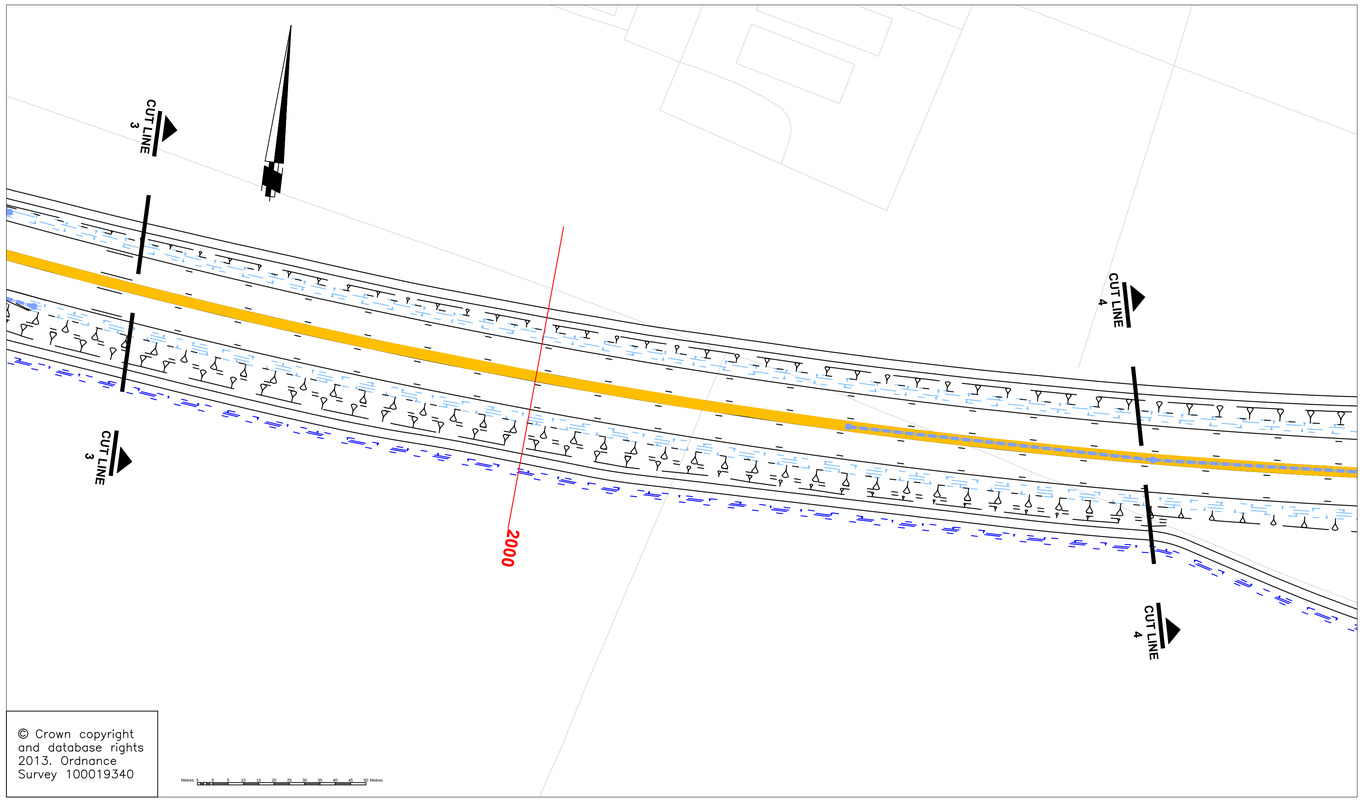

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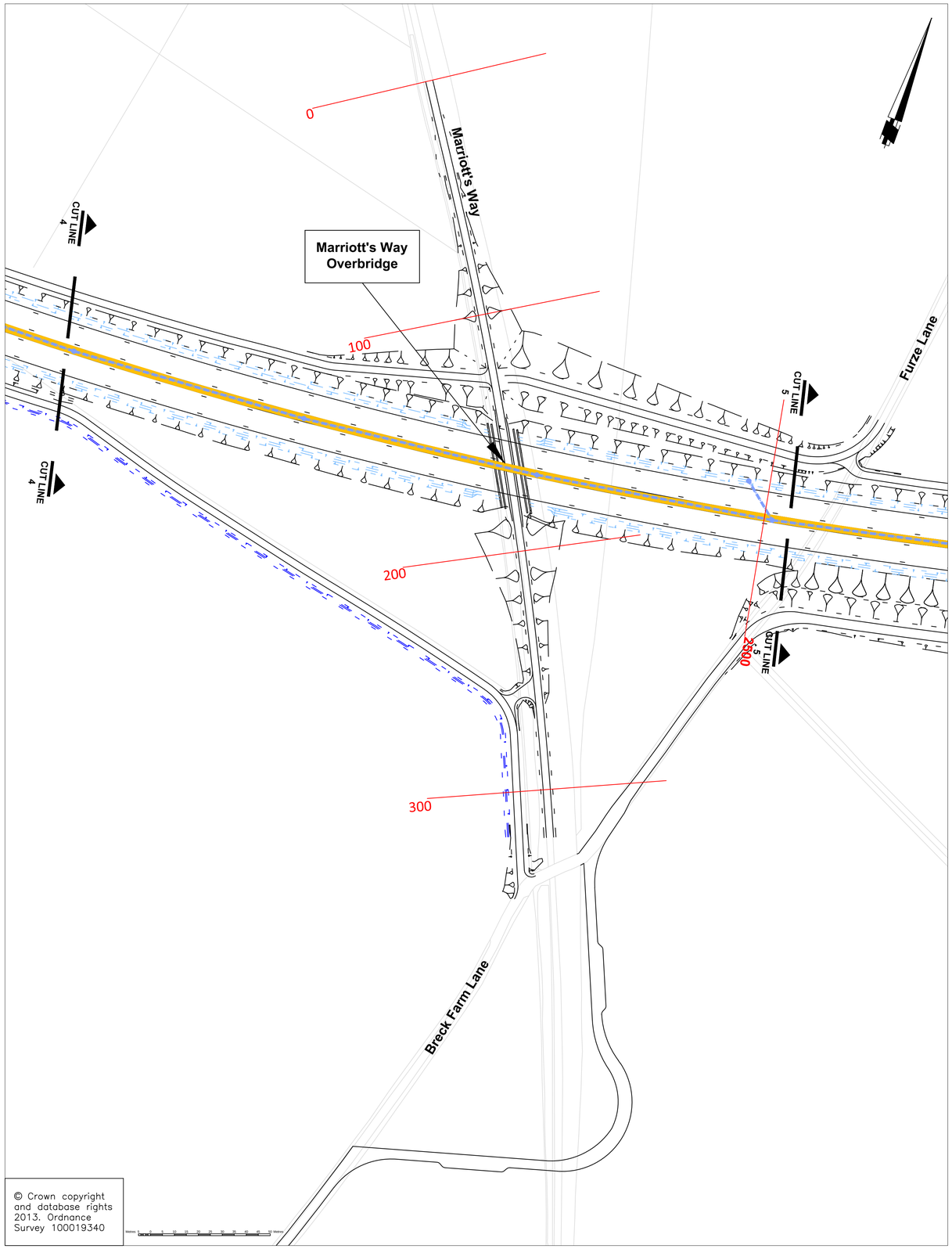

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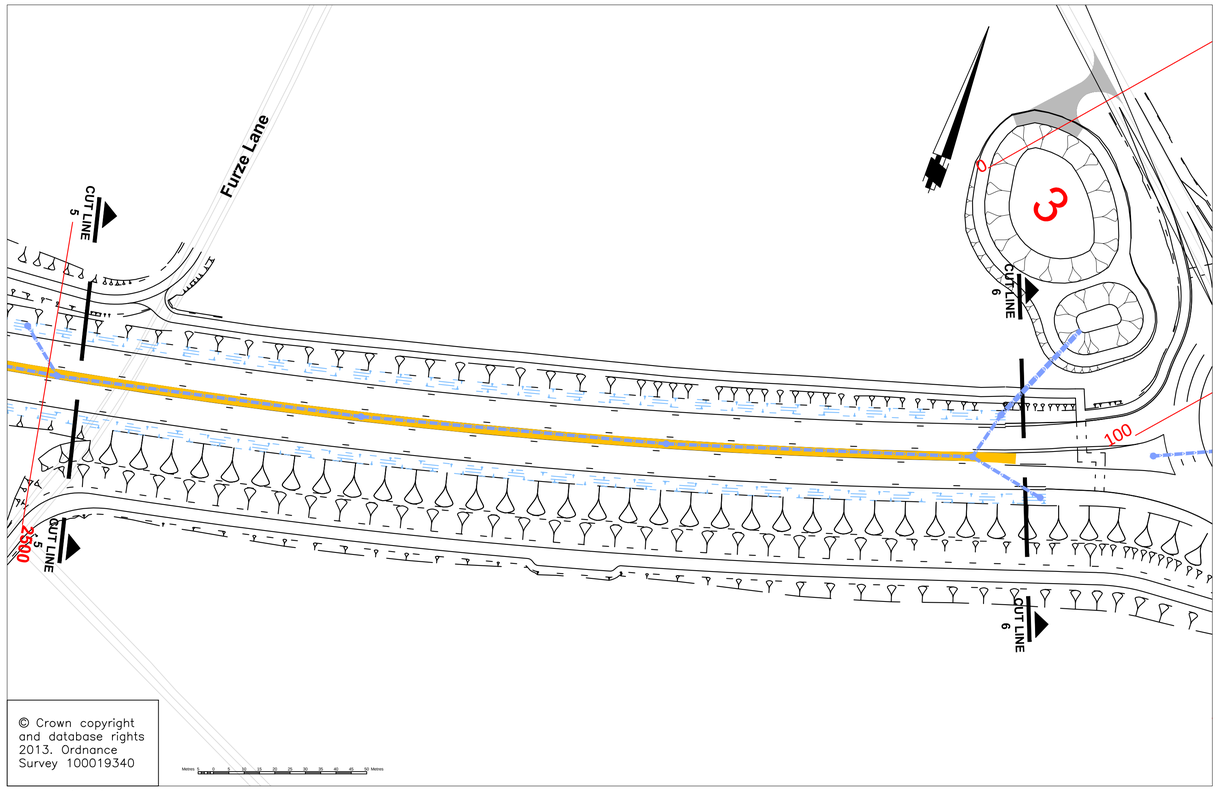

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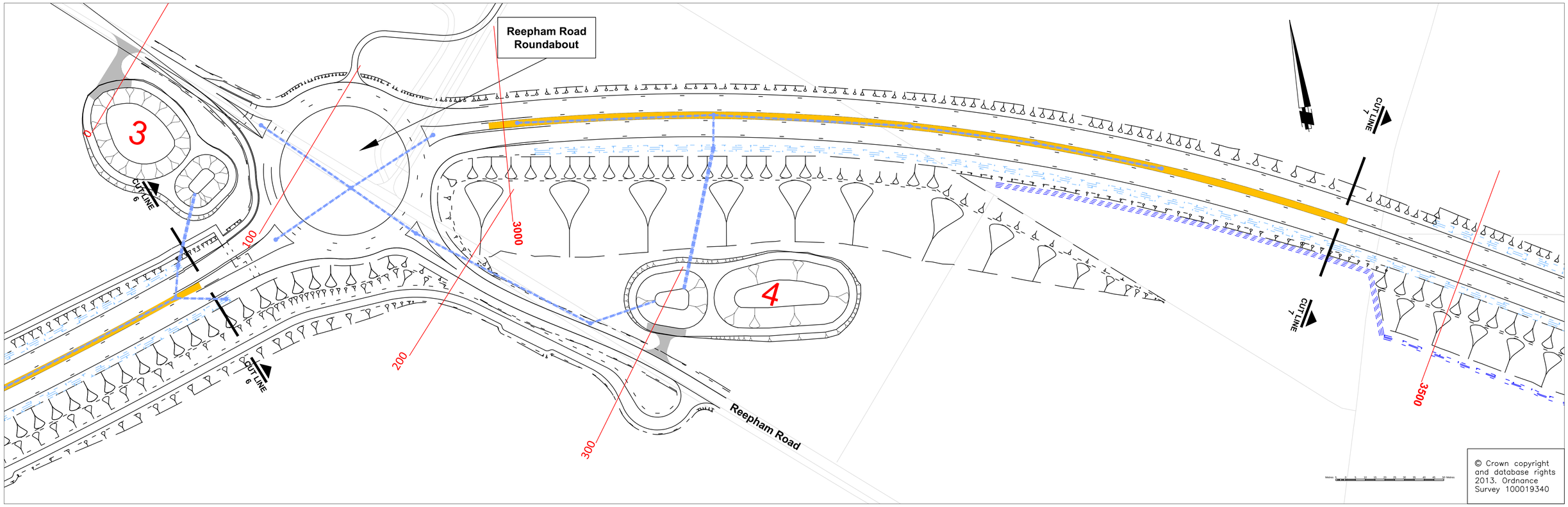

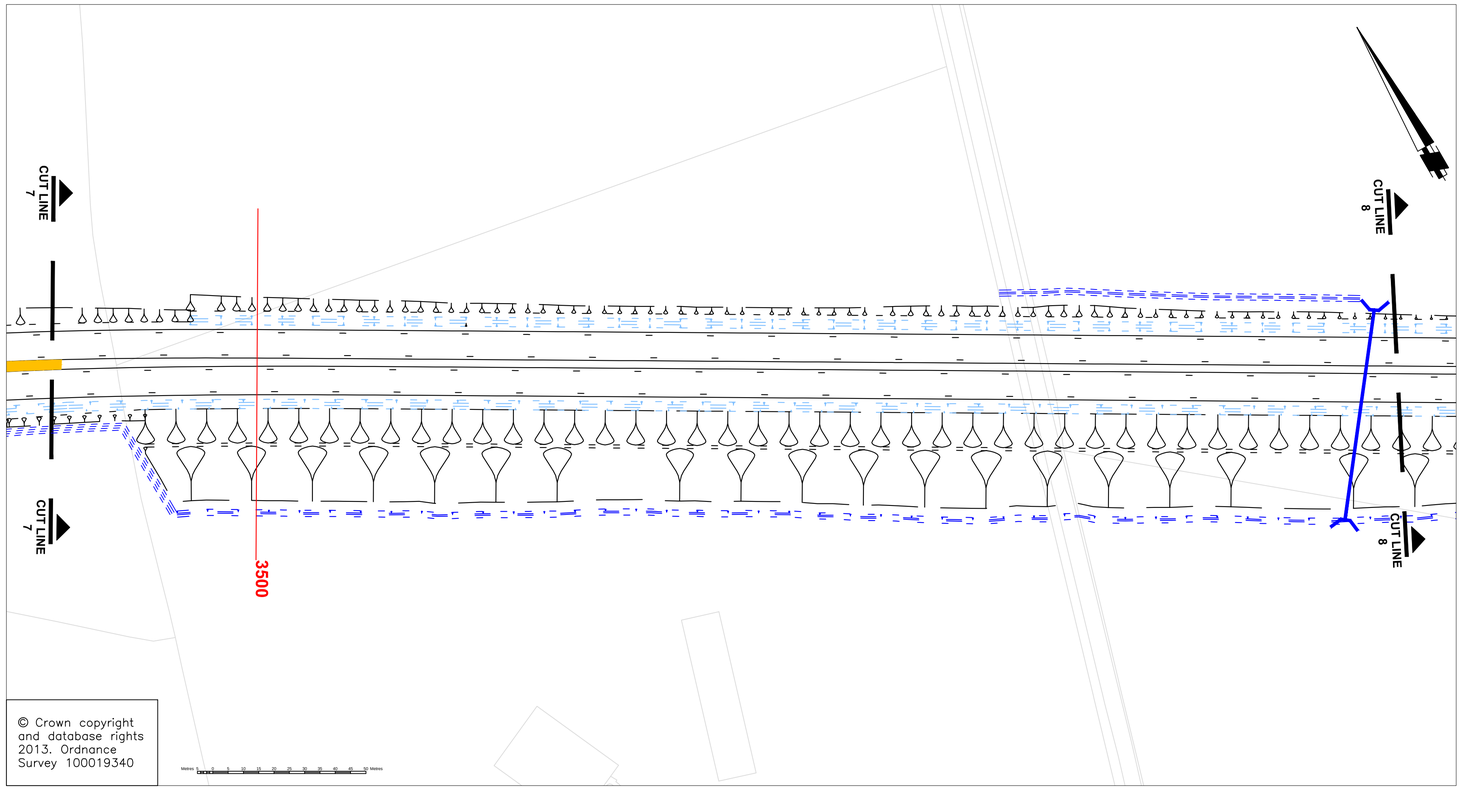

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- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

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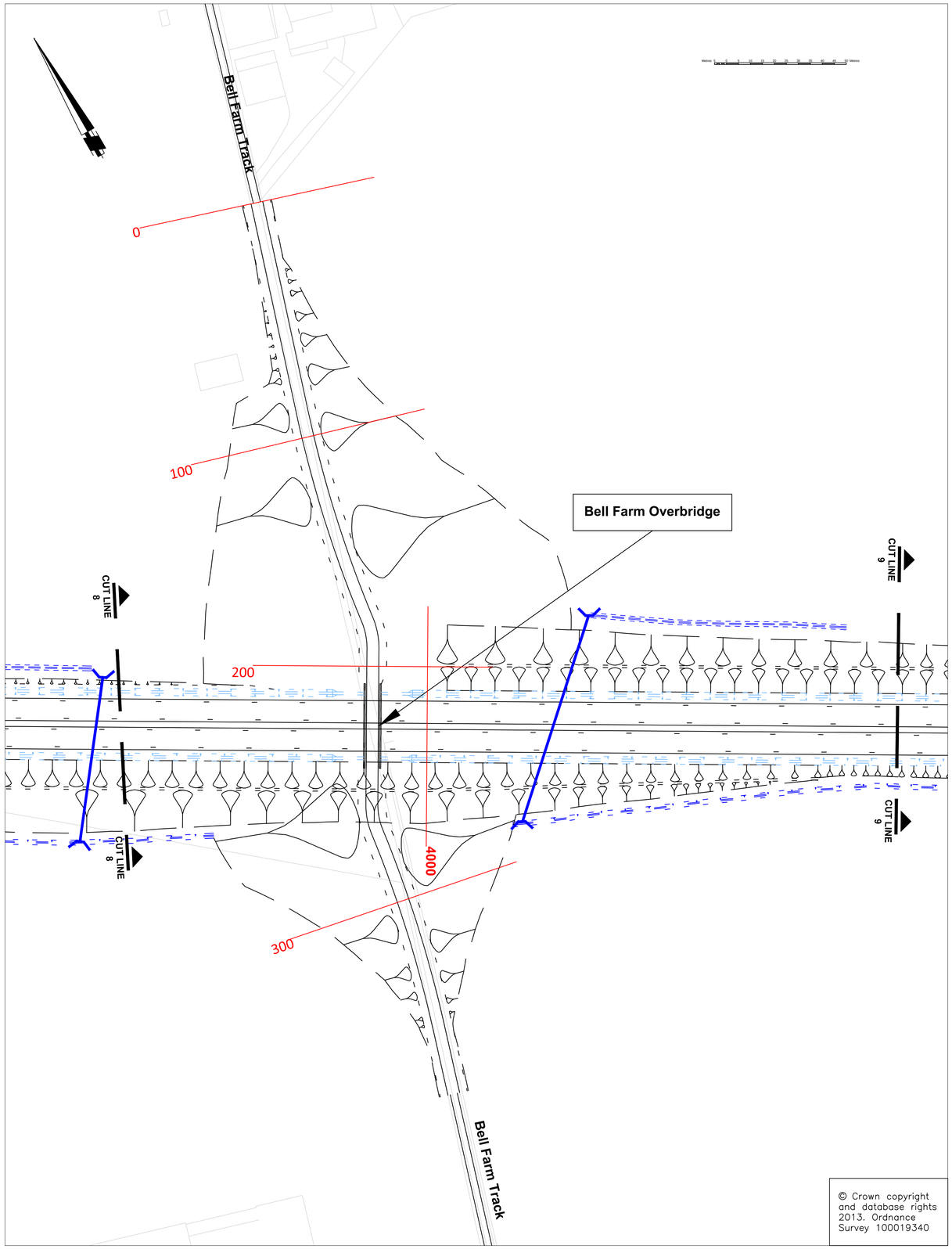

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- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- Chainage (8500)

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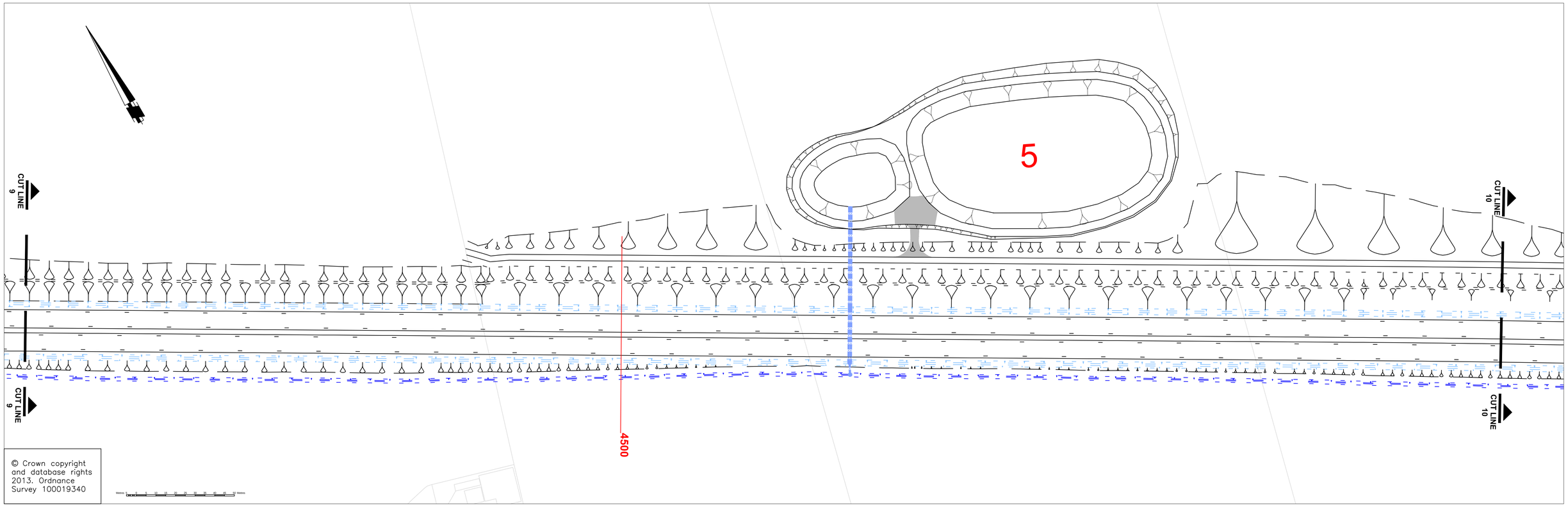

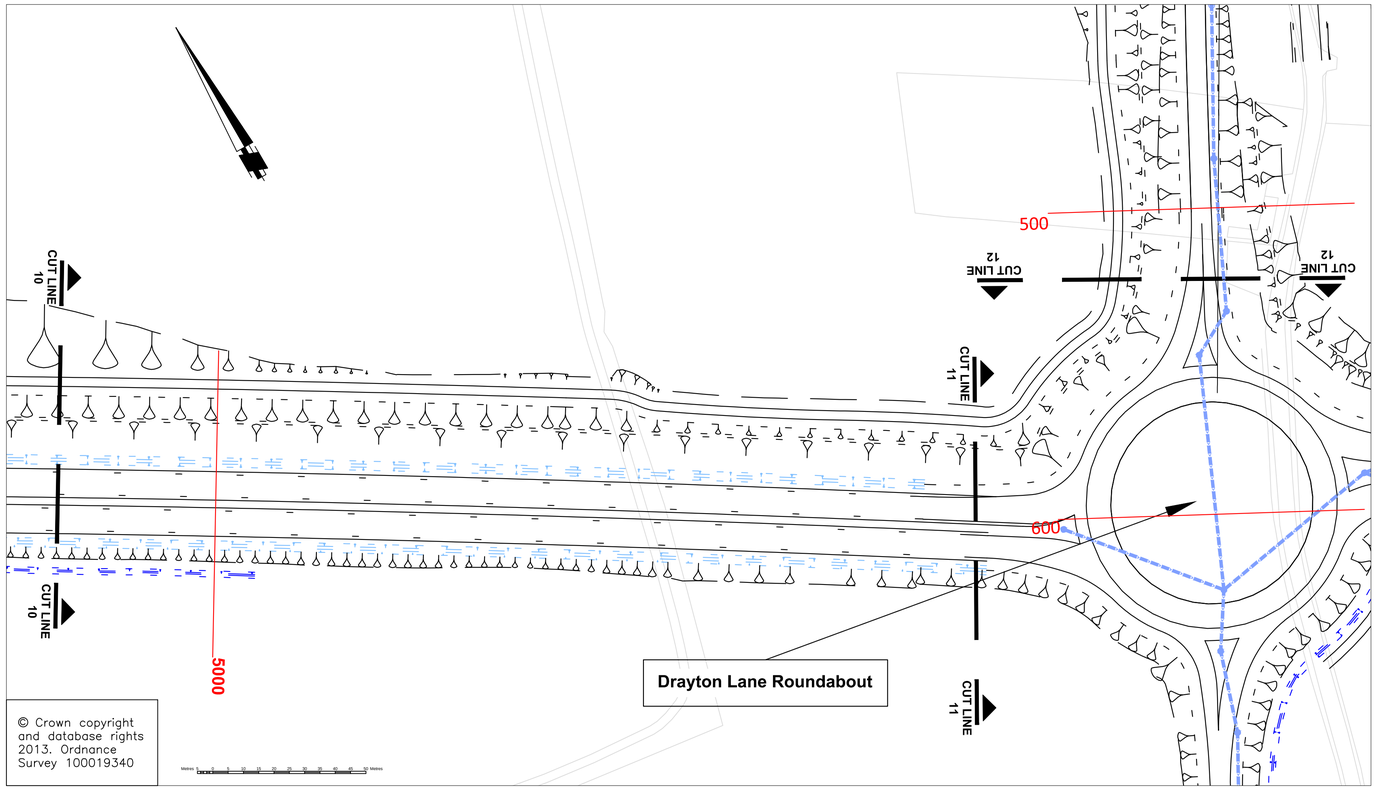

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- Proposed Pipe Network
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- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

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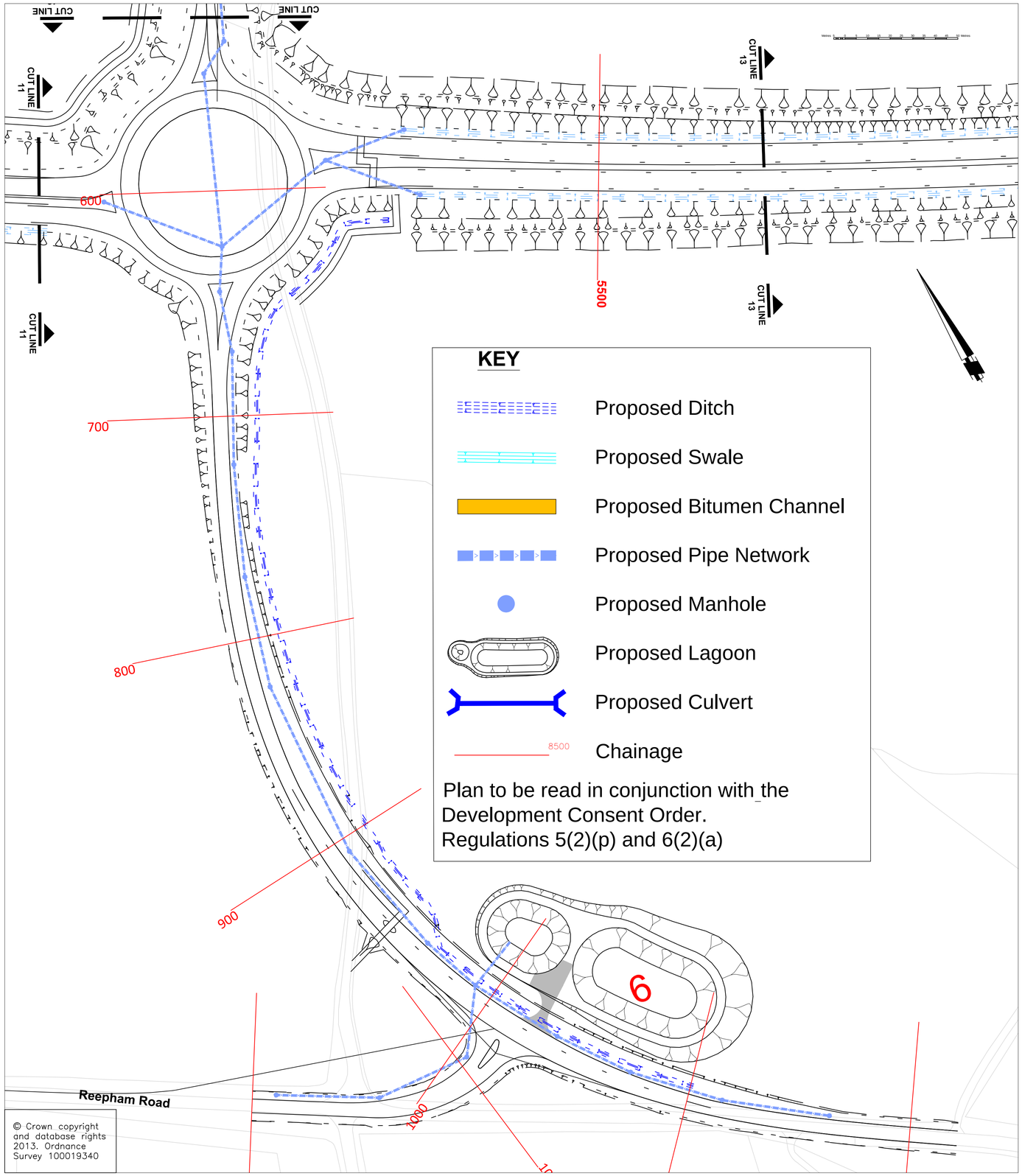

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- Chainage (8500)

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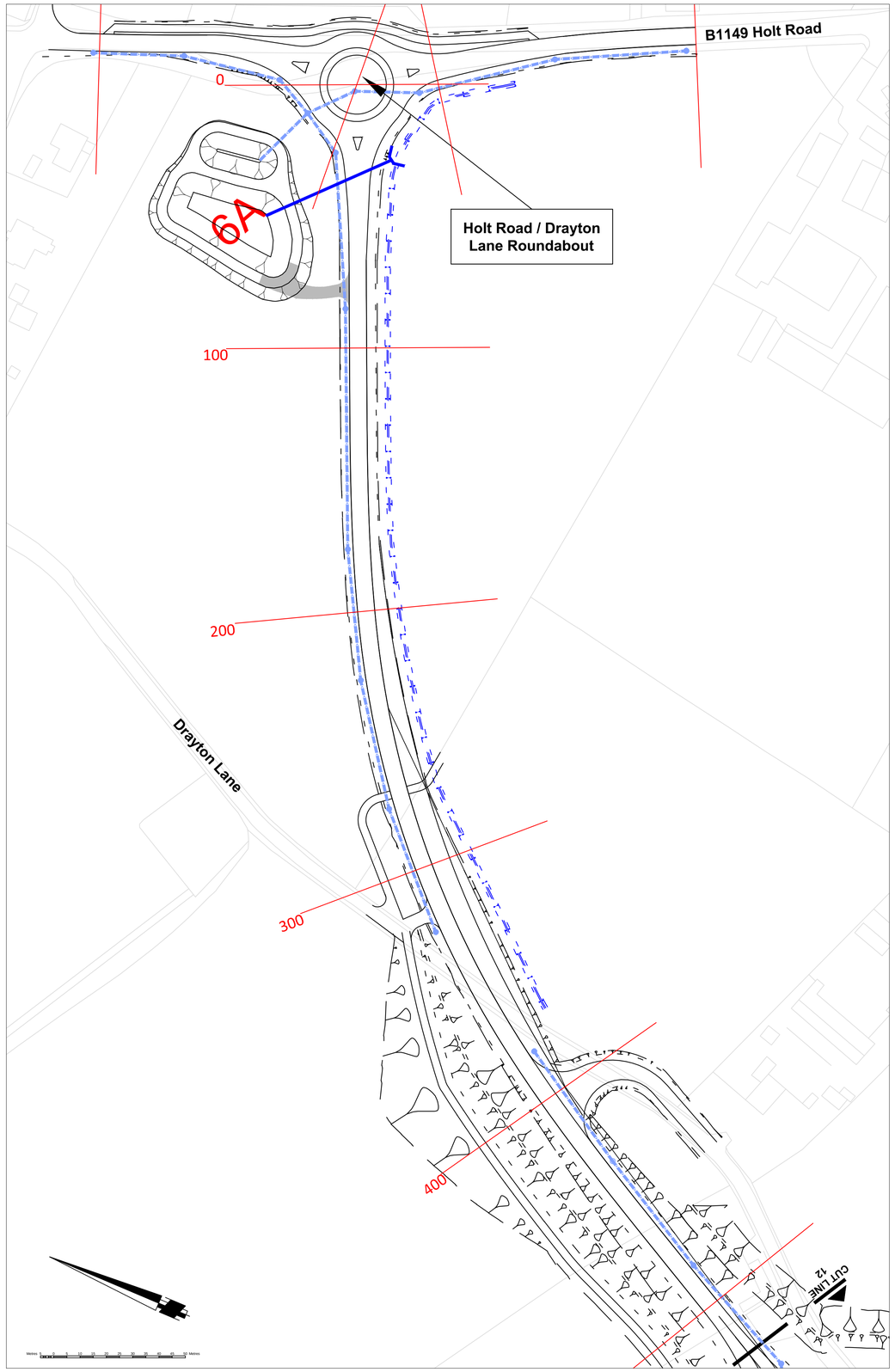

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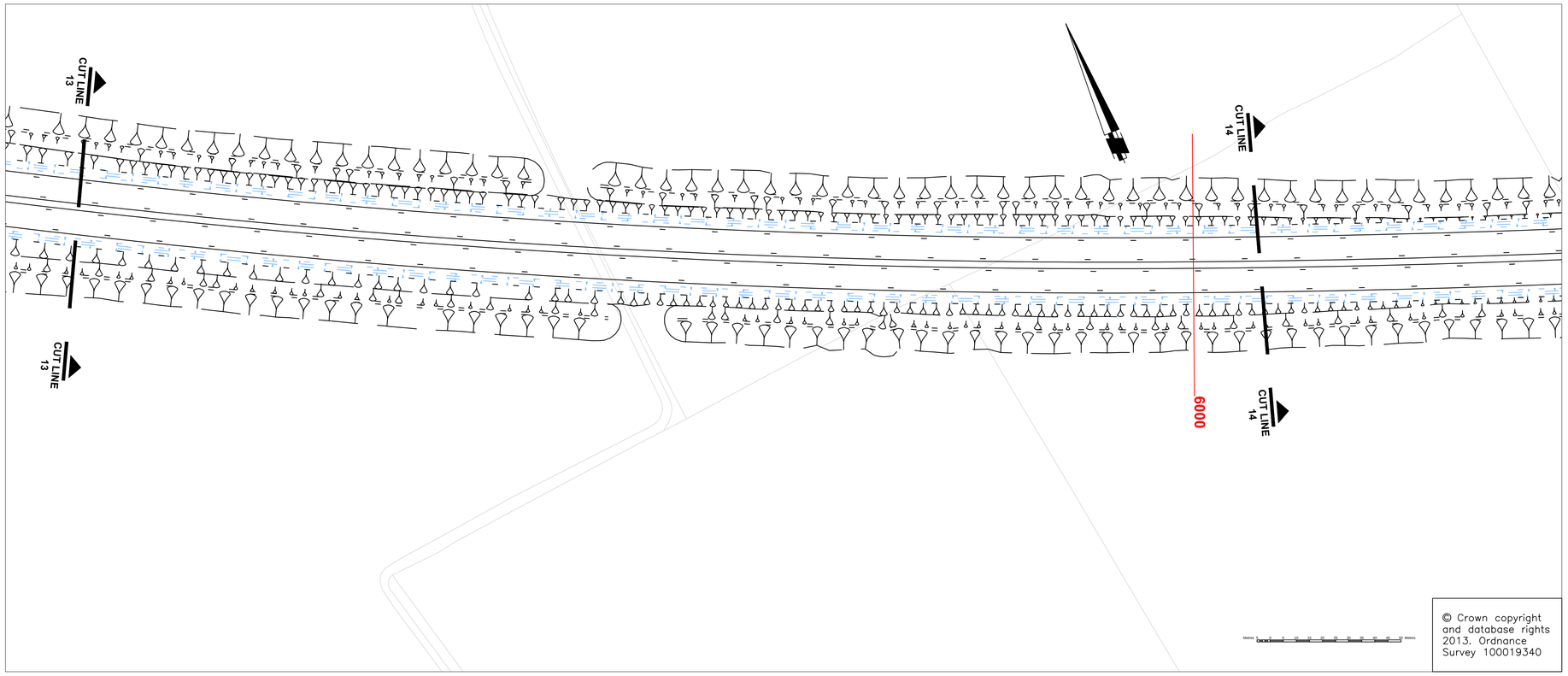

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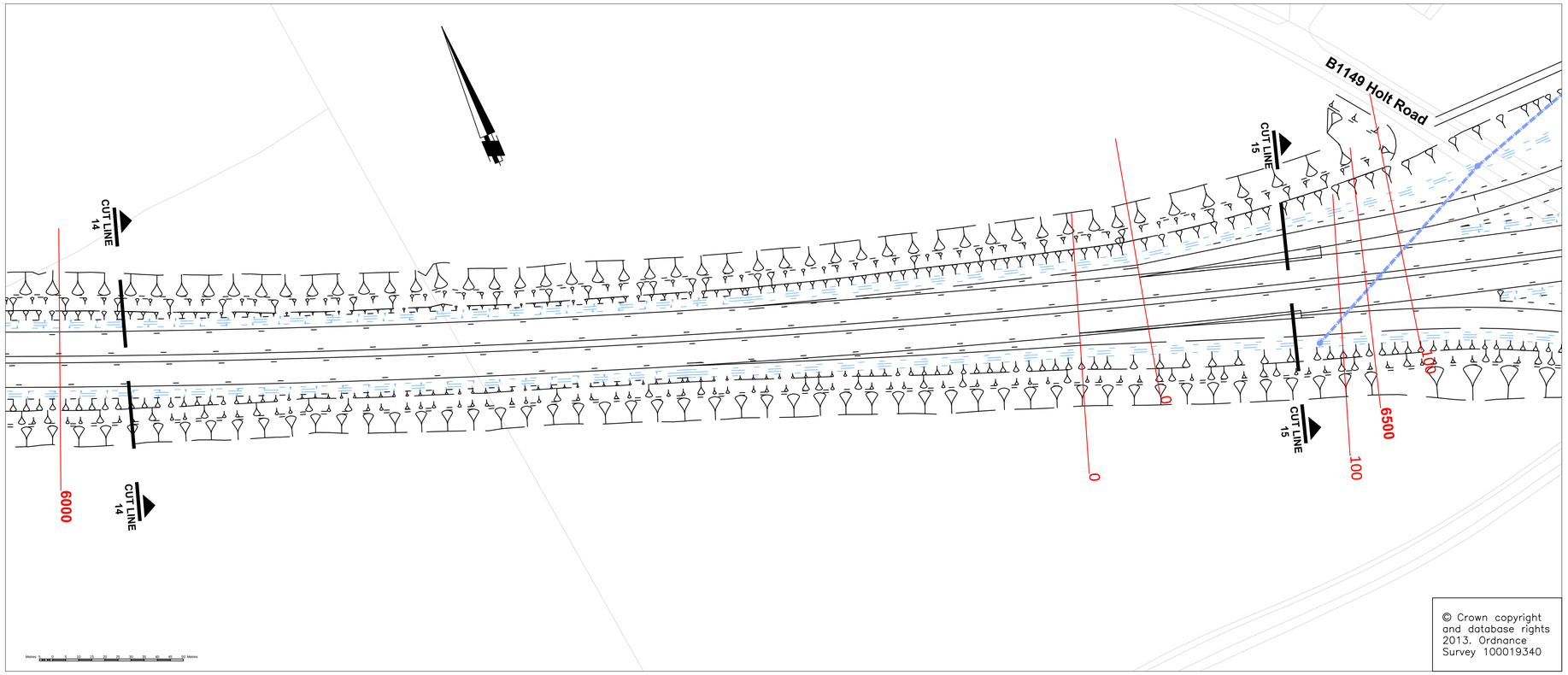

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Cromer Road Overbridge

Cromer Road Roundabout South

B1149 Holt Road

Hall Lane

A140 Cromer Road

8

8A

CUT LINE 15

CUT LINE 16

CUT LINE 17

KEY

- Proposed Ditch
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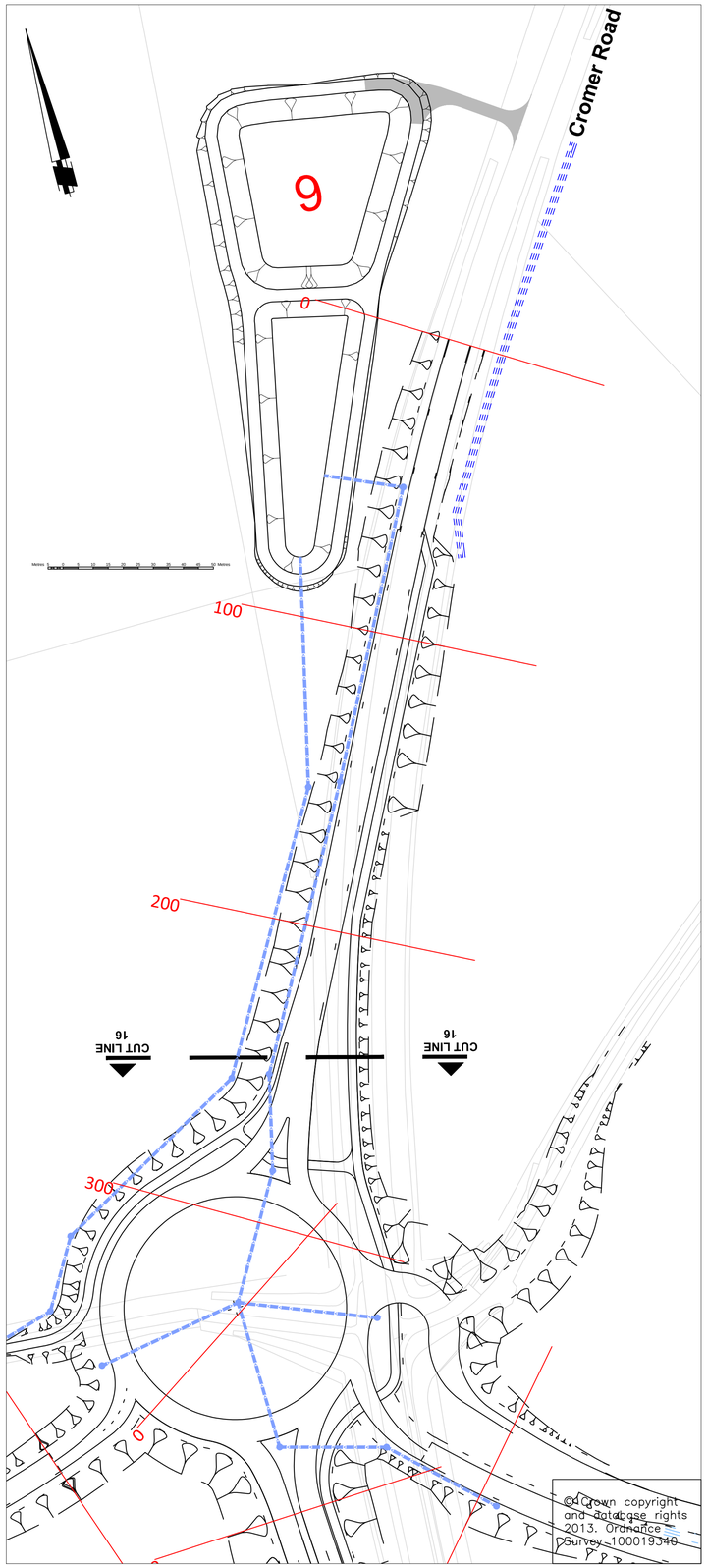

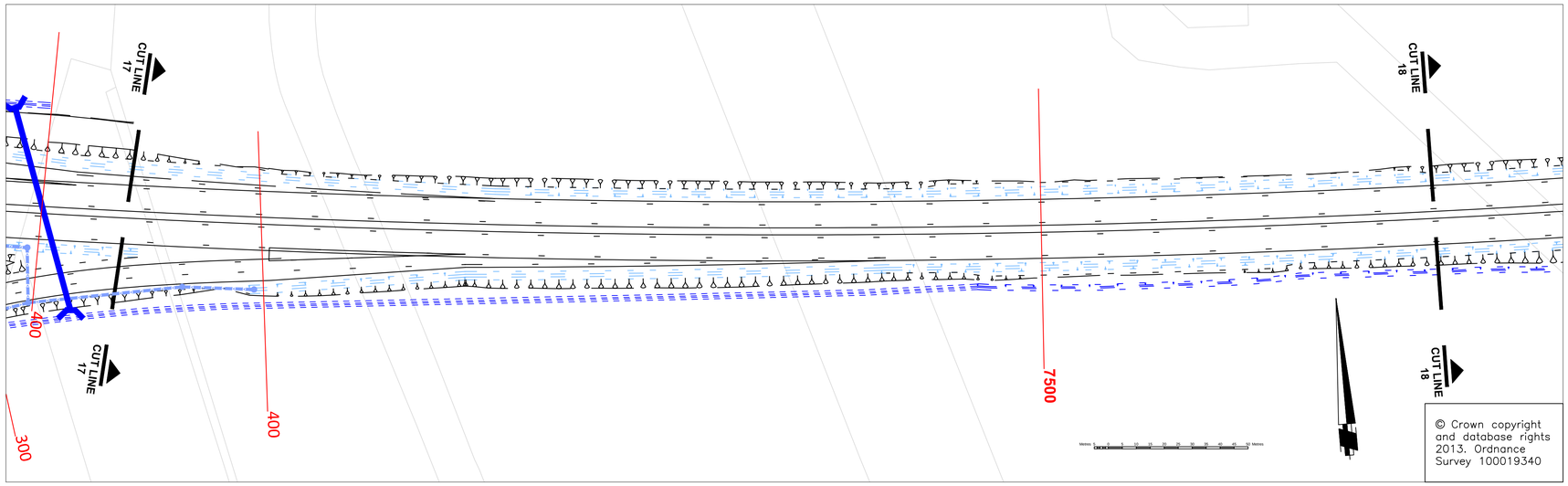

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Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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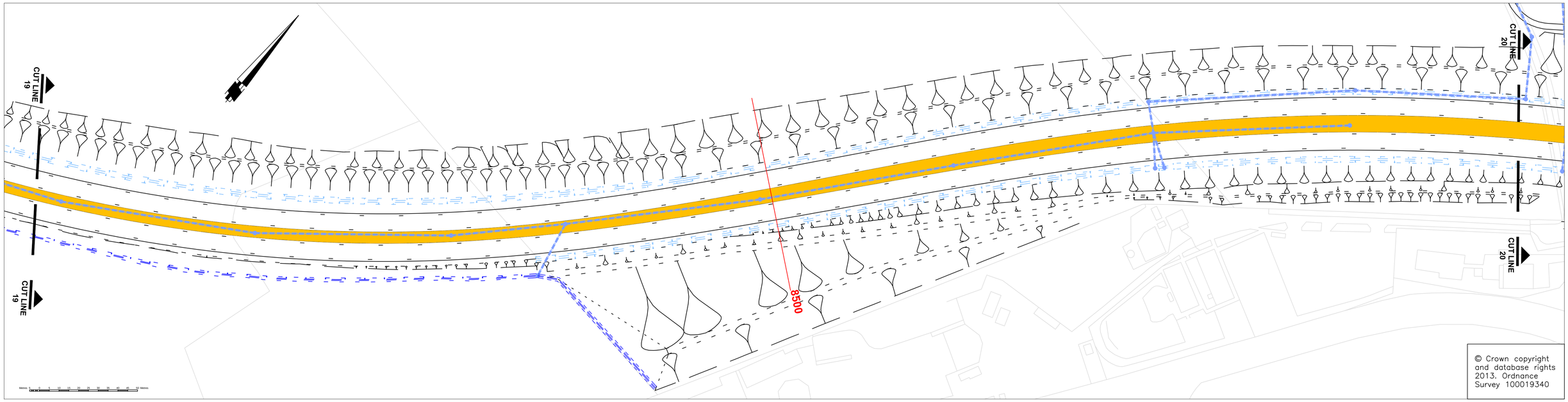

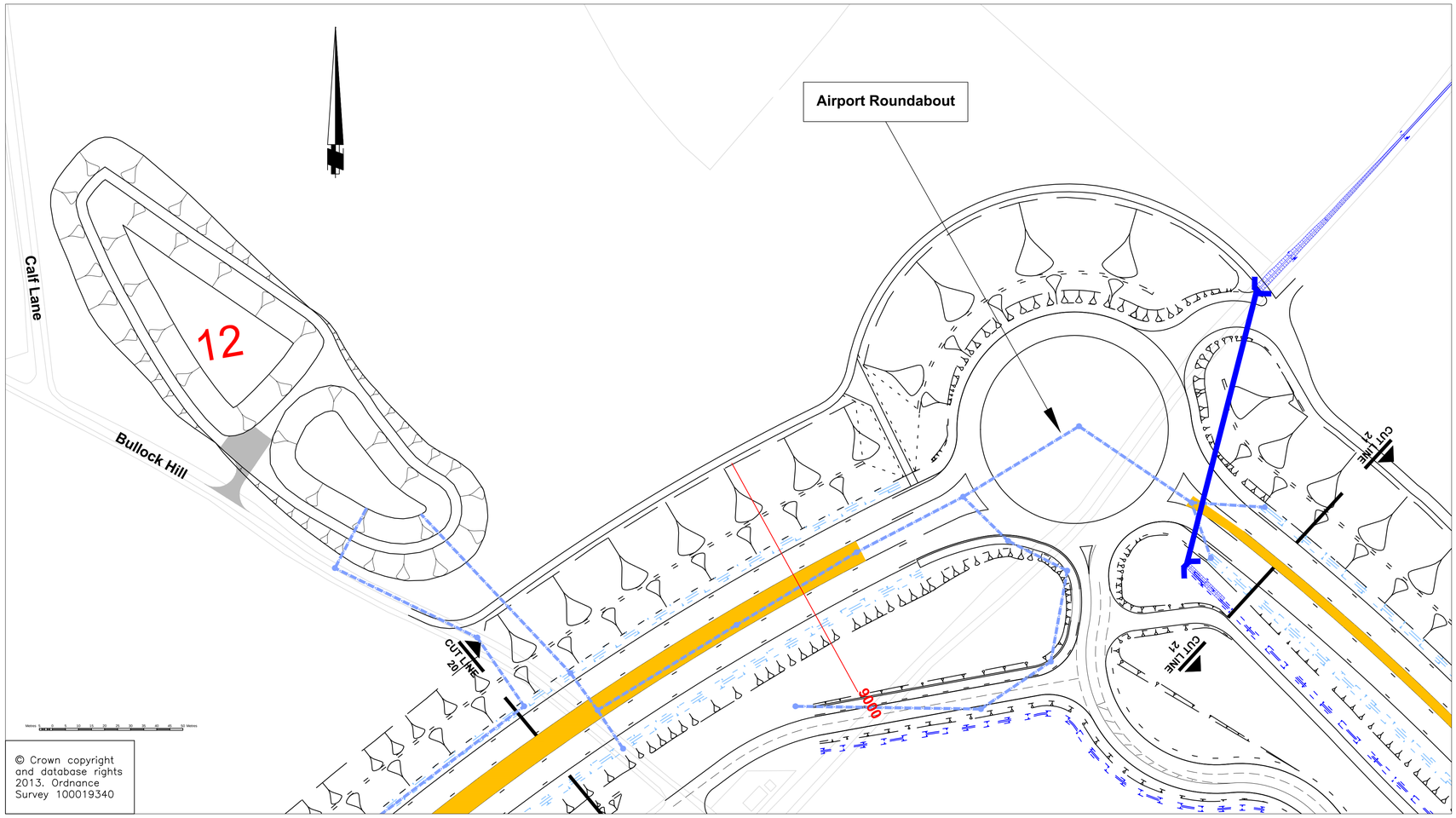

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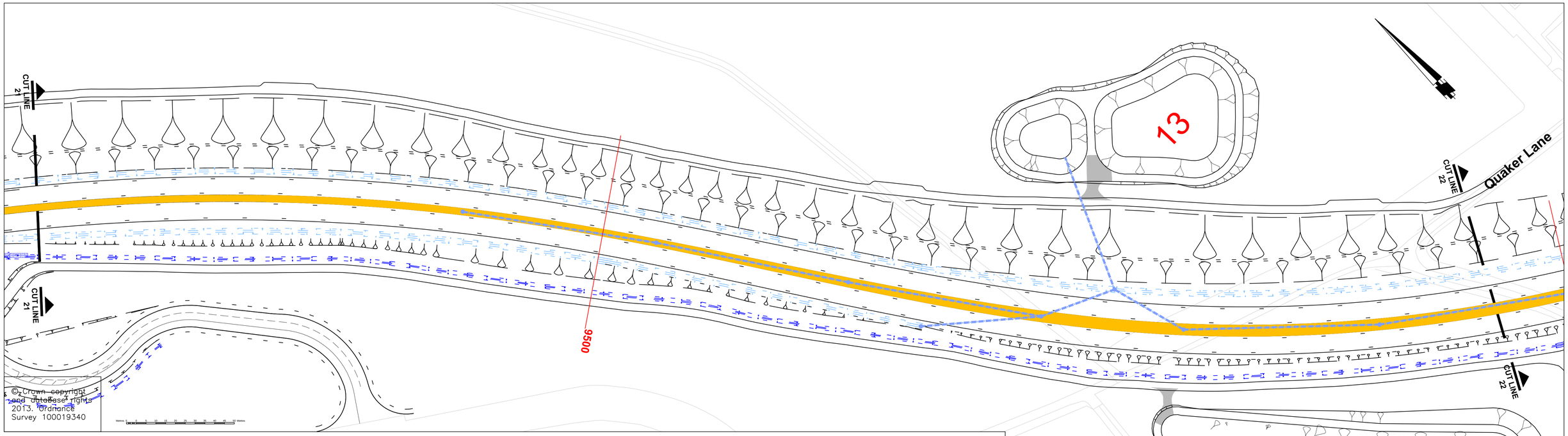

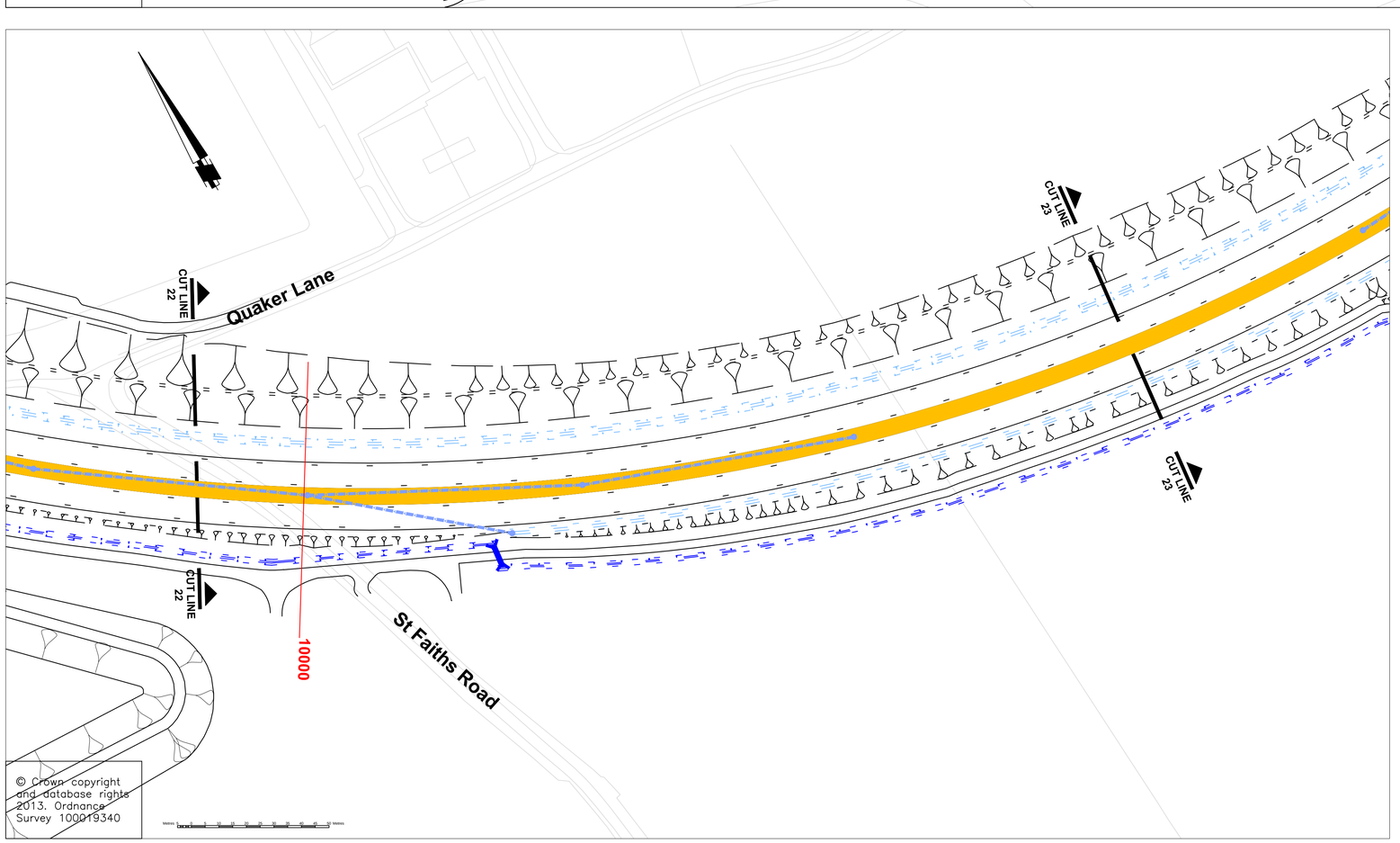

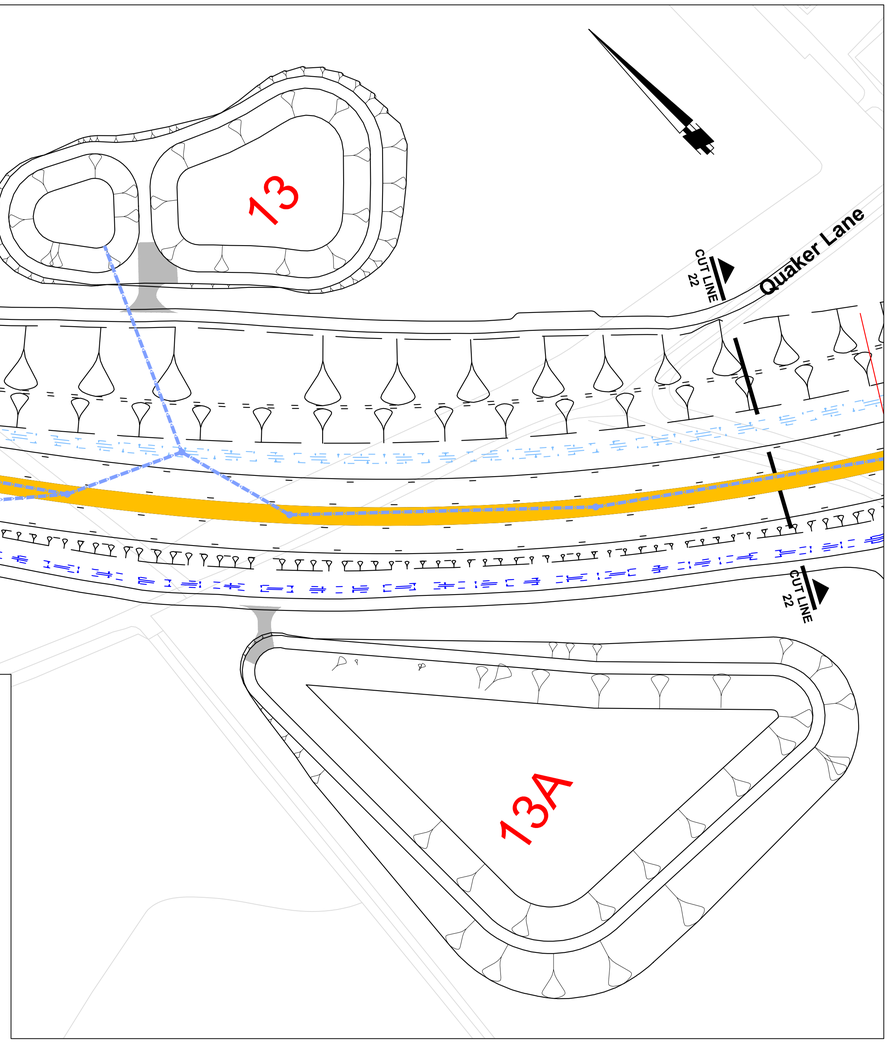

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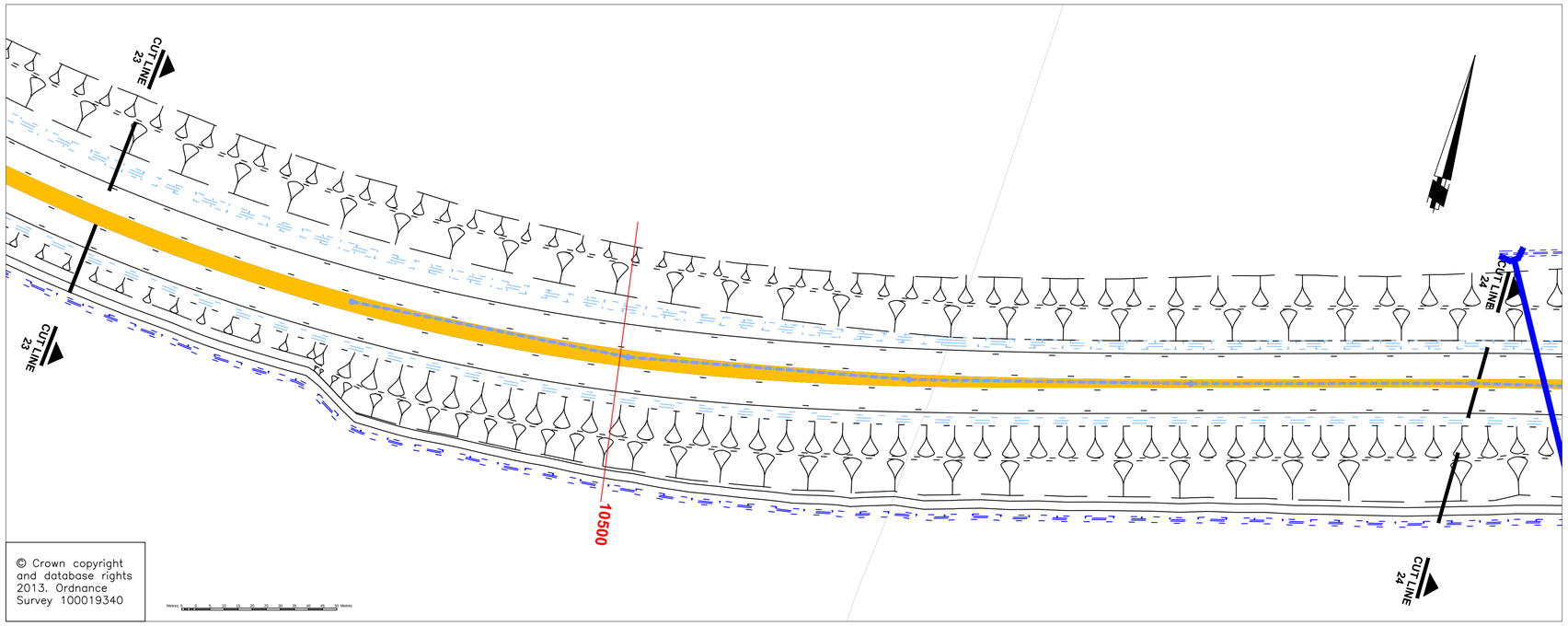
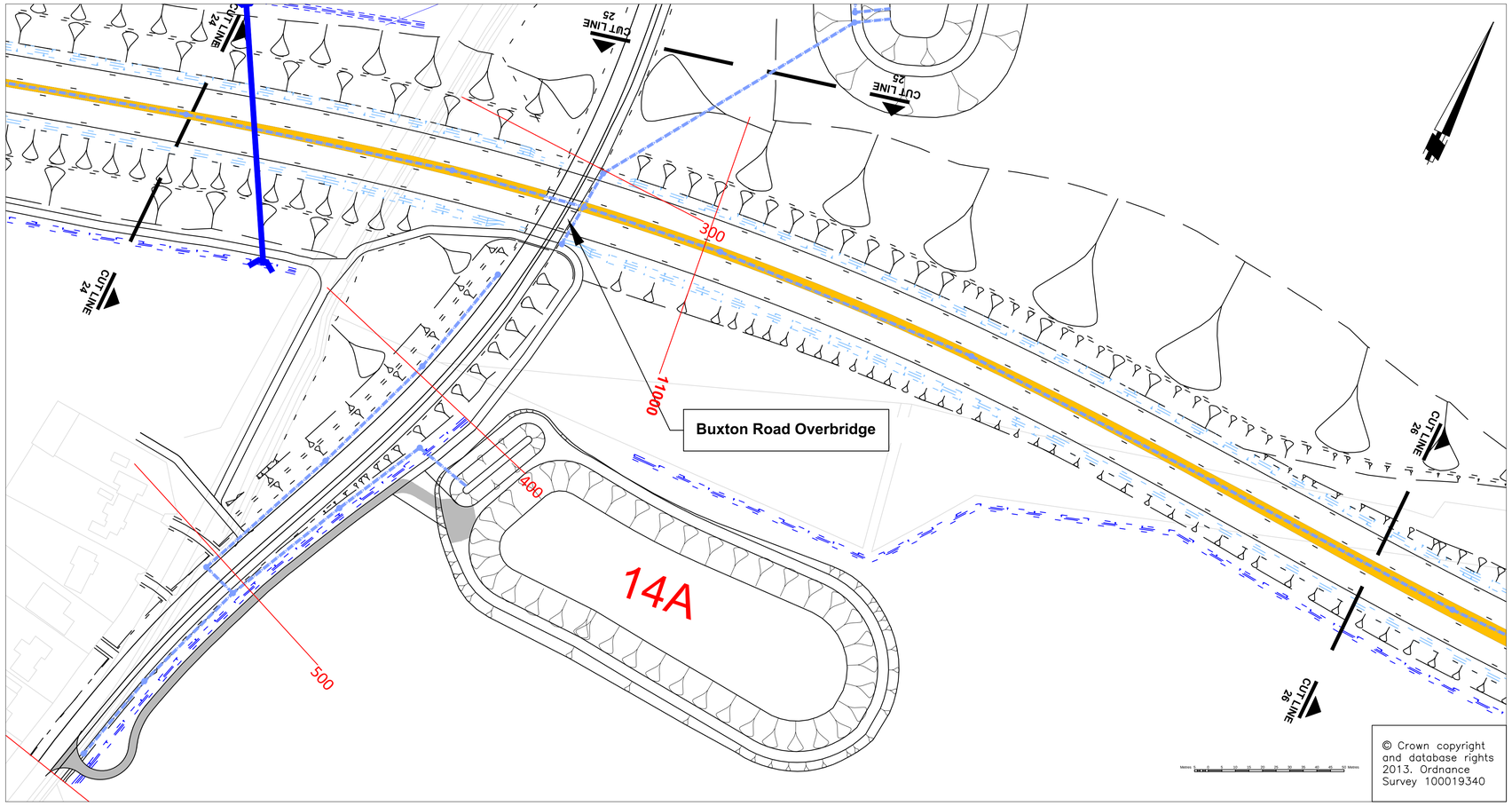
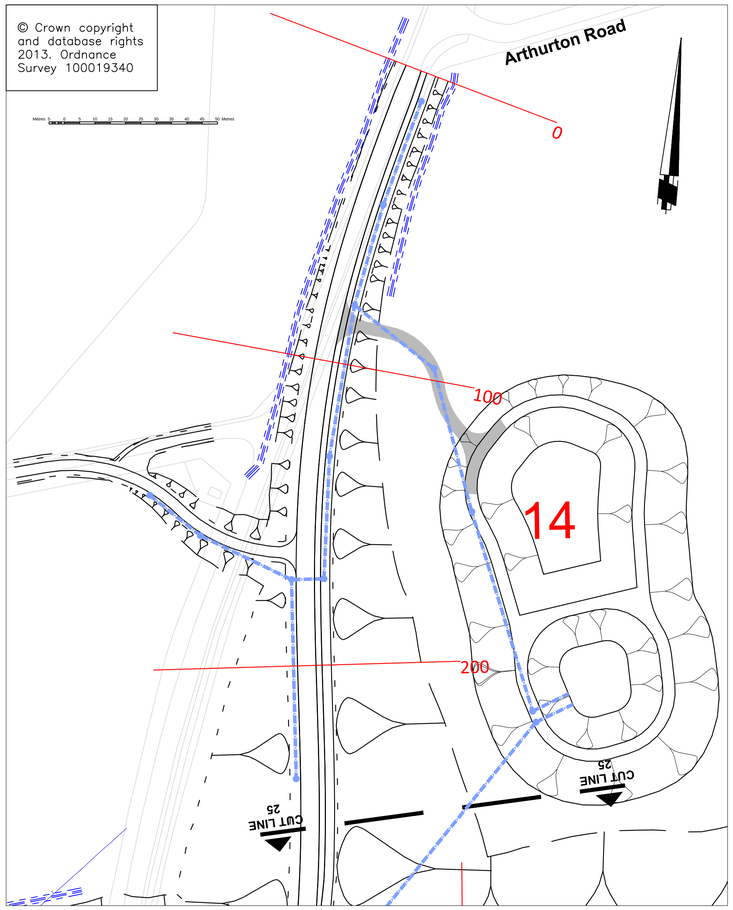
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1







KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order.
Regulations 5(2)(p) and 6(2)(a)

Norfolk County Council
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Birse Civils

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Interim Director of Environment
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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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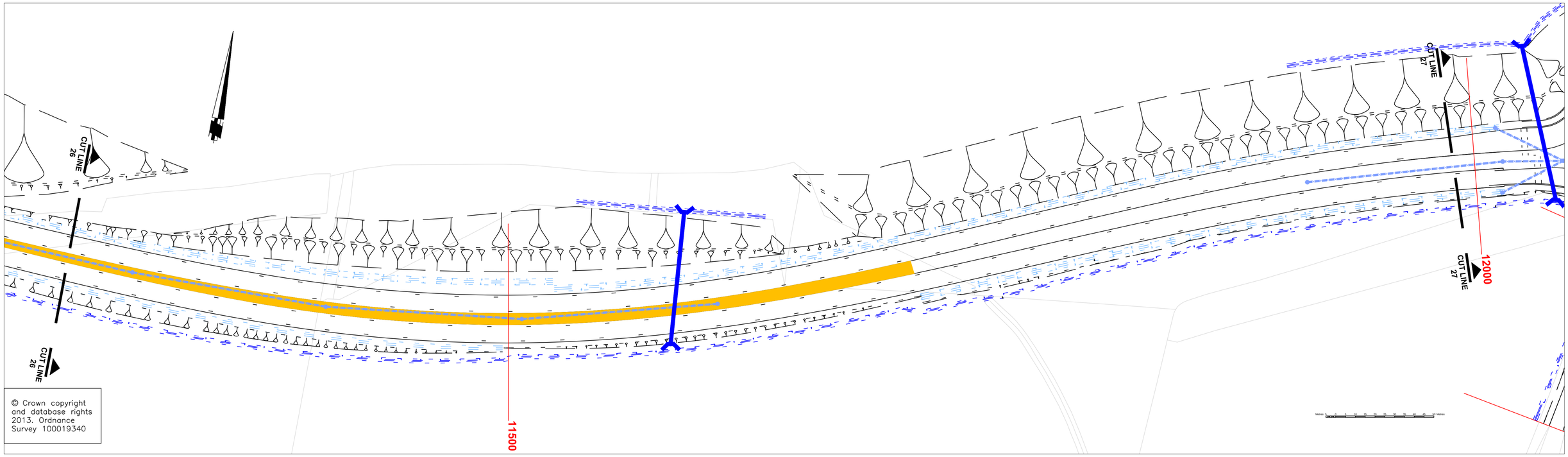
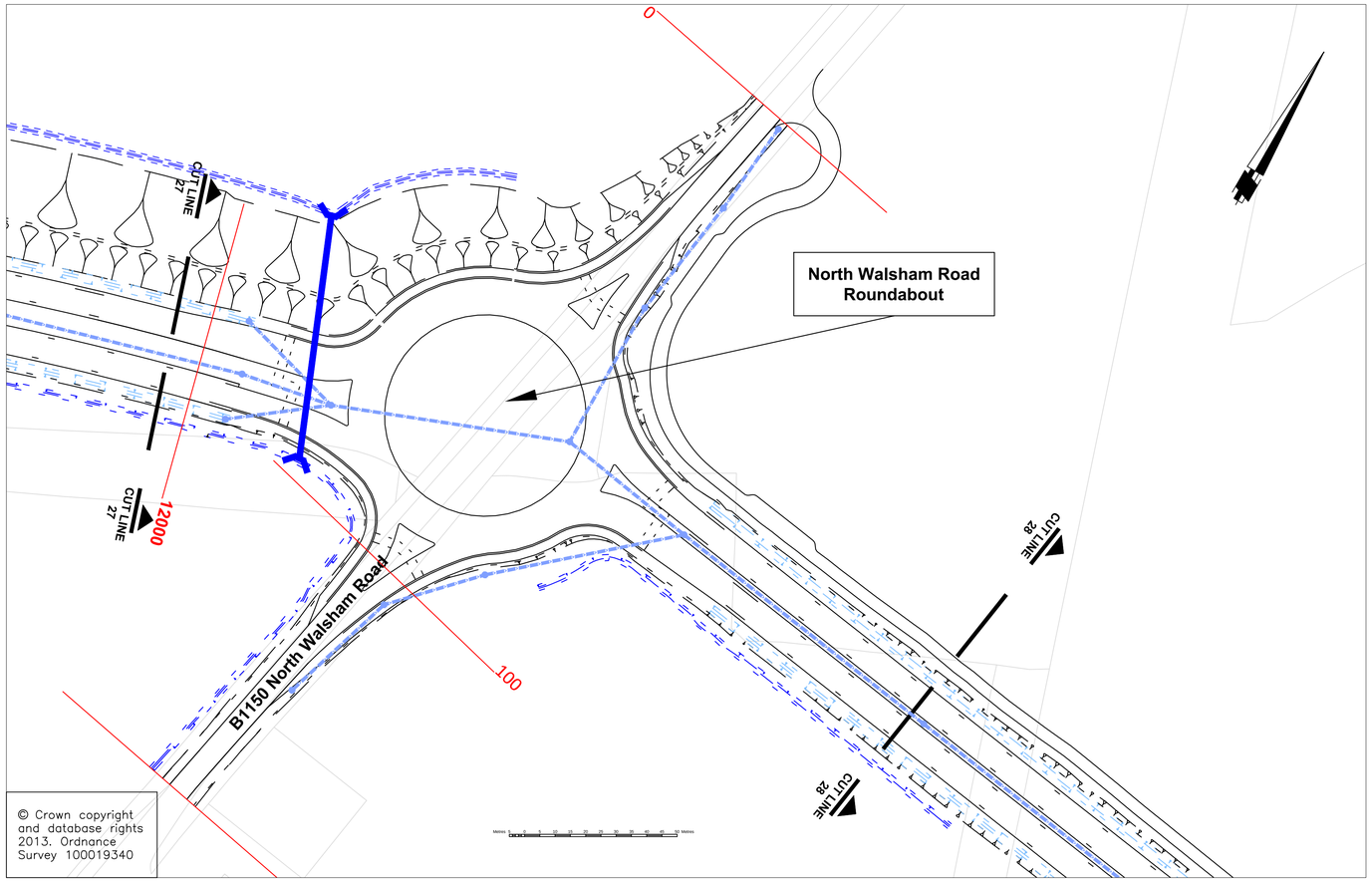
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5076
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1

BS. 0505/12





KEY

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- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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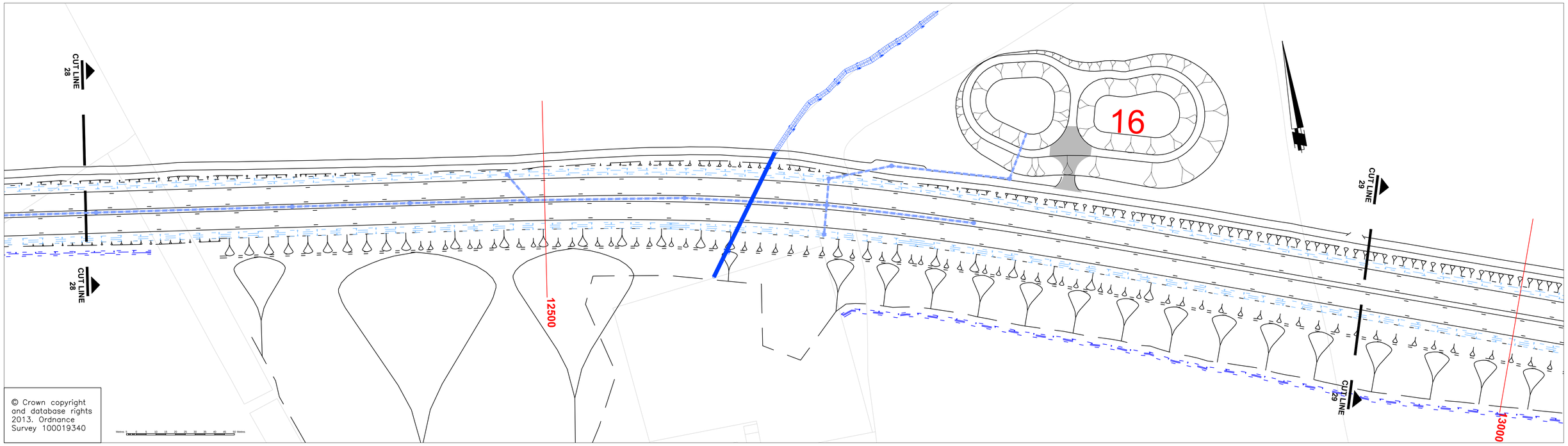
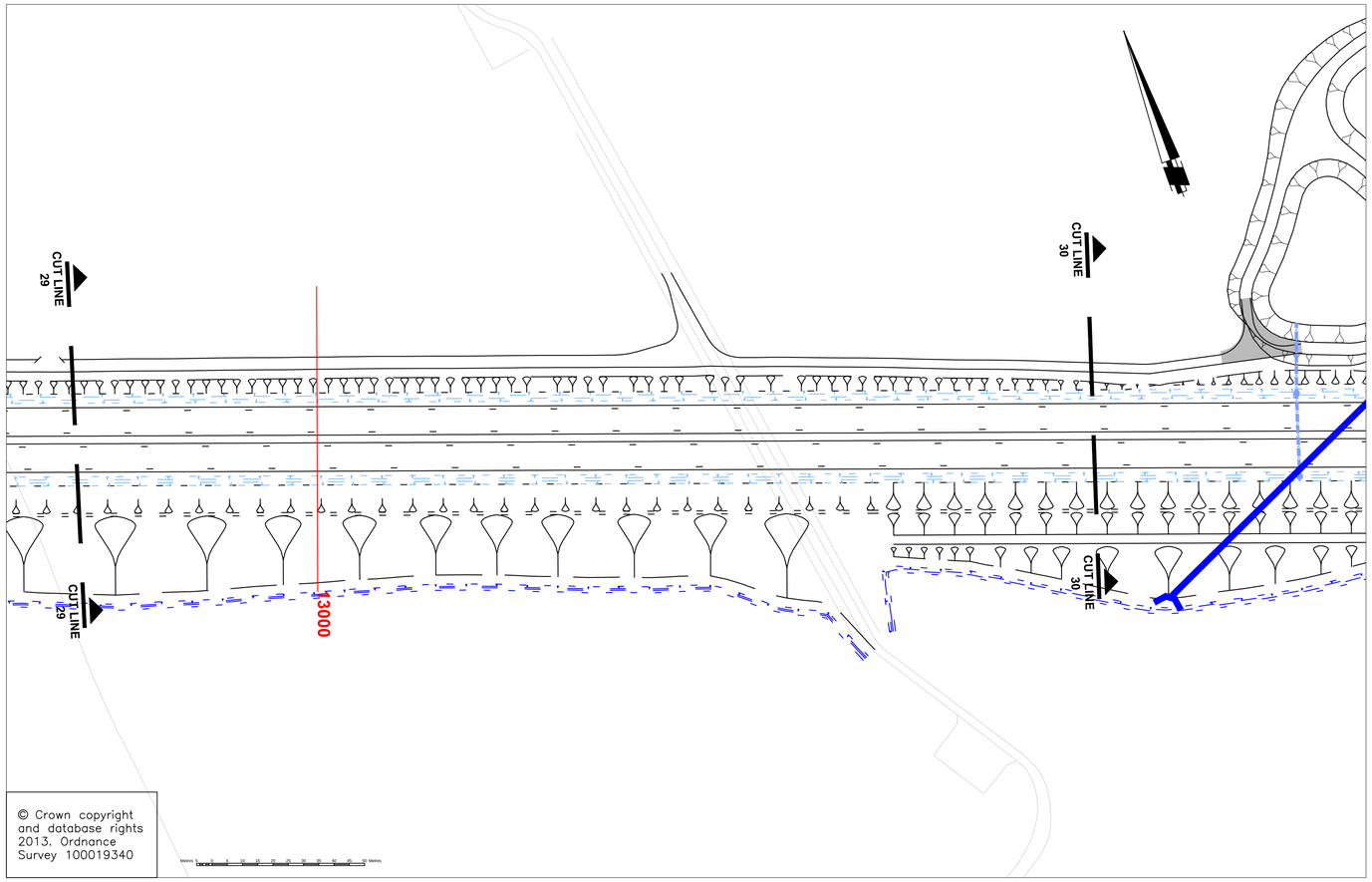
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	OS	2013
DESIGNED BY	JT/BF	07/13
DRAWN BY	JT	11/13
CHECKED BY	JB	11/13

DRAWING No. R1C093-R1-5077
PROJECT TITLE Norwich Northern Distributor Road
SCALE 1:1000
FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order.
Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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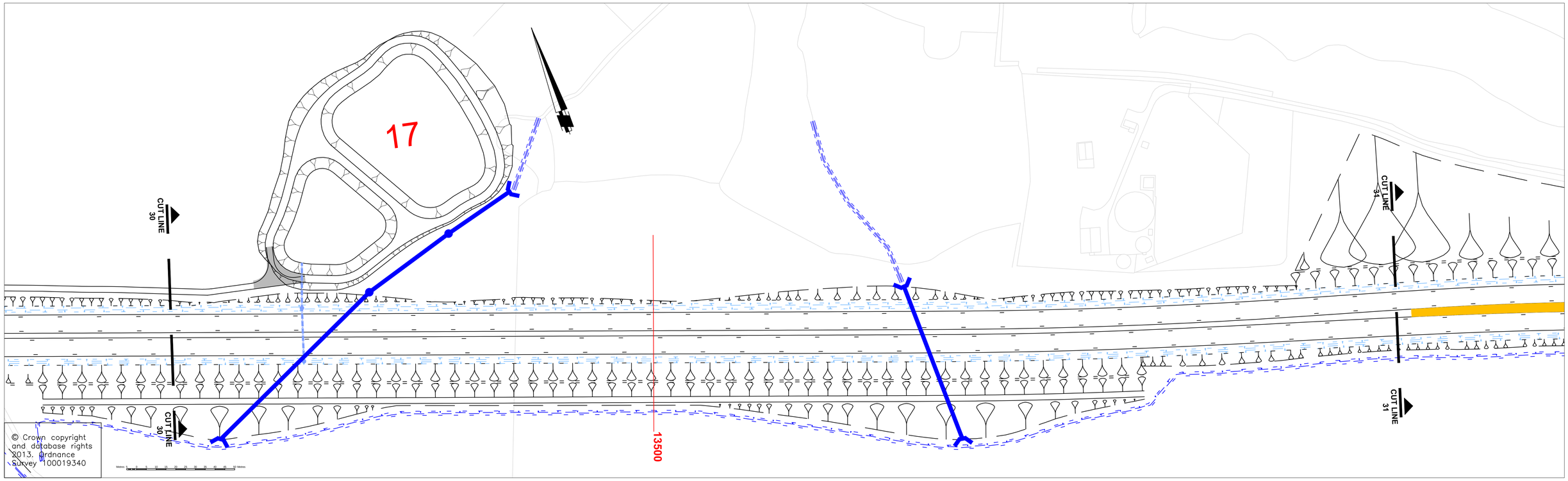
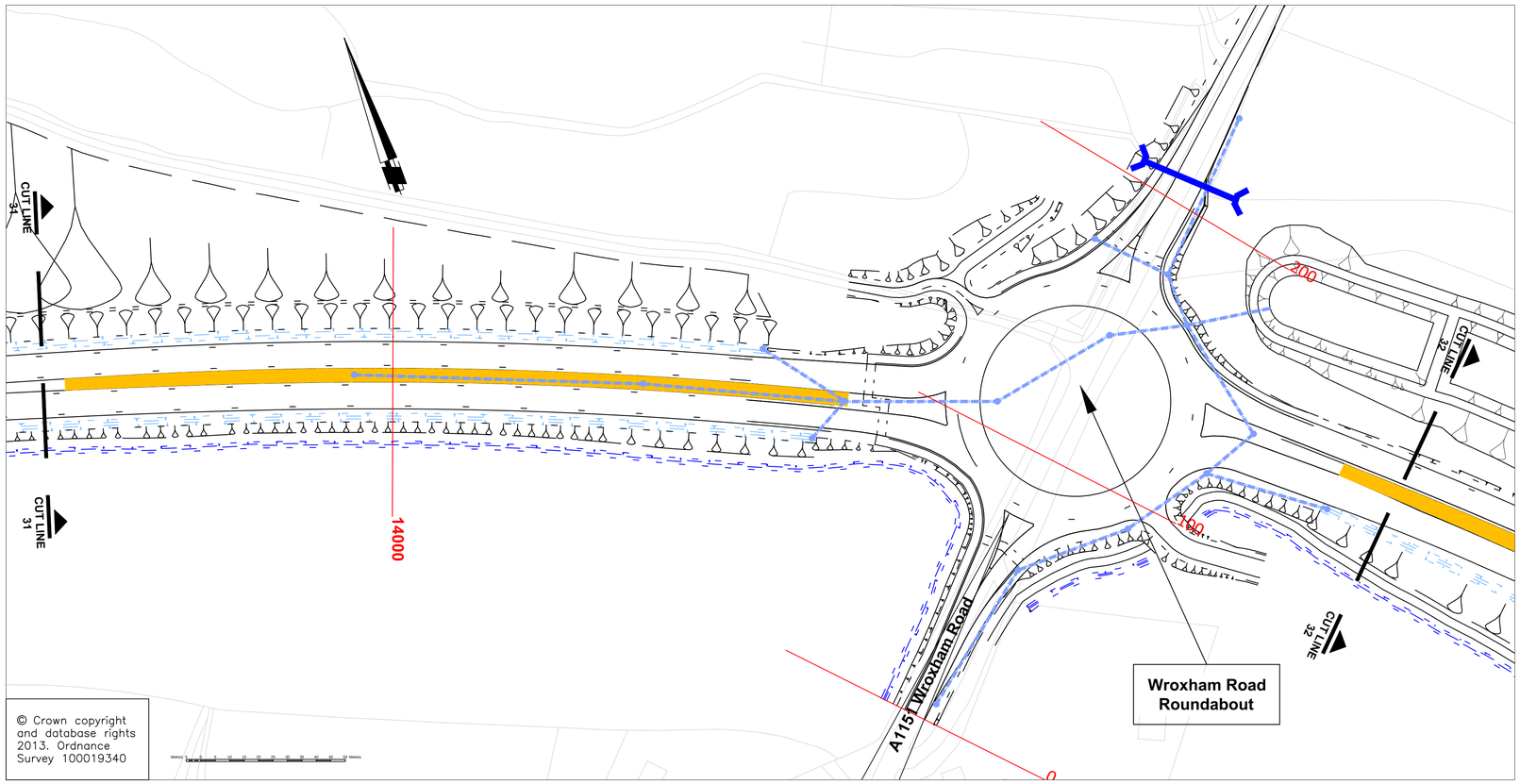
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5078
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order.
Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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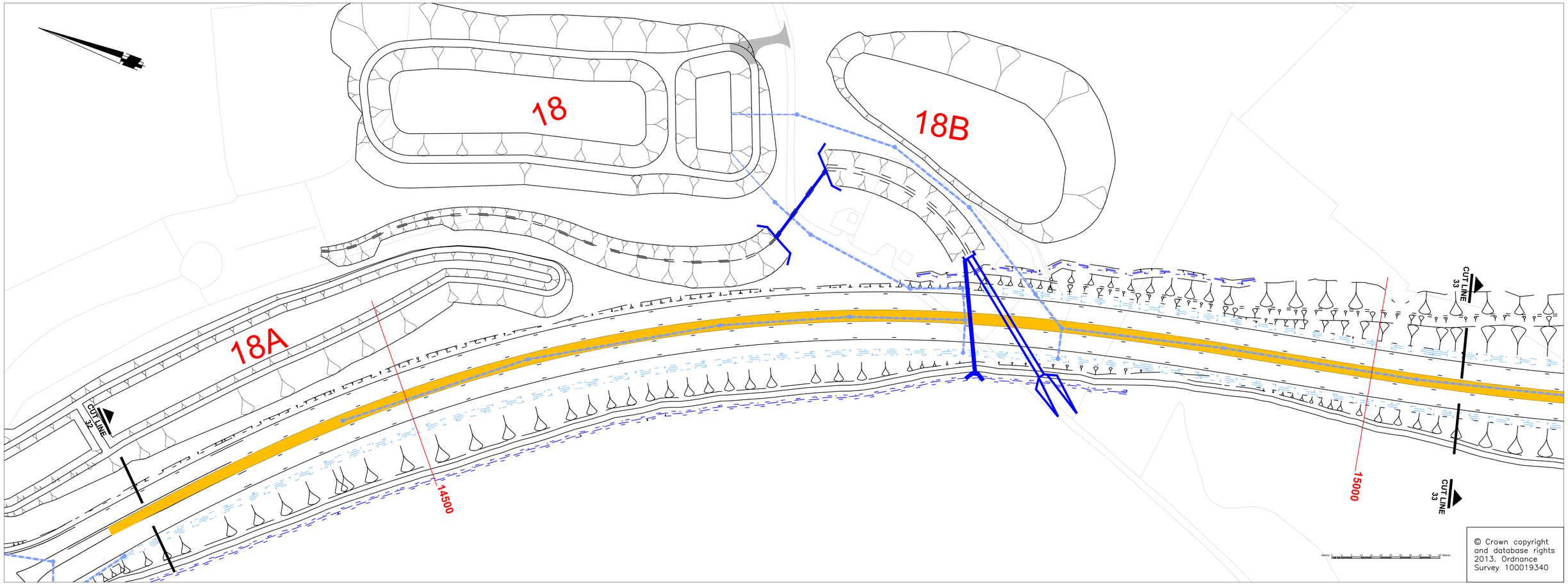
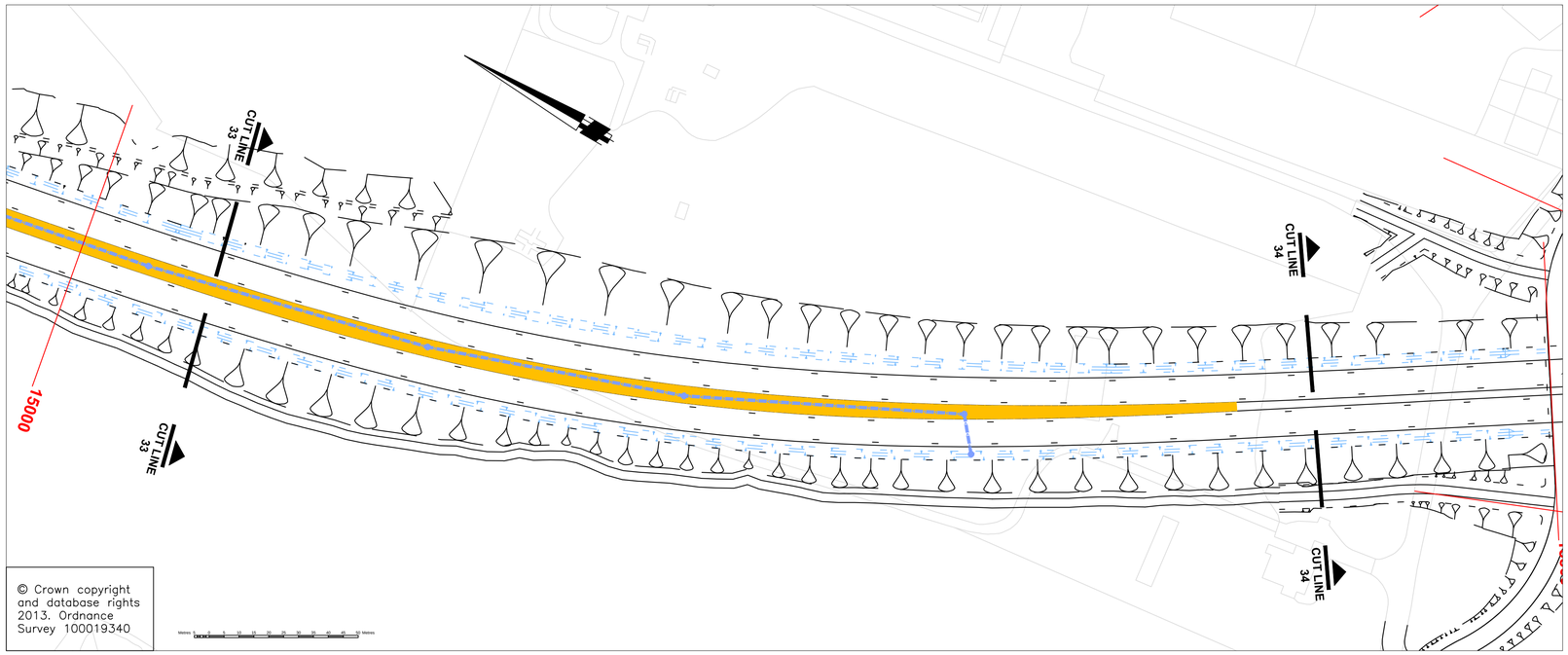
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5079
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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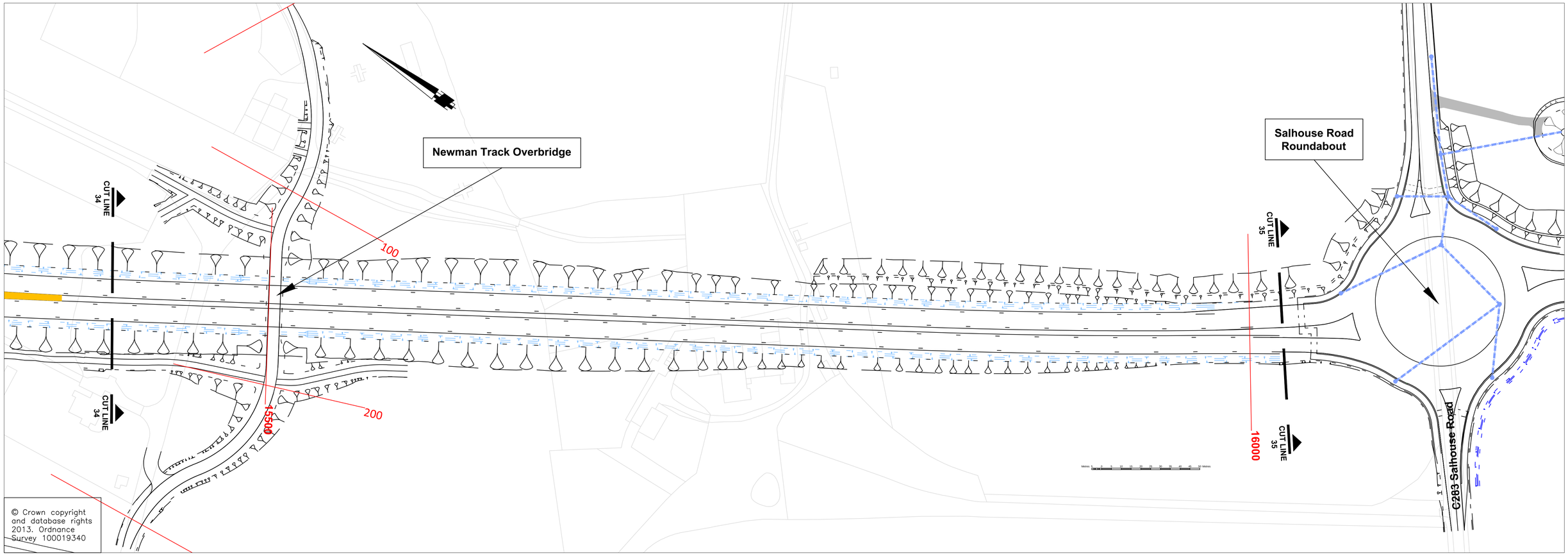
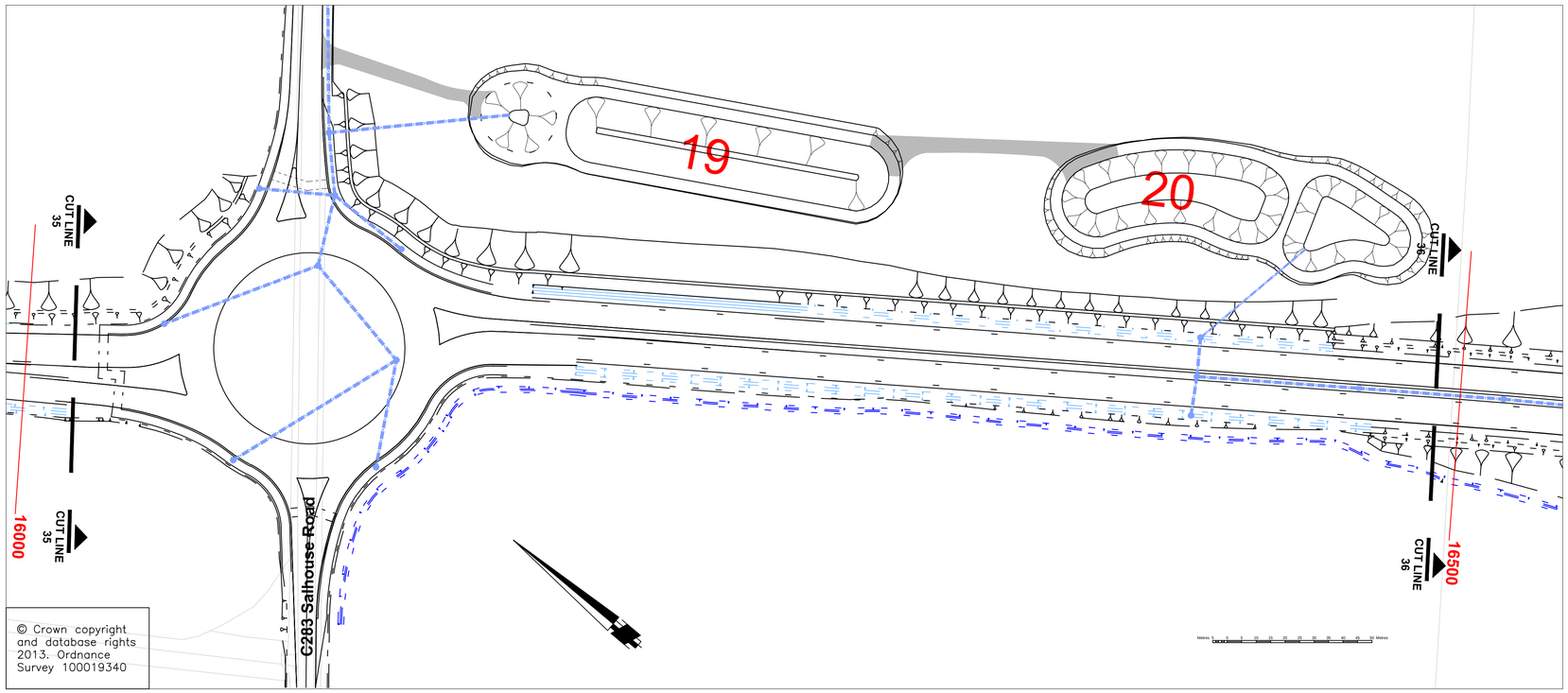
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	OS	2013
DESIGNED BY	JT/BF	07/13
DRAWN BY	JT	11/13
CHECKED BY	JB	11/13

DRAWING No. R1C093-R1-5080
PROJECT TITLE Norwich Northern Distributor Road
SCALE 1:1000
FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order.
Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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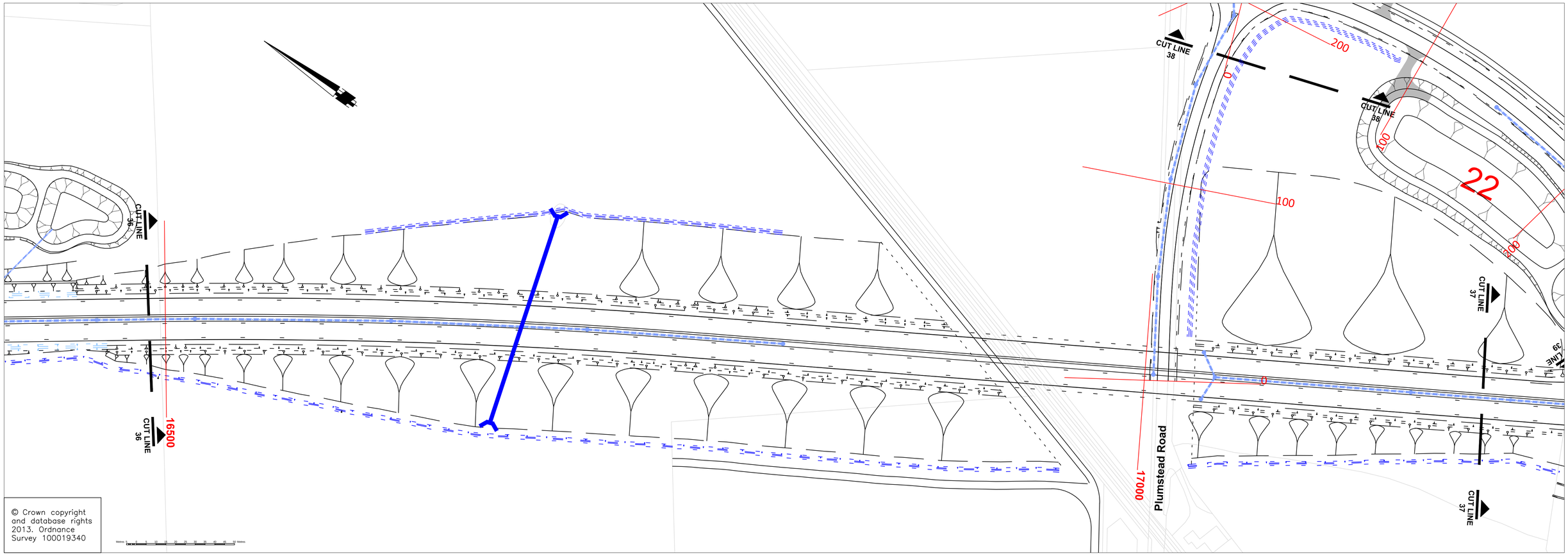
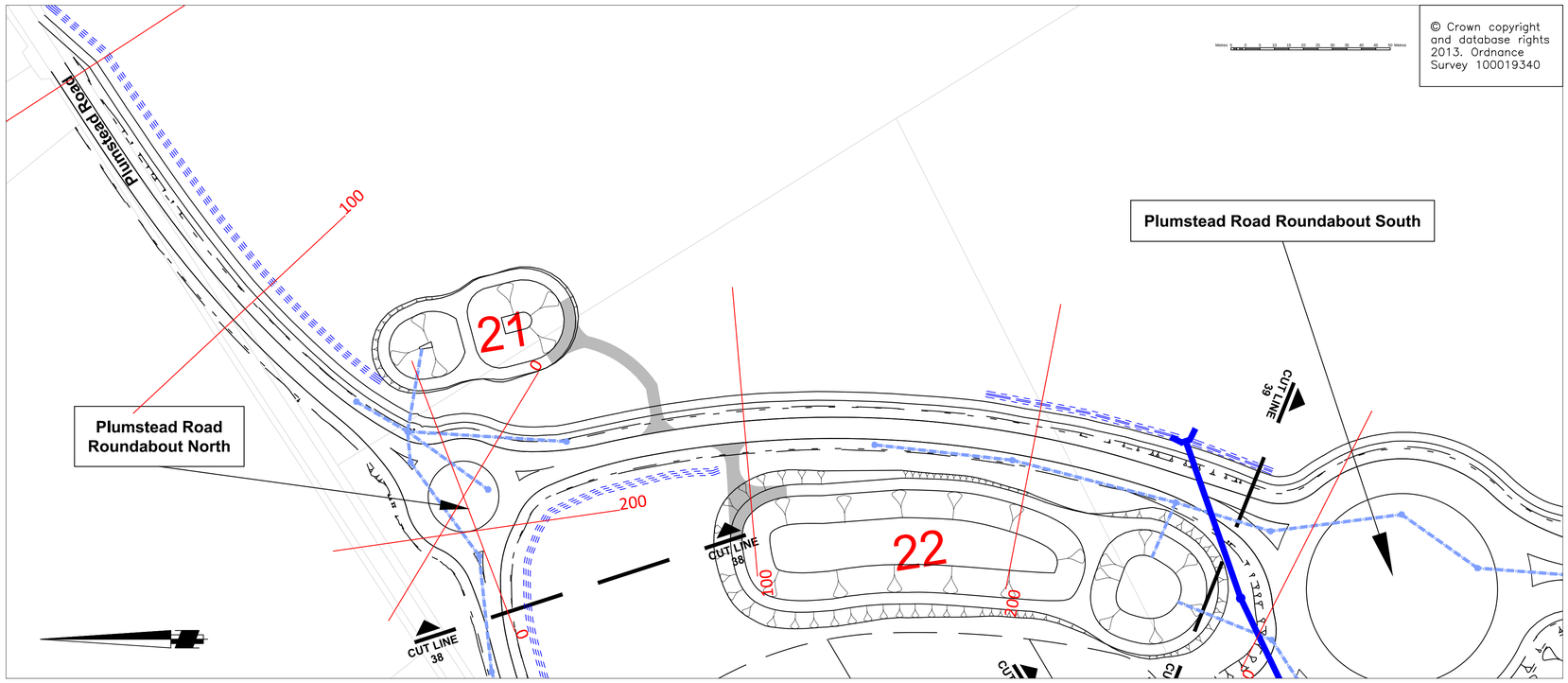
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5081
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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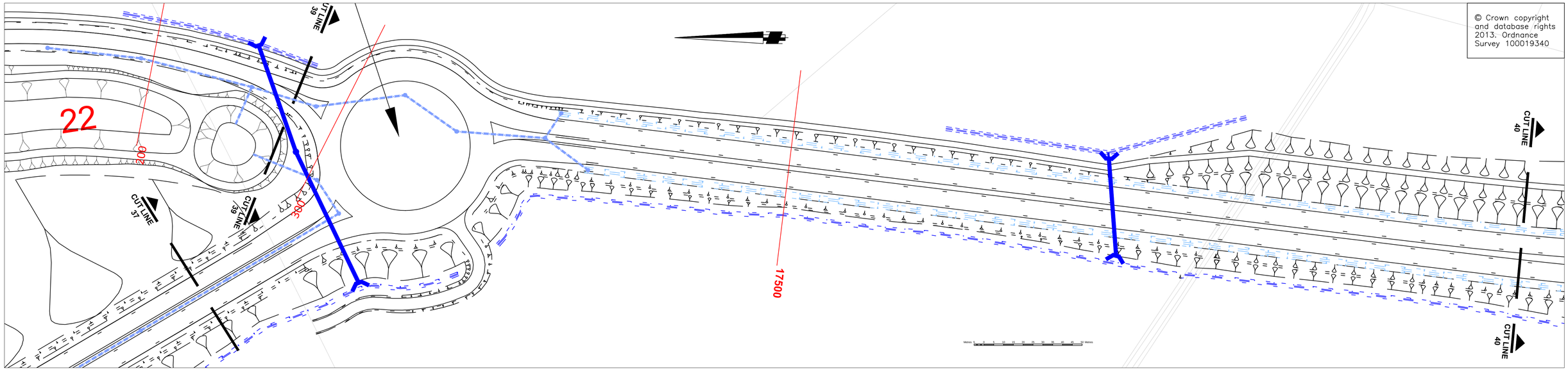
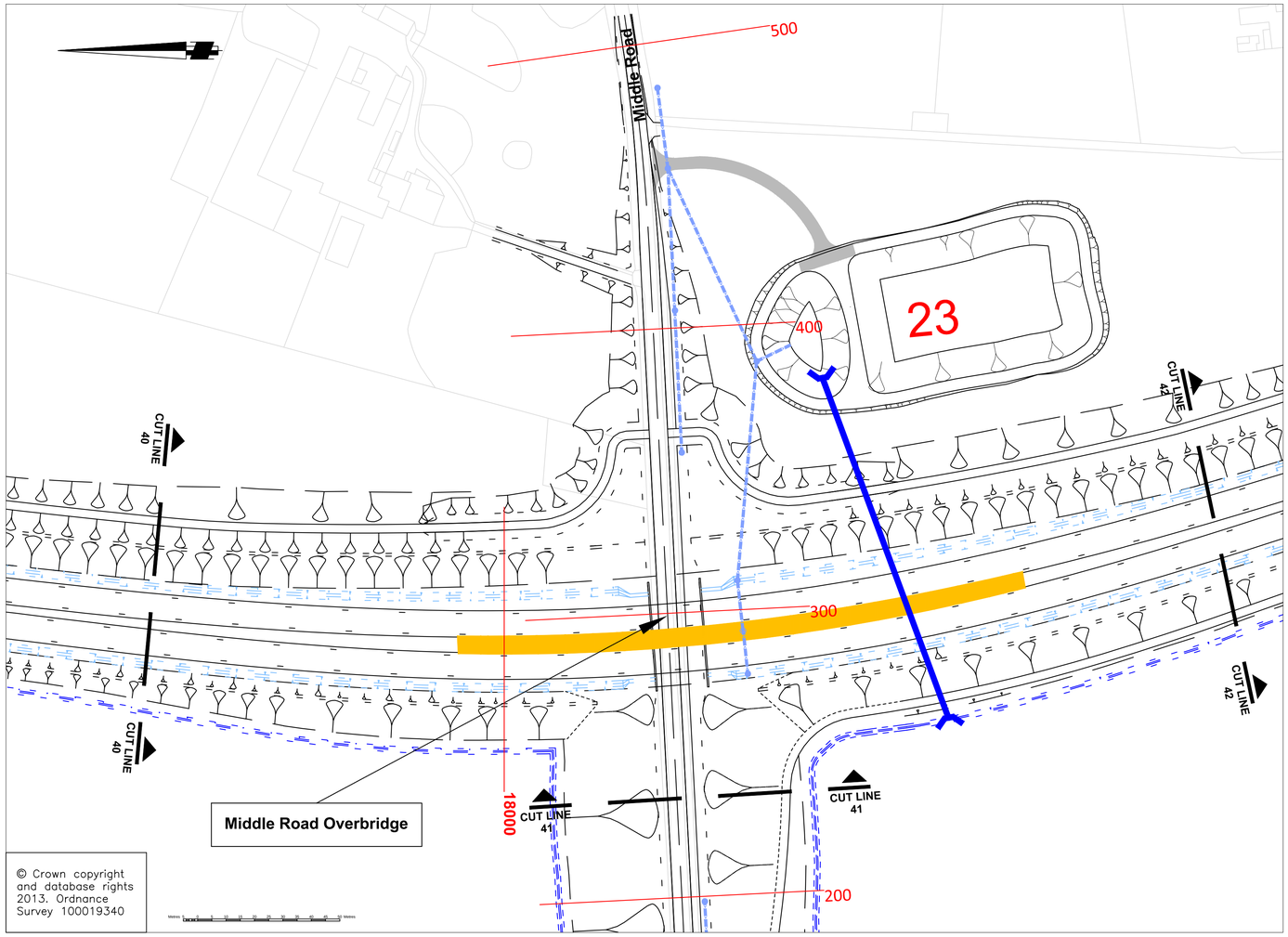
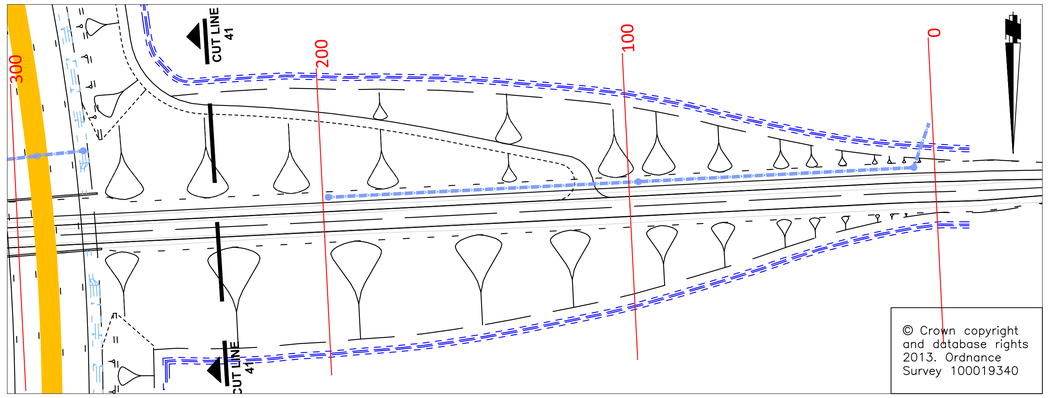
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5082
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1







KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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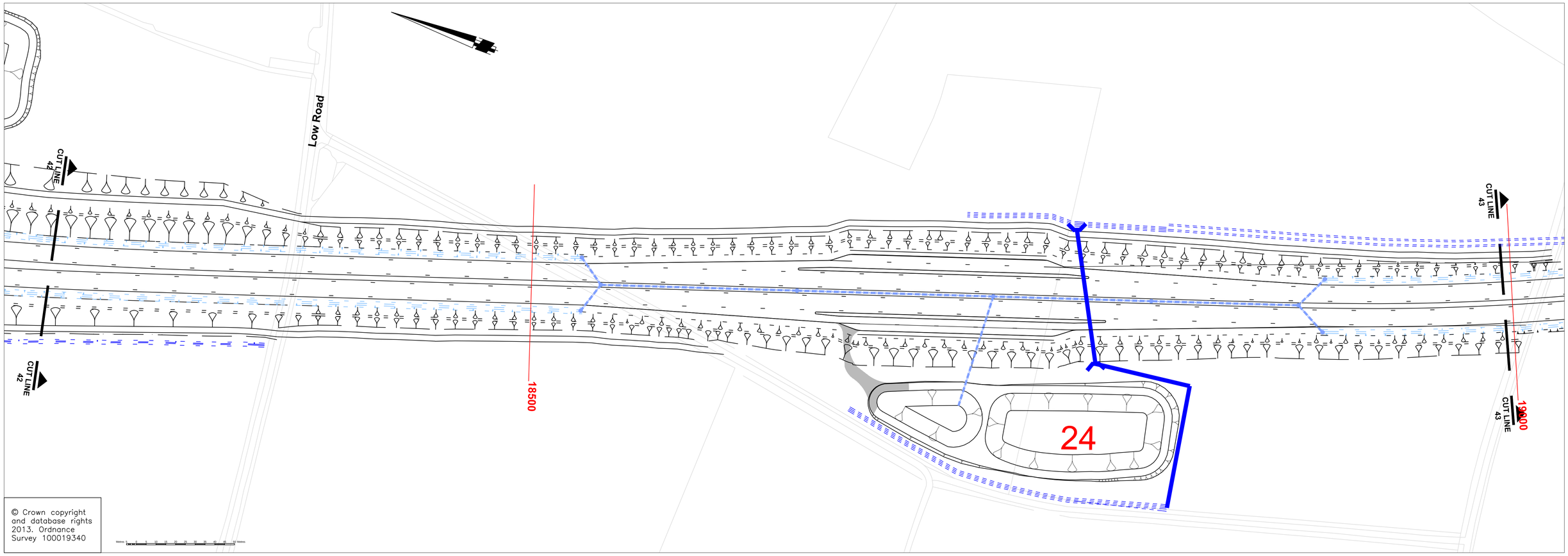
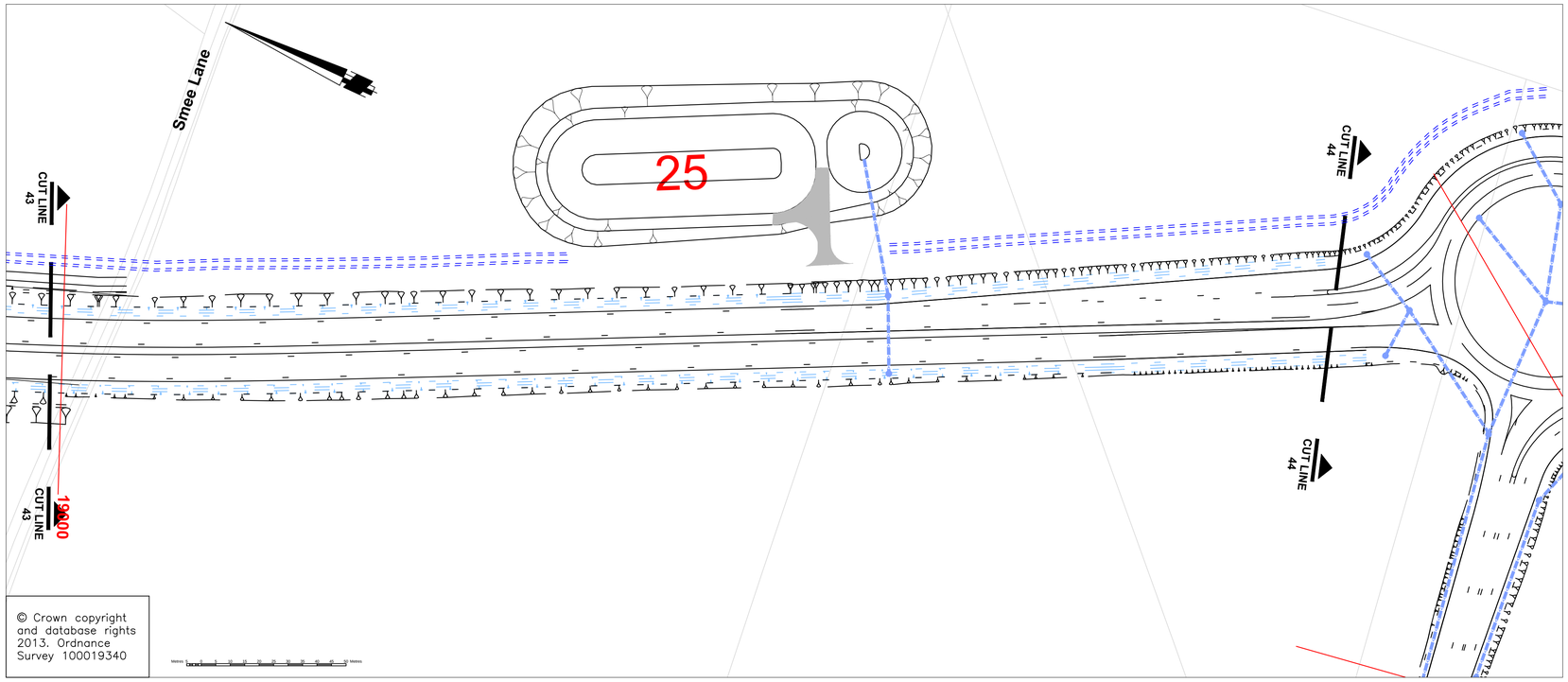
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5083
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1

BIL 09/09/12





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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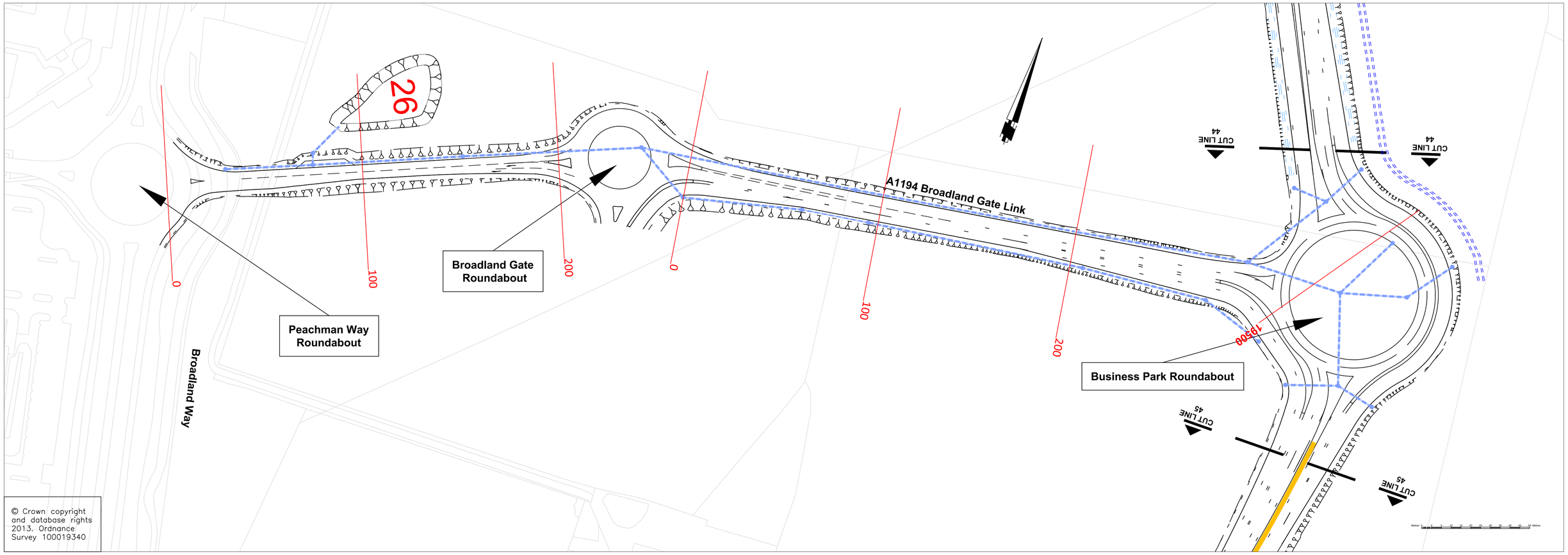
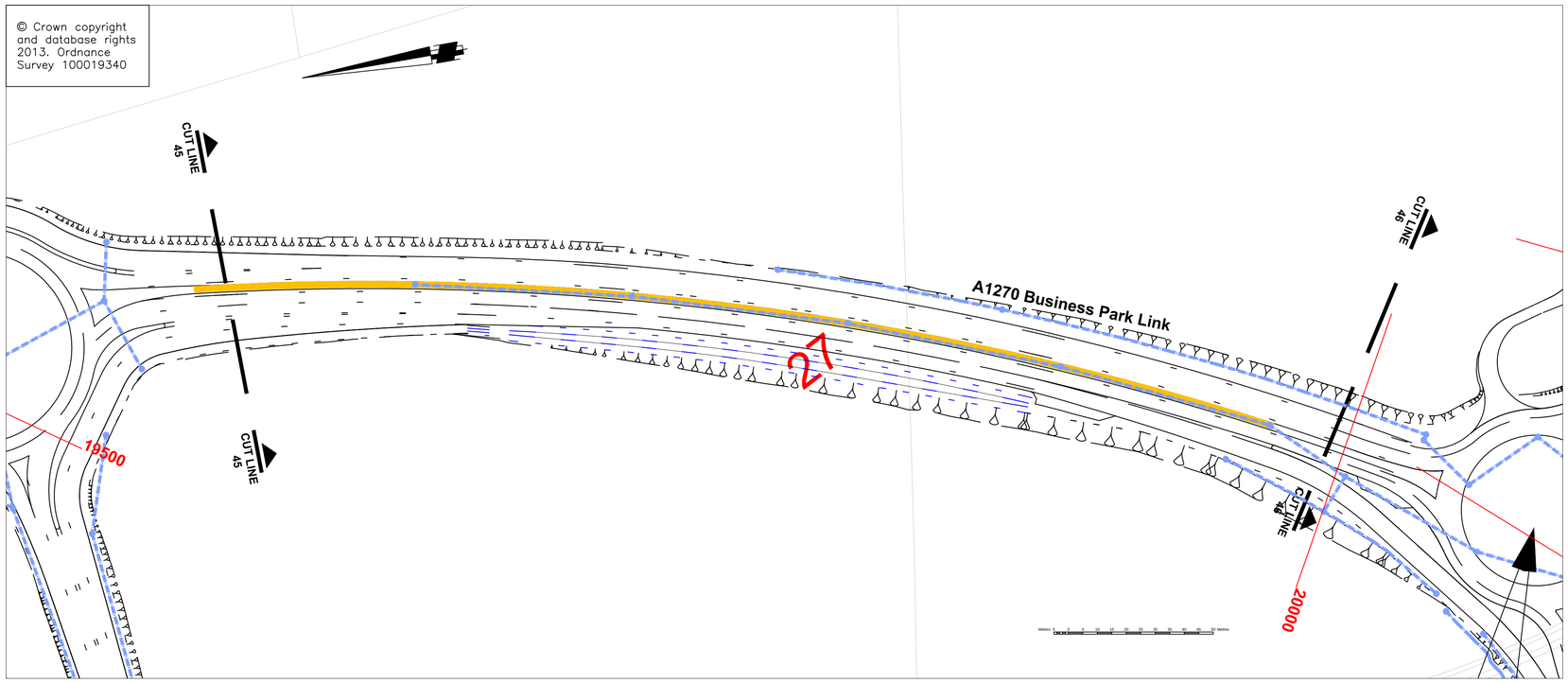
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5084
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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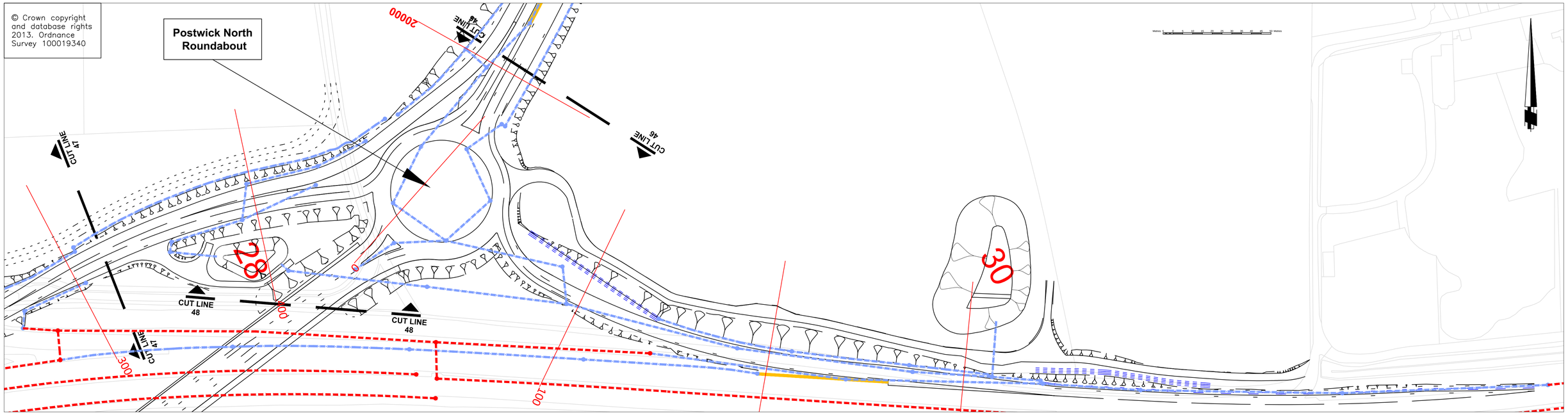
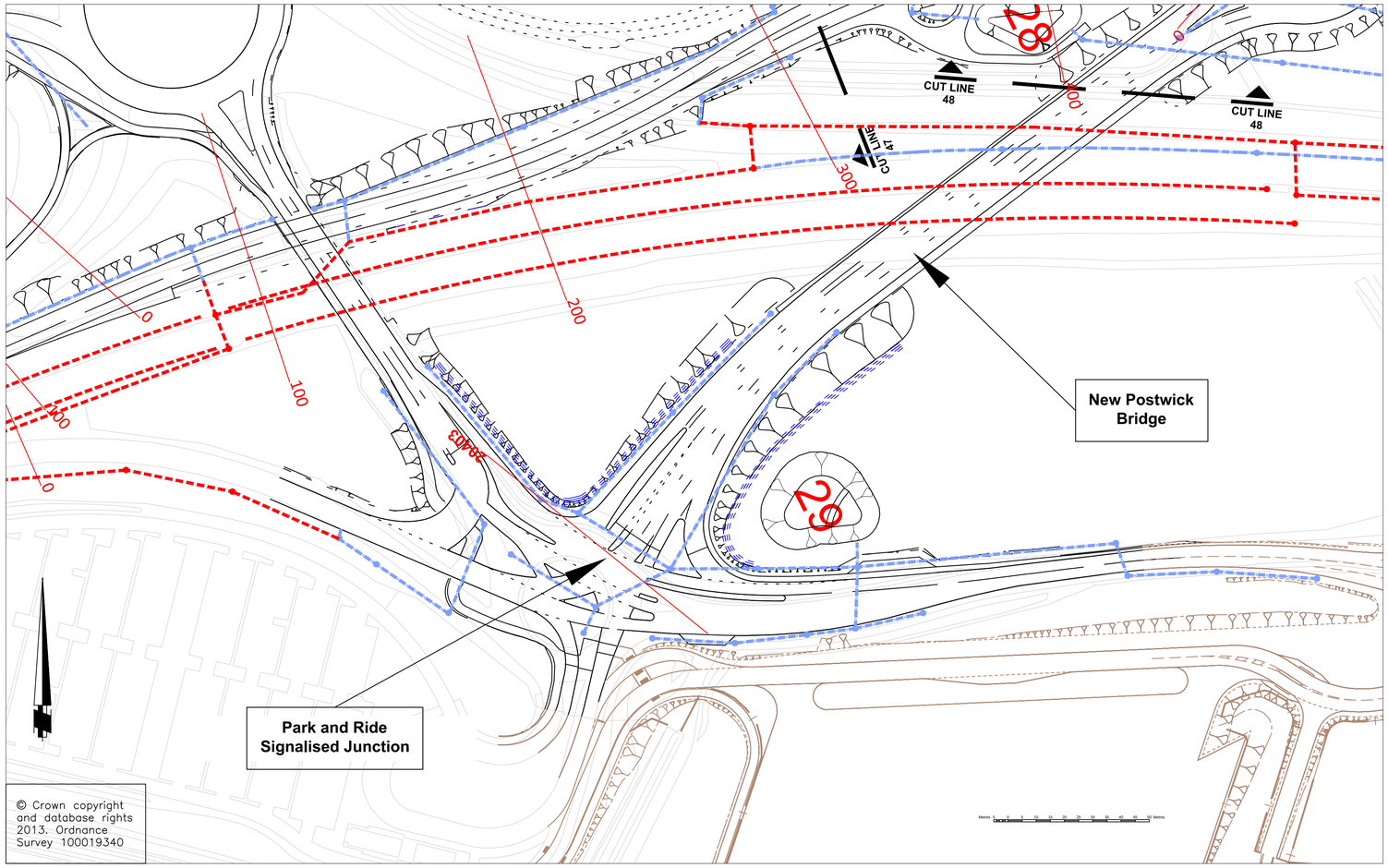
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5085
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1





KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Existing Trunk Road Pipe Network
- Existing Trunk Road Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order. Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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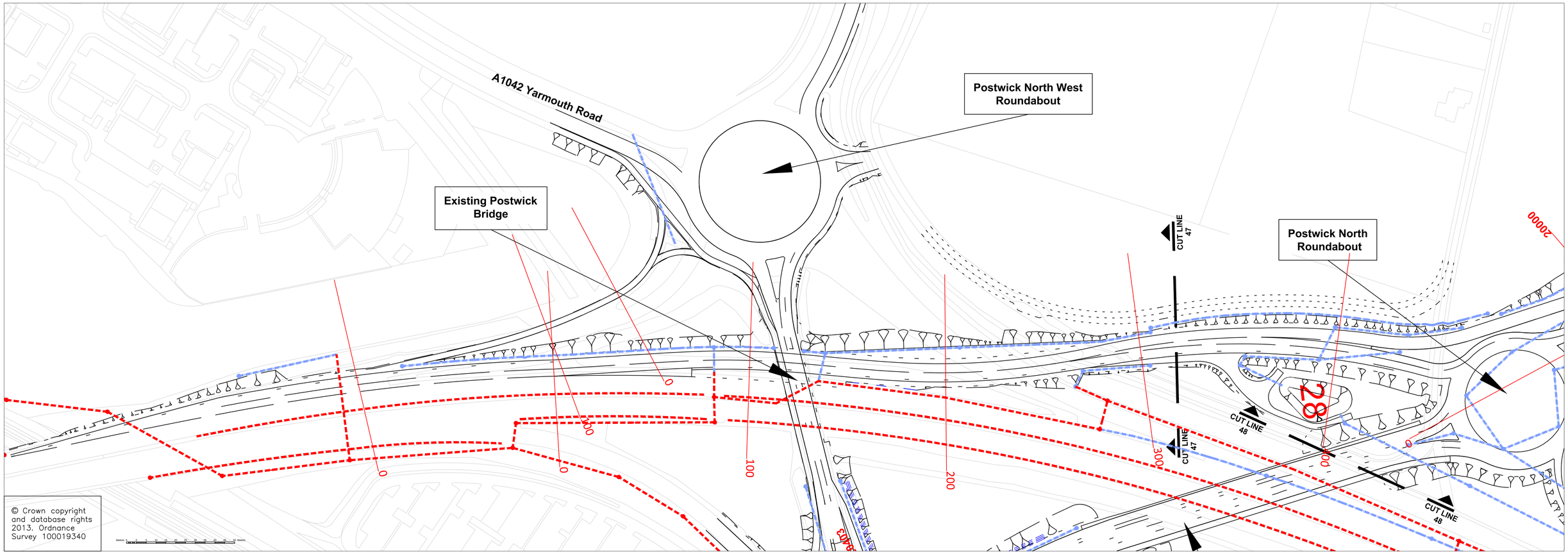
REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	DRAWING No. R1C093-R1-5086	
SURVEYED BY	OS	2013	PROJECT TITLE Norwich Northern Distributor Road	
DESIGNED BY	JT/BF	07/13		
DRAWN BY	JT	11/13		
CHECKED BY	JB	11/13	SCALE 1:1000	FILE No. R1C093

ORIGINAL SIZE: A1

BIL 09/09/12



KEY

- Proposed Ditch
- Proposed Swale
- Proposed Bitumen Channel
- Proposed Pipe Network
- Proposed Manhole
- Existing Trunk Road Pipe Network
- Existing Trunk Road Manhole
- Proposed Lagoon
- Proposed Culvert
- 8500 Chainage

Plan to be read in conjunction with the Development Consent Order Regulations 5(2)(p) and 6(2)(a)

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DRAWING TITLE
Norwich Northern Distributor Road
Outline Drainage Works Plan
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REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	
SURVEYED BY	OS	2013	DRAWING No. R1C093-R1-5087
DESIGNED BY	JT/BF	07/13	PROJECT TITLE Norwich Northern Distributor Road
DRAWN BY	JT	11/13	
CHECKED BY	JB	11/13	SCALE 1:1000 / FILE No. R1C093

ORIGINAL SIZE: A1

KEY

- New carriageway
- Existing carriageway to become verge
- Grasscrete turning head
- Existing carriageway to be broken out
- Highway boundary
- Proposed carriageway

Right-turn lane for Crostwick Lane to be extended by removing existing right-turn lane for Rackheath Lane

Tie into existing kerbing

Widen carriageway to allow additional left turn movements while vehicles are waiting to turn right

Tie into existing kerbing

Junction to be stopped-up. Bund/landscaping to be provided to block headlight from turning vehicles.

To be confirmed at detailed design stage.

Existing carriageway to be broken out and paved with grasscrete

Existing junction to be stopped up

Grasscrete Turning Head

Crostwick Lane

Rackheath Lane

B1150 North Walsham Road

Toll-Bar Cottage

R15.0m

2.2m

3,63

3,65

3,63

19.2m

6.0m

6.0m

R10.0m

R10.0m

Notes

1. Preliminary layout based on the ordinance survey.
2. Provision for HGV's for the turning head.
3. Exact location of the junction will be determined based on the safety audit comments, junction capacity checks and the environmental impact assessment.
4. Signing design to be carried out as part of the NDR.

Utilities Affected:

1. Widening on Crostwick Lane - Utilities Present and Impact
   BT - Likely to be affected
   Water Pipe (90mm MDPE/PE80) - Likely to be affected
2. Breaking out existing carriageway on Rackheath Lane - Utilities Present and Impact
   BT - Unlikely to be affected
   Water Pipe - Unlikely to be affected

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Norfolk County Council working with MAYGURNEY Mott MacDonald

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Director of Environment, Transport and Development
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Mott MacDonald
County Hall
Martineau Lane
Norwich, NR1 2US
Tel 01603 767530
Fax 01603 226760
Web www.mottmac.com

DRAWING TITLE
Preliminary General Arrangement

REV.	DESCRIPTION	CHECKED	DATE
A	Layout reviewed after Stage-1 RSA	UK	09/13

	INIT.	DATE
DESIGNED BY	XF	09/13
DRAWN BY	JCR	09/13
CHECKED BY	UK	09/13
APPROVED BY	MMG	09/13

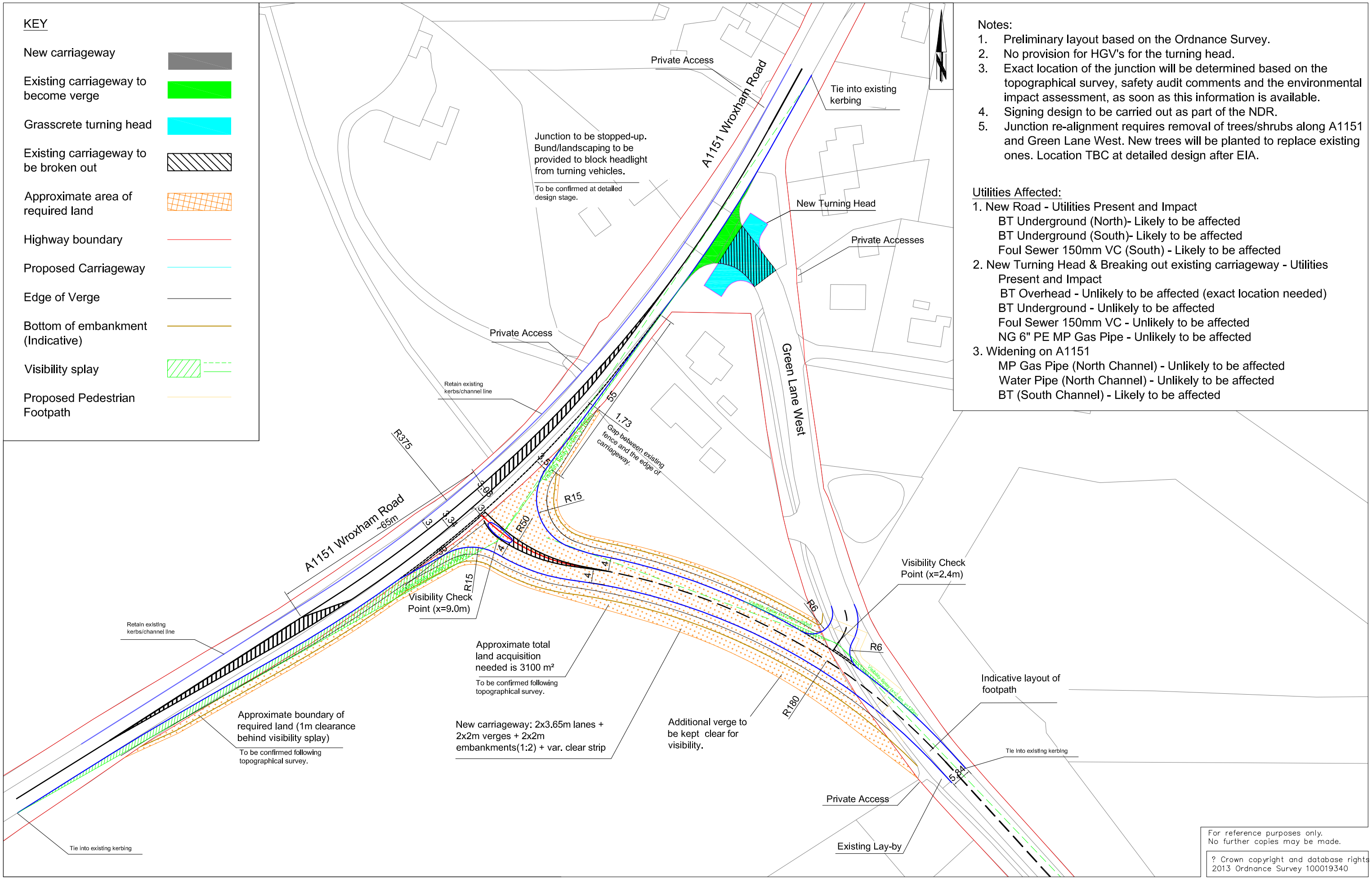
DRAWING No. MMD-233906-ES-01-C-DR-00-XX-002A
PROJECT TITLE Crostwick Junction Improvements
SCALE AT A3 1:500
FILE No. 233906-ES-01

ORIGINAL SIZE: A3

30/06/2009

KEY

- New carriageway
- Existing carriageway to become verge
- Grasscrete turning head
- Existing carriageway to be broken out
- Approximate area of required land
- Highway boundary
- Proposed Carriageway
- Edge of Verge
- Bottom of embankment (Indicative)
- Visibility splay
- Proposed Pedestrian Footpath



Notes:

1. Preliminary layout based on the Ordnance Survey.
2. No provision for HGV's for the turning head.
3. Exact location of the junction will be determined based on the topographical survey, safety audit comments and the environmental impact assessment, as soon as this information is available.
4. Signing design to be carried out as part of the NDR.
5. Junction re-alignment requires removal of trees/shrubs along A1151 and Green Lane West. New trees will be planted to replace existing ones. Location TBC at detailed design after EIA.

Utilities Affected:

1. New Road - Utilities Present and Impact
   - BT Underground (North)- Likely to be affected
   - BT Underground (South)- Likely to be affected
   - Foul Sewer 150mm VC (South) - Likely to be affected
2. New Turning Head & Breaking out existing carriageway - Utilities Present and Impact
   - BT Overhead - Unlikely to be affected (exact location needed)
   - BT Underground - Unlikely to be affected
   - Foul Sewer 150mm VC - Unlikely to be affected
   - NG 6" PE MP Gas Pipe - Unlikely to be affected
3. Widening on A1151
   - MP Gas Pipe (North Channel) - Unlikely to be affected
   - Water Pipe (North Channel) - Unlikely to be affected
   - BT (South Channel) - Likely to be affected

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DRAWING TITLE
Preliminary General Arrangement

REV.	DESCRIPTION	CHECKED	DATE
A	Layout revised after Stage-1 RSA.	AH	09/13
B	Alignment revised to resolve landtake issues.	AH	10/13
C	Design changes after interim RSA	AH	10/13

	INIT.	DATE
DESIGNED BY	UK	09/13
DRAWN BY	JCR	09/13
CHECKED BY	AH	09/13
APPROVED BY	MMG	09/13

DRAWING No. MMD-233906-ES-02-C-DR-00-XX-006C
PROJECT TITLE Rackeath Junction Improvements
SCALE AT A3 1:1000
FILE No. 233906-ES-02

ORIGINAL SIZE: A3

30/06/2009

KEY

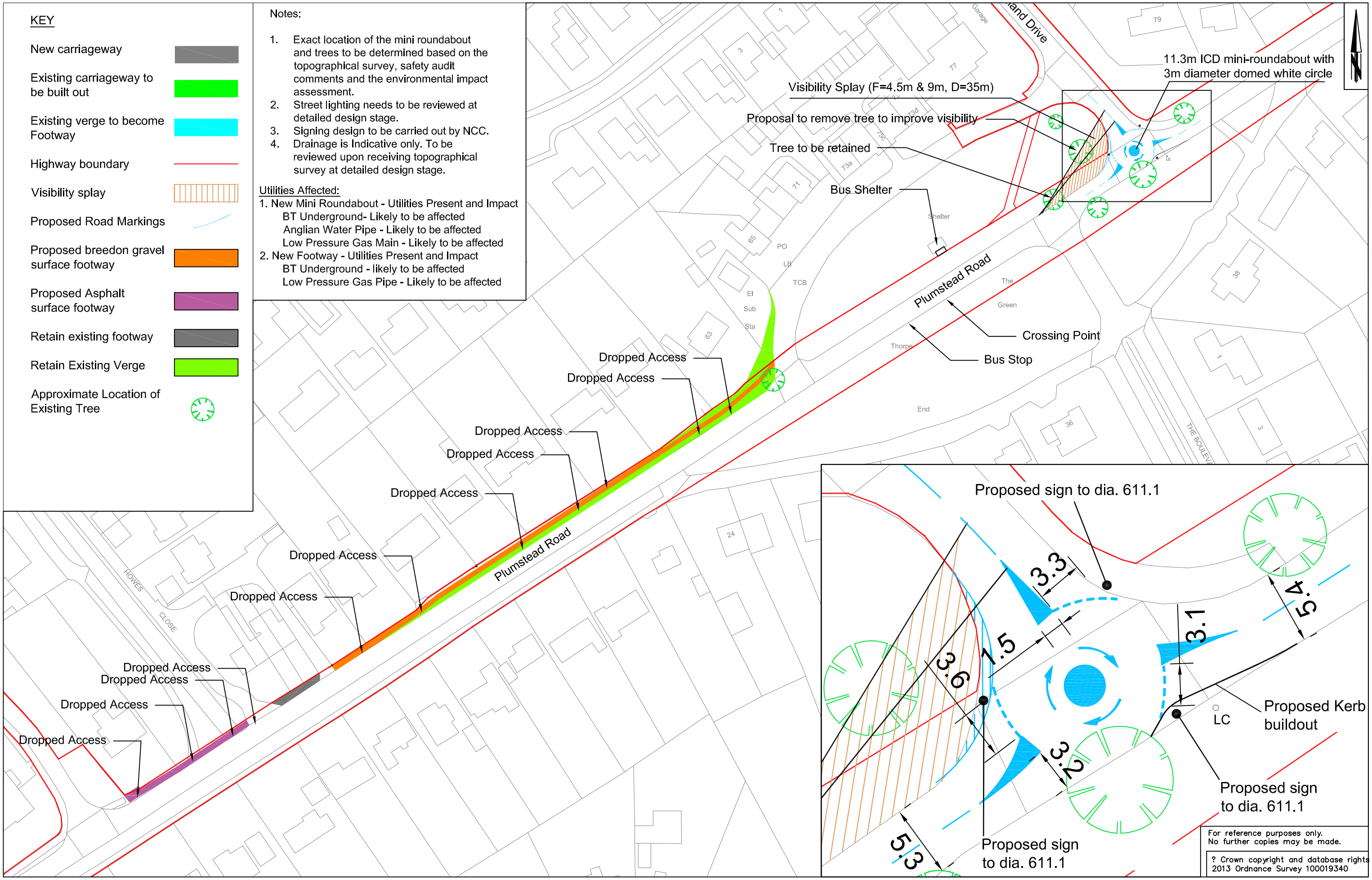
- New carriageway
- Existing carriageway to be built out
- Existing verge to become Footway
- Highway boundary
- Visibility splay
- Proposed Road Markings
- Proposed breedon gravel surface footway
- Proposed Asphalt surface footway
- Retain existing footway
- Retain Existing Verge
- Approximate Location of Existing Tree

Notes:

1. Exact location of the mini roundabout and trees to be determined based on the topographical survey, safety audit comments and the environmental impact assessment.
2. Street lighting needs to be reviewed at detailed design stage.
3. Signing design to be carried out by NCC.
4. Drainage is Indicative only. To be reviewed upon receiving topographical survey at detailed design stage.

Utilities Affected:

1. New Mini Roundabout - Utilities Present and Impact
   BT Underground- Likely to be affected
   Anglian Water Pipe - Likely to be affected
   Low Pressure Gas Main - Likely to be affected
2. New Footway - Utilities Present and Impact
   BT Underground - likely to be affected
   Low Pressure Gas Pipe - Likely to be affected



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DRAWING TITLE
Preliminary General Arrangement

REV.	DESCRIPTION	CHECKED	DATE
A	Mini roundabout alignment revised.	UK	09/13
B	Layout revised after Stage-1 RSA	UK	09/13

	INIT.	DATE
DESIGNED BY	JT	09/13
DRAWN BY	JCR	09/13
CHECKED BY	UK	09/13
APPROVED BY	MMG	09/13

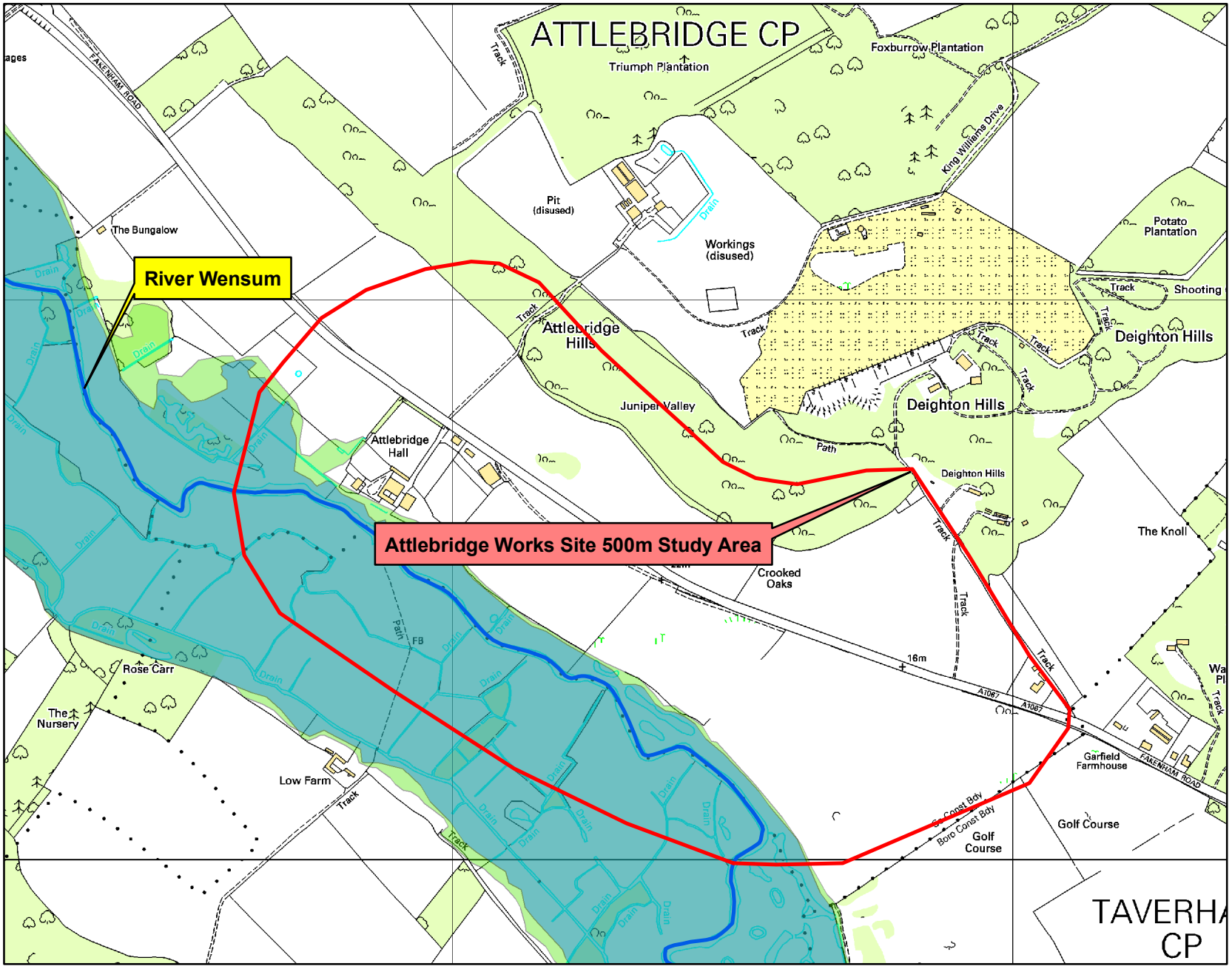
DRAWING No. MMD-233906-ES-03-C-DR-00-XX-002B
PROJECT TITLE Thorpe End - Plumstead Road Highways Improvements
SCALE AT A3 1:1000
FILE No. 233906-ES-02

ORIGINAL SIZE: A3

30/06/2009

Appendix B. EA Flood Maps

Detailed Flood Map centred on Attlebridge, Norfolk - Created 25/06/2013.
Ref: CCE/2013/50619



Environment Agency

Scale 1:10,000

Legend

- Site Outline
- Main River
- Areas Benefit Flood Defence
- Flood Storage Area
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

N

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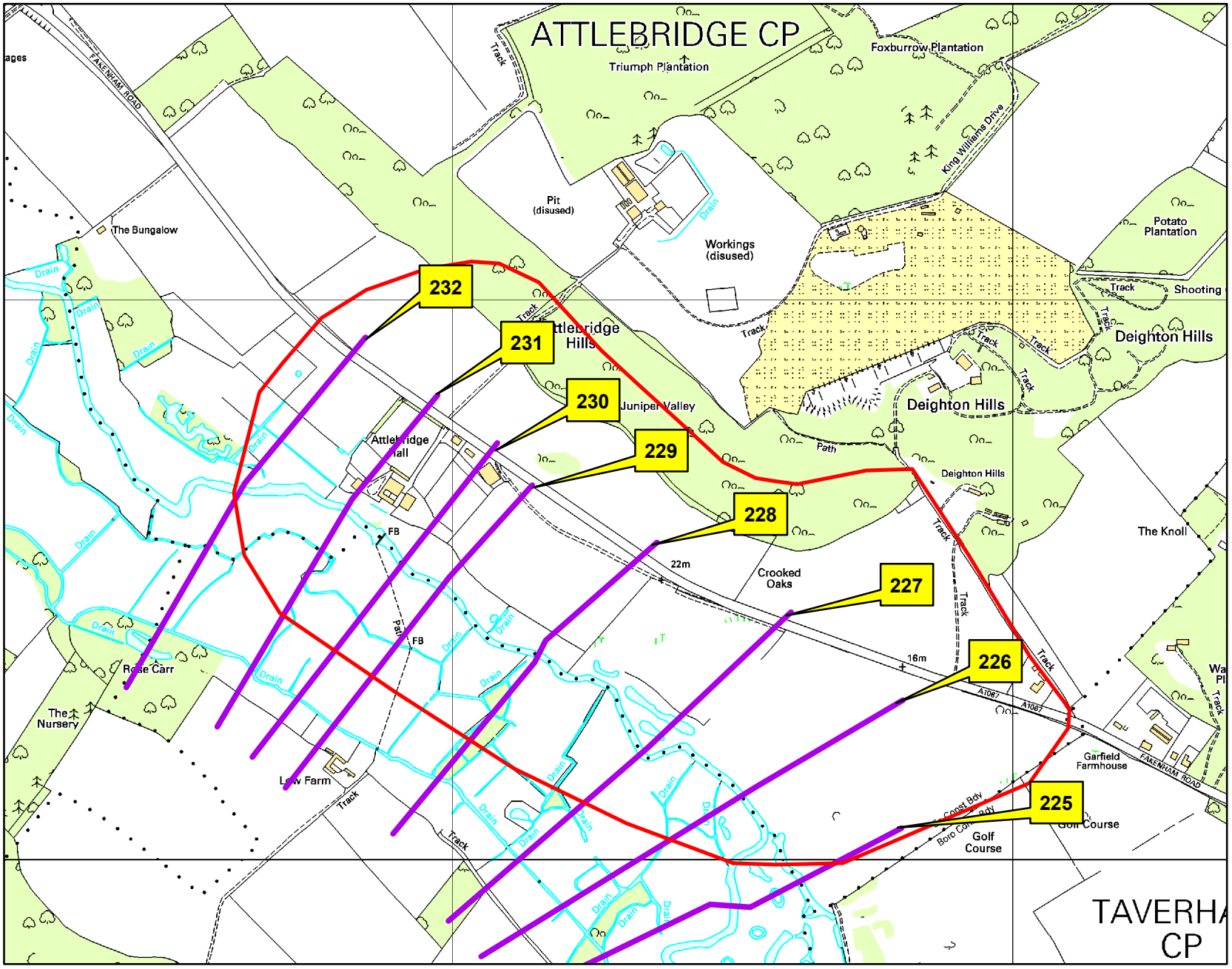
Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Modelled Flood Level Location Map centred on Attlebridge, Norfolk - Created 25/06/2013.
Ref: CCE/2013/50619



Environment Agency

Scale 1:10,000

Legend

Site Outline

Modelled Flood Level Cross Section

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Datasheet Reference CCE/2013/50619

Fluvial flood levels (mAODN)

UNDEFENDED LEVELS

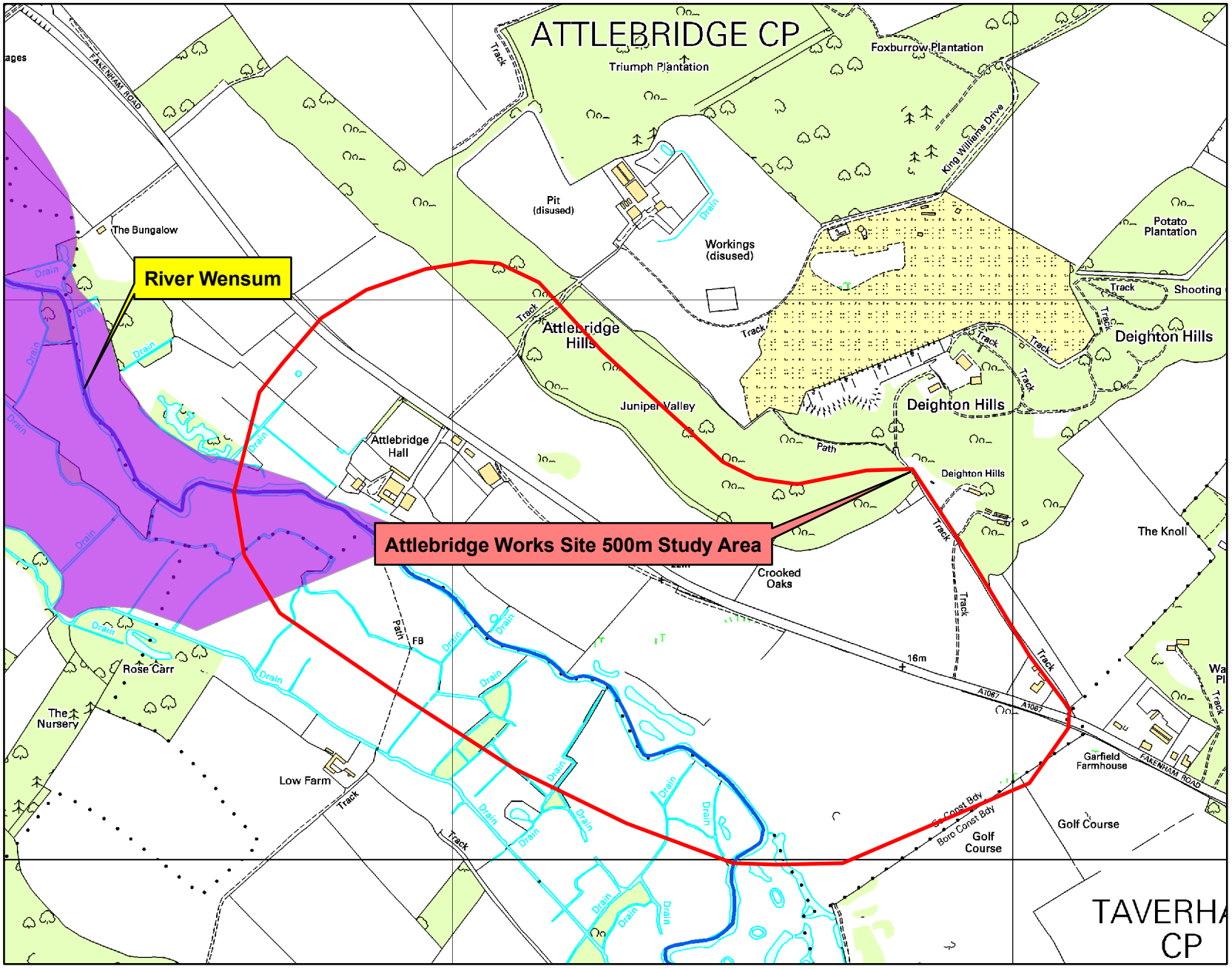
Node	20%(1:5)	10%(1:10)	5%(1:20)	2% (1:50)	1.3%(1:75)
225	9.36	9.38	9.42	9.45	9.46
226	9.40	9.42	9.45	9.48	9.49
227	9.47	9.48	9.51	9.53	9.54
228	9.52	9.53	9.56	9.58	9.59
229	9.58	9.59	9.63	9.65	9.66
230	9.62	9.63	9.67	9.70	9.71
231	9.69	9.70	9.74	9.77	9.78
232	9.85	9.86	9.89	9.91	9.92

Node	1%(1:100)	1%(1:100)+CC	0.1%(1:1000)
225	9.48	9.59	9.92
226	9.50	9.61	9.93
227	9.55	9.65	9.94
228	9.60	9.69	9.96
229	9.67	9.77	10.02
230	9.72	9.82	10.11
231	9.79	9.90	10.20
232	9.93	10.01	10.25

CC = Climate Change

Source of information: Wensum River Study 2009 by JBA for the Environment Agency

Historic Flood Events Map centred on Attlebridge, Norfolk - Created 25/06/2013.
Ref: CCE/2013/50619



Scale 1:10,000

Legend

- Site Outline
- 1993 Flood
- Main River

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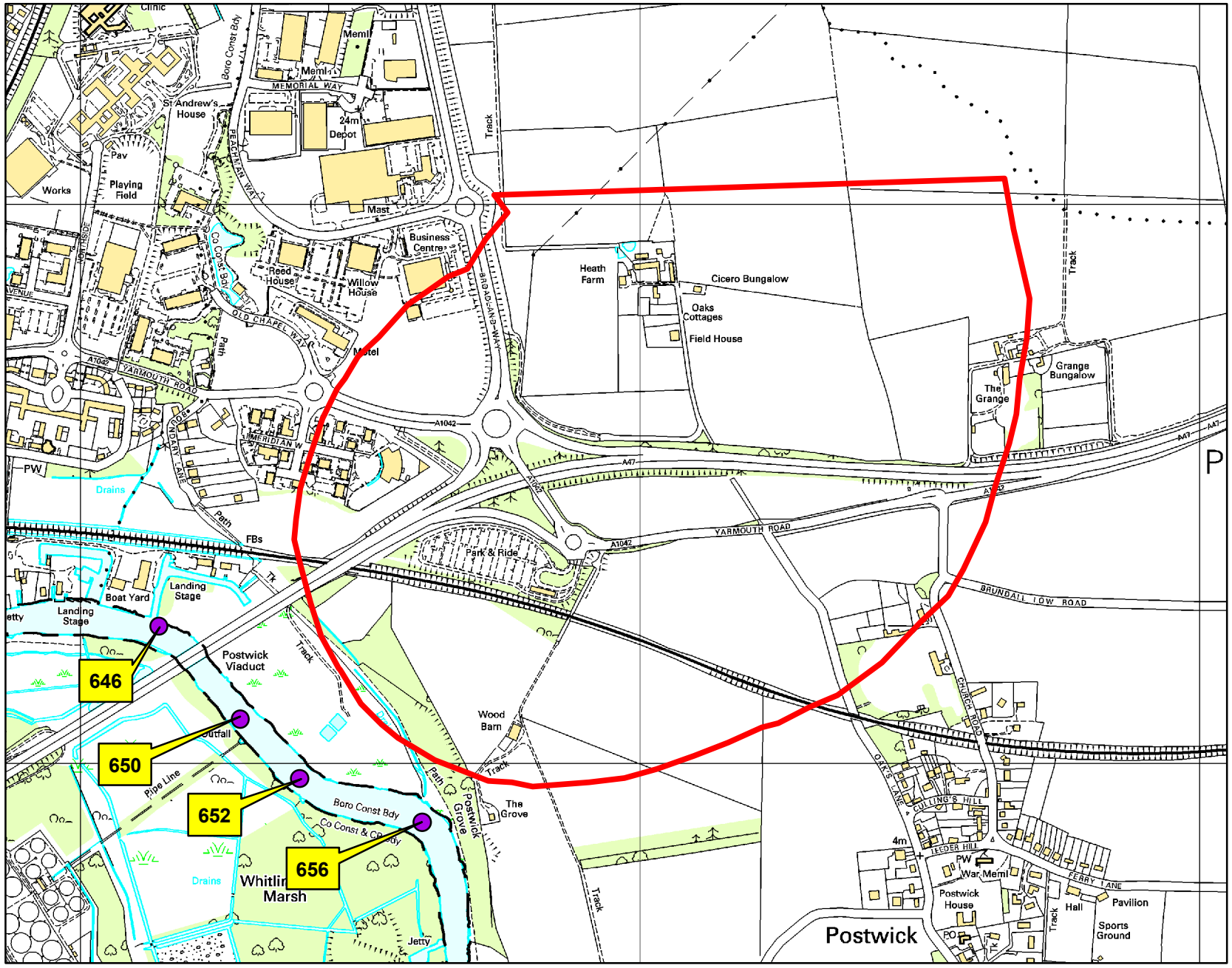
Modelled Flood Level Location Map centred on Postwick, Norfolk - Created 27/06/2013.
Ref: CCE/2013/50619



Scale 1:10,000

Legend

- Modelled Flood Level Node Points
- Site Outline

N

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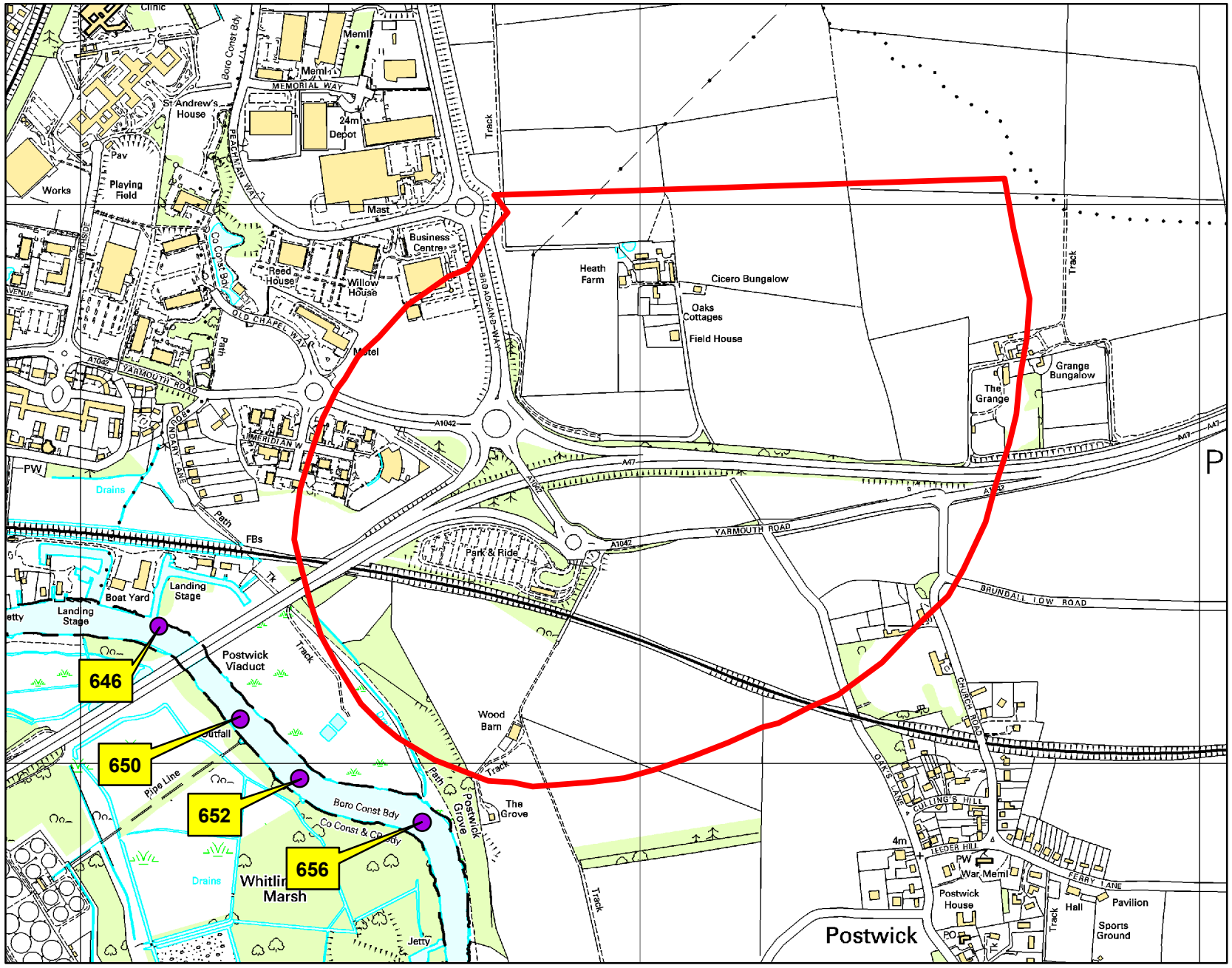
Modelled Flood Level Location Map centred on Postwick, Norfolk - Created 27/06/2013.
Ref: CCE/2013/50619



Scale 1:10,000

Legend

- Modelled Flood Level Node Points
- Site Outline

N

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Datasheet Reference CCE/2013/50619

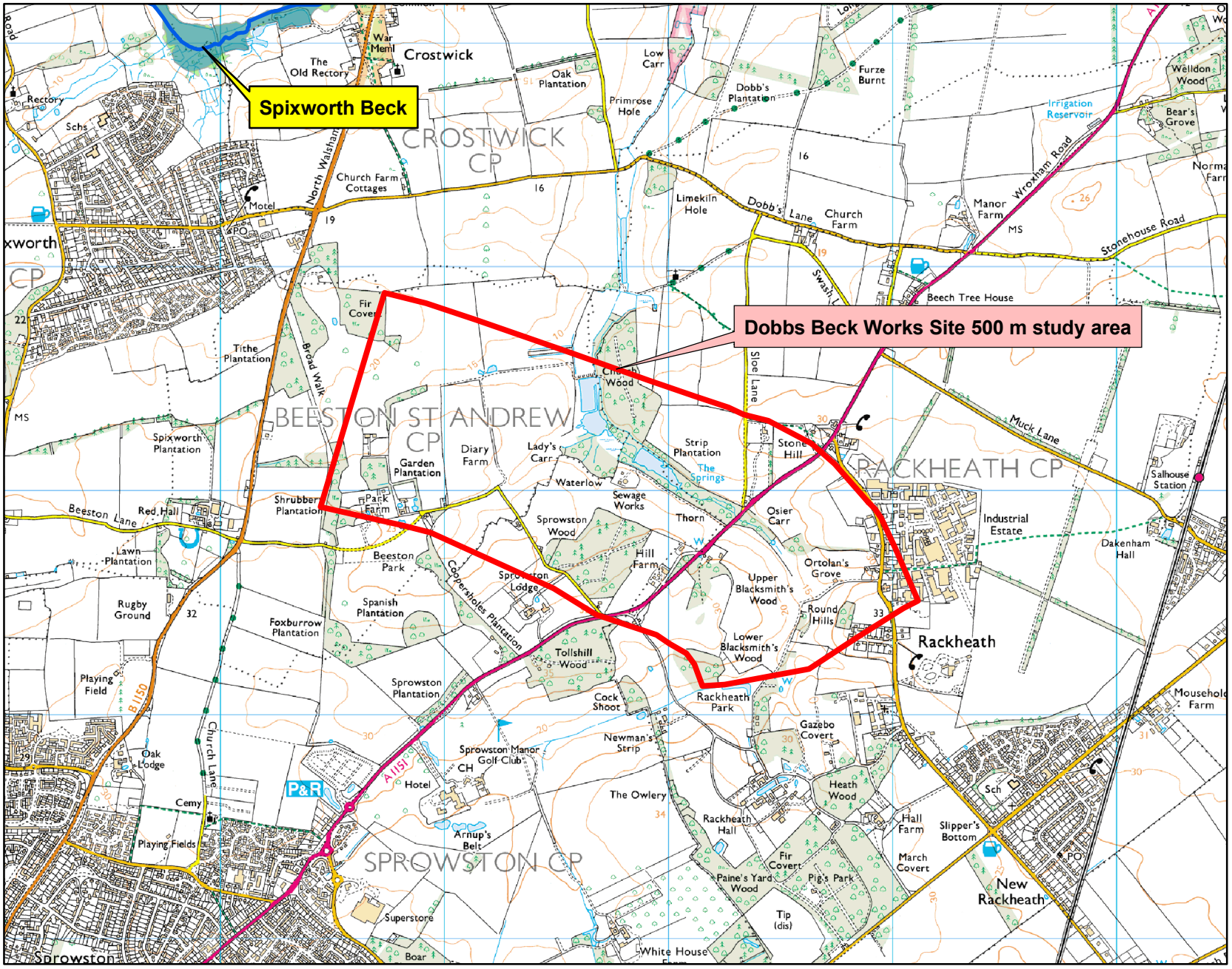
Fluvial flood levels (mAODN)

Node	10% (1:10)	5% (1:20)	2% (1:50)	1% (1:100)	0.1% (1:1000)	5% (1:20)+CC	1% (1:100)+CC
646	1.26	1.37	1.50	1.64	2.49	1.84	2.10
650	1.25	1.35	1.48	1.60	2.41	1.82	2.06
652	1.24	1.34	1.47	1.59	2.38	1.81	2.05
656	1.23	1.33	1.45	1.56	2.33	1.80	2.03

Node	0.1% (1:1000)+CC
646	2.92
650	2.84
652	2.81
656	2.76

CC=Climate Change

Detailed Flood Map centred on Dobbs Beck, Norfolk - Created 03/07/2013.
Ref: CCE/2013/50619



Environment Agency

Scale 1:25,000

Legend

- Site Outline
- Main River
- Areas Benefit Flood Defence
- Flood Storage Area
- Spixworth Beck Flood Zone 3
- Spixworth Beck Flood Zone 2

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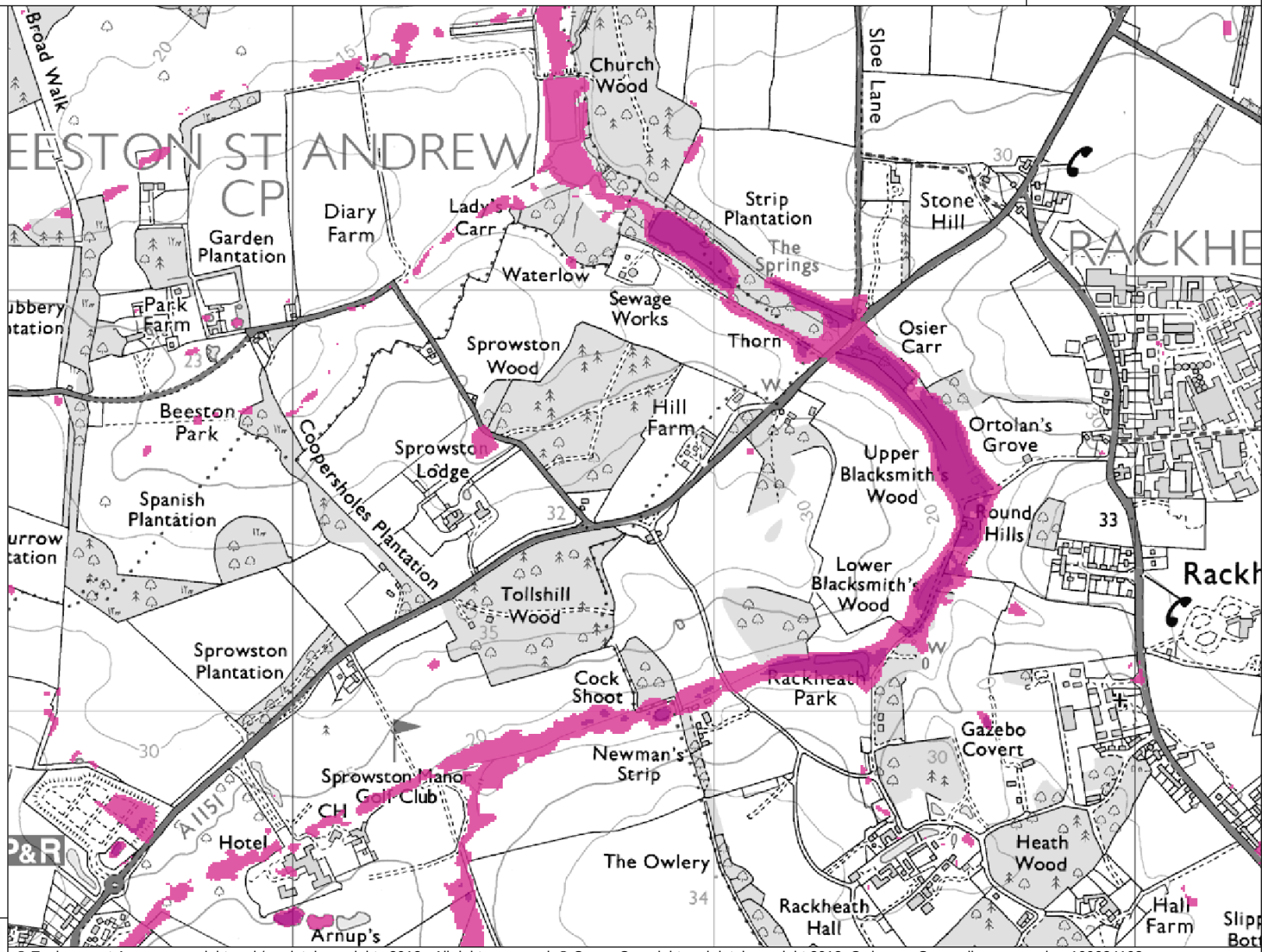
Areas Susceptible to Surface Water - Dobbs Beck - CCE/2013/50619

Environment Agency

Legend

Areas Susceptible to Surface Water

- Less
- Intermediate
- More
- Out of range



0 130 260 390 m.

N W E S

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Flood Map for Surface Water - Dobbs Beck - CCE/2013/50619

Environment Agency

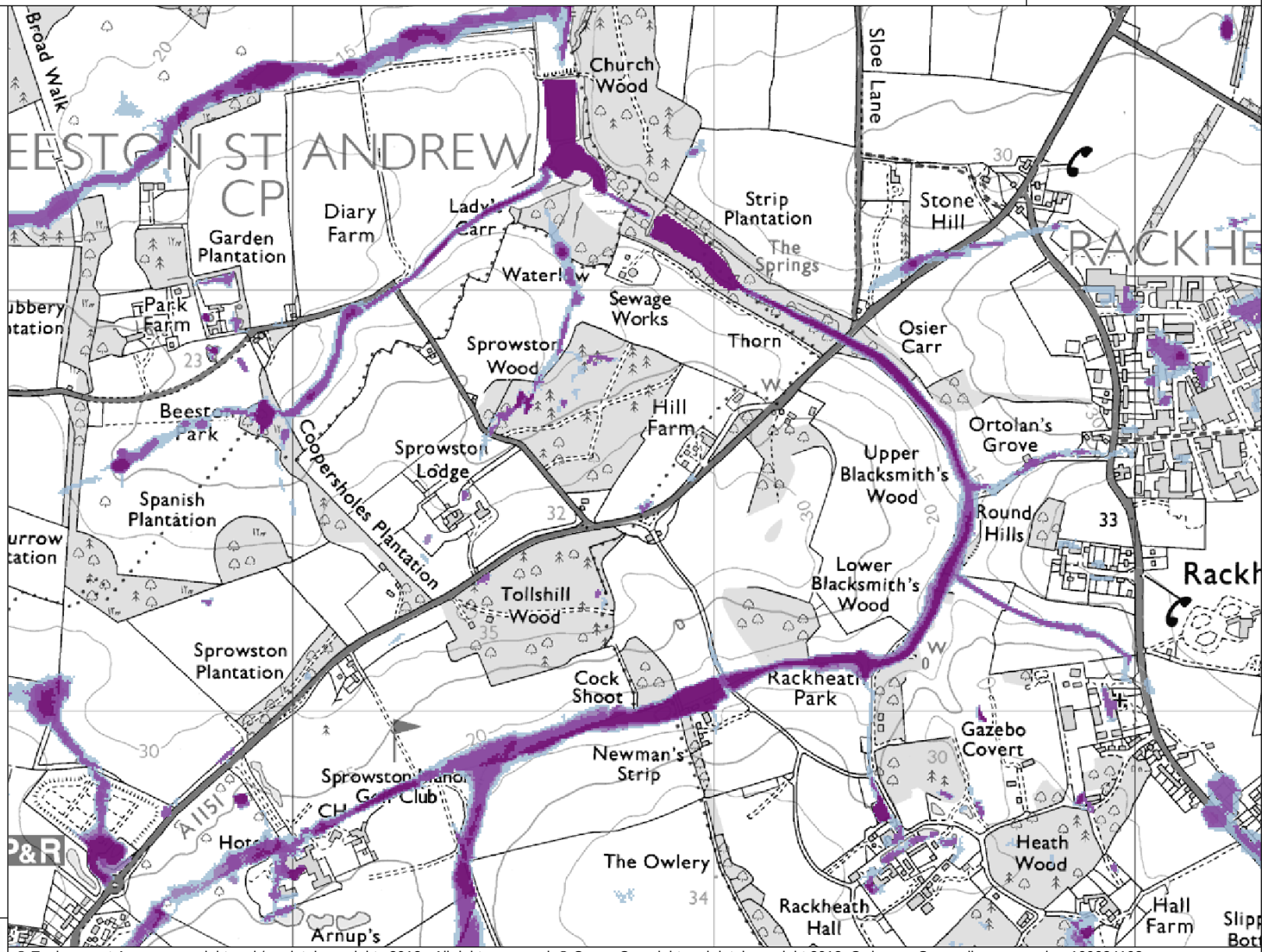
Legend

FMfSW - 1 in 30 chance rain

- Surface Water Flooding
- Deeper Surface Water Flooding
- Out of range

FMfSW - 1 in 200 chance rain

- Surface Water Flooding
- Deeper Surface Water Flooding
- Out of range



0 130 260 390 m.

N W E S

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Appendix C. Micro-Drainage Output Files

Cascade Summary of Results for Lagoon 1 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 1 Infiltration.srcx	Lagoon 1 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	15.110	1.710	233.6	0.0	233.6	1676.3	O K
30 min Summer	15.208	1.808	240.8	9.3	250.1	1815.5	O K
60 min Summer	15.224	1.824	241.9	51.5	293.4	1839.4	O K
120 min Summer	15.178	1.778	238.6	0.0	238.6	1772.3	O K
180 min Summer	15.108	1.708	233.5	0.0	233.5	1673.2	O K
240 min Summer	15.035	1.635	228.0	0.0	228.0	1572.5	O K
360 min Summer	14.894	1.494	217.1	0.0	217.1	1386.8	O K
480 min Summer	14.767	1.367	206.7	0.0	206.7	1228.2	O K
600 min Summer	14.655	1.255	197.1	0.0	197.1	1094.9	O K
720 min Summer	14.556	1.156	188.2	0.0	188.2	982.3	O K
960 min Summer	14.416	1.016	174.8	0.0	174.8	831.5	O K
1440 min Summer	14.208	0.808	152.4	0.0	152.4	624.6	O K
2160 min Summer	14.011	0.611	127.6	0.0	127.6	447.3	O K
2880 min Summer	13.894	0.494	110.1	0.0	110.1	349.3	O K
4320 min Summer	13.778	0.378	83.0	0.0	83.0	258.4	O K
5760 min Summer	13.722	0.322	65.4	0.0	65.4	216.9	O K
7200 min Summer	13.686	0.286	54.1	0.0	54.1	190.6	O K
8640 min Summer	13.661	0.261	46.4	0.0	46.4	172.2	O K
10080 min Summer	13.642	0.242	40.6	0.0	40.6	158.7	O K
15 min Winter	15.246	1.846	243.5	135.6	379.1	1871.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.700	0.0	1903.5	0.0	26
30 min Summer	114.873	0.0	2147.5	1.8	37
60 min Summer	64.781	0.0	2426.3	31.5	58
120 min Summer	36.532	0.0	2736.7	0.0	94
180 min Summer	26.131	0.0	2936.4	0.0	128
240 min Summer	20.602	0.0	3086.8	0.0	160
360 min Summer	14.736	0.0	3312.0	0.0	228
480 min Summer	11.618	0.0	3481.7	0.0	292
600 min Summer	9.661	0.0	3619.2	0.0	356
720 min Summer	8.310	0.0	3735.4	0.0	418
960 min Summer	6.695	0.0	4012.0	0.0	540
1440 min Summer	4.936	0.0	4436.5	0.0	780
2160 min Summer	3.640	0.0	4910.5	0.0	1132
2880 min Summer	2.932	0.0	5274.4	0.0	1484
4320 min Summer	2.067	0.0	5574.5	0.0	2204
5760 min Summer	1.613	0.0	5803.2	0.0	2936
7200 min Summer	1.331	0.0	5983.9	0.0	3672
8640 min Summer	1.137	0.0	6135.4	0.0	4400
10080 min Summer	0.995	0.0	6264.6	0.0	5128
15 min Winter	203.700	0.0	2132.6	38.9	25

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Cascade Summary of Results for Lagoon 1 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	15.295	1.895	246.9	397.6	644.5	1944.4	O K
60 min Winter	15.290	1.890	246.6	366.5	613.1	1936.4	O K
120 min Winter	15.260	1.860	244.5	201.6	446.1	1892.2	O K
180 min Winter	15.224	1.824	241.9	51.5	293.4	1839.8	O K
240 min Winter	15.138	1.738	235.7	0.0	235.7	1716.0	O K
360 min Winter	14.942	1.542	220.8	0.0	220.8	1448.8	O K
480 min Winter	14.766	1.366	206.6	0.0	206.6	1226.7	O K
600 min Winter	14.613	1.213	193.3	0.0	193.3	1046.4	O K
720 min Winter	14.481	1.081	181.2	0.0	181.2	900.6	O K
960 min Winter	14.297	0.897	162.3	0.0	162.3	710.6	O K
1440 min Winter	14.051	0.651	132.9	0.0	132.9	481.4	O K
2160 min Winter	13.858	0.458	104.2	0.0	104.2	320.6	O K
2880 min Winter	13.786	0.386	85.7	0.0	85.7	264.9	O K
4320 min Winter	13.708	0.308	60.8	0.0	60.8	206.1	O K
5760 min Winter	13.664	0.264	47.5	0.0	47.5	175.0	O K
7200 min Winter	13.636	0.236	39.2	0.0	39.2	155.1	O K
8640 min Winter	13.611	0.211	33.5	0.0	33.5	137.2	O K
10080 min Winter	13.592	0.192	29.4	0.0	29.4	124.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	114.873	0.0	2405.9	192.1	33
60 min Winter	64.781	0.0	2717.7	276.0	52
120 min Winter	36.532	0.0	3065.4	175.1	90
180 min Winter	26.131	0.0	3289.0	37.6	132
240 min Winter	20.602	0.0	3457.5	0.0	174
360 min Winter	14.736	0.0	3709.7	0.0	244
480 min Winter	11.618	0.0	3899.7	0.0	310
600 min Winter	9.661	0.0	4053.8	0.0	374
720 min Winter	8.310	0.0	4184.0	0.0	436
960 min Winter	6.695	0.0	4493.9	0.0	558
1440 min Winter	4.936	0.0	4969.5	0.0	794
2160 min Winter	3.640	0.0	5500.0	0.0	1136
2880 min Winter	2.932	0.0	5907.5	0.0	1480
4320 min Winter	2.067	0.0	6244.2	0.0	2204
5760 min Winter	1.613	0.0	6499.7	0.0	2936
7200 min Winter	1.331	0.0	6702.2	0.0	3672
8640 min Winter	1.137	0.0	6871.9	0.0	4408
10080 min Winter	0.995	0.0	7017.3	0.0	5128

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Cascade Model Details for Lagoon 1 Primary.srcx

Storage is Online Cover Level (m) 15.600

Tank or Pond Structure

Invert Level (m) 13.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	611.0	1.400	1234.0	2.800	0.0	4.200	0.0
0.200	688.0	1.600	1339.0	3.000	0.0	4.400	0.0
0.400	768.0	1.800	1448.0	3.200	0.0	4.600	0.0
0.600	854.0	2.000	1561.9	3.400	0.0	4.800	0.0
0.800	943.0	2.200	1679.2	3.600	0.0	5.000	0.0
1.000	1036.0	2.400	0.0	3.800	0.0		
1.200	1133.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	17.000	Upstream Invert Level (m)	13.400
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 8.000 Invert Level (m) 15.200

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Cascade Summary of Results for Lagoon 1 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 1 Primary.srcx		(None)	(None)

Half Drain Time : 148 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	14.315	1.115	123.1	1220.5	O K
30 min Summer	14.496	1.296	138.9	1514.3	O K
60 min Summer	14.669	1.469	154.3	1822.6	O K
120 min Summer	14.868	1.668	172.4	2208.3	O K
180 min Summer	14.977	1.777	182.5	2436.7	O K
240 min Summer	15.052	1.852	189.5	2598.3	O K
360 min Summer	15.144	1.944	198.2	2805.1	O K
480 min Summer	15.193	1.993	202.8	2917.3	O K
600 min Summer	15.202	2.002	203.7	2939.0	O K
720 min Summer	15.185	1.985	202.0	2898.0	O K
960 min Summer	15.185	1.985	202.0	2898.9	O K
1440 min Summer	15.150	1.950	198.8	2818.8	O K
2160 min Summer	15.063	1.863	190.5	2623.4	O K
2880 min Summer	14.965	1.765	181.4	2410.5	O K
4320 min Summer	14.691	1.491	156.3	1863.6	O K
5760 min Summer	14.475	1.275	137.0	1478.5	O K
7200 min Summer	14.304	1.104	122.2	1203.6	O K
8640 min Summer	14.166	0.966	110.4	999.8	O K
10080 min Summer	14.053	0.853	100.8	843.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	203.700	0.0	203
30 min Summer	114.873	0.0	235
60 min Summer	64.781	0.0	268
120 min Summer	36.532	0.0	316
180 min Summer	26.131	0.0	356
240 min Summer	20.602	0.0	392
360 min Summer	14.736	0.0	462
480 min Summer	11.618	0.0	532
600 min Summer	9.661	0.0	612
720 min Summer	8.310	0.0	678
960 min Summer	6.695	0.0	800
1440 min Summer	4.936	0.0	1046
2160 min Summer	3.640	0.0	1420
2880 min Summer	2.932	0.0	1796
4320 min Summer	2.067	0.0	2528
5760 min Summer	1.613	0.0	3248
7200 min Summer	1.331	0.0	3968
8640 min Summer	1.137	0.0	4688
10080 min Summer	0.995	0.0	5400

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Cascade Summary of Results for Lagoon 1 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	14.405	1.205	130.9	1362.6	O K
30 min Winter	14.575	1.375	145.9	1651.1	O K
60 min Winter	14.749	1.549	161.5	1972.9	O K
120 min Winter	14.954	1.754	180.4	2387.1	O K
180 min Winter	15.076	1.876	191.8	2651.4	O K
240 min Winter	15.152	1.952	198.9	2822.4	O K
360 min Winter	15.240	2.040	207.3	3027.7	O K
480 min Winter	15.283	2.083	211.5	3131.0	O K
600 min Winter	15.291	2.091	212.2	3150.2	O K
720 min Winter	15.264	2.064	209.6	3084.9	O K
960 min Winter	15.238	2.038	207.1	3023.6	O K
1440 min Winter	15.146	1.946	198.3	2808.6	O K
2160 min Winter	14.964	1.764	181.3	2408.9	O K
2880 min Winter	14.795	1.595	165.8	2063.0	O K
4320 min Winter	14.437	1.237	133.7	1415.5	O K
5760 min Winter	14.182	0.982	111.8	1022.6	O K
7200 min Winter	13.998	0.798	96.3	772.2	O K
8640 min Winter	13.857	0.657	84.7	599.2	O K
10080 min Winter	13.747	0.547	75.8	475.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	203.700	0.0	208
30 min Winter	114.873	0.0	229
60 min Winter	64.781	0.0	262
120 min Winter	36.532	0.0	312
180 min Winter	26.131	0.0	356
240 min Winter	20.602	0.0	394
360 min Winter	14.736	0.0	464
480 min Winter	11.618	0.0	532
600 min Winter	9.661	0.0	608
720 min Winter	8.310	0.0	682
960 min Winter	6.695	0.0	800
1440 min Winter	4.936	0.0	1056
2160 min Winter	3.640	0.0	1444
2880 min Winter	2.932	0.0	1824
4320 min Winter	2.067	0.0	2552
5760 min Winter	1.613	0.0	3264
7200 min Winter	1.331	0.0	3984
8640 min Winter	1.137	0.0	4688
10080 min Winter	0.995	0.0	5400

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Cascade Model Details for Lagoon 1 Infiltration.srcx

Storage is Online Cover Level (m) 15.600

Infiltration Basin Structure

Invert Level (m) 13.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.36300 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.36300

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	663.0	0.800	1285.0	1.600	1972.0	2.400	2723.2
0.200	813.0	1.000	1451.0	1.800	2153.0		
0.400	966.0	1.200	1620.0	2.000	2339.0		
0.600	1124.0	1.400	1794.0	2.200	2529.0		

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Cascade Summary of Results for Lagoon 2 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 2 Infiltration.srcx	Lagoon 2 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	34.618	1.618	220.0	20.1	240.1	312.9	O K
30 min Summer	34.590	1.590	218.0	0.0	218.0	302.1	O K
60 min Summer	34.454	1.454	207.7	0.0	207.7	251.6	O K
120 min Summer	34.232	1.232	189.9	0.0	189.9	181.0	O K
180 min Summer	34.045	1.045	173.5	0.0	173.5	131.9	O K
240 min Summer	33.892	0.892	158.8	0.0	158.8	98.4	O K
360 min Summer	33.667	0.667	134.3	0.0	134.3	58.9	O K
480 min Summer	33.527	0.527	115.3	0.0	115.3	39.6	O K
600 min Summer	33.439	0.439	100.9	0.0	100.9	29.6	O K
720 min Summer	33.396	0.396	88.7	0.0	88.7	25.2	O K
960 min Summer	33.343	0.343	71.9	0.0	71.9	20.2	O K
1440 min Summer	33.282	0.282	52.8	0.0	52.8	15.2	O K
2160 min Summer	33.233	0.233	38.5	0.0	38.5	11.7	O K
2880 min Summer	33.198	0.198	30.7	0.0	30.7	9.4	O K
4320 min Summer	33.162	0.162	21.8	0.0	21.8	7.2	O K
5760 min Summer	33.146	0.146	17.1	0.0	17.1	6.3	O K
7200 min Summer	33.134	0.134	14.1	0.0	14.1	5.7	O K
8640 min Summer	33.123	0.123	12.1	0.0	12.1	5.1	O K
10080 min Summer	33.114	0.114	10.6	0.0	10.6	4.6	O K
15 min Winter	34.675	1.675	224.1	174.1	398.2	336.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	202.701	0.0	497.5	2.0	20
30 min Summer	114.786	0.0	563.4	0.0	29
60 min Summer	65.002	0.0	638.1	0.0	46
120 min Summer	36.809	0.0	722.7	0.0	76
180 min Summer	26.393	0.0	777.3	0.0	106
240 min Summer	20.845	0.0	818.6	0.0	136
360 min Summer	14.946	0.0	880.4	0.0	194
480 min Summer	11.804	0.0	927.1	0.0	254
600 min Summer	9.829	0.0	965.0	0.0	312
720 min Summer	8.464	0.0	997.1	0.0	370
960 min Summer	6.764	0.0	1062.4	0.0	490
1440 min Summer	4.931	0.0	1161.8	0.0	734
2160 min Summer	3.595	0.0	1270.5	0.0	1092
2880 min Summer	2.873	0.0	1353.8	0.0	1448
4320 min Summer	2.032	0.0	1436.1	0.0	2148
5760 min Summer	1.589	0.0	1497.5	0.0	2840
7200 min Summer	1.313	0.0	1547.0	0.0	3600
8640 min Summer	1.124	0.0	1588.6	0.0	4360
10080 min Summer	0.985	0.0	1624.7	0.0	5024
15 min Winter	202.701	0.0	557.2	39.6	19

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Cascade Summary of Results for Lagoon 2 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	34.656	1.656	222.7	112.1	334.9	328.4	O K
60 min Winter	34.527	1.527	213.3	0.0	213.3	277.9	O K
120 min Winter	34.206	1.206	187.7	0.0	187.7	173.8	O K
180 min Winter	33.945	0.945	164.0	0.0	164.0	109.4	O K
240 min Winter	33.745	0.745	143.3	0.0	143.3	71.3	O K
360 min Winter	33.503	0.503	111.6	0.0	111.6	36.7	O K
480 min Winter	33.401	0.401	90.5	0.0	90.5	25.7	O K
600 min Winter	33.355	0.355	75.7	0.0	75.7	21.3	O K
720 min Winter	33.322	0.322	65.2	0.0	65.2	18.4	O K
960 min Winter	33.280	0.280	52.2	0.0	52.2	15.1	O K
1440 min Winter	33.231	0.231	38.0	0.0	38.0	11.6	O K
2160 min Winter	33.185	0.185	27.9	0.0	27.9	8.5	O K
2880 min Winter	33.164	0.164	22.2	0.0	22.2	7.3	O K
4320 min Winter	33.142	0.142	15.7	0.0	15.7	6.1	O K
5760 min Winter	33.124	0.124	12.4	0.0	12.4	5.1	O K
7200 min Winter	33.112	0.112	10.2	0.0	10.2	4.5	O K
8640 min Winter	33.103	0.103	8.8	0.0	8.8	4.1	O K
10080 min Winter	33.097	0.097	7.6	0.0	7.6	3.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	114.786	0.0	631.1	30.7	28
60 min Winter	65.002	0.0	714.7	0.0	48
120 min Winter	36.809	0.0	809.5	0.0	80
180 min Winter	26.393	0.0	870.6	0.0	110
240 min Winter	20.845	0.0	916.8	0.0	138
360 min Winter	14.946	0.0	986.0	0.0	194
480 min Winter	11.804	0.0	1038.3	0.0	250
600 min Winter	9.829	0.0	1080.8	0.0	310
720 min Winter	8.464	0.0	1116.7	0.0	370
960 min Winter	6.764	0.0	1189.9	0.0	492
1440 min Winter	4.931	0.0	1301.2	0.0	736
2160 min Winter	3.595	0.0	1423.0	0.0	1088
2880 min Winter	2.873	0.0	1516.2	0.0	1440
4320 min Winter	2.032	0.0	1608.4	0.0	2140
5760 min Winter	1.589	0.0	1677.2	0.0	2880
7200 min Winter	1.313	0.0	1732.6	0.0	3552
8640 min Winter	1.124	0.0	1779.2	0.0	4328
10080 min Winter	0.985	0.0	1819.6	0.0	4976

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Cascade Model Details for Lagoon 2 Primary.srcx

Storage is Online Cover Level (m) 35.000

Tank or Pond Structure

Invert Level (m) 33.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	32.7	1.400	334.0	2.800	0.0	4.200	0.0
0.200	63.7	1.600	393.3	3.000	0.0	4.400	0.0
0.400	98.7	1.800	456.4	3.200	0.0	4.600	0.0
0.600	137.7	2.000	523.6	3.400	0.0	4.800	0.0
0.800	180.8	2.200	0.0	3.600	0.0	5.000	0.0
1.000	227.1	2.400	0.0	3.800	0.0		
1.200	279.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	20.000	Upstream Invert Level (m)	33.000
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 34.600

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Cascade Summary of Results for Lagoon 2 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 2 Primary.srcx		(None)	(None)

Half Drain Time : 560 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	34.132	1.332	10.6	469.1	O K
30 min Summer	34.230	1.430	11.4	530.3	O K
60 min Summer	34.331	1.531	12.3	598.1	O K
120 min Summer	34.421	1.621	13.1	662.0	O K
180 min Summer	34.453	1.653	13.4	685.7	O K
240 min Summer	34.466	1.666	13.5	695.7	O K
360 min Summer	34.467	1.667	13.5	695.8	O K
480 min Summer	34.457	1.657	13.4	688.4	O K
600 min Summer	34.447	1.647	13.3	681.1	O K
720 min Summer	34.436	1.636	13.3	673.4	O K
960 min Summer	34.425	1.625	13.2	665.1	O K
1440 min Summer	34.390	1.590	12.8	639.4	O K
2160 min Summer	34.326	1.526	12.3	594.3	O K
2880 min Summer	34.261	1.461	11.7	550.8	O K
4320 min Summer	34.114	1.314	10.5	457.9	O K
5760 min Summer	33.994	1.194	9.5	389.5	O K
7200 min Summer	33.894	1.094	8.7	336.9	O K
8640 min Summer	33.809	1.009	8.0	295.3	O K
10080 min Summer	33.735	0.935	7.5	261.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	202.701	0.0	59
30 min Summer	114.786	0.0	69
60 min Summer	65.002	0.0	86
120 min Summer	36.809	0.0	132
180 min Summer	26.393	0.0	188
240 min Summer	20.845	0.0	246
360 min Summer	14.946	0.0	360
480 min Summer	11.804	0.0	414
600 min Summer	9.829	0.0	474
720 min Summer	8.464	0.0	536
960 min Summer	6.764	0.0	672
1440 min Summer	4.931	0.0	946
2160 min Summer	3.595	0.0	1356
2880 min Summer	2.873	0.0	1760
4320 min Summer	2.032	0.0	2532
5760 min Summer	1.589	0.0	3296
7200 min Summer	1.313	0.0	4040
8640 min Summer	1.124	0.0	4760
10080 min Summer	0.985	0.0	5464

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Cascade Summary of Results for Lagoon 2 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	34.224	1.424	11.4	526.1	O K
30 min Winter	34.326	1.526	12.3	594.7	O K
60 min Winter	34.432	1.632	13.2	670.0	O K
120 min Winter	34.532	1.732	14.1	746.0	O K
180 min Winter	34.568	1.768	14.5	774.8	O K
240 min Winter	34.585	1.785	14.6	788.2	O K
360 min Winter	34.591	1.791	14.7	793.1	O K
480 min Winter	34.579	1.779	14.6	783.8	O K
600 min Winter	34.565	1.765	14.4	771.8	O K
720 min Winter	34.552	1.752	14.3	761.7	O K
960 min Winter	34.534	1.734	14.1	747.3	O K
1440 min Winter	34.480	1.680	13.6	705.8	O K
2160 min Winter	34.387	1.587	12.8	637.4	O K
2880 min Winter	34.296	1.496	12.0	574.2	O K
4320 min Winter	34.103	1.303	10.4	451.6	O K
5760 min Winter	33.948	1.148	9.1	364.8	O K
7200 min Winter	33.822	1.022	8.1	301.2	O K
8640 min Winter	33.716	0.916	7.3	252.9	O K
10080 min Winter	33.627	0.827	6.6	215.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	202.701	0.0	60
30 min Winter	114.786	0.0	71
60 min Winter	65.002	0.0	90
120 min Winter	36.809	0.0	130
180 min Winter	26.393	0.0	186
240 min Winter	20.845	0.0	242
360 min Winter	14.946	0.0	352
480 min Winter	11.804	0.0	456
600 min Winter	9.829	0.0	490
720 min Winter	8.464	0.0	564
960 min Winter	6.764	0.0	720
1440 min Winter	4.931	0.0	1020
2160 min Winter	3.595	0.0	1456
2880 min Winter	2.873	0.0	1876
4320 min Winter	2.032	0.0	2684
5760 min Winter	1.589	0.0	3440
7200 min Winter	1.313	0.0	4184
8640 min Winter	1.124	0.0	4936
10080 min Winter	0.985	0.0	5656

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Cascade Model Details for Lagoon 2 Infiltration.srcx

Storage is Online Cover Level (m) 35.000

Infiltration Basin Structure

Invert Level (m) 32.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.07020 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.07020

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	130.1	1.400	634.4	2.800	0.0	4.200	0.0
0.200	189.4	1.600	722.7	3.000	0.0	4.400	0.0
0.400	253.3	1.800	814.9	3.200	0.0	4.600	0.0
0.600	321.5	2.000	911.3	3.400	0.0	4.800	0.0
0.800	393.7	2.200	1011.6	3.600	0.0	5.000	0.0
1.000	469.9	2.400	0.0	3.800	0.0		
1.200	550.1	2.600	0.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 3 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 3 Infiltration.srcx	Lagoon 3 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	34.067	1.467	210.3	1408.4	1618.8	349.6	O K
30 min Summer	34.040	1.440	208.2	1200.1	1408.3	338.1	O K
60 min Summer	33.992	1.392	204.2	858.4	1062.6	318.8	O K
120 min Summer	33.931	1.331	199.2	486.1	685.3	295.2	O K
180 min Summer	33.899	1.299	196.4	317.2	513.7	283.0	O K
240 min Summer	33.877	1.277	194.5	217.4	411.9	274.6	O K
360 min Summer	33.839	1.239	191.3	79.5	270.8	261.0	O K
480 min Summer	33.734	1.134	181.8	0.0	181.8	225.3	O K
600 min Summer	33.568	0.968	165.7	0.0	165.7	174.4	O K
720 min Summer	33.436	0.836	151.7	0.0	151.7	138.9	O K
960 min Summer	33.262	0.662	131.0	0.0	131.0	98.3	O K
1440 min Summer	33.066	0.466	102.9	0.0	102.9	60.6	O K
2160 min Summer	32.960	0.360	77.2	0.0	77.2	43.3	O K
2880 min Summer	32.912	0.312	62.1	0.0	62.1	36.3	O K
4320 min Summer	32.852	0.252	43.8	0.0	43.8	28.0	O K
5760 min Summer	32.814	0.214	34.3	0.0	34.3	23.1	O K
7200 min Summer	32.787	0.187	28.3	0.0	28.3	19.8	O K
8640 min Summer	32.771	0.171	24.3	0.0	24.3	17.8	O K
10080 min Summer	32.760	0.160	21.2	0.0	21.2	16.6	O K
15 min Winter	34.092	1.492	212.3	1611.0	1823.3	360.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.636	0.0	980.4	541.6	12
30 min Summer	115.315	0.0	1110.4	561.9	20
60 min Summer	65.301	0.0	1257.7	501.2	34
120 min Summer	36.979	0.0	1424.4	379.4	64
180 min Summer	26.515	0.0	1532.0	277.7	96
240 min Summer	20.941	0.0	1613.2	191.2	126
360 min Summer	15.015	0.0	1735.1	57.3	192
480 min Summer	11.858	0.0	1827.1	0.0	264
600 min Summer	9.875	0.0	1901.8	0.0	322
720 min Summer	8.503	0.0	1965.1	0.0	380
960 min Summer	6.832	0.0	2105.3	0.0	498
1440 min Summer	5.019	0.0	2320.1	0.0	736
2160 min Summer	3.688	0.0	2556.8	0.0	1100
2880 min Summer	2.963	0.0	2739.3	0.0	1468
4320 min Summer	2.090	0.0	2897.6	0.0	2152
5760 min Summer	1.631	0.0	3015.5	0.0	2896
7200 min Summer	1.346	0.0	3110.2	0.0	3576
8640 min Summer	1.150	0.0	3189.8	0.0	4344
10080 min Summer	1.007	0.0	3258.7	0.0	5072
15 min Winter	203.636	0.0	1098.1	652.1	12

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Cascade Summary of Results for Lagoon 3 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	34.042	1.442	208.3	1215.2	1423.5	339.1	O K
60 min Winter	33.970	1.370	202.5	718.2	920.6	310.4	O K
120 min Winter	33.905	1.305	197.0	349.1	546.1	285.3	O K
180 min Winter	33.873	1.273	194.2	202.7	396.9	273.4	O K
240 min Winter	33.852	1.252	192.4	120.4	312.7	265.6	O K
360 min Winter	33.793	1.193	187.1	0.0	187.1	245.0	O K
480 min Winter	33.530	0.930	161.8	0.0	161.8	163.8	O K
600 min Winter	33.344	0.744	141.2	0.0	141.2	116.7	O K
720 min Winter	33.213	0.613	124.6	0.0	124.6	88.2	O K
960 min Winter	33.062	0.462	102.2	0.0	102.2	59.9	O K
1440 min Winter	32.956	0.356	76.0	0.0	76.0	42.7	O K
2160 min Winter	32.892	0.292	56.0	0.0	56.0	33.5	O K
2880 min Winter	32.856	0.256	44.9	0.0	44.9	28.5	O K
4320 min Winter	32.803	0.203	31.7	0.0	31.7	21.7	O K
5760 min Winter	32.773	0.173	24.8	0.0	24.8	18.1	O K
7200 min Winter	32.758	0.158	20.4	0.0	20.4	16.3	O K
8640 min Winter	32.748	0.148	17.5	0.0	17.5	15.1	O K
10080 min Winter	32.740	0.140	15.3	0.0	15.3	14.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.315	0.0	1243.7	685.0	20
60 min Winter	65.301	0.0	1408.6	620.3	34
120 min Winter	36.979	0.0	1595.3	452.5	64
180 min Winter	26.515	0.0	1715.8	300.8	94
240 min Winter	20.941	0.0	1806.8	171.9	128
360 min Winter	15.015	0.0	1943.3	0.0	210
480 min Winter	11.858	0.0	2046.3	0.0	268
600 min Winter	9.875	0.0	2130.0	0.0	324
720 min Winter	8.503	0.0	2200.9	0.0	382
960 min Winter	6.832	0.0	2358.0	0.0	498
1440 min Winter	5.019	0.0	2598.5	0.0	734
2160 min Winter	3.688	0.0	2863.7	0.0	1092
2880 min Winter	2.963	0.0	3068.0	0.0	1468
4320 min Winter	2.090	0.0	3245.3	0.0	2204
5760 min Winter	1.631	0.0	3377.4	0.0	2928
7200 min Winter	1.346	0.0	3483.5	0.0	3656
8640 min Winter	1.150	0.0	3572.6	0.0	4336
10080 min Winter	1.007	0.0	3649.7	0.0	5120

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Cascade Model Details for Lagoon 3 Primary.srcx

Storage is Online Cover Level (m) 34.400

Tank or Pond Structure

Invert Level (m) 32.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	91.1	1.400	402.0	2.800	0.0	4.200	0.0
0.200	123.4	1.600	462.4	3.000	0.0	4.400	0.0
0.400	159.8	1.800	527.0	3.200	0.0	4.600	0.0
0.600	200.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	244.6	2.200	0.0	3.600	0.0	5.000	0.0
1.000	293.0	2.400	0.0	3.800	0.0		
1.200	345.5	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	120.0	Coefficient of Contraction	0.600
Length (m)	18.000	Upstream Invert Level (m)	32.600
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 6.000 Invert Level (m) 33.800

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Cascade Summary of Results for Lagoon 3 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 3 Primary.srcx		(None)	(None)

Half Drain Time : 1078 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	33.350	0.950	11.6	934.8	O K
30 min Summer	33.449	1.049	12.3	1057.3	O K
60 min Summer	33.553	1.153	13.1	1190.6	O K
120 min Summer	33.659	1.259	13.9	1333.2	O K
180 min Summer	33.716	1.316	14.3	1412.2	O K
240 min Summer	33.749	1.349	14.6	1458.4	O K
360 min Summer	33.784	1.384	14.8	1507.7	O K
480 min Summer	33.795	1.395	14.9	1524.8	O K
600 min Summer	33.795	1.395	14.9	1524.3	O K
720 min Summer	33.787	1.387	14.9	1513.2	O K
960 min Summer	33.789	1.389	14.9	1515.2	O K
1440 min Summer	33.780	1.380	14.8	1503.3	O K
2160 min Summer	33.751	1.351	14.6	1461.1	O K
2880 min Summer	33.711	1.311	14.3	1405.4	O K
4320 min Summer	33.581	1.181	13.3	1227.6	O K
5760 min Summer	33.474	1.074	12.5	1088.1	O K
7200 min Summer	33.380	0.980	11.8	971.5	O K
8640 min Summer	33.297	0.897	11.2	870.9	O K
10080 min Summer	33.221	0.821	10.7	783.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	203.636	0.0	61
30 min Summer	115.315	0.0	73
60 min Summer	65.301	0.0	98
120 min Summer	36.979	0.0	144
180 min Summer	26.515	0.0	194
240 min Summer	20.941	0.0	252
360 min Summer	15.015	0.0	368
480 min Summer	11.858	0.0	486
600 min Summer	9.875	0.0	604
720 min Summer	8.503	0.0	720
960 min Summer	6.832	0.0	824
1440 min Summer	5.019	0.0	1074
2160 min Summer	3.688	0.0	1480
2880 min Summer	2.963	0.0	1904
4320 min Summer	2.090	0.0	2732
5760 min Summer	1.631	0.0	3528
7200 min Summer	1.346	0.0	4328
8640 min Summer	1.150	0.0	5104
10080 min Summer	1.007	0.0	5856

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Cascade Summary of Results for Lagoon 3 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	33.444	1.044	12.3	1050.3	O K
30 min Winter	33.551	1.151	13.1	1188.1	O K
60 min Winter	33.663	1.263	13.9	1337.7	O K
120 min Winter	33.777	1.377	14.8	1497.9	O K
180 min Winter	33.841	1.441	15.3	1591.4	O K
240 min Winter	33.880	1.480	15.6	1648.7	O K
360 min Winter	33.921	1.521	15.9	1710.3	O K
480 min Winter	33.937	1.537	16.1	1735.4	O K
600 min Winter	33.942	1.542	16.1	1741.8	O K
720 min Winter	33.938	1.538	16.1	1736.9	O K
960 min Winter	33.942	1.542	16.1	1741.8	O K
1440 min Winter	33.929	1.529	16.0	1722.0	O K
2160 min Winter	33.890	1.490	15.7	1664.5	O K
2880 min Winter	33.837	1.437	15.3	1585.4	O K
4320 min Winter	33.663	1.263	13.9	1338.8	O K
5760 min Winter	33.520	1.120	12.8	1147.7	O K
7200 min Winter	33.395	0.995	11.9	989.5	O K
8640 min Winter	33.284	0.884	11.1	855.9	O K
10080 min Winter	33.185	0.785	10.4	741.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	203.636	0.0	61
30 min Winter	115.315	0.0	73
60 min Winter	65.301	0.0	98
120 min Winter	36.979	0.0	146
180 min Winter	26.515	0.0	194
240 min Winter	20.941	0.0	248
360 min Winter	15.015	0.0	362
480 min Winter	11.858	0.0	476
600 min Winter	9.875	0.0	588
720 min Winter	8.503	0.0	698
960 min Winter	6.832	0.0	906
1440 min Winter	5.019	0.0	1128
2160 min Winter	3.688	0.0	1592
2880 min Winter	2.963	0.0	2052
4320 min Winter	2.090	0.0	2940
5760 min Winter	1.631	0.0	3768
7200 min Winter	1.346	0.0	4608
8640 min Winter	1.150	0.0	5376
10080 min Winter	1.007	0.0	6160

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Cascade Model Details for Lagoon 3 Infiltration.srcx

Storage is Online Cover Level (m) 34.400

Infiltration Basin Structure

Invert Level (m) 32.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.05040 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.05040

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	774.2	1.400	1446.7	2.800	0.0	4.200	0.0
0.200	858.0	1.600	1559.0	3.000	0.0	4.400	0.0
0.400	946.0	1.800	1675.0	3.200	0.0	4.600	0.0
0.600	1038.2	2.000	1795.0	3.400	0.0	4.800	0.0
0.800	1134.2	2.200	0.0	3.600	0.0	5.000	0.0
1.000	1234.3	2.400	0.0	3.800	0.0		
1.200	1338.5	2.600	0.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 4 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 4 Infiltration.srcx	Lagoon 4 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	33.150	1.850	222.4	0.0	222.4	690.7	O K
30 min Summer	33.157	1.857	222.8	0.0	222.8	695.1	O K
60 min Summer	33.080	1.780	217.9	0.0	217.9	645.3	O K
120 min Summer	32.916	1.616	207.0	0.0	207.0	545.9	O K
180 min Summer	32.766	1.466	196.4	0.0	196.4	463.4	O K
240 min Summer	32.633	1.333	186.6	0.0	186.6	396.5	O K
360 min Summer	32.411	1.111	168.9	0.0	168.9	297.3	O K
480 min Summer	32.237	0.937	153.6	0.0	153.6	229.9	O K
600 min Summer	32.100	0.800	140.4	0.0	140.4	182.9	O K
720 min Summer	31.991	0.691	129.1	0.0	129.1	149.1	O K
960 min Summer	31.848	0.548	112.3	0.0	112.3	109.3	O K
1440 min Summer	31.701	0.401	90.5	0.0	90.5	73.7	O K
2160 min Summer	31.628	0.328	67.3	0.0	67.3	57.7	O K
2880 min Summer	31.586	0.286	54.1	0.0	54.1	49.1	O K
4320 min Summer	31.532	0.232	38.3	0.0	38.3	38.5	O K
5760 min Summer	31.494	0.194	29.8	0.0	29.8	31.5	O K
7200 min Summer	31.472	0.172	24.7	0.0	24.7	27.5	O K
8640 min Summer	31.460	0.160	21.2	0.0	21.2	25.4	O K
10080 min Summer	31.451	0.151	18.5	0.0	18.5	23.8	O K
15 min Winter	33.286	1.986	230.9	0.0	230.9	784.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.636	0.0	855.0	0.0	19
30 min Summer	115.315	0.0	968.4	0.0	30
60 min Summer	65.301	0.0	1096.9	0.0	46
120 min Summer	36.979	0.0	1242.4	0.0	80
180 min Summer	26.515	0.0	1336.2	0.0	112
240 min Summer	20.941	0.0	1407.1	0.0	144
360 min Summer	15.015	0.0	1513.4	0.0	206
480 min Summer	11.858	0.0	1593.6	0.0	266
600 min Summer	9.875	0.0	1658.8	0.0	324
720 min Summer	8.503	0.0	1714.0	0.0	382
960 min Summer	6.832	0.0	1836.3	0.0	500
1440 min Summer	5.019	0.0	2023.6	0.0	736
2160 min Summer	3.688	0.0	2230.2	0.0	1100
2880 min Summer	2.963	0.0	2389.3	0.0	1468
4320 min Summer	2.090	0.0	2527.4	0.0	2196
5760 min Summer	1.631	0.0	2630.3	0.0	2928
7200 min Summer	1.346	0.0	2712.9	0.0	3576
8640 min Summer	1.150	0.0	2782.3	0.0	4328
10080 min Summer	1.007	0.0	2842.3	0.0	5000
15 min Winter	203.636	0.0	957.7	0.0	19

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Cascade Summary of Results for Lagoon 4 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	33.302	2.002	231.9	0.9	232.8	795.5	O K
60 min Winter	33.210	1.910	226.2	0.0	226.2	730.6	O K
120 min Winter	32.990	1.690	212.0	0.0	212.0	589.8	O K
180 min Winter	32.781	1.481	197.5	0.0	197.5	471.2	O K
240 min Winter	32.595	1.295	183.7	0.0	183.7	378.7	O K
360 min Winter	32.296	0.996	159.0	0.0	159.0	251.8	O K
480 min Winter	32.078	0.778	138.2	0.0	138.2	175.8	O K
600 min Winter	31.922	0.622	121.3	0.0	121.3	129.4	O K
720 min Winter	31.812	0.512	107.6	0.0	107.6	100.0	O K
960 min Winter	31.699	0.399	89.7	0.0	89.7	73.1	O K
1440 min Winter	31.625	0.325	66.2	0.0	66.2	57.0	O K
2160 min Winter	31.568	0.268	48.7	0.0	48.7	45.5	O K
2880 min Winter	31.536	0.236	39.2	0.0	39.2	39.3	O K
4320 min Winter	31.484	0.184	27.6	0.0	27.6	29.6	O K
5760 min Winter	31.462	0.162	21.6	0.0	21.6	25.7	O K
7200 min Winter	31.449	0.149	17.8	0.0	17.8	23.4	O K
8640 min Winter	31.440	0.140	15.3	0.0	15.3	21.9	O K
10080 min Winter	31.430	0.130	13.4	0.0	13.4	20.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.315	0.0	1084.6	0.1	31
60 min Winter	65.301	0.0	1228.6	0.0	50
120 min Winter	36.979	0.0	1391.5	0.0	86
180 min Winter	26.515	0.0	1496.6	0.0	120
240 min Winter	20.941	0.0	1576.0	0.0	152
360 min Winter	15.015	0.0	1695.0	0.0	212
480 min Winter	11.858	0.0	1784.9	0.0	272
600 min Winter	9.875	0.0	1857.9	0.0	328
720 min Winter	8.503	0.0	1919.7	0.0	386
960 min Winter	6.832	0.0	2056.7	0.0	494
1440 min Winter	5.019	0.0	2266.5	0.0	736
2160 min Winter	3.688	0.0	2497.9	0.0	1100
2880 min Winter	2.963	0.0	2676.1	0.0	1468
4320 min Winter	2.090	0.0	2830.7	0.0	2160
5760 min Winter	1.631	0.0	2946.0	0.0	2872
7200 min Winter	1.346	0.0	3038.5	0.0	3608
8640 min Winter	1.150	0.0	3116.2	0.0	4352
10080 min Winter	1.007	0.0	3183.4	0.0	5080

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Cascade Model Details for Lagoon 4 Primary.srcx

Storage is Online Cover Level (m) 33.700

Tank or Pond Structure

Invert Level (m) 31.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	143.0	1.400	503.0	2.800	0.0	4.200	0.0
0.200	183.0	1.600	571.0	3.000	0.0	4.400	0.0
0.400	226.0	1.800	642.0	3.200	0.0	4.600	0.0
0.600	273.0	2.000	718.0	3.400	0.0	4.800	0.0
0.800	325.0	2.200	797.0	3.600	0.0	5.000	0.0
1.000	380.0	2.400	880.0	3.800	0.0		
1.200	440.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	125.0	Coefficient of Contraction	0.600
Length (m)	25.000	Upstream Invert Level (m)	31.300
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 33.300

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Cascade Summary of Results for Lagoon 4 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 4 Primary.srcx	(None)	(None)

Half Drain Time : 356 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	32.285	1.185	38.6	969.2	O K
30 min Summer	32.446	1.346	42.7	1155.9	O K
60 min Summer	32.617	1.517	47.2	1372.1	O K
120 min Summer	32.795	1.695	52.0	1614.0	O K
180 min Summer	32.897	1.797	54.9	1761.4	O K
240 min Summer	32.964	1.864	56.8	1862.6	O K
360 min Summer	33.046	1.946	59.1	1988.4	O K
480 min Summer	33.088	1.988	60.3	2056.3	O K
600 min Summer	33.103	2.003	60.7	2080.4	O K
720 min Summer	33.093	1.993	60.4	2062.9	O K
960 min Summer	33.099	1.999	60.6	2072.8	O K
1440 min Summer	33.082	1.982	60.1	2045.2	O K
2160 min Summer	33.022	1.922	58.4	1951.0	O K
2880 min Summer	32.950	1.850	56.4	1840.6	O K
4320 min Summer	32.725	1.625	50.1	1517.2	O K
5760 min Summer	32.542	1.442	45.2	1275.0	O K
7200 min Summer	32.389	1.289	41.3	1088.7	O K
8640 min Summer	32.260	1.160	38.0	941.0	O K
10080 min Summer	32.149	1.049	35.2	820.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	203.636	0.0	236
30 min Summer	115.315	0.0	256
60 min Summer	65.301	0.0	280
120 min Summer	36.979	0.0	320
180 min Summer	26.515	0.0	354
240 min Summer	20.941	0.0	390
360 min Summer	15.015	0.0	458
480 min Summer	11.858	0.0	526
600 min Summer	9.875	0.0	608
720 min Summer	8.503	0.0	676
960 min Summer	6.832	0.0	800
1440 min Summer	5.019	0.0	1052
2160 min Summer	3.688	0.0	1436
2880 min Summer	2.963	0.0	1824
4320 min Summer	2.090	0.0	2584
5760 min Summer	1.631	0.0	3328
7200 min Summer	1.346	0.0	4056
8640 min Summer	1.150	0.0	4784
10080 min Summer	1.007	0.0	5512

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Cascade Summary of Results for Lagoon 4 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	32.357	1.257	40.4	1051.2	O K
30 min Winter	32.521	1.421	44.7	1249.3	O K
60 min Winter	32.696	1.596	49.3	1477.0	O K
120 min Winter	32.875	1.775	54.3	1730.1	O K
180 min Winter	32.978	1.878	57.2	1883.5	O K
240 min Winter	33.046	1.946	59.1	1988.4	O K
360 min Winter	33.126	2.026	61.4	2117.2	O K
480 min Winter	33.167	2.067	62.6	2184.5	O K
600 min Winter	33.182	2.082	63.1	2208.9	O K
720 min Winter	33.170	2.070	62.7	2188.7	O K
960 min Winter	33.159	2.059	62.4	2170.2	O K
1440 min Winter	33.111	2.011	61.0	2093.2	O K
2160 min Winter	32.998	1.898	57.7	1913.6	O K
2880 min Winter	32.875	1.775	54.3	1730.0	O K
4320 min Winter	32.575	1.475	46.1	1317.4	O K
5760 min Winter	32.342	1.242	40.1	1033.9	O K
7200 min Winter	32.156	1.056	35.4	828.8	O K
8640 min Winter	32.005	0.905	31.8	676.1	O K
10080 min Winter	31.880	0.780	28.8	558.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	203.636	0.0	230
30 min Winter	115.315	0.0	250
60 min Winter	65.301	0.0	276
120 min Winter	36.979	0.0	314
180 min Winter	26.515	0.0	350
240 min Winter	20.941	0.0	386
360 min Winter	15.015	0.0	454
480 min Winter	11.858	0.0	522
600 min Winter	9.875	0.0	602
720 min Winter	8.503	0.0	688
960 min Winter	6.832	0.0	814
1440 min Winter	5.019	0.0	1084
2160 min Winter	3.688	0.0	1496
2880 min Winter	2.963	0.0	1900
4320 min Winter	2.090	0.0	2680
5760 min Winter	1.631	0.0	3424
7200 min Winter	1.346	0.0	4176
8640 min Winter	1.150	0.0	4888
10080 min Winter	1.007	0.0	5608

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Cascade Model Details for Lagoon 4 Infiltration.srcx

Storage is Online Cover Level (m) 33.700

Infiltration Basin Structure

Invert Level (m) 31.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.16200 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.16200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	538.0	1.400	1242.0	2.800	0.0	4.200	0.0
0.200	626.0	1.600	1359.0	3.000	0.0	4.400	0.0
0.400	719.0	1.800	1480.0	3.200	0.0	4.600	0.0
0.600	815.0	2.000	1605.0	3.400	0.0	4.800	0.0
0.800	916.0	2.200	1734.0	3.600	0.0	5.000	0.0
1.000	1021.0	2.400	1867.0	3.800	0.0		
1.200	1129.0	2.600	2004.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 5 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 5 Infiltration.srcx	Lagoon 5 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	28.381	1.381	194.0	273.7	467.7	1671.5	O K
30 min Summer	28.419	1.419	197.1	488.1	685.1	1731.7	O K
60 min Summer	28.417	1.417	196.9	475.8	672.7	1729.3	O K
120 min Summer	28.403	1.403	195.8	395.7	591.5	1707.5	O K
180 min Summer	28.389	1.389	194.7	318.0	512.7	1685.0	O K
240 min Summer	28.378	1.378	193.7	258.6	452.3	1666.4	O K
360 min Summer	28.362	1.362	192.4	183.0	375.4	1641.7	O K
480 min Summer	28.353	1.353	191.7	144.5	336.2	1627.1	O K
600 min Summer	28.346	1.346	191.1	118.6	309.7	1617.2	O K
720 min Summer	28.341	1.341	190.7	99.9	290.6	1609.5	O K
960 min Summer	28.337	1.337	190.3	84.0	274.3	1602.2	O K
1440 min Summer	28.330	1.330	189.7	61.2	250.9	1591.9	O K
2160 min Summer	28.323	1.323	189.1	40.9	230.1	1580.5	O K
2880 min Summer	28.308	1.308	187.9	8.9	196.8	1558.8	O K
4320 min Summer	28.022	1.022	161.7	0.0	161.7	1141.1	O K
5760 min Summer	27.819	0.819	140.3	0.0	140.3	873.2	O K
7200 min Summer	27.682	0.682	123.8	0.0	123.8	703.8	O K
8640 min Summer	27.587	0.587	110.9	0.0	110.9	592.1	O K
10080 min Summer	27.517	0.517	100.3	0.0	100.3	513.1	O K
15 min Winter	28.444	1.444	199.1	650.0	849.1	1771.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.950	0.0	3813.4	112.2	24
30 min Summer	115.174	0.0	4420.5	290.6	32
60 min Summer	65.041	0.0	5273.0	423.1	48
120 min Summer	36.729	0.0	6090.1	471.8	80
180 min Summer	26.293	0.0	6629.4	453.0	114
240 min Summer	20.742	0.0	7042.8	454.8	148
360 min Summer	14.848	0.0	7672.9	641.1	216
480 min Summer	11.713	0.0	8156.4	775.7	284
600 min Summer	9.745	0.0	8553.9	822.4	352
720 min Summer	8.385	0.0	8894.1	770.5	420
960 min Summer	6.739	0.0	9672.8	734.1	556
1440 min Summer	4.953	0.0	10896.7	567.6	838
2160 min Summer	3.641	0.0	12582.6	281.3	1260
2880 min Summer	2.926	0.0	13684.4	26.1	1708
4320 min Summer	2.074	0.0	14712.6	0.0	2444
5760 min Summer	1.624	0.0	16080.1	0.0	3168
7200 min Summer	1.344	0.0	16716.1	0.0	3864
8640 min Summer	1.151	0.0	17256.6	0.0	4584
10080 min Summer	1.010	0.0	17728.9	0.0	5256
15 min Winter	203.950	0.0	4039.8	309.1	22

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Cascade Summary of Results for Lagoon 5 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	28.470	1.470	201.2	837.8	1039.0	1815.2	O K
60 min Winter	28.456	1.456	200.1	733.1	933.2	1791.3	O K
120 min Winter	28.426	1.426	197.6	531.9	729.5	1743.3	O K
180 min Winter	28.404	1.404	195.9	398.6	594.4	1707.6	O K
240 min Winter	28.388	1.388	194.5	310.0	504.6	1682.6	O K
360 min Winter	28.368	1.368	192.9	212.7	405.6	1651.5	O K
480 min Winter	28.357	1.357	192.0	163.4	355.4	1634.4	O K
600 min Winter	28.350	1.350	191.4	134.3	325.8	1623.3	O K
720 min Winter	28.345	1.345	191.0	114.8	305.8	1615.5	O K
960 min Winter	28.340	1.340	190.6	94.5	285.1	1606.9	O K
1440 min Winter	28.330	1.330	189.7	61.2	250.9	1591.4	O K
2160 min Winter	28.308	1.308	187.9	8.1	196.0	1557.5	O K
2880 min Winter	28.114	1.114	170.6	0.0	170.6	1269.8	O K
4320 min Winter	27.773	0.773	135.0	0.0	135.0	815.1	O K
5760 min Winter	27.588	0.588	111.0	0.0	111.0	593.1	O K
7200 min Winter	27.481	0.481	94.3	0.0	94.3	472.9	O K
8640 min Winter	27.414	0.414	82.3	0.0	82.3	400.4	O K
10080 min Winter	27.370	0.370	73.3	0.0	73.3	353.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.174	0.0	4676.2	524.7	30
60 min Winter	65.041	0.0	5561.8	688.4	48
120 min Winter	36.729	0.0	6416.3	757.2	82
180 min Winter	26.293	0.0	6979.6	748.4	116
240 min Winter	20.742	0.0	7411.2	752.6	150
360 min Winter	14.848	0.0	8068.5	916.2	220
480 min Winter	11.713	0.0	8572.5	1034.4	290
600 min Winter	9.745	0.0	8986.7	1068.9	360
720 min Winter	8.385	0.0	9340.9	1004.3	432
960 min Winter	6.739	0.0	10151.6	880.2	568
1440 min Winter	4.953	0.0	11424.6	544.7	854
2160 min Winter	3.641	0.0	13164.6	23.4	1348
2880 min Winter	2.926	0.0	14308.1	0.0	1736
4320 min Winter	2.074	0.0	15375.5	0.0	2432
5760 min Winter	1.624	0.0	16772.4	0.0	3128
7200 min Winter	1.344	0.0	17432.1	0.0	3824
8640 min Winter	1.151	0.0	17992.6	0.0	4576
10080 min Winter	1.010	0.0	18482.1	0.0	5248

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Cascade Model Details for Lagoon 5 Primary.srcx

Storage is Online Cover Level (m) 28.800

Tank or Pond Structure

Invert Level (m) 27.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	873.0	1.400	1592.0	2.800	0.0	4.200	0.0
0.200	963.4	1.600	1711.0	3.000	0.0	4.400	0.0
0.400	1058.0	1.800	1834.0	3.200	0.0	4.600	0.0
0.600	1156.6	2.000	0.0	3.400	0.0	4.800	0.0
0.800	1259.3	2.200	0.0	3.600	0.0	5.000	0.0
1.000	1366.1	2.400	0.0	3.800	0.0		
1.200	1477.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	20.000	Upstream Invert Level (m)	27.000
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 7.000 Invert Level (m) 28.300

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Cascade Summary of Results for Lagoon 5 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 5 Primary.srcx		(None)	(None)

Half Drain Time : 1707 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	27.227	0.427	34.1	2577.9	O K
30 min Summer	27.315	0.515	35.2	3134.9	O K
60 min Summer	27.412	0.612	36.4	3762.6	O K
120 min Summer	27.521	0.721	37.8	4481.3	O K
180 min Summer	27.589	0.789	38.6	4936.5	O K
240 min Summer	27.639	0.839	39.3	5275.2	O K
360 min Summer	27.712	0.912	40.2	5775.5	O K
480 min Summer	27.764	0.964	40.9	6131.8	O K
600 min Summer	27.802	1.002	41.4	6396.5	O K
720 min Summer	27.830	1.030	41.7	6594.8	O K
960 min Summer	27.894	1.094	42.6	7050.2	O K
1440 min Summer	27.967	1.167	43.5	7574.6	O K
2160 min Summer	27.998	1.198	43.9	7796.1	O K
2880 min Summer	28.000	1.200	44.0	7814.2	O K
4320 min Summer	27.914	1.114	42.8	7189.4	O K
5760 min Summer	27.840	1.040	41.9	6663.0	O K
7200 min Summer	27.773	0.973	41.0	6195.3	O K
8640 min Summer	27.711	0.911	40.2	5763.9	O K
10080 min Summer	27.652	0.852	39.4	5361.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	203.950	0.0	523
30 min Summer	115.174	0.0	544
60 min Summer	65.041	0.0	582
120 min Summer	36.729	0.0	636
180 min Summer	26.293	0.0	686
240 min Summer	20.742	0.0	732
360 min Summer	14.848	0.0	810
480 min Summer	11.713	0.0	888
600 min Summer	9.745	0.0	966
720 min Summer	8.385	0.0	1046
960 min Summer	6.739	0.0	1212
1440 min Summer	4.953	0.0	1536
2160 min Summer	3.641	0.0	2020
2880 min Summer	2.926	0.0	2412
4320 min Summer	2.074	0.0	3200
5760 min Summer	1.624	0.0	4008
7200 min Summer	1.344	0.0	4816
8640 min Summer	1.151	0.0	5616
10080 min Summer	1.010	0.0	6416

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Cascade Summary of Results for Lagoon 5 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	27.261	0.461	34.5	2787.7	O K
30 min Winter	27.352	0.552	35.6	3372.5	O K
60 min Winter	27.453	0.653	36.9	4032.0	O K
120 min Winter	27.566	0.766	38.3	4782.3	O K
180 min Winter	27.637	0.837	39.2	5258.1	O K
240 min Winter	27.689	0.889	39.9	5611.7	O K
360 min Winter	27.764	0.964	40.9	6134.2	O K
480 min Winter	27.817	1.017	41.6	6507.1	O K
600 min Winter	27.857	1.057	42.1	6786.1	O K
720 min Winter	27.887	1.087	42.5	6997.1	O K
960 min Winter	27.954	1.154	43.4	7480.1	O K
1440 min Winter	28.033	1.233	44.4	8053.3	O K
2160 min Winter	28.072	1.272	44.9	8339.9	O K
2880 min Winter	28.067	1.267	44.8	8301.0	O K
4320 min Winter	27.958	1.158	43.4	7509.7	O K
5760 min Winter	27.858	1.058	42.1	6791.1	O K
7200 min Winter	27.764	0.964	40.9	6132.1	O K
8640 min Winter	27.675	0.875	39.7	5518.9	O K
10080 min Winter	27.591	0.791	38.7	4949.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	203.950	0.0	521
30 min Winter	115.174	0.0	543
60 min Winter	65.041	0.0	580
120 min Winter	36.729	0.0	636
180 min Winter	26.293	0.0	686
240 min Winter	20.742	0.0	730
360 min Winter	14.848	0.0	810
480 min Winter	11.713	0.0	888
600 min Winter	9.745	0.0	966
720 min Winter	8.385	0.0	1048
960 min Winter	6.739	0.0	1218
1440 min Winter	4.953	0.0	1554
2160 min Winter	3.641	0.0	2100
2880 min Winter	2.926	0.0	2524
4320 min Winter	2.074	0.0	3384
5760 min Winter	1.624	0.0	4272
7200 min Winter	1.344	0.0	5136
8640 min Winter	1.151	0.0	5984
10080 min Winter	1.010	0.0	6816

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Cascade Model Details for Lagoon 5 Infiltration.srcx

Storage is Online Cover Level (m) 28.800

Infiltration Basin Structure

Invert Level (m) 26.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.03600 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.03600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	5778.0	1.400	7528.0	2.800	0.0	4.200	0.0
0.200	6016.0	1.600	7794.0	3.000	0.0	4.400	0.0
0.400	6258.0	1.800	8064.0	3.200	0.0	4.600	0.0
0.600	6504.0	2.000	8338.0	3.400	0.0	4.800	0.0
0.800	6754.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	7008.0	2.400	0.0	3.800	0.0		
1.200	7266.0	2.600	0.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 6 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 6 Infiltration.srcx	Lagoon 6 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	27.830	1.630	213.5	71.7	285.2	796.6	O K
30 min Summer	27.851	1.651	215.1	155.8	370.9	812.5	O K
60 min Summer	27.831	1.631	213.6	73.5	287.1	797.2	O K
120 min Summer	27.751	1.551	207.5	0.0	207.5	736.9	O K
180 min Summer	27.653	1.453	199.9	0.0	199.9	666.7	O K
240 min Summer	27.568	1.368	192.9	0.0	192.9	608.4	O K
360 min Summer	27.436	1.236	181.6	0.0	181.6	523.1	O K
480 min Summer	27.336	1.136	172.6	0.0	172.6	462.9	O K
600 min Summer	27.253	1.053	164.8	0.0	164.8	416.1	O K
720 min Summer	27.183	0.983	157.9	0.0	157.9	377.8	O K
960 min Summer	27.089	0.889	148.1	0.0	148.1	329.3	O K
1440 min Summer	26.963	0.763	133.8	0.0	133.8	268.4	O K
2160 min Summer	26.852	0.652	119.9	0.0	119.9	219.4	O K
2880 min Summer	26.776	0.576	109.2	0.0	109.2	187.5	O K
4320 min Summer	26.644	0.444	88.0	0.0	88.0	136.8	O K
5760 min Summer	26.573	0.373	73.9	0.0	73.9	111.2	O K
7200 min Summer	26.530	0.330	64.0	0.0	64.0	96.8	O K
8640 min Summer	26.495	0.295	56.9	0.0	56.9	85.2	O K
10080 min Summer	26.477	0.277	51.3	0.0	51.3	79.1	O K
15 min Winter	27.890	1.690	217.9	366.5	584.4	843.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	202.577	0.0	1713.6	13.1	21
30 min Summer	114.636	0.0	2005.8	53.4	29
60 min Summer	64.872	0.0	2437.3	30.2	48
120 min Summer	36.710	0.0	2837.1	0.0	84
180 min Summer	26.312	0.0	3102.8	0.0	118
240 min Summer	20.774	0.0	3307.5	0.0	152
360 min Summer	14.889	0.0	3620.8	0.0	218
480 min Summer	11.756	0.0	3862.4	0.0	282
600 min Summer	9.787	0.0	4061.8	0.0	346
720 min Summer	8.426	0.0	4232.8	0.0	408
960 min Summer	6.776	0.0	4625.3	0.0	536
1440 min Summer	4.984	0.0	5246.1	0.0	796
2160 min Summer	3.666	0.0	6135.1	0.0	1172
2880 min Summer	2.949	0.0	6701.7	0.0	1560
4320 min Summer	2.082	0.0	7223.1	0.0	2292
5760 min Summer	1.626	0.0	7979.7	0.0	3000
7200 min Summer	1.343	0.0	8304.3	0.0	3744
8640 min Summer	1.148	0.0	8580.9	0.0	4408
10080 min Summer	1.006	0.0	8822.9	0.0	5144
15 min Winter	202.577	0.0	1829.9	106.0	19

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Cascade Summary of Results for Lagoon 6 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	27.896	1.696	218.4	403.9	622.2	848.1	O K
60 min Winter	27.872	1.672	216.7	264.7	481.4	829.5	O K
120 min Winter	27.826	1.626	213.2	58.0	271.2	793.9	O K
180 min Winter	27.714	1.514	204.6	0.0	204.6	709.8	O K
240 min Winter	27.595	1.395	195.2	0.0	195.2	626.8	O K
360 min Winter	27.416	1.216	179.9	0.0	179.9	511.3	O K
480 min Winter	27.291	1.091	168.5	0.0	168.5	437.4	O K
600 min Winter	27.198	0.998	159.4	0.0	159.4	385.6	O K
720 min Winter	27.123	0.923	151.7	0.0	151.7	346.4	O K
960 min Winter	27.028	0.828	141.4	0.0	141.4	299.3	O K
1440 min Winter	26.892	0.692	125.1	0.0	125.1	236.6	O K
2160 min Winter	26.752	0.552	105.7	0.0	105.7	178.1	O K
2880 min Winter	26.663	0.463	91.3	0.0	91.3	143.7	O K
4320 min Winter	26.549	0.349	68.7	0.0	68.7	103.3	O K
5760 min Winter	26.491	0.291	55.5	0.0	55.5	83.8	O K
7200 min Winter	26.463	0.263	47.0	0.0	47.0	74.7	O K
8640 min Winter	26.442	0.242	40.8	0.0	40.8	68.3	O K
10080 min Winter	26.423	0.223	36.3	0.0	36.3	62.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	114.636	0.0	2137.5	165.5	28
60 min Winter	64.872	0.0	2586.3	141.7	46
120 min Winter	36.710	0.0	3005.7	29.8	86
180 min Winter	26.312	0.0	3284.1	0.0	126
240 min Winter	20.774	0.0	3498.3	0.0	162
360 min Winter	14.889	0.0	3826.0	0.0	232
480 min Winter	11.756	0.0	4078.4	0.0	302
600 min Winter	9.787	0.0	4286.5	0.0	372
720 min Winter	8.426	0.0	4465.0	0.0	442
960 min Winter	6.776	0.0	4874.3	0.0	582
1440 min Winter	4.984	0.0	5520.8	0.0	852
2160 min Winter	3.666	0.0	6438.3	0.0	1216
2880 min Winter	2.949	0.0	7026.8	0.0	1588
4320 min Winter	2.082	0.0	7567.4	0.0	2292
5760 min Winter	1.626	0.0	8338.3	0.0	3000
7200 min Winter	1.343	0.0	8674.5	0.0	3744
8640 min Winter	1.148	0.0	8960.6	0.0	4496
10080 min Winter	1.006	0.0	9211.0	0.0	5144

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Cascade Model Details for Lagoon 6 Primary.srcx

Storage is Online Cover Level (m) 28.200

Tank or Pond Structure

Invert Level (m) 26.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	252.4	0.800	472.9	1.600	757.7	2.400	0.0
0.200	301.5	1.000	538.0	1.800	838.9	2.600	0.0
0.400	354.6	1.200	607.0	2.000	924.2	2.800	0.0
0.600	411.7	1.400	680.5	2.200	0.0	3.000	0.0

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	20.000	Upstream Invert Level (m)	26.200
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 8.000 Invert Level (m) 27.800

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Cascade Summary of Results for Lagoon 6 Infiltration.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 6 Primary.srcx	(None)	(None)

Half Drain Time : 415 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	26.831	0.831	34.7	887.7	O K
30 min Summer	26.985	0.985	38.3	1092.9	O K
60 min Summer	27.151	1.151	42.2	1328.8	O K
120 min Summer	27.329	1.329	46.6	1601.3	O K
180 min Summer	27.435	1.435	49.2	1773.7	O K
240 min Summer	27.509	1.509	51.1	1897.4	O K
360 min Summer	27.606	1.606	53.6	2064.5	O K
480 min Summer	27.664	1.664	55.1	2167.4	O K
600 min Summer	27.701	1.701	56.1	2233.4	O K
720 min Summer	27.722	1.722	56.6	2272.2	O K
960 min Summer	27.755	1.755	57.5	2332.3	O K
1440 min Summer	27.764	1.764	57.7	2349.4	O K
2160 min Summer	27.736	1.736	57.0	2297.2	O K
2880 min Summer	27.690	1.690	55.8	2214.4	O K
4320 min Summer	27.500	1.500	50.9	1881.5	O K
5760 min Summer	27.336	1.336	46.8	1613.2	O K
7200 min Summer	27.195	1.195	43.3	1395.0	O K
8640 min Summer	27.072	1.072	40.3	1214.2	O K
10080 min Summer	26.964	0.964	37.8	1064.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	202.577	0.0	283
30 min Summer	114.636	0.0	309
60 min Summer	64.872	0.0	346
120 min Summer	36.710	0.0	398
180 min Summer	26.312	0.0	438
240 min Summer	20.774	0.0	476
360 min Summer	14.889	0.0	548
480 min Summer	11.756	0.0	618
600 min Summer	9.787	0.0	686
720 min Summer	8.426	0.0	756
960 min Summer	6.776	0.0	908
1440 min Summer	4.984	0.0	1158
2160 min Summer	3.666	0.0	1540
2880 min Summer	2.949	0.0	1932
4320 min Summer	2.082	0.0	2688
5760 min Summer	1.626	0.0	3440
7200 min Summer	1.343	0.0	4184
8640 min Summer	1.148	0.0	4928
10080 min Summer	1.006	0.0	5656

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Cascade Summary of Results for Lagoon 6 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	26.899	0.899	36.3	976.2	O K
30 min Winter	27.055	1.055	39.9	1190.2	O K
60 min Winter	27.224	1.224	44.0	1438.2	O K
120 min Winter	27.409	1.409	48.6	1731.0	O K
180 min Winter	27.518	1.518	51.4	1912.8	O K
240 min Winter	27.593	1.593	53.3	2041.9	O K
360 min Winter	27.691	1.691	55.8	2215.0	O K
480 min Winter	27.748	1.748	57.3	2320.6	O K
600 min Winter	27.783	1.783	58.3	2385.8	O K
720 min Winter	27.803	1.803	58.8	2422.1	O K
960 min Winter	27.833	1.833	59.6	2480.0	O K
1440 min Winter	27.815	1.815	59.1	2445.0	O K
2160 min Winter	27.746	1.746	57.3	2316.7	O K
2880 min Winter	27.656	1.656	54.9	2152.1	O K
4320 min Winter	27.388	1.388	48.0	1696.7	O K
5760 min Winter	27.169	1.169	42.6	1356.8	O K
7200 min Winter	26.989	0.989	38.4	1098.5	O K
8640 min Winter	26.839	0.839	34.9	897.1	O K
10080 min Winter	26.711	0.711	32.0	735.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	202.577	0.0	272
30 min Winter	114.636	0.0	299
60 min Winter	64.872	0.0	340
120 min Winter	36.710	0.0	390
180 min Winter	26.312	0.0	434
240 min Winter	20.774	0.0	472
360 min Winter	14.889	0.0	544
480 min Winter	11.756	0.0	610
600 min Winter	9.787	0.0	678
720 min Winter	8.426	0.0	750
960 min Winter	6.776	0.0	922
1440 min Winter	4.984	0.0	1178
2160 min Winter	3.666	0.0	1588
2880 min Winter	2.949	0.0	2004
4320 min Winter	2.082	0.0	2788
5760 min Winter	1.626	0.0	3560
7200 min Winter	1.343	0.0	4320
8640 min Winter	1.148	0.0	5056
10080 min Winter	1.006	0.0	5784

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Cascade Model Details for Lagoon 6 Infiltration.srcx

Storage is Online Cover Level (m) 28.200

Infiltration Basin Structure

Invert Level (m) 26.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.14400 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.14400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	856.7	0.800	1272.9	1.600	1753.5	2.400	0.0
0.200	954.7	1.000	1387.0	1.800	1883.0	2.600	0.0
0.400	1056.7	1.200	1505.0	2.000	2018.0	2.800	0.0
0.600	1162.8	1.400	1627.3	2.200	2156.0	3.000	0.0

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Cascade Summary of Results for Lagoon 6A Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 6A Infiltration.srcx	Lagoon 6A Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	32.311	1.211	186.0	9.5	195.5	154.0	O K
30 min Summer	32.235	1.135	179.0	0.0	179.0	134.8	O K
60 min Summer	32.091	0.991	164.9	0.0	164.9	102.4	O K
120 min Summer	31.871	0.771	140.7	0.0	140.7	62.5	O K
180 min Summer	31.717	0.617	121.0	0.0	121.0	41.1	O K
240 min Summer	31.610	0.510	105.1	0.0	105.1	29.0	O K
360 min Summer	31.485	0.385	82.8	0.0	82.8	17.7	O K
480 min Summer	31.429	0.329	67.5	0.0	67.5	13.5	O K
600 min Summer	31.395	0.295	56.9	0.0	56.9	11.3	O K
720 min Summer	31.370	0.270	49.1	0.0	49.1	9.8	O K
960 min Summer	31.338	0.238	39.6	0.0	39.6	8.1	O K
1440 min Summer	31.291	0.191	29.2	0.0	29.2	5.7	O K
2160 min Summer	31.261	0.161	21.5	0.0	21.5	4.5	O K
2880 min Summer	31.247	0.147	17.2	0.0	17.2	3.9	O K
4320 min Summer	31.223	0.123	12.2	0.0	12.2	3.1	O K
5760 min Summer	31.208	0.108	9.5	0.0	9.5	2.6	O K
7200 min Summer	31.198	0.098	7.9	0.0	7.9	2.3	O K
8640 min Summer	31.191	0.091	6.7	0.0	6.7	2.1	O K
10080 min Summer	31.185	0.085	5.9	0.0	5.9	1.9	O K
15 min Winter	32.356	1.256	190.1	112.1	302.2	166.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.455	0.0	275.4	0.9	16
30 min Summer	114.942	0.0	311.2	0.0	24
60 min Summer	64.937	0.0	351.6	0.0	40
120 min Summer	36.686	0.0	397.3	0.0	70
180 min Summer	26.268	0.0	426.7	0.0	100
240 min Summer	20.726	0.0	448.9	0.0	130
360 min Summer	14.840	0.0	482.2	0.0	188
480 min Summer	11.709	0.0	507.2	0.0	246
600 min Summer	9.743	0.0	527.6	0.0	308
720 min Summer	8.384	0.0	544.8	0.0	368
960 min Summer	6.734	0.0	583.4	0.0	490
1440 min Summer	4.945	0.0	642.6	0.0	726
2160 min Summer	3.631	0.0	707.7	0.0	1080
2880 min Summer	2.916	0.0	757.9	0.0	1460
4320 min Summer	2.060	0.0	803.3	0.0	2188
5760 min Summer	1.610	0.0	837.0	0.0	2856
7200 min Summer	1.330	0.0	864.2	0.0	3544
8640 min Summer	1.138	0.0	887.1	0.0	4256
10080 min Summer	0.997	0.0	906.9	0.0	5040
15 min Winter	203.455	0.0	308.5	18.9	16

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Cascade Summary of Results for Lagoon 6A Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	32.299	1.199	185.0	0.0	185.0	151.0	O K
60 min Winter	32.097	0.997	165.6	0.0	165.6	103.8	O K
120 min Winter	31.792	0.692	131.0	0.0	131.0	50.9	O K
180 min Winter	31.606	0.506	104.5	0.0	104.5	28.6	O K
240 min Winter	31.500	0.400	85.8	0.0	85.8	18.9	O K
360 min Winter	31.414	0.314	62.7	0.0	62.7	12.5	O K
480 min Winter	31.372	0.272	49.7	0.0	49.7	9.9	O K
600 min Winter	31.345	0.245	41.6	0.0	41.6	8.4	O K
720 min Winter	31.321	0.221	35.7	0.0	35.7	7.1	O K
960 min Winter	31.289	0.189	28.7	0.0	28.7	5.6	O K
1440 min Winter	31.260	0.160	21.2	0.0	21.2	4.4	O K
2160 min Winter	31.241	0.141	15.6	0.0	15.6	3.7	O K
2880 min Winter	31.225	0.125	12.4	0.0	12.4	3.1	O K
4320 min Winter	31.204	0.104	8.8	0.0	8.8	2.4	O K
5760 min Winter	31.193	0.093	7.0	0.0	7.0	2.1	O K
7200 min Winter	31.183	0.083	5.7	0.0	5.7	1.8	O K
8640 min Winter	31.176	0.076	4.9	0.0	4.9	1.7	O K
10080 min Winter	31.171	0.071	4.3	0.0	4.3	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	114.942	0.0	348.5	0.0	26
60 min Winter	64.937	0.0	393.8	0.0	42
120 min Winter	36.686	0.0	445.0	0.0	72
180 min Winter	26.268	0.0	477.9	0.0	100
240 min Winter	20.726	0.0	502.8	0.0	130
360 min Winter	14.840	0.0	540.0	0.0	188
480 min Winter	11.709	0.0	568.1	0.0	246
600 min Winter	9.743	0.0	590.9	0.0	306
720 min Winter	8.384	0.0	610.2	0.0	370
960 min Winter	6.734	0.0	653.4	0.0	490
1440 min Winter	4.945	0.0	719.7	0.0	722
2160 min Winter	3.631	0.0	792.7	0.0	1092
2880 min Winter	2.916	0.0	848.9	0.0	1428
4320 min Winter	2.060	0.0	899.7	0.0	2188
5760 min Winter	1.610	0.0	937.5	0.0	2880
7200 min Winter	1.330	0.0	967.9	0.0	3640
8640 min Winter	1.138	0.0	993.5	0.0	4320
10080 min Winter	0.997	0.0	1015.7	0.0	5072

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Cascade Model Details for Lagoon 6A Primary.srcx

Storage is Online Cover Level (m) 32.700

Tank or Pond Structure

Invert Level (m) 31.100

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	17.0	1.400	314.6	2.800	0.0	4.200	0.0
0.200	47.0	1.600	373.2	3.000	0.0	4.400	0.0
0.400	81.9	1.800	0.0	3.200	0.0	4.600	0.0
0.600	120.4	2.000	0.0	3.400	0.0	4.800	0.0
0.800	162.9	2.200	0.0	3.600	0.0	5.000	0.0
1.000	209.5	2.400	0.0	3.800	0.0		
1.200	260.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	150.0	Coefficient of Contraction	0.600
Length (m)	18.000	Upstream Invert Level (m)	31.100
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 32.300

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Cascade Summary of Results for Lagoon 6A Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 6A Primary.srcx		(None)	(None)

Half Drain Time : 448 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	31.540	0.640	10.8	307.5	O K
30 min Summer	31.648	0.748	12.0	375.6	O K
60 min Summer	31.758	0.858	13.2	450.6	O K
120 min Summer	31.880	0.980	14.6	539.8	O K
180 min Summer	31.953	1.053	15.5	596.2	O K
240 min Summer	32.004	1.104	16.1	637.4	O K
360 min Summer	32.073	1.173	16.9	694.6	O K
480 min Summer	32.115	1.215	17.4	731.0	O K
600 min Summer	32.142	1.242	17.8	754.7	O K
720 min Summer	32.159	1.259	18.0	770.3	O K
960 min Summer	32.202	1.302	18.5	808.5	O K
1440 min Summer	32.212	1.312	18.6	817.7	O K
2160 min Summer	32.198	1.298	18.5	805.1	O K
2880 min Summer	32.170	1.270	18.1	779.9	O K
4320 min Summer	32.046	1.146	16.6	672.0	O K
5760 min Summer	31.938	1.038	15.3	584.4	O K
7200 min Summer	31.844	0.944	14.2	512.5	O K
8640 min Summer	31.761	0.861	13.3	452.5	O K
10080 min Summer	31.688	0.788	12.4	402.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	203.455	0.0	378
30 min Summer	114.942	0.0	396
60 min Summer	64.937	0.0	430
120 min Summer	36.686	0.0	472
180 min Summer	26.268	0.0	510
240 min Summer	20.726	0.0	544
360 min Summer	14.840	0.0	614
480 min Summer	11.709	0.0	682
600 min Summer	9.743	0.0	750
720 min Summer	8.384	0.0	814
960 min Summer	6.734	0.0	966
1440 min Summer	4.945	0.0	1222
2160 min Summer	3.631	0.0	1600
2880 min Summer	2.916	0.0	1980
4320 min Summer	2.060	0.0	2736
5760 min Summer	1.610	0.0	3496
7200 min Summer	1.330	0.0	4248
8640 min Summer	1.138	0.0	4976
10080 min Summer	0.997	0.0	5704

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Cascade Summary of Results for Lagoon 6A Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	31.577	0.677	11.2	330.0	O K
30 min Winter	31.687	0.787	12.4	401.4	O K
60 min Winter	31.799	0.899	13.7	479.8	O K
120 min Winter	31.922	1.022	15.1	572.0	O K
180 min Winter	31.996	1.096	16.0	630.6	O K
240 min Winter	32.048	1.148	16.6	673.6	O K
360 min Winter	32.117	1.217	17.5	733.0	O K
480 min Winter	32.160	1.260	18.0	770.4	O K
600 min Winter	32.186	1.286	18.3	794.2	O K
720 min Winter	32.202	1.302	18.5	809.2	O K
960 min Winter	32.243	1.343	19.0	846.2	O K
1440 min Winter	32.240	1.340	19.0	843.9	O K
2160 min Winter	32.202	1.302	18.5	809.1	O K
2880 min Winter	32.147	1.247	17.8	759.6	O K
4320 min Winter	31.972	1.072	15.7	611.2	O K
5760 min Winter	31.826	0.926	14.0	499.0	O K
7200 min Winter	31.704	0.804	12.6	412.9	O K
8640 min Winter	31.601	0.701	11.5	345.3	O K
10080 min Winter	31.514	0.614	10.5	291.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	203.455	0.0	369
30 min Winter	114.942	0.0	388
60 min Winter	64.937	0.0	422
120 min Winter	36.686	0.0	466
180 min Winter	26.268	0.0	504
240 min Winter	20.726	0.0	540
360 min Winter	14.840	0.0	608
480 min Winter	11.709	0.0	676
600 min Winter	9.743	0.0	744
720 min Winter	8.384	0.0	808
960 min Winter	6.734	0.0	954
1440 min Winter	4.945	0.0	1244
2160 min Winter	3.631	0.0	1636
2880 min Winter	2.916	0.0	2044
4320 min Winter	2.060	0.0	2836
5760 min Winter	1.610	0.0	3608
7200 min Winter	1.330	0.0	4352
8640 min Winter	1.138	0.0	5104
10080 min Winter	0.997	0.0	5840

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Cascade Model Details for Lagoon 6A Infiltration.srcx

Storage is Online Cover Level (m) 32.700

Infiltration Basin Structure

Invert Level (m) 30.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.09000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.09000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	358.3	1.400	962.7	2.800	0.0	4.200	0.0
0.200	431.8	1.600	1065.4	3.000	0.0	4.400	0.0
0.400	510.0	1.800	1172.1	3.200	0.0	4.600	0.0
0.600	592.5	2.000	0.0	3.400	0.0	4.800	0.0
0.800	678.9	2.200	0.0	3.600	0.0	5.000	0.0
1.000	769.5	2.400	0.0	3.800	0.0		
1.200	864.0	2.600	0.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 8 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 8 Infiltration.srcx	Lagoon 8 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	25.131	2.831	292.1	0.0	292.1	1453.6	O K
30 min Summer	25.213	2.913	296.4	0.0	296.4	1548.2	O K
60 min Summer	25.187	2.887	295.1	0.0	295.1	1518.7	O K
120 min Summer	25.045	2.745	287.4	0.0	287.4	1358.4	O K
180 min Summer	24.910	2.610	280.0	0.0	280.0	1216.2	O K
240 min Summer	24.787	2.487	273.1	0.0	273.1	1095.1	O K
360 min Summer	24.563	2.263	260.0	0.0	260.0	893.9	O K
480 min Summer	24.361	2.061	247.6	0.0	247.6	732.2	O K
600 min Summer	24.178	1.878	235.8	0.0	235.8	602.3	O K
720 min Summer	24.015	1.715	224.8	0.0	224.8	498.2	O K
960 min Summer	23.766	1.466	206.8	0.0	206.8	361.3	O K
1440 min Summer	23.397	1.097	176.8	0.0	176.8	203.0	O K
2160 min Summer	23.056	0.756	143.8	0.0	143.8	100.0	O K
2880 min Summer	22.863	0.563	120.8	0.0	120.8	58.5	O K
4320 min Summer	22.690	0.390	87.0	0.0	87.0	31.0	O K
5760 min Summer	22.632	0.332	68.4	0.0	68.4	23.7	O K
7200 min Summer	22.595	0.295	56.7	0.0	56.7	19.6	O K
8640 min Summer	22.568	0.268	48.7	0.0	48.7	16.9	O K
10080 min Summer	22.548	0.248	42.6	0.0	42.6	15.0	O K
15 min Winter	25.299	2.999	300.9	0.0	300.9	1652.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	202.050	0.0	1881.1	0.0	26
30 min Summer	114.544	0.0	2140.9	0.0	37
60 min Summer	64.937	0.0	2447.2	0.0	58
120 min Summer	36.813	0.0	2784.2	0.0	90
180 min Summer	26.413	0.0	3002.9	0.0	124
240 min Summer	20.870	0.0	3168.6	0.0	158
360 min Summer	14.974	0.0	3418.1	0.0	222
480 min Summer	11.831	0.0	3607.2	0.0	286
600 min Summer	9.856	0.0	3761.2	0.0	346
720 min Summer	8.489	0.0	3892.0	0.0	406
960 min Summer	6.816	0.0	4178.1	0.0	524
1440 min Summer	5.003	0.0	4618.3	0.0	760
2160 min Summer	3.672	0.0	5127.8	0.0	1112
2880 min Summer	2.948	0.0	5506.1	0.0	1472
4320 min Summer	2.081	0.0	5841.1	0.0	2200
5760 min Summer	1.625	0.0	6134.0	0.0	2920
7200 min Summer	1.341	0.0	6335.7	0.0	3672
8640 min Summer	1.146	0.0	6505.6	0.0	4384
10080 min Summer	1.004	0.0	6653.0	0.0	5136
15 min Winter	202.050	0.0	2095.6	0.0	27

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Cascade Summary of Results for Lagoon 8 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	25.393	3.093	305.7	0.0	305.7	1769.6	O K
60 min Winter	25.384	3.084	305.3	0.0	305.3	1757.4	O K
120 min Winter	25.216	2.916	296.6	0.0	296.6	1552.5	O K
180 min Winter	25.040	2.740	287.2	0.0	287.2	1352.6	O K
240 min Winter	24.868	2.568	277.7	0.0	277.7	1174.7	O K
360 min Winter	24.553	2.253	259.4	0.0	259.4	885.4	O K
480 min Winter	24.269	1.969	241.7	0.0	241.7	664.8	O K
600 min Winter	24.016	1.716	224.9	0.0	224.9	499.1	O K
720 min Winter	23.796	1.496	209.0	0.0	209.0	376.5	O K
960 min Winter	23.473	1.173	183.4	0.0	183.4	231.5	O K
1440 min Winter	23.064	0.764	144.6	0.0	144.6	101.9	O K
2160 min Winter	22.788	0.488	109.3	0.0	109.3	45.6	O K
2880 min Winter	22.695	0.395	88.6	0.0	88.6	31.7	O K
4320 min Winter	22.614	0.314	62.9	0.0	62.9	21.7	O K
5760 min Winter	22.570	0.270	49.3	0.0	49.3	17.1	O K
7200 min Winter	22.542	0.242	40.8	0.0	40.8	14.4	O K
8640 min Winter	22.517	0.217	34.9	0.0	34.9	12.2	O K
10080 min Winter	22.498	0.198	30.6	0.0	30.6	10.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	114.544	0.0	2384.0	0.0	37
60 min Winter	64.937	0.0	2722.9	0.0	60
120 min Winter	36.813	0.0	3096.8	0.0	98
180 min Winter	26.413	0.0	3339.3	0.0	134
240 min Winter	20.870	0.0	3523.0	0.0	170
360 min Winter	14.974	0.0	3799.5	0.0	236
480 min Winter	11.831	0.0	4009.0	0.0	300
600 min Winter	9.856	0.0	4179.6	0.0	360
720 min Winter	8.489	0.0	4324.5	0.0	418
960 min Winter	6.816	0.0	4641.1	0.0	534
1440 min Winter	5.003	0.0	5128.0	0.0	760
2160 min Winter	3.672	0.0	5689.0	0.0	1108
2880 min Winter	2.948	0.0	6106.9	0.0	1468
4320 min Winter	2.081	0.0	6477.0	0.0	2188
5760 min Winter	1.625	0.0	6796.1	0.0	2920
7200 min Winter	1.341	0.0	7018.9	0.0	3600
8640 min Winter	1.146	0.0	7206.5	0.0	4408
10080 min Winter	1.004	0.0	7369.2	0.0	5112

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Cascade Model Details for Lagoon 8 Primary.srcx

Storage is Online Cover Level (m) 25.900

Tank or Pond Structure

Invert Level (m) 22.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	30.2	1.400	474.0	2.800	1116.0	4.200	0.0
0.200	81.6	1.600	554.0	3.000	1224.0	4.400	0.0
0.400	137.1	1.800	637.0	3.200	1335.0	4.600	0.0
0.600	196.5	2.000	725.0	3.400	1451.0	4.800	0.0
0.800	260.0	2.200	817.0	3.600	1571.0	5.000	0.0
1.000	327.0	2.400	912.0	3.800	0.0		
1.200	399.0	2.600	1012.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	21.000	Upstream Invert Level (m)	22.300
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 10.000 Invert Level (m) 25.500

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Cascade Summary of Results for Lagoon 8 Infiltration.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 8 Primary.srcx	(None)	(None)

Half Drain Time : 2373 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	24.219	2.119	10.6	1779.7	O K
30 min Summer	24.379	2.279	11.5	2026.8	O K
60 min Summer	24.548	2.448	12.5	2306.7	O K
120 min Summer	24.724	2.624	13.5	2621.3	O K
180 min Summer	24.829	2.729	14.1	2820.5	O K
240 min Summer	24.904	2.804	14.6	2967.6	O K
360 min Summer	25.009	2.909	15.2	3179.0	O K
480 min Summer	25.071	2.971	15.6	3309.8	O K
600 min Summer	25.111	3.011	15.9	3394.8	O K
720 min Summer	25.138	3.038	16.0	3453.5	O K
960 min Summer	25.199	3.099	16.4	3586.2	O K
1440 min Summer	25.256	3.156	16.8	3713.0	O K
2160 min Summer	25.284	3.184	16.9	3777.2	O K
2880 min Summer	25.297	3.197	17.0	3808.4	O K
4320 min Summer	25.220	3.120	16.5	3633.1	O K
5760 min Summer	25.141	3.041	16.0	3459.7	O K
7200 min Summer	25.064	2.964	15.6	3294.0	O K
8640 min Summer	24.988	2.888	15.1	3137.2	O K
10080 min Summer	24.916	2.816	14.6	2990.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	202.050	0.0	155
30 min Summer	114.544	0.0	174
60 min Summer	64.937	0.0	198
120 min Summer	36.813	0.0	236
180 min Summer	26.413	0.0	272
240 min Summer	20.870	0.0	306
360 min Summer	14.974	0.0	382
480 min Summer	11.831	0.0	496
600 min Summer	9.856	0.0	614
720 min Summer	8.489	0.0	732
960 min Summer	6.816	0.0	968
1440 min Summer	5.003	0.0	1442
2160 min Summer	3.672	0.0	1808
2880 min Summer	2.948	0.0	2176
4320 min Summer	2.081	0.0	2968
5760 min Summer	1.625	0.0	3808
7200 min Summer	1.341	0.0	4616
8640 min Summer	1.146	0.0	5448
10080 min Summer	1.004	0.0	6256

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Cascade Summary of Results for Lagoon 8 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	24.356	2.256	11.4	1989.0	O K
30 min Winter	24.523	2.423	12.3	2264.0	O K
60 min Winter	24.699	2.599	13.3	2575.5	O K
120 min Winter	24.883	2.783	14.4	2925.5	O K
180 min Winter	24.993	2.893	15.1	3146.9	O K
240 min Winter	25.071	2.971	15.6	3310.1	O K
360 min Winter	25.180	3.080	16.3	3545.3	O K
480 min Winter	25.248	3.148	16.7	3696.4	O K
600 min Winter	25.292	3.192	17.0	3795.2	O K
720 min Winter	25.322	3.222	17.2	3864.5	O K
960 min Winter	25.389	3.289	17.6	4020.9	O K
1440 min Winter	25.457	3.357	18.1	4184.3	O K
2160 min Winter	25.484	3.384	18.2	4249.8	O K
2880 min Winter	25.489	3.389	18.3	4263.0	O K
4320 min Winter	25.391	3.291	17.6	4026.6	O K
5760 min Winter	25.287	3.187	17.0	3784.1	O K
7200 min Winter	25.183	3.083	16.3	3551.4	O K
8640 min Winter	25.083	2.983	15.7	3333.8	O K
10080 min Winter	24.987	2.887	15.1	3133.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	202.050	0.0	164
30 min Winter	114.544	0.0	184
60 min Winter	64.937	0.0	210
120 min Winter	36.813	0.0	248
180 min Winter	26.413	0.0	282
240 min Winter	20.870	0.0	316
360 min Winter	14.974	0.0	386
480 min Winter	11.831	0.0	490
600 min Winter	9.856	0.0	604
720 min Winter	8.489	0.0	718
960 min Winter	6.816	0.0	948
1440 min Winter	5.003	0.0	1396
2160 min Winter	3.672	0.0	2012
2880 min Winter	2.948	0.0	2280
4320 min Winter	2.081	0.0	3200
5760 min Winter	1.625	0.0	4096
7200 min Winter	1.341	0.0	4976
8640 min Winter	1.146	0.0	5808
10080 min Winter	1.004	0.0	6664

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Cascade Model Details for Lagoon 8 Infiltration.srcx

Storage is Online Cover Level (m) 25.900

Infiltration Basin Structure

Invert Level (m) 22.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02840 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02840

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	310.0	1.400	1016.0	2.800	1984.0	4.200	0.0
0.200	387.0	1.600	1141.0	3.000	2139.0	4.400	0.0
0.400	472.0	1.800	1271.0	3.200	2297.0	4.600	0.0
0.600	556.0	2.000	1406.0	3.400	2460.0	4.800	0.0
0.800	668.0	2.200	1544.0	3.600	2647.0	5.000	0.0
1.000	779.0	2.400	1687.0	3.800	2797.0		
1.200	895.0	2.600	1833.0	4.000	0.0		

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 3438 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	25.163	0.563	28.1	3365.9	O K
30 min Summer	25.315	0.715	29.8	4352.4	O K
60 min Summer	25.492	0.892	31.8	5538.9	O K
120 min Summer	25.698	1.098	34.1	6969.0	O K
180 min Summer	25.831	1.231	35.6	7933.1	O K
240 min Summer	25.932	1.332	36.8	8676.0	O K
360 min Summer	26.081	1.481	38.5	9799.9	O K
480 min Summer	26.190	1.590	39.8	10641.5	O K
600 min Summer	26.274	1.674	40.8	11308.9	O K
720 min Summer	26.343	1.743	41.6	11857.2	O K
960 min Summer	26.497	1.897	43.4	13114.5	O K
1440 min Summer	26.713	2.113	46.0	14939.2	O K
2160 min Summer	26.918	2.318	48.6	16736.4	O K
2880 min Summer	27.046	2.446	50.1	17888.1	O K
4320 min Summer	27.035	2.435	50.0	17787.9	O K
5760 min Summer	27.008	2.408	49.7	17542.7	O K
7200 min Summer	26.972	2.372	49.2	17224.4	O K
8640 min Summer	26.932	2.332	48.7	16858.7	O K
10080 min Summer	26.888	2.288	48.2	16466.7	O K
15 min Winter	25.163	0.563	28.1	3365.9	O K
30 min Winter	25.315	0.715	29.8	4352.4	O K
60 min Winter	25.492	0.892	31.8	5538.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	202.050	0.0	736
30 min Summer	114.544	0.0	745
60 min Summer	64.937	0.0	766
120 min Summer	36.813	0.0	802
180 min Summer	26.413	0.0	838
240 min Summer	20.870	0.0	874
360 min Summer	14.974	0.0	946
480 min Summer	11.831	0.0	1026
600 min Summer	9.856	0.0	1106
720 min Summer	8.489	0.0	1192
960 min Summer	6.816	0.0	1378
1440 min Summer	5.003	0.0	1778
2160 min Summer	3.672	0.0	2404
2880 min Summer	2.948	0.0	3020
4320 min Summer	2.081	0.0	3876
5760 min Summer	1.625	0.0	4640
7200 min Summer	1.341	0.0	5448
8640 min Summer	1.146	0.0	6272
10080 min Summer	1.004	0.0	7104
15 min Winter	202.050	0.0	736
30 min Winter	114.544	0.0	745
60 min Winter	64.937	0.0	766

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
120 min Winter	25.698	1.098	34.1	6968.8	O K
180 min Winter	25.831	1.231	35.6	7930.9	O K
240 min Winter	25.932	1.332	36.8	8672.0	O K
360 min Winter	26.080	1.480	38.5	9793.5	O K
480 min Winter	26.189	1.589	39.8	10635.1	O K
600 min Winter	26.274	1.674	40.8	11305.9	O K
720 min Winter	26.343	1.743	41.6	11859.4	O K
960 min Winter	26.499	1.899	43.5	13130.2	O K
1440 min Winter	26.718	2.118	46.1	14983.1	O K
2160 min Winter	26.928	2.328	48.7	16823.3	O K
2880 min Winter	27.059	2.459	50.3	18013.8	O K
4320 min Winter	27.044	2.444	50.1	17876.6	O K
5760 min Winter	27.009	2.409	49.7	17553.7	O K
7200 min Winter	26.964	2.364	49.1	17145.0	O K
8640 min Winter	26.911	2.311	48.5	16670.1	O K
10080 min Winter	26.853	2.253	47.8	16161.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
120 min Winter	36.813	0.0	802
180 min Winter	26.413	0.0	838
240 min Winter	20.870	0.0	874
360 min Winter	14.974	0.0	950
480 min Winter	11.831	0.0	1030
600 min Winter	9.856	0.0	1114
720 min Winter	8.489	0.0	1202
960 min Winter	6.816	0.0	1384
1440 min Winter	5.003	0.0	1774
2160 min Winter	3.672	0.0	2392
2880 min Winter	2.948	0.0	3016
4320 min Winter	2.081	0.0	4092
5760 min Winter	1.625	0.0	4832
7200 min Winter	1.341	0.0	5744
8640 min Winter	1.146	0.0	6656
10080 min Winter	1.004	0.0	7568

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Model Details

Storage is Online Cover Level (m) 27.400

Infiltration Basin Structure

Invert Level (m) 24.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02840 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02840

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	5608.3	1.400	7545.3	2.800	9679.3	4.200	0.0
0.200	5873.0	1.600	7838.1	3.000	0.0	4.400	0.0
0.400	6141.7	1.800	8134.9	3.200	0.0	4.600	0.0
0.600	6414.0	2.000	8435.7	3.400	0.0	4.800	0.0
0.800	6691.0	2.200	8740.6	3.600	0.0	5.000	0.0
1.000	6971.8	2.400	9049.6	3.800	0.0		
1.200	7256.5	2.600	9362.4	4.000	0.0		

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Cascade Summary of Results for Lagoon 9 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 9 Infiltration.srcx	Lagoon 9 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	22.536	0.936	153.2	0.0	153.2	1612.8	O K
30 min Summer	22.602	1.002	158.5	0.7	159.2	1753.5	O K
60 min Summer	22.631	1.031	160.8	55.1	215.9	1817.1	O K
120 min Summer	22.621	1.021	160.0	31.7	191.7	1796.1	O K
180 min Summer	22.605	1.005	158.8	3.9	162.7	1761.3	O K
240 min Summer	22.579	0.979	156.7	0.0	156.7	1704.2	O K
360 min Summer	22.521	0.921	152.0	0.0	152.0	1580.5	O K
480 min Summer	22.462	0.862	147.1	0.0	147.1	1460.1	O K
600 min Summer	22.408	0.808	142.4	0.0	142.4	1349.2	O K
720 min Summer	22.357	0.757	137.9	0.0	137.9	1248.9	O K
960 min Summer	22.287	0.687	131.4	0.0	131.4	1113.8	O K
1440 min Summer	22.175	0.575	120.4	0.0	120.4	907.0	O K
2160 min Summer	22.069	0.469	106.1	0.0	106.1	720.2	O K
2880 min Summer	22.011	0.411	93.5	0.0	93.5	620.3	O K
4320 min Summer	21.937	0.337	70.0	0.0	70.0	498.7	O K
5760 min Summer	21.894	0.294	56.4	0.0	56.4	429.8	O K
7200 min Summer	21.864	0.264	47.3	0.0	47.3	383.6	O K
8640 min Summer	21.842	0.242	40.6	0.0	40.6	349.3	O K
10080 min Summer	21.822	0.222	35.9	0.0	35.9	318.2	O K
15 min Winter	22.627	1.027	160.5	46.0	206.5	1808.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	206.821	0.0	1740.4	0.0	27
30 min Summer	115.715	0.0	1950.0	0.1	39
60 min Summer	64.742	0.0	2199.6	44.8	62
120 min Summer	36.223	0.0	2462.6	37.5	96
180 min Summer	25.790	0.0	2630.7	2.4	134
240 min Summer	20.266	0.0	2756.7	0.0	168
360 min Summer	14.429	0.0	2944.6	0.0	236
480 min Summer	11.339	0.0	3085.5	0.0	302
600 min Summer	9.406	0.0	3199.3	0.0	368
720 min Summer	8.073	0.0	3295.1	0.0	432
960 min Summer	6.505	0.0	3539.6	0.0	558
1440 min Summer	4.798	0.0	3913.1	0.0	798
2160 min Summer	3.539	0.0	4344.3	0.0	1152
2880 min Summer	2.851	0.0	4665.5	0.0	1504
4320 min Summer	2.024	0.0	4960.2	0.0	2216
5760 min Summer	1.587	0.0	5203.1	0.0	2944
7200 min Summer	1.315	0.0	5384.7	0.0	3680
8640 min Summer	1.127	0.0	5535.5	0.0	4408
10080 min Summer	0.989	0.0	5661.7	0.0	5144
15 min Winter	206.821	0.0	1952.0	16.0	27

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Cascade Summary of Results for Lagoon 9 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	22.674	1.074	164.1	204.8	368.8	1912.0	O K
60 min Winter	22.684	1.084	164.8	247.8	412.6	1934.2	O K
120 min Winter	22.670	1.070	163.7	188.3	352.1	1902.3	O K
180 min Winter	22.653	1.053	162.4	123.9	286.3	1865.3	O K
240 min Winter	22.635	1.035	161.1	67.7	228.8	1827.0	O K
360 min Winter	22.576	0.976	156.5	0.0	156.5	1698.8	O K
480 min Winter	22.493	0.893	149.7	0.0	149.7	1522.3	O K
600 min Winter	22.415	0.815	143.1	0.0	143.1	1364.1	O K
720 min Winter	22.345	0.745	136.8	0.0	136.8	1225.1	O K
960 min Winter	22.245	0.645	127.4	0.0	127.4	1035.0	O K
1440 min Winter	22.102	0.502	111.5	0.0	111.5	777.4	O K
2160 min Winter	22.000	0.400	90.2	0.0	90.2	603.4	O K
2880 min Winter	21.950	0.350	74.1	0.0	74.1	520.3	O K
4320 min Winter	21.884	0.284	53.5	0.0	53.5	415.0	O K
5760 min Winter	21.847	0.247	42.2	0.0	42.2	356.9	O K
7200 min Winter	21.817	0.217	34.9	0.0	34.9	311.7	O K
8640 min Winter	21.795	0.195	30.1	0.0	30.1	278.6	O K
10080 min Winter	21.779	0.179	26.5	0.0	26.5	254.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.715	0.0	2187.1	136.3	36
60 min Winter	64.742	0.0	2465.1	254.7	56
120 min Winter	36.223	0.0	2759.7	266.4	92
180 min Winter	25.790	0.0	2947.9	185.2	130
240 min Winter	20.266	0.0	3089.1	99.2	172
360 min Winter	14.429	0.0	3299.5	0.0	254
480 min Winter	11.339	0.0	3457.3	0.0	324
600 min Winter	9.406	0.0	3584.8	0.0	392
720 min Winter	8.073	0.0	3692.3	0.0	456
960 min Winter	6.505	0.0	3966.3	0.0	582
1440 min Winter	4.798	0.0	4385.3	0.0	816
2160 min Winter	3.539	0.0	4866.7	0.0	1160
2880 min Winter	2.851	0.0	5226.8	0.0	1524
4320 min Winter	2.024	0.0	5558.4	0.0	2248
5760 min Winter	1.587	0.0	5828.0	0.0	2952
7200 min Winter	1.315	0.0	6031.8	0.0	3688
8640 min Winter	1.127	0.0	6201.4	0.0	4416
10080 min Winter	0.989	0.0	6344.6	0.0	5144

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Cascade Model Details for Lagoon 9 Primary.srcx

Storage is Online Cover Level (m) 23.000

Tank or Pond Structure

Invert Level (m) 21.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1351.4	1.400	2519.2	2.800	0.0	4.200	0.0
0.200	1506.2	1.600	0.0	3.000	0.0	4.400	0.0
0.400	1664.9	1.800	0.0	3.200	0.0	4.600	0.0
0.600	1827.8	2.000	0.0	3.400	0.0	4.800	0.0
0.800	1994.6	2.200	0.0	3.600	0.0	5.000	0.0
1.000	2165.4	2.400	0.0	3.800	0.0		
1.200	2340.3	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	31.000	Upstream Invert Level (m)	21.600
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 6.000 Invert Level (m) 22.600

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Cascade Summary of Results for Lagoon 9 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 9 Primary.srcx		(None)	(None)

Half Drain Time : 2894 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	21.853	0.653	8.4	1445.6	O K
30 min Summer	21.931	0.731	8.7	1639.3	O K
60 min Summer	22.017	0.817	9.1	1857.2	O K
120 min Summer	22.108	0.908	9.5	2096.9	O K
180 min Summer	22.164	0.964	9.8	2246.8	O K
240 min Summer	22.205	1.005	10.0	2358.1	O K
360 min Summer	22.264	1.064	10.3	2519.3	O K
480 min Summer	22.305	1.105	10.5	2634.3	O K
600 min Summer	22.335	1.135	10.6	2719.2	O K
720 min Summer	22.356	1.156	10.7	2780.4	O K
960 min Summer	22.411	1.211	11.0	2936.9	O K
1440 min Summer	22.468	1.268	11.2	3105.4	O K
2160 min Summer	22.496	1.296	11.4	3187.0	O K
2880 min Summer	22.498	1.298	11.4	3192.7	O K
4320 min Summer	22.436	1.236	11.1	3009.8	O K
5760 min Summer	22.376	1.176	10.8	2836.9	O K
7200 min Summer	22.321	1.121	10.5	2678.5	O K
8640 min Summer	22.270	1.070	10.3	2537.3	O K
10080 min Summer	22.224	1.024	10.1	2409.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	206.821	0.0	407
30 min Summer	115.715	0.0	429
60 min Summer	64.742	0.0	456
120 min Summer	36.223	0.0	500
180 min Summer	25.790	0.0	542
240 min Summer	20.266	0.0	578
360 min Summer	14.429	0.0	646
480 min Summer	11.339	0.0	714
600 min Summer	9.406	0.0	788
720 min Summer	8.073	0.0	874
960 min Summer	6.505	0.0	1066
1440 min Summer	4.798	0.0	1496
2160 min Summer	3.539	0.0	2172
2880 min Summer	2.851	0.0	2564
4320 min Summer	2.024	0.0	3316
5760 min Summer	1.587	0.0	4120
7200 min Summer	1.315	0.0	4944
8640 min Summer	1.127	0.0	5768
10080 min Summer	0.989	0.0	6584

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Cascade Summary of Results for Lagoon 9 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	21.932	0.732	8.7	1641.7	O K
30 min Winter	22.019	0.819	9.1	1863.1	O K
60 min Winter	22.113	0.913	9.6	2109.7	O K
120 min Winter	22.213	1.013	10.0	2379.4	O K
180 min Winter	22.273	1.073	10.3	2546.1	O K
240 min Winter	22.317	1.117	10.5	2668.4	O K
360 min Winter	22.380	1.180	10.8	2846.7	O K
480 min Winter	22.425	1.225	11.0	2977.7	O K
600 min Winter	22.459	1.259	11.2	3077.4	O K
720 min Winter	22.484	1.284	11.3	3152.0	O K
960 min Winter	22.546	1.346	11.6	3337.0	O K
1440 min Winter	22.616	1.416	11.9	3550.1	O K
2160 min Winter	22.656	1.456	12.1	3672.6	O K
2880 min Winter	22.662	1.462	12.2	3690.4	O K
4320 min Winter	22.590	1.390	11.8	3469.2	O K
5760 min Winter	22.520	1.320	11.5	3257.9	O K
7200 min Winter	22.449	1.249	11.1	3047.4	O K
8640 min Winter	22.381	1.181	10.8	2851.8	O K
10080 min Winter	22.319	1.119	10.5	2672.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	206.821	0.0	421
30 min Winter	115.715	0.0	432
60 min Winter	64.742	0.0	452
120 min Winter	36.223	0.0	496
180 min Winter	25.790	0.0	542
240 min Winter	20.266	0.0	586
360 min Winter	14.429	0.0	662
480 min Winter	11.339	0.0	730
600 min Winter	9.406	0.0	800
720 min Winter	8.073	0.0	878
960 min Winter	6.505	0.0	1064
1440 min Winter	4.798	0.0	1478
2160 min Winter	3.539	0.0	2144
2880 min Winter	2.851	0.0	2772
4320 min Winter	2.024	0.0	3488
5760 min Winter	1.587	0.0	4408
7200 min Winter	1.315	0.0	5320
8640 min Winter	1.127	0.0	6216
10080 min Winter	0.989	0.0	7096

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Cascade Model Details for Lagoon 9 Infiltration.srcx

Storage is Online Cover Level (m) 23.000

Infiltration Basin Structure

Invert Level (m) 21.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02050 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02050

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1975.6	1.400	3058.3	2.800	0.0	4.200	0.0
0.200	2118.1	1.600	3229.2	3.000	0.0	4.400	0.0
0.400	2264.6	1.800	3404.1	3.200	0.0	4.600	0.0
0.600	2415.2	2.000	0.0	3.400	0.0	4.800	0.0
0.800	2569.9	2.200	0.0	3.600	0.0	5.000	0.0
1.000	2728.7	2.400	0.0	3.800	0.0		
1.200	2891.4	2.600	0.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 12 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 12 Infiltration.srcx	Lagoon 12 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	21.240	1.640	212.0	0.0	212.0	2307.6	O K
30 min Summer	21.345	1.745	218.9	0.0	218.9	2516.8	O K
60 min Summer	21.407	1.807	222.9	0.0	222.9	2644.5	O K
120 min Summer	21.393	1.793	222.0	0.0	222.0	2615.0	O K
180 min Summer	21.355	1.755	219.5	0.0	219.5	2537.3	O K
240 min Summer	21.319	1.719	217.2	0.0	217.2	2465.5	O K
360 min Summer	21.254	1.654	212.9	0.0	212.9	2336.1	O K
480 min Summer	21.195	1.595	208.9	0.0	208.9	2220.8	O K
600 min Summer	21.139	1.539	205.1	0.0	205.1	2114.9	O K
720 min Summer	21.085	1.485	201.3	0.0	201.3	2014.3	O K
960 min Summer	21.016	1.416	196.5	0.0	196.5	1890.3	O K
1440 min Summer	20.884	1.284	186.7	0.0	186.7	1658.9	O K
2160 min Summer	20.709	1.109	172.9	0.0	172.9	1372.3	O K
2880 min Summer	20.561	0.961	160.3	0.0	160.3	1146.1	O K
4320 min Summer	20.296	0.696	134.9	0.0	134.9	773.6	O K
5760 min Summer	20.134	0.534	116.5	0.0	116.5	568.7	O K
7200 min Summer	20.045	0.445	102.0	0.0	102.0	461.9	O K
8640 min Summer	20.003	0.403	91.0	0.0	91.0	413.3	O K
10080 min Summer	19.973	0.373	81.4	0.0	81.4	379.5	O K
15 min Winter	21.384	1.784	221.4	0.0	221.4	2596.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	208.280	0.0	3482.0	0.0	27
30 min Summer	116.483	0.0	3950.8	0.0	39
60 min Summer	65.145	0.0	4555.6	0.0	64
120 min Summer	36.433	0.0	5161.7	0.0	114
180 min Summer	25.933	0.0	5554.9	0.0	146
240 min Summer	20.376	0.0	5852.9	0.0	178
360 min Summer	14.504	0.0	6301.9	0.0	250
480 min Summer	11.395	0.0	6642.5	0.0	322
600 min Summer	9.451	0.0	6920.0	0.0	392
720 min Summer	8.111	0.0	7155.8	0.0	462
960 min Summer	6.516	0.0	7739.6	0.0	604
1440 min Summer	4.785	0.0	8649.5	0.0	876
2160 min Summer	3.514	0.0	9814.1	0.0	1260
2880 min Summer	2.823	0.0	10620.1	0.0	1624
4320 min Summer	2.004	0.0	11400.5	0.0	2336
5760 min Summer	1.571	0.0	12272.5	0.0	3008
7200 min Summer	1.301	0.0	12754.2	0.0	3688
8640 min Summer	1.115	0.0	13163.1	0.0	4416
10080 min Summer	0.979	0.0	13519.5	0.0	5144
15 min Winter	208.280	0.0	3783.8	0.0	27

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Cascade Summary of Results for Lagoon 12 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	21.498	1.898	228.6	0.0	228.6	2835.8	O K
60 min Winter	21.571	1.971	233.1	0.0	233.1	2993.0	O K
120 min Winter	21.569	1.969	232.9	0.0	232.9	2987.6	O K
180 min Winter	21.518	1.918	229.8	0.0	229.8	2877.5	O K
240 min Winter	21.474	1.874	227.1	0.0	227.1	2783.7	O K
360 min Winter	21.390	1.790	221.8	0.0	221.8	2608.2	O K
480 min Winter	21.312	1.712	216.7	0.0	216.7	2450.0	O K
600 min Winter	21.237	1.637	211.8	0.0	211.8	2303.1	O K
720 min Winter	21.163	1.563	206.8	0.0	206.8	2161.2	O K
960 min Winter	21.059	1.459	199.5	0.0	199.5	1966.9	O K
1440 min Winter	20.848	1.248	183.9	0.0	183.9	1598.8	O K
2160 min Winter	20.580	0.980	162.0	0.0	162.0	1173.8	O K
2880 min Winter	20.380	0.780	143.4	0.0	143.4	886.5	O K
4320 min Winter	20.105	0.505	111.9	0.0	111.9	532.7	O K
5760 min Winter	20.003	0.403	91.0	0.0	91.0	413.6	O K
7200 min Winter	19.957	0.357	76.5	0.0	76.5	361.9	O K
8640 min Winter	19.925	0.325	66.2	0.0	66.2	326.2	O K
10080 min Winter	19.901	0.301	58.6	0.0	58.6	300.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	116.483	0.0	4288.3	0.0	39
60 min Winter	65.145	0.0	4933.2	0.0	64
120 min Winter	36.433	0.0	5584.0	0.0	118
180 min Winter	25.933	0.0	6005.8	0.0	156
240 min Winter	20.376	0.0	6325.3	0.0	192
360 min Winter	14.504	0.0	6806.3	0.0	274
480 min Winter	11.395	0.0	7170.8	0.0	354
600 min Winter	9.451	0.0	7467.7	0.0	430
720 min Winter	8.111	0.0	7720.0	0.0	506
960 min Winter	6.516	0.0	8343.9	0.0	650
1440 min Winter	4.785	0.0	9315.2	0.0	918
2160 min Winter	3.514	0.0	10547.4	0.0	1296
2880 min Winter	2.823	0.0	11405.4	0.0	1648
4320 min Winter	2.004	0.0	12236.8	0.0	2336
5760 min Winter	1.571	0.0	13146.6	0.0	3000
7200 min Winter	1.301	0.0	13659.0	0.0	3744
8640 min Winter	1.115	0.0	14093.8	0.0	4416
10080 min Winter	0.979	0.0	14472.9	0.0	5144

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Cascade Model Details for Lagoon 12 Primary.srcx

Storage is Online Cover Level (m) 22.000

Tank or Pond Structure

Invert Level (m) 19.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	913.6	1.400	1779.0	2.800	0.0	4.200	0.0
0.200	1025.1	1.600	1918.8	3.000	0.0	4.400	0.0
0.400	1140.6	1.800	2063.0	3.200	0.0	4.600	0.0
0.600	1260.2	2.000	2211.4	3.400	0.0	4.800	0.0
0.800	1383.8	2.200	2363.0	3.600	0.0	5.000	0.0
1.000	1511.5	2.400	2519.4	3.800	0.0		
1.200	1643.2	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	25.000	Upstream Invert Level (m)	19.600
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 10.000 Invert Level (m) 21.600

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Cascade Summary of Results for Lagoon 12 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 12 Primary.srcx	(None)	(None)

Half Drain Time : 544 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	20.469	1.069	56.1	2109.9	O K
30 min Summer	20.605	1.205	60.4	2453.6	O K
60 min Summer	20.745	1.345	64.9	2824.0	O K
120 min Summer	20.889	1.489	69.6	3224.4	O K
180 min Summer	20.972	1.572	72.3	3466.6	O K
240 min Summer	21.030	1.630	74.2	3637.1	O K
360 min Summer	21.105	1.705	76.8	3866.7	O K
480 min Summer	21.152	1.752	78.4	4011.5	O K
600 min Summer	21.182	1.782	79.4	4104.6	O K
720 min Summer	21.200	1.800	80.0	4161.3	O K
960 min Summer	21.250	1.850	81.7	4321.1	O K
1440 min Summer	21.257	1.857	81.9	4346.1	O K
2160 min Summer	21.222	1.822	80.7	4233.5	O K
2880 min Summer	21.172	1.772	79.0	4074.5	O K
4320 min Summer	20.985	1.585	72.8	3505.4	O K
5760 min Summer	20.818	1.418	67.2	3024.7	O K
7200 min Summer	20.674	1.274	62.6	2633.7	O K
8640 min Summer	20.550	1.150	58.7	2312.6	O K
10080 min Summer	20.441	1.041	55.2	2041.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	208.280	0.0	362
30 min Summer	116.483	0.0	398
60 min Summer	65.145	0.0	444
120 min Summer	36.433	0.0	502
180 min Summer	25.933	0.0	548
240 min Summer	20.376	0.0	590
360 min Summer	14.504	0.0	666
480 min Summer	11.395	0.0	740
600 min Summer	9.451	0.0	810
720 min Summer	8.111	0.0	880
960 min Summer	6.516	0.0	1026
1440 min Summer	4.785	0.0	1290
2160 min Summer	3.514	0.0	1652
2880 min Summer	2.823	0.0	2020
4320 min Summer	2.004	0.0	2748
5760 min Summer	1.571	0.0	3504
7200 min Summer	1.301	0.0	4256
8640 min Summer	1.115	0.0	5000
10080 min Summer	0.979	0.0	5736

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Cascade Summary of Results for Lagoon 12 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	20.562	1.162	59.0	2343.2	O K
30 min Winter	20.702	1.302	63.5	2706.8	O K
60 min Winter	20.845	1.445	68.1	3099.8	O K
120 min Winter	20.992	1.592	73.0	3524.9	O K
180 min Winter	21.078	1.678	75.8	3782.0	O K
240 min Winter	21.137	1.737	77.8	3964.2	O K
360 min Winter	21.215	1.815	80.5	4211.0	O K
480 min Winter	21.264	1.864	82.2	4367.9	O K
600 min Winter	21.295	1.895	83.2	4469.7	O K
720 min Winter	21.314	1.914	83.9	4532.0	O K
960 min Winter	21.366	1.966	85.7	4704.4	O K
1440 min Winter	21.372	1.972	85.9	4723.7	O K
2160 min Winter	21.306	1.906	83.6	4505.1	O K
2880 min Winter	21.215	1.815	80.5	4210.4	O K
4320 min Winter	20.941	1.541	71.3	3374.4	O K
5760 min Winter	20.719	1.319	64.0	2752.8	O K
7200 min Winter	20.534	1.134	58.1	2270.9	O K
8640 min Winter	20.376	0.976	53.2	1885.6	O K
10080 min Winter	20.240	0.840	49.0	1573.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	208.280	0.0	375
30 min Winter	116.483	0.0	413
60 min Winter	65.145	0.0	458
120 min Winter	36.433	0.0	518
180 min Winter	25.933	0.0	564
240 min Winter	20.376	0.0	606
360 min Winter	14.504	0.0	682
480 min Winter	11.395	0.0	756
600 min Winter	9.451	0.0	826
720 min Winter	8.111	0.0	896
960 min Winter	6.516	0.0	1044
1440 min Winter	4.785	0.0	1328
2160 min Winter	3.514	0.0	1696
2880 min Winter	2.823	0.0	2080
4320 min Winter	2.004	0.0	2864
5760 min Winter	1.571	0.0	3648
7200 min Winter	1.301	0.0	4416
8640 min Winter	1.115	0.0	5168
10080 min Winter	0.979	0.0	5904

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Cascade Model Details for Lagoon 12 Infiltration.srcx

Storage is Online Cover Level (m) 22.000

Infiltration Basin Structure

Invert Level (m) 19.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.11880 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.11880

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1523.1	1.400	2771.0	2.800	0.0	4.200	0.0
0.200	1683.3	1.600	2969.0	3.000	0.0	4.400	0.0
0.400	1850.6	1.800	3171.0	3.200	0.0	4.600	0.0
0.600	2024.9	2.000	3377.0	3.400	0.0	4.800	0.0
0.800	2204.9	2.200	3587.5	3.600	0.0	5.000	0.0
1.000	2389.0	2.400	3802.0	3.800	0.0		
1.200	2578.0	2.600	4020.7	4.000	0.0		

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Cascade Summary of Results for Lagoon 13 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 13 Infiltration.srcx	Lagoon 13 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	22.122	1.422	205.3	0.0	205.3	1051.8	O K
30 min Summer	22.176	1.476	209.5	0.0	209.5	1109.3	O K
60 min Summer	22.157	1.457	208.0	0.0	208.0	1088.5	O K
120 min Summer	22.075	1.375	201.6	0.0	201.6	1004.1	O K
180 min Summer	21.988	1.288	194.5	0.0	194.5	917.3	O K
240 min Summer	21.904	1.204	187.5	0.0	187.5	836.9	O K
360 min Summer	21.755	1.055	174.4	0.0	174.4	701.9	O K
480 min Summer	21.631	0.931	162.6	0.0	162.6	597.0	O K
600 min Summer	21.529	0.829	152.3	0.0	152.3	515.2	O K
720 min Summer	21.444	0.744	143.1	0.0	143.1	450.7	O K
960 min Summer	21.330	0.630	129.8	0.0	129.8	368.7	O K
1440 min Summer	21.188	0.488	109.2	0.0	109.2	272.7	O K
2160 min Summer	21.092	0.392	87.5	0.0	87.5	212.5	O K
2880 min Summer	21.043	0.343	71.9	0.0	71.9	183.0	O K
4320 min Summer	20.978	0.278	51.7	0.0	51.7	145.6	O K
5760 min Summer	20.942	0.242	40.6	0.0	40.6	124.9	O K
7200 min Summer	20.912	0.212	33.7	0.0	33.7	108.3	O K
8640 min Summer	20.890	0.190	29.0	0.0	29.0	96.5	O K
10080 min Summer	20.875	0.175	25.4	0.0	25.4	88.2	O K
15 min Winter	22.249	1.549	214.9	0.0	214.9	1187.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	206.464	0.0	1221.8	0.0	23
30 min Summer	115.708	0.0	1369.8	0.0	34
60 min Summer	64.846	0.0	1537.6	0.0	54
120 min Summer	36.341	0.0	1723.5	0.0	86
180 min Summer	25.900	0.0	1842.5	0.0	120
240 min Summer	20.367	0.0	1931.9	0.0	154
360 min Summer	14.515	0.0	2065.3	0.0	218
480 min Summer	11.414	0.0	2165.5	0.0	280
600 min Summer	9.473	0.0	2246.5	0.0	340
720 min Summer	8.134	0.0	2314.9	0.0	400
960 min Summer	6.544	0.0	2482.8	0.0	520
1440 min Summer	4.815	0.0	2739.9	0.0	754
2160 min Summer	3.544	0.0	3026.3	0.0	1108
2880 min Summer	2.851	0.0	3245.8	0.0	1472
4320 min Summer	2.020	0.0	3448.9	0.0	2204
5760 min Summer	1.582	0.0	3603.6	0.0	2936
7200 min Summer	1.309	0.0	3726.6	0.0	3672
8640 min Summer	1.121	0.0	3830.0	0.0	4400
10080 min Summer	0.984	0.0	3918.8	0.0	5072
15 min Winter	206.464	0.0	1368.8	0.0	23

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Cascade Summary of Results for Lagoon 13 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	22.310	1.610	219.4	9.8	229.2	1255.3	O K
60 min Winter	22.293	1.593	218.2	0.0	218.2	1236.3	O K
120 min Winter	22.182	1.482	209.9	0.0	209.9	1115.3	O K
180 min Winter	22.061	1.361	200.5	0.0	200.5	989.7	O K
240 min Winter	21.944	1.244	190.9	0.0	190.9	874.6	O K
360 min Winter	21.738	1.038	172.8	0.0	172.8	687.0	O K
480 min Winter	21.572	0.872	156.7	0.0	156.7	549.3	O K
600 min Winter	21.441	0.741	142.8	0.0	142.8	448.3	O K
720 min Winter	21.338	0.638	130.8	0.0	130.8	373.9	O K
960 min Winter	21.211	0.511	112.9	0.0	112.9	288.2	O K
1440 min Winter	21.094	0.394	88.1	0.0	88.1	213.7	O K
2160 min Winter	21.023	0.323	65.6	0.0	65.6	171.1	O K
2880 min Winter	20.982	0.282	52.9	0.0	52.9	147.8	O K
4320 min Winter	20.929	0.229	37.6	0.0	37.6	117.9	O K
5760 min Winter	20.893	0.193	29.5	0.0	29.5	97.9	O K
7200 min Winter	20.871	0.171	24.4	0.0	24.4	86.6	O K
8640 min Winter	20.860	0.160	21.0	0.0	21.0	80.2	O K
10080 min Winter	20.851	0.151	18.4	0.0	18.4	75.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.708	0.0	1534.5	1.9	34
60 min Winter	64.846	0.0	1722.2	0.0	58
120 min Winter	36.341	0.0	1930.5	0.0	92
180 min Winter	25.900	0.0	2063.8	0.0	128
240 min Winter	20.367	0.0	2163.9	0.0	164
360 min Winter	14.515	0.0	2313.3	0.0	230
480 min Winter	11.414	0.0	2425.5	0.0	292
600 min Winter	9.473	0.0	2516.2	0.0	352
720 min Winter	8.134	0.0	2592.9	0.0	412
960 min Winter	6.544	0.0	2781.0	0.0	528
1440 min Winter	4.815	0.0	3069.1	0.0	752
2160 min Winter	3.544	0.0	3389.5	0.0	1108
2880 min Winter	2.851	0.0	3635.5	0.0	1472
4320 min Winter	2.020	0.0	3863.2	0.0	2204
5760 min Winter	1.582	0.0	4036.1	0.0	2936
7200 min Winter	1.309	0.0	4173.9	0.0	3672
8640 min Winter	1.121	0.0	4289.8	0.0	4408
10080 min Winter	0.984	0.0	4389.6	0.0	5048

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Cascade Model Details for Lagoon 13 Primary.srcx

Storage is Online Cover Level (m) 22.700

Tank or Pond Structure

Invert Level (m) 20.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	476.7	1.400	1027.0	2.800	0.0	4.200	0.0
0.200	543.3	1.600	1122.0	3.000	0.0	4.400	0.0
0.400	613.9	1.800	1221.0	3.200	0.0	4.600	0.0
0.600	688.0	2.000	1324.0	3.400	0.0	4.800	0.0
0.800	767.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	850.0	2.400	0.0	3.800	0.0		
1.200	936.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	20.000	Upstream Invert Level (m)	20.700
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 6.000 Invert Level (m) 22.300

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Cascade Summary of Results for Lagoon 13 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 13 Primary.srcx	(None)	(None)

Half Drain Time exceeds 7 days.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	21.071	0.571	2.0	1168.0	O K
30 min Summer	21.135	0.635	2.1	1313.7	O K
60 min Summer	21.205	0.705	2.1	1476.7	O K
120 min Summer	21.282	0.782	2.2	1658.6	O K
180 min Summer	21.330	0.830	2.3	1774.2	O K
240 min Summer	21.365	0.865	2.3	1860.3	O K
360 min Summer	21.415	0.915	2.4	1985.6	O K
480 min Summer	21.451	0.951	2.4	2074.8	O K
600 min Summer	21.478	0.978	2.4	2143.7	O K
720 min Summer	21.500	1.000	2.5	2199.3	O K
960 min Summer	21.554	1.054	2.5	2339.9	O K
1440 min Summer	21.631	1.131	2.6	2541.5	O K
2160 min Summer	21.704	1.204	2.7	2738.6	O K
2880 min Summer	21.751	1.251	2.8	2868.5	O K
4320 min Summer	21.762	1.262	2.8	2898.6	O K
5760 min Summer	21.754	1.254	2.8	2877.3	O K
7200 min Summer	21.737	1.237	2.8	2828.7	O K
8640 min Summer	21.715	1.215	2.7	2770.2	O K
10080 min Summer	21.696	1.196	2.7	2717.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	206.464	0.0	310
30 min Summer	115.708	0.0	324
60 min Summer	64.846	0.0	344
120 min Summer	36.341	0.0	378
180 min Summer	25.900	0.0	412
240 min Summer	20.367	0.0	446
360 min Summer	14.515	0.0	526
480 min Summer	11.414	0.0	626
600 min Summer	9.473	0.0	734
720 min Summer	8.134	0.0	848
960 min Summer	6.544	0.0	1078
1440 min Summer	4.815	0.0	1540
2160 min Summer	3.544	0.0	2240
2880 min Summer	2.851	0.0	2944
4320 min Summer	2.020	0.0	4360
5760 min Summer	1.582	0.0	5784
7200 min Summer	1.309	0.0	7208
8640 min Summer	1.121	0.0	7864
10080 min Summer	0.984	0.0	8536

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Cascade Summary of Results for Lagoon 13 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	21.134	0.634	2.1	1312.8	O K
30 min Winter	21.205	0.705	2.1	1475.9	O K
60 min Winter	21.282	0.782	2.2	1658.6	O K
120 min Winter	21.366	0.866	2.3	1862.5	O K
180 min Winter	21.418	0.918	2.4	1992.2	O K
240 min Winter	21.456	0.956	2.4	2088.9	O K
360 min Winter	21.512	1.012	2.5	2230.7	O K
480 min Winter	21.551	1.051	2.5	2332.3	O K
600 min Winter	21.581	1.081	2.6	2410.9	O K
720 min Winter	21.605	1.105	2.6	2474.8	O K
960 min Winter	21.666	1.166	2.7	2635.4	O K
1440 min Winter	21.751	1.251	2.8	2867.1	O K
2160 min Winter	21.833	1.333	2.9	3097.4	O K
2880 min Winter	21.887	1.387	2.9	3252.2	O K
4320 min Winter	21.905	1.405	3.0	3303.5	O K
5760 min Winter	21.903	1.403	3.0	3297.8	O K
7200 min Winter	21.891	1.391	2.9	3262.1	O K
8640 min Winter	21.872	1.372	2.9	3209.0	O K
10080 min Winter	21.850	1.350	2.9	3145.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	206.464	0.0	317
30 min Winter	115.708	0.0	331
60 min Winter	64.846	0.0	352
120 min Winter	36.341	0.0	388
180 min Winter	25.900	0.0	420
240 min Winter	20.367	0.0	454
360 min Winter	14.515	0.0	526
480 min Winter	11.414	0.0	622
600 min Winter	9.473	0.0	728
720 min Winter	8.134	0.0	836
960 min Winter	6.544	0.0	1060
1440 min Winter	4.815	0.0	1516
2160 min Winter	3.544	0.0	2204
2880 min Winter	2.851	0.0	2900
4320 min Winter	2.020	0.0	4288
5760 min Winter	1.582	0.0	5656
7200 min Winter	1.309	0.0	6984
8640 min Winter	1.121	0.0	8272
10080 min Winter	0.984	0.0	9488

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Cascade Model Details for Lagoon 13 Infiltration.srcx

Storage is Online Cover Level (m) 22.700

Infiltration Basin Structure

Invert Level (m) 20.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00540 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00540

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1852.3	1.400	2879.0	2.800	0.0	4.200	0.0
0.200	1987.0	1.600	3041.0	3.000	0.0	4.400	0.0
0.400	2125.0	1.800	3208.0	3.200	0.0	4.600	0.0
0.600	2268.0	2.000	3379.0	3.400	0.0	4.800	0.0
0.800	2414.0	2.200	3554.0	3.600	0.0	5.000	0.0
1.000	2565.0	2.400	0.0	3.800	0.0		
1.200	2720.0	2.600	0.0	4.000	0.0		

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time exceeds 7 days.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	21.660	0.460	4.9	2737.9	O K
30 min Summer	21.744	0.544	5.0	3270.9	O K
60 min Summer	21.840	0.640	5.2	3892.9	O K
120 min Summer	21.950	0.750	5.5	4626.7	O K
180 min Summer	22.022	0.822	5.6	5114.7	O K
240 min Summer	22.076	0.876	5.8	5489.8	O K
360 min Summer	22.158	0.958	5.9	6060.6	O K
480 min Summer	22.219	1.019	6.1	6497.4	O K
600 min Summer	22.268	1.068	6.2	6854.2	O K
720 min Summer	22.310	1.110	6.3	7157.5	O K
960 min Summer	22.413	1.213	6.5	7916.3	O K
1440 min Summer	22.569	1.369	6.9	9107.3	O K
2160 min Summer	22.741	1.541	7.3	10460.5	O K
2880 min Summer	22.870	1.670	7.6	11505.0	O K
4320 min Summer	22.974	1.774	7.8	12373.3	O K
5760 min Summer	23.044	1.844	8.0	12962.1	O K
7200 min Summer	23.093	1.893	8.1	13385.6	O K
8640 min Summer	23.130	1.930	8.2	13698.5	O K
10080 min Summer	23.156	1.956	8.2	13931.9	O K
15 min Winter	21.660	0.460	4.9	2737.9	O K
30 min Winter	21.744	0.544	5.0	3270.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	206.464	0.0	859
30 min Summer	115.708	0.0	861
60 min Summer	64.846	0.0	870
120 min Summer	36.341	0.0	912
180 min Summer	25.900	0.0	954
240 min Summer	20.367	0.0	998
360 min Summer	14.515	0.0	1094
480 min Summer	11.414	0.0	1194
600 min Summer	9.473	0.0	1298
720 min Summer	8.134	0.0	1404
960 min Summer	6.544	0.0	1620
1440 min Summer	4.815	0.0	2062
2160 min Summer	3.544	0.0	2736
2880 min Summer	2.851	0.0	3420
4320 min Summer	2.020	0.0	4796
5760 min Summer	1.582	0.0	6184
7200 min Summer	1.309	0.0	7584
8640 min Summer	1.121	0.0	8984
10080 min Summer	0.984	0.0	10384
15 min Winter	206.464	0.0	859
30 min Winter	115.708	0.0	861

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
60 min Winter	21.840	0.640	5.2	3893.0	O K
120 min Winter	21.950	0.750	5.5	4626.8	O K
180 min Winter	22.022	0.822	5.6	5114.8	O K
240 min Winter	22.076	0.876	5.8	5489.7	O K
360 min Winter	22.158	0.958	5.9	6060.8	O K
480 min Winter	22.219	1.019	6.1	6497.9	O K
600 min Winter	22.269	1.069	6.2	6855.3	O K
720 min Winter	22.310	1.110	6.3	7159.4	O K
960 min Winter	22.413	1.213	6.5	7920.4	O K
1440 min Winter	22.570	1.370	6.9	9115.5	O K
2160 min Winter	22.743	1.543	7.3	10475.3	O K
2880 min Winter	22.872	1.672	7.6	11526.3	O K
4320 min Winter	22.978	1.778	7.8	12407.3	O K
5760 min Winter	23.049	1.849	8.0	13008.4	O K
7200 min Winter	23.100	1.900	8.1	13443.6	O K
8640 min Winter	23.138	1.938	8.2	13768.1	O K
10080 min Winter	23.166	1.966	8.3	14012.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
60 min Winter	64.846	0.0	874
120 min Winter	36.341	0.0	916
180 min Winter	25.900	0.0	956
240 min Winter	20.367	0.0	998
360 min Winter	14.515	0.0	1094
480 min Winter	11.414	0.0	1192
600 min Winter	9.473	0.0	1294
720 min Winter	8.134	0.0	1398
960 min Winter	6.544	0.0	1610
1440 min Winter	4.815	0.0	2044
2160 min Winter	3.544	0.0	2708
2880 min Winter	2.851	0.0	3376
4320 min Winter	2.020	0.0	4720
5760 min Winter	1.582	0.0	6080
7200 min Winter	1.309	0.0	7448
8640 min Winter	1.121	0.0	8816
10080 min Winter	0.984	0.0	10176

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Model Details

Storage is Online Cover Level (m) 24.000

Infiltration Basin Structure

Invert Level (m) 21.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00500 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00500

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	5611.9	1.400	7783.1	2.800	10170.4	4.200	0.0
0.200	5905.0	1.600	8112.1	3.000	0.0	4.400	0.0
0.400	6204.0	1.800	8445.0	3.200	0.0	4.600	0.0
0.600	6509.7	2.000	8782.0	3.400	0.0	4.800	0.0
0.800	6820.6	2.200	9123.1	3.600	0.0	5.000	0.0
1.000	7137.3	2.400	9468.1	3.800	0.0		
1.200	7458.2	2.600	9817.2	4.000	0.0		

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Cascade Summary of Results for Lagoon 14 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 14 Infiltration.srcx	Lagoon 14 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	18.698	1.898	237.1	419.8	656.9	1547.4	O K
30 min Summer	18.720	1.920	238.5	564.9	803.4	1573.6	O K
60 min Summer	18.705	1.905	237.6	462.1	699.7	1554.9	O K
120 min Summer	18.673	1.873	235.5	267.5	502.9	1516.3	O K
180 min Summer	18.642	1.842	233.4	118.4	351.8	1478.7	O K
240 min Summer	18.597	1.797	230.4	0.0	230.4	1425.0	O K
360 min Summer	18.430	1.630	218.8	0.0	218.8	1234.8	O K
480 min Summer	18.282	1.482	208.0	0.0	208.0	1077.2	O K
600 min Summer	18.152	1.352	198.0	0.0	198.0	946.9	O K
720 min Summer	18.037	1.237	188.8	0.0	188.8	838.1	O K
960 min Summer	17.868	1.068	174.2	0.0	174.2	688.2	O K
1440 min Summer	17.620	0.820	150.5	0.0	150.5	490.6	O K
2160 min Summer	17.396	0.596	125.2	0.0	125.2	332.1	O K
2880 min Summer	17.274	0.474	107.0	0.0	107.0	254.7	O K
4320 min Summer	17.166	0.366	79.3	0.0	79.3	190.0	O K
5760 min Summer	17.113	0.313	62.6	0.0	62.6	159.5	O K
7200 min Summer	17.079	0.279	51.9	0.0	51.9	140.4	O K
8640 min Summer	17.054	0.254	44.4	0.0	44.4	127.2	O K
10080 min Summer	17.036	0.236	39.0	0.0	39.0	117.0	O K
15 min Winter	18.767	1.967	241.6	928.2	1169.7	1632.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	206.327	0.0	1826.6	132.9	21
30 min Summer	116.435	0.0	2061.9	262.5	29
60 min Summer	65.707	0.0	2329.3	300.3	46
120 min Summer	37.080	0.0	2629.1	197.6	80
180 min Summer	26.534	0.0	2822.1	86.0	118
240 min Summer	20.925	0.0	2967.5	0.0	158
360 min Summer	14.974	0.0	3185.2	0.0	224
480 min Summer	11.809	0.0	3349.3	0.0	290
600 min Summer	9.822	0.0	3482.4	0.0	352
720 min Summer	8.450	0.0	3595.0	0.0	414
960 min Summer	6.778	0.0	3844.8	0.0	534
1440 min Summer	4.968	0.0	4226.1	0.0	772
2160 min Summer	3.641	0.0	4647.7	0.0	1128
2880 min Summer	2.920	0.0	4970.7	0.0	1476
4320 min Summer	2.072	0.0	5288.9	0.0	2204
5760 min Summer	1.624	0.0	5529.7	0.0	2936
7200 min Summer	1.345	0.0	5722.3	0.0	3672
8640 min Summer	1.152	0.0	5884.6	0.0	4400
10080 min Summer	1.011	0.0	6024.5	0.0	5136
15 min Winter	206.327	0.0	2046.1	329.8	20

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Cascade Summary of Results for Lagoon 14 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	18.771	1.971	241.9	966.0	1207.9	1638.7	O K
60 min Winter	18.743	1.943	240.1	739.0	979.1	1602.8	O K
120 min Winter	18.700	1.900	237.3	432.7	669.9	1550.1	O K
180 min Winter	18.668	1.868	235.2	243.0	478.2	1510.1	O K
240 min Winter	18.639	1.839	233.2	106.0	339.2	1475.6	O K
360 min Winter	18.469	1.669	221.5	0.0	221.5	1277.6	O K
480 min Winter	18.264	1.464	206.6	0.0	206.6	1058.2	O K
600 min Winter	18.086	1.286	192.8	0.0	192.8	883.9	O K
720 min Winter	17.934	1.134	180.1	0.0	180.1	745.4	O K
960 min Winter	17.715	0.915	160.0	0.0	160.0	563.0	O K
1440 min Winter	17.431	0.631	129.5	0.0	129.5	355.6	O K
2160 min Winter	17.234	0.434	100.2	0.0	100.2	230.1	O K
2880 min Winter	17.172	0.372	81.1	0.0	81.1	193.1	O K
4320 min Winter	17.098	0.298	57.7	0.0	57.7	151.1	O K
5760 min Winter	17.057	0.257	45.3	0.0	45.3	128.6	O K
7200 min Winter	17.029	0.229	37.5	0.0	37.5	113.3	O K
8640 min Winter	17.005	0.205	32.2	0.0	32.2	100.6	O K
10080 min Winter	16.987	0.187	28.3	0.0	28.3	91.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	116.435	0.0	2309.7	490.6	28
60 min Winter	65.707	0.0	2609.0	551.8	46
120 min Winter	37.080	0.0	2944.8	424.4	80
180 min Winter	26.534	0.0	3160.9	266.3	118
240 min Winter	20.925	0.0	3323.7	108.7	158
360 min Winter	14.974	0.0	3567.6	0.0	240
480 min Winter	11.809	0.0	3751.4	0.0	306
600 min Winter	9.822	0.0	3900.4	0.0	368
720 min Winter	8.450	0.0	4026.6	0.0	430
960 min Winter	6.778	0.0	4306.4	0.0	550
1440 min Winter	4.968	0.0	4733.6	0.0	782
2160 min Winter	3.641	0.0	5205.6	0.0	1120
2880 min Winter	2.920	0.0	5567.3	0.0	1472
4320 min Winter	2.072	0.0	5924.0	0.0	2204
5760 min Winter	1.624	0.0	6193.4	0.0	2904
7200 min Winter	1.345	0.0	6409.1	0.0	3672
8640 min Winter	1.152	0.0	6590.9	0.0	4376
10080 min Winter	1.011	0.0	6747.9	0.0	5128

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Cascade Model Details for Lagoon 14 Primary.srcx

Storage is Online Cover Level (m) 19.400

Tank or Pond Structure

Invert Level (m) 16.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	459.1	1.400	993.7	2.800	0.0	4.200	0.0
0.200	523.4	1.600	1086.1	3.000	0.0	4.400	0.0
0.400	591.7	1.800	1182.6	3.200	0.0	4.600	0.0
0.600	664.1	2.000	1283.1	3.400	0.0	4.800	0.0
0.800	740.4	2.200	1387.6	3.600	0.0	5.000	0.0
1.000	820.8	2.400	1496.1	3.800	0.0		
1.200	905.2	2.600	1608.7	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	21.000	Upstream Invert Level (m)	16.800
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 8.000 Invert Level (m) 18.600

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Cascade Summary of Results for Lagoon 14 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 14 Primary.srcx		(None)	(None)

Half Drain Time : 1124 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	17.828	1.228	19.1	1577.7	O K
30 min Summer	17.956	1.356	20.4	1792.2	O K
60 min Summer	18.090	1.490	21.9	2027.6	O K
120 min Summer	18.227	1.627	23.4	2280.5	O K
180 min Summer	18.307	1.707	24.3	2435.3	O K
240 min Summer	18.364	1.764	24.9	2546.3	O K
360 min Summer	18.442	1.842	25.8	2703.9	O K
480 min Summer	18.485	1.885	26.3	2793.0	O K
600 min Summer	18.497	1.897	26.4	2816.9	O K
720 min Summer	18.494	1.894	26.4	2810.8	O K
960 min Summer	18.498	1.898	26.4	2819.2	O K
1440 min Summer	18.490	1.890	26.3	2803.5	O K
2160 min Summer	18.459	1.859	26.0	2738.7	O K
2880 min Summer	18.415	1.815	25.5	2649.6	O K
4320 min Summer	18.265	1.665	23.8	2354.2	O K
5760 min Summer	18.138	1.538	22.4	2115.5	O K
7200 min Summer	18.028	1.428	21.2	1917.1	O K
8640 min Summer	17.929	1.329	20.2	1745.8	O K
10080 min Summer	17.839	1.239	19.2	1595.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	206.327	0.0	198
30 min Summer	116.435	0.0	208
60 min Summer	65.707	0.0	232
120 min Summer	37.080	0.0	280
180 min Summer	26.534	0.0	322
240 min Summer	20.925	0.0	362
360 min Summer	14.974	0.0	432
480 min Summer	11.809	0.0	514
600 min Summer	9.822	0.0	618
720 min Summer	8.450	0.0	730
960 min Summer	6.778	0.0	880
1440 min Summer	4.968	0.0	1128
2160 min Summer	3.641	0.0	1532
2880 min Summer	2.920	0.0	1944
4320 min Summer	2.072	0.0	2764
5760 min Summer	1.624	0.0	3568
7200 min Summer	1.345	0.0	4352
8640 min Summer	1.152	0.0	5128
10080 min Summer	1.011	0.0	5896

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Cascade Summary of Results for Lagoon 14 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	17.950	1.350	20.4	1781.6	O K
30 min Winter	18.087	1.487	21.8	2022.9	O K
60 min Winter	18.231	1.631	23.4	2288.0	O K
120 min Winter	18.376	1.776	25.0	2571.4	O K
180 min Winter	18.462	1.862	26.0	2744.2	O K
240 min Winter	18.521	1.921	26.7	2866.9	O K
360 min Winter	18.603	2.003	27.6	3042.2	O K
480 min Winter	18.656	2.056	28.3	3156.3	O K
600 min Winter	18.678	2.078	28.5	3205.4	O K
720 min Winter	18.680	2.080	28.5	3208.7	O K
960 min Winter	18.689	2.089	28.7	3229.2	O K
1440 min Winter	18.673	2.073	28.5	3193.5	O K
2160 min Winter	18.632	2.032	28.0	3104.2	O K
2880 min Winter	18.573	1.973	27.3	2977.5	O K
4320 min Winter	18.381	1.781	25.1	2581.3	O K
5760 min Winter	18.208	1.608	23.1	2246.0	O K
7200 min Winter	18.061	1.461	21.5	1975.4	O K
8640 min Winter	17.929	1.329	20.1	1745.6	O K
10080 min Winter	17.810	1.210	18.9	1548.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	206.327	0.0	197
30 min Winter	116.435	0.0	207
60 min Winter	65.707	0.0	230
120 min Winter	37.080	0.0	280
180 min Winter	26.534	0.0	326
240 min Winter	20.925	0.0	368
360 min Winter	14.974	0.0	444
480 min Winter	11.809	0.0	518
600 min Winter	9.822	0.0	612
720 min Winter	8.450	0.0	720
960 min Winter	6.778	0.0	932
1440 min Winter	4.968	0.0	1178
2160 min Winter	3.641	0.0	1636
2880 min Winter	2.920	0.0	2092
4320 min Winter	2.072	0.0	2964
5760 min Winter	1.624	0.0	3816
7200 min Winter	1.345	0.0	4624
8640 min Winter	1.152	0.0	5440
10080 min Winter	1.011	0.0	6216

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Cascade Model Details for Lagoon 14 Infiltration.srcx

Storage is Online Cover Level (m) 19.400

Infiltration Basin Structure

Invert Level (m) 16.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.05890 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.05890

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	958.8	1.400	1746.4	2.800	2752.2	4.200	0.0
0.200	1057.9	1.600	1876.7	3.000	0.0	4.400	0.0
0.400	1161.5	1.800	2011.5	3.200	0.0	4.600	0.0
0.600	1269.6	2.000	2150.7	3.400	0.0	4.800	0.0
0.800	1382.1	2.200	2294.4	3.600	0.0	5.000	0.0
1.000	1499.1	2.400	2442.5	3.800	0.0		
1.200	1620.5	2.600	2595.1	4.000	0.0		

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Cascade Summary of Results for Lagoon 14A Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 14A Infiltration.srcx	Lagoon 14A Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	21.848	0.448	102.6	0.0	102.6	64.6	O K
30 min Summer	21.823	0.423	97.3	0.0	97.3	59.4	O K
60 min Summer	21.775	0.375	82.2	0.0	82.2	50.1	O K
120 min Summer	21.712	0.312	62.1	0.0	62.1	38.7	O K
180 min Summer	21.671	0.271	49.6	0.0	49.6	32.1	O K
240 min Summer	21.643	0.243	40.9	0.0	40.9	27.8	O K
360 min Summer	21.602	0.202	31.6	0.0	31.6	22.0	O K
480 min Summer	21.578	0.178	26.2	0.0	26.2	18.7	O K
600 min Summer	21.564	0.164	22.3	0.0	22.3	16.9	O K
720 min Summer	21.554	0.154	19.4	0.0	19.4	15.7	O K
960 min Summer	21.542	0.142	15.7	0.0	15.7	14.1	O K
1440 min Summer	21.520	0.120	11.7	0.0	11.7	11.7	O K
2160 min Summer	21.503	0.103	8.7	0.0	8.7	9.7	O K
2880 min Summer	21.493	0.093	7.0	0.0	7.0	8.7	O K
4320 min Summer	21.477	0.077	4.9	0.0	4.9	7.0	O K
5760 min Summer	21.468	0.068	3.9	0.0	3.9	6.1	O K
7200 min Summer	21.462	0.062	3.2	0.0	3.2	5.5	O K
8640 min Summer	21.457	0.057	2.8	0.0	2.8	5.1	O K
10080 min Summer	21.453	0.053	2.4	0.0	2.4	4.7	O K
15 min Winter	21.881	0.481	108.1	0.0	108.1	71.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	206.605	0.0	113.4	0.0	16
30 min Summer	116.269	0.0	127.7	0.0	23
60 min Summer	65.432	0.0	143.7	0.0	38
120 min Summer	36.823	0.0	161.8	0.0	70
180 min Summer	26.307	0.0	173.4	0.0	100
240 min Summer	20.722	0.0	182.1	0.0	130
360 min Summer	14.804	0.0	195.2	0.0	190
480 min Summer	11.662	0.0	205.0	0.0	250
600 min Summer	9.691	0.0	212.9	0.0	310
720 min Summer	8.331	0.0	219.7	0.0	370
960 min Summer	6.700	0.0	235.5	0.0	492
1440 min Summer	4.928	0.0	259.9	0.0	736
2160 min Summer	3.625	0.0	286.8	0.0	1100
2880 min Summer	2.915	0.0	307.5	0.0	1468
4320 min Summer	2.064	0.0	326.6	0.0	2200
5760 min Summer	1.616	0.0	340.8	0.0	2936
7200 min Summer	1.336	0.0	352.3	0.0	3608
8640 min Summer	1.144	0.0	362.0	0.0	4384
10080 min Summer	1.003	0.0	370.4	0.0	5072
15 min Winter	206.605	0.0	127.1	0.0	16

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Cascade Summary of Results for Lagoon 14A Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	21.842	0.442	101.5	0.0	101.5	63.3	O K
60 min Winter	21.773	0.373	81.6	0.0	81.6	49.7	O K
120 min Winter	21.691	0.291	55.5	0.0	55.5	35.2	O K
180 min Winter	21.645	0.245	41.7	0.0	41.7	28.1	O K
240 min Winter	21.612	0.212	33.8	0.0	33.8	23.3	O K
360 min Winter	21.574	0.174	25.1	0.0	25.1	18.1	O K
480 min Winter	21.556	0.156	20.0	0.0	20.0	15.9	O K
600 min Winter	21.545	0.145	16.6	0.0	16.6	14.5	O K
720 min Winter	21.535	0.135	14.2	0.0	14.2	13.4	O K
960 min Winter	21.519	0.119	11.5	0.0	11.5	11.6	O K
1440 min Winter	21.502	0.102	8.5	0.0	8.5	9.6	O K
2160 min Winter	21.488	0.088	6.3	0.0	6.3	8.1	O K
2880 min Winter	21.478	0.078	5.1	0.0	5.1	7.1	O K
4320 min Winter	21.466	0.066	3.6	0.0	3.6	5.9	O K
5760 min Winter	21.458	0.058	2.8	0.0	2.8	5.1	O K
7200 min Winter	21.452	0.052	2.3	0.0	2.3	4.6	O K
8640 min Winter	21.448	0.048	2.0	0.0	2.0	4.2	O K
10080 min Winter	21.446	0.046	1.8	0.0	1.8	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	116.269	0.0	143.0	0.0	24
60 min Winter	65.432	0.0	161.0	0.0	40
120 min Winter	36.823	0.0	181.2	0.0	70
180 min Winter	26.307	0.0	194.2	0.0	102
240 min Winter	20.722	0.0	204.0	0.0	132
360 min Winter	14.804	0.0	218.6	0.0	190
480 min Winter	11.662	0.0	229.6	0.0	250
600 min Winter	9.691	0.0	238.5	0.0	310
720 min Winter	8.331	0.0	246.0	0.0	374
960 min Winter	6.700	0.0	263.8	0.0	494
1440 min Winter	4.928	0.0	291.1	0.0	736
2160 min Winter	3.625	0.0	321.2	0.0	1088
2880 min Winter	2.915	0.0	344.4	0.0	1452
4320 min Winter	2.064	0.0	365.8	0.0	2160
5760 min Winter	1.616	0.0	381.8	0.0	2896
7200 min Winter	1.336	0.0	394.6	0.0	3640
8640 min Winter	1.144	0.0	405.5	0.0	4400
10080 min Winter	1.003	0.0	414.8	0.0	5096

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Cascade Model Details for Lagoon 14A Primary.srcx

Storage is Online Cover Level (m) 22.600

Tank or Pond Structure

Invert Level (m) 21.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	81.6	1.400	0.0	2.800	0.0	4.200	0.0
0.200	137.1	1.600	0.0	3.000	0.0	4.400	0.0
0.400	196.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	260.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	327.6	2.200	0.0	3.600	0.0	5.000	0.0
1.000	399.2	2.400	0.0	3.800	0.0		
1.200	474.7	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	12.000	Upstream Invert Level (m)	21.400
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 6.000 Invert Level (m) 22.200

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Cascade Summary of Results for Lagoon 14A Infiltration.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 14A Primary.srcx	(None)	(None)

Half Drain Time : 2525 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	20.325	0.525	21.7	2624.3	O K
30 min Summer	20.420	0.620	22.7	3141.2	O K
60 min Summer	20.528	0.728	23.7	3739.7	O K
120 min Summer	20.649	0.849	24.9	4429.0	O K
180 min Summer	20.725	0.925	25.7	4874.2	O K
240 min Summer	20.781	0.981	26.2	5204.1	O K
360 min Summer	20.859	1.059	27.0	5677.0	O K
480 min Summer	20.913	1.113	27.6	6005.1	O K
600 min Summer	20.952	1.152	28.0	6246.8	O K
720 min Summer	20.982	1.182	28.3	6431.2	O K
960 min Summer	21.061	1.261	29.1	6931.9	O K
1440 min Summer	21.163	1.363	30.1	7586.7	O K
2160 min Summer	21.243	1.443	30.9	8112.0	O K
2880 min Summer	21.284	1.484	31.4	8379.9	O K
4320 min Summer	21.238	1.438	30.9	8074.1	O K
5760 min Summer	21.188	1.388	30.4	7751.6	O K
7200 min Summer	21.140	1.340	29.9	7436.3	O K
8640 min Summer	21.095	1.295	29.4	7147.8	O K
10080 min Summer	21.053	1.253	29.0	6880.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	206.605	0.0	483
30 min Summer	116.269	0.0	490
60 min Summer	65.432	0.0	510
120 min Summer	36.823	0.0	546
180 min Summer	26.307	0.0	582
240 min Summer	20.722	0.0	620
360 min Summer	14.804	0.0	698
480 min Summer	11.662	0.0	786
600 min Summer	9.691	0.0	878
720 min Summer	8.331	0.0	974
960 min Summer	6.700	0.0	1178
1440 min Summer	4.928	0.0	1598
2160 min Summer	3.625	0.0	2212
2880 min Summer	2.915	0.0	2644
4320 min Summer	2.064	0.0	3404
5760 min Summer	1.616	0.0	4216
7200 min Summer	1.336	0.0	5048
8640 min Summer	1.144	0.0	5880
10080 min Summer	1.003	0.0	6696

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Cascade Summary of Results for Lagoon 14A Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	20.327	0.527	21.8	2635.2	O K
30 min Winter	20.422	0.622	22.7	3153.7	O K
60 min Winter	20.531	0.731	23.8	3754.0	O K
120 min Winter	20.652	0.852	25.0	4444.9	O K
180 min Winter	20.728	0.928	25.7	4889.7	O K
240 min Winter	20.783	0.983	26.3	5219.6	O K
360 min Winter	20.862	1.062	27.1	5694.2	O K
480 min Winter	20.917	1.117	27.6	6026.9	O K
600 min Winter	20.957	1.157	28.0	6274.5	O K
720 min Winter	20.987	1.187	28.3	6465.0	O K
960 min Winter	21.069	1.269	29.2	6978.3	O K
1440 min Winter	21.174	1.374	30.2	7656.1	O K
2160 min Winter	21.258	1.458	31.1	8210.5	O K
2880 min Winter	21.298	1.498	31.5	8475.9	O K
4320 min Winter	21.243	1.443	30.9	8113.1	O K
5760 min Winter	21.182	1.382	30.3	7712.4	O K
7200 min Winter	21.116	1.316	29.6	7283.7	O K
8640 min Winter	21.055	1.255	29.0	6892.7	O K
10080 min Winter	20.996	1.196	28.4	6522.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	206.605	0.0	483
30 min Winter	116.269	0.0	490
60 min Winter	65.432	0.0	510
120 min Winter	36.823	0.0	546
180 min Winter	26.307	0.0	584
240 min Winter	20.722	0.0	622
360 min Winter	14.804	0.0	704
480 min Winter	11.662	0.0	790
600 min Winter	9.691	0.0	882
720 min Winter	8.331	0.0	976
960 min Winter	6.700	0.0	1174
1440 min Winter	4.928	0.0	1590
2160 min Winter	3.625	0.0	2216
2880 min Winter	2.915	0.0	2804
4320 min Winter	2.064	0.0	3552
5760 min Winter	1.616	0.0	4472
7200 min Winter	1.336	0.0	5384
8640 min Winter	1.144	0.0	6280
10080 min Winter	1.003	0.0	7160

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Cascade Model Details for Lagoon 14A Infiltration.srcx

Storage is Online Cover Level (m) 22.600

Infiltration Basin Structure

Invert Level (m) 19.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02590 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02590

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	4662.1	1.400	6552.6	2.800	8640.3	4.200	0.0
0.200	4920.1	1.600	6838.2	3.000	0.0	4.400	0.0
0.400	5182.1	1.800	7128.9	3.200	0.0	4.600	0.0
0.600	5448.1	2.000	7423.2	3.400	0.0	4.800	0.0
0.800	5718.2	2.200	7721.4	3.600	0.0	5.000	0.0
1.000	5992.3	2.400	8023.7	3.800	0.0		
1.200	6270.4	2.600	8329.9	4.000	0.0		

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Cascade Summary of Results for Lagoon 16 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 16 Infiltration.srcx	Lagoon 16 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	15.634	1.334	190.1	0.0	190.1	1491.2	O K
30 min Summer	15.710	1.410	196.3	13.1	209.5	1602.8	O K
60 min Summer	15.722	1.422	197.4	45.2	242.6	1621.4	O K
120 min Summer	15.695	1.395	195.1	0.0	195.1	1580.3	O K
180 min Summer	15.646	1.346	191.1	0.0	191.1	1509.0	O K
240 min Summer	15.594	1.294	186.7	0.0	186.7	1433.6	O K
360 min Summer	15.491	1.191	177.6	0.0	177.6	1288.4	O K
480 min Summer	15.396	1.096	168.9	0.0	168.9	1160.4	O K
600 min Summer	15.312	1.012	160.8	0.0	160.8	1050.9	O K
720 min Summer	15.239	0.939	153.3	0.0	153.3	957.7	O K
960 min Summer	15.138	0.838	142.4	0.0	142.4	834.8	O K
1440 min Summer	14.988	0.688	124.6	0.0	124.6	661.8	O K
2160 min Summer	14.845	0.545	104.7	0.0	104.7	506.3	O K
2880 min Summer	14.758	0.458	90.4	0.0	90.4	416.1	O K
4320 min Summer	14.648	0.348	68.4	0.0	68.4	308.2	O K
5760 min Summer	14.590	0.290	55.2	0.0	55.2	252.5	O K
7200 min Summer	14.559	0.259	45.9	0.0	45.9	224.2	O K
8640 min Summer	14.536	0.236	39.2	0.0	39.2	203.3	O K
10080 min Summer	14.515	0.215	34.5	0.0	34.5	184.1	O K
15 min Winter	15.747	1.447	199.3	137.8	337.1	1658.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	208.214	0.0	1640.7	0.0	23
30 min Summer	116.932	0.0	1843.9	3.3	35
60 min Summer	65.668	0.0	2077.8	31.4	56
120 min Summer	36.879	0.0	2334.1	0.0	92
180 min Summer	26.315	0.0	2498.4	0.0	126
240 min Summer	20.711	0.0	2622.0	0.0	160
360 min Summer	14.778	0.0	2806.5	0.0	228
480 min Summer	11.631	0.0	2945.1	0.0	292
600 min Summer	9.659	0.0	3057.3	0.0	356
720 min Summer	8.299	0.0	3152.0	0.0	420
960 min Summer	6.690	0.0	3387.3	0.0	542
1440 min Summer	4.937	0.0	3748.4	0.0	784
2160 min Summer	3.643	0.0	4155.1	0.0	1144
2880 min Summer	2.937	0.0	4465.2	0.0	1500
4320 min Summer	2.075	0.0	4729.2	0.0	2208
5760 min Summer	1.622	0.0	4934.5	0.0	2936
7200 min Summer	1.340	0.0	5094.8	0.0	3672
8640 min Summer	1.146	0.0	5229.0	0.0	4408
10080 min Summer	1.004	0.0	5342.4	0.0	5136
15 min Winter	208.214	0.0	1838.7	43.1	22

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Cascade Summary of Results for Lagoon 16 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	15.785	1.485	202.4	336.3	538.7	1716.5	O K
60 min Winter	15.780	1.480	202.0	309.9	511.9	1709.1	O K
120 min Winter	15.757	1.457	200.1	184.3	384.4	1673.9	O K
180 min Winter	15.731	1.431	198.0	73.5	271.5	1634.4	O K
240 min Winter	15.683	1.383	194.1	0.0	194.1	1562.6	O K
360 min Winter	15.537	1.237	181.8	0.0	181.8	1352.4	O K
480 min Winter	15.406	1.106	169.8	0.0	169.8	1173.3	O K
600 min Winter	15.292	0.992	158.8	0.0	158.8	1025.4	O K
720 min Winter	15.195	0.895	148.7	0.0	148.7	904.0	O K
960 min Winter	15.062	0.762	133.6	0.0	133.6	745.4	O K
1440 min Winter	14.882	0.582	110.2	0.0	110.2	545.8	O K
2160 min Winter	14.737	0.437	86.7	0.0	86.7	395.6	O K
2880 min Winter	14.662	0.362	71.6	0.0	71.6	321.7	O K
4320 min Winter	14.577	0.277	51.4	0.0	51.4	241.3	O K
5760 min Winter	14.541	0.241	40.3	0.0	40.3	207.3	O K
7200 min Winter	14.510	0.210	33.3	0.0	33.3	179.4	O K
8640 min Winter	14.488	0.188	28.5	0.0	28.5	160.1	O K
10080 min Winter	14.474	0.174	25.1	0.0	25.1	147.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	116.932	0.0	2066.2	169.0	32
60 min Winter	65.668	0.0	2327.6	242.5	50
120 min Winter	36.879	0.0	2614.7	171.6	88
180 min Winter	26.315	0.0	2798.7	66.2	128
240 min Winter	20.711	0.0	2937.1	0.0	172
360 min Winter	14.778	0.0	3143.7	0.0	244
480 min Winter	11.631	0.0	3299.1	0.0	310
600 min Winter	9.659	0.0	3424.7	0.0	376
720 min Winter	8.299	0.0	3530.9	0.0	438
960 min Winter	6.690	0.0	3794.6	0.0	562
1440 min Winter	4.937	0.0	4199.2	0.0	800
2160 min Winter	3.643	0.0	4654.0	0.0	1152
2880 min Winter	2.937	0.0	5001.6	0.0	1504
4320 min Winter	2.075	0.0	5297.9	0.0	2208
5760 min Winter	1.622	0.0	5526.9	0.0	2936
7200 min Winter	1.340	0.0	5706.5	0.0	3672
8640 min Winter	1.146	0.0	5857.1	0.0	4408
10080 min Winter	1.004	0.0	5985.0	0.0	5120

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Cascade Model Details for Lagoon 16 Primary.srcx

Storage is Online Cover Level (m) 16.300

Tank or Pond Structure

Invert Level (m) 14.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	810.4	1.400	1490.1	2.800	0.0	4.200	0.0
0.200	896.0	1.600	1604.1	3.000	0.0	4.400	0.0
0.400	984.7	1.800	1721.0	3.200	0.0	4.600	0.0
0.600	1078.0	2.000	1842.0	3.400	0.0	4.800	0.0
0.800	1175.1	2.200	0.0	3.600	0.0	5.000	0.0
1.000	1276.3	2.400	0.0	3.800	0.0		
1.200	1382.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	20.000	Upstream Invert Level (m)	14.300
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 8.000 Invert Level (m) 15.700

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Cascade Summary of Results for Lagoon 16 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 16 Primary.srcx	(None)	(None)

Half Drain Time : 338 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	15.072	0.972	41.4	1046.9	O K
30 min Summer	15.178	1.078	44.1	1190.3	O K
60 min Summer	15.290	1.190	47.0	1349.0	O K
120 min Summer	15.398	1.298	49.9	1509.9	O K
180 min Summer	15.459	1.359	51.5	1604.5	O K
240 min Summer	15.499	1.399	52.6	1667.2	O K
360 min Summer	15.544	1.444	53.8	1737.3	O K
480 min Summer	15.555	1.455	54.1	1755.7	O K
600 min Summer	15.536	1.436	53.6	1725.1	O K
720 min Summer	15.510	1.410	52.9	1683.0	O K
960 min Summer	15.489	1.389	52.3	1651.1	O K
1440 min Summer	15.434	1.334	50.8	1565.0	O K
2160 min Summer	15.340	1.240	48.3	1422.9	O K
2880 min Summer	15.246	1.146	45.8	1285.7	O K
4320 min Summer	15.019	0.919	40.0	976.1	O K
5760 min Summer	14.840	0.740	35.6	752.9	O K
7200 min Summer	14.699	0.599	32.2	587.9	O K
8640 min Summer	14.582	0.482	29.5	458.7	O K
10080 min Summer	14.483	0.383	27.3	355.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	208.214	0.0	203
30 min Summer	116.932	0.0	222
60 min Summer	65.668	0.0	248
120 min Summer	36.879	0.0	292
180 min Summer	26.315	0.0	328
240 min Summer	20.711	0.0	364
360 min Summer	14.778	0.0	436
480 min Summer	11.631	0.0	512
600 min Summer	9.659	0.0	586
720 min Summer	8.299	0.0	642
960 min Summer	6.690	0.0	760
1440 min Summer	4.937	0.0	1008
2160 min Summer	3.643	0.0	1392
2880 min Summer	2.937	0.0	1772
4320 min Summer	2.075	0.0	2520
5760 min Summer	1.622	0.0	3272
7200 min Summer	1.340	0.0	4000
8640 min Summer	1.146	0.0	4720
10080 min Summer	1.004	0.0	5448

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Cascade Summary of Results for Lagoon 16 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	15.179	1.079	44.1	1191.6	O K
30 min Winter	15.299	1.199	47.2	1363.3	O K
60 min Winter	15.422	1.322	50.5	1546.3	O K
120 min Winter	15.535	1.435	53.6	1723.8	O K
180 min Winter	15.595	1.495	55.2	1819.9	O K
240 min Winter	15.634	1.534	56.3	1884.1	O K
360 min Winter	15.684	1.584	57.7	1968.2	O K
480 min Winter	15.702	1.602	58.2	1998.7	O K
600 min Winter	15.692	1.592	57.9	1982.5	O K
720 min Winter	15.660	1.560	57.0	1928.6	O K
960 min Winter	15.629	1.529	56.2	1876.9	O K
1440 min Winter	15.541	1.441	53.7	1733.4	O K
2160 min Winter	15.389	1.289	49.6	1496.8	O K
2880 min Winter	15.248	1.148	45.9	1288.6	O K
4320 min Winter	14.949	0.849	38.3	886.6	O K
5760 min Winter	14.728	0.628	32.9	620.5	O K
7200 min Winter	14.553	0.453	28.9	428.5	O K
8640 min Winter	14.415	0.315	25.7	287.1	O K
10080 min Winter	14.303	0.203	23.3	179.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	208.214	0.0	212
30 min Winter	116.932	0.0	222
60 min Winter	65.668	0.0	244
120 min Winter	36.879	0.0	294
180 min Winter	26.315	0.0	338
240 min Winter	20.711	0.0	378
360 min Winter	14.778	0.0	446
480 min Winter	11.631	0.0	520
600 min Winter	9.659	0.0	600
720 min Winter	8.299	0.0	668
960 min Winter	6.690	0.0	792
1440 min Winter	4.937	0.0	1060
2160 min Winter	3.643	0.0	1464
2880 min Winter	2.937	0.0	1860
4320 min Winter	2.075	0.0	2636
5760 min Winter	1.622	0.0	3392
7200 min Winter	1.340	0.0	4120
8640 min Winter	1.146	0.0	4824
10080 min Winter	1.004	0.0	5496

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Cascade Model Details for Lagoon 16 Infiltration.srcx

Storage is Online Cover Level (m) 16.300

Infiltration Basin Structure

Invert Level (m) 14.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.16200 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.16200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	836.0	1.400	1577.5	2.800	0.0	4.200	0.0
0.200	932.0	1.600	1699.1	3.000	0.0	4.400	0.0
0.400	1030.0	1.800	1825.0	3.200	0.0	4.600	0.0
0.600	1131.1	2.000	1954.5	3.400	0.0	4.800	0.0
0.800	1236.7	2.200	2088.2	3.600	0.0	5.000	0.0
1.000	1346.2	2.400	0.0	3.800	0.0		
1.200	1460.0	2.600	0.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 17 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 17 - Tank.srcx	Lagoon 17 - Tank.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	12.562	0.562	14.9	0.0	14.9	1058.0	O K
30 min Summer	12.635	0.635	16.0	0.0	16.0	1211.1	O K
60 min Summer	12.717	0.717	17.0	0.0	17.0	1387.3	O K
120 min Summer	12.806	0.806	18.2	0.0	18.2	1585.4	O K
180 min Summer	12.861	0.861	18.8	0.0	18.8	1708.8	O K
240 min Summer	12.900	0.900	19.2	0.0	19.2	1797.3	O K
360 min Summer	12.952	0.952	19.8	0.0	19.8	1919.2	O K
480 min Summer	12.985	0.985	20.2	0.0	20.2	1997.4	O K
600 min Summer	12.999	0.999	20.3	0.0	20.3	2029.0	O K
720 min Summer	13.001	1.001	20.4	0.3	20.6	2033.9	O K
960 min Summer	13.007	1.007	20.4	8.4	28.8	2049.8	O K
1440 min Summer	13.011	1.011	20.5	16.3	36.7	2059.4	O K
2160 min Summer	13.012	1.012	20.5	18.5	39.0	2061.1	O K
2880 min Summer	13.010	1.010	20.5	14.1	34.6	2057.1	O K
4320 min Summer	12.958	0.958	19.9	0.0	19.9	1933.4	O K
5760 min Summer	12.879	0.879	19.0	0.0	19.0	1748.6	O K
7200 min Summer	12.808	0.808	18.2	0.0	18.2	1589.3	O K
8640 min Summer	12.746	0.746	17.4	0.0	17.4	1451.3	O K
10080 min Summer	12.691	0.691	16.7	0.0	16.7	1332.0	O K
15 min Winter	12.618	0.618	15.7	0.0	15.7	1174.8	O K
30 min Winter	12.696	0.696	16.8	0.0	16.8	1342.4	O K
60 min Winter	12.784	0.784	17.9	0.0	17.9	1534.2	O K
120 min Winter	12.879	0.879	19.0	0.0	19.0	1749.7	O K
180 min Winter	12.937	0.937	19.7	0.0	19.7	1883.9	O K
240 min Winter	12.978	0.978	20.1	0.0	20.1	1979.9	O K
360 min Winter	13.016	1.016	20.5	28.2	48.8	2070.4	O K
480 min Winter	13.019	1.019	20.5	35.0	55.5	2077.3	O K
600 min Winter	13.017	1.017	20.5	30.9	51.4	2073.0	O K
720 min Winter	13.017	1.017	20.5	30.9	51.4	2072.9	O K
960 min Winter	13.020	1.020	20.6	37.8	58.4	2079.3	O K
1440 min Winter	13.020	1.020	20.6	37.8	58.4	2079.2	O K
2160 min Winter	13.017	1.017	20.5	29.5	50.1	2072.4	O K
2880 min Winter	13.014	1.014	20.5	22.0	42.5	2065.3	O K
4320 min Winter	12.984	0.984	20.2	0.0	20.2	1995.4	O K
5760 min Winter	12.875	0.875	19.0	0.0	19.0	1740.7	O K
7200 min Winter	12.780	0.780	17.8	0.0	17.8	1526.2	O K
8640 min Winter	12.698	0.698	16.8	0.0	16.8	1346.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	208.214	0.0	991.8	0.0	176
30 min Summer	116.932	0.0	1085.8	0.0	198
60 min Summer	65.668	0.0	1574.6	0.0	224
120 min Summer	36.879	0.0	1782.7	0.0	264
180 min Summer	26.315	0.0	1913.6	0.0	300
240 min Summer	20.711	0.0	2010.0	0.0	334
360 min Summer	14.778	0.0	2146.9	0.0	402
480 min Summer	11.631	0.0	2239.5	0.0	488
600 min Summer	9.659	0.0	2303.5	0.0	604
720 min Summer	8.299	0.0	2347.5	0.2	720
960 min Summer	6.690	0.0	2469.3	47.9	770
1440 min Summer	4.937	0.0	2583.8	104.9	986
2160 min Summer	3.643	0.0	3582.8	127.1	1368
2880 min Summer	2.937	0.0	3876.4	109.9	1788
4320 min Summer	2.075	0.0	4024.1	0.0	2736
5760 min Summer	1.622	0.0	4486.0	0.0	3528
7200 min Summer	1.340	0.0	4650.0	0.0	4328
8640 min Summer	1.146	0.0	4786.0	0.0	5096
10080 min Summer	1.004	0.0	4893.4	0.0	5848
15 min Winter	208.214	0.0	1063.3	0.0	171
30 min Winter	116.932	0.0	1159.5	0.0	193
60 min Winter	65.668	0.0	1722.5	0.0	220
120 min Winter	36.879	0.0	1944.6	0.0	260
180 min Winter	26.315	0.0	2083.6	0.0	296
240 min Winter	20.711	0.0	2184.1	0.0	332
360 min Winter	14.778	0.0	2337.3	71.1	356
480 min Winter	11.631	0.0	2451.0	151.4	442
600 min Winter	9.659	0.0	2531.3	195.0	500
720 min Winter	8.299	0.0	2586.5	213.7	562
960 min Winter	6.690	0.0	2729.1	283.2	684
1440 min Winter	4.937	0.0	2854.6	324.1	950
2160 min Winter	3.643	0.0	3896.6	321.3	1364
2880 min Winter	2.937	0.0	4210.6	268.2	1792
4320 min Winter	2.075	0.0	4324.4	0.0	2940
5760 min Winter	1.622	0.0	4859.8	0.0	3752
7200 min Winter	1.340	0.0	5035.8	0.0	4544
8640 min Winter	1.146	0.0	5182.0	0.0	5352

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Cascade Summary of Results for Lagoon 17 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	12.628	0.628	15.9	0.0	15.9	1196.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
10080 min Winter	1.004	0.0	5300.0	0.0	6064

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Cascade Model Details for Lagoon 17 Primary.srcx

Storage is Online Cover Level (m) 13.400

Tank or Pond Structure

Invert Level (m) 12.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1702.5	1.000	2379.0	2.000	0.0	3.000	0.0	4.000	0.0	5.000	0.0
0.200	1829.8	1.200	2526.5	2.200	0.0	3.200	0.0	4.200	0.0		
0.400	1961.0	1.400	2677.9	2.400	0.0	3.400	0.0	4.400	0.0		
0.600	2096.0	1.600	0.0	2.600	0.0	3.600	0.0	4.600	0.0		
0.800	2235.6	1.800	0.0	2.800	0.0	3.800	0.0	4.800	0.0		

Orifice Outflow Control

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 12.000

Weir Overflow Control

Discharge Coef 0.544 Width (m) 8.000 Invert Level (m) 13.000

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Cascade Summary of Results for Lagoon 17 - Tank.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 17 Primary.srcx	(None)	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	12.211	0.211	6.0	0.0	6.0	810.8	O K
30 min Summer	12.242	0.242	6.1	0.0	6.1	931.6	O K
60 min Summer	12.291	0.291	6.1	0.0	6.1	1128.3	O K
120 min Summer	12.344	0.344	6.1	0.0	6.1	1344.7	O K
180 min Summer	12.381	0.381	6.1	0.0	6.1	1493.6	O K
240 min Summer	12.409	0.409	6.1	0.0	6.1	1609.4	O K
360 min Summer	12.452	0.452	6.1	0.0	6.1	1786.6	O K
480 min Summer	12.484	0.484	6.1	0.0	6.1	1921.8	O K
600 min Summer	12.510	0.510	6.1	0.0	6.1	2030.1	O K
720 min Summer	12.529	0.529	6.1	0.0	6.1	2114.1	O K
960 min Summer	12.580	0.580	6.1	0.0	6.1	2328.9	O K
1440 min Summer	12.641	0.641	6.1	0.0	6.1	2595.7	O K
2160 min Summer	12.761	0.761	6.1	0.0	6.1	3125.1	O K
2880 min Summer	12.823	0.823	6.3	0.0	6.3	3404.8	O K
4320 min Summer	12.858	0.858	6.5	0.0	6.5	3564.3	O K
5760 min Summer	12.878	0.878	6.5	0.0	6.5	3655.9	O K
7200 min Summer	12.882	0.882	6.5	0.0	6.5	3674.6	O K
8640 min Summer	12.870	0.870	6.5	0.0	6.5	3617.2	O K
10080 min Summer	12.853	0.853	6.4	0.0	6.4	3540.5	O K
15 min Winter	12.227	0.227	6.0	0.0	6.0	874.6	O K
30 min Winter	12.259	0.259	6.1	0.0	6.1	999.9	O K
60 min Winter	12.318	0.318	6.1	0.0	6.1	1239.1	O K
120 min Winter	12.377	0.377	6.1	0.0	6.1	1477.3	O K
180 min Winter	12.416	0.416	6.1	0.0	6.1	1638.7	O K
240 min Winter	12.446	0.446	6.1	0.0	6.1	1763.0	O K
360 min Winter	12.494	0.494	6.1	0.0	6.1	1965.2	O K
480 min Winter	12.532	0.532	6.1	0.0	6.1	2127.3	O K
600 min Winter	12.562	0.562	6.1	0.0	6.1	2252.8	O K
720 min Winter	12.584	0.584	6.1	0.0	6.1	2347.7	O K
960 min Winter	12.638	0.638	6.1	0.0	6.1	2579.8	O K
1440 min Winter	12.700	0.700	6.1	0.0	6.1	2853.0	O K
2160 min Winter	12.820	0.820	6.3	0.0	6.3	3391.0	O K
2880 min Winter	12.883	0.883	6.5	0.0	6.5	3676.5	O K
4320 min Winter	12.913	0.913	6.6	0.0	6.6	3818.9	O K
5760 min Winter	12.935	0.935	6.7	0.0	6.7	3920.9	O K
7200 min Winter	12.943	0.943	6.7	0.0	6.7	3954.9	O K
8640 min Winter	12.935	0.935	6.7	0.0	6.7	3920.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	208.214	0.0	388.8	0.0	1440
30 min Summer	116.932	0.0	403.4	0.0	1440
60 min Summer	65.668	0.0	930.4	0.0	1952
120 min Summer	36.879	0.0	914.9	0.0	2194
180 min Summer	26.315	0.0	898.9	0.0	2356
240 min Summer	20.711	0.0	885.7	0.0	2480
360 min Summer	14.778	0.0	864.4	0.0	2670
480 min Summer	11.631	0.0	846.8	0.0	2822
600 min Summer	9.659	0.0	831.2	0.0	2880
720 min Summer	8.299	0.0	816.9	0.0	2880
960 min Summer	6.690	0.0	791.8	0.0	2880
1440 min Summer	4.937	0.0	750.0	0.0	2880
2160 min Summer	3.643	0.0	1738.4	0.0	4204
2880 min Summer	2.937	0.0	1715.1	0.0	4720
4320 min Summer	2.075	0.0	1596.8	0.0	5644
5760 min Summer	1.622	0.0	3577.5	0.0	6520
7200 min Summer	1.340	0.0	3490.4	0.0	7504
8640 min Summer	1.146	0.0	3382.6	0.0	8432
10080 min Summer	1.004	0.0	3253.8	0.0	9080
15 min Winter	208.214	0.0	396.5	0.0	1440
30 min Winter	116.932	0.0	408.7	0.0	1440
60 min Winter	65.668	0.0	927.3	0.0	2098
120 min Winter	36.879	0.0	908.2	0.0	2352
180 min Winter	26.315	0.0	893.7	0.0	2516
240 min Winter	20.711	0.0	882.2	0.0	2640
360 min Winter	14.778	0.0	867.3	0.0	2776
480 min Winter	11.631	0.0	851.9	0.0	2862
600 min Winter	9.659	0.0	836.3	0.0	2880
720 min Winter	8.299	0.0	822.3	0.0	2880
960 min Winter	6.690	0.0	800.8	0.0	2880
1440 min Winter	4.937	0.0	763.5	0.0	2880
2160 min Winter	3.643	0.0	1788.4	0.0	4236
2880 min Winter	2.937	0.0	1766.7	0.0	4780
4320 min Winter	2.075	0.0	1637.6	0.0	5760
5760 min Winter	1.622	0.0	3683.4	0.0	6656
7200 min Winter	1.340	0.0	3600.2	0.0	7584
8640 min Winter	1.146	0.0	3494.2	0.0	8616

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Cascade Summary of Results for Lagoon 17 - Tank.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	12.916	0.916	6.6	0.0	6.6	3829.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
10080 min Winter	1.004	0.0	3367.3	0.0	9520

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Cascade Model Details for Lagoon 17 - Tank.srcx

Storage is Online Cover Level (m) 13.400

Tank or Pond Structure

Invert Level (m) 12.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	3744.0	1.000	4720.7	2.000	0.0	3.000	0.0	4.000	0.0	5.000	0.0
0.200	3931.0	1.200	4928.0	2.200	0.0	3.200	0.0	4.200	0.0		
0.400	4122.5	1.400	5135.5	2.400	0.0	3.400	0.0	4.400	0.0		
0.600	4317.9	1.600	0.0	2.600	0.0	3.600	0.0	4.600	0.0		
0.800	4517.3	1.800	0.0	2.800	0.0	3.800	0.0	4.800	0.0		

Hydro-Brake® Outflow Control

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 12.000
Design Flow (l/s) 7.0 Diameter (mm) 110

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)	Depth (m)	Flow (l/s)
0.100	3.4	0.600	5.7	1.600	8.7	2.600	11.1	5.000	15.4	7.500	18.9
0.200	5.9	0.800	6.3	1.800	9.3	3.000	12.0	5.500	16.2	8.000	19.5
0.300	6.0	1.000	6.9	2.000	9.8	3.500	12.9	6.000	16.9	8.500	20.1
0.400	5.7	1.200	7.6	2.200	10.2	4.000	13.8	6.500	17.6	9.000	20.7
0.500	5.6	1.400	8.2	2.400	10.7	4.500	14.6	7.000	18.3	9.500	21.3

Weir Overflow Control

Discharge Coef 0.544 Width (m) 10.000 Invert Level (m) 13.100

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Cascade Summary of Results for Lagoon 18 - Tank.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 18 Primary.srcx	(None)	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	13.645	0.445	5.4	0.0	5.4	1908.4	O K
30 min Summer	13.699	0.499	5.4	0.0	5.4	2156.2	O K
60 min Summer	13.758	0.558	5.4	0.0	5.4	2433.9	O K
120 min Summer	13.823	0.623	5.4	0.0	5.4	2744.3	O K
180 min Summer	13.864	0.664	5.4	0.0	5.4	2941.7	O K
240 min Summer	13.894	0.694	5.4	0.0	5.4	3088.7	O K
360 min Summer	13.938	0.738	5.5	0.0	5.5	3304.9	O K
480 min Summer	13.970	0.770	5.6	0.0	5.6	3462.8	O K
600 min Summer	13.994	0.794	5.7	0.0	5.7	3584.7	O K
720 min Summer	14.013	0.813	5.7	0.0	5.7	3679.2	O K
960 min Summer	14.071	0.871	5.9	0.0	5.9	3974.7	O K
1440 min Summer	14.152	0.952	6.2	0.0	6.2	4397.6	O K
2160 min Summer	14.231	1.031	6.4	0.0	6.4	4814.3	O K
2880 min Summer	14.283	1.083	6.6	0.0	6.6	5092.3	O K
4320 min Summer	14.265	1.065	6.5	0.0	6.5	4996.8	O K
5760 min Summer	14.234	1.034	6.4	0.0	6.4	4830.2	O K
7200 min Summer	14.204	1.004	6.3	0.0	6.3	4668.7	O K
8640 min Summer	14.176	0.976	6.2	0.0	6.2	4524.4	O K
10080 min Summer	14.151	0.951	6.2	0.0	6.2	4390.6	O K
15 min Winter	13.697	0.497	5.4	0.0	5.4	2150.5	O K
30 min Winter	13.757	0.557	5.4	0.0	5.4	2427.6	O K
60 min Winter	13.822	0.622	5.4	0.0	5.4	2738.1	O K
120 min Winter	13.893	0.693	5.4	0.0	5.4	3085.2	O K
180 min Winter	13.938	0.738	5.5	0.0	5.5	3306.1	O K
240 min Winter	13.971	0.771	5.6	0.0	5.6	3470.8	O K
360 min Winter	14.020	0.820	5.7	0.0	5.7	3713.2	O K
480 min Winter	14.055	0.855	5.9	0.0	5.9	3891.2	O K
600 min Winter	14.082	0.882	5.9	0.0	5.9	4030.3	O K
720 min Winter	14.103	0.903	6.0	0.0	6.0	4141.2	O K
960 min Winter	14.168	0.968	6.2	0.0	6.2	4479.0	O K
1440 min Winter	14.260	1.060	6.5	0.0	6.5	4967.4	O K
2160 min Winter	14.349	1.149	6.7	0.0	6.7	5455.7	O K
2880 min Winter	14.409	1.209	6.9	0.0	6.9	5787.7	O K
4320 min Winter	14.397	1.197	6.9	0.0	6.9	5720.2	O K
5760 min Winter	14.370	1.170	6.8	0.0	6.8	5572.9	O K
7200 min Winter	14.337	1.137	6.7	0.0	6.7	5390.5	O K
8640 min Winter	14.302	1.102	6.6	0.0	6.6	5198.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	206.422	0.0	420.5	0.0	362
30 min Summer	115.893	0.0	417.2	0.0	386
60 min Summer	65.067	0.0	846.3	0.0	416
120 min Summer	36.531	0.0	852.4	0.0	458
180 min Summer	26.062	0.0	859.3	0.0	494
240 min Summer	20.510	0.0	864.9	0.0	528
360 min Summer	14.632	0.0	872.4	0.0	596
480 min Summer	11.515	0.0	876.1	0.0	670
600 min Summer	9.562	0.0	877.1	0.0	750
720 min Summer	8.215	0.0	876.0	0.0	848
960 min Summer	6.717	0.0	883.7	0.0	1066
1440 min Summer	5.058	0.0	881.0	0.0	1526
2160 min Summer	3.808	0.0	1881.6	0.0	2228
2880 min Summer	3.114	0.0	1881.0	0.0	2928
4320 min Summer	2.182	0.0	1758.5	0.0	4344
5760 min Summer	1.696	0.0	3623.4	0.0	5616
7200 min Summer	1.394	0.0	3518.6	0.0	6200
8640 min Summer	1.188	0.0	3393.4	0.0	6912
10080 min Summer	1.038	0.0	3250.0	0.0	7656
15 min Winter	206.422	0.0	419.1	0.0	379
30 min Winter	115.893	0.0	421.2	0.0	403
60 min Winter	65.067	0.0	858.3	0.0	432
120 min Winter	36.531	0.0	876.1	0.0	474
180 min Winter	26.062	0.0	888.8	0.0	510
240 min Winter	20.510	0.0	898.1	0.0	544
360 min Winter	14.632	0.0	910.1	0.0	612
480 min Winter	11.515	0.0	916.4	0.0	682
600 min Winter	9.562	0.0	919.0	0.0	758
720 min Winter	8.215	0.0	919.1	0.0	846
960 min Winter	6.717	0.0	928.8	0.0	1056
1440 min Winter	5.058	0.0	926.3	0.0	1502
2160 min Winter	3.808	0.0	1983.0	0.0	2192
2880 min Winter	3.114	0.0	1980.1	0.0	2884
4320 min Winter	2.182	0.0	1847.1	0.0	4248
5760 min Winter	1.696	0.0	3831.1	0.0	5568
7200 min Winter	1.394	0.0	3720.5	0.0	6808
8640 min Winter	1.188	0.0	3589.1	0.0	7336

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Cascade Summary of Results for Lagoon 18 - Tank.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	14.274	1.074	6.5	0.0	6.5	5042.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
10080 min Winter	1.038	0.0	3440.0	0.0	8016

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Cascade Model Details for Lagoon 18 - Tank.srcx

Storage is Online Cover Level (m) 16.000

Tank or Pond Structure

Invert Level (m) 13.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	4009.6	1.000	5305.4	2.000	6701.6	3.000	0.0	4.000	0.0	5.000	0.0
0.200	4260.7	1.200	5576.6	2.200	6993.0	3.200	0.0	4.200	0.0		
0.400	4515.8	1.400	5851.8	2.400	7288.3	3.400	0.0	4.400	0.0		
0.600	4775.0	1.600	6131.1	2.600	7587.7	3.600	0.0	4.600	0.0		
0.800	5038.2	1.800	6414.3	2.800	7891.0	3.800	0.0	4.800	0.0		

Hydro-Brake® Outflow Control

Design Head (m) 2.500 Hydro-Brake® Type Md6 SW Only Invert Level (m) 13.200
Design Flow (l/s) 10.0 Diameter (mm) 105

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)	Depth (m)	Flow (l/s)
0.100	3.2	0.600	5.1	1.600	8.0	2.600	10.1	5.000	14.1	7.500	17.2
0.200	5.3	0.800	5.7	1.800	8.4	3.000	10.9	5.500	14.8	8.000	17.8
0.300	5.3	1.000	6.3	2.000	8.9	3.500	11.8	6.000	15.4	8.500	18.3
0.400	5.0	1.200	6.9	2.200	9.3	4.000	12.6	6.500	16.0	9.000	18.9
0.500	5.0	1.400	7.4	2.400	9.7	4.500	13.3	7.000	16.6	9.500	19.4

Weir Overflow Control

Discharge Coef 0.544 Width (m) 10.000 Invert Level (m) 15.900

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Cascade Summary of Results for Lagoon 18 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 18 - Tank.srcx	Lagoon 18 - Tank.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	15.052	1.652	222.4	0.0	222.4	1838.9	O K
30 min Summer	15.144	1.744	229.3	0.0	229.3	1987.8	O K
60 min Summer	15.182	1.782	232.1	0.0	232.1	2049.8	O K
120 min Summer	15.133	1.733	228.5	0.0	228.5	1969.8	O K
180 min Summer	15.074	1.674	224.1	0.0	224.1	1875.1	O K
240 min Summer	15.012	1.612	219.4	0.0	219.4	1777.2	O K
360 min Summer	14.889	1.489	209.7	0.0	209.7	1591.3	O K
480 min Summer	14.776	1.376	200.5	0.0	200.5	1428.3	O K
600 min Summer	14.675	1.275	191.8	0.0	191.8	1288.7	O K
720 min Summer	14.585	1.185	183.7	0.0	183.7	1168.9	O K
960 min Summer	14.476	1.076	173.4	0.0	173.4	1030.5	O K
1440 min Summer	14.301	0.901	155.5	0.0	155.5	822.8	O K
2160 min Summer	14.119	0.719	134.4	0.0	134.4	623.9	O K
2880 min Summer	13.999	0.599	118.4	0.0	118.4	501.8	O K
4320 min Summer	13.824	0.424	90.2	0.0	90.2	337.3	O K
5760 min Summer	13.746	0.346	73.0	0.0	73.0	269.1	O K
7200 min Summer	13.706	0.306	60.4	0.0	60.4	235.2	O K
8640 min Summer	13.678	0.278	51.6	0.0	51.6	211.4	O K
10080 min Summer	13.656	0.256	45.0	0.0	45.0	194.0	O K
15 min Winter	15.196	1.796	233.0	0.0	233.0	2072.1	O K
30 min Winter	15.298	1.898	240.3	0.0	240.3	2245.8	O K
60 min Winter	15.345	1.945	243.6	0.0	243.6	2328.4	O K
120 min Winter	15.289	1.889	239.7	0.0	239.7	2229.8	O K
180 min Winter	15.211	1.811	234.1	0.0	234.1	2097.6	O K
240 min Winter	15.126	1.726	227.9	0.0	227.9	1957.1	O K
360 min Winter	14.955	1.555	215.0	0.0	215.0	1690.3	O K
480 min Winter	14.799	1.399	202.3	0.0	202.3	1460.5	O K
600 min Winter	14.660	1.260	190.5	0.0	190.5	1268.8	O K
720 min Winter	14.539	1.139	179.4	0.0	179.4	1110.0	O K
960 min Winter	14.385	0.985	164.4	0.0	164.4	921.0	O K
1440 min Winter	14.161	0.761	139.6	0.0	139.6	668.2	O K
2160 min Winter	13.962	0.562	113.0	0.0	113.0	465.8	O K
2880 min Winter	13.851	0.451	95.1	0.0	95.1	361.8	O K
4320 min Winter	13.731	0.331	68.2	0.0	68.2	256.5	O K
5760 min Winter	13.683	0.283	53.2	0.0	53.2	215.9	O K
7200 min Winter	13.652	0.252	43.8	0.0	43.8	190.4	O K
8640 min Winter	13.628	0.228	37.3	0.0	37.3	170.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	206.422	0.0	2054.6	0.0	27
30 min Summer	115.893	0.0	2307.8	0.0	39
60 min Summer	65.067	0.0	2596.7	0.0	62
120 min Summer	36.531	0.0	2916.0	0.0	98
180 min Summer	26.062	0.0	3120.7	0.0	130
240 min Summer	20.510	0.0	3274.6	0.0	164
360 min Summer	14.632	0.0	3504.4	0.0	232
480 min Summer	11.515	0.0	3677.1	0.0	298
600 min Summer	9.562	0.0	3816.8	0.0	362
720 min Summer	8.215	0.0	3934.8	0.0	424
960 min Summer	6.717	0.0	4289.5	0.0	548
1440 min Summer	5.058	0.0	4843.6	0.0	792
2160 min Summer	3.808	0.0	5475.3	0.0	1152
2880 min Summer	3.114	0.0	5968.8	0.0	1504
4320 min Summer	2.182	0.0	6271.5	0.0	2212
5760 min Summer	1.696	0.0	6502.4	0.0	2936
7200 min Summer	1.394	0.0	6683.2	0.0	3672
8640 min Summer	1.188	0.0	6834.3	0.0	4400
10080 min Summer	1.038	0.0	6962.4	0.0	5136
15 min Winter	206.422	0.0	2301.9	0.0	27
30 min Winter	115.893	0.0	2585.5	0.0	39
60 min Winter	65.067	0.0	2908.6	0.0	64
120 min Winter	36.531	0.0	3266.3	0.0	104
180 min Winter	26.062	0.0	3495.5	0.0	140
240 min Winter	20.510	0.0	3667.9	0.0	178
360 min Winter	14.632	0.0	3925.2	0.0	248
480 min Winter	11.515	0.0	4118.7	0.0	316
600 min Winter	9.562	0.0	4275.2	0.0	382
720 min Winter	8.215	0.0	4407.4	0.0	446
960 min Winter	6.717	0.0	4804.8	0.0	570
1440 min Winter	5.058	0.0	5425.7	0.0	810
2160 min Winter	3.808	0.0	6132.6	0.0	1164
2880 min Winter	3.114	0.0	6685.4	0.0	1508
4320 min Winter	2.182	0.0	7025.0	0.0	2208
5760 min Winter	1.696	0.0	7282.8	0.0	2936
7200 min Winter	1.394	0.0	7485.5	0.0	3672
8640 min Winter	1.188	0.0	7654.9	0.0	4408

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Cascade Summary of Results for Lagoon 18 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	13.607	0.207	32.6	0.0	32.6	153.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
10080 min Winter	1.038	0.0	7799.1	0.0	5136

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Cascade Model Details for Lagoon 18 Primary.srcx

Storage is Online Cover Level (m) 16.000

Tank or Pond Structure

Invert Level (m) 13.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	698.0	1.000	1196.1	2.000	1794.8	3.000	0.0	4.000	0.0	5.000	0.0
0.200	789.6	1.200	1307.8	2.200	1926.7	3.200	0.0	4.200	0.0		
0.400	885.2	1.400	1423.5	2.400	2062.5	3.400	0.0	4.400	0.0		
0.600	984.8	1.600	1543.2	2.600	2202.4	3.600	0.0	4.600	0.0		
0.800	1088.4	1.800	1667.0	2.800	0.0	3.800	0.0	4.800	0.0		

Pipe Outflow Control

Diameter (m) 0.300 Length (m) 18.000 Entry Loss Coefficient 0.500 Upstream Invert Level (m) 13.400
Slope (1:X) 150.0 Roughness k (mm) 0.600 Coefficient of Contraction 0.600

Weir Overflow Control

Discharge Coef 0.544 Width (m) 6.000 Invert Level (m) 15.400

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Cascade Summary of Results for Lagoon 18A Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 18A Infiltration.srcx	Lagoon 18A Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	14.598	0.598	125.8	0.0	125.8	691.6	O K
30 min Summer	14.623	0.623	129.2	72.5	201.7	725.4	O K
60 min Summer	14.625	0.625	129.4	79.6	209.1	727.0	O K
120 min Summer	14.617	0.617	128.4	46.3	174.7	716.9	O K
180 min Summer	14.604	0.604	126.6	5.7	132.3	700.0	O K
240 min Summer	14.579	0.579	123.1	0.0	123.1	666.7	O K
360 min Summer	14.529	0.529	115.7	0.0	115.7	601.0	O K
480 min Summer	14.486	0.486	108.9	0.0	108.9	545.8	O K
600 min Summer	14.452	0.452	102.0	0.0	102.0	503.1	O K
720 min Summer	14.425	0.425	94.8	0.0	94.8	469.5	O K
960 min Summer	14.390	0.390	84.3	0.0	84.3	426.0	O K
1440 min Summer	14.343	0.343	68.2	0.0	68.2	370.3	O K
2160 min Summer	14.299	0.299	49.0	0.0	49.0	319.1	O K
2880 min Summer	14.255	0.255	44.7	0.0	44.7	269.1	O K
4320 min Summer	14.207	0.207	32.6	0.0	32.6	214.9	O K
5760 min Summer	14.178	0.178	26.3	0.0	26.3	184.0	O K
7200 min Summer	14.163	0.163	22.1	0.0	22.1	167.5	O K
8640 min Summer	14.152	0.152	18.8	0.0	18.8	156.0	O K
10080 min Summer	14.144	0.144	16.5	0.0	16.5	147.5	O K
15 min Winter	14.641	0.641	131.7	171.3	303.0	749.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.915	0.0	767.0	0.0	23
30 min Summer	115.314	0.0	869.0	29.4	32
60 min Summer	65.210	0.0	991.6	46.4	48
120 min Summer	36.876	0.0	1122.2	27.2	82
180 min Summer	26.420	0.0	1206.3	2.2	120
240 min Summer	20.853	0.0	1269.8	0.0	154
360 min Summer	14.940	0.0	1364.8	0.0	218
480 min Summer	11.793	0.0	1436.4	0.0	280
600 min Summer	9.815	0.0	1494.4	0.0	340
720 min Summer	8.449	0.0	1543.5	0.0	402
960 min Summer	6.802	0.0	1656.7	0.0	522
1440 min Summer	5.012	0.0	1829.4	0.0	766
2160 min Summer	3.693	0.0	2030.1	0.0	1152
2880 min Summer	2.973	0.0	2178.3	0.0	1500
4320 min Summer	2.088	0.0	2290.2	0.0	2212
5760 min Summer	1.625	0.0	2384.7	0.0	2944
7200 min Summer	1.338	0.0	2453.5	0.0	3672
8640 min Summer	1.141	0.0	2510.0	0.0	4408
10080 min Summer	0.998	0.0	2555.9	0.0	5136
15 min Winter	203.915	0.0	860.5	53.9	21

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Cascade Summary of Results for Lagoon 18A Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	14.653	0.653	133.3	251.2	384.5	766.4	O K
60 min Winter	14.647	0.647	132.5	210.0	342.5	757.7	O K
120 min Winter	14.633	0.633	130.5	121.2	251.7	738.0	O K
180 min Winter	14.619	0.619	128.7	54.6	183.3	720.0	O K
240 min Winter	14.601	0.601	126.2	0.9	127.1	695.4	O K
360 min Winter	14.528	0.528	115.5	0.0	115.5	598.6	O K
480 min Winter	14.470	0.470	106.2	0.0	106.2	524.8	O K
600 min Winter	14.429	0.429	95.7	0.0	95.7	473.8	O K
720 min Winter	14.398	0.398	86.8	0.0	86.8	435.6	O K
960 min Winter	14.358	0.358	73.8	0.0	73.8	388.5	O K
1440 min Winter	14.313	0.313	55.4	0.0	55.4	335.1	O K
2160 min Winter	14.249	0.249	42.8	0.0	42.8	261.5	O K
2880 min Winter	14.216	0.216	34.7	0.0	34.7	225.3	O K
4320 min Winter	14.173	0.173	25.0	0.0	25.0	178.2	O K
5760 min Winter	14.155	0.155	19.6	0.0	19.6	158.3	O K
7200 min Winter	14.143	0.143	16.0	0.0	16.0	145.9	O K
8640 min Winter	14.132	0.132	13.6	0.0	13.6	134.2	O K
10080 min Winter	14.122	0.122	12.0	0.0	12.0	123.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.314	0.0	974.8	117.0	30
60 min Winter	65.210	0.0	1111.4	143.5	48
120 min Winter	36.876	0.0	1257.6	103.1	82
180 min Winter	26.420	0.0	1351.8	48.5	120
240 min Winter	20.853	0.0	1422.9	0.2	164
360 min Winter	14.940	0.0	1529.3	0.0	230
480 min Winter	11.793	0.0	1609.6	0.0	290
600 min Winter	9.815	0.0	1674.6	0.0	352
720 min Winter	8.449	0.0	1729.6	0.0	412
960 min Winter	6.802	0.0	1856.5	0.0	534
1440 min Winter	5.012	0.0	2050.3	0.0	790
2160 min Winter	3.693	0.0	2274.2	0.0	1148
2880 min Winter	2.973	0.0	2440.4	0.0	1508
4320 min Winter	2.088	0.0	2566.5	0.0	2208
5760 min Winter	1.625	0.0	2671.2	0.0	2944
7200 min Winter	1.338	0.0	2748.3	0.0	3680
8640 min Winter	1.141	0.0	2812.0	0.0	4416
10080 min Winter	0.998	0.0	2864.3	0.0	5136

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Cascade Model Details for Lagoon 18A Primary.srcx

Storage is Online Cover Level (m) 15.000

Tank or Pond Structure

Invert Level (m) 14.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	980.4	1.400	0.0	2.800	0.0	4.200	0.0
0.200	1095.8	1.600	0.0	3.000	0.0	4.400	0.0
0.400	1215.7	1.800	0.0	3.200	0.0	4.600	0.0
0.600	1340.2	2.000	0.0	3.400	0.0	4.800	0.0
0.800	1469.2	2.200	0.0	3.600	0.0	5.000	0.0
1.000	1602.9	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	4.500	Upstream Invert Level (m)	14.000
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 12.000 Invert Level (m) 14.600

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Cascade Summary of Results for Lagoon 18A Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 18A Primary.srcx		(None)	(None)

Half Drain Time : 9047 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	14.197	0.197	1.6	0.0	1.6	691.2	O K
30 min Summer	14.224	0.224	1.6	0.0	1.6	791.2	O K
60 min Summer	14.254	0.254	1.7	0.0	1.7	904.3	O K
120 min Summer	14.287	0.287	1.8	0.0	1.8	1031.5	O K
180 min Summer	14.307	0.307	1.8	0.0	1.8	1113.0	O K
240 min Summer	14.323	0.323	1.8	0.0	1.8	1174.0	O K
360 min Summer	14.345	0.345	1.8	0.0	1.8	1263.7	O K
480 min Summer	14.361	0.361	1.9	0.0	1.9	1329.4	O K
600 min Summer	14.374	0.374	1.9	0.0	1.9	1380.8	O K
720 min Summer	14.384	0.384	1.9	0.0	1.9	1422.3	O K
960 min Summer	14.407	0.407	1.9	0.0	1.9	1518.6	O K
1440 min Summer	14.440	0.440	2.0	0.0	2.0	1655.4	O K
2160 min Summer	14.471	0.471	2.1	0.0	2.1	1787.4	O K
2880 min Summer	14.491	0.491	2.1	0.0	2.1	1873.0	O K
4320 min Summer	14.489	0.489	2.1	0.0	2.1	1866.0	O K
5760 min Summer	14.481	0.481	2.1	0.0	2.1	1829.4	O K
7200 min Summer	14.469	0.469	2.0	0.0	2.0	1777.9	O K
8640 min Summer	14.458	0.458	2.0	0.0	2.0	1730.1	O K
10080 min Summer	14.447	0.447	2.0	0.0	2.0	1685.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	203.915	0.0	0.0	515
30 min Summer	115.314	0.0	0.0	520
60 min Summer	65.210	0.0	0.0	538
120 min Summer	36.876	0.0	0.0	576
180 min Summer	26.420	0.0	0.0	614
240 min Summer	20.853	0.0	0.0	650
360 min Summer	14.940	0.0	0.0	730
480 min Summer	11.793	0.0	0.0	816
600 min Summer	9.815	0.0	0.0	910
720 min Summer	8.449	0.0	0.0	1012
960 min Summer	6.802	0.0	0.0	1222
1440 min Summer	5.012	0.0	0.0	1656
2160 min Summer	3.693	0.0	0.0	2328
2880 min Summer	2.973	0.0	0.0	3016
4320 min Summer	2.088	0.0	0.0	4400
5760 min Summer	1.625	0.0	0.0	5784
7200 min Summer	1.338	0.0	0.0	6840
8640 min Summer	1.141	0.0	0.0	7416
10080 min Summer	0.998	0.0	0.0	8160

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Cascade Summary of Results for Lagoon 18A Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	14.222	0.222	1.6	0.0	1.6	783.0	O K
30 min Winter	14.251	0.251	1.7	0.0	1.7	895.5	O K
60 min Winter	14.284	0.284	1.7	0.0	1.7	1022.3	O K
120 min Winter	14.320	0.320	1.8	0.0	1.8	1164.6	O K
180 min Winter	14.343	0.343	1.8	0.0	1.8	1255.7	O K
240 min Winter	14.360	0.360	1.9	0.0	1.9	1323.8	O K
360 min Winter	14.385	0.385	1.9	0.0	1.9	1424.6	O K
480 min Winter	14.403	0.403	1.9	0.0	1.9	1498.6	O K
600 min Winter	14.417	0.417	2.0	0.0	2.0	1556.7	O K
720 min Winter	14.428	0.428	2.0	0.0	2.0	1604.3	O K
960 min Winter	14.454	0.454	2.0	0.0	2.0	1713.7	O K
1440 min Winter	14.491	0.491	2.1	0.0	2.1	1870.8	O K
2160 min Winter	14.526	0.526	2.1	0.0	2.1	2024.8	O K
2880 min Winter	14.549	0.549	2.2	0.0	2.2	2127.2	O K
4320 min Winter	14.550	0.550	2.2	0.0	2.2	2132.4	O K
5760 min Winter	14.544	0.544	2.2	0.0	2.2	2103.4	O K
7200 min Winter	14.533	0.533	2.2	0.0	2.2	2057.1	O K
8640 min Winter	14.520	0.520	2.1	0.0	2.1	2001.4	O K
10080 min Winter	14.507	0.507	2.1	0.0	2.1	1942.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Winter	203.915	0.0	0.0	510
30 min Winter	115.314	0.0	0.0	512
60 min Winter	65.210	0.0	0.0	532
120 min Winter	36.876	0.0	0.0	572
180 min Winter	26.420	0.0	0.0	616
240 min Winter	20.853	0.0	0.0	654
360 min Winter	14.940	0.0	0.0	732
480 min Winter	11.793	0.0	0.0	818
600 min Winter	9.815	0.0	0.0	910
720 min Winter	8.449	0.0	0.0	1006
960 min Winter	6.802	0.0	0.0	1214
1440 min Winter	5.012	0.0	0.0	1644
2160 min Winter	3.693	0.0	0.0	2304
2880 min Winter	2.973	0.0	0.0	2976
4320 min Winter	2.088	0.0	0.0	4336
5760 min Winter	1.625	0.0	0.0	5696
7200 min Winter	1.338	0.0	0.0	7000
8640 min Winter	1.141	0.0	0.0	8224
10080 min Winter	0.998	0.0	0.0	8968

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Cascade Model Details for Lagoon 18A Infiltration.srcx

Storage is Online Cover Level (m) 15.000

Infiltration Basin Structure

Invert Level (m) 14.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00280 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00280

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	3304.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	3720.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	4140.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	4564.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	4994.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	5427.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 6.000 Invert Level (m) 14.700

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Cascade Summary of Results for Lagoon 19 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 19 Infiltration.srcx	Lagoon 19 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	27.242	1.942	235.7	0.0	235.7	324.8	O K
30 min Summer	27.151	1.851	229.4	0.0	229.4	292.3	O K
60 min Summer	26.968	1.668	216.3	0.0	216.3	233.3	O K
120 min Summer	26.679	1.379	193.8	0.0	193.8	156.9	O K
180 min Summer	26.448	1.148	173.8	0.0	173.8	109.0	O K
240 min Summer	26.269	0.969	156.4	0.0	156.4	78.9	O K
360 min Summer	26.017	0.717	128.2	0.0	128.2	46.2	O K
480 min Summer	25.863	0.563	107.3	0.0	107.3	31.0	O K
600 min Summer	25.767	0.467	92.0	0.0	92.0	23.2	O K
720 min Summer	25.703	0.403	80.2	0.0	80.2	18.6	O K
960 min Summer	25.639	0.339	66.2	0.0	66.2	14.5	O K
1440 min Summer	25.572	0.272	49.7	0.0	49.7	10.7	O K
2160 min Summer	25.528	0.228	37.3	0.0	37.3	8.5	O K
2880 min Summer	25.497	0.197	30.4	0.0	30.4	7.1	O K
4320 min Summer	25.462	0.162	21.6	0.0	21.6	5.6	O K
5760 min Summer	25.446	0.146	17.1	0.0	17.1	4.9	O K
7200 min Summer	25.434	0.134	14.1	0.0	14.1	4.5	O K
8640 min Summer	25.423	0.123	12.1	0.0	12.1	4.0	O K
10080 min Summer	25.414	0.114	10.6	0.0	10.6	3.7	O K
15 min Winter	27.345	2.045	242.6	82.0	324.6	364.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.962	0.0	491.7	0.0	17
30 min Summer	115.791	0.0	547.5	0.0	25
60 min Summer	64.471	0.0	609.7	0.0	42
120 min Summer	35.896	0.0	679.0	0.0	72
180 min Summer	25.485	0.0	723.1	0.0	102
240 min Summer	19.987	0.0	756.1	0.0	132
360 min Summer	14.190	0.0	805.2	0.0	190
480 min Summer	11.128	0.0	842.0	0.0	250
600 min Summer	9.216	0.0	871.6	0.0	308
720 min Summer	7.901	0.0	896.6	0.0	368
960 min Summer	6.438	0.0	974.1	0.0	488
1440 min Summer	4.824	0.0	1094.9	0.0	726
2160 min Summer	3.615	0.0	1230.6	0.0	1100
2880 min Summer	2.945	0.0	1337.0	0.0	1440
4320 min Summer	2.094	0.0	1425.6	0.0	2140
5760 min Summer	1.643	0.0	1491.9	0.0	2864
7200 min Summer	1.362	0.0	1545.6	0.0	3544
8640 min Summer	1.168	0.0	1590.8	0.0	4360
10080 min Summer	1.026	0.0	1630.1	0.0	5016
15 min Winter	207.962	0.0	550.7	13.8	16

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Cascade Summary of Results for Lagoon 19 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	27.265	1.965	237.3	0.0	237.3	333.6	O K
60 min Winter	27.031	1.731	220.9	0.0	220.9	252.7	O K
120 min Winter	26.623	1.323	189.2	0.0	189.2	144.3	O K
180 min Winter	26.312	1.012	160.8	0.0	160.8	85.6	O K
240 min Winter	26.091	0.791	137.1	0.0	137.1	54.8	O K
360 min Winter	25.836	0.536	103.2	0.0	103.2	28.6	O K
480 min Winter	25.713	0.413	82.2	0.0	82.2	19.3	O K
600 min Winter	25.648	0.348	68.4	0.0	68.4	15.1	O K
720 min Winter	25.610	0.310	58.7	0.0	58.7	12.8	O K
960 min Winter	25.566	0.266	47.9	0.0	47.9	10.4	O K
1440 min Winter	25.522	0.222	35.9	0.0	35.9	8.2	O K
2160 min Winter	25.481	0.181	27.0	0.0	27.0	6.4	O K
2880 min Winter	25.463	0.163	22.1	0.0	22.1	5.6	O K
4320 min Winter	25.441	0.141	15.6	0.0	15.6	4.8	O K
5760 min Winter	25.424	0.124	12.3	0.0	12.3	4.1	O K
7200 min Winter	25.412	0.112	10.2	0.0	10.2	3.6	O K
8640 min Winter	25.403	0.103	8.8	0.0	8.8	3.3	O K
10080 min Winter	25.397	0.097	7.7	0.0	7.7	3.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.791	0.0	613.2	0.0	26
60 min Winter	64.471	0.0	682.9	0.0	44
120 min Winter	35.896	0.0	760.4	0.0	76
180 min Winter	25.485	0.0	809.8	0.0	106
240 min Winter	19.987	0.0	846.8	0.0	134
360 min Winter	14.190	0.0	901.8	0.0	190
480 min Winter	11.128	0.0	943.0	0.0	248
600 min Winter	9.216	0.0	976.2	0.0	308
720 min Winter	7.901	0.0	1004.2	0.0	368
960 min Winter	6.438	0.0	1091.0	0.0	490
1440 min Winter	4.824	0.0	1226.3	0.0	734
2160 min Winter	3.615	0.0	1378.3	0.0	1092
2880 min Winter	2.945	0.0	1497.4	0.0	1436
4320 min Winter	2.094	0.0	1596.6	0.0	2132
5760 min Winter	1.643	0.0	1671.0	0.0	2864
7200 min Winter	1.362	0.0	1731.0	0.0	3616
8640 min Winter	1.168	0.0	1781.7	0.0	4304
10080 min Winter	1.026	0.0	1825.7	0.0	5112

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Cascade Model Details for Lagoon 19 Primary.srcx

Storage is Online Cover Level (m) 27.700

Tank or Pond Structure

Invert Level (m) 25.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	27.7	1.400	236.5	2.800	0.0	4.200	0.0
0.200	45.4	1.600	282.5	3.000	0.0	4.400	0.0
0.400	67.1	1.800	332.5	3.200	0.0	4.600	0.0
0.600	92.9	2.000	386.6	3.400	0.0	4.800	0.0
0.800	122.7	2.200	444.7	3.600	0.0	5.000	0.0
1.000	156.6	2.400	506.9	3.800	0.0		
1.200	194.5	2.600	0.0	4.000	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	20.000	Upstream Invert Level (m)	25.300
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 27.300

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Cascade Summary of Results for Lagoon 19 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 19 Primary.srcx		(None)	(None)

Half Drain Time : 614 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	26.414	1.314	22.2	928.3	O K
30 min Summer	26.542	1.442	24.4	1095.7	O K
60 min Summer	26.678	1.578	26.7	1290.7	O K
120 min Summer	26.818	1.718	29.2	1508.4	O K
180 min Summer	26.899	1.799	30.6	1642.7	O K
240 min Summer	26.953	1.853	31.6	1736.9	O K
360 min Summer	27.021	1.921	32.8	1857.0	O K
480 min Summer	27.056	1.956	33.4	1922.3	O K
600 min Summer	27.075	1.975	33.8	1957.7	O K
720 min Summer	27.081	1.981	33.9	1968.2	O K
960 min Summer	27.130	2.030	34.8	2060.8	O K
1440 min Summer	27.186	2.086	35.8	2170.2	O K
2160 min Summer	27.219	2.119	36.4	2234.0	O K
2880 min Summer	27.222	2.122	36.4	2240.0	O K
4320 min Summer	27.088	1.988	34.0	1981.4	O K
5760 min Summer	26.968	1.868	31.8	1762.5	O K
7200 min Summer	26.862	1.762	29.9	1581.6	O K
8640 min Summer	26.768	1.668	28.3	1429.6	O K
10080 min Summer	26.685	1.585	26.8	1300.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.962	0.0	278
30 min Summer	115.791	0.0	292
60 min Summer	64.471	0.0	310
120 min Summer	35.896	0.0	344
180 min Summer	25.485	0.0	380
240 min Summer	19.987	0.0	414
360 min Summer	14.190	0.0	486
480 min Summer	11.128	0.0	558
600 min Summer	9.216	0.0	628
720 min Summer	7.901	0.0	718
960 min Summer	6.438	0.0	850
1440 min Summer	4.824	0.0	1116
2160 min Summer	3.615	0.0	1520
2880 min Summer	2.945	0.0	1920
4320 min Summer	2.094	0.0	2708
5760 min Summer	1.643	0.0	3480
7200 min Summer	1.362	0.0	4240
8640 min Summer	1.168	0.0	4984
10080 min Summer	1.026	0.0	5720

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Cascade Summary of Results for Lagoon 19 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	26.451	1.351	22.8	975.6	O K
30 min Winter	26.580	1.480	25.0	1149.6	O K
60 min Winter	26.717	1.617	27.4	1350.0	O K
120 min Winter	26.857	1.757	29.9	1573.7	O K
180 min Winter	26.938	1.838	31.3	1711.0	O K
240 min Winter	26.993	1.893	32.3	1806.9	O K
360 min Winter	27.060	1.960	33.5	1929.0	O K
480 min Winter	27.096	1.996	34.1	1995.2	O K
600 min Winter	27.114	2.014	34.5	2029.5	O K
720 min Winter	27.121	2.021	34.6	2043.6	O K
960 min Winter	27.167	2.067	35.4	2132.1	O K
1440 min Winter	27.207	2.107	36.2	2210.4	O K
2160 min Winter	27.213	2.113	36.3	2222.9	O K
2880 min Winter	27.188	2.088	35.8	2173.9	O K
4320 min Winter	27.003	1.903	32.5	1825.2	O K
5760 min Winter	26.841	1.741	29.6	1546.4	O K
7200 min Winter	26.702	1.602	27.1	1327.1	O K
8640 min Winter	26.582	1.482	25.1	1151.4	O K
10080 min Winter	26.477	1.377	23.3	1009.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	207.962	0.0	276
30 min Winter	115.791	0.0	290
60 min Winter	64.471	0.0	310
120 min Winter	35.896	0.0	344
180 min Winter	25.485	0.0	378
240 min Winter	19.987	0.0	414
360 min Winter	14.190	0.0	486
480 min Winter	11.128	0.0	564
600 min Winter	9.216	0.0	638
720 min Winter	7.901	0.0	718
960 min Winter	6.438	0.0	888
1440 min Winter	4.824	0.0	1166
2160 min Winter	3.615	0.0	1604
2880 min Winter	2.945	0.0	2028
4320 min Winter	2.094	0.0	2852
5760 min Winter	1.643	0.0	3632
7200 min Winter	1.362	0.0	4400
8640 min Winter	1.168	0.0	5152
10080 min Winter	1.026	0.0	5880

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Cascade Model Details for Lagoon 19 Infiltration.srcx

Storage is Online Cover Level (m) 27.700

Infiltration Basin Structure

Invert Level (m) 25.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.06840 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.06840

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	186.5	1.400	1334.5	2.800	0.0	4.200	0.0
0.200	338.3	1.600	1514.6	3.000	0.0	4.400	0.0
0.400	494.3	1.800	1698.8	3.200	0.0	4.600	0.0
0.600	654.2	2.000	1887.0	3.400	0.0	4.800	0.0
0.800	818.2	2.200	2079.3	3.600	0.0	5.000	0.0
1.000	986.3	2.400	2275.6	3.800	0.0		
1.200	1158.0	2.600	2475.9	4.000	0.0		

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Cascade Summary of Results for Lagoon 20 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 20 Infiltration.srcx	Lagoon 20 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	27.049	1.149	177.3	0.0	177.3	572.6	O K
30 min Summer	27.051	1.151	177.6	0.0	177.6	574.4	O K
60 min Summer	27.002	1.102	172.9	0.0	172.9	539.3	O K
120 min Summer	26.898	0.998	162.4	0.0	162.4	468.4	O K
180 min Summer	26.802	0.902	152.2	0.0	152.2	407.3	O K
240 min Summer	26.719	0.819	142.8	0.0	142.8	357.1	O K
360 min Summer	26.589	0.689	126.6	0.0	126.6	284.0	O K
480 min Summer	26.495	0.595	113.4	0.0	113.4	235.0	O K
600 min Summer	26.424	0.524	102.5	0.0	102.5	200.8	O K
720 min Summer	26.371	0.471	93.3	0.0	93.3	175.9	O K
960 min Summer	26.310	0.410	81.6	0.0	81.6	148.7	O K
1440 min Summer	26.238	0.338	65.3	0.0	65.3	118.5	O K
2160 min Summer	26.177	0.277	51.3	0.0	51.3	94.3	O K
2880 min Summer	26.147	0.247	42.2	0.0	42.2	82.8	O K
4320 min Summer	26.096	0.196	30.2	0.0	30.2	64.0	O K
5760 min Summer	26.069	0.169	23.8	0.0	23.8	54.6	O K
7200 min Summer	26.055	0.155	19.7	0.0	19.7	49.8	O K
8640 min Summer	26.046	0.146	16.9	0.0	16.9	46.5	O K
10080 min Summer	26.039	0.139	14.9	0.0	14.9	44.1	O K
15 min Winter	27.148	1.248	186.5	0.0	186.5	646.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.962	0.0	689.9	0.0	18
30 min Summer	115.791	0.0	768.4	0.0	30
60 min Summer	64.471	0.0	856.2	0.0	46
120 min Summer	35.896	0.0	953.6	0.0	80
180 min Summer	25.485	0.0	1015.5	0.0	112
240 min Summer	19.987	0.0	1061.9	0.0	144
360 min Summer	14.190	0.0	1130.9	0.0	204
480 min Summer	11.128	0.0	1182.5	0.0	266
600 min Summer	9.216	0.0	1224.2	0.0	324
720 min Summer	7.901	0.0	1259.3	0.0	384
960 min Summer	6.438	0.0	1368.2	0.0	502
1440 min Summer	4.824	0.0	1537.7	0.0	740
2160 min Summer	3.615	0.0	1728.9	0.0	1104
2880 min Summer	2.945	0.0	1878.3	0.0	1468
4320 min Summer	2.094	0.0	2002.4	0.0	2200
5760 min Summer	1.643	0.0	2096.3	0.0	2904
7200 min Summer	1.362	0.0	2171.5	0.0	3672
8640 min Summer	1.168	0.0	2234.9	0.0	4304
10080 min Summer	1.026	0.0	2289.7	0.0	5136
15 min Winter	207.962	0.0	772.8	0.0	19

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Cascade Summary of Results for Lagoon 20 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	27.156	1.256	187.2	0.0	187.2	652.6	O K
60 min Winter	27.090	1.190	181.2	0.0	181.2	602.7	O K
120 min Winter	26.946	1.046	167.3	0.0	167.3	500.3	O K
180 min Winter	26.813	0.913	153.4	0.0	153.4	413.6	O K
240 min Winter	26.700	0.800	140.5	0.0	140.5	346.2	O K
360 min Winter	26.533	0.633	118.9	0.0	118.9	254.5	O K
480 min Winter	26.421	0.521	102.0	0.0	102.0	199.3	O K
600 min Winter	26.346	0.446	88.7	0.0	88.7	164.5	O K
720 min Winter	26.293	0.393	78.2	0.0	78.2	141.7	O K
960 min Winter	26.238	0.338	65.4	0.0	65.4	118.7	O K
1440 min Winter	26.172	0.272	49.9	0.0	49.9	92.6	O K
2160 min Winter	26.129	0.229	37.5	0.0	37.5	76.2	O K
2880 min Winter	26.098	0.198	30.7	0.0	30.7	64.9	O K
4320 min Winter	26.063	0.163	21.9	0.0	21.9	52.3	O K
5760 min Winter	26.047	0.147	17.2	0.0	17.2	46.8	O K
7200 min Winter	26.035	0.135	14.2	0.0	14.2	42.9	O K
8640 min Winter	26.024	0.124	12.3	0.0	12.3	39.0	O K
10080 min Winter	26.015	0.115	10.7	0.0	10.7	36.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.791	0.0	860.7	0.0	30
60 min Winter	64.471	0.0	959.1	0.0	48
120 min Winter	35.896	0.0	1068.0	0.0	84
180 min Winter	25.485	0.0	1137.5	0.0	118
240 min Winter	19.987	0.0	1189.4	0.0	150
360 min Winter	14.190	0.0	1266.7	0.0	212
480 min Winter	11.128	0.0	1324.5	0.0	272
600 min Winter	9.216	0.0	1371.2	0.0	330
720 min Winter	7.901	0.0	1410.5	0.0	388
960 min Winter	6.438	0.0	1532.4	0.0	506
1440 min Winter	4.824	0.0	1722.3	0.0	740
2160 min Winter	3.615	0.0	1936.4	0.0	1108
2880 min Winter	2.945	0.0	2103.7	0.0	1468
4320 min Winter	2.094	0.0	2242.8	0.0	2188
5760 min Winter	1.643	0.0	2347.9	0.0	2920
7200 min Winter	1.362	0.0	2432.1	0.0	3672
8640 min Winter	1.168	0.0	2503.2	0.0	4400
10080 min Winter	1.026	0.0	2564.7	0.0	5136

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Cascade Model Details for Lagoon 20 Primary.srcx

Storage is Online Cover Level (m) 27.700

Tank or Pond Structure

Invert Level (m) 25.900

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	296.2	0.800	579.6	1.600	926.3	2.400	0.0
0.200	361.0	1.000	660.5	1.800	1023.3	2.600	0.0
0.400	429.8	1.200	745.6	2.000	0.0	2.800	0.0
0.600	502.7	1.400	833.4	2.200	0.0	3.000	0.0

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	18.100	Upstream Invert Level (m)	25.900
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 27.300

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Cascade Summary of Results for Lagoon 20 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 20 Primary.srcx	(None)	(None)

Half Drain Time : 3460 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	26.475	0.775	2.8	647.9	O K
30 min Summer	26.544	0.844	3.0	723.9	O K
60 min Summer	26.618	0.918	3.1	808.1	O K
120 min Summer	26.696	0.996	3.3	900.8	O K
180 min Summer	26.742	1.042	3.4	958.3	O K
240 min Summer	26.775	1.075	3.5	999.2	O K
360 min Summer	26.817	1.117	3.6	1053.4	O K
480 min Summer	26.844	1.144	3.7	1088.1	O K
600 min Summer	26.862	1.162	3.7	1112.7	O K
720 min Summer	26.876	1.176	3.8	1130.5	O K
960 min Summer	26.928	1.228	3.9	1200.8	O K
1440 min Summer	26.992	1.292	4.1	1290.1	O K
2160 min Summer	27.038	1.338	4.2	1356.4	O K
2880 min Summer	27.059	1.359	4.2	1386.3	O K
4320 min Summer	27.024	1.324	4.1	1335.8	O K
5760 min Summer	26.989	1.289	4.1	1286.8	O K
7200 min Summer	26.954	1.254	4.0	1237.7	O K
8640 min Summer	26.919	1.219	3.9	1189.4	O K
10080 min Summer	26.885	1.185	3.8	1142.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.962	0.0	181
30 min Summer	115.791	0.0	191
60 min Summer	64.471	0.0	208
120 min Summer	35.896	0.0	240
180 min Summer	25.485	0.0	276
240 min Summer	19.987	0.0	318
360 min Summer	14.190	0.0	422
480 min Summer	11.128	0.0	534
600 min Summer	9.216	0.0	648
720 min Summer	7.901	0.0	762
960 min Summer	6.438	0.0	994
1440 min Summer	4.824	0.0	1460
2160 min Summer	3.615	0.0	2164
2880 min Summer	2.945	0.0	2540
4320 min Summer	2.094	0.0	3268
5760 min Summer	1.643	0.0	4064
7200 min Summer	1.362	0.0	4904
8640 min Summer	1.168	0.0	5720
10080 min Summer	1.026	0.0	6544

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Cascade Summary of Results for Lagoon 20 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	26.548	0.848	3.0	728.4	O K
30 min Winter	26.623	0.923	3.2	813.5	O K
60 min Winter	26.702	1.002	3.3	908.0	O K
120 min Winter	26.785	1.085	3.6	1012.0	O K
180 min Winter	26.835	1.135	3.7	1076.8	O K
240 min Winter	26.870	1.170	3.8	1123.4	O K
360 min Winter	26.917	1.217	3.9	1186.0	O K
480 min Winter	26.946	1.246	4.0	1226.7	O K
600 min Winter	26.967	1.267	4.0	1255.6	O K
720 min Winter	26.982	1.282	4.0	1277.0	O K
960 min Winter	27.040	1.340	4.2	1359.2	O K
1440 min Winter	27.112	1.412	4.4	1466.0	O K
2160 min Winter	27.168	1.468	4.5	1550.9	O K
2880 min Winter	27.193	1.493	4.6	1589.7	O K
4320 min Winter	27.150	1.450	4.5	1523.3	O K
5760 min Winter	27.110	1.410	4.4	1462.0	O K
7200 min Winter	27.066	1.366	4.3	1397.7	O K
8640 min Winter	27.022	1.322	4.1	1333.5	O K
10080 min Winter	26.978	1.278	4.0	1271.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	207.962	0.0	185
30 min Winter	115.791	0.0	195
60 min Winter	64.471	0.0	212
120 min Winter	35.896	0.0	244
180 min Winter	25.485	0.0	280
240 min Winter	19.987	0.0	320
360 min Winter	14.190	0.0	416
480 min Winter	11.128	0.0	526
600 min Winter	9.216	0.0	638
720 min Winter	7.901	0.0	752
960 min Winter	6.438	0.0	978
1440 min Winter	4.824	0.0	1436
2160 min Winter	3.615	0.0	2108
2880 min Winter	2.945	0.0	2748
4320 min Winter	2.094	0.0	3432
5760 min Winter	1.643	0.0	4344
7200 min Winter	1.362	0.0	5272
8640 min Winter	1.168	0.0	6160
10080 min Winter	1.026	0.0	7072

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Cascade Model Details for Lagoon 20 Infiltration.srcx

Storage is Online Cover Level (m) 27.700

Infiltration Basin Structure

Invert Level (m) 25.700 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01310 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01310

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	610.7	0.800	1089.5	1.600	1633.4	2.400	0.0
0.200	723.8	1.000	1219.4	1.800	1779.5	2.600	0.0
0.400	841.6	1.200	1353.4	2.000	1929.6	2.800	0.0
0.600	963.5	1.400	1491.4	2.200	0.0	3.000	0.0

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Cascade Summary of Results for Lagoon 21 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 21 Infiltration.srcx	Lagoon 21 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	24.138	1.738	210.2	0.0	210.2	174.5	O K
30 min Summer	24.030	1.630	202.8	0.0	202.8	149.1	O K
60 min Summer	23.835	1.435	188.6	0.0	188.6	109.6	O K
120 min Summer	23.522	1.122	163.5	0.0	163.5	61.6	O K
180 min Summer	23.284	0.884	141.4	0.0	141.4	36.2	O K
240 min Summer	23.114	0.714	123.2	0.0	123.2	22.8	O K
360 min Summer	22.903	0.503	96.0	0.0	96.0	11.3	O K
480 min Summer	22.793	0.393	78.1	0.0	78.1	7.1	O K
600 min Summer	22.730	0.330	65.8	0.0	65.8	5.2	O K
720 min Summer	22.695	0.295	56.7	0.0	56.7	4.3	O K
960 min Summer	22.661	0.261	46.4	0.0	46.4	3.5	O K
1440 min Summer	22.617	0.217	34.8	0.0	34.8	2.6	O K
2160 min Summer	22.578	0.178	26.2	0.0	26.2	1.9	O K
2880 min Summer	22.561	0.161	21.5	0.0	21.5	1.6	O K
4320 min Summer	22.539	0.139	14.9	0.0	14.9	1.3	O K
5760 min Summer	22.520	0.120	11.6	0.0	11.6	1.1	O K
7200 min Summer	22.508	0.108	9.5	0.0	9.5	0.9	O K
8640 min Summer	22.499	0.099	8.1	0.0	8.1	0.8	O K
10080 min Summer	22.493	0.093	7.0	0.0	7.0	0.8	O K
15 min Winter	24.243	1.843	217.1	0.0	217.1	201.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	205.488	0.0	320.9	0.0	16
30 min Summer	115.769	0.0	361.6	0.0	24
60 min Summer	65.223	0.0	407.5	0.0	40
120 min Summer	36.746	0.0	459.1	0.0	70
180 min Summer	26.269	0.0	492.3	0.0	100
240 min Summer	20.702	0.0	517.3	0.0	128
360 min Summer	14.799	0.0	554.8	0.0	186
480 min Summer	11.663	0.0	582.9	0.0	246
600 min Summer	9.696	0.0	605.8	0.0	306
720 min Summer	8.338	0.0	625.1	0.0	366
960 min Summer	6.804	0.0	680.1	0.0	486
1440 min Summer	5.108	0.0	765.9	0.0	734
2160 min Summer	3.835	0.0	862.6	0.0	1084
2880 min Summer	3.130	0.0	938.6	0.0	1444
4320 min Summer	2.180	0.0	980.6	0.0	2172
5760 min Summer	1.687	0.0	1011.6	0.0	2840
7200 min Summer	1.382	0.0	1036.4	0.0	3672
8640 min Summer	1.175	0.0	1057.0	0.0	4256
10080 min Summer	1.024	0.0	1074.8	0.0	4976
15 min Winter	205.488	0.0	359.5	0.0	17

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Cascade Summary of Results for Lagoon 21 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	24.116	1.716	208.7	0.0	208.7	169.1	O K
60 min Winter	23.843	1.443	189.3	0.0	189.3	111.2	O K
120 min Winter	23.397	0.997	152.3	0.0	152.3	47.2	O K
180 min Winter	23.102	0.702	121.8	0.0	121.8	22.1	O K
240 min Winter	22.928	0.528	99.6	0.0	99.6	12.4	O K
360 min Winter	22.763	0.363	72.4	0.0	72.4	6.1	O K
480 min Winter	22.697	0.297	57.4	0.0	57.4	4.3	O K
600 min Winter	22.665	0.265	47.8	0.0	47.8	3.6	O K
720 min Winter	22.643	0.243	41.1	0.0	41.1	3.1	O K
960 min Winter	22.611	0.211	33.5	0.0	33.5	2.5	O K
1440 min Winter	22.574	0.174	25.1	0.0	25.1	1.8	O K
2160 min Winter	22.553	0.153	19.0	0.0	19.0	1.5	O K
2880 min Winter	22.541	0.141	15.4	0.0	15.4	1.3	O K
4320 min Winter	22.515	0.115	10.8	0.0	10.8	1.0	O K
5760 min Winter	22.501	0.101	8.3	0.0	8.3	0.9	O K
7200 min Winter	22.492	0.092	6.9	0.0	6.9	0.8	O K
8640 min Winter	22.484	0.084	5.9	0.0	5.9	0.7	O K
10080 min Winter	22.478	0.078	5.1	0.0	5.1	0.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.769	0.0	405.0	0.0	25
60 min Winter	65.223	0.0	456.4	0.0	42
120 min Winter	36.746	0.0	514.2	0.0	72
180 min Winter	26.269	0.0	551.4	0.0	100
240 min Winter	20.702	0.0	579.4	0.0	128
360 min Winter	14.799	0.0	621.3	0.0	186
480 min Winter	11.663	0.0	652.9	0.0	244
600 min Winter	9.696	0.0	678.5	0.0	304
720 min Winter	8.338	0.0	700.1	0.0	364
960 min Winter	6.804	0.0	761.7	0.0	482
1440 min Winter	5.108	0.0	857.9	0.0	730
2160 min Winter	3.835	0.0	966.2	0.0	1076
2880 min Winter	3.130	0.0	1051.2	0.0	1420
4320 min Winter	2.180	0.0	1098.3	0.0	2168
5760 min Winter	1.687	0.0	1133.0	0.0	2856
7200 min Winter	1.382	0.0	1160.7	0.0	3640
8640 min Winter	1.175	0.0	1183.9	0.0	4256
10080 min Winter	1.024	0.0	1203.8	0.0	5120

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Cascade Model Details for Lagoon 21 Primary.srcx

Storage is Online Cover Level (m) 25.000

Tank or Pond Structure

Invert Level (m) 22.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	6.0	1.200	139.1	2.400	419.7	3.600	0.0
0.200	17.7	1.400	175.7	2.600	480.7	3.800	0.0
0.400	33.6	1.600	216.4	2.800	0.0	4.000	0.0
0.600	53.8	1.800	261.1	3.000	0.0		
0.800	78.1	2.000	310.0	3.200	0.0		
1.000	106.6	2.200	362.8	3.400	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	25.000	Upstream Invert Level (m)	22.400
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 24.600

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Cascade Summary of Results for Lagoon 21 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 21 Primary.srcx	(None)	(None)

Half Drain Time : 1556 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	23.814	1.614	2.7	316.8	O K
30 min Summer	23.914	1.714	2.9	356.7	O K
60 min Summer	24.016	1.816	3.1	400.3	O K
120 min Summer	24.111	1.911	3.4	444.3	O K
180 min Summer	24.163	1.963	3.5	469.4	O K
240 min Summer	24.197	1.997	3.6	486.3	O K
360 min Summer	24.238	2.038	3.7	507.2	O K
480 min Summer	24.260	2.060	3.7	518.5	O K
600 min Summer	24.271	2.071	3.8	524.4	O K
720 min Summer	24.276	2.076	3.8	526.7	O K
960 min Summer	24.309	2.109	3.9	544.7	O K
1440 min Summer	24.347	2.147	3.9	565.3	O K
2160 min Summer	24.377	2.177	4.0	582.2	O K
2880 min Summer	24.389	2.189	4.1	588.8	O K
4320 min Summer	24.297	2.097	3.8	538.1	O K
5760 min Summer	24.212	2.012	3.6	493.9	O K
7200 min Summer	24.135	1.935	3.4	455.7	O K
8640 min Summer	24.064	1.864	3.3	422.3	O K
10080 min Summer	23.999	1.799	3.1	393.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	205.488	0.0	39
30 min Summer	115.769	0.0	48
60 min Summer	65.223	0.0	68
120 min Summer	36.746	0.0	128
180 min Summer	26.269	0.0	186
240 min Summer	20.702	0.0	246
360 min Summer	14.799	0.0	366
480 min Summer	11.663	0.0	484
600 min Summer	9.696	0.0	604
720 min Summer	8.338	0.0	722
960 min Summer	6.804	0.0	954
1440 min Summer	5.108	0.0	1172
2160 min Summer	3.835	0.0	1556
2880 min Summer	3.130	0.0	1964
4320 min Summer	2.180	0.0	2772
5760 min Summer	1.687	0.0	3592
7200 min Summer	1.382	0.0	4400
8640 min Summer	1.175	0.0	5192
10080 min Summer	1.024	0.0	5960

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Cascade Summary of Results for Lagoon 21 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	23.909	1.709	2.9	354.8	O K
30 min Winter	24.013	1.813	3.1	399.4	O K
60 min Winter	24.121	1.921	3.4	448.9	O K
120 min Winter	24.221	2.021	3.6	498.5	O K
180 min Winter	24.277	2.077	3.8	527.3	O K
240 min Winter	24.313	2.113	3.9	546.7	O K
360 min Winter	24.358	2.158	4.0	571.1	O K
480 min Winter	24.382	2.182	4.0	584.9	O K
600 min Winter	24.396	2.196	4.1	592.7	O K
720 min Winter	24.403	2.203	4.1	596.6	O K
960 min Winter	24.443	2.243	4.2	619.9	O K
1440 min Winter	24.478	2.278	4.3	640.4	O K
2160 min Winter	24.504	2.304	4.4	655.9	O K
2880 min Winter	24.507	2.307	4.4	658.0	O K
4320 min Winter	24.390	2.190	4.1	589.2	O K
5760 min Winter	24.281	2.081	3.8	529.5	O K
7200 min Winter	24.181	1.981	3.5	478.2	O K
8640 min Winter	24.090	1.890	3.3	434.2	O K
10080 min Winter	24.006	1.806	3.1	396.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	205.488	0.0	42
30 min Winter	115.769	0.0	50
60 min Winter	65.223	0.0	68
120 min Winter	36.746	0.0	126
180 min Winter	26.269	0.0	184
240 min Winter	20.702	0.0	242
360 min Winter	14.799	0.0	358
480 min Winter	11.663	0.0	474
600 min Winter	9.696	0.0	590
720 min Winter	8.338	0.0	702
960 min Winter	6.804	0.0	924
1440 min Winter	5.108	0.0	1320
2160 min Winter	3.835	0.0	1648
2880 min Winter	3.130	0.0	2108
4320 min Winter	2.180	0.0	2992
5760 min Winter	1.687	0.0	3864
7200 min Winter	1.382	0.0	4688
8640 min Winter	1.175	0.0	5536
10080 min Winter	1.024	0.0	6352

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Cascade Model Details for Lagoon 21 Infiltration.srcx

Storage is Online Cover Level (m) 25.000

Infiltration Basin Structure

Invert Level (m) 22.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02670 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02670

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	54.2	1.200	274.0	2.400	641.7	3.600	0.0
0.200	79.7	1.400	325.2	2.600	717.0	3.800	0.0
0.400	109.8	1.600	380.4	2.800	796.3	4.000	0.0
0.600	144.4	1.800	439.7	3.000	0.0		
0.800	183.6	2.000	503.0	3.200	0.0		
1.000	226.8	2.200	570.3	3.400	0.0		

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Cascade Summary of Results for Lagoon 22 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 22 Infiltration.srcx	Lagoon 22 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	23.429	1.629	205.7	68.2	273.9	1053.0	O K
30 min Summer	23.457	1.657	207.7	186.7	394.4	1080.1	O K
60 min Summer	23.444	1.644	206.8	126.9	333.7	1067.9	O K
120 min Summer	23.395	1.595	203.2	0.0	203.2	1020.3	O K
180 min Summer	23.301	1.501	196.4	0.0	196.4	933.5	O K
240 min Summer	23.211	1.411	189.5	0.0	189.5	853.2	O K
360 min Summer	23.049	1.249	176.5	0.0	176.5	718.3	O K
480 min Summer	22.913	1.113	164.9	0.0	164.9	613.2	O K
600 min Summer	22.800	1.000	154.5	0.0	154.5	531.1	O K
720 min Summer	22.705	0.905	145.2	0.0	145.2	465.6	O K
960 min Summer	22.585	0.785	132.6	0.0	132.6	388.6	O K
1440 min Summer	22.420	0.620	112.9	0.0	112.9	289.8	O K
2160 min Summer	22.276	0.476	92.3	0.0	92.3	211.7	O K
2880 min Summer	22.196	0.396	78.7	0.0	78.7	171.3	O K
4320 min Summer	22.095	0.295	56.7	0.0	56.7	123.2	O K
5760 min Summer	22.053	0.253	44.1	0.0	44.1	104.1	O K
7200 min Summer	22.023	0.223	36.2	0.0	36.2	90.5	O K
8640 min Summer	21.998	0.198	30.7	0.0	30.7	79.9	O K
10080 min Summer	21.981	0.181	26.9	0.0	26.9	72.4	O K
15 min Winter	23.500	1.700	210.7	432.7	643.4	1123.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	205.488	0.0	1232.7	14.9	22
30 min Summer	115.769	0.0	1389.2	72.7	31
60 min Summer	65.223	0.0	1566.4	65.9	48
120 min Summer	36.746	0.0	1765.1	0.0	86
180 min Summer	26.269	0.0	1892.8	0.0	120
240 min Summer	20.702	0.0	1988.9	0.0	154
360 min Summer	14.799	0.0	2132.8	0.0	218
480 min Summer	11.663	0.0	2241.1	0.0	282
600 min Summer	9.696	0.0	2328.9	0.0	342
720 min Summer	8.338	0.0	2403.2	0.0	402
960 min Summer	6.804	0.0	2614.7	0.0	522
1440 min Summer	5.108	0.0	2944.6	0.0	760
2160 min Summer	3.835	0.0	3317.3	0.0	1112
2880 min Summer	3.130	0.0	3609.2	0.0	1476
4320 min Summer	2.180	0.0	3770.4	0.0	2204
5760 min Summer	1.687	0.0	3890.7	0.0	2936
7200 min Summer	1.382	0.0	3985.6	0.0	3672
8640 min Summer	1.175	0.0	4064.8	0.0	4400
10080 min Summer	1.024	0.0	4132.6	0.0	5112
15 min Winter	205.488	0.0	1380.8	133.2	21

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Cascade Summary of Results for Lagoon 22 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	23.511	1.711	211.4	502.4	713.8	1132.9	O K
60 min Winter	23.488	1.688	209.8	354.3	564.2	1110.4	O K
120 min Winter	23.448	1.648	207.0	142.2	349.3	1071.1	O K
180 min Winter	23.387	1.587	202.7	0.0	202.7	1013.2	O K
240 min Winter	23.261	1.461	193.4	0.0	193.4	897.8	O K
360 min Winter	23.038	1.238	175.6	0.0	175.6	709.5	O K
480 min Winter	22.855	1.055	159.7	0.0	159.7	570.7	O K
600 min Winter	22.709	0.909	145.6	0.0	145.6	468.4	O K
720 min Winter	22.591	0.791	133.3	0.0	133.3	392.1	O K
960 min Winter	22.448	0.648	116.5	0.0	116.5	306.2	O K
1440 min Winter	22.278	0.478	92.7	0.0	92.7	213.2	O K
2160 min Winter	22.160	0.360	71.6	0.0	71.6	153.6	O K
2880 min Winter	22.103	0.303	58.9	0.0	58.9	126.9	O K
4320 min Winter	22.044	0.244	41.3	0.0	41.3	99.8	O K
5760 min Winter	22.003	0.203	31.8	0.0	31.8	82.2	O K
7200 min Winter	21.978	0.178	26.2	0.0	26.2	71.1	O K
8640 min Winter	21.964	0.164	22.2	0.0	22.2	65.3	O K
10080 min Winter	21.954	0.154	19.4	0.0	19.4	61.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.769	0.0	1556.1	219.3	29
60 min Winter	65.223	0.0	1754.5	222.3	46
120 min Winter	36.746	0.0	1977.0	101.1	86
180 min Winter	26.269	0.0	2120.0	0.0	130
240 min Winter	20.702	0.0	2227.7	0.0	164
360 min Winter	14.799	0.0	2388.9	0.0	230
480 min Winter	11.663	0.0	2510.2	0.0	294
600 min Winter	9.696	0.0	2608.5	0.0	354
720 min Winter	8.338	0.0	2691.7	0.0	414
960 min Winter	6.804	0.0	2928.6	0.0	532
1440 min Winter	5.108	0.0	3298.1	0.0	766
2160 min Winter	3.835	0.0	3715.5	0.0	1116
2880 min Winter	3.130	0.0	4042.4	0.0	1472
4320 min Winter	2.180	0.0	4223.1	0.0	2188
5760 min Winter	1.687	0.0	4357.6	0.0	2936
7200 min Winter	1.382	0.0	4464.0	0.0	3672
8640 min Winter	1.175	0.0	4552.8	0.0	4400
10080 min Winter	1.024	0.0	4628.8	0.0	5104

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Cascade Model Details for Lagoon 22 Primary.srcx

Storage is Online Cover Level (m) 24.000

Tank or Pond Structure

Invert Level (m) 21.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	375.1	1.000	703.9	2.000	1133.5	3.000	0.0
0.200	432.8	1.200	781.7	2.200	1231.5	3.200	0.0
0.400	494.5	1.400	863.6	2.400	0.0		
0.600	560.3	1.600	949.5	2.600	0.0		
0.800	630.1	1.800	1039.5	2.800	0.0		

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	23.500	Upstream Invert Level (m)	21.800
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 8.000 Invert Level (m) 23.400

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Cascade Summary of Results for Lagoon 22 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 22 Primary.srcx		(None)	(None)

Half Drain Time exceeds 7 days.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	22.274	0.674	1.5	1194.0	O K
30 min Summer	22.347	0.747	1.6	1348.6	O K
60 min Summer	22.426	0.826	1.7	1522.3	O K
120 min Summer	22.512	0.912	1.8	1717.2	O K
180 min Summer	22.566	0.966	1.9	1842.0	O K
240 min Summer	22.605	1.005	1.9	1935.4	O K
360 min Summer	22.662	1.062	2.0	2073.2	O K
480 min Summer	22.702	1.102	2.0	2172.9	O K
600 min Summer	22.733	1.133	2.0	2250.7	O K
720 min Summer	22.758	1.158	2.1	2314.5	O K
960 min Summer	22.831	1.231	2.2	2503.0	O K
1440 min Summer	22.937	1.337	2.3	2785.5	O K
2160 min Summer	23.044	1.444	2.4	3082.1	O K
2880 min Summer	23.118	1.518	2.5	3295.7	O K
4320 min Summer	23.124	1.524	2.5	3312.5	O K
5760 min Summer	23.115	1.515	2.5	3287.1	O K
7200 min Summer	23.099	1.499	2.5	3239.2	O K
8640 min Summer	23.077	1.477	2.4	3177.7	O K
10080 min Summer	23.054	1.454	2.4	3110.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	205.488	0.0	302
30 min Summer	115.769	0.0	309
60 min Summer	65.223	0.0	328
120 min Summer	36.746	0.0	368
180 min Summer	26.269	0.0	402
240 min Summer	20.702	0.0	436
360 min Summer	14.799	0.0	512
480 min Summer	11.663	0.0	610
600 min Summer	9.696	0.0	720
720 min Summer	8.338	0.0	836
960 min Summer	6.804	0.0	1068
1440 min Summer	5.108	0.0	1532
2160 min Summer	3.835	0.0	2236
2880 min Summer	3.130	0.0	2944
4320 min Summer	2.180	0.0	4368
5760 min Summer	1.687	0.0	5792
7200 min Summer	1.382	0.0	7224
8640 min Summer	1.175	0.0	8648
10080 min Summer	1.024	0.0	9560

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Cascade Summary of Results for Lagoon 22 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	22.343	0.743	1.6	1340.7	O K
30 min Winter	22.423	0.823	1.7	1514.0	O K
60 min Winter	22.509	0.909	1.8	1708.7	O K
120 min Winter	22.601	1.001	1.9	1926.9	O K
180 min Winter	22.659	1.059	2.0	2066.4	O K
240 min Winter	22.701	1.101	2.0	2171.2	O K
360 min Winter	22.763	1.163	2.1	2326.4	O K
480 min Winter	22.807	1.207	2.1	2439.7	O K
600 min Winter	22.841	1.241	2.2	2528.1	O K
720 min Winter	22.868	1.268	2.2	2600.7	O K
960 min Winter	22.948	1.348	2.3	2814.2	O K
1440 min Winter	23.062	1.462	2.4	3135.0	O K
2160 min Winter	23.179	1.579	2.6	3474.2	O K
2880 min Winter	23.261	1.661	2.7	3720.7	O K
4320 min Winter	23.271	1.671	2.7	3752.4	O K
5760 min Winter	23.266	1.666	2.7	3737.1	O K
7200 min Winter	23.253	1.653	2.6	3697.1	O K
8640 min Winter	23.235	1.635	2.6	3642.8	O K
10080 min Winter	23.214	1.614	2.6	3579.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	205.488	0.0	298
30 min Winter	115.769	0.0	304
60 min Winter	65.223	0.0	324
120 min Winter	36.746	0.0	370
180 min Winter	26.269	0.0	408
240 min Winter	20.702	0.0	442
360 min Winter	14.799	0.0	516
480 min Winter	11.663	0.0	606
600 min Winter	9.696	0.0	712
720 min Winter	8.338	0.0	824
960 min Winter	6.804	0.0	1050
1440 min Winter	5.108	0.0	1508
2160 min Winter	3.835	0.0	2204
2880 min Winter	3.130	0.0	2900
4320 min Winter	2.180	0.0	4296
5760 min Winter	1.687	0.0	5672
7200 min Winter	1.382	0.0	7032
8640 min Winter	1.175	0.0	8368
10080 min Winter	1.024	0.0	9656

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Cascade Model Details for Lagoon 22 Infiltration.srcx

Storage is Online Cover Level (m) 24.000

Infiltration Basin Structure

Invert Level (m) 21.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00410 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00410

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1472.0	0.800	2200.0	1.600	2994.0	2.400	3852.0
0.200	1648.0	1.000	2393.0	1.800	3202.0	2.600	0.0
0.400	1828.0	1.200	2589.0	2.000	3415.0	2.800	0.0
0.600	2012.0	1.400	2789.0	2.200	3631.0	3.000	0.0

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Cascade Summary of Results for Lagoon 23 Infiltration.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 23 Primary.srcx	(None)	(None)

Half Drain Time exceeds 7 days.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	23.919	0.519	0.6	1029.1	O K
30 min Summer	23.986	0.586	0.7	1178.2	O K
60 min Summer	24.061	0.661	0.7	1347.8	O K
120 min Summer	24.145	0.745	0.7	1541.6	O K
180 min Summer	24.198	0.798	0.8	1667.6	O K
240 min Summer	24.237	0.837	0.8	1763.2	O K
360 min Summer	24.296	0.896	0.8	1907.1	O K
480 min Summer	24.340	0.940	0.8	2016.1	O K
600 min Summer	24.375	0.975	0.8	2104.8	O K
720 min Summer	24.404	1.004	0.8	2180.0	O K
960 min Summer	24.496	1.096	0.9	2419.2	O K
1440 min Summer	24.637	1.237	0.9	2801.2	O K
2160 min Summer	24.793	1.393	1.0	3243.8	O K
2880 min Summer	24.913	1.513	1.1	3597.0	O K
4320 min Summer	25.001	1.601	1.1	3864.7	O K
5760 min Summer	25.063	1.663	1.1	4058.6	O K
7200 min Summer	25.110	1.710	1.2	4209.2	O K
8640 min Summer	25.148	1.748	1.2	4330.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	208.838	0.0	393
30 min Summer	116.069	0.0	398
60 min Summer	64.509	0.0	414
120 min Summer	35.853	0.0	450
180 min Summer	25.428	0.0	496
240 min Summer	19.927	0.0	546
360 min Summer	14.132	0.0	650
480 min Summer	11.075	0.0	760
600 min Summer	9.167	0.0	872
720 min Summer	7.855	0.0	986
960 min Summer	6.405	0.0	1216
1440 min Summer	4.804	0.0	1682
2160 min Summer	3.603	0.0	2388
2880 min Summer	2.938	0.0	3096
4320 min Summer	2.084	0.0	4516
5760 min Summer	1.633	0.0	5944
7200 min Summer	1.351	0.0	7376
8640 min Summer	1.158	0.0	8800

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Cascade Summary of Results for Lagoon 23 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	25.180	1.780	1.2	4431.6	O K
15 min Winter	23.954	0.554	0.7	1105.1	O K
30 min Winter	24.024	0.624	0.7	1262.7	O K
60 min Winter	24.102	0.702	0.7	1441.7	O K
120 min Winter	24.189	0.789	0.8	1645.9	O K
180 min Winter	24.244	0.844	0.8	1778.6	O K
240 min Winter	24.285	0.885	0.8	1879.1	O K
360 min Winter	24.345	0.945	0.8	2030.5	O K
480 min Winter	24.390	0.990	0.8	2145.1	O K
600 min Winter	24.427	1.027	0.9	2238.2	O K
720 min Winter	24.457	1.057	0.9	2317.2	O K
960 min Winter	24.552	1.152	0.9	2568.4	O K
1440 min Winter	24.697	1.297	1.0	2969.2	O K
2160 min Winter	24.858	1.458	1.0	3432.9	O K
2880 min Winter	24.980	1.580	1.1	3802.6	O K
4320 min Winter	25.071	1.671	1.1	4083.4	O K
5760 min Winter	25.135	1.735	1.2	4286.8	O K
7200 min Winter	25.184	1.784	1.2	4445.0	O K
8640 min Winter	25.223	1.823	1.2	4572.9	O K
10080 min Winter	25.255	1.855	1.2	4679.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.016	0.0	10232
15 min Winter	208.838	0.0	388
30 min Winter	116.069	0.0	394
60 min Winter	64.509	0.0	410
120 min Winter	35.853	0.0	448
180 min Winter	25.428	0.0	490
240 min Winter	19.927	0.0	540
360 min Winter	14.132	0.0	642
480 min Winter	11.075	0.0	752
600 min Winter	9.167	0.0	862
720 min Winter	7.855	0.0	972
960 min Winter	6.405	0.0	1198
1440 min Winter	4.804	0.0	1654
2160 min Winter	3.603	0.0	2348
2880 min Winter	2.938	0.0	3044
4320 min Winter	2.084	0.0	4444
5760 min Winter	1.633	0.0	5848
7200 min Winter	1.351	0.0	7256
8640 min Winter	1.158	0.0	8664
10080 min Winter	1.016	0.0	10080

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Cascade Model Details for Lagoon 23 Infiltration.srcx

Storage is Online Cover Level (m) 26.000

Infiltration Basin Structure

Invert Level (m) 23.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00180 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00180

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1793.0	1.400	2907.9	2.800	0.0	4.200	0.0
0.200	1938.0	1.600	3084.8	3.000	0.0	4.400	0.0
0.400	2088.0	1.800	3265.0	3.200	0.0	4.600	0.0
0.600	2243.0	2.000	3450.0	3.400	0.0	4.800	0.0
0.800	2402.0	2.200	3639.0	3.600	0.0	5.000	0.0
1.000	2566.6	2.400	3832.0	3.800	0.0		
1.200	2735.0	2.600	4029.0	4.000	0.0		

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Cascade Summary of Results for Lagoon 23 Infiltration.srcx

	Upstream Structures	Outflow To	Overflow To
	Lagoon 23 Primary.srcx	(None)	(None)

Half Drain Time : 5855 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	24.082	0.682	3.1	990.0	O K
30 min Summer	24.169	0.769	3.3	1136.9	O K
60 min Summer	24.264	0.864	3.5	1303.1	O K
120 min Summer	24.368	0.968	3.7	1490.9	O K
180 min Summer	24.432	1.032	3.8	1610.3	O K
240 min Summer	24.479	1.079	3.9	1698.8	O K
360 min Summer	24.545	1.145	4.1	1827.4	O K
480 min Summer	24.592	1.192	4.2	1920.2	O K
600 min Summer	24.628	1.228	4.3	1992.2	O K
720 min Summer	24.656	1.256	4.3	2050.4	O K
960 min Summer	24.753	1.353	4.5	2250.8	O K
1440 min Summer	24.892	1.492	4.8	2551.0	O K
2160 min Summer	25.031	1.631	5.1	2863.5	O K
2880 min Summer	25.124	1.724	5.3	3080.9	O K
4320 min Summer	25.130	1.730	5.4	3096.9	O K
5760 min Summer	25.117	1.717	5.3	3066.4	O K
7200 min Summer	25.103	1.703	5.3	3033.4	O K
8640 min Summer	25.088	1.688	5.3	2996.6	O K
10080 min Summer	25.071	1.671	5.2	2957.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	208.838	0.0	264
30 min Summer	116.069	0.0	274
60 min Summer	64.509	0.0	294
120 min Summer	35.853	0.0	334
180 min Summer	25.428	0.0	380
240 min Summer	19.927	0.0	428
360 min Summer	14.132	0.0	530
480 min Summer	11.075	0.0	636
600 min Summer	9.167	0.0	744
720 min Summer	7.855	0.0	854
960 min Summer	6.405	0.0	1076
1440 min Summer	4.804	0.0	1530
2160 min Summer	3.603	0.0	2216
2880 min Summer	2.938	0.0	2912
4320 min Summer	2.084	0.0	4328
5760 min Summer	1.633	0.0	4992
7200 min Summer	1.351	0.0	5728
8640 min Summer	1.158	0.0	6472
10080 min Summer	1.016	0.0	7272

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Cascade Summary of Results for Lagoon 23 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	24.127	0.727	3.2	1065.0	O K
30 min Winter	24.217	0.817	3.4	1220.4	O K
60 min Winter	24.316	0.916	3.6	1395.9	O K
120 min Winter	24.423	1.023	3.8	1593.9	O K
180 min Winter	24.490	1.090	4.0	1719.9	O K
240 min Winter	24.538	1.138	4.1	1813.2	O K
360 min Winter	24.606	1.206	4.2	1949.3	O K
480 min Winter	24.655	1.255	4.3	2047.8	O K
600 min Winter	24.692	1.292	4.4	2124.4	O K
720 min Winter	24.722	1.322	4.5	2186.5	O K
960 min Winter	24.823	1.423	4.7	2399.3	O K
1440 min Winter	24.967	1.567	5.0	2719.2	O K
2160 min Winter	25.112	1.712	5.3	3053.7	O K
2880 min Winter	25.210	1.810	5.5	3288.1	O K
4320 min Winter	25.222	1.822	5.6	3319.5	O K
5760 min Winter	25.208	1.808	5.5	3284.0	O K
7200 min Winter	25.186	1.786	5.5	3231.7	O K
8640 min Winter	25.168	1.768	5.4	3187.3	O K
10080 min Winter	25.147	1.747	5.4	3136.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	208.838	0.0	264
30 min Winter	116.069	0.0	273
60 min Winter	64.509	0.0	292
120 min Winter	35.853	0.0	334
180 min Winter	25.428	0.0	380
240 min Winter	19.927	0.0	426
360 min Winter	14.132	0.0	526
480 min Winter	11.075	0.0	630
600 min Winter	9.167	0.0	736
720 min Winter	7.855	0.0	842
960 min Winter	6.405	0.0	1062
1440 min Winter	4.804	0.0	1506
2160 min Winter	3.603	0.0	2180
2880 min Winter	2.938	0.0	2868
4320 min Winter	2.084	0.0	4204
5760 min Winter	1.633	0.0	5440
7200 min Winter	1.351	0.0	5896
8640 min Winter	1.158	0.0	6768
10080 min Winter	1.016	0.0	7696

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Cascade Model Details for Lagoon 23 Infiltration.srcx

Storage is Online Cover Level (m) 26.000

Infiltration Basin Structure

Invert Level (m) 23.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01090 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01090

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1250.6	1.400	2140.8	2.800	0.0	4.200	0.0
0.200	1365.7	1.600	2284.0	3.000	0.0	4.400	0.0
0.400	1484.8	1.800	2431.3	3.200	0.0	4.600	0.0
0.600	1607.9	2.000	2582.6	3.400	0.0	4.800	0.0
0.800	1735.1	2.200	2737.9	3.600	0.0	5.000	0.0
1.000	1866.3	2.400	2897.2	3.800	0.0		
1.200	2001.5	2.600	3060.6	4.000	0.0		

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Cascade Summary of Results for Lagoon 24 Primary REV 3.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 24 Infiltration REV 4.srcx	Lagoon 24 Infiltration REV 4.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	23.457	1.457	190.3	0.0	190.3	746.0	O K
30 min Summer	23.483	1.483	192.2	0.0	192.2	767.2	O K
60 min Summer	23.433	1.433	188.5	0.0	188.5	725.6	O K
120 min Summer	23.318	1.318	179.7	0.0	179.7	635.4	O K
180 min Summer	23.210	1.210	170.9	0.0	170.9	555.9	O K
240 min Summer	23.114	1.114	162.8	0.0	162.8	489.6	O K
360 min Summer	22.953	0.953	148.1	0.0	148.1	388.1	O K
480 min Summer	22.827	0.827	135.5	0.0	135.5	316.0	O K
600 min Summer	22.726	0.726	124.6	0.0	124.6	263.7	O K
720 min Summer	22.645	0.645	115.0	0.0	115.0	224.6	O K
960 min Summer	22.551	0.551	102.9	0.0	102.9	182.6	O K
1440 min Summer	22.432	0.432	85.0	0.0	85.0	134.1	O K
2160 min Summer	22.340	0.340	67.9	0.0	67.9	100.3	O K
2880 min Summer	22.295	0.295	56.9	0.0	56.9	84.8	O K
4320 min Summer	22.241	0.241	40.3	0.0	40.3	67.0	O K
5760 min Summer	22.202	0.202	31.6	0.0	31.6	55.0	O K
7200 min Summer	22.177	0.177	26.1	0.0	26.1	47.6	O K
8640 min Summer	22.164	0.164	22.3	0.0	22.3	43.7	O K
10080 min Summer	22.155	0.155	19.6	0.0	19.6	40.9	O K
15 min Winter	23.571	1.571	198.6	0.0	198.6	843.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.764	0.0	904.6	0.0	22
30 min Summer	115.712	0.0	1007.7	0.0	33
60 min Summer	64.445	0.0	1122.9	0.0	50
120 min Summer	35.892	0.0	1250.8	0.0	84
180 min Summer	25.486	0.0	1332.3	0.0	116
240 min Summer	19.990	0.0	1393.3	0.0	150
360 min Summer	14.194	0.0	1484.0	0.0	212
480 min Summer	11.133	0.0	1552.0	0.0	272
600 min Summer	9.221	0.0	1606.8	0.0	332
720 min Summer	7.905	0.0	1653.0	0.0	392
960 min Summer	6.474	0.0	1804.9	0.0	510
1440 min Summer	4.885	0.0	2042.9	0.0	746
2160 min Summer	3.686	0.0	2312.9	0.0	1104
2880 min Summer	3.019	0.0	2525.4	0.0	1468
4320 min Summer	2.132	0.0	2674.3	0.0	2200
5760 min Summer	1.665	0.0	2786.0	0.0	2928
7200 min Summer	1.375	0.0	2875.4	0.0	3672
8640 min Summer	1.176	0.0	2950.5	0.0	4328
10080 min Summer	1.030	0.0	3015.3	0.0	5024
15 min Winter	207.764	0.0	1013.3	0.0	23

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Cascade Summary of Results for Lagoon 24 Primary REV 3.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	23.603	1.603	200.8	1.2	202.1	871.6	O K
60 min Winter	23.547	1.547	196.9	0.0	196.9	822.5	O K
120 min Winter	23.398	1.398	185.8	0.0	185.8	697.2	O K
180 min Winter	23.250	1.250	174.2	0.0	174.2	584.5	O K
240 min Winter	23.118	1.118	163.1	0.0	163.1	491.9	O K
360 min Winter	22.900	0.900	143.0	0.0	143.0	357.1	O K
480 min Winter	22.738	0.738	126.0	0.0	126.0	269.7	O K
600 min Winter	22.618	0.618	111.7	0.0	111.7	212.2	O K
720 min Winter	22.529	0.529	99.8	0.0	99.8	173.2	O K
960 min Winter	22.433	0.433	85.0	0.0	85.0	134.4	O K
1440 min Winter	22.332	0.332	66.1	0.0	66.1	97.2	O K
2160 min Winter	22.274	0.274	50.5	0.0	50.5	77.8	O K
2880 min Winter	22.244	0.244	41.4	0.0	41.4	68.1	O K
4320 min Winter	22.191	0.191	29.2	0.0	29.2	51.8	O K
5760 min Winter	22.166	0.166	22.9	0.0	22.9	44.3	O K
7200 min Winter	22.153	0.153	19.0	0.0	19.0	40.3	O K
8640 min Winter	22.143	0.143	16.2	0.0	16.2	37.6	O K
10080 min Winter	22.135	0.135	14.2	0.0	14.2	35.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.712	0.0	1128.7	0.1	33
60 min Winter	64.445	0.0	1257.7	0.0	54
120 min Winter	35.892	0.0	1400.9	0.0	90
180 min Winter	25.486	0.0	1492.2	0.0	124
240 min Winter	19.990	0.0	1560.5	0.0	158
360 min Winter	14.194	0.0	1662.1	0.0	220
480 min Winter	11.133	0.0	1738.2	0.0	280
600 min Winter	9.221	0.0	1799.7	0.0	340
720 min Winter	7.905	0.0	1851.4	0.0	398
960 min Winter	6.474	0.0	2021.6	0.0	514
1440 min Winter	4.885	0.0	2288.2	0.0	746
2160 min Winter	3.686	0.0	2590.4	0.0	1104
2880 min Winter	3.019	0.0	2828.5	0.0	1472
4320 min Winter	2.132	0.0	2995.4	0.0	2204
5760 min Winter	1.665	0.0	3120.4	0.0	2912
7200 min Winter	1.375	0.0	3220.5	0.0	3648
8640 min Winter	1.176	0.0	3304.6	0.0	4280
10080 min Winter	1.030	0.0	3377.3	0.0	5136

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Cascade Model Details for Lagoon 24 Primary REV 3.srcx

Storage is Online Cover Level (m) 24.000

Tank or Pond Structure

Invert Level (m) 22.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	241.3	0.800	530.6	1.600	898.8	2.400	0.0
0.200	303.7	1.000	616.6	1.800	1000.9	2.600	0.0
0.400	372.7	1.200	706.6	2.000	1107.0	2.800	0.0
0.600	448.7	1.400	800.7	2.200	0.0	3.000	0.0

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	200.0	Coefficient of Contraction	0.600
Length (m)	25.000	Upstream Invert Level (m)	22.000
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 23.600

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Cascade Summary of Results for Lagoon 24 Infiltration REV 4.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 24 Primary REV 3.srcx	(None)	(None)

Half Drain Time exceeds 7 days.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	22.332	0.532	0.4	893.0	O K
30 min Summer	22.386	0.586	0.4	995.7	O K
60 min Summer	22.445	0.645	0.4	1109.9	O K
120 min Summer	22.508	0.708	0.5	1237.0	O K
180 min Summer	22.548	0.748	0.5	1317.8	O K
240 min Summer	22.578	0.778	0.5	1378.0	O K
360 min Summer	22.620	0.820	0.5	1466.5	O K
480 min Summer	22.651	0.851	0.5	1531.8	O K
600 min Summer	22.675	0.875	0.5	1583.9	O K
720 min Summer	22.696	0.896	0.5	1627.5	O K
960 min Summer	22.762	0.962	0.5	1773.4	O K
1440 min Summer	22.863	1.063	0.6	1999.0	O K
2160 min Summer	22.969	1.169	0.6	2248.9	O K
2880 min Summer	23.049	1.249	0.6	2441.0	O K
4320 min Summer	23.094	1.294	0.6	2550.9	O K
5760 min Summer	23.122	1.322	0.6	2622.3	O K
7200 min Summer	23.142	1.342	0.6	2671.5	O K
8640 min Summer	23.155	1.355	0.7	2706.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.764	0.0	324
30 min Summer	115.712	0.0	335
60 min Summer	64.445	0.0	354
120 min Summer	35.892	0.0	384
180 min Summer	25.486	0.0	418
240 min Summer	19.990	0.0	456
360 min Summer	14.194	0.0	554
480 min Summer	11.133	0.0	666
600 min Summer	9.221	0.0	782
720 min Summer	7.905	0.0	896
960 min Summer	6.474	0.0	1128
1440 min Summer	4.885	0.0	1594
2160 min Summer	3.686	0.0	2300
2880 min Summer	3.019	0.0	3012
4320 min Summer	2.132	0.0	4436
5760 min Summer	1.665	0.0	5864
7200 min Summer	1.375	0.0	7296
8640 min Summer	1.176	0.0	8728

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Cascade Summary of Results for Lagoon 24 Infiltration REV 4.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	23.165	1.365	0.7	2730.8	O K
15 min Winter	22.389	0.589	0.4	1001.2	O K
30 min Winter	22.448	0.648	0.4	1116.2	O K
60 min Winter	22.512	0.712	0.5	1244.2	O K
120 min Winter	22.582	0.782	0.5	1386.6	O K
180 min Winter	22.625	0.825	0.5	1477.1	O K
240 min Winter	22.657	0.857	0.5	1544.6	O K
360 min Winter	22.703	0.903	0.5	1644.2	O K
480 min Winter	22.737	0.937	0.5	1717.7	O K
600 min Winter	22.764	0.964	0.5	1776.4	O K
720 min Winter	22.786	0.986	0.5	1825.4	O K
960 min Winter	22.858	1.058	0.6	1989.4	O K
1440 min Winter	22.967	1.167	0.6	2243.5	O K
2160 min Winter	23.083	1.283	0.6	2525.3	O K
2880 min Winter	23.170	1.370	0.7	2742.5	O K
4320 min Winter	23.219	1.419	0.7	2869.4	O K
5760 min Winter	23.251	1.451	0.7	2953.1	O K
7200 min Winter	23.274	1.474	0.7	3012.0	O K
8640 min Winter	23.290	1.490	0.7	3054.7	O K
10080 min Winter	23.302	1.502	0.7	3086.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.030	0.0	10160
15 min Winter	207.764	0.0	329
30 min Winter	115.712	0.0	339
60 min Winter	64.445	0.0	358
120 min Winter	35.892	0.0	392
180 min Winter	25.486	0.0	424
240 min Winter	19.990	0.0	458
360 min Winter	14.194	0.0	548
480 min Winter	11.133	0.0	656
600 min Winter	9.221	0.0	770
720 min Winter	7.905	0.0	882
960 min Winter	6.474	0.0	1112
1440 min Winter	4.885	0.0	1570
2160 min Winter	3.686	0.0	2268
2880 min Winter	3.019	0.0	2968
4320 min Winter	2.132	0.0	4376
5760 min Winter	1.665	0.0	5792
7200 min Winter	1.375	0.0	7200
8640 min Winter	1.176	0.0	8600
10080 min Winter	1.030	0.0	10008

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Cascade Model Details for Lagoon 24 Infiltration REV 4.srcx

Storage is Online Cover Level (m) 24.000

Infiltration Basin Structure

Invert Level (m) 21.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00130 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00130

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1488.1	0.800	2084.3	1.600	2744.9	2.400	0.0
0.200	1631.1	1.000	2243.4	1.800	2920.1	2.600	0.0
0.400	1778.1	1.200	2406.5	2.000	3099.0	2.800	0.0
0.600	1929.2	1.400	2573.7	2.200	3282.0	3.000	0.0

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Cascade Summary of Results for Lagoon 25 Primary.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Lagoon 25 Infiltration.srcx	Lagoon 25 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	25.049	2.049	230.2	0.0	230.2	304.8	O K
30 min Summer	24.952	1.952	224.1	0.0	224.1	272.0	O K
60 min Summer	24.761	1.761	211.7	0.0	211.7	214.3	O K
120 min Summer	24.461	1.461	190.6	0.0	190.6	140.7	O K
180 min Summer	24.223	1.223	172.0	0.0	172.0	95.8	O K
240 min Summer	24.037	1.037	155.9	0.0	155.9	68.0	O K
360 min Summer	23.781	0.781	130.6	0.0	130.6	39.0	O K
480 min Summer	23.622	0.622	112.1	0.0	112.1	25.7	O K
600 min Summer	23.519	0.519	98.4	0.0	98.4	18.8	O K
720 min Summer	23.449	0.449	87.7	0.0	87.7	14.8	O K
960 min Summer	23.383	0.383	76.3	0.0	76.3	11.5	O K
1440 min Summer	23.319	0.319	63.3	0.0	63.3	8.7	O K
2160 min Summer	23.284	0.284	53.5	0.0	53.5	7.4	O K
2880 min Summer	23.265	0.265	47.6	0.0	47.6	6.7	O K
4320 min Summer	23.225	0.225	36.6	0.0	36.6	5.3	O K
5760 min Summer	23.195	0.195	30.1	0.0	30.1	4.4	O K
7200 min Summer	23.176	0.176	25.7	0.0	25.7	3.8	O K
8640 min Summer	23.164	0.164	22.3	0.0	22.3	3.5	O K
10080 min Summer	23.156	0.156	20.0	0.0	20.0	3.3	O K
15 min Winter	25.170	2.170	237.5	0.0	237.5	349.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	711.2	0.0	17
30 min Summer	115.526	0.0	810.6	0.0	26
60 min Summer	64.252	0.0	947.7	0.0	42
120 min Summer	35.735	0.0	1077.2	0.0	74
180 min Summer	25.354	0.0	1161.5	0.0	104
240 min Summer	19.875	0.0	1225.6	0.0	132
360 min Summer	14.101	0.0	1322.5	0.0	192
480 min Summer	11.054	0.0	1396.2	0.0	250
600 min Summer	9.151	0.0	1456.4	0.0	310
720 min Summer	7.843	0.0	1507.7	0.0	370
960 min Summer	6.426	0.0	1680.7	0.0	490
1440 min Summer	4.853	0.0	1961.6	0.0	736
2160 min Summer	3.665	0.0	2341.1	0.0	1100
2880 min Summer	3.003	0.0	2613.0	0.0	1468
4320 min Summer	2.119	0.0	2793.6	0.0	2200
5760 min Summer	1.654	0.0	3025.1	0.0	2936
7200 min Summer	1.365	0.0	3135.7	0.0	3672
8640 min Summer	1.167	0.0	3229.4	0.0	4400
10080 min Summer	1.022	0.0	3311.0	0.0	5136
15 min Winter	207.717	0.0	767.7	0.0	18

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Cascade Summary of Results for Lagoon 25 Primary.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	25.068	2.068	231.3	0.0	231.3	311.6	O K
60 min Winter	24.821	1.821	215.7	0.0	215.7	231.3	O K
120 min Winter	24.399	1.399	185.9	0.0	185.9	127.9	O K
180 min Winter	24.076	1.076	159.4	0.0	159.4	73.3	O K
240 min Winter	23.846	0.846	137.5	0.0	137.5	45.4	O K
360 min Winter	23.583	0.583	107.2	0.0	107.2	23.0	O K
480 min Winter	23.457	0.457	88.9	0.0	88.9	15.2	O K
600 min Winter	23.387	0.387	77.1	0.0	77.1	11.7	O K
720 min Winter	23.345	0.345	68.9	0.0	68.9	9.8	O K
960 min Winter	23.307	0.307	60.7	0.0	60.7	8.2	O K
1440 min Winter	23.278	0.278	51.6	0.0	51.6	7.1	O K
2160 min Winter	23.250	0.250	43.1	0.0	43.1	6.1	O K
2880 min Winter	23.228	0.228	37.3	0.0	37.3	5.4	O K
4320 min Winter	23.184	0.184	27.5	0.0	27.5	4.1	O K
5760 min Winter	23.163	0.163	22.1	0.0	22.1	3.5	O K
7200 min Winter	23.151	0.151	18.5	0.0	18.5	3.2	O K
8640 min Winter	23.142	0.142	15.9	0.0	15.9	2.9	O K
10080 min Winter	23.134	0.134	14.1	0.0	14.1	2.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.526	0.0	873.5	0.0	27
60 min Winter	64.252	0.0	1017.6	0.0	44
120 min Winter	35.735	0.0	1154.9	0.0	76
180 min Winter	25.354	0.0	1244.3	0.0	106
240 min Winter	19.875	0.0	1312.1	0.0	134
360 min Winter	14.101	0.0	1414.5	0.0	192
480 min Winter	11.054	0.0	1492.4	0.0	252
600 min Winter	9.151	0.0	1556.0	0.0	314
720 min Winter	7.843	0.0	1610.1	0.0	374
960 min Winter	6.426	0.0	1792.6	0.0	512
1440 min Winter	4.853	0.0	2088.4	0.0	764
2160 min Winter	3.665	0.0	2484.7	0.0	1144
2880 min Winter	3.003	0.0	2769.8	0.0	1528
4320 min Winter	2.119	0.0	2959.6	0.0	2248
5760 min Winter	1.654	0.0	3197.9	0.0	2944
7200 min Winter	1.365	0.0	3313.9	0.0	3672
8640 min Winter	1.167	0.0	3412.2	0.0	4376
10080 min Winter	1.022	0.0	3497.8	0.0	5136

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Cascade Model Details for Lagoon 25 Primary.srcx

Storage is Online Cover Level (m) 25.800

Tank or Pond Structure

Invert Level (m) 23.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	16.0	1.000	127.3	2.000	339.0	3.000	0.0
0.200	30.1	1.200	161.6	2.200	393.6	3.200	0.0
0.400	48.4	1.400	200.0	2.400	452.1	3.400	0.0
0.600	70.7	1.600	242.3	2.600	514.6	3.600	0.0
0.800	96.9	1.800	288.7	2.800	581.1	3.800	0.0

Pipe Outflow Control

Diameter (m) 0.300 Entry Loss Coefficient 0.500
Slope (1:X) 200.0 Coefficient of Contraction 0.600
Length (m) 25.000 Upstream Invert Level (m) 23.000
Roughness k (mm) 0.600

Weir Overflow Control

Discharge Coef 0.544 Width (m) 7.000 Invert Level (m) 25.400

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Cascade Summary of Results for Lagoon 25 Infiltration.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 25 Primary.srcx	(None)	(None)

Half Drain Time exceeds 7 days.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	23.536	0.736	0.3	686.5	O K
30 min Summer	23.618	0.818	0.4	785.4	O K
60 min Summer	23.708	0.908	0.4	898.2	O K
120 min Summer	23.805	1.005	0.4	1027.1	O K
180 min Summer	23.866	1.066	0.4	1111.0	O K
240 min Summer	23.911	1.111	0.5	1174.7	O K
360 min Summer	23.976	1.176	0.5	1270.9	O K
480 min Summer	24.025	1.225	0.5	1343.9	O K
600 min Summer	24.064	1.264	0.5	1403.4	O K
720 min Summer	24.096	1.296	0.5	1454.0	O K
960 min Summer	24.202	1.402	0.5	1624.7	O K
1440 min Summer	24.364	1.564	0.6	1900.4	O K
2160 min Summer	24.539	1.739	0.7	2222.9	O K
2880 min Summer	24.672	1.872	0.7	2484.0	O K
4320 min Summer	24.752	1.952	0.7	2646.3	O K
5760 min Summer	24.807	2.007	0.7	2762.9	O K
7200 min Summer	24.849	2.049	0.8	2852.9	O K
8640 min Summer	24.883	2.083	0.8	2925.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	441
30 min Summer	115.526	0.0	452
60 min Summer	64.252	0.0	474
120 min Summer	35.735	0.0	522
180 min Summer	25.354	0.0	572
240 min Summer	19.875	0.0	626
360 min Summer	14.101	0.0	736
480 min Summer	11.054	0.0	846
600 min Summer	9.151	0.0	958
720 min Summer	7.843	0.0	1070
960 min Summer	6.426	0.0	1300
1440 min Summer	4.853	0.0	1762
2160 min Summer	3.665	0.0	2460
2880 min Summer	3.003	0.0	3164
4320 min Summer	2.119	0.0	4572
5760 min Summer	1.654	0.0	5992
7200 min Summer	1.365	0.0	7408
8640 min Summer	1.167	0.0	8824

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Cascade Summary of Results for Lagoon 25 Infiltration.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	24.910	2.110	0.8	2984.9	O K
15 min Winter	23.583	0.783	0.4	742.7	O K
30 min Winter	23.668	0.868	0.4	847.9	O K
60 min Winter	23.761	0.961	0.4	967.7	O K
120 min Winter	23.861	1.061	0.4	1104.4	O K
180 min Winter	23.923	1.123	0.5	1193.2	O K
240 min Winter	23.970	1.170	0.5	1260.7	O K
360 min Winter	24.037	1.237	0.5	1362.4	O K
480 min Winter	24.087	1.287	0.5	1439.5	O K
600 min Winter	24.127	1.327	0.5	1502.4	O K
720 min Winter	24.160	1.360	0.5	1555.7	O K
960 min Winter	24.269	1.469	0.6	1735.8	O K
1440 min Winter	24.434	1.634	0.6	2026.2	O K
2160 min Winter	24.613	1.813	0.7	2365.3	O K
2880 min Winter	24.748	1.948	0.7	2639.5	O K
4320 min Winter	24.830	2.030	0.8	2810.4	O K
5760 min Winter	24.886	2.086	0.8	2933.3	O K
7200 min Winter	24.930	2.130	0.8	3028.2	O K
8640 min Winter	24.964	2.164	0.8	3104.5	O K
10080 min Winter	24.992	2.192	0.8	3167.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.022	0.0	10248
15 min Winter	207.717	0.0	440
30 min Winter	115.526	0.0	451
60 min Winter	64.252	0.0	472
120 min Winter	35.735	0.0	518
180 min Winter	25.354	0.0	568
240 min Winter	19.875	0.0	622
360 min Winter	14.101	0.0	728
480 min Winter	11.054	0.0	836
600 min Winter	9.151	0.0	948
720 min Winter	7.843	0.0	1058
960 min Winter	6.426	0.0	1282
1440 min Winter	4.853	0.0	1732
2160 min Winter	3.665	0.0	2416
2880 min Winter	3.003	0.0	3104
4320 min Winter	2.119	0.0	4488
5760 min Winter	1.654	0.0	5880
7200 min Winter	1.365	0.0	7264
8640 min Winter	1.167	0.0	8656
10080 min Winter	1.022	0.0	10072

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Cascade Model Details for Lagoon 25 Infiltration.srcx

Storage is Online Cover Level (m) 25.800

Infiltration Basin Structure

Invert Level (m) 22.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00150 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00150

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	700.8	0.800	1217.9	1.600	1799.3	2.400	2445.1
0.200	824.3	1.000	1357.2	1.800	1954.7	2.600	2616.6
0.400	951.3	1.200	1500.6	2.000	2114.2	2.800	2792.1
0.600	1082.6	1.400	1647.9	2.200	2277.6	3.000	2971.6

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 372 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	18.222	0.722	23.0	721.1	O K
30 min Summer	18.279	0.779	23.9	790.7	O K
60 min Summer	18.329	0.829	24.8	852.6	O K
120 min Summer	18.360	0.860	25.3	892.0	O K
180 min Summer	18.361	0.861	25.3	893.4	O K
240 min Summer	18.350	0.850	25.1	879.2	O K
360 min Summer	18.320	0.820	24.6	841.2	O K
480 min Summer	18.292	0.792	24.1	806.8	O K
600 min Summer	18.266	0.766	23.7	774.4	O K
720 min Summer	18.241	0.741	23.3	743.7	O K
960 min Summer	18.229	0.729	23.1	729.9	O K
1440 min Summer	18.200	0.700	22.6	694.5	O K
2160 min Summer	18.149	0.649	21.7	635.2	O K
2880 min Summer	18.098	0.598	20.9	576.8	O K
4320 min Summer	17.949	0.449	18.5	415.9	O K
5760 min Summer	17.835	0.335	16.7	299.7	O K
7200 min Summer	17.745	0.245	15.3	213.7	O K
8640 min Summer	17.674	0.174	14.3	148.8	O K
10080 min Summer	17.619	0.119	13.5	100.4	O K
15 min Winter	18.295	0.795	24.2	809.4	O K
30 min Winter	18.358	0.858	25.3	889.1	O K
60 min Winter	18.414	0.914	26.2	961.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	27
30 min Summer	115.526	0.0	41
60 min Summer	64.252	0.0	70
120 min Summer	35.735	0.0	126
180 min Summer	25.354	0.0	184
240 min Summer	19.875	0.0	240
360 min Summer	14.101	0.0	302
480 min Summer	11.054	0.0	362
600 min Summer	9.151	0.0	428
720 min Summer	7.843	0.0	498
960 min Summer	6.426	0.0	636
1440 min Summer	4.853	0.0	914
2160 min Summer	3.665	0.0	1320
2880 min Summer	3.003	0.0	1708
4320 min Summer	2.119	0.0	2468
5760 min Summer	1.654	0.0	3184
7200 min Summer	1.365	0.0	3896
8640 min Summer	1.167	0.0	4592
10080 min Summer	1.022	0.0	5256
15 min Winter	207.717	0.0	27
30 min Winter	115.526	0.0	40
60 min Winter	64.252	0.0	68

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
120 min Winter	18.453	0.953	26.9	1012.6	O K
180 min Winter	18.459	0.959	27.0	1020.7	O K
240 min Winter	18.452	0.952	26.9	1011.1	O K
360 min Winter	18.420	0.920	26.3	969.3	O K
480 min Winter	18.388	0.888	25.8	928.3	O K
600 min Winter	18.358	0.858	25.3	889.3	O K
720 min Winter	18.327	0.827	24.7	850.0	O K
960 min Winter	18.306	0.806	24.4	823.4	O K
1440 min Winter	18.253	0.753	23.5	759.0	O K
2160 min Winter	18.171	0.671	22.1	660.4	O K
2880 min Winter	18.091	0.591	20.8	569.7	O K
4320 min Winter	17.895	0.395	17.7	359.8	O K
5760 min Winter	17.749	0.249	15.4	217.4	O K
7200 min Winter	17.640	0.140	13.8	118.4	O K
8640 min Winter	17.565	0.065	12.7	54.1	O K
10080 min Winter	17.547	0.047	11.6	38.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
120 min Winter	35.735	0.0	124
180 min Winter	25.354	0.0	180
240 min Winter	19.875	0.0	236
360 min Winter	14.101	0.0	338
480 min Winter	11.054	0.0	382
600 min Winter	9.151	0.0	458
720 min Winter	7.843	0.0	536
960 min Winter	6.426	0.0	688
1440 min Winter	4.853	0.0	984
2160 min Winter	3.665	0.0	1408
2880 min Winter	3.003	0.0	1820
4320 min Winter	2.119	0.0	2596
5760 min Winter	1.654	0.0	3296
7200 min Winter	1.365	0.0	3976
8640 min Winter	1.167	0.0	4584
10080 min Winter	1.022	0.0	5088

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Model Details

Storage is Online Cover Level (m) 19.100

Infiltration Basin Structure

Invert Level (m) 17.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.10400 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.10400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	811.0	1.400	1608.0	2.800	1.0	4.200	1.0
0.200	912.0	1.600	1739.0	3.000	1.0	4.400	1.0
0.400	1018.0	1.800	1.0	3.200	1.0	4.600	1.0
0.600	1127.0	2.000	1.0	3.400	1.0	4.800	1.0
0.800	1241.0	2.200	1.0	3.600	1.0	5.000	1.0
1.000	1359.0	2.400	1.0	3.800	1.0		
1.200	1481.0	2.600	1.0	4.000	1.0		

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 20 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	24.597	0.447	0.0	40.6	36.2	76.8	67.1	O K
30 min Summer	24.578	0.428	0.0	40.1	26.1	66.2	60.6	O K
60 min Summer	24.546	0.396	0.0	39.2	11.9	51.1	50.4	O K
120 min Summer	24.492	0.342	0.0	37.6	0.0	37.6	35.7	O K
180 min Summer	24.432	0.282	0.0	35.8	0.0	35.8	23.0	O K
240 min Summer	24.379	0.229	0.0	34.2	0.0	34.2	14.4	O K
360 min Summer	24.290	0.140	0.0	31.2	0.0	31.2	4.9	O K
480 min Summer	24.222	0.072	0.0	28.6	0.0	28.6	1.2	O K
600 min Summer	24.164	0.014	0.0	26.3	0.0	26.3	0.0	O K
720 min Summer	24.150	0.000	0.0	23.8	0.0	23.8	0.0	O K
960 min Summer	24.150	0.000	0.0	21.6	0.0	21.6	0.0	O K
1440 min Summer	24.150	0.000	0.0	19.3	0.0	19.3	0.0	O K
2160 min Summer	24.150	0.000	0.0	19.0	0.0	19.0	0.0	O K
2880 min Summer	24.150	0.000	0.0	18.3	0.0	18.3	0.0	O K
4320 min Summer	24.150	0.000	0.0	15.0	0.0	15.0	0.0	O K
5760 min Summer	24.150	0.000	0.0	12.6	0.0	12.6	0.0	O K
7200 min Summer	24.150	0.000	0.0	11.0	0.0	11.0	0.0	O K
8640 min Summer	24.150	0.000	0.0	9.8	0.0	9.8	0.0	O K
10080 min Summer	24.150	0.000	0.0	8.8	0.0	8.8	0.0	O K
15 min Winter	24.618	0.468	0.0	41.2	48.5	89.7	74.7	O K
30 min Winter	24.597	0.447	0.0	40.6	36.2	76.8	67.0	O K
60 min Winter	24.559	0.409	0.0	39.5	17.0	56.5	54.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	272.6	18.9	16
30 min Summer	115.526	0.0	316.9	16.6	24
60 min Summer	64.252	0.0	382.6	7.3	42
120 min Summer	35.735	0.0	442.4	0.0	76
180 min Summer	25.354	0.0	480.5	0.0	106
240 min Summer	19.875	0.0	510.0	0.0	136
360 min Summer	14.101	0.0	555.1	0.0	192
480 min Summer	11.054	0.0	589.6	0.0	250
600 min Summer	9.151	0.0	617.8	0.0	306
720 min Summer	7.843	0.0	642.0	0.0	0
960 min Summer	6.426	0.0	723.9	0.0	0
1440 min Summer	4.853	0.0	858.7	0.0	0
2160 min Summer	3.665	0.0	1052.8	0.0	0
2880 min Summer	3.003	0.0	1187.3	0.0	0
4320 min Summer	2.119	0.0	1275.6	0.0	0
5760 min Summer	1.654	0.0	1406.3	0.0	0
7200 min Summer	1.365	0.0	1460.8	0.0	0
8640 min Summer	1.167	0.0	1507.1	0.0	0
10080 min Summer	1.022	0.0	1547.5	0.0	0
15 min Winter	207.717	0.0	286.5	27.9	16
30 min Winter	115.526	0.0	332.2	26.0	25
60 min Winter	64.252	0.0	400.9	13.3	42

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
120 min Winter	24.487	0.337	0.0	37.5	0.0	37.5	34.5	O K
180 min Winter	24.399	0.249	0.0	34.8	0.0	34.8	17.3	O K
240 min Winter	24.318	0.168	0.0	32.1	0.0	32.1	7.3	O K
360 min Winter	24.184	0.034	0.0	27.1	0.0	27.1	0.3	O K
480 min Winter	24.150	0.000	0.0	23.2	0.0	23.2	0.0	O K
600 min Winter	24.150	0.000	0.0	20.9	0.0	20.9	0.0	O K
720 min Winter	24.150	0.000	0.0	19.5	0.0	19.5	0.0	O K
960 min Winter	24.150	0.000	0.0	19.0	0.0	19.0	0.0	O K
1440 min Winter	24.150	0.000	0.0	18.6	0.0	18.6	0.0	O K
2160 min Winter	24.150	0.000	0.0	17.1	0.0	17.1	0.0	O K
2880 min Winter	24.150	0.000	0.0	15.5	0.0	15.5	0.0	O K
4320 min Winter	24.150	0.000	0.0	11.8	0.0	11.8	0.0	O K
5760 min Winter	24.150	0.000	0.0	9.5	0.0	9.5	0.0	O K
7200 min Winter	24.150	0.000	0.0	8.1	0.0	8.1	0.0	O K
8640 min Winter	24.150	0.000	0.0	7.0	0.0	7.0	0.0	O K
10080 min Winter	24.150	0.000	0.0	6.2	0.0	6.2	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
120 min Winter	35.735	0.0	460.0	0.0	80
180 min Winter	25.354	0.0	500.7	0.0	110
240 min Winter	19.875	0.0	530.8	0.0	138
360 min Winter	14.101	0.0	576.9	0.0	190
480 min Winter	11.054	0.0	612.4	0.0	0
600 min Winter	9.151	0.0	641.4	0.0	0
720 min Winter	7.843	0.0	666.3	0.0	0
960 min Winter	6.426	0.0	750.4	0.0	0
1440 min Winter	4.853	0.0	888.8	0.0	0
2160 min Winter	3.665	0.0	1086.9	0.0	0
2880 min Winter	3.003	0.0	1224.5	0.0	0
4320 min Winter	2.119	0.0	1315.0	0.0	0
5760 min Winter	1.654	0.0	1447.3	0.0	0
7200 min Winter	1.365	0.0	1503.1	0.0	0
8640 min Winter	1.167	0.0	1550.5	0.0	0
10080 min Winter	1.022	0.0	1591.9	0.0	0

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Model Details

Storage is Online Cover Level (m) 24.650

Swale Structure

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	205.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	4.0
Safety Factor	2.0	Slope (1:X)	210.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	24.150	Cap Infiltration Depth (m)	0.000
Base Width (m)	2.0		

Orifice Outflow Control

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 23.775

Weir Overflow Control

Discharge Coef 0.544 Width (m) 0.700 Invert Level (m) 24.500

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	18.786	0.436	2.1	0.0	2.1	89.5	O K
30 min Summer	18.822	0.472	2.1	0.0	2.1	98.7	O K
60 min Summer	18.858	0.508	2.1	0.0	2.1	107.9	O K
120 min Summer	18.893	0.543	2.1	0.0	2.1	117.3	O K
180 min Summer	18.920	0.570	2.1	0.0	2.1	124.8	O K
240 min Summer	18.939	0.589	2.1	0.0	2.1	130.0	O K
360 min Summer	18.963	0.613	2.1	0.0	2.1	136.7	O K
480 min Summer	18.976	0.626	2.1	0.0	2.1	140.6	O K
600 min Summer	18.980	0.630	2.1	0.0	2.1	141.7	O K
720 min Summer	18.975	0.625	2.1	0.0	2.1	140.1	O K
960 min Summer	18.986	0.636	2.2	0.0	2.2	143.3	O K
1440 min Summer	18.995	0.645	2.2	0.0	2.2	146.0	O K
2160 min Summer	18.994	0.644	2.2	0.0	2.2	145.6	O K
2880 min Summer	18.985	0.635	2.2	0.0	2.2	143.0	O K
4320 min Summer	18.894	0.544	2.1	0.0	2.1	117.6	O K
5760 min Summer	18.806	0.456	2.1	0.0	2.1	94.5	O K
7200 min Summer	18.708	0.358	2.1	0.0	2.1	70.8	O K
8640 min Summer	18.621	0.271	2.1	0.0	2.1	51.2	O K
10080 min Summer	18.557	0.207	2.1	0.0	2.1	37.9	O K
15 min Winter	18.829	0.479	2.1	0.0	2.1	100.4	O K
30 min Winter	18.869	0.519	2.1	0.0	2.1	110.7	O K
60 min Winter	18.908	0.558	2.1	0.0	2.1	121.3	O K
120 min Winter	18.945	0.595	2.1	0.0	2.1	131.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	110.6	0.0	22
30 min Summer	115.526	0.0	124.4	0.0	36
60 min Summer	64.252	0.0	142.8	0.0	66
120 min Summer	35.735	0.0	160.8	0.0	266
180 min Summer	25.354	0.0	172.3	0.0	310
240 min Summer	19.875	0.0	181.1	0.0	348
360 min Summer	14.101	0.0	194.2	0.0	412
480 min Summer	11.054	0.0	204.2	0.0	486
600 min Summer	9.151	0.0	212.2	0.0	602
720 min Summer	7.843	0.0	219.1	0.0	720
960 min Summer	6.426	0.0	242.1	0.0	856
1440 min Summer	4.853	0.0	278.2	0.0	1114
2160 min Summer	3.665	0.0	326.1	0.0	1516
2880 min Summer	3.003	0.0	360.9	0.0	1928
4320 min Summer	2.119	0.0	384.2	0.0	2724
5760 min Summer	1.654	0.0	409.7	0.0	3520
7200 min Summer	1.365	0.0	423.9	0.0	4248
8640 min Summer	1.167	0.0	435.9	0.0	4848
10080 min Summer	1.022	0.0	446.3	0.0	5472
15 min Winter	207.717	0.0	121.3	0.0	22
30 min Winter	115.526	0.0	136.0	0.0	36
60 min Winter	64.252	0.0	156.3	0.0	64
120 min Winter	35.735	0.0	175.8	0.0	124

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	18.972	0.622	2.1	0.0	2.1	139.4	O K
240 min Winter	18.992	0.642	2.2	0.0	2.2	145.2	O K
360 min Winter	19.017	0.667	2.2	0.0	2.2	152.7	O K
480 min Winter	19.032	0.682	2.2	0.0	2.2	157.0	O K
600 min Winter	19.036	0.686	2.2	0.0	2.2	158.3	O K
720 min Winter	19.032	0.682	2.2	0.0	2.2	157.1	O K
960 min Winter	19.045	0.695	2.2	0.0	2.2	160.9	O K
1440 min Winter	19.048	0.698	2.2	0.0	2.2	161.7	O K
2160 min Winter	19.035	0.685	2.2	0.0	2.2	157.9	O K
2880 min Winter	19.011	0.661	2.2	0.0	2.2	150.7	O K
4320 min Winter	18.880	0.530	2.1	0.0	2.1	113.7	O K
5760 min Winter	18.731	0.381	2.1	0.0	2.1	76.2	O K
7200 min Winter	18.583	0.233	2.1	0.0	2.1	43.3	O K
8640 min Winter	18.504	0.154	2.0	0.0	2.0	27.4	O K
10080 min Winter	18.455	0.105	1.9	0.0	1.9	18.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
180 min Winter	25.354	0.0	188.4	0.0	302
240 min Winter	19.875	0.0	197.8	0.0	340
360 min Winter	14.101	0.0	212.0	0.0	404
480 min Winter	11.054	0.0	222.8	0.0	482
600 min Winter	9.151	0.0	231.5	0.0	594
720 min Winter	7.843	0.0	238.9	0.0	700
960 min Winter	6.426	0.0	263.7	0.0	898
1440 min Winter	4.853	0.0	301.1	0.0	1154
2160 min Winter	3.665	0.0	353.9	0.0	1600
2880 min Winter	3.003	0.0	391.2	0.0	2048
4320 min Winter	2.119	0.0	416.3	0.0	2904
5760 min Winter	1.654	0.0	443.2	0.0	3720
7200 min Winter	1.365	0.0	458.4	0.0	4248
8640 min Winter	1.167	0.0	471.3	0.0	4840
10080 min Winter	1.022	0.0	482.5	0.0	5344

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Model Details

Storage is Online Cover Level (m) 19.850

Tank or Pond Structure

Invert Level (m) 18.350

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	164.1	1.400	473.5	2.800	473.5	4.200	473.5
0.200	201.5	1.600	473.5	3.000	473.5	4.400	473.5
0.400	241.2	1.800	473.5	3.200	473.5	4.600	473.5
0.600	283.1	2.000	473.5	3.400	473.5	4.800	473.5
0.800	327.3	2.200	473.5	3.600	473.5	5.000	473.5
1.000	373.8	2.400	473.5	3.800	473.5		
1.200	422.5	2.600	473.5	4.000	473.5		

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.350

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9000	1.200	2.9000	3.000	2.9000	7.000	2.9000
0.200	2.1000	1.400	2.9000	3.500	2.9000	7.500	2.9000
0.300	2.0000	1.600	2.9000	4.000	2.9000	8.000	2.9000
0.400	1.8000	1.800	2.9000	4.500	2.9000	8.500	2.9000
0.500	1.9000	2.000	2.9000	5.000	2.9000	9.000	2.9000
0.600	2.1000	2.200	2.9000	5.500	2.9000	9.500	2.9000
0.800	2.4000	2.400	2.9000	6.000	2.9000		
1.000	2.7000	2.600	2.9000	6.500	2.9000		

V-Notch Weir Overflow Control

Angle of V in Degrees 90.000 Discharge Coefficient 0.300 Invert Level (m) 19.500

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Cascade Summary of Results for Lagoon 29 - Postwick.srcx

Upstream Structures	Outflow To	Overflow To
(None)	Infiltration Lagoon 29 - Postwick.srcx	Infiltration Lagoon 29 - Postwick.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	11.509	1.909	249.2	0.0	249.2	301.7	O K
30 min Summer	11.396	1.796	241.0	0.0	241.0	274.2	O K
60 min Summer	11.163	1.563	223.3	0.0	223.3	222.0	O K
120 min Summer	10.813	1.213	193.7	0.0	193.7	153.8	O K
180 min Summer	10.564	0.964	169.5	0.0	169.5	112.2	O K
240 min Summer	10.388	0.788	150.0	0.0	150.0	86.2	O K
360 min Summer	10.167	0.567	121.3	0.0	121.3	57.1	O K
480 min Summer	10.052	0.452	102.2	0.0	102.2	43.7	O K
600 min Summer	9.996	0.396	86.9	0.0	86.9	37.5	O K
720 min Summer	9.960	0.360	75.4	0.0	75.4	33.6	O K
960 min Summer	9.926	0.326	62.5	0.0	62.5	30.0	O K
1440 min Summer	9.864	0.264	47.3	0.0	47.3	23.7	O K
2160 min Summer	9.821	0.221	35.8	0.0	35.8	19.5	O K
2880 min Summer	9.792	0.192	29.4	0.0	29.4	16.8	O K
4320 min Summer	9.759	0.159	20.7	0.0	20.7	13.7	O K
5760 min Summer	9.744	0.144	16.3	0.0	16.3	12.3	O K
7200 min Summer	9.730	0.130	13.4	0.0	13.4	11.1	O K
8640 min Summer	9.719	0.119	11.5	0.0	11.5	10.1	O K
10080 min Summer	9.711	0.111	10.0	0.0	10.0	9.4	O K
15 min Winter	11.669	2.069	260.2	0.0	260.2	342.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.601	0.0	460.0	0.0	17
30 min Summer	115.701	0.0	512.8	0.0	25
60 min Summer	64.484	0.0	571.6	0.0	42
120 min Summer	35.938	0.0	637.2	0.0	72
180 min Summer	25.530	0.0	678.9	0.0	102
240 min Summer	20.029	0.0	710.2	0.0	132
360 min Summer	14.228	0.0	756.8	0.0	190
480 min Summer	11.163	0.0	791.6	0.0	250
600 min Summer	9.248	0.0	819.8	0.0	308
720 min Summer	7.930	0.0	843.5	0.0	368
960 min Summer	6.500	0.0	921.8	0.0	490
1440 min Summer	4.911	0.0	1044.7	0.0	734
2160 min Summer	3.710	0.0	1184.0	0.0	1096
2880 min Summer	3.041	0.0	1293.9	0.0	1456
4320 min Summer	2.148	0.0	1370.9	0.0	2200
5760 min Summer	1.678	0.0	1428.3	0.0	2848
7200 min Summer	1.386	0.0	1474.5	0.0	3648
8640 min Summer	1.186	0.0	1513.4	0.0	4328
10080 min Summer	1.039	0.0	1547.0	0.0	5096
15 min Winter	207.601	0.0	515.2	0.0	17

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Cascade Summary of Results for Lagoon 29 - Postwick.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	11.534	1.934	250.9	0.0	250.9	307.7	O K
60 min Winter	11.223	1.623	228.0	0.0	228.0	234.9	O K
120 min Winter	10.737	1.137	186.6	0.0	186.6	140.4	O K
180 min Winter	10.422	0.822	154.0	0.0	154.0	91.1	O K
240 min Winter	10.226	0.626	129.6	0.0	129.6	64.5	O K
360 min Winter	10.034	0.434	97.6	0.0	97.6	41.7	O K
480 min Winter	9.966	0.366	77.3	0.0	77.3	34.2	O K
600 min Winter	9.930	0.330	64.3	0.0	64.3	30.4	O K
720 min Winter	9.909	0.309	55.3	0.0	55.3	28.3	O K
960 min Winter	9.857	0.257	45.3	0.0	45.3	23.0	O K
1440 min Winter	9.814	0.214	34.3	0.0	34.3	18.9	O K
2160 min Winter	9.776	0.176	25.9	0.0	25.9	15.3	O K
2880 min Winter	9.761	0.161	21.3	0.0	21.3	13.8	O K
4320 min Winter	9.739	0.139	15.0	0.0	15.0	11.9	O K
5760 min Winter	9.721	0.121	11.8	0.0	11.8	10.2	O K
7200 min Winter	9.709	0.109	9.7	0.0	9.7	9.2	O K
8640 min Winter	9.701	0.101	8.3	0.0	8.3	8.5	O K
10080 min Winter	9.695	0.095	7.3	0.0	7.3	7.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	115.701	0.0	574.3	0.0	27
60 min Winter	64.484	0.0	640.2	0.0	44
120 min Winter	35.938	0.0	713.6	0.0	76
180 min Winter	25.530	0.0	760.4	0.0	104
240 min Winter	20.029	0.0	795.4	0.0	134
360 min Winter	14.228	0.0	847.6	0.0	190
480 min Winter	11.163	0.0	886.6	0.0	248
600 min Winter	9.248	0.0	918.2	0.0	308
720 min Winter	7.930	0.0	944.8	0.0	370
960 min Winter	6.500	0.0	1032.5	0.0	490
1440 min Winter	4.911	0.0	1170.1	0.0	734
2160 min Winter	3.710	0.0	1326.1	0.0	1100
2880 min Winter	3.041	0.0	1449.2	0.0	1432
4320 min Winter	2.148	0.0	1535.4	0.0	2188
5760 min Winter	1.678	0.0	1599.7	0.0	2904
7200 min Winter	1.386	0.0	1651.5	0.0	3656
8640 min Winter	1.186	0.0	1695.0	0.0	4360
10080 min Winter	1.039	0.0	1732.6	0.0	5144

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Cascade Model Details for Lagoon 29 - Postwick.srcx

Storage is Online Cover Level (m) 12.000

Tank or Pond Structure

Invert Level (m) 9.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	80.8	1.000	158.8	2.000	257.8	3.000	0.0
0.200	94.6	1.200	176.9	2.200	279.9	3.200	0.0
0.400	109.2	1.400	196.0	2.400	303.0	3.400	0.0
0.600	124.9	1.600	216.0	2.600	0.0	3.600	0.0
0.800	141.6	1.800	236.6	2.800	0.0	3.800	0.0

Pipe Outflow Control

Diameter (m) 0.300 Entry Loss Coefficient 0.500
Slope (1:X) 100.0 Coefficient of Contraction 0.600
Length (m) 5.000 Upstream Invert Level (m) 9.600
Roughness k (mm) 0.600

Weir Overflow Control

Discharge Coef 0.544 Width (m) 25.000 Invert Level (m) 11.800

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Cascade Summary of Results for Infiltration Lagoon 29 - Postwick.srcx

	Upstream Structures	Outflow To	Overflow To
Lagoon 29 - Postwick.srcx		(None)	(None)

Half Drain Time : 547 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	10.606	1.206	10.5	433.7	O K
30 min Summer	10.713	1.313	11.1	484.4	O K
60 min Summer	10.825	1.425	11.8	539.6	O K
120 min Summer	10.952	1.552	12.6	605.5	O K
180 min Summer	11.029	1.629	13.1	646.4	O K
240 min Summer	11.081	1.681	13.5	675.2	O K
360 min Summer	11.147	1.747	13.9	712.0	O K
480 min Summer	11.174	1.774	14.1	727.8	O K
600 min Summer	11.169	1.769	14.0	725.1	O K
720 min Summer	11.150	1.750	13.9	714.1	O K
960 min Summer	11.190	1.790	14.2	736.6	O K
1440 min Summer	11.227	1.827	14.4	758.5	O K
2160 min Summer	11.233	1.833	14.5	761.8	O K
2880 min Summer	11.212	1.812	14.3	749.6	O K
4320 min Summer	11.010	1.610	13.0	636.4	O K
5760 min Summer	10.842	1.442	11.9	548.4	O K
7200 min Summer	10.698	1.298	11.0	477.3	O K
8640 min Summer	10.573	1.173	10.3	418.7	O K
10080 min Summer	10.464	1.064	9.7	369.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.601	0.0	62
30 min Summer	115.701	0.0	72
60 min Summer	64.484	0.0	90
120 min Summer	35.938	0.0	240
180 min Summer	25.530	0.0	280
240 min Summer	20.029	0.0	314
360 min Summer	14.228	0.0	392
480 min Summer	11.163	0.0	492
600 min Summer	9.248	0.0	602
720 min Summer	7.930	0.0	662
960 min Summer	6.500	0.0	786
1440 min Summer	4.911	0.0	1044
2160 min Summer	3.710	0.0	1444
2880 min Summer	3.041	0.0	1848
4320 min Summer	2.148	0.0	2640
5760 min Summer	1.678	0.0	3408
7200 min Summer	1.386	0.0	4160
8640 min Summer	1.186	0.0	4904
10080 min Summer	1.039	0.0	5648

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Cascade Summary of Results for Infiltration Lagoon 29 - Postwick.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	10.718	1.318	11.2	486.6	O K
30 min Winter	10.833	1.433	11.9	543.6	O K
60 min Winter	10.952	1.552	12.6	605.5	O K
120 min Winter	11.078	1.678	13.4	673.6	O K
180 min Winter	11.158	1.758	14.0	718.2	O K
240 min Winter	11.213	1.813	14.3	749.9	O K
360 min Winter	11.282	1.882	14.8	790.8	O K
480 min Winter	11.312	1.912	15.0	808.6	O K
600 min Winter	11.310	1.910	15.0	807.8	O K
720 min Winter	11.290	1.890	14.9	795.8	O K
960 min Winter	11.319	1.919	15.0	813.2	O K
1440 min Winter	11.342	1.942	15.2	827.0	O K
2160 min Winter	11.312	1.912	15.0	808.8	O K
2880 min Winter	11.253	1.853	14.6	773.7	O K
4320 min Winter	10.979	1.579	12.8	619.6	O K
5760 min Winter	10.757	1.357	11.4	505.8	O K
7200 min Winter	10.572	1.172	10.3	418.1	O K
8640 min Winter	10.414	1.014	9.4	348.4	O K
10080 min Winter	10.279	0.879	8.6	292.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	207.601	0.0	64
30 min Winter	115.701	0.0	74
60 min Winter	64.484	0.0	92
120 min Winter	35.938	0.0	228
180 min Winter	25.530	0.0	266
240 min Winter	20.029	0.0	304
360 min Winter	14.228	0.0	382
480 min Winter	11.163	0.0	484
600 min Winter	9.248	0.0	588
720 min Winter	7.930	0.0	682
960 min Winter	6.500	0.0	802
1440 min Winter	4.911	0.0	1086
2160 min Winter	3.710	0.0	1524
2880 min Winter	3.041	0.0	1956
4320 min Winter	2.148	0.0	2776
5760 min Winter	1.678	0.0	3568
7200 min Winter	1.386	0.0	4328
8640 min Winter	1.186	0.0	5096
10080 min Winter	1.039	0.0	5840

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Cascade Model Details for Infiltration Lagoon 29 - Postwick.srcx

Storage is Online Cover Level (m) 12.000

Infiltration Basin Structure

Invert Level (m) 9.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.11160 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.11160

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	264.9	1.400	499.5	2.800	0.0	4.200	0.0
0.200	294.3	1.600	538.6	3.000	0.0	4.400	0.0
0.400	325.0	1.800	579.2	3.200	0.0	4.600	0.0
0.600	357.1	2.000	621.2	3.400	0.0	4.800	0.0
0.800	390.6	2.200	664.9	3.600	0.0	5.000	0.0
1.000	425.5	2.400	710.0	3.800	0.0		
1.200	461.7	2.600	756.4	4.000	0.0		

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	17.236	1.636	229.0	0.0	229.0	373.0	O K
30 min Summer	17.202	1.602	226.4	0.0	226.4	361.9	O K
60 min Summer	17.045	1.445	213.8	0.0	213.8	311.7	O K
120 min Summer	16.786	1.186	191.2	0.0	191.2	236.5	O K
180 min Summer	16.589	0.989	172.0	0.0	172.0	185.2	O K
240 min Summer	16.437	0.837	155.7	0.0	155.7	149.3	O K
360 min Summer	16.231	0.631	130.3	0.0	130.3	104.9	O K
480 min Summer	16.106	0.506	112.1	0.0	112.1	80.7	O K
600 min Summer	16.037	0.437	98.2	0.0	98.2	67.9	O K
720 min Summer	15.994	0.394	86.2	0.0	86.2	60.2	O K
960 min Summer	15.951	0.351	72.3	0.0	72.3	53.0	O K
1440 min Summer	15.908	0.308	54.5	0.0	54.5	45.7	O K
2160 min Summer	15.846	0.246	41.9	0.0	41.9	35.7	O K
2880 min Summer	15.815	0.215	34.4	0.0	34.4	30.8	O K
4320 min Summer	15.771	0.171	24.4	0.0	24.4	24.2	O K
5760 min Summer	15.753	0.153	19.0	0.0	19.0	21.4	O K
7200 min Summer	15.742	0.142	15.7	0.0	15.7	19.8	O K
8640 min Summer	15.730	0.130	13.4	0.0	13.4	18.1	O K
10080 min Summer	15.721	0.121	11.8	0.0	11.8	16.7	O K
15 min Winter	17.383	1.783	240.1	0.0	240.1	424.2	O K
30 min Winter	17.343	1.743	237.1	0.0	237.1	409.8	O K
60 min Winter	17.138	1.538	221.3	0.0	221.3	340.8	O K
120 min Winter	16.775	1.175	190.2	0.0	190.2	233.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	546.6	0.0	21
30 min Summer	115.526	0.0	608.1	0.0	29
60 min Summer	64.252	0.0	676.5	0.0	46
120 min Summer	35.735	0.0	752.5	0.0	76
180 min Summer	25.354	0.0	800.8	0.0	108
240 min Summer	19.875	0.0	837.0	0.0	138
360 min Summer	14.101	0.0	890.8	0.0	196
480 min Summer	11.054	0.0	931.1	0.0	256
600 min Summer	9.151	0.0	963.5	0.0	314
720 min Summer	7.843	0.0	990.9	0.0	374
960 min Summer	6.426	0.0	1082.6	0.0	492
1440 min Summer	4.853	0.0	1226.3	0.0	738
2160 min Summer	3.665	0.0	1389.4	0.0	1100
2880 min Summer	3.003	0.0	1517.9	0.0	1468
4320 min Summer	2.119	0.0	1606.2	0.0	2188
5760 min Summer	1.654	0.0	1672.1	0.0	2856
7200 min Summer	1.365	0.0	1725.0	0.0	3616
8640 min Summer	1.167	0.0	1769.5	0.0	4360
10080 min Summer	1.022	0.0	1807.9	0.0	5040
15 min Winter	207.717	0.0	612.2	0.0	21
30 min Winter	115.526	0.0	681.0	0.0	30
60 min Winter	64.252	0.0	757.7	0.0	48
120 min Winter	35.735	0.0	842.8	0.0	80

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	16.508	0.908	163.5	0.0	163.5	165.7	O K
240 min Winter	16.320	0.720	141.8	0.0	141.8	123.5	O K
360 min Winter	16.098	0.498	110.8	0.0	110.8	79.1	O K
480 min Winter	16.006	0.406	89.8	0.0	89.8	62.5	O K
600 min Winter	15.959	0.359	75.1	0.0	75.1	54.3	O K
720 min Winter	15.931	0.331	64.5	0.0	64.5	49.5	O K
960 min Winter	15.903	0.303	52.1	0.0	52.1	44.9	O K
1440 min Winter	15.840	0.240	40.2	0.0	40.2	34.8	O K
2160 min Winter	15.797	0.197	30.4	0.0	30.4	28.0	O K
2880 min Winter	15.773	0.173	25.0	0.0	25.0	24.5	O K
4320 min Winter	15.748	0.148	17.6	0.0	17.6	20.7	O K
5760 min Winter	15.732	0.132	13.7	0.0	13.7	18.4	O K
7200 min Winter	15.718	0.118	11.3	0.0	11.3	16.4	O K
8640 min Winter	15.709	0.109	9.7	0.0	9.7	15.0	O K
10080 min Winter	15.702	0.102	8.5	0.0	8.5	14.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
180 min Winter	25.354	0.0	897.0	0.0	112
240 min Winter	19.875	0.0	937.5	0.0	140
360 min Winter	14.101	0.0	997.7	0.0	198
480 min Winter	11.054	0.0	1042.8	0.0	254
600 min Winter	9.151	0.0	1079.2	0.0	314
720 min Winter	7.843	0.0	1109.8	0.0	374
960 min Winter	6.426	0.0	1212.5	0.0	504
1440 min Winter	4.853	0.0	1373.5	0.0	734
2160 min Winter	3.665	0.0	1556.1	0.0	1096
2880 min Winter	3.003	0.0	1700.0	0.0	1468
4320 min Winter	2.119	0.0	1799.0	0.0	2148
5760 min Winter	1.654	0.0	1872.8	0.0	2896
7200 min Winter	1.365	0.0	1932.0	0.0	3576
8640 min Winter	1.167	0.0	1981.8	0.0	4328
10080 min Winter	1.022	0.0	2024.9	0.0	5048

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Model Details

Storage is Online Cover Level (m) 18.000

Tank or Pond Structure

Invert Level (m) 15.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	132.8	1.000	248.1	2.000	391.4	3.000	0.0
0.200	153.0	1.200	274.5	2.200	423.5	3.200	0.0
0.400	175.6	1.400	302.0	2.400	456.5	3.400	0.0
0.600	198.6	1.600	330.7	2.600	0.0	3.600	0.0
0.800	222.8	1.800	360.5	2.800	0.0	3.800	0.0

Pipe Outflow Control

Diameter (m)	0.300	Entry Loss Coefficient	0.500
Slope (1:X)	100.0	Coefficient of Contraction	0.600
Length (m)	5.000	Upstream Invert Level (m)	15.600
Roughness k (mm)	0.600		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 30.000 Invert Level (m) 17.600

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Cascade Summary of Results for Infiltration Lagoon 30 - Postwick.srcx

Upstream Structures	Outflow To	Overflow To
Lagoon 30 - Postwick.srcx Swale 2013.srcx Pond 28 with hydrobrake 2013.srcx	(None)	(None)

Half Drain Time : 2812 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	15.944	1.144	5.1	816.0	O K
30 min Summer	16.078	1.278	5.4	934.5	O K
60 min Summer	16.223	1.423	5.8	1067.9	O K
120 min Summer	16.383	1.583	6.2	1222.7	O K
180 min Summer	16.481	1.681	6.4	1321.0	O K
240 min Summer	16.553	1.753	6.6	1394.9	O K
360 min Summer	16.656	1.856	6.9	1503.4	O K
480 min Summer	16.729	1.929	7.1	1582.0	O K
600 min Summer	16.784	1.984	7.2	1642.2	O K
720 min Summer	16.827	2.027	7.4	1690.0	O K
960 min Summer	16.978	2.178	7.8	1863.1	O K
1440 min Summer	17.189	2.389	8.3	2115.1	O K
2160 min Summer	17.373	2.573	8.9	2346.1	O K
2880 min Summer	17.476	2.676	9.1	2480.5	O K
4320 min Summer	17.418	2.618	9.0	2404.5	O K
5760 min Summer	17.361	2.561	8.8	2330.9	O K
7200 min Summer	17.311	2.511	8.7	2267.8	O K
8640 min Summer	17.254	2.454	8.5	2196.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	207.717	0.0	487
30 min Summer	115.526	0.0	495
60 min Summer	64.252	0.0	520
120 min Summer	35.735	0.0	558
180 min Summer	25.354	0.0	592
240 min Summer	19.875	0.0	628
360 min Summer	14.101	0.0	702
480 min Summer	11.054	0.0	776
600 min Summer	9.151	0.0	854
720 min Summer	7.843	0.0	932
960 min Summer	6.426	0.0	1100
1440 min Summer	4.853	0.0	1470
2160 min Summer	3.665	0.0	2172
2880 min Summer	3.003	0.0	2728
4320 min Summer	2.119	0.0	3428
5760 min Summer	1.654	0.0	4232
7200 min Summer	1.365	0.0	5064
8640 min Summer	1.167	0.0	5792

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Cascade Summary of Results for Infiltration Lagoon 30 - Postwick.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	17.186	2.386	8.3	2111.1	O K
15 min Winter	16.028	1.228	5.3	889.6	O K
30 min Winter	16.169	1.369	5.6	1017.6	O K
60 min Winter	16.322	1.522	6.0	1162.5	O K
120 min Winter	16.486	1.686	6.5	1325.5	O K
180 min Winter	16.588	1.788	6.7	1431.7	O K
240 min Winter	16.663	1.863	6.9	1510.1	O K
360 min Winter	16.769	1.969	7.2	1625.5	O K
480 min Winter	16.844	2.044	7.4	1709.3	O K
600 min Winter	16.901	2.101	7.6	1774.0	O K
720 min Winter	16.946	2.146	7.7	1825.6	O K
960 min Winter	17.104	2.304	8.1	2011.3	O K
1440 min Winter	17.324	2.524	8.7	2284.2	O K
2160 min Winter	17.521	2.721	9.3	2541.1	O K
2880 min Winter	17.635	2.835	9.6	2694.6	O K
4320 min Winter	17.562	2.762	9.4	2595.2	O K
5760 min Winter	17.501	2.701	9.2	2513.6	O K
7200 min Winter	17.432	2.632	9.0	2423.6	O K
8640 min Winter	17.338	2.538	8.8	2302.0	O K
10080 min Winter	17.245	2.445	8.5	2184.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.022	0.0	6568
15 min Winter	207.717	0.0	473
30 min Winter	115.526	0.0	484
60 min Winter	64.252	0.0	512
120 min Winter	35.735	0.0	550
180 min Winter	25.354	0.0	586
240 min Winter	19.875	0.0	622
360 min Winter	14.101	0.0	694
480 min Winter	11.054	0.0	772
600 min Winter	9.151	0.0	852
720 min Winter	7.843	0.0	934
960 min Winter	6.426	0.0	1104
1440 min Winter	4.853	0.0	1462
2160 min Winter	3.665	0.0	2128
2880 min Winter	3.003	0.0	2772
4320 min Winter	2.119	0.0	3552
5760 min Winter	1.654	0.0	4472
7200 min Winter	1.365	0.0	5272
8640 min Winter	1.167	0.0	6144
10080 min Winter	1.022	0.0	7000

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Cascade Model Details for Infiltration Lagoon 30 - Postwick.srcx

Storage is Online Cover Level (m) 18.000

Infiltration Basin Structure

Invert Level (m) 14.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.03100 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.03100

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	568.4	1.400	936.1	2.800	1359.9	4.200	0.0
0.200	617.5	1.600	993.4	3.000	1425.0	4.400	0.0
0.400	667.8	1.800	1051.7	3.200	1491.2	4.600	0.0
0.600	719.1	2.000	1111.0	3.400	0.0	4.800	0.0
0.800	771.4	2.200	1171.5	3.600	0.0	5.000	0.0
1.000	825.1	2.400	1233.2	3.800	0.0		
1.200	879.8	2.600	1295.9	4.000	0.0		

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Appendix D. ReFH Calculation Summary Sheets

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL01A	**Date/time modelled**	20-Aug-2013 10:24
Company name	Mott MacDonald	**Catchment easting**	614900	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315450		
		Catchment area	0.51		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	704	**T_p (hr)**	2.53	**BL (hr)**	45.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.16
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

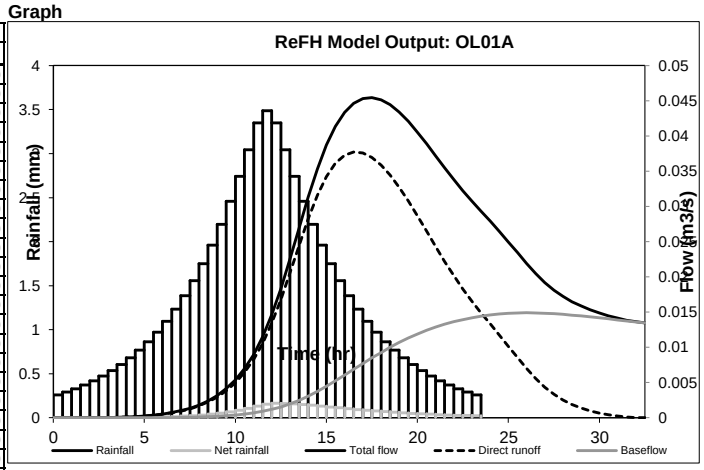
Summary of results

FEH DDF rainfall (mm)	91	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.2	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.2**	**2.7**	**2.7**	**1.6**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL01A.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:54
BFIHOST value of 0.885 used
PROPWET value of 0.31 used
SAAR value of 629 used
DPLBAR value of 1.25 used
DPSBAR value of 24.3 used
URBEXT value of 0.011 used
Catchment area changed from imported value of 2.27 to 0.51
C value of -0.02365 used
D1 value of 0.287 used
D2 value of 0.34302 used
D3 value of 0.25085 used
E value of 0.31337 used
F value of 2.46915 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL01B	**Date/time modelled**	20-Aug-2013 10:53
Company name	Mott MacDonald	**Catchment easting**	614900	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315450		
		Catchment area	0.51		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	704	**T_p (hr)**	2.53	**BL (hr)**	45.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.16
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

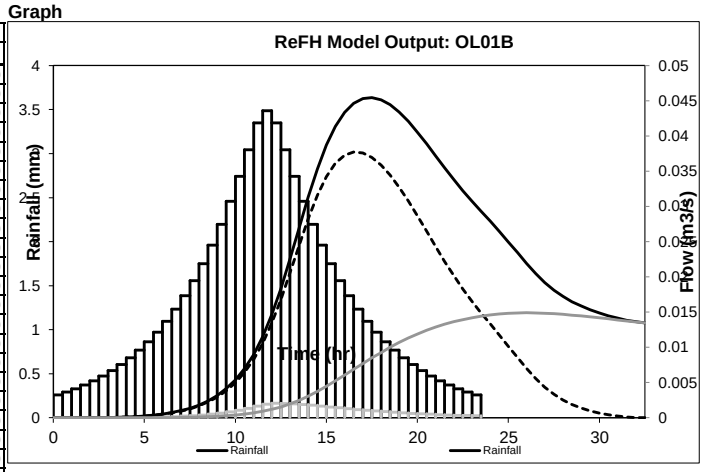
Summary of results

FEH DDF rainfall (mm)	91	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.2	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.2**	**2.7**	**2.7**	**1.6**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL01A.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:54
BFIHOST value of 0.885 used
PROPWET value of 0.31 used
SAAR value of 629 used
DPLBAR value of 1.25 used
DPSBAR value of 24.3 used
URBEXT value of 0.011 used
Catchment area changed from imported value of 2.27 to 0.51
C value of -0.02365 used
D1 value of 0.287 used
D2 value of 0.34302 used
D3 value of 0.25085 used
E value of 0.31337 used
F value of 2.46915 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL01C	**Date/time modelled**	20-Aug-2013 10:50
Company name	Mott MacDonald	**Catchment easting**	615600	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	316050		
		Catchment area	0.042		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	695	**T_p (hr)**	2.09	**BL (hr)**	41.7
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.12
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

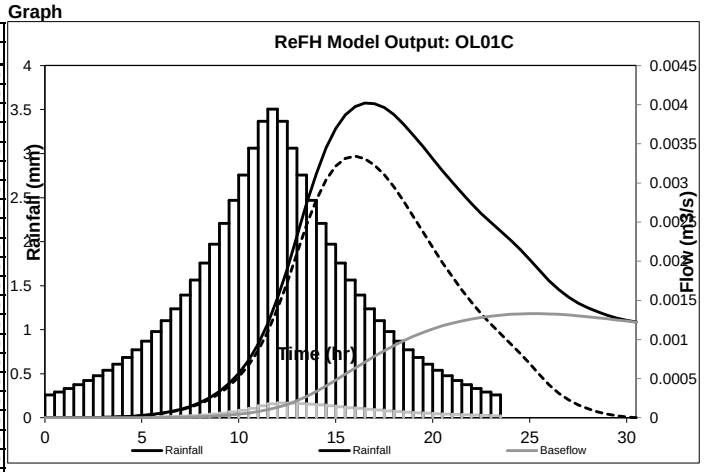
Summary of results

FEH DDF rainfall (mm)	91	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.5	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.8	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.8	0.1	0.0	0.0	0.0
10.5	3.1	0.1	0.0	0.0	0.0
11.0	3.4	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.4	0.2	0.0	0.0	0.0
12.5	3.1	0.2	0.0	0.0	0.0
13.0	2.8	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.8	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.5**	**2.8**	**2.8**	**1.6**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL01C.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 13:09
BFIHOST value of 0.873 used
PROPWET value of 0.31 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

SAAR value of 629 used
DPLBAR value of 0.74 used
DPSBAR value of 17.9 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.8 to 0.042
C value of -0.02368 used
D1 value of 0.28778 used
D2 value of 0.33793 used
D3 value of 0.25264 used
E value of 0.31415 used
F value of 2.46685 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL02A	**Date/time modelled**	20-Aug-2013 10:54
Company name	Mott MacDonald	**Catchment easting**	614800	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315400		
		Catchment area	0.152		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	704	**T_p (hr)**	2.61	**BL (hr)**	46
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.16
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

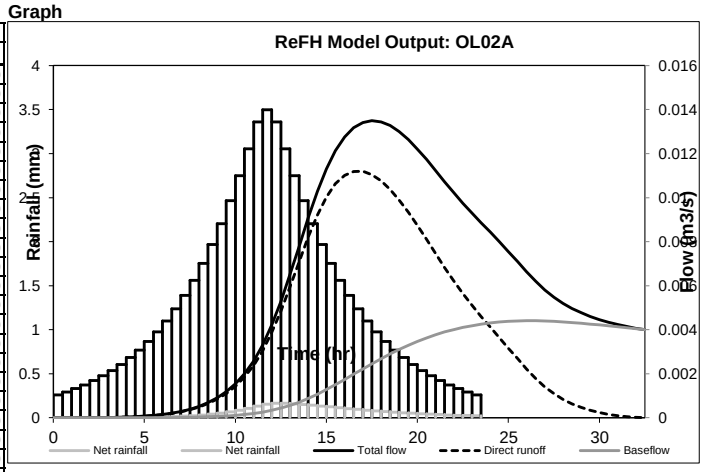
Summary of results

FEH DDF rainfall (mm)	91	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.8	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.1	0.1	0.0	0.0	0.0
11.0	3.4	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.4	0.2	0.0	0.0	0.0
12.5	3.1	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.8	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.4**	**2.8**	**2.8**	**1.6**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL02A.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 13:15
BFIHOST value of 0.885 used
PROPWET value of 0.31 used
SAAR value of 629 used
DPLBAR value of 1.33 used
DPSBAR value of 24.7 used
URBEXT value of 0.0106 used
Catchment area changed from imported value of 2.35 to 0.152
C value of -0.02366 used
D1 value of 0.28692 used
D2 value of 0.34337 used
D3 value of 0.25077 used
E value of 0.31331 used
F value of 2.46939 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL02B	**Date/time modelled**	20-Aug-2013 10:56
Company name	Mott MacDonald	**Catchment easting**	614700	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315350		
		Catchment area	0.0372		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	705	**T_p (hr)**	2.58	**BL (hr)**	46.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.16
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

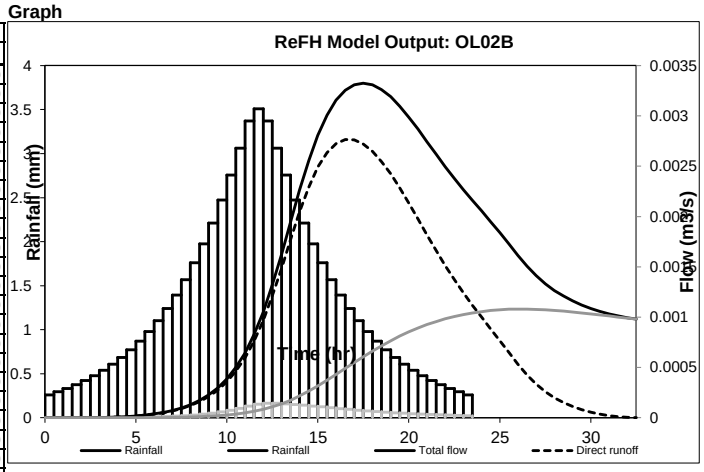
Summary of results

FEH DDF rainfall (mm)	91	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.6	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.8	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.8	0.1	0.0	0.0	0.0
10.5	3.1	0.1	0.0	0.0	0.0
11.0	3.4	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.4	0.2	0.0	0.0	0.0
12.5	3.1	0.2	0.0	0.0	0.0
13.0	2.8	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.8	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.6**	**2.8**	**2.8**	**1.6**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL02B.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 13:17
BFIHOST value of 0.886 used
PROPWET value of 0.31 used
SAAR value of 629 used
DPLBAR value of 1.36 used
DPSBAR value of 27.5 used
URBEXT value of 0.0098 used
Catchment area changed from imported value of 2.56 to 0.0372
C value of -0.02364 used
D1 value of 0.28686 used
D2 value of 0.34365 used
D3 value of 0.2507 used
E value of 0.31323 used
F value of 2.4698 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL02C	**Date/time modelled**	20-Aug-2013 10:57
Company name	Mott MacDonald	**Catchment easting**	615200	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315650		
		Catchment area	0.914		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	699	**T_p (hr)**	2.57	**BL (hr)**	45.8
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.14
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

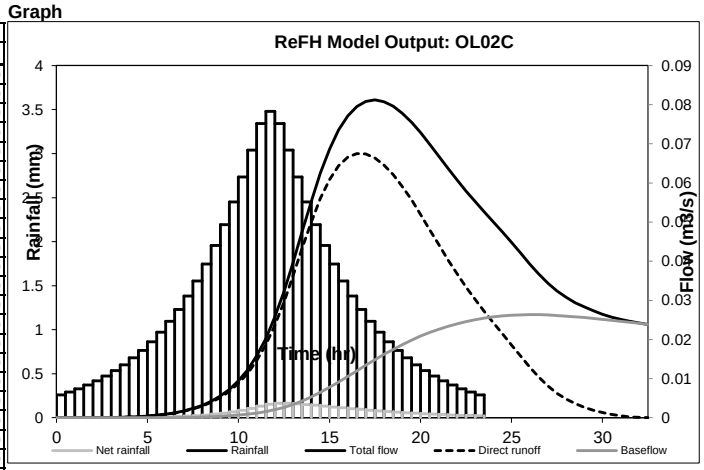
Summary of results

FEH DDF rainfall (mm)	91	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.1	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.1	0.0	0.1
14.5	2.0	0.1	0.1	0.0	0.1
15.0	1.7	0.1	0.1	0.0	0.1
15.5	1.6	0.1	0.1	0.0	0.1
16.0	1.4	0.1	0.1	0.0	0.1
16.5	1.2	0.1	0.1	0.0	0.1
17.0	1.1	0.1	0.1	0.0	0.1
17.5	1.0	0.1	0.1	0.0	0.1
18.0	0.9	0.1	0.1	0.0	0.1
18.5	0.8	0.1	0.1	0.0	0.1
19.0	0.7	0.1	0.1	0.0	0.1
19.5	0.6	0.1	0.1	0.0	0.1
20.0	0.5	0.0	0.1	0.0	0.1
20.5	0.5	0.0	0.0	0.0	0.1
21.0	0.4	0.0	0.0	0.0	0.1
21.5	0.4	0.0	0.0	0.0	0.1
22.0	0.3	0.0	0.0	0.0	0.1
22.5	0.3	0.0	0.0	0.0	0.1
23.0	0.3	0.0	0.0	0.0	0.1
23.5	0.0	0.0	0.0	0.0	0.1
24.0	0.0	0.0	0.0	0.0	0.1
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.1**	**2.8**	**2.8**	**1.6**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL02C.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 13:17
BFIHOST value of 0.878 used
PROPWET value of 0.31 used
SAAR value of 630 used
DPLBAR value of 1.14 used
DPSBAR value of 21.4 used
URBEXT value of 0 used
Catchment area changed from imported value of 1.28 to 0.914
C value of -0.0236 used
D1 value of 0.2874 used
D2 value of 0.33895 used
D3 value of 0.25215 used
E value of 0.31379 used
F value of 2.46799 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL03A	**Date/time modelled**	20-Aug-2013 10:58
Company name	Mott MacDonald	**Catchment easting**	617600	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	316150		
		Catchment area	0.097		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	604	**T_p (hr)**	2.59	**BL (hr)**	39.6
Duration (hr)	23.5	**C_{ini} (mm)**	53	**U_p**	0.65	**BR**	1.81
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

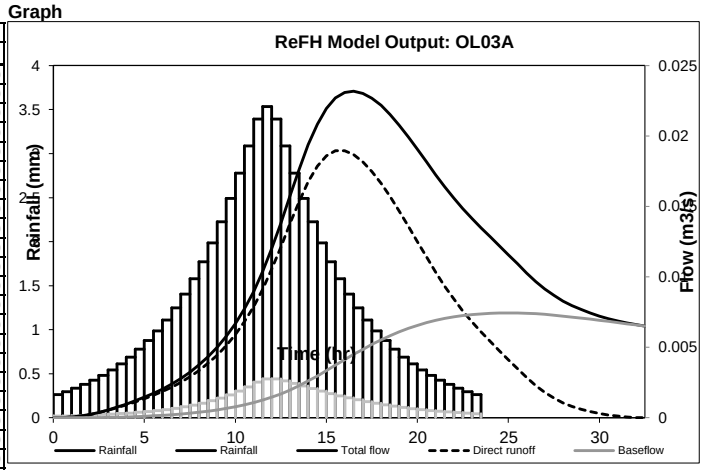
Summary of results

FEH DDF rainfall (mm)	91.9	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	63	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.1	0.0	0.0	0.0
4.5	0.8	0.1	0.0	0.0	0.0
5.0	0.9	0.1	0.0	0.0	0.0
5.5	1.0	0.1	0.0	0.0	0.0
6.0	1.1	0.1	0.0	0.0	0.0
6.5	1.2	0.1	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.6	0.1	0.0	0.0	0.0
8.0	1.8	0.2	0.0	0.0	0.0
8.5	2.0	0.2	0.0	0.0	0.0
9.0	2.2	0.2	0.0	0.0	0.0
9.5	2.5	0.3	0.0	0.0	0.0
10.0	2.8	0.3	0.0	0.0	0.0
10.5	3.1	0.4	0.0	0.0	0.0
11.0	3.4	0.4	0.0	0.0	0.0
11.5	3.5	0.4	0.0	0.0	0.0
12.0	3.4	0.4	0.0	0.0	0.0
12.5	3.1	0.4	0.0	0.0	0.0
13.0	2.8	0.4	0.0	0.0	0.0
13.5	2.5	0.4	0.0	0.0	0.0
14.0	2.2	0.3	0.0	0.0	0.0
14.5	2.0	0.3	0.0	0.0	0.0
15.0	1.8	0.3	0.0	0.0	0.0
15.5	1.6	0.2	0.0	0.0	0.0
16.0	1.4	0.2	0.0	0.0	0.0
16.5	1.2	0.2	0.0	0.0	0.0
17.0	1.1	0.2	0.0	0.0	0.0
17.5	1.0	0.2	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.1	0.0	0.0	0.0
21.0	0.4	0.1	0.0	0.0	0.0
21.5	0.4	0.1	0.0	0.0	0.0
22.0	0.3	0.1	0.0	0.0	0.0
22.5	0.3	0.1	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**63.0**	**7.9**	**7.9**	**4.7**	**12.6**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL03A.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:49
BFIHOST value of 0.753 used
PROPWET value of 0.31 used
SAAR value of 628 used
DPLBAR value of 0.8 used
DPSBAR value of 9.7 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.097
C value of -0.02402 used
D1 value of 0.28961 used
D2 value of 0.34858 used
D3 value of 0.24977 used
E value of 0.3157 used
F value of 2.4632 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL03B	**Date/time modelled**	20-Aug-2013 10:59
Company name	Mott MacDonald	**Catchment easting**	618200	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315850		
		Catchment area	0.094		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	615	**T_p (hr)**	2.82	**BL (hr)**	40
Duration (hr)	23.5	**C_{ini} (mm)**	46	**U_p**	0.65	**BR**	1.85
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

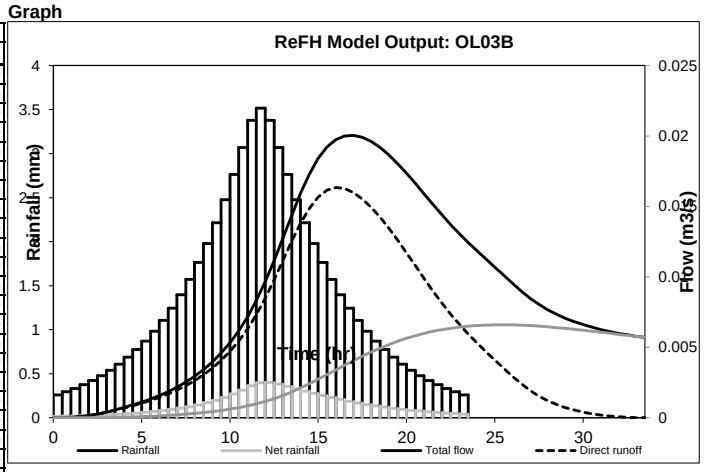
Summary of results

FEH DDF rainfall (mm)	91.6	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.7	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.1	0.0	0.0	0.0
5.0	0.9	0.1	0.0	0.0	0.0
5.5	1.0	0.1	0.0	0.0	0.0
6.0	1.1	0.1	0.0	0.0	0.0
6.5	1.2	0.1	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.6	0.1	0.0	0.0	0.0
8.0	1.8	0.1	0.0	0.0	0.0
8.5	2.0	0.2	0.0	0.0	0.0
9.0	2.2	0.2	0.0	0.0	0.0
9.5	2.5	0.2	0.0	0.0	0.0
10.0	2.8	0.3	0.0	0.0	0.0
10.5	3.1	0.3	0.0	0.0	0.0
11.0	3.4	0.4	0.0	0.0	0.0
11.5	3.5	0.4	0.0	0.0	0.0
12.0	3.4	0.4	0.0	0.0	0.0
12.5	3.1	0.4	0.0	0.0	0.0
13.0	2.8	0.4	0.0	0.0	0.0
13.5	2.5	0.3	0.0	0.0	0.0
14.0	2.2	0.3	0.0	0.0	0.0
14.5	2.0	0.3	0.0	0.0	0.0
15.0	1.8	0.3	0.0	0.0	0.0
15.5	1.6	0.2	0.0	0.0	0.0
16.0	1.4	0.2	0.0	0.0	0.0
16.5	1.2	0.2	0.0	0.0	0.0
17.0	1.1	0.2	0.0	0.0	0.0
17.5	1.0	0.2	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.1	0.0	0.0	0.0
21.0	0.4	0.1	0.0	0.0	0.0
21.5	0.4	0.1	0.0	0.0	0.0
22.0	0.3	0.1	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.7**	**7.1**	**7.1**	**4.5**	**11.6**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptors imported from file
Catchment descriptor file = 'OL03B.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:51
BFIHOST value of 0.767 used
PROPWET value of 0.31 used
SAAR value of 626 used
DPLBAR value of 0.81 used
DPSBAR value of 7.4 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.094
C value of -0.02428 used
D1 value of 0.2895 used
D2 value of 0.34968 used
D3 value of 0.24742 used
E value of 0.31427 used
F value of 2.46944 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL03C	**Date/time modelled**	20-Aug-2013 11:00
Company name	Mott MacDonald	**Catchment easting**	618200	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315850		
		Catchment area	0.028		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	615	**T_p (hr)**	2.82	**BL (hr)**	40
Duration (hr)	23.5	**C_{ini} (mm)**	46	**U_p**	0.65	**BR**	1.85
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

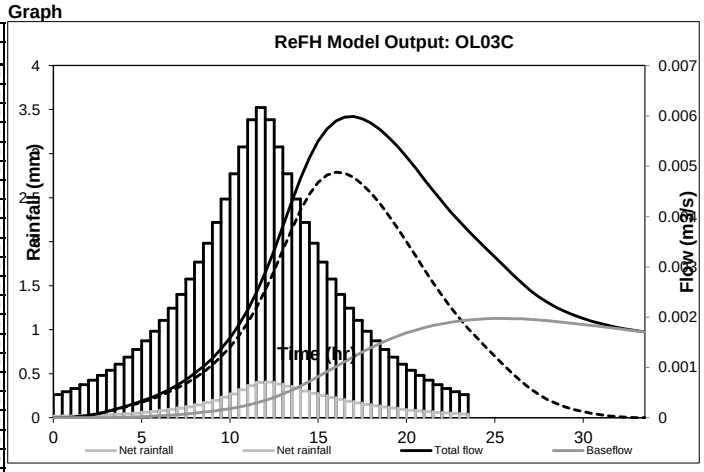
Summary of results

FEH DDF rainfall (mm)	91.6	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.8	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.1	0.0	0.0	0.0
5.0	0.9	0.1	0.0	0.0	0.0
5.5	1.0	0.1	0.0	0.0	0.0
6.0	1.1	0.1	0.0	0.0	0.0
6.5	1.2	0.1	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.6	0.1	0.0	0.0	0.0
8.0	1.8	0.1	0.0	0.0	0.0
8.5	2.0	0.2	0.0	0.0	0.0
9.0	2.2	0.2	0.0	0.0	0.0
9.5	2.5	0.2	0.0	0.0	0.0
10.0	2.8	0.3	0.0	0.0	0.0
10.5	3.1	0.3	0.0	0.0	0.0
11.0	3.4	0.4	0.0	0.0	0.0
11.5	3.5	0.4	0.0	0.0	0.0
12.0	3.4	0.4	0.0	0.0	0.0
12.5	3.1	0.4	0.0	0.0	0.0
13.0	2.8	0.4	0.0	0.0	0.0
13.5	2.5	0.3	0.0	0.0	0.0
14.0	2.2	0.3	0.0	0.0	0.0
14.5	2.0	0.3	0.0	0.0	0.0
15.0	1.8	0.3	0.0	0.0	0.0
15.5	1.6	0.2	0.0	0.0	0.0
16.0	1.4	0.2	0.0	0.0	0.0
16.5	1.2	0.2	0.0	0.0	0.0
17.0	1.1	0.2	0.0	0.0	0.0
17.5	1.0	0.2	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.1	0.0	0.0	0.0
21.0	0.4	0.1	0.0	0.0	0.0
21.5	0.4	0.1	0.0	0.0	0.0
22.0	0.3	0.1	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.8**	**7.1**	**7.1**	**4.5**	**11.6**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptors imported from file
Catchment descriptor file = 'OL03C.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:52
BFIHOST value of 0.767 used
PROPWET value of 0.31 used
SAAR value of 626 used
DPLBAR value of 0.81 used
DPSBAR value of 7.4 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.028
C value of -0.02428 used
D1 value of 0.2895 used
D2 value of 0.34968 used
D3 value of 0.24742 used
E value of 0.31427 used
F value of 2.46944 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL04	**Date/time modelled**	20-Aug-2013 11:02
Company name	Mott MacDonald	**Catchment easting**	618850	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315550		
		Catchment area	0.23		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	554	**T_p (hr)**	2.2	**BL (hr)**	35.7
Duration (hr)	23.5	**C_{ini} (mm)**	79	**U_p**	0.65	**BR**	1.64
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

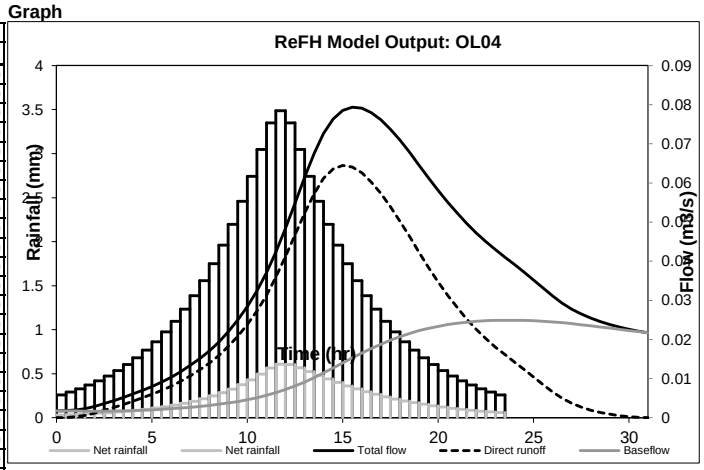
Summary of results

FEH DDF rainfall (mm)	91.3	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.2	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.1	0.0	0.0	0.0
2.5	0.5	0.1	0.0	0.0	0.0
3.0	0.5	0.1	0.0	0.0	0.0
3.5	0.6	0.1	0.0	0.0	0.0
4.0	0.7	0.1	0.0	0.0	0.0
4.5	0.8	0.1	0.0	0.0	0.0
5.0	0.9	0.1	0.0	0.0	0.0
5.5	1.0	0.1	0.0	0.0	0.0
6.0	1.1	0.1	0.0	0.0	0.0
6.5	1.2	0.2	0.0	0.0	0.0
7.0	1.4	0.2	0.0	0.0	0.0
7.5	1.6	0.2	0.0	0.0	0.0
8.0	1.7	0.2	0.0	0.0	0.0
8.5	2.0	0.3	0.0	0.0	0.0
9.0	2.2	0.3	0.0	0.0	0.0
9.5	2.5	0.4	0.0	0.0	0.0
10.0	2.7	0.4	0.0	0.0	0.0
10.5	3.0	0.5	0.0	0.0	0.0
11.0	3.3	0.6	0.0	0.0	0.0
11.5	3.5	0.6	0.0	0.0	0.0
12.0	3.3	0.6	0.0	0.0	0.0
12.5	3.0	0.6	0.0	0.0	0.1
13.0	2.7	0.5	0.1	0.0	0.1
13.5	2.5	0.5	0.1	0.0	0.1
14.0	2.2	0.4	0.1	0.0	0.1
14.5	2.0	0.4	0.1	0.0	0.1
15.0	1.7	0.4	0.1	0.0	0.1
15.5	1.6	0.3	0.1	0.0	0.1
16.0	1.4	0.3	0.1	0.0	0.1
16.5	1.2	0.3	0.1	0.0	0.1
17.0	1.1	0.2	0.1	0.0	0.1
17.5	1.0	0.2	0.1	0.0	0.1
18.0	0.9	0.2	0.1	0.0	0.1
18.5	0.8	0.2	0.0	0.0	0.1
19.0	0.7	0.2	0.0	0.0	0.1
19.5	0.6	0.1	0.0	0.0	0.1
20.0	0.5	0.1	0.0	0.0	0.1
20.5	0.5	0.1	0.0	0.0	0.1
21.0	0.4	0.1	0.0	0.0	0.1
21.5	0.4	0.1	0.0	0.0	0.0
22.0	0.3	0.1	0.0	0.0	0.0
22.5	0.3	0.1	0.0	0.0	0.0
23.0	0.3	0.1	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.2**	**10.9**	**10.9**	**6.8**	**17.6**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL04.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:56
BFIHOST value of 0.688 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

PROPWET value of 0.31 used
SAAR value of 621 used
DPLBAR value of 0.6 used
DPSBAR value of 9.4 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.59 to 0.23
C value of -0.02406 used
D1 value of 0.2875 used
D2 value of 0.34964 used
D3 value of 0.25403 used
E value of 0.31171 used
F value of 2.47975 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL05A	**Date/time modelled**	20-Aug-2013 11:45
Company name	Mott MacDonald	**Catchment easting**	619550	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315750		
		Catchment area	0.04		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	610	**T_p (hr)**	4.25	**BL (hr)**	46.6
Duration (hr)	23.5	**C_{ini} (mm)**	49	**U_p**	0.65	**BR**	1.83
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

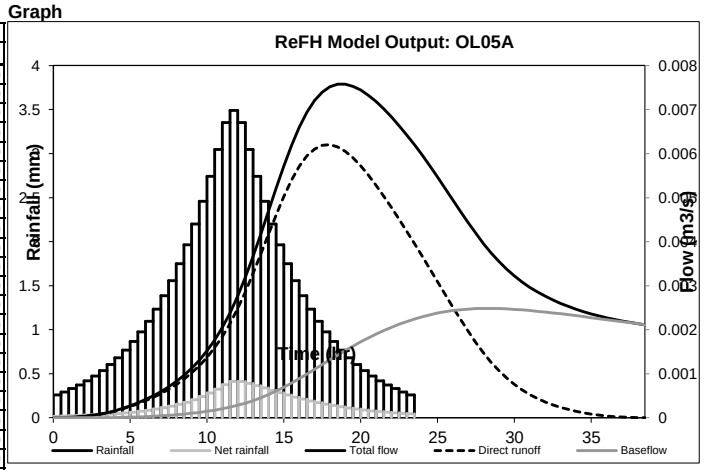
Summary of results

FEH DDF rainfall (mm)	90.8	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.2	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.1	0.0	0.0	0.0
5.0	0.9	0.1	0.0	0.0	0.0
5.5	1.0	0.1	0.0	0.0	0.0
6.0	1.1	0.1	0.0	0.0	0.0
6.5	1.2	0.1	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.6	0.1	0.0	0.0	0.0
8.0	1.8	0.2	0.0	0.0	0.0
8.5	2.0	0.2	0.0	0.0	0.0
9.0	2.2	0.2	0.0	0.0	0.0
9.5	2.5	0.2	0.0	0.0	0.0
10.0	2.7	0.3	0.0	0.0	0.0
10.5	3.0	0.3	0.0	0.0	0.0
11.0	3.4	0.4	0.0	0.0	0.0
11.5	3.5	0.4	0.0	0.0	0.0
12.0	3.4	0.4	0.0	0.0	0.0
12.5	3.0	0.4	0.0	0.0	0.0
13.0	2.7	0.4	0.0	0.0	0.0
13.5	2.5	0.3	0.0	0.0	0.0
14.0	2.2	0.3	0.0	0.0	0.0
14.5	2.0	0.3	0.0	0.0	0.0
15.0	1.8	0.3	0.0	0.0	0.0
15.5	1.6	0.2	0.0	0.0	0.0
16.0	1.4	0.2	0.0	0.0	0.0
16.5	1.2	0.2	0.0	0.0	0.0
17.0	1.1	0.2	0.0	0.0	0.0
17.5	1.0	0.2	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.1	0.0	0.0	0.0
21.0	0.4	0.1	0.0	0.0	0.0
21.5	0.4	0.1	0.0	0.0	0.0
22.0	0.3	0.1	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0
37.5	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

38.0	0.0	0.0	0.0	0.0	0.0
38.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.2**	**7.3**	**7.3**	**4.6**	**11.9**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL05A.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:56
BFIHOST value of 0.761 used
PROPWET value of 0.31 used
SAAR value of 625 used
DPLBAR value of 2.58 used
DPSBAR value of 14.5 used
URBEXT value of 0.0291 used
Catchment area changed from imported value of 7.69 to 0.04
C value of -0.02427 used
D1 value of 0.28784 used
D2 value of 0.34661 used
D3 value of 0.25302 used
E value of 0.31464 used
F value of 2.46514 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL06	**Date/time modelled**	20-Aug-2013 11:03
Company name	Mott MacDonald	**Catchment easting**	620450	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314200		
		Catchment area	1.15		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	715	**T_p (hr)**	3.53	**BL (hr)**	45.3
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.06
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

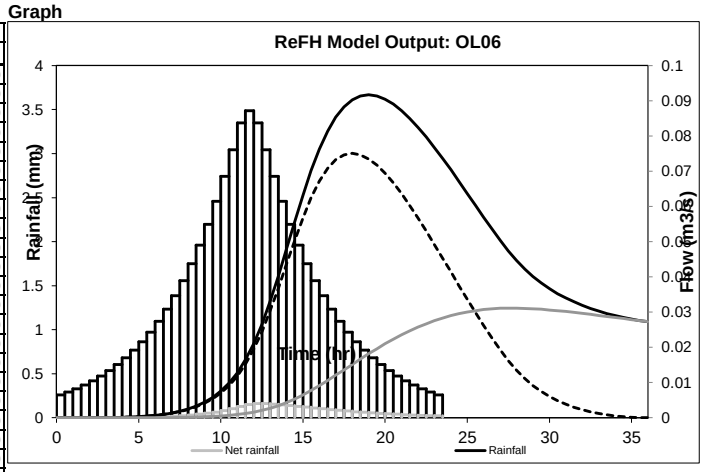
Summary of results

FEH DDF rainfall (mm)	91.9	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.2	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.5	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.1	0.0	0.1
15.0	1.7	0.1	0.1	0.0	0.1
15.5	1.6	0.1	0.1	0.0	0.1
16.0	1.4	0.1	0.1	0.0	0.1
16.5	1.2	0.1	0.1	0.0	0.1
17.0	1.1	0.1	0.1	0.0	0.1
17.5	1.0	0.1	0.1	0.0	0.1
18.0	0.9	0.1	0.1	0.0	0.1
18.5	0.8	0.1	0.1	0.0	0.1
19.0	0.7	0.1	0.1	0.0	0.1
19.5	0.6	0.0	0.1	0.0	0.1
20.0	0.5	0.0	0.1	0.0	0.1
20.5	0.5	0.0	0.1	0.0	0.1
21.0	0.4	0.0	0.1	0.0	0.1
21.5	0.4	0.0	0.1	0.0	0.1
22.0	0.3	0.0	0.1	0.0	0.1
22.5	0.3	0.0	0.1	0.0	0.1
23.0	0.3	0.0	0.0	0.0	0.1
23.5	0.0	0.0	0.0	0.0	0.1
24.0	0.0	0.0	0.0	0.0	0.1
24.5	0.0	0.0	0.0	0.0	0.1
25.0	0.0	0.0	0.0	0.0	0.1
25.5	0.0	0.0	0.0	0.0	0.1
26.0	0.0	0.0	0.0	0.0	0.1
26.5	0.0	0.0	0.0	0.0	0.1
27.0	0.0	0.0	0.0	0.0	0.1
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.2**	**2.7**	**2.7**	**1.7**	**4.4**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL06.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:57
BFIHOST value of 0.877 used
PROPWET value of 0.28 used
SAAR value of 618 used
DPLBAR value of 1 used
DPSBAR value of 6.7 used
URBEXT value of 0.0125 used
Catchment area changed from imported value of 0.8 to 1.15
C value of -0.02334 used
D1 value of 0.28737 used
D2 value of 0.34932 used
D3 value of 0.2437 used
E value of 0.31 used
F value of 2.48454 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL07B	**Date/time modelled**	20-Aug-2013 11:07
Company name	Mott MacDonald	**Catchment easting**	620650	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314550		
		Catchment area	0.109		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	687	**T_p (hr)**	3.71	**BL (hr)**	46.8
Duration (hr)	23.5	**C_{ini} (mm)**	2	**U_p**	0.65	**BR**	1.92
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

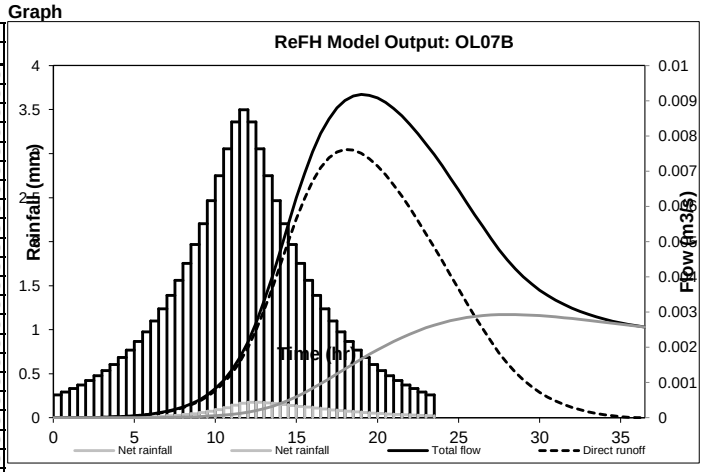
Summary of results

FEH DDF rainfall (mm)	91.6	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.8	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.1	0.1	0.0	0.0	0.0
11.0	3.4	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.4	0.2	0.0	0.0	0.0
12.5	3.1	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.2	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.8	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.4**	**3.0**	**3.0**	**1.7**	**4.7**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL07B.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:55
BFIHOST value of 0.833 used
PROPWET value of 0.27 used
SAAR value of 617 used
DPLBAR value of 1.11 used
DPSBAR value of 8.6 used
URBEXT value of 0.007 used
Catchment area changed from imported value of 1.62 to 0.109
C value of -0.02317 used
D1 value of 0.28532 used
D2 value of 0.34786 used
D3 value of 0.24596 used
E value of 0.31 used
F value of 2.48493 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL08	**Date/time modelled**	20-Aug-2013 11:08
Company name	Mott MacDonald	**Catchment easting**	620450	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314200		
		Catchment area	0.1785		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	715	**T_p (hr)**	3.53	**BL (hr)**	45.3
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.06
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

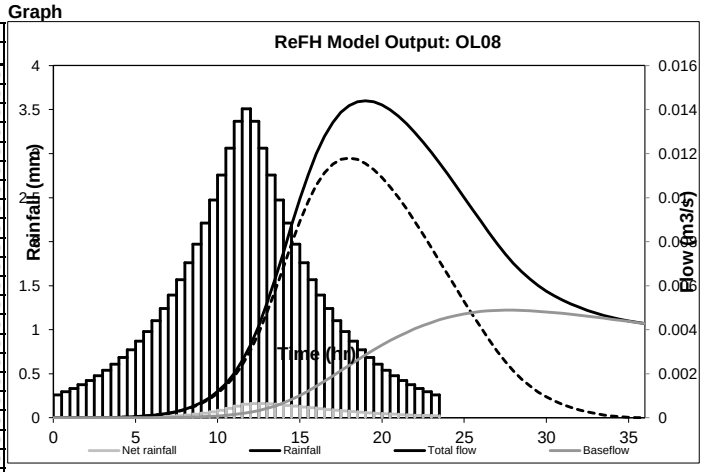
Summary of results

FEH DDF rainfall (mm)	91.9	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	62.6	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.6	0.0	0.0	0.0	0.0
8.0	1.8	0.0	0.0	0.0	0.0
8.5	2.0	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.5	0.1	0.0	0.0	0.0
10.0	2.8	0.1	0.0	0.0	0.0
10.5	3.1	0.1	0.0	0.0	0.0
11.0	3.4	0.1	0.0	0.0	0.0
11.5	3.5	0.2	0.0	0.0	0.0
12.0	3.4	0.2	0.0	0.0	0.0
12.5	3.1	0.2	0.0	0.0	0.0
13.0	2.8	0.2	0.0	0.0	0.0
13.5	2.5	0.2	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	2.0	0.1	0.0	0.0	0.0
15.0	1.8	0.1	0.0	0.0	0.0
15.5	1.6	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**62.6**	**2.7**	**2.7**	**1.7**	**4.5**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL08.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:56
BFIHOST value of 0.877 used
PROPWET value of 0.28 used
SAAR value of 618 used
DPLBAR value of 1 used
DPSBAR value of 6.7 used
URBEXT value of 0.0125 used
Catchment area changed from imported value of 0.8 to 0.1785
C value of -0.02334 used
D1 value of 0.28737 used
D2 value of 0.34932 used
D3 value of 0.2437 used
E value of 0.31 used
F value of 2.48454 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL09	**Date/time modelled**	20-Aug-2013 11:09
Company name	Mott MacDonald	**Catchment easting**	622250	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315000		
		Catchment area	0.11		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	676	**T_p (hr)**	2.78	**BL (hr)**	42.5
Duration (hr)	23.5	**C_{ini} (mm)**	10	**U_p**	0.65	**BR**	1.89
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

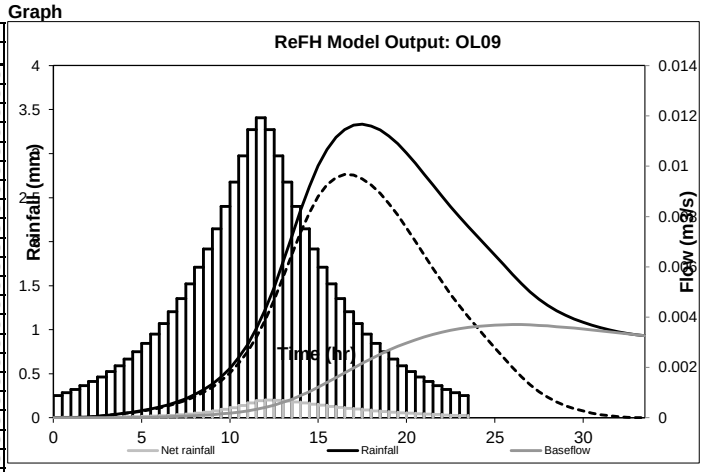
Summary of results

FEH DDF rainfall (mm)	89.2	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.8	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.1	0.0	0.0	0.0
8.5	1.9	0.1	0.0	0.0	0.0
9.0	2.1	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.2	0.0	0.0	0.0
11.5	3.4	0.2	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.2	0.0	0.0	0.0
14.0	2.1	0.2	0.0	0.0	0.0
14.5	1.9	0.2	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.8**	**3.5**	**3.5**	**2.0**	**5.5**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptors imported from file
Catchment descriptor file = 'OL09.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:57
BFIHOST value of 0.819 used
PROPWET value of 0.27 used
SAAR value of 617 used
DPLBAR value of 0.87 used
DPSBAR value of 12.2 used
URBEXT value of 0.02 used
Catchment area changed from imported value of 0.5 to 0.11
C value of -0.02348 used
D1 value of 0.27439 used
D2 value of 0.35421 used
D3 value of 0.26042 used
E value of 0.31136 used
F value of 2.47949 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL10	**Date/time modelled**	20-Aug-2013 11:12
Company name	Mott MacDonald	**Catchment easting**	622250	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	315000		
		Catchment area	0.026		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	676	**T_p (hr)**	2.78	**BL (hr)**	42.5
Duration (hr)	23.5	**C_{ini} (mm)**	10	**U_p**	0.65	**BR**	1.89
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

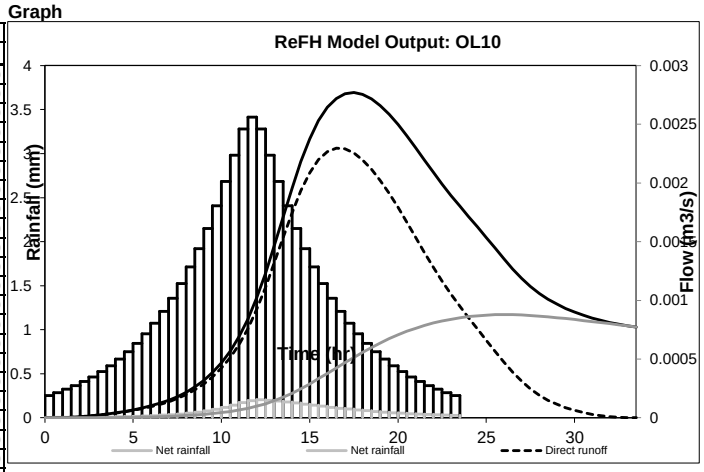
Summary of results

FEH DDF rainfall (mm)	89.2	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.9	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.1	0.0	0.0	0.0
8.5	1.9	0.1	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.2	0.0	0.0	0.0
11.5	3.4	0.2	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.2	0.0	0.0	0.0
14.0	2.2	0.2	0.0	0.0	0.0
14.5	1.9	0.2	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.9**	**3.5**	**3.5**	**2.0**	**5.5**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptors imported from file
Catchment descriptor file = 'OL10.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:57
BFIHOST value of 0.819 used
PROPWET value of 0.27 used
SAAR value of 617 used
DPLBAR value of 0.87 used
DPSBAR value of 12.2 used
URBEXT value of 0.02 used
Catchment area changed from imported value of 0.5 to 0.026
C value of -0.02348 used
D1 value of 0.27439 used
D2 value of 0.35421 used
D3 value of 0.26042 used
E value of 0.31136 used
F value of 2.47949 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.69 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL11	**Date/time modelled**	20-Aug-2013 11:13
Company name	Mott MacDonald	**Catchment easting**	623300	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314800		
		Catchment area	0.39		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	681	**T_p (hr)**	3.17	**BL (hr)**	45.3
Duration (hr)	23.5	**C_{ini} (mm)**	6	**U_p**	0.65	**BR**	1.9
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

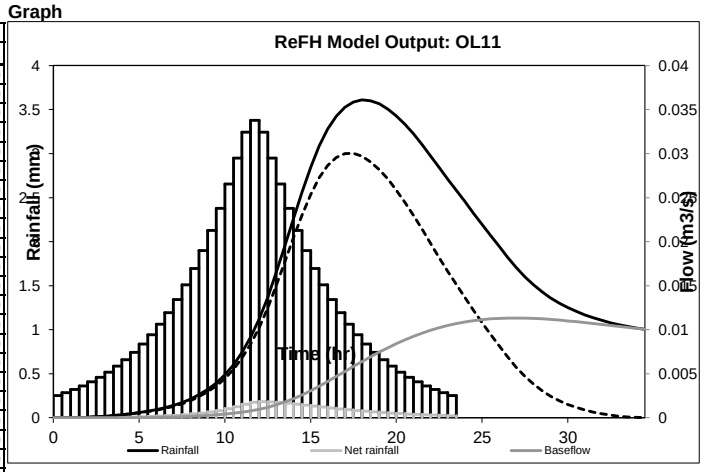
Summary of results

FEH DDF rainfall (mm)	88.8	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.2	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.1	0.0	0.0	0.0
9.0	2.1	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	2.9	0.1	0.0	0.0	0.0
11.0	3.2	0.2	0.0	0.0	0.0
11.5	3.4	0.2	0.0	0.0	0.0
12.0	3.2	0.2	0.0	0.0	0.0
12.5	2.9	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.2	0.0	0.0	0.0
14.0	2.1	0.2	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.3	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	0.9	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.2**	**3.1**	**3.1**	**1.8**	**4.9**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL11.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 14:58
BFIHOST value of 0.825 used
PROPWET value of 0.27 used
SAAR value of 616 used
DPLBAR value of 0.88 used
DPSBAR value of 9.9 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.39
C value of -0.02398 used
D1 value of 0.27592 used
D2 value of 0.35399 used
D3 value of 0.26185 used
E value of 0.31126 used
F value of 2.47891 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL12	**Date/time modelled**	20-Aug-2013 11:14
Company name	Mott MacDonald	**Catchment easting**	624000	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314100		
		Catchment area	0.548		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	659	**T_p (hr)**	2.61	**BL (hr)**	35.9
Duration (hr)	23.5	**C_{ini} (mm)**	22	**U_p**	0.65	**BR**	1.83
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

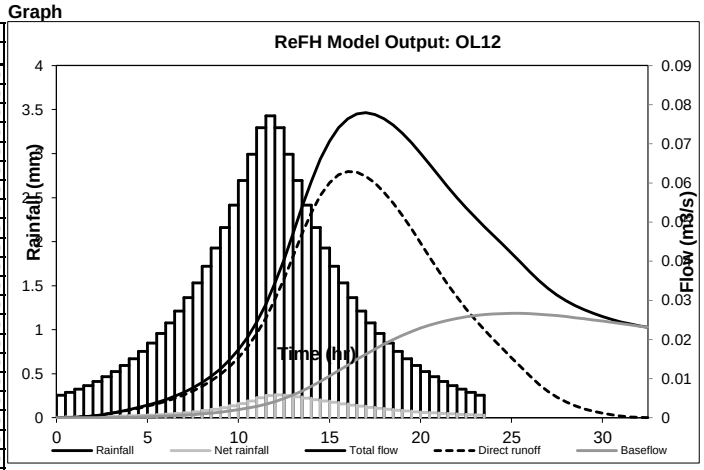
Summary of results

FEH DDF rainfall (mm)	90.3	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.2	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.5	0.1	0.0	0.0	0.0
8.0	1.7	0.1	0.0	0.0	0.0
8.5	1.9	0.1	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.2	0.0	0.0	0.0
10.5	3.0	0.2	0.0	0.0	0.0
11.0	3.3	0.2	0.0	0.0	0.0
11.5	3.4	0.3	0.0	0.0	0.0
12.0	3.3	0.3	0.0	0.0	0.0
12.5	3.0	0.3	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.2	0.0	0.0	0.1
14.0	2.2	0.2	0.1	0.0	0.1
14.5	1.9	0.2	0.1	0.0	0.1
15.0	1.7	0.2	0.1	0.0	0.1
15.5	1.5	0.2	0.1	0.0	0.1
16.0	1.4	0.1	0.1	0.0	0.1
16.5	1.2	0.1	0.1	0.0	0.1
17.0	1.1	0.1	0.1	0.0	0.1
17.5	1.0	0.1	0.1	0.0	0.1
18.0	0.9	0.1	0.1	0.0	0.1
18.5	0.8	0.1	0.1	0.0	0.1
19.0	0.7	0.1	0.1	0.0	0.1
19.5	0.6	0.1	0.0	0.0	0.1
20.0	0.5	0.1	0.0	0.0	0.1
20.5	0.5	0.1	0.0	0.0	0.1
21.0	0.4	0.0	0.0	0.0	0.1
21.5	0.4	0.0	0.0	0.0	0.1
22.0	0.3	0.0	0.0	0.0	0.1
22.5	0.3	0.0	0.0	0.0	0.1
23.0	0.3	0.0	0.0	0.0	0.1
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.2**	**4.5**	**4.5**	**2.9**	**7.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL12.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:58
BFIHOST value of 0.797 used
PROPWET value of 0.27 used
SAAR value of 614 used
DPLBAR value of 0.88 used
DPSBAR value of 8.4 used
URBEXT value of 0.0753 used
Catchment area changed from imported value of 0.73 to 0.548
C value of -0.02351 used
D1 value of 0.27609 used
D2 value of 0.35899 used
D3 value of 0.2588 used
E value of 0.311 used
F value of 2.4868 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL13	**Date/time modelled**	20-Aug-2013 11:15
Company name	Mott MacDonald	**Catchment easting**	624050	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314050		
		Catchment area	0.618		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	658	**T_p (hr)**	2.5	**BL (hr)**	35.1
Duration (hr)	23.5	**C_{ini} (mm)**	22	**U_p**	0.65	**BR**	1.83
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

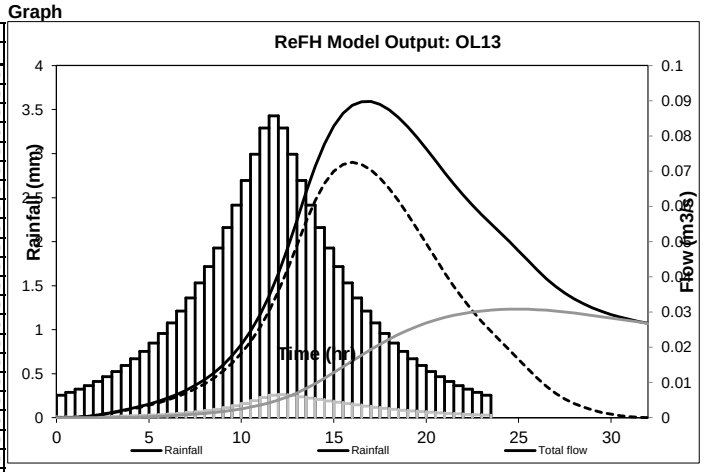
Summary of results

FEH DDF rainfall (mm)	90.3	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.1	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.5	0.1	0.0	0.0	0.0
8.0	1.7	0.1	0.0	0.0	0.0
8.5	1.9	0.1	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.2	0.0	0.0	0.0
10.5	3.0	0.2	0.0	0.0	0.0
11.0	3.3	0.2	0.0	0.0	0.0
11.5	3.4	0.3	0.0	0.0	0.0
12.0	3.3	0.3	0.0	0.0	0.0
12.5	3.0	0.3	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.1
13.5	2.4	0.2	0.1	0.0	0.1
14.0	2.2	0.2	0.1	0.0	0.1
14.5	1.9	0.2	0.1	0.0	0.1
15.0	1.7	0.2	0.1	0.0	0.1
15.5	1.5	0.2	0.1	0.0	0.1
16.0	1.4	0.1	0.1	0.0	0.1
16.5	1.2	0.1	0.1	0.0	0.1
17.0	1.1	0.1	0.1	0.0	0.1
17.5	1.0	0.1	0.1	0.0	0.1
18.0	0.8	0.1	0.1	0.0	0.1
18.5	0.8	0.1	0.1	0.0	0.1
19.0	0.7	0.1	0.1	0.0	0.1
19.5	0.6	0.1	0.1	0.0	0.1
20.0	0.5	0.1	0.0	0.0	0.1
20.5	0.5	0.1	0.0	0.0	0.1
21.0	0.4	0.0	0.0	0.0	0.1
21.5	0.4	0.0	0.0	0.0	0.1
22.0	0.3	0.0	0.0	0.0	0.1
22.5	0.3	0.0	0.0	0.0	0.1
23.0	0.3	0.0	0.0	0.0	0.1
23.5	0.0	0.0	0.0	0.0	0.1
24.0	0.0	0.0	0.0	0.0	0.1
24.5	0.0	0.0	0.0	0.0	0.1
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.1**	**4.6**	**4.6**	**2.9**	**7.5**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL13.csv'
Catchment decriptor file exported from CD ROM version 3

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptor file exported on 19-Aug-2013 08:59
BFIHOST value of 0.796 used
PROPWET value of 0.27 used
SAAR value of 614 used
DPLBAR value of 0.82 used
DPSBAR value of 8.3 used
URBEXT value of 0.0769 used
Catchment area changed from imported value of 0.71 to 0.618
C value of -0.0235 used
D1 value of 0.27599 used
D2 value of 0.35912 used
D3 value of 0.2588 used
E value of 0.311 used
F value of 2.48679 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL14	**Date/time modelled**	20-Aug-2013 11:16
Company name	Mott MacDonald	**Catchment easting**	624100	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314300		
		Catchment area	0.06		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	660	**T_p (hr)**	2.99	**BL (hr)**	38.7
Duration (hr)	23.5	**C_{ini} (mm)**	21	**U_p**	0.65	**BR**	1.84
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

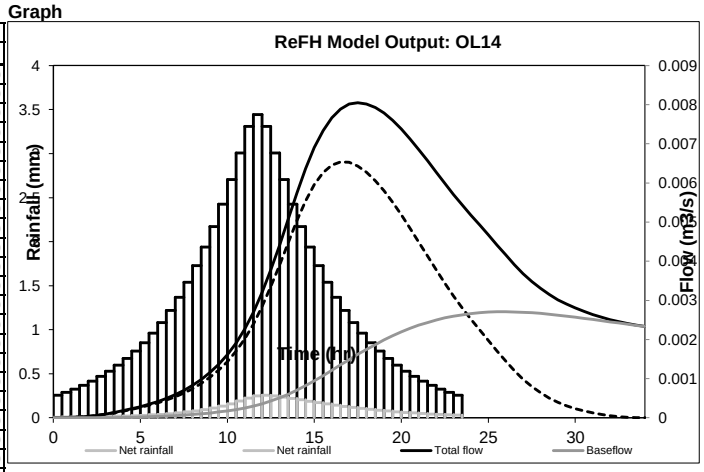
Summary of results

FEH DDF rainfall (mm)	90.2	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.1	0.0	0.0	0.0
7.5	1.5	0.1	0.0	0.0	0.0
8.0	1.7	0.1	0.0	0.0	0.0
8.5	1.9	0.1	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.2	0.0	0.0	0.0
10.5	3.0	0.2	0.0	0.0	0.0
11.0	3.3	0.2	0.0	0.0	0.0
11.5	3.4	0.3	0.0	0.0	0.0
12.0	3.3	0.3	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.2	0.0	0.0	0.0
14.0	2.2	0.2	0.0	0.0	0.0
14.5	1.9	0.2	0.0	0.0	0.0
15.0	1.7	0.2	0.0	0.0	0.0
15.5	1.5	0.2	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.1	0.0	0.0	0.0
20.0	0.5	0.1	0.0	0.0	0.0
20.5	0.5	0.1	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.4**	**4.5**	**4.5**	**2.8**	**7.3**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL14.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 08:59
BFIHOST value of 0.799 used
PROPWET value of 0.27 used
SAAR value of 614 used
DPLBAR value of 1.05 used
DPSBAR value of 8.8 used
URBEXT value of 0.0615 used
Catchment area changed from imported value of 0.9 to 0.06
C value of -0.0236 used
D1 value of 0.27658 used
D2 value of 0.35804 used
D3 value of 0.25898 used
E value of 0.31101 used
F value of 2.48654 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL15A	**Date/time modelled**	20-Aug-2013 11:16
Company name	Mott MacDonald	**Catchment easting**	625700	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314300		
		Catchment area	0.15		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	710	**T_p (hr)**	2.26	**BL (hr)**	43.1
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

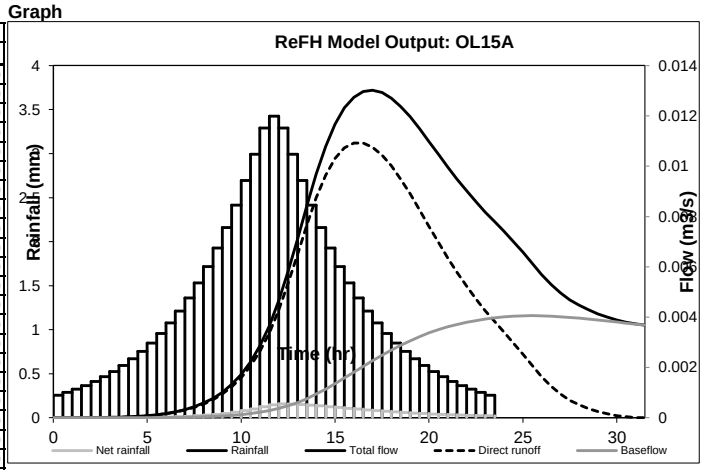
Summary of results

FEH DDF rainfall (mm)	90	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.1	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.1**	**2.6**	**2.6**	**1.5**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL15A.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 15:01

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

BFIHOST value of 0.862 used
PROPWET value of 0.27 used
SAAR value of 612 used
DPLBAR value of 0.63 used
DPSBAR value of 16.2 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.51 to 0.15
C value of -0.024 used
D1 value of 0.27589 used
D2 value of 0.3641 used
D3 value of 0.2562 used
E value of 0.31141 used
F value of 2.48582 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL15B	**Date/time modelled**	20-Aug-2013 11:17
Company name	Mott MacDonald	**Catchment easting**	625700	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314300		
		Catchment area	0.334		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	710	**T_p (hr)**	2.26	**BL (hr)**	43.1
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

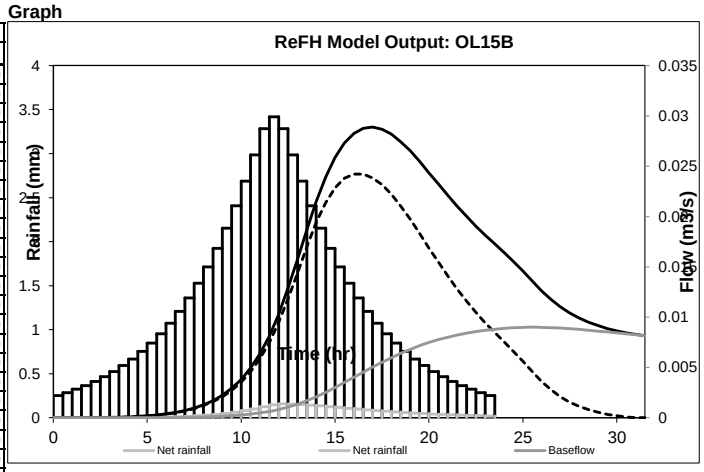
Summary of results

FEH DDF rainfall (mm)	90	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.0**	**2.6**	**2.6**	**1.5**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL15B.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 15:03

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

BFIHOST value of 0.862 used
PROPWET value of 0.27 used
SAAR value of 612 used
DPLBAR value of 0.63 used
DPSBAR value of 16.2 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.51 to 0.334
C value of -0.024 used
D1 value of 0.27589 used
D2 value of 0.3641 used
D3 value of 0.2562 used
E value of 0.31141 used
F value of 2.48582 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL16	**Date/time modelled**	20-Aug-2013 11:19
Company name	Mott MacDonald	**Catchment easting**	626300	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314050		
		Catchment area	1.048		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	704	**T_p (hr)**	2.17	**BL (hr)**	43.1
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.97
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

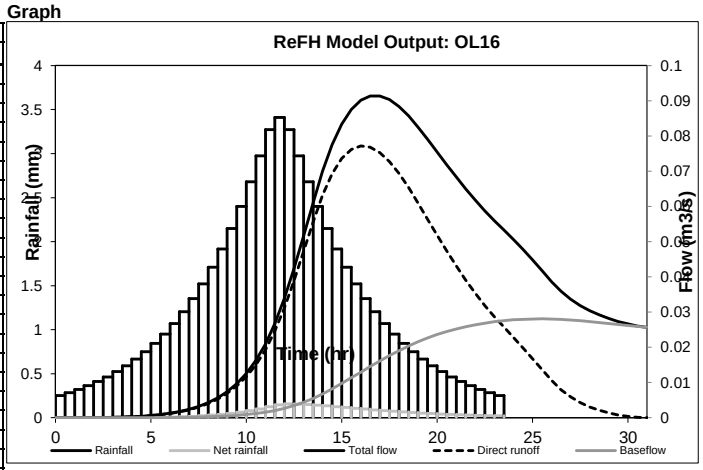
Summary of results

FEH DDF rainfall (mm)	90.2	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.8	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.1
13.5	2.4	0.1	0.1	0.0	0.1
14.0	2.1	0.1	0.1	0.0	0.1
14.5	1.9	0.1	0.1	0.0	0.1
15.0	1.7	0.1	0.1	0.0	0.1
15.5	1.5	0.1	0.1	0.0	0.1
16.0	1.4	0.1	0.1	0.0	0.1
16.5	1.2	0.1	0.1	0.0	0.1
17.0	1.1	0.1	0.1	0.0	0.1
17.5	1.0	0.1	0.1	0.0	0.1
18.0	0.8	0.1	0.1	0.0	0.1
18.5	0.8	0.1	0.1	0.0	0.1
19.0	0.7	0.1	0.1	0.0	0.1
19.5	0.6	0.0	0.1	0.0	0.1
20.0	0.5	0.0	0.1	0.0	0.1
20.5	0.5	0.0	0.0	0.0	0.1
21.0	0.4	0.0	0.0	0.0	0.1
21.5	0.4	0.0	0.0	0.0	0.1
22.0	0.3	0.0	0.0	0.0	0.1
22.5	0.3	0.0	0.0	0.0	0.1
23.0	0.3	0.0	0.0	0.0	0.1
23.5	0.0	0.0	0.0	0.0	0.1
24.0	0.0	0.0	0.0	0.0	0.1
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.8**	**2.6**	**2.6**	**1.4**	**4.0**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL16.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:00
BFIHOST value of 0.854 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

PROPWET value of 0.27 used
SAAR value of 611 used
DPLBAR value of 0.64 used
DPSBAR value of 19.6 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.61 to 1.048
C value of -0.024 used
D1 value of 0.27583 used
D2 value of 0.36769 used
D3 value of 0.25367 used
E value of 0.31159 used
F value of 2.48444 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL16A	**Date/time modelled**	04-Nov-2013 11:17
Company name	Mott MacDonald	**Catchment easting**	626350	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314200		
		Catchment area	0.38		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	701	**T_p (hr)**	2.45	**BL (hr)**	44.9
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.97
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

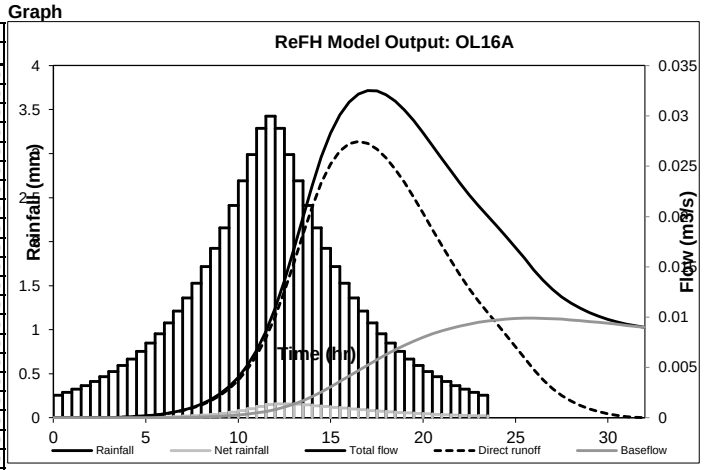
Summary of results

FEH DDF rainfall (mm)	90.2	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.0**	**2.7**	**2.7**	**1.4**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL16A.csv'
Catchment decriptor file exported from CD ROM version 3

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptor file exported on 04-Nov-2013 10:50
BFIHOST value of 0.851 used
PROPWET value of 0.27 used
SAAR value of 611 used
DPLBAR value of 0.78 used
DPSBAR value of 19.4 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.65 to 0.38
C value of -0.024 used
D1 value of 0.27609 used
D2 value of 0.36723 used
D3 value of 0.25359 used
E value of 0.31161 used
F value of 2.48446 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL16B	**Date/time modelled**	04-Nov-2013 11:18
Company name	Mott MacDonald	**Catchment easting**	626400	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314250		
		Catchment area	0.36		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	701	**T_p (hr)**	2.58	**BL (hr)**	45.7
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.97
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

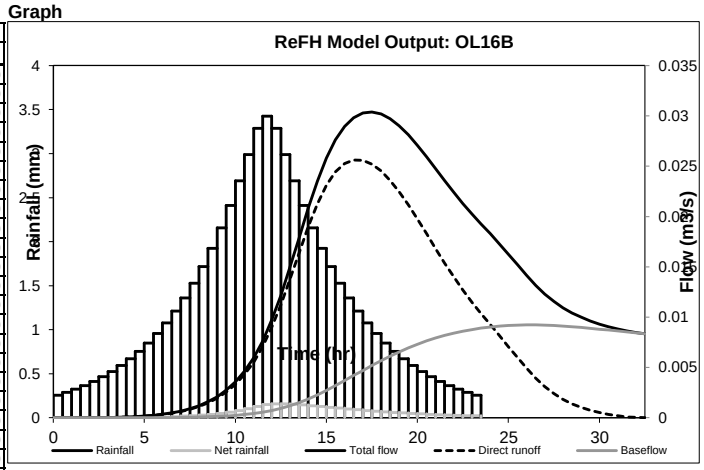
Summary of results

FEH DDF rainfall (mm)	90.2	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.1	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.1**	**2.7**	**2.7**	**1.4**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL16B.csv'

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 04-Nov-2013 10:54
BFIHOST value of 0.851 used
PROPWET value of 0.27 used
SAAR value of 611 used
DPLBAR value of 0.85 used
DPSBAR value of 19.4 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.65 to 0.36
C value of -0.024 used
D1 value of 0.27612 used
D2 value of 0.36719 used
D3 value of 0.25358 used
E value of 0.31161 used
F value of 2.48446 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL17	**Date/time modelled**	20-Aug-2013 11:20
Company name	Mott MacDonald	**Catchment easting**	626900	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	314200		
		Catchment area	0.082		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	711	**T_p (hr)**	4.59	**BL (hr)**	44.8
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

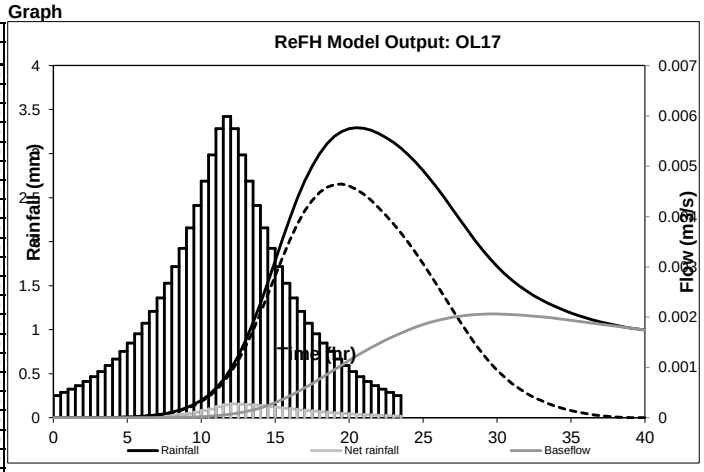
Summary of results

FEH DDF rainfall (mm)	89.9	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0
37.5	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

38.0	0.0	0.0	0.0	0.0	0.0
38.5	0.0	0.0	0.0	0.0	0.0
39.0	0.0	0.0	0.0	0.0	0.0
39.5	0.0	0.0	0.0	0.0	0.0
40.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.0**	**2.6**	**2.6**	**1.8**	**4.4**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL17.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:00
BFIHOST value of 0.864 used
PROPWET value of 0.27 used
SAAR value of 610 used
DPLBAR value of 3.72 used
DPSBAR value of 15.3 used
URBEXT value of 0.1185 used
Catchment area changed from imported value of 9.38 to 0.082
C value of -0.02359 used
D1 value of 0.27077 used
D2 value of 0.3807 used
D3 value of 0.25536 used
E value of 0.31039 used
F value of 2.48449 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL18	**Date/time modelled**	20-Aug-2013 11:21
Company name	Mott MacDonald	**Catchment easting**	627350	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	313800		
		Catchment area	0.09		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	711	**T_p (hr)**	4.24	**BL (hr)**	42.7
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

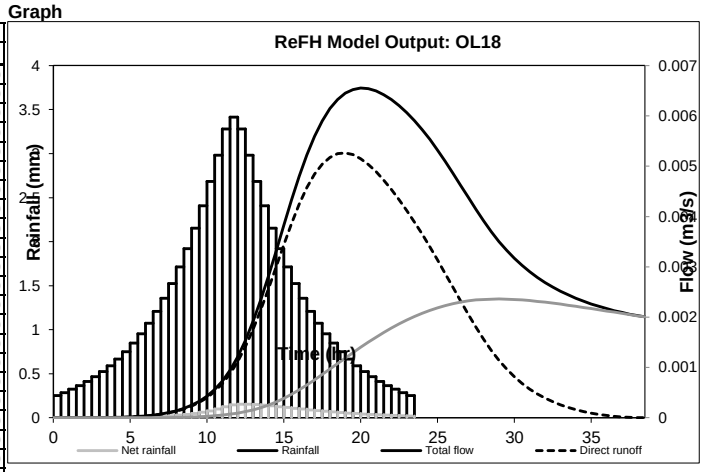
Summary of results

FEH DDF rainfall (mm)	89.8	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.9	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0
37.5	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

38.0	0.0	0.0	0.0	0.0	0.0
38.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.9**	**2.6**	**2.6**	**1.8**	**4.4**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL18.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:01
BFIHOST value of 0.864 used
PROPWET value of 0.27 used
SAAR value of 610 used
DPLBAR value of 3.29 used
DPSBAR value of 14.4 used
URBEXT value of 0.1263 used
Catchment area changed from imported value of 8.8 to 0.09
C value of -0.02356 used
D1 value of 0.26971 used
D2 value of 0.38222 used
D3 value of 0.25625 used
E value of 0.31028 used
F value of 2.48478 used

Rainfall
Recommended season is Summer, as URBEXT => 0.125
Recommended season overridden by the user
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL19	**Date/time modelled**	20-Aug-2013 11:46
Company name	Mott MacDonald	**Catchment easting**	627300	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	313850		
		Catchment area	0.341756		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	711	**T_p (hr)**	4.29	**BL (hr)**	42.9
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

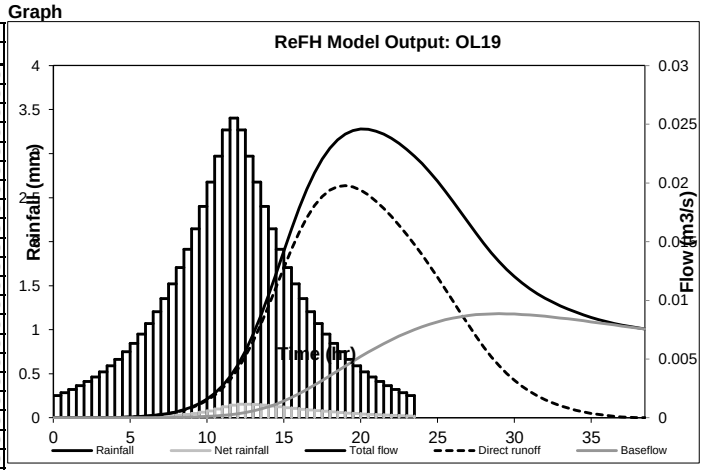
Summary of results

FEH DDF rainfall (mm)	89.8	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.7	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0
37.5	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

38.0	0.0	0.0	0.0	0.0	0.0
38.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.7**	**2.6**	**2.6**	**1.8**	**4.4**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL19A.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:02
BFIHOST value of 0.864 used
PROPWET value of 0.27 used
SAAR value of 610 used
DPLBAR value of 3.35 used
DPSBAR value of 14.4 used
URBEXT value of 0.1259 used
Catchment area changed from imported value of 8.81 to 0.34175645074726
C value of -0.02356 used
D1 value of 0.26973 used
D2 value of 0.38218 used
D3 value of 0.25622 used
E value of 0.31029 used
F value of 2.48477 used

Rainfall
Recommended season is Summer, as URBEXT => 0.125
Recommended season overridden by the user
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL20	**Date/time modelled**	20-Aug-2013 11:22
Company name	Mott MacDonald	**Catchment easting**	627500	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	313250		
		Catchment area	6.765		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	3.79	**BL (hr)**	39.7
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

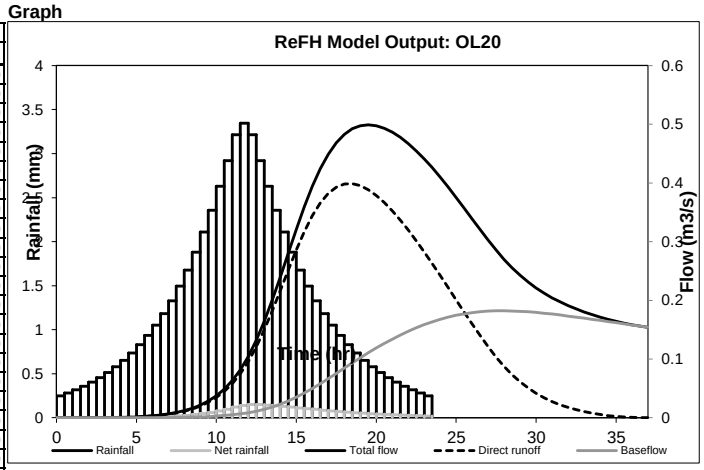
Summary of results

FEH DDF rainfall (mm)	89.5	**Peak rainfall (mm)**	3.3
Design rainfall (mm)	59.7	**Peak flow (m^3/s)**	0.5

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.2	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.6	0.1	0.0	0.0	0.0
10.5	2.9	0.1	0.0	0.0	0.0
11.0	3.2	0.1	0.1	0.0	0.1
11.5	3.3	0.1	0.1	0.0	0.1
12.0	3.2	0.2	0.1	0.0	0.1
12.5	2.9	0.1	0.1	0.0	0.1
13.0	2.6	0.1	0.1	0.0	0.2
13.5	2.4	0.1	0.2	0.0	0.2
14.0	2.1	0.1	0.2	0.0	0.2
14.5	1.9	0.1	0.3	0.0	0.3
15.0	1.7	0.1	0.3	0.0	0.3
15.5	1.5	0.1	0.3	0.0	0.4
16.0	1.3	0.1	0.3	0.0	0.4
16.5	1.2	0.1	0.4	0.1	0.4
17.0	1.1	0.1	0.4	0.1	0.4
17.5	0.9	0.1	0.4	0.1	0.5
18.0	0.8	0.1	0.4	0.1	0.5
18.5	0.7	0.1	0.4	0.1	0.5
19.0	0.7	0.1	0.4	0.1	0.5
19.5	0.6	0.0	0.4	0.1	0.5
20.0	0.5	0.0	0.4	0.1	0.5
20.5	0.5	0.0	0.4	0.1	0.5
21.0	0.4	0.0	0.4	0.1	0.5
21.5	0.4	0.0	0.3	0.1	0.5
22.0	0.3	0.0	0.3	0.1	0.5
22.5	0.3	0.0	0.3	0.2	0.5
23.0	0.2	0.0	0.3	0.2	0.4
23.5	0.0	0.0	0.3	0.2	0.4
24.0	0.0	0.0	0.2	0.2	0.4
24.5	0.0	0.0	0.2	0.2	0.4
25.0	0.0	0.0	0.2	0.2	0.4
25.5	0.0	0.0	0.2	0.2	0.4
26.0	0.0	0.0	0.2	0.2	0.3
26.5	0.0	0.0	0.1	0.2	0.3
27.0	0.0	0.0	0.1	0.2	0.3
27.5	0.0	0.0	0.1	0.2	0.3
28.0	0.0	0.0	0.1	0.2	0.3
28.5	0.0	0.0	0.1	0.2	0.3
29.0	0.0	0.0	0.1	0.2	0.2
29.5	0.0	0.0	0.1	0.2	0.2
30.0	0.0	0.0	0.0	0.2	0.2
30.5	0.0	0.0	0.0	0.2	0.2
31.0	0.0	0.0	0.0	0.2	0.2
31.5	0.0	0.0	0.0	0.2	0.2
32.0	0.0	0.0	0.0	0.2	0.2
32.5	0.0	0.0	0.0	0.2	0.2
33.0	0.0	0.0	0.0	0.2	0.2
33.5	0.0	0.0	0.0	0.2	0.2
34.0	0.0	0.0	0.0	0.2	0.2
34.5	0.0	0.0	0.0	0.2	0.2
35.0	0.0	0.0	0.0	0.2	0.2
35.5	0.0	0.0	0.0	0.2	0.2
36.0	0.0	0.0	0.0	0.2	0.2
36.5	0.0	0.0	0.0	0.2	0.2
37.0	0.0	0.0	0.0	0.2	0.2

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Total (mm)	**59.7**	**2.5**	**2.5**	**1.8**	**4.3**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL20.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:04
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 610 used
DPLBAR value of 2.83 used
DPSBAR value of 13.2 used
URBEXT value of 0.1419 used
Catchment area changed from imported value of 7.7 to 6.765
C value of -0.02359 used
D1 value of 0.26847 used
D2 value of 0.38345 used
D3 value of 0.25814 used
E value of 0.31015 used
F value of 2.48576 used

Rainfall
Recommended season is Summer, as URBEXT => 0.125
Recommended season overridden by the user
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.98 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL21	**Date/time modelled**	20-Aug-2013 11:23
Company name	Mott MacDonald	**Catchment easting**	627600	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	313300		
		Catchment area	0.355		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	729	**T_p (hr)**	2.4	**BL (hr)**	42.6
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.06
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

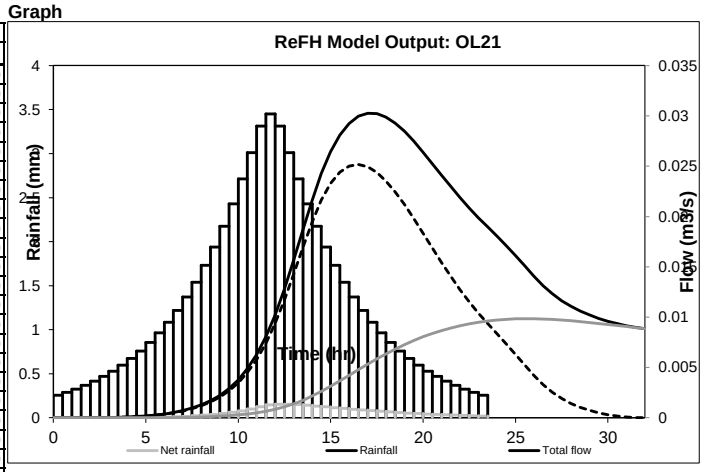
Summary of results

FEH DDF rainfall (mm)	91.1	**Peak rainfall (mm)**	3.5
Design rainfall (mm)	61.5	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.5	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.5**	**2.6**	**2.6**	**1.5**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL21.csv'
Catchment decriptor file exported from CD ROM version 3

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptor file exported on 19-Aug-2013 09:05
BFIHOST value of 0.887 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 0.75 used
DPSBAR value of 15 used
URBEXT value of 0.0209 used
Catchment area changed from imported value of 0.6 to 0.355
C value of -0.02304 used
D1 value of 0.27546 used
D2 value of 0.37897 used
D3 value of 0.24316 used
E value of 0.31074 used
F value of 2.47751 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL22	**Date/time modelled**	20-Aug-2013 11:24
Company name	Mott MacDonald	**Catchment easting**	628550	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	312150		
		Catchment area	0.12		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	726	**T_p (hr)**	2.17	**BL (hr)**	33.7
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.04
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

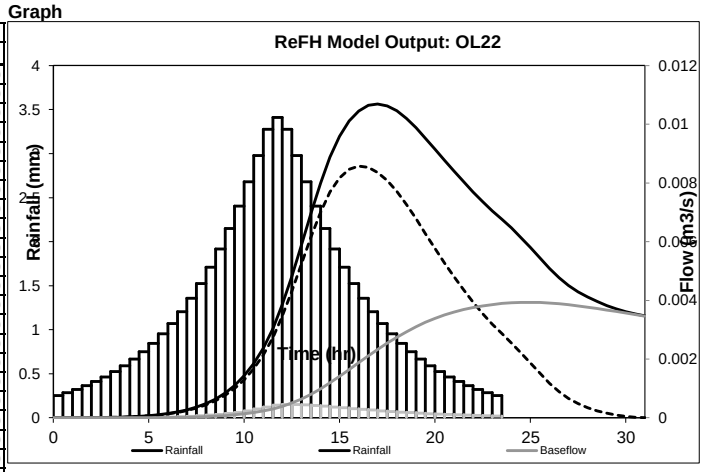
Summary of results

FEH DDF rainfall (mm)	89.8	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.8	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.8**	**2.5**	**2.5**	**1.7**	**4.3**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL22.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:07
BFIHOST value of 0.882 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 0.67 used
DPSBAR value of 7.3 used
URBEXT value of 0.0945 used
Catchment area changed from imported value of 0.5 to 0.12
C value of -0.023 used
D1 value of 0.2679 used
D2 value of 0.38775 used
D3 value of 0.25029 used
E value of 0.3092 used
F value of 2.4828 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL23	**Date/time modelled**	20-Aug-2013 11:25
Company name	Mott MacDonald	**Catchment easting**	628550	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	311750		
		Catchment area	1.045		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	722	**T_p (hr)**	2.98	**BL (hr)**	39.3
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.03
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

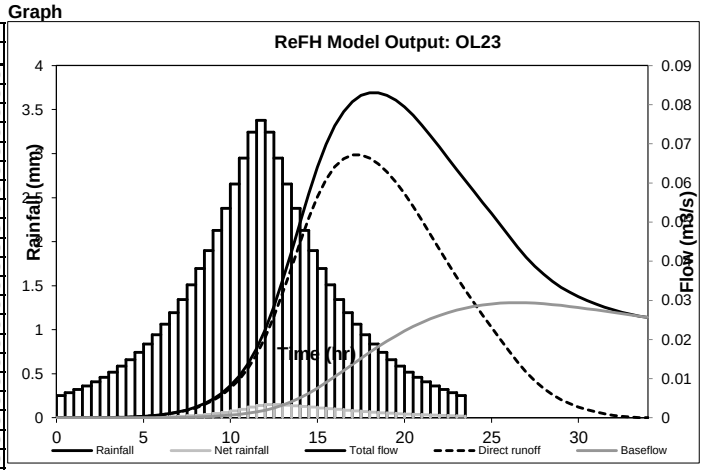
Summary of results

FEH DDF rainfall (mm)	89.5	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.2	**Peak flow (m^3/s)**	0.1

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	2.9	0.1	0.0	0.0	0.0
11.0	3.2	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.2	0.2	0.0	0.0	0.0
12.5	2.9	0.1	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.1	0.0	0.1
15.0	1.7	0.1	0.1	0.0	0.1
15.5	1.5	0.1	0.1	0.0	0.1
16.0	1.3	0.1	0.1	0.0	0.1
16.5	1.2	0.1	0.1	0.0	0.1
17.0	1.1	0.1	0.1	0.0	0.1
17.5	0.9	0.1	0.1	0.0	0.1
18.0	0.8	0.1	0.1	0.0	0.1
18.5	0.7	0.1	0.1	0.0	0.1
19.0	0.7	0.1	0.1	0.0	0.1
19.5	0.6	0.0	0.1	0.0	0.1
20.0	0.5	0.0	0.1	0.0	0.1
20.5	0.5	0.0	0.1	0.0	0.1
21.0	0.4	0.0	0.1	0.0	0.1
21.5	0.4	0.0	0.0	0.0	0.1
22.0	0.3	0.0	0.0	0.0	0.1
22.5	0.3	0.0	0.0	0.0	0.1
23.0	0.3	0.0	0.0	0.0	0.1
23.5	0.0	0.0	0.0	0.0	0.1
24.0	0.0	0.0	0.0	0.0	0.1
24.5	0.0	0.0	0.0	0.0	0.1
25.0	0.0	0.0	0.0	0.0	0.1
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.2**	**2.5**	**2.5**	**1.7**	**4.2**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL23.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:08
BFIHOST value of 0.878 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 0.96 used
DPSBAR value of 7 used
URBEXT value of 0.0655 used
Catchment area changed from imported value of 0.72 to 1.045
C value of -0.023 used
D1 value of 0.26657 used
D2 value of 0.38915 used
D3 value of 0.25213 used
E value of 0.30889 used
F value of 2.48371 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL24	**Date/time modelled**	20-Aug-2013 11:25
Company name	Mott MacDonald	**Catchment easting**	628700	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	311600		
		Catchment area	0.493		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	714	**T_p (hr)**	3.61	**BL (hr)**	42.8
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	2.01
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

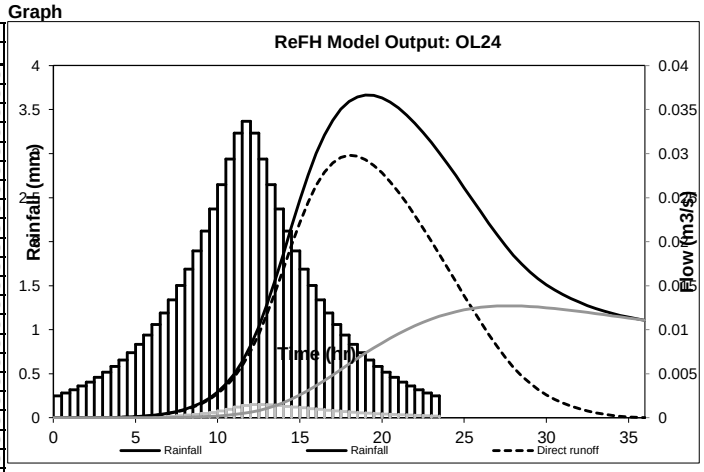
Summary of results

FEH DDF rainfall (mm)	89	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.6	0.1	0.0	0.0	0.0
10.5	2.9	0.1	0.0	0.0	0.0
11.0	3.2	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.2	0.2	0.0	0.0	0.0
12.5	2.9	0.1	0.0	0.0	0.0
13.0	2.6	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.3	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	0.9	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.0**	**2.5**	**2.5**	**1.6**	**4.2**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL24.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:09
BFIHOST value of 0.867 used
PROPWET value of 0.27 used
SAAR value of 607 used
DPLBAR value of 1.28 used
DPSBAR value of 7.4 used
URBEXT value of 0.0547 used
Catchment area changed from imported value of 2.06 to 0.493
C value of -0.02326 used
D1 value of 0.26483 used
D2 value of 0.39184 used
D3 value of 0.25774 used
E value of 0.3088 used
F value of 2.48485 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL25	**Date/time modelled**	20-Aug-2013 11:26
Company name	Mott MacDonald	**Catchment easting**	629050	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	311200		
		Catchment area	0.207		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	710	**T_p (hr)**	1.88	**BL (hr)**	27.3
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

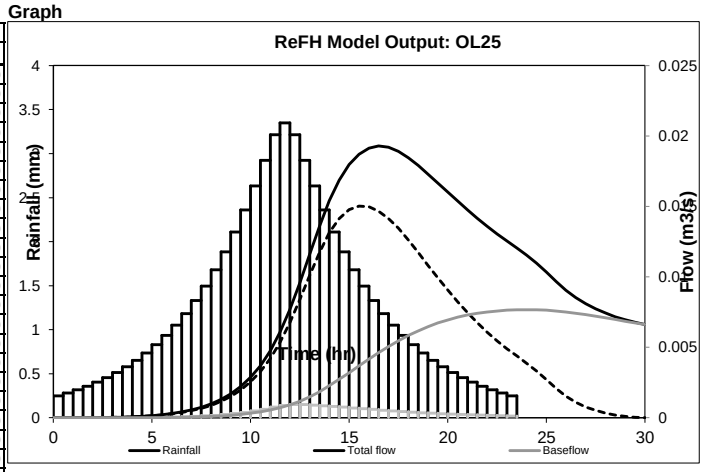
Summary of results

FEH DDF rainfall (mm)	88.4	**Peak rainfall (mm)**	3.3
Design rainfall (mm)	59.7	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.2	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.6	0.1	0.0	0.0	0.0
10.5	2.9	0.1	0.0	0.0	0.0
11.0	3.2	0.1	0.0	0.0	0.0
11.5	3.3	0.1	0.0	0.0	0.0
12.0	3.2	0.2	0.0	0.0	0.0
12.5	2.9	0.1	0.0	0.0	0.0
13.0	2.6	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.3	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	0.9	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.2	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**59.7**	**2.5**	**2.5**	**1.9**	**4.4**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL25.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:09
BFIHOST value of 0.862 used
PROPWET value of 0.27 used
SAAR value of 606 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

DPLBAR value of 0.84 used
DPSBAR value of 7.4 used
URBEXT value of 0.1881 used
Catchment area changed from imported value of 0.53 to 0.207
C value of -0.024 used
D1 value of 0.26436 used
D2 value of 0.39699 used
D3 value of 0.2591 used
E value of 0.30944 used
F value of 2.48288 used

Rainfall
Recommended season is Summer, as URBEXT => 0.125
Recommended season overridden by the user
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL27	**Date/time modelled**	20-Aug-2013 11:27
Company name	Mott MacDonald	**Catchment easting**	628250	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	310100		
		Catchment area	0.0697		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	2.34	**BL (hr)**	39.3
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

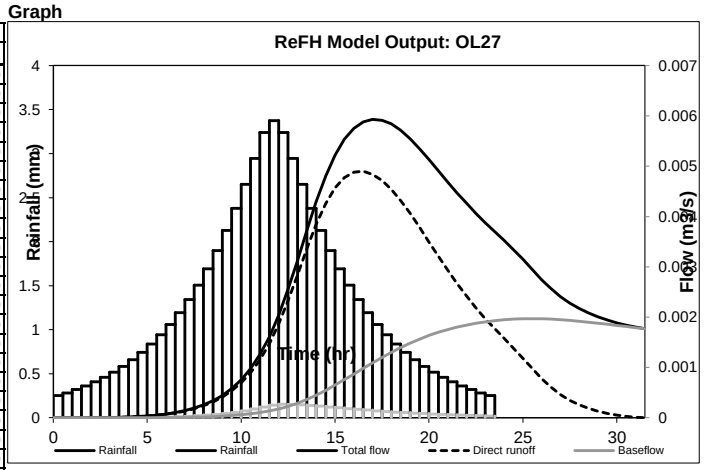
Summary of results

FEH DDF rainfall (mm)	88.9	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.2	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	2.9	0.1	0.0	0.0	0.0
11.0	3.2	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.2	0.2	0.0	0.0	0.0
12.5	2.9	0.2	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.3	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	0.9	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.2**	**2.6**	**2.6**	**1.5**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL27.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 19-Aug-2013 09:10

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 606 used
DPLBAR value of 0.76 used
DPSBAR value of 12.8 used
URBEXT value of 0.0448 used
Catchment area changed from imported value of 0.67 to 0.0697
C value of -0.02387 used
D1 value of 0.26567 used
D2 value of 0.3967 used
D3 value of 0.2595 used
E value of 0.30964 used
F value of 2.4827 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL28	**Date/time modelled**	20-Aug-2013 11:28
Company name	Mott MacDonald	**Catchment easting**	628300	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	309850		
		Catchment area	0.138		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	2.47	**BL (hr)**	28.6
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

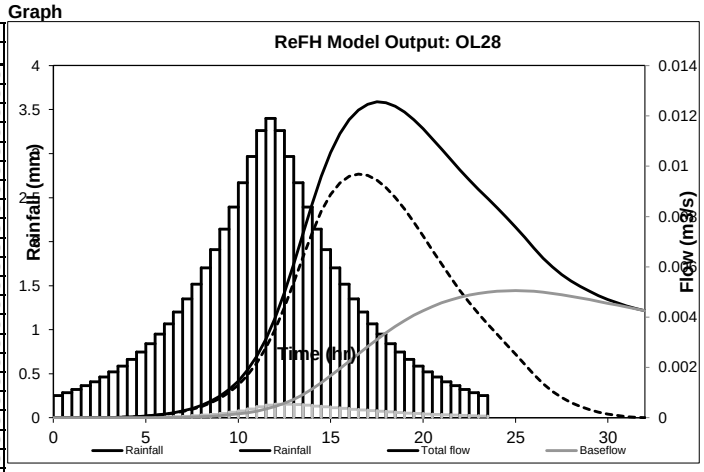
Summary of results

FEH DDF rainfall (mm)	89.5	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.6	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	0.9	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.6**	**2.6**	**2.6**	**2.0**	**4.6**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL28.csv'
Catchment decriptor file exported from CD ROM version 3

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptor file exported on 15-Aug-2013 15:04
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 2.22 used
DPSBAR value of 12.1 used
URBEXT value of 0.2519 used
Catchment area changed from imported value of 3.36 to 0.138
C value of -0.02326 used
D1 value of 0.26592 used
D2 value of 0.38954 used
D3 value of 0.26203 used
E value of 0.30917 used
F value of 2.48706 used

Rainfall
Recommended season is Summer, as URBEXT => 0.125
Recommended season overridden by the user
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL29	**Date/time modelled**	20-Aug-2013 11:29
Company name	Mott MacDonald	**Catchment easting**	629000	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308850		
		Catchment area	0.044		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	3.57	**BL (hr)**	46.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

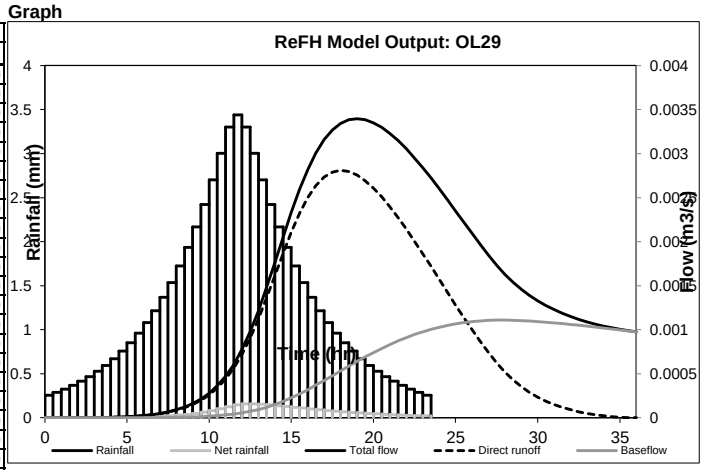
Summary of results

FEH DDF rainfall (mm)	90.4	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.3	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.3**	**2.7**	**2.7**	**1.6**	**4.2**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL29.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 15-Aug-2013 15:06
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 0.89 used
DPSBAR value of 6.7 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.044
C value of -0.024 used
D1 value of 0.26789 used
D2 value of 0.41915 used
D3 value of 0.23754 used
E value of 0.309 used
F value of 2.48397 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL30	**Date/time modelled**	05-Nov-2013 14:03
Company name	Mott MacDonald	**Catchment easting**	628800	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308900		
		Catchment area	0.5		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	2.79	**BL (hr)**	44.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

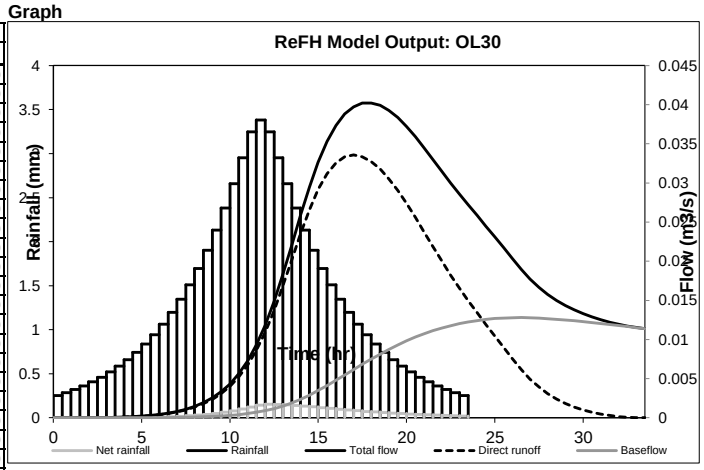
Summary of results

FEH DDF rainfall (mm)	89.3	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	60.3	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.7	0.0	0.0	0.0	0.0
5.0	0.8	0.0	0.0	0.0	0.0
5.5	0.9	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.3	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.1	0.0	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.2	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.2	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.1	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.1	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.3	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	0.9	0.1	0.0	0.0	0.0
18.0	0.8	0.1	0.0	0.0	0.0
18.5	0.7	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**60.3**	**2.6**	**2.6**	**1.5**	**4.1**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Catchment descriptors imported from file
Catchment descriptor file = 'OL30.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 05-Nov-2013 13:56
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 609 used
DPLBAR value of 0.72 used
DPSBAR value of 10.2 used
URBEXT value of 0 used
C value of -0.024 used
D1 value of 0.26533 used
D2 value of 0.41625 used
D3 value of 0.25023 used
E value of 0.309 used
F value of 2.48048 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 0.99 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL31	**Date/time modelled**	05-Nov-2013 14:06
Company name	Mott MacDonald	**Catchment easting**	629000	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308850		
		Catchment area	0.02		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	3.57	**BL (hr)**	46.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

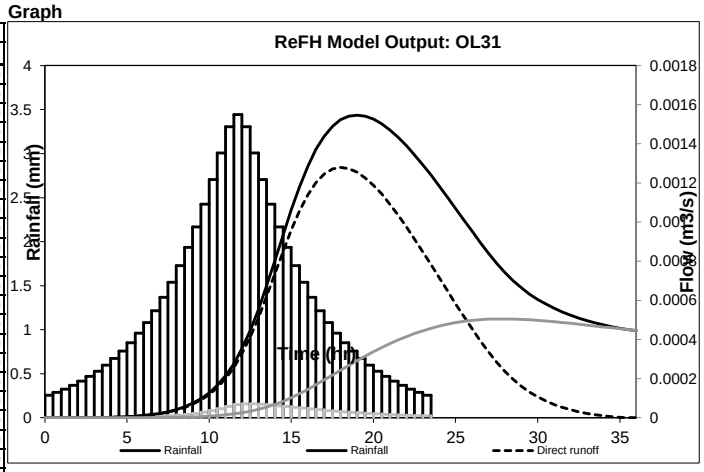
Summary of results

FEH DDF rainfall (mm)	90.4	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.4**	**2.7**	**2.7**	**1.6**	**4.3**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL31.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 05-Nov-2013 13:57
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 0.89 used
DPSBAR value of 6.7 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.02
C value of -0.024 used
D1 value of 0.26789 used
D2 value of 0.41915 used
D3 value of 0.23754 used
E value of 0.309 used
F value of 2.48397 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL32	**Date/time modelled**	05-Nov-2013 14:05
Company name	Mott MacDonald	**Catchment easting**	629000	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308850		
		Catchment area	0.02		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	3.57	**BL (hr)**	46.4
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

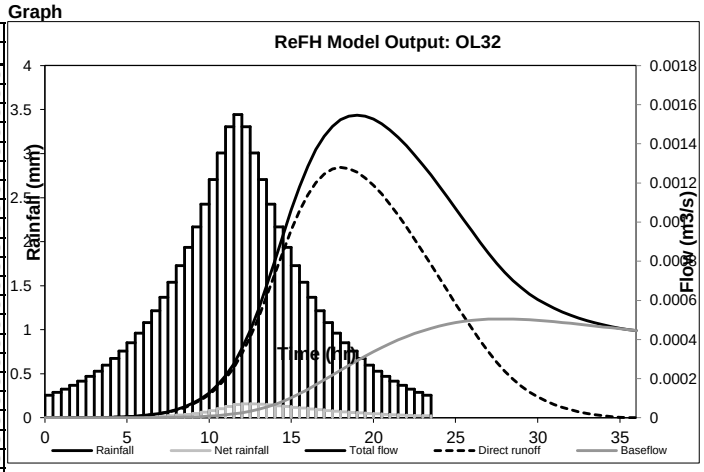
Summary of results

FEH DDF rainfall (mm)	90.4	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	**mm**	**mm**	**m^3/s**	**m^3/s**	**m^3/s**
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.4**	**2.7**	**2.7**	**1.6**	**4.3**

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL32.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 05-Nov-2013 13:57
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 0.89 used
DPSBAR value of 6.7 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.5 to 0.02
C value of -0.024 used
D1 value of 0.26789 used
D2 value of 0.41915 used
D3 value of 0.23754 used
E value of 0.309 used
F value of 2.48397 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL33	**Date/time modelled**	05-Nov-2013 14:08
Company name	Mott MacDonald	**Catchment easting**	628900	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308750		
		Catchment area	0.01		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	709	**T_p (hr)**	3.85	**BL (hr)**	47.7
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

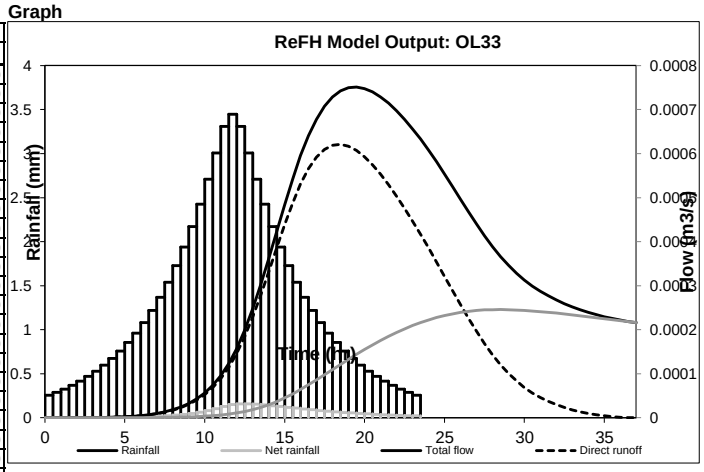
Summary of results

FEH DDF rainfall (mm)	90.4	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

Total (mm)	**61.4**	**2.7**	**2.7**	**1.6**	**4.3**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL33.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 05-Nov-2013 13:58
BFIHOST value of 0.861 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 1.02 used
DPSBAR value of 6.8 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.51 to 0.01
C value of -0.024 used
D1 value of 0.26784 used
D2 value of 0.41913 used
D3 value of 0.23774 used
E value of 0.309 used
F value of 2.48389 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL34	**Date/time modelled**	05-Nov-2013 14:09
Company name	Mott MacDonald	**Catchment easting**	628850	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308700		
		Catchment area	0.04		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	710	**T_p (hr)**	3.99	**BL (hr)**	48.3
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

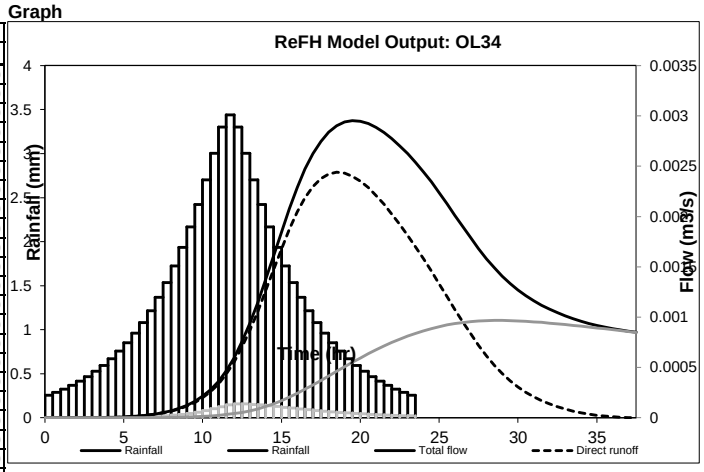
Summary of results

FEH DDF rainfall (mm)	90.4	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.3	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

37.5	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.3**	**2.6**	**2.6**	**1.6**	**4.3**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL34.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 05-Nov-2013 13:58
BFIHOST value of 0.862 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 1.08 used
DPSBAR value of 6.8 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.51 to 0.04
C value of -0.024 used
D1 value of 0.26783 used
D2 value of 0.41912 used
D3 value of 0.2378 used
E value of 0.309 used
F value of 2.48387 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	WJ Goh	**Catchment name**	OL35	**Date/time modelled**	05-Nov-2013 14:10
Company name	Mott MacDonald	**Catchment easting**	628800	**Version**	1.4
Project name	NDR Revision FRA	**Catchment northing**	308650		
		Catchment area	0.02		

Summary of model setup

Design rainfall parameters		Loss model parameters		Routing model parameters		Baseflow model parameters	
Return period (yr)	100	**C_{max} (mm)**	710	**T_p (hr)**	4.12	**BL (hr)**	48.9
Duration (hr)	23.5	**C_{ini} (mm)**	0	**U_p**	0.65	**BR**	1.99
Timestep (hr)	0.5	**α factor**	0.83	**U_k**	0.8	**BF_0 (m^3/s)**	0
Season	Winter						

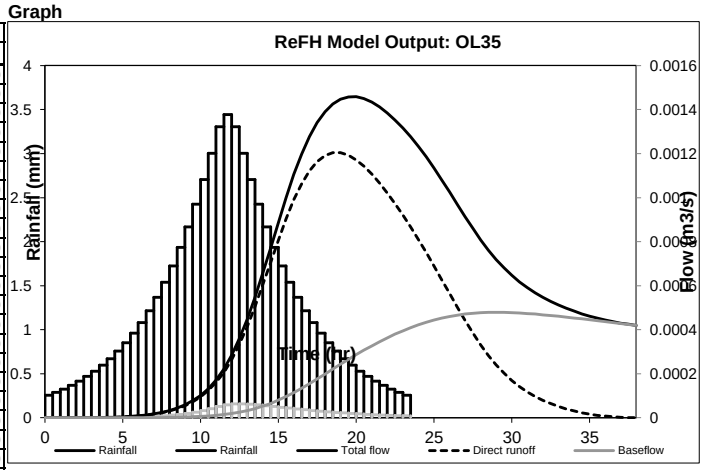
Summary of results

FEH DDF rainfall (mm)	90.4	**Peak rainfall (mm)**	3.4
Design rainfall (mm)	61.4	**Peak flow (m^3/s)**	0

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0.0	0.3	0.0	0.0	0.0	0.0
0.5	0.3	0.0	0.0	0.0	0.0
1.0	0.3	0.0	0.0	0.0	0.0
1.5	0.4	0.0	0.0	0.0	0.0
2.0	0.4	0.0	0.0	0.0	0.0
2.5	0.5	0.0	0.0	0.0	0.0
3.0	0.5	0.0	0.0	0.0	0.0
3.5	0.6	0.0	0.0	0.0	0.0
4.0	0.7	0.0	0.0	0.0	0.0
4.5	0.8	0.0	0.0	0.0	0.0
5.0	0.9	0.0	0.0	0.0	0.0
5.5	1.0	0.0	0.0	0.0	0.0
6.0	1.1	0.0	0.0	0.0	0.0
6.5	1.2	0.0	0.0	0.0	0.0
7.0	1.4	0.0	0.0	0.0	0.0
7.5	1.5	0.0	0.0	0.0	0.0
8.0	1.7	0.0	0.0	0.0	0.0
8.5	1.9	0.0	0.0	0.0	0.0
9.0	2.2	0.1	0.0	0.0	0.0
9.5	2.4	0.1	0.0	0.0	0.0
10.0	2.7	0.1	0.0	0.0	0.0
10.5	3.0	0.1	0.0	0.0	0.0
11.0	3.3	0.1	0.0	0.0	0.0
11.5	3.4	0.1	0.0	0.0	0.0
12.0	3.3	0.2	0.0	0.0	0.0
12.5	3.0	0.2	0.0	0.0	0.0
13.0	2.7	0.2	0.0	0.0	0.0
13.5	2.4	0.1	0.0	0.0	0.0
14.0	2.2	0.1	0.0	0.0	0.0
14.5	1.9	0.1	0.0	0.0	0.0
15.0	1.7	0.1	0.0	0.0	0.0
15.5	1.5	0.1	0.0	0.0	0.0
16.0	1.4	0.1	0.0	0.0	0.0
16.5	1.2	0.1	0.0	0.0	0.0
17.0	1.1	0.1	0.0	0.0	0.0
17.5	1.0	0.1	0.0	0.0	0.0
18.0	0.9	0.1	0.0	0.0	0.0
18.5	0.8	0.1	0.0	0.0	0.0
19.0	0.7	0.1	0.0	0.0	0.0
19.5	0.6	0.0	0.0	0.0	0.0
20.0	0.5	0.0	0.0	0.0	0.0
20.5	0.5	0.0	0.0	0.0	0.0
21.0	0.4	0.0	0.0	0.0	0.0
21.5	0.4	0.0	0.0	0.0	0.0
22.0	0.3	0.0	0.0	0.0	0.0
22.5	0.3	0.0	0.0	0.0	0.0
23.0	0.3	0.0	0.0	0.0	0.0
23.5	0.0	0.0	0.0	0.0	0.0
24.0	0.0	0.0	0.0	0.0	0.0
24.5	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0
25.5	0.0	0.0	0.0	0.0	0.0
26.0	0.0	0.0	0.0	0.0	0.0
26.5	0.0	0.0	0.0	0.0	0.0
27.0	0.0	0.0	0.0	0.0	0.0
27.5	0.0	0.0	0.0	0.0	0.0
28.0	0.0	0.0	0.0	0.0	0.0
28.5	0.0	0.0	0.0	0.0	0.0
29.0	0.0	0.0	0.0	0.0	0.0
29.5	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0
30.5	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0
31.5	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0
32.5	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0
33.5	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0
34.5	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0
35.5	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0
36.5	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0
37.5	0.0	0.0	0.0	0.0	0.0

Graph



Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

38.0	0.0	0.0	0.0	0.0	0.0
Total (mm)	**61.4**	**2.7**	**2.7**	**1.6**	**4.3**

Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = 'OL35.csv'
Catchment decriptor file exported from CD ROM version 3
Catchment descriptor file exported on 05-Nov-2013 13:59
BFIHOST value of 0.862 used
PROPWET value of 0.27 used
SAAR value of 608 used
DPLBAR value of 1.14 used
DPSBAR value of 6.8 used
URBEXT value of 0 used
Catchment area changed from imported value of 0.51 to 0.02
C value of -0.024 used
D1 value of 0.26782 used
D2 value of 0.41911 used
D3 value of 0.23787 used
E value of 0.309 used
F value of 2.48384 used

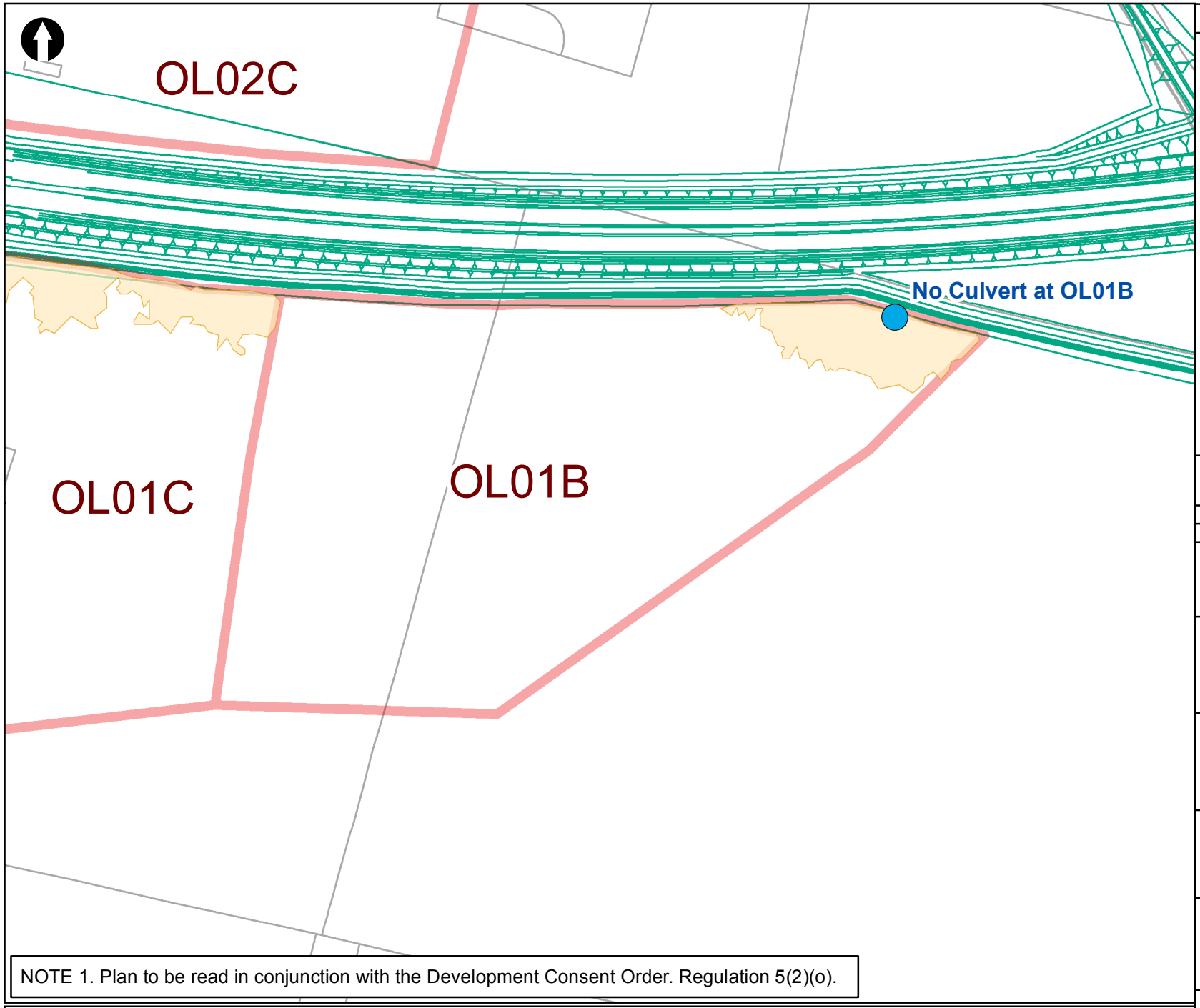
Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.68 applied
ReFH design standard Areal Reduction Factor of 1.00 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Appendix E. Overland Flow Flood Extents



NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters: 0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL01B

Scale	MM Project No.	Status
1:2,500	233906	INF

GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0828 Rev 0

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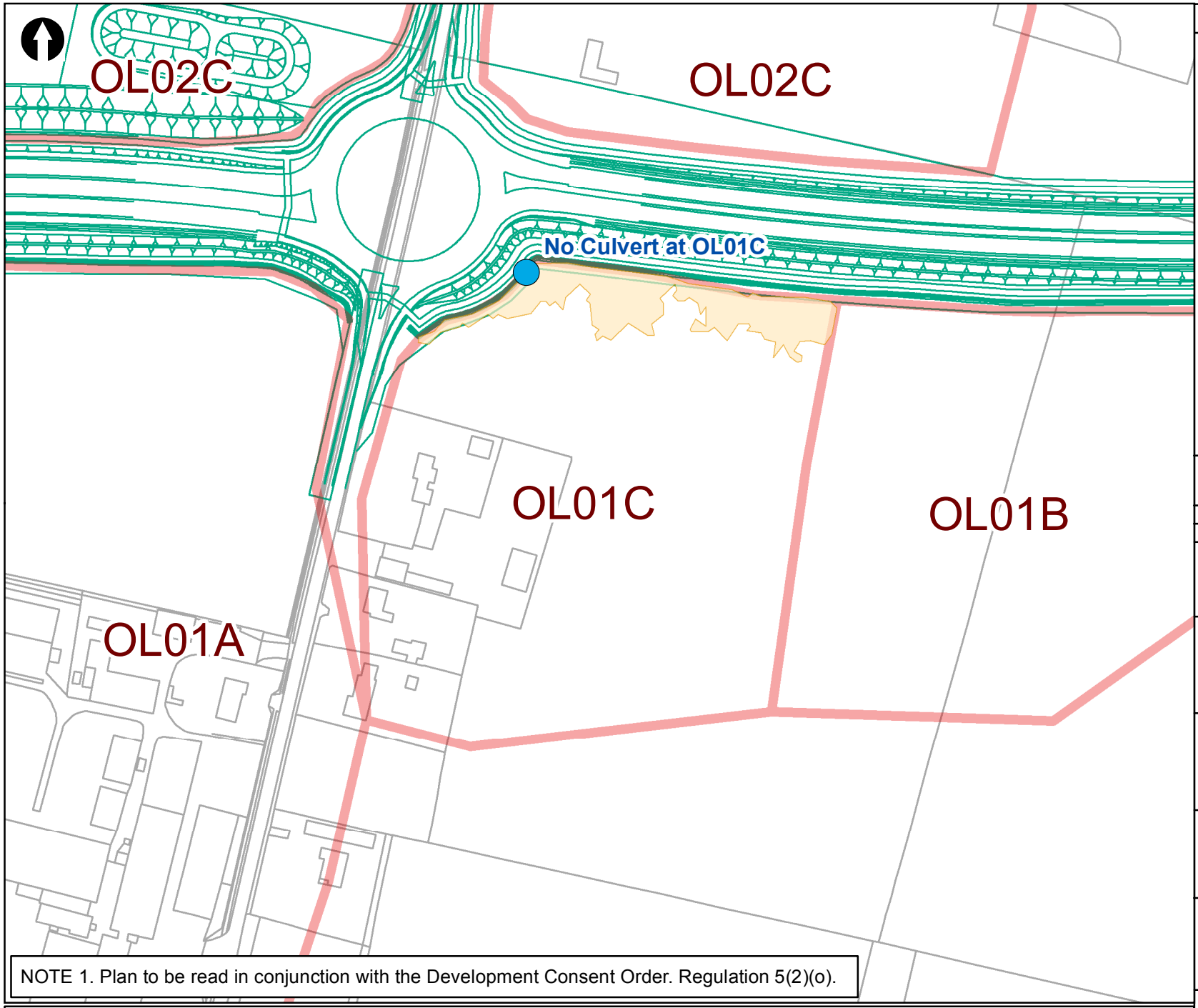

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

Norfolk County Council

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL01C

Scale	MM Project No.	Status
1:2,500	233906	INF

GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0829 Rev 0

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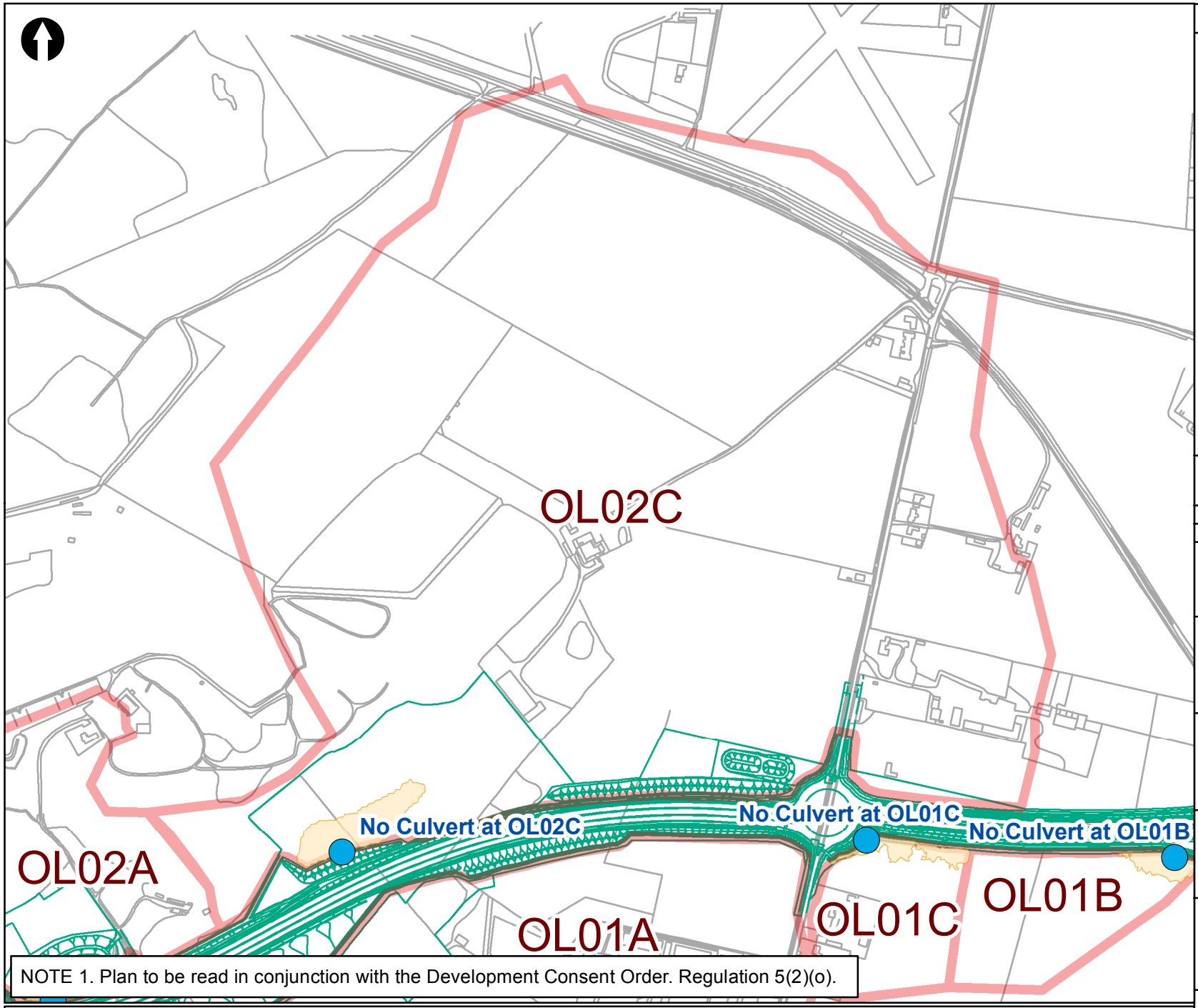

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 60 120 180 240

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

Norfolk County Council

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Environment Division
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL02C

Scale	MM Project No.	Status
1:7,500	233906	INF

GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0830 Rev 0

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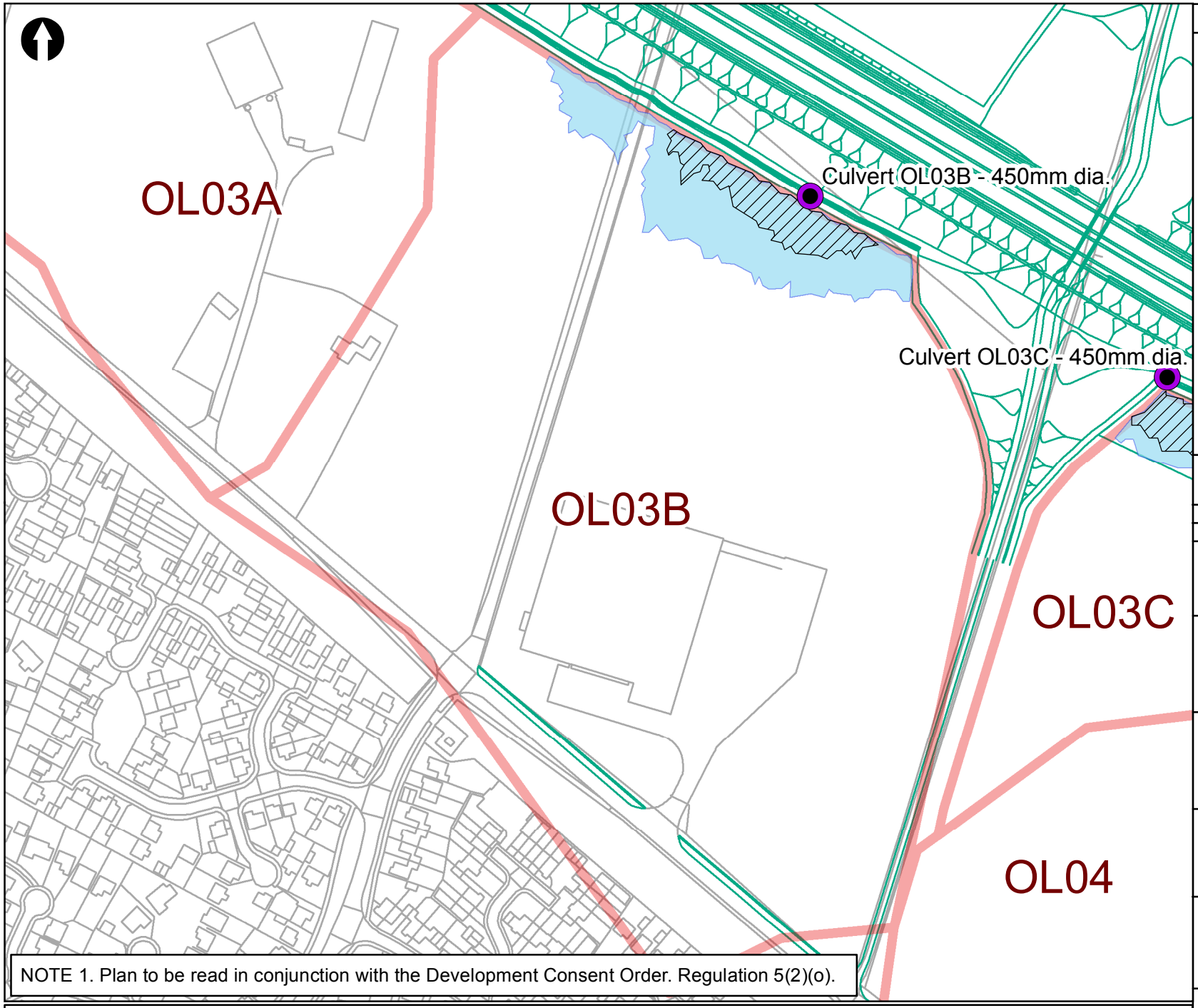

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL03B

Scale	MM Project No.	Status
1:2,500	233906	INF

GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0831 Rev 0

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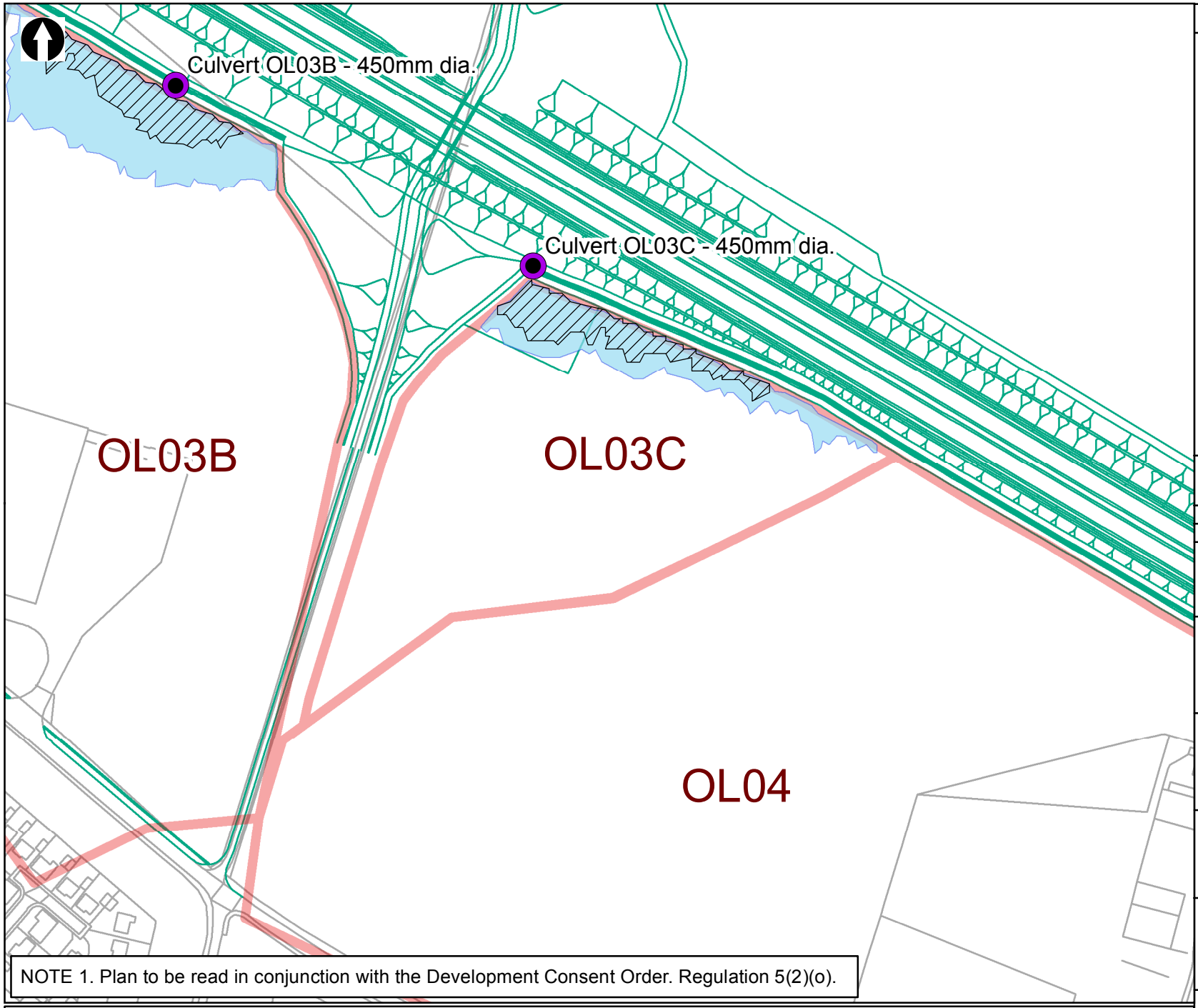

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Blockage)
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Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL03C

Scale	MM Project No.	Status
1:2,500	233906	INF

GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0832 Rev 0

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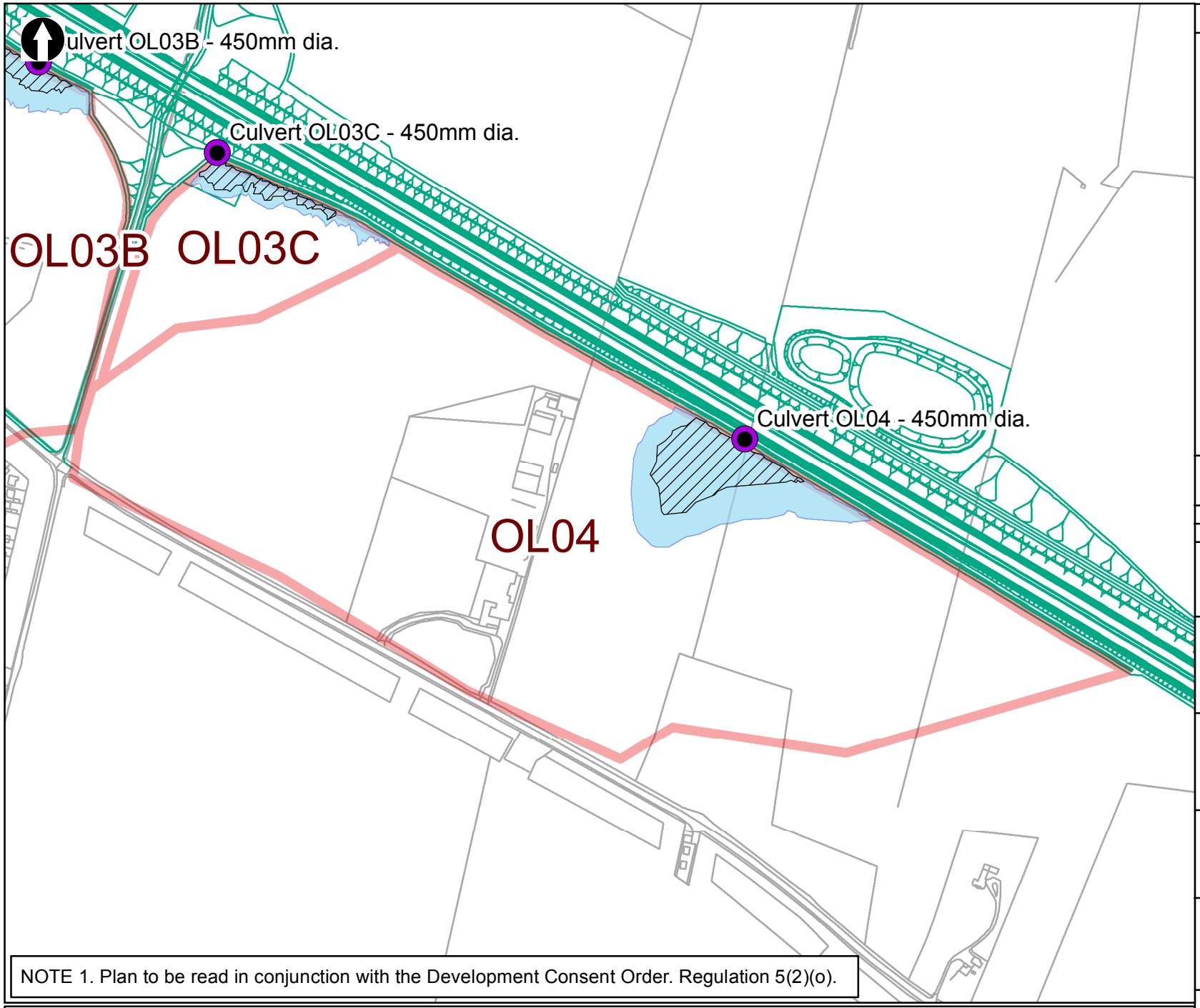

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
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- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 40 80 120 160

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL04

Scale	MM Project No.	Status
1:5,000	233906	INF

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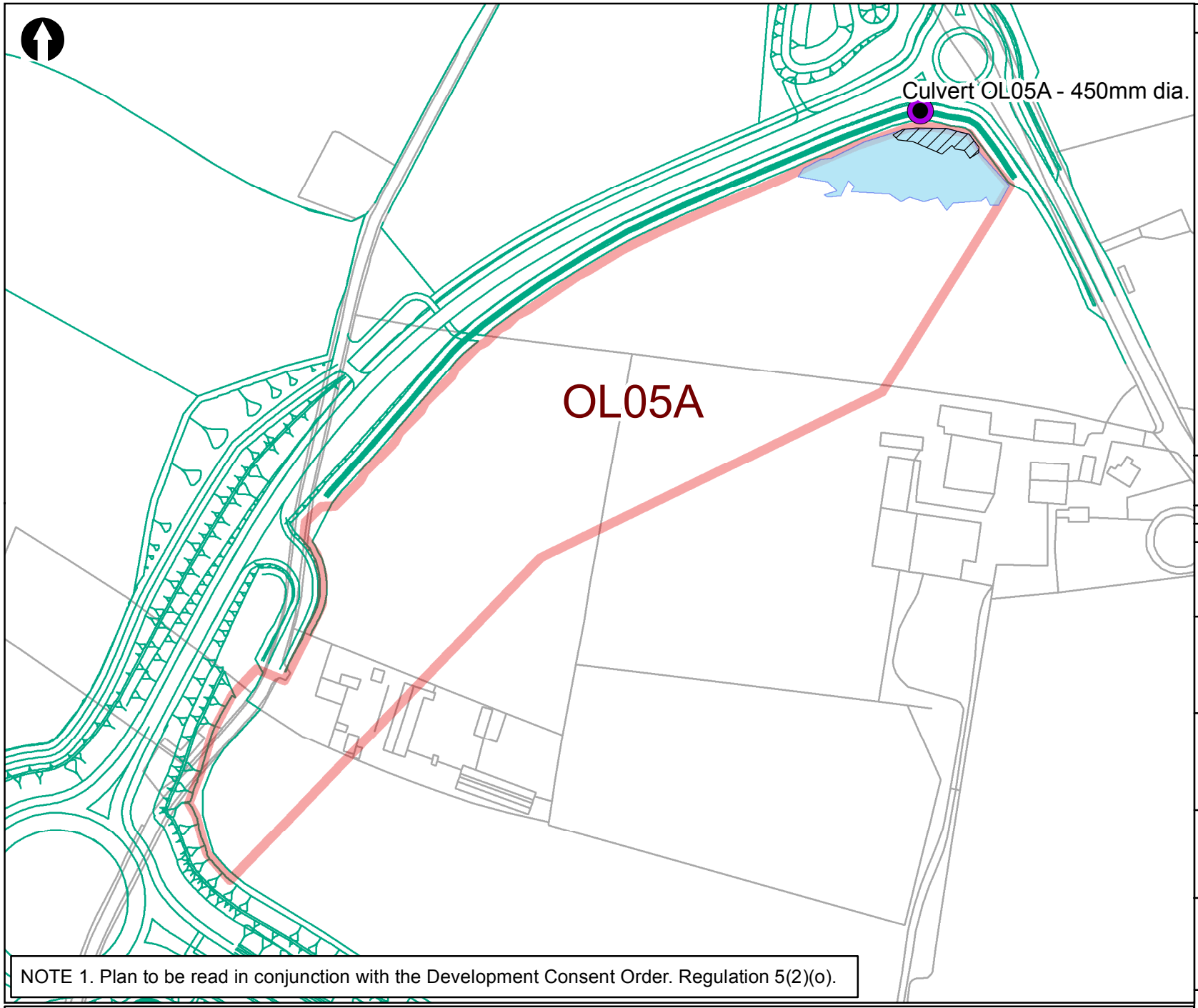

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

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Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL05A

Scale	MM Project No.	Status
1:2,500	233906	INF

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Drawing No. MMD-233906-DT-0834 Rev 0

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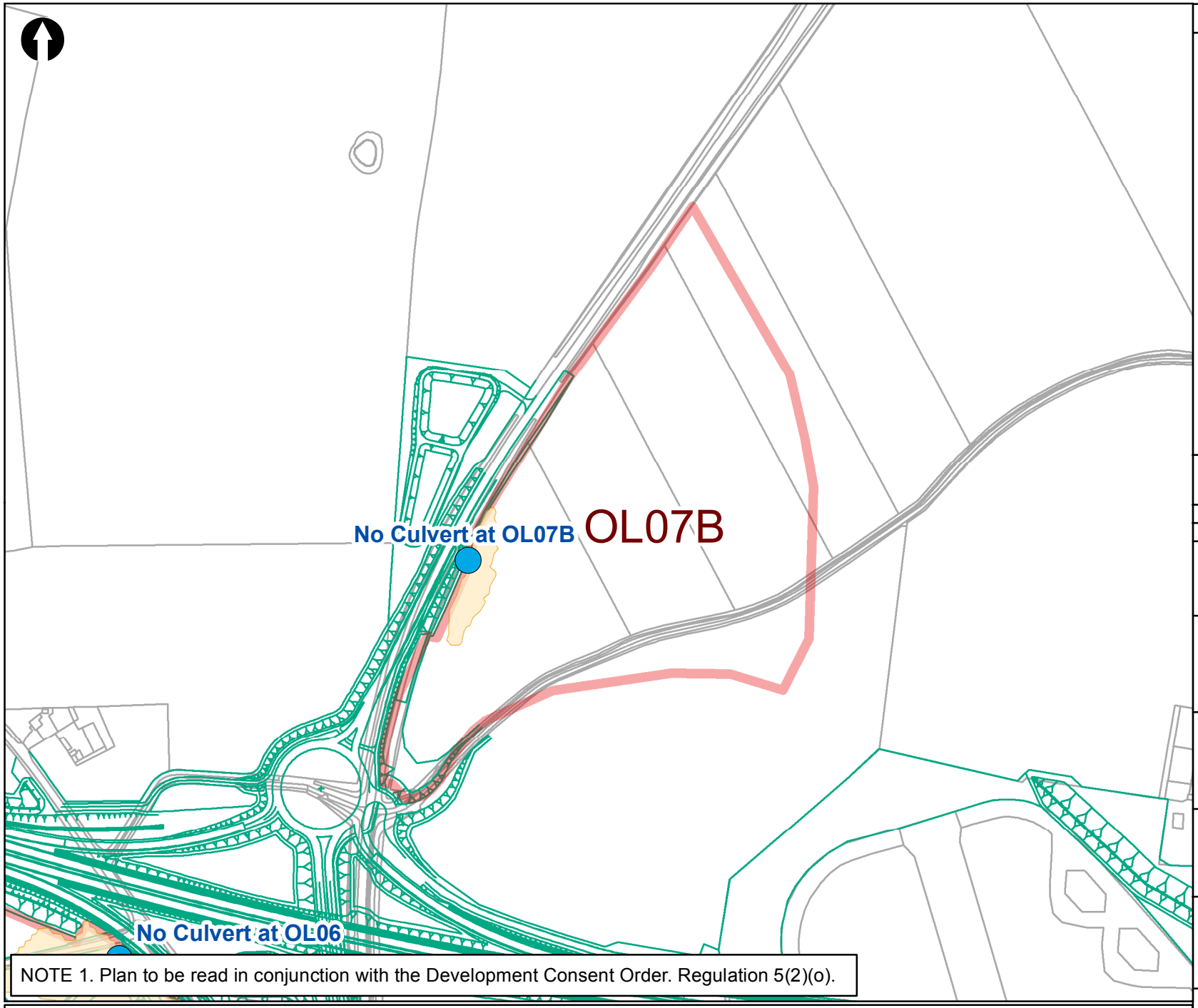

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
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- Catchment Low Point (Culvert)
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0 40 80 120 160 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL07B

Scale	MM Project No.	Status
1:5,000	233906	INF

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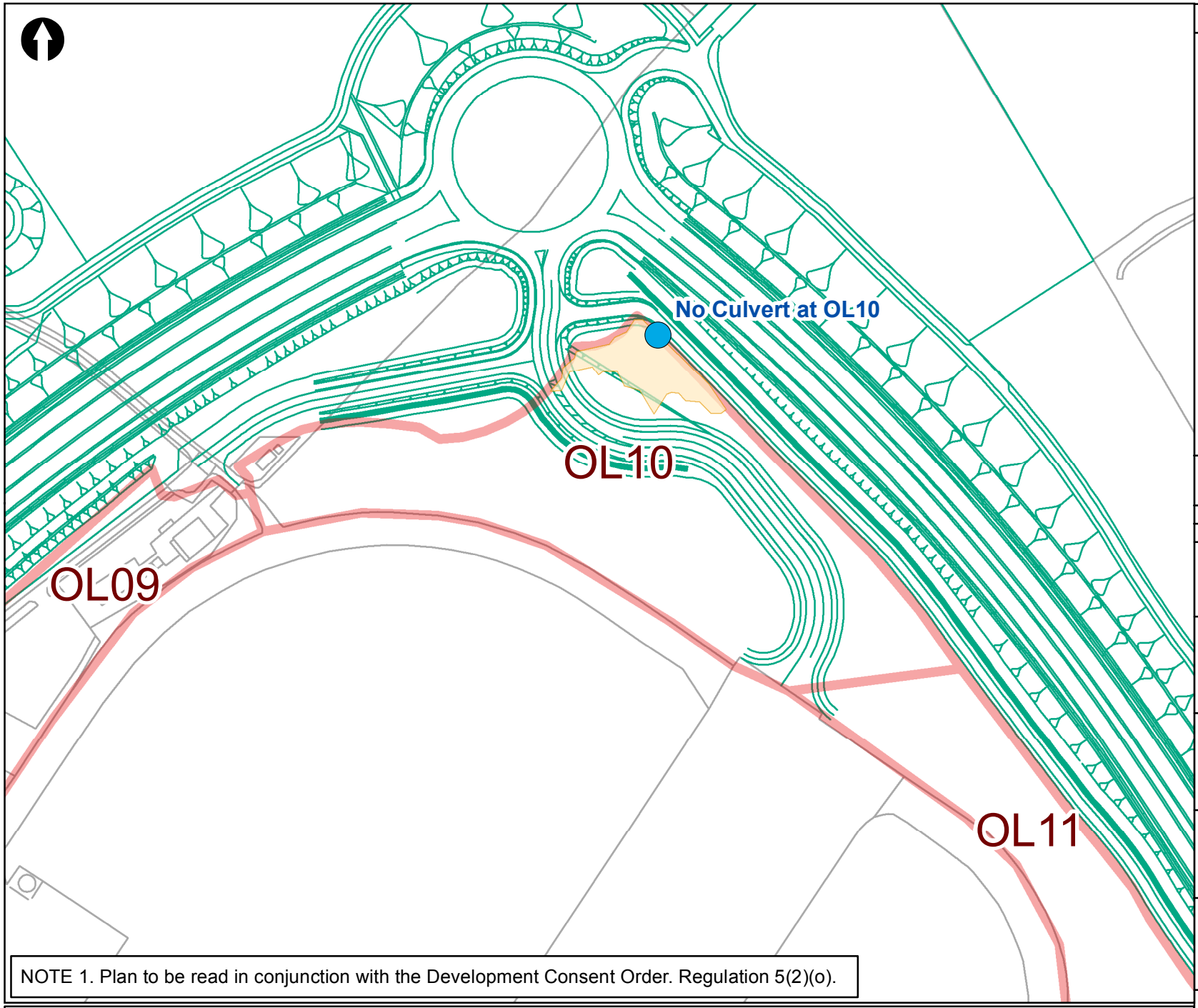

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Operational)
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- Flood Extents (No Culvert)

0 20 40 60 80 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL10

Scale	MM Project No.	Status
1:2,500	233906	INF

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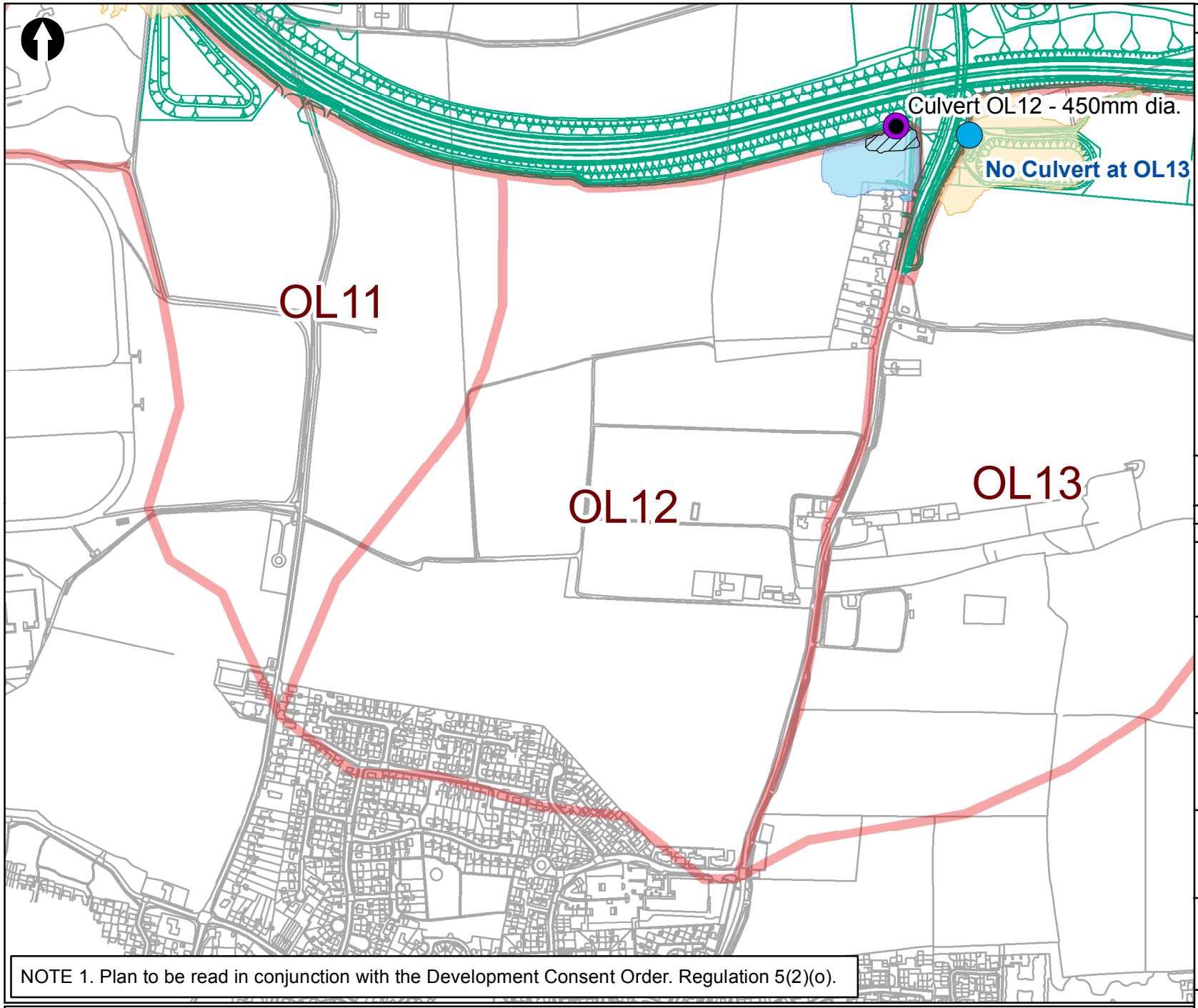

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

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- Culvert Location
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- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

0 60 120 180 240 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL12

Scale	MM Project No.	Status
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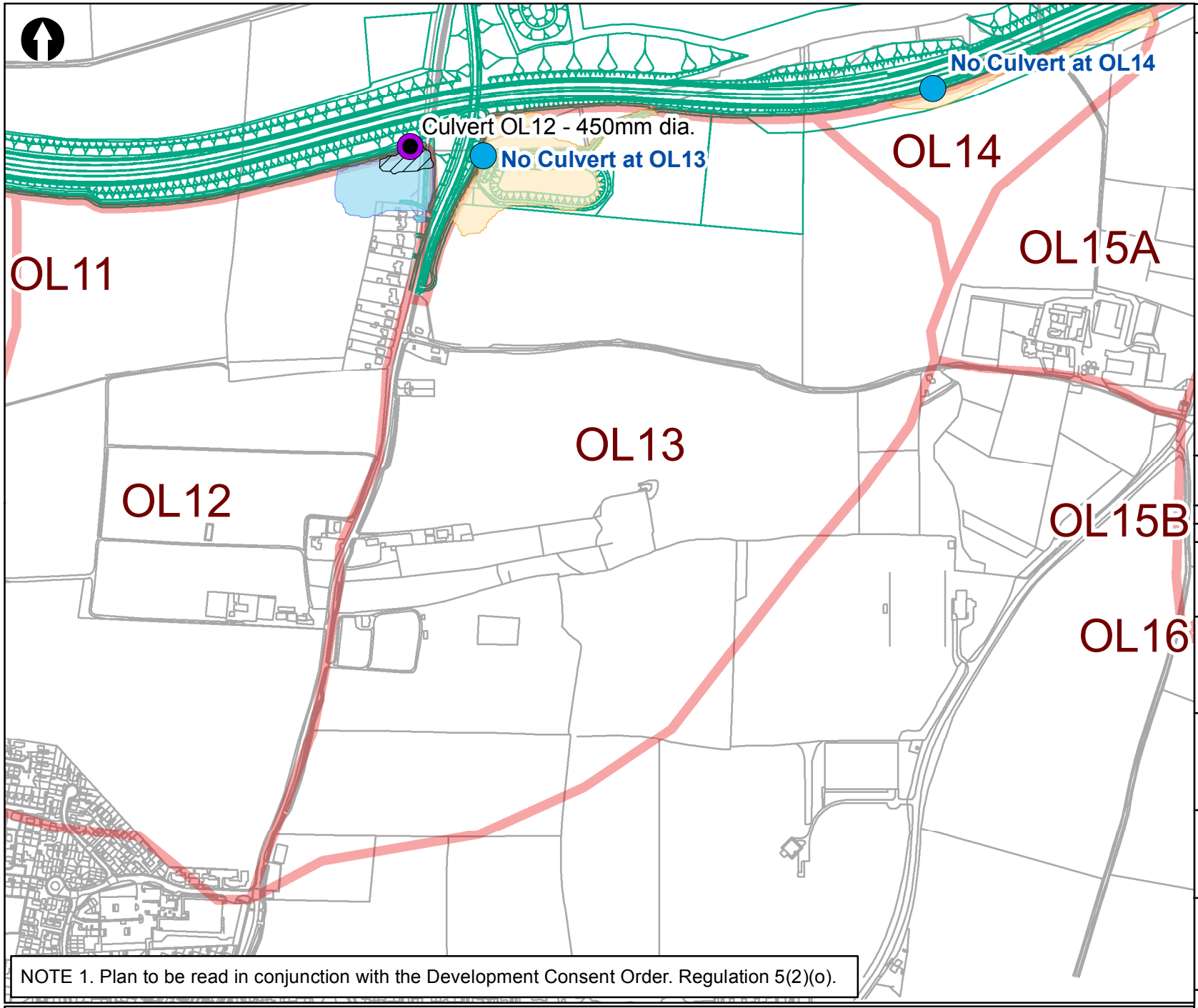

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
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- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 60 120 180 240

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL13

Scale	MM Project No.	Status
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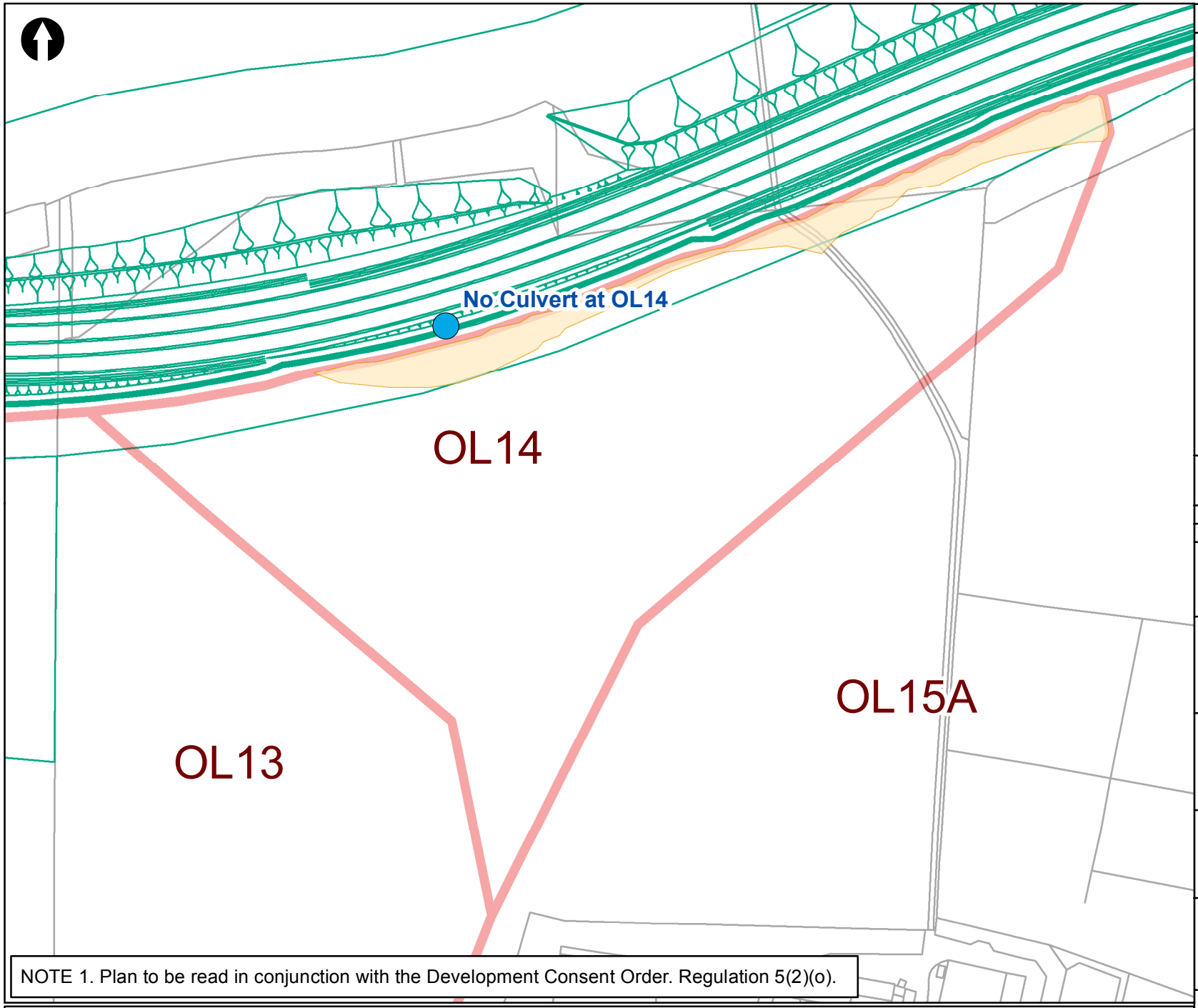

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
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- Flood Extents (No Culvert)

0 20 40 60 80 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL14

Scale	MM Project No.	Status
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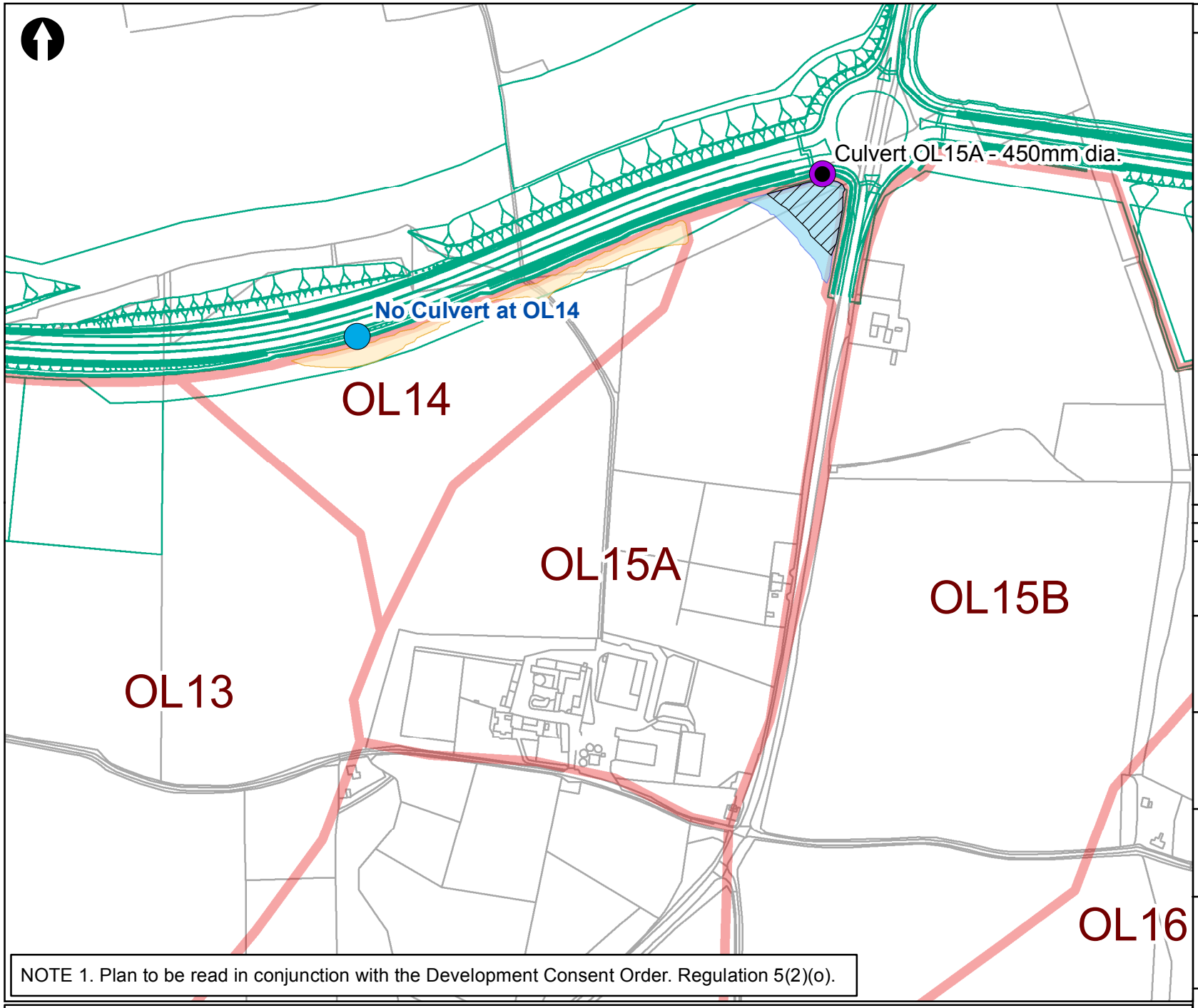

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Legend

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- Flood Extents (No Culvert)

Meters
0 40 80 120 160

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL15A

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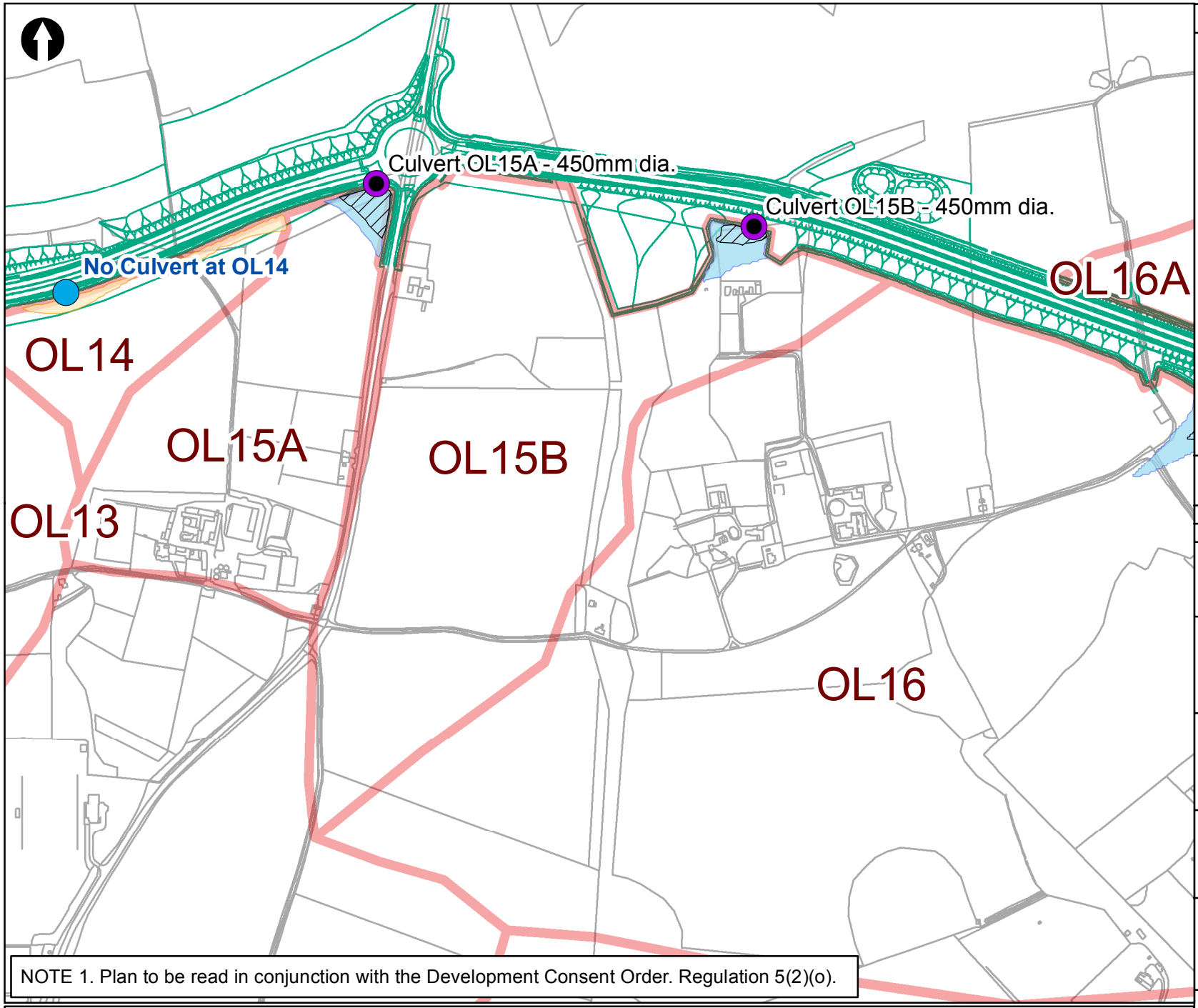

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

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- Culvert Location
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- Flood Extents (No Culvert)

Meters
0 60 120 180 240

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL15B

Scale	MM Project No.	Status
1:7,500	233906	INF

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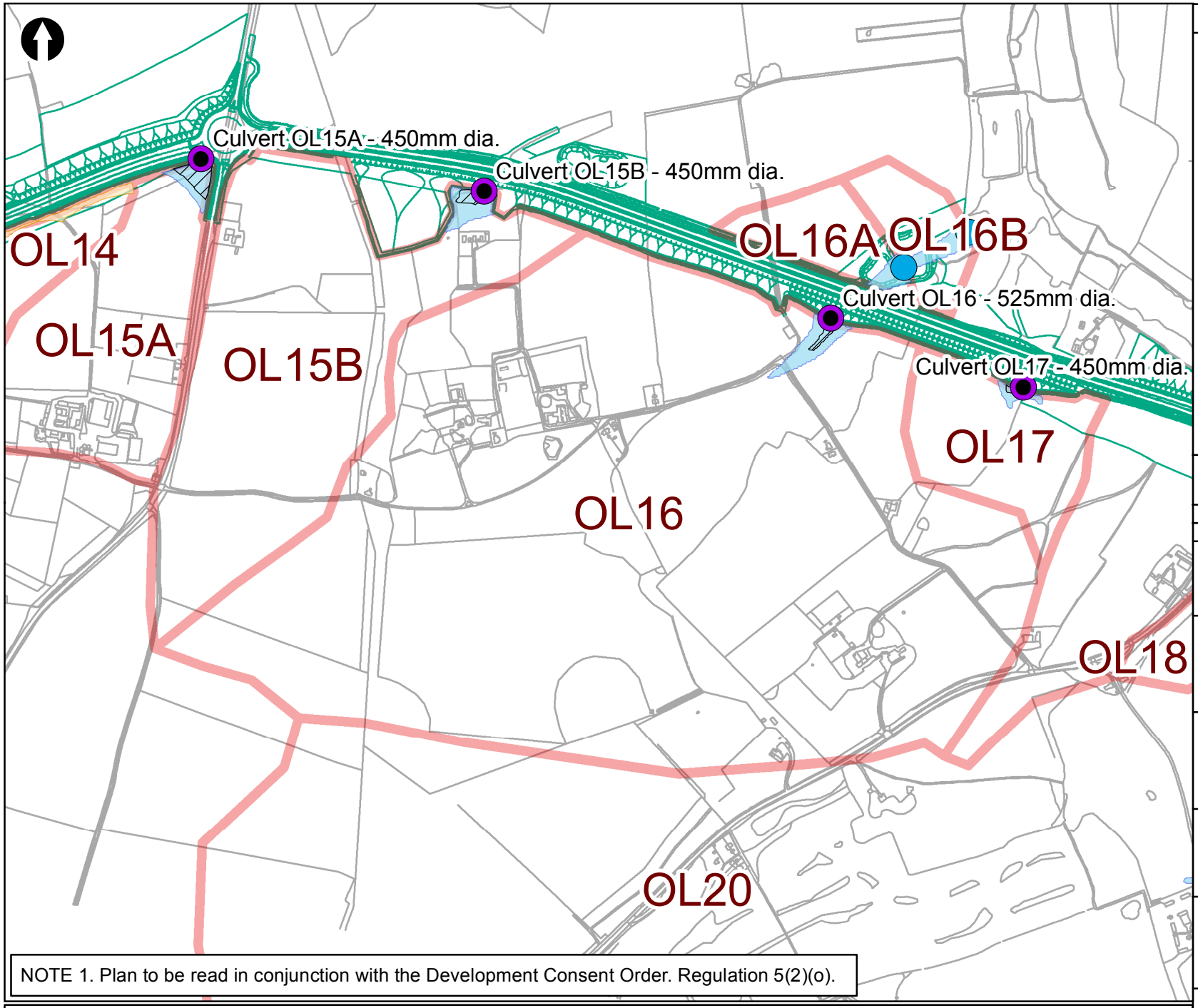

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

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- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 90 180 270 360

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL16

Scale	MM Project No.	Status
1:10,000	233906	INF

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Drawing No. MMD-233906-DT-0842 Rev 0

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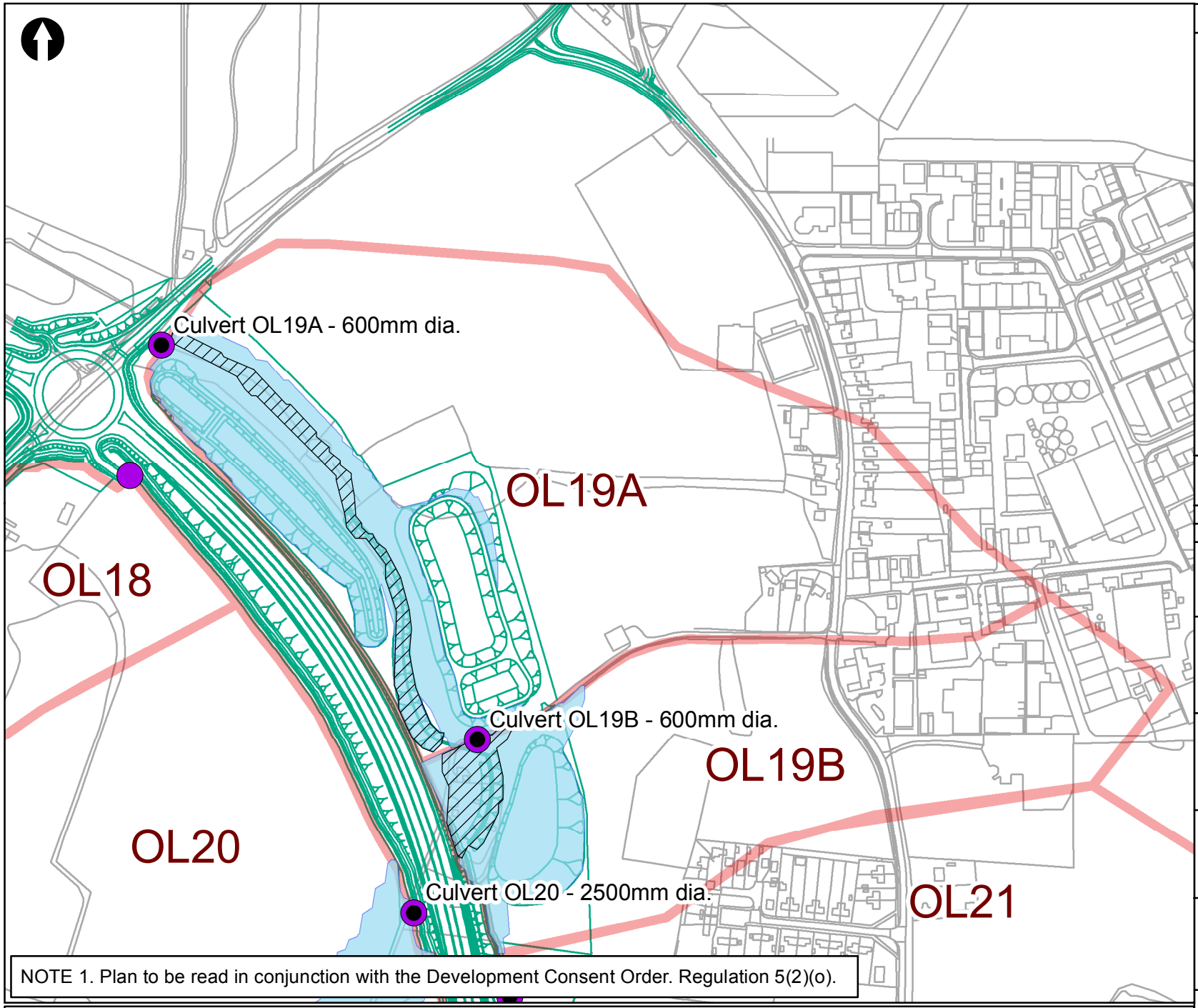

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

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- Flood Extents (No Culvert)

0 40 80 120 160 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL19A

Scale	MM Project No.	Status
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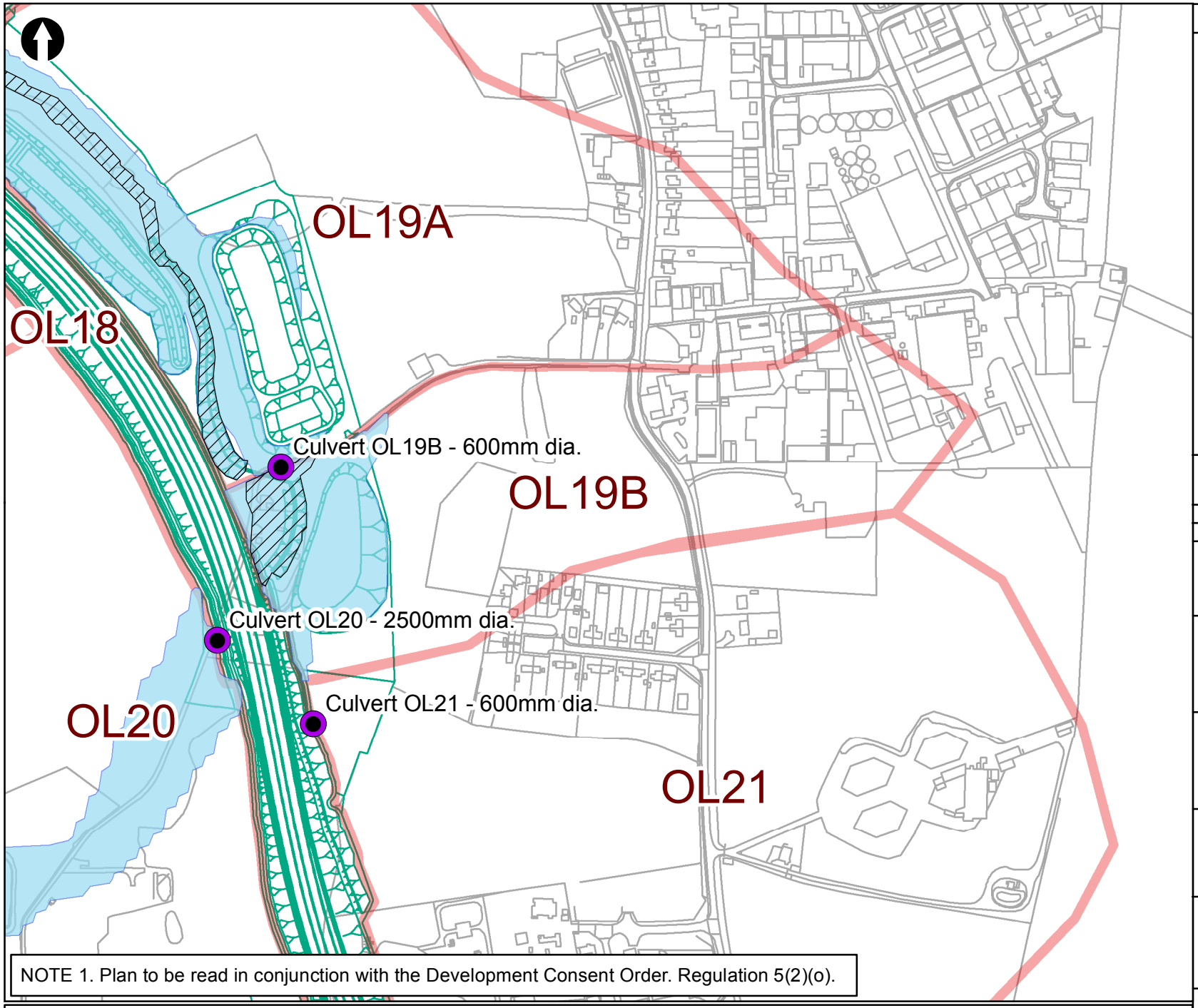

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

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- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 40 80 120 160

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL19B

Scale	MM Project No.	Status
1:5,000	233906	INF

GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0844 Rev 0

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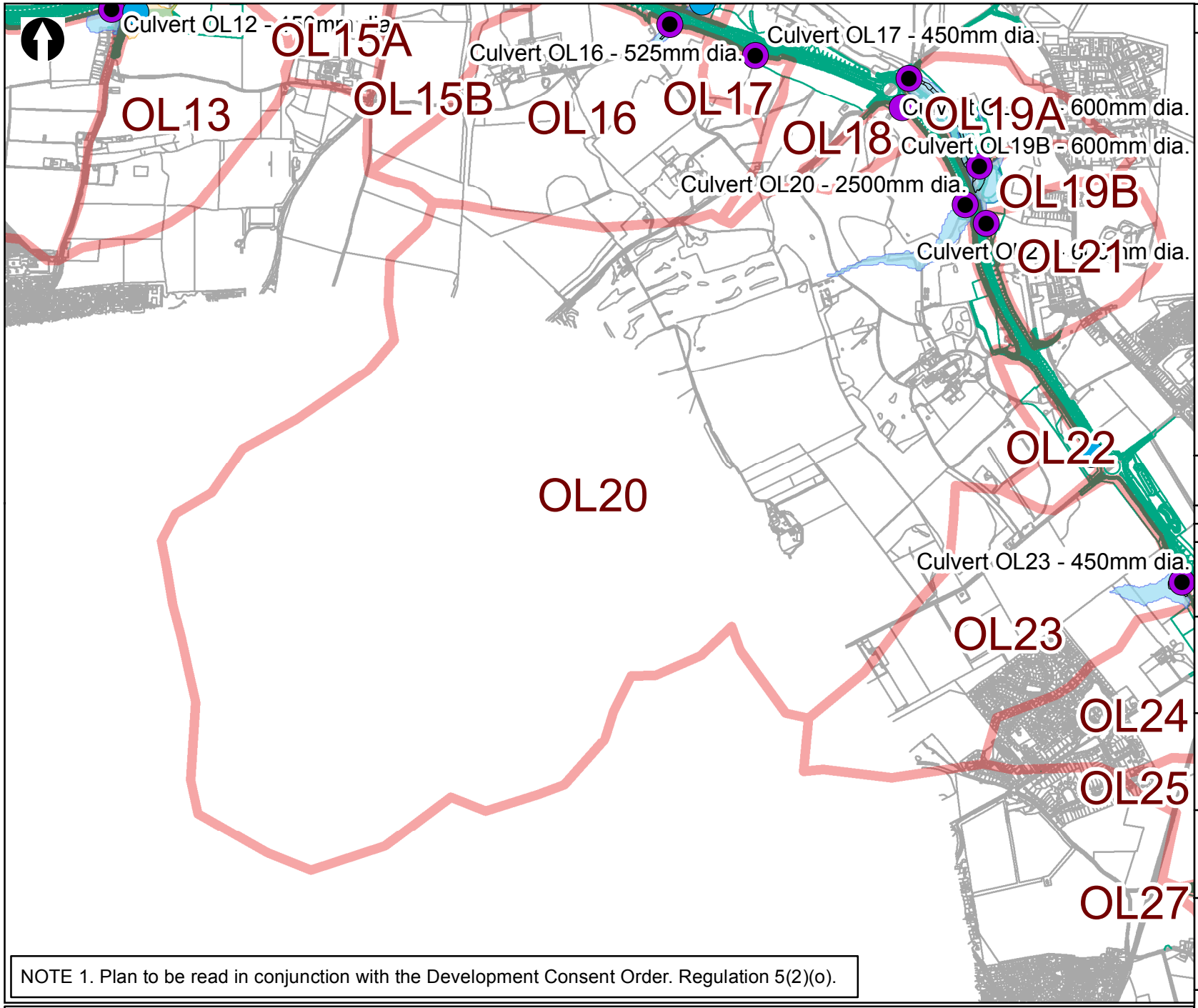

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 200 400 600 800

Rev	Date	Description	Drawn	Ch'k'd	App'd
0	06/12/2013	Revision for Submission	HP	BD	RG

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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL20

Scale 1:22,500 | MM Project No. 233906 | Status INF

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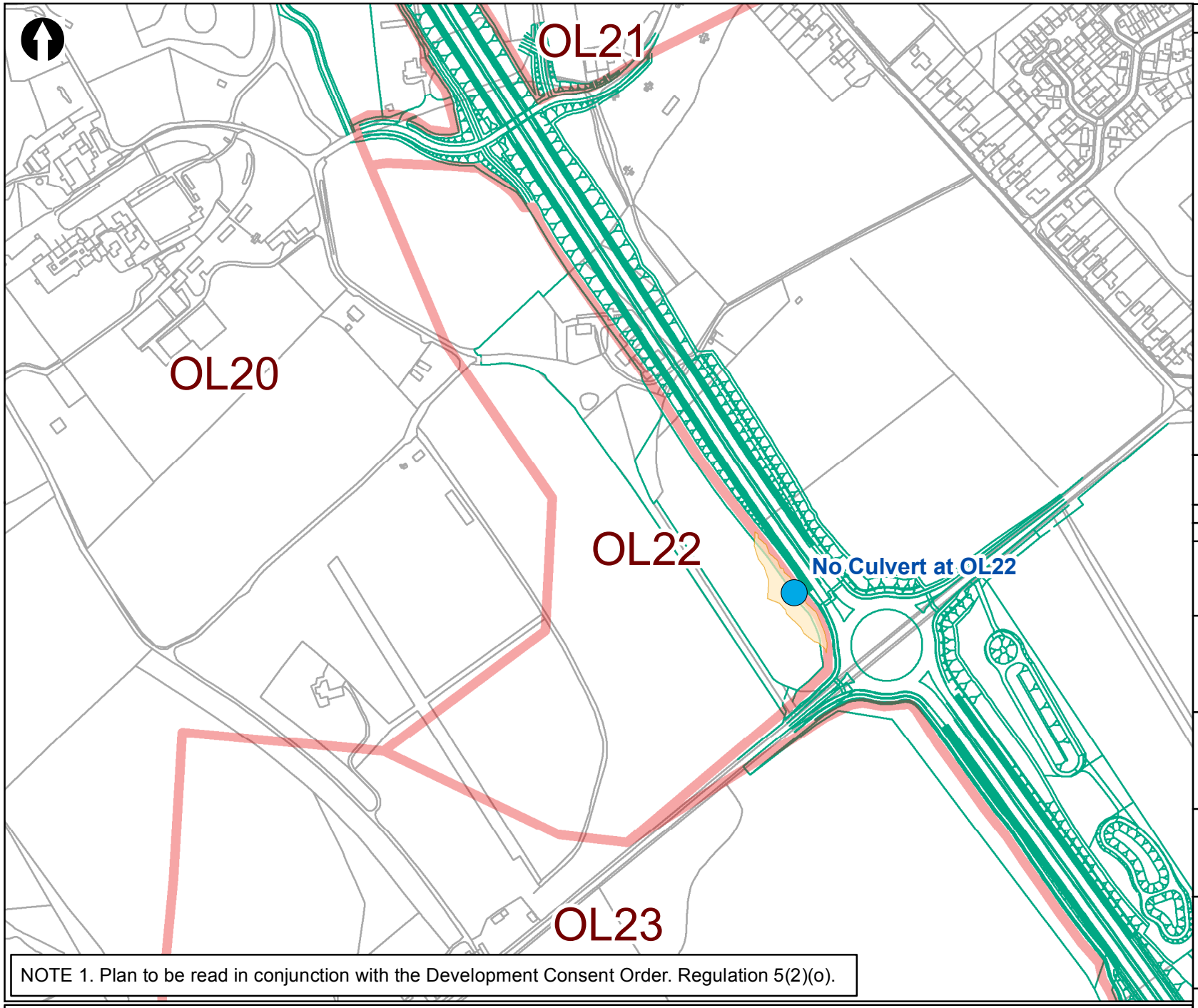

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

0 40 80 120 160 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL22

Scale	MM Project No.	Status
1:5,000	233906	INF

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Drawing No. MMD-233906-DT-0846 Rev 0

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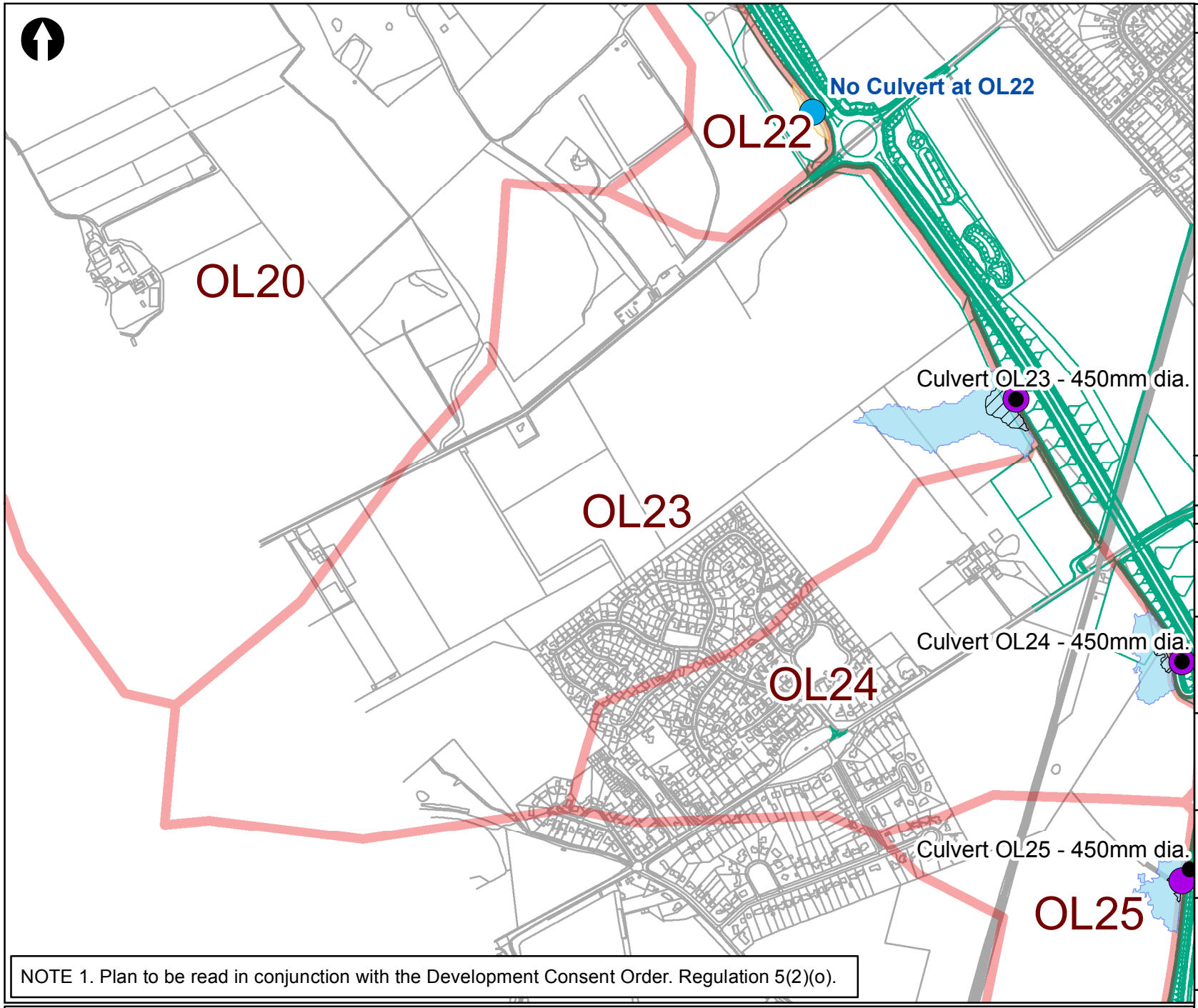

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 90 180 270 360

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL23

Scale	MM Project No.	Status
1:10,000	233906	INF

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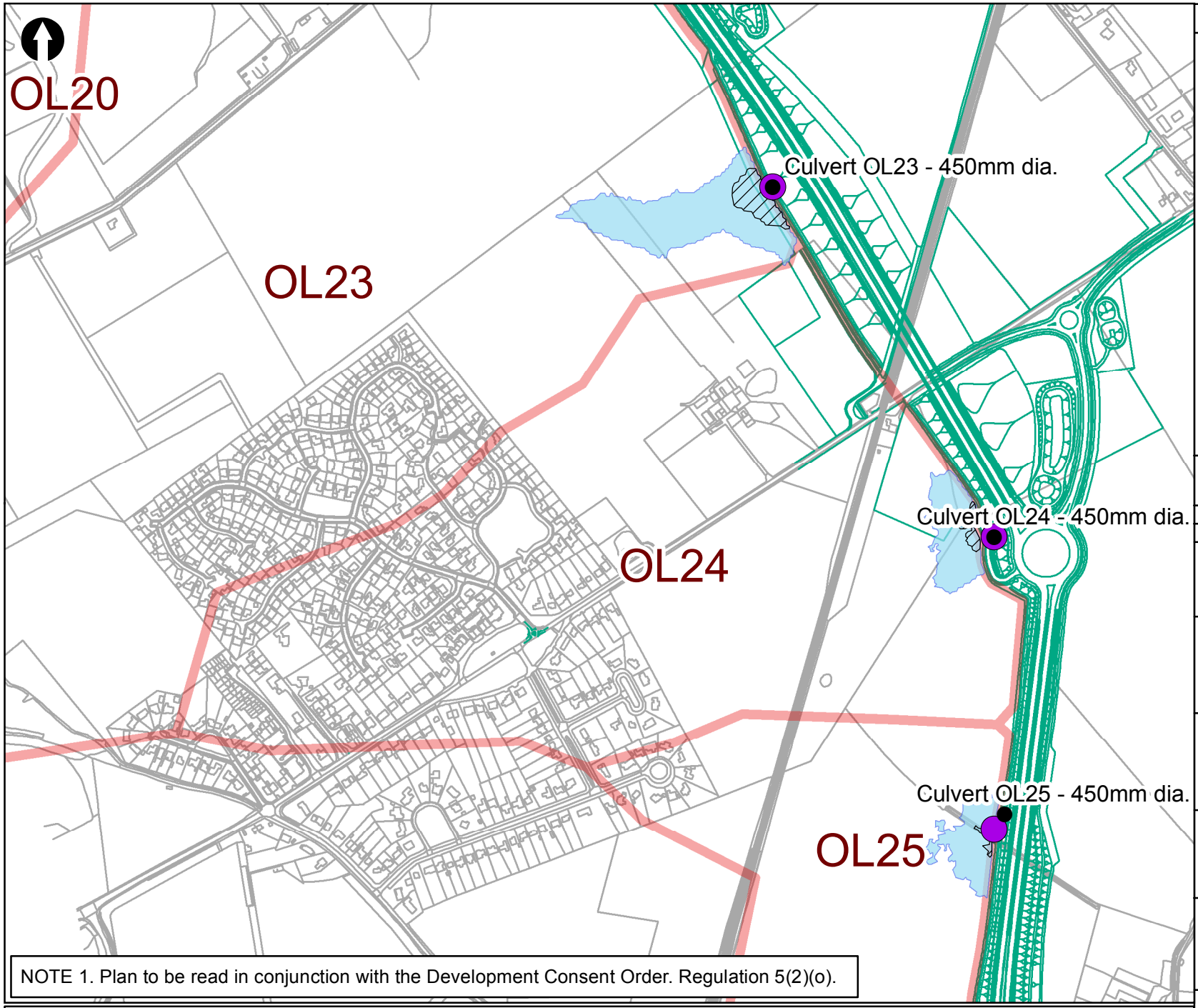

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 60 120 180 240

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL24

Scale	MM Project No.	Status
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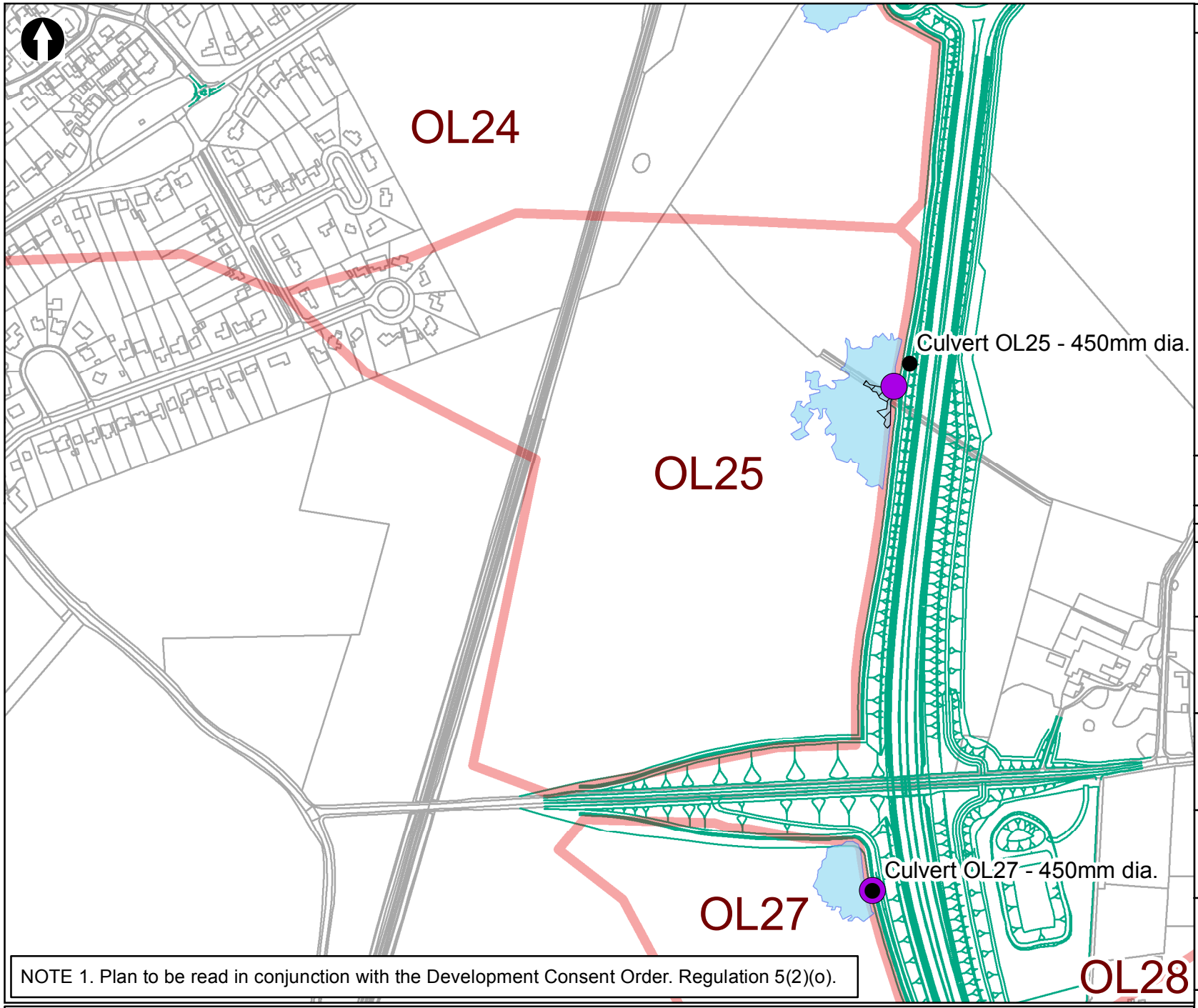

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

0 40 80 120 160 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL25

Scale	MM Project No.	Status
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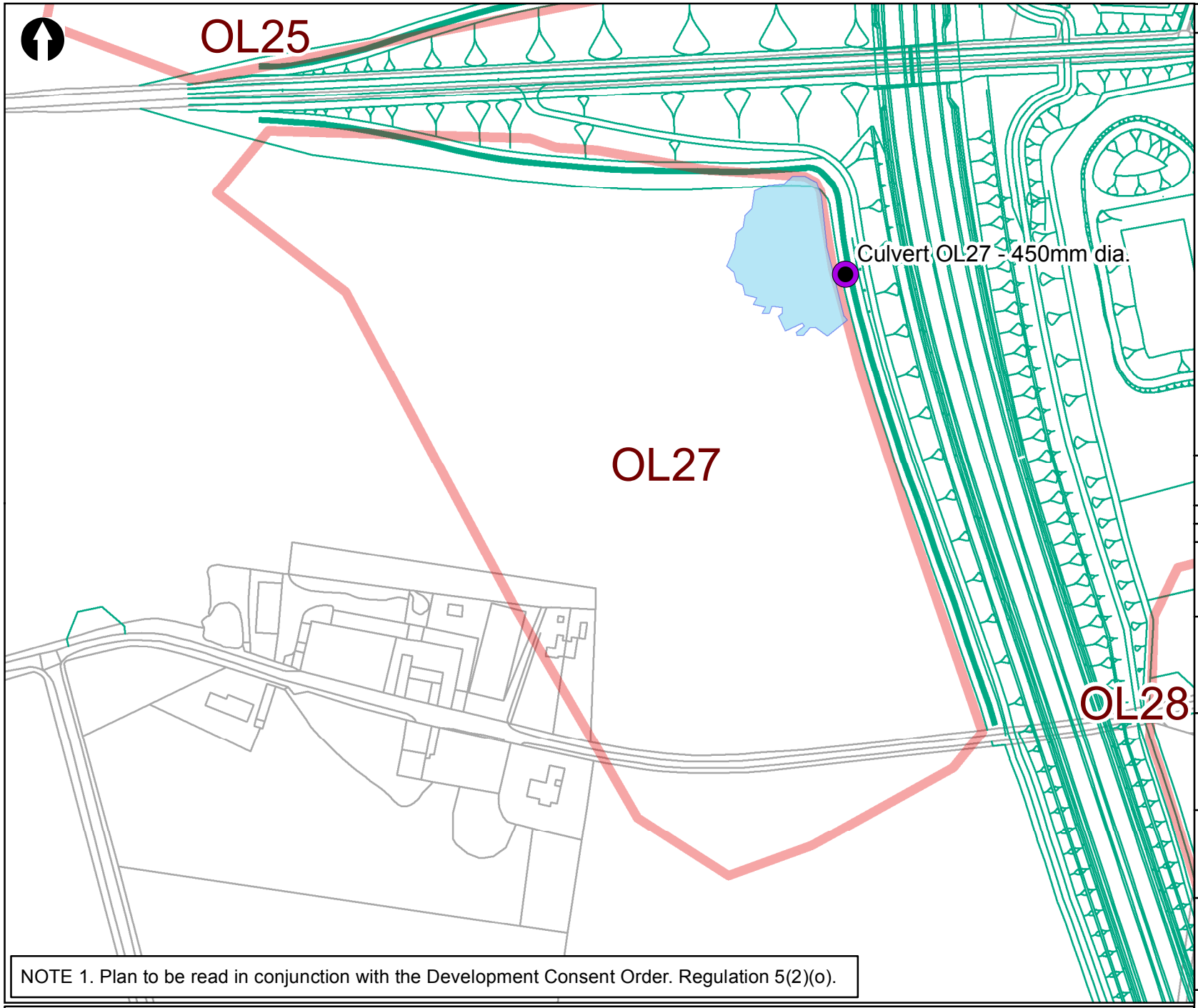

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL27

Scale	MM Project No.	Status
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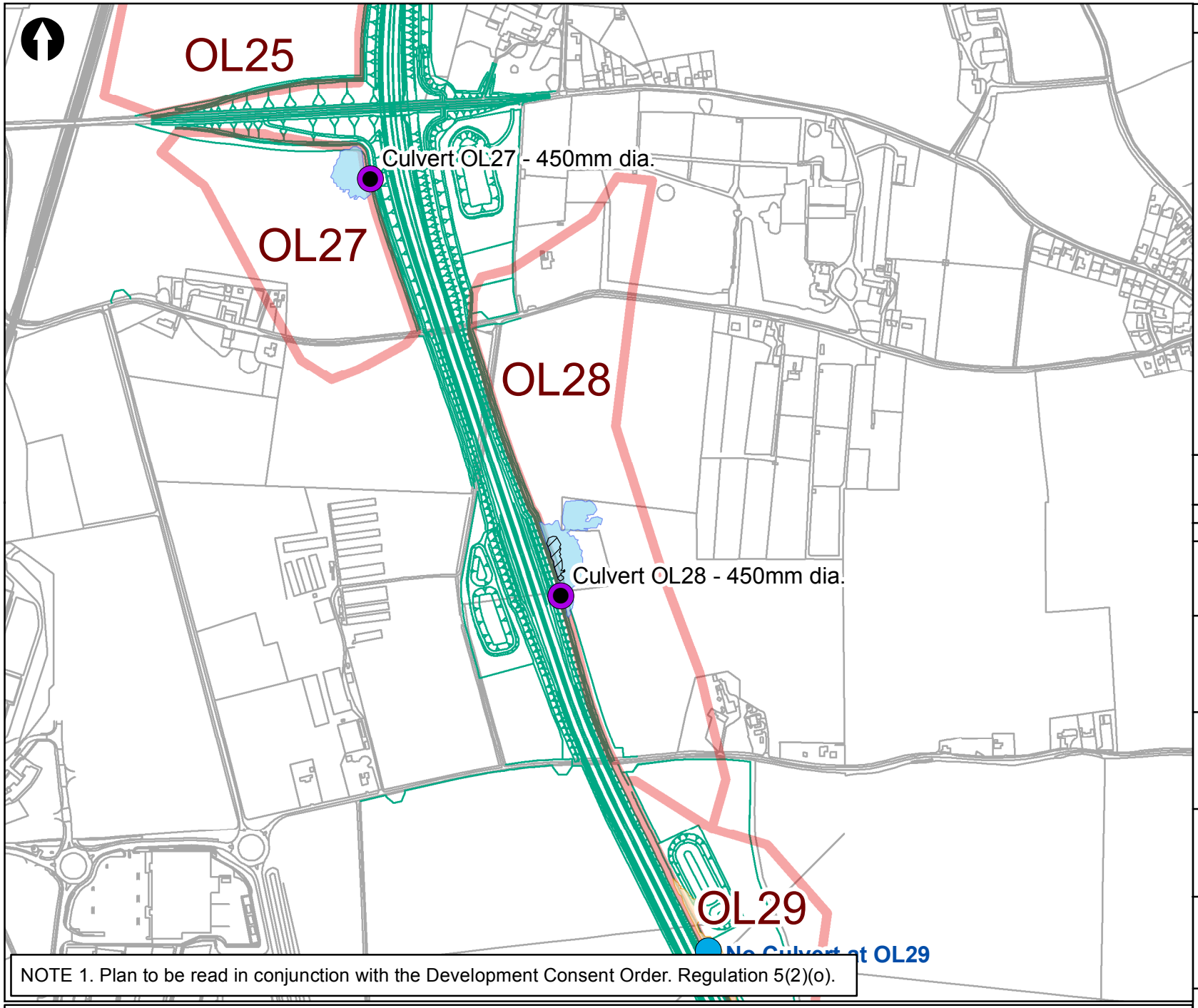

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

0 60 120 180 240 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL28

Scale	MM Project No.	Status
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Drawing No. MMD-233906-DT-0851 Rev 0

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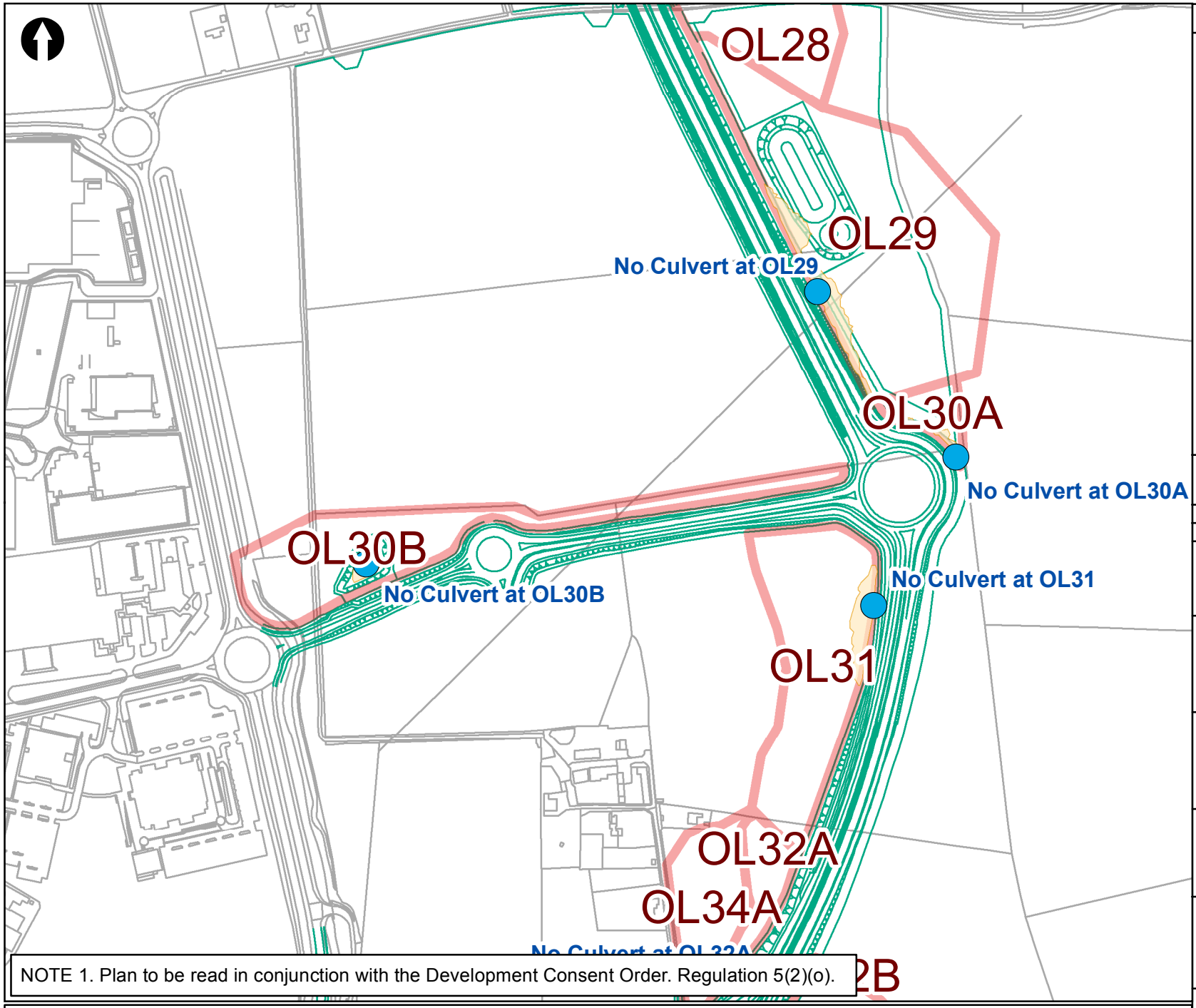

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 40 80 120 160

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL30

Scale	MM Project No.	Status
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Drawing No. MMD-233906-DT-0852 Rev 0

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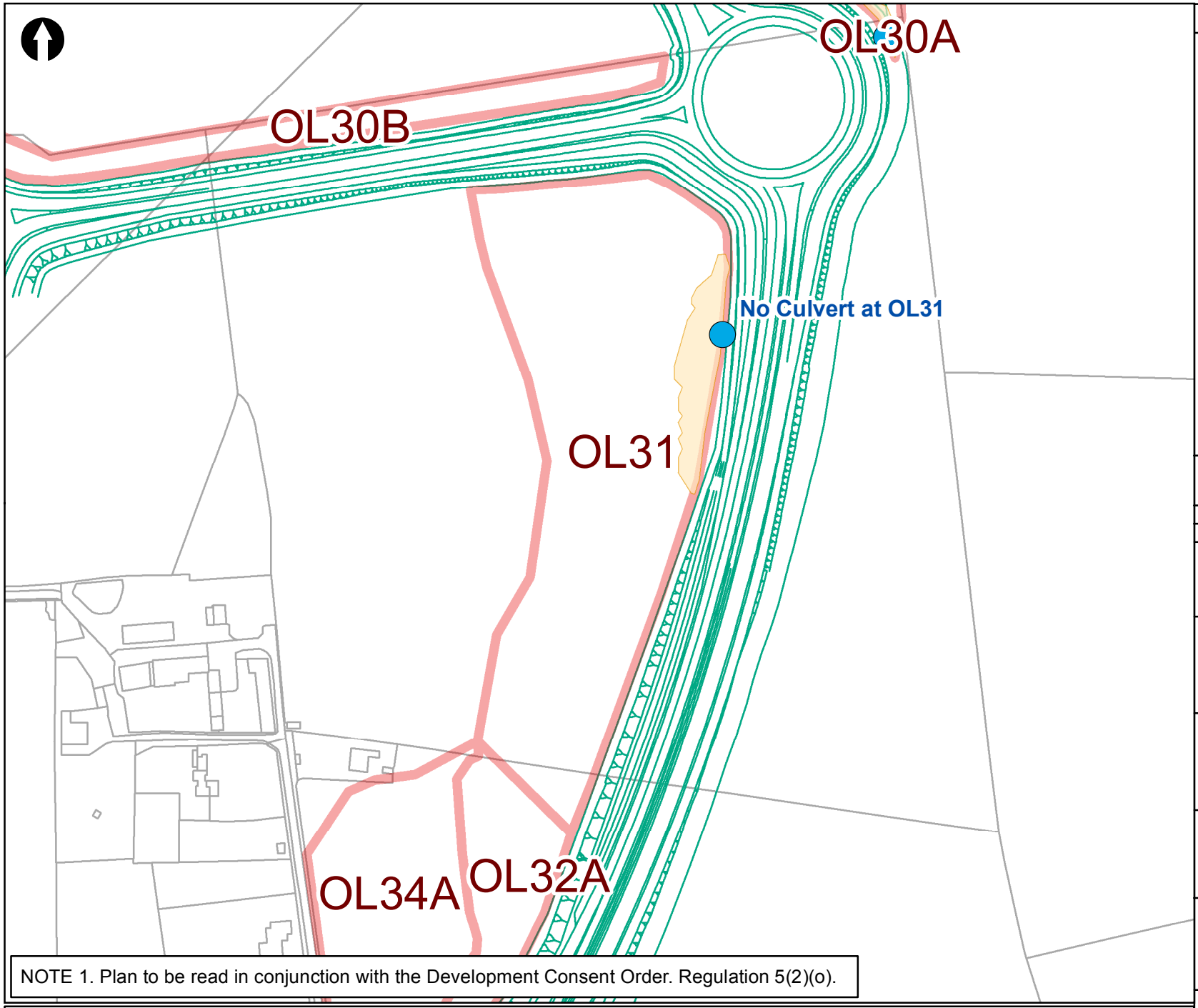

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

0 20 40 60 80 Meters

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL31

Scale	MM Project No.	Status
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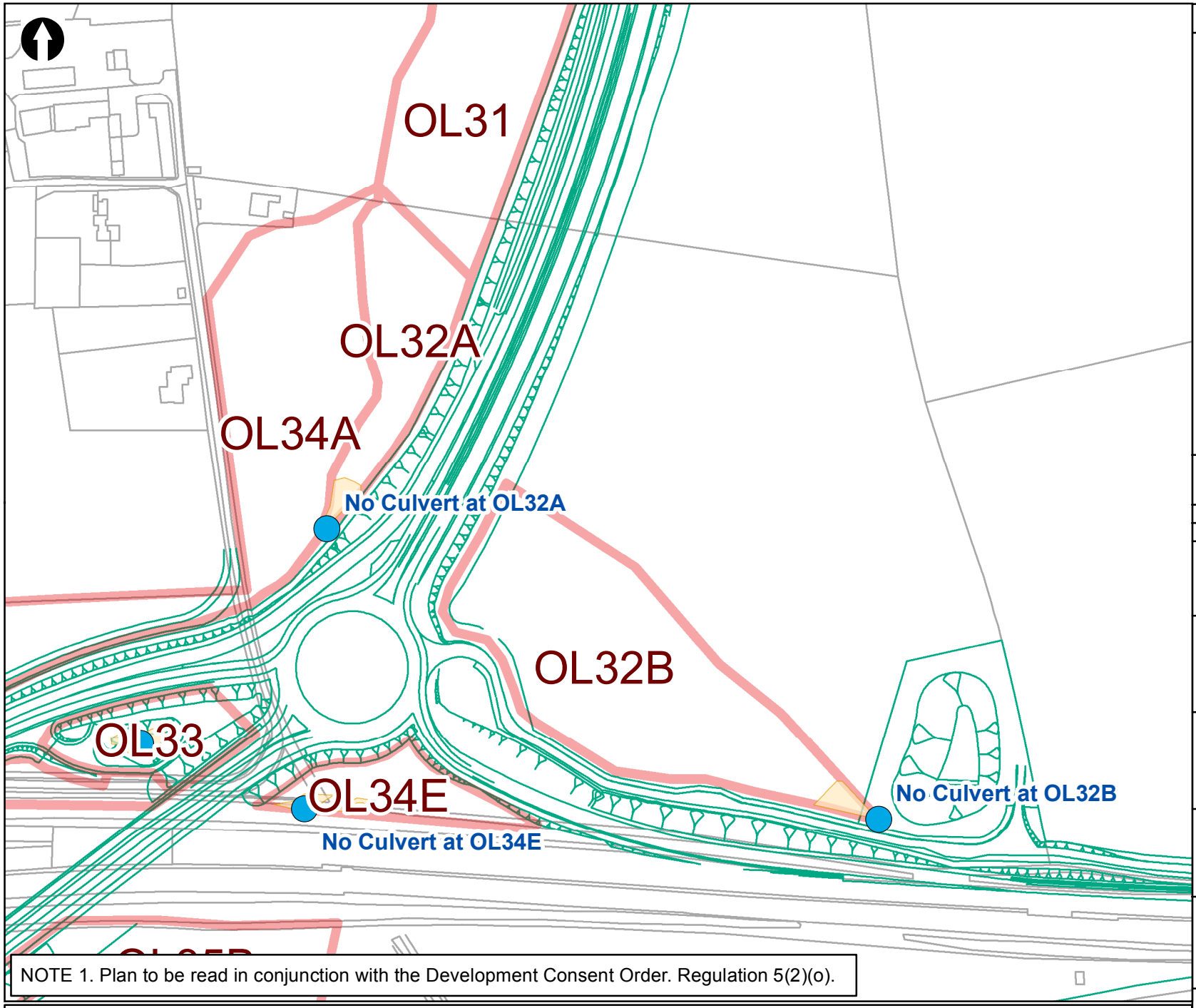

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
- Overland Flow Catchments
- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters 0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL32

Scale	MM Project No.	Status
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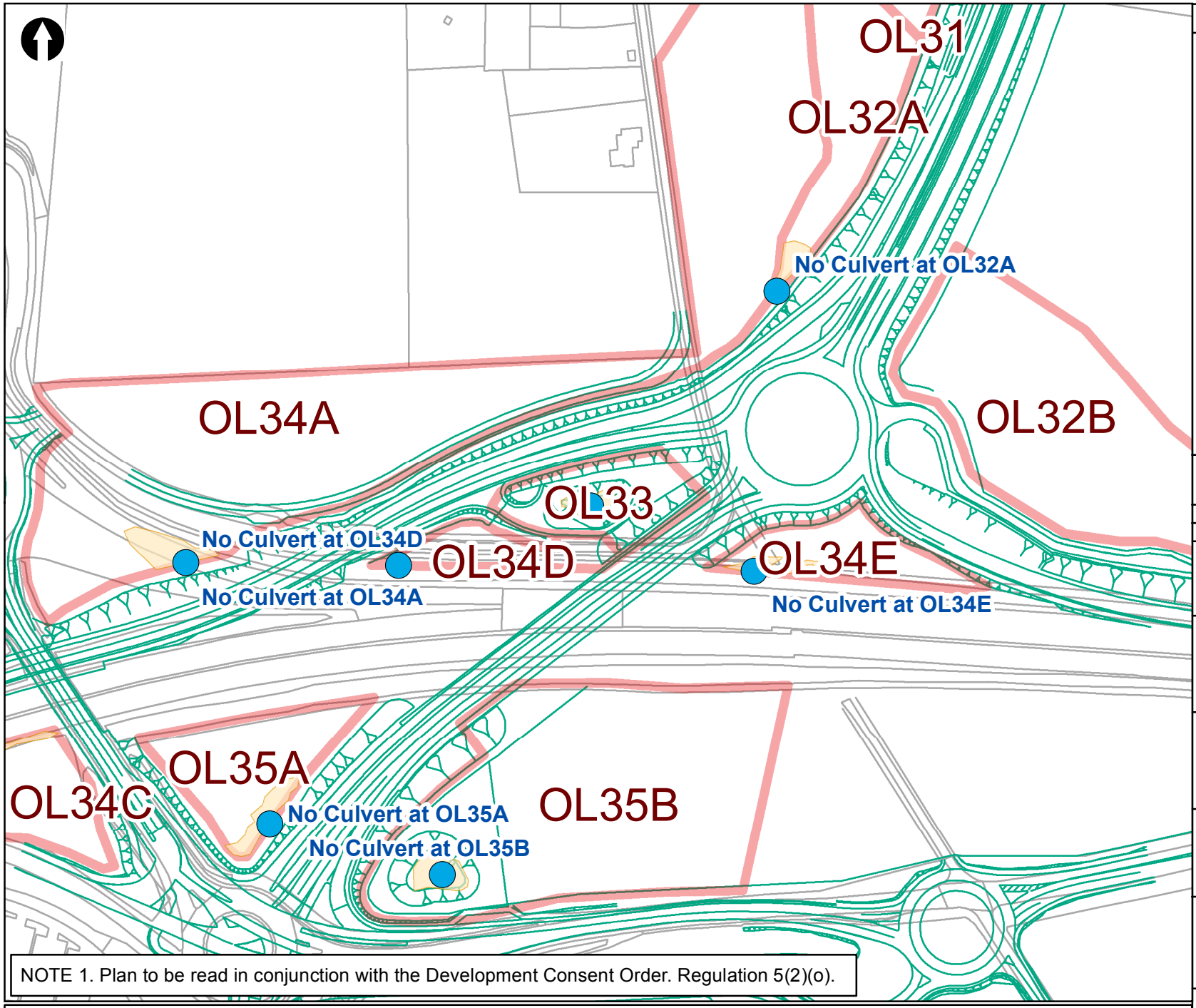

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
- Catchment Low Point (No Culvert)
- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL33

Scale	MM Project No.	Status
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Drawing No. MMD-233906-DT-0855 Rev 0

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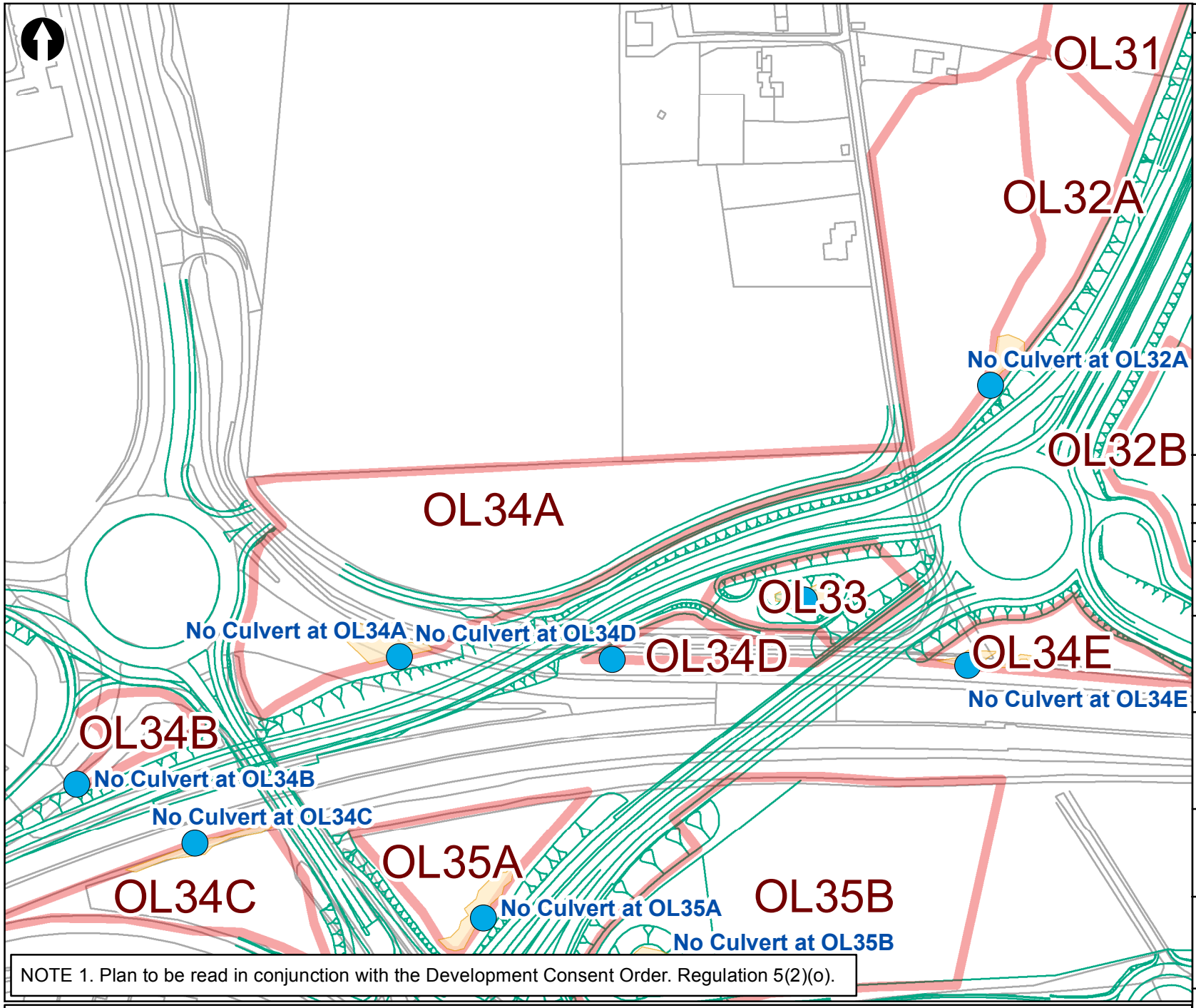

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
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- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters
0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL34

Scale	MM Project No.	Status
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GIS File FRA_DCO_Submission_20131128

Drawing No. MMD-233906-DT-0856 Rev 0

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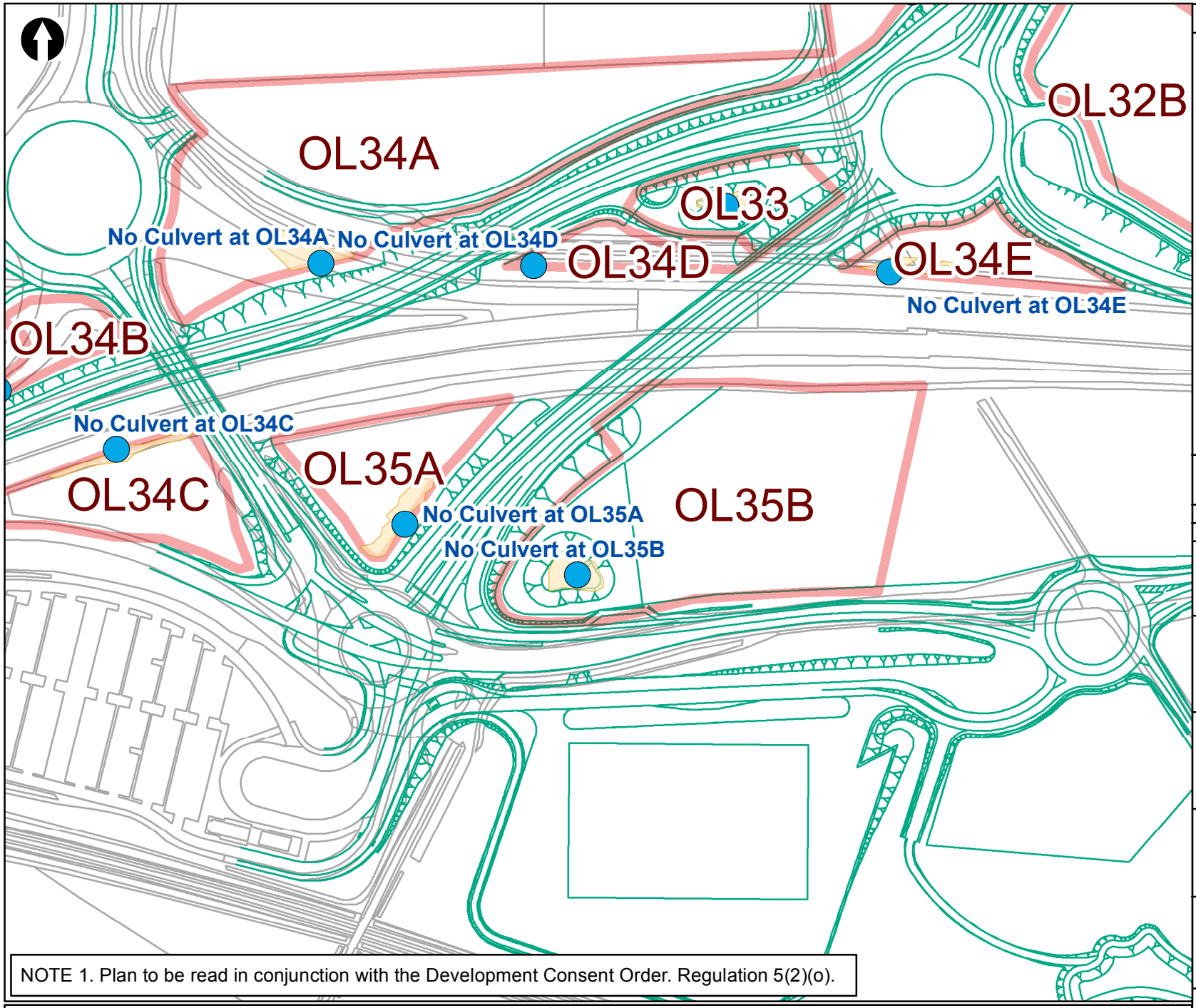

NOTE 1. Plan to be read in conjunction with the Development Consent Order. Regulation 5(2)(o).

Legend

- NDR Design
- Culvert Location
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- Catchment Low Point (Culvert)
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- Flood Extents (Culvert Operational)
- Flood Extents (Culvert Blockage)
- Flood Extents (No Culvert)

Meters: 0 20 40 60 80

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Regulation 5(2)(o)
Norwich Northern Distributor Road
Flood Risk Assessment

Drawing Title
Overland Flooding Extents
Revision E Alignment
Catchment OL35

Scale	MM Project No.	Status
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Appendix F. Response to EA Comments on the Draft FRA

Our ref GK/JF/RD/233906/FRA
T 01223 463619
E Richard.Gamble@mottmac.com
Your ref AE/2013/116937/01-L01

Mr Martin Barrell
Sustainable Places – Planning Specialist
Environment Agency
Eastern Area
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD

02 December 2013

Dear Mr Barrell,

R.E. ENVIRONMENT AGENCY COMMENTS ON DRAFT FRA FOR NORWICH NORTHERN DISTRIBUTOR ROAD (NDR)

Thank you for your comments on the draft Flood Risk Assessment for the Norwich Northern Distributor Road. In response to your letter of the 28 November 2013, we have the following remarks.

Infiltration basin design
Regarding your concern over the half drain down times for basins 24 and 25, we acknowledge that based on currently available data, these are significantly in excess of recommended durations. We propose that during the detailed design process further permeability testing is undertaken, and modifications to the designs and management of the basins be investigated in order to increase drainage rates. This could include the use of trenches in the bases of the lagoons, or other treatments to promote more effective infiltration.

We understood from the Environment Agency's letter dated 28 June 2013 that only those lagoons exceeding 7 days drain down time needed to accommodate follow up storms and, as such, only those were checked. However, all the lagoons are designed to cope with the 1 in 100 year plus climate change event, and have a freeboard of approximately 300mm; thereby providing additional capacity.

Lagoon design details are included for your information in the spreadsheet attached to this letter.

Overland flooding on third party land
The only overland flow routes that do not drain to a lagoon or via a culvert under the road are those with very small catchment areas. In such cases the drainage flows are directed to spreader ditches parallel with the road which will promote drainage by infiltration.

The areas upstream of proposed cross drainage culverts that are shown as potentially flooding, have been confirmed not to impact on any commercial or residential property, even under the extreme condition of a 100-year storm with climate change and the culverts completely blocked.

Areas that are determined as being at increased risk from flooding as a direct result of the proposed scheme will be discussed with the affected landowners. Any issues will be resolved as part of land compensation negotiations.

Greenfield flow rates
We can confirm that ReFH has been used to calculate Greenfield flow rates. Culvert sizes have been determined taking account of these rates in order to ensure that any overland flooding produced does not impact on any commercial or residential property.

Infiltration testing
The infiltration testing results and the logs are attached to this letter. The locations of the trial pits can be seen in the geological cross-section diagrams also attached to this letter.

Unsaturated zone depth calculations
We regret that Table 3.3 in the draft FRA included errors in the reported groundwater levels. The table has been corrected in the final FRA. We apologise for this error. 1.2m unsaturated depth has now been used as the basis of the groundwater contamination risk assessment for the infiltration basins, as advised by yourselves.

The corrected data in Table 3.3 shows that all lagoons are a minimum of 1.2m above the maximum groundwater level except for Lagoon 4, Lagoon 8, Lagoon 9, Lagoon 17 and Lagoon 18. As reported in the draft FRA, Lagoons 17 and 18 at 'The Springs' will be lined and discharge to surface water. It is not possible to line the infiltration ponds at Lagoons 4, 8 and 9 as there are no watercourses to receive a positive outfall. However, the risk assessment results confirm that, without lining these lagoons, the level of risk to groundwater from road runoff and from an accidental spillage is considered acceptable, and this risk is further reduced by the treatment systems and pollution prevention measures proposed.

Detailed designs for the proposed scheme
The detailed designs for the proposed scheme can be seen in 'Outline drainage worksplans', document reference 2.11 of the NNDR Development Consent Order (DCO) planning application. Most of the NDR drainage networks will comprise swales, lined lagoons and infiltration basins – a three-tiered treatment system, as per SuDS Manual (CIRIA 697) guidance.

We hope that the above clarifications go some way towards allaying your concerns. We recognise that there are still issues in relation to flood risk that require further consideration, and can assure you that we will continue to work closely with the Environment Agency to ensure that the scheme proceeds in accordance with the required guidance and best practice.

Yours sincerely,

MR RICHARD GAMBLE
Principal Hydraulic Engineer

Appendices:

1) *Lagoon details spreadsheet.*

2) *Infiltration testing logs*

3) *Infiltration testing results*

4) *Norwich Northern Distributor Road Geological Long Section Within 50m of the NDR. MMD-233906-DT-0815 to MMD-233906-DT-0827.*

Lagoon Details

NCC Lagoon No	Chainage	Trial Pit Number	Minimum Infiltration Rate at relevent depth (m/hr)	Max. Ground Water Level	Lagoon Invert level	Unsaturated zone (m)	Assumed min Ground Level	Depth of Lagoon (m)	Max. Water Level (m)	Max. Water Depth (m)	Base Surface Area (sq m)	Max Water Volume (cu m)	Critical Design Storm	Half Draindown Time (min)	Overland Detail	Max Water Volume (Primary + Infiltration) (m^3)	Total Volume Available (m^3)	Total Volume Available (Primary + Infiltration) (m^3)	Spare Volume Available (Primary + Infiltration) (m^3)	Max Water Volume for 1 in 10 yrs (m^3)	Max Water Volume for 1 in 10 (Primary + Infiltration) (m^3)	Total flooded volume for 1 in 10 follow on storm event (m^3)
1 Primary	600	n/a	n/a	10.510	13.400	2.890	15.600	2.20	15.295	1.895	611	1944.4	30W	n/a			2429			n/a	n/a	
															OL01A = 48.48ha (assumed only 32ha will flow into lagoon 1)	5094.6		6375	1280.4			
1 Infiltration	650	TP235	0.4320	10.510	13.200	2.690	15.600	2.40	15.291	2.091	663	3150.2	600W	148			3946			n/a	n/a	
1a Infiltration (OL Only)	600	TP235	0.4320	10.510	15.000	4.490	17.000	2.00	16.687	1.687	2700	6050.6	1440S	153	OL02 = 90.60ha OL02A = 15.03ha OL02B = 3.13ha	n/a	7515	7515	1465.0	n/a	n/a	
2 Primary	1675	n/a	n/a		33.000		35.000	2.00	34.675	1.675	33	336.3	15W	n/a		1129.4	489	1654	524.6	n/a	n/a	
2 Infiltration	1625	TP276	0.0720		32.800		35.000	2.20	34.591	1.791		793.1	360W	560			1165			n/a	n/a	
3 Primary	2840	n/a	n/a	30.930	32.600	1.670	34.400	1.80	34.092	1.492	91	360.2	15W	n/a		2102.2	507	3009	906.8	n/a	n/a	
3 Infiltration	2820	TP237	0.0504	30.930	32.400	1.470	34.400	2.00	33.942	1.542	774	1742.0	600W	1078			2502			n/a	n/a	
4 Primary	3065	n/a	n/a	30.930	31.300	0.370	33.700	2.40	33.302	2.002	143	795.5	30W	n/a		3004.4	1113	4268	1263.6	n/a	n/a	
4 Infiltration	3125	TP300	0.1620	30.930	31.100	0.170	33.700	2.60	33.182	2.082	538	2208.9	600w	356	OL03A = 9.31ha		3155			n/a	n/a	
5 Primary	4120	n/a	n/a	23.000	27.000	4.000	28.800	1.80	28.470	1.470	873	1815.2	30W	n/a	OL04 = 22.89ha	10155.1	2386	16435	6279.9	1019.4	4355.8	0.0
5 Infiltration	4200	TP239	0.0360	23.000	26.800	3.800	28.800	2.00	28.072	1.272	5778	8339.9	2160W	1707			14049			3336.4		
6 Primary	1000 Offline	n/a	n/a	20.000	26.200	6.200	28.200	2.00	27.896	1.696	252	848.1	30W	n/a		3328.1	1110	4334	1005.9	n/a	n/a	
6 Infiltration	1075 Offline	TP278	0.1440	20.000	26.000	6.000	28.200	2.20	27.833	1.833	856	2480.0	960W	415			3224			n/a	n/a	
6a Primary	10 Offline	n/a	n/a	20.000	31.100	11.100	32.700	1.60	32.356	1.256	17	166.1	15W	n/a		1012.3	277	1604	591.7	n/a	n/a	
6a Infiltration	50 Offline	TP357	0.0900	20.000	30.900	10.900	32.700	1.80	32.243	1.343	358	846.2	960W	448	OL05A = 4.04ha		1327			n/a	n/a	
8 Primary	320 Offline	n/a	n/a	20.990	22.300	1.310	25.900	3.60	25.393	3.093	30	1769.6	30W	n/a		6032.6	2489	7833	1800.4	n/a	n/a	
8 Infiltration	385 Offline	TP279	0.0284	20.990	22.100	1.110	25.900	3.80	25.489	3.389	310	4263.0	2880W	2373			5344			n/a		
8A Infiltration (OL only)	340 Offline	n/a	0.0284	n/a	24.600		27.400	2.80	27.059	2.459	5608	18013.0	2880W	3438	OL06 = 115.93ha (assumed only 90ha will flow into lagoon 8A)	18013	21218	21218	3205	n/a	n/a	
9 Primary	5 Offline	n/a	n/a	20.380	21.600	1.220	23.000	1.40	22.684	1.084	1351	1934.0	60W	n/a		n/a	n/a	n/a	n/a	n/a	n/a	
9 Infiltration	0 Offline	TP243	0.0205	20.380	21.200	0.820	23.000	1.80	22.662	1.462	1975	3690.0	2880W	2894								
12 Primary	8900	n/a	n/a	15.310	19.600	4.290	22.000	2.40	21.571	1.971	913	2993.0	60W	n/a	OL09 = 11.35ha	7716.7	4002	11036	3319.3	1234	3313	0.0
12 Infiltration	8900	TP281	0.1188	15.310	19.400	4.090	22.000	2.60	21.372	1.972	1523	4723.7	1440W	544			7034			2079		
13 Primary	9750	n/a	n/a	14.600	20.700	6.100	22.700	2.00	22.310	1.610	476	1733.0	30W	n/a		5036.5	1733	7590	2553.5	540	2445	0.0
13 Infiltration	9800	TP366	0.0054	14.600	20.500	5.900	22.700	2.20	21.905	1.405	1852	3303.5	4320W	> 7 days			5857			1905		
13a Infiltration (OL only)	9900	TP379	0.0050	14.600	21.200	6.600	24.000	2.80	23.166	1.966	5611	14012.9	10080W	> 7 days	OL11 = 39.32ha	14012.9	21889	21889	7876.1	6988	6988	0.0
14 Primary	250 Offline	n/a	n/a	13.180	16.800	3.620	19.400	2.60	18.771	1.971	459	1638.7	30W	n/a		4867.9	2540	7531	2663.1	n/a	n/a	
14 Infiltration	180 Offline	TP248	0.0589	13.180	16.600	3.420	19.400	2.80	18.689	2.089	958	3229.2	960W	1124			4991			n/a	n/a	
14a Primary	420 Offline	n/a	n/a	13.330	21.400	8.070	22.600	1.20	21.881	0.481	81	71.8	15W	n/a			318			n/a	n/a	
															OL13 = 61.83ha (assumed only 30.89ha will flow into lagoon 14A)	8546.8		18756	10209.2			
14a Infiltration	430 Offline	TP374	0.0259	13.330	19.800	6.470	22.600	2.80	21.298	1.498	4662	8475.0	2280W	2525			18438			n/a	n/a	
16 Primary	12750	n/a	n/a	11.500	14.300	2.800	16.300	2.00	15.785	1.485	810	1716.0	30W	n/a		3714.0	2586	5716	2002.0	n/a	n/a	
16 Infiltration	12800	TP250	0.1620	11.500	14.100	2.600	16.300	2.20	15.702	1.602	836	1998.0	480W	338			3130			n/a	n/a	
17 Primary	13330	n/a	n/a	11.680	12.000	0.320	13.400	1.40	13.020	1.020	1702	2079.0	1440W	n/a	OL16A = 3.79ha	6033.0	3043	9237	3204.0	1152	3069	0.0
17 Tank	13400	TP251	n/a	11.680	12.000	0.320	13.400	1.40	12.943	0.943	3744	3954.0	7200W	>7days	OL16B = 3.59ha		6194			1917		
18 Primary	14670	n/a	n/a	12.390	13.400	1.010	16.000	2.60	15.345	1.945	698	2328.4	60W	n/a			3622			1037		
18 Tank	14600	TP141	n/a	12.390	13.200	0.810	16.000	2.80	14.409	1.209	4009	5787.7	2880W	>7 days		8116.1	16476	20098	11981.9	3526	4563	0.0
18a Primary	14325	n/a	n/a	12.440	14.000	1.560	15.000	1.00	14.653	0.653	980	766.4	30W	n/a			1282			408		
18a Infiltration	14450	TP376	0.0028	12.440	14.000	1.560	15.000	1.00	14.550	0.550	3304	2132.4	4320W	9047		2898.8	4354	5636	2737.2	1209	1617	0.0
19 Primary	16140	n/a		18.150	25.300	7.150	27.700	2.40	27.345	2.045	28	364.7	15W	n/a			525			130.3		
19 Infiltration	16200	TP377	0.0684	18.150	25.100	6.950	27.700	2.60	27.222	2.122	187	2240.0	2880S	614	OL22 = 12.27ha	2604.7	3310	3835	1230.3	940.9	1071.2	0.0
20 Primary	16450	n/a	n/a	18.150	25.900	7.750	27.700	1.80	27.156	1.256	296	652.6	30W	n/a			1138			281.3		
20 Infiltration	16400	TP254	0.0131	18.150	25.700	7.550	27.700	2.00	27.193	1.493	610	1589.7	2880W	3460		2242.3	2440	3578	1335.7	878.2	1159.5	0.0
21 Primary	100 Offline	n/a	n/a	20.320	22.400	2.080	25.000	2.60	24.243	1.843	6	201.6	15W	n/a			482			n/a		
21 Infiltration	140 Offline	TP255	0.0267	20.320	22.200	1.880	25.000	2.80	24.507	2.307	54	658.0	2880W	1556		859.6	1003	1485	625.4	n/a	n/a	
22 Primary	250 Offline	n/a	n/a	17.950	21.800	3.850	24.000	2.20	23.511	1.711	375	1132.9	30W	n/a			1677			547		
22 Infiltration	160 Offline	TP256	0.0041	17.950	21.600	3.650	24.000	2.40	23.271	1.671	1472	3752.4	4320W	> 7 days		4885.3	6271	7948	3062.7	2206	2753	0.0
23 Primary	18000	n/a	n/a	15.250	23.600	8.350	26.000	2.40	25.054	1.454	176	553.6	30W	n/a	OL27 = 6.62ha		1325			221		
23 Infiltration	18160	TP392	0.0180	15.250	23.400	8.150	26.000	2.60	25.255	1.855	1793	4679.0	10080W	> 7 days		5232.6	7411	8736	3503.4	2667	2888	0.0
24 Primary	18700	n/a	n/a	15.250	22.000	6.750	24.000	2.00	23.603	1.603	241	871.6	30W	n/a			1269.3			364.9		
24 Infiltration	18760	TP285	0.0013	15.250	21.800	6.550	24.000	2.20	23.302	1.502	1488	3086.0	10080W	> 7 days		3957.6	5158	6427.3	2469.7	1939.5	2304.4	0.0
25 Primary	19270	n/a	n/a	9.140	23.000	13.860	25.800	2.80	25.170	2.170	16	349.5	15W	n/a	OL29 = 4.39ha		651.8			116.7		
25 Infiltration	19350	TP378	0.0015	9.140	22.800	13.660	25.800	3.00	24.992	2.192	701	3167.4	10080W	> 7 days		3516.9	5281.8	5933.6	2416.7	1836.8	1953.5	0.0
26 Infiltration	120 Offline		0.1040		17.500		19.100	1.60	18.459	0.959	811	1020.7	180W	372		1020.7	2003	2003	982.3	n/a	n/a	0.0
27 Swale	19750	n/a	n/a		24.150		24.650	0.50	24.618	0.468	n/a	74.7	15W	20								
28 Pond	400 Offline	n/a	n/a		18.350		19.850	1.50	19.048	0.698	164.1	161.7	1440W	n/a		161.7	528	528	366.3	n/a	n/a	0.0
29 Primary	20350	n/a	n/a		9.600		12.000	2.40	11.669	2.069	81	342.6	15W	n/a			436.6			n/a		
																1169.6		1711.9	542.3	n/a	n/a	0.0
29 Infiltration	20350	TP362	0.11160		9.400		12.000	2.60	11.342	1.942	264.9	827	1440W	547	OL35B = 1.57ha		1275.3					
30 Primary	Offline	n/a	n/a		15.600		18.000	2.40	17.541	1.941	132.8	482	15W	n/a		3176.6	675	3892.2	715.6	n/a	n/a	0.0
30 Infiltration	Offline	TP363	0.03100		14.800		18.000	3.20	17.635	2.835	568	2695	2880W	2790	OL32B = 1.24ha		3217.2			n/a	n/a	

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP235A
Carried out for Norfolk County Council	Date Started 23/07/2007	Date Finished	23/07/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.60	Height 17.950 mAOD	Logged by JT
	Co-ords 614859E - 315508N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : greyish brown silty fine to medium sand. Occasional angular fine to coarse flint gravel. (TOPSOIL)				1									
		Yellowish brown silty gravelly fine to medium SAND. Gravel is angular fine to coarse flint. (COVER SILT)		0.50		2		8							
		Dense light brown very silty very gravelly calcareous fine and medium SAND. Gravel is subangular to rounded fine to coarse flint with some dark occasional cobbly brown sand pockets. (CRAG_SAND)		1.00		3									
		End of Trialpit at 1.60 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP235B	
Carried out for Norfolk County Council	Date Started 23/07/2007	Date Finished 23/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Unstable to 1.50m with sides collapsing.No groundwater encountered.	Depth 3.05	Height 17.950 mAOD	Logged by JT
	Co-ords 614859E - 315508N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : greyish brown silty slightly gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)			●	1									
		Brown clayey silty very gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (COVER SILT)		0.50	●	2		7							
				1.00											
		Light brown very silty very gravelly calcareous fine and medium SAND. Gravel is subangular to angular fine to coarse flint with some chalk. Occasional flint cobbles and large sand pockets. (CRAG_SAND)		1.50	●	3 4		9							
				2.00											
				2.50											
		Firm yellowish white gravelly silty CHALK. Gravel is subangular fine to coarse chalk and flint. (UPPER CHALK)			●	5									
				3.00											
		End of Trialpit at 3.05 m													
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP236A	
Carried out for Norfolk County Council	Date Started 25/07/2007	Date Finished 25/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.55	Height 31.066 mAOD	Logged by JT
	Co-ords 615385E - 315678N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : brownish grey silty gravelly fine to medium SAND. Gravel is subangular fine to coarse flint. (TOPSOIL)				1									
		Orangey brown silty fine, medium and coarse GRAVEL with much medium sand. Gravel is fine to coarse flint. Some cobbles (GLACIAL SAND AND GRAVEL)		0.50		2		8							
				1.00											
				1.50		3									
		End of Trialpit at 1.55 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP236B	
Carried out for Norfolk County Council	Date Started 25/07/2007	Date Finished 25/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 3.00	Height 31.066 mAOD	Logged by JT
	Co-ords 615385E - 315678N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : brownish grey silty gravelly fine to medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)				1									
		Yellowish brown silty fine, medium and coarse GRAVEL with much medium sand. Gravel is fine to coarse flint. Some cobbles (GLACIAL SAND AND GRAVEL)		0.50											
		Orangey brown cobbly fine, medium and coarse GRAVEL with some medium sand. Gravel is angular to subrounded flint. (GLACIAL SAND AND GRAVEL)				2									
				1.00											
				1.50		3									
				2.00											
				2.50				3							
		...at 2.70m yellowish brown.				4									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP237A
Carried out for Norfolk County Council	Date Started 21/08/2007	Date Finished	21/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Poor stability during excavation.No groundwater encountered.	Depth 1.50	Height 34.682 mAOD	Logged by JT
	Co-ords 616960E - 315889N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark greyish brown silty slightly gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)				1									
		Yellowish brown slightly silty fine to medium SAND. Occasional angular fine to coarse flint. (GLACIAL SAND AND GRAVEL) ...at 0.50m becoming brown.		0.50		2		8							
				1.00											
						3									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP237B	
Carried out for Norfolk County Council	Date Started 21/08/2007	Date Finished 21/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Collapse at 2.60m.No groundwater encountered.	Depth 2.90	Height 34.682 mAOD	Logged by JT
	Co-ords 616960E - 315889N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark greyish brown silty slightly gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)													
		Brown slightly silty fine to medium SAND. (GLACIAL SAND AND GRAVEL) ...at 0.45m yellowish brown.		0.50											
		Brown silty gravelly fine to coarse SAND. Gravel is subangular to angular fine to coarse flint with occasional cobbles. (GLACIAL SAND AND GRAVEL)		1.00	●	1									
		...from 1.00m to 1.50m dark brown iron staining. ...from 1.50m orangish brown silty gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint.		1.50	●	2									
		...at 1.70m light yellowish brown.			●	4									
				2.00											
				2.50											
		Light yellow fine and medium SAND (GLACIAL SAND AND GRAVEL)			●	3		5							
		End of Trialpit at 2.90 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP238A
Carried out for Norfolk County Council	Date Started 24/07/2007	Date Finished	24/07/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks:	Depth 1.60	Height 24.825 mAOD	Logged by JT
	Co-ords 617098E - 315794N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brownish grey silty slightly gravelly fine to medium sand. Gravel is subangular fine to coarse flint. (TOPSOIL)				1									
		Greyish brown sandy CLAY with some clayey fine sand bands. (CORTON TILL)		0.50		2		16							
				1.00											
		Orangey brown silty gravelly fine to medium SAND. Gravel is subangular fine to coarse flint. (CORTON TILL)		1.50		3									
		End of Trialpit at 1.60 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP238B
Carried out for Norfolk County Council	Date Started 24/07/2007	Date Finished	24/07/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks:	Depth 3.00	Height 24.825 mAOD	Logged by JT
	Co-ords 617098E - 315794N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : brownish grey silty slightly gravelly fine to medium sand. Gravel is subangular fine to coarse flint. (TOPSOIL)				1									
		Brown clayey slightly gravelly fine to medium SAND. Gravel is subangular fine to coarse flint. (CORTON TILL)		0.50		2									
				1.00				9							
		Light yellowish brown very silty gravelly fine to medium SAND. Gravel is angular fine to coarse flint. (CORTON TILL)		1.50		3									
		Firm mottled grey and orangish brown slightly sandy CLAY. (CORTON TILL)		2.00		4		12							
		Yellowish brown very silty gravelly fine to medium SAND. Gravel is subangular to rounded fine to coarse flint. (CRAG_SAND)		2.50		5									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP239A	
Carried out for Norfolk County Council	Date Started 30/08/2007	Date Finished 30/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.50	Height 28.693 mAOD	Logged by JT
	Co-ords 618640E - 315150N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : Dark brown silty fine to medium sand. (TOPSOIL)													
		Brown silty fine SAND. (COVER SILT)		0.50											
				1.00											
		Yellowish brown slightly silty slightly gravelly fine to medium SAND. Gravel consists of subangular fine to medium flint. (GLACIAL SAND AND GRAVEL)													
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP239B	
Carried out for Norfolk County Council	Date Started 30/08/2007	Date Finished 30/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Collapse below 1.80m	Depth 3.00	Height 28.693 mAOD	Logged by JT
	Co-ords 618640E - 315150N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : Dark brown silty fine to medium sand. (TOPSOIL)													
		Brown silty fine SAND. (COVER SILT)		0.50											
		Yellowish brown slightly silty slightly gravelly fine to medium SAND. Gravel consists of subangular fine to medium flint. (GLACIAL SAND AND GRAVEL)		1.00											
				1.50											
		Light yellowish brown slightly silty fine to medium SAND. (GLACIAL SAND AND GRAVEL)		2.00	●	1									
		from 2.20m orangish brown slightly silty gravelly medium to coarse SAND. Gravel consists angular to subrounded fine to medium flint.			●	2									
	▼			2.50											
		End of Trialpit at 3.00 m		3.00	●	3									
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP240A	
Carried out for Norfolk County Council	Date Started 26/07/2007	Date Finished 26/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Poor stability during excavation.No groundwater encountered.	Depth 1.58	Height 31.811 mAOD	Logged by JT
	Co-ords 619248E - 314278N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty slightly gravelly fine to medium sand. Gravel is angular fine to coarse flint. (TOPSOIL)		0.50	●	1									
		Yellowish brown slightly silty slightly gravelly medium SAND with some tree roots. Gravel is fine to medium flint. (GLACIAL SAND AND GRAVEL)		1.00	●	2		4							
		...from 1.40m light yellowish brown.		1.50											
		End of Trialpit at 1.58 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP240B	
Carried out for Norfolk County Council	Date Started 26/07/2007	Date Finished 26/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Poor stability during excavation.No groundwater encountered.	Depth 3.00	Height 31.811 mAOD	Logged by JT
	Co-ords 619248E - 314278N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : Dark brown silty slightly gravelly fine to medium sand. Gravel is angular fine to medium flint. (TOPSOIL)													
		Yellowish brown slightly silty slightly gravelly medium SAND. Gravel is subangular fine to medium flint. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00											
				1.50											
				2.00		1									
				2.50				6							
						2									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP241A
Carried out for Norfolk County Council	Date Started 14/08/2007	Date Finished	14/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.50	Height 27.845 mAOD	Logged by JT
	Co-ords 620257E - 314279N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty slightly gravelly fine to medium sand. Gravel is angular fine to coarse flint. (TOPSOIL)				1									
		Brown clayey fine to medium SAND. (GLACIAL SAND AND GRAVEL)		0.50		2									
		...from 0.60m firm brown very sandy very clayey SILT.				3		17							
				1.00											
		End of Trialpit at 1.50 m		1.50		4									
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP241B	
Carried out for Norfolk County Council	Date Started 14/08/2007	Date Finished 14/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 3.55	Height 27.845 mAOD	Logged by JT
	Co-ords 620257E - 314279N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty slightly gravelly fine to medium sand. Gravel is angular fine to coarse flint. (TOPSOIL)													
		Brown clayey fine to medium SAND. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00											
				1.50											
		...from 1.70m some thin sand beds.		2.00	●	1									
				2.50											
		Yellowish brown silty gravelly fine to medium SAND. (GLACIAL SAND AND GRAVEL)			●	2		18							
				3.00											
		Firm brownish grey very sandy CLAY. (CORTON TILL)			●	3									
		End of Trialpit at 3.55 m		3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP242A	
Carried out for Norfolk County Council	Date Started 08/08/2007	Date Finished 08/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.50	Height 29.490 mAOD	Logged by JT
	Co-ords 620372E - 314377N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : brown silty slightly gravelly fine to medium sand. Gravel is subangular fine to coarse flint. (TOPSOIL)				1									
		Mottled brown and grey sandy CLAY and silty fine SAND. (COVER SILT)		0.50		2									
		Firm to stiff sandy CLAY. (CORTON TILL)		1.00		3		15 11							
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP242B	
Carried out for Norfolk County Council	Date Started 08/08/2007	Date Finished 08/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 3.70	Height 29.490 mAOD	Logged by JT
	Co-ords 620372E - 314377N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : brown silty slightly gravelly fine to medium sannd. Gravel is subangular fine to coarse flint. (TOPSOIL)													
		Mottled brown and grey sandy CLAY and silty fine SAND. (COVER SILT)		0.50											
		Firm to stiff sandy CLAY. (CORTON TILL)		1.00											
				1.50											
		Yellowish brown silty fine to medium SAND with some sandy clay bands. (CRAG_SAND)		2.00	●	1									
		...from 2.40m becoming very sandy.		2.50											
					●	2									
				3.00											
				3.50	●	3									
		End of Trialpit at 3.70 m													
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP243A
Carried out for Norfolk County Council	Date Started 09/08/2007	Date Finished	09/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout	Depth 1.50	Height 22.744 mAOD	Logged by JT
	Co-ords 620608E - 314674N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty slightly gravelly fine to medium sand. Gravel consists of subangular to angular fine to coarse flint. (TOPSOIL)				1									
		Brown very sandy gravelly clayey SILT. Gravel is fine flint. (COVER SILT)		0.50		2									
		Orangish brown slightly silty GRAVEL and medium and coarse SAND. Gravel consists of angular to subangular fine to coarse flint. (CRAG_GRAVEL)		1.00		3									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP243B
Carried out for Norfolk County Council	Date Started 09/08/2007	Date Finished	09/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Some collapse below 1.40m	Depth 3.00	Height 22.744 mAOD	Logged by JT
	Co-ords 620608E - 314674N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty slightly gravelly fine to medium sand. Gravel consists of subangular to angular fine to coarse flint. (TOPSOIL)				1									
		Brown very sandy gravelly clayey SILT. Gravel is fine flint. (COVER SILT)		0.50		2		23							
		Orangish brown slightly silty GRAVEL and medium and coarse SAND. Gravel consists of angular to subangular fine to coarse flint. (CRAG_GRAVEL)		1.00		3		7							
				1.50											
		Yellowish brown very gravelly medium SAND. Gravel consists of angular to subangular fine to medium flint (CRAG_SAND)				4		5							
				2.00											
						5		8							
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP244A	
Carried out for Norfolk County Council	Date Started 13/08/2007	Date Finished 13/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout	Depth 1.50	Height 30.507 mAOD	Logged by JT
	Co-ords 620802E - 314148N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)				1									
		Brown very silty fine to medium SAND. With some sandy clay bands. (GLACIAL SAND AND GRAVEL)		0.50		2		13							
				1.00											
		...from 1.20m firm to stiff very sandy clay with some clayey fine sand bands				3									
		End of Trialpit at 1.50 m		1.50		4									
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP244B
Carried out for Norfolk County Council	Date Started 13/08/2007	Date Finished	13/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout	Depth 3.40	Height 30.507 mAOD	Logged by JT
	Co-ords 620802E - 314148N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)													
		Brown very silty fine to medium SAND. With some sandy clay bands. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00											
				1.50											
		...from 1.90m brown very sandy CLAY with clayey sand bands		2.00	●	1		14							
		...from 2.40m brown very sandy CLAY with some very sandy clay bands		2.50											
				3.00	●	2		16							
		End of Trialpit at 3.40 m		3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP245A	
Carried out for Norfolk County Council	Date Started 10/08/2007	Date Finished 10/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout	Depth 1.60	Height 28.165 mAOD	Logged by JT
	Co-ords 620845E - 314238N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)				1									
		Greyish brown very silty gravelly fine to medium SAND. Gravel is fine and medium flint. (GLACIAL SAND AND GRAVEL)		0.50		2		23							
				1.00											
		Orangish brown silty gravelly fine to coarse SAND. Gravel consists of subangular to rounded fine to coarse flint. Occasional flint boulder. (GLACIAL SAND AND GRAVEL)				3									
				1.50		4									
		Firm mottled brown and grey very sandy CLAY. (CORTON TILL)													
		End of Trialpit at 1.60 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP245B	
Carried out for Norfolk County Council	Date Started 10/08/2007	Date Finished 10/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout	Depth 3.60	Height 28.165 mAOD	Logged by JT
	Co-ords 620845E - 314238N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)													
		Greyish brown very silty gravelly fine to medium SAND. Gravel is fine and medium flint. (GLACIAL SAND AND GRAVEL)		0.50 1.00											
		Orangish brown silty gravelly fine to coarse SAND. Gravel consists of subangular to rounded fine to coarse flint. Occasional flint boulder. (GLACIAL SAND AND GRAVEL)		1.50											
		Firm mottled brown and grey sandy CLAY. (CORTON TILL)		2.00 2.50	●	1		14							
		Yellowish brown slightly silty fine to medium SAND. (CRAG_SAND)		3.00 3.50	●	2		23							
		End of Trialpit at 3.60 m		4.00 4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP246A	
Carried out for Norfolk County Council	Date Started 17/08/2007	Date Finished 17/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.60	Height 27.170 mAOD	Logged by JT
	Co-ords 622122E - 314410N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty fine to medium sand. Occasional angular fine to coarse gravel. (TOPSOIL)				1									
		Brown very sandy SILT. (COVER SILT)		0.50		2									
		Brown silty fine to medium SAND (GLACIAL SAND AND GRAVEL)		1.00											
				1.50		3									
		End of Trialpit at 1.60 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP246B	
Carried out for Norfolk County Council	Date Started 17/08/2007	Date Finished 17/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 3.00	Height 27.170 mAOD	Logged by JT
	Co-ords 622122E - 314410N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty fine to medium sand. Occasional angular fine to coarse flint graval. (TOPSOIL)													
		Brown very silty fine SAND. (COVER SILT)		0.50											
		Brown silty fine to medium SAND. Occasional angular to subangular fine to coarse flint. (GLACIAL SAND AND GRAVEL)		1.00											
				1.50	●	1									
		Firm greyish brown very sandy CLAY with some clayey fine sand bands. (CORTON TILL)		2.00	●	2									
				2.50	●	3									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP247A	
Carried out for Norfolk County Council	Date Started 16/01/2008	Date Finished 16/01/2008	
Dimensions: 0.45 x 1.80	Type of Excavator JCB 3CX		
Remarks: Gravel fill to 0.6mbgl. Water seepage from 1.0mbgl.	Depth 1.60	Height 24.425 mAOD	Logged by JT
	Co-ords 622976E - 314357N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brownish grey silty fine SAND. Occasional angular fine to coarse flint gravel. (TOPSOIL)			●	1									
		Brownish grey very silty fine SAND. (GLACIAL SAND AND GRAVEL)		0.50	●	2		21							
		Mottled yellowish brown and brownish grey silty slightly gravelly fine and medium SAND. Gravel is angular to subangular fine to coarse flint. (GLACIAL SAND AND GRAVEL) ...From 1.0mbgl water seepage.		1.00	●	3		18							
				1.50											
		End of Trialpit at 1.60 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP247B	
Carried out for Norfolk County Council	Date Started 16/01/2008	Date Finished 16/01/2008	
Dimensions: 0.45 x 1.80	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 3.00	Height 24.425 mAOD	Logged by JT
	Co-ords 622976E - 314357N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brownish grey very silty fine SAND. Occasional angular fine to coarse flint gravel. (TOPSOIL)													
		Brownish grey very silty fine and medium SAND. Occasional angular fine to coarse flint gravel. (GLACIAL SAND AND GRAVEL)		0.50											
		...At 0.8mbgl brown silty slightly gravelly fine and medium SAND. Gravel is angular fine to coarse flint.		1.00											
		...At 1.2mbgl Some sandy clay pockets. Yellowish brown mottled yellowish grey.			●	1									
				1.50											
				2.00				14							
		Firm to stiff mottled yellowish brown and yellowish grey very sandy silty CLAY with silty sand pockets. (CORTON TILL)			●	2									
				2.50				13							
		Light yellowish brown silty gravelly fine and medium SAND. Gravel is subangular to rounded flint. (CRAG_SAND)			●	3									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP248A	
Carried out for Norfolk County Council	Date Started 27/07/2007	Date Finished 27/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks:	Depth 1.60	Height 18.152 mAOD	Logged by JT
	Co-ords 624129E - 314511N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty gravelly fine to medium sand. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)				1		16							
		Brown slightly silty gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium flint. (GLACIAL SAND AND GRAVEL)		0.50		2		9							
				1.00											
		Yellowish brown slightly silty gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse flint. Pockets of sandy clay. (GLACIAL SAND AND GRAVEL)		1.50											
		End of Trialpit at 1.60 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP248B	
Carried out for Norfolk County Council	Date Started 27/07/2007	Date Finished 27/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks:	Depth 3.00	Height 18.152 mAOD	Logged by JT
	Co-ords 624129E - 314511N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown TOPSOIL. (TOPSOIL)		0.50											
		Yellowish brown slightly silty gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		1.00		1									
				1.50											
		Orangish brown silty medium to coarse GRAVEL and medium SAND. Gravel is subangular flint. Some sandy clay pockets. (GLACIAL SAND AND GRAVEL)		2.00		2									
		Yellowish brown fine and medium SAND. (GLACIAL SAND AND GRAVEL)		2.50		3									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP249A	
Carried out for Norfolk County Council	Date Started 17/01/2008	Date Finished 17/01/2008	
Dimensions: 0.45 x 1.20	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.55	Height 21.678 mAOD	Logged by J. Tomalin
	Co-ords 629350E - 309005N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Greyish brown silty fine SAND. (TOPSOIL)			●	1									
		Light yellowish brown silty fine and medium SAND. (GLACIAL SAND AND GRAVEL)		0.50	●	2		14							
		Firm to stiff mottled orangish brown and light yellowish brown sandy CLAY with silty sand bands. (CORTON TILL)		1.00	●	3		15							
		End of Trialpit at 1.55 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP249B	
Carried out for Norfolk County Council	Date Started 17/01/2008	Date Finished 17/01/2008	
Dimensions: 0.45 x 1.20	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 3.00	Height 21.678 mAOD	Logged by J. Tomalin
	Co-ords 629350E - 309005N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Greyish brown silty slightly gravelly fine and medium SAND. (TOPSOIL)													
		Light yellowish brown silty fine SAND. (GLACIAL SAND AND GRAVEL)		0.50											
		Firm to stiff mottled orangish brown and light yellowish brown sandy CLAY. Occasional subrounded fine to coarse flint gravel with some silty fine sand bands. (CORTON TILL) ...At 1.0mbgl stiff and orangish brown		1.00		1									
				1.50											
		Orangish brown slightly silty slightly gravelly fine to coarse SAND. (CRAG_SAND)				2		12							
				2.00											
		Yellowish brown slightly silty fine SAND. (CRAG_SAND)		2.50											
						3		16							
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP250A	
Carried out for Norfolk County Council	Date Started 03/09/2007	Date Finished 03/09/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 1.50	Height 16.309 mAOD	Logged by JT
	Co-ords 625712E - 314394N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : greyish brown silty gravelly fine to medium sand. Gravel is subangular to subrounded fine to coarse flint. (TOPSOIL)			●	1									
		Yellowish brown slightly silty medium SAND and medium and coarse flint GRAVEL. Gravel is subangular to rounded. (CRAG_GRAVEL)		0.50	●	2		3							
				1.00											
		...from 1.10m yellowish brown very sandy clay.													
		Yellowish brown slightly silty gravelly fine to medium SAND. Gravel is subangular to rounded fine to coarse flint. (CRAG_SAND)		1.50											
		End of Trialpit at 1.50 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP250B	
Carried out for Norfolk County Council	Date Started 03/09/2007	Date Finished 03/09/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Major collapse at 2.60m.	Depth 2.60	Height 16.309 mAOD	Logged by JT
	Co-ords 625712E - 314394N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : greyish brown silty gravelly fine to medium sand and medium and coarse flint gravel. Gravel is subangular to subrounded. (TOPSOIL)													
		Yellowish brown slightly silty medium SAND. (CRAG_SAND)		0.50											
		...at 0.80m orangish brown.				1									
				1.00											
				1.50											
		...from 2.0m brown fine and medium SAND with much fine, medium and coarse flint gravel with iron staining.		2.00				7							
						2									
				2.50											
		End of Trialpit at 2.60 m													
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP251A
Carried out for Norfolk County Council	Date Started 31/08/2007	Date Finished	31/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks:	Depth 1.70	Height 13.074 mAOD	Logged by JT
	Co-ords 626389E - 314167N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)		0.50											
		Light brownish very sandy very clayey SILT (wet). (ALLUVIUM)		1.00		1									
				1.50											
		End of Trialpit at 1.70 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP251B	
Carried out for Norfolk County Council	Date Started 31/08/2007	Date Finished 31/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Very unstable	Depth 2.70	Height 13.074 mAOD	Logged by JT
	Co-ords 626389E - 314167N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty fine and medium sand. (TOPSOIL)			●	1									
		...from 0.40m gravelly. Gravel consists of subangular fine to coarse flint.		0.50											
		Mottled brown and greyish brown silty very gravelly SAND. Gravel consists of subangular to subrounded fine to medium flint. (COVER SILT)			●	2									
					●	3		22							
		Firm mottled dark brown and brownish grey very sandy very clayey SILT. (ALLUVIUM) ...from 1.10m mottled light grey and brownish grey.		1.00											
	▼			1.50											
		Light greyish brown silty fine and medium SAND (wet). (ALLUVIUM)			●	4		18							
		...from 1.90m light grey very silty fine sand with sandy silt bands.		2.00											
		Very soft creamy white chalky SILT. (ALLUVIUM)		2.50											
	▼	End of Trialpit at 2.70 m													
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP252A	
Carried out for Norfolk County Council	Date Started 29/08/2007	Date Finished 29/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.50	Height 17.530 mAOD	Logged by JT
	Co-ords 627543E - 313410N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty fine to medium sand. (TOPSOIL)				1									
		Brown silty fine to medium SAND. (COVER SILT)		0.50		2									
				1.00											
		Firm to stiff mottled orangish brown and grey sandy to very sandy CLAY. (CORTON TILL)				3		14							
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP252B	
Carried out for Norfolk County Council	Date Started 29/08/2007	Date Finished 29/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 3.00	Height 17.530 mAOD	Logged by JT
	Co-ords 627543E - 313410N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty fine to medium sand. (TOPSOIL)													
		Orangish brown silty fine to medium SAND with sandy clay bands. (COVER SILT)		0.50											
					●	1									
				1.00											
		Firm mottled grey and orangish brown sandy to very sandy CLAY. (CORTON TILL)		1.50											
		Yellowish brown slightly silty fine to medium SAND. (CRAG_SAND)													
					●	2									
				2.00											
				2.50											
					●	3									
				3.00	●	4									
		End of Trialpit at 3.00 m													
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP253A	
Carried out for Norfolk County Council	Date Started 30/07/2007	Date Finished 30/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Slight collapse during excavation.No groundwater encountered.	Depth 1.50	Height 30.425 mAOD	Logged by JT
	Co-ords 628134E - 312269N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty gravelly sand. Gravel is subangular fine to coarse flint. (TOPSOIL)			●	1									
		Orangish brown silty medium and coarse GRAVEL and medium SAND. Gravel is subangular to rounded medium to coarse flint, occasional cobbles. (GLACIAL SAND AND GRAVEL)		0.50	●	2		6							
		Yellowish brown slightly silty slightly gravelly medium SAND. Gravel is subangular to rounded flint. (GLACIAL SAND AND GRAVEL)		1.00	●	3									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP253B	
Carried out for Norfolk County Council	Date Started 30/07/2007	Date Finished 30/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stopped excavation due to collapse at 2.65m. Slight water seepage from 2.00m.	Depth 2.65	Height 30.425 mAOD	Logged by JT
	Co-ords 628134E - 312269N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty gravelly sand. Gravel is is subangular fine to coarse flint. (TOPSOIL)													
		Orangish brown silty medium to coarse GRAVEL and medium SAND. Gravel is subangular to rounded medium to coarse flint, occasional cobbles. (GLACIAL SAND AND GRAVEL)		0.50											
		Yellowish brown slightly silty slightly gravelly medium SAND. Gravel is subangular to rounded flint. (GLACIAL SAND AND GRAVEL)		1.00											
		Light yellowish brown very gravelly medium SAND. Gravel is subangular to rounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		1.50	●	1		6							
				2.00											
		Firm to stiff mottled orangey brown and grey sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse flint. (CORTON TILL)		2.50	●	2									
		End of Trialpit at 2.65 m													
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP254A
Carried out for Norfolk County Council	Date Started 15/08/2007	Date Finished	15/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 1.50	Height 28.063 mAOD	Logged by JT
	Co-ords 628404E - 312037N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty slightly gravelly fine to medium sand. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)													
		Brown silty slightly gravelly fine to medium SAND. Gravel is subangular fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50		2									
		...from 0.90m orangish brown silty slightly gravelly medium sand.		1.00		1									
		...from 1.30m brown clayey fine and medium SAND.				3		16							
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP254B	
Carried out for Norfolk County Council	Date Started 15/08/2007	Date Finished 15/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 3.00	Height 28.063 mAOD	Logged by JT
	Co-ords 628404E - 312037N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty slightly gravelly fine to medium sand. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)													
		Brown silty slightly gravelly fine to medium SAND. Gravel is subangular fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50											
		...from 0.70m mottled orangish brown and grey clayey sand.													
		...from 0.90m becoming very sandy clay with clayey sand bands.		1.00	●	1									
				1.50											
		...from 1.60m orangey brown silty slightly gravelly fine to medium sand. Gravel is subangular fine to coarse flint.			●	2									
				2.00											
		Orangish brown very sandy CLAY and clayey sand bands. (CORTON TILL) ...from 2.20m orangish brown very sandy clay and clayey sand bands.			●	3		18							
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP255A	
Carried out for Norfolk County Council	Date Started 31/07/2007	Date Finished 31/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 1.60	Height 25.031 mAOD	Logged by JT
	Co-ords 628905E - 311559N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty gravelly fine to medium sand. Gravel is subangular fine to coarse flint. (TOPSOIL)				1									
		Yellowish brown silty gravelly fine to medium SAND. Gravel is subangular to rounded flint. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00		2									
		...at 1.30m clayey sand.				3									
				1.50											
		End of Trialpit at 1.60 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP255B	
Carried out for Norfolk County Council	Date Started 31/07/2007	Date Finished 31/07/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Poor stability above 2.40m.	Depth 2.75	Height 25.031 mAOD	Logged by JT
	Co-ords 628905E - 311559N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty gravelly fine to medium sand. Gravel is subangular fine to coarse flint. (TOPSOIL)													
		Yellowish brown slightly silty gravelly medium to coarse SAND. Gravel is subangular to rounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00											
				1.50	●	1									
				2.00											
		Firm greyish brown sandy CLAY. (GLACIAL SAND AND GRAVEL)		2.50	●	2									
		Yellowish brown slightly silty gravelly SAND. Gravel is subangular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)			●	3									
		Yellowish brown clayey fine SAND. (GLACIAL SAND AND GRAVEL)		3.00											
		End of Trialpit at 2.75 m													
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP256A	
Carried out for Norfolk County Council	Date Started 28/08/2007	Date Finished 28/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.60	Height 23.276 mAOD	Logged by JT
	Co-ords 628828E - 311355N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : greyish brown silty fine to medium sand. (TOPSOIL)				1		17							
		Brown silty slightly gravelly fine to medium SAND. Gravel consists of angular fine to medium flint. (GLACIAL SAND AND GRAVEL)		0.50		2									
		Yellowish brown slightly silty slightly gravelly fine to medium SAND. Gravel consists of angular fine to medium flint. (GLACIAL SAND AND GRAVEL)		1.00		3									
		Firm to stiff yellowish brown and orangish brown sandy CLAY with thin silty sand bands. (CORTON TILL)		1.50		4		18							
		End of Trialpit at 1.60 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP256B	
Carried out for Norfolk County Council	Date Started 28/08/2007	Date Finished 28/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout	Depth 3.00	Height 23.276 mAOD	Logged by JT
	Co-ords 628828E - 311355N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : greyish brown silty fine to medium sand. (TOPSOIL)													
		Brown silty slightly gravelly fine to medium SAND. Gravel consists of angular fine to medium flint with some sandy clay bands. (GLACIAL SAND AND GRAVEL)		0.50 1.00 1.50											
		Yellowish brown slightly silty fine to medium SAND. (CORTON SAND)			●	1									
		...from 1.90m bands of brown and light yellowish brown.		2.00											
		...from 2.30m light yellowish brown slightly silty fine to medium sand.		2.50	●	2		11							
		End of Trialpit at 3.00 m		3.00	●	3									
				3.50 4.00 4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP257A	
Carried out for Norfolk County Council	Date Started 16/08/2007	Date Finished 16/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Unstable during excavation.No groundwater encountered.	Depth 1.55	Height 26.847 mAOD	Logged by JT
	Co-ords 628824E - 310172N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : orangish brown silty fine to medium sand. (TOPSOIL)			●	1									
					●	2									
		TOPSOIL : dark greyish brown silty fine to medium sand. (TOPSOIL)													
		Yellowish brown slightly silty fine SAND. (CORTON SAND)		0.50											
				1.00				21							
					●	3									
				1.50											
		End of Trialpit at 1.55 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP257B	
Carried out for Norfolk County Council	Date Started 16/08/2007	Date Finished 16/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: No groundwater encountered.Stable during excavation.	Depth 3.00	Height 26.847 mAOD	Logged by JT
	Co-ords 628824E - 310172N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark greyish brown silty fine to medium sand. (TOPSOIL)													
		Orangish brown silty fine to medium SAND. (CORTON SAND)		0.50											
		Firm mottled yellowish brown and light grey very sandy CLAY. (CORTON TILL)		1.00	●	1									
				1.50	●	2									
				2.00											
		Yellowish brown silty fine to medium SAND with some sandy clay bands. (CORTON SAND)		2.50	●	3		18							
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP259A	
Carried out for Norfolk County Council	Date Started 24/08/2007	Date Finished 24/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.50	Height 12.128 mAOD	Logged by JT
	Co-ords 628954E - 308427N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)				1									
		Brown silty fine SAND. (COVER SILT)		0.50		2									
		Stiff brown very sandy CLAY with clayey sand bands. (LOWESTOFT TILL)				3									
		...from 1.00m pockets of light yellowish brown sandy SILT.		1.00		4									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP259B	
Carried out for Norfolk County Council	Date Started 24/08/2007	Date Finished 24/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 3.00	Height 12.128 mAOD	Logged by JT
	Co-ords 628954E - 308427N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL : dark brown silty fine to medium sand. (TOPSOIL)													
		Brown silty gravelly fine to medium SAND. Gravel is subangular fine to medium flint. (COVER SILT)		0.50		1									
		Stiff grey and yellowish grey CLAY. (LOWESTOFT TILL)		1.00		2									
				1.50											
						3		13							
				2.00		4									
		...from 2.20m very stiff.		2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP272A	
Carried out for Norfolk County Council	Date Started 18/01/2008	Date Finished 18/01/2008	
Dimensions: 0.45 x 1.30	Type of Excavator JCB 3CX		
Remarks: No samples recovered. Dry and stable throughout.	Depth 1.60	Height 24.242 mAOD	Logged by JT
	Co-ords 629384E - 309013N		Drawn by ptp
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Greyish brown very silty fine SAND. Occasional angular fine to coarse flint gravel. (TOPSOIL)													
		Brown very silty fine SAND. (TOPSOIL) ...At 0.6mbgl orangish brown.		0.50 1.00											
		Firm orangish brown and light yellowish brown very sandy CLAY. (CORTON SAND)		1.50											
		End of Trialpit at 1.60 m		2.00 2.50 3.00 3.50 4.00 4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP272B	
Carried out for Norfolk County Council	Date Started 18/01/2008	Date Finished 18/01/2008	
Dimensions: 0.45 x 1.80	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 3.00	Height 24.242 mAOD	Logged by J. Tomalin
	Co-ords 629384E - 309013N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Greyish brown very silty fine SAND. Occasional angular fine to coarse flint gravel. (TOPSOIL)				1									
		Brown very silty fine SAND. (CORTON SAND)		0.50		2		13							
		...At 0.6mbgl orangish brown		1.00											
		Firm orangish brown and light yellowish brown very sandy CLAY. (CORTON TILL)		1.50		3		16							
		...At 2.0mbgl interbedded firm very sandy CLAY and silty fine and medium SAND.		2.00											
				2.50		4		15							
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP273A
Carried out for Norfolk County Council	Date Started 23/08/2007	Date Finished	23/08/2007
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.50	Height 17.456 mAOD	Logged by JT
	Co-ords 628780E - 308987N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty slightly gravelly fine to medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)													
		Brown silty fine SAND with some clayey sand bands. (CORTON SAND)		0.50	●	1									
				1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP273B	
Carried out for Norfolk County Council	Date Started 23/08/2007	Date Finished 23/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Slight collapse during excavation.No groundwater encountered.	Depth 3.00	Height 17.456 mAOD	Logged by JT
	Co-ords 628780E - 308987N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty slightly gravelly fine to medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)				1									
		Brown silty fine to medium SAND. Some clayey sand bands. (CORTON SAND)		0.50		2									
				1.00											
		Orangey brown silty gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (CORTON SAND)		1.50		3									
		Yellowish brown slightly silty fine SAND. (CORTON SAND)				4									
				2.00											
				2.50											
		End of Trialpit at 3.00 m				5									
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP274A	
Carried out for Norfolk County Council	Date Started 22/08/2007	Date Finished 22/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 1.60	Height 18.722 mAOD	Logged by JT
	Co-ords 628938E - 308604N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty slightly gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)				1									
		Light brown silty fine SAND. (CORTON SAND)		0.50		3									
		...at 1.10m sandy clay bands.		1.00											
		Light yellowish brown slightly silty fine SAND. (CRAG_SAND)		1.50		3									
		End of Trialpit at 1.60 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP274B	
Carried out for Norfolk County Council	Date Started 22/08/2007	Date Finished 22/08/2007	
Dimensions: -	Type of Excavator JCB 3CX		
Remarks: Stable during excavation.No groundwater encountered.	Depth 3.00	Height 18.722 mAOD	Logged by JT
	Co-ords 628938E - 308604N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty slightly gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (TOPSOIL)													
		Light brown silty fine SAND. (CORTON SAND)		0.50											
		Firm brown sandy CLAY with clayey fine to medium sand bands. (CORTON TILL)		1.00	●	1									
		Yellowish brown and orangey brown silty fine to medium SAND. (CRAG_SAND)		1.50	●	2									
		...from 2.30m light yellowish brown slightly silty slightly gravelly fine to coarse sand. Gravel is subangular to subrounded fine to medium flint.		2.00 2.50	●	3									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP275A	
Carried out for Norfolk County Council	Date Started 11/09/2013	Date Finished 11/09/2013	
Dimensions: 0.50 x 1.40	Type of Excavator JCB		
Remarks: Dry and stable k = 1.4 x 10-5 m/sec	Depth 1.50	Height Unknown	Logged by SPB Drawn by SPB Checked by MLB
	Co-ords 614883E - 315405N		

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty TOPSOIL.			●	001									
		Brown silty fine SAND.		0.50	●	002									
				1.00											
		Light brown silty gravelly fine medium SAND. Gravel is fine medium angular to rounded flint and quartz.			●	003	K								
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG 275A

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP275B	
Carried out for Norfolk County Council	Date Started 11/09/2013	Date Finished 11/09/2013	
Dimensions: 0.50 x 1.50	Type of Excavator JCB		
Remarks: Dry and stable k = 7.1 x 10-6 m/sec	Depth 3.00	Height Unknown	Logged by SPB Drawn by MLB Checked by MLB
	Co-ords 614883E - 315403N		

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty TOPSOIL			●	001									
		Brown silty gravelly fine to medium SAND. Gravel is fine to coarse angular flint occasional flint cobbles.		0.50	●	002									
				1.00											
		Light brown gravelly slightly cobbly silty fine medium SAND. Gravel is medium to coarse angular to rounded flint and quartz.		1.50	●	003									
		Stiff orangey brown silty sandy gravelly CLAY. Gravel is fine medium and coarse angular to subangular flint.		2.00	●	004									
		Whilte silt sized comminuted CHALK with some fine medium gravel size intact chalk. Weak. Some flint cobbles. Grade VI Dm.		2.50	●	005	K								
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG 275B

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP276A	
Carried out for Norfolk County Council	Date Started 25/01/2008	Date Finished 25/01/2008	
Dimensions: 0.45 x 1.30	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.50	Height 37.347 mAOD	Logged by J. Tomalin
	Co-ords 615846E - 315776N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)			●	1									
		Yellowish brown slightly silty fine and medium SAND. Occasional thin sandy clay bands to 0.90mbgl. (GLACIAL SAND AND GRAVEL)		0.50	●	2		10							
				1.00											
					●	3									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP276B	
Carried out for Norfolk County Council	Date Started 25/01/2008	Date Finished 25/01/2008	
Dimensions: 0.50 x 1.70	Type of Excavator JCB 3CX		
Remarks: Dry and poor stability throughout.	Depth 2.70	Height 37.347 mAOD	Logged by J. Tomalin
	Co-ords 615846E - 315776N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)													
		Yellowish brown slightly silty fine and medium SAND. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00											
				1.50											
				2.00	●	1									
				2.50											
		...From 2.60mbgl slightly gravelly, gravel is subangular fine to medium flint.			●	2		10							
		End of Trialpit at 2.70 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP277A	
Carried out for Norfolk County Council	Date Started 17/01/2008	Date Finished 17/01/2008	
Dimensions: 0.45 x 1.80	Type of Excavator JCB 3CX		
Remarks: Poor stability, collapse from 1.0mbgl. Moderate water seepage from 1.0mbgl.	Depth 1.55	Height 28.627 mAOD	Logged by JT
	Co-ords 618573E - 315195N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown very silty fine SAND. (TOPSOIL)			●	1									
		Brown very silty fine and medium SAND with some fine and medium flint gravel. (COVER SILT)		0.50	●	2		21							
		Yelllowish brown slightly silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse flint. (GLACIAL SAND AND GRAVEL)		1.00	●	3									
		Yellowish brown slightly silty fine and medium SAND. (GLACIAL SAND AND GRAVEL) ...From 1.0mbgl moderate water seepage.			●	4		15							
		End of Trialpit at 1.55 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP277B	
Carried out for Norfolk County Council	Date Started 21/01/2008	Date Finished 21/01/2008	
Dimensions: 0.50 x 2.00	Type of Excavator JCB 3CX		
Remarks: Slight water seepage from 0.9mbgl. Collapse from 1.7mbgl, very unstable. Dimensions after collapse to 1.5mbgl.	Depth 2.80	Height 28.627 mAOD	Logged by J. Tomalin
	Co-ords 618573E - 315195N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine SAND. (TOPSOIL)													
		Brown very silty fine and medium SAND with some fine and medium flint gravel. (COVER SILT)		0.50											
		Yellowish brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		1.00											
		Yellowish brown slightly silty fine and medium SAND. (GLACIAL SAND AND GRAVEL) ...At 1.5mbgl mottled yellowish brown and light grey.		1.50											
				2.00	●	1		16							
		Firm mottled brown and grey sandy CLAY. (CORTON TILL)		2.50											
		End of Trialpit at 2.80 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP278A
Carried out for Norfolk County Council	Date Started 22/01/2008	Date Finished	22/01/2008
Dimensions: 0.45 x 1.45	Type of Excavator JCB 3CX		
Remarks: Stable and dry throughout.	Depth 1.55	Height 31.839 mAOD	Logged by J. Tomalin
	Co-ords 619204E - 314335N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)			●	1									
		Yellowish brown slightly silty fine mainly medium to coarse SAND. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00	●	2									
		Light yellowish brown slightly silty fine to medium SAND (GLACIAL SAND AND GRAVEL)		1.50											
		End of Trialpit at 1.55 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP278B	
Carried out for Norfolk County Council	Date Started 22/01/2008	Date Finished 22/01/2008	
Dimensions: 0.45 x 1.60	Type of Excavator JCB 3CX		
Remarks: Collapse from 1.4mbgl. Dry throughout.	Depth 2.70	Height 31.839 mAOD	Logged by J. Tomalin
	Co-ords 619204E - 314335N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)													
		Yellowish brown slightly silty fine to medium and coarse SAND. (GLACIAL SAND AND GRAVEL)		0.50 1.00											
		Light yellowish brown slightly silty fine and medium SAND. (GLACIAL SAND AND GRAVEL)		1.50	●	1									
				2.00											
				2.50	●	2									
		End of Trialpit at 2.70 m													
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP279A	
Carried out for Norfolk County Council	Date Started 24/08/2009	Date Finished 24/08/2009	
Dimensions: 0.65 x 1.50	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.55	Height 26.695 mAOD	Logged by MT
	Co-ords 620445E - 314240N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. (Drillers description).													
		Yellow and yellowish brown silty slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded flint.		0.50											
		Soft to firm orangish brown and grey slightly sandy CLAY.		1.00											
				1.50			K								
		End of Trialpit at 1.55 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP279B	
Carried out for Norfolk County Council	Date Started 24/08/2009	Date Finished 24/08/2009	
Dimensions: 0.65 x 1.65	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 26.695 mAOD	Logged by MT
	Co-ords 620445E - 314240N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. (Drillers description).													
		Yellow and yellowish brown silty slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded flint.		0.50											
		Soft to firm orangish brown and grey slightly sandy CLAY.		1.00											
				1.50											
				2.00											
		Yellow very slightly silty fine to coarse SAND.		2.50											
				3.00			K								
		End of Trialpit at 3.00 m													
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP280A	
Carried out for Norfolk County Council	Date Started 21/01/2008	Date Finished 21/01/2008	
Dimensions: 0.45 x 1.30	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.50	Height 29.220 mAOD	Logged by J. Tomalin
	Co-ords 620848E - 314144N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)				1									
		Brown very clayey sandy SILT (COVER SILT)		0.50		2		20							
		Yellowish brown slightly clayey very sandy SILT (COVER SILT)		1.00		3		19							
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP280B	
Carried out for Norfolk County Council	Date Started 23/01/2008	Date Finished 23/01/2008	
Dimensions: 0.45 x 1.50	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 2.80	Height 29.220 mAOD	Logged by J. Tomalin
	Co-ords 620848E - 314144N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)													
		Brown silty slightly clayey fine and medium SAND. (COVER SILT)		0.50											
		...From 0.9mbgl yellowish brown slightly silty fine and medium SAND.		1.00											
		Orangish brown slightly silty gravelly fine and mdium SAND. Gravel is subangular to subrounded fine and medium flint. (GLACIAL SAND AND GRAVEL)		1.50											
					●	1		8							
		Yellowish brown silty fine and medium SAND with some fine, medium and coarse flint gravel. (GLACIAL SAND AND GRAVEL)		2.00											
				2.50											
		End of Trialpit at 2.80 m													
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP281A	
Carried out for Norfolk County Council	Date Started 03/09/2008	Date Finished 03/09/2008	
Dimensions: 0.45 x 1.20	Type of Excavator JCB 3CX		
Remarks:	Depth 1.52	Height 22.188 mAOD	Logged by J. Tomalin
	Co-ords 622223E - 314899N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Dark brownish grey slightly gravelly silty fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)			●	1									
				0.50											
		Brownish grey clayey gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)			●	2									
		Orangish brown slightly silty gravelly to very gravelly medium and coarse SAND. Gravel is subangular to rounded fine and medium flint. (GLACIAL SAND AND GRAVEL)		1.00	●	3									
				1.50											
		End of Trialpit at 1.52 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP281B	
Carried out for Norfolk County Council	Date Started 03/09/2008	Date Finished 03/09/2008	
Dimensions: 1.10 x 1.95	Type of Excavator JCB 3CX		
Remarks:	Depth 2.52	Height 22.188 mAOD	Logged by J. Tomalin
	Co-ords 622223E - 314899N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Dark brownish grey slightly gravelly silty fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)		0.50											
		Brownish grey clayey gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)													
		Orangish brown gravelly slightly silty gravelly medium and coarse SAND. Gravel is angular to subangular fine and medium flint. (GLACIAL SAND AND GRAVEL)		1.00	●	1									
				1.50											
		Yellowish brown gravelly to very gravelly slightly silty fine to coarse SAND. Gravel is subangular to rounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		2.00	●	2									
		End of Trialpit at 2.52 m		2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP282A	
Carried out for Norfolk County Council	Date Started 24/01/2008	Date Finished 24/01/2008	
Dimensions: 0.45 x 1.30	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 1.55	Height 26.466 mAOD	Logged by J. Tomalin
	Co-ords 622613E - 314875N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)													
		Yellowish brown silty gravelly fine, medium and coarse SAND with firm sandy clay bands. (COVER SILT)		0.50	●	1		13							
		Firm mottled orangish brown and light brown sandy CLAY. (CORTON TILL)		1.00	●	2		14							
				1.50	●	3									
		End of Trialpit at 1.55 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP282B	
Carried out for Norfolk County Council	Date Started 24/01/2008	Date Finished 24/01/2008	
Dimensions: 0.45 x 1.60	Type of Excavator JCB 3CX		
Remarks: Dry and stable throughout.	Depth 3.10	Height 26.466 mAOD	Logged by J. Tomalin
	Co-ords 622613E - 314875N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL: Dark brown silty fine and medium SAND. (TOPSOIL)													
		Yellowish brown silty fine and medium SAND with some sandy clay bands. (COVER SILT)		0.50											
		Firm mottled orangish brown and light brown very sandy CLAY with some silty sand bands (CORTON TILL)		1.00											
				1.50	●	1		16							
				2.00											
				2.50											
				3.00											
		End of Trialpit at 3.10 m													
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP283A	
Carried out for Norfolk County Council	Date Started 19/09/2008	Date Finished 19/09/2008	
Dimensions: 0.60 x 1.50	Type of Excavator Hand Tools		
Remarks: Trial pit dry throughout.	Depth 1.50	Height 31.045 mAOD	Logged by P. Lewin
	Co-ords 628071E - 312256N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown and dark brown gravelly very sandy SILT. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)				1									
		Orangish brown slightly silty very gravelly SAND. Gravel is angular to rounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00		2									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP283B	
Carried out for Norfolk County Council	Date Started 19/09/2008	Date Finished 19/09/2008	
Dimensions: 0.30 x 2.40	Type of Excavator Hand Tools		
Remarks: Trial pit dry throughout.	Depth 2.30	Height 31.045 mAOD	Logged by P. Lewin
	Co-ords 628071E - 312256N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown and dark brown gravelly very sandy SILT. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)			●	1									
		Orangish brown slightly silty very gravelly SAND. Gravel is angular to rounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00	●	2									
		. . . From 1.30mbgl occasional flint cobbles.		1.50											
		Orangish brown slightly silty gravelly SAND. Gravel is angular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		2.00											
		End of Trialpit at 2.30 m		2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP284B	
Carried out for Norfolk County Council	Date Started 13/08/2010	Date Finished 13/08/2010	
Dimensions: 0.62 x 1.35	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.10	Height Unknown	Logged by JR
	Co-ords 628879E - 310479N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty fine to medium SAND with much organic material.						8							
		Light brown silty fine to medium SAND.		0.50	●	001									
		Orangish brown clayey fine to medium SAND.		1.00	●	002		11							
		Yellowish brown silty fine to medium SAND with rare fine to coarse flint gravel.		1.50				8							
				2.00	●	003									
				2.50											
		Orangish brown and light brown silty CLAY.		3.00	●	004									
		End of Trialpit at 3.10 m													
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP284A	
Carried out for Norfolk County Council	Date Started 13/08/2010	Date Finished 13/08/2010	
Dimensions: 0.62 x 1.35	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.80	Height Unknown	Logged by JR
	Co-ords 628879E - 310481N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty fine to medium SAND with much organic material.													
		Light brown silty fine to medium SAND.		0.50											
		Orangish brown clayey fine to medium SAND.		1.00											
		Reddish brown and light brown silty sandy CLAY.						14							
				1.50	●	001									
		End of Trialpit at 1.80 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP285A	
Carried out for Norfolk County Council	Date Started 02/09/2008	Date Finished 02/09/2008	
Dimensions: 0.45 x 1.60	Type of Excavator JCB 3CX		
Remarks:	Depth 1.60	Height 24.104 mAOD	Logged by J. Tomalin
	Co-ords 628909E - 309896N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brownish grey clayey slightly gravelly fine and medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)				1									
		Mottled brown and light brownish grey silty fine SAND. (COVER SILT)		0.50		2									
		. . . From 0.80mbgl becoming clayey slightly gravelly fine and medium SAND. Gravel is angular fine to coarse flint.		1.00		3		11							
		Stiff very sandy CLAY with occasional clayey sand bands. (CORTON TILL)		1.50											
		End of Trialpit at 1.60 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP285B	
Carried out for Norfolk County Council	Date Started 02/09/2008	Date Finished 02/09/2008	
Dimensions: 0.00 x 0.00	Type of Excavator JCB 3CX		
Remarks:	Depth 2.70	Height 24.104 mAOD	Logged by JT
	Co-ords 628909E - 309896N		Drawn by ptp
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brownish grey silty slightly gravelly fine and medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)													
		Mottled brown and light brownish grey silty fine SAND. (COVER SILT)		0.50											
		Stiff brown and light brown silty sandy CLAY with occasional clayey sand bands and occasional angular fine to coarse flint. (CORTON TILL)		1.00											
				1.50											
		. . . From 1.80mbgl becoming stiff brown slightly sandy CLAY with occasional silt partings and angular fine to coarse flint.		2.00											
				2.50											
		End of Trialpit at 2.70 m													
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP300A	
Carried out for Norfolk County Council	Date Started 14/04/2010	Date Finished 14/04/2010	
Dimensions: 0.50 x 1.75	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height Unknown	Logged by JR
	Co-ords 617252E - 315783N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown fine to medium SAND with much organic debris.													
		Yellowish brown very silty fine to medium SAND with some medium to coarse flint gravel.		0.50											
		Orangey brown slightly silty fine to coarse SAND and fine to coarse flint gravel.		1.00											
		Yellowish brown slightly silty fine to medium SAND.		1.50											
		End of Trialpit at 1.50 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP300B	
Carried out for Norfolk County Council	Date Started 14/04/2010	Date Finished 14/04/2010	
Dimensions: 0.50 x 1.75	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height Unknown	Logged by JR
	Co-ords 617252E - 315783N		Drawn by MLB
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown fine to medium SAND with much organic debris.													
		Yellowish brown very silty fine to medium SAND with some medium to coarse flint gravel.		0.50		001		13							
		Orangey brown slightly silty fine to coarse SAND and fine to coarse flint gravel.		1.00		002		9							
		Yellowish brown slightly silty fine to medium SAND.		1.50		003		6							
		...at 2.30m rare flint cobble.		2.00											
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP301A	
Carried out for Norfolk County Council	Date Started 15/07/2008	Date Finished 15/07/2008	
Dimensions: 0.45 x 1.70	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 24.288 mAOD	Logged by JT
	Co-ords 625158E - 314345N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Greyish brown silty slightly gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)			●	1									
		Firm to stiff mottled grey and brown sandy CLAY. (CORTON TILL)		0.50				15							
				1.00	●	2									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP301B	
Carried out for Norfolk County Council	Date Started 15/07/2008	Date Finished 15/07/2008	
Dimensions: 0.45 x 2.10	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 24.288 mAOD	Logged by JT
	Co-ords 625158E - 314345N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Greyish brown silty slightly gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)													
		Firm to stiff mottled grey and brown sandy CLAY. (CORTON TILL)		0.50											
				1.00											
		...From 1.20m occasional clayey sand bands.													
				1.50											
		...From 1.80m firm brown with a little grey slightly sandy clay.			●	2		18							
				2.00											
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP303A	
Carried out for Norfolk County Council	Date Started 11/08/2008	Date Finished 11/08/2008	
Dimensions: 0.65 x 1.50	Type of Excavator JCB Type Excavator		
Remarks:	Depth 1.70	Height 20.229 mAOD	Logged by JG
	Co-ords 628773E - 309094N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Dark brown silty sandy CLAY with some roots and fine to medium flint gravel. (TOPSOIL)													
		Soft light brown silty clayey fine to medium SAND with some fine to medium flint gravel. (GLACIAL SAND AND GRAVEL)		0.50											
		Stiff brown, dark brown, orange and grey laminated beds of CLAY with some fine to medium flint gravel. (CORTON TILL)		1.00											
		Yellow, orange and white medium to coarse SAND with some fine to medium flint gravel. (CORTON SAND)		1.50											
		End of Trialpit at 1.70 m													
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP303B	
Carried out for Norfolk County Council	Date Started 11/08/2008	Date Finished 11/08/2008	
Dimensions: 0.74 x 1.75	Type of Excavator JCB Type Excavator		
Remarks:	Depth 2.50	Height 20.229 mAOD	Logged by JG
	Co-ords 628773E - 309094N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Dark brown sandy TOPSOIL with fine to medium flint gravel. Many roots throughout.													
		Light brown and brown fine to medium SAND with some fine to medium flint gravel. (GLACIAL SAND AND GRAVEL)		0.50											
		Yellow medium to coarse SAND with laminated beds of reddish fine to medium sand and some fine to coarse flint gravel. (GLACIAL SAND AND GRAVEL)		1.00		1									
				1.50											
		...from 1.70-2.50m pockets of silty clay.				2									
		...at 1.90m fine to coarse sandy layer.		2.00											
		End of Trialpit at 2.50 m		2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP306A	
Carried out for Norfolk County Council	Date Started 14/07/2008	Date Finished 14/07/2008	
Dimensions: 0.60 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Slight collapse during excavation.	Depth 1.53	Height 38.251 mAOD	Logged by JT
	Co-ords 615925E - 315773N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty slightly gravelly fine and medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)				1									
		Yellow brown slight silty gravelly fine and medium SAND. Gravel is angular to subangular fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50		2									
				1.00											
						3									
		End of Trialpit at 1.53 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP306B	
Carried out for Norfolk County Council	Date Started 14/07/2008	Date Finished 14/07/2008	
Dimensions: 0.70 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Some collapse of pit during excavation.	Depth 2.67	Height 38.251 mAOD	Logged by JT
	Co-ords 615925E - 315773N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty slightly gravelly fine and medium SAND. Gravel is angular fine to coarse flint. (TOPSOIL)													
		Yellow brown slightly silty slightly gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse flint. (GLACIAL SAND AND GRAVEL)		0.50											
				1.00											
		...from 1.40m occasional gravel.		1.50											
					●	001									
				2.00											
				2.50											
		End of Trialpit at 2.67 m													
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP316A	
Carried out for Norfolk County Council	Date Started 04/09/2008	Date Finished 04/09/2008	
Dimensions: 0.45 x 1.40	Type of Excavator JCB 3CX		
Remarks:	Depth 1.50	Height 26.540 mAOD	Logged by J. Tomalin
	Co-ords 622929E - 314564N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Dark brownish grey slightly gravelly silty fine and medium SAND. Gravel is subangular to subrounded fine to coarse flint. (TOPSOIL)				1									
		Brown and dark brown silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse flint. (COVER SILT)		0.50		2									
		Stiff orange brown and light grey sandy CLAY. Occasional angular fine to coarse flint. Occasional silty fine sand bands. (CORTON TILL)		1.00		3		13							
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP316B	
Carried out for Norfolk County Council	Date Started 04/09/2008	Date Finished 04/09/2008	
Dimensions: 0.45 x 2.00	Type of Excavator JCB 3CX		
Remarks:	Depth 3.00	Height 26.540 mAOD	Logged by J. Tomalin
	Co-ords 622929E - 314564N		Drawn by 130
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Dark brownish grey slightly gravelly silty fine and medium SAND. Gravel is subangular to subrounded fine to coarse flint. (TOPSOIL)													
		Brown and dark brown silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse flint. (COVER SILT)		0.50											
		Stiff orange brown and light grey sandy CLAY. Occasional angular fine to coarse flint. Occasional silty fine sand bands. (CORTON TILL)		1.00 1.50											
		Yellowish brown slightly silty SAND. (CRAG_SAND)		2.00 2.50		1									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP356A	
Carried out for Norfolk County Council	Date Started 31/07/2009	Date Finished 31/07/2009	
Dimensions: 0.60 x 1.80	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 28.988 mAOD	Logged by MT
	Co-ords 619030E - 314428N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Yellowish brown slightly gravelly silty fine to medium SAND. Gravel is fine to medium subangular to subrounded flint. (COVER SILT)		0.50	●	001		8							
		Yellow and brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. Occasional clay lenses throughout. (GLACIAL SAND AND GRAVEL)		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP356B	
Carried out for Norfolk County Council	Date Started 31/07/2009	Date Finished 31/07/2009	
Dimensions: 0.60 x 1.80	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 28.988 mAOD	Logged by MT
	Co-ords 619030E - 314428N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Yellowish brown slightly gravelly silty fine to medium SAND. Gravel is fine to medium subangular to subrounded flint. (COVER SILT)		0.50				4						71.0	
		Yellow and brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. Occasional clay lenses throughout. (GLACIAL SAND AND GRAVEL)		1.00											
				1.50	●	002									
				2.00											
				2.50				13							
		Brown and orangish brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. (GLACIAL SAND AND GRAVEL)			●	003									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP357A	
Carried out for Norfolk County Council	Date Started 24/08/2009	Date Finished 24/08/2009	
Dimensions: 0.65 x 1.50	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height Unknown	Logged by MT
	Co-ords 619539E - 315242N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. (Drillers description)													
		Yellowish brown and brown silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to angular flint.		0.50											
		Yellow, orange and orangish brown silty fine to coarse SAND. Occasional clay lenses throughout.		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP357B	
Carried out for Norfolk County Council	Date Started 24/08/2009	Date Finished 24/08/2009	
Dimensions: 0.65 x 1.50	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 2.90	Height Unknown	Logged by MT
	Co-ords 619539E - 315242N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. (Drillers description)													
		Yellowish brown and brown silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to angular flint.		0.50											
		Yellowish brown and brown silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to angular flint.		1.00											
				1.50											
				2.00											
				2.50											
		End of Trialpit at 2.90 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP358A	
Carried out for Norfolk County Council	Date Started 30/07/2008	Date Finished 30/07/2008	
Dimensions: 0.60 x 1.50	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 26.750 mAOD	Logged by MT
	Co-ords 629237E - 308843N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Brown and orangish brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse subangular to subrounded flint. (CORTON SAND)		0.50 1.00											
		Yellow and orange slightly clayey fine to coarse SAND. (CORTON SAND)		1.50											
		End of Trialpit at 1.50 m		2.00 2.50 3.00 3.50 4.00 4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP358B	
Carried out for Norfolk County Council	Date Started 30/07/2008	Date Finished 30/07/2008	
Dimensions: 0.60 x 2.30	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 26.750 mAOD	Logged by MT
	Co-ords 629234E - 308845N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Brown and orangish brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse subangular to subrounded flint. (CORTON SAND)		0.50				10							
				1.00	●	001									
		Yellow and orange slightly clayey fine to coarse SAND. (CORTON SAND)		1.50				13						3.1	
				2.00	●	002									
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP359B	
Carried out for Norfolk County Council	Date Started 24/07/2009	Date Finished 24/07/2009	
Dimensions: 0.70 x 1.50	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 20.150 mAOD	Logged by MT
	Co-ords 629040E - 308601N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Brown and light brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint.				001									
		Light brown and reddish brown slightly gravelly slightly sandy SILT. Gravel is fine to coarse subrounded to angular flint. (COVER SILT)		0.50		002		5							
		Yellow and reddish brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse rounded to subangular flint. (CRAG_SAND)		1.00		003		3							
				1.50											
				2.00											
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP359A	
Carried out for Norfolk County Council	Date Started 24/07/2009	Date Finished 24/07/2009	
Dimensions: 0.70 x 1.50	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 20.150 mAOD	Logged by MT
	Co-ords 629034E - 308600N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown and brown slightly sandy slightly gravelly SILT/CLAY. Gravel is fine to coarse angular to subrounded flint.													
		Yellowish brown and light brown slightly gravelly sandy SILT. Gravel is fine to coarse angular to subrounded flint. (COVER SILT)		0.50											
		Yellow and yellowish brown slightly gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to rounded flint. (CRAG_SAND)		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP360A	
Carried out for Norfolk County Council	Date Started 22/07/2009	Date Finished 22/07/2009	
Dimensions: 0.70 x 0.90	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 15.000 mAOD	Logged by MT
	Co-ords 629032E - 308482N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Yellowish brown and brown very slightly gravelly silty fine to medium SAND. Gravel is fine to medium subangular to subrounded flint. (GLACIAL SAND AND GRAVEL)		0.50				6							
				1.00	●	001									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP360B	
Carried out for Norfolk County Council	Date Started 21/07/2009	Date Finished 21/07/2009	
Dimensions: 0.70 x 1.20	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 15.000 mAOD	Logged by MT
	Co-ords 629025E - 308486N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Soft to firm orangish brown and grey very slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded flint. (LOWESTOFT TILL)		0.50 1.00 1.50											
		Soft to firm orangish brown and grey sandy very slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded flint. (LOWESTOFT TILL)		2.00	●	002		21							
		Firm yellowish brown and grey gravelly slightly sandy CLAY. Gravel is fine to coarse rounded to subangular flint and chalk. (LOWESTOFT TILL)		2.50	●	003		16							
		End of Trialpit at 3.00 m		3.00 3.50 4.00 4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP361A	
Carried out for Norfolk County Council	Date Started 23/07/2009	Date Finished 23/07/2009	
Dimensions: 0.70 x 1.10	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 13.500 mAOD	Logged by MT
	Co-ords 628896E - 308463N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL		0.50											
		Stiff to very stiff light grey and grey fissured CLAY. (LOWESTOFT TILL)		1.00	●	001		14							
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP361B	
Carried out for Norfolk County Council	Date Started 23/07/2009	Date Finished 23/07/2009	
Dimensions: 0.70 x 1.00	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 13.500 mAOD	Logged by MT
	Co-ords 628882E - 308466N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Firm to stiff orangish brown and brown slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded chalk. (LOWESTOFT TILL)		0.50		001		17							
				1.00				15							
		Stiff to very stiff mottled light grey and orangish brown fissured slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded chalk. Sand partings throughout. (LOWESTOFT TILL)		1.50											
				2.00		002									
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP362A	
Carried out for Norfolk County Council	Date Started 23/07/2009	Date Finished 23/07/2009	
Dimensions: 0.70 x 1.10	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 11.669 mAOD	Logged by MT
	Co-ords 628979E - 308416N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Light brown slightly gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint. (GLACIAL SAND AND GRAVEL)		0.50				5							
				1.00	↑ ● ↓	001									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP362B
Carried out for Norfolk County Council	Date Started 23/07/2009	Date Finished	23/07/2009
Dimensions: 0.70 x 1.30	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.10	Height 11.669 mAOD	Logged by MT
	Co-ords 628975E - 308420N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL													
		Light brown slightly gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint. (GLACIAL SAND AND GRAVEL)		0.50											
		Soft to firm grey, brown and orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse rounded to subangular flint and chalk. (LOWESTOFT TILL)		1.00	●	001		10							
		Yellow fine to coarse SAND. Occasional clay lenses throughout. (CRAG_SAND)		1.50				5							
				2.00	●	002									
				2.50											
				3.00											
		End of Trialpit at 3.10 m													
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP363A	
Carried out for Norfolk County Council	Date Started 28/07/2009	Date Finished 28/07/2009	
Dimensions: 0.60 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height 17.457 mAOD	Logged by MT
	Co-ords 629442E - 308561N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL		0.50											
		Orangish brown slightly gravelly silty fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. (CRAG_SAND)		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP363B	
Carried out for Norfolk County Council	Date Started 28/07/2009	Date Finished 28/07/2009	
Dimensions: 0.60 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.00	Height 17.457 mAOD	Logged by MT
	Co-ords 629444E - 308553N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL		0.50				10							
		Orangish brown slightly gravelly silty fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. (CRAG_SAND)		1.00											
					●	001									
				1.50											
				2.00				13							
		Orangish brown and reddish brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. (CRAG_SAND)													
				2.50	●	002									
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP366B	
Carried out for Norfolk County Council	Date Started 16/04/2010	Date Finished 16/04/2010	
Dimensions: -	Type of Excavator		
Remarks:	Depth 3.00	Height Unknown	Logged by
	Co-ords UNKNOWN		Drawn by MLB
			Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		End of Trialpit at 3.00 m													
				0.50	●	001		15							
				1.00											
				1.50	●	002		21							
				2.00	●	003		5							
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP366A	
Carried out for Norfolk County Council	Date Started 16/04/2010	Date Finished 16/04/2010	
Dimensions: -	Type of Excavator		
Remarks:	Depth 1.50	Height Unknown	Logged by
			Drawn by GJW
	Co-ords UNKNOWN		Checked by

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		End of Trialpit at 1.50 m													
				0.50											
				1.00											
				1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP374B	
Carried out for Norfolk County Council	Date Started 22/04/2010	Date Finished 22/04/2010	
Dimensions: 0.45 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Dry with sides collapsing from 1.10m. Hole aborted at 2.90m.	Depth 2.90	Height Unknown	Logged by MT
	Co-ords 624110E - 314134N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown slightly gravelly sandy SILT. Gravel is fine to coarse subangular to subrounded flint. Frequent roots throughout.		0.50											
		Reddish brown slightly silty slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint.		1.00	●	001		6							
				1.50	●	002									
				2.00											
				2.50	●	003		5							
		End of Trialpit at 2.90 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP374A	
Carried out for Norfolk County Council	Date Started 22/04/2010	Date Finished 22/04/2010	
Dimensions: 0.45 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Dry with sides collapsing from 1.10m. Hole aborted at 2.90m.	Depth 1.50	Height Unknown	Logged by MT
	Co-ords 624110E - 314134N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint.		0.50											
		Reddish brown slightly silty slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint.		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP375B	
Carried out for Norfolk County Council	Date Started 23/04/2010	Date Finished 23/04/2010	
Dimensions: 0.45 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 2.90	Height Unknown	Logged by JR
	Co-ords 625197E - 314578N		Drawn by MLB
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty fine to coarse SAND with some organic debris.													
		Brown slightly clayey silty fine to medium SAND with rare fine to medium flint gravel.		0.50		001		12							
		Yellowish brown silty fine to coarse SAND.				002		11							
		Mottled light blueish grey and orangish brown sandy CLAY with some fine to coarse flint gravel.		1.00		003		19							
				1.50											
		Light brown, yellowish brown, orangey brown and reddish brown slightly silty fine to coarse SAND.		2.00		004		9							
				2.50											
		End of Trialpit at 2.90 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP375A	
Carried out for Norfolk County Council	Date Started 23/04/2010	Date Finished 23/04/2010	
Dimensions: 0.45 x 2.00	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height Unknown	Logged by JR
	Co-ords 625197E - 314578N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Dark brown silty fine to coarse SAND with some organic debris.													
		Brown slightly clayey silty fine to medium SAND with rare fine to medium flint gravel.		0.50											
		Yellowish brown silty fine to coarse SAND.		1.00											
		Mottled light blueish grey and orangish brown sandy CLAY with some fine to coarse flint gravel.													
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP376B	
Carried out for Norfolk County Council	Date Started 12/08/2010	Date Finished 12/08/2010	
Dimensions: 0.62 x 1.20	Type of Excavator JCB Type Excavator		
Remarks:	Depth 3.00	Height Unknown	Logged by JR
	Co-ords 627429E - 313765N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Light brown silty fine to medium SAND with much organic material.													
		Light brown slightly silty fine to medium SAND with rare fine to medium flint gravel.		0.50		001		12							
		Mottled orangish brown and light brown silty CLAY.		1.00		002		20							
		Mottled orangish brown and light brown very sandy silty CLAY.		1.50		003									
		Brown slightly silty fine to coarse SAND with some fine flint gravel.		2.00		004		13							
		Orange slightly silty fine to coarse SAND with much fine to medium flint gravel.		2.50		005									
	▼	End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP376A	
Carried out for Norfolk County Council	Date Started 12/08/2010	Date Finished 12/08/2010	
Dimensions: 0.62 x 1.20	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.50	Height Unknown	Logged by JR
	Co-ords 627431E - 313767N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. Light brown silty fine to medium SAND with much organic material.													
		Light brown slightly silty fine to medium SAND with rare fine to medium flint gravel.		0.50											
		Mottled orangish brown and light brown silty CLAY.		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP377A	
Carried out for Norfolk County Council	Date Started 09/08/2010	Date Finished 09/08/2010	
Dimensions: -	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 1.80	Height Unknown	Logged by JR
	Co-ords 628256E - 312259N		Drawn by MLB
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. dark brown silty fine to medium SAND with much organic material.													
		Light brown slightly silty fine to medium SAND.													
		Orangish brown slightly silty fine to medium SAND.		0.50	●	001									
				1.00	●	002									
		Firm orangish brown and light brown very sandy silty CLAY.		1.50											
		End of Trialpit at 1.80 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No.	TP377B
Carried out for Norfolk County Council	Date Started 09/08/2010	Date Finished	09/08/2010
Dimensions: -	Type of Excavator JCB Type Excavator		
Remarks: Dry and stable throughout.	Depth 3.25	Height Unknown	Logged by JR
	Co-ords 628258E - 312257N		Drawn by 130
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		TOPSOIL. dark brown silty fine to medium SAND with much organic material.													
		Light brown slightly silty fine to medium SAND.				001									
		Orangish brown slightly silty fine to medium SAND.		0.50		002		8							
				1.00				13							
		Firm orangish brown and light brown very sandy silty CLAY.		1.50		003									
				2.00				6							
		Yellowish brown slightly silty fine to coarse SAND and fine to medium flint GRAVEL.		2.50		004									
		Soft to firm orangey brown silty sandy CLAY.		3.00		005		19							
		End of Trialpit at 3.25 m													
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP378A	
Carried out for Norfolk County Council	Date Started 12/04/2010	Date Finished 12/04/2010	
Dimensions: 0.44 x 1.52	Type of Excavator JCB Type Excavtor		
Remarks: Dry and stable throughout.	Depth 1.50	Height Unknown	Logged by JR
	Co-ords 629150E - 309310N		Drawn by ptp
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Light brown silty sandy CLAY with some medium to coarse flint gravel. Frequent organic debris throughout. (TOPSOIL)													
		Orangish brown very sandy CLAY.		0.50											
		Orangey brown very sandy CLAY.		1.00											
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP378B	
Carried out for Norfolk County Council	Date Started 12/04/2010	Date Finished 12/04/2010	
Dimensions: 0.44 x 2.10	Type of Excavator JCB Type Excavtor		
Remarks: Dry and stable throughout.	Depth 3.00	Height Unknown	Logged by JR
	Co-ords 629150E - 309310N		Drawn by MLB
			Checked by MB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Light brown silty sandy CLAY with some medium to coarse flint gravel. Frequent organic debris throughout. (TOPSOIL)				001									
		Orangish brown very sandy CLAY.													
		Orangey brown very sandy CLAY.		0.50		002		11							
				1.00											
				1.50											
				2.00		003		13							
		Orangey brown slightly sandy CLAY with occasional flint gravel.													
				2.50		004		17							
		Light brown very sandy CLAY with occasional fine to medium gravel.													
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

FIG

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP379A	
Carried out for Norfolk County Council	Date Started 09/08/2013	Date Finished 09/08/2013	
Dimensions: 0.50 x 2.10	Type of Excavator JCB		
Remarks: Dry	Depth 1.50	Height Unknown	Logged by SPB
	Co-ords 623018E - 314231N		Drawn by MLB
			Checked by MLB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty TOPSOIL			●	001									
		Orangey brown sandy SILT		0.50	●	002									
		Firm orangey brown very silty very sandy CLAY.		1.00	●	003									
		End of Trialpit at 1.50 m		1.50											
				2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP379B	
Carried out for Norfolk County Council	Date Started 09/08/2013	Date Finished 09/08/2013	
Dimensions: 0.50 x 2.10	Type of Excavator JCB		
Remarks: Dry	Depth 3.00	Height Unknown	Logged by SPB
	Co-ords 623018E - 314227N		Drawn by MLB
			Checked by MLB

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty TOPSOIL			●	001									
		Orangey brown very sandy slightly gravelly SILT. Gravel is fine angular flint.		0.50	●	002									
		Orangey brown silty very sandy CLAY with laminae of light greyish brown silty fine sand.		1.00	●	003									
		Silty sandy gravelly CLAY		1.50	●	004									
		End of Trialpit at 3.00 m		2.00											
				2.50											
				3.00											
				3.50											
				4.00											
				4.50											

FIG 379B

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP392A	
Carried out for Norfolk County Council	Date Started 12/09/2013	Date Finished 12/09/2013	
Dimensions: 0.50 x 1.20	Type of Excavator JCB		
Remarks: Dry and stable k = 2.6 x 10-6 m/sec	Depth 1.50	Height Unknown	Logged by SPB Drawn by SPB Checked by MLB
	Co-ords 628894E - 310437N		

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty TOPSOIL.			●	001									
		Orangey brown very clayey silty gravelly fine medium SAND. Gravel is fine medium rounded flint. Lenses of light grey very sandy silty clay.		0.50	●	002	K								
		End of Trialpit at 1.50 m		1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50											

FIG 392A

NORFOLK PARTNERSHIP LABORATORY

TRIAL PIT LOG

Sheet 1 of 1

Scheme Norwich Northern Distributor Road	Job No. PTPK1000ii	Trialpit No. TP392B	
Carried out for Norfolk County Council	Date Started 12/09/2013	Date Finished 12/09/2013	
Dimensions: 0.50 x 3.00	Type of Excavator JCB		
Remarks: Dry and stable k = 5.1 x 10-7 m/sec	Depth 3.00	Height Unknown	Logged by SPB Drawn by MLB Checked by MLB
	Co-ords 628894E - 310435N		

Backfill	Water	Description	Legend	Depth (m)	Sample Type	Sample No.	Field Tests	MC%	ρ_s	SO_3	Cl-	pH	Org.	CBR	Other
		Brown silty TOPSOIL.			●	001									
		Orangey brown clayey silty gravelly fine medium SAND. Gravel is medium to coarse rounded flint.		0.50	●	002									
				1.00											
		Firm to stiff mottled light grey, brown and orangey brown silty very sandy slightly gravelly CLAY. Gravel is fine medium subangular flint.		1.50											
				2.00	●	003									
				2.50											
		End of Trialpit at 3.00 m		3.00											
				3.50											
				4.00											
				4.50											

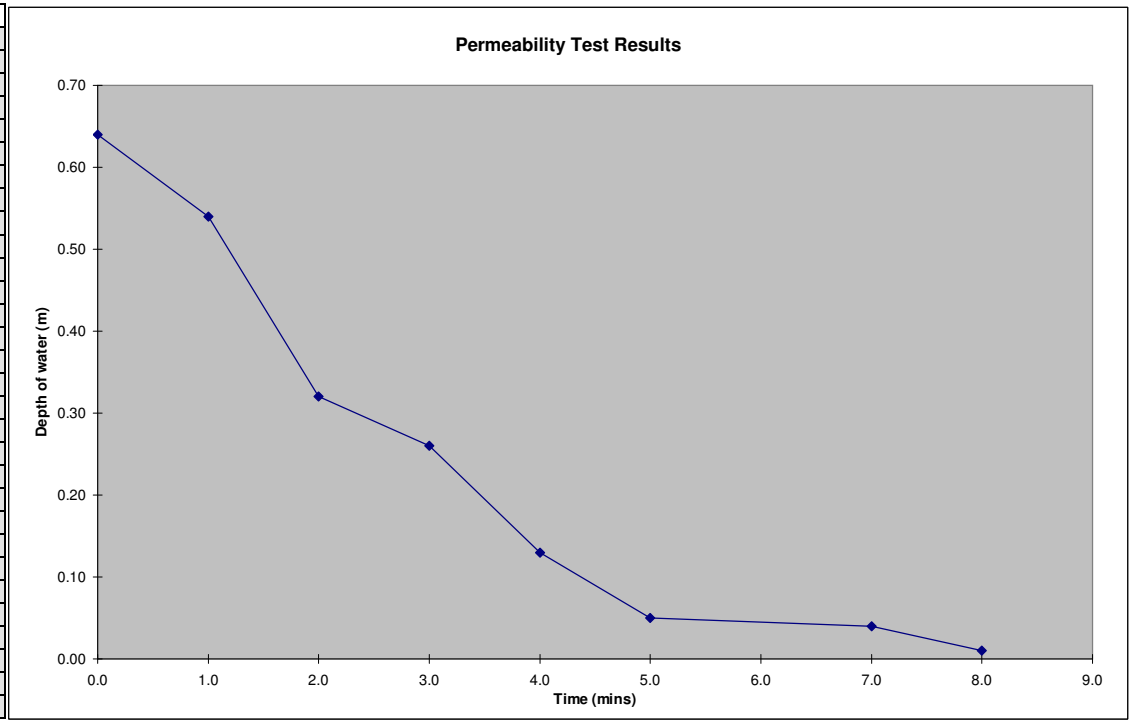
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	235A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.48
No of runs	3
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4800	0.3200	0.1600
Time (mins)	1	2	4

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.64	0.96	1.260
1.0	0.54	1.06	1.360
2.0	0.32	1.28	1.580
3.0	0.26	1.34	1.640
4.0	0.13	1.47	1.770
5.0	0.05	1.55	1.850
7.0	0.04	1.56	1.860
8.0	0.01	1.59	1.890



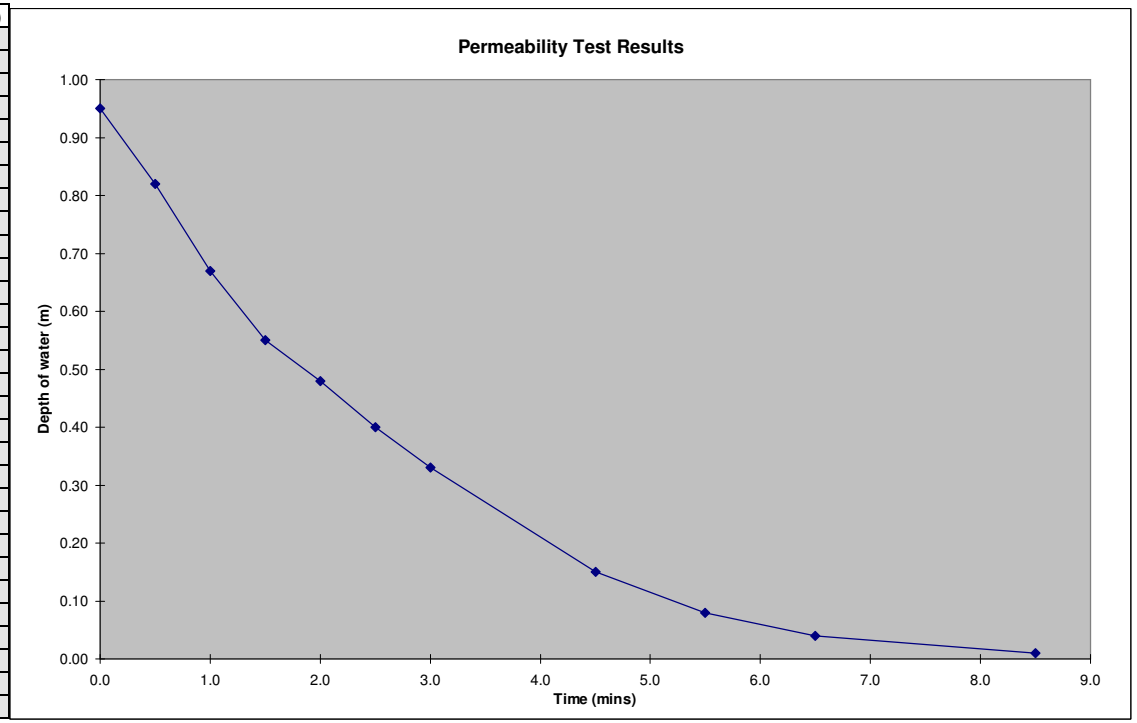
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	235A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.48
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7125	0.4750	0.2375
Time (mins)	1	2	4

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.95	0.65	0.950
0.5	0.82	0.78	1.080
1.0	0.67	0.93	1.230
1.5	0.55	1.05	1.350
2.0	0.48	1.12	1.420
2.5	0.40	1.20	1.500
3.0	0.33	1.27	1.570
4.5	0.15	1.45	1.750
5.5	0.08	1.52	1.820
6.5	0.04	1.56	1.860
8.5	0.01	1.59	1.890



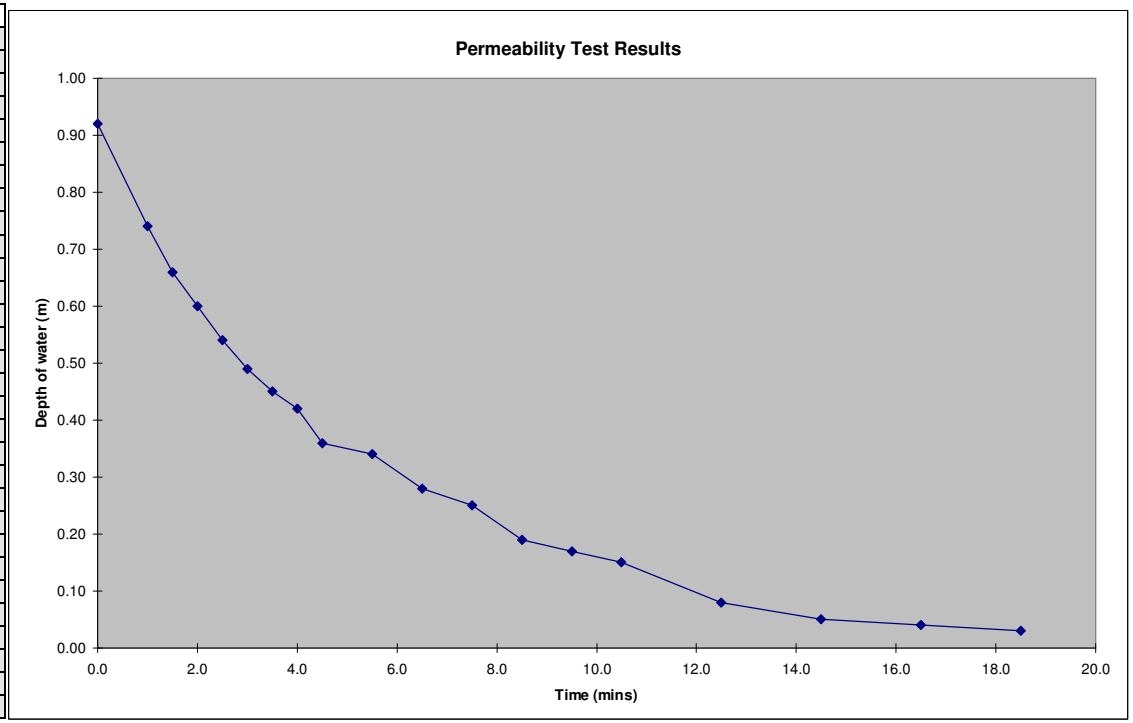
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	235A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.48
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6900	0.4600	0.2300
Time (mins)	1	3	8

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.92	0.68	0.980
1.0	0.74	0.86	1.160
1.5	0.66	0.94	1.240
2.0	0.60	1.00	1.300
2.5	0.54	1.06	1.360
3.0	0.49	1.11	1.410
3.5	0.45	1.15	1.450
4.0	0.42	1.18	1.480
4.5	0.36	1.24	1.540
5.5	0.34	1.26	1.560
6.5	0.28	1.32	1.620
7.5	0.25	1.35	1.650
8.5	0.19	1.41	1.710
9.5	0.17	1.43	1.730
10.5	0.15	1.45	1.750
12.5	0.08	1.52	1.820
14.5	0.05	1.55	1.850
16.5	0.04	1.56	1.860
18.5	0.03	1.57	1.870



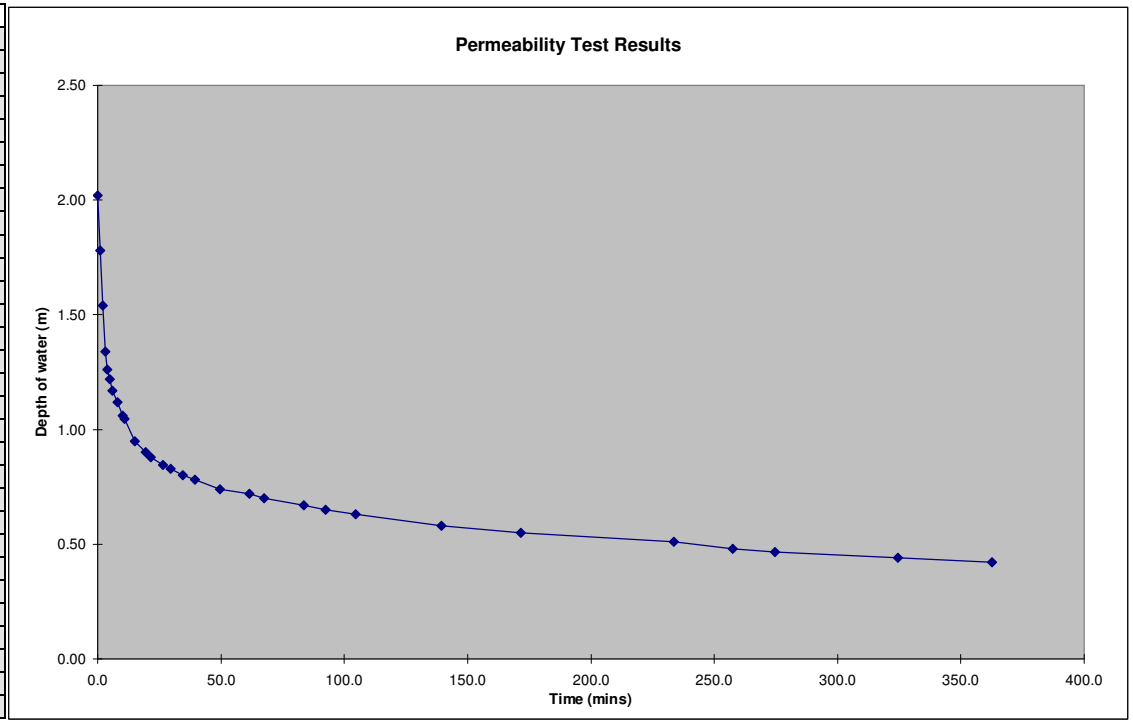
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	235B
Depth of Trial Pit (m)=	3.05
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.60
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5150	1.0100	0.5050
Time (mins)	2	12	238

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.02	1.03	1.030
1.0	1.78	1.27	1.270
2.0	1.54	1.51	1.510
3.0	1.34	1.71	1.710
4.0	1.26	1.79	1.790
5.0	1.22	1.83	1.830
6.0	1.17	1.88	1.880
8.0	1.12	1.93	1.930
10.0	1.06	1.99	1.990
11.0	1.05	2.01	2.005
15.0	0.95	2.10	2.100
19.5	0.90	2.15	2.150
21.5	0.88	2.17	2.170
26.5	0.85	2.21	2.205
29.5	0.83	2.22	2.220
34.5	0.80	2.25	2.250
39.5	0.78	2.27	2.270
49.5	0.74	2.31	2.310
61.5	0.72	2.33	2.330
67.5	0.70	2.35	2.350
83.5	0.67	2.38	2.380
92.5	0.65	2.40	2.400
104.5	0.63	2.42	2.420
139.5	0.58	2.47	2.470
171.5	0.55	2.50	2.500
233.5	0.51	2.54	2.540
257.5	0.48	2.57	2.570
274.5	0.47	2.59	2.585
324.5	0.44	2.61	2.610
362.5	0.42	2.63	2.630



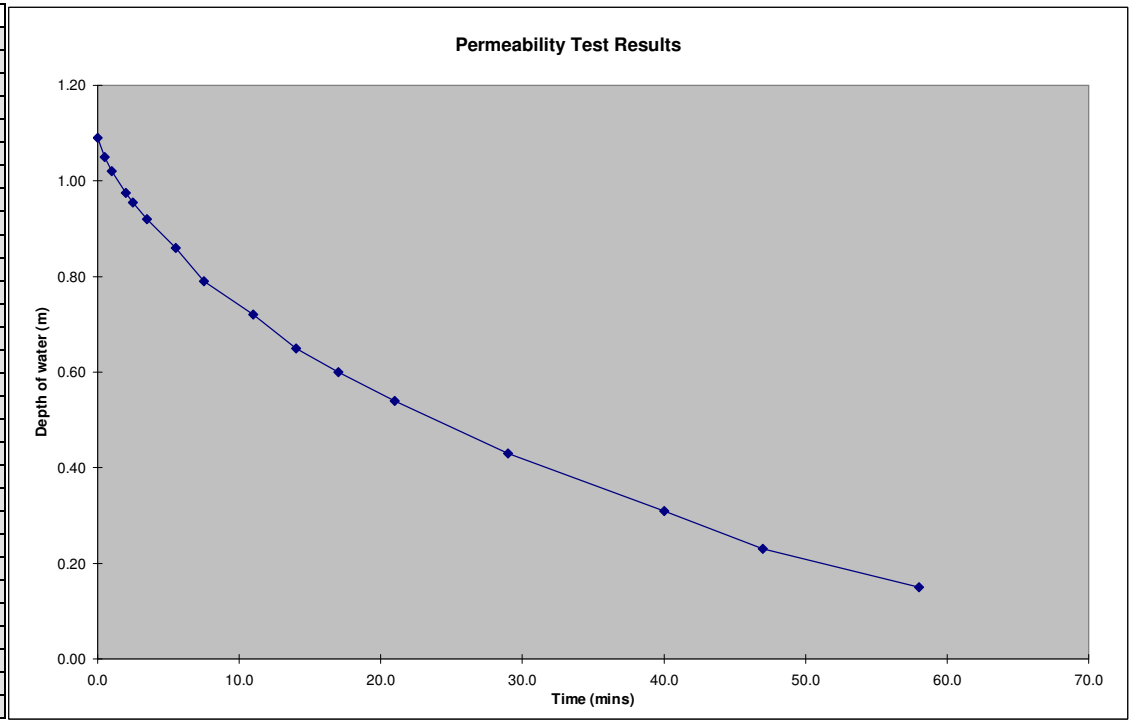
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	236A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.45
No of runs	2
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8175	0.5450	0.2725
Time (mins)	7	21	43

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.09	0.46	0.760
0.5	1.05	0.50	0.800
1.0	1.02	0.53	0.830
2.0	0.98	0.58	0.875
2.5	0.96	0.60	0.895
3.5	0.92	0.63	0.930
5.5	0.86	0.69	0.990
7.5	0.79	0.76	1.060
11.0	0.72	0.83	1.130
14.0	0.65	0.90	1.200
17.0	0.60	0.95	1.250
21.0	0.54	1.01	1.310
29.0	0.43	1.12	1.420
40.0	0.31	1.24	1.540
47.0	0.23	1.32	1.620
58.0	0.15	1.40	1.700



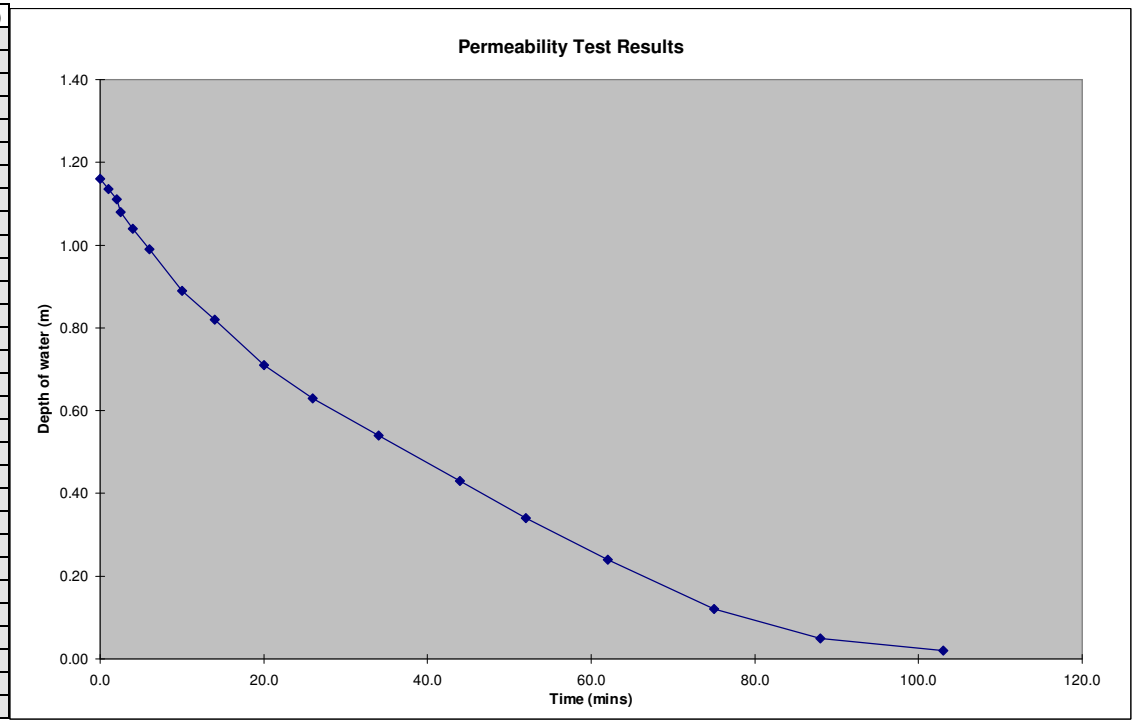
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	236A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.45
No of runs	2.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8700	0.5800	0.2900
Time (mins)	11	30	57

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.16	0.39	0.690
1.0	1.14	0.42	0.715
2.0	1.11	0.44	0.740
2.5	1.08	0.47	0.770
4.0	1.04	0.51	0.810
6.0	0.99	0.56	0.860
10.0	0.89	0.66	0.960
14.0	0.82	0.73	1.030
20.0	0.71	0.84	1.140
26.0	0.63	0.92	1.220
34.0	0.54	1.01	1.310
44.0	0.43	1.12	1.420
52.0	0.34	1.21	1.510
62.0	0.24	1.31	1.610
75.0	0.12	1.43	1.730
88.0	0.05	1.50	1.800
103.0	0.02	1.53	1.830



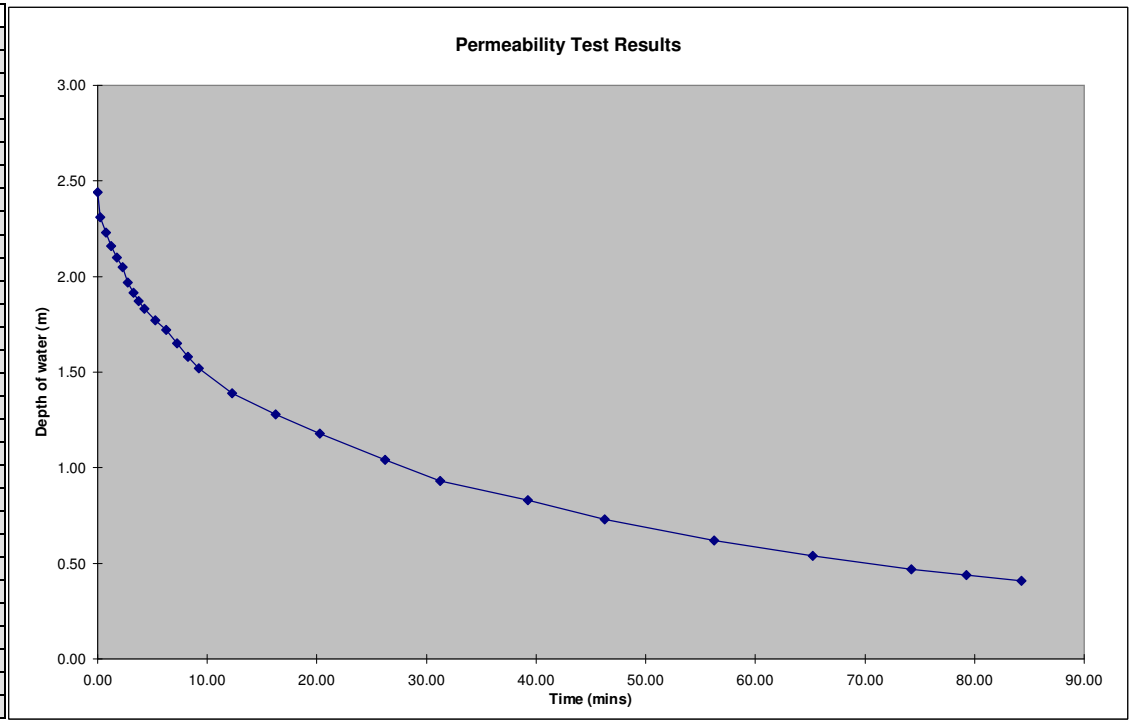
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	236B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.60
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8300	1.2200	0.6100
Time (mins)	4	19	57

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.44	0.56	0.560
0.25	2.31	0.69	0.690
0.75	2.23	0.77	0.770
1.25	2.16	0.84	0.840
1.75	2.10	0.90	0.900
2.25	2.05	0.95	0.950
2.75	1.97	1.03	1.030
3.25	1.92	1.09	1.085
3.75	1.87	1.13	1.130
4.25	1.83	1.17	1.170
5.25	1.77	1.23	1.230
6.25	1.72	1.28	1.280
7.25	1.65	1.35	1.350
8.25	1.58	1.42	1.420
9.25	1.52	1.48	1.480
12.25	1.39	1.61	1.610
16.25	1.28	1.72	1.720
20.25	1.18	1.82	1.820
26.25	1.04	1.96	1.960
31.25	0.93	2.07	2.070
39.25	0.83	2.17	2.170
46.25	0.73	2.27	2.270
56.25	0.62	2.38	2.380
65.25	0.54	2.46	2.460
74.25	0.47	2.53	2.530
79.25	0.44	2.56	2.560
84.25	0.41	2.59	2.590



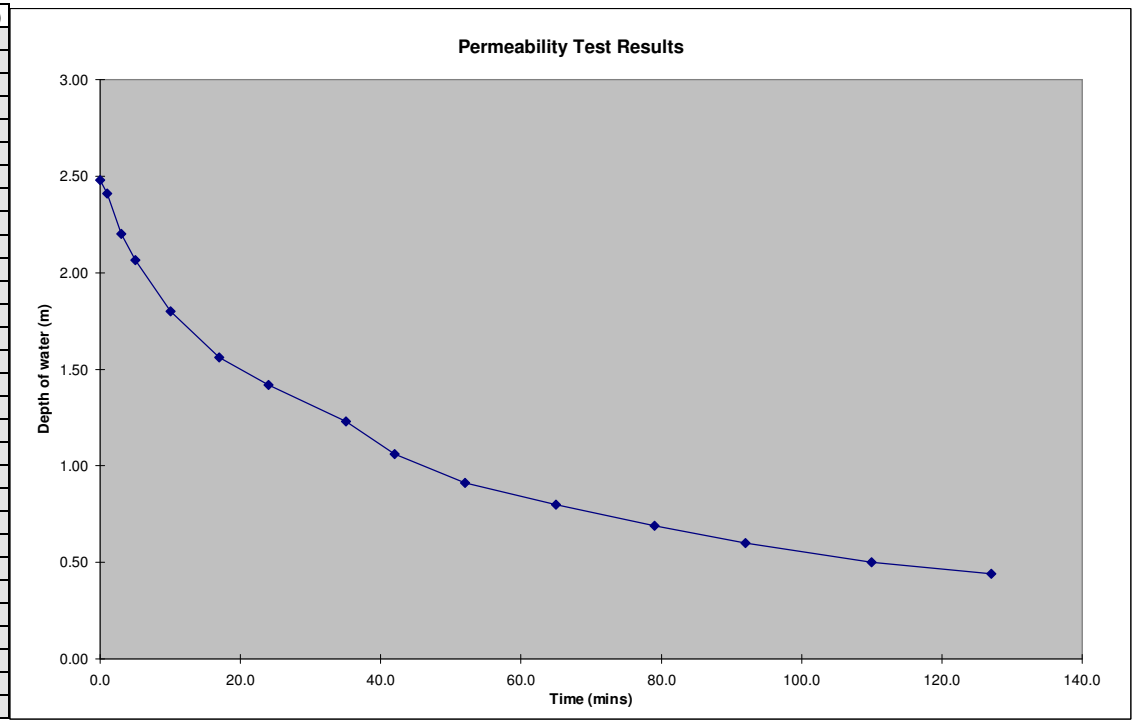
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	236B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.60
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8600	1.2400	0.6200
Time (mins)	9	34	89

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.48	0.52	0.520
1.0	2.41	0.59	0.590
3.0	2.20	0.80	0.800
5.0	2.07	0.94	0.935
10.0	1.80	1.20	1.200
17.0	1.56	1.44	1.440
24.0	1.42	1.58	1.580
35.0	1.23	1.77	1.770
42.0	1.06	1.94	1.940
52.0	0.91	2.09	2.090
65.0	0.80	2.20	2.200
79.0	0.69	2.31	2.310
92.0	0.60	2.40	2.400
110.0	0.50	2.50	2.500
127.0	0.44	2.56	2.560



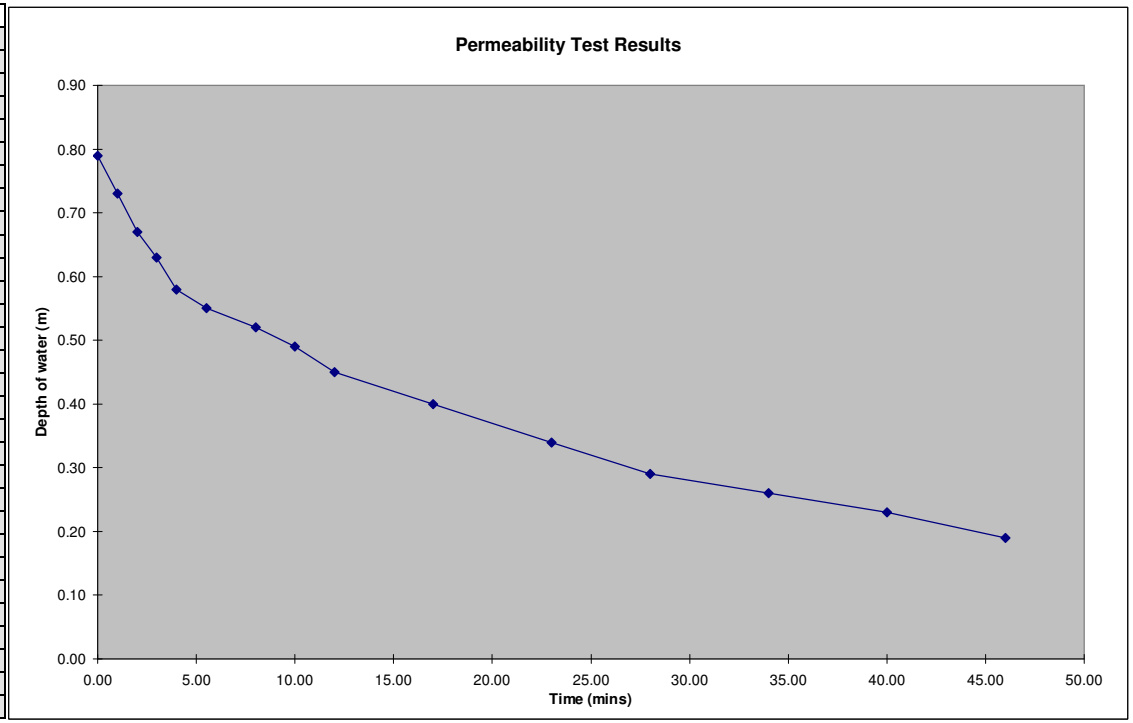
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	237A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.45
No of runs	2
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5925	0.3950	0.1975
Time (mins)	4	18	45

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.79	0.71	1.110
1.00	0.73	0.77	1.170
2.00	0.67	0.83	1.230
3.00	0.63	0.87	1.270
4.00	0.58	0.92	1.320
5.50	0.55	0.95	1.350
8.00	0.52	0.98	1.380
10.00	0.49	1.01	1.410
12.00	0.45	1.05	1.450
17.00	0.40	1.10	1.500
23.00	0.34	1.16	1.560
28.00	0.29	1.21	1.610
34.00	0.26	1.24	1.640
40.00	0.23	1.27	1.670
46.00	0.19	1.31	1.710



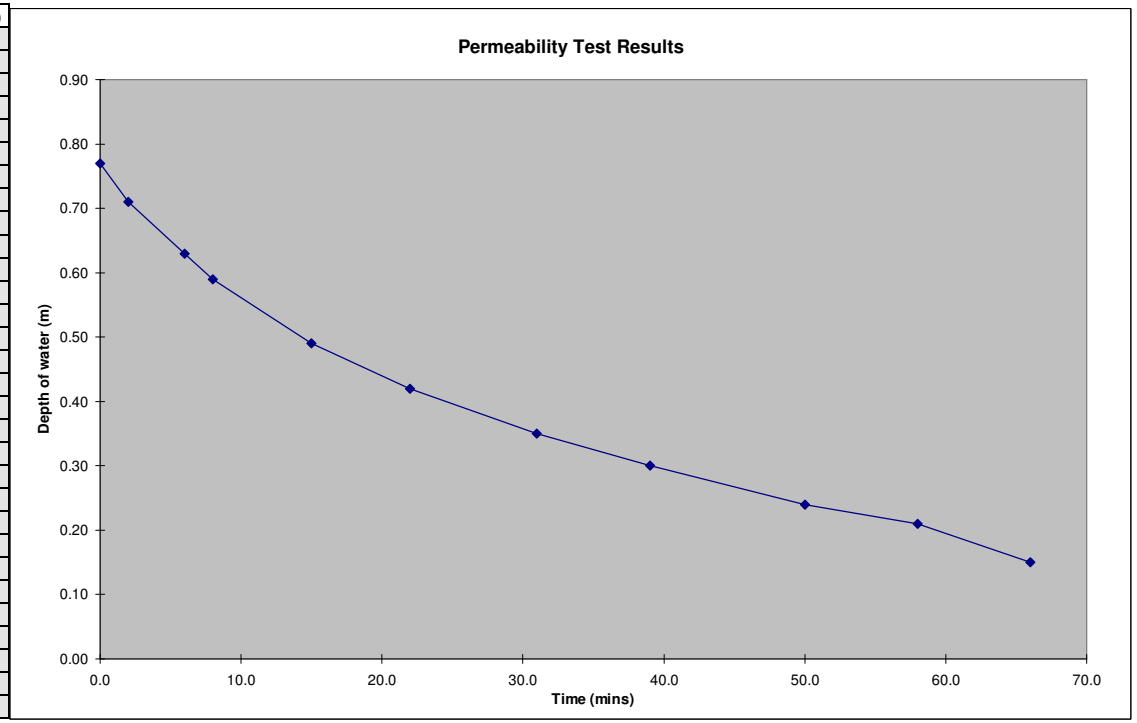
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	237A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.45
No of runs	2.00
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5775	0.3850	0.1925
Time (mins)	9	27	60

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.77	0.73	1.130
2.0	0.71	0.79	1.190
6.0	0.63	0.87	1.270
8.0	0.59	0.91	1.310
15.0	0.49	1.01	1.410
22.0	0.42	1.08	1.480
31.0	0.35	1.15	1.550
39.0	0.30	1.20	1.600
50.0	0.24	1.26	1.660
58.0	0.21	1.29	1.690
66.0	0.15	1.35	1.750



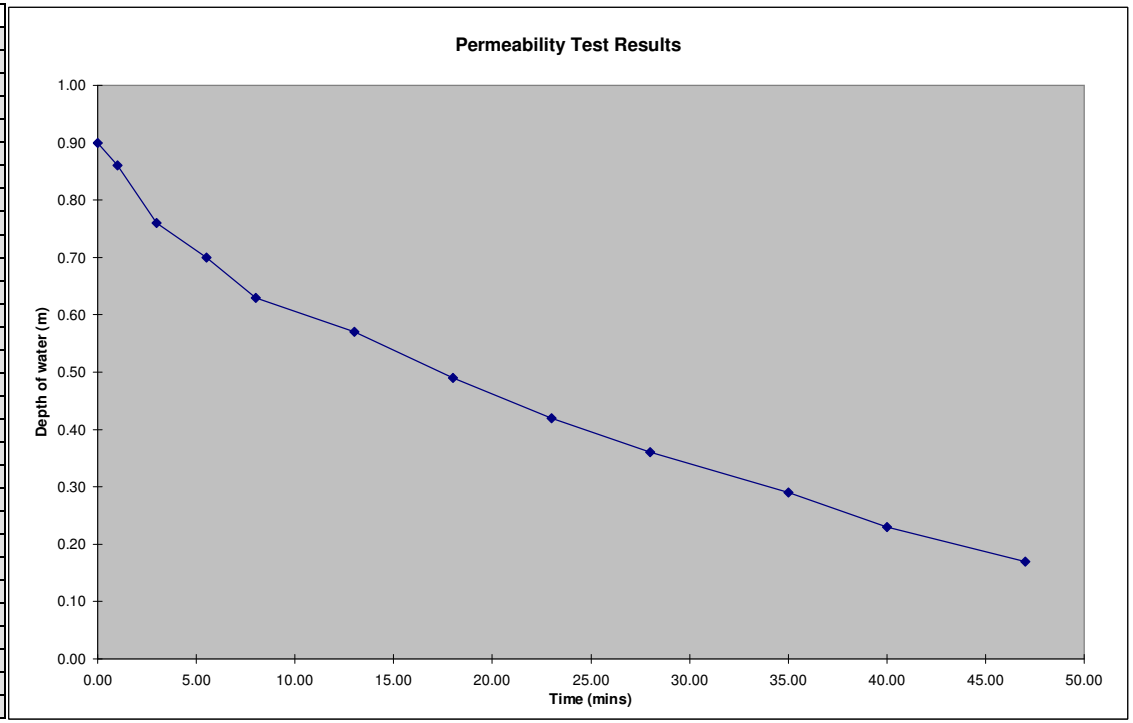
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	237B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.775
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6750	0.4500	0.2250
Time (mins)	6	21	41

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.90	2.00	2.000
1.00	0.86	2.04	2.040
3.00	0.76	2.14	2.140
5.50	0.70	2.20	2.200
8.00	0.63	2.27	2.270
13.00	0.57	2.33	2.330
18.00	0.49	2.41	2.410
23.00	0.42	2.48	2.480
28.00	0.36	2.54	2.540
35.00	0.29	2.61	2.610
40.00	0.23	2.67	2.670
47.00	0.17	2.73	2.730



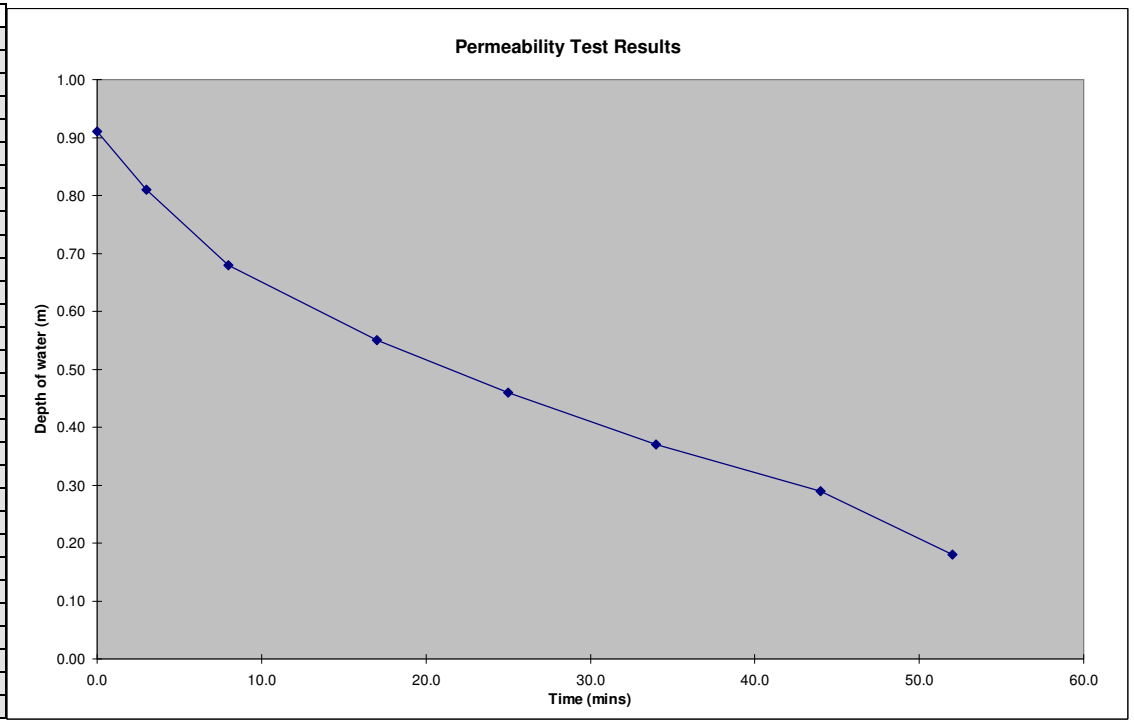
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	237B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.78
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6825	0.4550	0.2275
Time (mins)	8	26	48

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.91	1.99	1.990
3.0	0.81	2.09	2.090
8.0	0.68	2.22	2.220
17.0	0.55	2.35	2.350
25.0	0.46	2.44	2.440
34.0	0.37	2.53	2.530
44.0	0.29	2.61	2.610
52.0	0.18	2.72	2.720



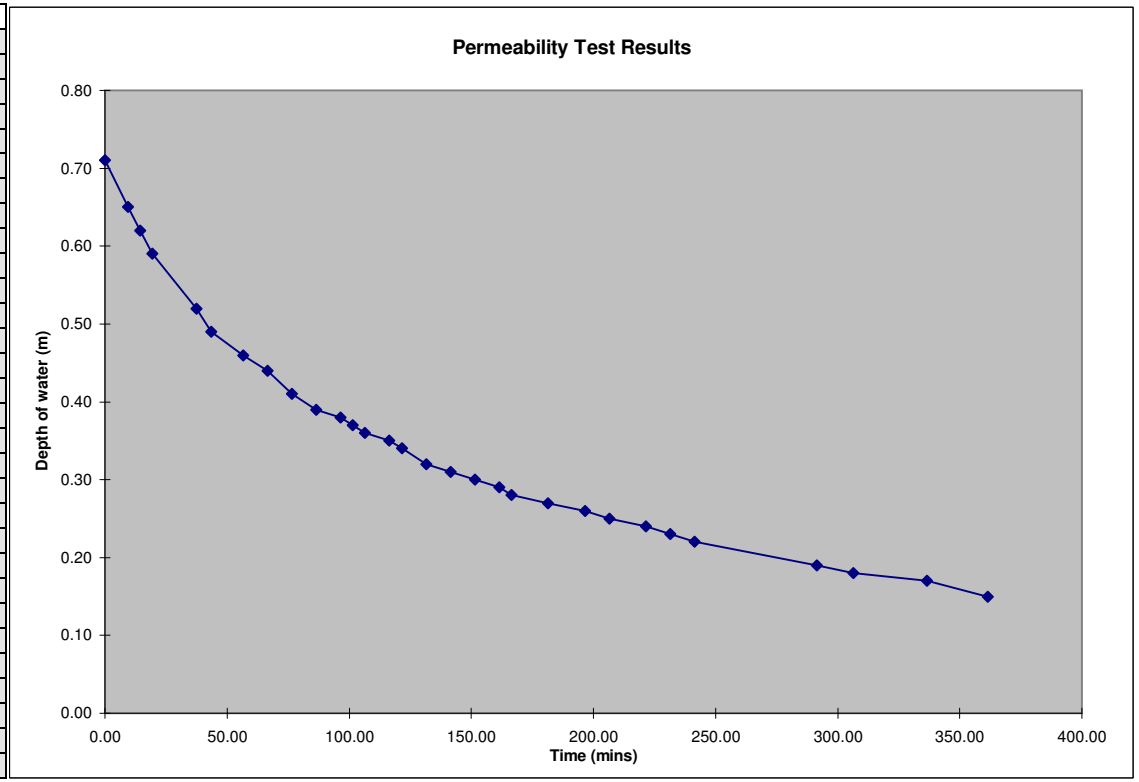
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	238A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.45
Breadth of Trial Pit (m)=	0.48
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5325	0.3550	0.1775
Time (mins)	34	111	314

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.71	0.89	0.890
9.50	0.65	0.95	0.950
14.50	0.62	0.98	0.980
19.50	0.59	1.01	1.010
37.50	0.52	1.08	1.080
43.50	0.49	1.11	1.110
56.50	0.46	1.14	1.140
66.50	0.44	1.16	1.160
76.50	0.41	1.19	1.190
86.50	0.39	1.21	1.210
96.50	0.38	1.22	1.220
101.50	0.37	1.23	1.230
106.50	0.36	1.24	1.240
116.50	0.35	1.25	1.250
121.50	0.34	1.26	1.260
131.50	0.32	1.28	1.280
141.50	0.31	1.29	1.290
151.50	0.30	1.30	1.300
161.50	0.29	1.31	1.310
166.50	0.28	1.32	1.320
181.50	0.27	1.33	1.330
196.50	0.26	1.34	1.340
206.50	0.25	1.35	1.350
221.50	0.24	1.36	1.360
231.50	0.23	1.37	1.370
241.50	0.22	1.38	1.380
291.50	0.19	1.41	1.410
306.50	0.18	1.42	1.420
336.50	0.17	1.43	1.430
361.50	0.15	1.45	1.450



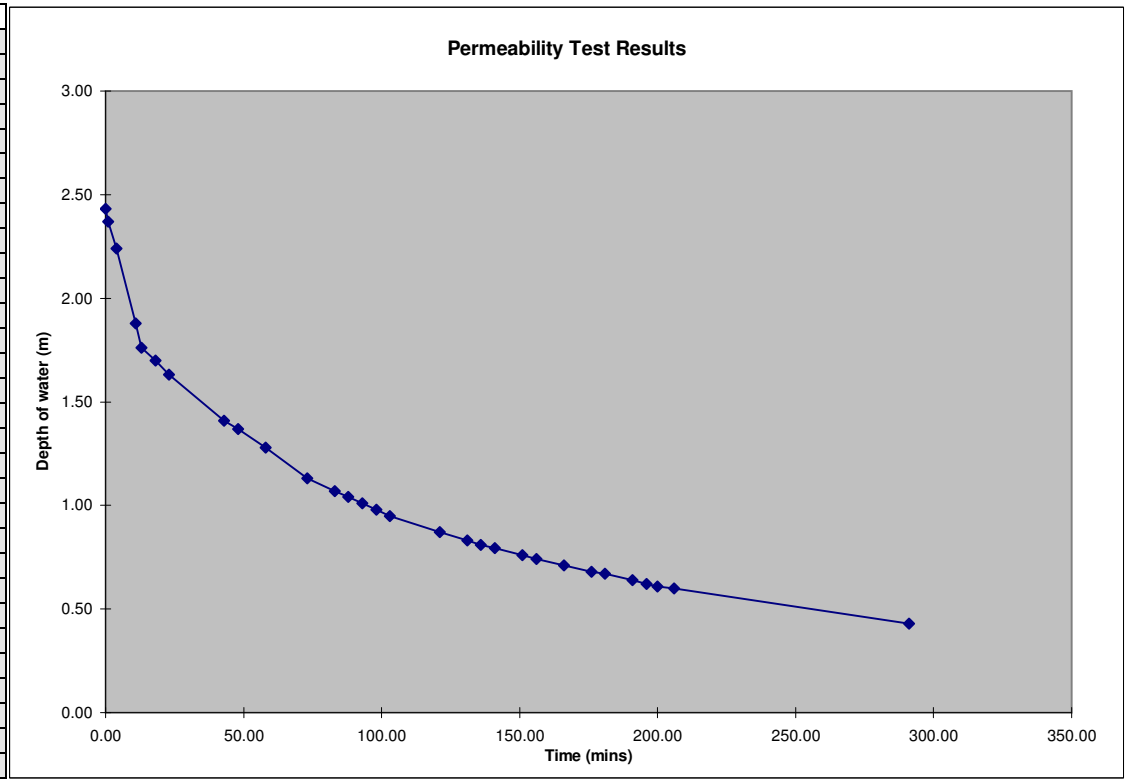
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	238B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8225	1.2150	0.6075
Time (mins)	12	65	202

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.43	0.57	0.570
1.00	2.37	0.63	0.630
4.00	2.24	0.76	0.760
11.00	1.88	1.12	1.120
13.00	1.76	1.24	1.240
18.00	1.70	1.30	1.300
23.00	1.63	1.37	1.370
43.00	1.41	1.59	1.590
48.00	1.37	1.63	1.630
58.00	1.28	1.72	1.720
73.00	1.13	1.87	1.870
83.00	1.07	1.93	1.930
88.00	1.04	1.96	1.960
93.00	1.01	1.99	1.990
98.00	0.98	2.02	2.020
103.00	0.95	2.05	2.050
121.00	0.87	2.13	2.130
131.00	0.83	2.17	2.170
136.00	0.81	2.19	2.190
141.00	0.80	2.21	2.205
151.00	0.76	2.24	2.240
156.00	0.74	2.26	2.260
166.00	0.71	2.29	2.290
176.00	0.68	2.32	2.320
181.00	0.67	2.33	2.330
191.00	0.64	2.36	2.360
196.00	0.62	2.38	2.380
200.00	0.61	2.39	2.390
206.00	0.60	2.40	2.400
291.00	0.43	2.57	2.570



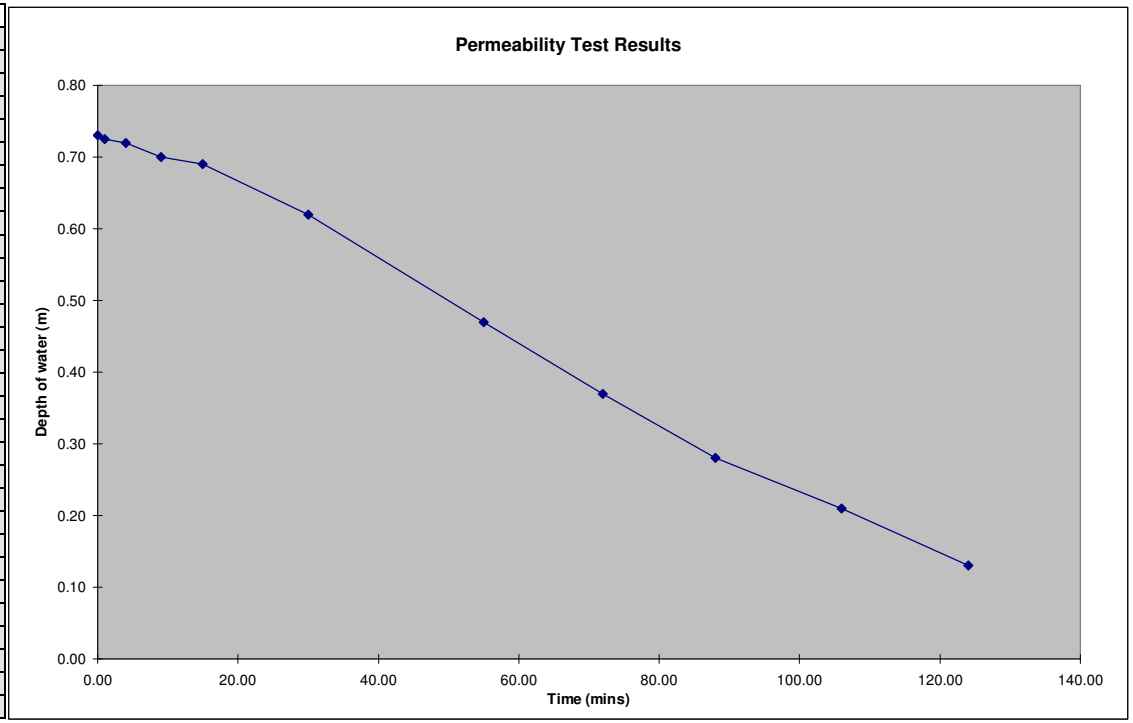
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	239A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.45
No of runs	2
Pipe upstand (m)	0.350

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5475	0.3650	0.1825
Time (mins)	42	73	112

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.73	0.77	1.120
1.00	0.73	0.78	1.125
4.00	0.72	0.78	1.130
9.00	0.70	0.80	1.150
15.00	0.69	0.81	1.160
30.00	0.62	0.88	1.230
55.00	0.47	1.03	1.380
72.00	0.37	1.13	1.480
88.00	0.28	1.22	1.570
106.00	0.21	1.29	1.640
124.00	0.13	1.37	1.720



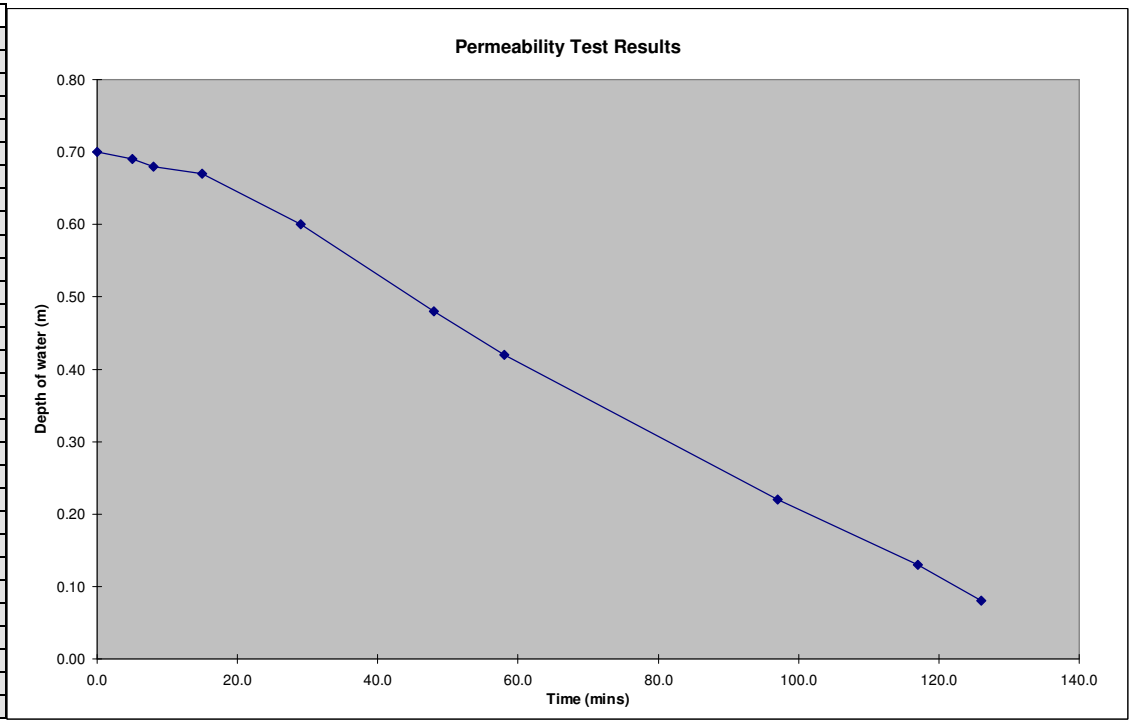
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	239A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.45
No of runs	2.00
Pipe upstand (m)	0.350

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5250	0.3500	0.1750
Time (mins)	41	72	107

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.70	0.80	1.150
5.0	0.69	0.81	1.160
8.0	0.68	0.82	1.170
15.0	0.67	0.83	1.180
29.0	0.60	0.90	1.250
48.0	0.48	1.02	1.370
58.0	0.42	1.08	1.430
97.0	0.22	1.28	1.630
117.0	0.13	1.37	1.720
126.0	0.08	1.42	1.770



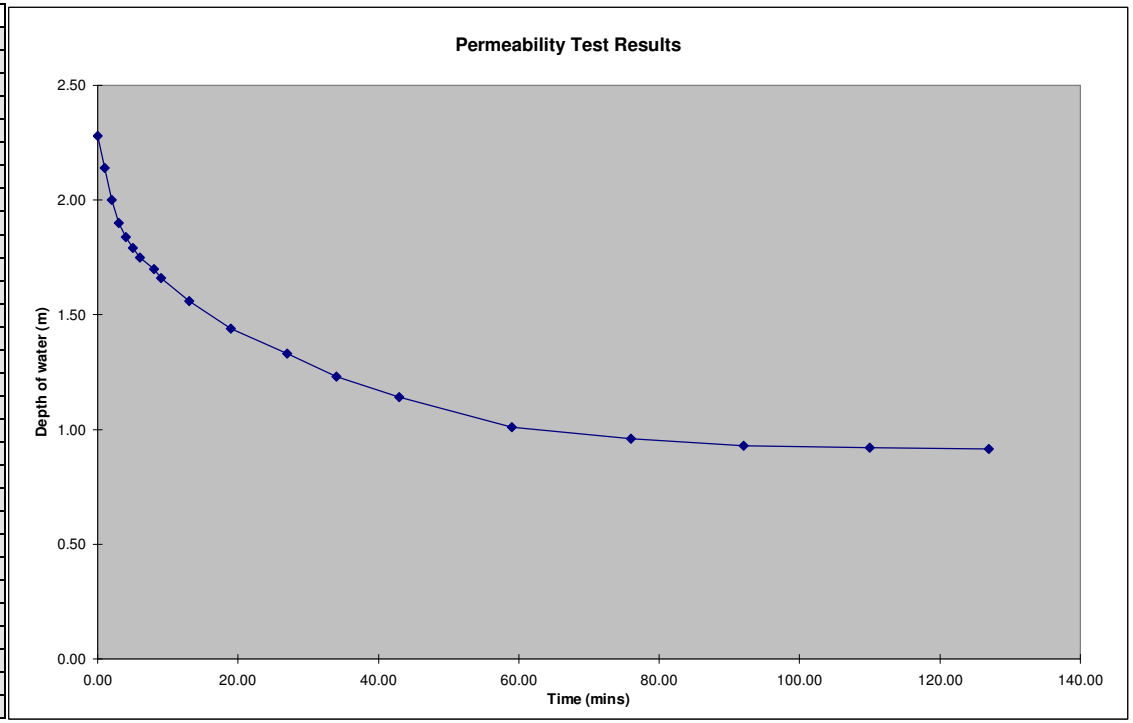
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	239B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.675
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7100	1.1400	0.5700
Time (mins)	7	43	903

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.28	0.72	0.720
1.00	2.14	0.86	0.860
2.00	2.00	1.00	1.000
3.00	1.90	1.10	1.100
4.00	1.84	1.16	1.160
5.00	1.79	1.21	1.210
6.00	1.75	1.25	1.250
8.00	1.70	1.30	1.300
9.00	1.66	1.34	1.340
13.00	1.56	1.44	1.440
19.00	1.44	1.56	1.560
27.00	1.33	1.67	1.670
34.00	1.23	1.77	1.770
43.00	1.14	1.86	1.860
59.00	1.01	1.99	1.990
76.00	0.96	2.04	2.040
92.00	0.93	2.07	2.070
110.00	0.92	2.08	2.080
127.00	0.92	2.09	2.085



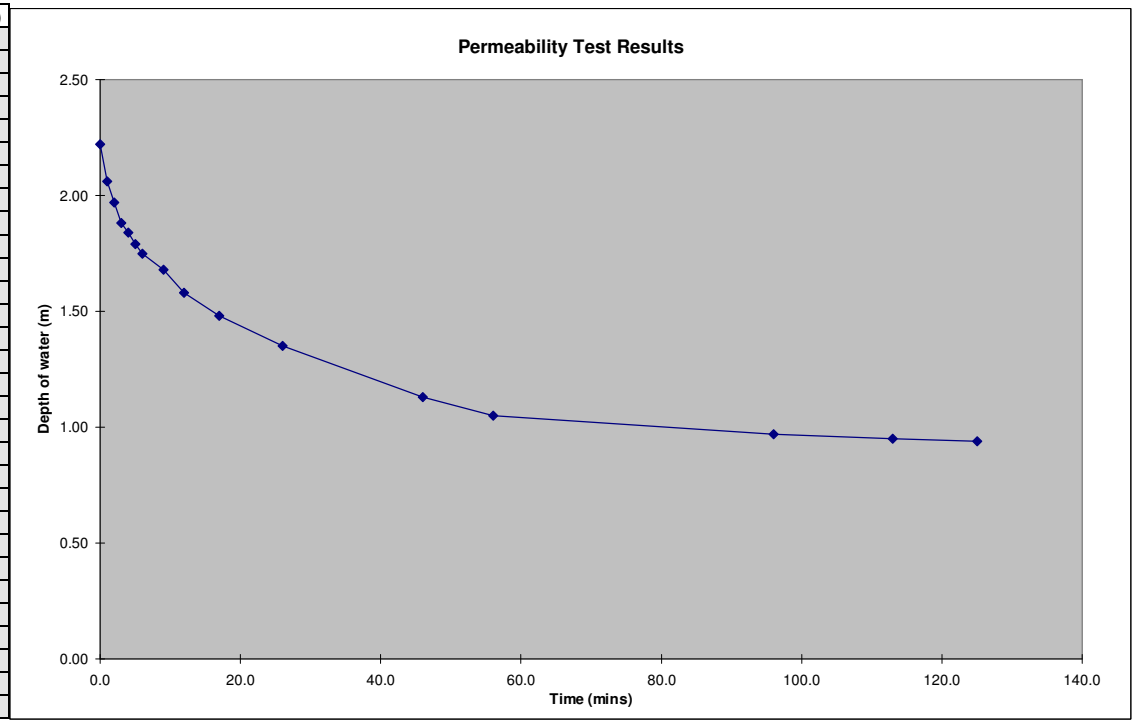
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	239B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.675
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6650	1.1100	0.5550
Time (mins)	9	49	587

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.22	0.78	0.780
1.0	2.06	0.94	0.940
2.0	1.97	1.03	1.030
3.0	1.88	1.12	1.120
4.0	1.84	1.16	1.160
5.0	1.79	1.21	1.210
6.0	1.75	1.25	1.250
9.0	1.68	1.32	1.320
12.0	1.58	1.42	1.420
17.0	1.48	1.52	1.520
26.0	1.35	1.65	1.650
46.0	1.13	1.87	1.870
56.0	1.05	1.95	1.950
96.0	0.97	2.03	2.030
113.0	0.95	2.05	2.050
125.0	0.94	2.06	2.060



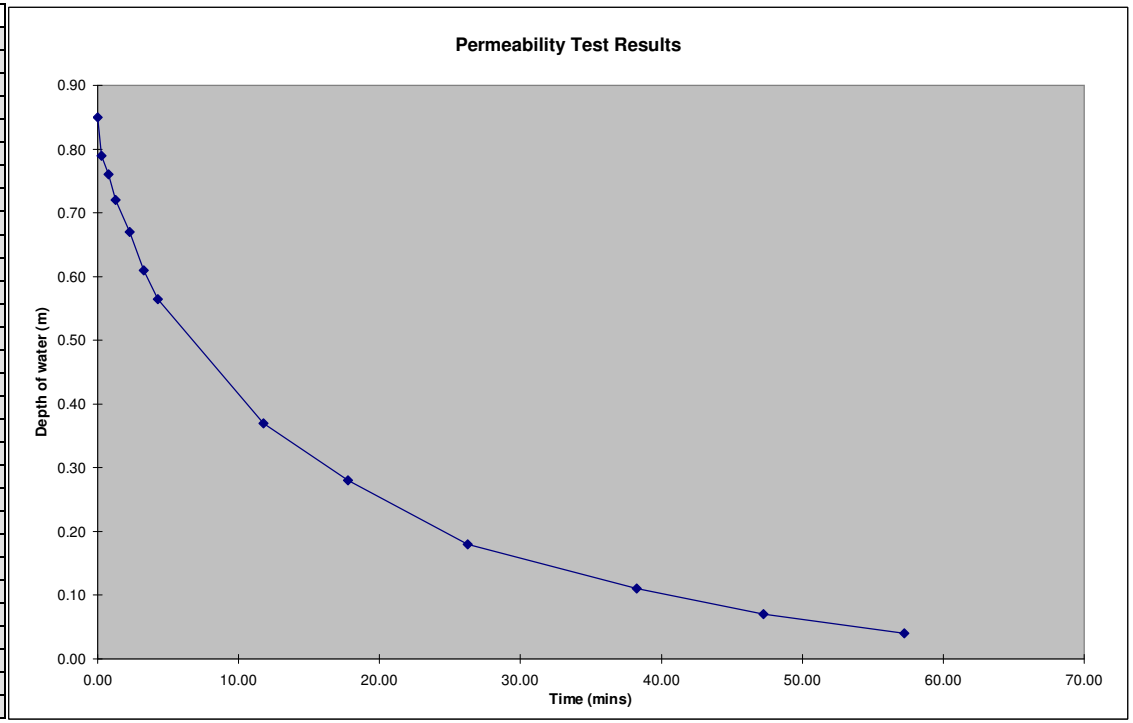
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	240A
Depth of Trial Pit (m)=	1.58
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.480
No of runs	2
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6375	0.4250	0.2125
Time (mins)	3	10	23

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.85	0.73	0.930
0.25	0.79	0.79	0.990
0.75	0.76	0.82	1.020
1.25	0.72	0.86	1.060
2.25	0.67	0.91	1.110
3.25	0.61	0.97	1.170
4.25	0.57	1.02	1.215
11.75	0.37	1.21	1.410
17.75	0.28	1.30	1.500
26.25	0.18	1.40	1.600
38.25	0.11	1.47	1.670
47.25	0.07	1.51	1.710
57.25	0.04	1.54	1.740



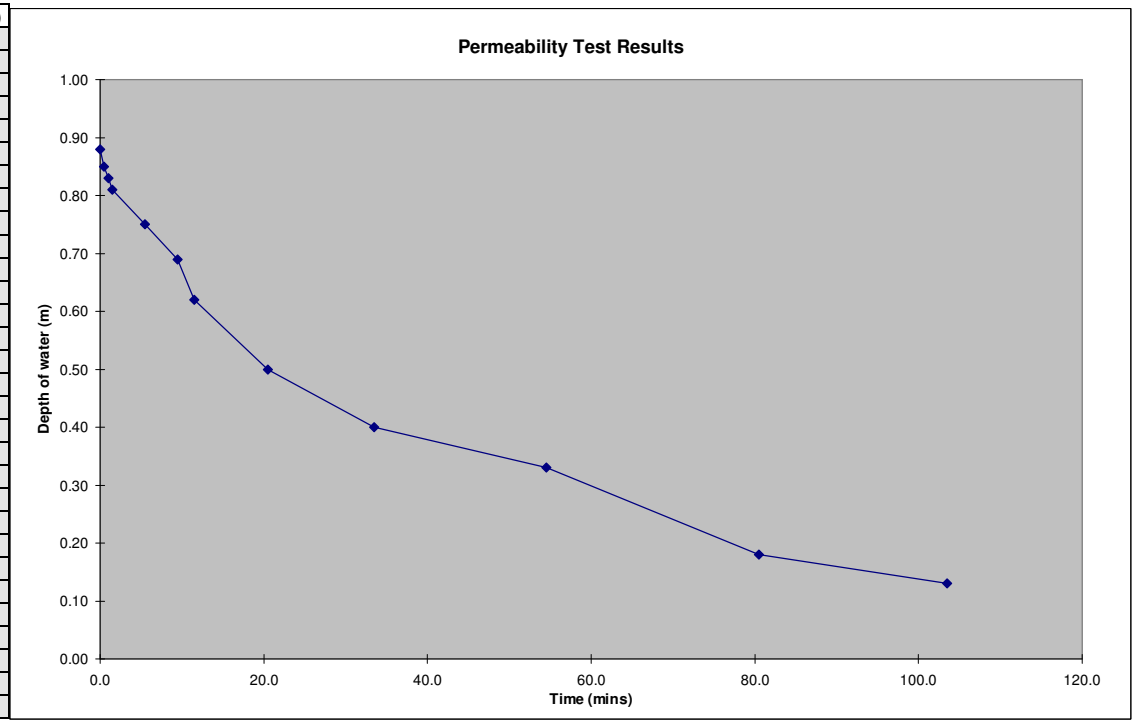
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	240A
Depth of Trial Pit (m)=	1.58
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.480
No of runs	2.00
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6600	0.4400	0.2200
Time (mins)	10	28	73

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.88	0.70	0.900
0.5	0.85	0.73	0.930
1.0	0.83	0.75	0.950
1.5	0.81	0.77	0.970
5.5	0.75	0.83	1.030
9.5	0.69	0.89	1.090
11.5	0.62	0.96	1.160
20.5	0.50	1.08	1.280
33.5	0.40	1.18	1.380
54.5	0.33	1.25	1.450
80.5	0.18	1.40	1.600
103.5	0.13	1.45	1.650



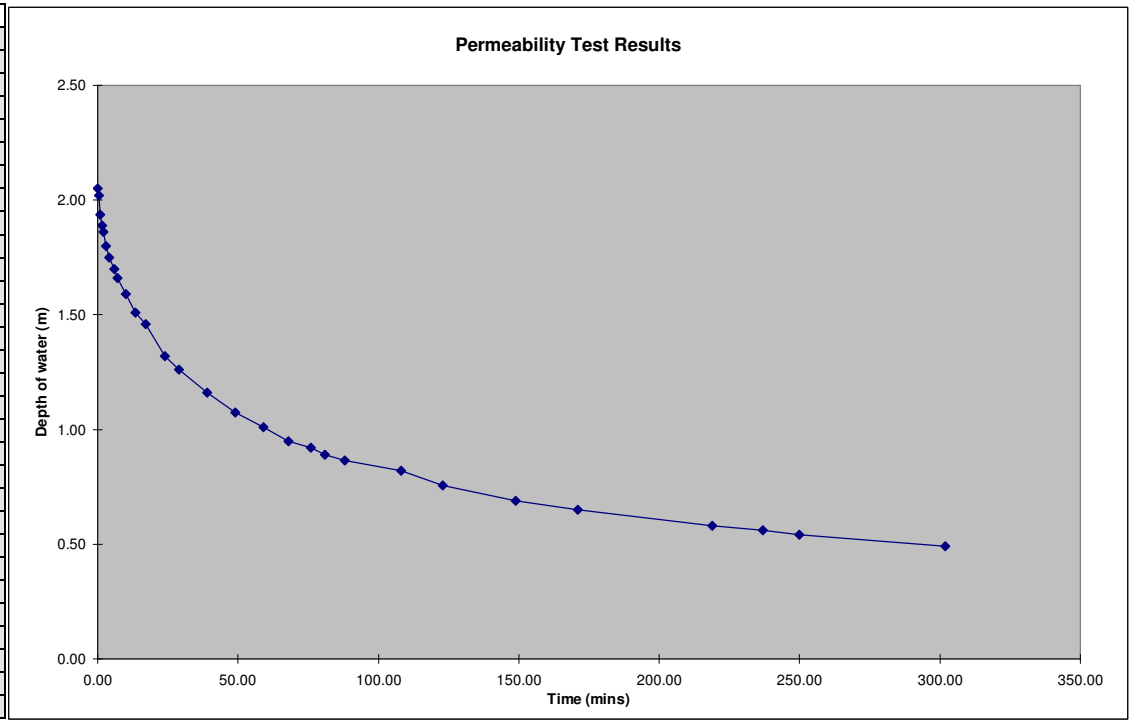
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	240B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5375	1.0250	0.5125
Time (mins)	12	57	279

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.05	0.95	0.950
0.50	2.02	0.98	0.980
1.00	1.94	1.07	1.065
1.50	1.89	1.11	1.110
2.00	1.86	1.14	1.140
3.00	1.80	1.20	1.200
4.00	1.75	1.25	1.250
6.00	1.70	1.30	1.300
7.00	1.66	1.34	1.340
10.00	1.59	1.41	1.410
13.50	1.51	1.49	1.490
17.00	1.46	1.54	1.540
24.00	1.32	1.68	1.680
29.00	1.26	1.74	1.740
39.00	1.16	1.84	1.840
49.00	1.08	1.93	1.925
59.00	1.01	1.99	1.990
68.00	0.95	2.05	2.050
76.00	0.92	2.08	2.080
81.00	0.89	2.11	2.110
88.00	0.87	2.14	2.135
108.00	0.82	2.18	2.180
123.00	0.76	2.25	2.245
149.00	0.69	2.31	2.310
171.00	0.65	2.35	2.350
219.00	0.58	2.42	2.420
237.00	0.56	2.44	2.440
250.00	0.54	2.46	2.460
302.00	0.49	2.51	2.510



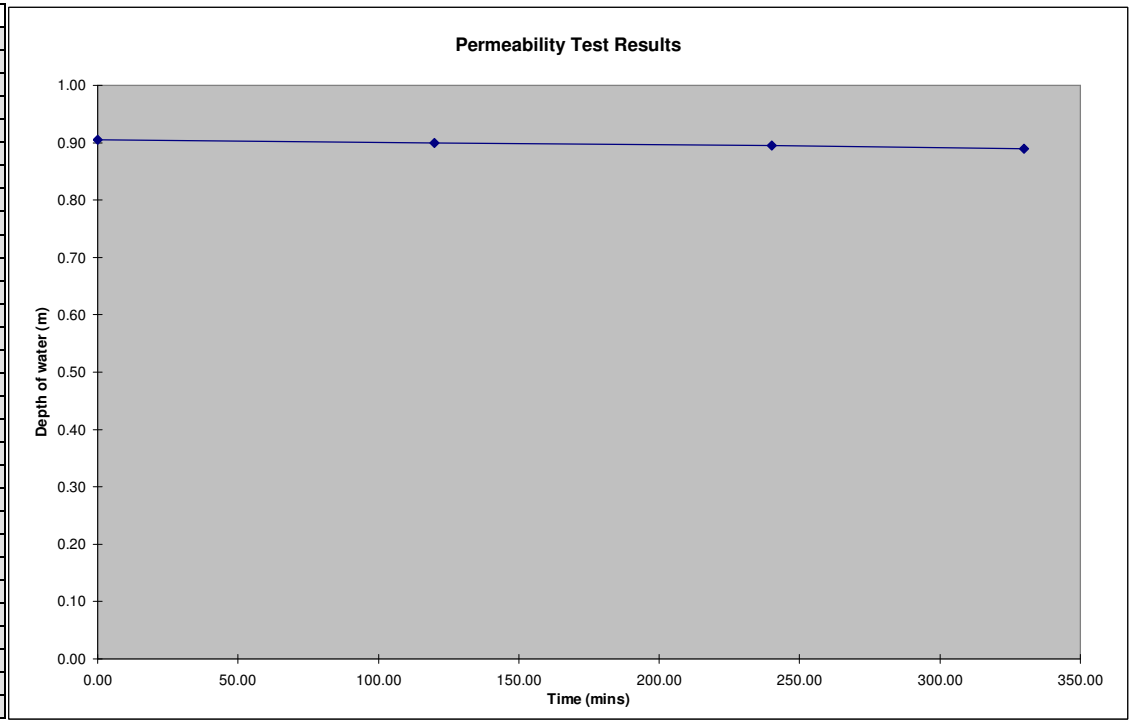
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	241A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6788	0.4525	0.2263
Time (mins)	4133	8205	12278

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.91	0.60	0.595
120.00	0.90	0.60	0.600
240.00	0.90	0.61	0.605
330.00	0.89	0.61	0.610



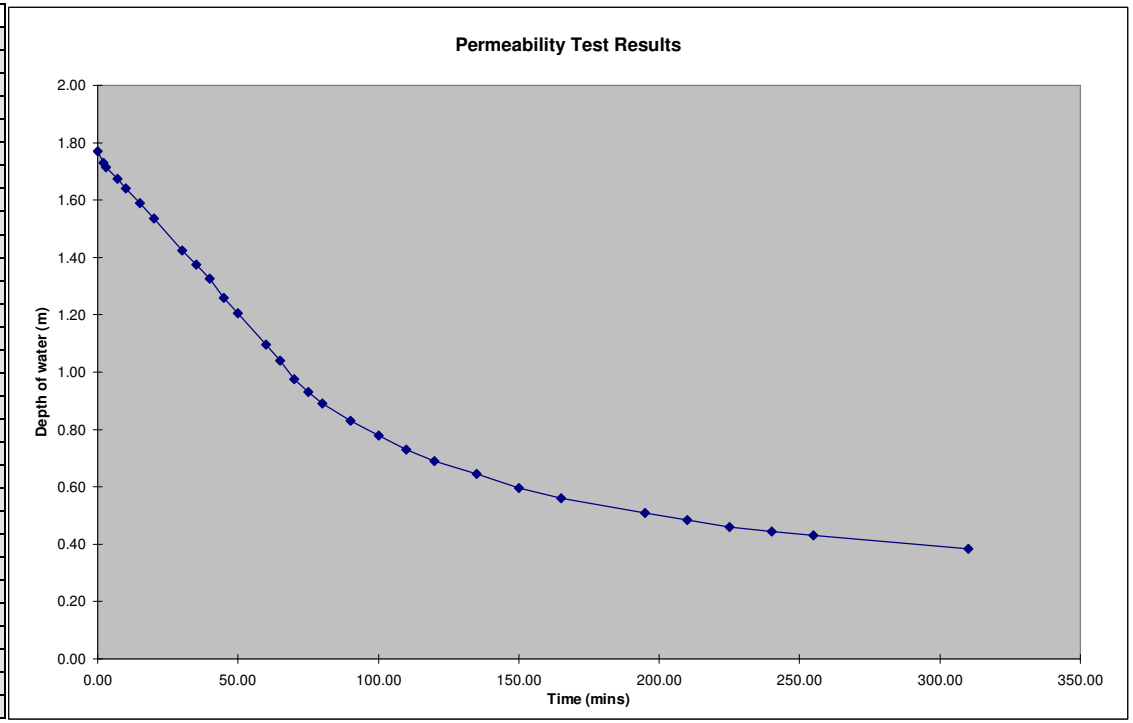
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	241B
Depth of Trial Pit (m)=	3.60
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.3275	0.8850	0.4425
Time (mins)	39	81	243

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.77	1.83	1.930
2.00	1.73	1.87	1.970
3.00	1.72	1.89	1.985
7.00	1.68	1.93	2.025
10.00	1.64	1.96	2.060
15.00	1.59	2.01	2.110
20.00	1.54	2.07	2.165
30.00	1.43	2.18	2.275
35.00	1.38	2.23	2.325
40.00	1.33	2.28	2.375
45.00	1.26	2.34	2.440
50.00	1.21	2.40	2.495
60.00	1.10	2.51	2.605
65.00	1.04	2.56	2.660
70.00	0.98	2.63	2.725
75.00	0.93	2.67	2.770
80.00	0.89	2.71	2.810
90.00	0.83	2.77	2.870
100.00	0.78	2.82	2.920
110.00	0.73	2.87	2.970
120.00	0.69	2.91	3.010
135.00	0.65	2.96	3.055
150.00	0.60	3.01	3.105
165.00	0.56	3.04	3.140
195.00	0.51	3.09	3.190
210.00	0.49	3.12	3.215
225.00	0.46	3.14	3.240
240.00	0.45	3.16	3.255
255.00	0.43	3.17	3.270
310.00	0.39	3.22	3.315



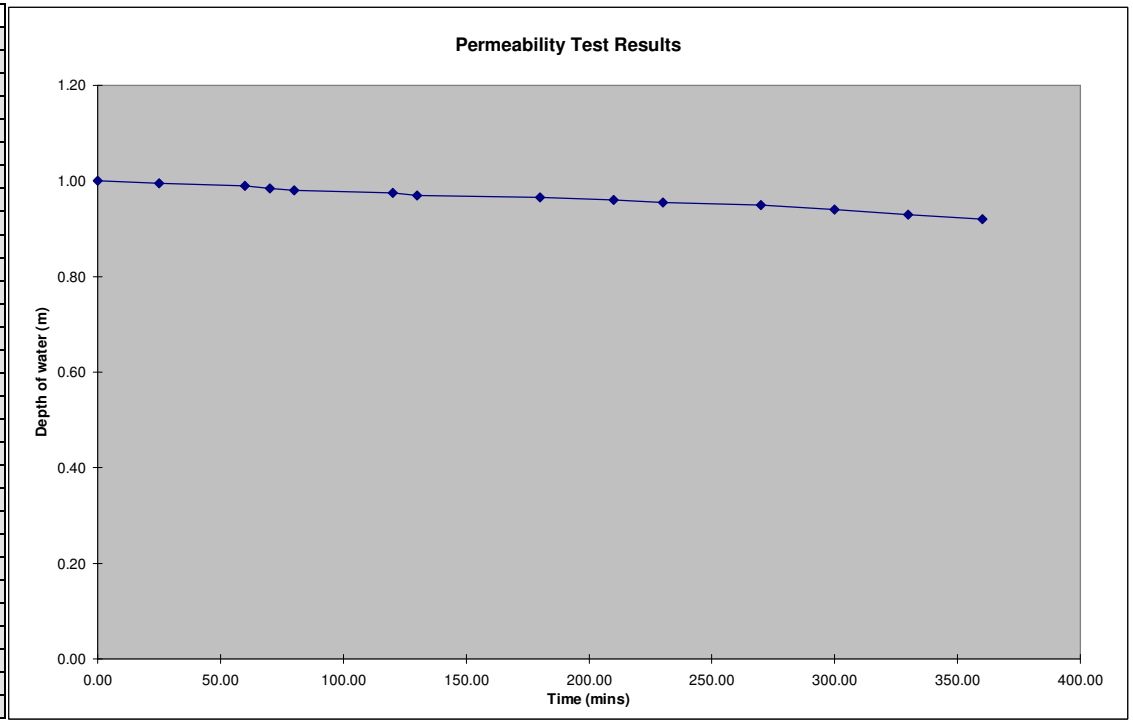
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	242A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7500	0.5000	0.2500
Time (mins)	870	1620	2370

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.00	0.50	0.500
25.00	1.00	0.51	0.505
60.00	0.99	0.51	0.510
70.00	0.99	0.52	0.515
80.00	0.98	0.52	0.520
120.00	0.98	0.53	0.525
130.00	0.97	0.53	0.530
180.00	0.97	0.54	0.535
210.00	0.96	0.54	0.540
230.00	0.96	0.55	0.545
270.00	0.95	0.55	0.550
300.00	0.94	0.56	0.560
330.00	0.93	0.57	0.570
360.00	0.92	0.58	0.580



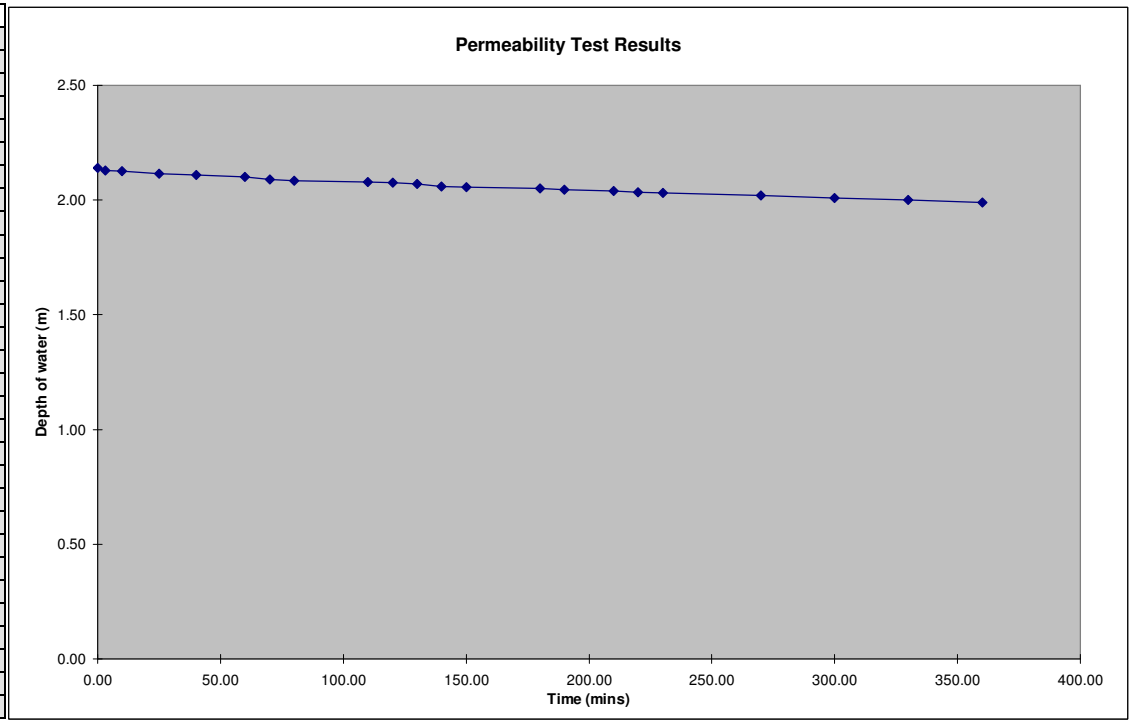
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	242B
Depth of Trial Pit (m)=	3.70
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6050	1.0700	0.5350
Time (mins)	1515	3120	4725

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.14	1.56	1.560
3.00	2.13	1.57	1.570
10.00	2.13	1.58	1.575
25.00	2.12	1.59	1.585
40.00	2.11	1.59	1.590
60.00	2.10	1.60	1.600
70.00	2.09	1.61	1.610
80.00	2.09	1.62	1.615
110.00	2.08	1.62	1.620
120.00	2.08	1.63	1.625
130.00	2.07	1.63	1.630
140.00	2.06	1.64	1.640
150.00	2.06	1.65	1.645
180.00	2.05	1.65	1.650
190.00	2.05	1.66	1.655
210.00	2.04	1.66	1.660
220.00	2.04	1.67	1.665
230.00	2.03	1.67	1.670
270.00	2.02	1.68	1.680
300.00	2.01	1.69	1.690
330.00	2.00	1.70	1.700
360.00	1.99	1.71	1.710



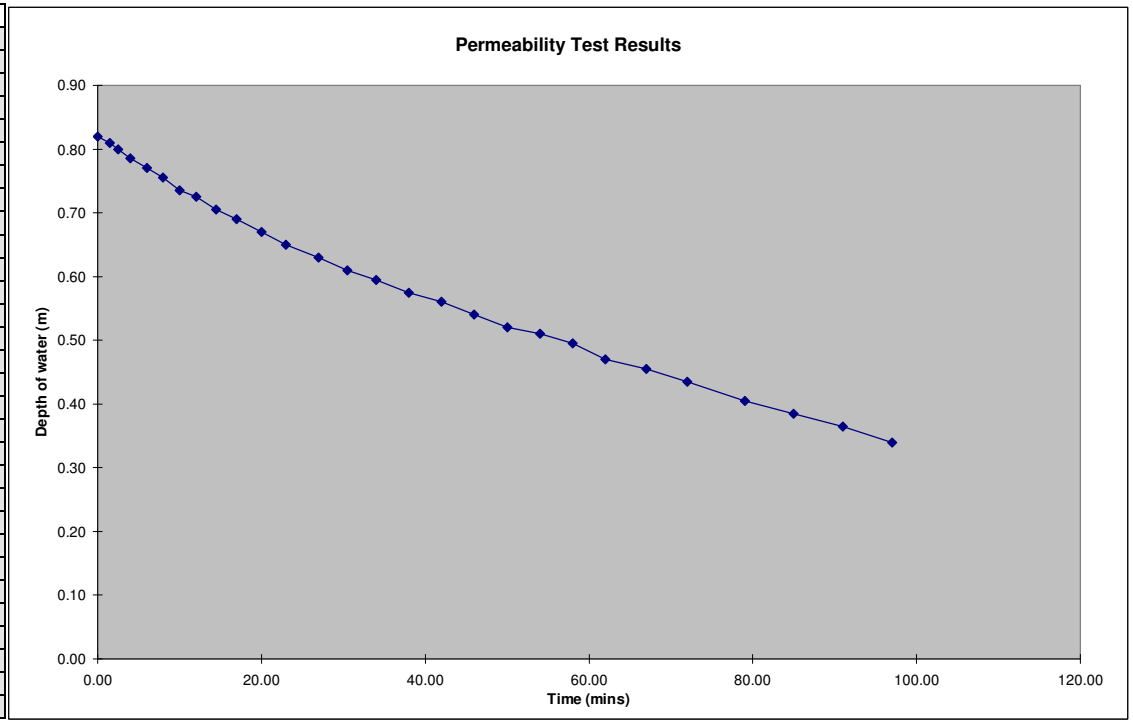
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	243A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6150	0.4100	0.2050
Time (mins)	29	78	133

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.82	0.68	1.080
1.50	0.81	0.69	1.090
2.50	0.80	0.70	1.100
4.00	0.79	0.72	1.115
6.00	0.77	0.73	1.130
8.00	0.76	0.75	1.145
10.00	0.74	0.77	1.165
12.00	0.73	0.78	1.175
14.50	0.71	0.80	1.195
17.00	0.69	0.81	1.210
20.00	0.67	0.83	1.230
23.00	0.65	0.85	1.250
27.00	0.63	0.87	1.270
30.50	0.61	0.89	1.290
34.00	0.60	0.91	1.305
38.00	0.58	0.93	1.325
42.00	0.56	0.94	1.340
46.00	0.54	0.96	1.360
50.00	0.52	0.98	1.380
54.00	0.51	0.99	1.390
58.00	0.50	1.01	1.405
62.00	0.47	1.03	1.430
67.00	0.46	1.05	1.445
72.00	0.44	1.07	1.465
79.00	0.41	1.10	1.495
85.00	0.39	1.12	1.515
91.00	0.37	1.14	1.535
97.00	0.34	1.16	1.560



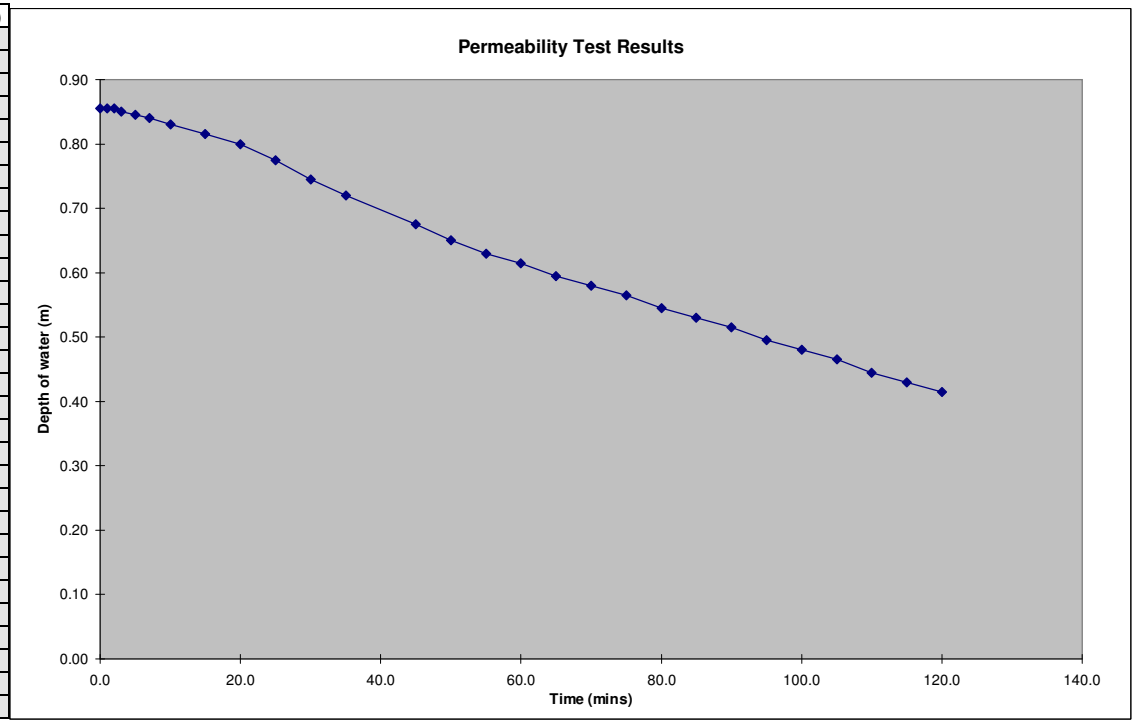
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	243A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6413	0.4275	0.2138
Time (mins)	52	116	187

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.86	0.65	1.045
1.0	0.86	0.65	1.045
2.0	0.86	0.65	1.045
3.0	0.85	0.65	1.050
5.0	0.85	0.66	1.055
7.0	0.84	0.66	1.060
10.0	0.83	0.67	1.070
15.0	0.82	0.69	1.085
20.0	0.80	0.70	1.100
25.0	0.78	0.73	1.125
30.0	0.75	0.76	1.155
35.0	0.72	0.78	1.180
45.0	0.68	0.83	1.225
50.0	0.65	0.85	1.250
55.0	0.63	0.87	1.270
60.0	0.62	0.89	1.285
65.0	0.60	0.91	1.305
70.0	0.58	0.92	1.320
75.0	0.57	0.94	1.335
80.0	0.55	0.96	1.355
85.0	0.53	0.97	1.370
90.0	0.52	0.99	1.385
95.0	0.50	1.01	1.405
100.0	0.48	1.02	1.420
105.0	0.47	1.04	1.435
110.0	0.45	1.06	1.455
115.0	0.43	1.07	1.470
120.0	0.42	1.09	1.485



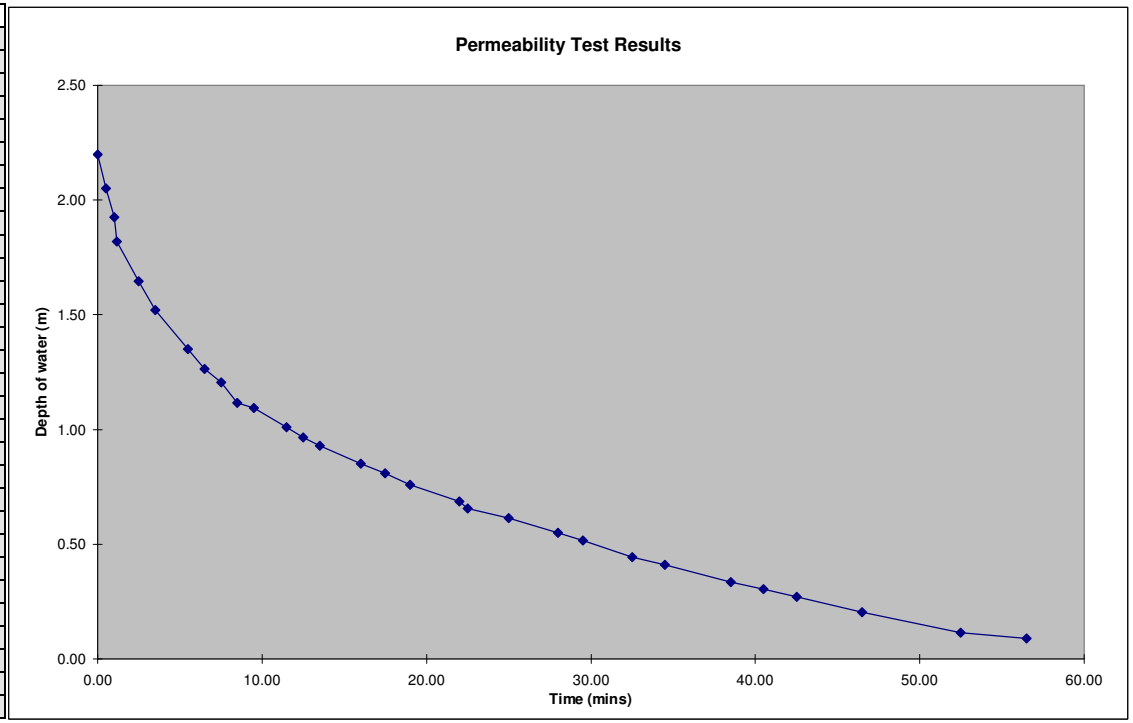
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	243B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.450
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6500	1.1000	0.5500
Time (mins)	2	9	28

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.20	0.80	0.800
0.50	2.05	0.95	0.950
1.00	1.93	1.08	1.075
1.15	1.82	1.18	1.180
2.50	1.65	1.36	1.355
3.50	1.52	1.48	1.480
5.50	1.35	1.65	1.650
6.50	1.27	1.74	1.735
7.50	1.21	1.80	1.795
8.50	1.12	1.89	1.885
9.50	1.10	1.91	1.905
11.50	1.01	1.99	1.990
12.50	0.97	2.04	2.035
13.50	0.93	2.07	2.070
16.00	0.85	2.15	2.150
17.50	0.81	2.19	2.190
19.00	0.76	2.24	2.240
22.00	0.69	2.32	2.315
22.50	0.66	2.35	2.345
25.00	0.62	2.39	2.385
28.00	0.55	2.45	2.450
29.50	0.52	2.49	2.485
32.50	0.45	2.56	2.555
34.50	0.41	2.59	2.590
38.50	0.34	2.67	2.665
40.50	0.31	2.70	2.695
42.50	0.27	2.73	2.730
46.50	0.21	2.80	2.795
52.50	0.12	2.89	2.885
56.50	0.09	2.91	2.910



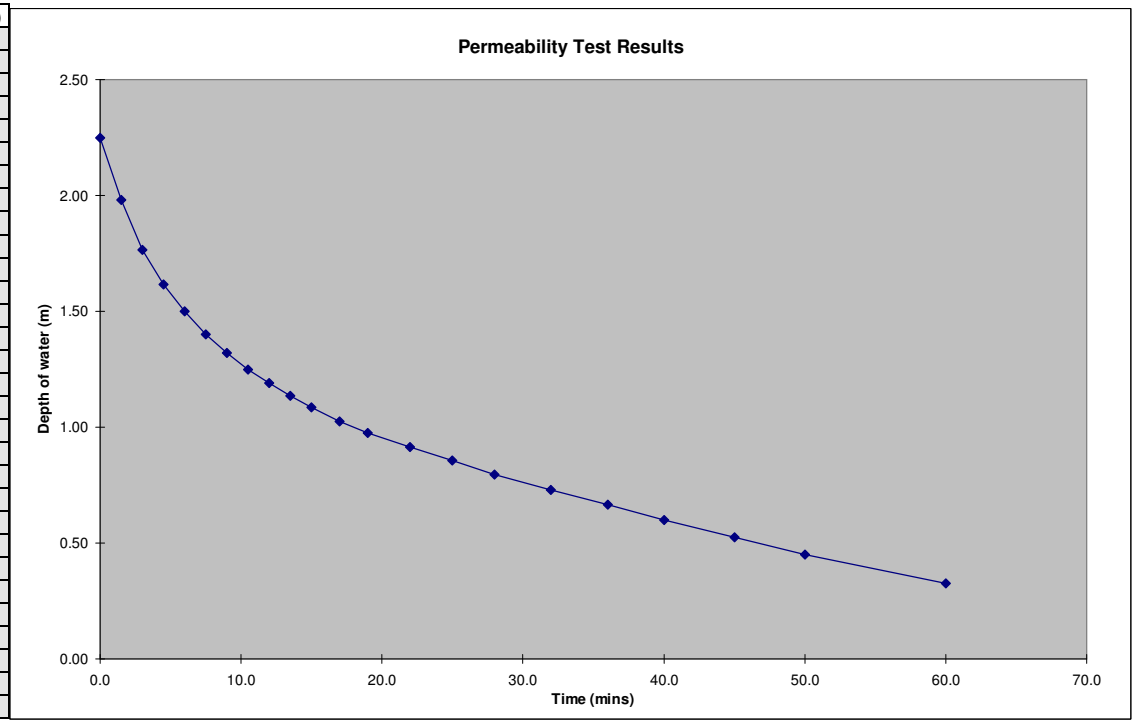
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	243B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.450
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6875	1.1250	0.5625
Time (mins)	4	14	43

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.25	0.75	0.750
1.5	1.98	1.02	1.020
3.0	1.77	1.24	1.235
4.5	1.62	1.39	1.385
6.0	1.50	1.50	1.500
7.5	1.40	1.60	1.600
9.0	1.32	1.68	1.680
10.5	1.25	1.75	1.750
12.0	1.19	1.81	1.810
13.5	1.14	1.87	1.865
15.0	1.09	1.92	1.915
17.0	1.03	1.98	1.975
19.0	0.98	2.03	2.025
22.0	0.92	2.09	2.085
25.0	0.86	2.15	2.145
28.0	0.80	2.21	2.205
32.0	0.73	2.27	2.270
36.0	0.67	2.34	2.335
40.0	0.60	2.40	2.400
45.0	0.53	2.48	2.475
50.0	0.45	2.55	2.550
60.0	0.33	2.68	2.675



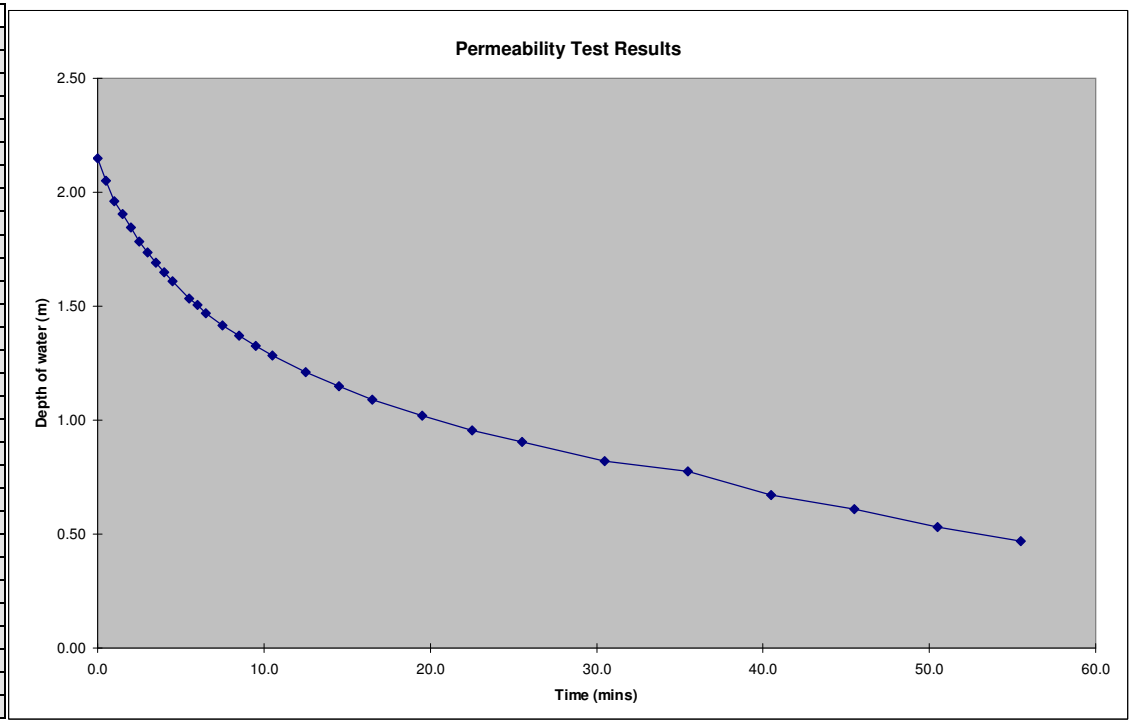
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	243B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6125	1.0750	0.5375
Time (mins)	4.5	17.1	50.0

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.15	0.85	0.850
0.5	2.05	0.95	0.950
1.0	1.96	1.04	1.040
1.5	1.91	1.10	1.095
2.0	1.85	1.16	1.155
2.5	1.79	1.22	1.215
3.0	1.74	1.27	1.265
3.5	1.69	1.31	1.310
4.0	1.65	1.35	1.350
4.5	1.61	1.39	1.390
5.5	1.54	1.47	1.465
6.0	1.51	1.50	1.495
6.5	1.47	1.53	1.530
7.5	1.42	1.59	1.585
8.5	1.37	1.63	1.630
9.5	1.33	1.68	1.675
10.5	1.29	1.72	1.715
12.5	1.21	1.79	1.790
14.5	1.15	1.85	1.850
16.5	1.09	1.91	1.910
19.5	1.02	1.98	1.980
22.5	0.96	2.05	2.045
25.5	0.91	2.10	2.095
30.5	0.82	2.18	2.180
35.5	0.78	2.23	2.225
40.5	0.67	2.33	2.330
45.5	0.61	2.39	2.390
50.5	0.53	2.47	2.470
55.5	0.47	2.53	2.530



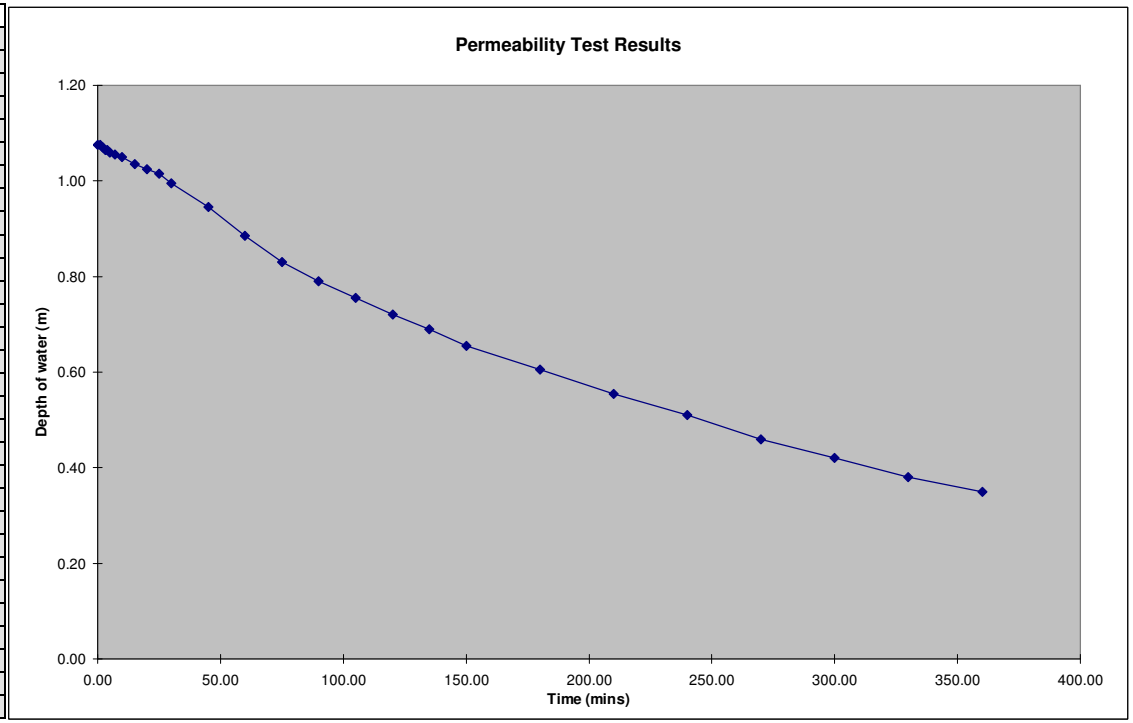
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	244A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.410

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8063	0.5375	0.2688
Time (mins)	84	222	441

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.08	0.53	0.935
1.00	1.08	0.53	0.935
2.00	1.07	0.53	0.940
3.00	1.07	0.54	0.945
4.00	1.07	0.54	0.945
5.00	1.06	0.54	0.950
7.00	1.06	0.55	0.955
10.00	1.05	0.55	0.960
15.00	1.04	0.57	0.975
20.00	1.03	0.58	0.985
25.00	1.02	0.59	0.995
30.00	1.00	0.61	1.015
45.00	0.95	0.66	1.065
60.00	0.89	0.72	1.125
75.00	0.83	0.77	1.180
90.00	0.79	0.81	1.220
105.00	0.76	0.85	1.255
120.00	0.72	0.88	1.290
135.00	0.69	0.91	1.320
150.00	0.66	0.95	1.355
180.00	0.61	1.00	1.405
210.00	0.56	1.05	1.455
240.00	0.51	1.09	1.500
270.00	0.46	1.14	1.550
300.00	0.42	1.18	1.590
330.00	0.38	1.22	1.630
360.00	0.35	1.25	1.660



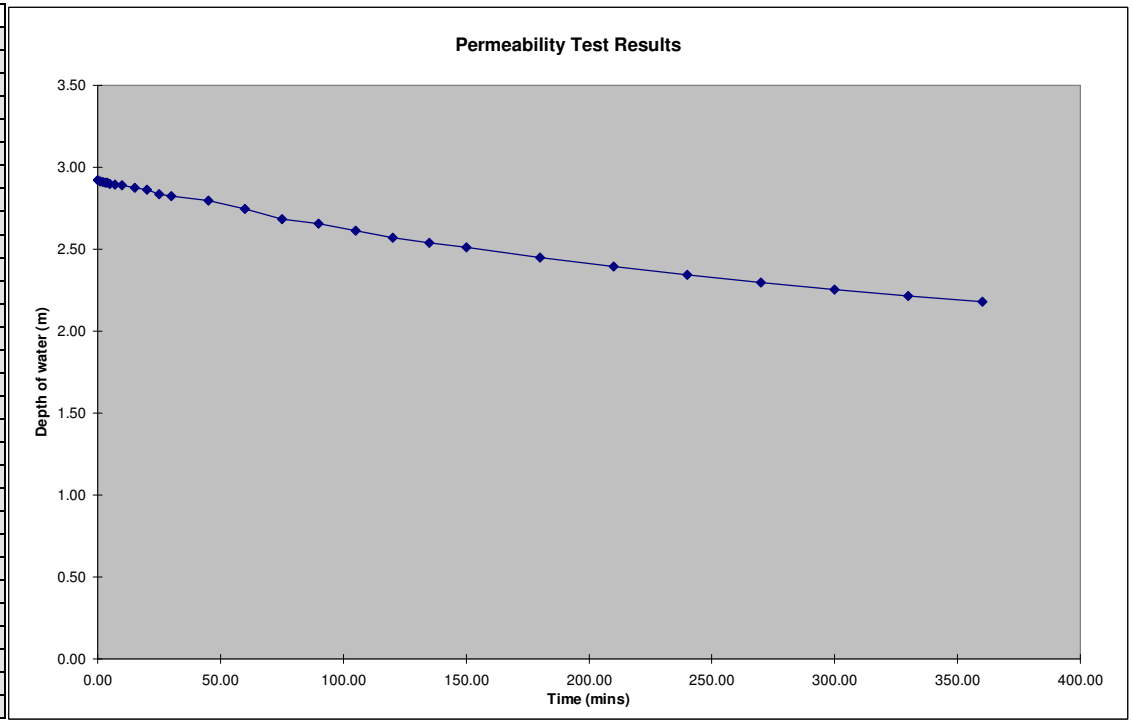
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	244B
Depth of Trial Pit (m)=	3.40
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.630

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.1900	1.4600	0.7300
Time (mins)	351	934	1518

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.92	0.48	1.110
1.00	2.92	0.49	1.115
2.00	2.91	0.49	1.120
3.00	2.91	0.50	1.125
4.00	2.91	0.50	1.125
5.00	2.90	0.50	1.130
7.00	2.90	0.51	1.135
10.00	2.89	0.51	1.140
15.00	2.88	0.53	1.155
20.00	2.87	0.54	1.165
25.00	2.84	0.57	1.195
30.00	2.83	0.58	1.205
45.00	2.80	0.61	1.235
60.00	2.75	0.66	1.285
75.00	2.69	0.72	1.345
90.00	2.66	0.75	1.375
105.00	2.62	0.79	1.415
120.00	2.57	0.83	1.460
135.00	2.54	0.86	1.490
150.00	2.51	0.89	1.520
180.00	2.45	0.95	1.580
210.00	2.40	1.01	1.635
240.00	2.35	1.06	1.685
270.00	2.30	1.11	1.735
300.00	2.26	1.15	1.775
330.00	2.22	1.19	1.815
360.00	2.18	1.22	1.850



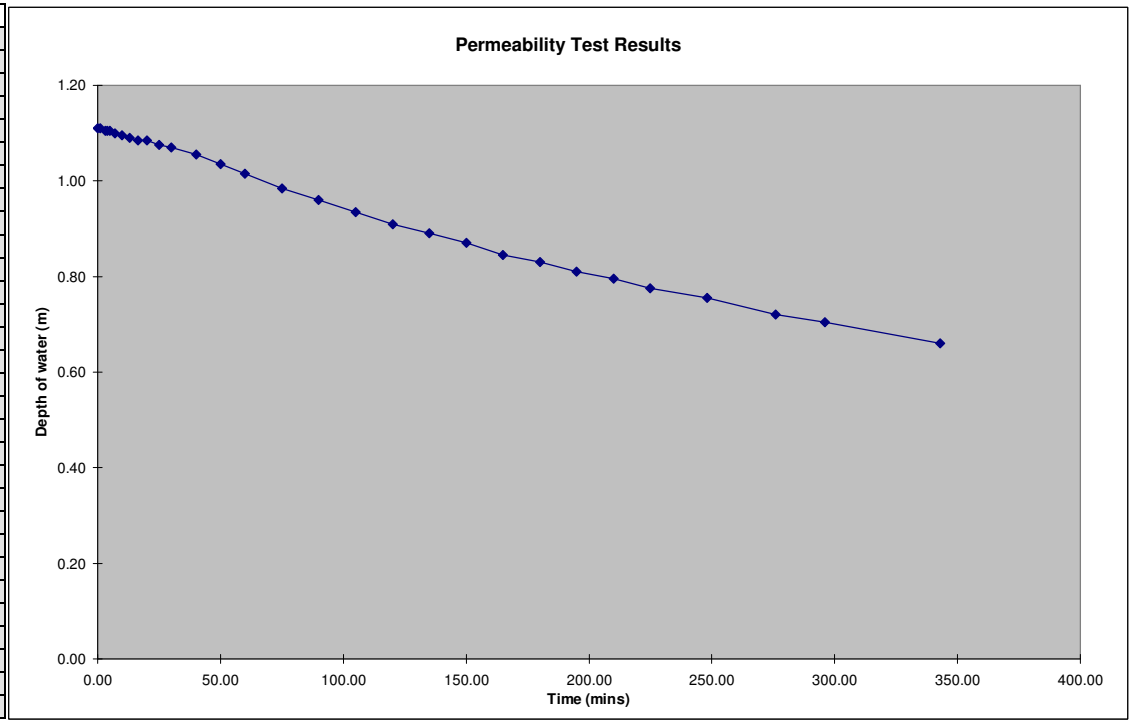
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	245A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.350

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8325	0.5550	0.2775
Time (mins)	177	453	743

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.11	0.49	0.840
1.00	1.11	0.49	0.840
3.00	1.11	0.50	0.845
4.00	1.11	0.50	0.845
5.00	1.11	0.50	0.845
7.00	1.10	0.50	0.850
10.00	1.10	0.51	0.855
13.00	1.09	0.51	0.860
16.50	1.09	0.52	0.865
20.00	1.09	0.52	0.865
25.00	1.08	0.53	0.875
30.00	1.07	0.53	0.880
40.00	1.06	0.55	0.895
50.00	1.04	0.57	0.915
60.00	1.02	0.59	0.935
75.00	0.99	0.62	0.965
90.00	0.96	0.64	0.990
105.00	0.94	0.67	1.015
120.00	0.91	0.69	1.040
135.00	0.89	0.71	1.060
150.00	0.87	0.73	1.080
165.00	0.85	0.76	1.105
180.00	0.83	0.77	1.120
195.00	0.81	0.79	1.140
210.00	0.80	0.81	1.155
225.00	0.78	0.83	1.175
248.00	0.76	0.85	1.195
276.00	0.72	0.88	1.230
296.00	0.71	0.90	1.245
343.00	0.66	0.94	1.290



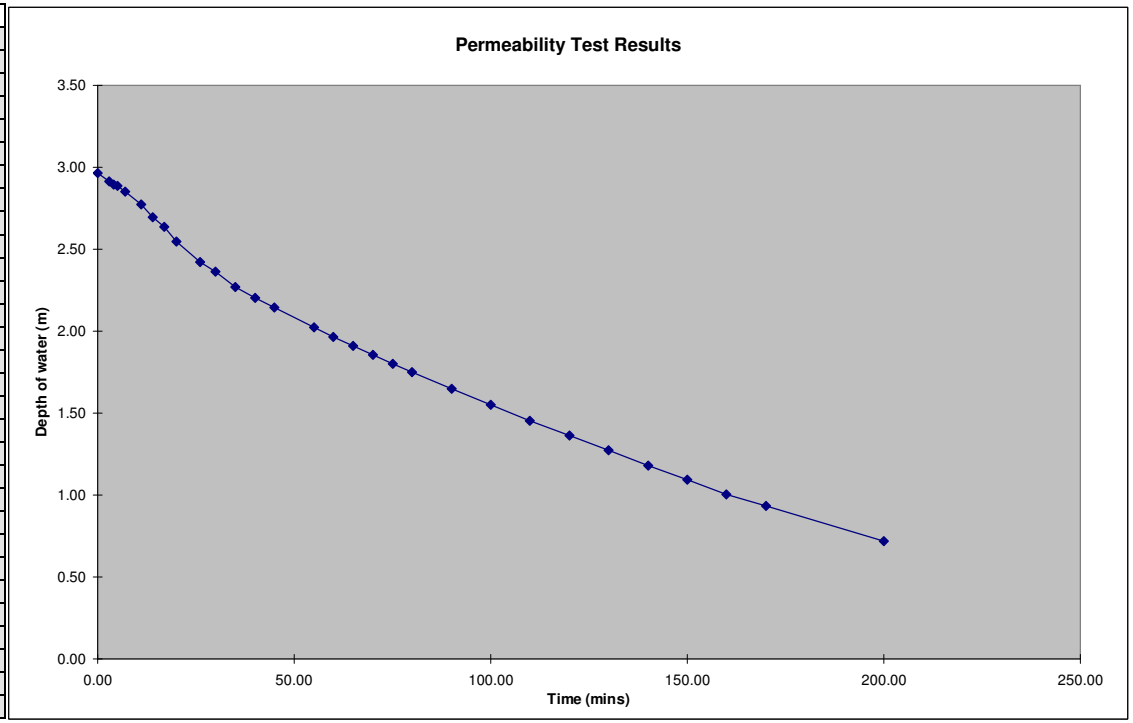
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	245B
Depth of Trial Pit (m)=	3.60
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.2238	1.4825	0.7413
Time (mins)	39	107	197

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.97	0.64	0.735
3.00	2.92	0.69	0.785
4.00	2.90	0.71	0.805
5.00	2.89	0.72	0.815
7.00	2.85	0.75	0.850
11.00	2.78	0.83	0.925
14.00	2.70	0.91	1.005
17.00	2.64	0.97	1.065
20.00	2.55	1.06	1.155
26.00	2.42	1.18	1.280
30.00	2.37	1.24	1.335
35.00	2.27	1.33	1.430
40.00	2.21	1.40	1.495
45.00	2.15	1.46	1.555
55.00	2.03	1.58	1.675
60.00	1.97	1.64	1.735
65.00	1.91	1.69	1.790
70.00	1.86	1.75	1.845
75.00	1.80	1.80	1.900
80.00	1.75	1.85	1.950
90.00	1.65	1.95	2.050
100.00	1.55	2.05	2.150
110.00	1.46	2.15	2.245
120.00	1.37	2.24	2.335
130.00	1.28	2.33	2.425
140.00	1.18	2.42	2.520
150.00	1.10	2.51	2.605
160.00	1.01	2.60	2.695
170.00	0.94	2.67	2.765
200.00	0.72	2.88	2.980



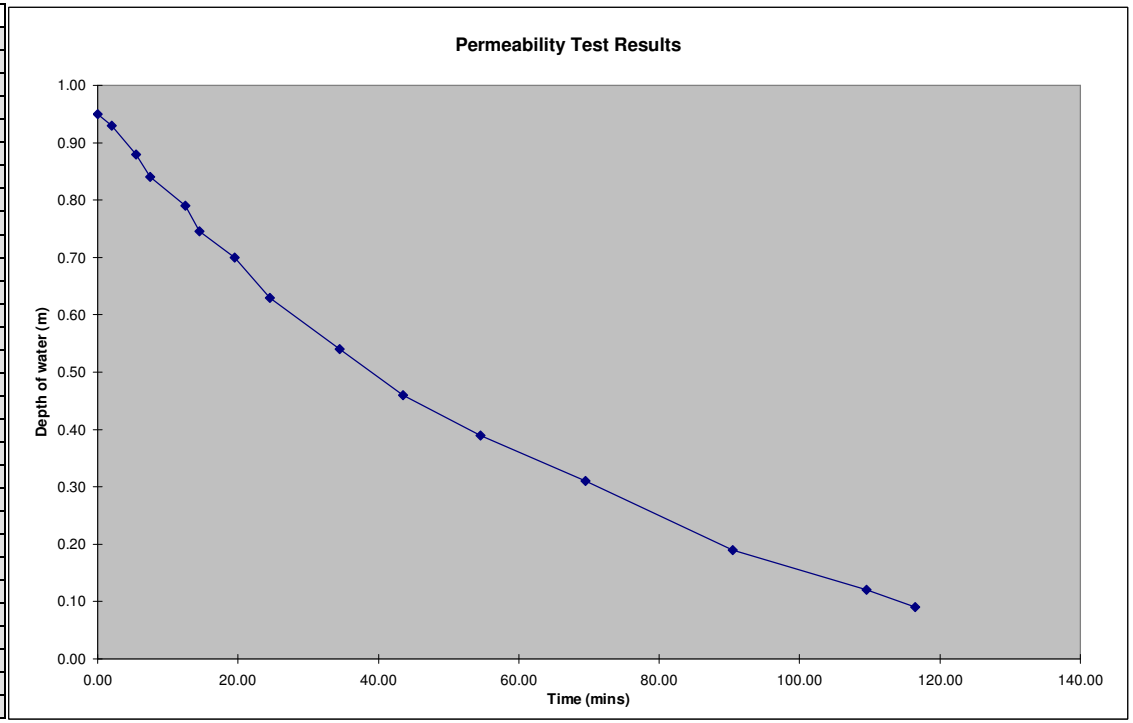
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	246A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7125	0.4750	0.2375
Time (mins)	18	42	82

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.95	0.65	0.850
2.00	0.93	0.67	0.870
5.50	0.88	0.72	0.920
7.50	0.84	0.76	0.960
12.50	0.79	0.81	1.010
14.50	0.75	0.86	1.055
19.50	0.70	0.90	1.100
24.50	0.63	0.97	1.170
34.50	0.54	1.06	1.260
43.50	0.46	1.14	1.340
54.50	0.39	1.21	1.410
69.50	0.31	1.29	1.490
90.50	0.19	1.41	1.610
109.50	0.12	1.48	1.680
116.50	0.09	1.51	1.710



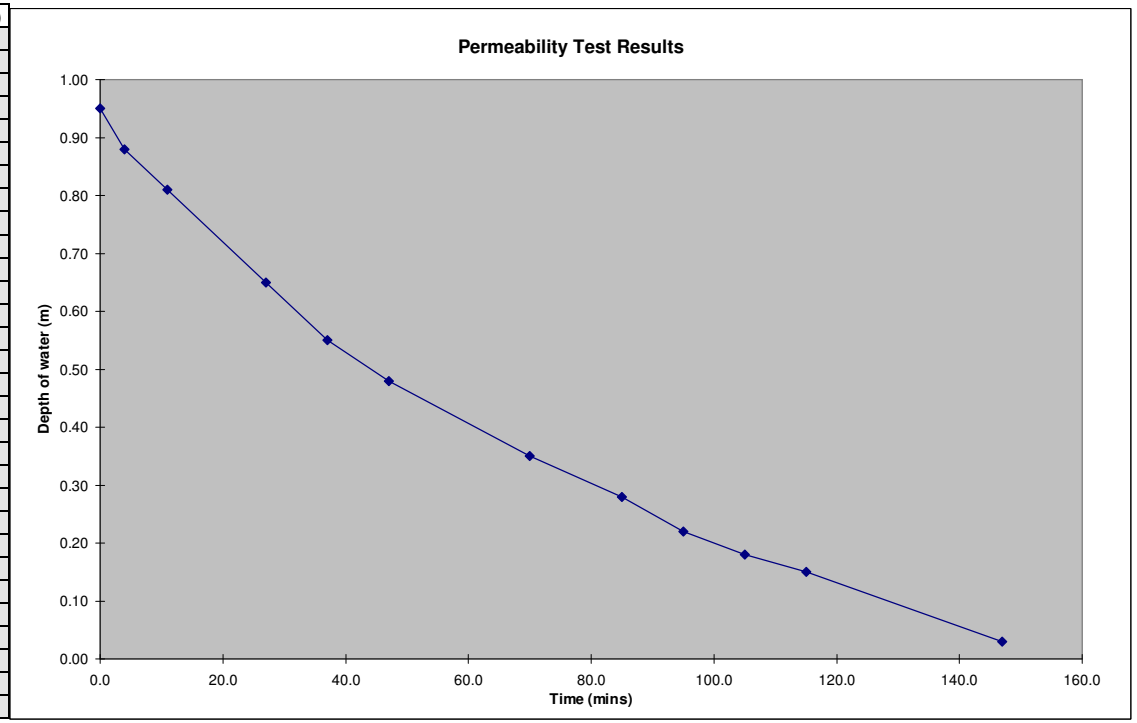
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	246A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7125	0.4750	0.2375
Time (mins)	21	48	93

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.95	0.65	0.850
4.0	0.88	0.72	0.920
11.0	0.81	0.79	0.990
27.0	0.65	0.95	1.150
37.0	0.55	1.05	1.250
47.0	0.48	1.12	1.320
70.0	0.35	1.25	1.450
85.0	0.28	1.32	1.520
95.0	0.22	1.38	1.580
105.0	0.18	1.42	1.620
115.0	0.15	1.45	1.650
147.0	0.03	1.57	1.770



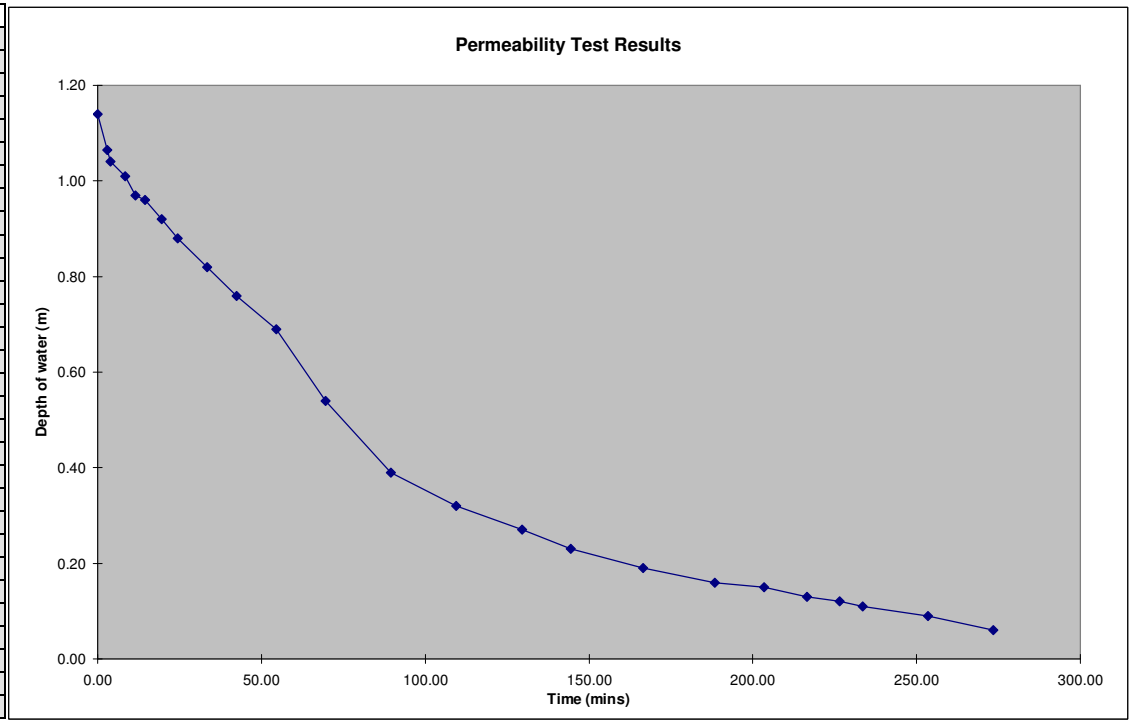
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	246B
Depth of Trial Pit (m)=	1.95
Length of Trial Pit (m)=	3.00
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8550	0.5700	0.2850
Time (mins)	28	67	124

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.14	0.81	0.810
3.00	1.07	0.89	0.885
4.00	1.04	0.91	0.910
8.50	1.01	0.94	0.940
11.50	0.97	0.98	0.980
14.50	0.96	0.99	0.990
19.50	0.92	1.03	1.030
24.50	0.88	1.07	1.070
33.50	0.82	1.13	1.130
42.50	0.76	1.19	1.190
54.50	0.69	1.26	1.260
69.50	0.54	1.41	1.410
89.50	0.39	1.56	1.560
109.50	0.32	1.63	1.630
129.50	0.27	1.68	1.680
144.50	0.23	1.72	1.720
166.50	0.19	1.76	1.760
188.50	0.16	1.79	1.790
203.50	0.15	1.80	1.800
216.50	0.13	1.82	1.820
226.50	0.12	1.83	1.830
233.50	0.11	1.84	1.840
253.50	0.09	1.86	1.860
273.50	0.06	1.89	1.890



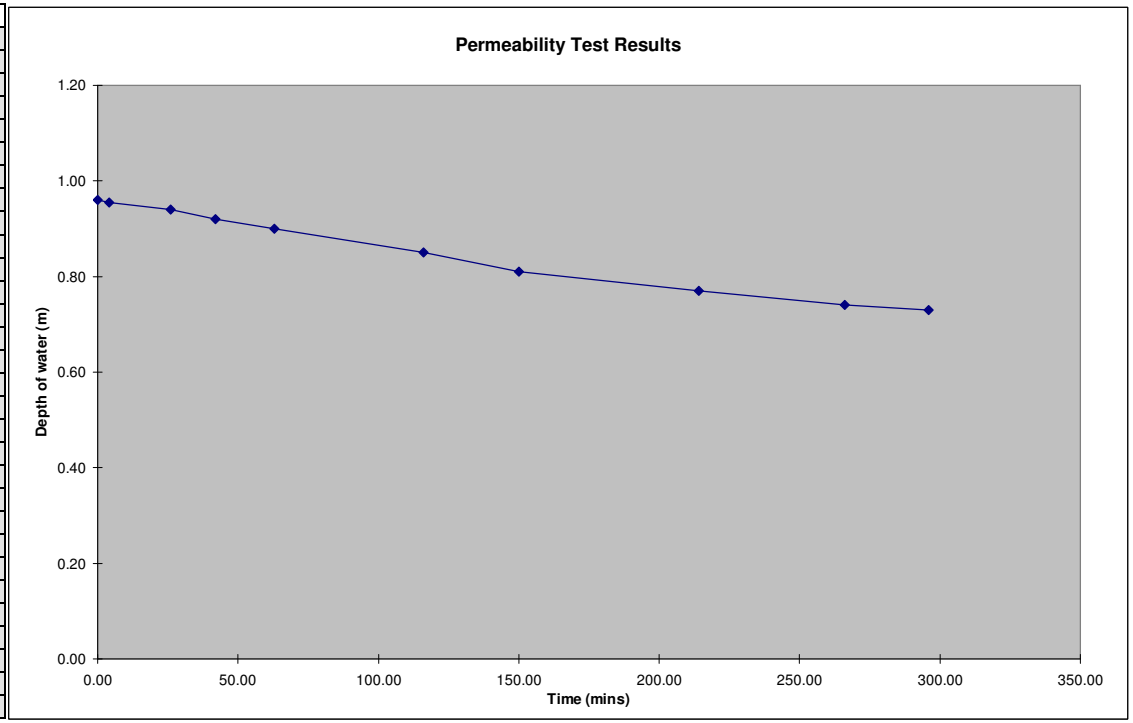
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP247A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7200	0.4800	0.2400
Time (mins)	326	1046	1766

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.96	0.64	1.040
4.00	0.96	0.65	1.045
26.00	0.94	0.66	1.060
42.00	0.92	0.68	1.080
63.00	0.90	0.70	1.100
116.00	0.85	0.75	1.150
150.00	0.81	0.79	1.190
214.00	0.77	0.83	1.230
266.00	0.74	0.86	1.260
296.00	0.73	0.87	1.270



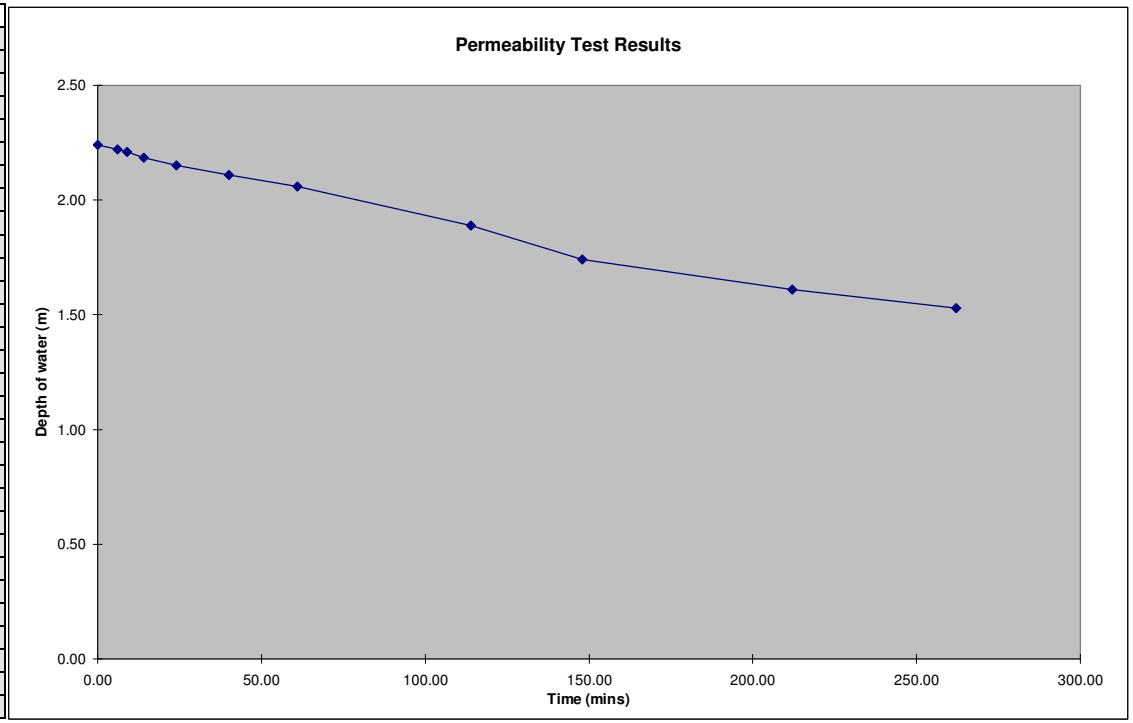
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP247B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.800

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6800	1.1200	0.5600
Time (mins)	178	518	868

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.24	0.76	1.560
6.00	2.22	0.78	1.580
9.00	2.21	0.79	1.590
14.00	2.19	0.82	1.615
24.00	2.15	0.85	1.650
40.00	2.11	0.89	1.690
61.00	2.06	0.94	1.740
114.00	1.89	1.11	1.910
148.00	1.74	1.26	2.060
212.00	1.61	1.39	2.190
262.00	1.53	1.47	2.270



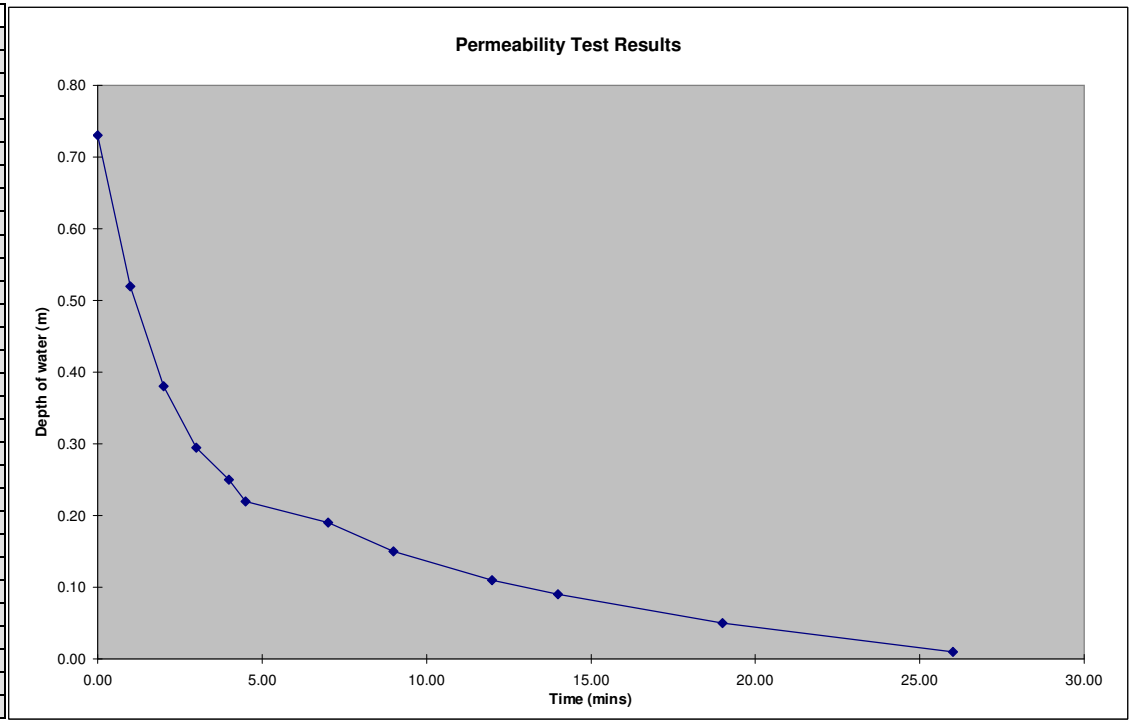
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	248A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.020

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5475	0.3650	0.1825
Time (mins)	1	2	7

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.73	0.87	0.890
1.00	0.52	1.08	1.100
2.00	0.38	1.22	1.240
3.00	0.30	1.31	1.325
4.00	0.25	1.35	1.370
4.50	0.22	1.38	1.400
7.00	0.19	1.41	1.430
9.00	0.15	1.45	1.470
12.00	0.11	1.49	1.510
14.00	0.09	1.51	1.530
19.00	0.05	1.55	1.570
26.00	0.01	1.59	1.610



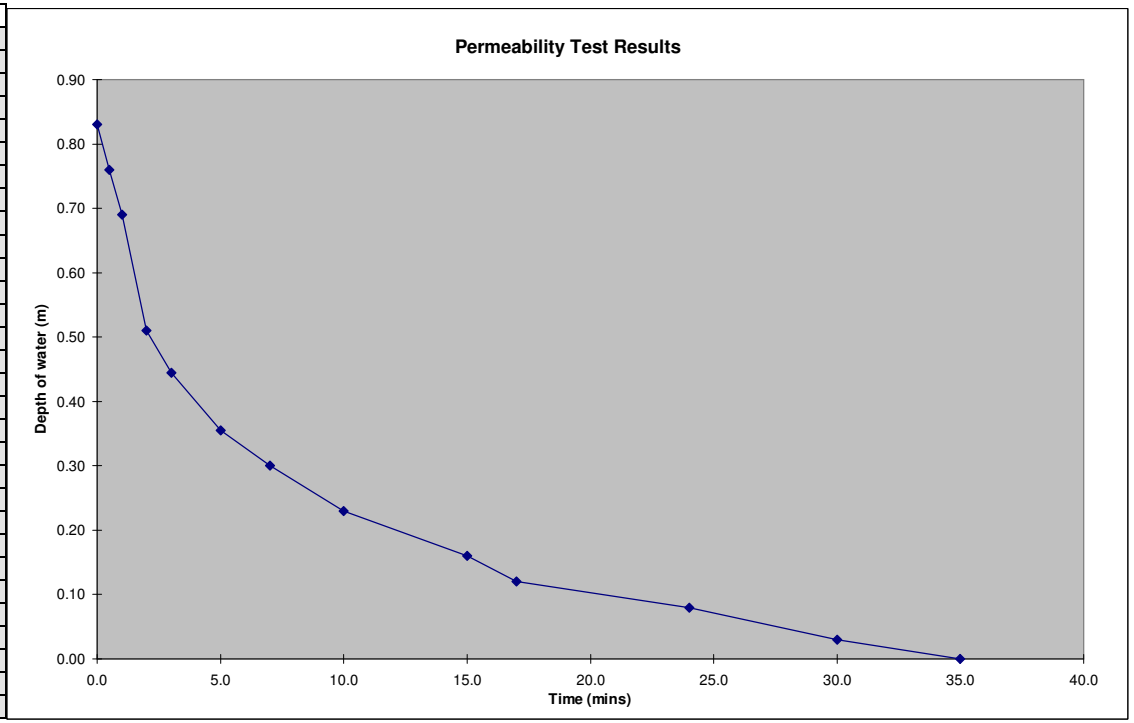
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	248A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.020

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6225	0.4150	0.2075
Time (mins)	1	4	12

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.83	0.77	0.790
0.5	0.76	0.84	0.860
1.0	0.69	0.91	0.930
2.0	0.51	1.09	1.110
3.0	0.45	1.16	1.175
5.0	0.36	1.25	1.265
7.0	0.30	1.30	1.320
10.0	0.23	1.37	1.390
15.0	0.16	1.44	1.460
17.0	0.12	1.48	1.500
24.0	0.08	1.52	1.540
30.0	0.03	1.57	1.590
35.0	0.00	1.60	1.620



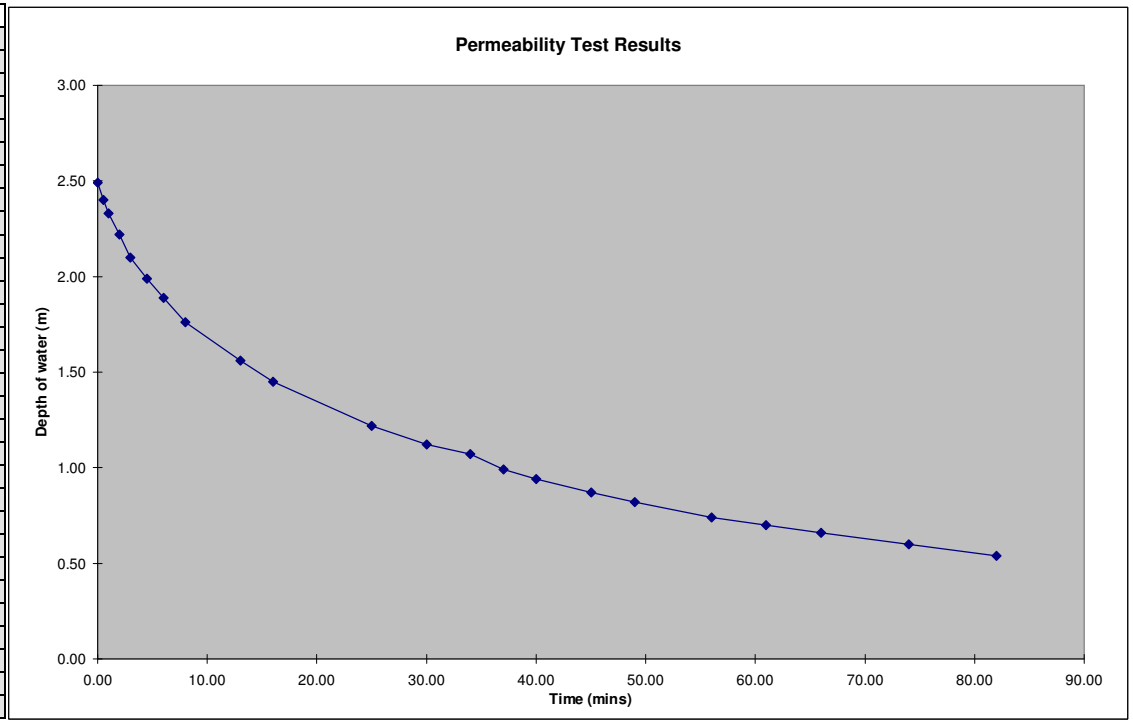
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	248B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.500
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8675	1.2450	0.6225
Time (mins)	6	24	71

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.49	0.51	0.510
0.50	2.40	0.60	0.600
1.00	2.33	0.67	0.670
2.00	2.22	0.78	0.780
3.00	2.10	0.90	0.900
4.50	1.99	1.01	1.010
6.00	1.89	1.11	1.110
8.00	1.76	1.24	1.240
13.00	1.56	1.44	1.440
16.00	1.45	1.55	1.550
25.00	1.22	1.78	1.780
30.00	1.12	1.88	1.880
34.00	1.07	1.93	1.930
37.00	0.99	2.01	2.010
40.00	0.94	2.06	2.060
45.00	0.87	2.13	2.130
49.00	0.82	2.18	2.180
56.00	0.74	2.26	2.260
61.00	0.70	2.30	2.300
66.00	0.66	2.34	2.340
74.00	0.60	2.40	2.400
82.00	0.54	2.46	2.460



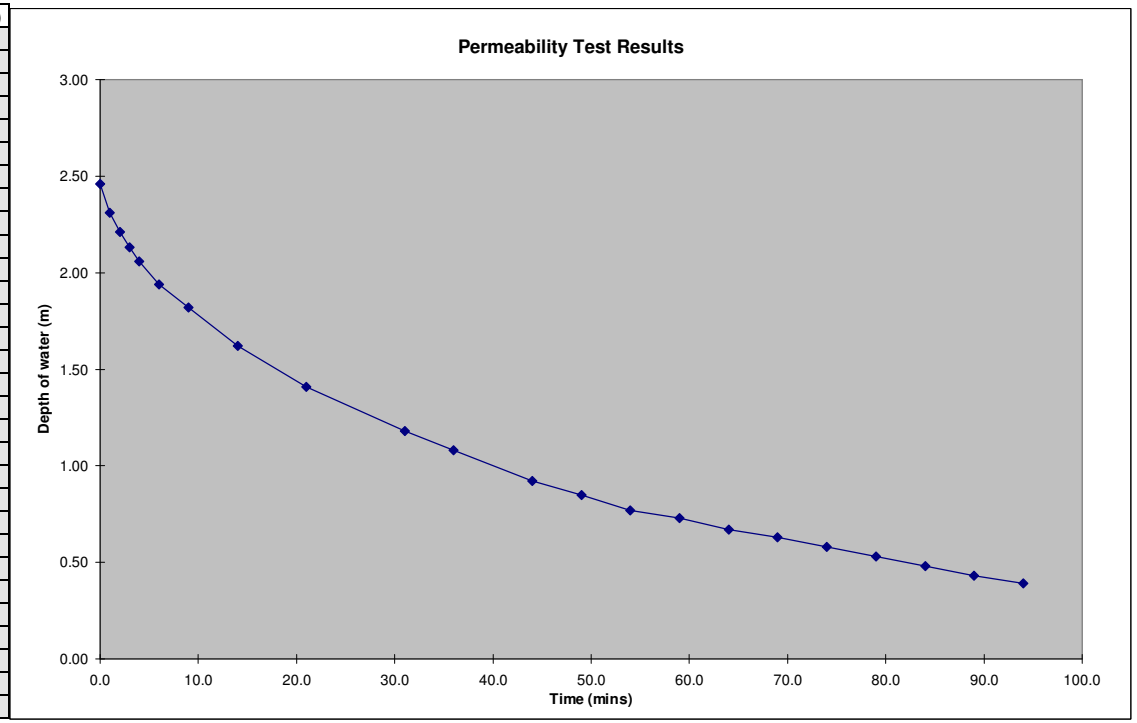
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	248B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.500
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8450	1.2300	0.6150
Time (mins)	8	29	71

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.46	0.54	0.540
1.0	2.31	0.69	0.690
2.0	2.21	0.79	0.790
3.0	2.13	0.87	0.870
4.0	2.06	0.94	0.940
6.0	1.94	1.06	1.060
9.0	1.82	1.18	1.180
14.0	1.62	1.38	1.380
21.0	1.41	1.59	1.590
31.0	1.18	1.82	1.820
36.0	1.08	1.92	1.920
44.0	0.92	2.08	2.080
49.0	0.85	2.15	2.150
54.0	0.77	2.23	2.230
59.0	0.73	2.27	2.270
64.0	0.67	2.33	2.330
69.0	0.63	2.37	2.370
74.0	0.58	2.42	2.420
79.0	0.53	2.47	2.470
84.0	0.48	2.52	2.520
89.0	0.43	2.57	2.570
94.0	0.39	2.61	2.610



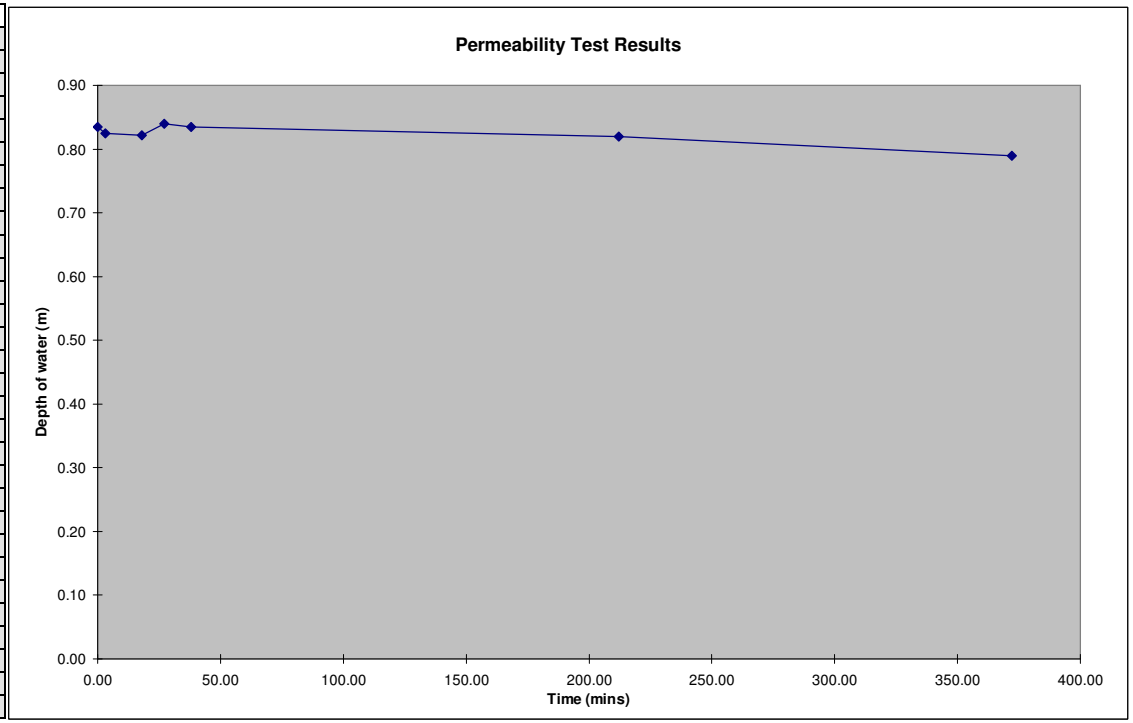
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP249A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6263	0.4175	0.2088
Time (mins)	1552	3039	4526

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.84	0.72	0.715
3.00	0.83	0.73	0.725
18.00	0.82	0.73	0.728
27.00	0.84	0.71	0.710
38.00	0.84	0.72	0.715
212.00	0.82	0.73	0.730
372.00	0.79	0.76	0.760



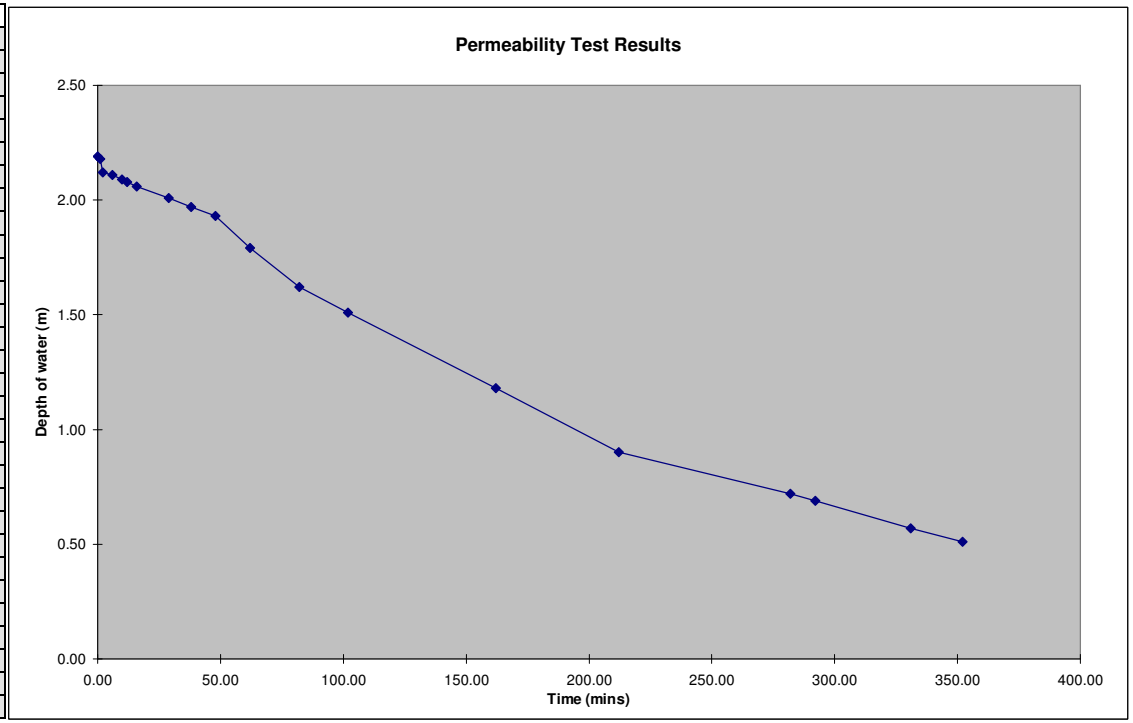
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP249B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6425	1.0950	0.5475
Time (mins)	82	178	339

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.19	0.81	0.810
1.00	2.18	0.82	0.820
2.00	2.12	0.88	0.880
6.00	2.11	0.89	0.890
10.00	2.09	0.91	0.910
12.00	2.08	0.92	0.920
16.00	2.06	0.94	0.940
29.00	2.01	0.99	0.990
38.00	1.97	1.03	1.030
48.00	1.93	1.07	1.070
62.00	1.79	1.21	1.210
82.00	1.62	1.38	1.380
102.00	1.51	1.49	1.490
162.00	1.18	1.82	1.820
212.00	0.90	2.10	2.100
282.00	0.72	2.28	2.280
292.00	0.69	2.31	2.310
331.00	0.57	2.43	2.430
352.00	0.51	2.49	2.490



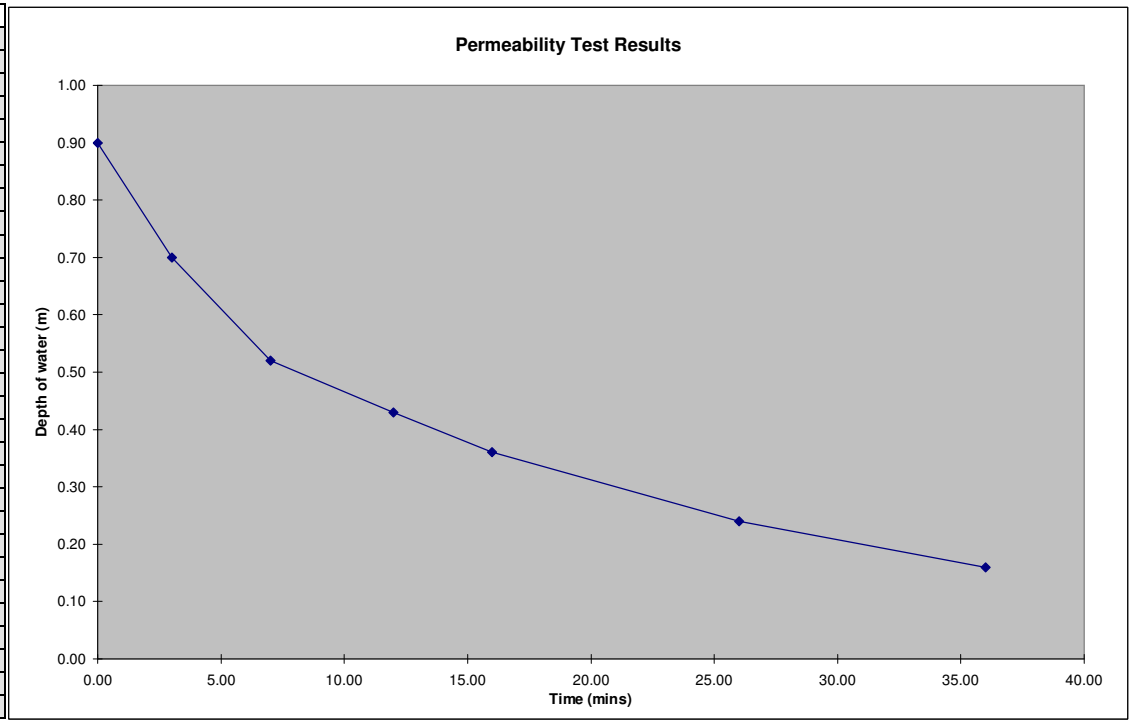
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	250A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6750	0.4500	0.2250
Time (mins)	4	11	28

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.90	0.60	0.900
3.00	0.70	0.80	1.100
7.00	0.52	0.98	1.280
12.00	0.43	1.07	1.370
16.00	0.36	1.14	1.440
26.00	0.24	1.26	1.560
36.00	0.16	1.34	1.640



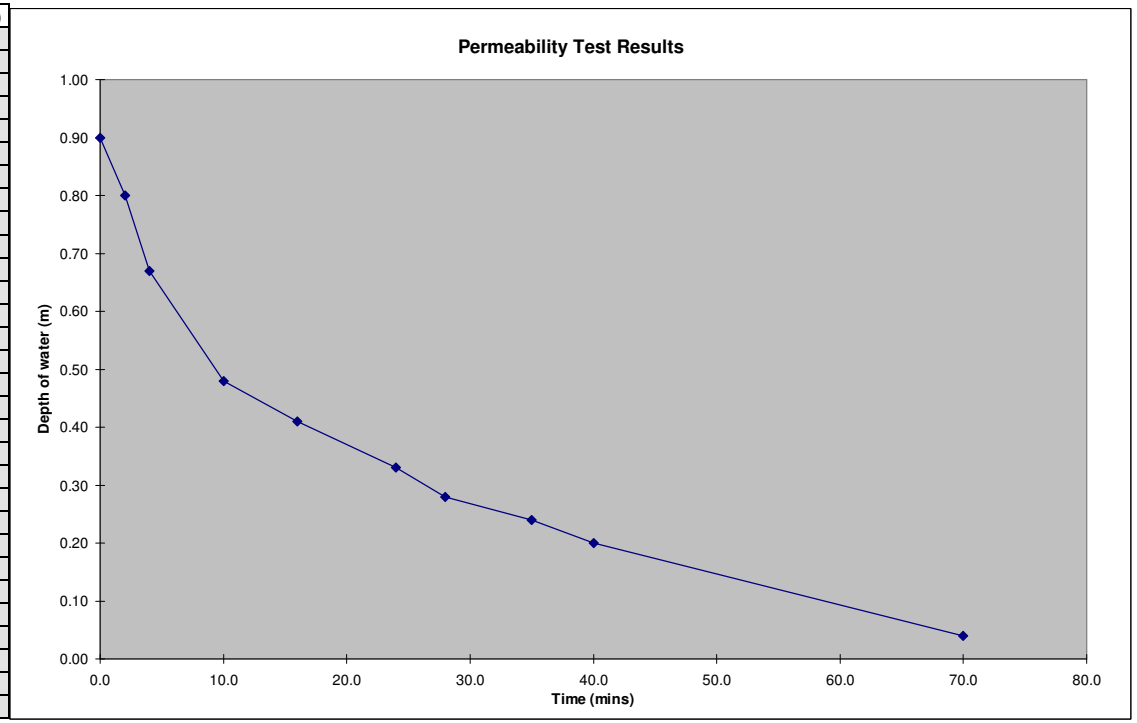
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	250A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6750	0.4500	0.2250
Time (mins)	4	13	37

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.90	0.60	0.900
2.0	0.80	0.70	1.000
4.0	0.67	0.83	1.130
10.0	0.48	1.02	1.320
16.0	0.41	1.09	1.390
24.0	0.33	1.17	1.470
28.0	0.28	1.22	1.520
35.0	0.24	1.26	1.560
40.0	0.20	1.30	1.600
70.0	0.04	1.46	1.760



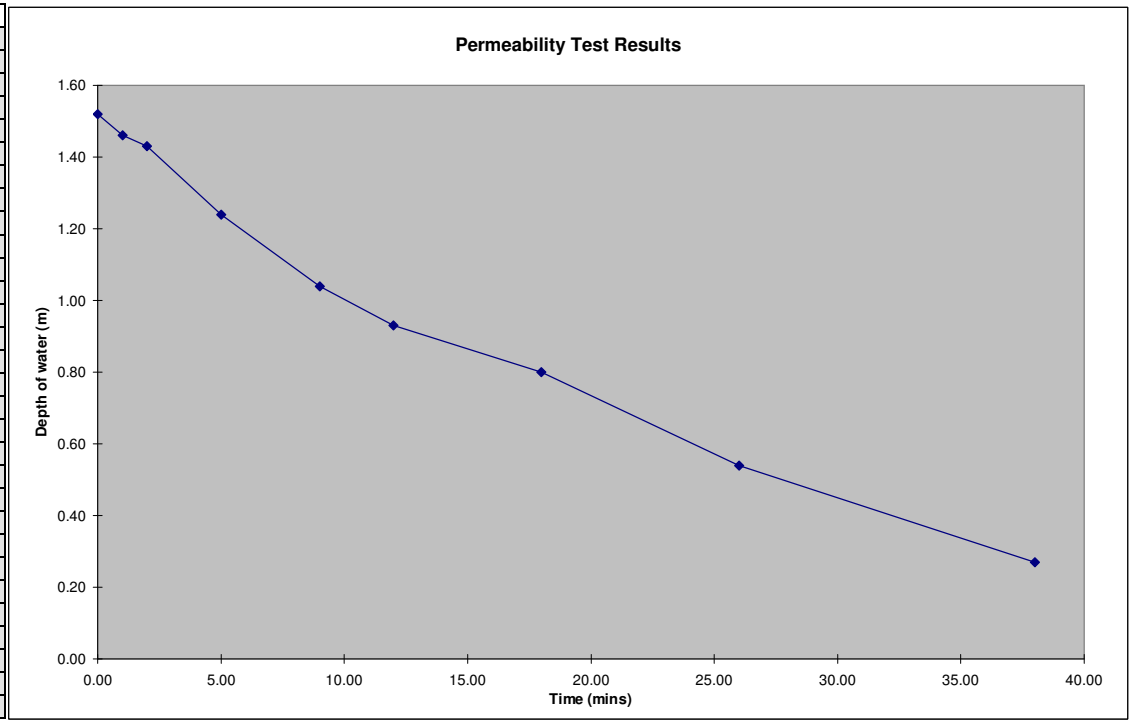
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	250B
Depth of Trial Pit (m)=	2.20
Length of Trial Pit (m)=	2.60
Breadth of Trial Pit (m)=	0.750
No of runs	2
Pipe upstand (m)	0.600

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1400	0.7600	0.3800
Time (mins)	7	19	33

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.52	0.68	1.280
1.00	1.46	0.74	1.340
2.00	1.43	0.77	1.370
5.00	1.24	0.96	1.560
9.00	1.04	1.16	1.760
12.00	0.93	1.27	1.870
18.00	0.80	1.40	2.000
26.00	0.54	1.66	2.260
38.00	0.27	1.93	2.530



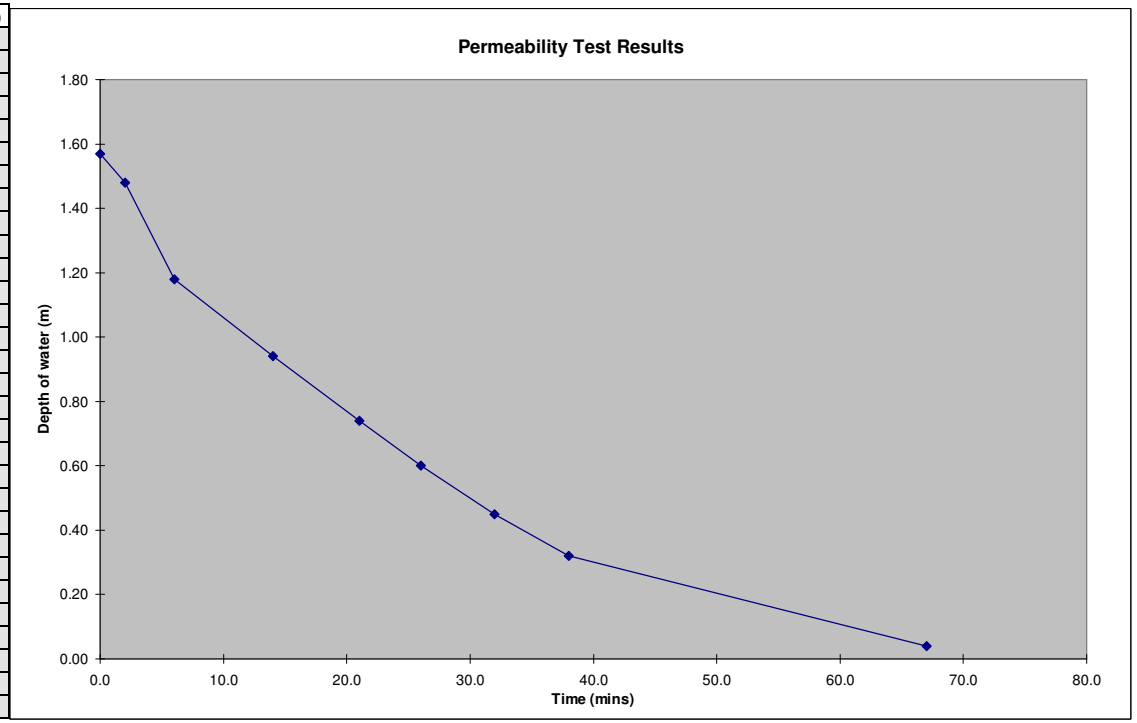
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	250B
Depth of Trial Pit (m)=	2.20
Length of Trial Pit (m)=	2.60
Breadth of Trial Pit (m)=	0.750
No of runs	2.00
Pipe upstand (m)	0.600

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1775	0.7850	0.3925
Time (mins)	6	19	35

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.57	0.63	1.230
2.0	1.48	0.72	1.320
6.0	1.18	1.02	1.620
14.0	0.94	1.26	1.860
21.0	0.74	1.46	2.060
26.0	0.60	1.60	2.200
32.0	0.45	1.75	2.350
38.0	0.32	1.88	2.480
67.0	0.04	2.16	2.760



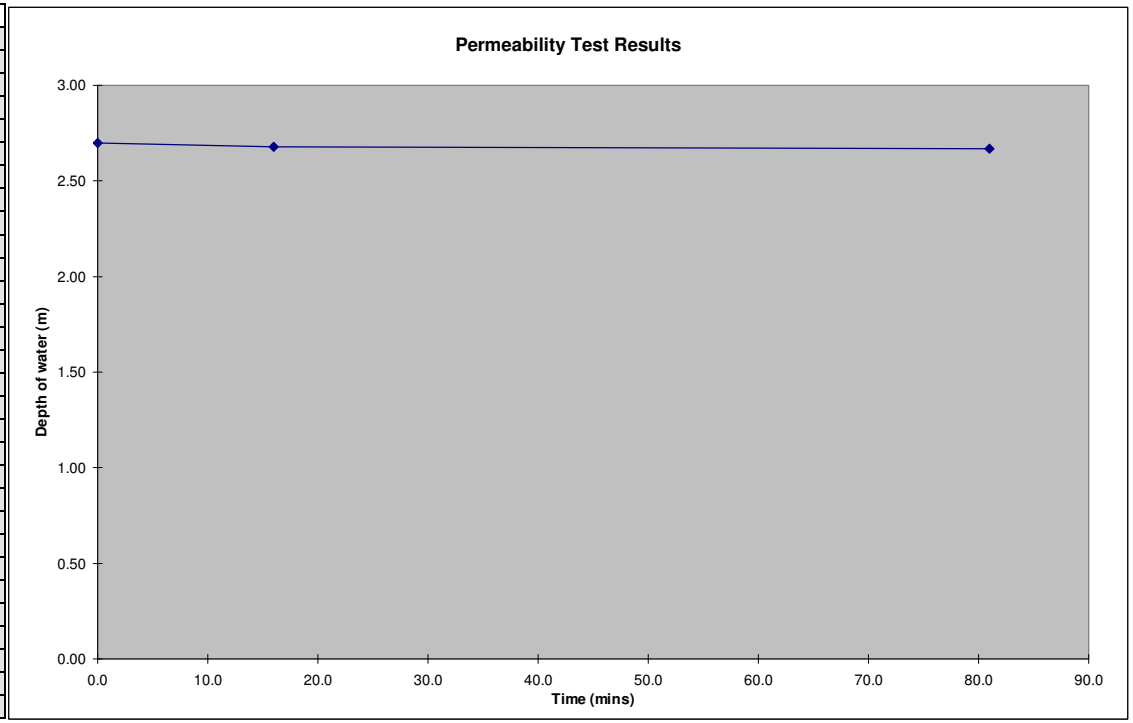
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	251B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.55
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.0250	1.3500	0.6750
Time (mins)	4274	8661	13049

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.70	0.00	0.000
16.0	2.68	0.02	0.020
81.0	2.67	0.03	0.030



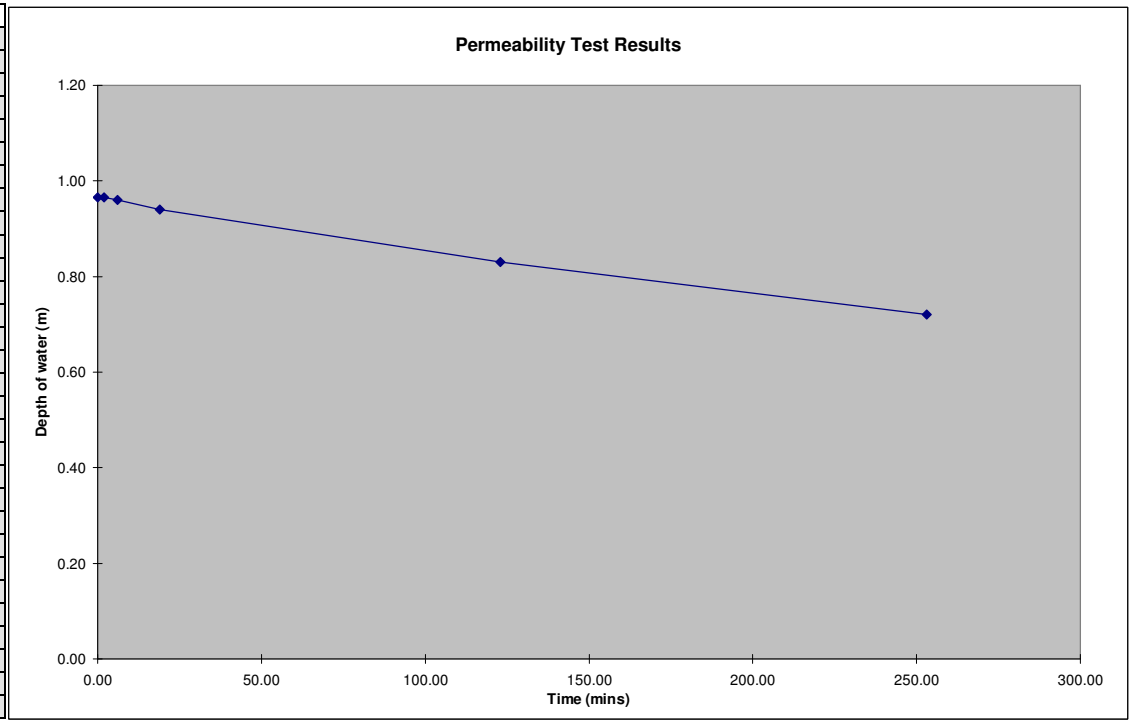
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	252A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7238	0.4825	0.2413
Time (mins)	249	534	819

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.97	0.54	0.535
2.00	0.97	0.54	0.535
6.00	0.96	0.54	0.540
19.00	0.94	0.56	0.560
123.00	0.83	0.67	0.670
253.00	0.72	0.78	0.780



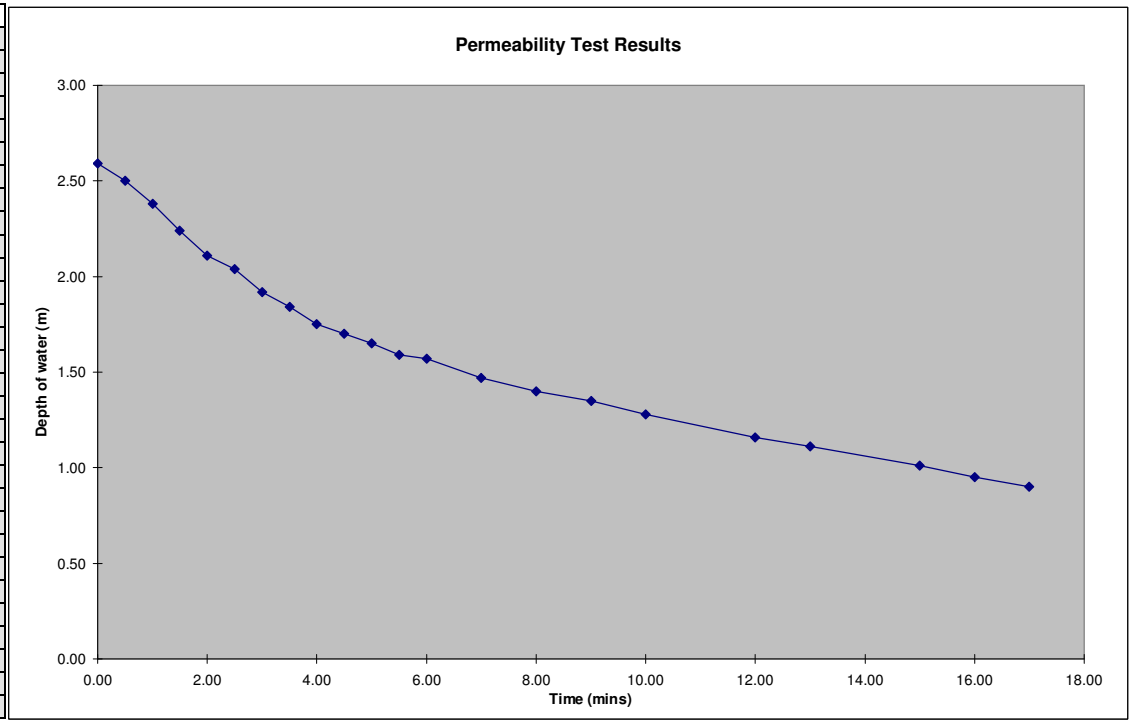
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	252B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.9425	1.2950	0.6475
Time (mins)	3	10	22

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.59	0.41	0.410
0.50	2.50	0.50	0.500
1.00	2.38	0.62	0.620
1.50	2.24	0.76	0.760
2.00	2.11	0.89	0.890
2.50	2.04	0.96	0.960
3.00	1.92	1.08	1.080
3.50	1.84	1.16	1.160
4.00	1.75	1.25	1.250
4.50	1.70	1.30	1.300
5.00	1.65	1.35	1.350
5.50	1.59	1.41	1.410
6.00	1.57	1.43	1.430
7.00	1.47	1.53	1.530
8.00	1.40	1.60	1.600
9.00	1.35	1.65	1.650
10.00	1.28	1.72	1.720
12.00	1.16	1.84	1.840
13.00	1.11	1.89	1.890
15.00	1.01	1.99	1.990
16.00	0.95	2.05	2.050
17.00	0.90	2.10	2.100



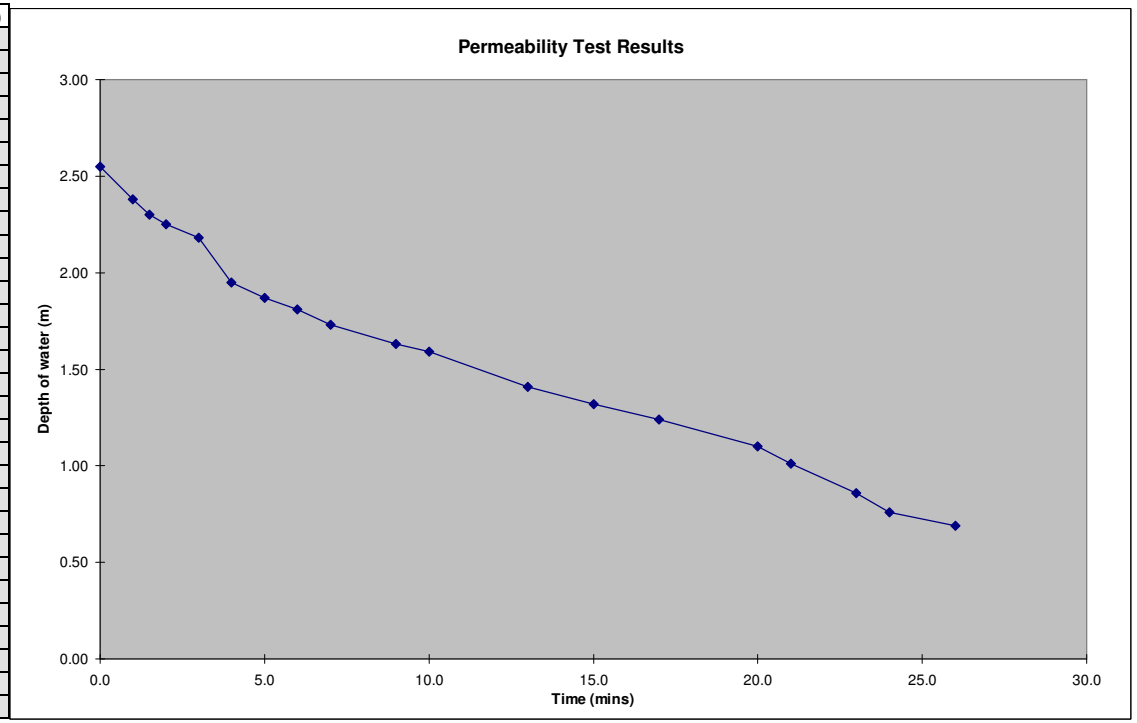
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	252B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.9125	1.2750	0.6375
Time (mins)	4	16	28

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.55	0.45	0.450
1.0	2.38	0.62	0.620
1.5	2.30	0.70	0.700
2.0	2.25	0.75	0.750
3.0	2.18	0.82	0.820
4.0	1.95	1.05	1.050
5.0	1.87	1.13	1.130
6.0	1.81	1.19	1.190
7.0	1.73	1.27	1.270
9.0	1.63	1.37	1.370
10.0	1.59	1.41	1.410
13.0	1.41	1.59	1.590
15.0	1.32	1.68	1.680
17.0	1.24	1.76	1.760
20.0	1.10	1.90	1.900
21.0	1.01	1.99	1.990
23.0	0.86	2.14	2.140
24.0	0.76	2.24	2.240
26.0	0.69	2.31	2.310



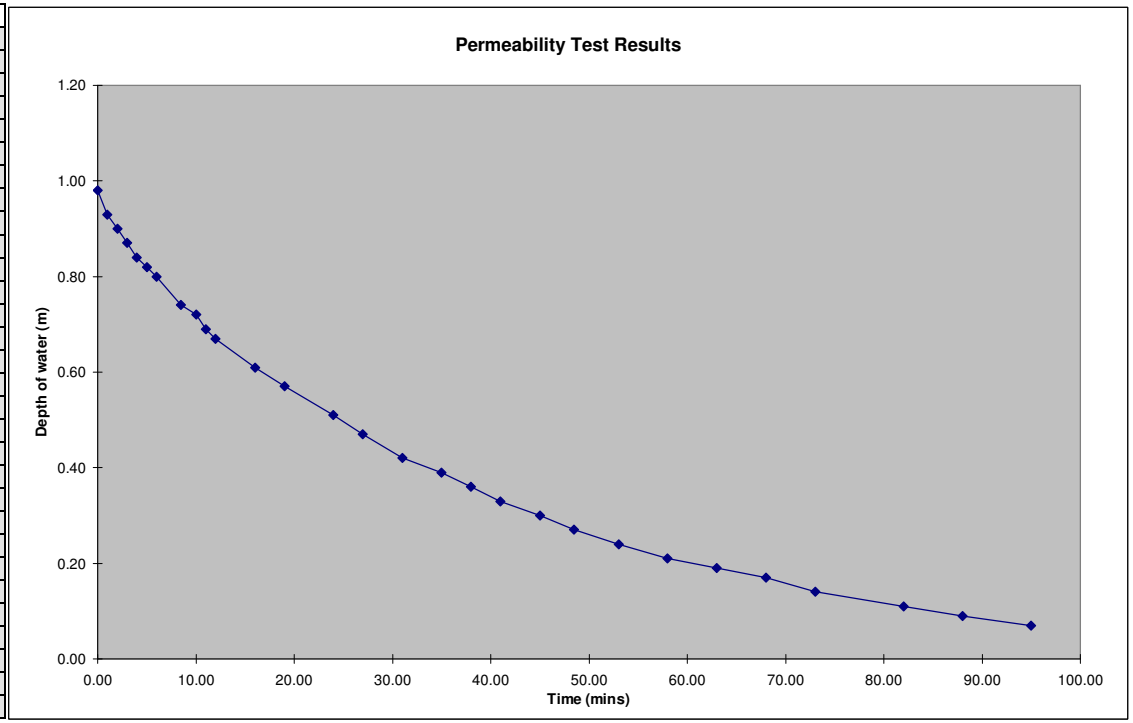
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	253A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.500
No of runs	2
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7350	0.4900	0.2450
Time (mins)	9	25	52

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.98	0.52	0.920
1.00	0.93	0.57	0.970
2.00	0.90	0.60	1.000
3.00	0.87	0.63	1.030
4.00	0.84	0.66	1.060
5.00	0.82	0.68	1.080
6.00	0.80	0.70	1.100
8.50	0.74	0.76	1.160
10.00	0.72	0.78	1.180
11.00	0.69	0.81	1.210
12.00	0.67	0.83	1.230
16.00	0.61	0.89	1.290
19.00	0.57	0.93	1.330
24.00	0.51	0.99	1.390
27.00	0.47	1.03	1.430
31.00	0.42	1.08	1.480
35.00	0.39	1.11	1.510
38.00	0.36	1.14	1.540
41.00	0.33	1.17	1.570
45.00	0.30	1.20	1.600
48.50	0.27	1.23	1.630
53.00	0.24	1.26	1.660
58.00	0.21	1.29	1.690
63.00	0.19	1.31	1.710
68.00	0.17	1.33	1.730
73.00	0.14	1.36	1.760
82.00	0.11	1.39	1.790
88.00	0.09	1.41	1.810
95.00	0.07	1.43	1.830



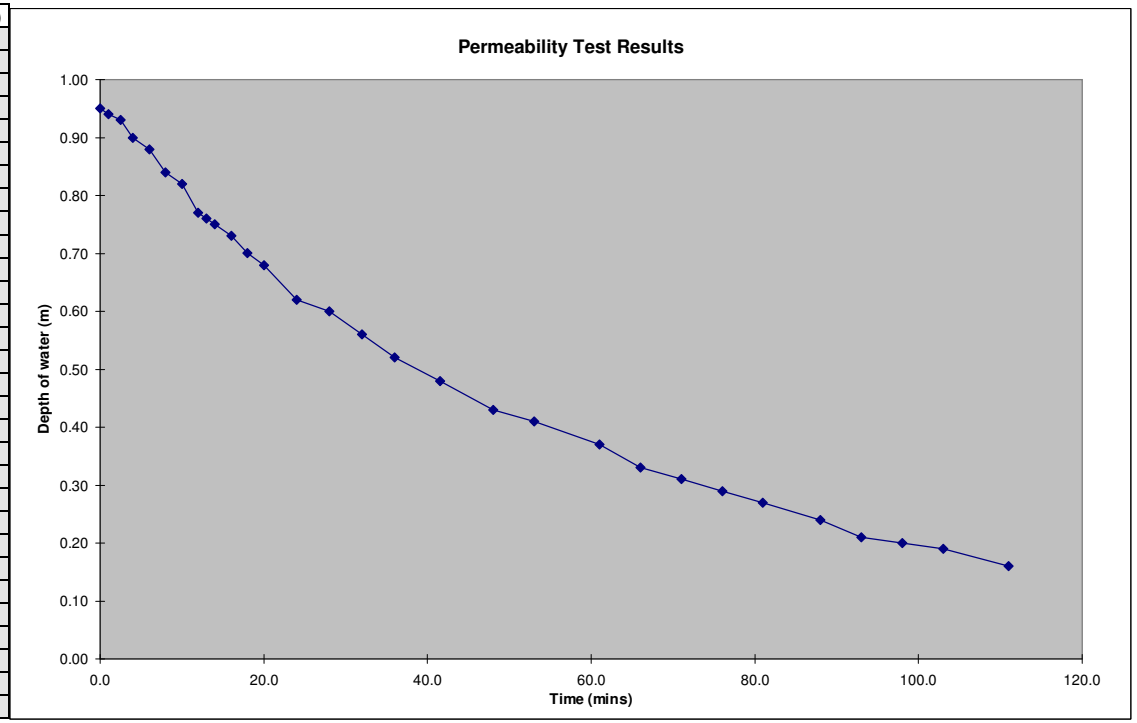
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	253A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.500
No of runs	2.00
Pipe upstand (m)	0.400

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7125	0.4750	0.2375
Time (mins)	17	42	88

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.95	0.55	0.950
1.0	0.94	0.56	0.960
2.5	0.93	0.57	0.970
4.0	0.90	0.60	1.000
6.0	0.88	0.62	1.020
8.0	0.84	0.66	1.060
10.0	0.82	0.68	1.080
12.0	0.77	0.73	1.130
13.0	0.76	0.74	1.140
14.0	0.75	0.75	1.150
16.0	0.73	0.77	1.170
18.0	0.70	0.80	1.200
20.0	0.68	0.82	1.220
24.0	0.62	0.88	1.280
28.0	0.60	0.90	1.300
32.0	0.56	0.94	1.340
36.0	0.52	0.98	1.380
41.5	0.48	1.02	1.420
48.0	0.43	1.07	1.470
53.0	0.41	1.09	1.490
61.0	0.37	1.13	1.530
66.0	0.33	1.17	1.570
71.0	0.31	1.19	1.590
76.0	0.29	1.21	1.610
81.0	0.27	1.23	1.630
88.0	0.24	1.26	1.660
93.0	0.21	1.29	1.690
98.0	0.20	1.30	1.700
103.0	0.19	1.31	1.710
111.0	0.16	1.34	1.740



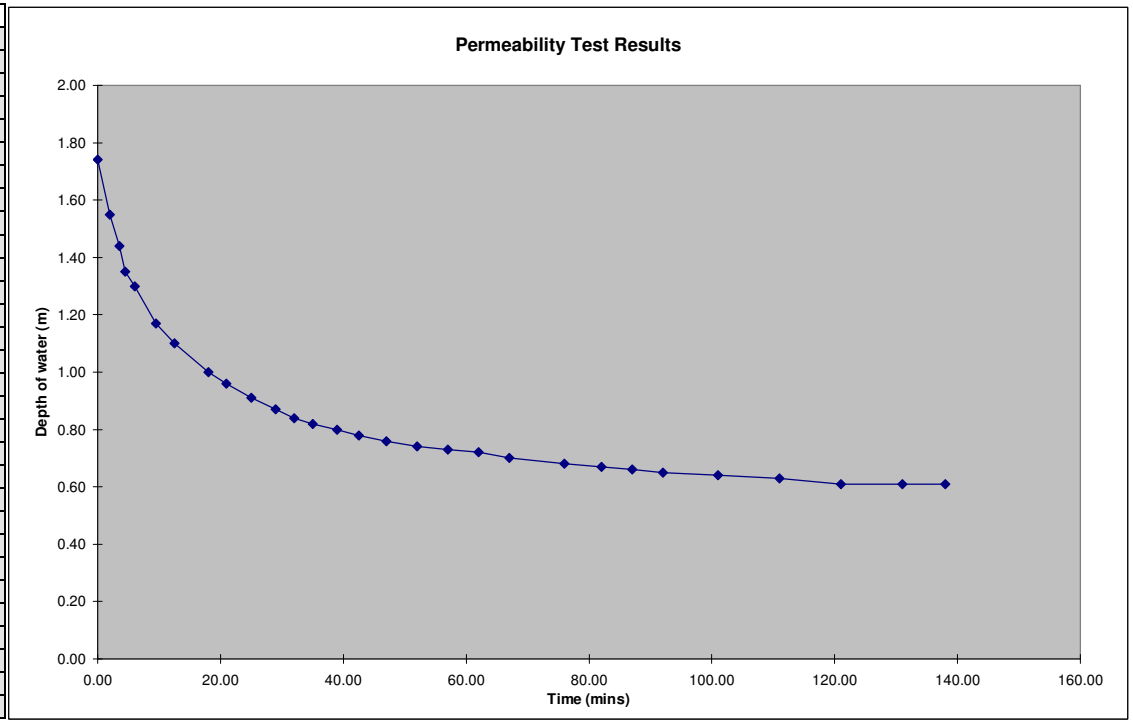
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	253B
Depth of Trial Pit (m)=	2.65
Length of Trial Pit (m)=	1.95
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.3050	0.8700	0.4350
Time (mins)	6	29	298

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.74	0.91	0.910
2.00	1.55	1.10	1.100
3.50	1.44	1.21	1.210
4.50	1.35	1.30	1.300
6.00	1.30	1.35	1.350
9.50	1.17	1.48	1.480
12.50	1.10	1.55	1.550
18.00	1.00	1.65	1.650
21.00	0.96	1.69	1.690
25.00	0.91	1.74	1.740
29.00	0.87	1.78	1.780
32.00	0.84	1.81	1.810
35.00	0.82	1.83	1.830
39.00	0.80	1.85	1.850
42.50	0.78	1.87	1.870
47.00	0.76	1.89	1.890
52.00	0.74	1.91	1.910
57.00	0.73	1.92	1.920
62.00	0.72	1.93	1.930
67.00	0.70	1.95	1.950
76.00	0.68	1.97	1.970
82.00	0.67	1.98	1.980
87.00	0.66	1.99	1.990
92.00	0.65	2.00	2.000
101.00	0.64	2.01	2.010
111.00	0.63	2.02	2.020
121.00	0.61	2.04	2.040
131.00	0.61	2.04	2.040
138.00	0.61	2.04	2.040



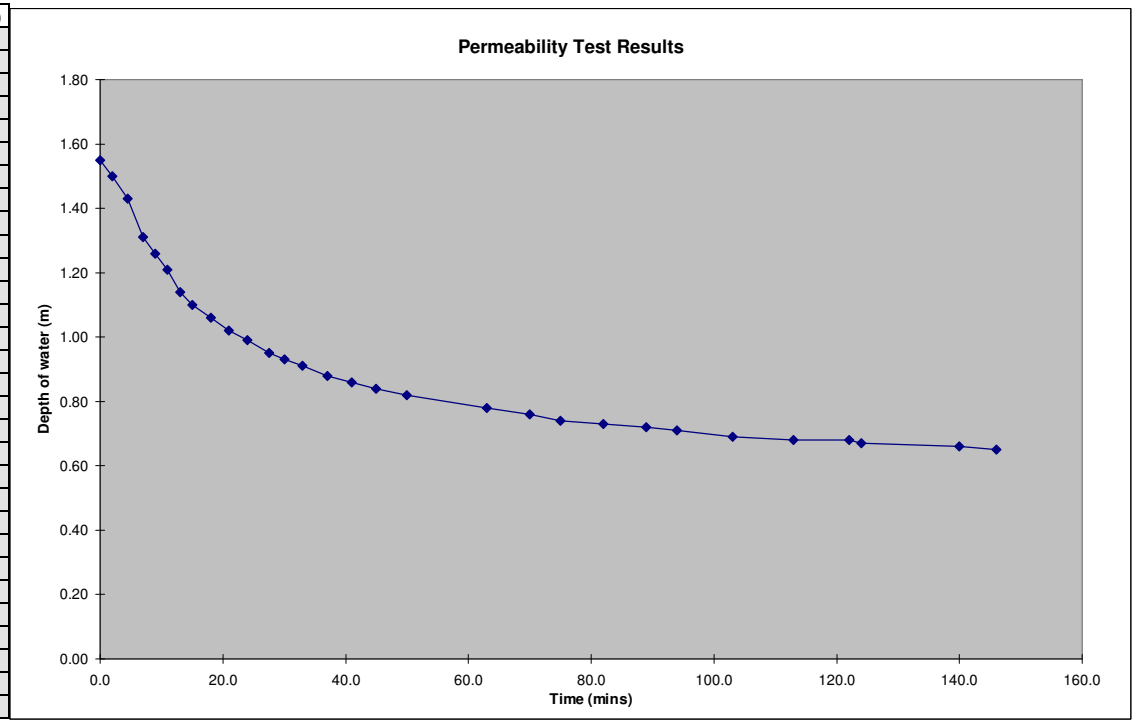
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	253B
Depth of Trial Pit (m)=	2.65
Length of Trial Pit (m)=	1.95
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1625	0.7750	0.3875
Time (mins)	12	65	410

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.55	1.10	1.100
2.0	1.50	1.15	1.150
4.5	1.43	1.22	1.220
7.0	1.31	1.34	1.340
9.0	1.26	1.39	1.390
11.0	1.21	1.44	1.440
13.0	1.14	1.51	1.510
15.0	1.10	1.55	1.550
18.0	1.06	1.59	1.590
21.0	1.02	1.63	1.630
24.0	0.99	1.66	1.660
27.5	0.95	1.70	1.700
30.0	0.93	1.72	1.720
33.0	0.91	1.74	1.740
37.0	0.88	1.77	1.770
41.0	0.86	1.79	1.790
45.0	0.84	1.81	1.810
50.0	0.82	1.83	1.830
63.0	0.78	1.87	1.870
70.0	0.76	1.89	1.890
75.0	0.74	1.91	1.910
82.0	0.73	1.92	1.920
89.0	0.72	1.93	1.930
94.0	0.71	1.94	1.940
103.0	0.69	1.96	1.960
113.0	0.68	1.97	1.970
122.0	0.68	1.97	1.970
124.0	0.67	1.98	1.980
140.0	0.66	1.99	1.990
146.0	0.65	2.00	2.000



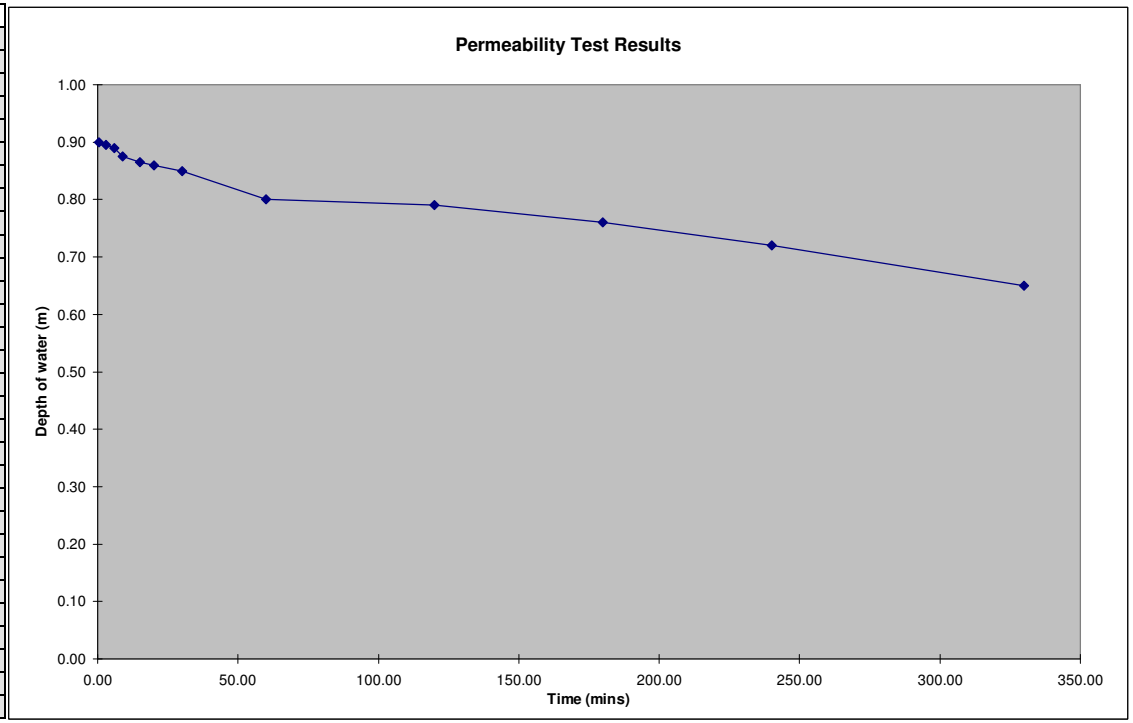
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	254A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.380

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6750	0.4500	0.2250
Time (mins)	298	587	876

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.50	0.90	0.65	1.030
3.00	0.90	0.66	1.035
6.00	0.89	0.66	1.040
9.00	0.88	0.68	1.055
15.00	0.87	0.69	1.065
20.00	0.86	0.69	1.070
30.00	0.85	0.70	1.080
60.00	0.80	0.75	1.130
120.00	0.79	0.76	1.140
180.00	0.76	0.79	1.170
240.00	0.72	0.83	1.210
330.00	0.65	0.90	1.280



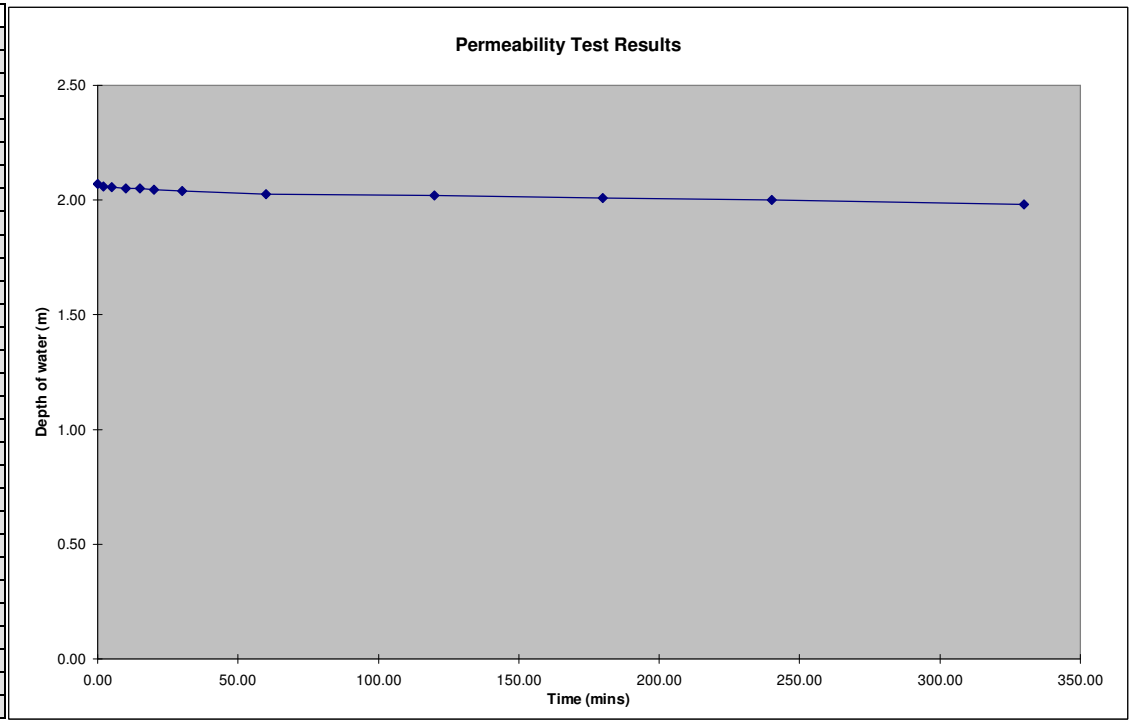
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	254B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	-0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5525	1.0350	0.5175
Time (mins)	2254	4582	6911

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.07	0.93	0.830
2.00	2.06	0.94	0.840
5.00	2.06	0.95	0.845
10.00	2.05	0.95	0.850
15.00	2.05	0.95	0.850
20.00	2.05	0.96	0.855
30.00	2.04	0.96	0.860
60.00	2.03	0.98	0.875
120.00	2.02	0.98	0.880
180.00	2.01	0.99	0.890
240.00	2.00	1.00	0.900
330.00	1.98	1.02	0.920



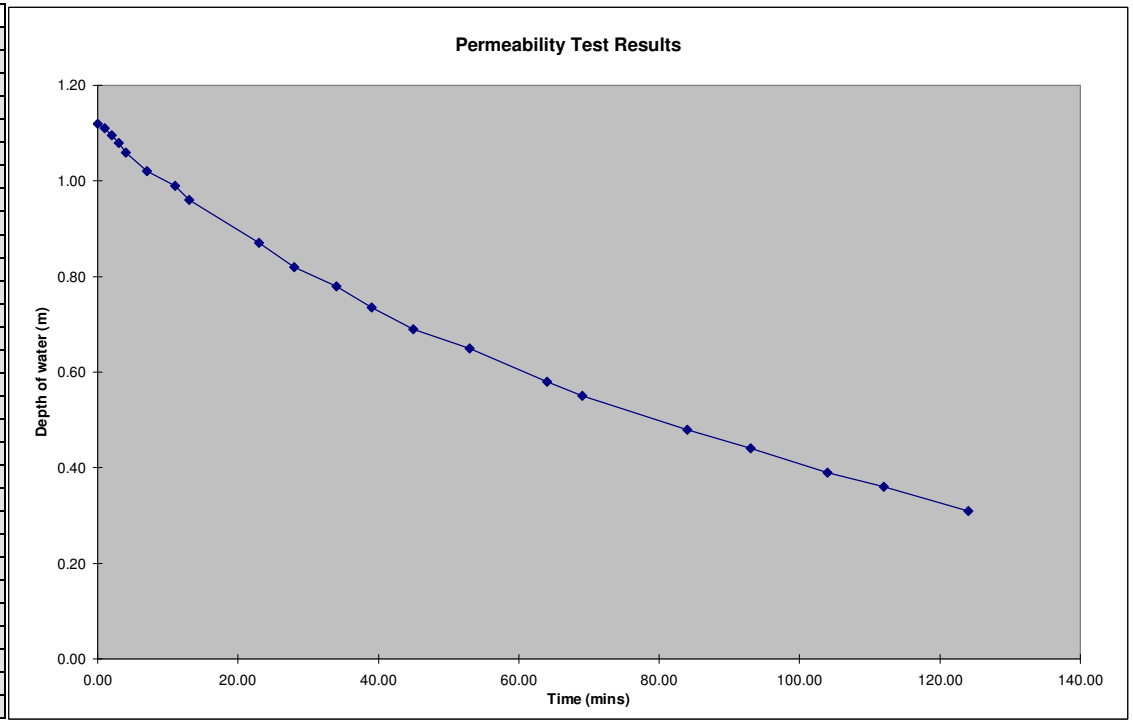
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	255A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.500
No of runs	1
Pipe upstand (m)	0.500

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8400	0.5600	0.2800
Time (mins)	26	67	132

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.12	0.48	0.980
1.00	1.11	0.49	0.990
2.00	1.10	0.51	1.005
3.00	1.08	0.52	1.020
4.00	1.06	0.54	1.040
7.00	1.02	0.58	1.080
11.00	0.99	0.61	1.110
13.00	0.96	0.64	1.140
23.00	0.87	0.73	1.230
28.00	0.82	0.78	1.280
34.00	0.78	0.82	1.320
39.00	0.74	0.87	1.365
45.00	0.69	0.91	1.410
53.00	0.65	0.95	1.450
64.00	0.58	1.02	1.520
69.00	0.55	1.05	1.550
84.00	0.48	1.12	1.620
93.00	0.44	1.16	1.660
104.00	0.39	1.21	1.710
112.00	0.36	1.24	1.740
124.00	0.31	1.29	1.790



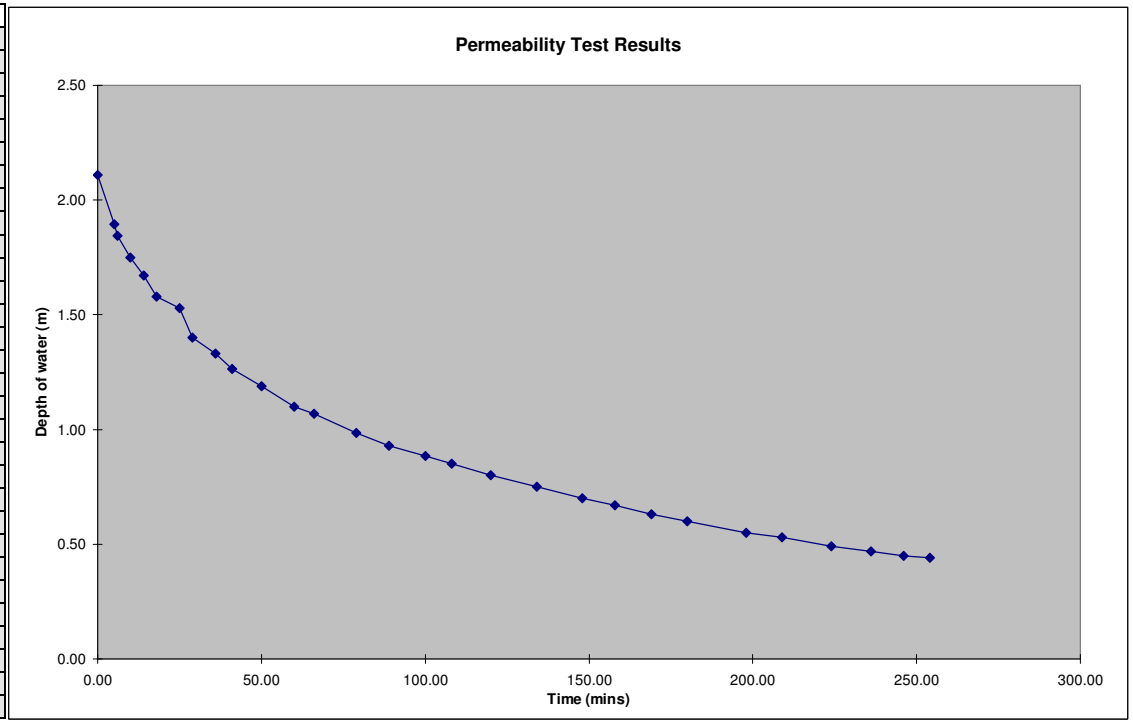
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	255B
Depth of Trial Pit (m)=	2.75
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.850
No of runs	1
Pipe upstand (m)	0.180

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5825	1.0550	0.5275
Time (mins)	18	68	210

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.11	0.64	0.820
5.00	1.90	0.86	1.035
6.00	1.85	0.91	1.085
10.00	1.75	1.00	1.180
14.00	1.67	1.08	1.260
18.00	1.58	1.17	1.350
25.00	1.53	1.22	1.400
29.00	1.40	1.35	1.530
36.00	1.33	1.42	1.600
41.00	1.27	1.49	1.665
50.00	1.19	1.56	1.740
60.00	1.10	1.65	1.830
66.00	1.07	1.68	1.860
79.00	0.99	1.77	1.945
89.00	0.93	1.82	2.000
100.00	0.89	1.87	2.045
108.00	0.85	1.90	2.080
120.00	0.80	1.95	2.130
134.00	0.75	2.00	2.180
148.00	0.70	2.05	2.230
158.00	0.67	2.08	2.260
169.00	0.63	2.12	2.300
180.00	0.60	2.15	2.330
198.00	0.55	2.20	2.380
209.00	0.53	2.22	2.400
224.00	0.49	2.26	2.440
236.00	0.47	2.28	2.460
246.00	0.45	2.30	2.480
254.00	0.44	2.31	2.490



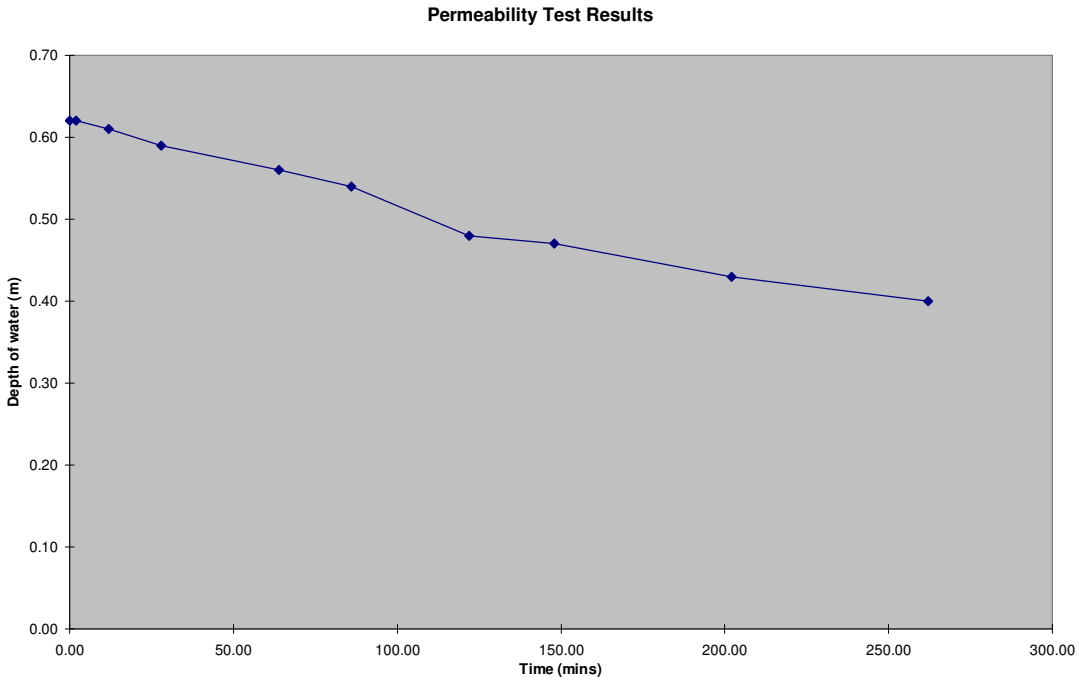
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	256A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4650	0.3100	0.1550
Time (mins)	155	442	752

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.62	0.98	0.980
2.00	0.62	0.98	0.980
12.00	0.61	0.99	0.990
28.00	0.59	1.01	1.010
64.00	0.56	1.04	1.040
86.00	0.54	1.06	1.060
122.00	0.48	1.12	1.120
148.00	0.47	1.13	1.130
202.00	0.43	1.17	1.170
262.00	0.40	1.20	1.200



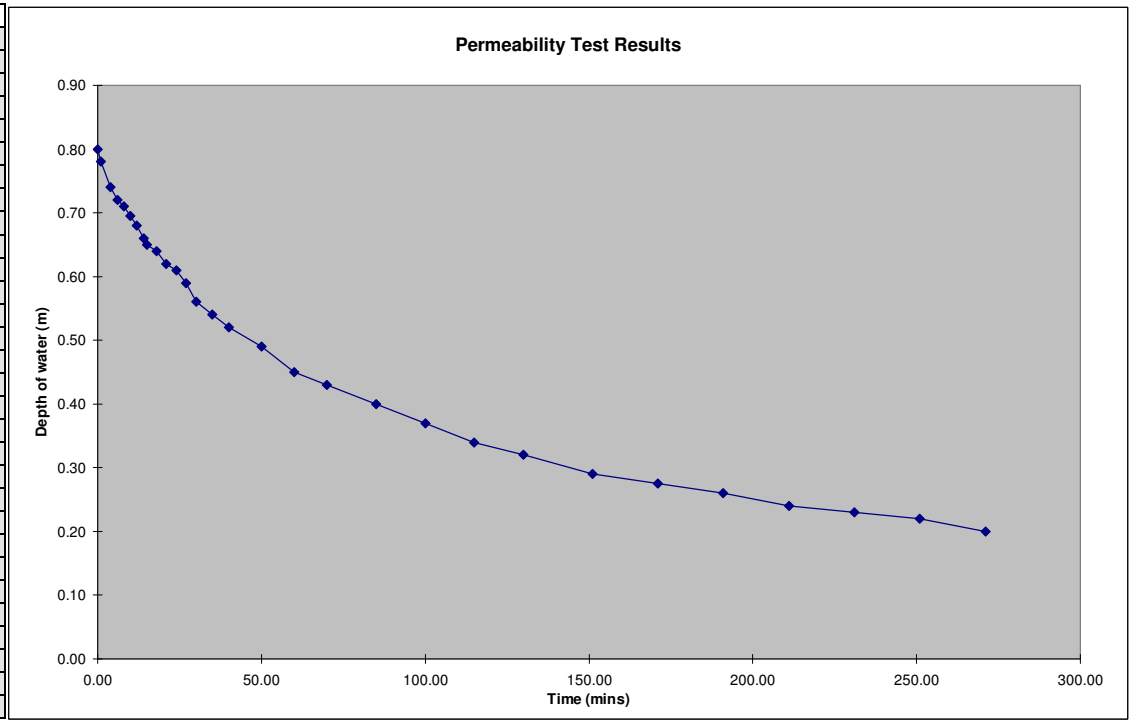
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	257A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.360

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6000	0.4000	0.2000
Time (mins)	24	85	272

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.80	0.75	1.110
1.00	0.78	0.77	1.130
4.00	0.74	0.81	1.170
6.00	0.72	0.83	1.190
8.00	0.71	0.84	1.200
10.00	0.70	0.86	1.215
12.00	0.68	0.87	1.230
14.00	0.66	0.89	1.250
15.00	0.65	0.90	1.260
18.00	0.64	0.91	1.270
21.00	0.62	0.93	1.290
24.00	0.61	0.94	1.300
27.00	0.59	0.96	1.320
30.00	0.56	0.99	1.350
35.00	0.54	1.01	1.370
40.00	0.52	1.03	1.390
50.00	0.49	1.06	1.420
60.00	0.45	1.10	1.460
70.00	0.43	1.12	1.480
85.00	0.40	1.15	1.510
100.00	0.37	1.18	1.540
115.00	0.34	1.21	1.570
130.00	0.32	1.23	1.590
151.00	0.29	1.26	1.620
171.00	0.28	1.28	1.635
191.00	0.26	1.29	1.650
211.00	0.24	1.31	1.670
231.00	0.23	1.32	1.680
251.00	0.22	1.33	1.690
271.00	0.20	1.35	1.710



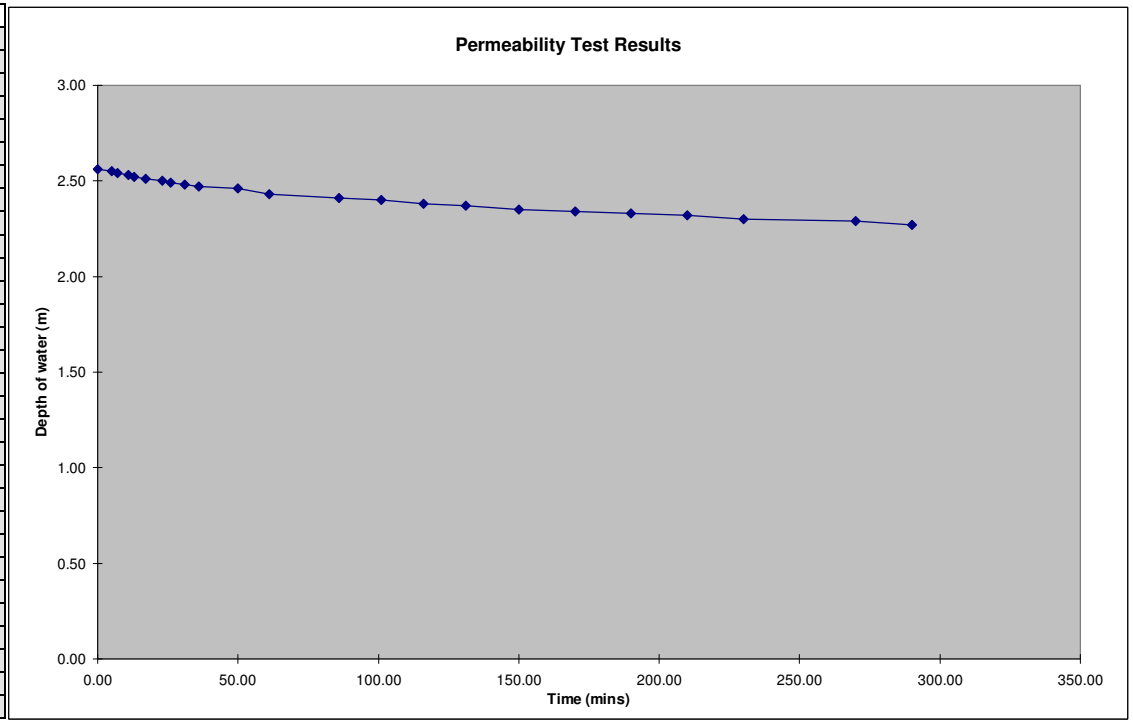
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	257B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.9200	1.2800	0.6400
Time (mins)	944	2133	3321

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.56	0.44	0.440
5.00	2.55	0.45	0.450
7.00	2.54	0.46	0.460
11.00	2.53	0.47	0.470
13.00	2.52	0.48	0.480
17.00	2.51	0.49	0.490
23.00	2.50	0.50	0.500
26.00	2.49	0.51	0.510
31.00	2.48	0.52	0.520
36.00	2.47	0.53	0.530
50.00	2.46	0.54	0.540
61.00	2.43	0.57	0.570
86.00	2.41	0.59	0.590
101.00	2.40	0.60	0.600
116.00	2.38	0.62	0.620
131.00	2.37	0.63	0.630
150.00	2.35	0.65	0.650
170.00	2.34	0.66	0.660
190.00	2.33	0.67	0.670
210.00	2.32	0.68	0.680
230.00	2.30	0.70	0.700
270.00	2.29	0.71	0.710
290.00	2.27	0.73	0.730



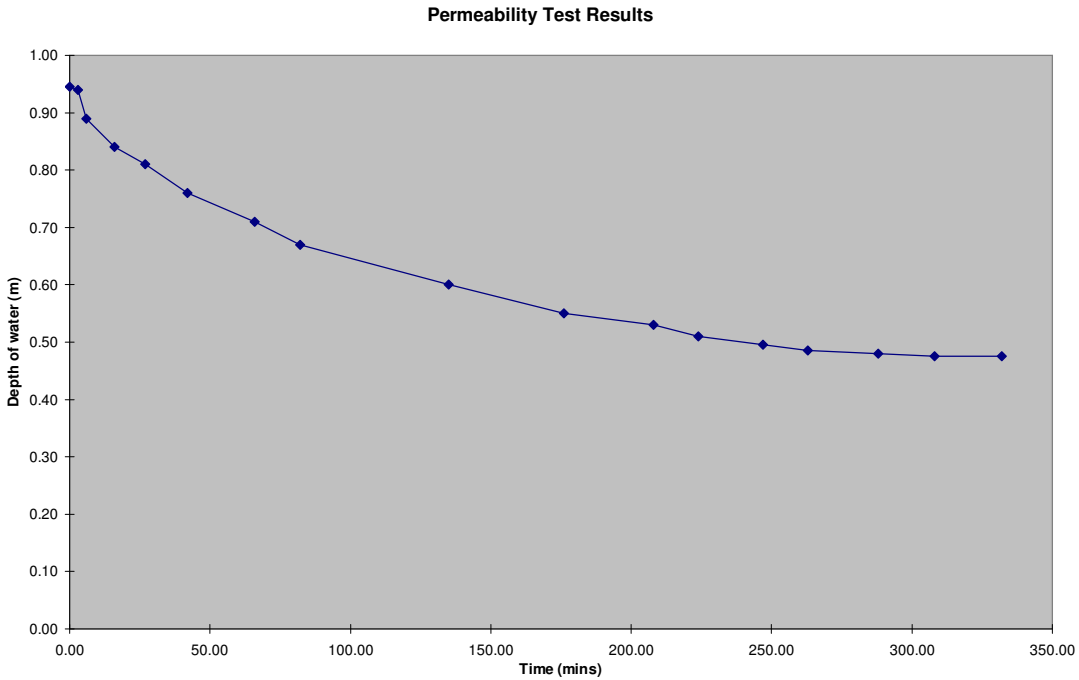
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	259A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7088	0.4725	0.2363
Time (mins)	67	334	1695

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.95	0.56	0.555
3.00	0.94	0.56	0.560
6.00	0.89	0.61	0.610
16.00	0.84	0.66	0.660
27.00	0.81	0.69	0.690
42.00	0.76	0.74	0.740
66.00	0.71	0.79	0.790
82.00	0.67	0.83	0.830
135.00	0.60	0.90	0.900
176.00	0.55	0.95	0.950
208.00	0.53	0.97	0.970
224.00	0.51	0.99	0.990
247.00	0.50	1.01	1.005
263.00	0.49	1.02	1.015
288.00	0.48	1.02	1.020
308.00	0.48	1.03	1.025
332.00	0.48	1.03	1.025



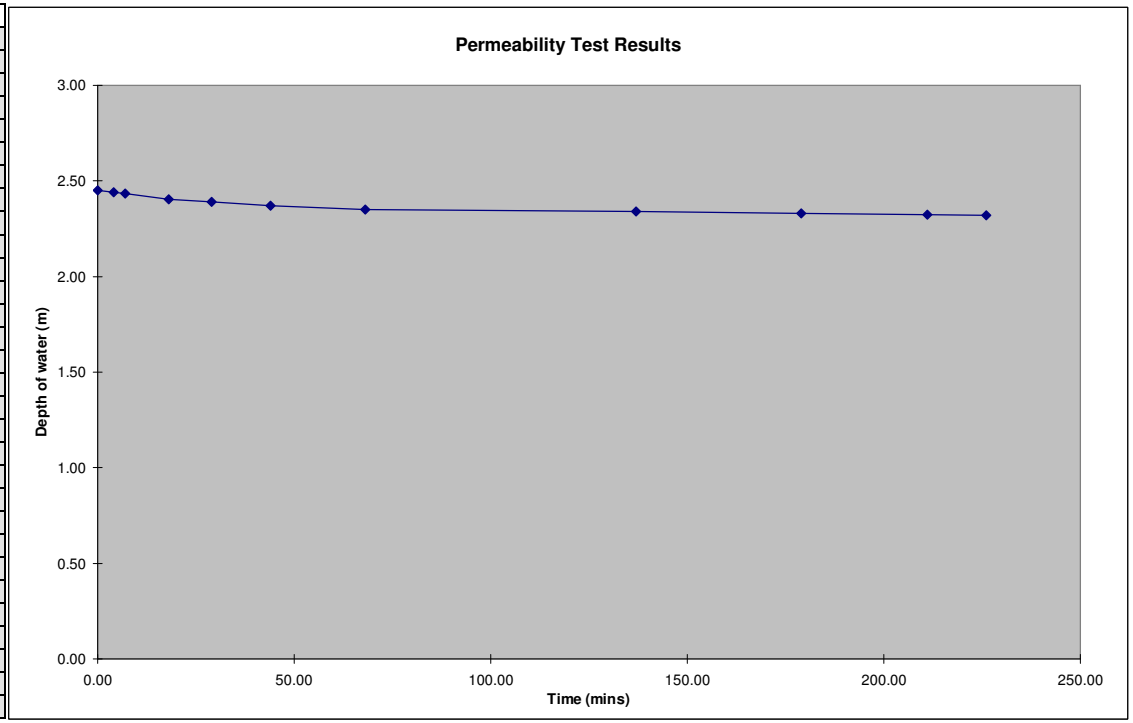
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	259B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.20
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8375	1.2250	0.6125
Time (mins)	1673	3511	5348

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.45	0.55	0.550
4.00	2.44	0.56	0.560
7.00	2.44	0.57	0.565
18.00	2.41	0.60	0.595
29.00	2.39	0.61	0.610
44.00	2.37	0.63	0.630
68.00	2.35	0.65	0.650
137.00	2.34	0.66	0.660
179.00	2.33	0.67	0.670
211.00	2.33	0.68	0.675
226.00	2.32	0.68	0.680



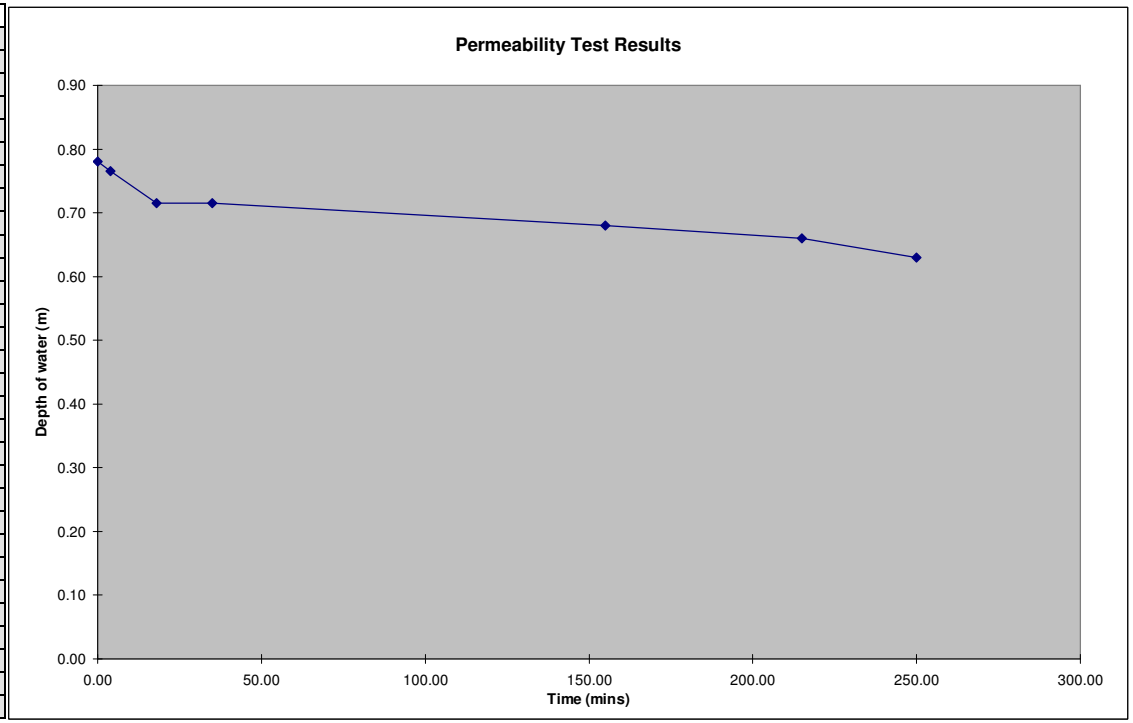
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP272A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5850	0.3900	0.1950
Time (mins)	339	698	1057

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.78	0.82	0.820
4.00	0.77	0.84	0.835
18.00	0.72	0.89	0.885
35.00	0.72	0.89	0.885
155.00	0.68	0.92	0.920
215.00	0.66	0.94	0.940
250.00	0.63	0.97	0.970



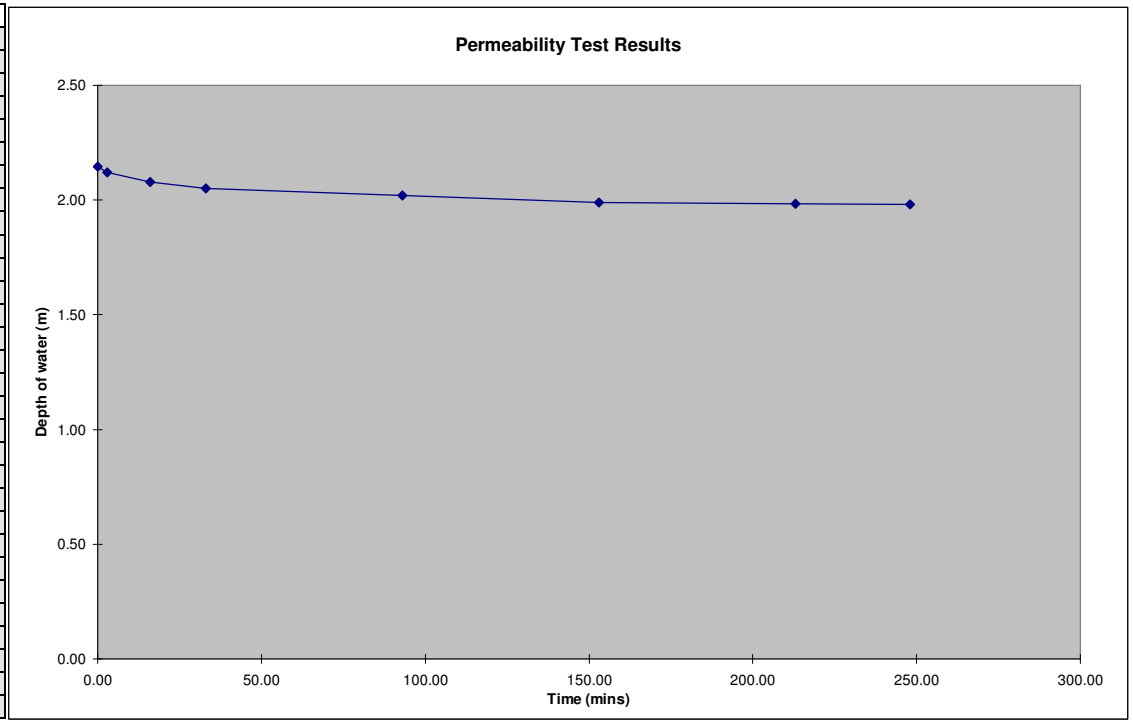
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP272B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6088	1.0725	0.5363
Time (mins)	3779	8873	13968

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.15	0.86	0.855
3.00	2.12	0.88	0.880
16.00	2.08	0.92	0.920
33.00	2.05	0.95	0.950
93.00	2.02	0.98	0.980
153.00	1.99	1.01	1.010
213.00	1.99	1.02	1.015
248.00	1.98	1.02	1.020



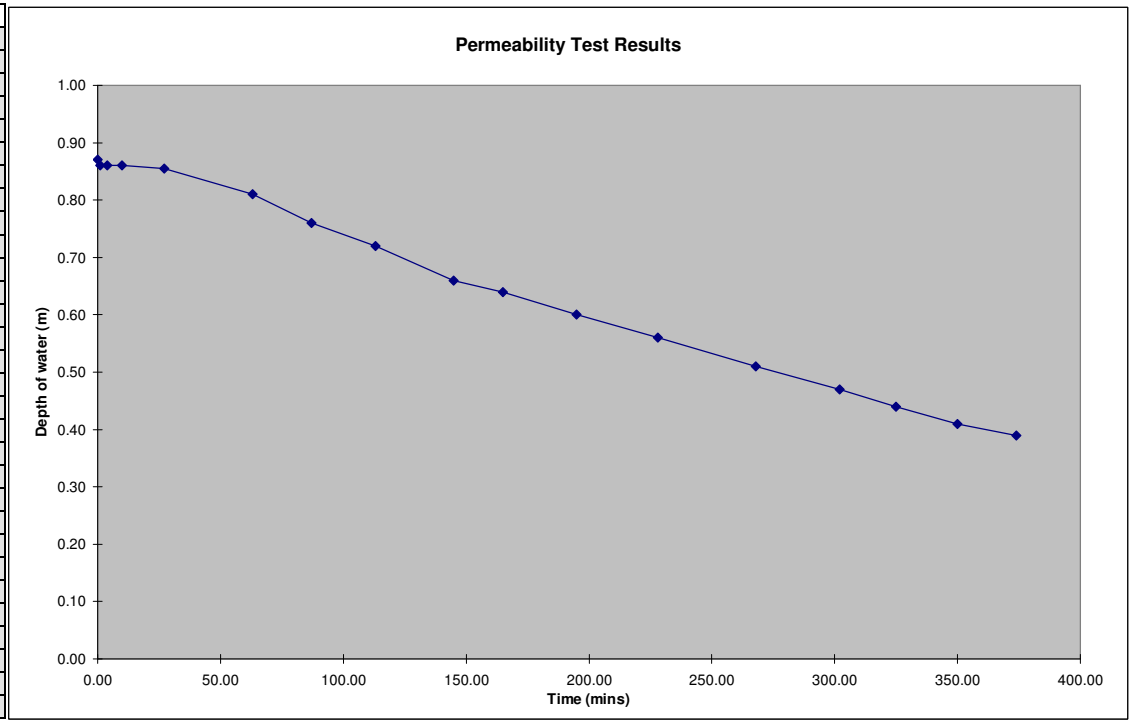
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	273A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6525	0.4350	0.2175
Time (mins)	154	329	581

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.87	0.68	0.980
1.00	0.86	0.69	0.990
4.00	0.86	0.69	0.990
10.00	0.86	0.69	0.990
27.00	0.86	0.70	0.995
63.00	0.81	0.74	1.040
87.00	0.76	0.79	1.090
113.00	0.72	0.83	1.130
145.00	0.66	0.89	1.190
165.00	0.64	0.91	1.210
195.00	0.60	0.95	1.250
228.00	0.56	0.99	1.290
268.00	0.51	1.04	1.340
302.00	0.47	1.08	1.380
325.00	0.44	1.11	1.410
350.00	0.41	1.14	1.440
374.00	0.39	1.16	1.460



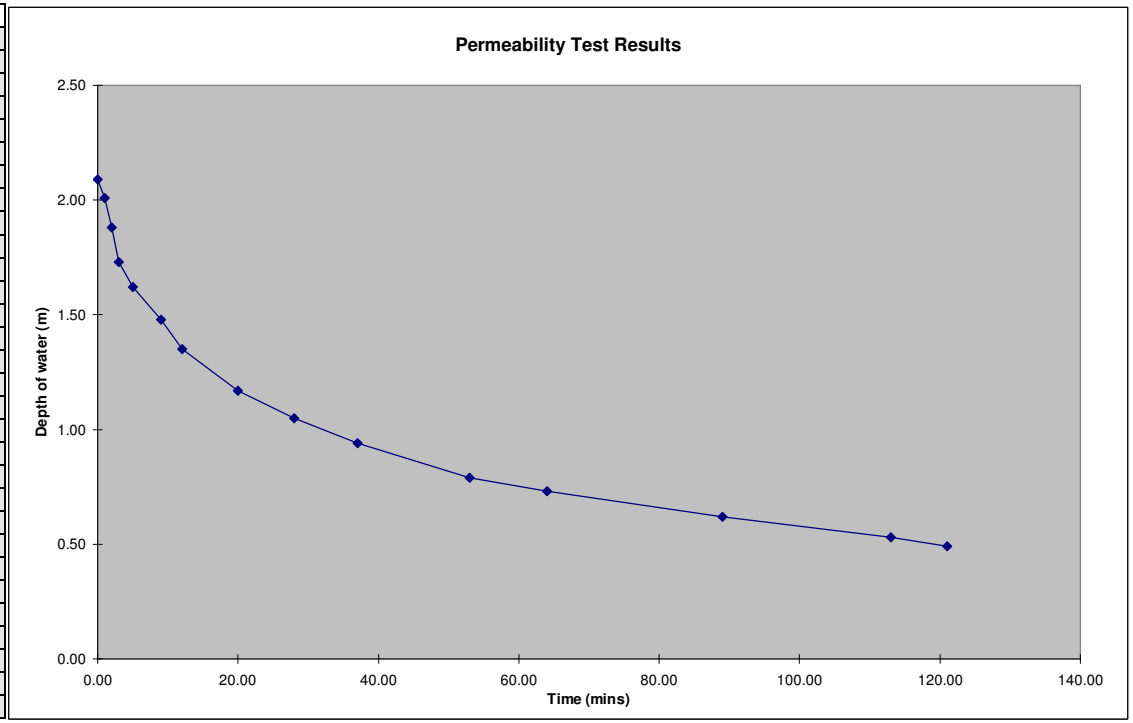
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	273B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5675	1.0450	0.5225
Time (mins)	7	28	115

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.09	0.91	0.910
1.00	2.01	0.99	0.990
2.00	1.88	1.12	1.120
3.00	1.73	1.27	1.270
5.00	1.62	1.38	1.380
9.00	1.48	1.52	1.520
12.00	1.35	1.65	1.650
20.00	1.17	1.83	1.830
28.00	1.05	1.95	1.950
37.00	0.94	2.06	2.060
53.00	0.79	2.21	2.210
64.00	0.73	2.27	2.270
89.00	0.62	2.38	2.380
113.00	0.53	2.47	2.470
121.00	0.49	2.51	2.510



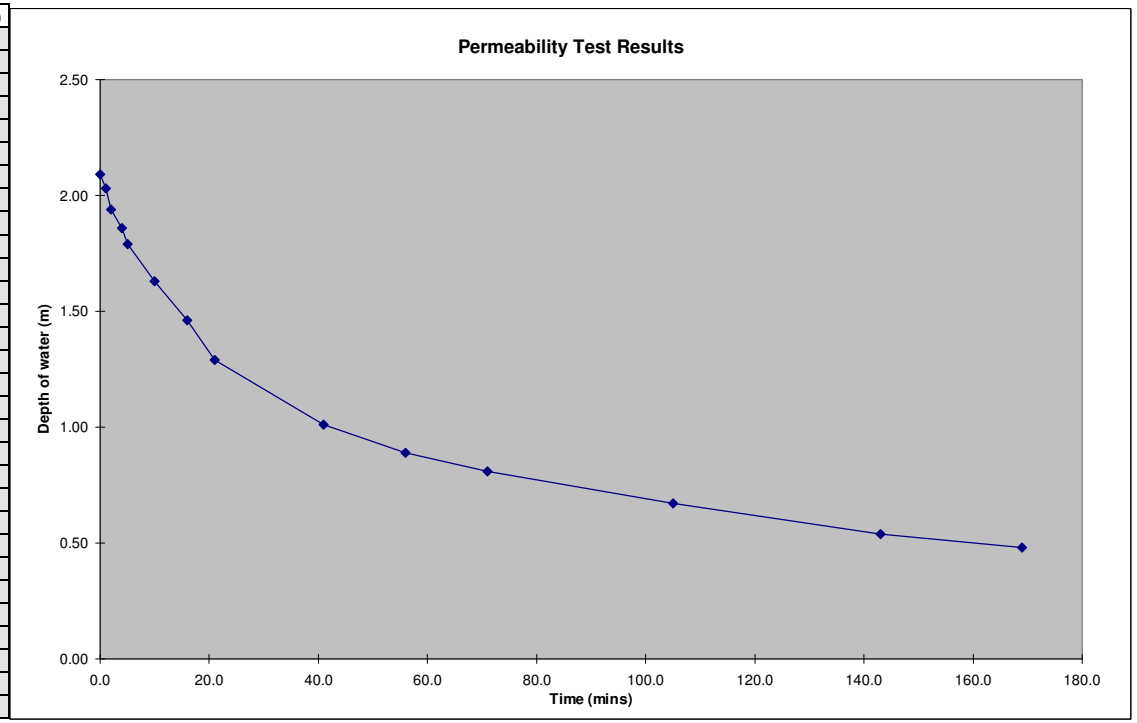
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	273B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5675	1.0450	0.5225
Time (mins)	12	39	151

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.09	0.91	0.910
1.0	2.03	0.97	0.970
2.0	1.94	1.06	1.060
4.0	1.86	1.14	1.140
5.0	1.79	1.21	1.210
10.0	1.63	1.37	1.370
16.0	1.46	1.54	1.540
21.0	1.29	1.71	1.710
41.0	1.01	1.99	1.990
56.0	0.89	2.11	2.110
71.0	0.81	2.19	2.190
105.0	0.67	2.33	2.330
143.0	0.54	2.46	2.460
169.0	0.48	2.52	2.520



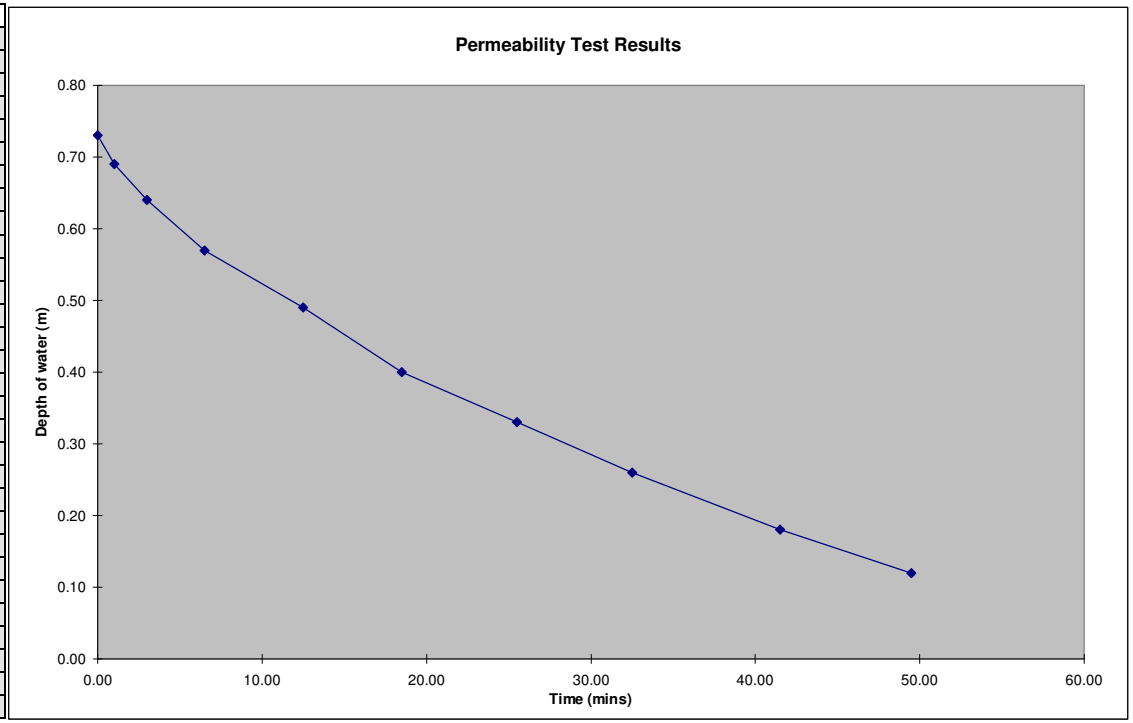
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	274A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.330

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5475	0.3650	0.1825
Time (mins)	8	22	41

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.73	0.87	1.200
1.00	0.69	0.91	1.240
3.00	0.64	0.96	1.290
6.50	0.57	1.03	1.360
12.50	0.49	1.11	1.440
18.50	0.40	1.20	1.530
25.50	0.33	1.27	1.600
32.50	0.26	1.34	1.670
41.50	0.18	1.42	1.750
49.50	0.12	1.48	1.810



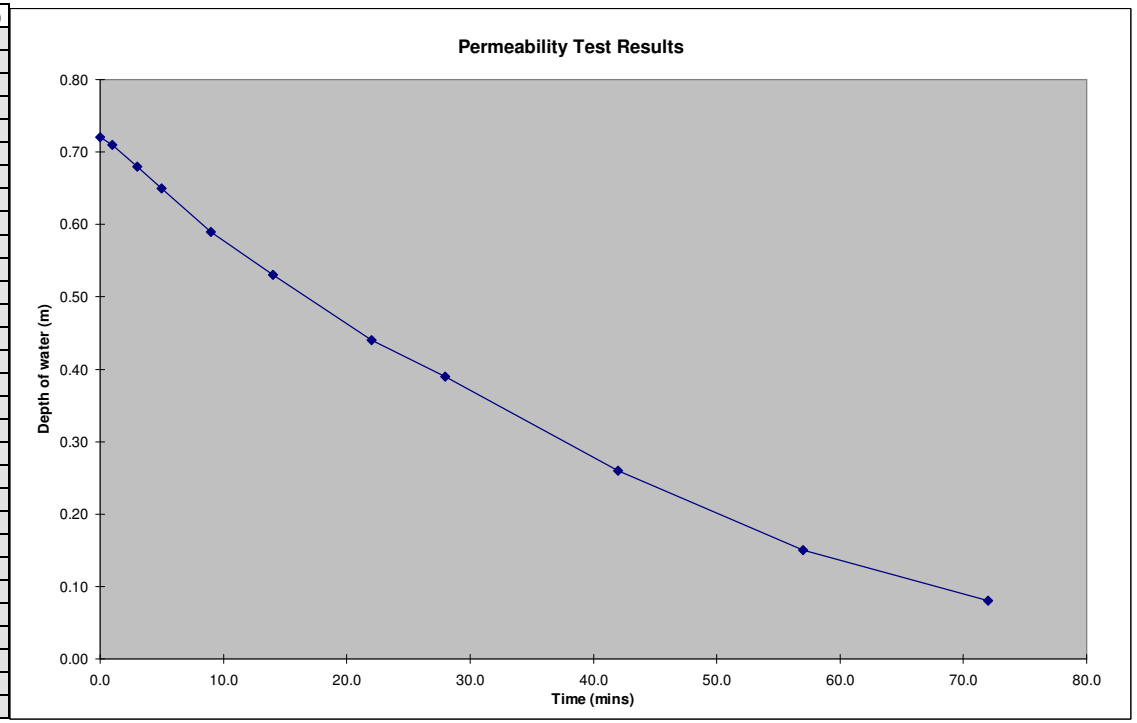
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	274A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.330

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5400	0.3600	0.1800
Time (mins)	13	31	53

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.72	0.88	1.210
1.0	0.71	0.89	1.220
3.0	0.68	0.92	1.250
5.0	0.65	0.95	1.280
9.0	0.59	1.01	1.340
14.0	0.53	1.07	1.400
22.0	0.44	1.16	1.490
28.0	0.39	1.21	1.540
42.0	0.26	1.34	1.670
57.0	0.15	1.45	1.780
72.0	0.08	1.52	1.850



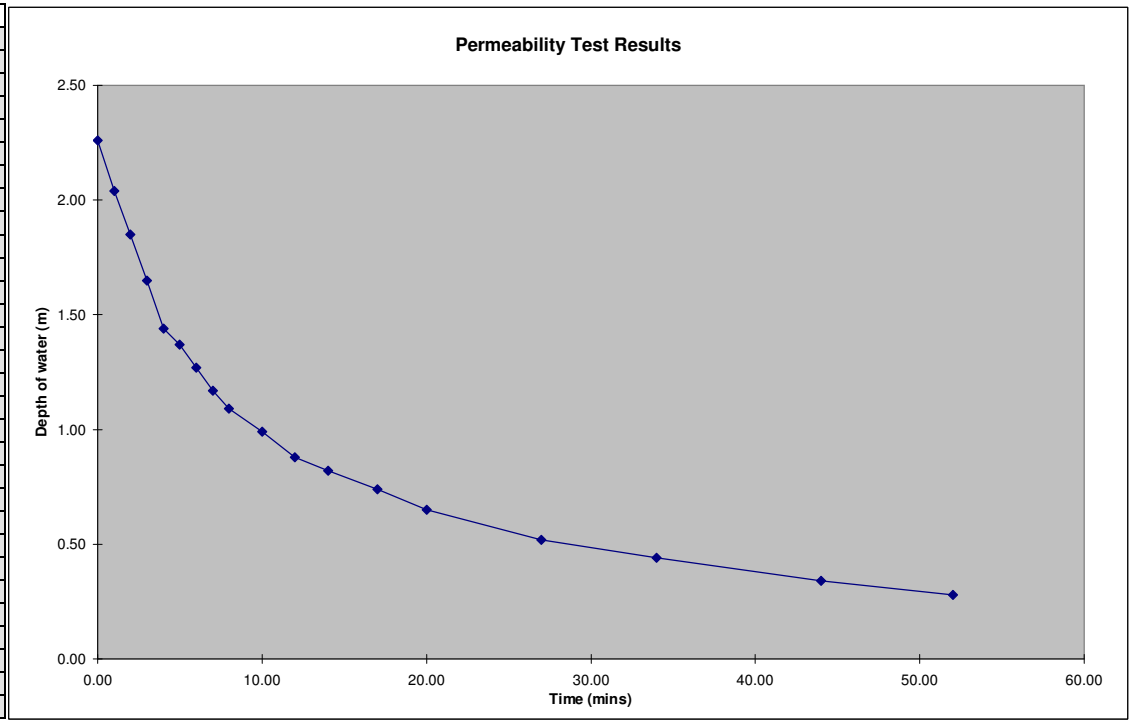
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	274B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6950	1.1300	0.5650
Time (mins)	3	8	25

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.26	0.74	0.740
1.00	2.04	0.96	0.960
2.00	1.85	1.15	1.150
3.00	1.65	1.35	1.350
4.00	1.44	1.56	1.560
5.00	1.37	1.63	1.630
6.00	1.27	1.73	1.730
7.00	1.17	1.83	1.830
8.00	1.09	1.91	1.910
10.00	0.99	2.01	2.010
12.00	0.88	2.12	2.120
14.00	0.82	2.18	2.180
17.00	0.74	2.26	2.260
20.00	0.65	2.35	2.350
27.00	0.52	2.48	2.480
34.00	0.44	2.56	2.560
44.00	0.34	2.66	2.660
52.00	0.28	2.72	2.720



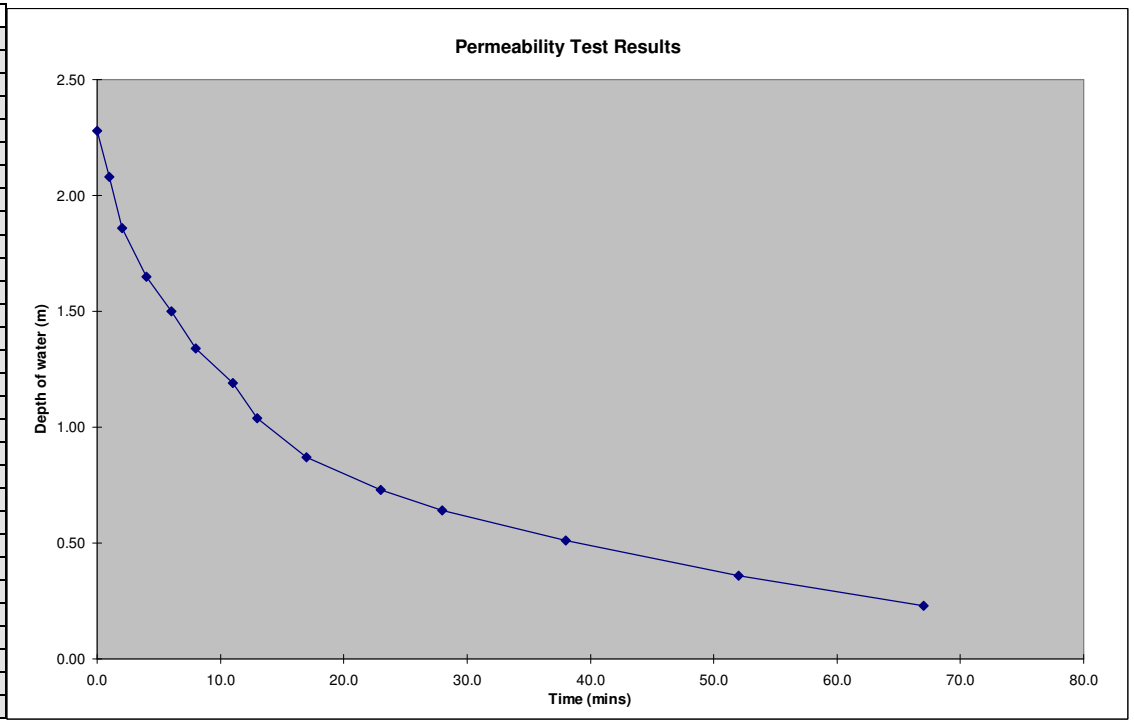
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	274B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7100	1.1400	0.5700
Time (mins)	3	12	33

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.28	0.72	0.720
1.0	2.08	0.92	0.920
2.0	1.86	1.14	1.140
4.0	1.65	1.35	1.350
6.0	1.50	1.50	1.500
8.0	1.34	1.66	1.660
11.0	1.19	1.81	1.810
13.0	1.04	1.96	1.960
17.0	0.87	2.13	2.130
23.0	0.73	2.27	2.270
28.0	0.64	2.36	2.360
38.0	0.51	2.49	2.490
52.0	0.36	2.64	2.640
67.0	0.23	2.77	2.770



Results from Site Observation

Scheme:	**NDR**
Project No	**PTPK1000**
Trial Pit No.	275A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.50
No of runs	2
Pipe upstand (m)	0.000

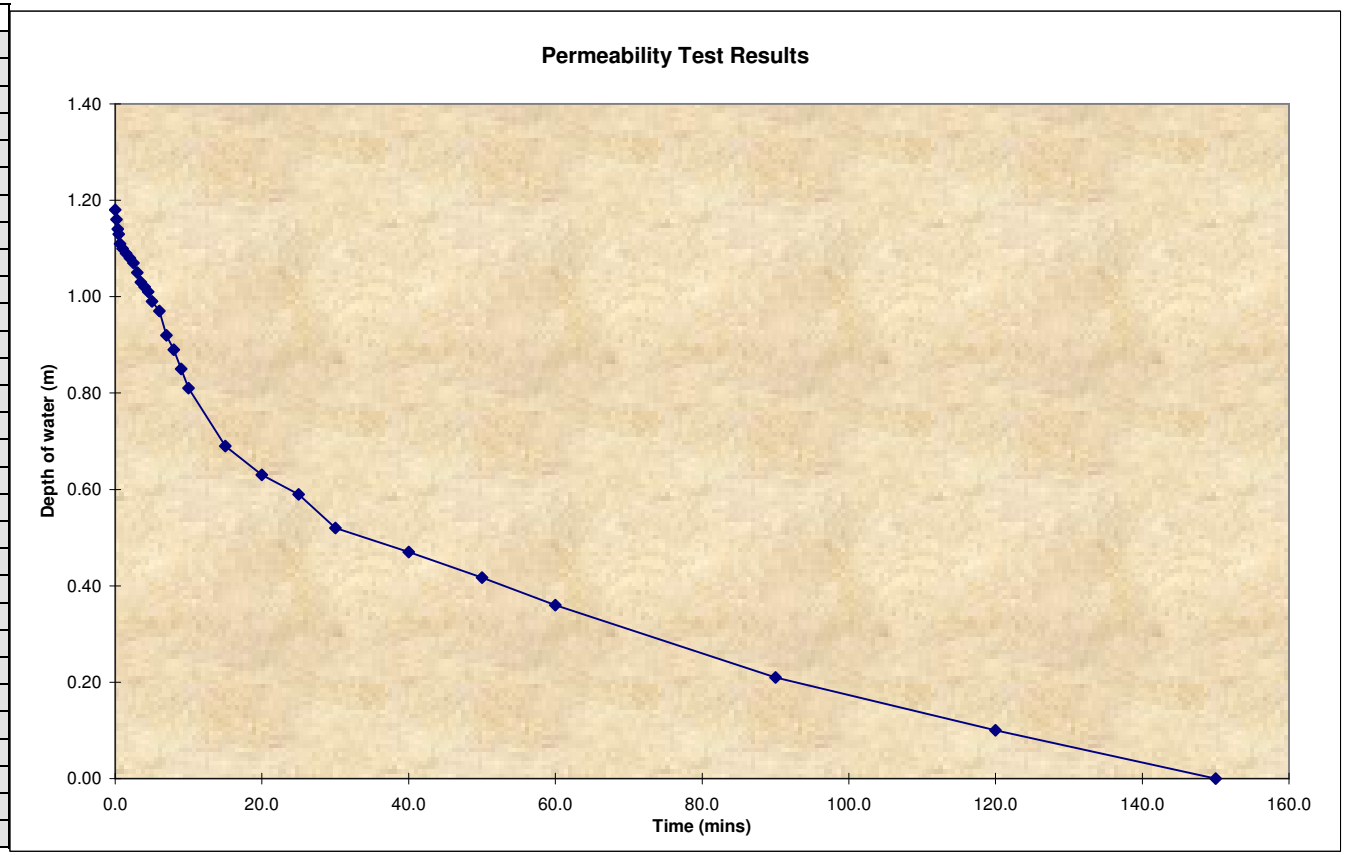
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8850	0.5900	0.2950
Time (mins)	8	24	73

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
1.6E-05 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.18	0.32	0.320
0.2	1.16	0.34	0.340
0.3	1.14	0.36	0.360
0.5	1.13	0.37	0.370
0.7	1.11	0.39	0.390
1.0	1.10	0.40	0.400
1.5	1.09	0.41	0.410
2.0	1.08	0.42	0.420
2.5	1.07	0.43	0.430
3.0	1.05	0.45	0.450
3.5	1.03	0.47	0.470
4.0	1.02	0.48	0.480
4.5	1.01	0.49	0.490
5.0	0.99	0.51	0.510
6.0	0.97	0.53	0.530
7.0	0.92	0.58	0.580
8.0	0.89	0.61	0.610
9.0	0.85	0.65	0.650
10.0	0.81	0.69	0.690
15.0	0.69	0.81	0.810
20.0	0.63	0.87	0.870
25.0	0.59	0.91	0.910
30.0	0.52	0.98	0.980
40.0	0.47	1.03	1.030
50.0	0.42	1.08	1.083
60.0	0.36	1.14	1.140
90.0	0.21	1.29	1.290
120.0	0.10	1.40	1.400
150.0	0.00	1.50	1.500



Results from Site Observation

Scheme:	**NDR**
Project	**PTPK1000**
Trial Pit No.	275A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.50
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

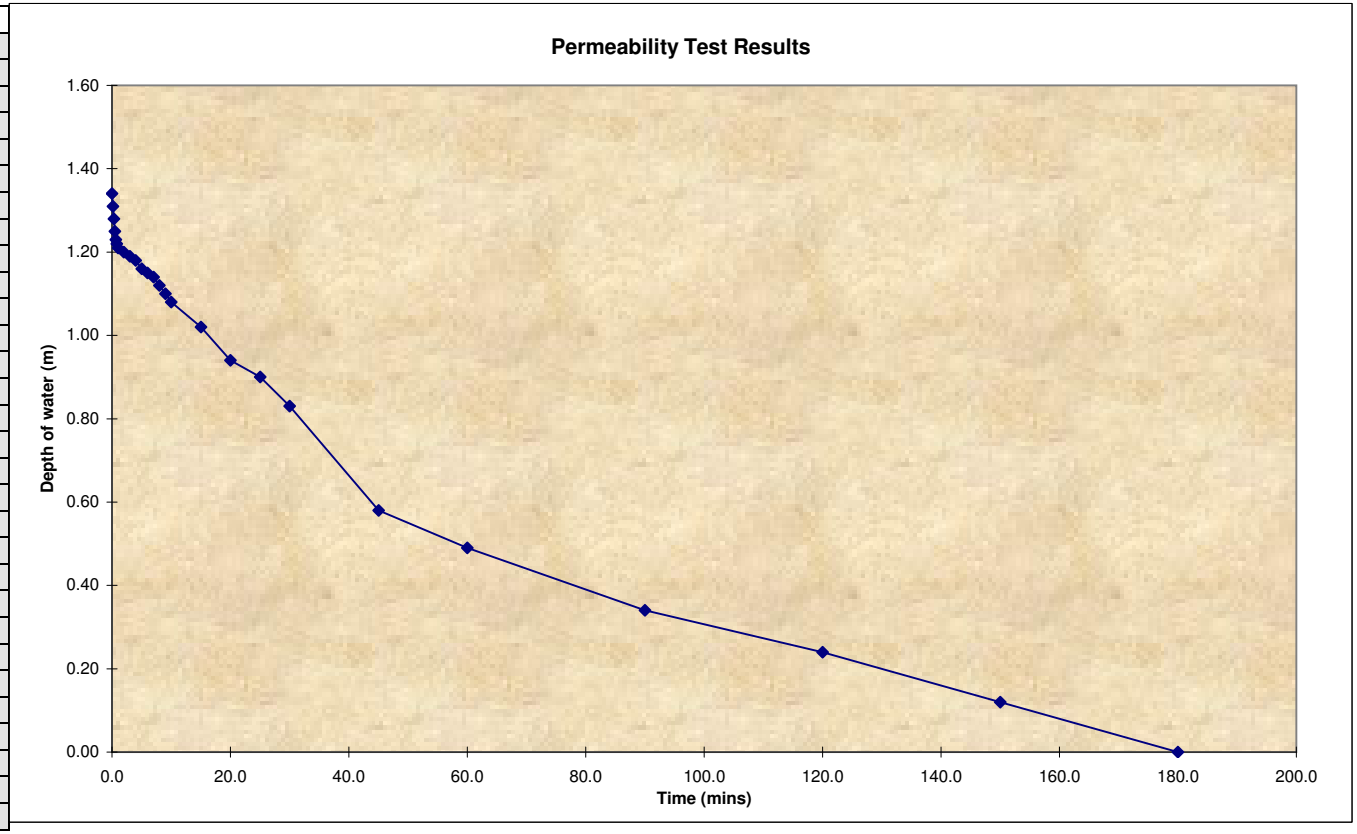
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0050	0.6700	0.3350
Time (mins)	16	41	92

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
1.4E-05 m/sec

Mean
1.5E-05 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.34	0.16	0.160
0.2	1.31	0.19	0.190
0.3	1.28	0.22	0.220
0.5	1.25	0.25	0.250
0.7	1.23	0.27	0.270
0.8	1.22	0.28	0.280
1.0	1.21	0.29	0.290
2.0	1.20	0.30	0.300
3.0	1.19	0.31	0.310
4.0	1.18	0.32	0.320
5.0	1.16	0.34	0.340
6.0	1.15	0.35	0.350
7.0	1.14	0.36	0.360
8.0	1.12	0.38	0.380
9.0	1.10	0.40	0.400
10.0	1.08	0.42	0.420
15.0	1.02	0.48	0.480
20.0	0.94	0.56	0.560
25.0	0.90	0.60	0.600
30.0	0.83	0.67	0.670
45.0	0.58	0.92	0.920
60.0	0.49	1.01	1.010
90.0	0.34	1.16	1.160
120.0	0.24	1.26	1.260
150.0	0.12	1.38	1.380
180.0	0.00	1.50	1.500



Results from Site Observation

Scheme:	**NDR**
Project No	**PTPK1000**
Trial Pit No.	275B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.50
No of runs	2
Pipe upstand (m)	0.000

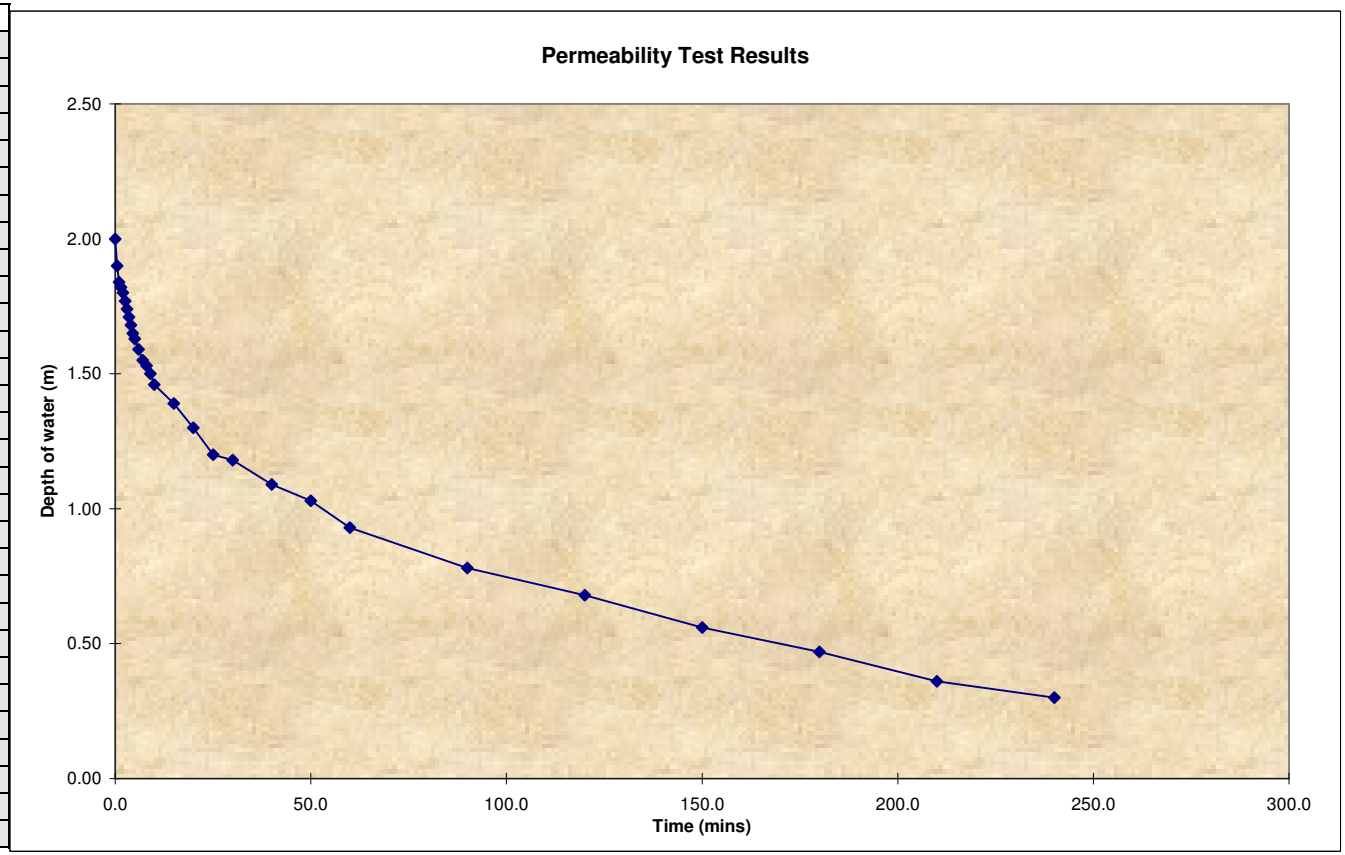
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5000	1.0000	0.5000
Time (mins)	9	53	170

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
7.1E-06 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.00	1.00	1.000
0.5	1.90	1.10	1.100
1.0	1.84	1.16	1.160
1.5	1.82	1.18	1.180
2.0	1.80	1.20	1.200
2.5	1.77	1.23	1.230
3.0	1.74	1.26	1.260
3.5	1.71	1.29	1.290
4.0	1.68	1.32	1.320
4.5	1.65	1.35	1.350
5.0	1.63	1.37	1.370
6.0	1.59	1.41	1.410
7.0	1.55	1.45	1.450
8.0	1.53	1.47	1.470
9.0	1.50	1.50	1.500
10.0	1.46	1.54	1.540
15.0	1.39	1.61	1.610
20.0	1.30	1.70	1.700
25.0	1.20	1.80	1.800
30.0	1.18	1.82	1.820
40.0	1.09	1.91	1.910
50.0	1.03	1.97	1.970
60.0	0.93	2.07	2.070
90.0	0.78	2.22	2.220
120.0	0.68	2.32	2.320
150.0	0.56	2.44	2.440
180.0	0.47	2.53	2.530
210.0	0.36	2.64	2.640
240.0	0.30	2.70	2.700



Results from Site Observation

Scheme:	**NDR**
Project	**PTPK1000**
Trial Pit No.	275B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.50
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

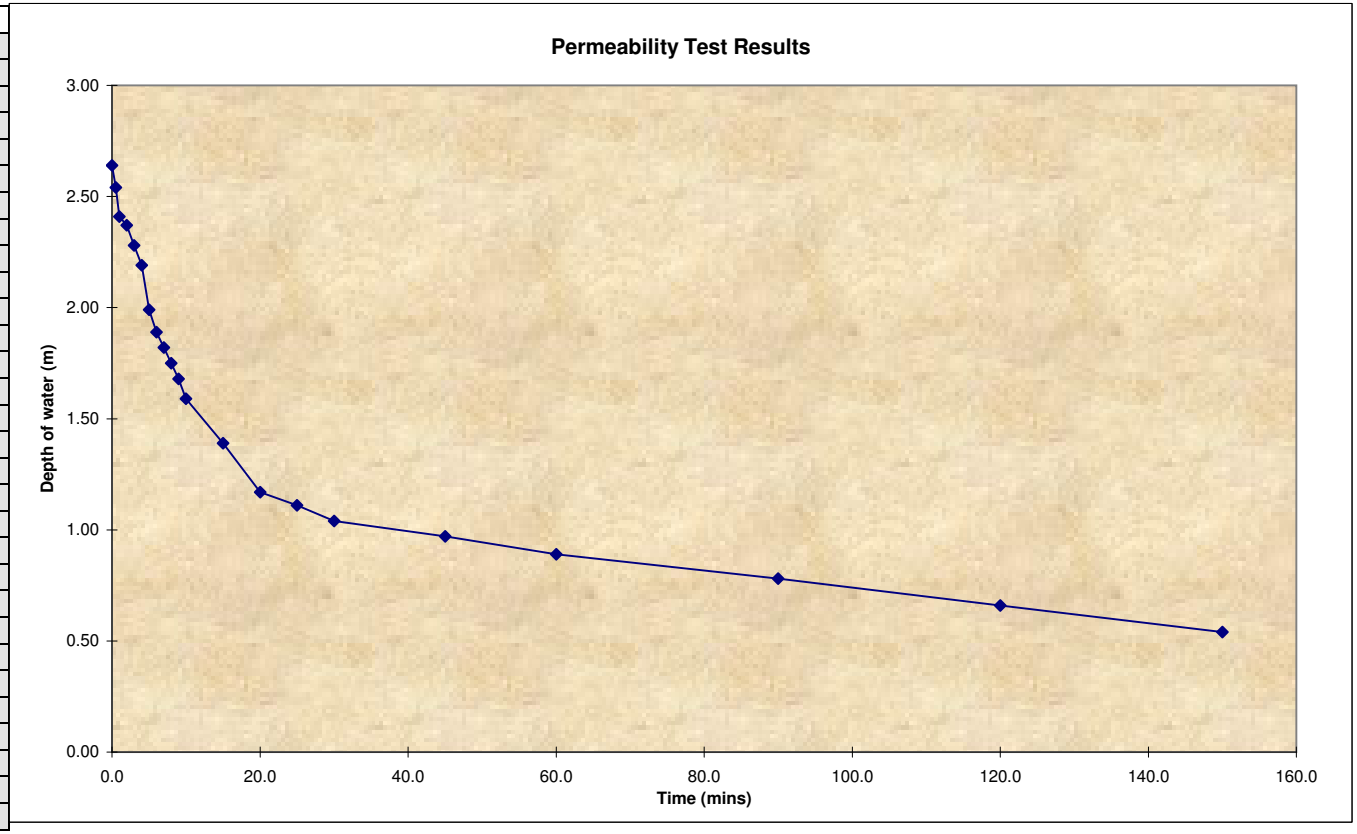
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.9800	1.3200	0.6600
Time (mins)	5	17	120

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
1.0E-05 m/sec

Mean
8.5E-06 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.64	0.36	0.360
0.5	2.54	0.46	0.460
1.0	2.41	0.59	0.590
2.0	2.37	0.63	0.630
3.0	2.28	0.72	0.720
4.0	2.19	0.81	0.810
5.0	1.99	1.01	1.010
6.0	1.89	1.11	1.110
7.0	1.82	1.18	1.180
8.0	1.75	1.25	1.250
9.0	1.68	1.32	1.320
10.0	1.59	1.41	1.410
15.0	1.39	1.61	1.610
20.0	1.17	1.83	1.830
25.0	1.11	1.89	1.890
30.0	1.04	1.96	1.960
45.0	0.97	2.03	2.030
60.0	0.89	2.11	2.110
90.0	0.78	2.22	2.220
120.0	0.66	2.34	2.340
150.0	0.54	2.46	2.460



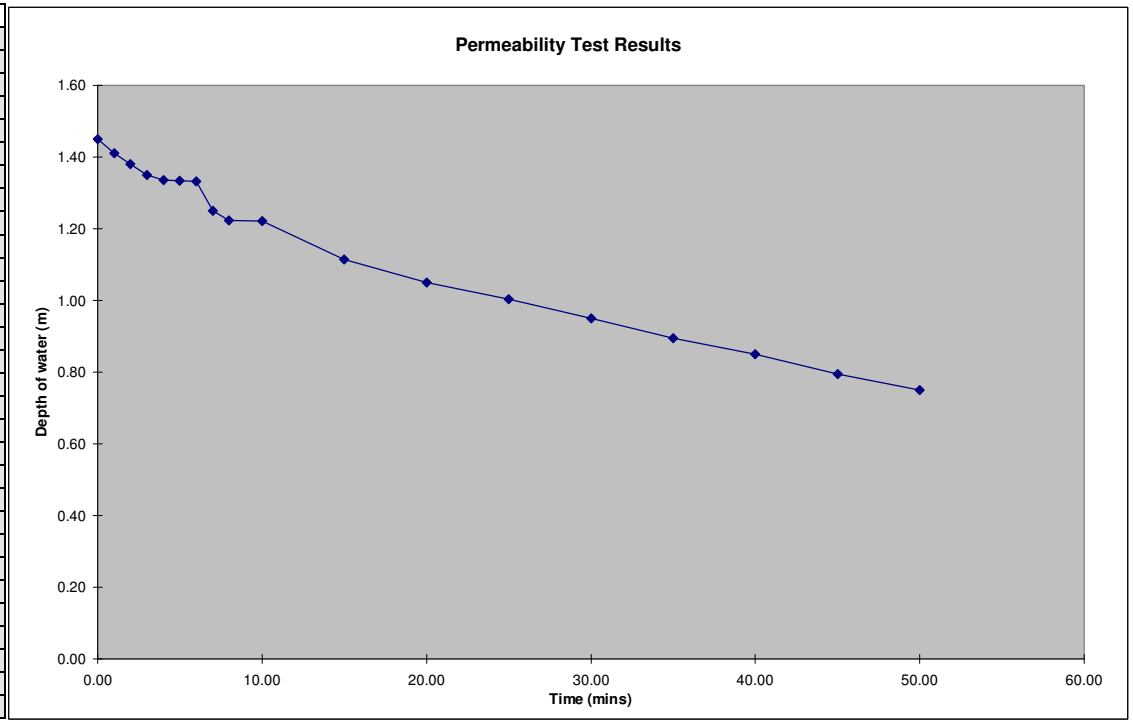
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP276A
Depth of Trial Pit (m)=	2.45
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0875	0.7250	0.3625
Time (mins)	20	48	76

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.45	1.00	1.000
1.00	1.41	1.04	1.040
2.00	1.38	1.07	1.070
3.00	1.35	1.10	1.100
4.00	1.34	1.11	1.114
5.00	1.33	1.12	1.116
6.00	1.33	1.12	1.118
7.00	1.25	1.20	1.200
8.00	1.22	1.23	1.226
10.00	1.22	1.23	1.228
15.00	1.12	1.34	1.335
20.00	1.05	1.40	1.400
25.00	1.00	1.45	1.446
30.00	0.95	1.50	1.500
35.00	0.90	1.56	1.555
40.00	0.85	1.60	1.600
45.00	0.80	1.66	1.655
50.00	0.75	1.70	1.700



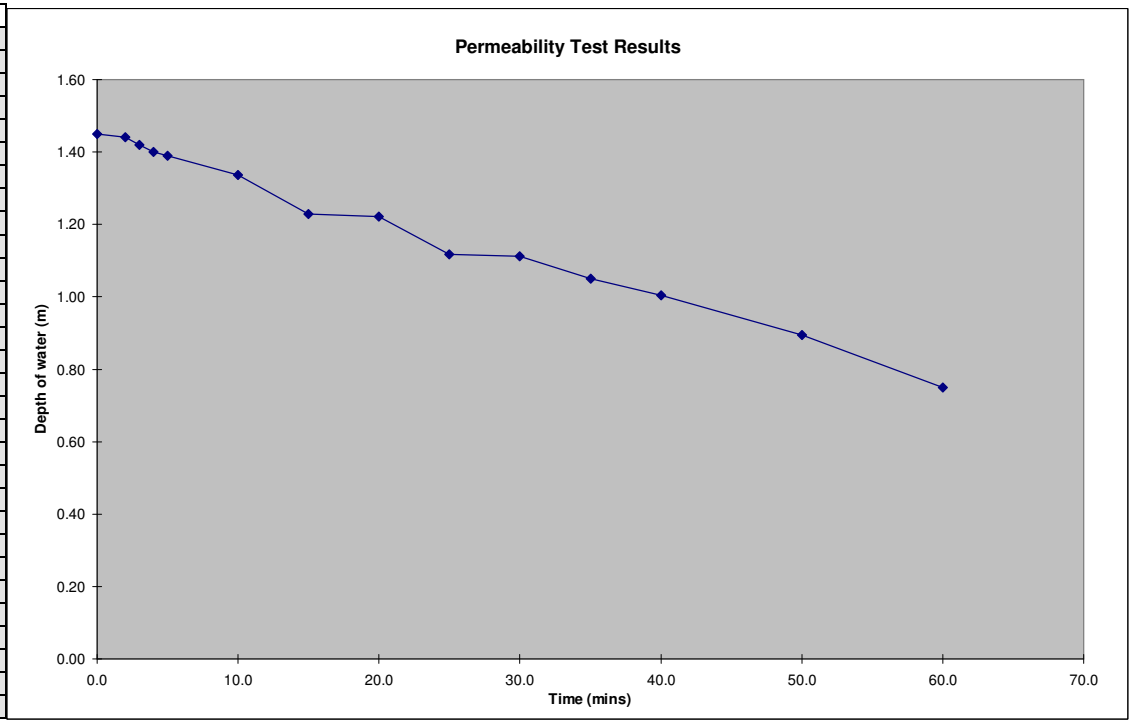
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP276A
Depth of Trial Pit (m)=	2.45
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0875	0.7250	0.3625
Time (mins)	32	62	91

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.45	1.00	1.000
2.0	1.44	1.01	1.010
3.0	1.42	1.03	1.030
4.0	1.40	1.05	1.050
5.0	1.39	1.06	1.060
10.0	1.34	1.11	1.114
15.0	1.23	1.22	1.222
20.0	1.22	1.23	1.228
25.0	1.12	1.33	1.333
30.0	1.11	1.34	1.338
35.0	1.05	1.40	1.400
40.0	1.00	1.45	1.446
50.0	0.90	1.56	1.555
60.0	0.75	1.70	1.700



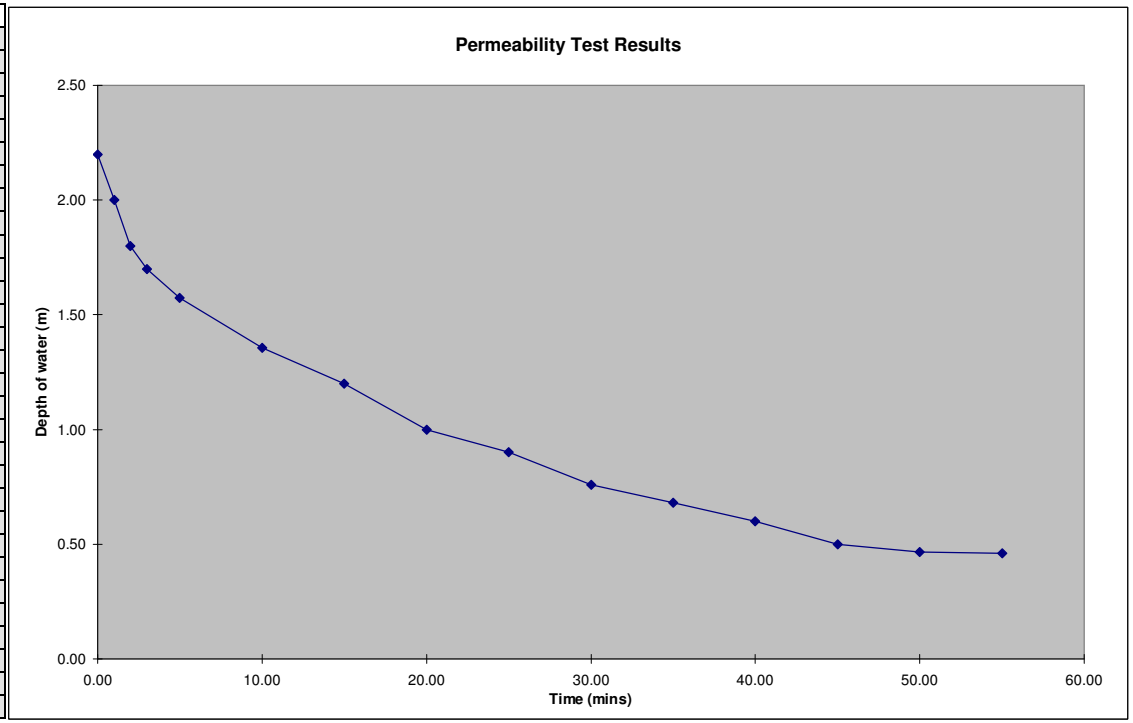
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP276B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.600
No of runs	2
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6500	1.1000	0.5500
Time (mins)	4	17	43

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.20	0.50	0.600
1.00	2.00	0.70	0.800
2.00	1.80	0.90	1.000
3.00	1.70	1.00	1.100
5.00	1.57	1.13	1.226
10.00	1.36	1.34	1.444
15.00	1.20	1.50	1.600
20.00	1.00	1.70	1.800
25.00	0.90	1.80	1.900
30.00	0.76	1.94	2.040
35.00	0.68	2.02	2.118
40.00	0.60	2.10	2.200
45.00	0.50	2.20	2.300
50.00	0.47	2.24	2.335
55.00	0.46	2.24	2.339



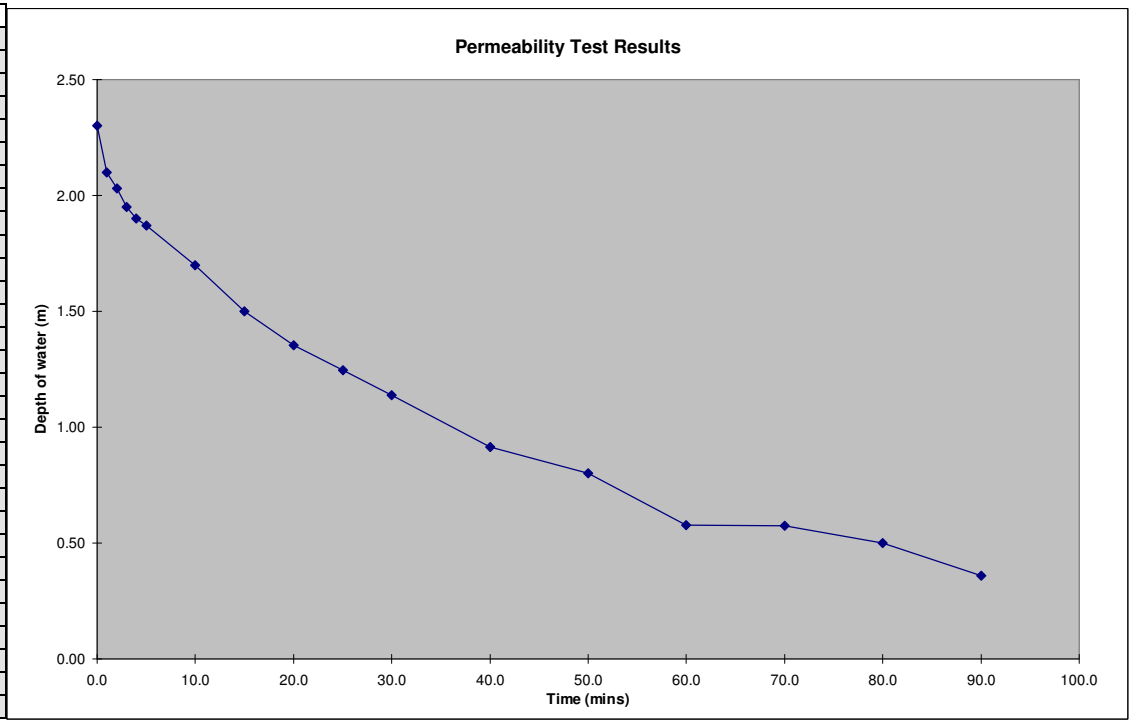
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP276B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.600
No of runs	2.00
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7250	1.1500	0.5750
Time (mins)	7	25	65

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.30	0.40	0.500
1.0	2.10	0.60	0.700
2.0	2.03	0.67	0.770
3.0	1.95	0.75	0.850
4.0	1.90	0.80	0.900
5.0	1.87	0.83	0.930
10.0	1.70	1.00	1.100
15.0	1.50	1.20	1.300
20.0	1.35	1.35	1.446
25.0	1.25	1.46	1.555
30.0	1.14	1.56	1.662
40.0	0.91	1.79	1.886
50.0	0.80	1.90	2.000
60.0	0.58	2.12	2.222
70.0	0.58	2.13	2.225
80.0	0.50	2.20	2.300
90.0	0.36	2.34	2.442



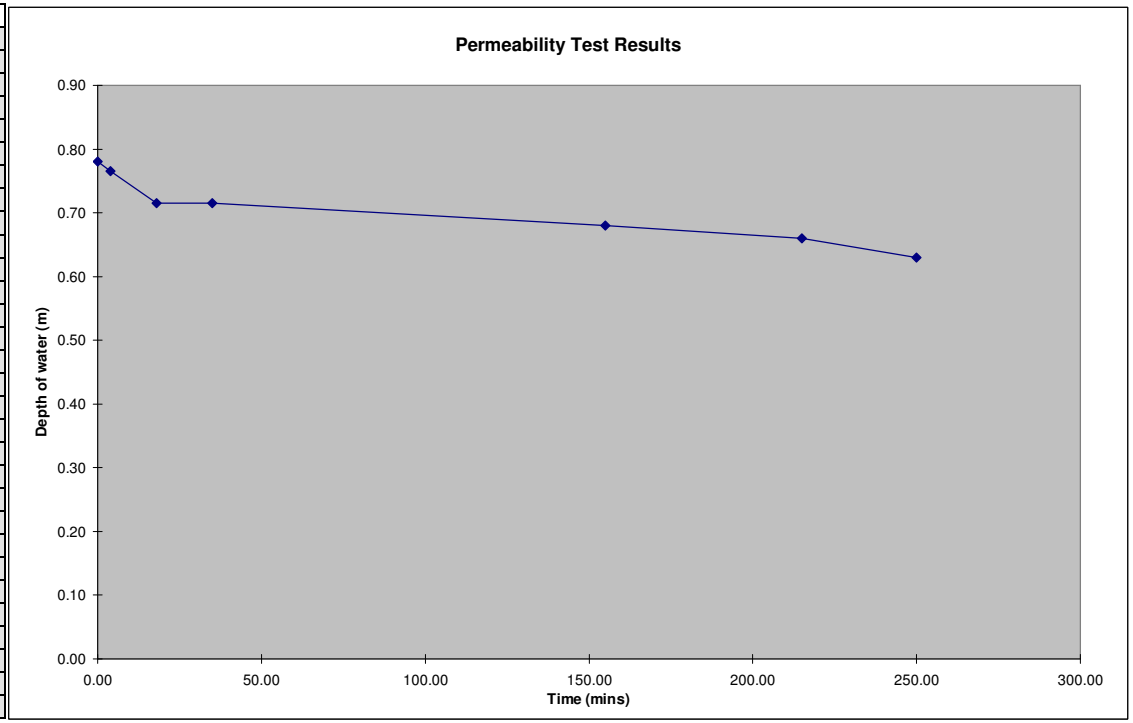
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP272A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5850	0.3900	0.1950
Time (mins)	339	698	1057

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.78	0.82	0.820
4.00	0.77	0.84	0.835
18.00	0.72	0.89	0.885
35.00	0.72	0.89	0.885
155.00	0.68	0.92	0.920
215.00	0.66	0.94	0.940
250.00	0.63	0.97	0.970



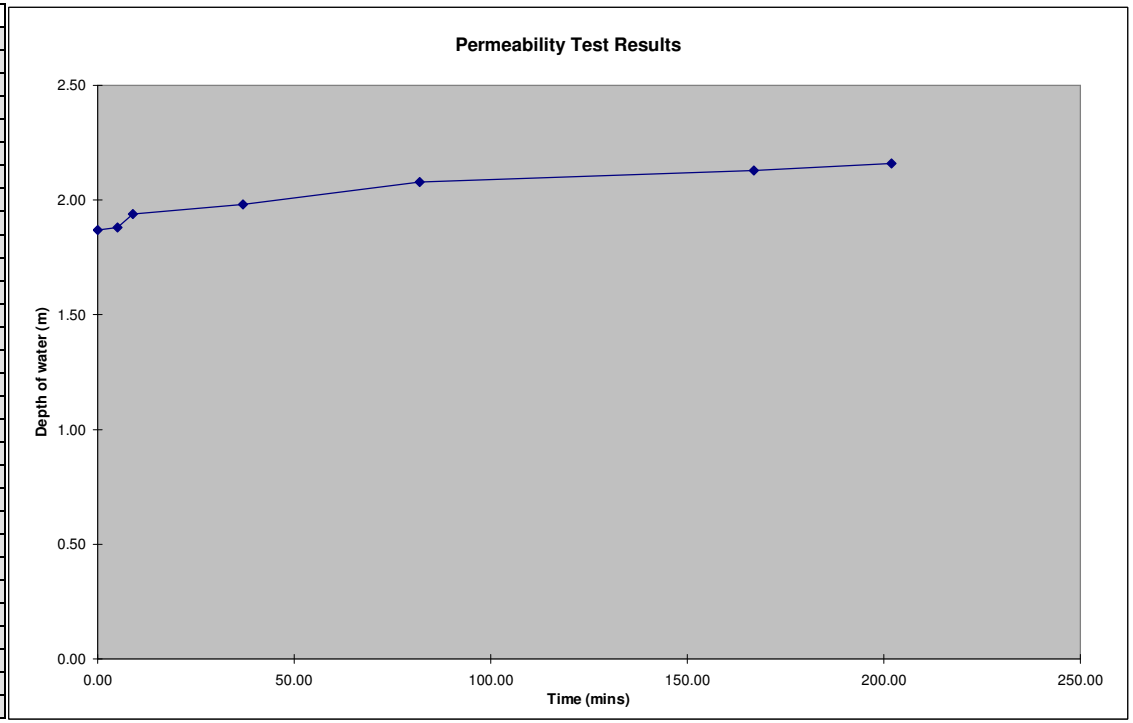
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP277B
Depth of Trial Pit (m)=	2.80
Length of Trial Pit (m)=	2.30
Breadth of Trial Pit (m)=	1.600
No of runs	1
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.4025	0.9350	0.4675
Time (mins)	-234	-468	-701

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.87	0.93	1.130
5.00	1.88	0.92	1.120
9.00	1.94	0.86	1.060
37.00	1.98	0.82	1.020
82.00	2.08	0.72	0.920
167.00	2.13	0.67	0.870
202.00	2.16	0.64	0.840



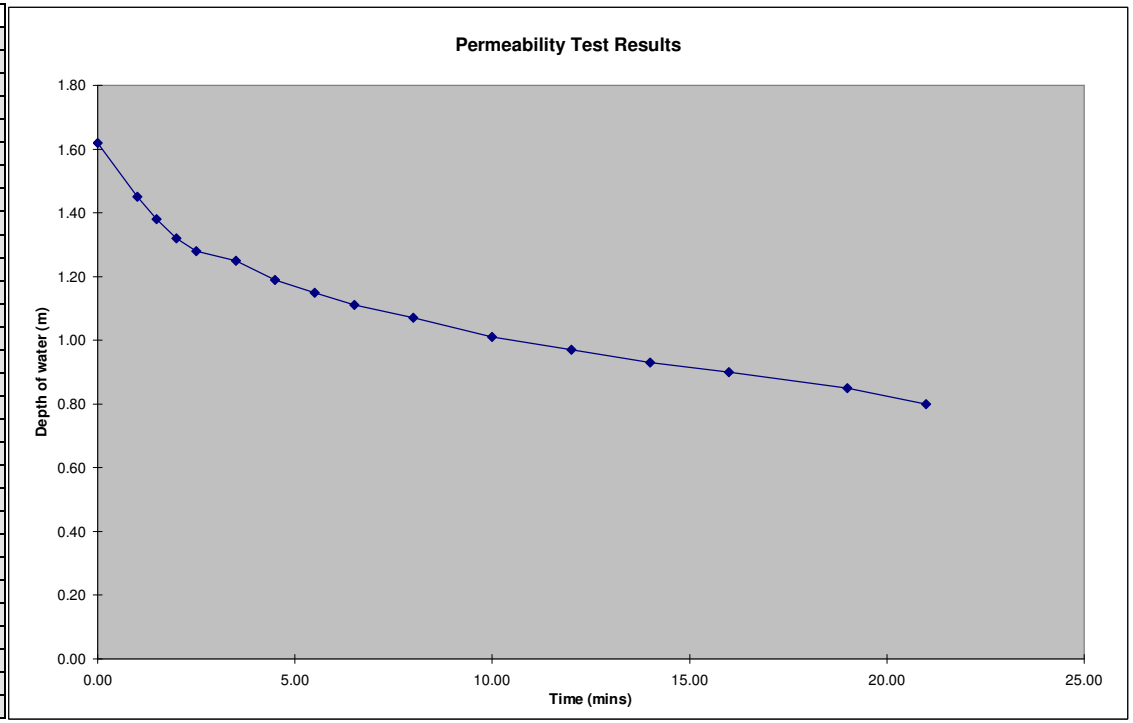
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP278A
Depth of Trial Pit (m)=	2.58
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.500
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2150	0.8100	0.4050
Time (mins)	4	21	41

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.62	0.96	0.960
1.00	1.45	1.13	1.130
1.50	1.38	1.20	1.200
2.00	1.32	1.26	1.260
2.50	1.28	1.30	1.300
3.50	1.25	1.33	1.330
4.50	1.19	1.39	1.390
5.50	1.15	1.43	1.430
6.50	1.11	1.47	1.470
8.00	1.07	1.51	1.510
10.00	1.01	1.57	1.570
12.00	0.97	1.61	1.610
14.00	0.93	1.65	1.650
16.00	0.90	1.68	1.680
19.00	0.85	1.73	1.730
21.00	0.80	1.78	1.780



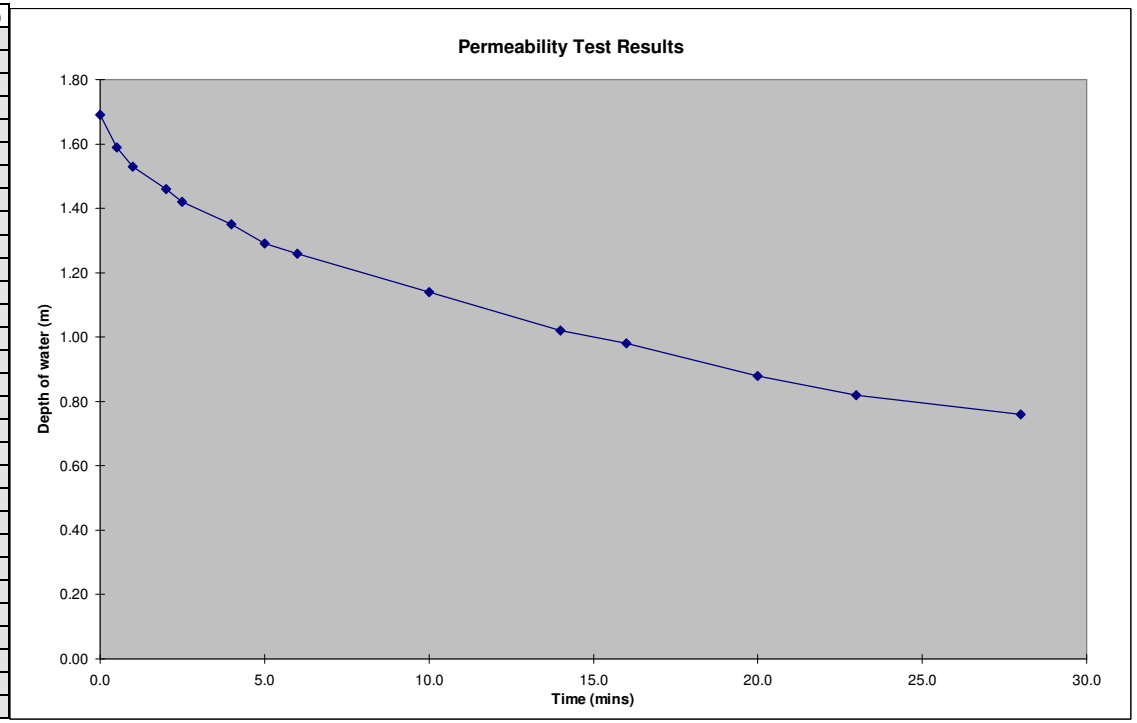
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP278A
Depth of Trial Pit (m)=	2.58
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.500
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2675	0.8450	0.4225
Time (mins)	6	22	50

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.69	0.89	0.890
0.5	1.59	0.99	0.990
1.0	1.53	1.05	1.050
2.0	1.46	1.12	1.120
2.5	1.42	1.16	1.160
4.0	1.35	1.23	1.230
5.0	1.29	1.29	1.290
6.0	1.26	1.32	1.320
10.0	1.14	1.44	1.440
14.0	1.02	1.56	1.560
16.0	0.98	1.60	1.600
20.0	0.88	1.70	1.700
23.0	0.82	1.76	1.760
28.0	0.76	1.82	1.820



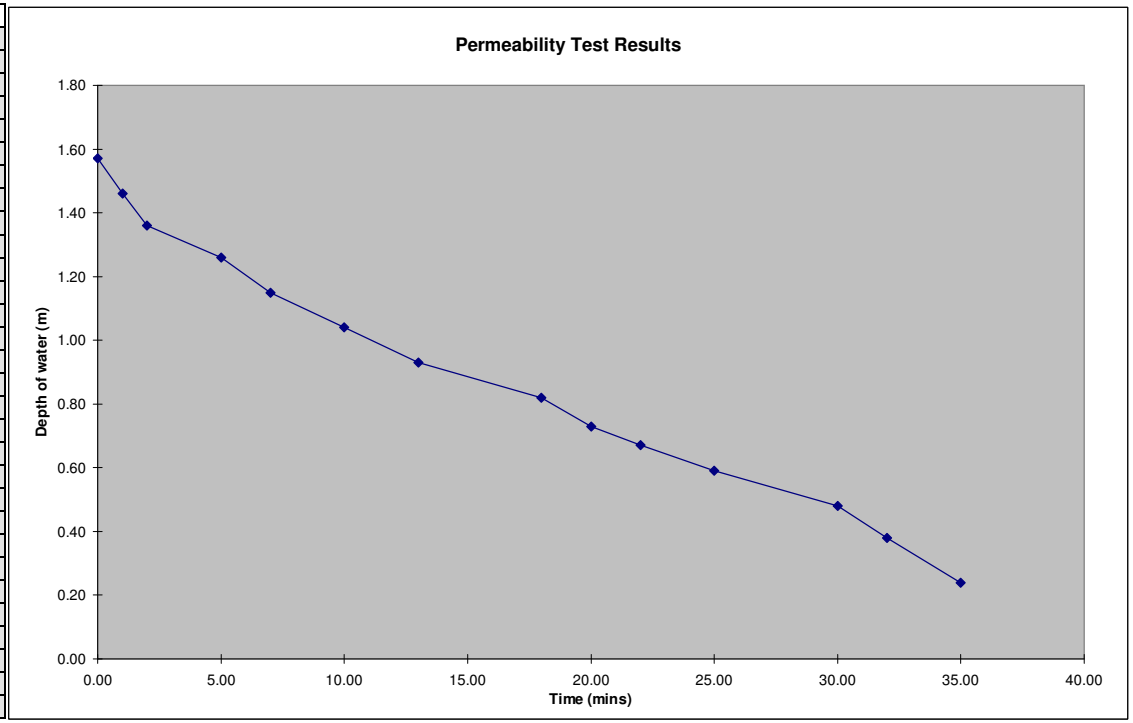
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP278B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	1.400
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1775	0.7850	0.3925
Time (mins)	4	19	32

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.57	1.13	1.130
1.00	1.46	1.24	1.240
2.00	1.36	1.34	1.340
5.00	1.26	1.44	1.440
7.00	1.15	1.55	1.550
10.00	1.04	1.66	1.660
13.00	0.93	1.77	1.770
18.00	0.82	1.88	1.880
20.00	0.73	1.97	1.970
22.00	0.67	2.03	2.030
25.00	0.59	2.11	2.110
30.00	0.48	2.22	2.220
32.00	0.38	2.32	2.320
35.00	0.24	2.46	2.460



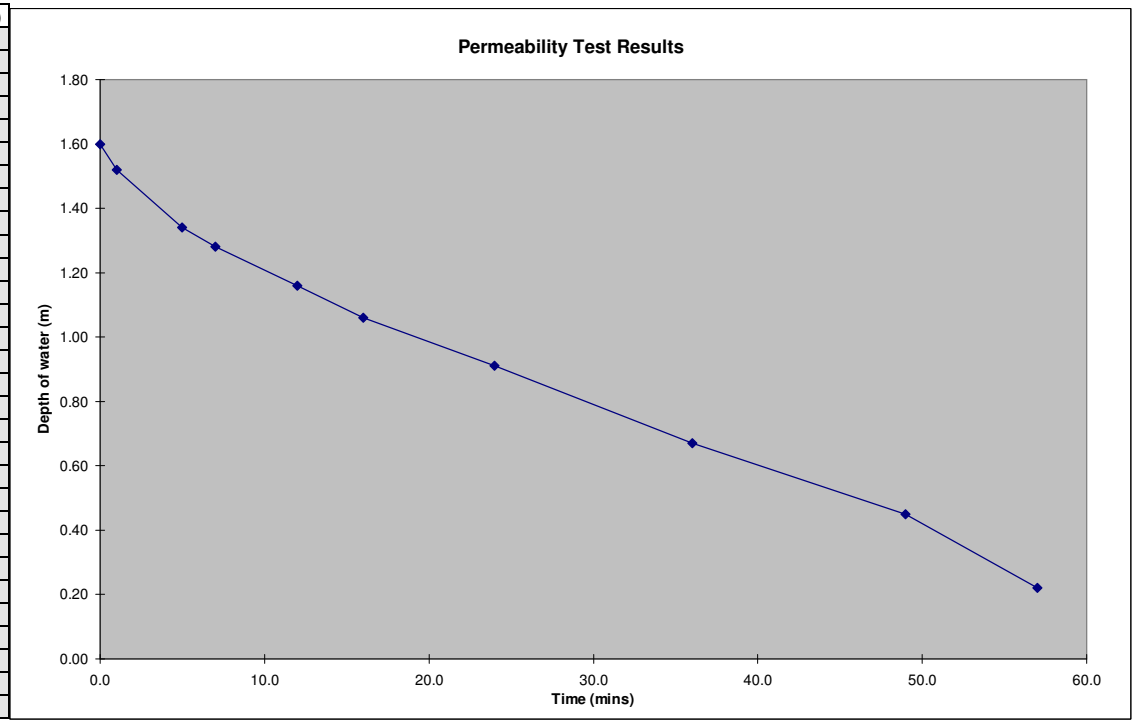
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP278B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	1.400
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2000	0.8000	0.4000
Time (mins)	10	30	50

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.60	1.10	1.100
1.0	1.52	1.18	1.180
5.0	1.34	1.36	1.360
7.0	1.28	1.42	1.420
12.0	1.16	1.54	1.540
16.0	1.06	1.64	1.640
24.0	0.91	1.79	1.790
36.0	0.67	2.03	2.030
49.0	0.45	2.25	2.250
57.0	0.22	2.48	2.480



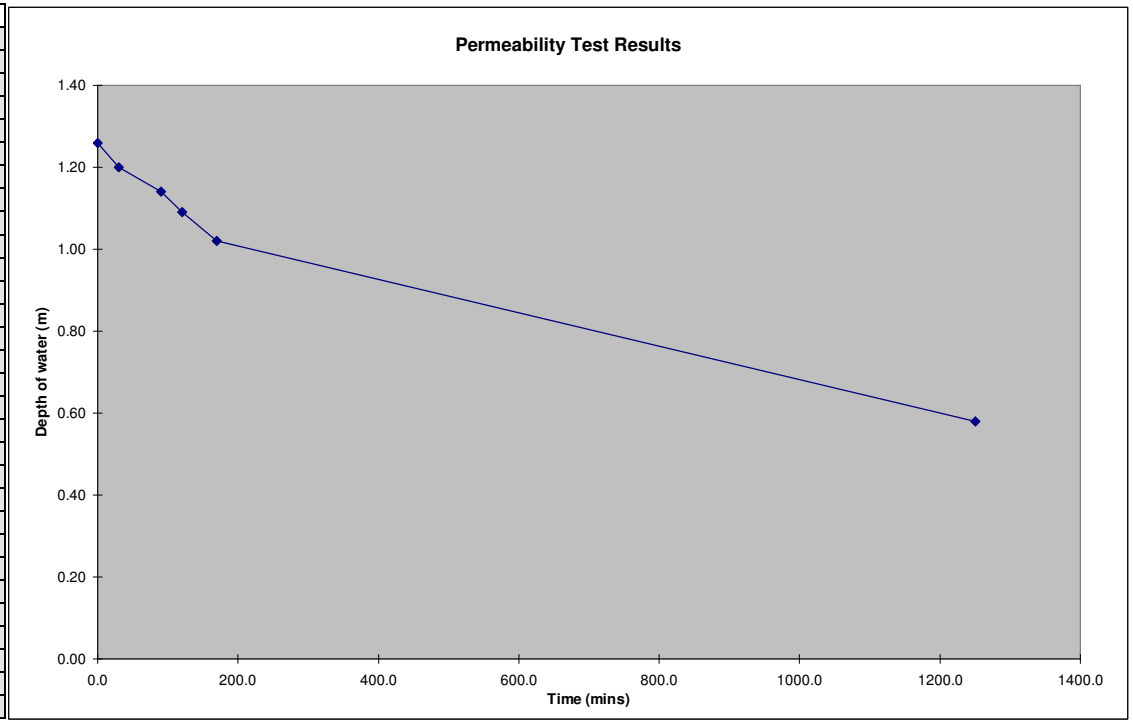
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP279A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	2
Pipe upstand (m)	0.900

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9450	0.6300	0.3150
Time (mins)	354	1127	1900

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.26	0.29	1.190
30.0	1.20	0.35	1.250
90.0	1.14	0.41	1.310
120.0	1.09	0.46	1.360
170.0	1.02	0.53	1.430
1250.0	0.58	0.97	1.870



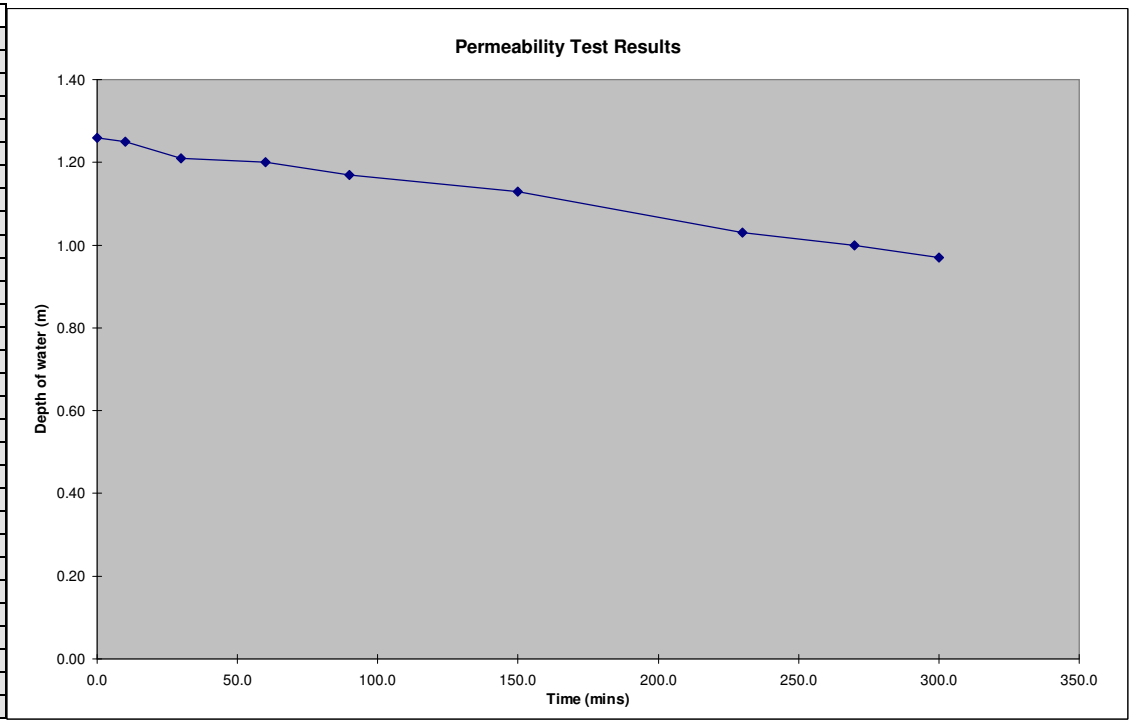
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP279A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	2.00
Pipe upstand (m)	0.900

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9450	0.6300	0.3150
Time (mins)	325	640	955

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.26	0.29	1.190
10.0	1.25	0.30	1.200
30.0	1.21	0.34	1.240
60.0	1.20	0.35	1.250
90.0	1.17	0.38	1.280
150.0	1.13	0.42	1.320
230.0	1.03	0.52	1.420
270.0	1.00	0.55	1.450
300.0	0.97	0.58	1.480



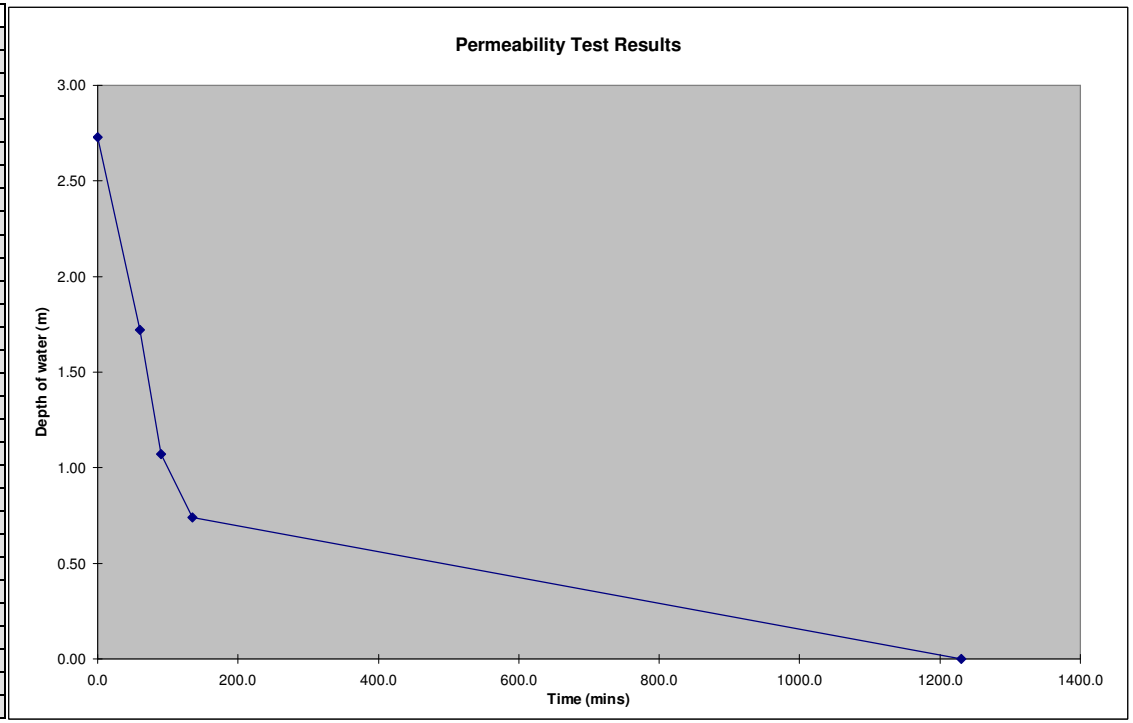
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP279B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.65
No of runs	3
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.0475	1.3650	0.6825
Time (mins)	41	76	220

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.73	0.27	0.570
60.0	1.72	1.28	1.580
90.0	1.07	1.93	2.230
135.0	0.74	2.26	2.560
1230.0	0.00	3.00	3.300



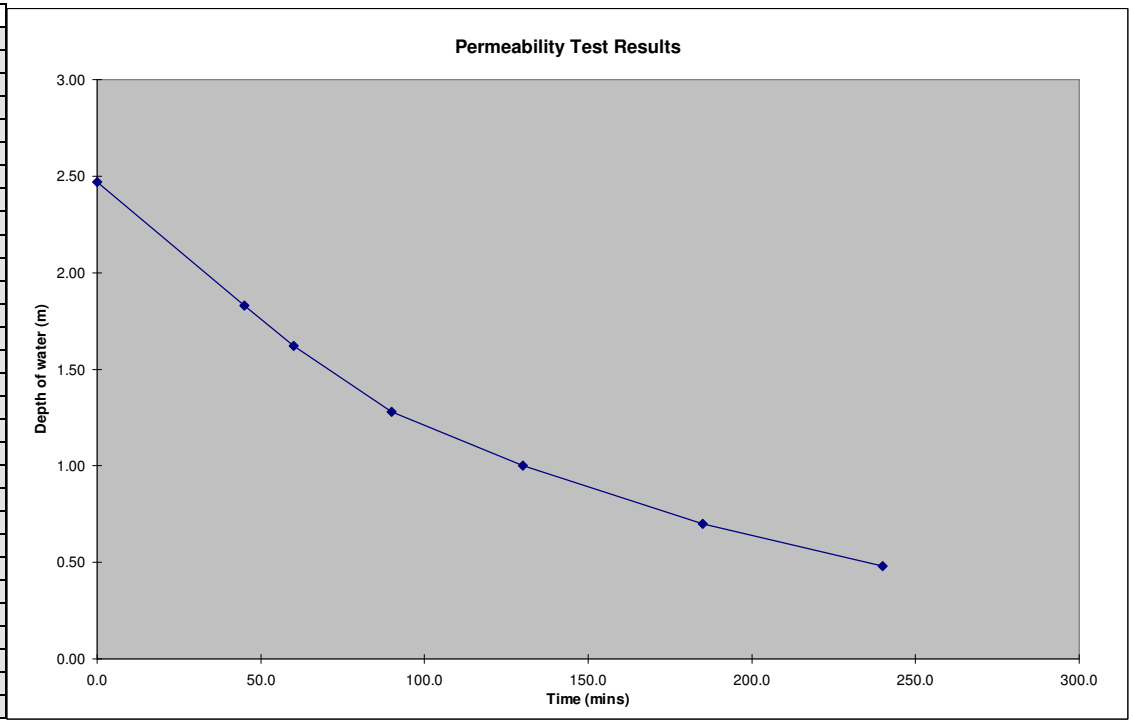
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP279B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.65
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8525	1.2350	0.6175
Time (mins)	43	96	206

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.47	0.53	0.830
45.0	1.83	1.17	1.470
60.0	1.62	1.38	1.680
90.0	1.28	1.72	2.020
130.0	1.00	2.00	2.300
185.0	0.70	2.30	2.600
240.0	0.48	2.52	2.820



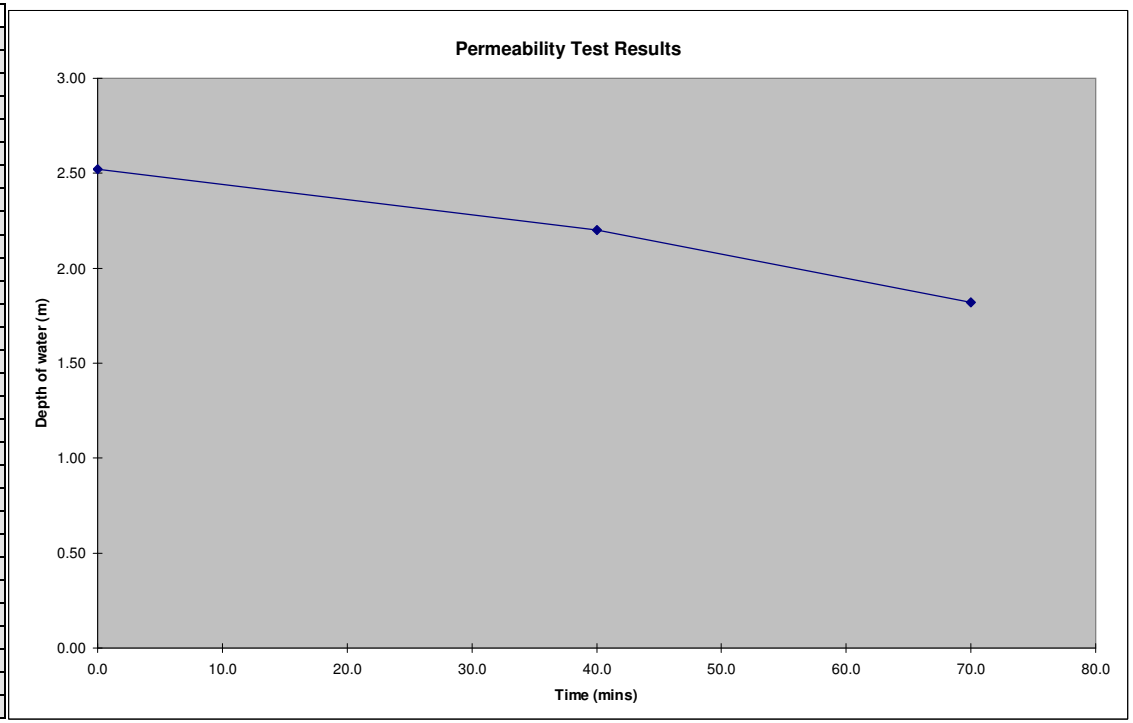
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP279B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.65
Breadth of Trial Pit (m)=	0.65
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8900	1.2600	0.6300
Time (mins)	64.5	114.2	163.9

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.52	0.48	0.780
40.0	2.20	0.80	1.100
70.0	1.82	1.18	1.480



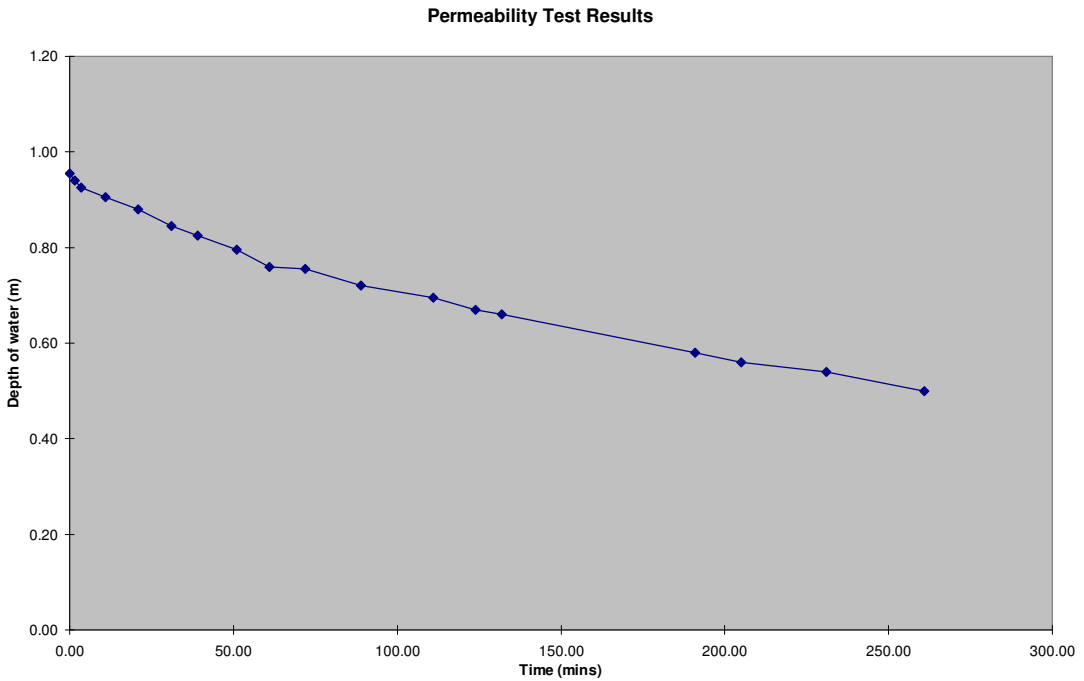
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP280A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7163	0.4775	0.2388
Time (mins)	95	283	500

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.96	0.55	0.545
1.50	0.94	0.56	0.560
3.50	0.93	0.58	0.575
11.00	0.91	0.60	0.595
21.00	0.88	0.62	0.620
31.00	0.85	0.66	0.655
39.00	0.83	0.68	0.675
51.00	0.80	0.71	0.705
61.00	0.76	0.74	0.740
72.00	0.76	0.75	0.745
89.00	0.72	0.78	0.780
111.00	0.70	0.81	0.805
124.00	0.67	0.83	0.830
132.00	0.66	0.84	0.840
191.00	0.58	0.92	0.920
205.00	0.56	0.94	0.940
231.00	0.54	0.96	0.960
261.00	0.50	1.00	1.000



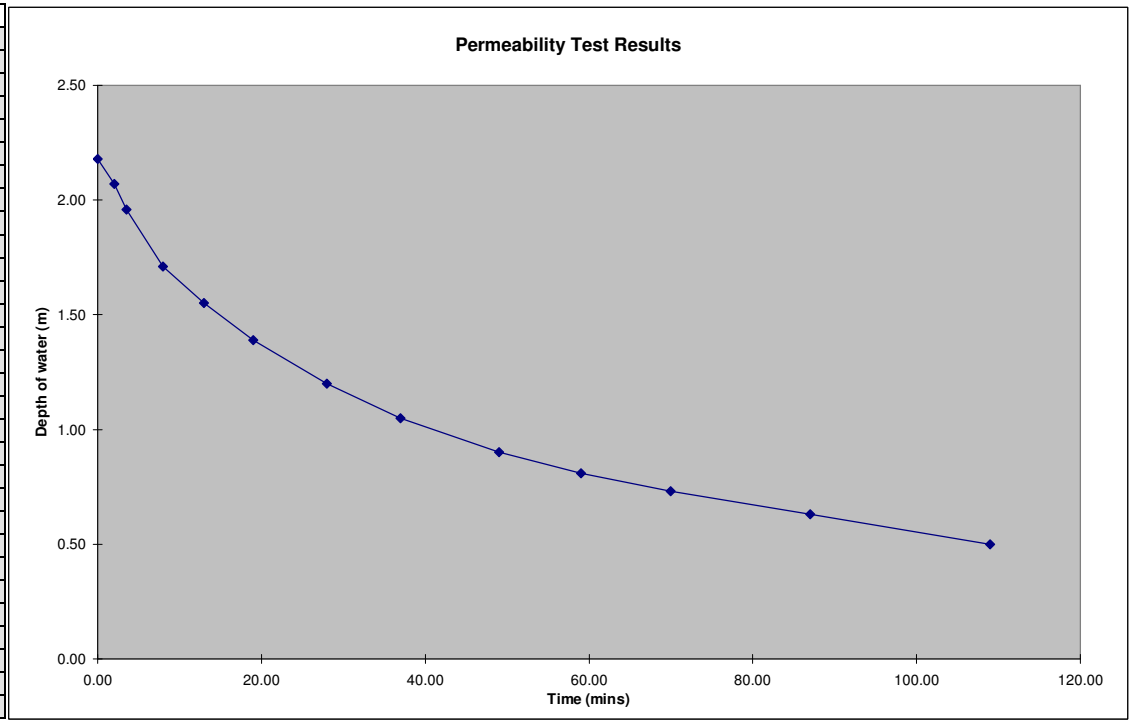
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP280B
Depth of Trial Pit (m)=	2.80
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.450
No of runs	2
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6350	1.0900	0.5450
Time (mins)	10	35	101

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	2.18	0.62	0.720
2.00	2.07	0.73	0.830
3.50	1.96	0.84	0.940
8.00	1.71	1.09	1.190
13.00	1.55	1.25	1.350
19.00	1.39	1.41	1.510
28.00	1.20	1.60	1.700
37.00	1.05	1.75	1.850
49.00	0.90	1.90	2.000
59.00	0.81	1.99	2.090
70.00	0.73	2.07	2.170
87.00	0.63	2.17	2.270
109.00	0.50	2.30	2.400



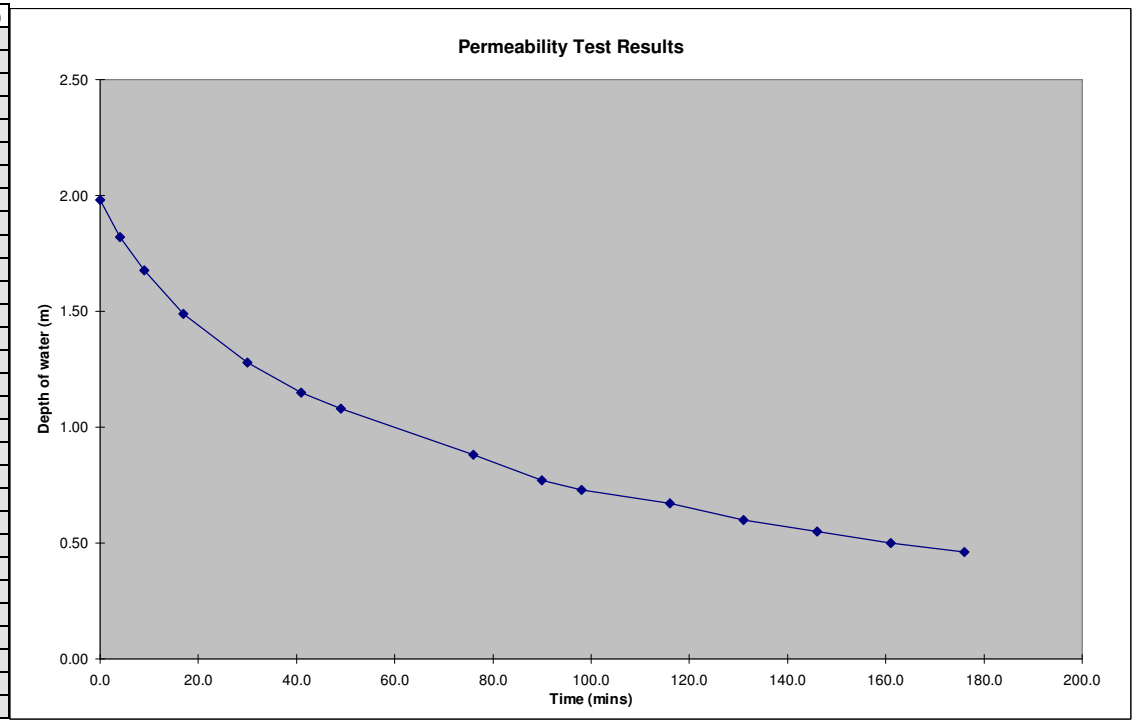
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP280B
Depth of Trial Pit (m)=	2.80
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.450
No of runs	2.00
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.4850	0.9900	0.4950
Time (mins)	19	61	164

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.98	0.82	0.920
4.0	1.82	0.98	1.080
9.0	1.68	1.12	1.224
17.0	1.49	1.31	1.410
30.0	1.28	1.52	1.620
41.0	1.15	1.65	1.750
49.0	1.08	1.72	1.820
76.0	0.88	1.92	2.020
90.0	0.77	2.03	2.130
98.0	0.73	2.07	2.170
116.0	0.67	2.13	2.230
131.0	0.60	2.20	2.300
146.0	0.55	2.25	2.350
161.0	0.50	2.30	2.400
176.0	0.46	2.34	2.440



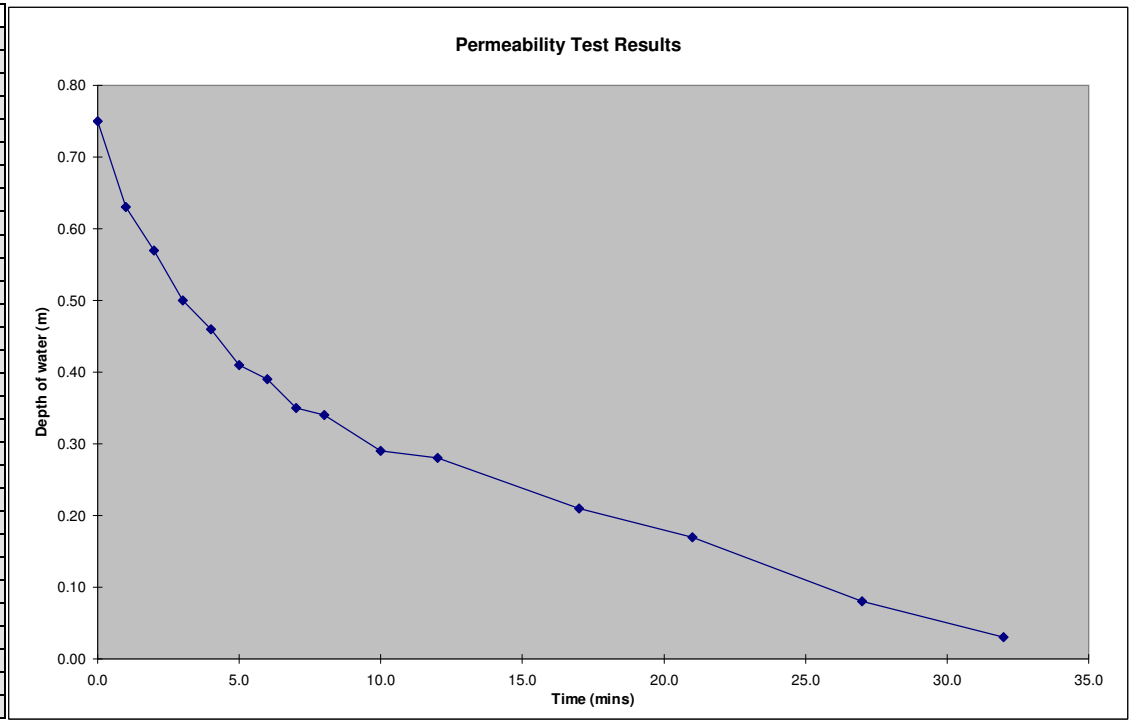
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	281A
Depth of Trial Pit (m)=	1.52
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.45
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5625	0.3750	0.1875
Time (mins)	2	6	19

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.75	0.77	0.770
1.0	0.63	0.89	0.890
2.0	0.57	0.95	0.950
3.0	0.50	1.02	1.020
4.0	0.46	1.06	1.060
5.0	0.41	1.11	1.110
6.0	0.39	1.13	1.130
7.0	0.35	1.17	1.170
8.0	0.34	1.18	1.180
10.0	0.29	1.23	1.230
12.0	0.28	1.24	1.240
17.0	0.21	1.31	1.310
21.0	0.17	1.35	1.350
27.0	0.08	1.44	1.440
32.0	0.03	1.49	1.490



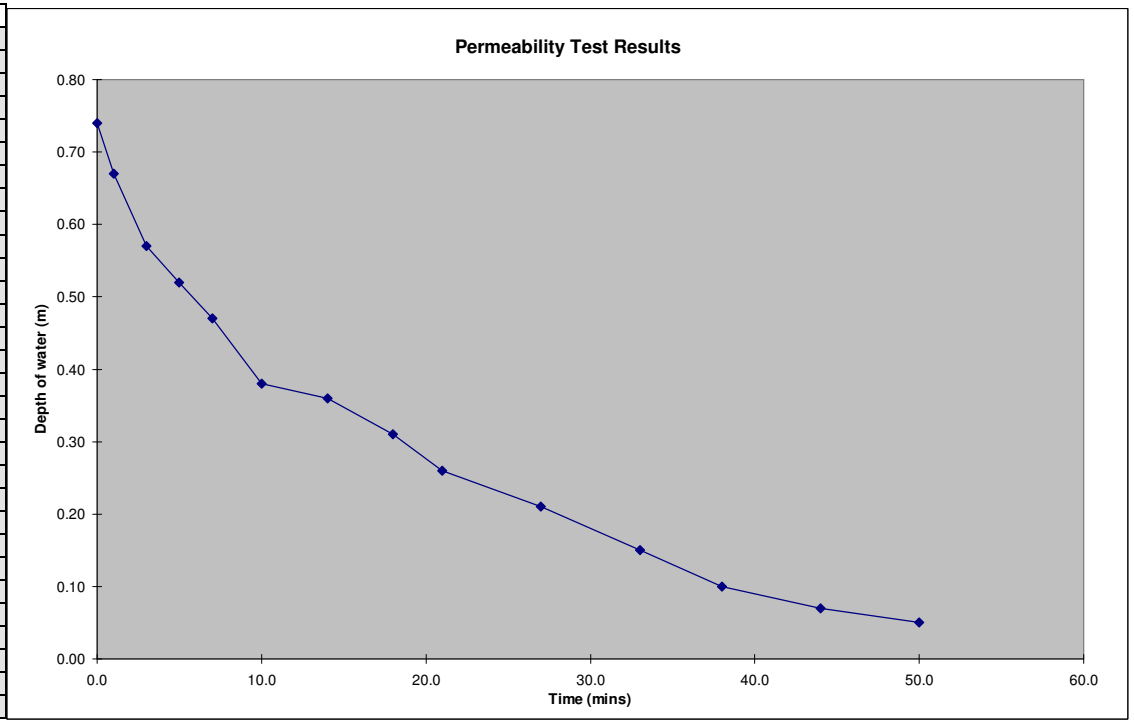
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	281A
Depth of Trial Pit (m)=	1.52
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5550	0.3700	0.1850
Time (mins)	4	13	30

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.74	0.78	0.780
1.0	0.67	0.85	0.850
3.0	0.57	0.95	0.950
5.0	0.52	1.00	1.000
7.0	0.47	1.05	1.050
10.0	0.38	1.14	1.140
14.0	0.36	1.16	1.160
18.0	0.31	1.21	1.210
21.0	0.26	1.26	1.260
27.0	0.21	1.31	1.310
33.0	0.15	1.37	1.370
38.0	0.10	1.42	1.420
44.0	0.07	1.45	1.450
50.0	0.05	1.47	1.470



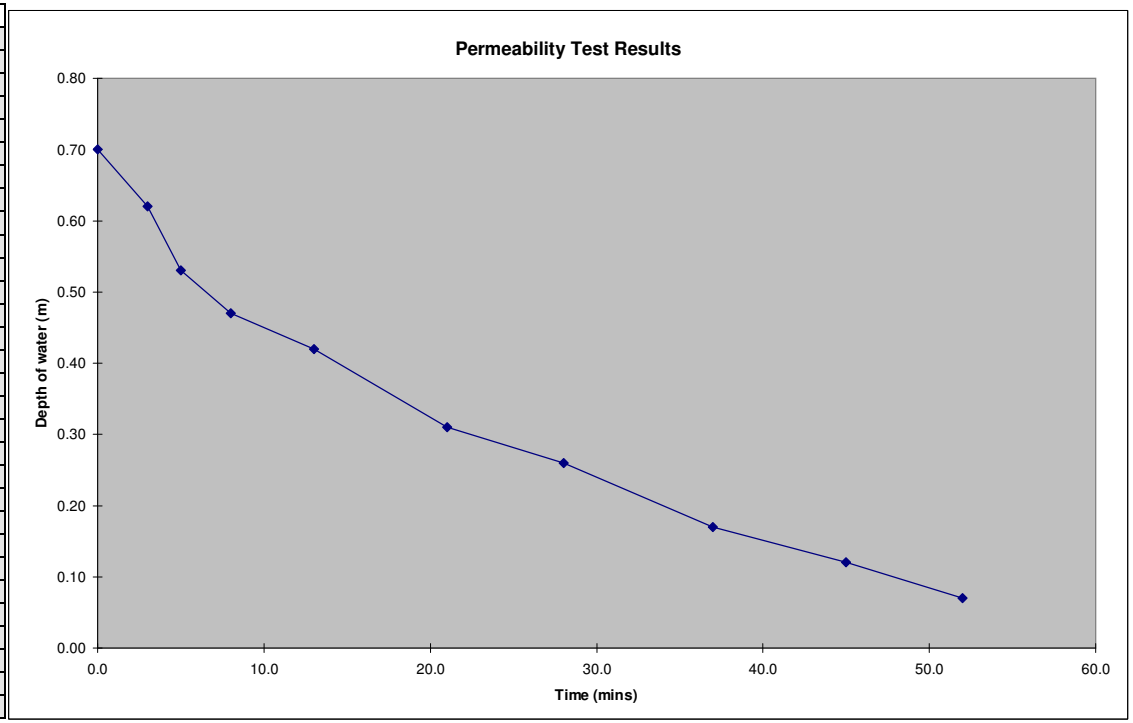
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	281A
Depth of Trial Pit (m)=	1.52
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5250	0.3500	0.1750
Time (mins)	7	19	38

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.70	0.82	0.820
3.0	0.62	0.90	0.900
5.0	0.53	0.99	0.990
8.0	0.47	1.05	1.050
13.0	0.42	1.10	1.100
21.0	0.31	1.21	1.210
28.0	0.26	1.26	1.260
37.0	0.17	1.35	1.350
45.0	0.12	1.40	1.400
52.0	0.07	1.45	1.450



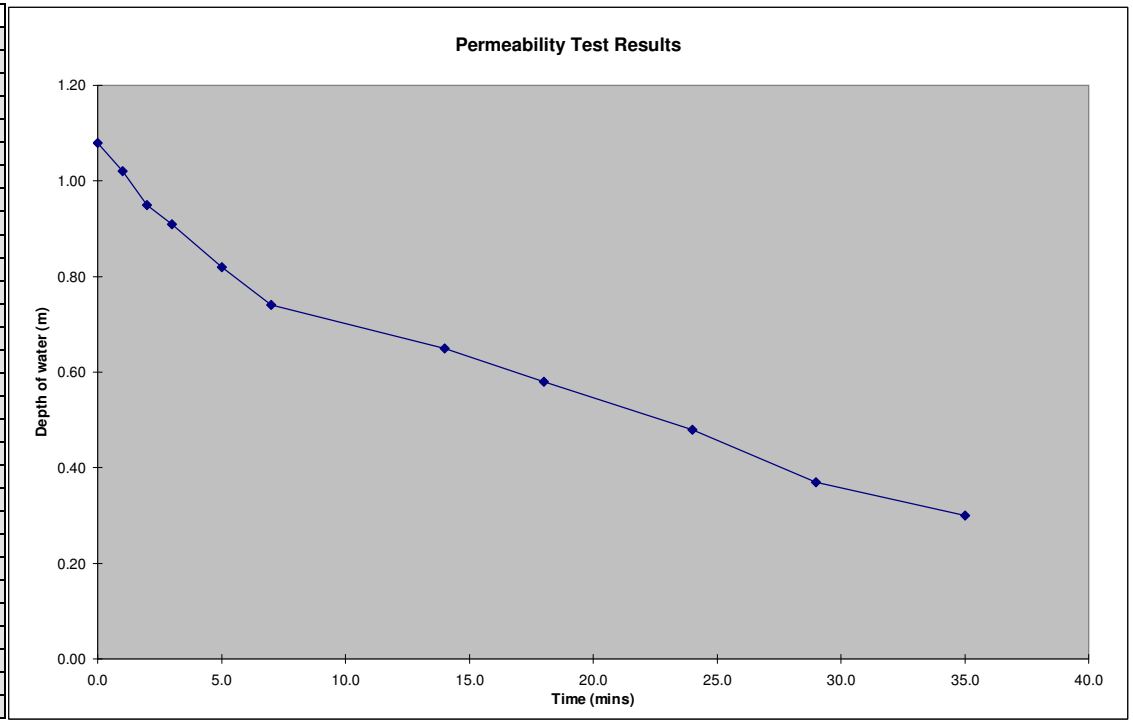
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	281B
Depth of Trial Pit (m)=	2.52
Length of Trial Pit (m)=	1.95
Breadth of Trial Pit (m)=	0.75
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8100	0.5400	0.2700
Time (mins)	5	20	38

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.08	1.44	1.440
1.0	1.02	1.50	1.500
2.0	0.95	1.57	1.570
3.0	0.91	1.61	1.610
5.0	0.82	1.70	1.700
7.0	0.74	1.78	1.780
14.0	0.65	1.87	1.870
18.0	0.58	1.94	1.940
24.0	0.48	2.04	2.040
29.0	0.37	2.15	2.150
35.0	0.30	2.22	2.220



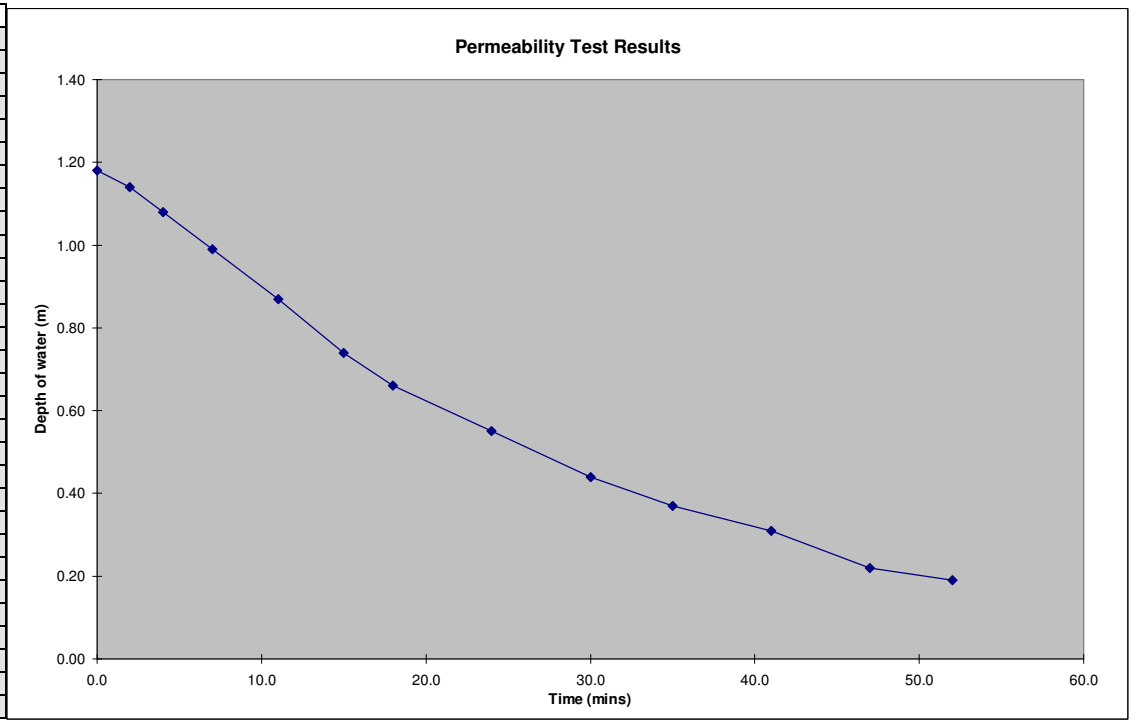
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	281B
Depth of Trial Pit (m)=	2.52
Length of Trial Pit (m)=	1.95
Breadth of Trial Pit (m)=	0.75
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8850	0.5900	0.2950
Time (mins)	11	22	42

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.18	1.34	1.340
2.0	1.14	1.38	1.380
4.0	1.08	1.44	1.440
7.0	0.99	1.53	1.530
11.0	0.87	1.65	1.650
15.0	0.74	1.78	1.780
18.0	0.66	1.86	1.860
24.0	0.55	1.97	1.970
30.0	0.44	2.08	2.080
35.0	0.37	2.15	2.150
41.0	0.31	2.21	2.210
47.0	0.22	2.30	2.300
52.0	0.19	2.33	2.330



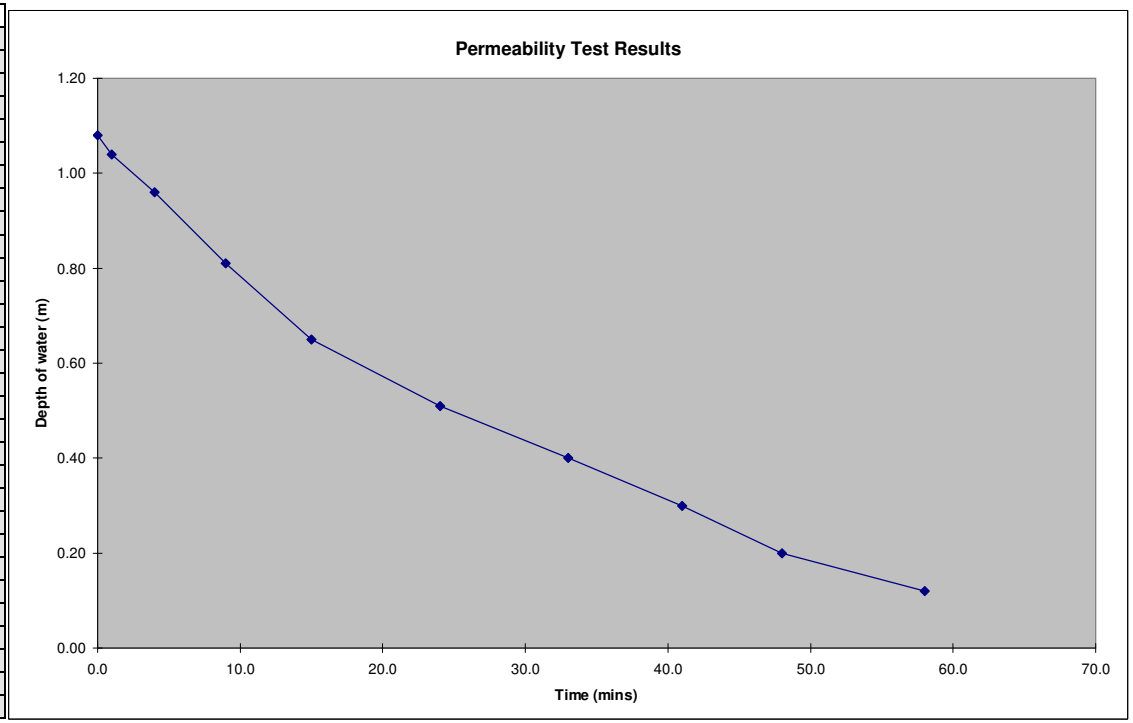
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	281B
Depth of Trial Pit (m)=	2.52
Length of Trial Pit (m)=	1.95
Breadth of Trial Pit (m)=	0.75
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8100	0.5400	0.2700
Time (mins)	9	23	44

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.08	1.44	1.440
1.0	1.04	1.48	1.480
4.0	0.96	1.56	1.560
9.0	0.81	1.71	1.710
15.0	0.65	1.87	1.870
24.0	0.51	2.01	2.010
33.0	0.40	2.12	2.120
41.0	0.30	2.22	2.220
48.0	0.20	2.32	2.320
58.0	0.12	2.40	2.400



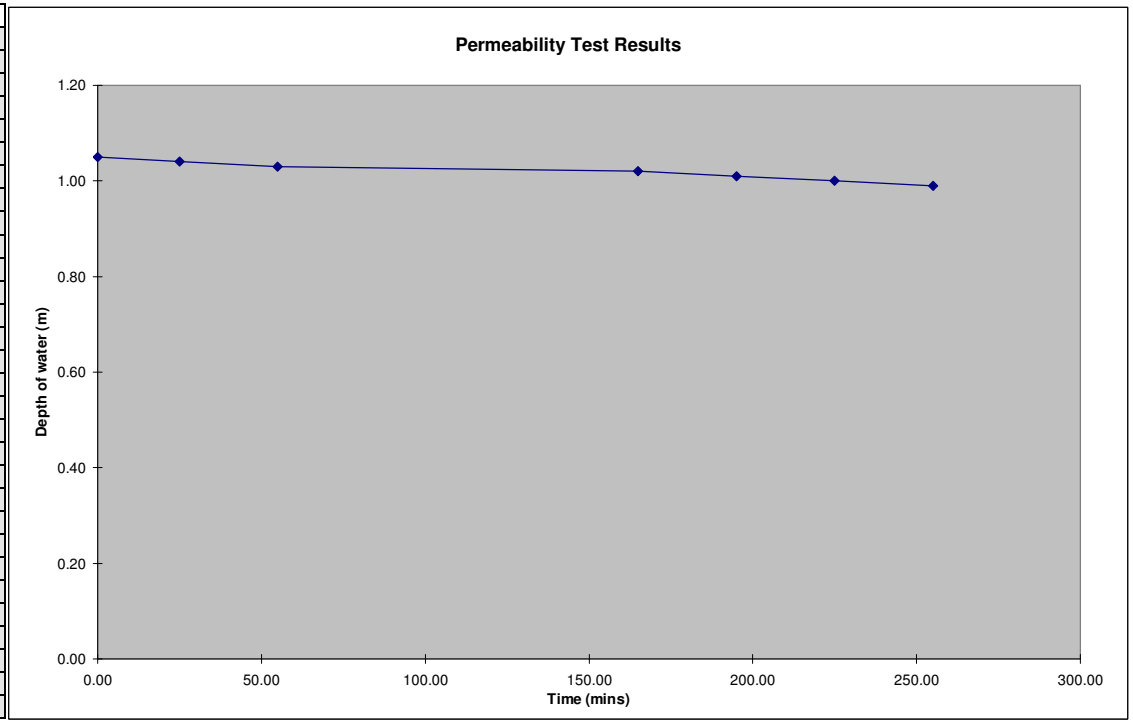
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP282A
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7875	0.5250	0.2625
Time (mins)	721	3617	2438

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	1.05	0.50	0.500
25.00	1.04	0.51	0.510
55.00	1.03	0.52	0.520
165.00	1.02	0.53	0.530
195.00	1.01	0.54	0.540
225.00	1.00	0.55	0.550
255.00	0.99	0.56	0.560



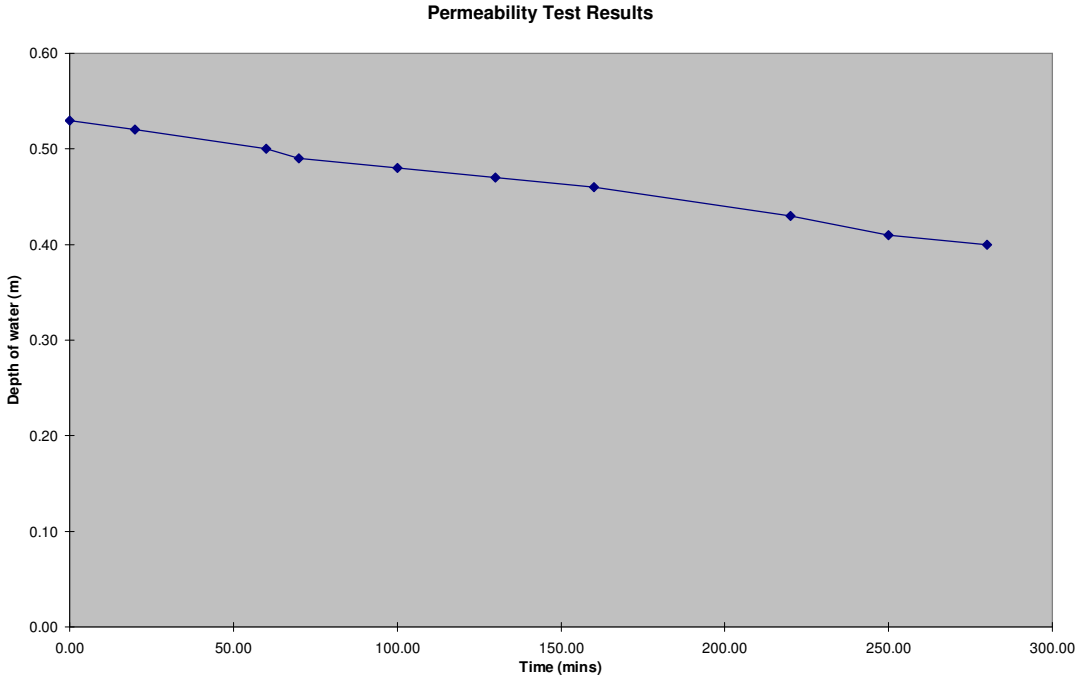
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	TP282B
Depth of Trial Pit (m)=	1.55
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.450
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.3975	0.2650	0.1325
Time (mins)	281	536	792

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.00	0.53	1.02	1.020
20.00	0.52	1.03	1.030
60.00	0.50	1.05	1.050
70.00	0.49	1.06	1.060
100.00	0.48	1.07	1.070
130.00	0.47	1.08	1.080
160.00	0.46	1.09	1.090
220.00	0.43	1.12	1.120
250.00	0.41	1.14	1.140
280.00	0.40	1.15	1.150



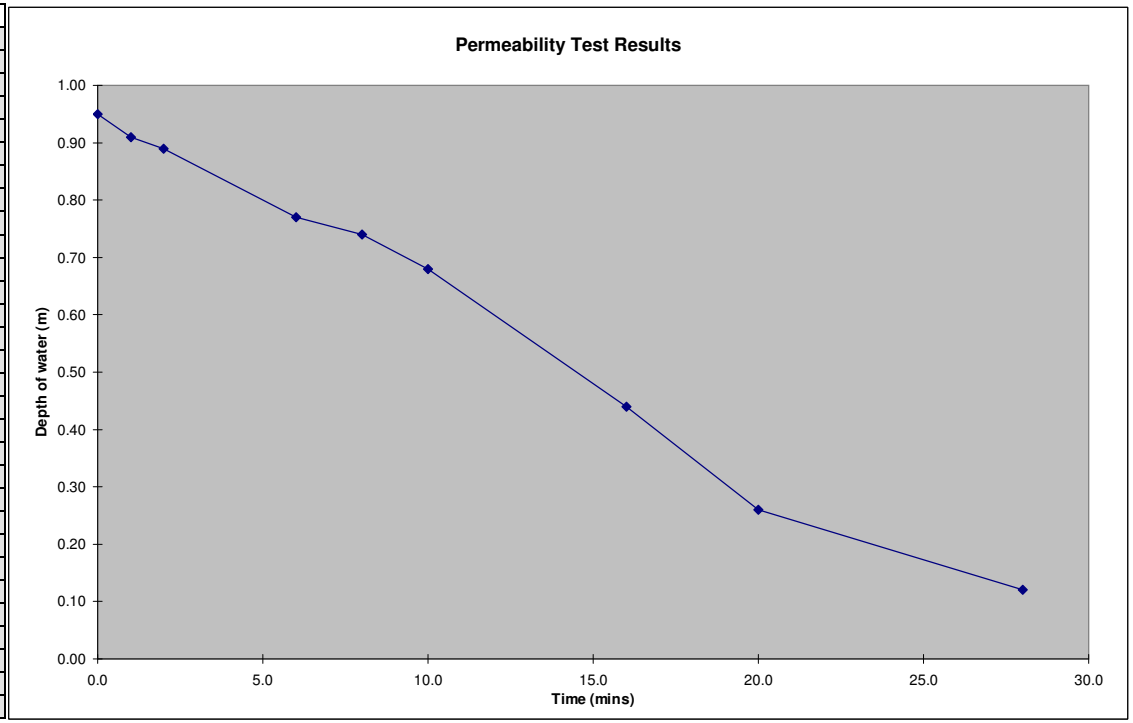
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	283A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.45
Breadth of Trial Pit (m)=	0.60
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7125	0.4750	0.2375
Time (mins)	9	15	21

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.95	0.55	0.550
1.0	0.91	0.59	0.590
2.0	0.89	0.61	0.610
6.0	0.77	0.73	0.730
8.0	0.74	0.76	0.760
10.0	0.68	0.82	0.820
16.0	0.44	1.06	1.060
20.0	0.26	1.24	1.240
28.0	0.12	1.38	1.380



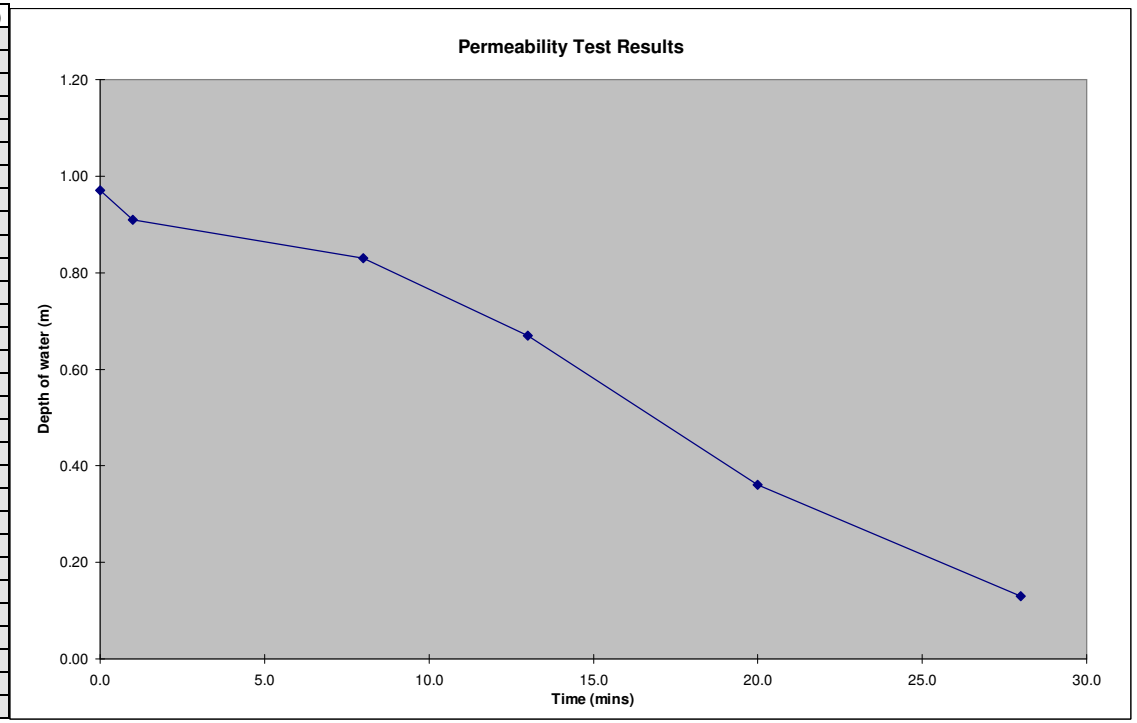
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	283A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.45
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7275	0.4850	0.2425
Time (mins)	11	17	24

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.97	0.53	0.530
1.0	0.91	0.59	0.590
8.0	0.83	0.67	0.670
13.0	0.67	0.83	0.830
20.0	0.36	1.14	1.140
28.0	0.13	1.37	1.370



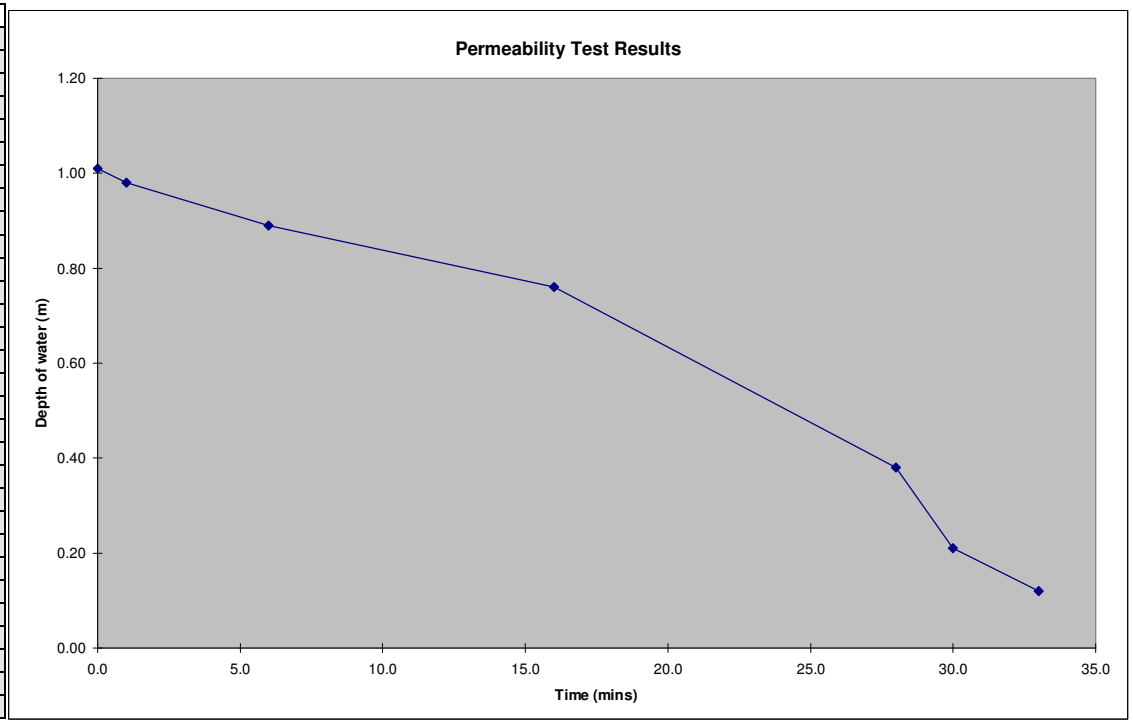
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	283A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.45
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7575	0.5050	0.2525
Time (mins)	13	24	30

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.01	0.49	0.490
1.0	0.98	0.52	0.520
6.0	0.89	0.61	0.610
16.0	0.76	0.74	0.740
28.0	0.38	1.12	1.120
30.0	0.21	1.29	1.290
33.0	0.12	1.38	1.380



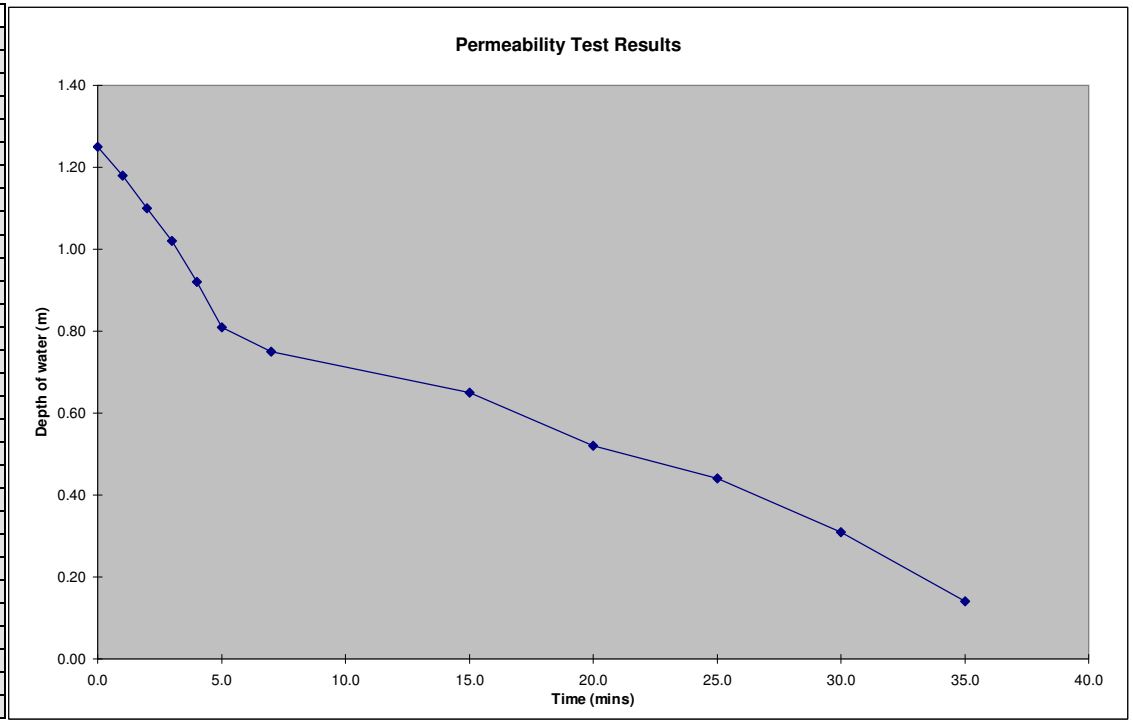
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	283B
Depth of Trial Pit (m)=	2.55
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.50
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9375	0.6250	0.3125
Time (mins)	4	16	29

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.25	1.30	1.300
1.0	1.18	1.37	1.370
2.0	1.10	1.45	1.450
3.0	1.02	1.53	1.530
4.0	0.92	1.63	1.630
5.0	0.81	1.74	1.740
7.0	0.75	1.80	1.800
15.0	0.65	1.90	1.900
20.0	0.52	2.03	2.030
25.0	0.44	2.11	2.110
30.0	0.31	2.24	2.240
35.0	0.14	2.41	2.410



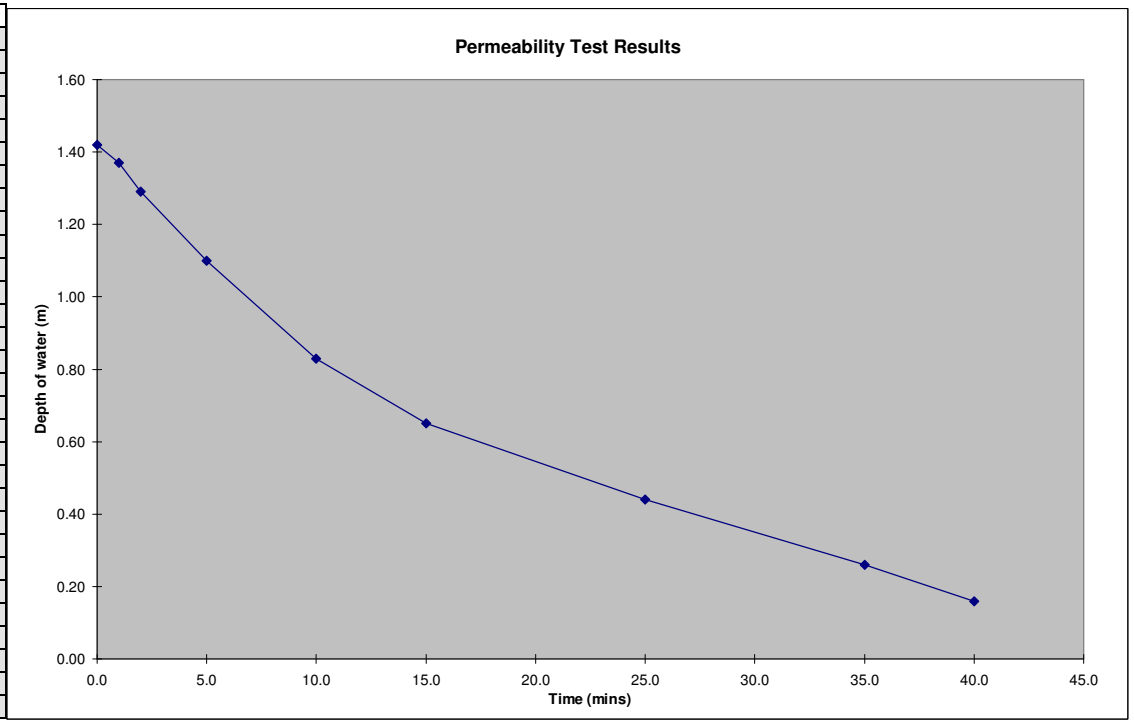
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	283B
Depth of Trial Pit (m)=	2.55
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.50
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0650	0.7100	0.3550
Time (mins)	6	13	30

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.42	1.13	1.130
1.0	1.37	1.18	1.180
2.0	1.29	1.26	1.260
5.0	1.10	1.45	1.450
10.0	0.83	1.72	1.720
15.0	0.65	1.90	1.900
25.0	0.44	2.11	2.110
35.0	0.26	2.29	2.290
40.0	0.16	2.39	2.390



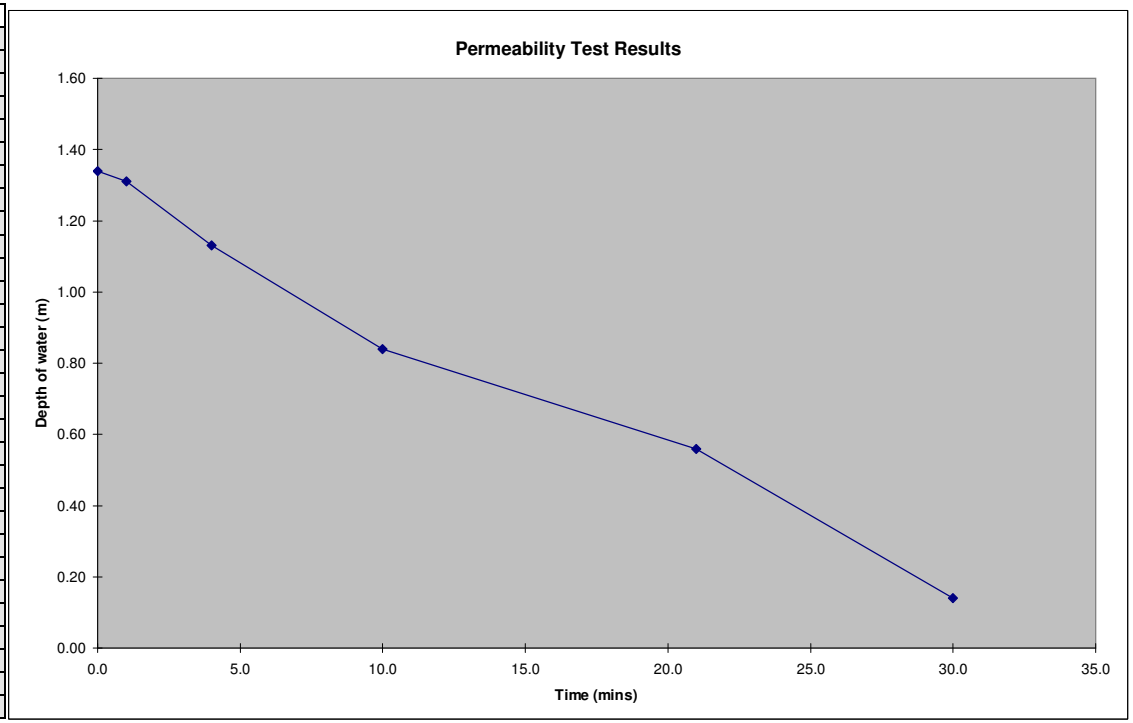
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	283B
Depth of Trial Pit (m)=	2.55
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.50
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0050	0.6700	0.3350
Time (mins)	7	17	25

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.34	1.21	1.210
1.0	1.31	1.24	1.240
4.0	1.13	1.42	1.420
10.0	0.84	1.71	1.710
21.0	0.56	1.99	1.990
30.0	0.14	2.41	2.410



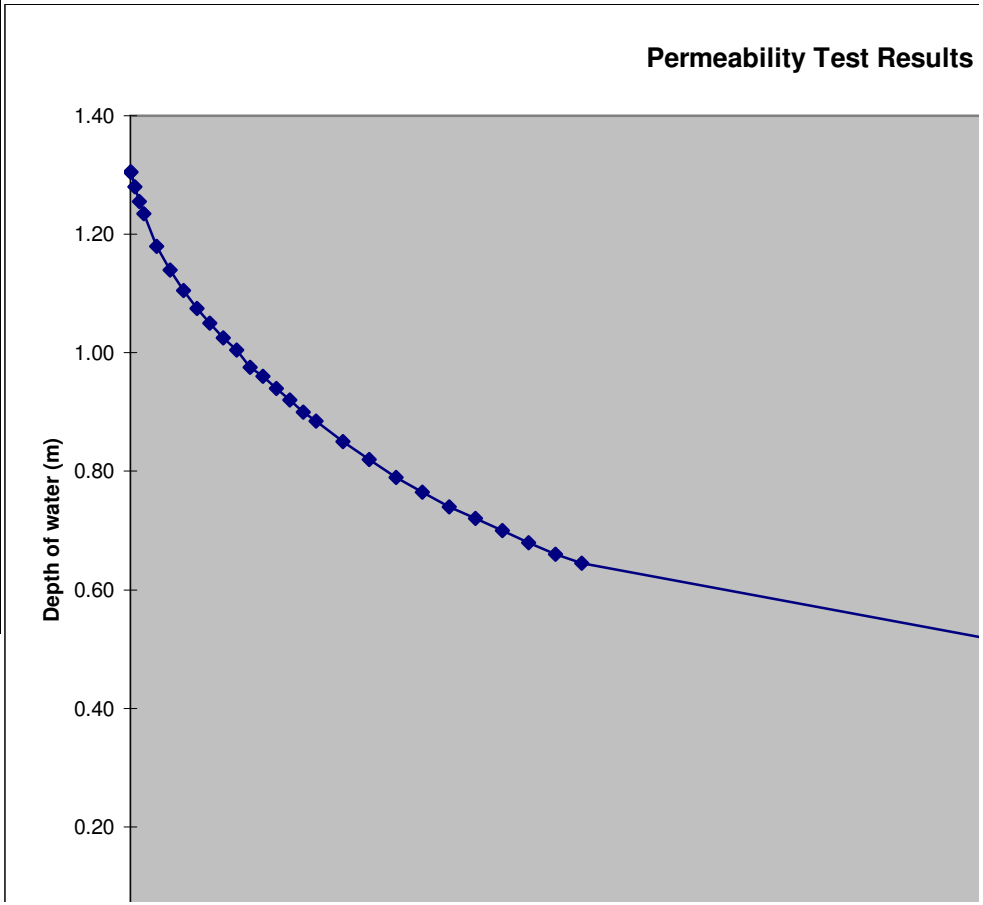
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP284A
Depth of Trial Pit (m)=	1.80
Length of Trial Pit (m)=	1.35
Breadth of Trial Pit (m)=	0.62
No of runs	2
Pipe upstand (m)	0.600

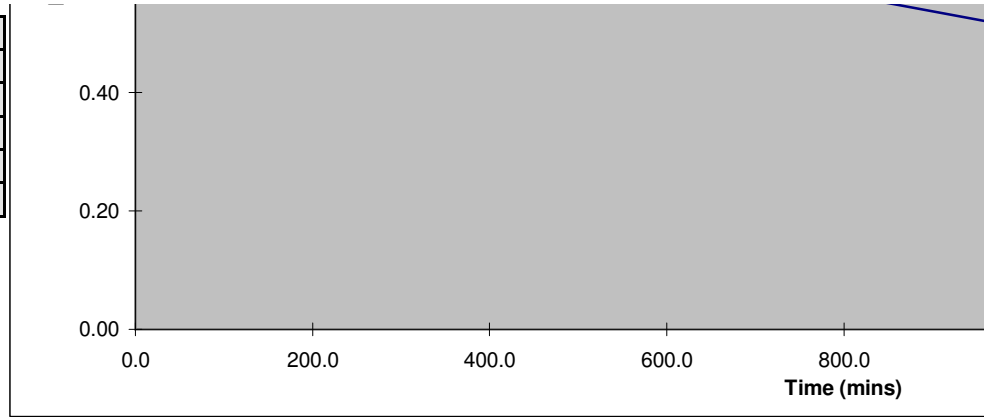
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9788	0.6525	0.3263
Time (mins)	131	495	1823

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.31	0.50	1.095
1.0	1.31	0.50	1.095
5.0	1.28	0.52	1.120
10.0	1.26	0.55	1.145
15.0	1.24	0.57	1.165
30.0	1.18	0.62	1.220
45.0	1.14	0.66	1.260
60.0	1.11	0.70	1.295
75.0	1.08	0.73	1.325
90.0	1.05	0.75	1.350
105.0	1.03	0.78	1.375
120.0	1.01	0.80	1.395
135.0	0.98	0.83	1.425
150.0	0.96	0.84	1.440
165.0	0.94	0.86	1.460
180.0	0.92	0.88	1.480
195.0	0.90	0.90	1.500
210.0	0.89	0.92	1.515



240.0	0.85	0.95	1.550
270.0	0.82	0.98	1.580
300.0	0.79	1.01	1.610
330.0	0.77	1.04	1.635
360.0	0.74	1.06	1.660
390.0	0.72	1.08	1.680



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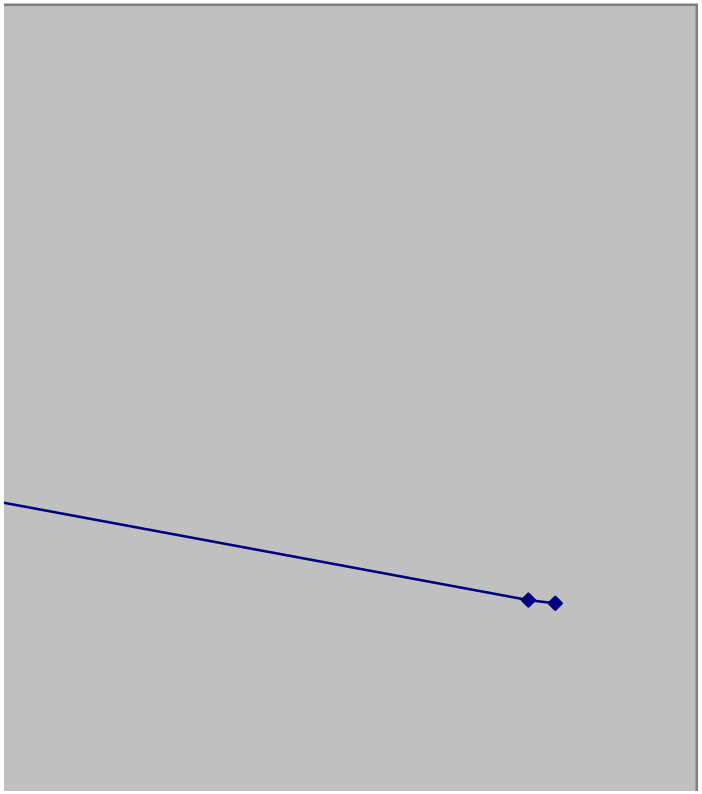

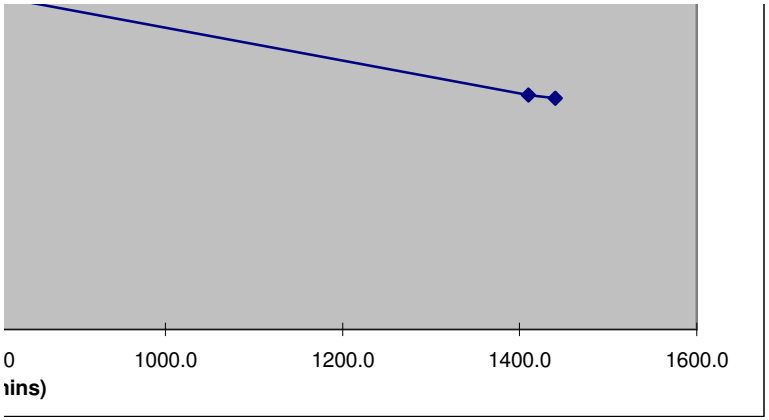
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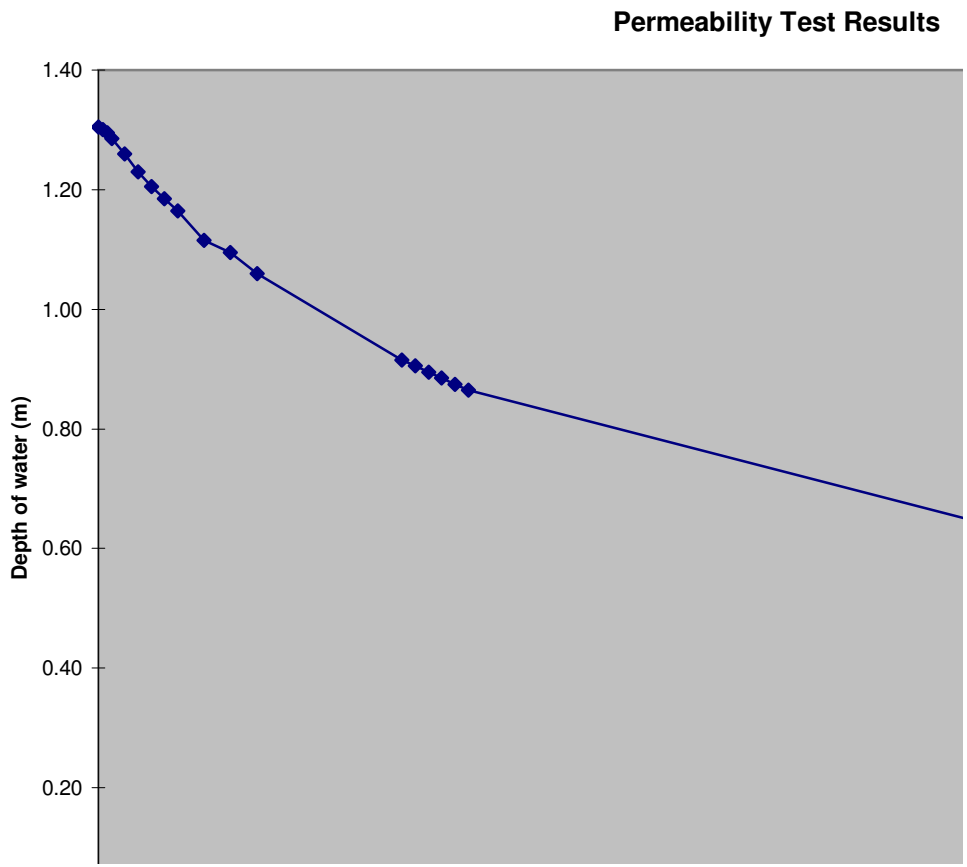
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP284A
Depth of Trial Pit (m)=	1.80
Length of Trial Pit (m)=	1.35
Breadth of Trial Pit (m)=	0.62
No of runs	2.00
Pipe upstand (m)	0.600

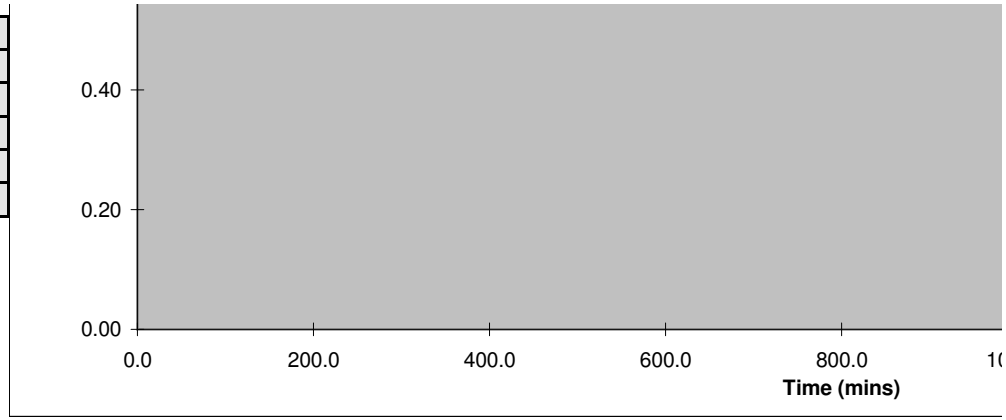
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9788	0.6525	0.3263
Time (mins)	272	979	2423

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.31	0.50	1.095
5.0	1.30	0.50	1.100
10.0	1.30	0.51	1.105
15.0	1.29	0.52	1.115
30.0	1.26	0.54	1.140
45.0	1.23	0.57	1.170
60.0	1.21	0.60	1.195
75.0	1.19	0.62	1.215
90.0	1.17	0.64	1.235
120.0	1.12	0.69	1.285
150.0	1.10	0.71	1.305
180.0	1.06	0.74	1.340
345.0	0.92	0.89	1.485
360.0	0.91	0.90	1.495
375.0	0.90	0.91	1.505
390.0	0.89	0.92	1.515
405.0	0.88	0.93	1.525
420.0	0.87	0.94	1.535



1380.0	0.50	1.30	1.900
1410.0	0.50	1.31	1.905
1440.0	0.49	1.31	1.910
1470.0	0.49	1.32	1.915



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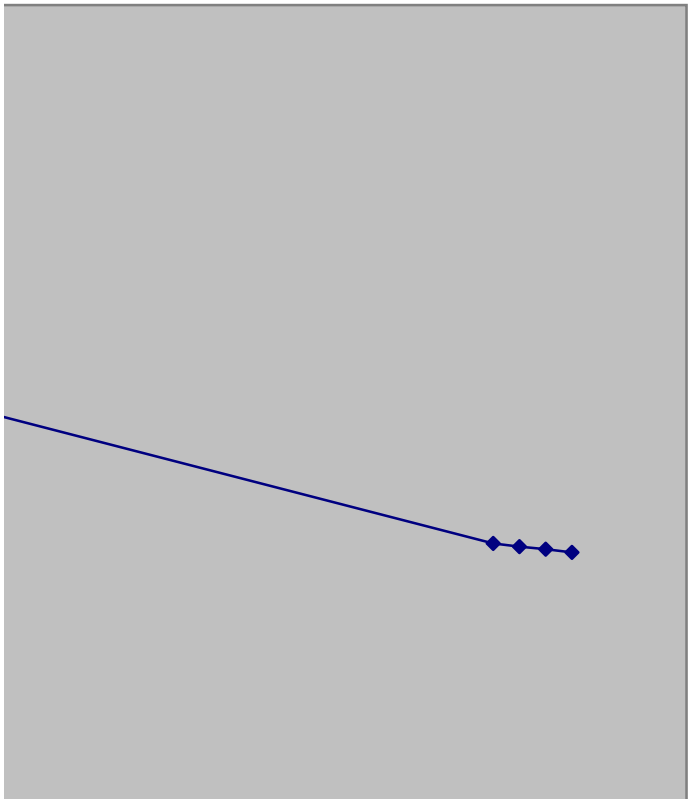

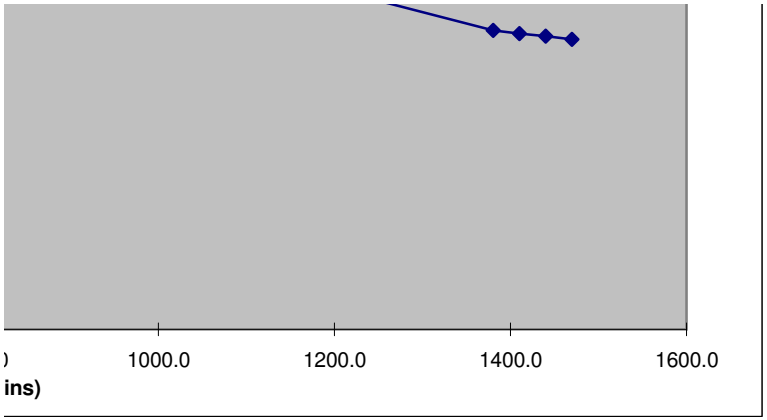
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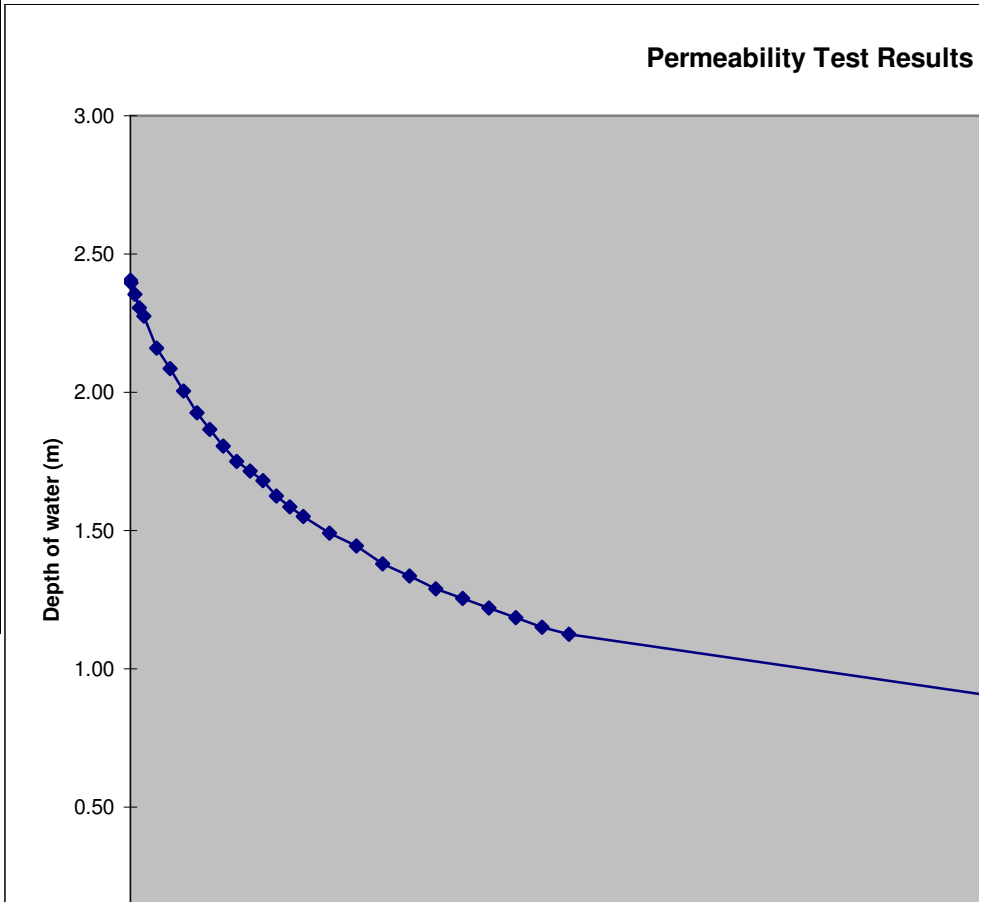
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP284A
Depth of Trial Pit (m)=	3.10
Length of Trial Pit (m)=	1.60
Breadth of Trial Pit (m)=	0.62
No of runs	1
Pipe upstand (m)	0.200

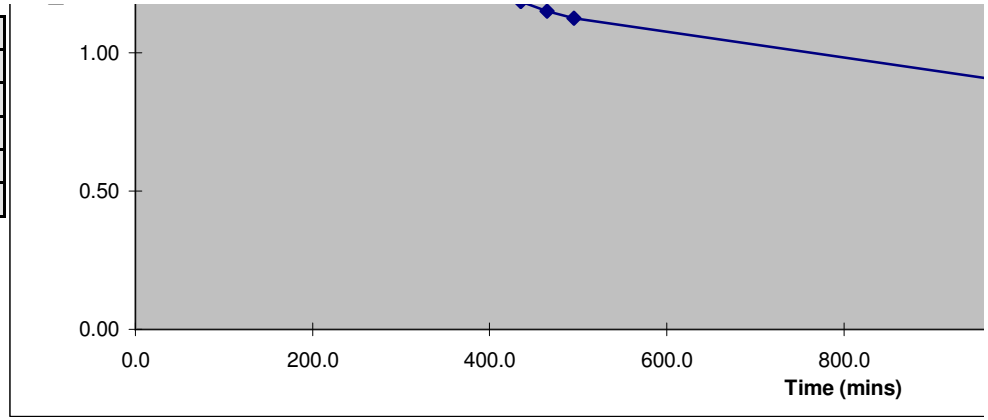
Time of Emptying of Soakaway
(Values to be checked on chart)

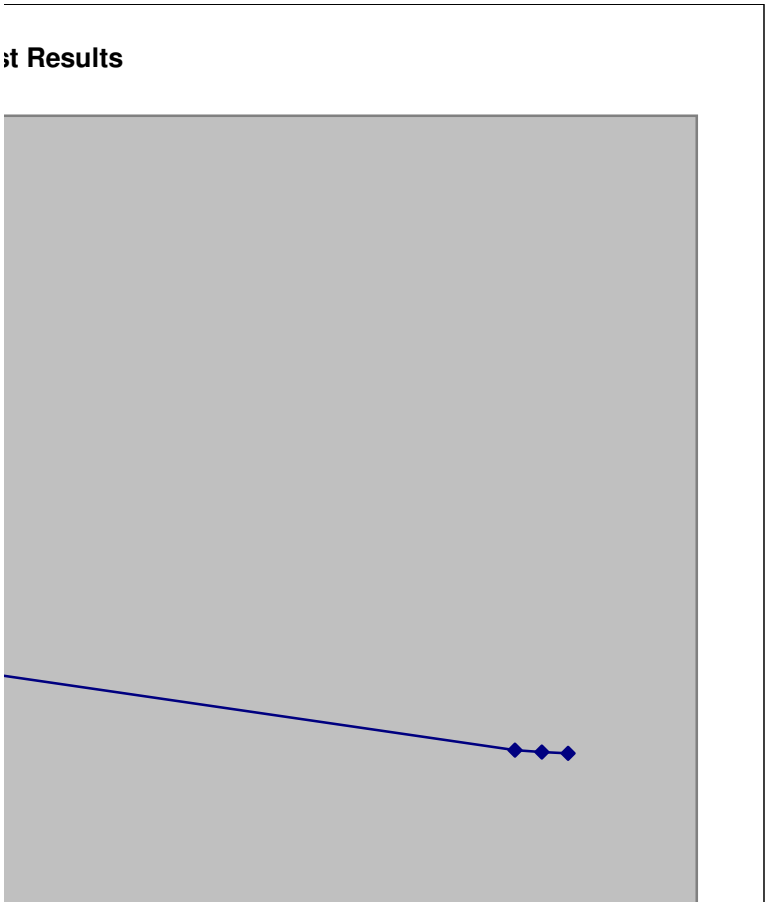
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8038	1.2025	0.6013
Time (mins)	105	420	2018

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.41	0.70	0.895
1.0	2.40	0.71	0.905
5.0	2.36	0.75	0.945
10.0	2.31	0.80	0.995
15.0	2.28	0.83	1.025
30.0	2.16	0.94	1.140
45.0	2.09	1.02	1.215
60.0	2.01	1.10	1.295
75.0	1.93	1.18	1.375
90.0	1.87	1.24	1.435
105.0	1.81	1.30	1.495
120.0	1.75	1.35	1.550
135.0	1.72	1.39	1.585
150.0	1.68	1.42	1.620
165.0	1.63	1.48	1.675
180.0	1.59	1.52	1.715
195.0	1.55	1.55	1.750
225.0	1.49	1.61	1.810



255.0	1.45	1.66	1.855
285.0	1.38	1.72	1.920
315.0	1.34	1.77	1.965
345.0	1.29	1.81	2.010
375.0	1.26	1.85	2.045
405.0	1.22	1.88	2.080

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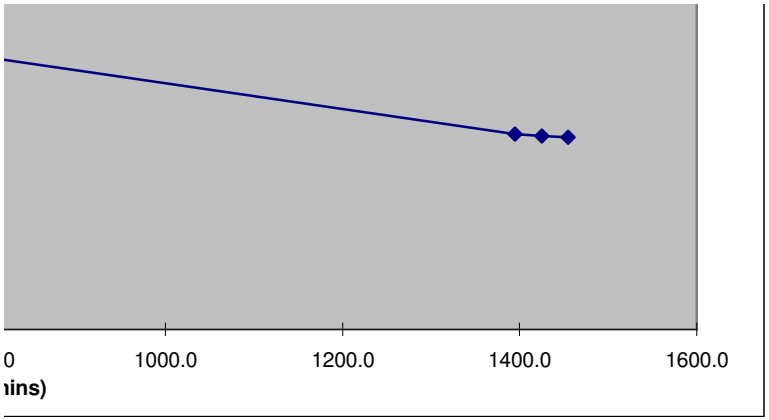
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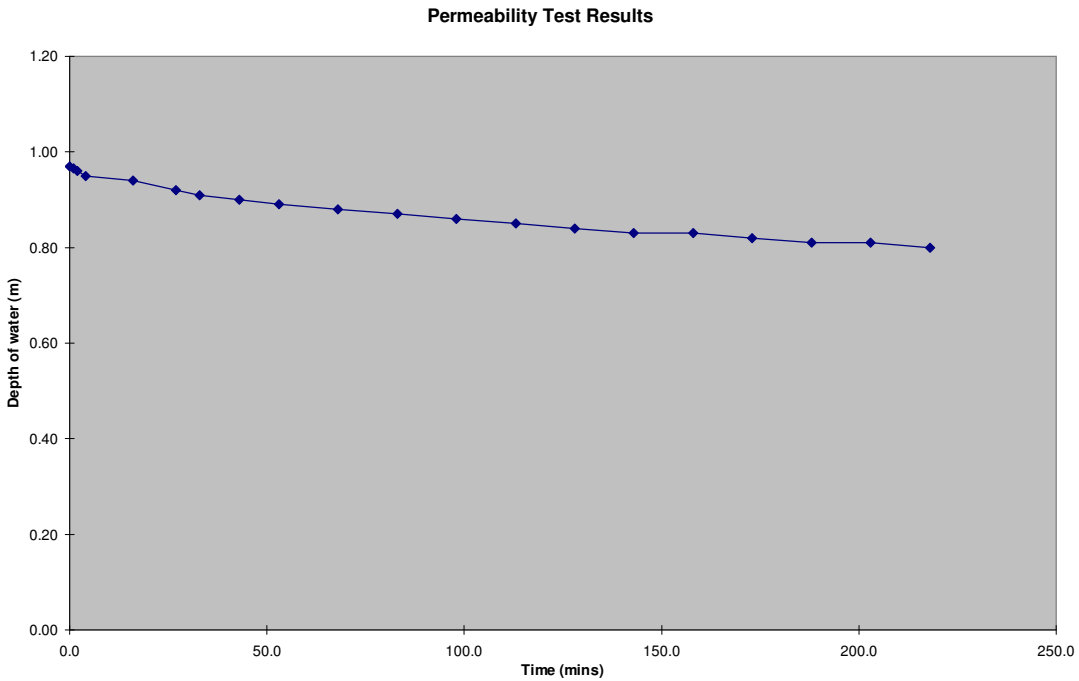
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	285A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.10
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7275	0.4850	0.2425
Time (mins)	133	458	1024

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.97	0.63	0.630
1.0	0.97	0.64	0.635
2.0	0.96	0.64	0.640
4.0	0.95	0.65	0.650
16.0	0.94	0.66	0.660
27.0	0.92	0.68	0.680
33.0	0.91	0.69	0.690
43.0	0.90	0.70	0.700
53.0	0.89	0.71	0.710
68.0	0.88	0.72	0.720
83.0	0.87	0.73	0.730
98.0	0.86	0.74	0.740
113.0	0.85	0.75	0.750
128.0	0.84	0.76	0.760
143.0	0.83	0.77	0.770
158.0	0.83	0.77	0.770
173.0	0.82	0.78	0.780
188.0	0.81	0.79	0.790
203.0	0.81	0.79	0.790
218.0	0.80	0.80	0.800



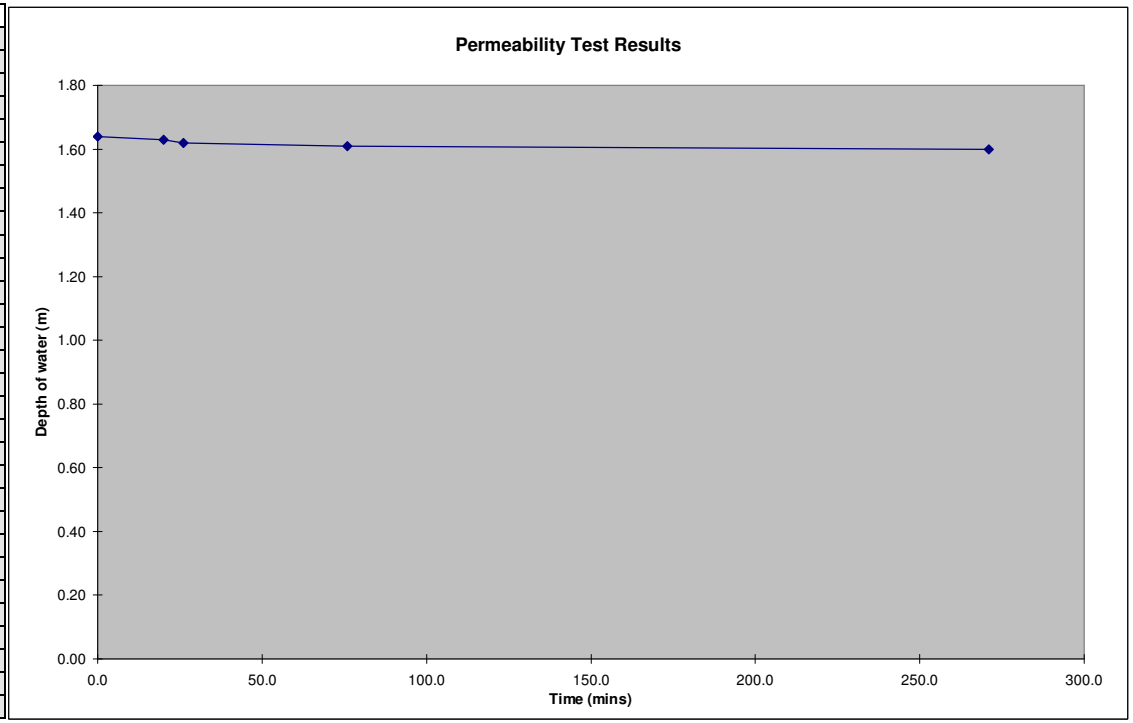
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	285B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2300	0.8200	0.4100
Time (mins)	3190	6482	9774

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.64	1.06	1.060
20.0	1.63	1.07	1.070
26.0	1.62	1.08	1.080
76.0	1.61	1.09	1.090
271.0	1.60	1.10	1.100



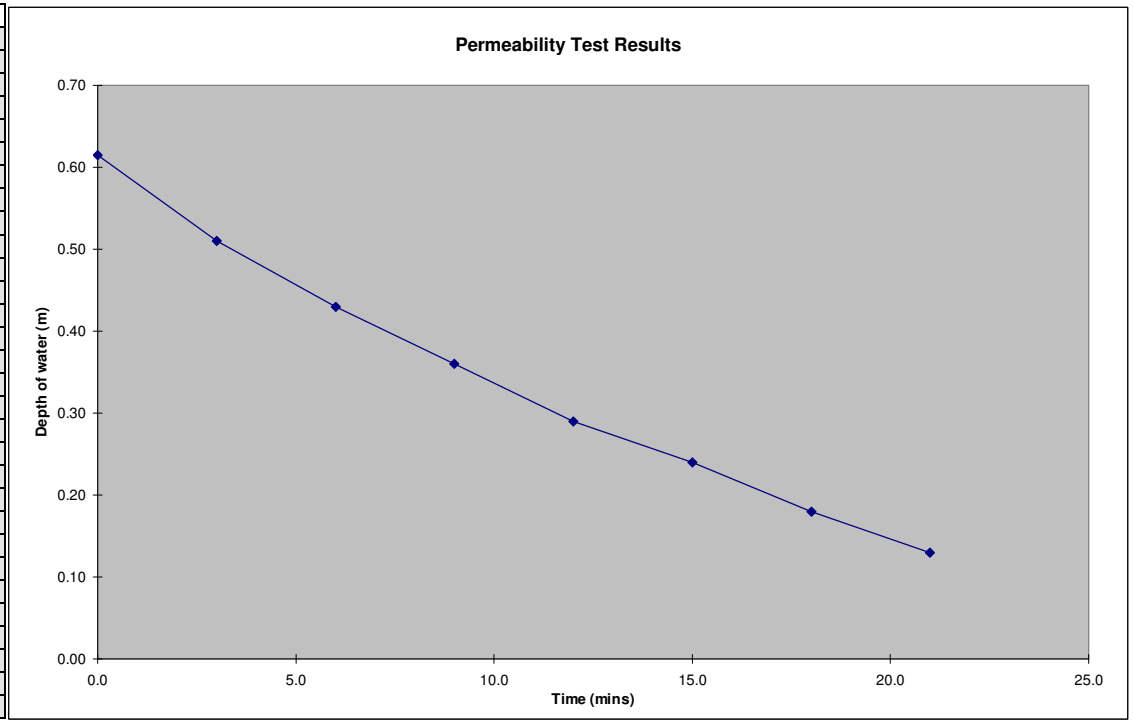
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP300A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.50
No of runs	3
Pipe upstand (m)	0.785

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4613	0.3075	0.1538
Time (mins)	5	11	20

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.62	0.89	1.670
3.0	0.51	0.99	1.775
6.0	0.43	1.07	1.855
9.0	0.36	1.14	1.925
12.0	0.29	1.21	1.995
15.0	0.24	1.26	2.045
18.0	0.18	1.32	2.105
21.0	0.13	1.37	2.155



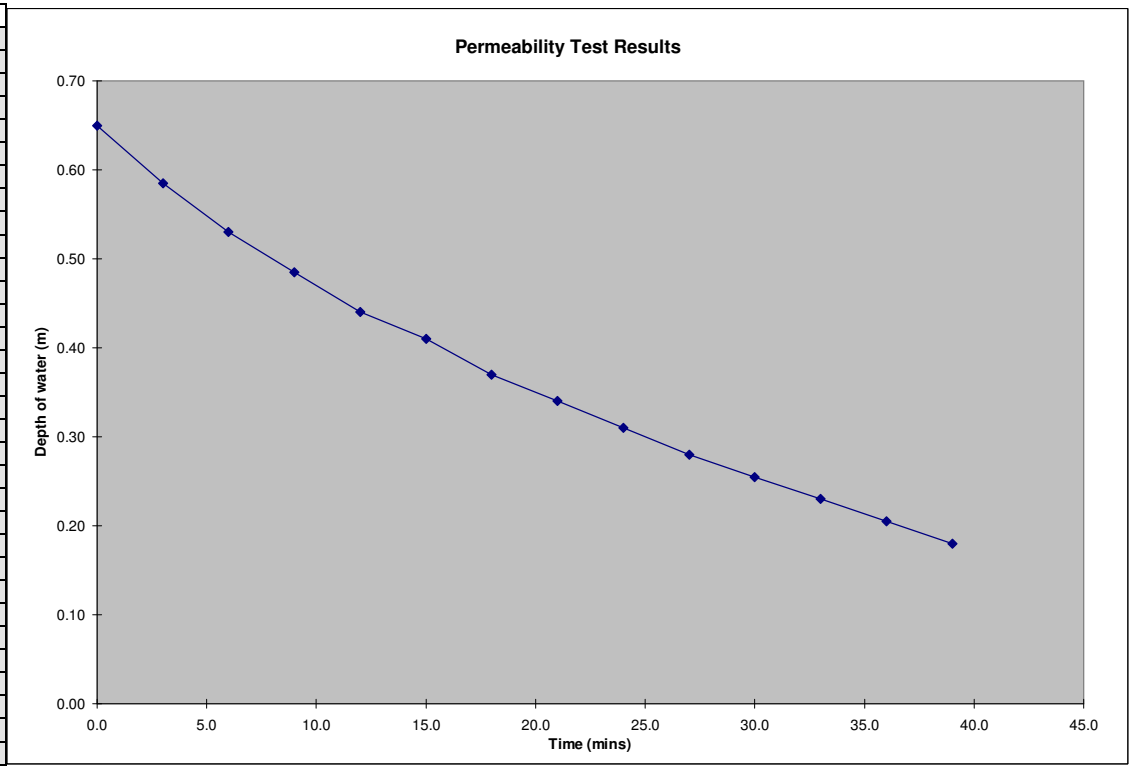
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP300A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.50
No of runs	3.00
Pipe upstand (m)	0.785

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4875	0.3250	0.1625
Time (mins)	9	23	41

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.65	0.85	1.635
3.0	0.59	0.92	1.700
6.0	0.53	0.97	1.755
9.0	0.49	1.02	1.800
12.0	0.44	1.06	1.845
15.0	0.41	1.09	1.875
18.0	0.37	1.13	1.915
21.0	0.34	1.16	1.945
24.0	0.31	1.19	1.975
27.0	0.28	1.22	2.005
30.0	0.26	1.25	2.030
33.0	0.23	1.27	2.055
36.0	0.21	1.30	2.080
39.0	0.18	1.32	2.105



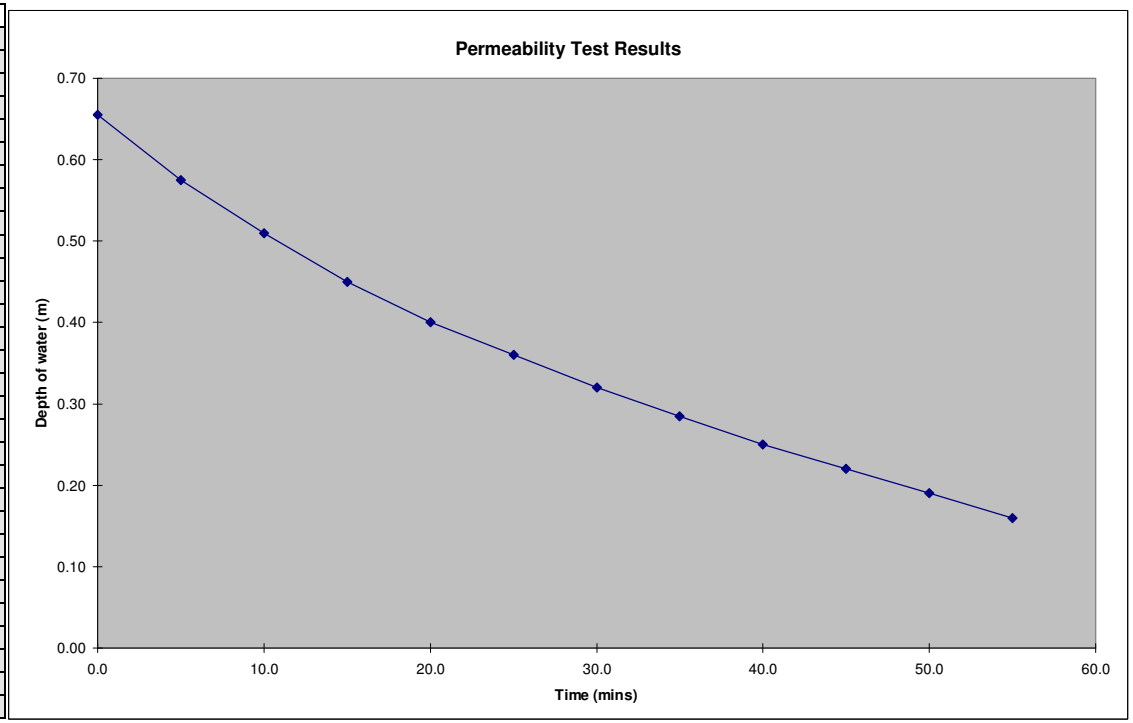
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP300A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.50
No of runs	3.00
Pipe upstand (m)	0.785

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4913	0.3275	0.1638
Time (mins)	11.6	29.1	54.4

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.66	0.85	1.630
5.0	0.58	0.93	1.710
10.0	0.51	0.99	1.775
15.0	0.45	1.05	1.835
20.0	0.40	1.10	1.885
25.0	0.36	1.14	1.925
30.0	0.32	1.18	1.965
35.0	0.29	1.22	2.000
40.0	0.25	1.25	2.035
45.0	0.22	1.28	2.065
50.0	0.19	1.31	2.095
55.0	0.16	1.34	2.125



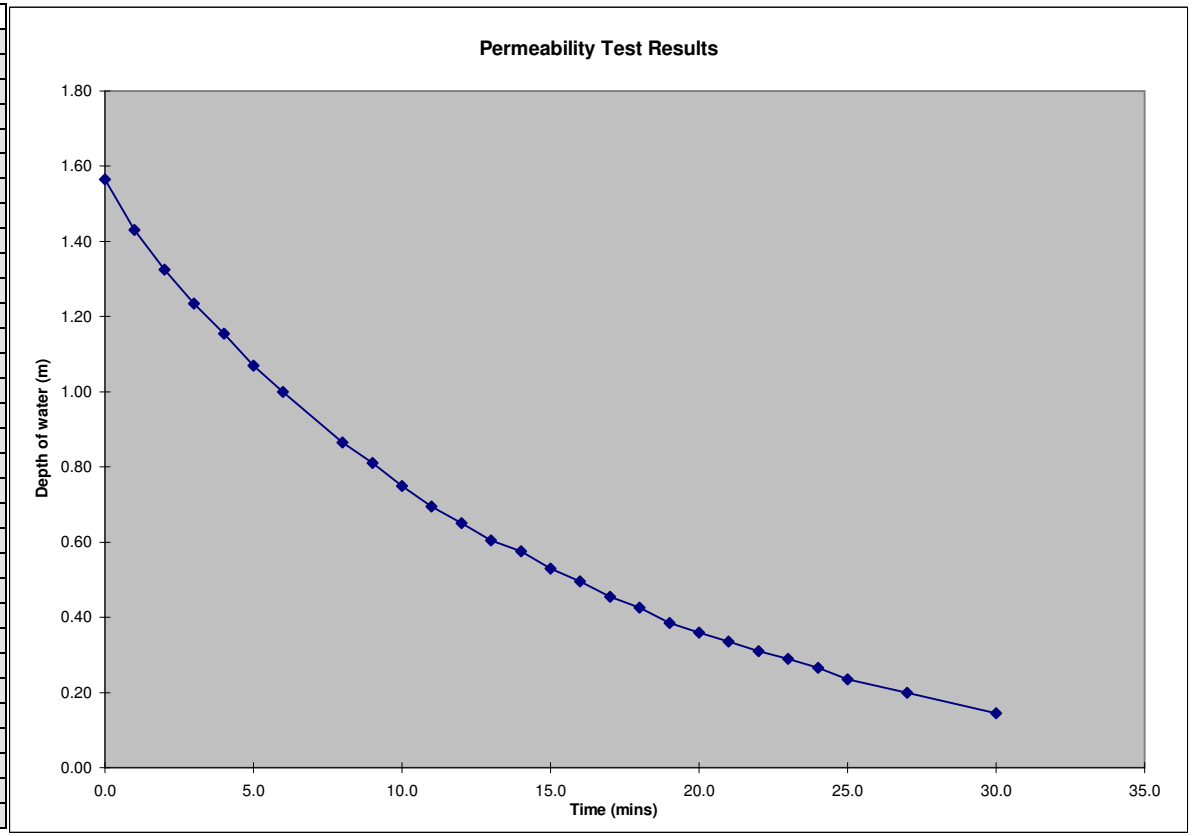
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP300B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.78
No of runs	3
Pipe upstand (m)	0.360

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1738	0.7825	0.3913
Time (mins)	4	9	19

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.57	1.44	1.795
1.0	1.43	1.57	1.930
2.0	1.33	1.68	2.035
3.0	1.24	1.77	2.125
4.0	1.16	1.85	2.205
5.0	1.07	1.93	2.290
6.0	1.00	2.00	2.360
8.0	0.87	2.14	2.495
9.0	0.81	2.19	2.550
10.0	0.75	2.25	2.610
11.0	0.70	2.31	2.665
12.0	0.65	2.35	2.710
13.0	0.61	2.40	2.755
14.0	0.58	2.43	2.785
15.0	0.53	2.47	2.830
16.0	0.50	2.51	2.865
17.0	0.46	2.55	2.905
18.0	0.43	2.58	2.935
19.0	0.39	2.62	2.975
20.0	0.36	2.64	3.000
21.0	0.34	2.67	3.025
22.0	0.31	2.69	3.050
23.0	0.29	2.71	3.070
24.0	0.27	2.74	3.095
25.0	0.24	2.77	3.125
27.0	0.20	2.80	3.160
30.0	0.15	2.86	3.215



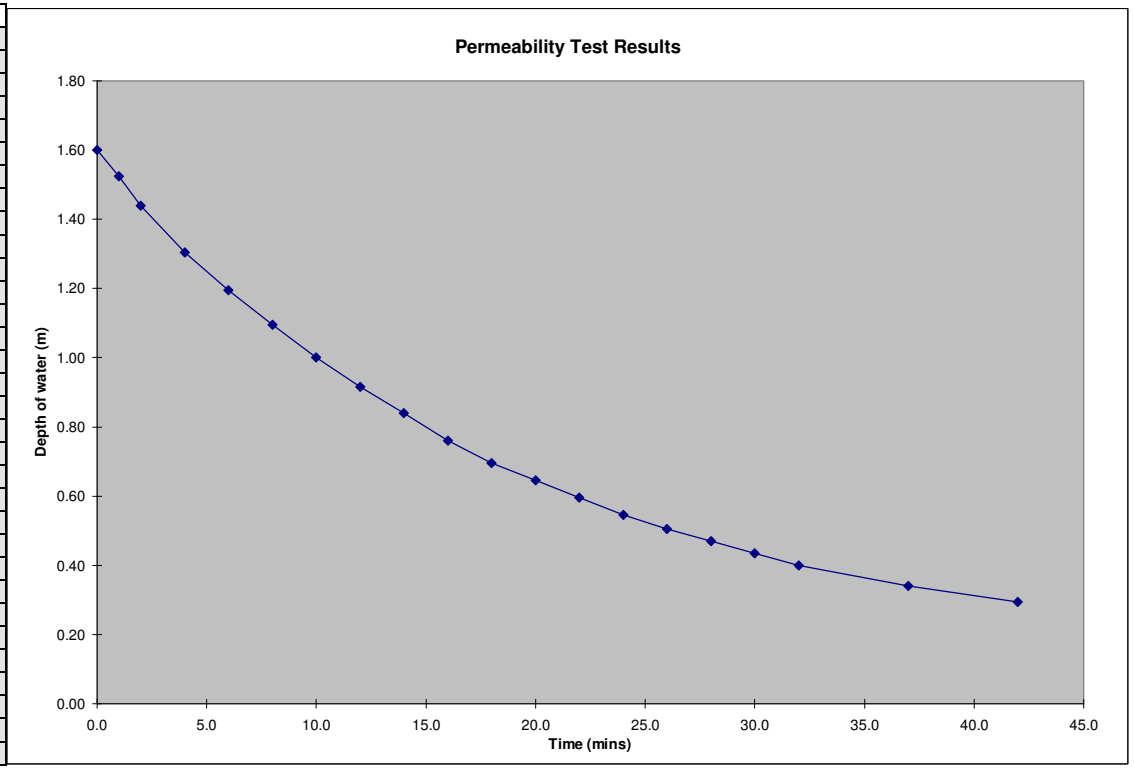
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP300B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.78
No of runs	3.00
Pipe upstand (m)	0.360

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2000	0.8000	0.4000
Time (mins)	6	15	32

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.60	1.40	1.760
1.0	1.53	1.48	1.835
2.0	1.44	1.56	1.920
4.0	1.31	1.70	2.055
6.0	1.20	1.81	2.165
8.0	1.10	1.91	2.265
10.0	1.00	2.00	2.360
12.0	0.92	2.09	2.445
14.0	0.84	2.16	2.520
16.0	0.76	2.24	2.600
18.0	0.70	2.31	2.665
20.0	0.65	2.36	2.715
22.0	0.60	2.41	2.765
24.0	0.55	2.46	2.815
26.0	0.51	2.50	2.855
28.0	0.47	2.53	2.890
30.0	0.44	2.57	2.925
32.0	0.40	2.60	2.960
37.0	0.34	2.66	3.020
42.0	0.30	2.71	3.065



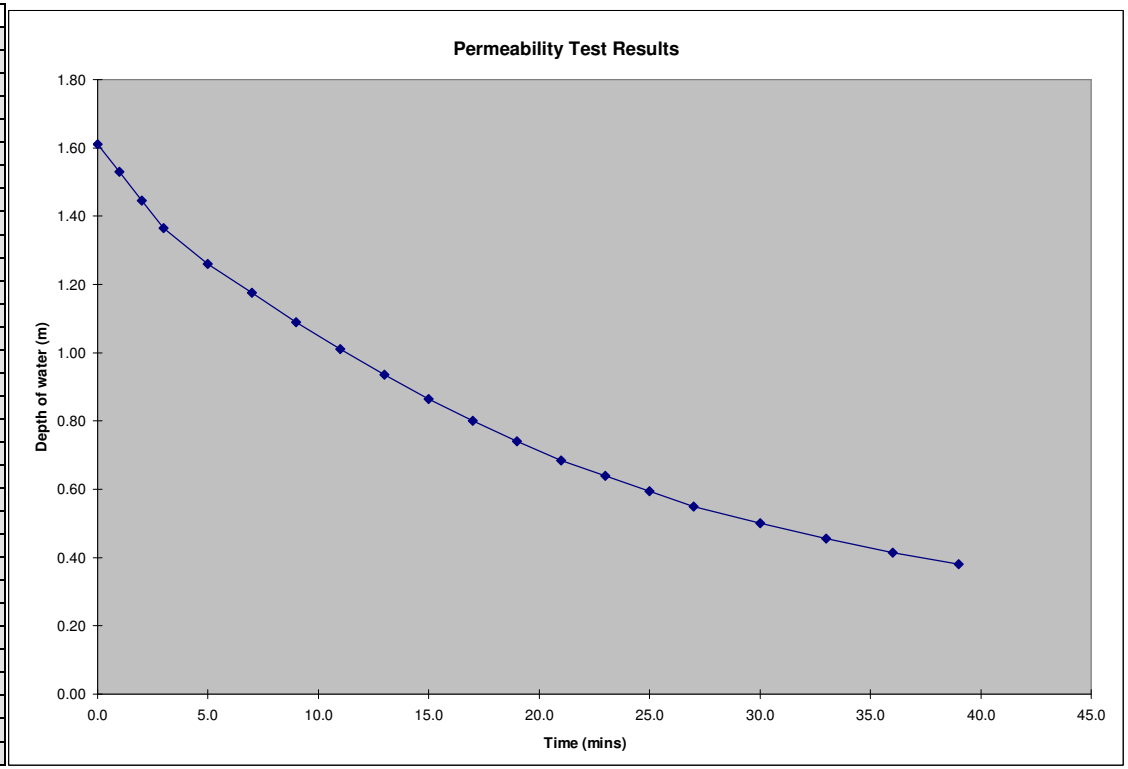
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP300B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.78
No of runs	3.00
Pipe upstand (m)	0.360

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2075	0.8050	0.4025
Time (mins)	6.2	16.8	37.1

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.61	1.39	1.750
1.0	1.53	1.47	1.830
2.0	1.45	1.56	1.915
3.0	1.37	1.64	1.995
5.0	1.26	1.74	2.100
7.0	1.18	1.83	2.185
9.0	1.09	1.91	2.270
11.0	1.01	1.99	2.350
13.0	0.94	2.07	2.425
15.0	0.87	2.14	2.495
17.0	0.80	2.20	2.560
19.0	0.74	2.26	2.620
21.0	0.69	2.32	2.675
23.0	0.64	2.36	2.720
25.0	0.60	2.41	2.765
27.0	0.55	2.45	2.810
30.0	0.50	2.50	2.860
33.0	0.46	2.55	2.905
36.0	0.42	2.59	2.945
39.0	0.38	2.62	2.980



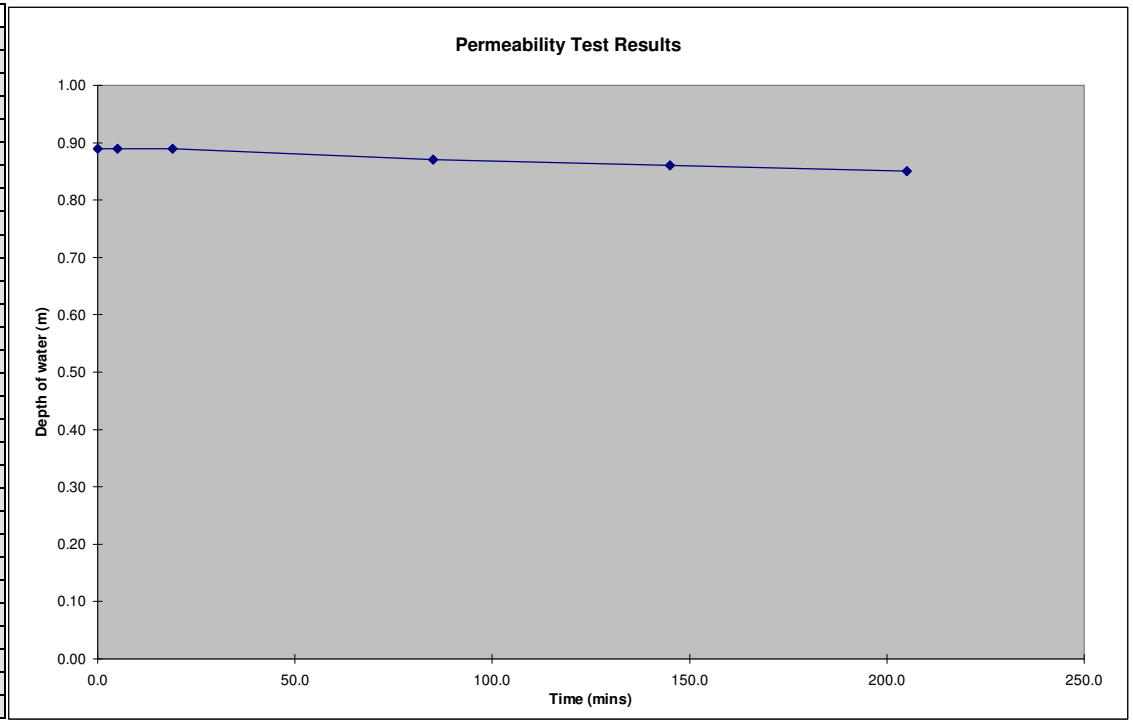
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	301A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.70
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6675	0.4450	0.2225
Time (mins)	1300	2635	3970

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.89	0.61	0.610
5.0	0.89	0.61	0.610
19.0	0.89	0.61	0.610
85.0	0.87	0.63	0.630
145.0	0.86	0.64	0.640
205.0	0.85	0.65	0.650



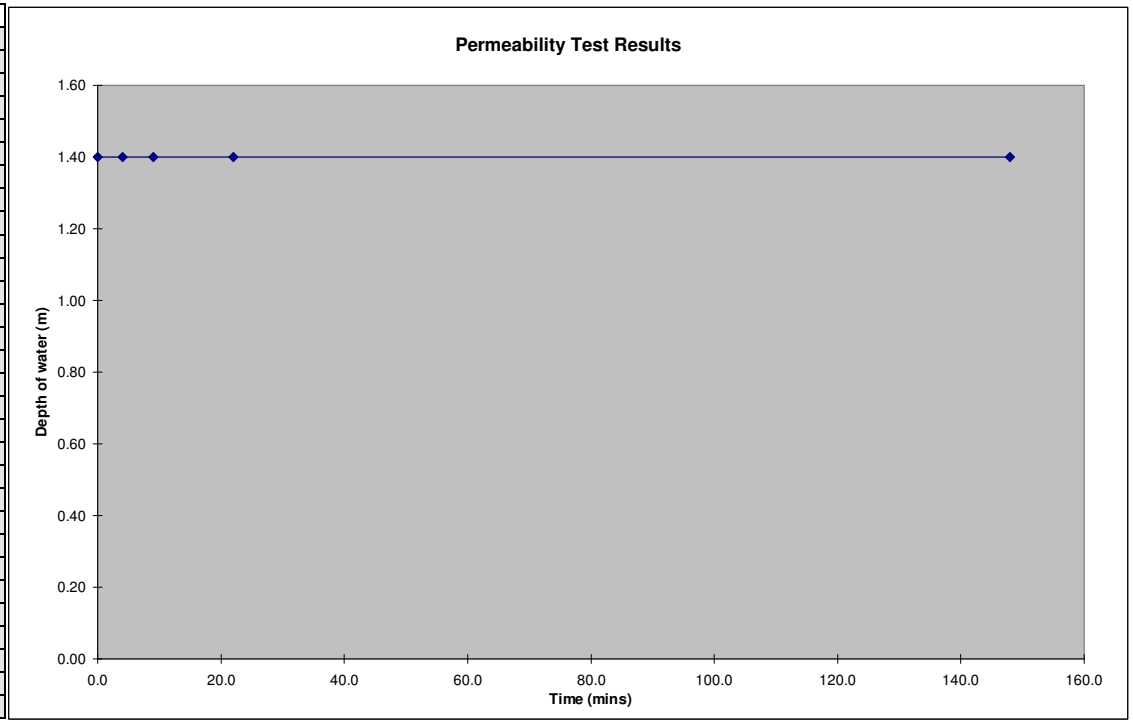
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	301B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0500	0.7000	0.3500
Time (mins)	#VALUE!	#VALUE!	#VALUE!

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.40	1.60	1.600
4.0	1.40	1.60	1.600
9.0	1.40	1.60	1.600
22.0	1.40	1.60	1.600
148.0	1.40	1.60	1.600



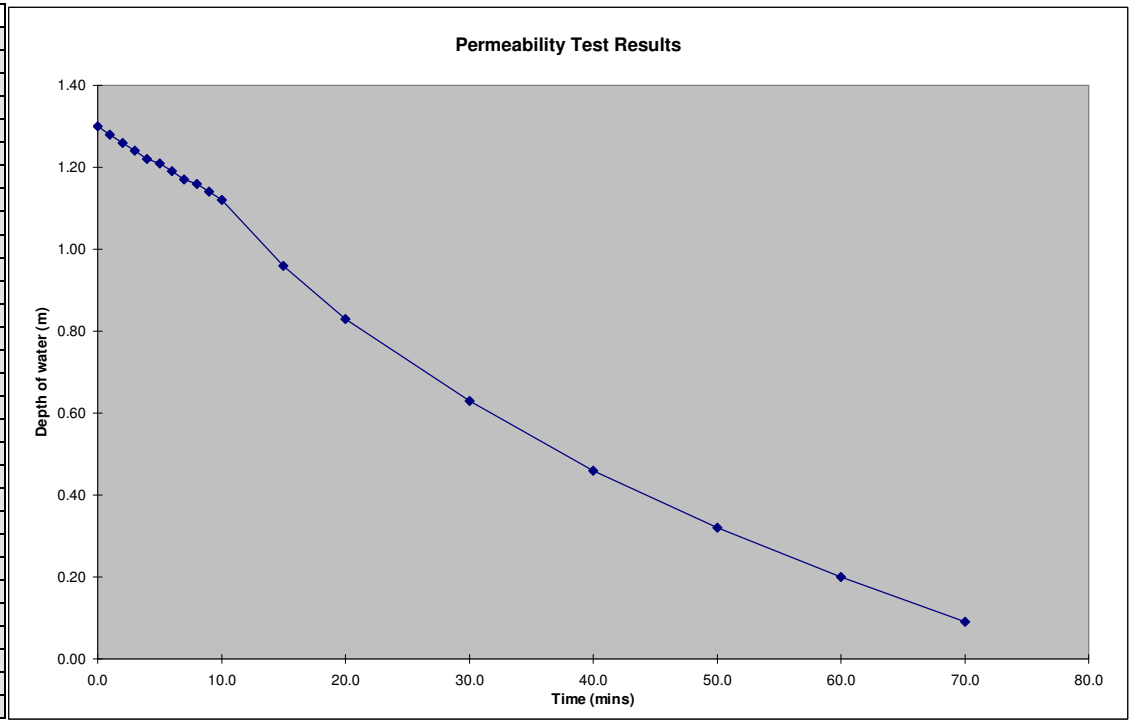
Results from Site Observation

Scheme:	**PTPK1000**
Trial Pit No.	303A
Depth of Trial Pit (m)=	1.70
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9750	0.6500	0.3250
Time (mins)	15	29	50

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.30	0.40	0.400
1.0	1.28	0.42	0.420
2.0	1.26	0.44	0.440
3.0	1.24	0.46	0.460
4.0	1.22	0.48	0.480
5.0	1.21	0.49	0.490
6.0	1.19	0.51	0.510
7.0	1.17	0.53	0.530
8.0	1.16	0.54	0.540
9.0	1.14	0.56	0.560
10.0	1.12	0.58	0.580
15.0	0.96	0.74	0.740
20.0	0.83	0.87	0.870
30.0	0.63	1.07	1.070
40.0	0.46	1.24	1.240
50.0	0.32	1.38	1.380
60.0	0.20	1.50	1.500
70.0	0.09	1.61	1.610



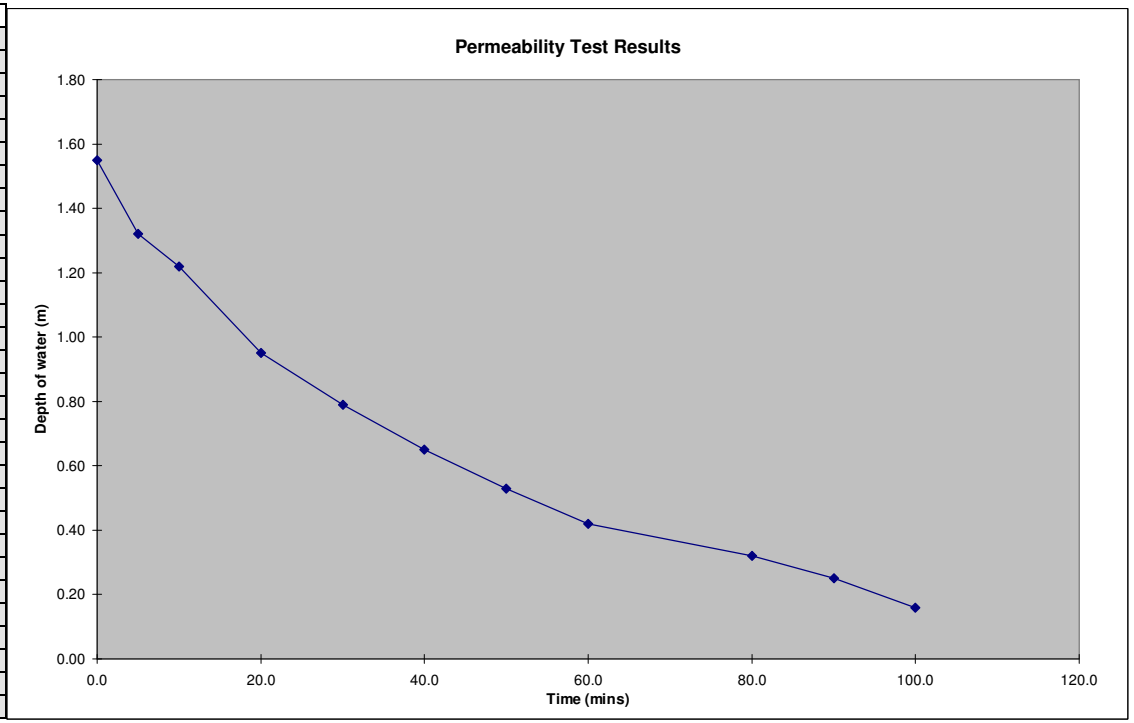
Results from Site Observation

Scheme:	**PTPK1000**
Trial Pit No.	303A
Depth of Trial Pit (m)=	1.70
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1625	0.7750	0.3875
Time (mins)	12	31	69

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.55	0.15	0.150
5.0	1.32	0.38	0.380
10.0	1.22	0.48	0.480
20.0	0.95	0.75	0.750
30.0	0.79	0.91	0.910
40.0	0.65	1.05	1.050
50.0	0.53	1.17	1.170
60.0	0.42	1.28	1.280
80.0	0.32	1.38	1.380
90.0	0.25	1.45	1.450
100.0	0.16	1.54	1.540



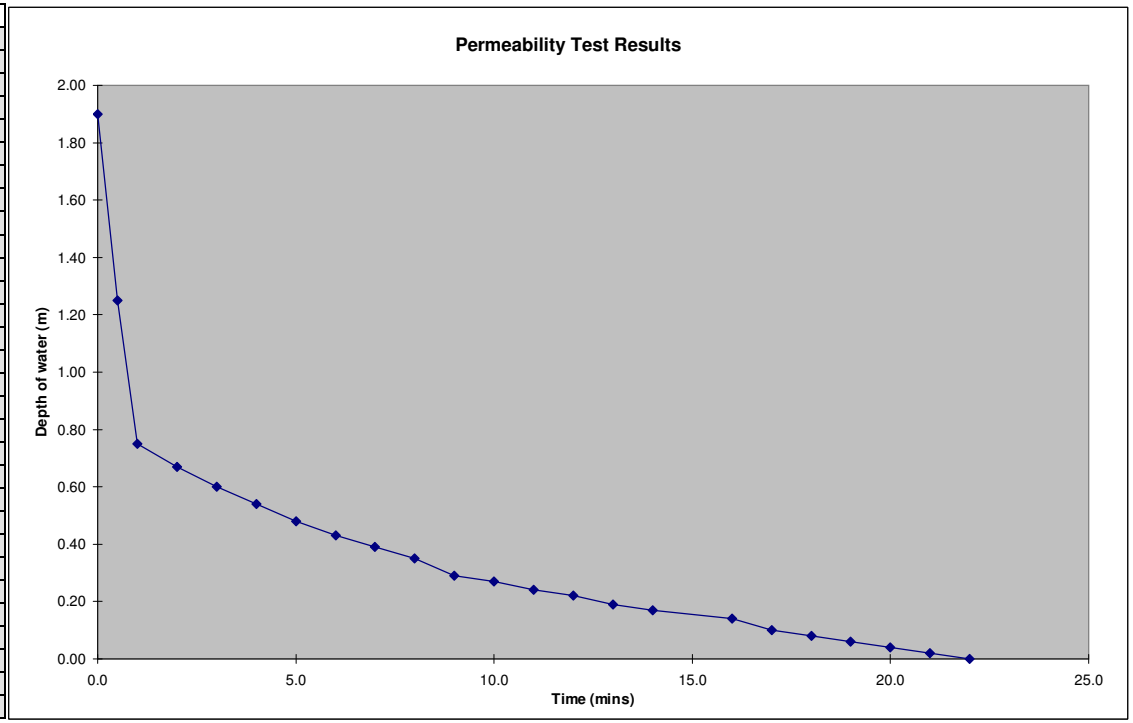
Results from Site Observation

Scheme:	**PTPK1000**
Trial Pit No.	303B
Depth of Trial Pit (m)=	2.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.74
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.4250	0.9500	0.4750
Time (mins)	0	1	5

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.90	0.60	0.600
0.5	1.25	1.25	1.250
1.0	0.75	1.75	1.750
2.0	0.67	1.83	1.830
3.0	0.60	1.90	1.900
4.0	0.54	1.96	1.960
5.0	0.48	2.02	2.020
6.0	0.43	2.07	2.070
7.0	0.39	2.11	2.110
8.0	0.35	2.15	2.150
9.0	0.29	2.21	2.210
10.0	0.27	2.23	2.230
11.0	0.24	2.26	2.260
12.0	0.22	2.28	2.280
13.0	0.19	2.31	2.310
14.0	0.17	2.33	2.330
16.0	0.14	2.36	2.360
17.0	0.10	2.40	2.400
18.0	0.08	2.42	2.420
19.0	0.06	2.44	2.440
20.0	0.04	2.46	2.460
21.0	0.02	2.48	2.480
22.0	0.00	2.50	2.500



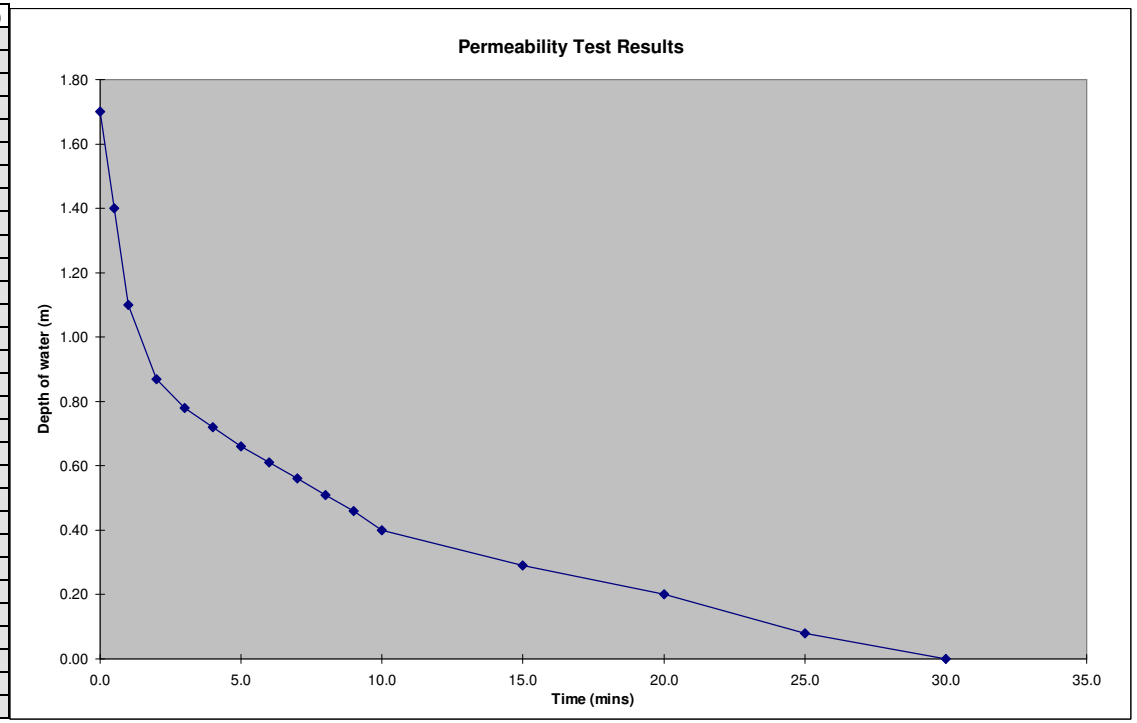
Results from Site Observation

Scheme:	**PTPK1000**
Trial Pit No.	303B
Depth of Trial Pit (m)=	2.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.74
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2750	0.8500	0.4250
Time (mins)	1	2	10

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.70	0.80	0.800
0.5	1.40	1.10	1.100
1.0	1.10	1.40	1.400
2.0	0.87	1.63	1.630
3.0	0.78	1.72	1.720
4.0	0.72	1.78	1.780
5.0	0.66	1.84	1.840
6.0	0.61	1.89	1.890
7.0	0.56	1.94	1.940
8.0	0.51	1.99	1.990
9.0	0.46	2.04	2.040
10.0	0.40	2.10	2.100
15.0	0.29	2.21	2.210
20.0	0.20	2.30	2.300
25.0	0.08	2.42	2.420
30.0	0.00	2.50	2.500



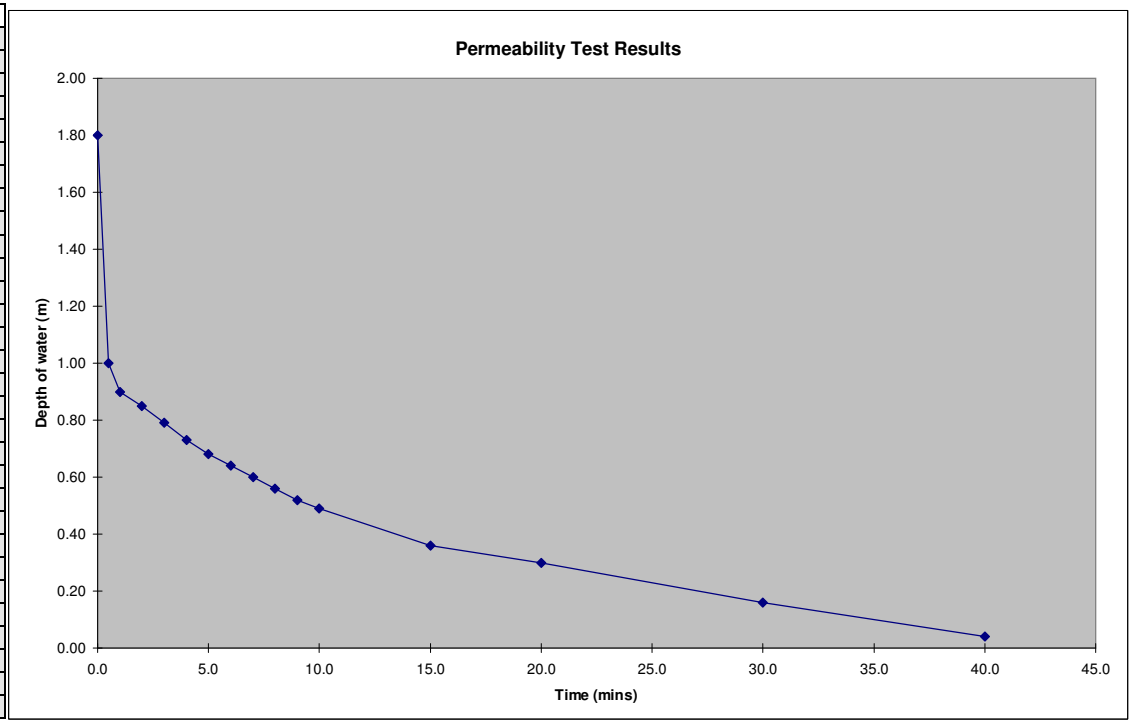
Results from Site Observation

Scheme:	**PTPK1000**
Trial Pit No.	303B
Depth of Trial Pit (m)=	2.50
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.74
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.3500	0.9000	0.4500
Time (mins)	0	1	12

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.80	0.70	0.700
0.5	1.00	1.50	1.500
1.0	0.90	1.60	1.600
2.0	0.85	1.65	1.650
3.0	0.79	1.71	1.710
4.0	0.73	1.77	1.770
5.0	0.68	1.82	1.820
6.0	0.64	1.86	1.860
7.0	0.60	1.90	1.900
8.0	0.56	1.94	1.940
9.0	0.52	1.98	1.980
10.0	0.49	2.01	2.010
15.0	0.36	2.14	2.140
20.0	0.30	2.20	2.200
30.0	0.16	2.34	2.340
40.0	0.04	2.46	2.460



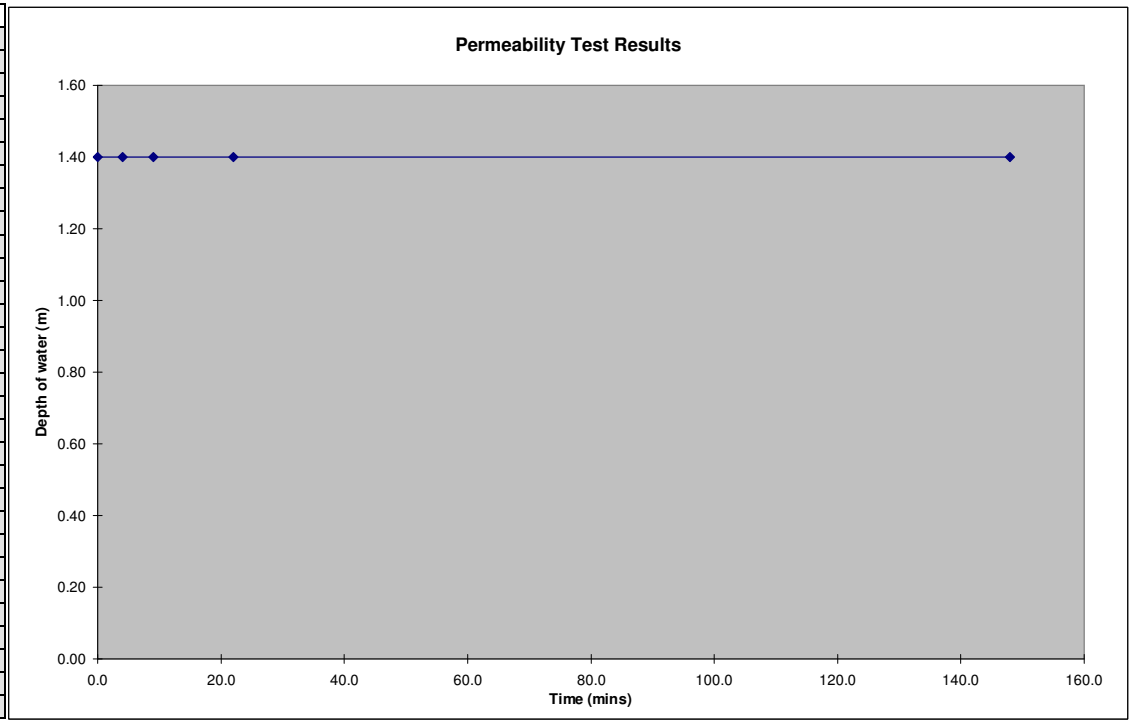
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	301B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0500	0.7000	0.3500
Time (mins)	#VALUE!	#VALUE!	#VALUE!

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.40	1.60	1.600
4.0	1.40	1.60	1.600
9.0	1.40	1.60	1.600
22.0	1.40	1.60	1.600
148.0	1.40	1.60	1.600



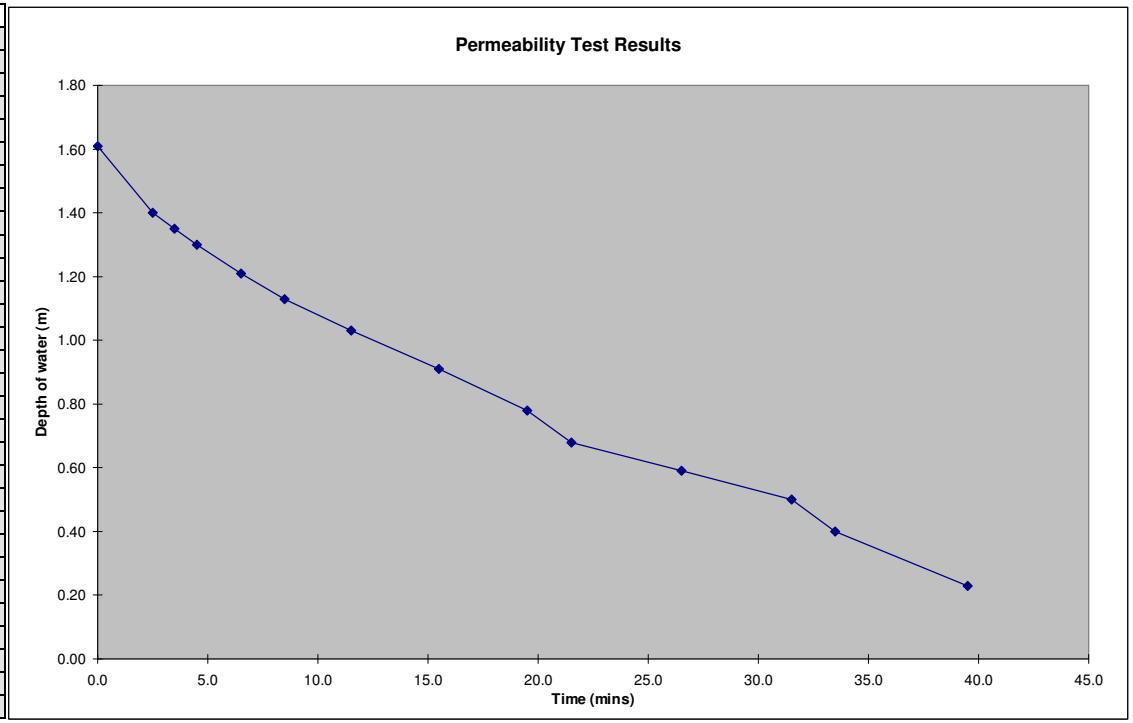
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	306B
Depth of Trial Pit (m)=	2.67
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.70
No of runs	2
Pipe upstand (m)	0.150

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2075	0.8050	0.4025
Time (mins)	7	18	34

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.61	1.06	1.210
2.5	1.40	1.27	1.420
3.5	1.35	1.32	1.470
4.5	1.30	1.37	1.520
6.5	1.21	1.46	1.610
8.5	1.13	1.54	1.690
11.5	1.03	1.64	1.790
15.5	0.91	1.76	1.910
19.5	0.78	1.89	2.040
21.5	0.68	1.99	2.140
26.5	0.59	2.08	2.230
31.5	0.50	2.17	2.320
33.5	0.40	2.27	2.420
39.5	0.23	2.44	2.590



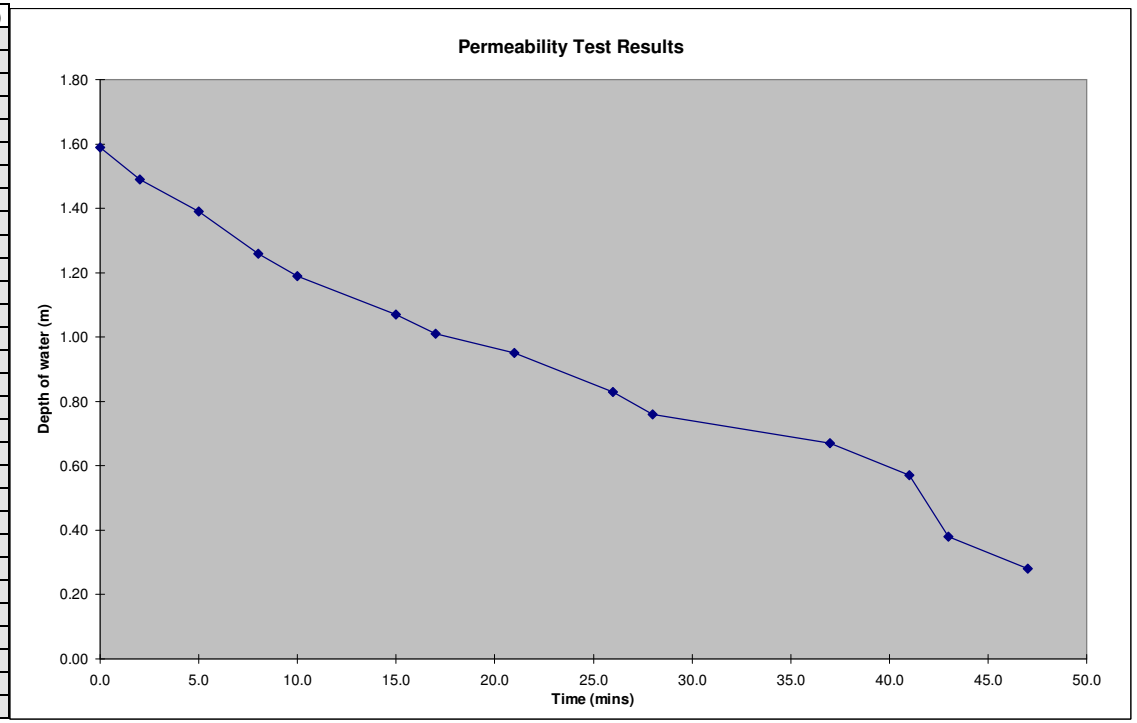
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	306B
Depth of Trial Pit (m)=	2.67
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.70
No of runs	2.00
Pipe upstand (m)	0.150

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1925	0.7950	0.3975
Time (mins)	10	27	42

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.59	1.08	1.230
2.0	1.49	1.18	1.330
5.0	1.39	1.28	1.430
8.0	1.26	1.41	1.560
10.0	1.19	1.48	1.630
15.0	1.07	1.60	1.750
17.0	1.01	1.66	1.810
21.0	0.95	1.72	1.870
26.0	0.83	1.84	1.990
28.0	0.76	1.91	2.060
37.0	0.67	2.00	2.150
41.0	0.57	2.10	2.250
43.0	0.38	2.29	2.440
47.0	0.28	2.39	2.540



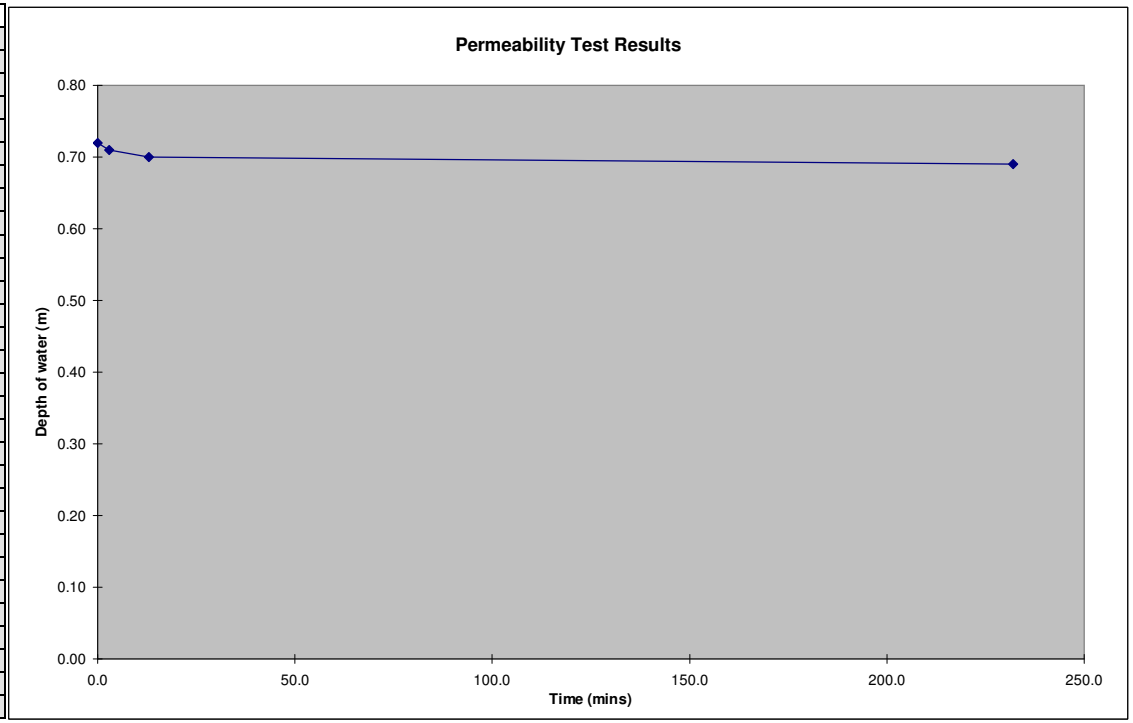
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	316a
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5400	0.3600	0.1800
Time (mins)	1915	3976	6037

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.72	0.78	0.780
3.0	0.71	0.79	0.790
13.0	0.70	0.80	0.800
232.0	0.69	0.81	0.810



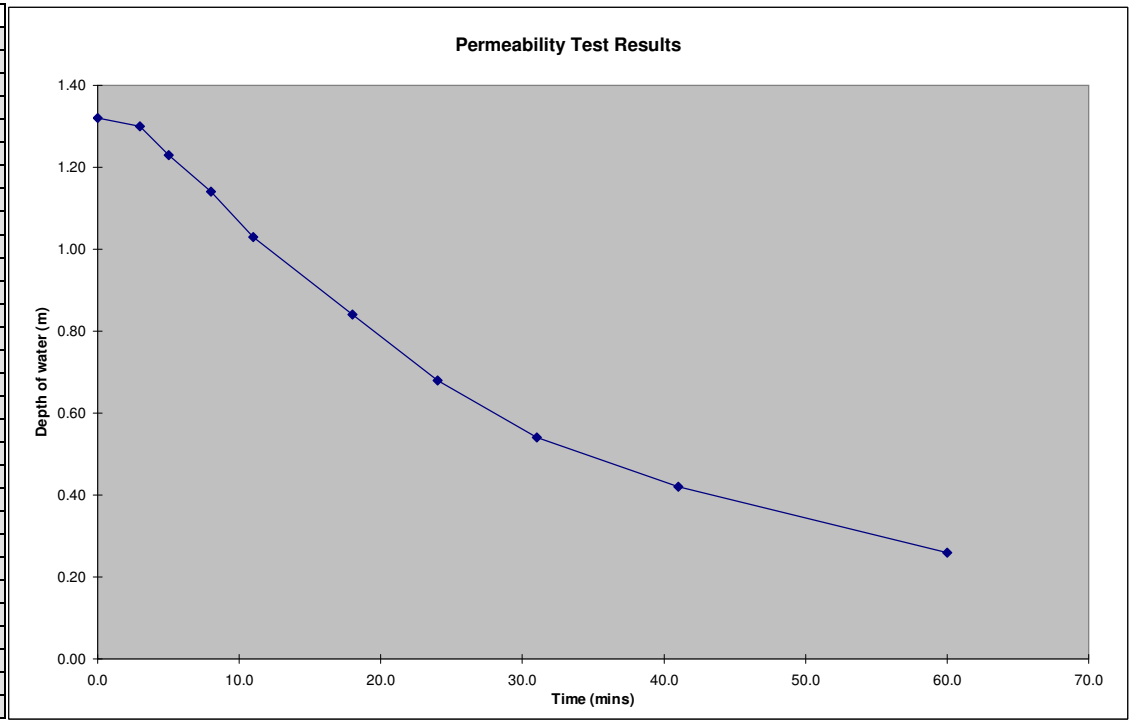
Results from Site Observation

Scheme:	**PTPK100 NDR**
Trial Pit No.	316B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9900	0.6600	0.3300
Time (mins)	12	25	52

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.32	1.58	1.580
3.0	1.30	1.60	1.600
5.0	1.23	1.67	1.670
8.0	1.14	1.76	1.760
11.0	1.03	1.87	1.870
18.0	0.84	2.06	2.060
24.0	0.68	2.22	2.220
31.0	0.54	2.36	2.360
41.0	0.42	2.48	2.480
60.0	0.26	2.64	2.640



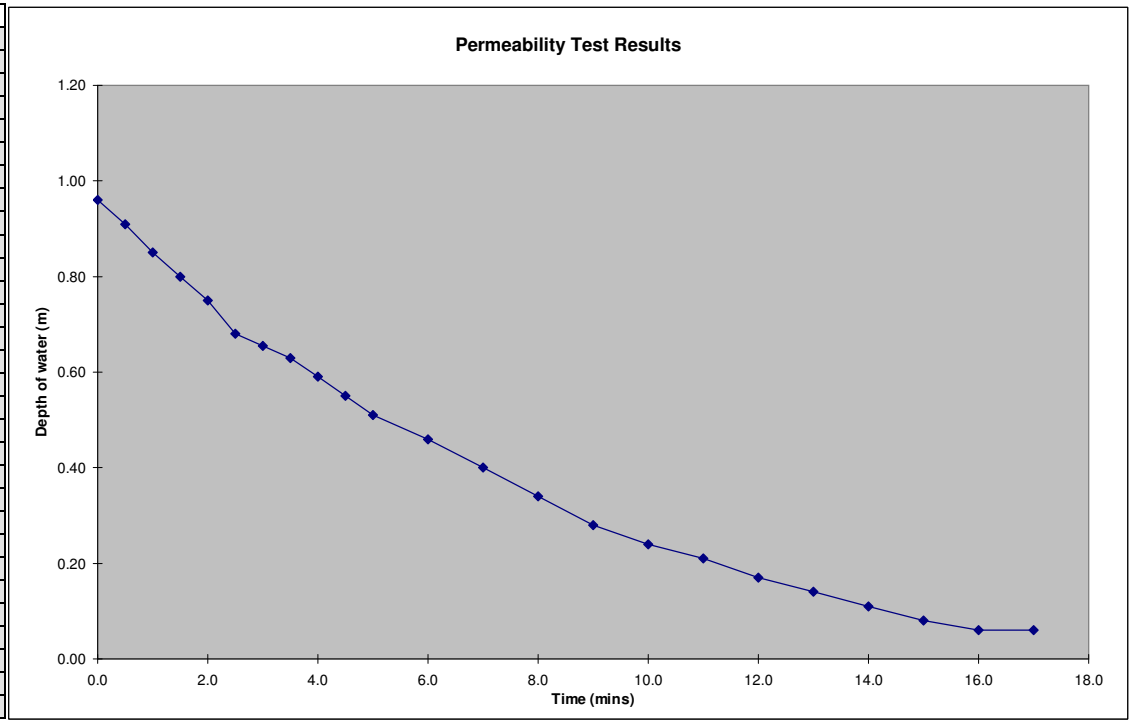
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP356A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.60
No of runs	3
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7200	0.4800	0.2400
Time (mins)	2	6	10

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.96	0.54	0.740
0.5	0.91	0.59	0.790
1.0	0.85	0.65	0.850
1.5	0.80	0.70	0.900
2.0	0.75	0.75	0.950
2.5	0.68	0.82	1.020
3.0	0.66	0.85	1.045
3.5	0.63	0.87	1.070
4.0	0.59	0.91	1.110
4.5	0.55	0.95	1.150
5.0	0.51	0.99	1.190
6.0	0.46	1.04	1.240
7.0	0.40	1.10	1.300
8.0	0.34	1.16	1.360
9.0	0.28	1.22	1.420
10.0	0.24	1.26	1.460
11.0	0.21	1.29	1.490
12.0	0.17	1.33	1.530
13.0	0.14	1.36	1.560
14.0	0.11	1.39	1.590
15.0	0.08	1.42	1.620
16.0	0.06	1.44	1.640
17.0	0.06	1.44	1.640



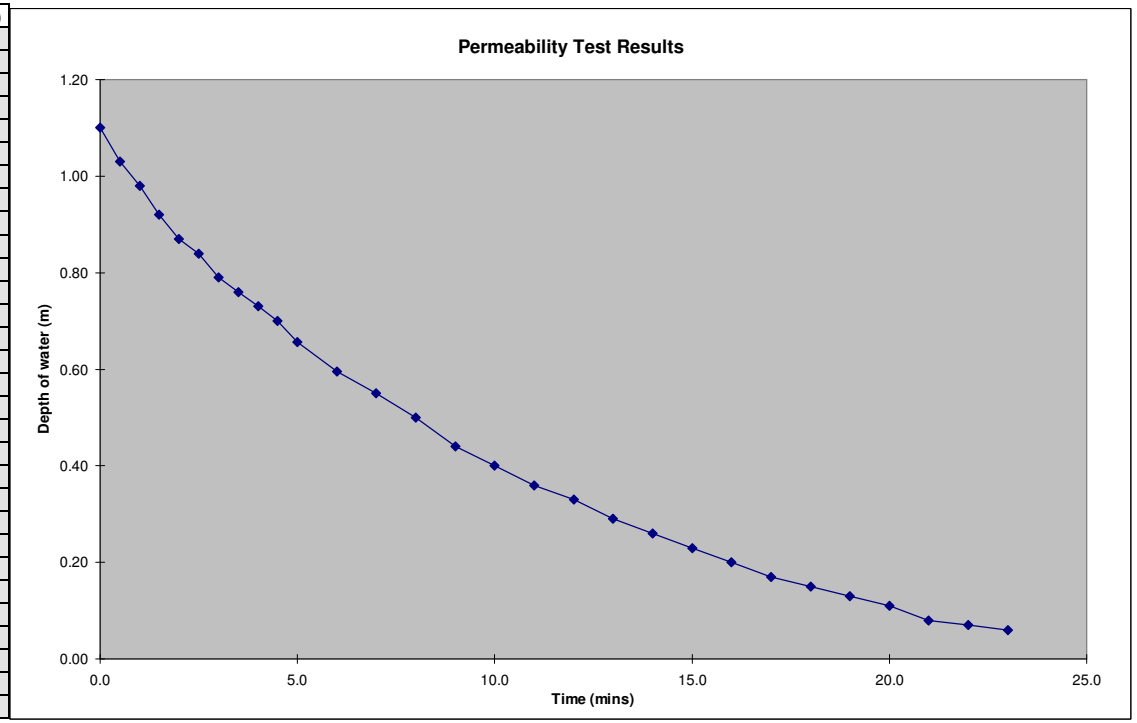
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP356A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8250	0.5500	0.2750
Time (mins)	3	7	14

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.10	0.40	0.600
0.5	1.03	0.47	0.670
1.0	0.98	0.52	0.720
1.5	0.92	0.58	0.780
2.0	0.87	0.63	0.830
2.5	0.84	0.66	0.860
3.0	0.79	0.71	0.910
3.5	0.76	0.74	0.940
4.0	0.73	0.77	0.970
4.5	0.70	0.80	1.000
5.0	0.66	0.84	1.044
6.0	0.60	0.91	1.105
7.0	0.55	0.95	1.150
8.0	0.50	1.00	1.200
9.0	0.44	1.06	1.260
10.0	0.40	1.10	1.300
11.0	0.36	1.14	1.340
12.0	0.33	1.17	1.370
13.0	0.29	1.21	1.410
14.0	0.26	1.24	1.440
15.0	0.23	1.27	1.470
16.0	0.20	1.30	1.500
17.0	0.17	1.33	1.530
18.0	0.15	1.35	1.550
19.0	0.13	1.37	1.570
20.0	0.11	1.39	1.590
21.0	0.08	1.42	1.620
22.0	0.07	1.43	1.630
23.0	0.06	1.44	1.640



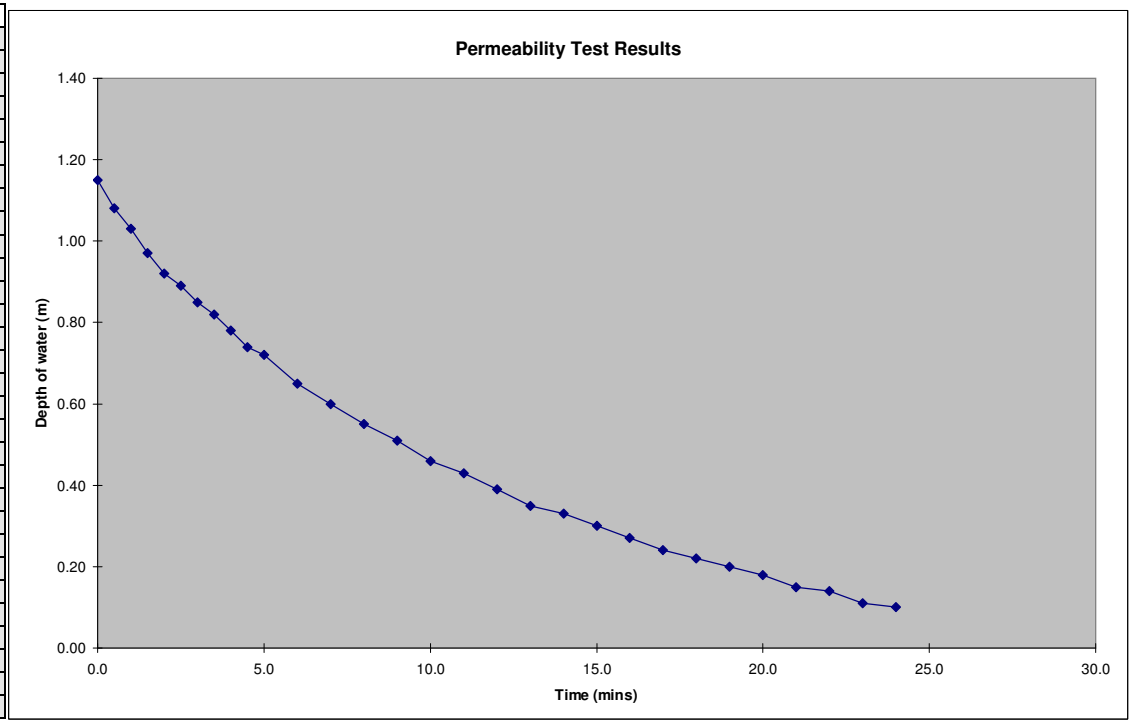
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP356A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.200

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8625	0.5750	0.2875
Time (mins)	2.8	7.5	15.4

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.15	0.35	0.550
0.5	1.08	0.42	0.620
1.0	1.03	0.47	0.670
1.5	0.97	0.53	0.730
2.0	0.92	0.58	0.780
2.5	0.89	0.61	0.810
3.0	0.85	0.65	0.850
3.5	0.82	0.68	0.880
4.0	0.78	0.72	0.920
4.5	0.74	0.76	0.960
5.0	0.72	0.78	0.980
6.0	0.65	0.85	1.050
7.0	0.60	0.90	1.100
8.0	0.55	0.95	1.150
9.0	0.51	0.99	1.190
10.0	0.46	1.04	1.240
11.0	0.43	1.07	1.270
12.0	0.39	1.11	1.310
13.0	0.35	1.15	1.350
14.0	0.33	1.17	1.370
15.0	0.30	1.20	1.400
16.0	0.27	1.23	1.430
17.0	0.24	1.26	1.460
18.0	0.22	1.28	1.480
19.0	0.20	1.30	1.500
20.0	0.18	1.32	1.520
21.0	0.15	1.35	1.550
22.0	0.14	1.36	1.560
23.0	0.11	1.39	1.590
24.0	0.10	1.40	1.600



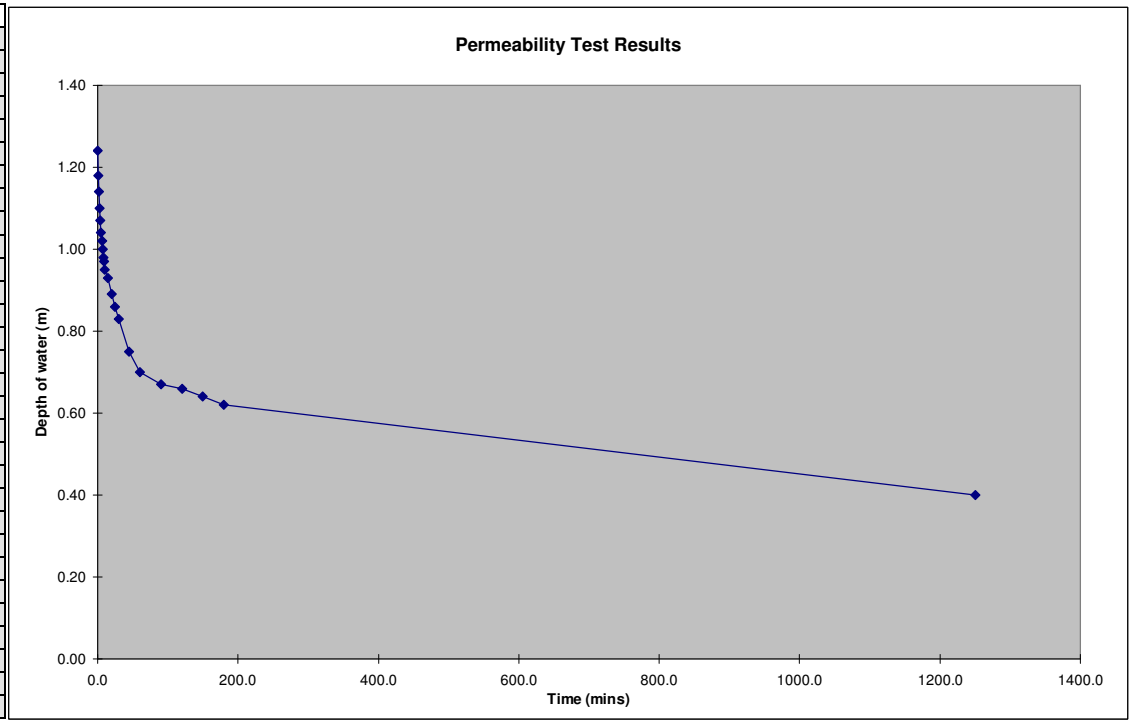
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP356B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.60
No of runs	2
Pipe upstand (m)	0.520

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9300	0.6200	0.3100
Time (mins)	14	213	1688

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.24	1.46	1.980
1.0	1.18	1.52	2.040
2.0	1.14	1.56	2.080
3.0	1.10	1.60	2.120
4.0	1.07	1.63	2.150
5.0	1.04	1.66	2.180
6.0	1.02	1.68	2.200
7.0	1.00	1.70	2.220
8.0	0.98	1.72	2.240
9.0	0.97	1.73	2.250
10.0	0.95	1.75	2.270
15.0	0.93	1.77	2.290
20.0	0.89	1.81	2.330
25.0	0.86	1.84	2.360
30.0	0.83	1.87	2.390
45.0	0.75	1.95	2.470
60.0	0.70	2.00	2.520
90.0	0.67	2.03	2.550
120.0	0.66	2.04	2.560
150.0	0.64	2.06	2.580
180.0	0.62	2.08	2.600
1250.0	0.40	2.30	2.820



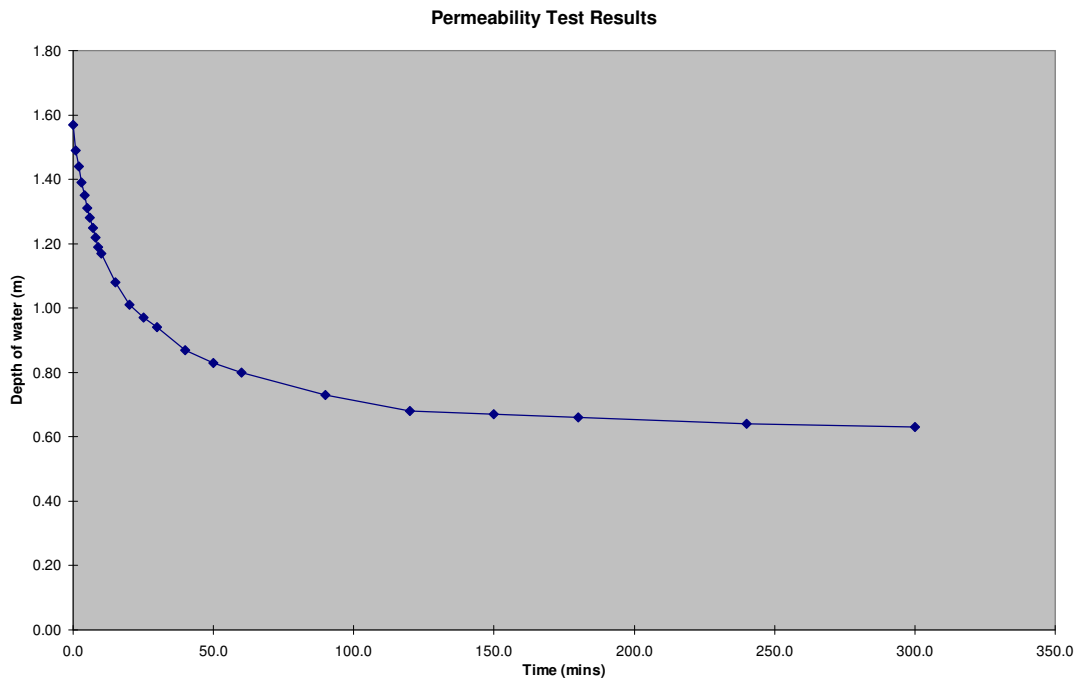
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP356B
Depth of Trial Pit (m)=	2.70
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.60
No of runs	2.00
Pipe upstand (m)	0.520

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1775	0.7850	0.3925
Time (mins)	10	66	1725

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.57	1.13	1.650
1.0	1.49	1.21	1.730
2.0	1.44	1.26	1.780
3.0	1.39	1.31	1.830
4.0	1.35	1.35	1.870
5.0	1.31	1.39	1.910
6.0	1.28	1.42	1.940
7.0	1.25	1.45	1.970
8.0	1.22	1.48	2.000
9.0	1.19	1.51	2.030
10.0	1.17	1.53	2.050
15.0	1.08	1.62	2.140
20.0	1.01	1.69	2.210
25.0	0.97	1.73	2.250
30.0	0.94	1.76	2.280
40.0	0.87	1.83	2.350
50.0	0.83	1.87	2.390
60.0	0.80	1.90	2.420
90.0	0.73	1.97	2.490
120.0	0.68	2.02	2.540
150.0	0.67	2.03	2.550
180.0	0.66	2.04	2.560
240.0	0.64	2.06	2.580
300.0	0.63	2.07	2.590



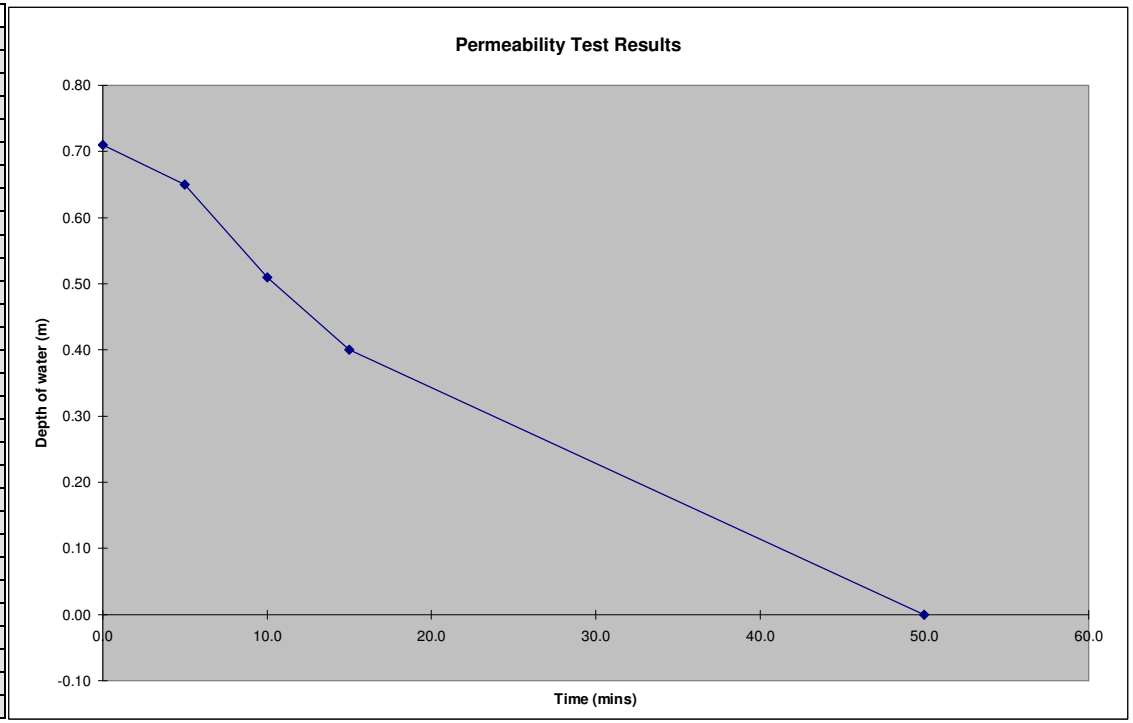
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP357A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	3
Pipe upstand (m)	0.950

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5325	0.3550	0.1775
Time (mins)	9	19	34

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.71	0.79	1.740
5.0	0.65	0.85	1.800
10.0	0.51	0.99	1.940
15.0	0.40	1.10	2.050
50.0	0.00	1.50	2.450



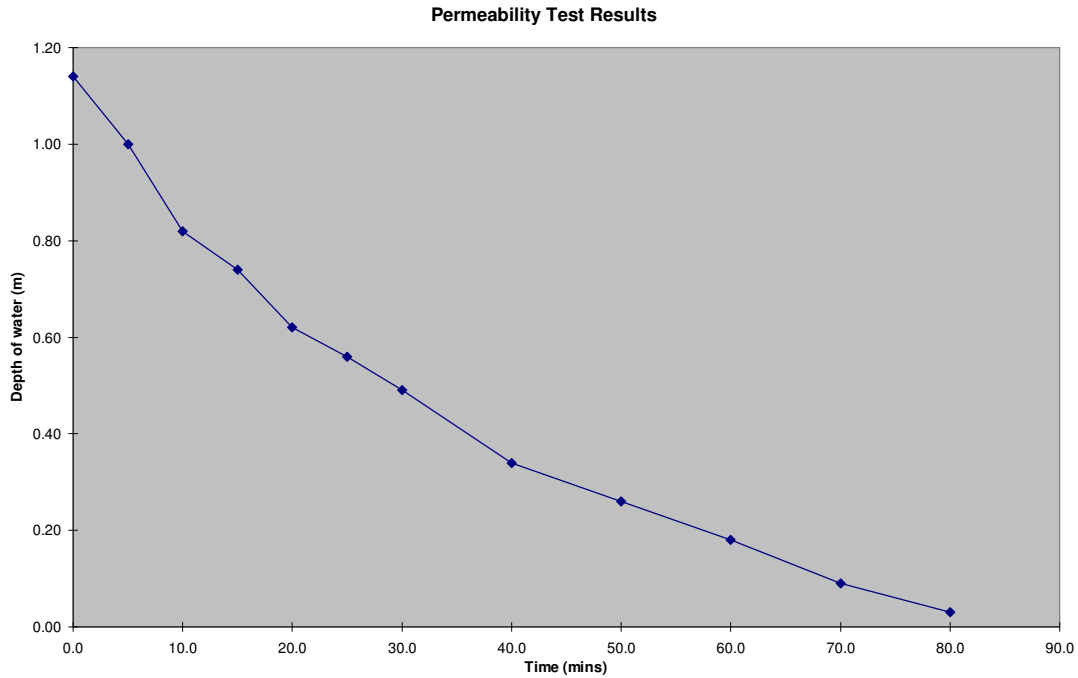
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP357A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	3.00
Pipe upstand (m)	0.950

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8550	0.5700	0.2850
Time (mins)	9	24	47

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.14	0.36	1.310
5.0	1.00	0.50	1.450
10.0	0.82	0.68	1.630
15.0	0.74	0.76	1.710
20.0	0.62	0.88	1.830
25.0	0.56	0.94	1.890
30.0	0.49	1.01	1.960
40.0	0.34	1.16	2.110
50.0	0.26	1.24	2.190
60.0	0.18	1.32	2.270
70.0	0.09	1.41	2.360
80.0	0.03	1.47	2.420



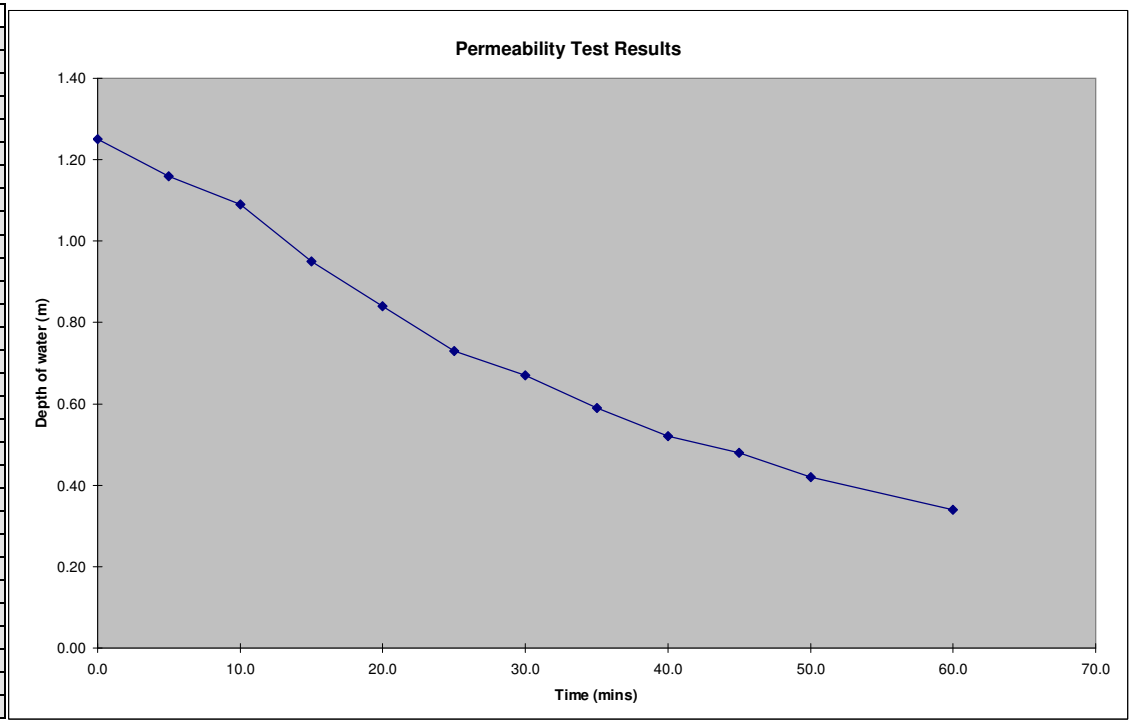
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP357A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	3.00
Pipe upstand (m)	0.950

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9375	0.6250	0.3125
Time (mins)	15.6	32.8	63.4

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.25	0.25	1.200
5.0	1.16	0.34	1.290
10.0	1.09	0.41	1.360
15.0	0.95	0.55	1.500
20.0	0.84	0.66	1.610
25.0	0.73	0.77	1.720
30.0	0.67	0.83	1.780
35.0	0.59	0.91	1.860
40.0	0.52	0.98	1.930
45.0	0.48	1.02	1.970
50.0	0.42	1.08	2.030
60.0	0.34	1.16	2.110



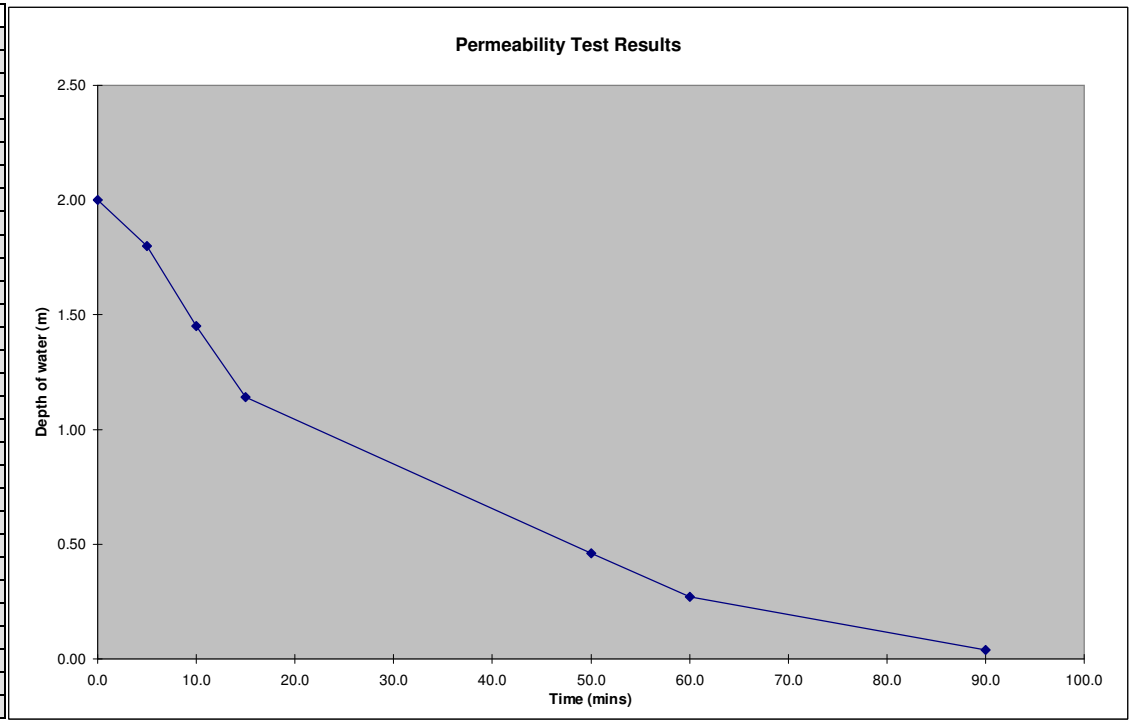
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP357B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	3
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5000	1.0000	0.5000
Time (mins)	9	22	48

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.00	0.90	1.200
5.0	1.80	1.10	1.400
10.0	1.45	1.45	1.750
15.0	1.14	1.76	2.060
50.0	0.46	2.44	2.740
60.0	0.27	2.63	2.930
90.0	0.04	2.86	3.160



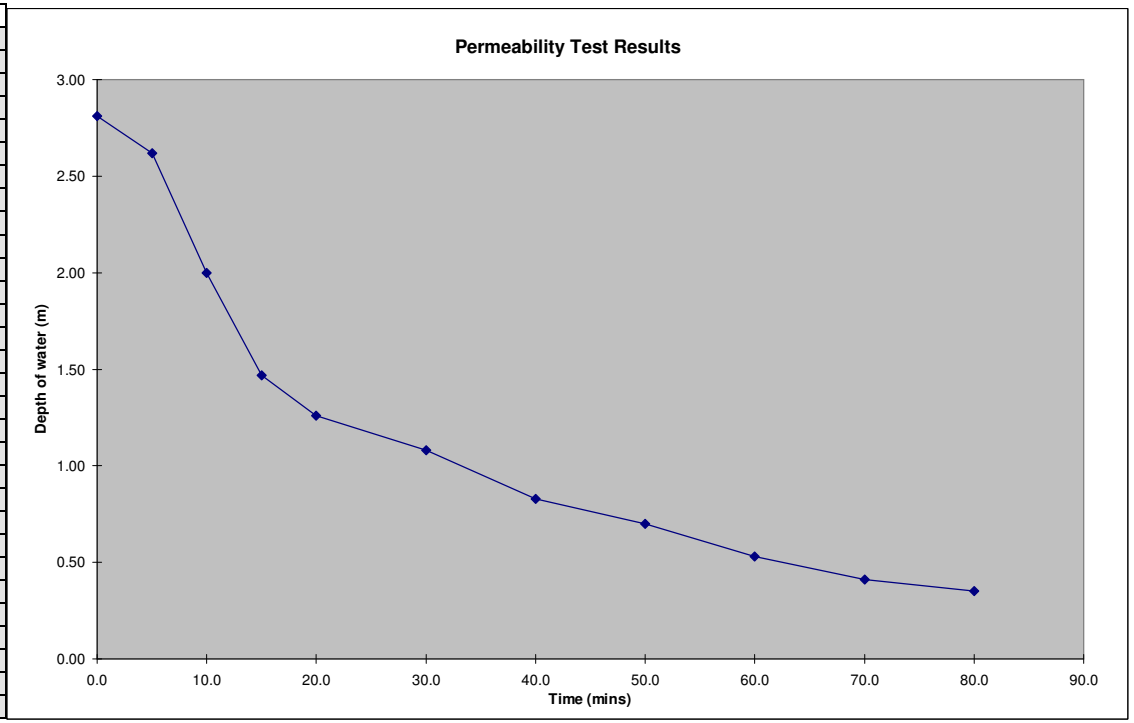
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP357B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.1075	1.4050	0.7025
Time (mins)	9	17	50

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.81	0.09	0.390
5.0	2.62	0.28	0.580
10.0	2.00	0.90	1.200
15.0	1.47	1.43	1.730
20.0	1.26	1.64	1.940
30.0	1.08	1.82	2.120
40.0	0.83	2.07	2.370
50.0	0.70	2.20	2.500
60.0	0.53	2.37	2.670
70.0	0.41	2.49	2.790
80.0	0.35	2.55	2.850



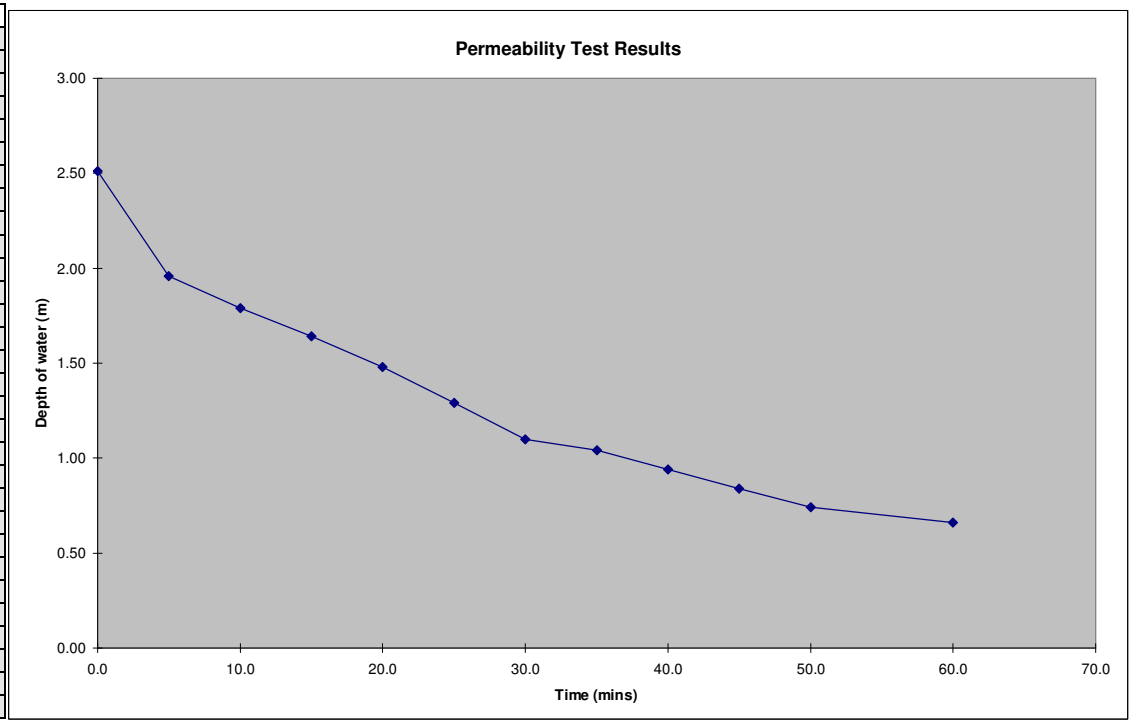
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP357B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.65
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8825	1.2550	0.6275
Time (mins)	7.3	25.9	64.1

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.51	0.39	0.690
5.0	1.96	0.94	1.240
10.0	1.79	1.11	1.410
15.0	1.64	1.26	1.560
20.0	1.48	1.42	1.720
25.0	1.29	1.61	1.910
30.0	1.10	1.80	2.100
35.0	1.04	1.86	2.160
40.0	0.94	1.96	2.260
45.0	0.84	2.06	2.360
50.0	0.74	2.16	2.460
60.0	0.66	2.24	2.540



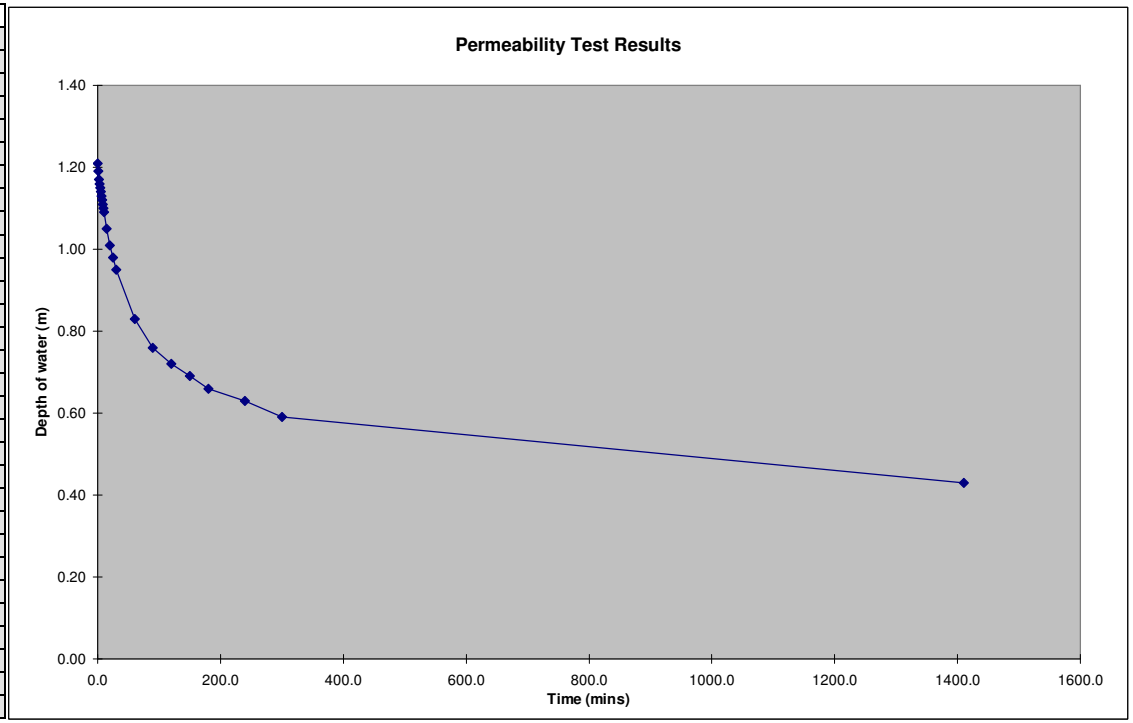
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP358A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.60
No of runs	1
Pipe upstand (m)	0.150

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9075	0.6050	0.3025
Time (mins)	41	277	2295

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.21	0.29	0.440
1.0	1.19	0.31	0.460
2.0	1.17	0.33	0.480
3.0	1.16	0.34	0.490
4.0	1.15	0.35	0.500
5.0	1.14	0.36	0.510
6.0	1.13	0.37	0.520
7.0	1.12	0.38	0.530
8.0	1.11	0.39	0.540
9.0	1.10	0.40	0.550
10.0	1.09	0.41	0.560
15.0	1.05	0.45	0.600
20.0	1.01	0.49	0.640
25.0	0.98	0.52	0.670
30.0	0.95	0.55	0.700
60.0	0.83	0.67	0.820
90.0	0.76	0.74	0.890
120.0	0.72	0.78	0.930
150.0	0.69	0.81	0.960
180.0	0.66	0.84	0.990
240.0	0.63	0.87	1.020
300.0	0.59	0.91	1.060
1410.0	0.43	1.07	1.220



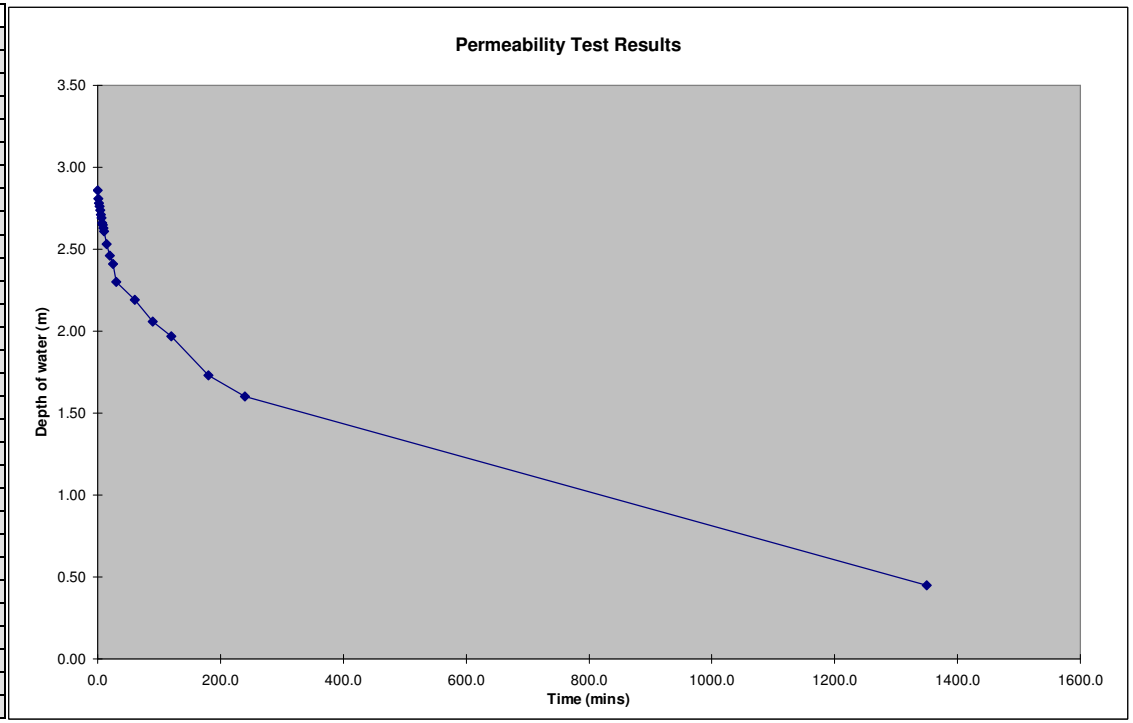
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP358B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.30
Breadth of Trial Pit (m)=	0.60
No of runs	2
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.1450	1.4300	0.7150
Time (mins)	70	404	1094

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.86	0.14	0.440
1.0	2.81	0.19	0.490
2.0	2.78	0.22	0.520
3.0	2.76	0.24	0.540
4.0	2.74	0.26	0.560
5.0	2.71	0.29	0.590
6.0	2.69	0.31	0.610
7.0	2.66	0.34	0.640
8.0	2.65	0.35	0.650
9.0	2.63	0.37	0.670
10.0	2.61	0.39	0.690
15.0	2.53	0.47	0.770
20.0	2.46	0.54	0.840
25.0	2.41	0.59	0.890
30.0	2.30	0.70	1.000
60.0	2.19	0.81	1.110
90.0	2.06	0.94	1.240
120.0	1.97	1.03	1.330
180.0	1.73	1.27	1.570
240.0	1.60	1.40	1.700
1350.0	0.45	2.55	2.850



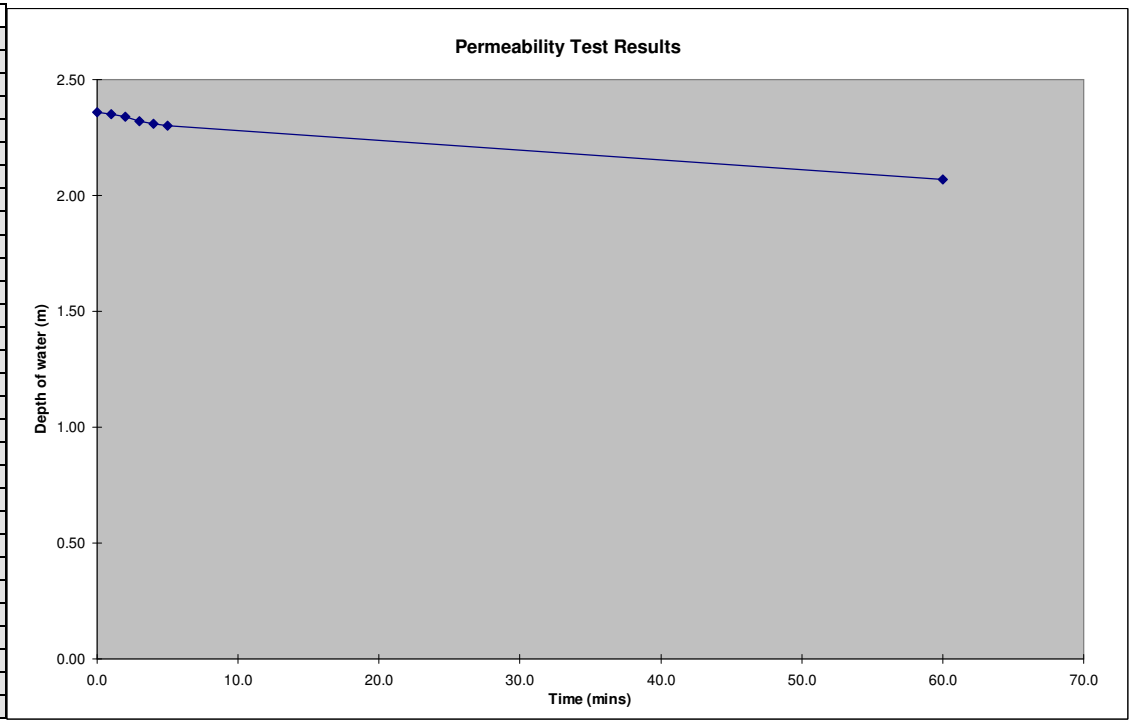
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP358B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.30
Breadth of Trial Pit (m)=	0.60
No of runs	2.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7700	1.1800	0.5900
Time (mins)	132	273	414

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.36	0.64	0.940
1.0	2.35	0.65	0.950
2.0	2.34	0.66	0.960
3.0	2.32	0.68	0.980
4.0	2.31	0.69	0.990
5.0	2.30	0.70	1.000
60.0	2.07	0.93	1.230



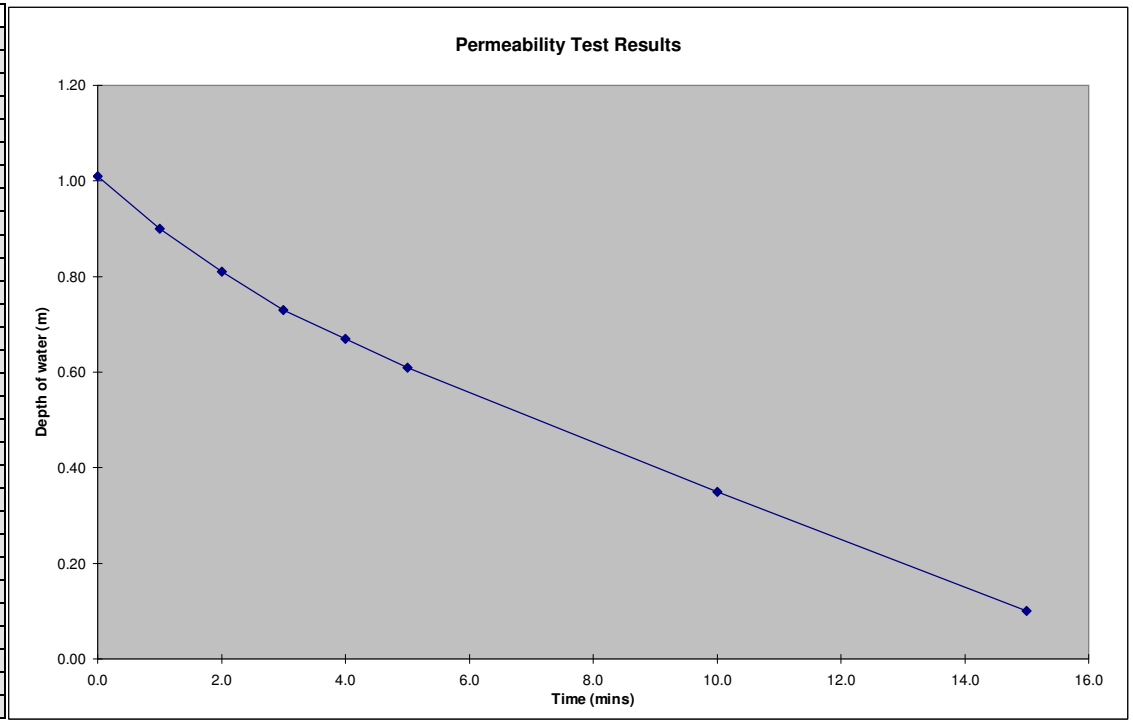
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP359A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.60
No of runs	3
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7575	0.5050	0.2525
Time (mins)	3	7	12

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.01	0.49	0.590
1.0	0.90	0.60	0.700
2.0	0.81	0.69	0.790
3.0	0.73	0.77	0.870
4.0	0.67	0.83	0.930
5.0	0.61	0.89	0.990
10.0	0.35	1.15	1.250
15.0	0.10	1.40	1.500



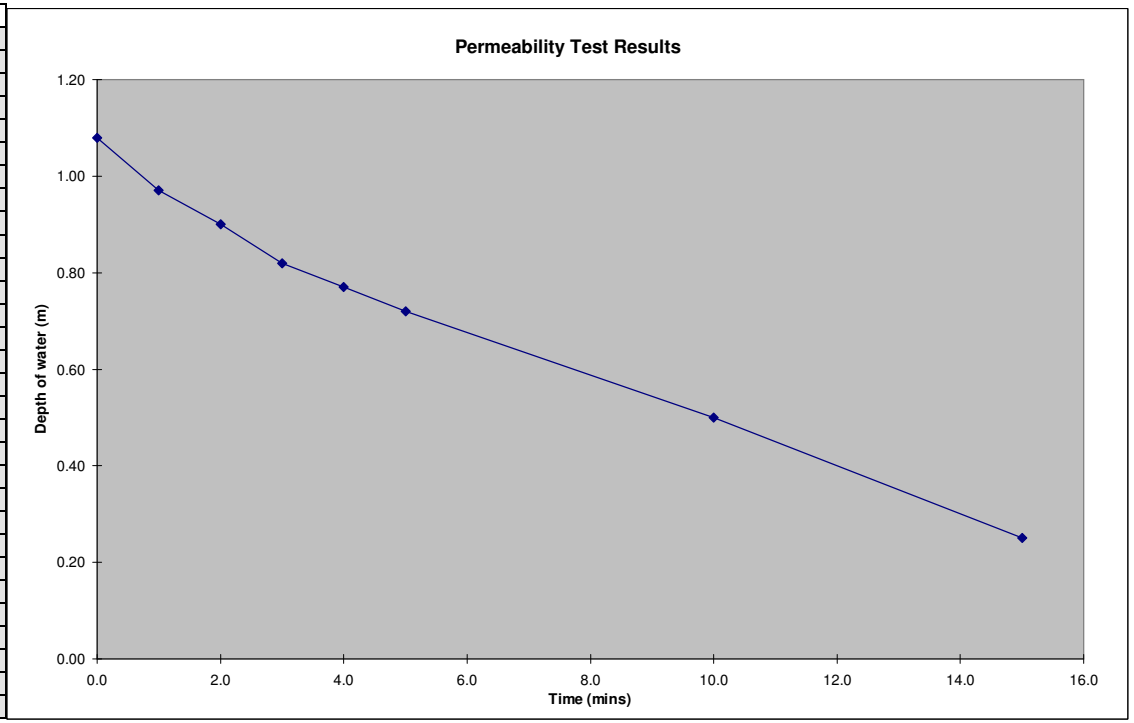
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP359A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8100	0.5400	0.2700
Time (mins)	3	9	15

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.08	0.42	0.520
1.0	0.97	0.53	0.630
2.0	0.90	0.60	0.700
3.0	0.82	0.68	0.780
4.0	0.77	0.73	0.830
5.0	0.72	0.78	0.880
10.0	0.50	1.00	1.100
15.0	0.25	1.25	1.350



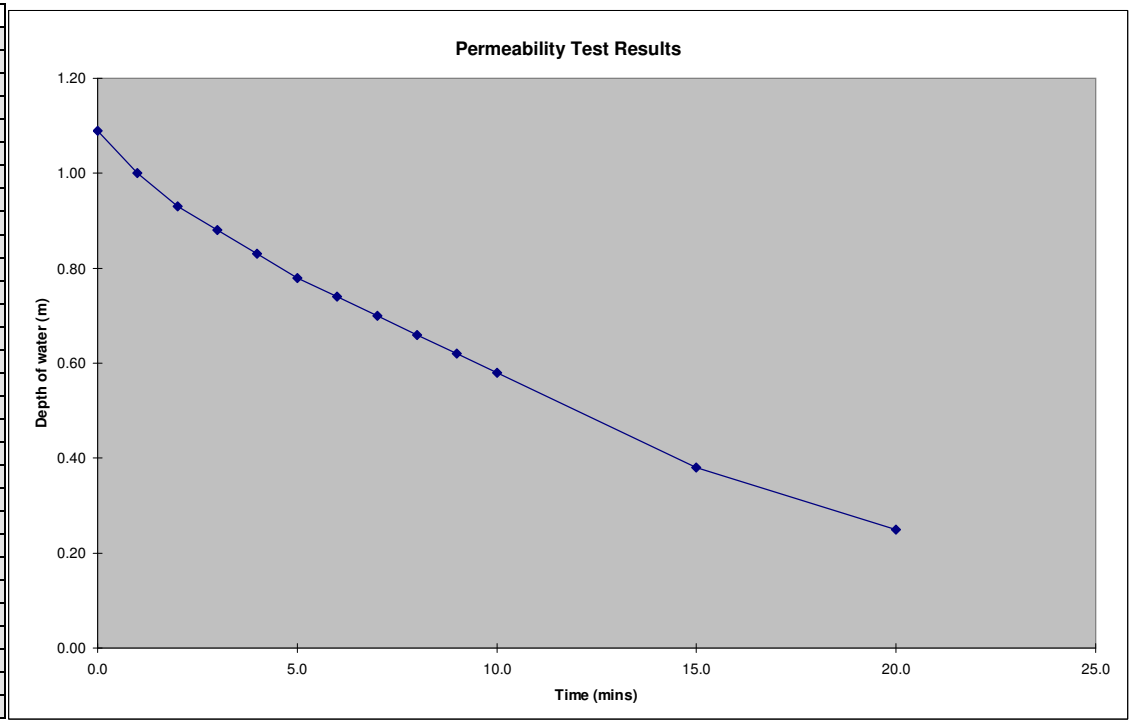
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP359A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.100

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8175	0.5450	0.2725
Time (mins)	4.3	10.9	19.1

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.09	0.41	0.510
1.0	1.00	0.50	0.600
2.0	0.93	0.57	0.670
3.0	0.88	0.62	0.720
4.0	0.83	0.67	0.770
5.0	0.78	0.72	0.820
6.0	0.74	0.76	0.860
7.0	0.70	0.80	0.900
8.0	0.66	0.84	0.940
9.0	0.62	0.88	0.980
10.0	0.58	0.92	1.020
15.0	0.38	1.12	1.220
20.0	0.25	1.25	1.350



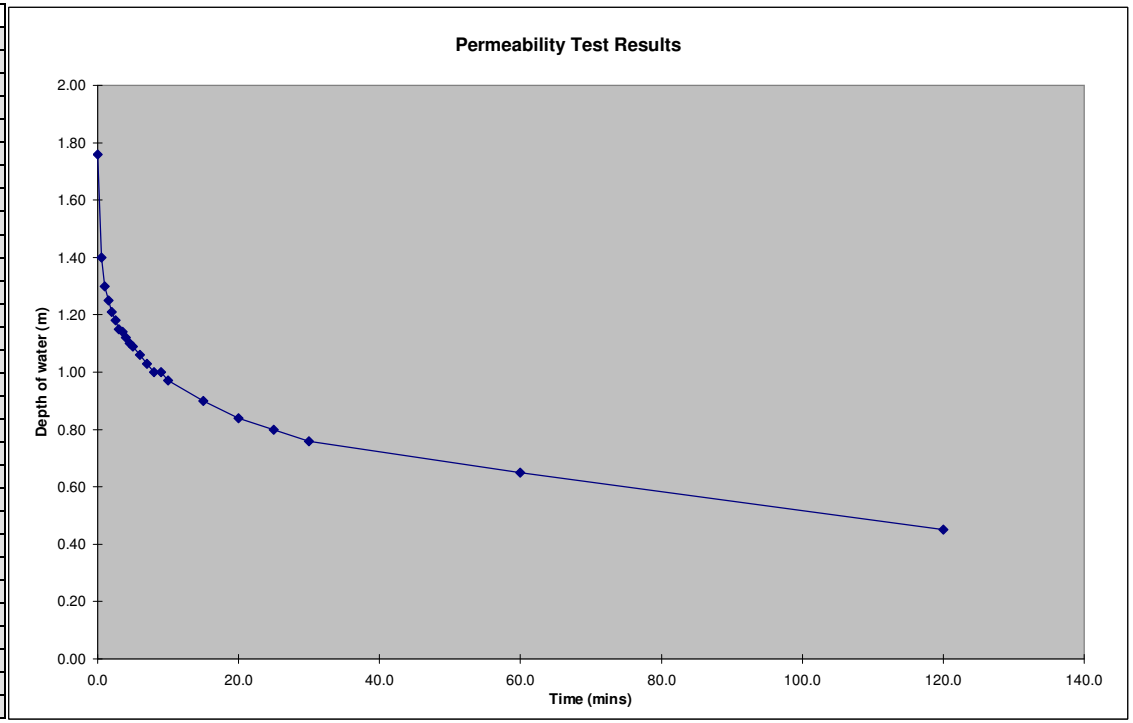
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP359B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.60
No of runs	3
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.3200	0.8800	0.4400
Time (mins)	1	17	123

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.76	1.24	1.540
0.5	1.40	1.60	1.900
1.0	1.30	1.70	2.000
1.5	1.25	1.75	2.050
2.0	1.21	1.79	2.090
2.5	1.18	1.82	2.120
3.0	1.15	1.85	2.150
3.5	1.14	1.86	2.160
4.0	1.12	1.88	2.180
4.5	1.10	1.90	2.200
5.0	1.09	1.91	2.210
6.0	1.06	1.94	2.240
7.0	1.03	1.97	2.270
8.0	1.00	2.00	2.300
9.0	1.00	2.00	2.300
10.0	0.97	2.03	2.330
15.0	0.90	2.10	2.400
20.0	0.84	2.16	2.460
25.0	0.80	2.20	2.500
30.0	0.76	2.24	2.540
60.0	0.65	2.35	2.650
120.0	0.45	2.55	2.850



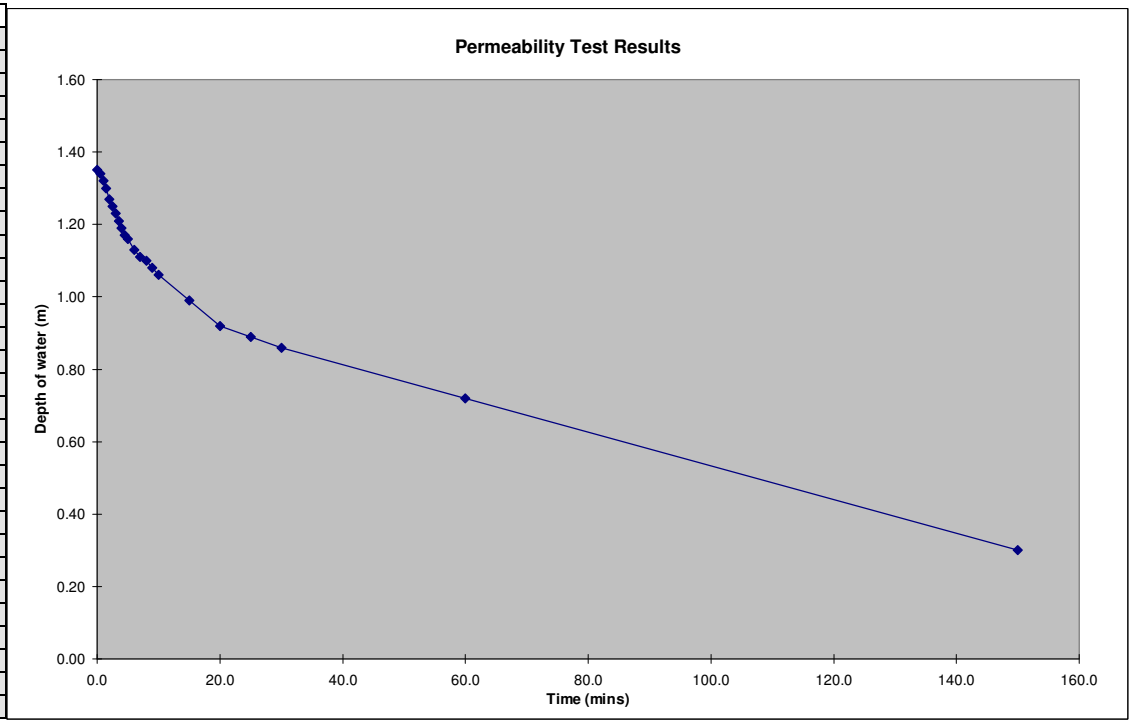
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP359B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0125	0.6750	0.3375
Time (mins)	13	70	142

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.35	1.65	1.950
0.5	1.34	1.66	1.960
1.0	1.32	1.68	1.980
1.5	1.30	1.70	2.000
2.0	1.27	1.73	2.030
2.5	1.25	1.75	2.050
3.0	1.23	1.77	2.070
3.5	1.21	1.79	2.090
4.0	1.19	1.81	2.110
4.5	1.17	1.83	2.130
5.0	1.16	1.84	2.140
6.0	1.13	1.87	2.170
7.0	1.11	1.89	2.190
8.0	1.10	1.90	2.200
9.0	1.08	1.92	2.220
10.0	1.06	1.94	2.240
15.0	0.99	2.01	2.310
20.0	0.92	2.08	2.380
25.0	0.89	2.11	2.410
30.0	0.86	2.14	2.440
60.0	0.72	2.28	2.580
150.0	0.30	2.70	3.000



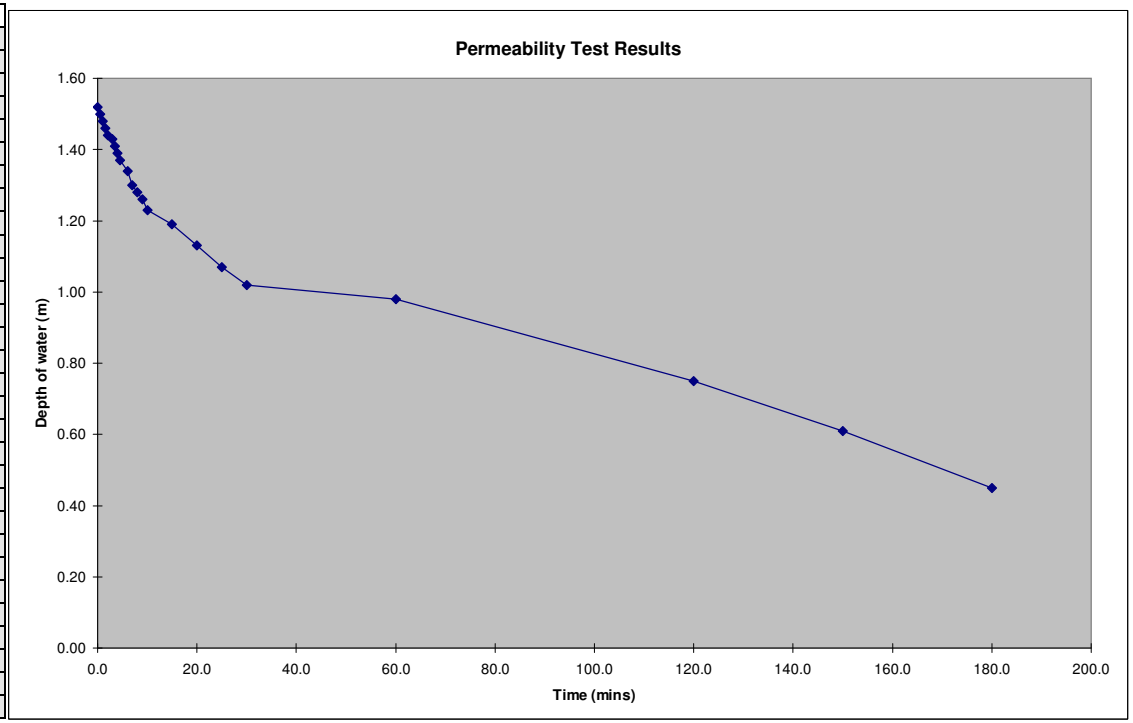
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP359B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.50
Breadth of Trial Pit (m)=	0.60
No of runs	3.00
Pipe upstand (m)	0.300

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1400	0.7600	0.3800
Time (mins)	19.2	117.4	193.1

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.52	1.48	1.780
0.5	1.50	1.50	1.800
1.0	1.48	1.52	1.820
1.5	1.46	1.54	1.840
2.0	1.44	1.56	1.860
3.0	1.43	1.57	1.870
3.5	1.41	1.59	1.890
4.0	1.39	1.61	1.910
4.5	1.37	1.63	1.930
6.0	1.34	1.66	1.960
7.0	1.30	1.70	2.000
8.0	1.28	1.72	2.020
9.0	1.26	1.74	2.040
10.0	1.23	1.77	2.070
15.0	1.19	1.81	2.110
20.0	1.13	1.87	2.170
25.0	1.07	1.93	2.230
30.0	1.02	1.98	2.280
60.0	0.98	2.02	2.320
120.0	0.75	2.25	2.550
150.0	0.61	2.39	2.690
180.0	0.45	2.55	2.850



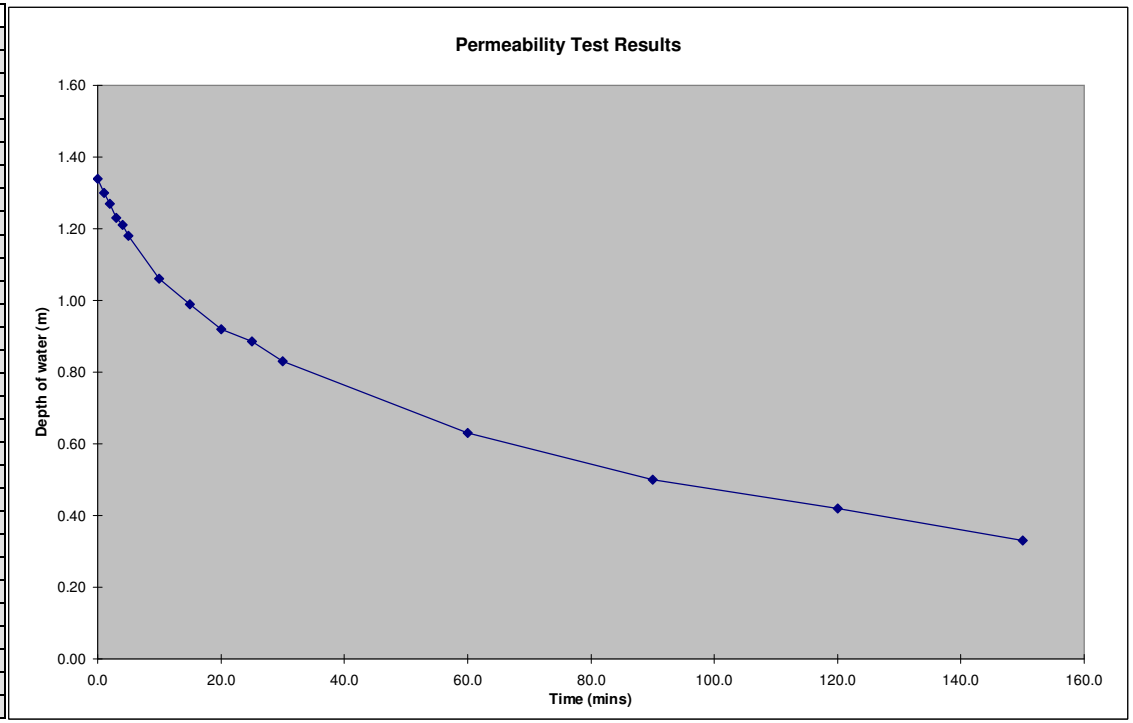
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	0.90
Breadth of Trial Pit (m)=	0.70
No of runs	3
Pipe upstand (m)	1.090

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0050	0.6700	0.3350
Time (mins)	14	54	148

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.34	0.16	1.250
1.0	1.30	0.20	1.290
2.0	1.27	0.23	1.320
3.0	1.23	0.27	1.360
4.0	1.21	0.29	1.380
5.0	1.18	0.32	1.410
10.0	1.06	0.44	1.530
15.0	0.99	0.51	1.600
20.0	0.92	0.58	1.670
25.0	0.89	0.62	1.705
30.0	0.83	0.67	1.760
60.0	0.63	0.87	1.960
90.0	0.50	1.00	2.090
120.0	0.42	1.08	2.170
150.0	0.33	1.17	2.260



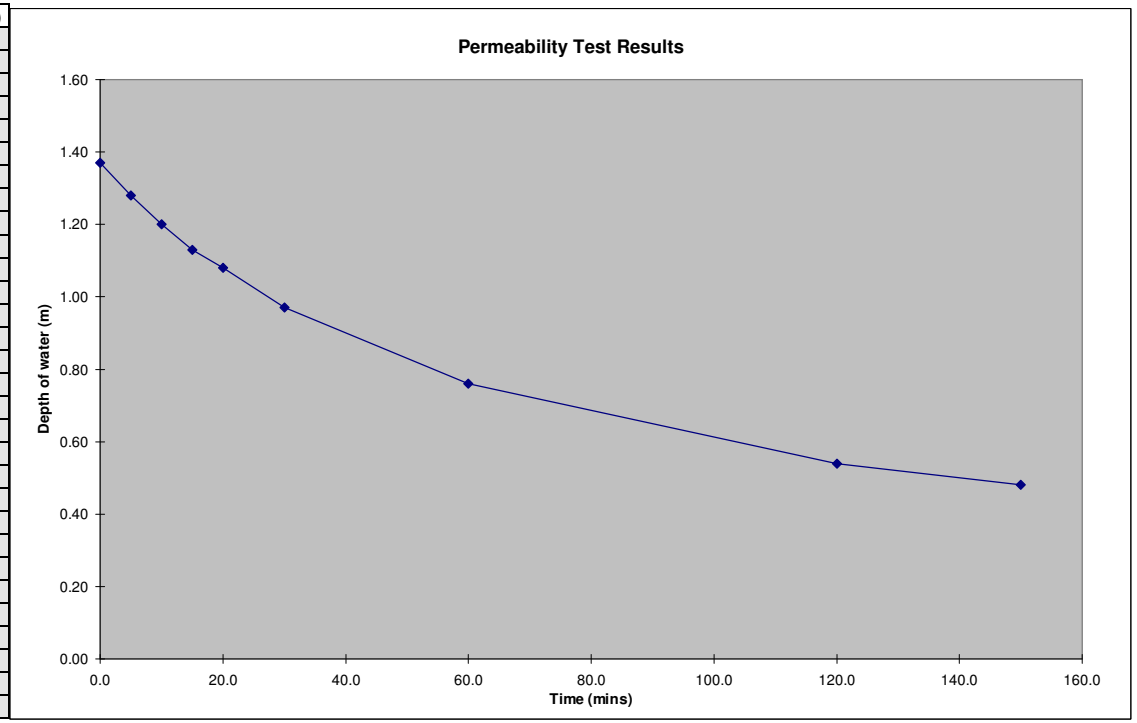
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	0.90
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	1.090

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0275	0.6850	0.3425
Time (mins)	25	80	219

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.37	0.13	1.220
5.0	1.28	0.22	1.310
10.0	1.20	0.30	1.390
15.0	1.13	0.37	1.460
20.0	1.08	0.42	1.510
30.0	0.97	0.53	1.620
60.0	0.76	0.74	1.830
120.0	0.54	0.96	2.050
150.0	0.48	1.02	2.110



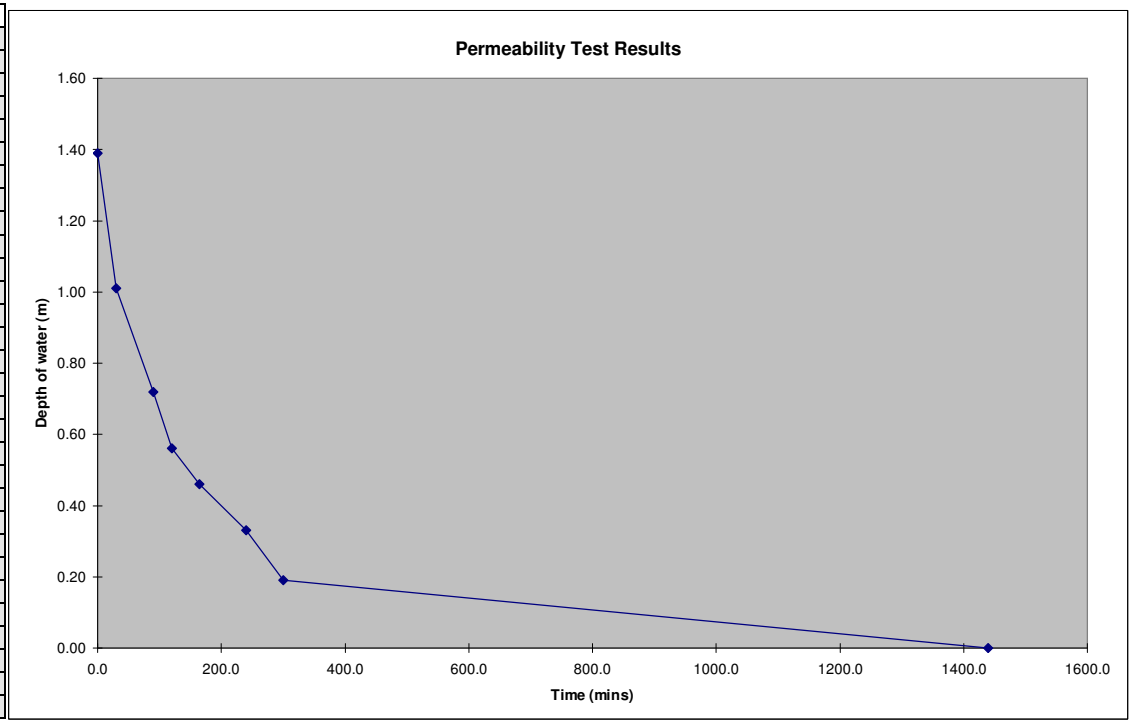
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	0.90
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	1.090

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0425	0.6950	0.3475
Time (mins)	27.4	94.7	229.9

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.39	0.11	1.200
30.0	1.01	0.49	1.580
90.0	0.72	0.78	1.870
120.0	0.56	0.94	2.030
165.0	0.46	1.04	2.130
240.0	0.33	1.17	2.260
300.0	0.19	1.31	2.400
1440.0	0.00	1.50	2.590



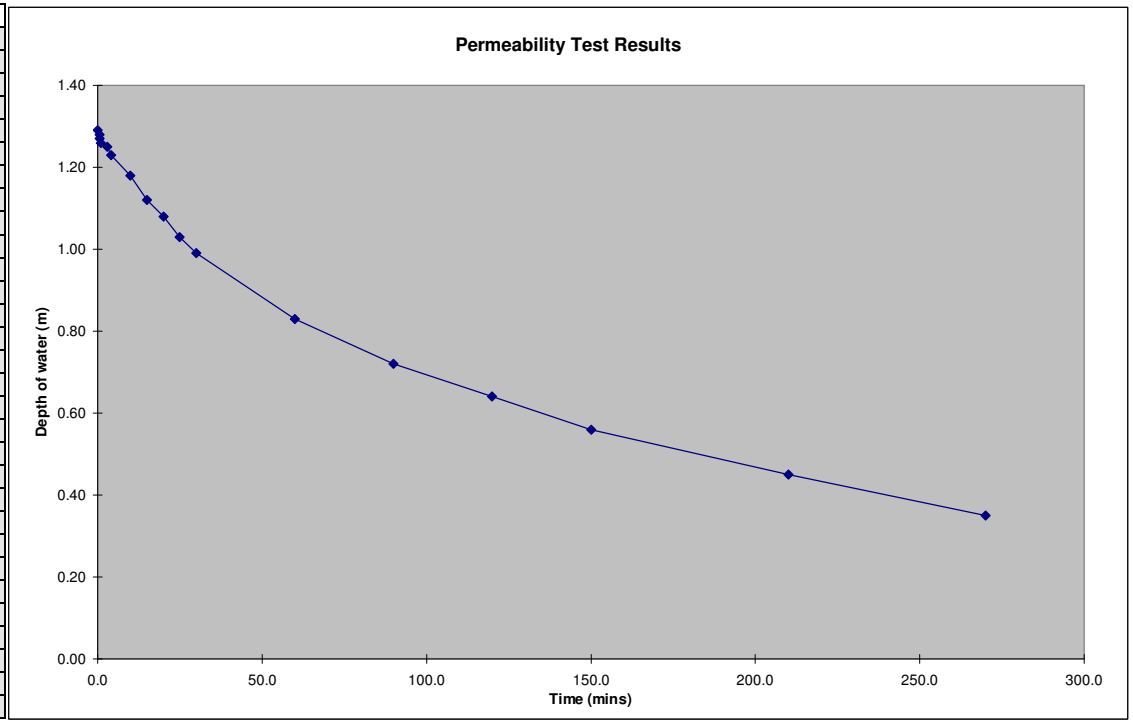
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	0.90
Breadth of Trial Pit (m)=	0.70
No of runs	1
Pipe upstand (m)	1.090

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9675	0.6450	0.3225
Time (mins)	28	95	239

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.29	0.21	1.300
0.5	1.28	0.22	1.310
0.7	1.27	0.23	1.320
1.0	1.26	0.24	1.330
3.0	1.25	0.25	1.340
4.0	1.23	0.27	1.360
10.0	1.18	0.32	1.410
15.0	1.12	0.38	1.470
20.0	1.08	0.42	1.510
25.0	1.03	0.47	1.560
30.0	0.99	0.51	1.600
60.0	0.83	0.67	1.760
90.0	0.72	0.78	1.870
120.0	0.64	0.86	1.950
150.0	0.56	0.94	2.030
210.0	0.45	1.05	2.140
270.0	0.35	1.15	2.240



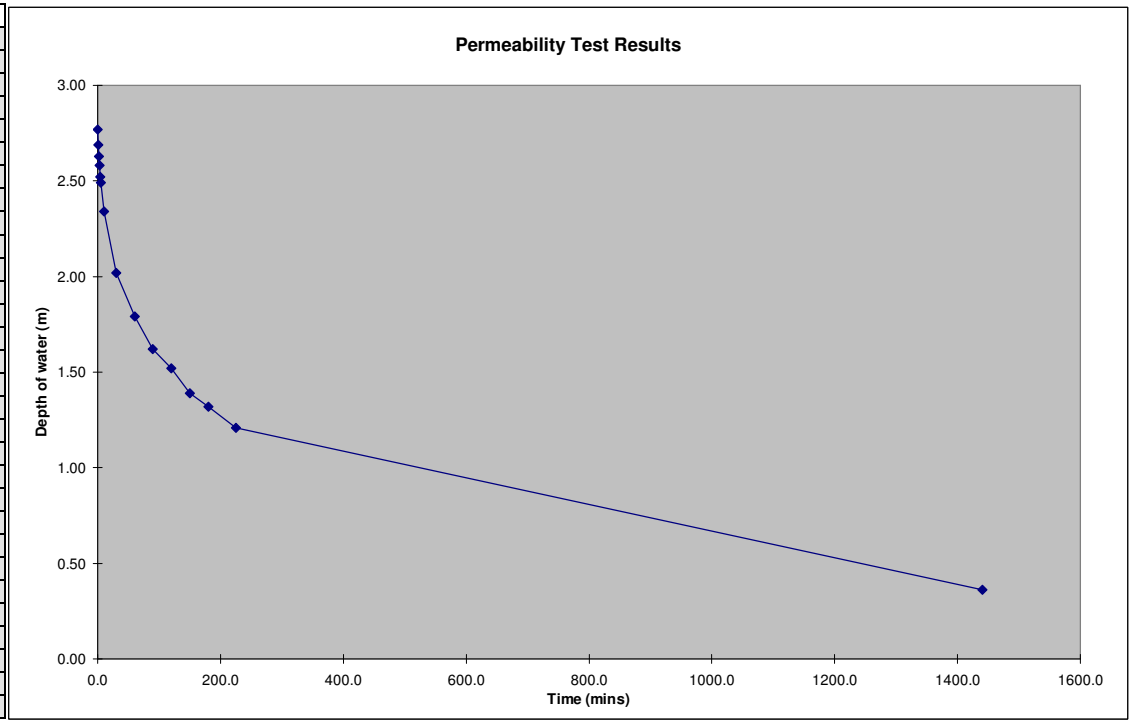
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.70
No of runs	3
Pipe upstand (m)	0.420

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.0775	1.3850	0.6925
Time (mins)	26	152	965

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.77	0.13	0.550
1.0	2.69	0.21	0.630
2.0	2.63	0.27	0.690
3.0	2.58	0.32	0.740
4.0	2.52	0.38	0.800
5.0	2.49	0.41	0.830
10.0	2.34	0.56	0.980
30.0	2.02	0.88	1.300
60.0	1.79	1.11	1.530
90.0	1.62	1.28	1.700
120.0	1.52	1.38	1.800
150.0	1.39	1.51	1.930
180.0	1.32	1.58	2.000
225.0	1.21	1.69	2.110
1440.0	0.36	2.54	2.960



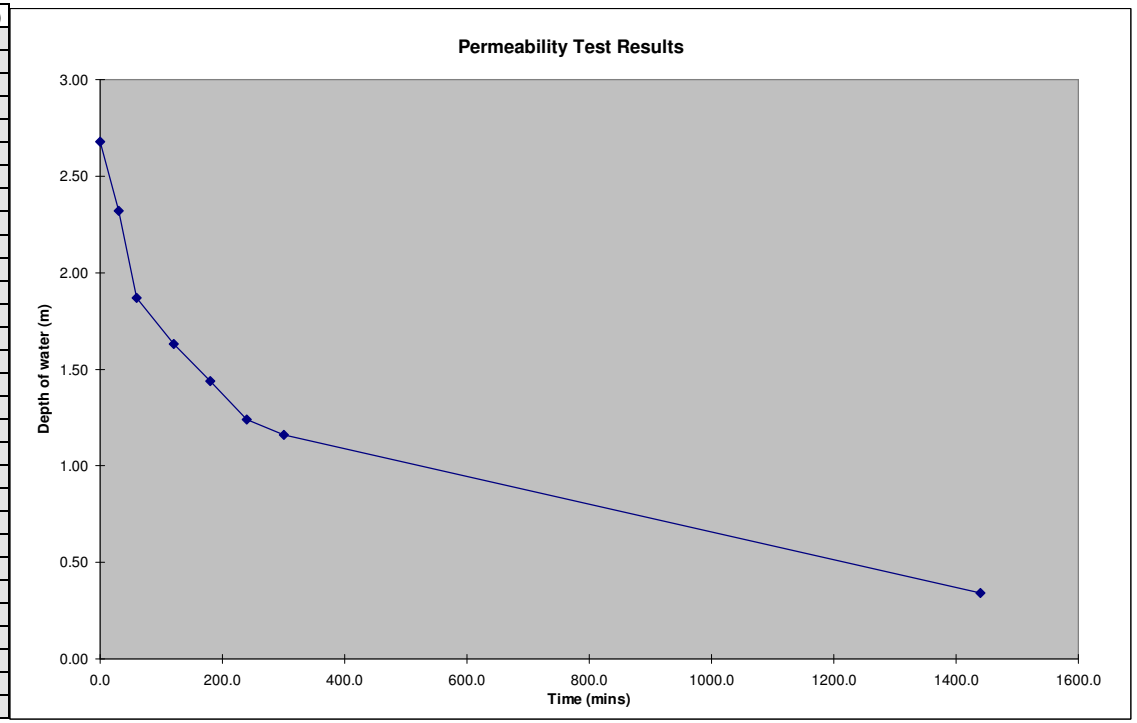
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.420

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.0100	1.3400	0.6700
Time (mins)	51	210	981

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.68	0.22	0.640
30.0	2.32	0.58	1.000
60.0	1.87	1.03	1.450
120.0	1.63	1.27	1.690
180.0	1.44	1.46	1.880
240.0	1.24	1.66	2.080
300.0	1.16	1.74	2.160
1440.0	0.34	2.56	2.980



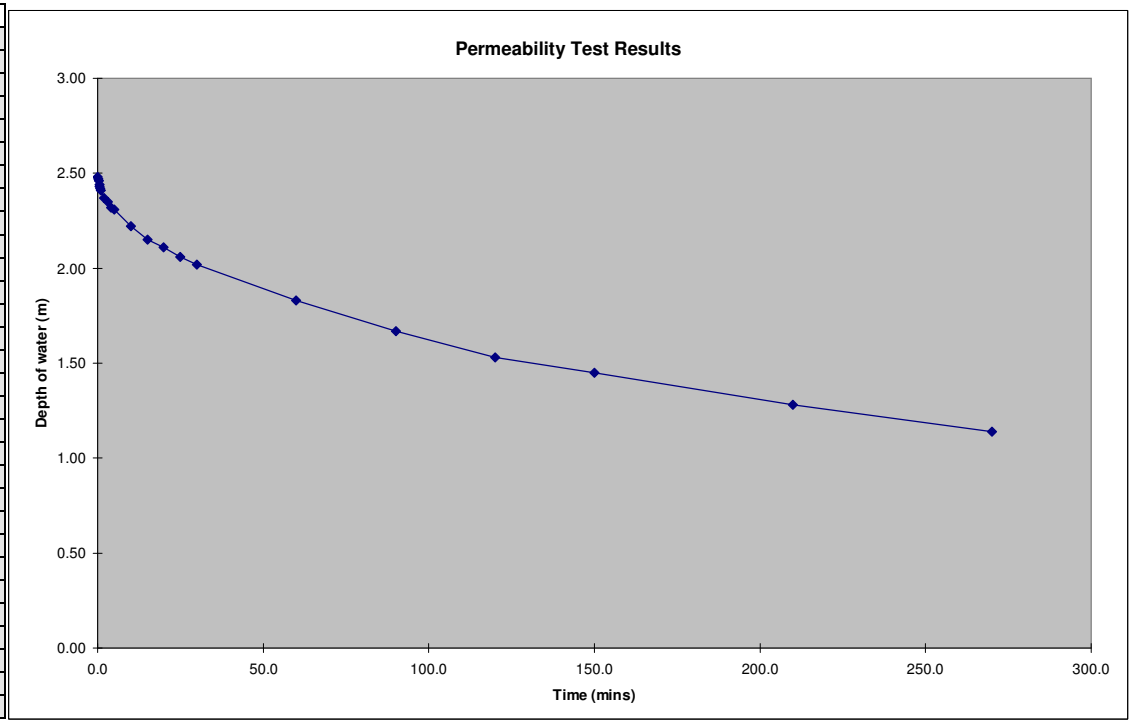
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	360B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.420

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8600	1.2400	0.6200
Time (mins)	55.3	227.1	492.9

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.48	0.42	0.840
0.2	2.47	0.43	0.850
0.3	2.46	0.44	0.860
0.5	2.44	0.46	0.880
0.7	2.43	0.47	0.890
0.8	2.42	0.48	0.900
1.0	2.41	0.49	0.910
2.0	2.37	0.53	0.950
3.0	2.35	0.55	0.970
4.0	2.32	0.58	1.000
5.0	2.31	0.59	1.010
10.0	2.22	0.68	1.100
15.0	2.15	0.75	1.170
20.0	2.11	0.79	1.210
25.0	2.06	0.84	1.260
30.0	2.02	0.88	1.300
60.0	1.83	1.07	1.490
90.0	1.67	1.23	1.650
120.0	1.53	1.37	1.790
150.0	1.45	1.45	1.870
210.0	1.28	1.62	2.040
270.0	1.14	1.76	2.180



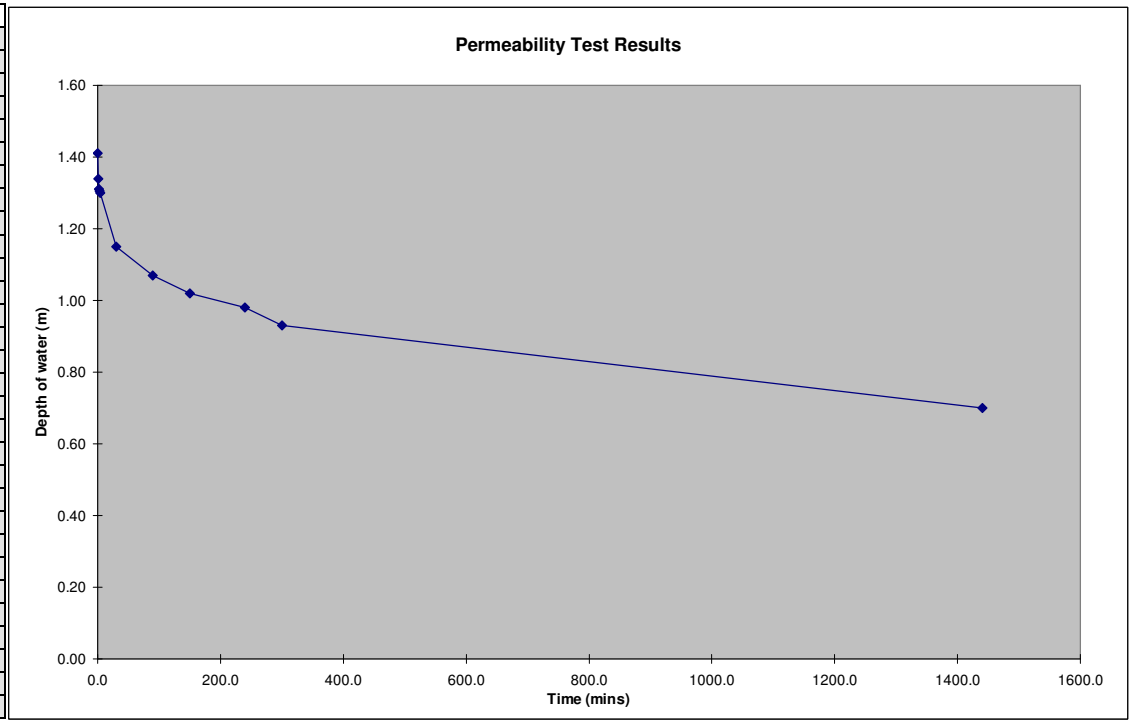
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	361A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.10
Breadth of Trial Pit (m)=	0.70
No of runs	2
Pipe upstand (m)	1.010

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0575	0.7050	0.3525
Time (mins)	105	1415	3162

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.41	0.09	1.100
1.0	1.34	0.16	1.170
2.0	1.31	0.19	1.200
3.0	1.31	0.20	1.205
4.0	1.30	0.20	1.210
30.0	1.15	0.35	1.360
90.0	1.07	0.43	1.440
150.0	1.02	0.48	1.490
240.0	0.98	0.52	1.530
300.0	0.93	0.57	1.580
1440.0	0.70	0.80	1.810



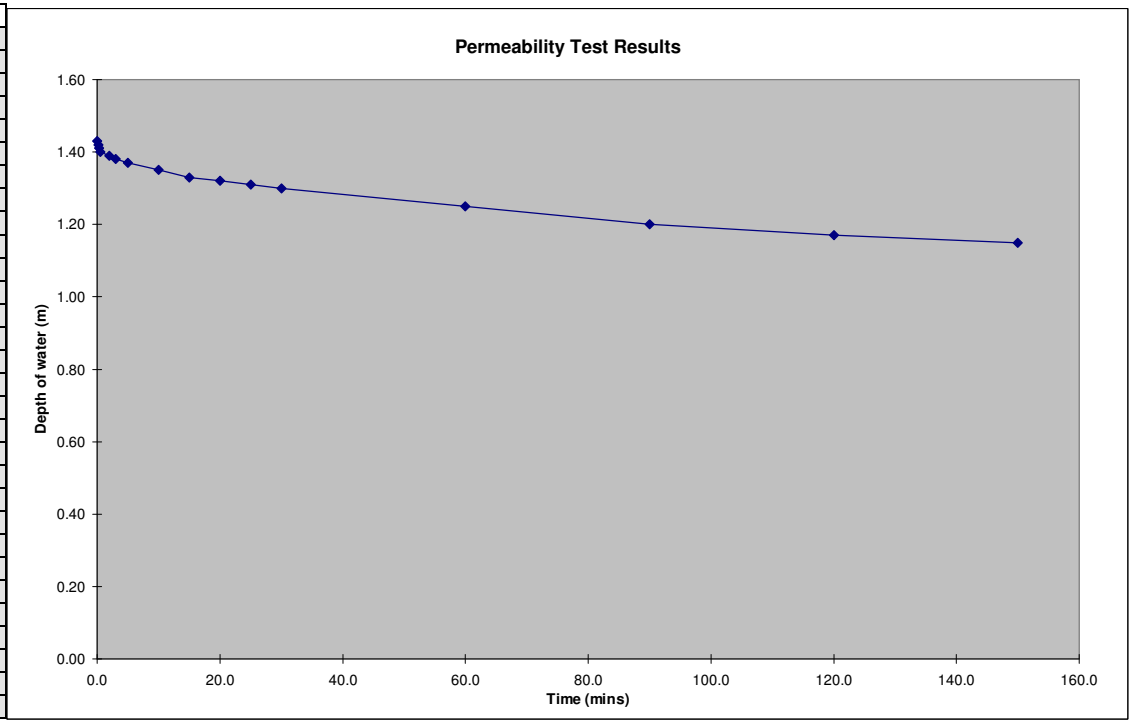
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	361A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.10
Breadth of Trial Pit (m)=	0.70
No of runs	2.00
Pipe upstand (m)	1.010

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0725	0.7150	0.3575
Time (mins)	144	381	1339

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.43	0.07	1.080
0.2	1.42	0.08	1.090
0.3	1.41	0.09	1.100
0.5	1.40	0.10	1.110
2.0	1.39	0.11	1.120
3.0	1.38	0.12	1.130
5.0	1.37	0.13	1.140
10.0	1.35	0.15	1.160
15.0	1.33	0.17	1.180
20.0	1.32	0.18	1.190
25.0	1.31	0.19	1.200
30.0	1.30	0.20	1.210
60.0	1.25	0.25	1.260
90.0	1.20	0.30	1.310
120.0	1.17	0.33	1.340
150.0	1.15	0.35	1.360



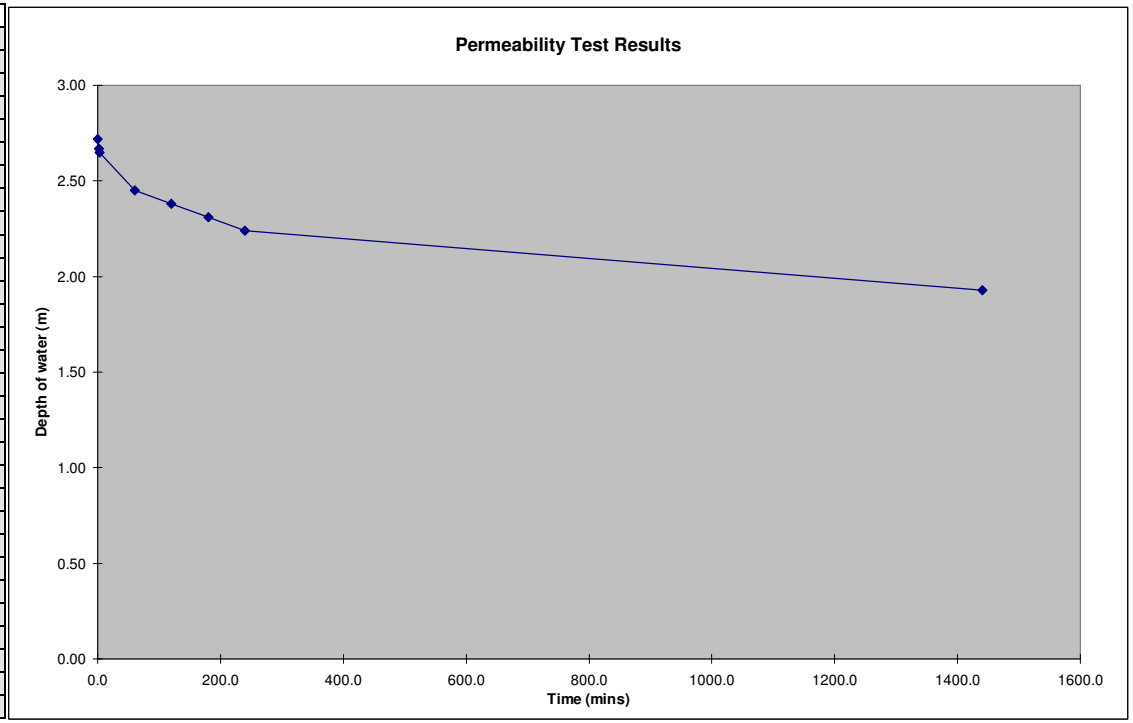
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	361B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.00
Breadth of Trial Pit (m)=	0.70
No of runs	2
Pipe upstand (m)	0.460

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.0400	1.3600	0.6800
Time (mins)	1014	3646	6279

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.72	0.28	0.740
2.0	2.67	0.33	0.790
3.0	2.65	0.35	0.810
60.0	2.45	0.55	1.010
120.0	2.38	0.62	1.080
180.0	2.31	0.69	1.150
240.0	2.24	0.76	1.220
1440.0	1.93	1.07	1.530



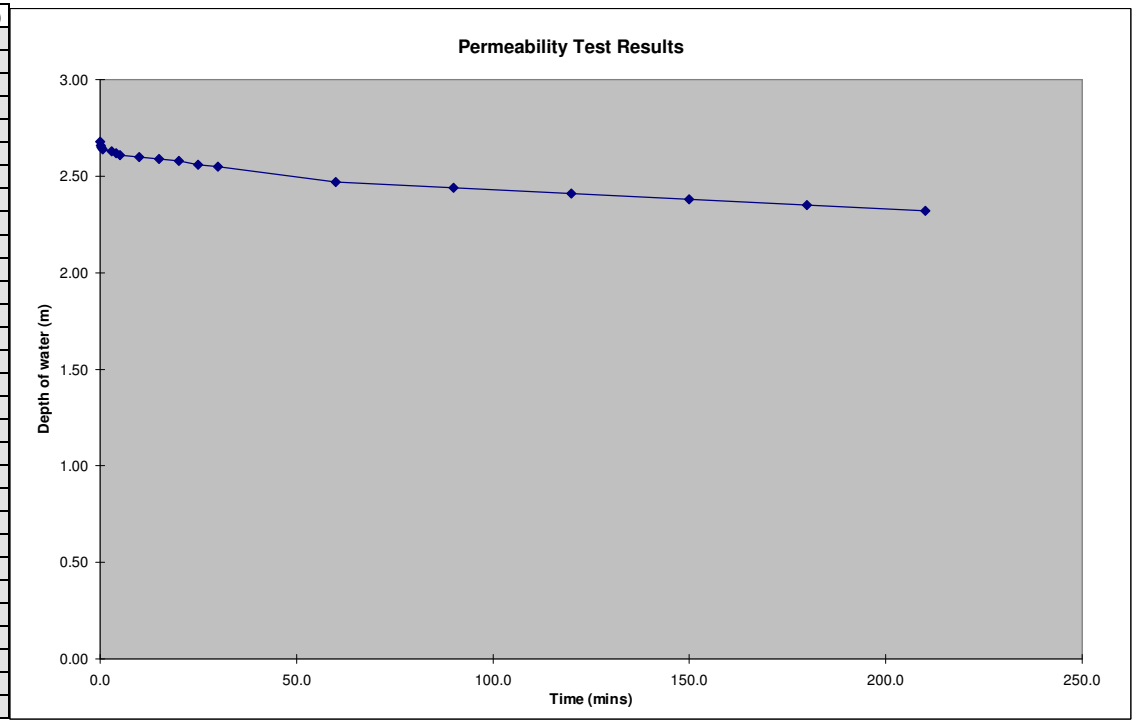
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	361B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.00
Breadth of Trial Pit (m)=	0.70
No of runs	2.00
Pipe upstand (m)	0.460

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	2.0100	1.3400	0.6700
Time (mins)	520	1190	1860

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.68	0.32	0.780
0.2	2.66	0.34	0.800
0.3	2.65	0.35	0.810
0.7	2.64	0.36	0.820
3.0	2.63	0.37	0.830
4.0	2.62	0.38	0.840
5.0	2.61	0.39	0.850
10.0	2.60	0.40	0.860
15.0	2.59	0.41	0.870
20.0	2.58	0.42	0.880
25.0	2.56	0.44	0.900
30.0	2.55	0.45	0.910
60.0	2.47	0.53	0.990
90.0	2.44	0.56	1.020
120.0	2.41	0.59	1.050
150.0	2.38	0.62	1.080
180.0	2.35	0.65	1.110
210.0	2.32	0.68	1.140



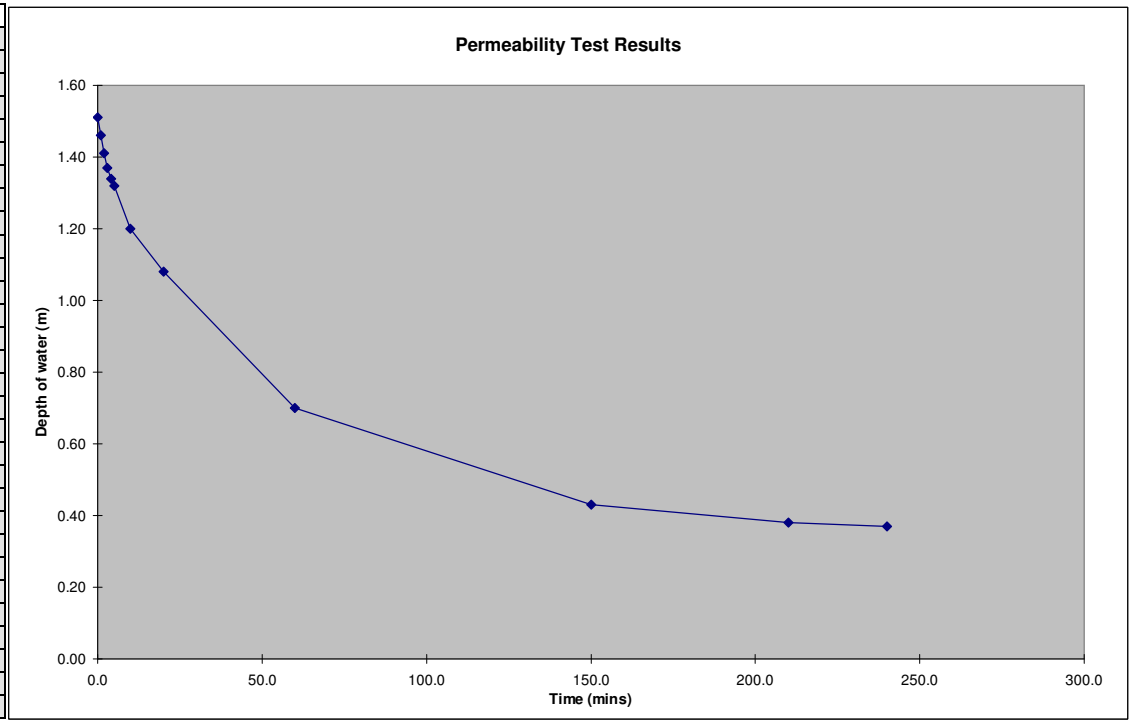
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP362A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.10
Breadth of Trial Pit (m)=	0.70
No of runs	3
Pipe upstand (m)	0.800

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1325	0.7550	0.3775
Time (mins)	16	54	218

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.51	0.09	0.890
1.0	1.46	0.14	0.940
2.0	1.41	0.19	0.990
3.0	1.37	0.23	1.030
4.0	1.34	0.26	1.060
5.0	1.32	0.28	1.080
10.0	1.20	0.40	1.200
20.0	1.08	0.52	1.320
60.0	0.70	0.90	1.700
150.0	0.43	1.17	1.970
210.0	0.38	1.22	2.020
240.0	0.37	1.23	2.030



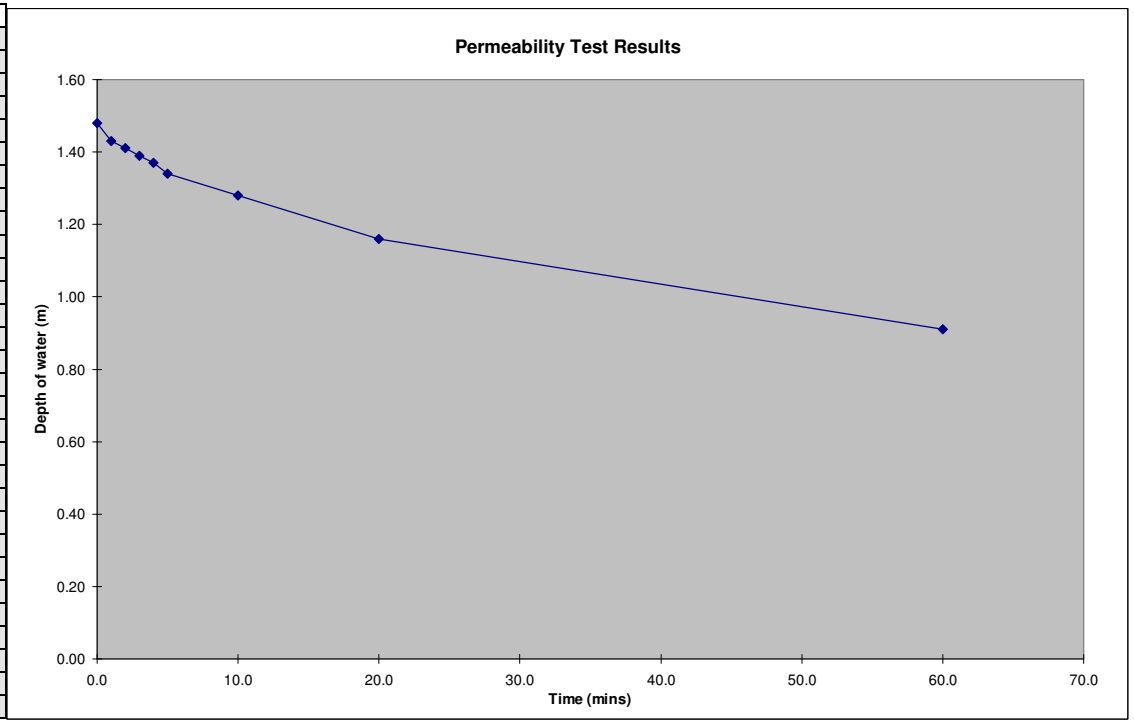
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP362A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.10
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.800

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1100	0.7400	0.3700
Time (mins)	28	87	146

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.48	0.12	0.920
1.0	1.43	0.17	0.970
2.0	1.41	0.19	0.990
3.0	1.39	0.21	1.010
4.0	1.37	0.23	1.030
5.0	1.34	0.26	1.060
10.0	1.28	0.32	1.120
20.0	1.16	0.44	1.240
60.0	0.91	0.69	1.490



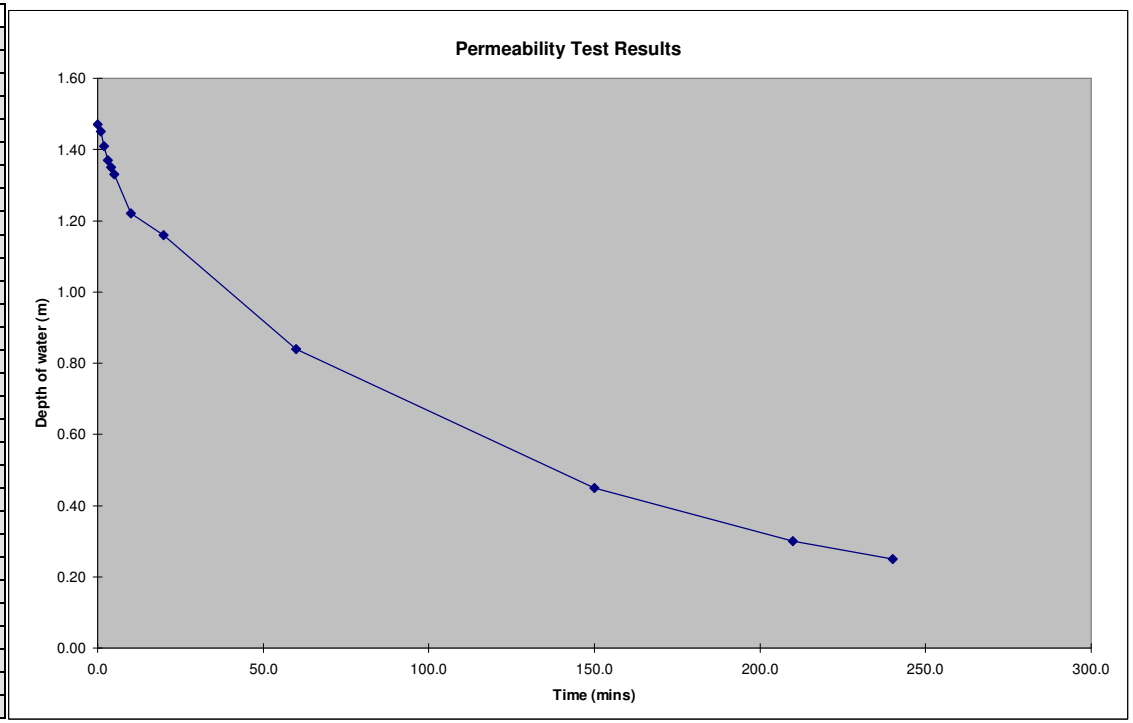
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP362A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	1.10
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.800

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.1025	0.7350	0.3675
Time (mins)	27.2	84.2	183.0

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.47	0.13	0.930
1.0	1.45	0.15	0.950
2.0	1.41	0.19	0.990
3.0	1.37	0.23	1.030
4.0	1.35	0.25	1.050
5.0	1.33	0.27	1.070
10.0	1.22	0.38	1.180
20.0	1.16	0.44	1.240
60.0	0.84	0.76	1.560
150.0	0.45	1.15	1.950
210.0	0.30	1.30	2.100
240.0	0.25	1.35	2.150



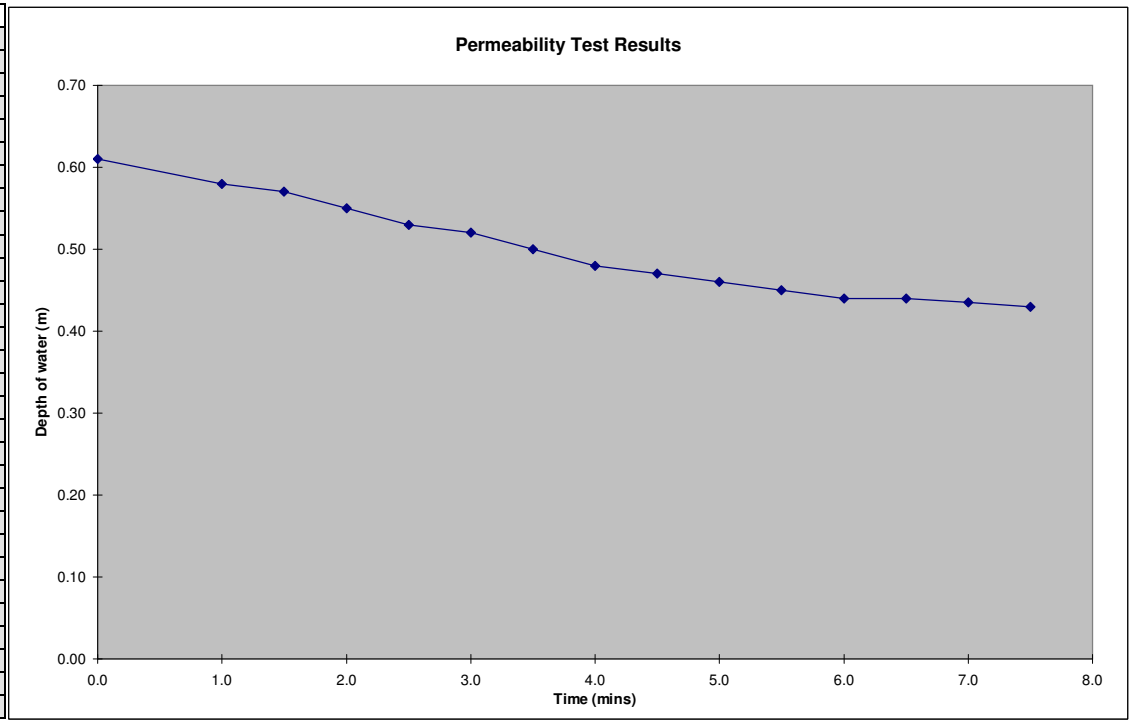
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP362B
Depth of Trial Pit (m)=	3.10
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.70
No of runs	3
Pipe upstand (m)	0.330

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4575	0.3050	0.1525
Time (mins)	5	20	35

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.61	2.49	2.820
1.0	0.58	2.52	2.850
1.5	0.57	2.53	2.860
2.0	0.55	2.55	2.880
2.5	0.53	2.57	2.900
3.0	0.52	2.58	2.910
3.5	0.50	2.60	2.930
4.0	0.48	2.62	2.950
4.5	0.47	2.63	2.960
5.0	0.46	2.64	2.970
5.5	0.45	2.65	2.980
6.0	0.44	2.66	2.990
6.5	0.44	2.66	2.990
7.0	0.44	2.67	2.995
7.5	0.43	2.67	3.000



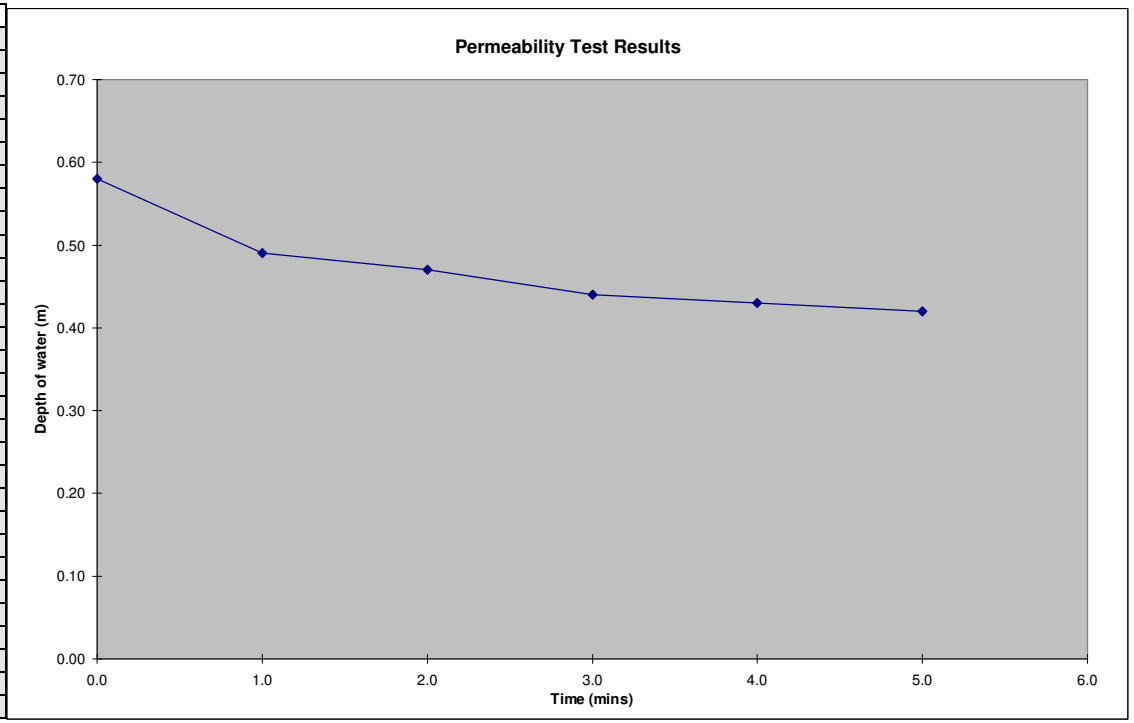
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP362B
Depth of Trial Pit (m)=	3.10
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.330

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.4350	0.2900	0.1450
Time (mins)	4	18	33

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.58	2.52	2.850
1.0	0.49	2.61	2.940
2.0	0.47	2.63	2.960
3.0	0.44	2.66	2.990
4.0	0.43	2.67	3.000
5.0	0.42	2.68	3.010



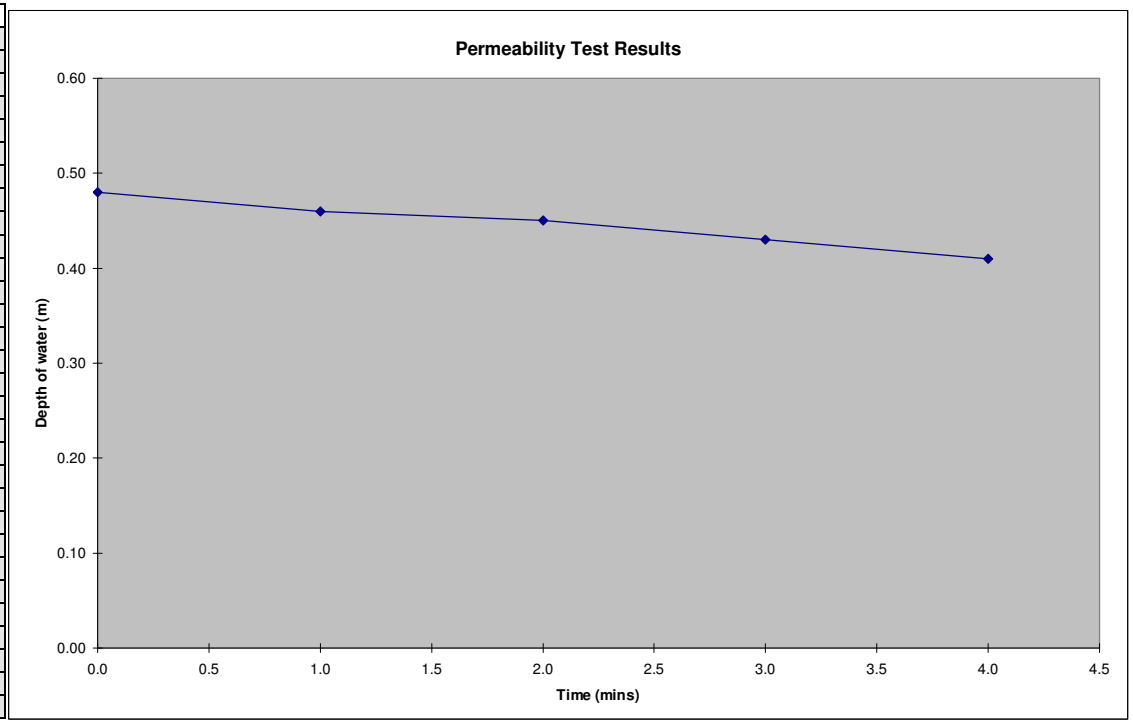
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP362B
Depth of Trial Pit (m)=	3.10
Length of Trial Pit (m)=	1.30
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.330

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.3600	0.2400	0.1200
Time (mins)	7.0	13.9	20.8

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.48	2.62	2.950
1.0	0.46	2.64	2.970
2.0	0.45	2.65	2.980
3.0	0.43	2.67	3.000
4.0	0.41	2.69	3.020



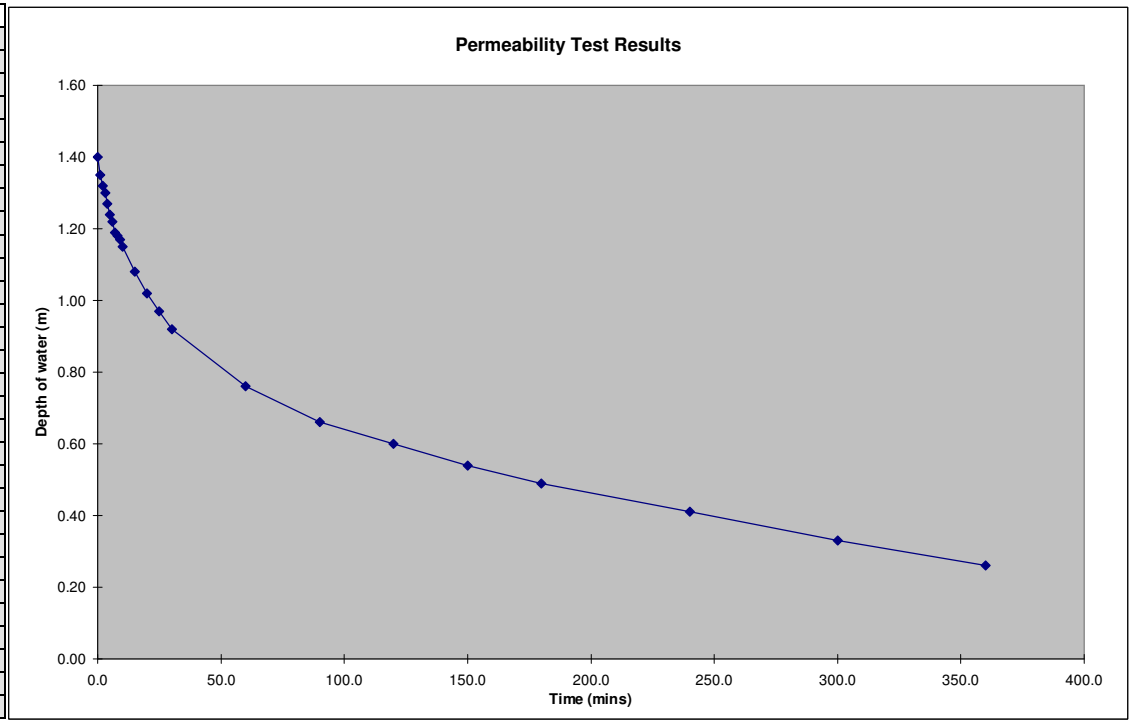
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP363A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.70
No of runs	3
Pipe upstand (m)	0.600

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0500	0.7000	0.3500
Time (mins)	18	78	285

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.40	0.20	0.800
1.0	1.35	0.25	0.850
2.0	1.32	0.28	0.880
3.0	1.30	0.30	0.900
4.0	1.27	0.33	0.930
5.0	1.24	0.36	0.960
6.0	1.22	0.38	0.980
7.0	1.19	0.41	1.010
8.0	1.18	0.42	1.020
9.0	1.17	0.43	1.030
10.0	1.15	0.45	1.050
15.0	1.08	0.52	1.120
20.0	1.02	0.58	1.180
25.0	0.97	0.63	1.230
30.0	0.92	0.68	1.280
60.0	0.76	0.84	1.440
90.0	0.66	0.94	1.540
120.0	0.60	1.00	1.600
150.0	0.54	1.06	1.660
180.0	0.49	1.11	1.710
240.0	0.41	1.19	1.790
300.0	0.33	1.27	1.870
360.0	0.26	1.34	1.940



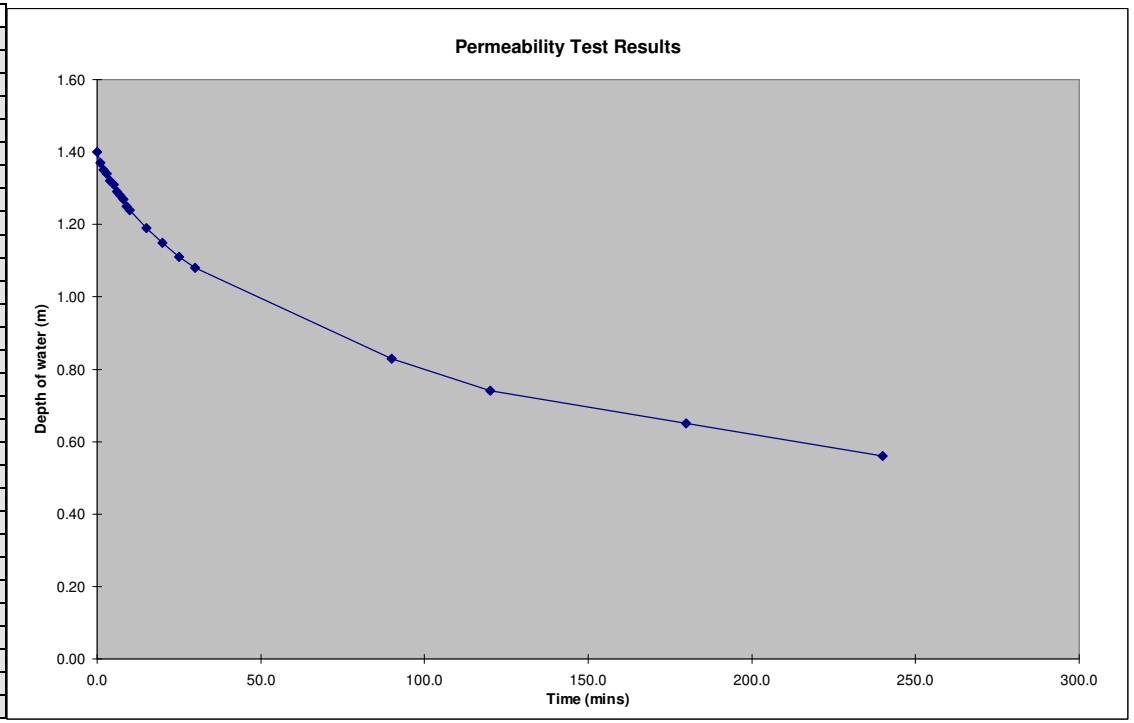
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP363A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.600

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0500	0.7000	0.3500
Time (mins)	37	147	380

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.40	0.20	0.800
1.0	1.37	0.23	0.830
2.0	1.35	0.25	0.850
3.0	1.34	0.26	0.860
4.0	1.32	0.28	0.880
5.0	1.31	0.29	0.890
6.0	1.29	0.31	0.910
7.0	1.28	0.32	0.920
8.0	1.27	0.33	0.930
9.0	1.25	0.35	0.950
10.0	1.24	0.36	0.960
15.0	1.19	0.41	1.010
20.0	1.15	0.45	1.050
25.0	1.11	0.49	1.090
30.0	1.08	0.52	1.120
90.0	0.83	0.77	1.370
120.0	0.74	0.86	1.460
180.0	0.65	0.95	1.550
240.0	0.56	1.04	1.640



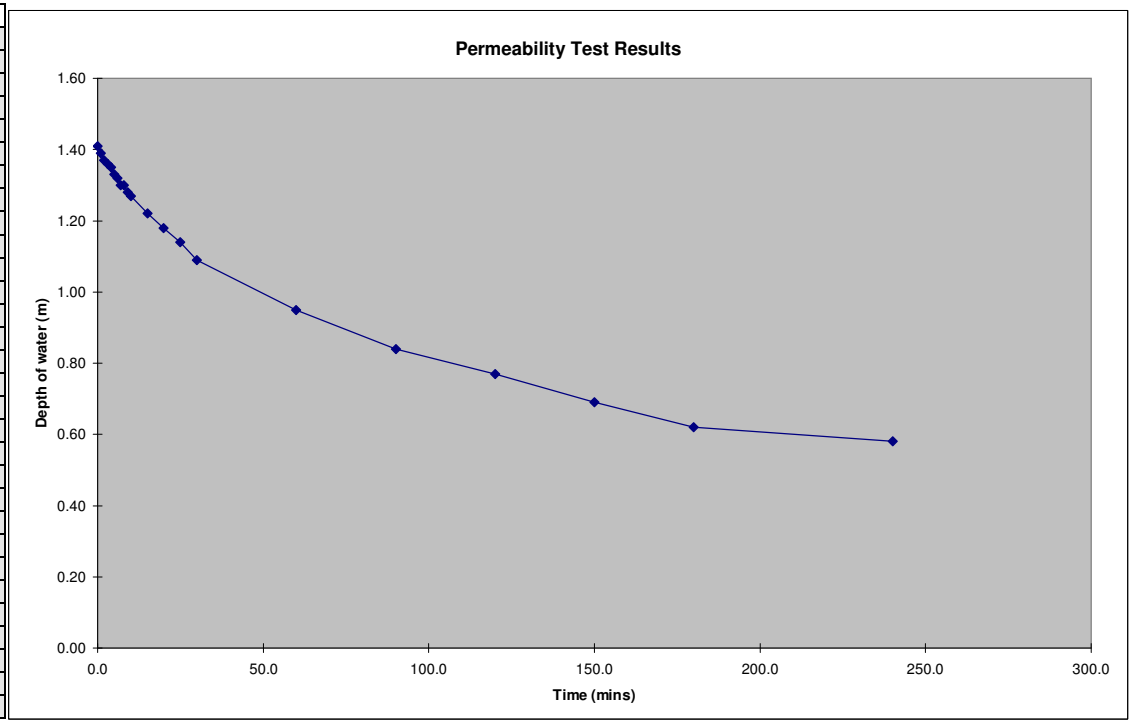
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP363A
Depth of Trial Pit (m)=	1.60
Length of Trial Pit (m)=	2.40
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.600

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.0575	0.7050	0.3525
Time (mins)	37.0	144.4	581.3

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.41	0.19	0.790
1.0	1.39	0.21	0.810
2.0	1.37	0.23	0.830
3.0	1.36	0.24	0.840
4.0	1.35	0.25	0.850
5.0	1.33	0.27	0.870
6.0	1.32	0.28	0.880
7.0	1.30	0.30	0.900
8.0	1.30	0.30	0.900
9.0	1.28	0.32	0.920
10.0	1.27	0.33	0.930
15.0	1.22	0.38	0.980
20.0	1.18	0.42	1.020
25.0	1.14	0.46	1.060
30.0	1.09	0.51	1.110
60.0	0.95	0.65	1.250
90.0	0.84	0.76	1.360
120.0	0.77	0.83	1.430
150.0	0.69	0.91	1.510
180.0	0.62	0.98	1.580
240.0	0.58	1.02	1.620



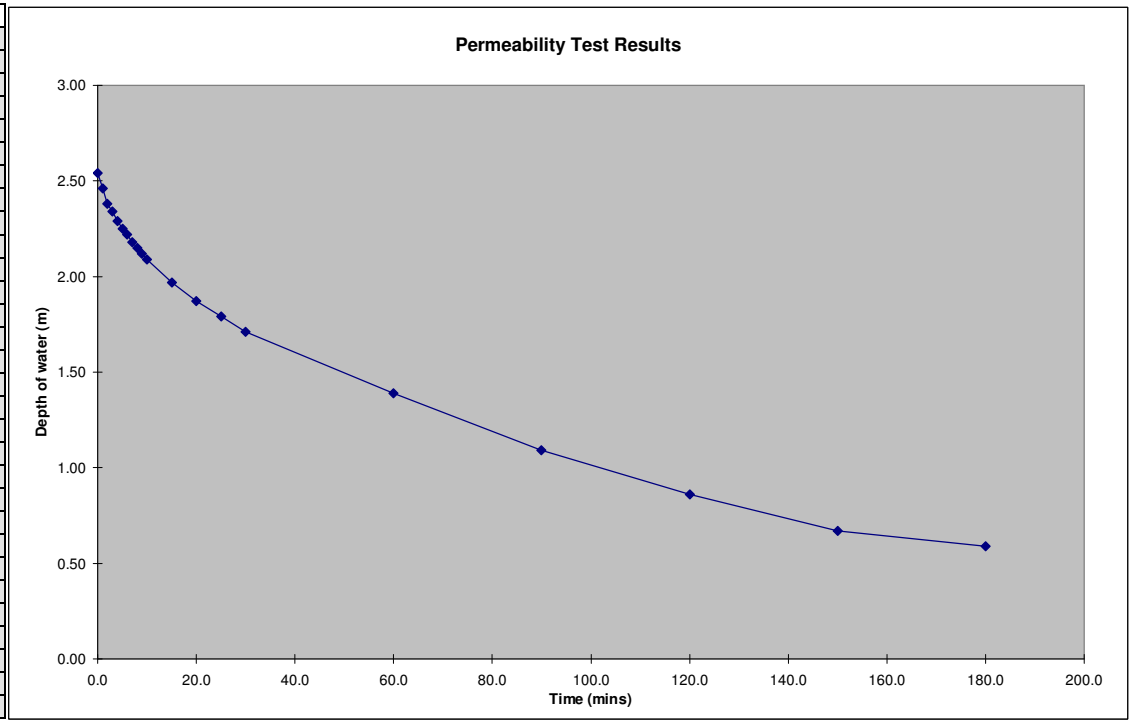
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP363B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.70
No of runs	3
Pipe upstand (m)	0.170

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.9050	1.2700	0.6350
Time (mins)	18	72	163

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.54	0.36	0.530
1.0	2.46	0.44	0.610
2.0	2.38	0.52	0.690
3.0	2.34	0.56	0.730
4.0	2.29	0.61	0.780
5.0	2.25	0.65	0.820
6.0	2.22	0.68	0.850
7.0	2.18	0.72	0.890
8.0	2.15	0.75	0.920
9.0	2.12	0.78	0.950
10.0	2.09	0.81	0.980
15.0	1.97	0.93	1.100
20.0	1.87	1.03	1.200
25.0	1.79	1.11	1.280
30.0	1.71	1.19	1.360
60.0	1.39	1.51	1.680
90.0	1.09	1.81	1.980
120.0	0.86	2.04	2.210
150.0	0.67	2.23	2.400
180.0	0.59	2.31	2.480



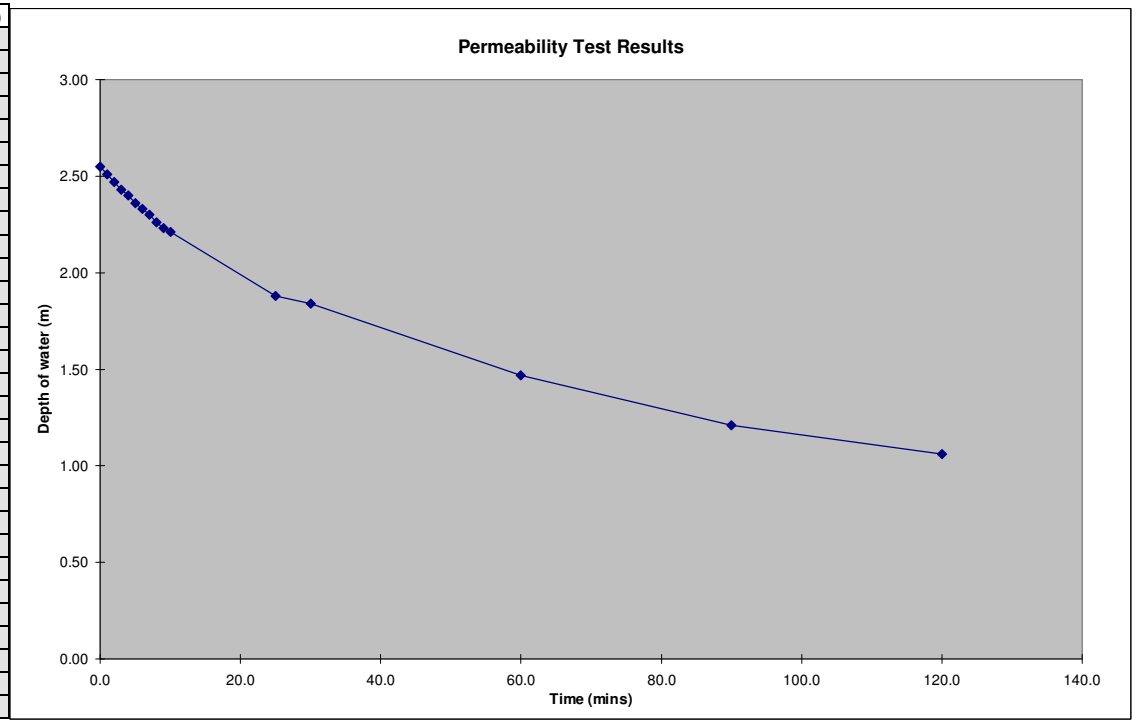
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP363B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.170

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.9125	1.2750	0.6375
Time (mins)	25	83	205

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.55	0.35	0.520
1.0	2.51	0.39	0.560
2.0	2.47	0.43	0.600
3.0	2.43	0.47	0.640
4.0	2.40	0.50	0.670
5.0	2.36	0.54	0.710
6.0	2.33	0.57	0.740
7.0	2.30	0.60	0.770
8.0	2.26	0.64	0.810
9.0	2.23	0.67	0.840
10.0	2.21	0.69	0.860
25.0	1.88	1.02	1.190
30.0	1.84	1.06	1.230
60.0	1.47	1.43	1.600
90.0	1.21	1.69	1.860
120.0	1.06	1.84	2.010



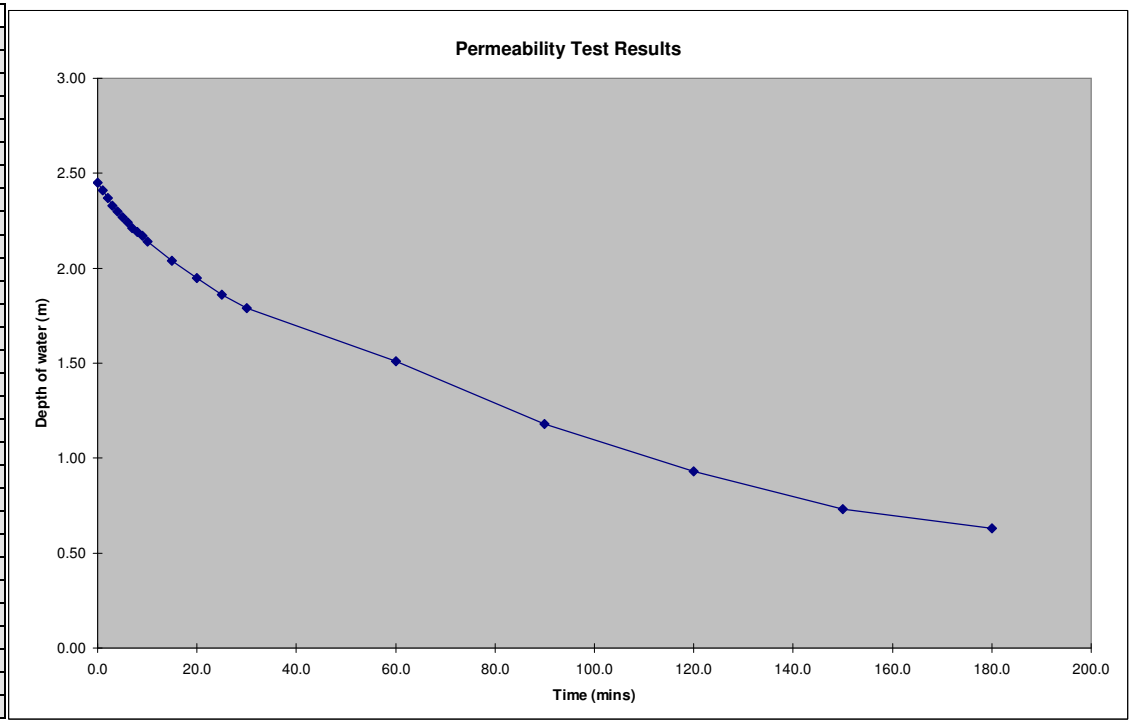
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP363B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.70
No of runs	3.00
Pipe upstand (m)	0.170

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.8375	1.2250	0.6125
Time (mins)	26.6	85.9	185.3

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.45	0.45	0.620
1.0	2.41	0.49	0.660
2.0	2.37	0.53	0.700
3.0	2.33	0.57	0.740
4.0	2.30	0.60	0.770
5.0	2.27	0.63	0.800
6.0	2.24	0.66	0.830
7.0	2.21	0.69	0.860
8.0	2.19	0.71	0.880
9.0	2.17	0.73	0.900
10.0	2.14	0.76	0.930
15.0	2.04	0.86	1.030
20.0	1.95	0.95	1.120
25.0	1.86	1.04	1.210
30.0	1.79	1.11	1.280
60.0	1.51	1.39	1.560
90.0	1.18	1.72	1.890
120.0	0.93	1.97	2.140
150.0	0.73	2.17	2.340
180.0	0.63	2.27	2.440



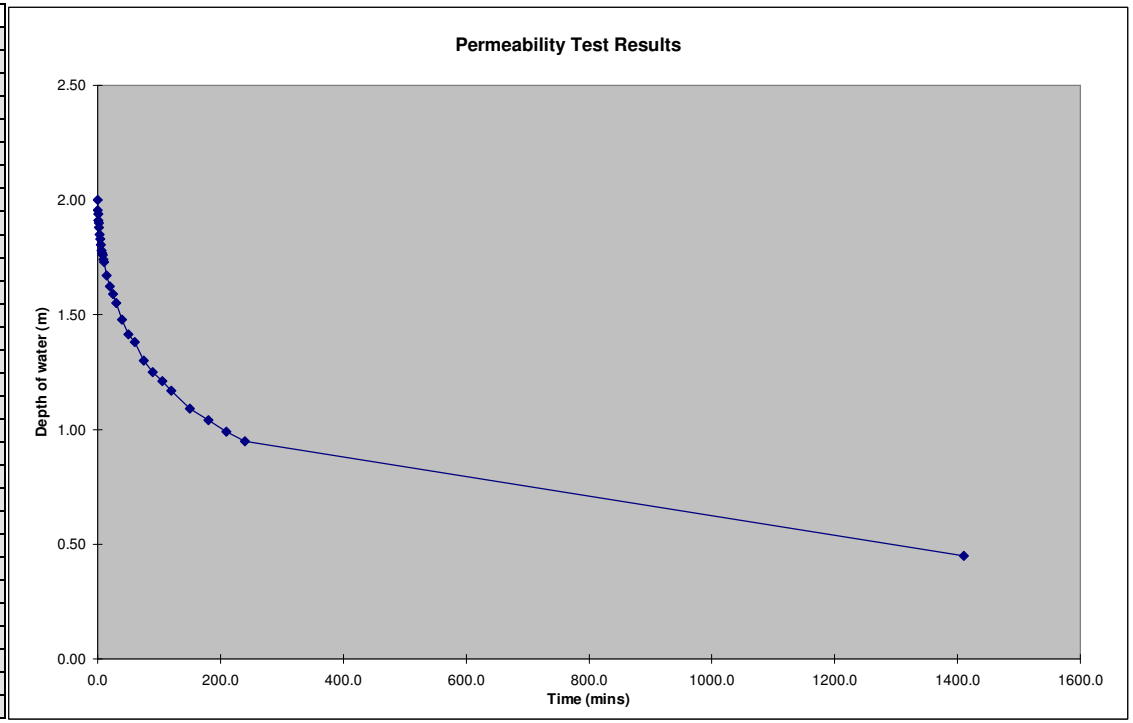
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP364
Depth of Trial Pit (m)=	2.00
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.70
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5000	1.0000	0.5000
Time (mins)	37	204	1293

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.00	0.00	0.000
0.5	1.96	0.05	0.045
1.0	1.94	0.06	0.060
1.5	1.91	0.09	0.090
2.0	1.90	0.10	0.100
2.5	1.88	0.12	0.120
3.0	1.85	0.15	0.150
4.0	1.83	0.17	0.170
5.0	1.81	0.20	0.195
6.0	1.78	0.22	0.220
7.0	1.77	0.23	0.230
8.0	1.76	0.24	0.240
9.0	1.74	0.26	0.260
10.0	1.73	0.27	0.270
15.0	1.67	0.33	0.330
20.0	1.63	0.38	0.375
25.0	1.59	0.41	0.410
30.0	1.55	0.45	0.450
40.0	1.48	0.52	0.520
50.0	1.42	0.59	0.585
60.0	1.38	0.62	0.620
75.0	1.30	0.70	0.700
90.0	1.25	0.75	0.750
105.0	1.21	0.79	0.790
120.0	1.17	0.83	0.830
150.0	1.09	0.91	0.910
180.0	1.04	0.96	0.960
210.0	0.99	1.01	1.010
240.0	0.95	1.05	1.050
1410.0	0.45	1.55	1.550



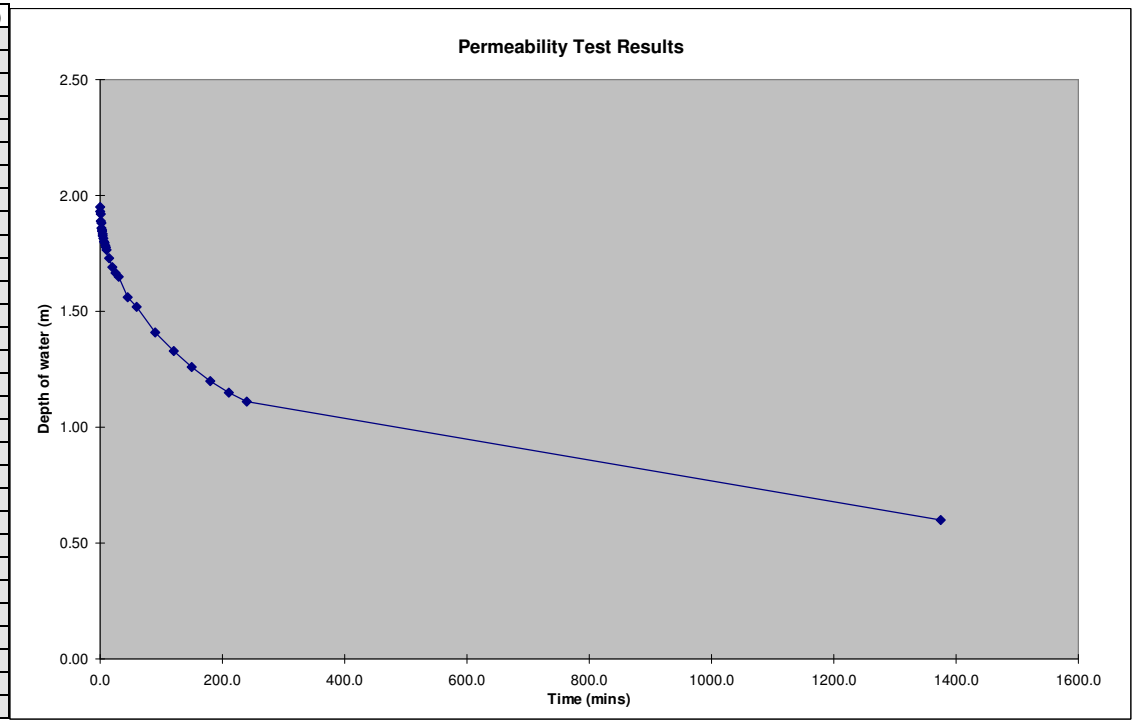
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP364
Depth of Trial Pit (m)=	2.00
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.70
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.4625	0.9750	0.4875
Time (mins)	76	540	1625

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.95	0.05	0.050
0.5	1.93	0.07	0.070
1.0	1.92	0.08	0.080
1.5	1.89	0.11	0.110
2.0	1.88	0.12	0.120
2.5	1.86	0.14	0.140
3.0	1.85	0.15	0.150
3.5	1.85	0.16	0.155
4.0	1.84	0.17	0.165
4.5	1.83	0.18	0.175
5.0	1.82	0.19	0.185
6.0	1.80	0.20	0.200
7.0	1.80	0.21	0.205
8.0	1.79	0.22	0.215
9.0	1.78	0.23	0.225
10.0	1.77	0.24	0.235
15.0	1.73	0.27	0.270
20.0	1.69	0.31	0.310
25.0	1.67	0.34	0.335
30.0	1.65	0.35	0.350
45.0	1.56	0.44	0.440
60.0	1.52	0.48	0.480
90.0	1.41	0.59	0.590
120.0	1.33	0.67	0.670
150.0	1.26	0.74	0.740
180.0	1.20	0.80	0.800
210.0	1.15	0.85	0.850
240.0	1.11	0.89	0.890
1375.0	0.60	1.40	1.400



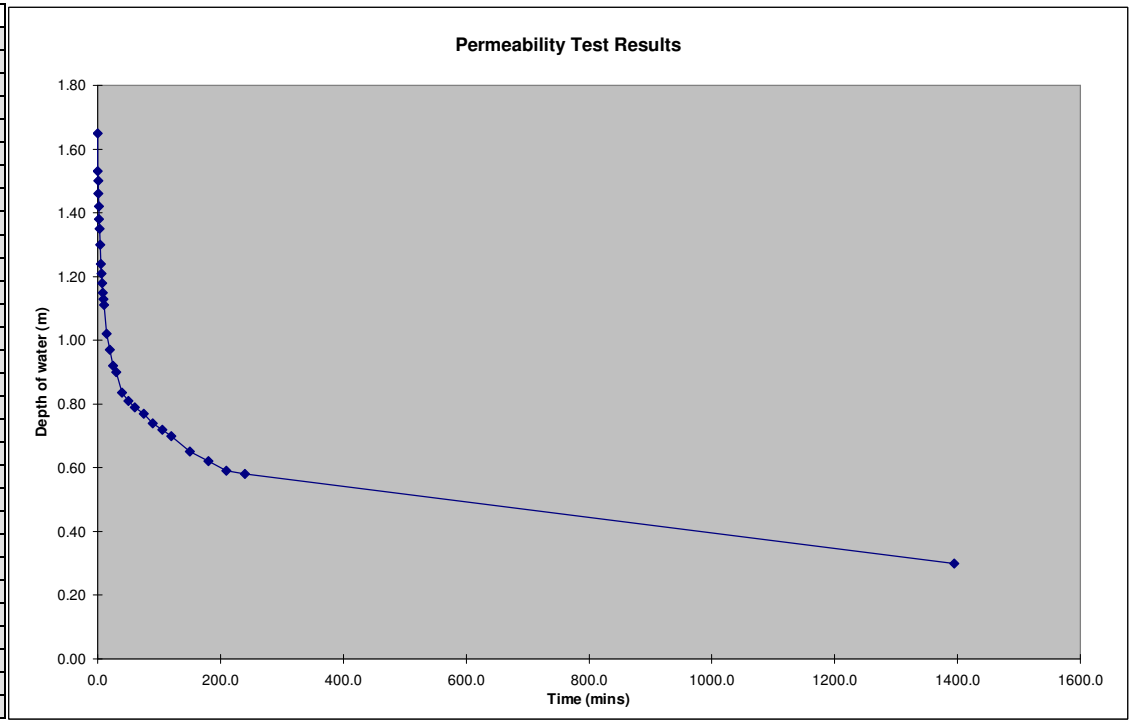
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP365
Depth of Trial Pit (m)=	2.00
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.70
No of runs	2
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2375	0.8250	0.4125
Time (mins)	5	44	931

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.65	0.35	0.350
0.5	1.53	0.47	0.470
1.0	1.50	0.50	0.500
1.5	1.46	0.54	0.540
2.0	1.42	0.58	0.580
2.5	1.38	0.62	0.620
3.0	1.35	0.65	0.650
4.0	1.30	0.70	0.700
5.0	1.24	0.76	0.760
6.0	1.21	0.79	0.790
7.0	1.18	0.82	0.820
8.0	1.15	0.85	0.850
9.0	1.13	0.87	0.870
10.0	1.11	0.89	0.890
15.0	1.02	0.98	0.980
20.0	0.97	1.03	1.030
25.0	0.92	1.08	1.080
30.0	0.90	1.10	1.100
40.0	0.84	1.17	1.165
50.0	0.81	1.19	1.190
60.0	0.79	1.21	1.210
75.0	0.77	1.23	1.230
90.0	0.74	1.26	1.260
105.0	0.72	1.28	1.280
120.0	0.70	1.30	1.300
150.0	0.65	1.35	1.350
180.0	0.62	1.38	1.380
210.0	0.59	1.41	1.410
240.0	0.58	1.42	1.420
1395.0	0.30	1.70	1.700



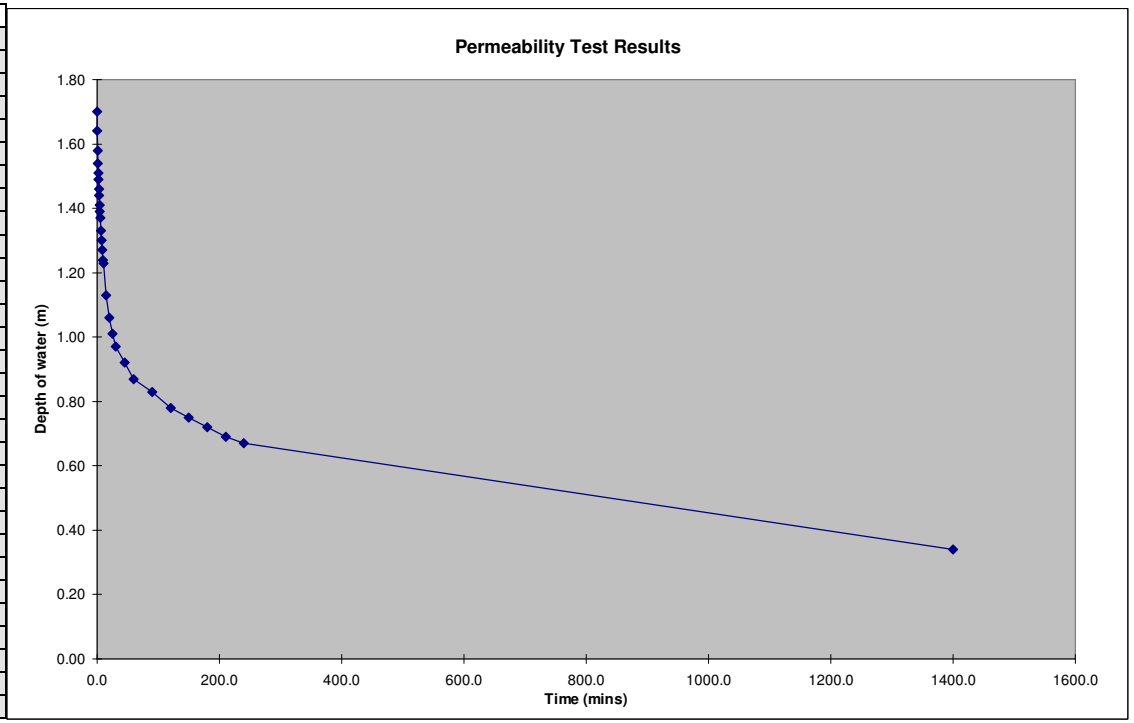
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP365
Depth of Trial Pit (m)=	2.00
Length of Trial Pit (m)=	1.40
Breadth of Trial Pit (m)=	0.70
No of runs	2.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2750	0.8500	0.4250
Time (mins)	8	75	1101

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.70	0.30	0.300
0.5	1.64	0.36	0.360
1.0	1.58	0.42	0.420
1.5	1.54	0.46	0.460
2.0	1.51	0.49	0.490
2.5	1.49	0.51	0.510
3.0	1.46	0.54	0.540
3.5	1.44	0.56	0.560
4.0	1.41	0.59	0.590
4.5	1.39	0.61	0.610
5.0	1.37	0.63	0.630
6.0	1.33	0.67	0.670
7.0	1.30	0.70	0.700
8.0	1.27	0.73	0.730
9.0	1.24	0.76	0.760
10.0	1.23	0.77	0.770
15.0	1.13	0.87	0.870
20.0	1.06	0.94	0.940
25.0	1.01	0.99	0.990
30.0	0.97	1.03	1.030
45.0	0.92	1.08	1.080
60.0	0.87	1.13	1.130
90.0	0.83	1.17	1.170
120.0	0.78	1.22	1.220
150.0	0.75	1.25	1.250
180.0	0.72	1.28	1.280
210.0	0.69	1.31	1.310
240.0	0.67	1.33	1.330
1400.0	0.34	1.66	1.660



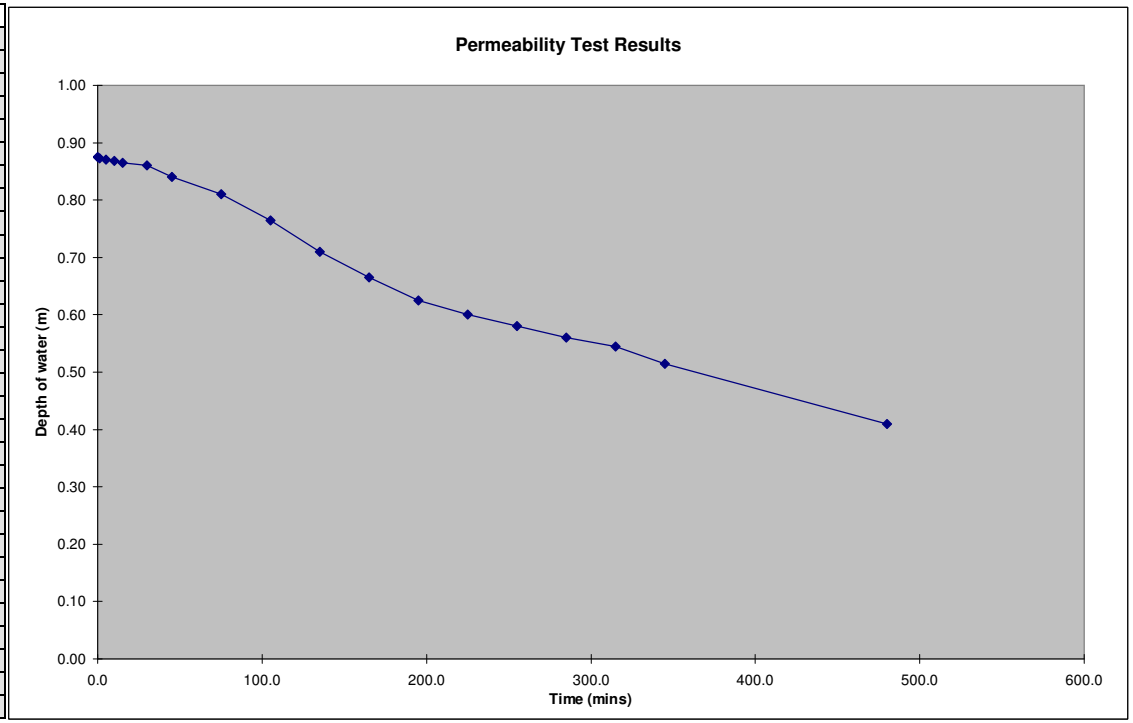
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP366A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.45
No of runs	3
Pipe upstand (m)	0.760

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6563	0.4375	0.2188
Time (mins)	172	423	726

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.88	0.63	1.385
1.0	0.87	0.63	1.387
5.0	0.87	0.63	1.390
10.0	0.87	0.63	1.392
15.0	0.87	0.64	1.395
30.0	0.86	0.64	1.400
45.0	0.84	0.66	1.420
75.0	0.81	0.69	1.450
105.0	0.77	0.74	1.495
135.0	0.71	0.79	1.550
165.0	0.67	0.84	1.595
195.0	0.63	0.88	1.635
225.0	0.60	0.90	1.660
255.0	0.58	0.92	1.680
285.0	0.56	0.94	1.700
315.0	0.55	0.96	1.715
345.0	0.52	0.99	1.745
480.0	0.41	1.09	1.850



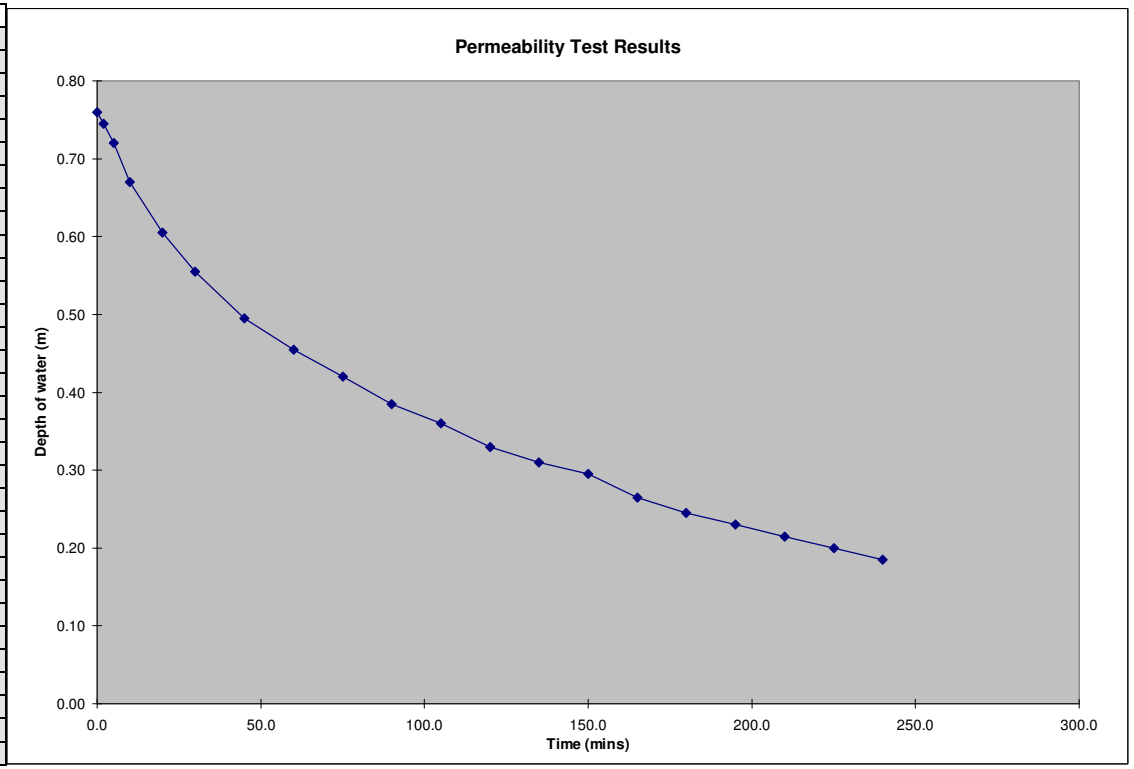
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP366A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.760

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5700	0.3800	0.1900
Time (mins)	27	93	235

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.76	0.74	1.500
2.0	0.75	0.76	1.515
5.0	0.72	0.78	1.540
10.0	0.67	0.83	1.590
20.0	0.61	0.90	1.655
30.0	0.56	0.95	1.705
45.0	0.50	1.01	1.765
60.0	0.46	1.05	1.805
75.0	0.42	1.08	1.840
90.0	0.39	1.12	1.875
105.0	0.36	1.14	1.900
120.0	0.33	1.17	1.930
135.0	0.31	1.19	1.950
150.0	0.30	1.21	1.965
165.0	0.27	1.24	1.995
180.0	0.25	1.26	2.015
195.0	0.23	1.27	2.030
210.0	0.22	1.29	2.045
225.0	0.20	1.30	2.060
240.0	0.19	1.32	2.075



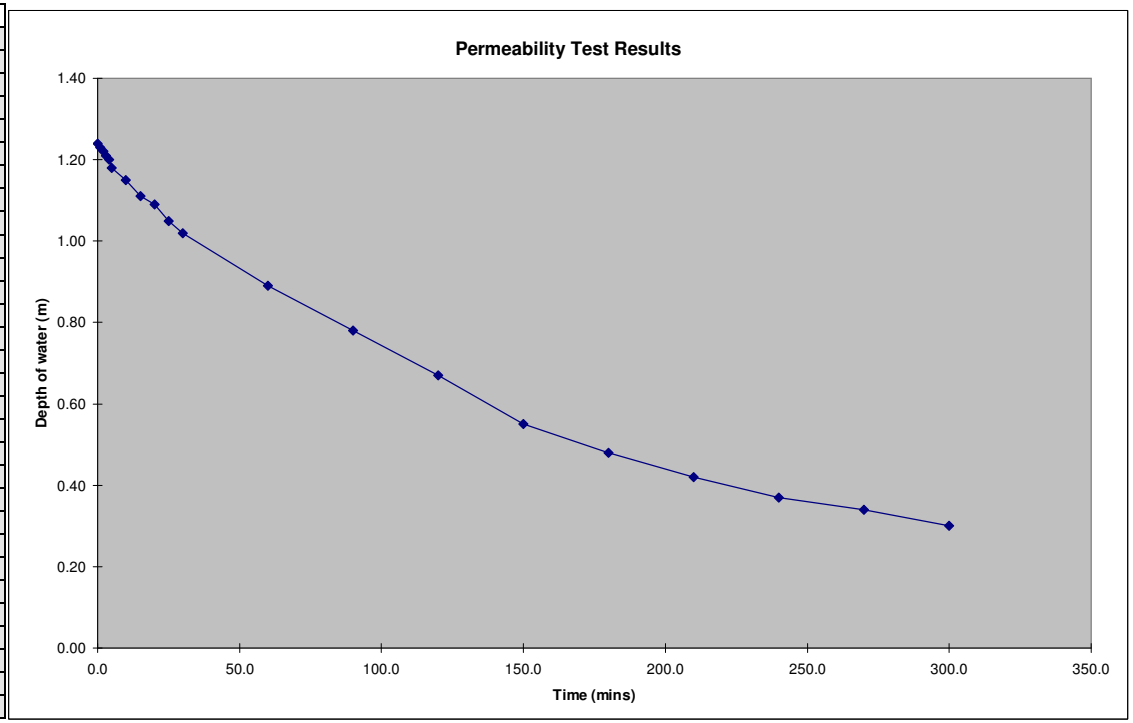
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP366A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.760

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9300	0.6200	0.3100
Time (mins)	50.8	132.5	292.5

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.24	0.26	1.020
1.0	1.23	0.27	1.030
2.0	1.22	0.28	1.040
3.0	1.21	0.29	1.050
4.0	1.20	0.30	1.060
5.0	1.18	0.32	1.080
10.0	1.15	0.35	1.110
15.0	1.11	0.39	1.150
20.0	1.09	0.41	1.170
25.0	1.05	0.45	1.210
30.0	1.02	0.48	1.240
60.0	0.89	0.61	1.370
90.0	0.78	0.72	1.480
120.0	0.67	0.83	1.590
150.0	0.55	0.95	1.710
180.0	0.48	1.02	1.780
210.0	0.42	1.08	1.840
240.0	0.37	1.13	1.890
270.0	0.34	1.16	1.920
300.0	0.30	1.20	1.960



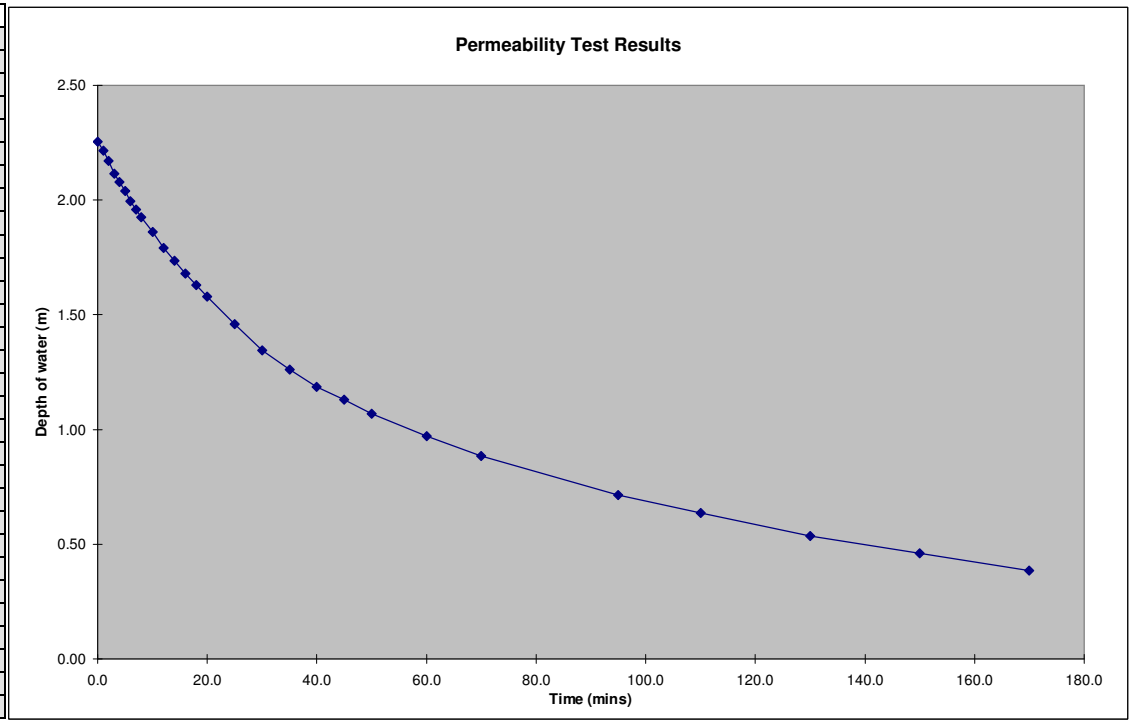
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP366B
Depth of Trial Pit (m)=	2.85
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.45
No of runs	3
Pipe upstand (m)	0.455

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6913	1.1275	0.5638
Time (mins)	16	45	124

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.26	0.60	1.050
1.0	2.22	0.64	1.090
2.0	2.17	0.68	1.135
3.0	2.12	0.74	1.190
4.0	2.08	0.77	1.225
5.0	2.04	0.81	1.265
6.0	2.00	0.86	1.310
7.0	1.96	0.89	1.345
8.0	1.93	0.93	1.380
10.0	1.86	0.99	1.445
12.0	1.79	1.06	1.515
14.0	1.74	1.12	1.570
16.0	1.68	1.17	1.625
18.0	1.63	1.22	1.675
20.0	1.58	1.27	1.725
25.0	1.46	1.39	1.845
30.0	1.35	1.51	1.960
35.0	1.26	1.59	2.045
40.0	1.19	1.67	2.120
45.0	1.13	1.72	2.175
50.0	1.07	1.78	2.235
60.0	0.97	1.88	2.335
70.0	0.89	1.97	2.420
95.0	0.72	2.14	2.590
110.0	0.64	2.22	2.670
130.0	0.54	2.32	2.770
150.0	0.46	2.39	2.845
170.0	0.39	2.47	2.920



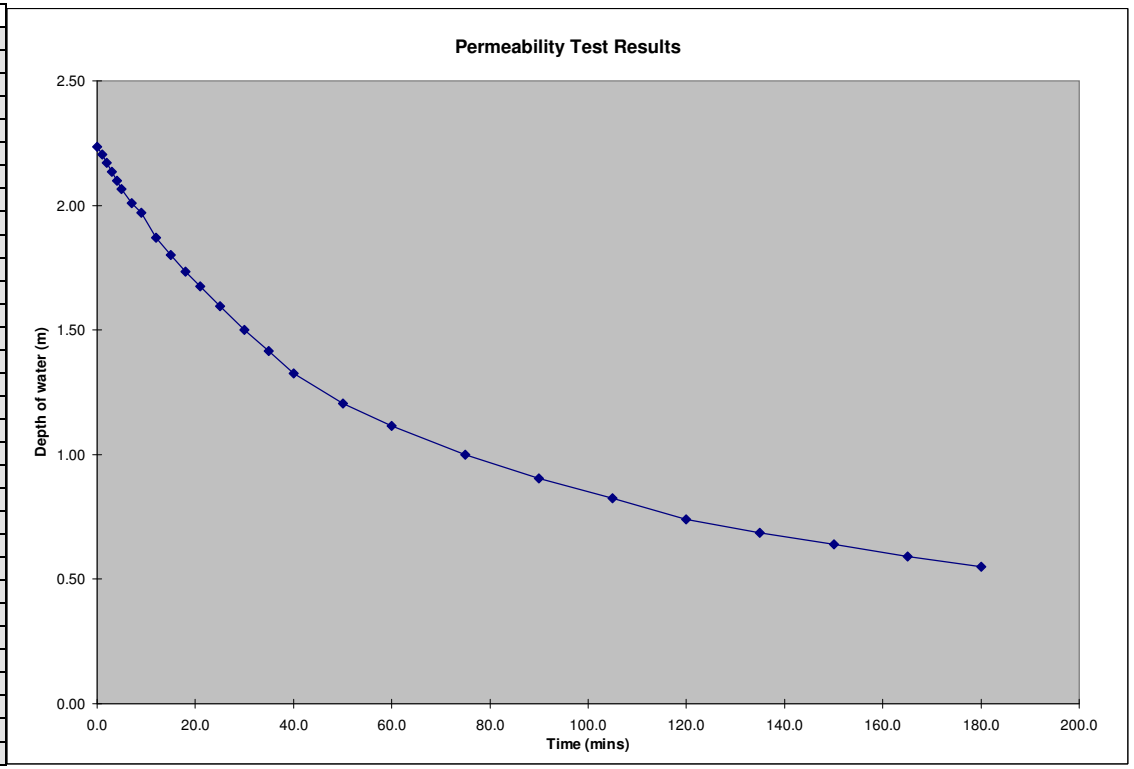
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP366B
Depth of Trial Pit (m)=	2.85
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.455

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6763	1.1175	0.5588
Time (mins)	21	60	177

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.24	0.62	1.070
1.0	2.21	0.65	1.100
2.0	2.17	0.68	1.135
3.0	2.14	0.72	1.170
4.0	2.10	0.75	1.205
5.0	2.07	0.79	1.240
7.0	2.01	0.84	1.295
9.0	1.97	0.88	1.335
12.0	1.87	0.98	1.435
15.0	1.80	1.05	1.505
18.0	1.74	1.12	1.570
21.0	1.68	1.18	1.630
25.0	1.60	1.26	1.710
30.0	1.50	1.35	1.805
35.0	1.42	1.44	1.890
40.0	1.33	1.53	1.980
50.0	1.21	1.65	2.100
60.0	1.12	1.74	2.190
75.0	1.00	1.85	2.305
90.0	0.91	1.95	2.400
105.0	0.83	2.03	2.480
120.0	0.74	2.11	2.565
135.0	0.69	2.17	2.620
150.0	0.64	2.21	2.665
165.0	0.59	2.26	2.715
180.0	0.55	2.30	2.755



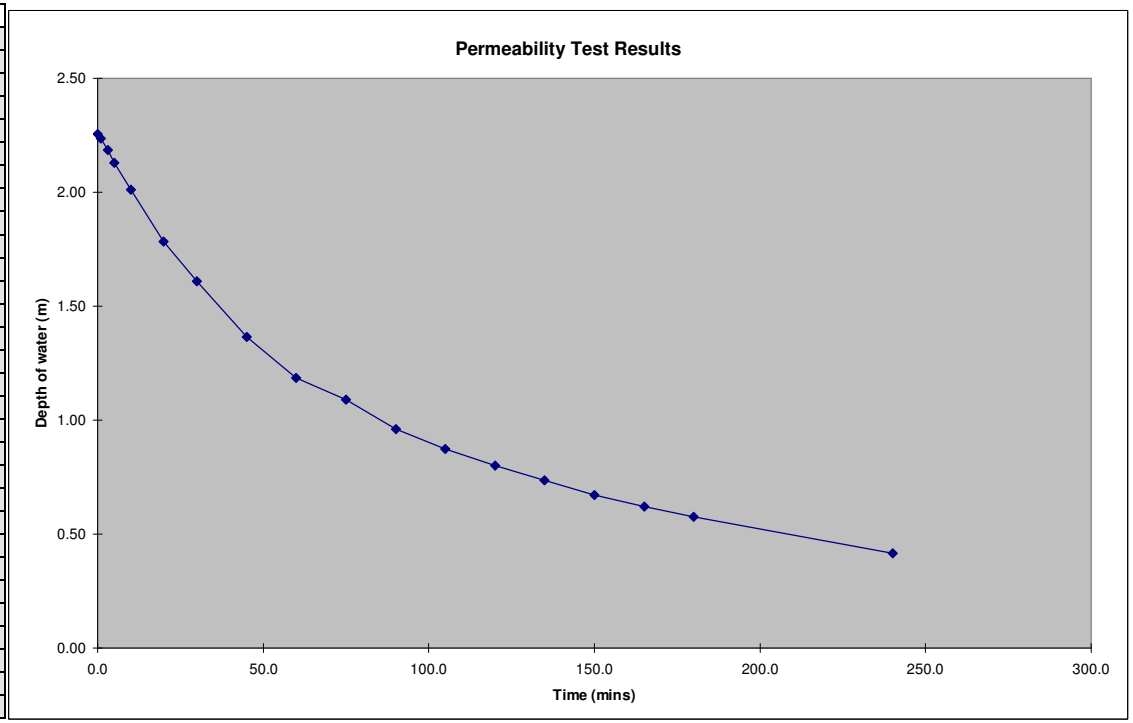
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP366B
Depth of Trial Pit (m)=	2.85
Length of Trial Pit (m)=	1.75
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.455

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6913	1.1275	0.5638
Time (mins)	25.4	69.1	184.2

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.26	0.60	1.050
1.0	2.24	0.62	1.070
3.0	2.19	0.67	1.120
5.0	2.13	0.72	1.175
10.0	2.01	0.84	1.295
20.0	1.79	1.07	1.520
30.0	1.61	1.24	1.695
45.0	1.37	1.49	1.940
60.0	1.19	1.67	2.120
75.0	1.09	1.76	2.215
90.0	0.96	1.89	2.345
105.0	0.88	1.98	2.430
120.0	0.80	2.05	2.505
135.0	0.74	2.12	2.570
150.0	0.67	2.18	2.635
165.0	0.62	2.23	2.685
180.0	0.58	2.28	2.730
240.0	0.42	2.44	2.890



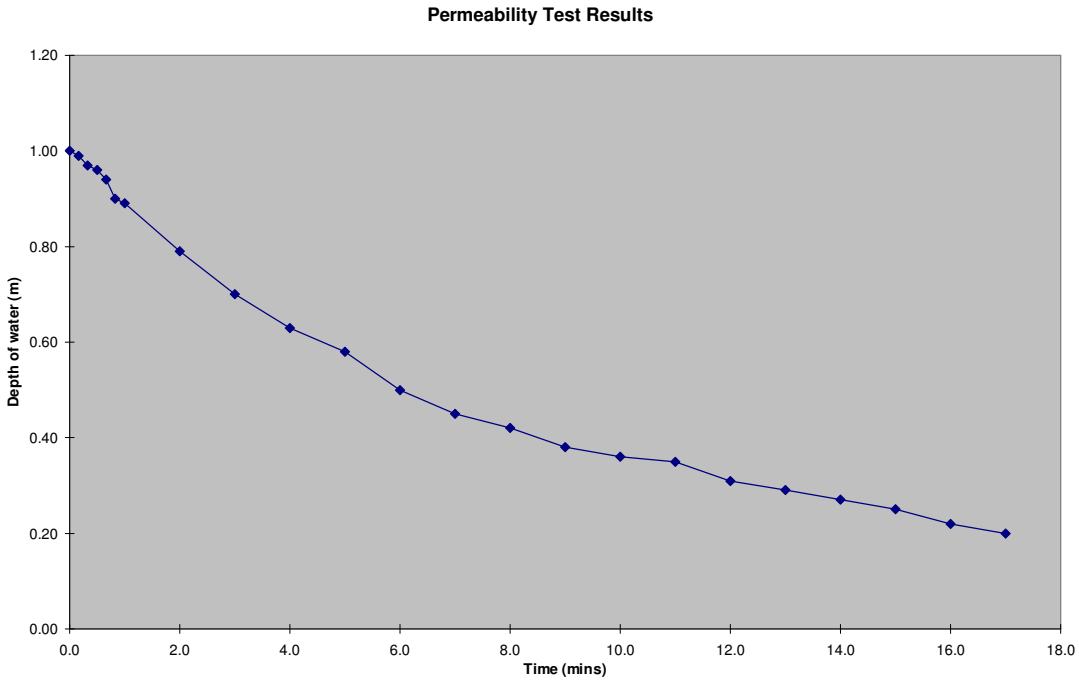
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP374A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.30
Breadth of Trial Pit (m)=	0.45
No of runs	3
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7500	0.5000	0.2500
Time (mins)	2	6	15

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.00	0.50	0.500
0.2	0.99	0.51	0.510
0.3	0.97	0.53	0.530
0.5	0.96	0.54	0.540
0.7	0.94	0.56	0.560
0.8	0.90	0.60	0.600
1.0	0.89	0.61	0.610
2.0	0.79	0.71	0.710
3.0	0.70	0.80	0.800
4.0	0.63	0.87	0.870
5.0	0.58	0.92	0.920
6.0	0.50	1.00	1.000
7.0	0.45	1.05	1.050
8.0	0.42	1.08	1.080
9.0	0.38	1.12	1.120
10.0	0.36	1.14	1.140
11.0	0.35	1.15	1.150
12.0	0.31	1.19	1.190
13.0	0.29	1.21	1.210
14.0	0.27	1.23	1.230
15.0	0.25	1.25	1.250
16.0	0.22	1.28	1.280
17.0	0.20	1.30	1.300



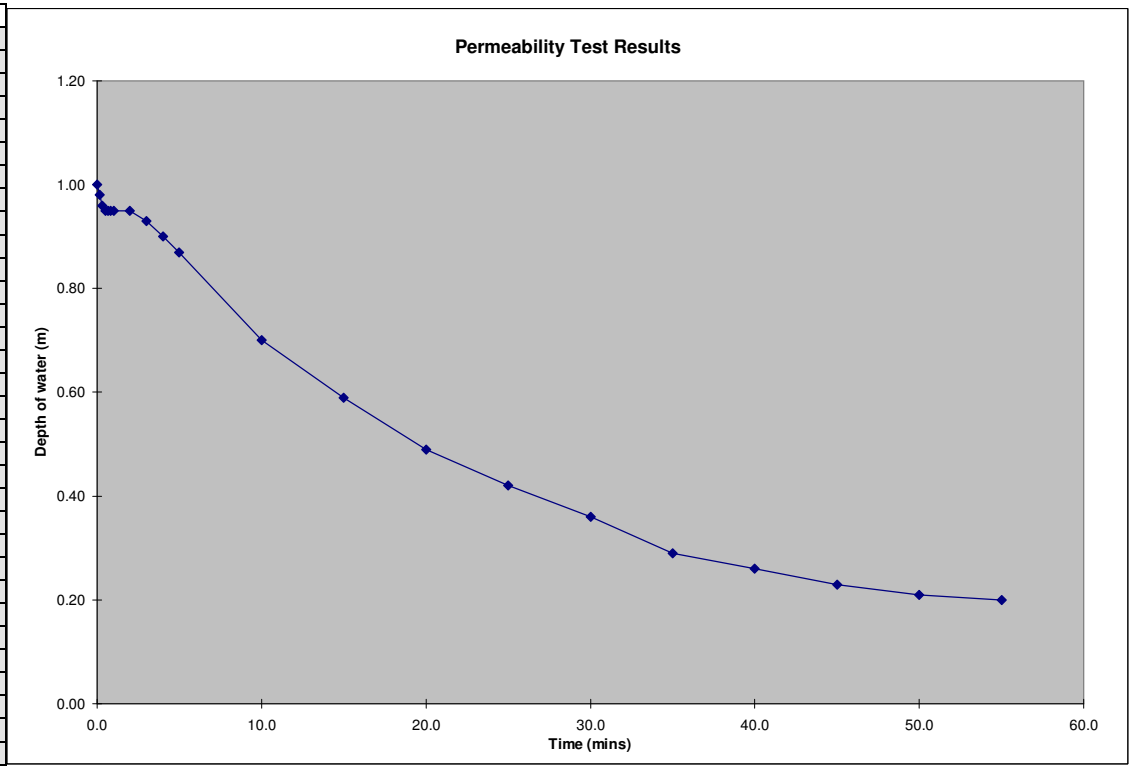
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP374A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.30
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7500	0.5000	0.2500
Time (mins)	9	20	42

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.00	0.50	0.500
0.2	0.98	0.52	0.520
0.3	0.96	0.54	0.540
0.5	0.95	0.55	0.550
0.7	0.95	0.55	0.550
0.8	0.95	0.55	0.550
1.0	0.95	0.55	0.550
2.0	0.95	0.55	0.550
3.0	0.93	0.57	0.570
4.0	0.90	0.60	0.600
5.0	0.87	0.63	0.630
10.0	0.70	0.80	0.800
15.0	0.59	0.91	0.910
20.0	0.49	1.01	1.010
25.0	0.42	1.08	1.080
30.0	0.36	1.14	1.140
35.0	0.29	1.21	1.210
40.0	0.26	1.24	1.240
45.0	0.23	1.27	1.270
50.0	0.21	1.29	1.290
55.0	0.20	1.30	1.300



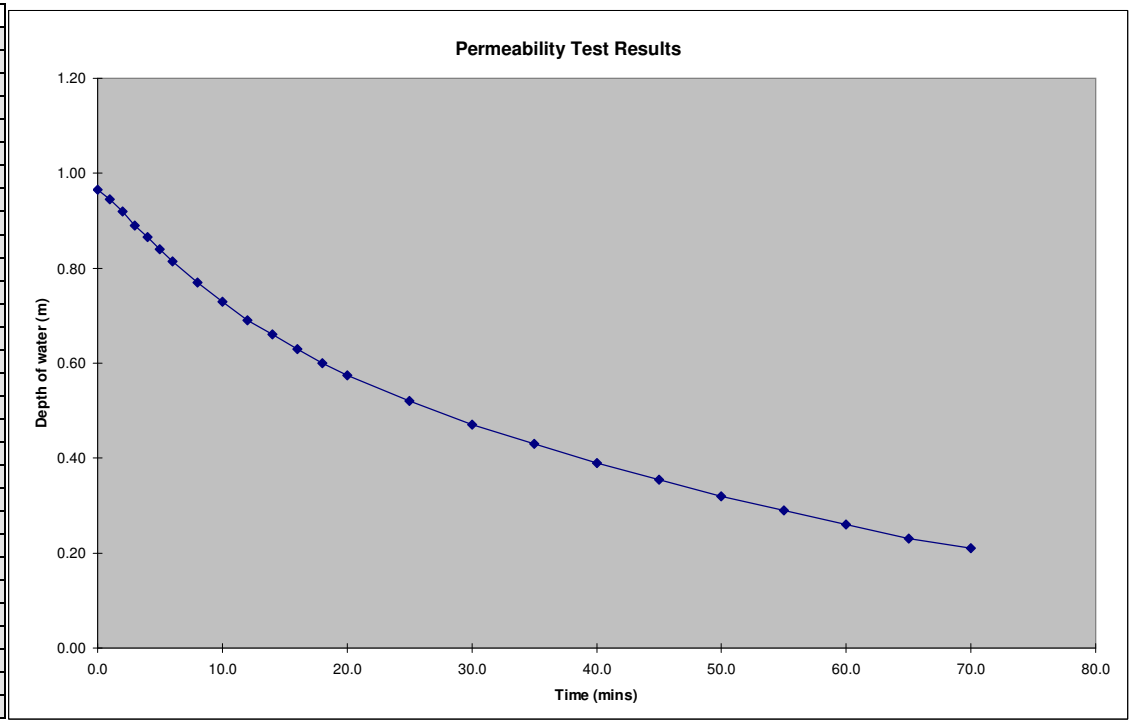
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP374A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	2.30
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.000

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7238	0.4825	0.2413
Time (mins)	10.3	28.8	63.1

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.97	0.54	0.535
1.0	0.95	0.56	0.555
2.0	0.92	0.58	0.580
3.0	0.89	0.61	0.610
4.0	0.87	0.64	0.635
5.0	0.84	0.66	0.660
6.0	0.82	0.69	0.685
8.0	0.77	0.73	0.730
10.0	0.73	0.77	0.770
12.0	0.69	0.81	0.810
14.0	0.66	0.84	0.840
16.0	0.63	0.87	0.870
18.0	0.60	0.90	0.900
20.0	0.58	0.93	0.925
25.0	0.52	0.98	0.980
30.0	0.47	1.03	1.030
35.0	0.43	1.07	1.070
40.0	0.39	1.11	1.110
45.0	0.36	1.15	1.145
50.0	0.32	1.18	1.180
55.0	0.29	1.21	1.210
60.0	0.26	1.24	1.240
65.0	0.23	1.27	1.270
70.0	0.21	1.29	1.290



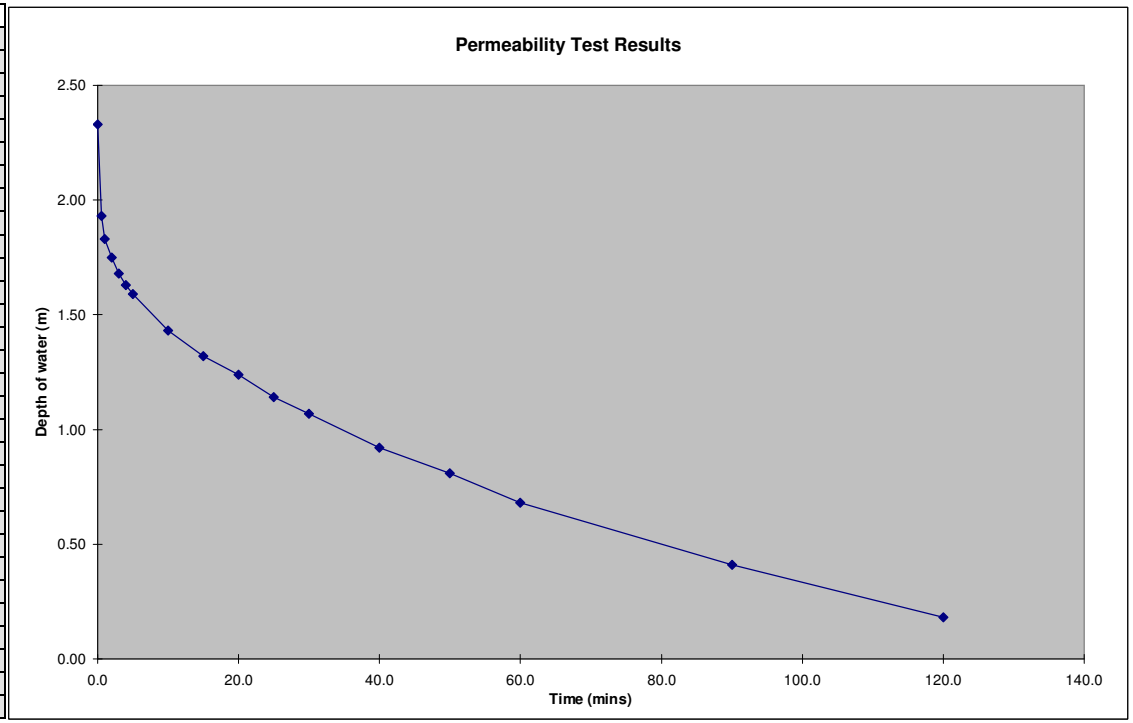
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP374B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	3
Pipe upstand (m)	0.430

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7475	1.1650	0.5825
Time (mins)	2	24	71

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.33	0.57	1.000
0.5	1.93	0.97	1.400
1.0	1.83	1.07	1.500
2.0	1.75	1.15	1.580
3.0	1.68	1.22	1.650
4.0	1.63	1.27	1.700
5.0	1.59	1.31	1.740
10.0	1.43	1.47	1.900
15.0	1.32	1.58	2.010
20.0	1.24	1.66	2.090
25.0	1.14	1.76	2.190
30.0	1.07	1.83	2.260
40.0	0.92	1.98	2.410
50.0	0.81	2.09	2.520
60.0	0.68	2.22	2.650
90.0	0.41	2.49	2.920
120.0	0.18	2.72	3.150



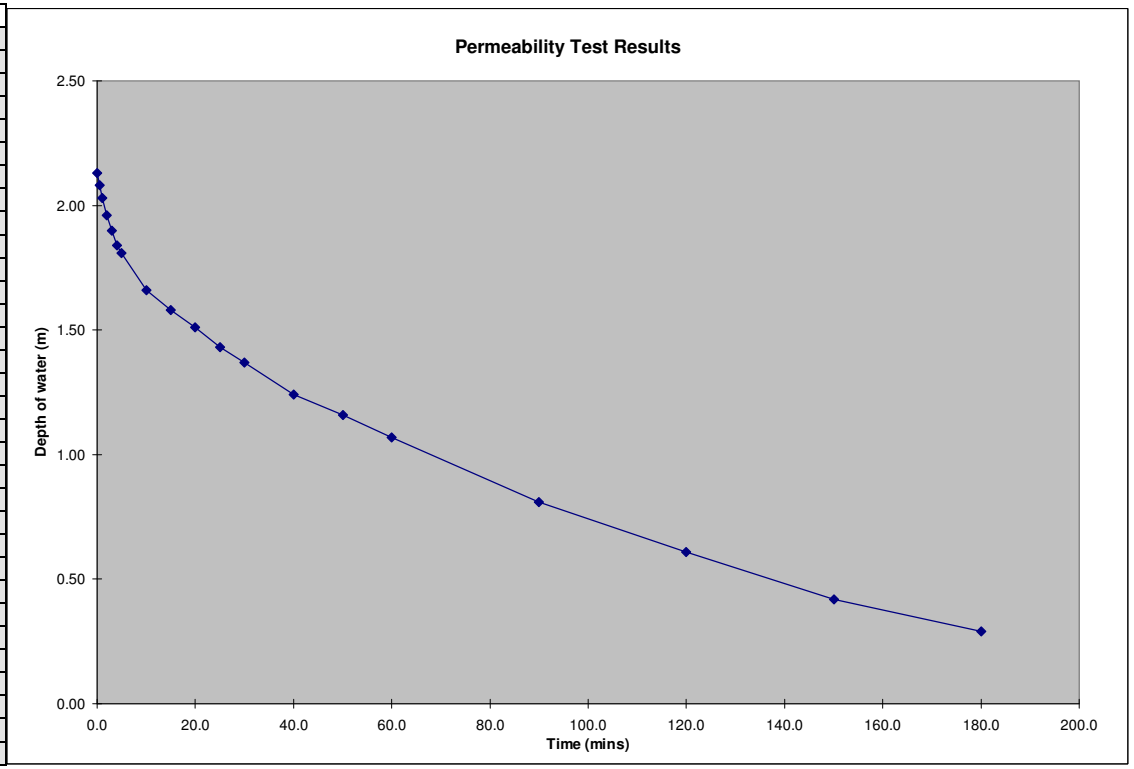
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP374B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.430

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5975	1.0650	0.5325
Time (mins)	14	61	132

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.13	0.77	1.200
0.5	2.08	0.82	1.250
1.0	2.03	0.87	1.300
2.0	1.96	0.94	1.370
3.0	1.90	1.00	1.430
4.0	1.84	1.06	1.490
5.0	1.81	1.09	1.520
10.0	1.66	1.24	1.670
15.0	1.58	1.32	1.750
20.0	1.51	1.39	1.820
25.0	1.43	1.47	1.900
30.0	1.37	1.53	1.960
40.0	1.24	1.66	2.090
50.0	1.16	1.74	2.170
60.0	1.07	1.83	2.260
90.0	0.81	2.09	2.520
120.0	0.61	2.29	2.720
150.0	0.42	2.48	2.910
180.0	0.29	2.61	3.040



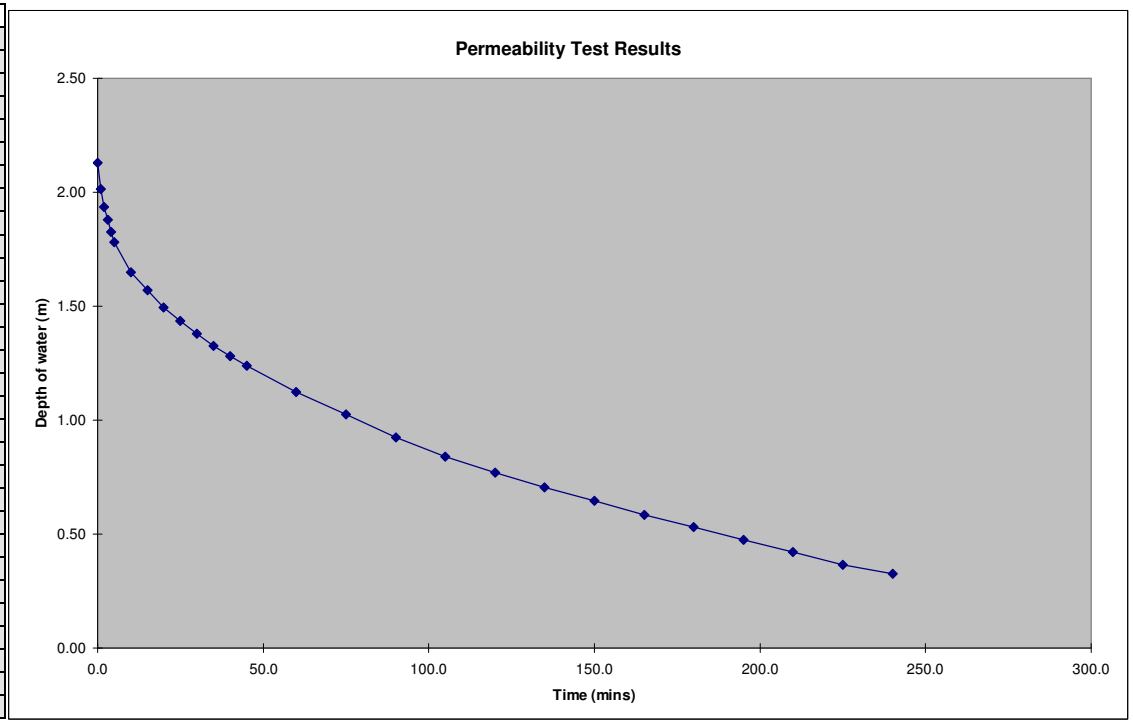
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP374B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.430

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.5975	1.0650	0.5325
Time (mins)	13.3	69.0	179.3

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.13	0.77	1.200
1.0	2.02	0.89	1.315
2.0	1.94	0.97	1.395
3.0	1.88	1.02	1.450
4.0	1.83	1.08	1.505
5.0	1.78	1.12	1.550
10.0	1.65	1.25	1.680
15.0	1.57	1.33	1.760
20.0	1.50	1.41	1.835
25.0	1.44	1.47	1.895
30.0	1.38	1.52	1.950
35.0	1.33	1.58	2.005
40.0	1.28	1.62	2.050
45.0	1.24	1.66	2.090
60.0	1.13	1.78	2.205
75.0	1.03	1.88	2.305
90.0	0.93	1.98	2.405
105.0	0.84	2.06	2.490
120.0	0.77	2.13	2.560
135.0	0.71	2.20	2.625
150.0	0.65	2.26	2.685
165.0	0.59	2.32	2.745
180.0	0.53	2.37	2.800
195.0	0.48	2.43	2.855
210.0	0.42	2.48	2.910
225.0	0.37	2.54	2.965
240.0	0.33	2.58	3.005



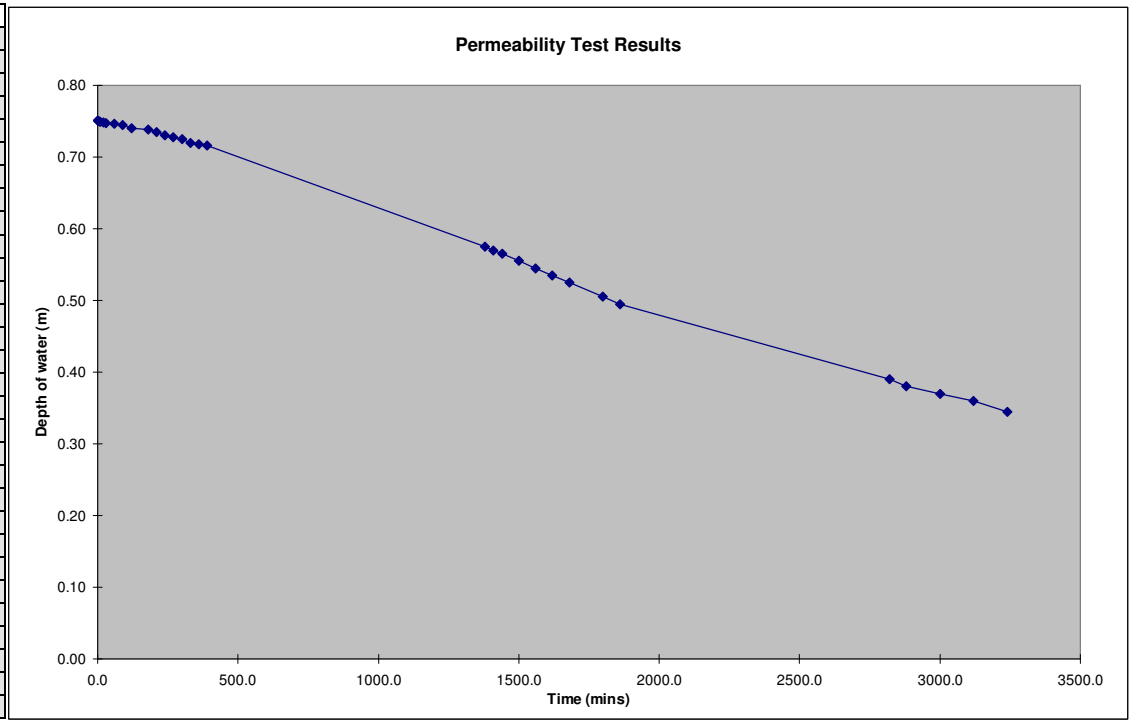
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP375A
Depth of Trial Pit (m)=	1.51
Length of Trial Pit (m)=	2.15
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.765

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5633	0.3755	0.1878
Time (mins)	1451	2950	4876

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.75	0.75	1.519
5.0	0.75	0.76	1.520
10.0	0.75	0.76	1.521
20.0	0.75	0.76	1.522
30.0	0.75	0.76	1.523
60.0	0.75	0.76	1.524
90.0	0.75	0.76	1.525
120.0	0.74	0.77	1.530
180.0	0.74	0.77	1.532
210.0	0.74	0.77	1.535
240.0	0.73	0.78	1.540
270.0	0.73	0.78	1.542
300.0	0.73	0.78	1.545
330.0	0.72	0.79	1.550
360.0	0.72	0.79	1.552
390.0	0.72	0.79	1.554
1380.0	0.58	0.93	1.695
1410.0	0.57	0.94	1.700
1440.0	0.57	0.94	1.705
1500.0	0.56	0.95	1.715
1560.0	0.55	0.96	1.725
1620.0	0.54	0.97	1.735
1680.0	0.53	0.98	1.745
1800.0	0.51	1.00	1.765
1860.0	0.50	1.01	1.775
2820.0	0.39	1.12	1.880
2880.0	0.38	1.13	1.890
3000.0	0.37	1.14	1.900
3120.0	0.36	1.15	1.910
3240.0	0.35	1.16	1.925



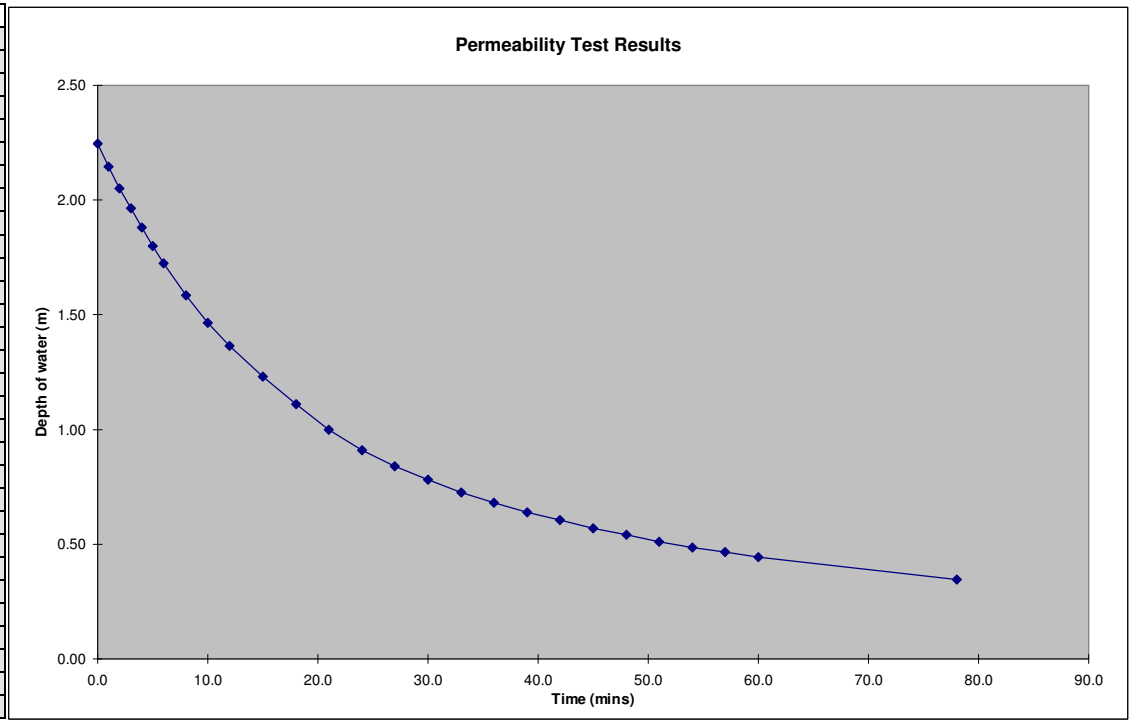
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP375B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	3
Pipe upstand (m)	0.450

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6838	1.1225	0.5613
Time (mins)	7	18	46

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.25	0.66	1.105
1.0	2.15	0.76	1.205
2.0	2.05	0.85	1.300
3.0	1.97	0.94	1.385
4.0	1.88	1.02	1.470
5.0	1.80	1.10	1.550
6.0	1.73	1.18	1.625
8.0	1.59	1.32	1.765
10.0	1.47	1.44	1.885
12.0	1.37	1.54	1.985
15.0	1.23	1.67	2.120
18.0	1.11	1.79	2.240
21.0	1.00	1.90	2.350
24.0	0.91	1.99	2.440
27.0	0.84	2.06	2.510
30.0	0.78	2.12	2.570
33.0	0.73	2.18	2.625
36.0	0.68	2.22	2.670
39.0	0.64	2.26	2.710
42.0	0.61	2.30	2.745
45.0	0.57	2.33	2.780
48.0	0.54	2.36	2.810
51.0	0.51	2.39	2.840
54.0	0.49	2.42	2.865
57.0	0.47	2.44	2.885
60.0	0.45	2.46	2.905
78.0	0.35	2.56	3.005



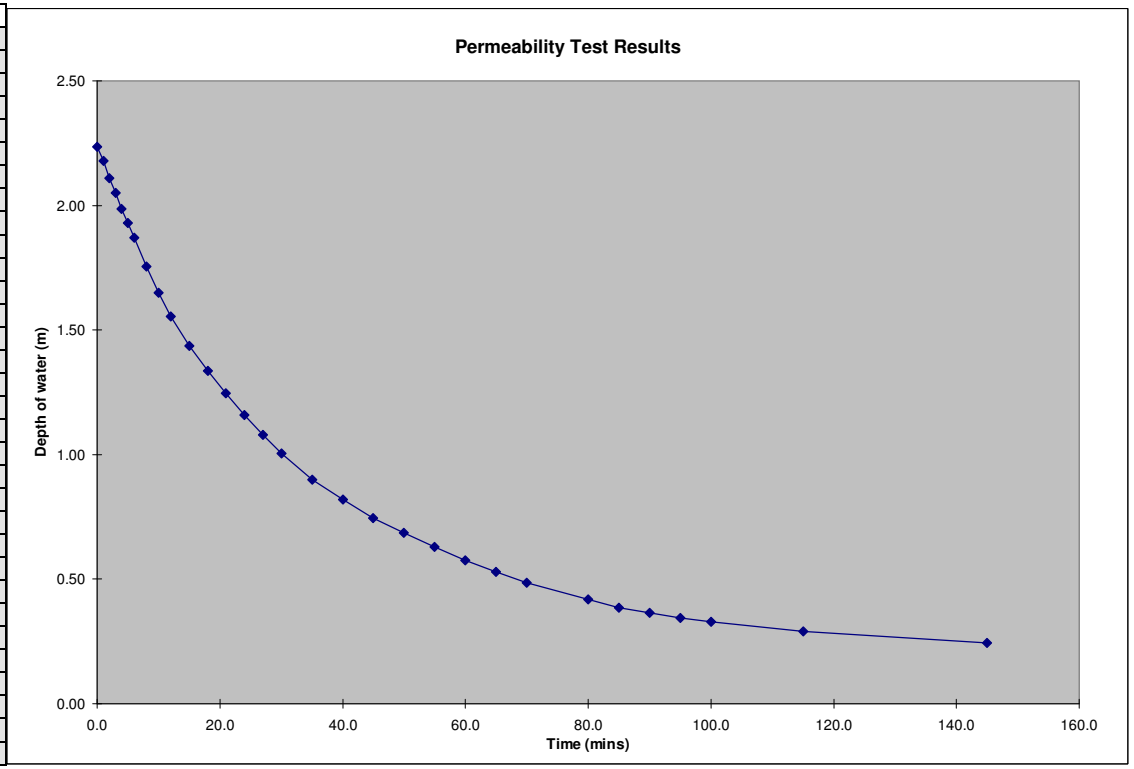
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP375B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.450

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6763	1.1175	0.5588
Time (mins)	10	26	62

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.24	0.67	1.115
1.0	2.18	0.72	1.170
2.0	2.11	0.79	1.240
3.0	2.05	0.85	1.300
4.0	1.99	0.92	1.365
5.0	1.93	0.97	1.420
6.0	1.87	1.03	1.480
8.0	1.76	1.15	1.595
10.0	1.65	1.25	1.700
12.0	1.56	1.35	1.795
15.0	1.44	1.47	1.915
18.0	1.34	1.57	2.015
21.0	1.25	1.66	2.105
24.0	1.16	1.74	2.190
27.0	1.08	1.82	2.270
30.0	1.01	1.90	2.345
35.0	0.90	2.00	2.450
40.0	0.82	2.08	2.530
45.0	0.75	2.16	2.605
50.0	0.69	2.22	2.665
55.0	0.63	2.27	2.720
60.0	0.58	2.33	2.775
65.0	0.53	2.37	2.820
70.0	0.49	2.42	2.865
80.0	0.42	2.48	2.930
85.0	0.39	2.52	2.965
90.0	0.37	2.54	2.985
95.0	0.35	2.56	3.005
100.0	0.33	2.57	3.020
115.0	0.29	2.61	3.060
145.0	0.25	2.655	3.105



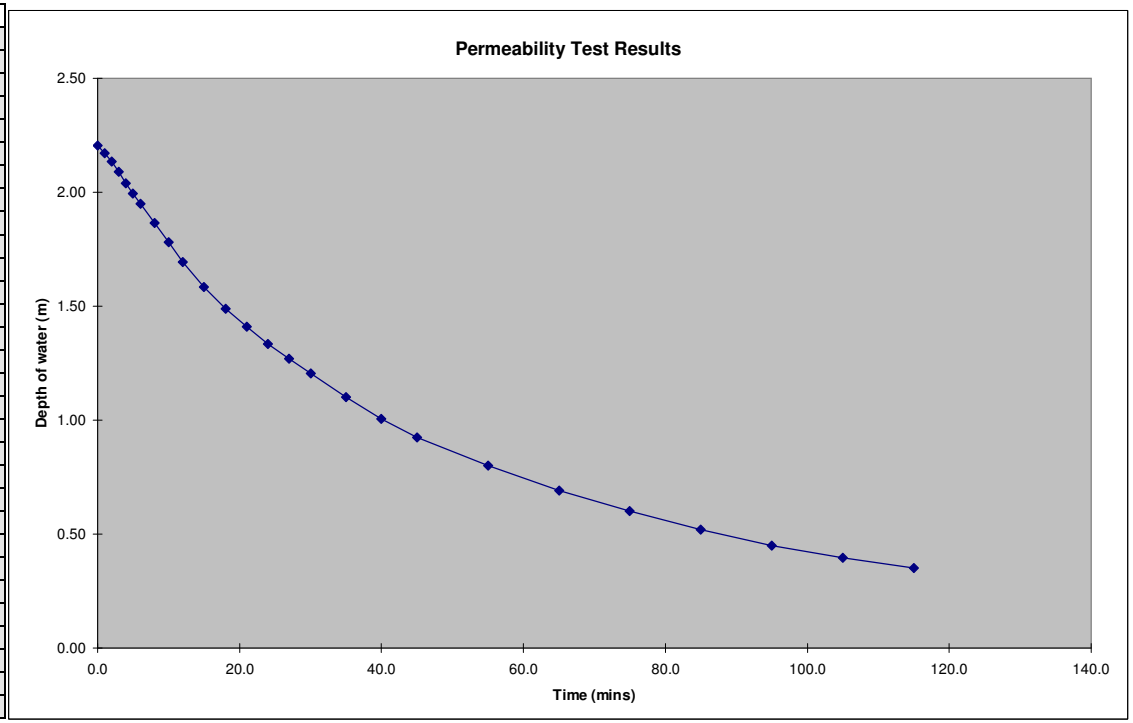
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP375B
Depth of Trial Pit (m)=	2.90
Length of Trial Pit (m)=	2.00
Breadth of Trial Pit (m)=	0.45
No of runs	3.00
Pipe upstand (m)	0.450

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.6538	1.1025	0.5513
Time (mins)	13.1	34.9	81.1

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.21	0.70	1.145
1.0	2.17	0.73	1.180
2.0	2.14	0.77	1.215
3.0	2.09	0.81	1.260
4.0	2.04	0.86	1.310
5.0	2.00	0.91	1.355
6.0	1.95	0.95	1.400
8.0	1.87	1.04	1.485
10.0	1.78	1.12	1.570
12.0	1.70	1.21	1.655
15.0	1.59	1.32	1.765
18.0	1.49	1.41	1.860
21.0	1.41	1.49	1.940
24.0	1.34	1.57	2.015
27.0	1.27	1.63	2.080
30.0	1.21	1.70	2.145
35.0	1.10	1.80	2.250
40.0	1.01	1.90	2.345
45.0	0.93	1.98	2.425
55.0	0.80	2.10	2.550
65.0	0.69	2.21	2.660
75.0	0.60	2.30	2.750
85.0	0.52	2.38	2.830
95.0	0.45	2.45	2.900
105.0	0.40	2.51	2.955
115.0	0.35	2.55	3.000



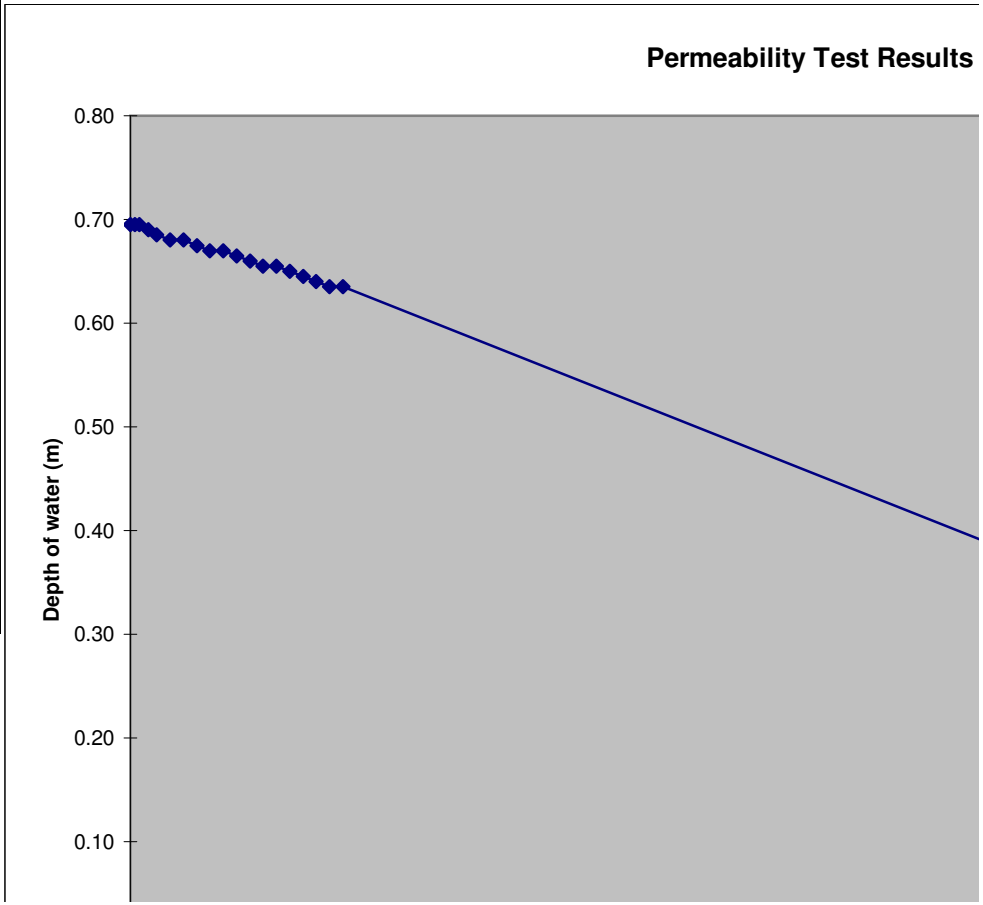
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP376A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.45
Breadth of Trial Pit (m)=	0.62
No of runs	1
Pipe upstand (m)	-0.100

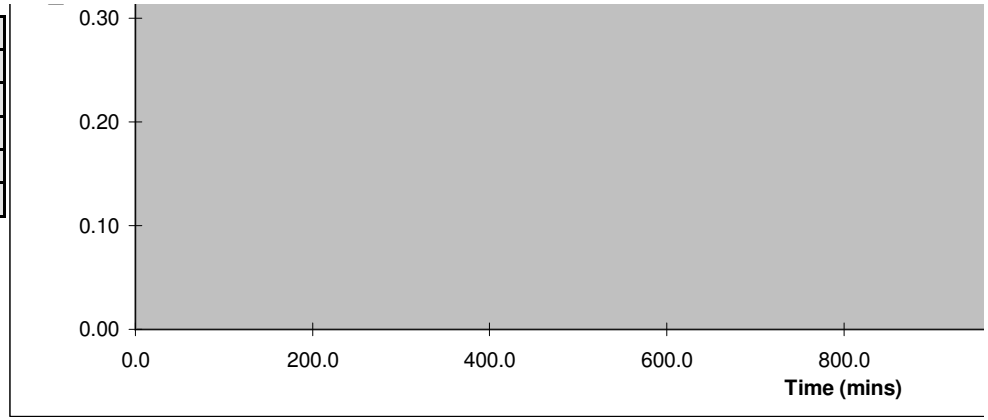
Time of Emptying of Soakaway
(Values to be checked on chart)

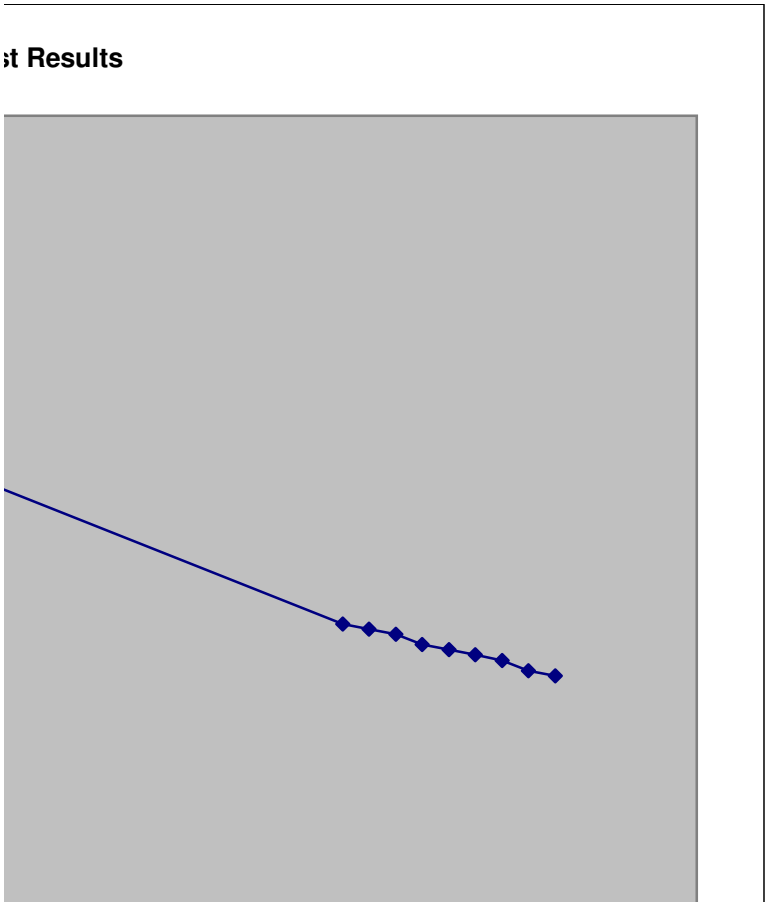
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.5213	0.3475	0.1738
Time (mins)	576	1089	1830

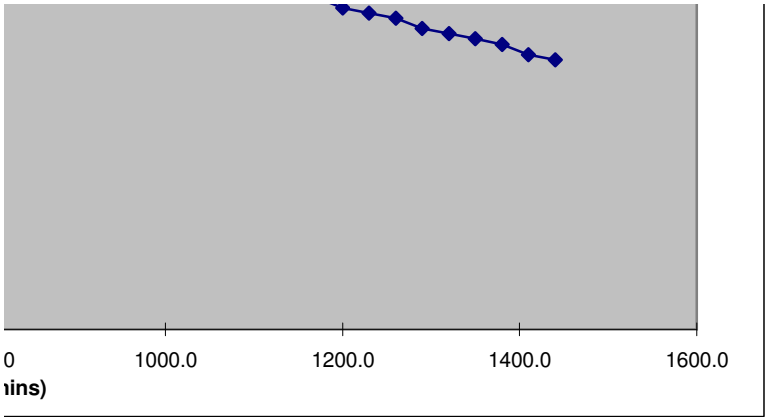
Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.70	0.81	0.705
5.0	0.70	0.81	0.705
10.0	0.70	0.81	0.705
20.0	0.69	0.81	0.710
30.0	0.69	0.82	0.715
45.0	0.68	0.82	0.720
60.0	0.68	0.82	0.720
75.0	0.68	0.83	0.725
90.0	0.67	0.83	0.730
105.0	0.67	0.83	0.730
120.0	0.67	0.84	0.735
135.0	0.66	0.84	0.740
150.0	0.66	0.85	0.745
165.0	0.66	0.85	0.745
180.0	0.65	0.85	0.750
195.0	0.65	0.86	0.755
210.0	0.64	0.86	0.760
225.0	0.64	0.87	0.765



240.0	0.64	0.87	0.765
1200.0	0.31	1.19	1.090
1230.0	0.31	1.20	1.095
1260.0	0.30	1.20	1.100
1290.0	0.29	1.21	1.110
1320.0	0.29	1.22	1.115




st Results


0
1000.0
1200.0
1400.0
1600.0
ins)

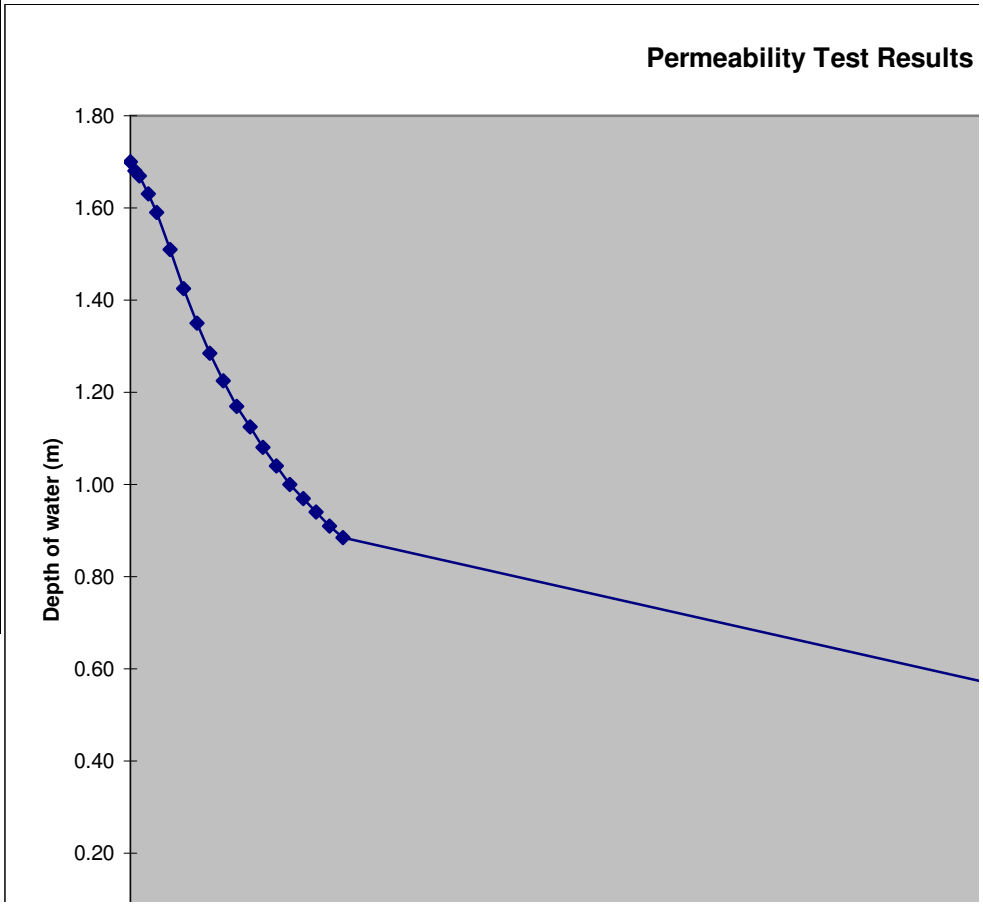
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP376A
Depth of Trial Pit (m)=	2.62
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.62
No of runs	1
Pipe upstand (m)	0.580

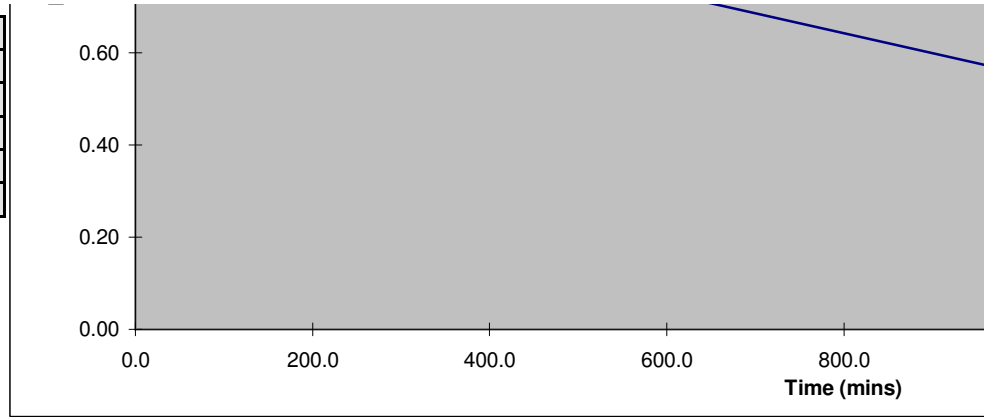
Time of Emptying of Soakaway
(Values to be checked on chart)

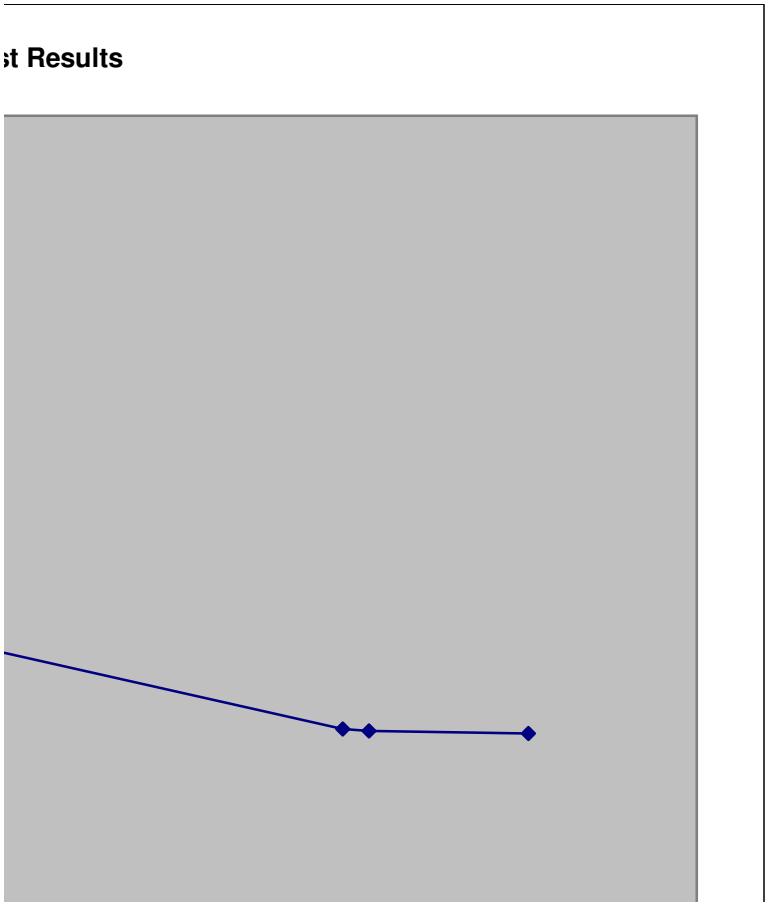
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.2750	0.8500	0.4250
Time (mins)	93	321	2120

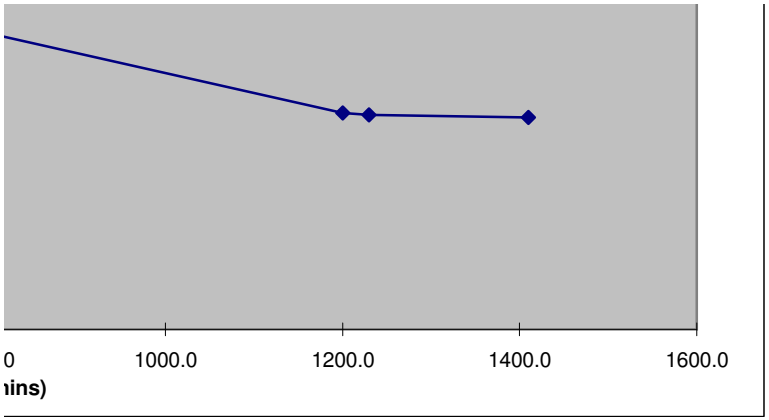
Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.70	0.92	1.500
5.0	1.68	0.94	1.520
10.0	1.67	0.95	1.530
20.0	1.63	0.99	1.570
30.0	1.59	1.03	1.610
45.0	1.51	1.11	1.690
60.0	1.43	1.20	1.775
75.0	1.35	1.27	1.850
90.0	1.29	1.34	1.915
105.0	1.23	1.40	1.975
120.0	1.17	1.45	2.030
135.0	1.13	1.50	2.075
150.0	1.08	1.54	2.120
165.0	1.04	1.58	2.160
180.0	1.00	1.62	2.200
195.0	0.97	1.65	2.230
210.0	0.94	1.68	2.260
225.0	0.91	1.71	2.290



240.0	0.89	1.74	2.315
1200.0	0.47	2.15	2.730
1230.0	0.47	2.16	2.735
1410.0	0.46	2.16	2.740




st Results


0
1000.0
1200.0
1400.0
1600.0
ins)

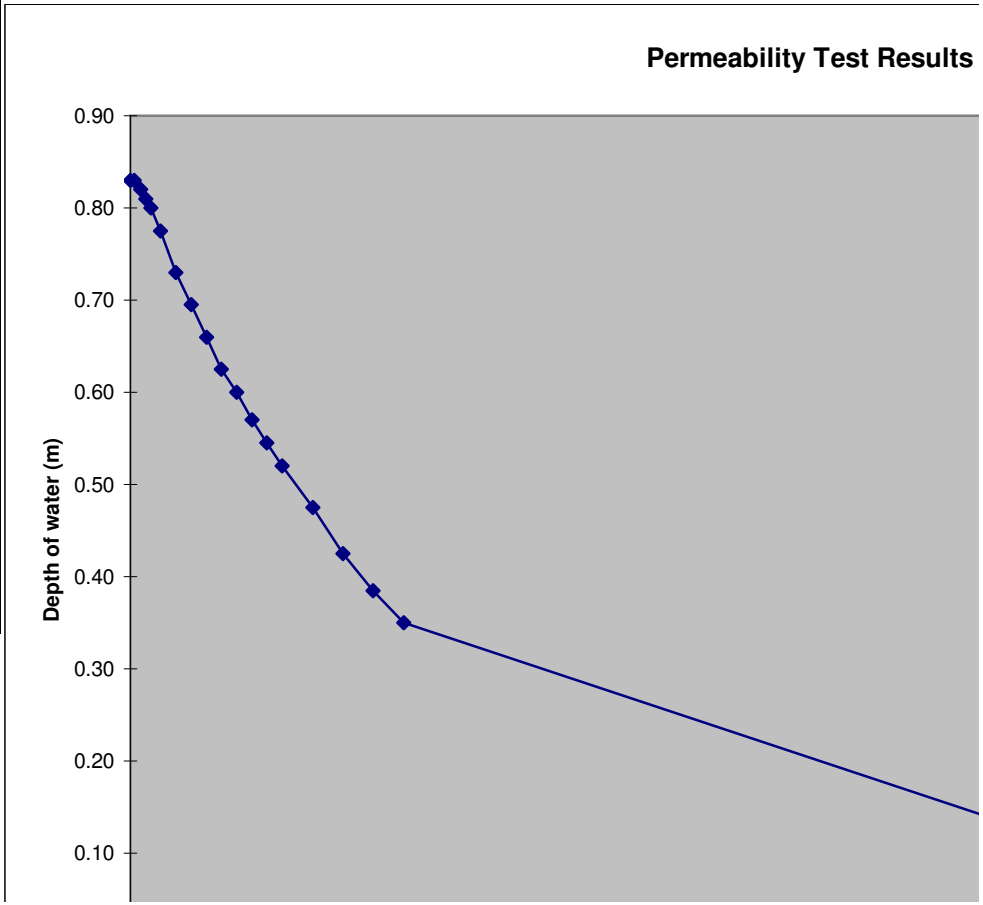
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP377A
Depth of Trial Pit (m)=	1.80
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.62
No of runs	3
Pipe upstand (m)	0.465

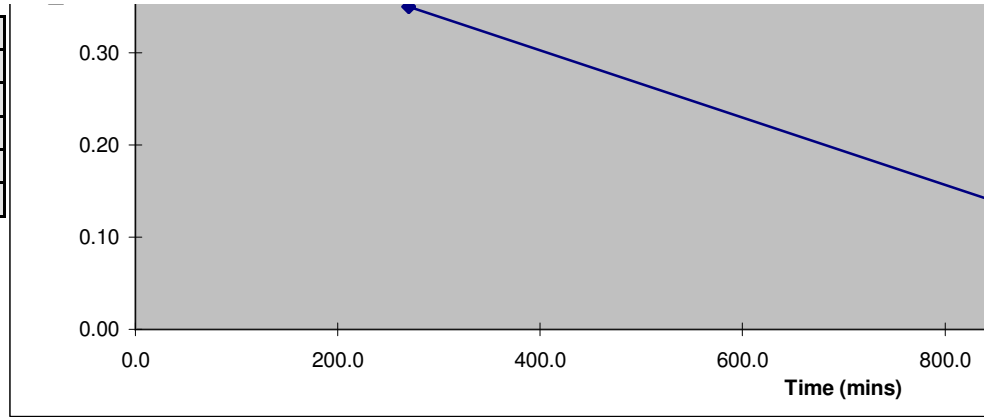
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6225	0.4150	0.2075
Time (mins)	92	218	679

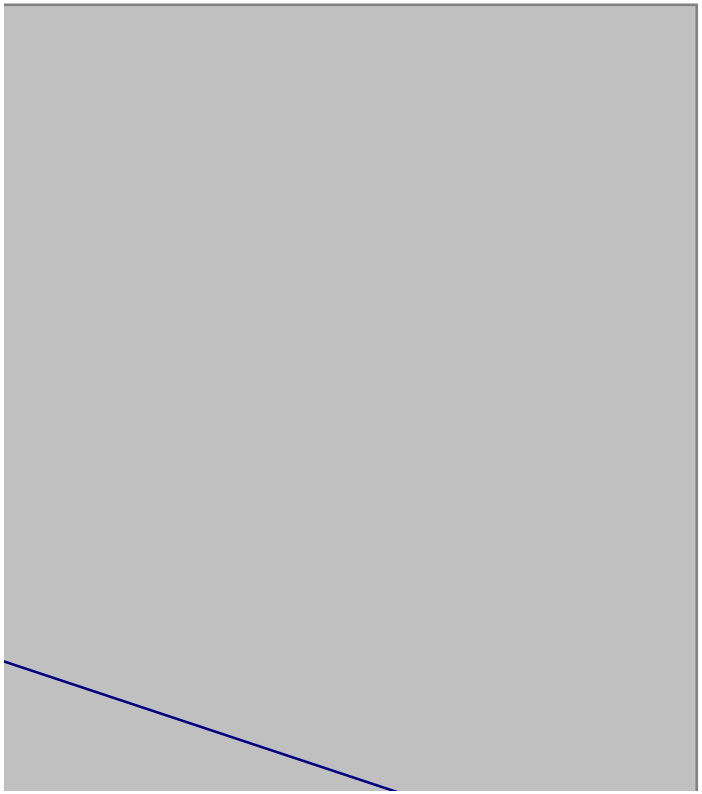
Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.83	0.97	1.435
4.0	0.83	0.97	1.435
10.0	0.82	0.98	1.445
15.0	0.81	0.99	1.455
20.0	0.80	1.00	1.465
30.0	0.78	1.03	1.490
45.0	0.73	1.07	1.535
60.0	0.70	1.11	1.570
75.0	0.66	1.14	1.605
90.0	0.63	1.18	1.640
105.0	0.60	1.20	1.665
120.0	0.57	1.23	1.695
135.0	0.55	1.26	1.720
150.0	0.52	1.28	1.745
180.0	0.48	1.33	1.790
210.0	0.43	1.38	1.840
240.0	0.39	1.42	1.880
270.0	0.35	1.45	1.915

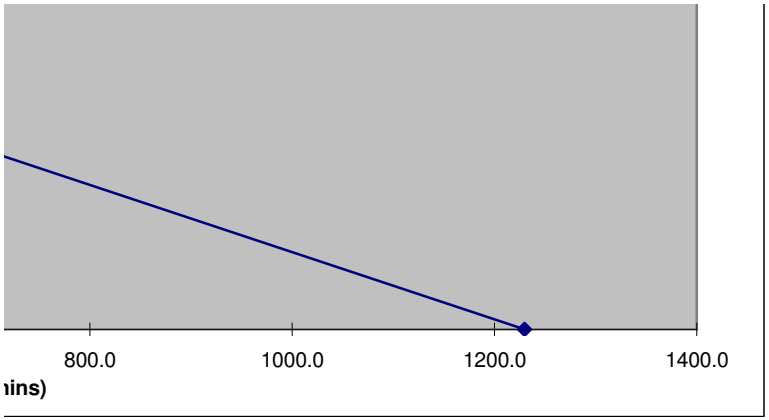


1230.0	0.00	1.80	2.265



st Results




800.0
1000.0
1200.0
1400.0
ins)

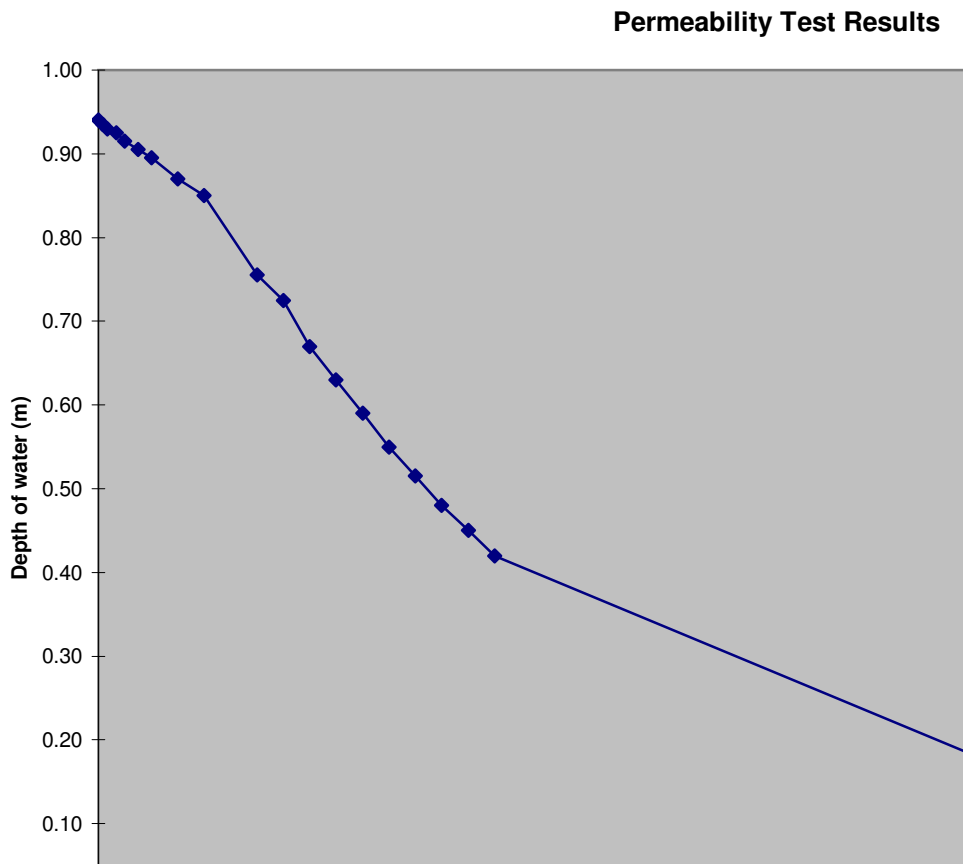
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP377A
Depth of Trial Pit (m)=	1.80
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.62
No of runs	3.00
Pipe upstand (m)	0.465

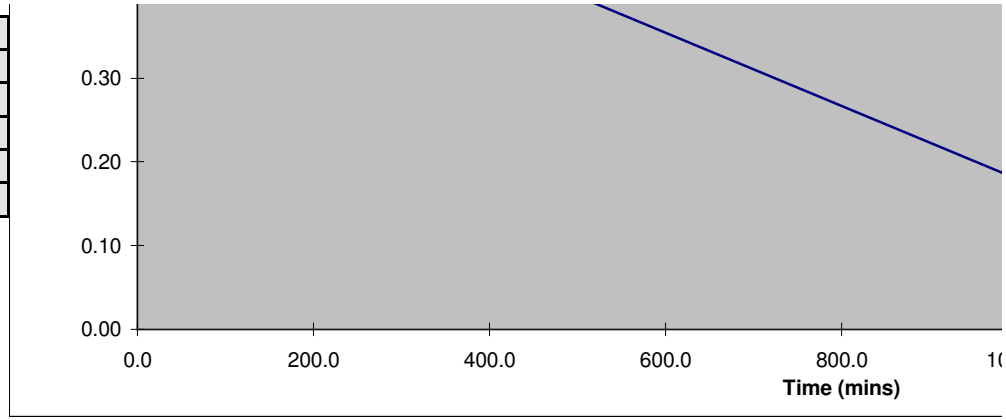
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.7050	0.4700	0.2350
Time (mins)	221	400	883

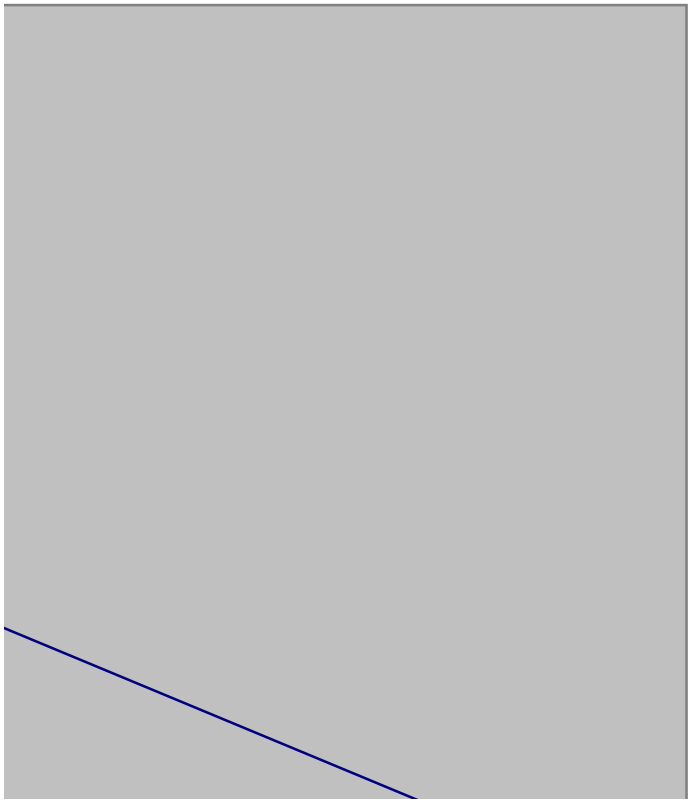
Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.94	0.86	1.325
5.0	0.94	0.87	1.330
10.0	0.93	0.87	1.335
20.0	0.93	0.88	1.340
30.0	0.92	0.89	1.350
45.0	0.91	0.90	1.360
60.0	0.90	0.91	1.370
90.0	0.87	0.93	1.395
120.0	0.85	0.95	1.415
180.0	0.76	1.05	1.510
210.0	0.73	1.08	1.540
240.0	0.67	1.13	1.595
270.0	0.63	1.17	1.635
300.0	0.59	1.21	1.675
330.0	0.55	1.25	1.715
360.0	0.52	1.29	1.750
390.0	0.48	1.32	1.785
420.0	0.45	1.35	1.815

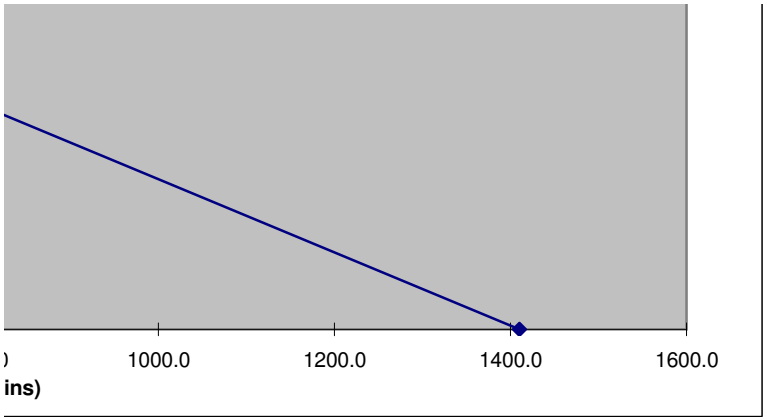


450.0	0.42	1.38	1.845
1410.0	0.00	1.80	2.265



t Results




1000.0
1200.0
1400.0
1600.0
ins)

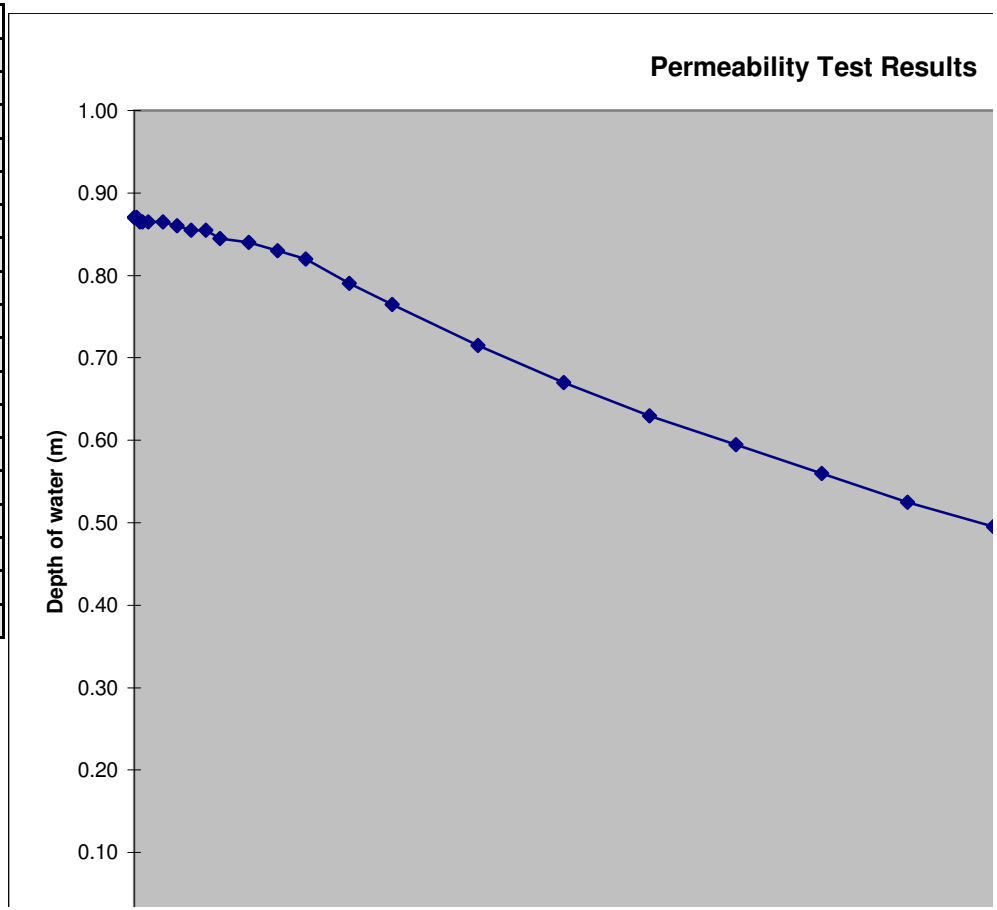
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP377A
Depth of Trial Pit (m)=	1.80
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.62
No of runs	3.00
Pipe upstand (m)	0.465

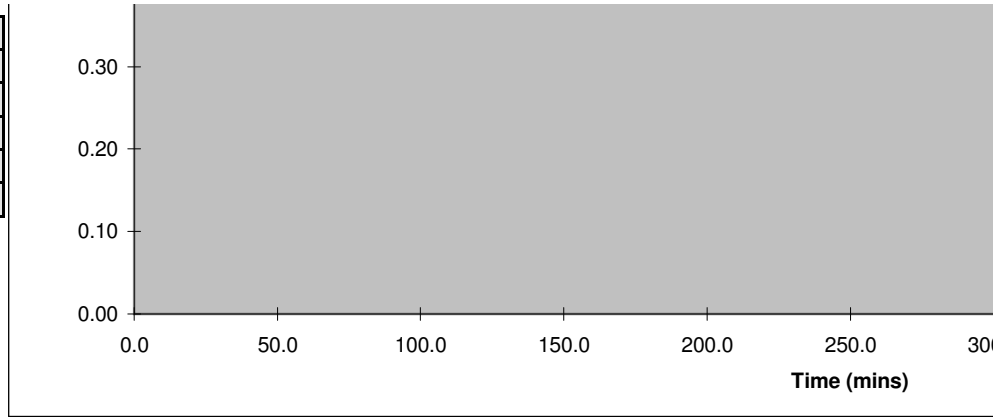
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6525	0.4350	0.2175
Time (mins)	163.1	372.0	657.9

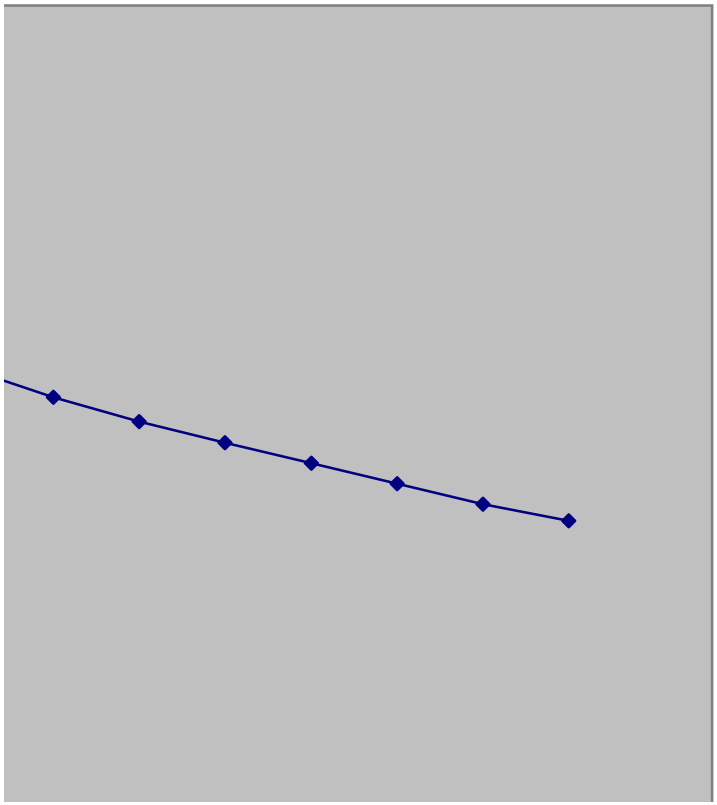
Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.87	0.93	1.395
1.0	0.87	0.93	1.395
2.0	0.87	0.94	1.400
3.0	0.87	0.94	1.400
5.0	0.87	0.94	1.400
10.0	0.87	0.94	1.400
15.0	0.86	0.94	1.405
20.0	0.86	0.95	1.410
25.0	0.86	0.95	1.410
30.0	0.85	0.96	1.420
40.0	0.84	0.96	1.425
50.0	0.83	0.97	1.435
60.0	0.82	0.98	1.445
75.0	0.79	1.01	1.475
90.0	0.77	1.04	1.500
120.0	0.72	1.09	1.550
150.0	0.67	1.13	1.595
180.0	0.63	1.17	1.635

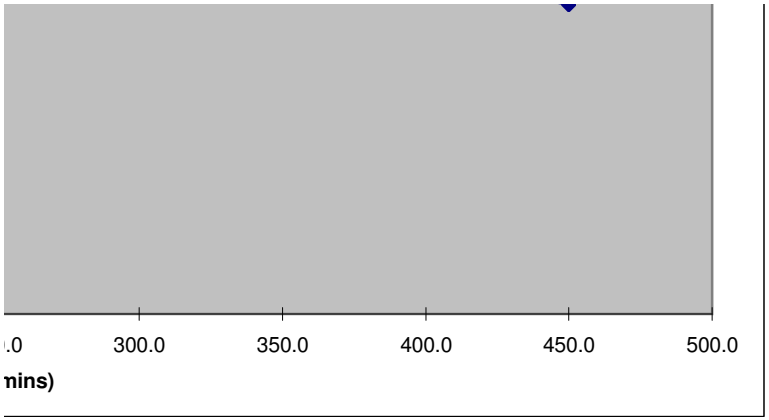


210.0	0.60	1.21	1.670
240.0	0.56	1.24	1.705
270.0	0.53	1.28	1.740
300.0	0.50	1.31	1.770
330.0	0.47	1.33	1.795
360.0	0.45	1.36	1.820



st Results




.0
300.0
350.0
400.0
450.0
500.0
nins)

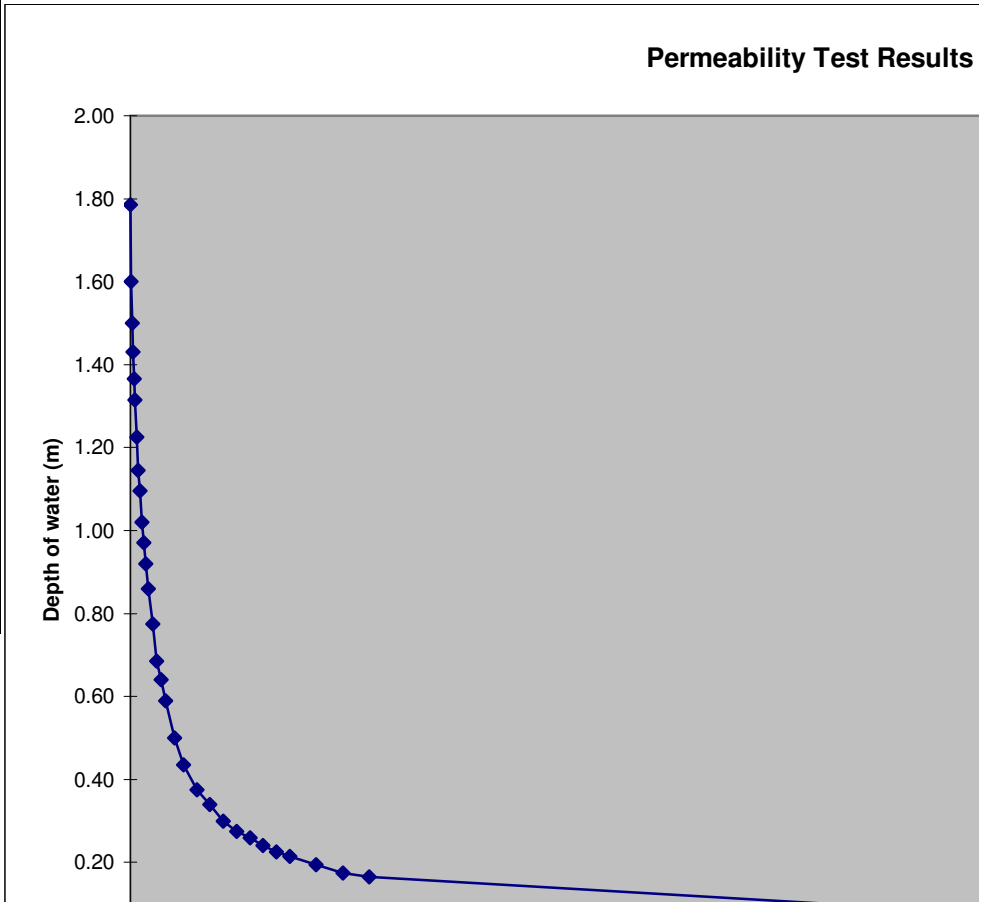
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP377B
Depth of Trial Pit (m)=	2.60
Length of Trial Pit (m)=	1.45
Breadth of Trial Pit (m)=	0.62
No of runs	2
Pipe upstand (m)	-0.015

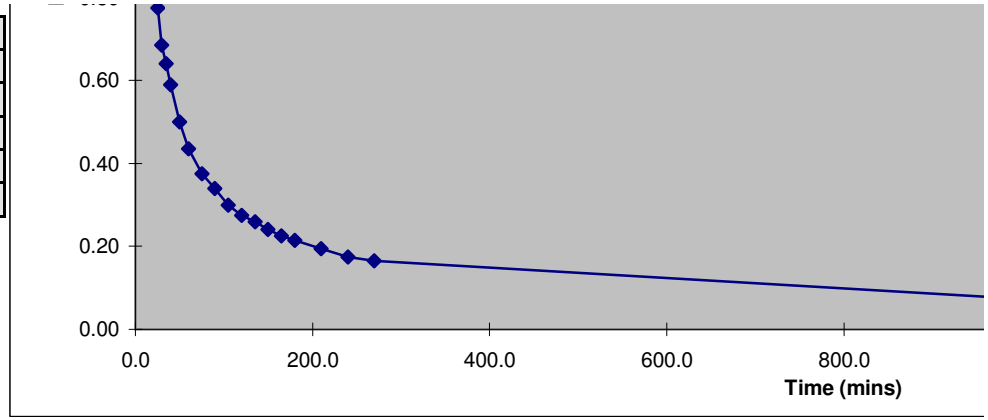
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.3388	0.8925	0.4463
Time (mins)	5	18	58

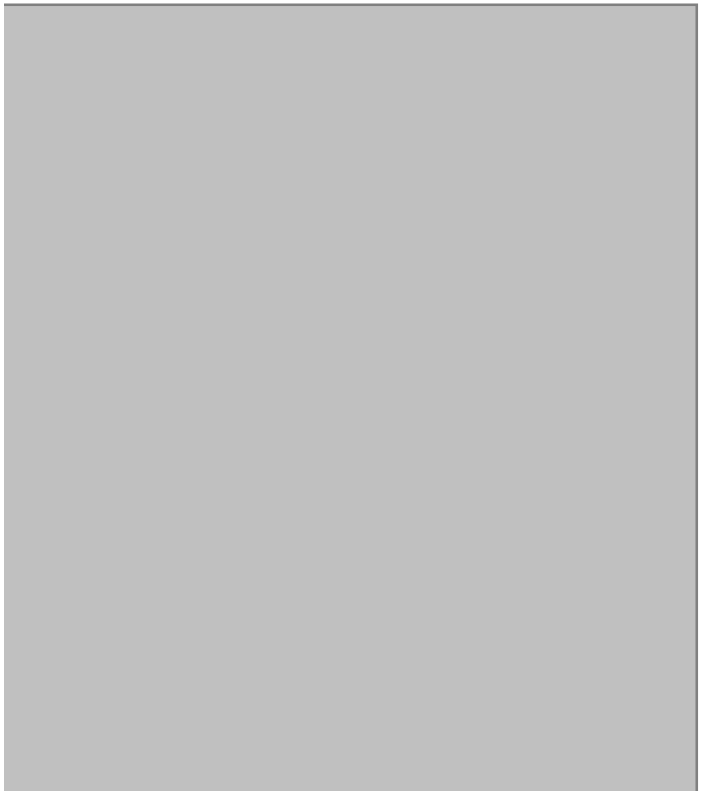
Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.79	0.82	0.800
1.0	1.60	1.00	0.985
2.0	1.50	1.10	1.085
3.0	1.43	1.17	1.155
4.0	1.37	1.24	1.220
5.0	1.32	1.29	1.270
7.0	1.23	1.38	1.360
9.0	1.15	1.46	1.440
11.0	1.10	1.51	1.490
13.0	1.02	1.58	1.565
15.0	0.97	1.63	1.615
17.0	0.92	1.68	1.665
20.0	0.86	1.74	1.725
25.0	0.78	1.83	1.810
30.0	0.69	1.92	1.900
35.0	0.64	1.96	1.945
40.0	0.59	2.01	1.995
50.0	0.50	2.10	2.085

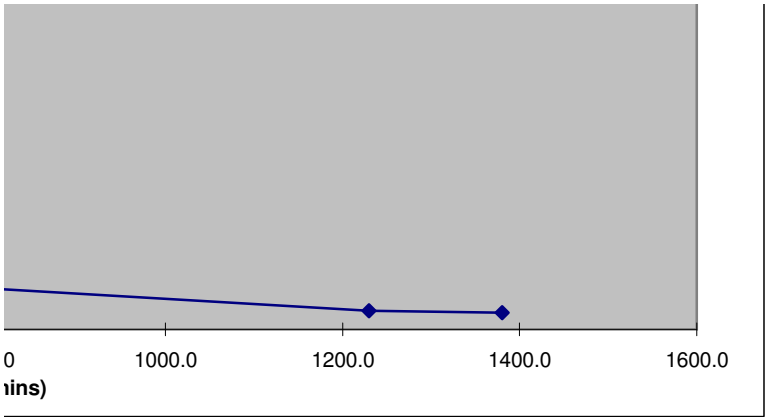


60.0	0.44	2.17	2.150
75.0	0.38	2.23	2.210
90.0	0.34	2.26	2.245
105.0	0.30	2.30	2.285
120.0	0.28	2.33	2.310
135.0	0.26	2.34	2.325



st Results




0
1000.0
1200.0
1400.0
1600.0
ins)

Results from Site Observation

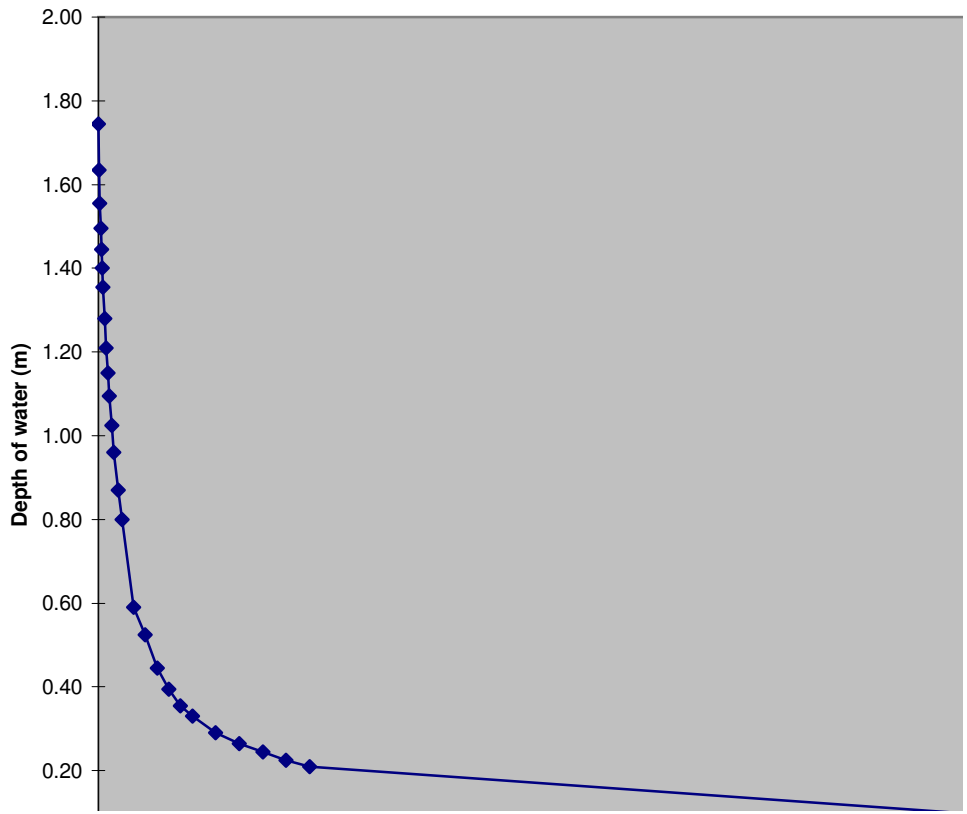
Scheme:	**NDR PTPK1000**
Trial Pit No.	TP377B
Depth of Trial Pit (m)=	2.60
Length of Trial Pit (m)=	1.45
Breadth of Trial Pit (m)=	0.62
No of runs	2.00
Pipe upstand (m)	-0.015

Time of Emptying of Soakaway
(Values to be checked on chart)

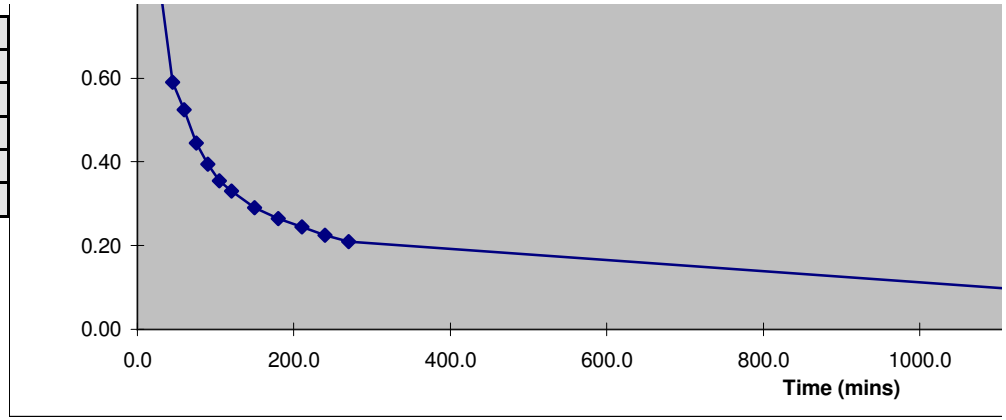
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.3088	0.8725	0.4363
Time (mins)	7	25	77

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.75	0.86	0.840
1.0	1.64	0.97	0.950
2.0	1.56	1.05	1.030
3.0	1.50	1.11	1.090
4.0	1.45	1.16	1.140
5.0	1.40	1.20	1.185
6.0	1.36	1.25	1.230
8.0	1.28	1.32	1.305
10.0	1.21	1.39	1.375
12.0	1.15	1.45	1.435
14.0	1.10	1.51	1.490
17.0	1.03	1.58	1.560
20.0	0.96	1.64	1.625
25.0	0.87	1.73	1.715
30.0	0.80	1.80	1.785
45.0	0.59	2.01	1.995
60.0	0.53	2.08	2.060
75.0	0.45	2.16	2.140

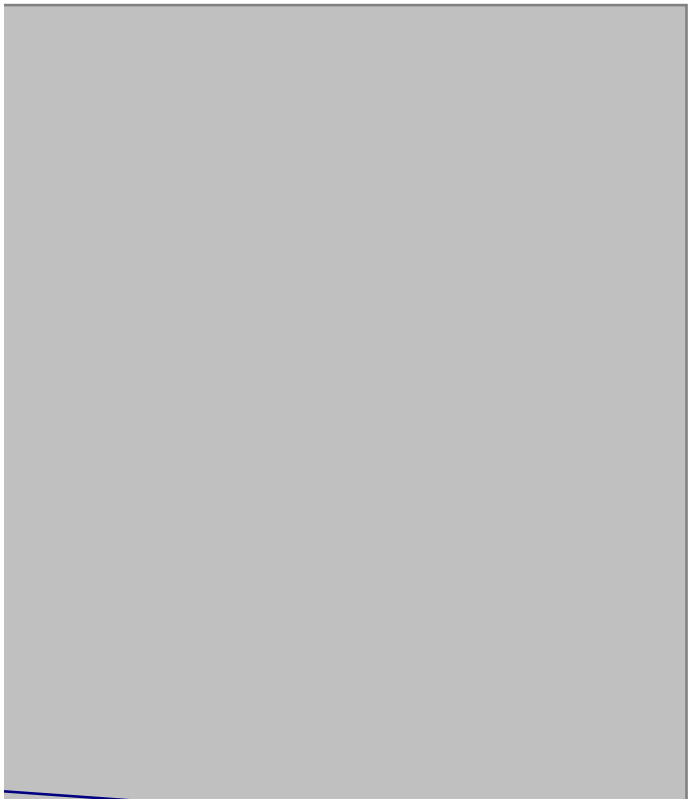
Permeability Test Results

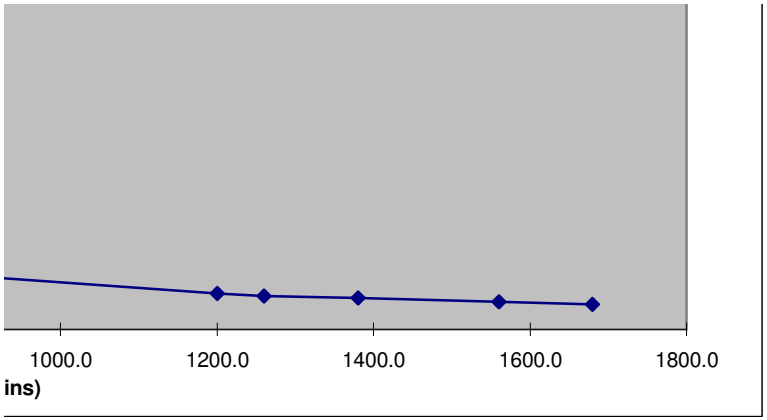


90.0	0.40	2.21	2.190
105.0	0.36	2.25	2.230
120.0	0.33	2.27	2.255
150.0	0.29	2.31	2.295
180.0	0.27	2.34	2.320
210.0	0.25	2.36	2.340



t Results




1000.0
1200.0
1400.0
1600.0
1800.0
ins)

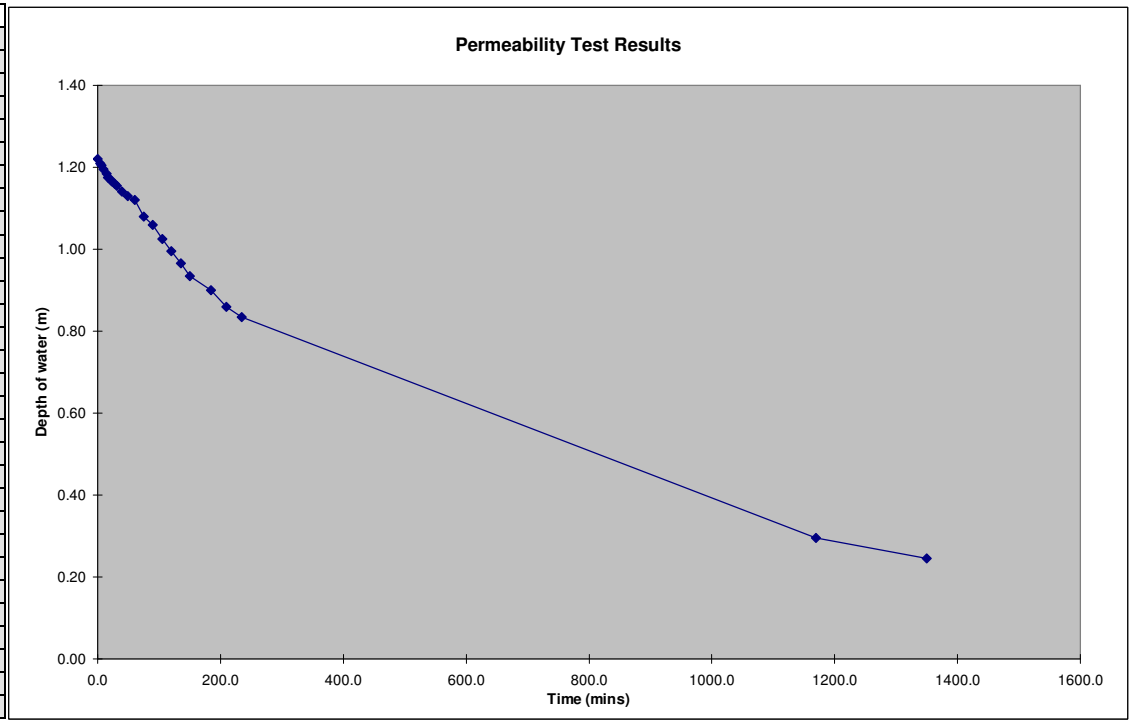
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP378A
Depth of Trial Pit (m)=	1.51
Length of Trial Pit (m)=	1.23
Breadth of Trial Pit (m)=	0.45
No of runs	2
Pipe upstand (m)	0.820

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9150	0.6100	0.3050
Time (mins)	160	625	1134

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.22	0.29	1.110
4.0	1.21	0.30	1.120
6.0	1.21	0.31	1.125
9.0	1.20	0.32	1.135
15.0	1.19	0.33	1.145
17.0	1.18	0.34	1.155
21.0	1.17	0.34	1.160
23.0	1.17	0.35	1.165
28.0	1.16	0.35	1.170
31.0	1.16	0.36	1.175
40.0	1.14	0.37	1.190
49.0	1.13	0.38	1.200
60.0	1.12	0.39	1.210
75.0	1.08	0.43	1.250
90.0	1.06	0.45	1.270
105.0	1.03	0.49	1.305
120.0	1.00	0.52	1.335
135.0	0.97	0.55	1.365
150.0	0.94	0.58	1.395
185.0	0.90	0.61	1.430
210.0	0.86	0.65	1.470
235.0	0.84	0.68	1.495
1170.0	0.30	1.22	2.035
1350.0	0.25	1.27	2.085



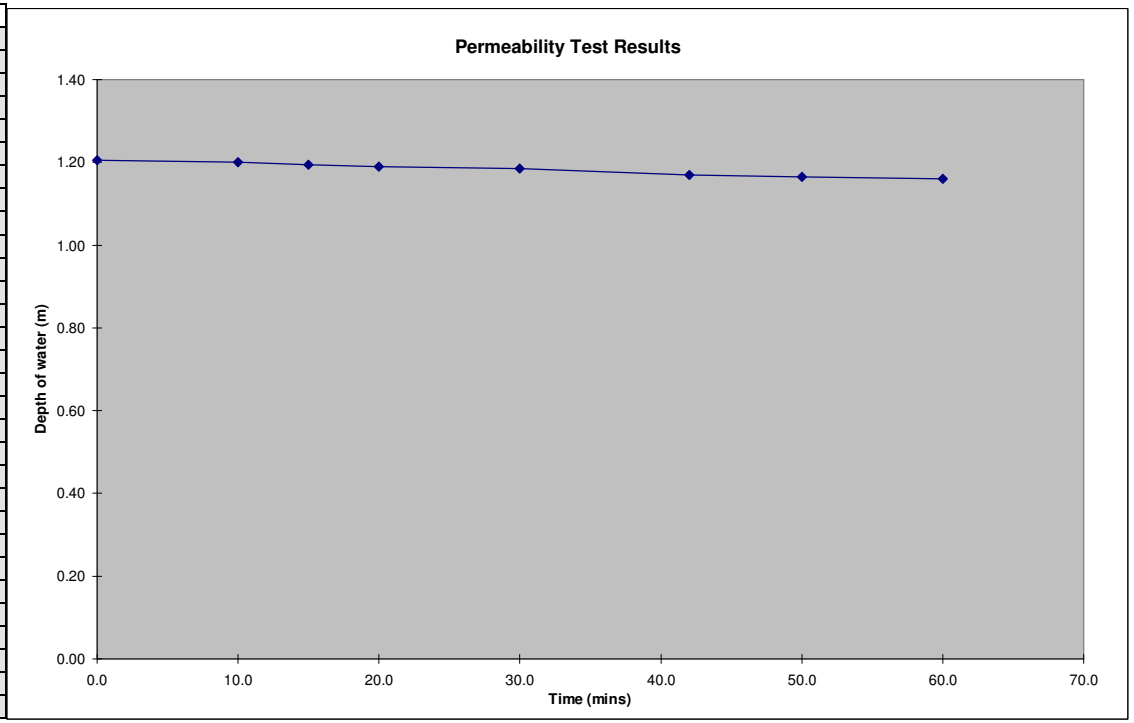
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP378A
Depth of Trial Pit (m)=	1.51
Length of Trial Pit (m)=	1.23
Breadth of Trial Pit (m)=	0.45
No of runs	2.00
Pipe upstand (m)	0.820

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.9038	0.6025	0.3013
Time (mins)	573	1175	1778

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.21	0.31	1.125
10.0	1.20	0.31	1.130
15.0	1.20	0.32	1.135
20.0	1.19	0.32	1.140
30.0	1.19	0.33	1.145
42.0	1.17	0.34	1.160
50.0	1.17	0.35	1.165
60.0	1.16	0.35	1.170



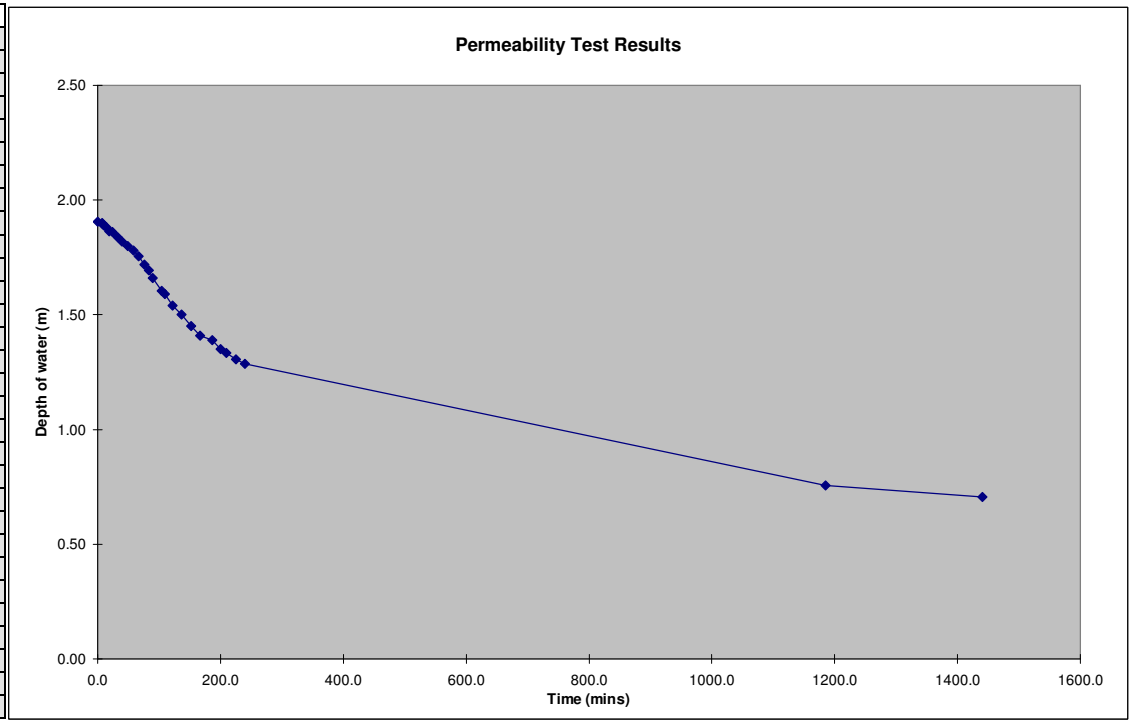
Results from Site Observation

Scheme:	**NDR PTPK1000**
Trial Pit No.	TP378B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	2.10
Breadth of Trial Pit (m)=	0.45
No of runs	1
Pipe upstand (m)	0.280

Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.4288	0.9525	0.4763
Time (mins)	160	833	2607

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.91	1.10	1.375
7.0	1.90	1.10	1.380
8.0	1.90	1.11	1.385
10.0	1.89	1.11	1.390
15.0	1.88	1.12	1.400
19.0	1.87	1.14	1.415
24.0	1.86	1.14	1.420
32.0	1.84	1.16	1.440
40.0	1.82	1.18	1.460
49.0	1.80	1.20	1.480
58.0	1.78	1.22	1.500
67.0	1.76	1.25	1.525
76.0	1.72	1.28	1.560
83.0	1.70	1.31	1.585
90.0	1.66	1.34	1.620
104.0	1.61	1.40	1.675
109.0	1.59	1.41	1.690
122.0	1.54	1.46	1.740
137.0	1.50	1.50	1.780
152.0	1.45	1.55	1.830
167.0	1.41	1.59	1.870
187.0	1.39	1.61	1.890
200.0	1.35	1.65	1.930
210.0	1.34	1.67	1.945
225.0	1.31	1.70	1.975
240.0	1.29	1.72	1.995
1185.0	0.76	2.25	2.525
1440.0	0.71	2.30	2.575



Results from Site Observation

Scheme:	**NDR**
Project No	**PTPK1000**
Trial Pit No.	379A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.80
Breadth of Trial Pit (m)=	0.60
No of runs	1
Pipe upstand (m)	0.000

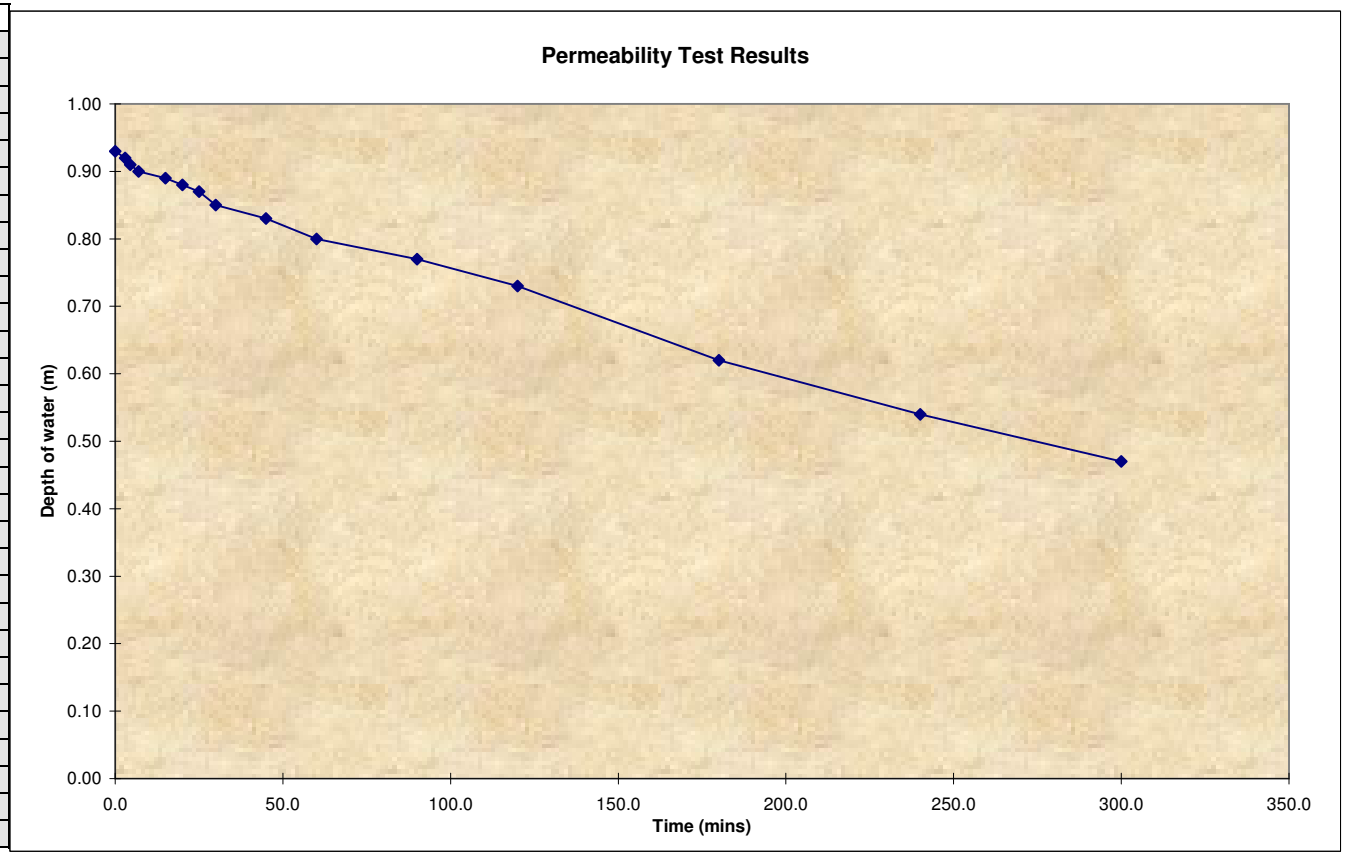
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.6975	0.4650	0.2325
Time (mins)	138	304	504

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
3.0E-06 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	0.93	0.57	0.570
3.0	0.92	0.58	0.580
4.5	0.91	0.59	0.590
7.0	0.90	0.60	0.600
15.0	0.89	0.61	0.610
20.0	0.88	0.62	0.620
25.0	0.87	0.63	0.630
30.0	0.85	0.65	0.650
45.0	0.83	0.67	0.670
60.0	0.80	0.70	0.700
90.0	0.77	0.73	0.730
120.0	0.73	0.77	0.770
180.0	0.62	0.88	0.880
240.0	0.54	0.96	0.960
300.0	0.47	1.03	1.030



Results from Site Observation

Scheme:	**NDR**
Project No	**PTPK1000**
Trial Pit No.	379B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	1.90
Breadth of Trial Pit (m)=	0.60
No of runs	1
Pipe upstand (m)	0.000

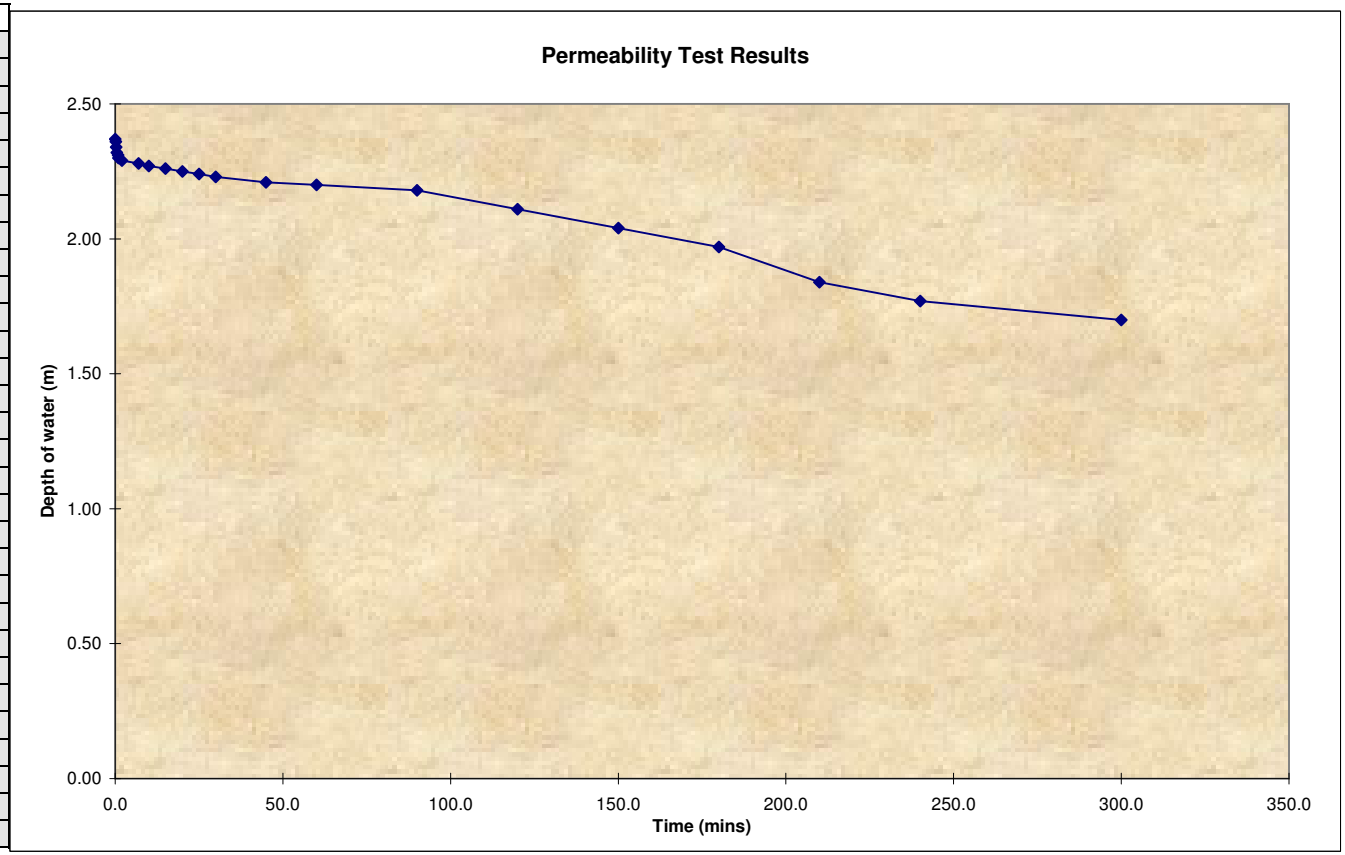
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7775	1.1850	0.5925
Time (mins)	237	741	1249

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
1.4E-06 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.37	0.63	0.630
0.2	2.36	0.64	0.640
0.3	2.34	0.66	0.660
0.5	2.32	0.68	0.680
0.8	2.31	0.69	0.690
1.0	2.30	0.70	0.700
2.0	2.29	0.71	0.710
7.0	2.28	0.72	0.720
10.0	2.27	0.73	0.730
15.0	2.26	0.74	0.740
20.0	2.25	0.75	0.750
25.0	2.24	0.76	0.760
30.0	2.23	0.77	0.770
45.0	2.21	0.79	0.790
60.0	2.20	0.80	0.800
90.0	2.18	0.82	0.820
120.0	2.11	0.89	0.890
150.0	2.04	0.96	0.960
180.0	1.97	1.03	1.030
210.0	1.84	1.16	1.160
240.0	1.77	1.23	1.230
300.0	1.70	1.30	1.300



Results from Site Observation

Scheme:	**NDR**
Project No	**PTPK1000**
Trial Pit No.	392A
Depth of Trial Pit (m)=	1.50
Length of Trial Pit (m)=	1.20
Breadth of Trial Pit (m)=	0.50
No of runs	1
Pipe upstand (m)	0.000

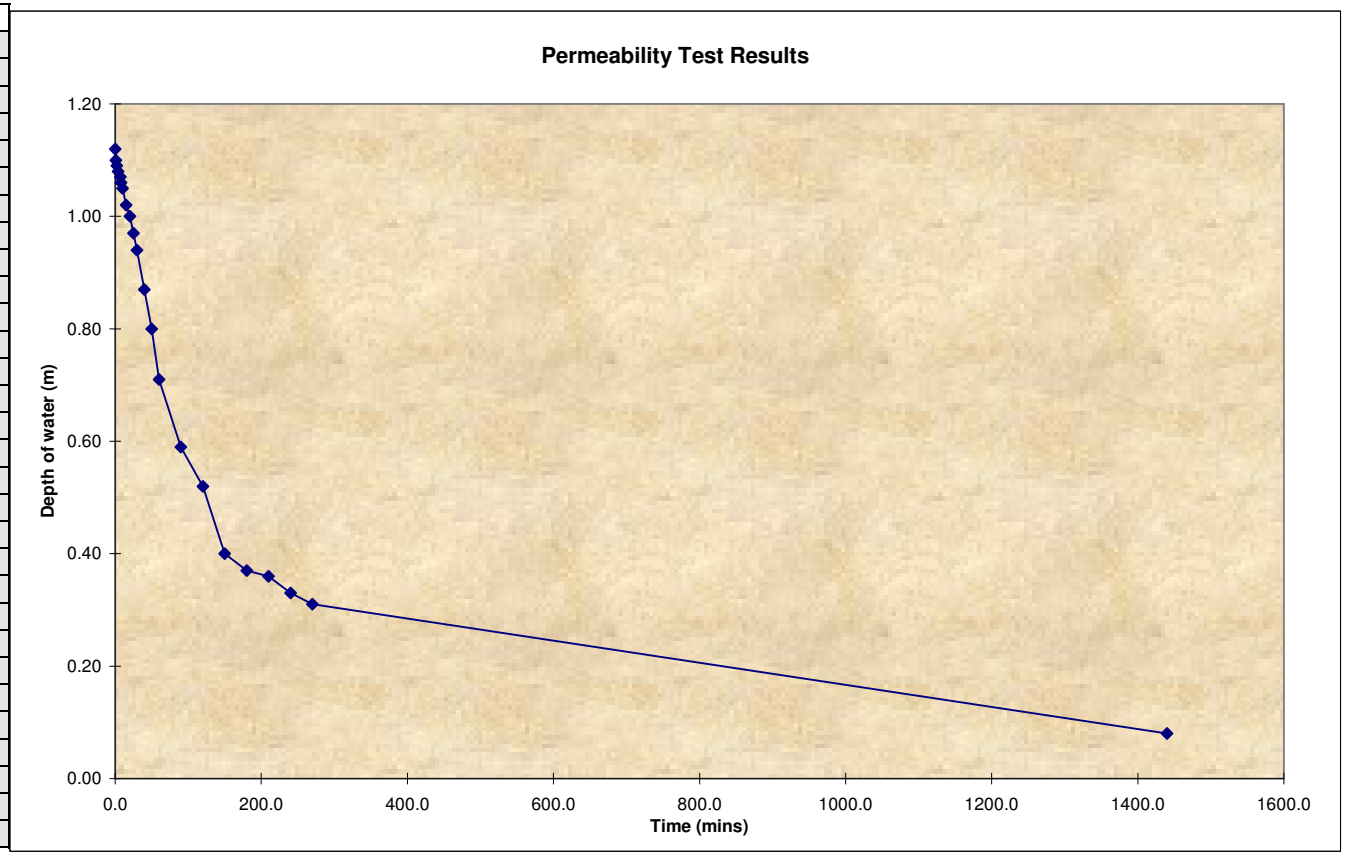
Time of Emptying of Soakaway
(Values to be checked on chart)

% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	0.8400	0.5600	0.2800
Time (mins)	44	103	423

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
2.6E-06 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	1.12	0.38	0.380
1.0	1.10	0.40	0.400
2.0	1.09	0.41	0.410
4.0	1.08	0.42	0.420
7.0	1.07	0.43	0.430
8.0	1.06	0.44	0.440
10.0	1.05	0.45	0.450
15.0	1.02	0.48	0.480
20.0	1.00	0.50	0.500
25.0	0.97	0.53	0.530
30.0	0.94	0.56	0.560
40.0	0.87	0.63	0.630
50.0	0.80	0.70	0.700
60.0	0.71	0.79	0.790
90.0	0.59	0.91	0.910
120.0	0.52	0.98	0.980
150.0	0.40	1.10	1.100
180.0	0.37	1.13	1.130
210.0	0.36	1.14	1.140
240.0	0.33	1.17	1.170
270.0	0.31	1.19	1.190
1440.0	0.08	1.42	1.420



Results from Site Observation

Scheme:	**NDR**
Project No	**PTPK1000**
Trial Pit No.	392B
Depth of Trial Pit (m)=	3.00
Length of Trial Pit (m)=	3.00
Breadth of Trial Pit (m)=	0.50
No of runs	1
Pipe upstand (m)	0.000

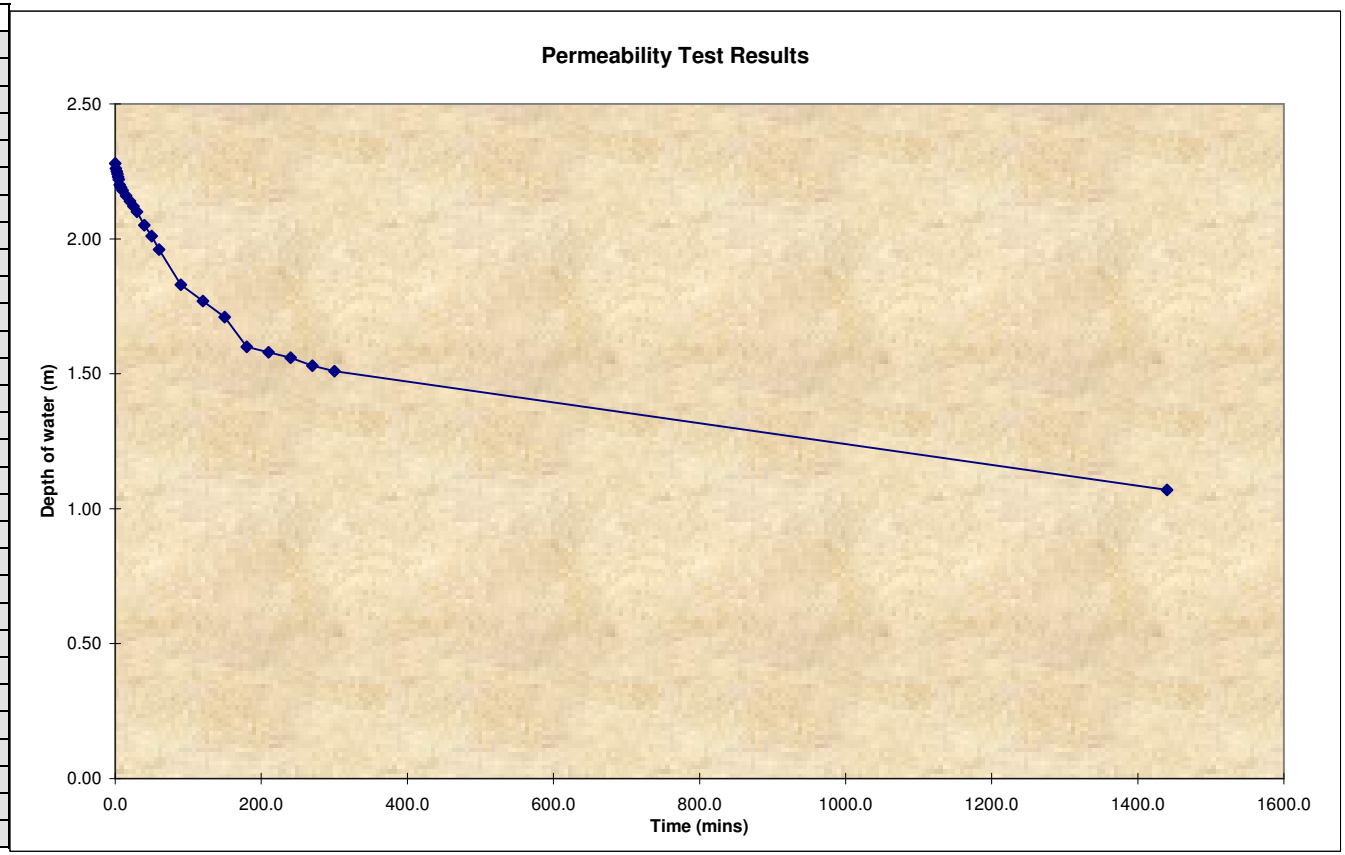
Time of Emptying of Soakaway
(Values to be checked on chart)

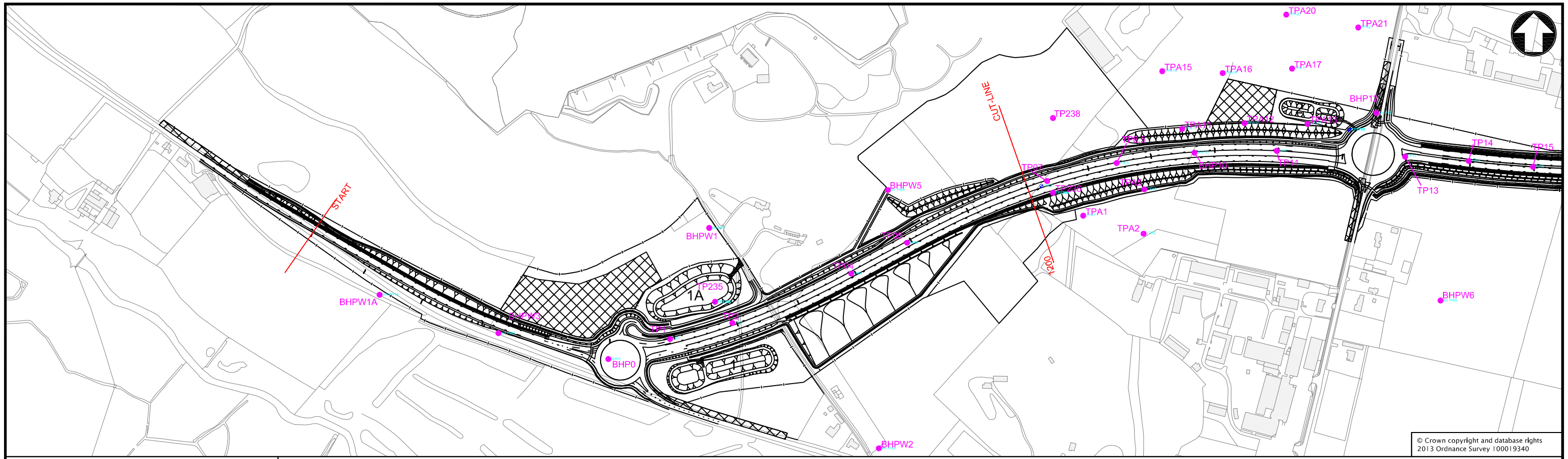
% Full	25% Empty	50% Empty	75% Empty
Depth of Water (m)	1.7100	1.1400	0.5700
Time (mins)	144	1259	2735

Gravel fill	Yes
Voids %	43.7

Infiltration Rate
5.1E-07 m/sec

Minutes	Depth of Water (m)	Depth Below E.G.L.(m)	Depth to water (m)
0.0	2.28	0.72	0.720
1.0	2.26	0.74	0.740
2.0	2.25	0.75	0.750
3.0	2.24	0.76	0.760
4.0	2.23	0.77	0.770
5.0	2.22	0.78	0.780
6.0	2.20	0.80	0.800
8.0	2.19	0.81	0.810
10.0	2.18	0.82	0.820
15.0	2.16	0.84	0.840
20.0	2.14	0.86	0.860
25.0	2.12	0.88	0.880
30.0	2.10	0.90	0.900
40.0	2.05	0.95	0.950
50.0	2.01	0.99	0.990
60.0	1.96	1.04	1.040
90.0	1.83	1.17	1.170
120.0	1.77	1.23	1.230
150.0	1.71	1.29	1.290
180.0	1.60	1.40	1.400
210.0	1.58	1.42	1.420
240.0	1.56	1.44	1.440
270.0	1.53	1.47	1.470
300.0	1.51	1.49	1.490
1440.0	1.07	1.93	1.930





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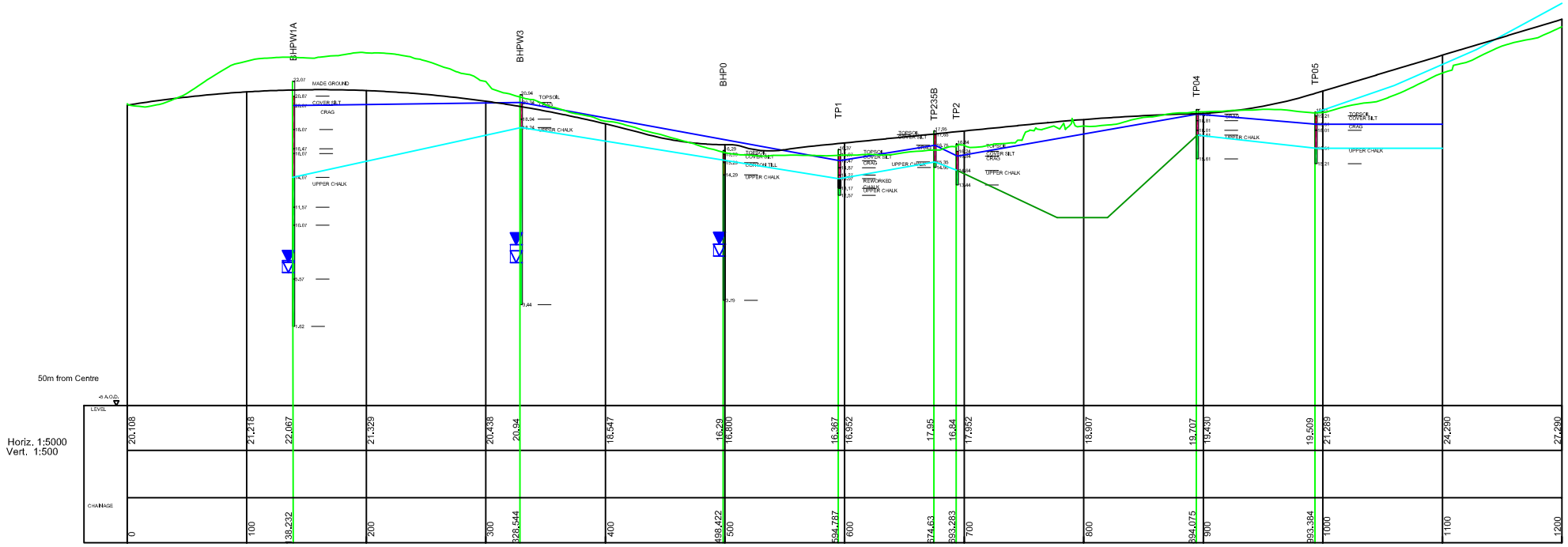
KEY:

- TOPSOIL
- ALLUVIUM
- GLACIAL SAND AND GRAVEL
- GLACIAL SAND & GRAVELS (CORTON FORMATION SAND)
- BRICKEARTH (CORTON FORMATION TILL)
- CRAG
- UPPER CHALK
- CHALK (1976 HYDROGEOLOGICAL MAP)
- NDR

KEY: WATERSTRIKE

INITIAL WATERSTRIKE LEVEL

SETTLED WATERSTRIKE LEVEL AFTER APPROX. 20 MINUTES



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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	11/13	AW	Rev E Alignment and 2013 Data Added	BD	SA

Title

Norwich Northern Distributor Road
Geological Long Section
Within 50m of NDR

1 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS

Drawing Number: MMD-233906-DT-0815

Rev	Status
P1	PRE

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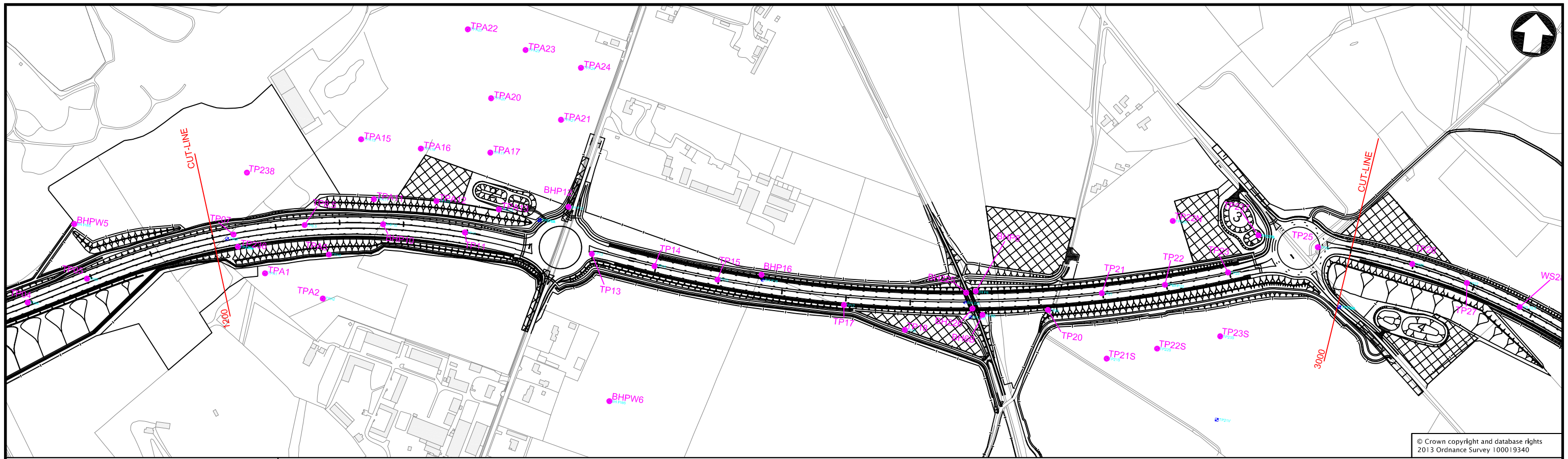

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KEY: WATERSTRIKE

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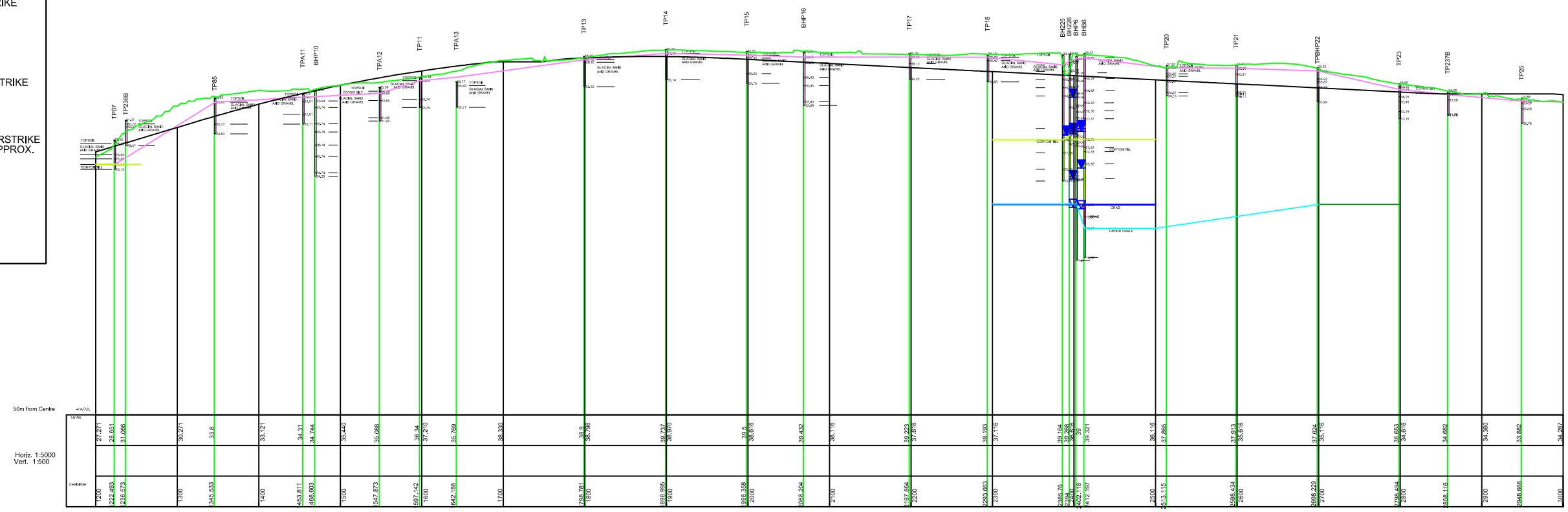

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Title

Norwich Northern Distributor Road
Geological Long Section
Within 50m of NDR

2 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS

Drawing Number: MMD-233906-DT-0816

Rev	Status
P1	PRE

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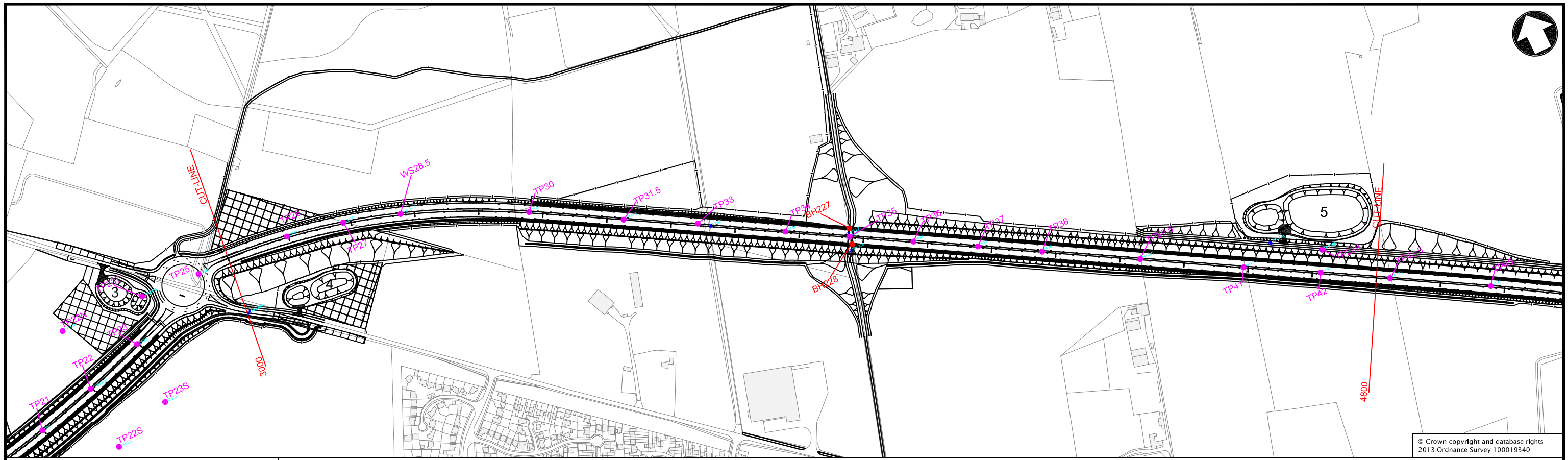

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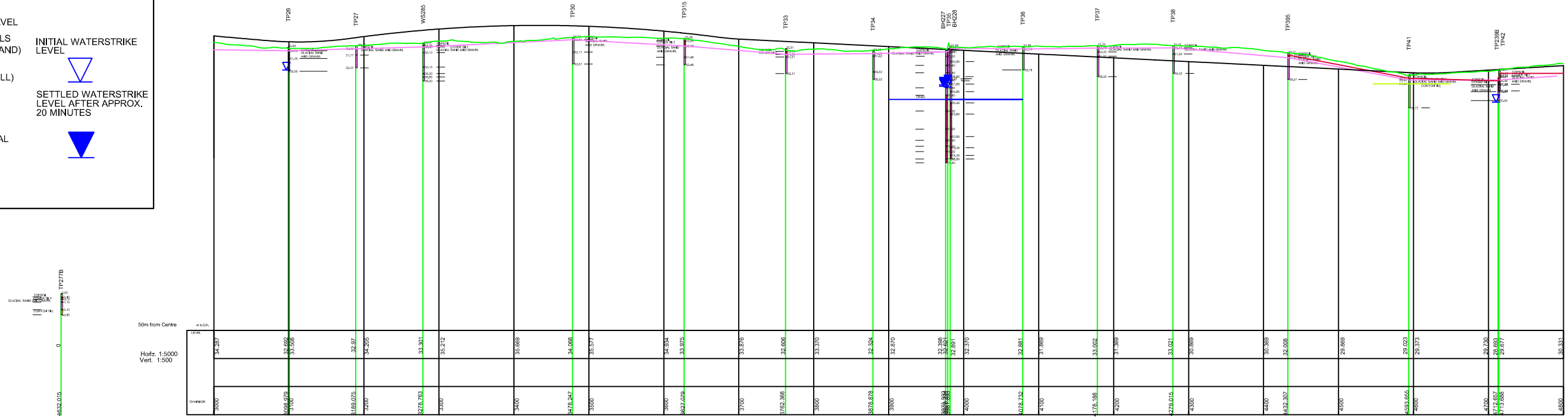
SETTLED WATERSTRIKE LEVEL AFTER APPROX. 20 MINUTES



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Norwich Northern Distributor Road
Geological Long Section
Within 50m of NDR

3 of 13

Drawing Number

MMD-233906-DT-0817

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Approved	SA
Scale at A3	NTS
Rev	P1
Status	PRE

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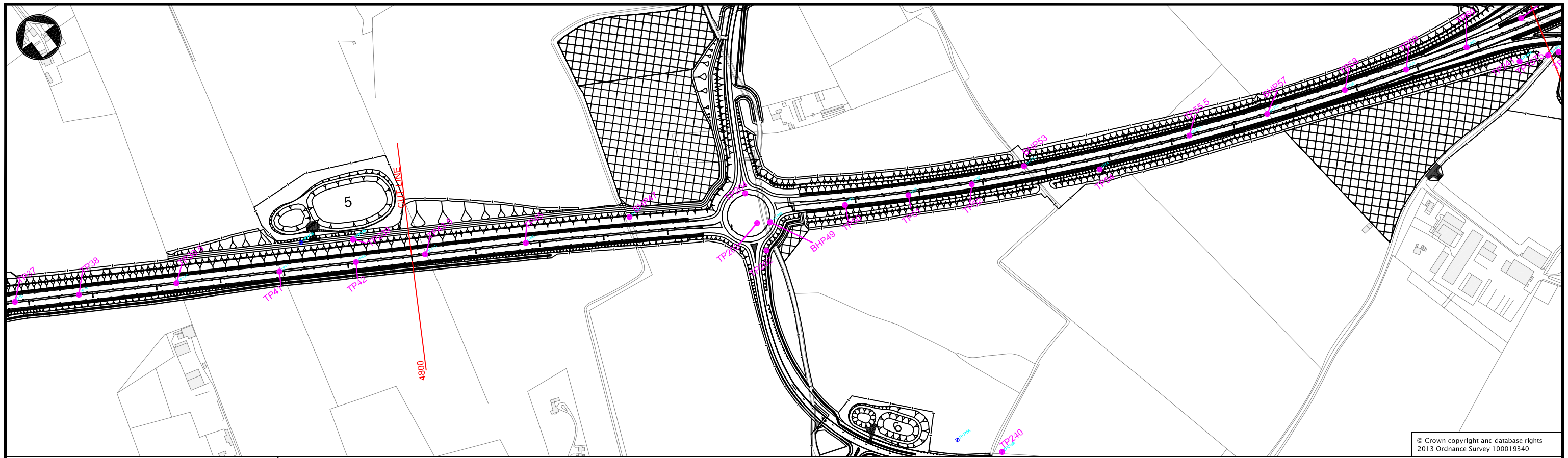

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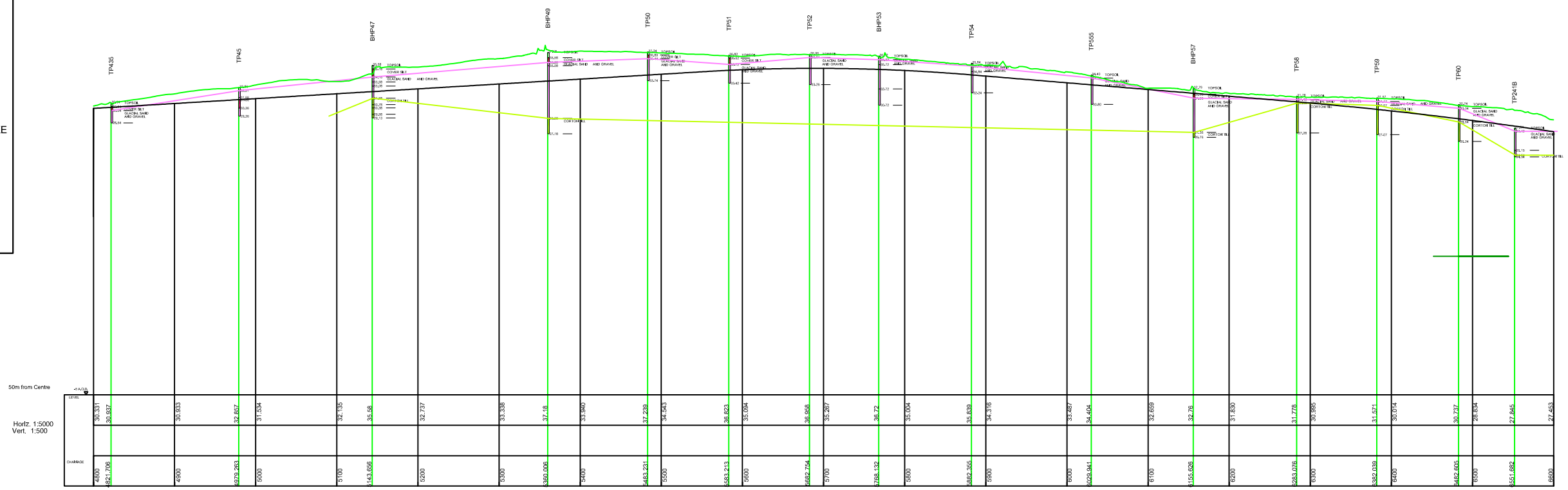

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Title

Norwich Northern Distributor Road
Geological Long Section
Within 50m of NDR

4 of 13

Drawing Number

MMD-233906-DT-0818

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS
Rev	P1
Status	PRE

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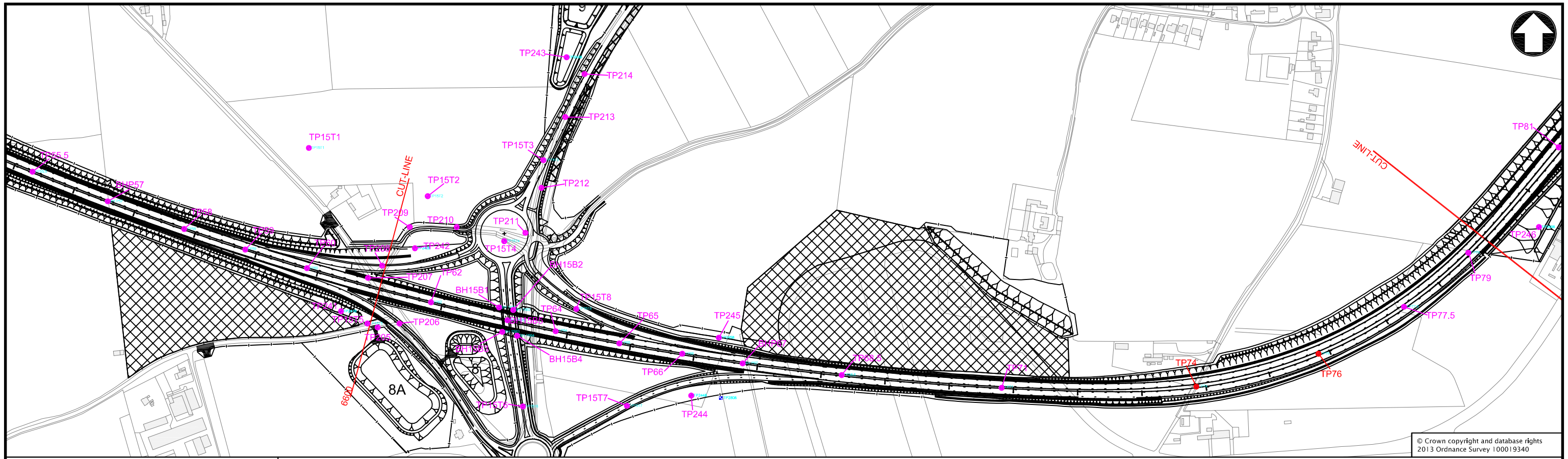

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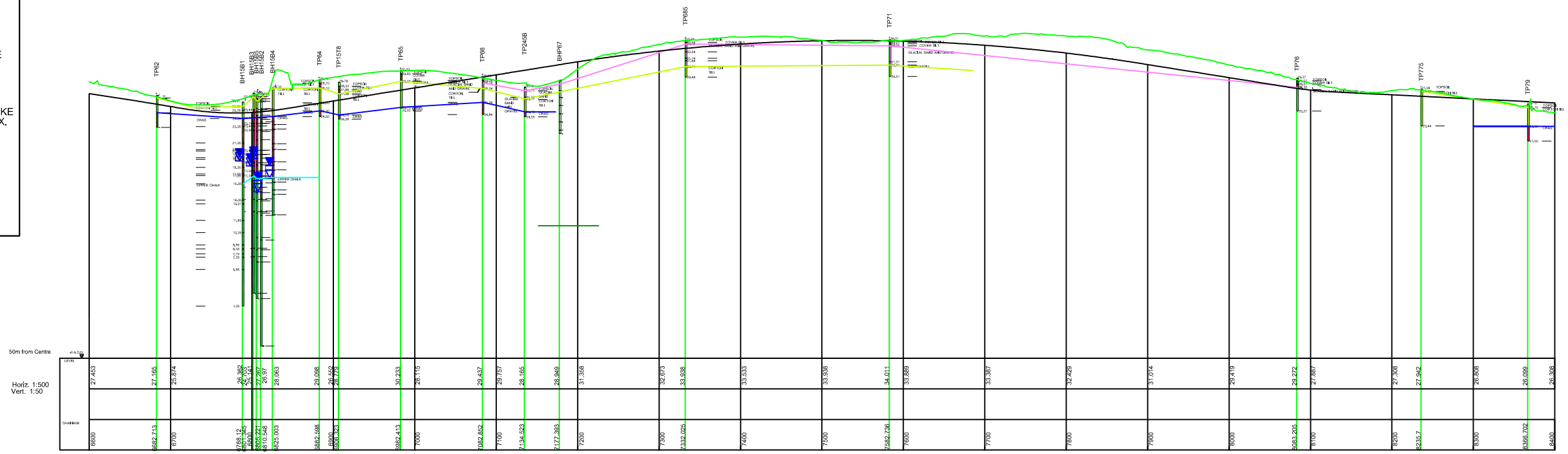
- GLACIAL SAND & GRAVELS (CORTON FORMATION SAND)
- BRICKEARTH (CORTON FORMATION TILL)
- CRAG
- UPPER CHALK
- CHALK (1976 HYDROGEOLOGICAL MAP)
- NDR

KEY: WATERSTRIKE

INITIAL WATERSTRIKE LEVEL

SETTLED WATERSTRIKE LEVEL AFTER APPROX. 20 MINUTES



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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	11/13	AW	Rev E Alignment and 2013 Data Added	BD	SA

Title

Norwich Northern Distributor Road
Geological Long Section
Within 50m of NDR

5 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS
Rev	P1
Status	PRE

Drawing Number
MMD-233906-DT-0819

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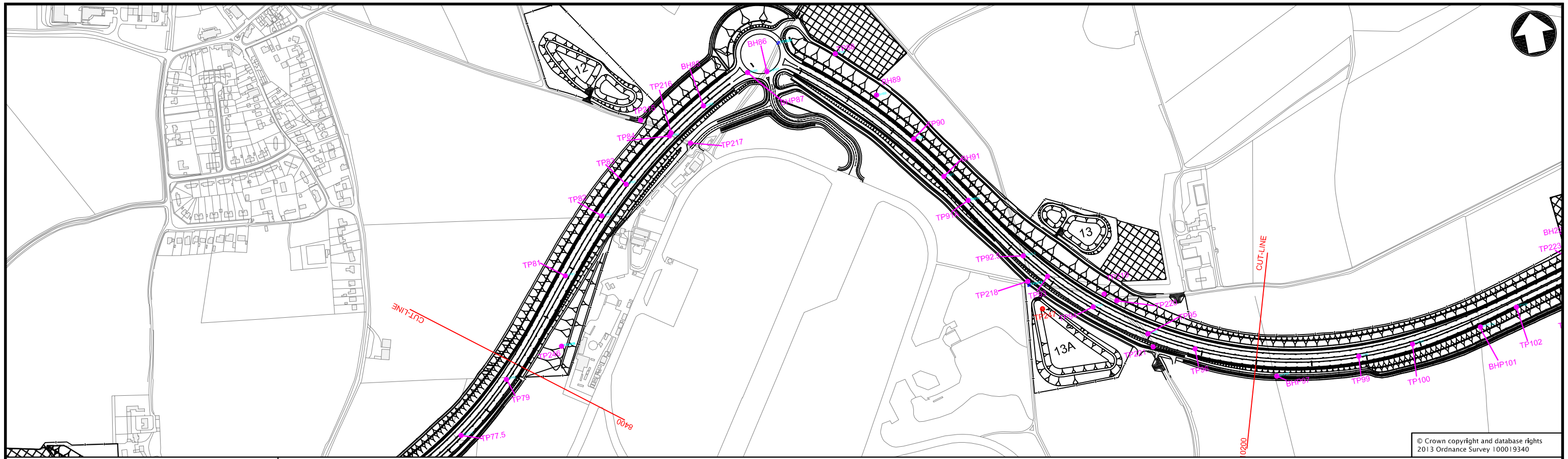

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KEY:

- TOPSOIL
- ALLUVIUM
- GLACIAL SAND AND GRAVEL
- GLACIAL SAND & GRAVELS (CORTON FORMATION SAND)
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KEY: WATERSTRIKE

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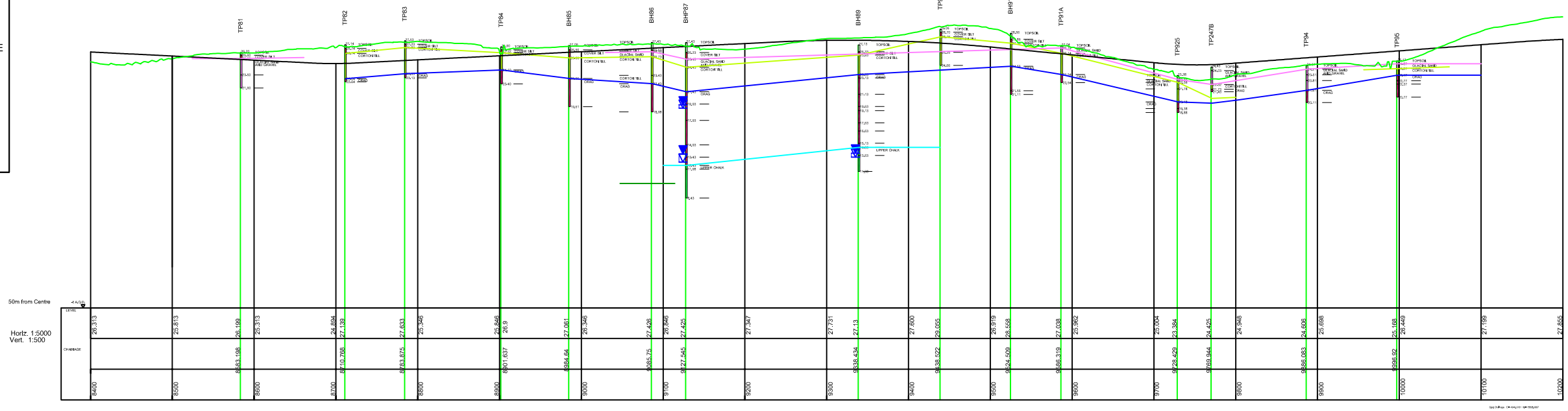

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Geological Long Section
Within 50m of NDR

6 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS

Drawing Number: MMD-233906-DT-0820

Rev	Status
P1	PRE

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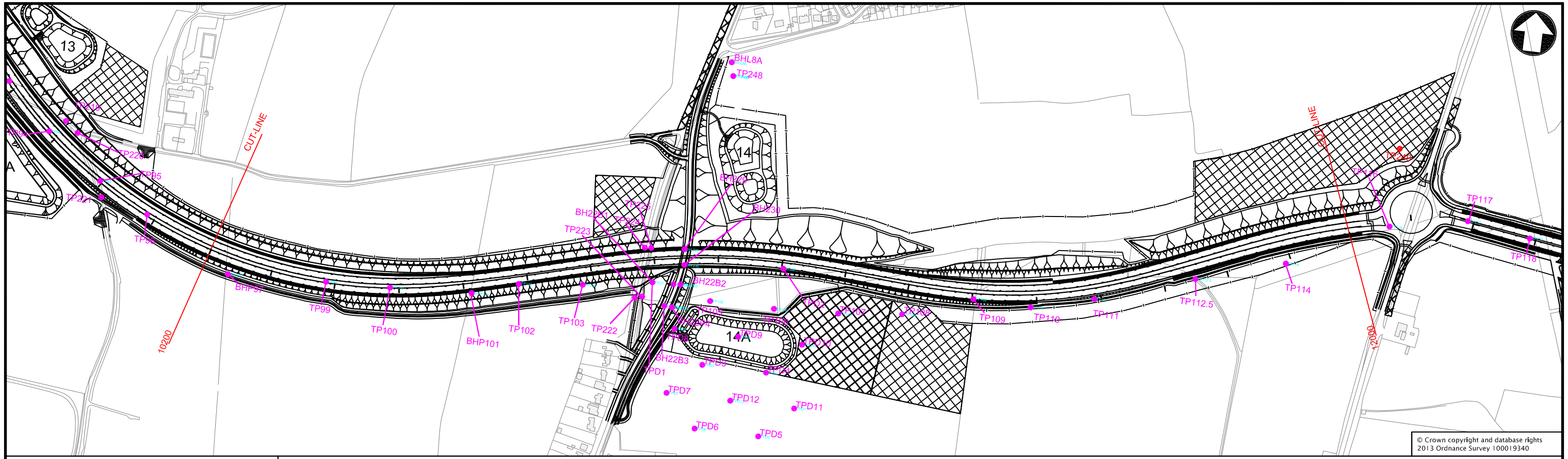

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KEY: WATERSTRIKE

INITIAL WATERSTRIKE LEVEL

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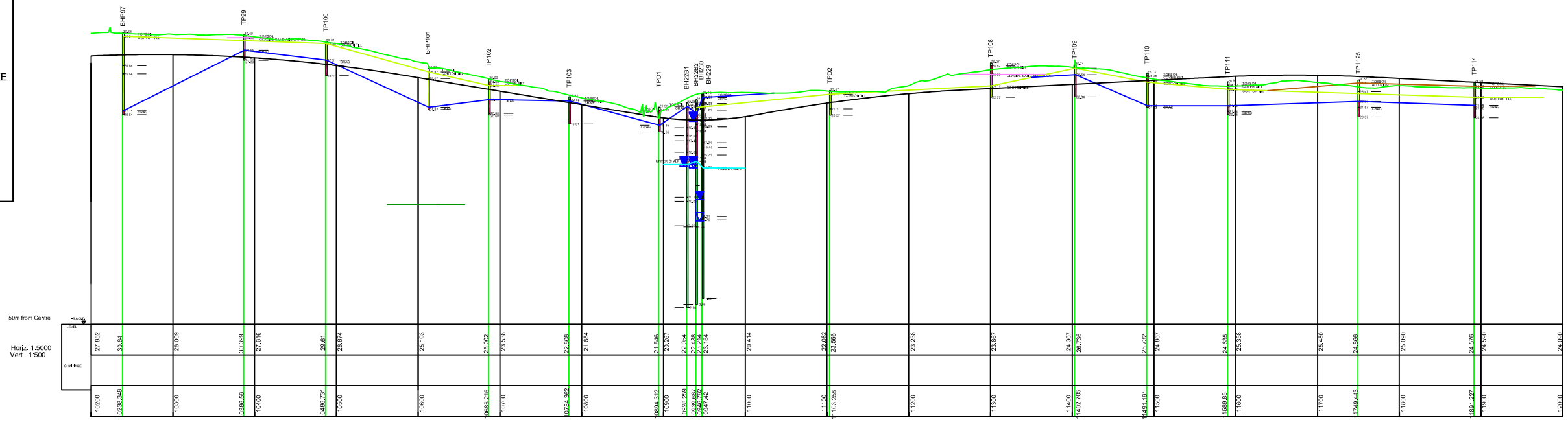

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Geological Long Section
Within 50m of NDR

7 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS

Drawing Number: MMD-233906-DT-0821

Rev	Status
P1	PRE

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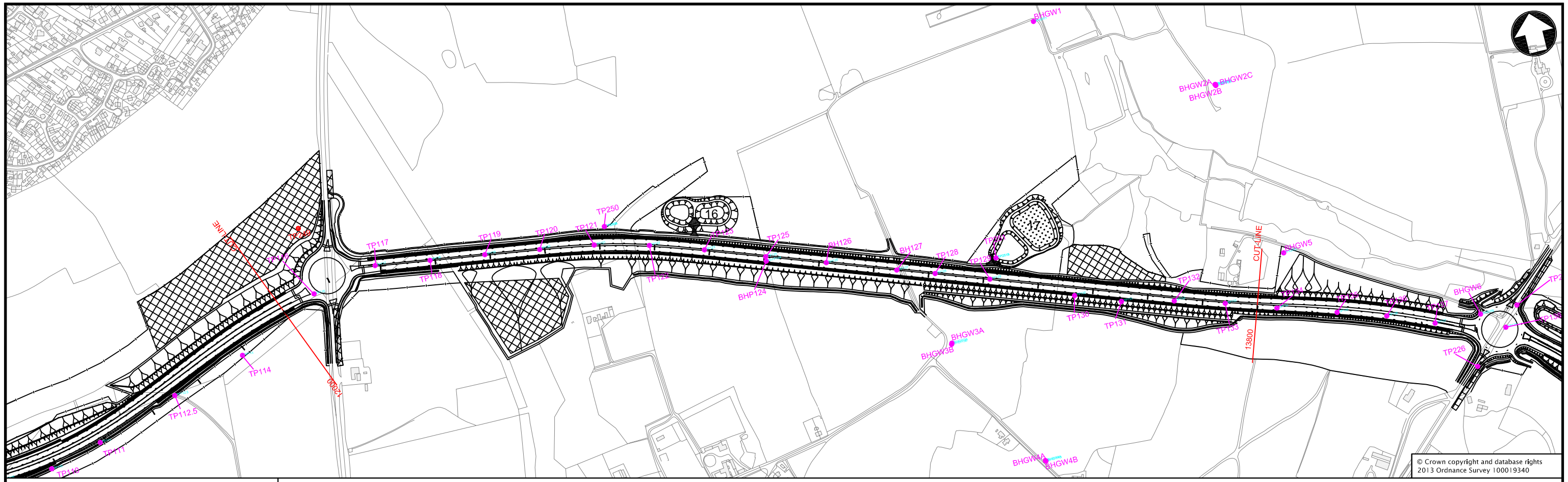

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KEY: WATERSTRIKE

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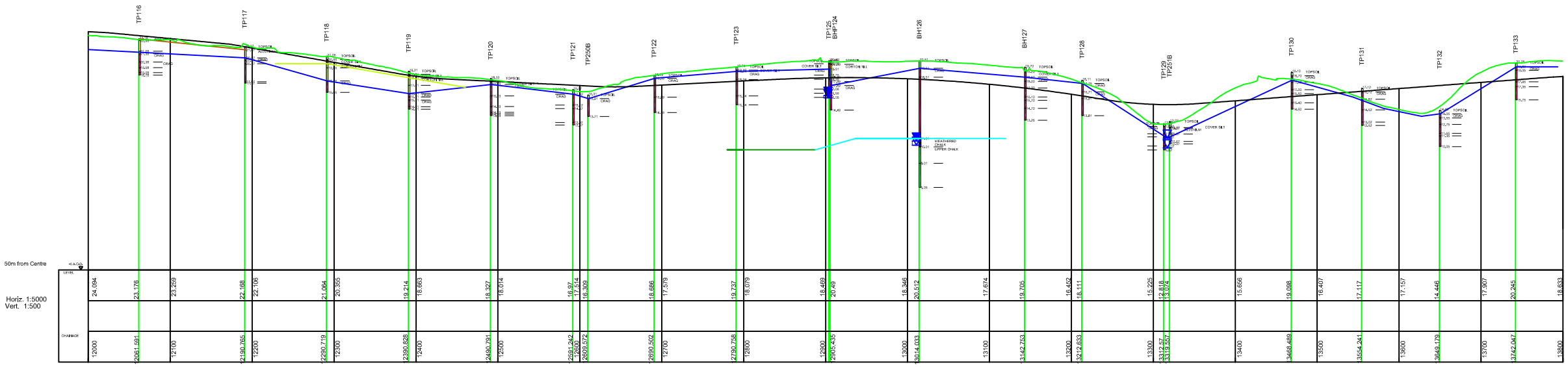

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8 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS
Drawing Number	MMD-233906-DT-0822
Rev	P1
Status	PRE

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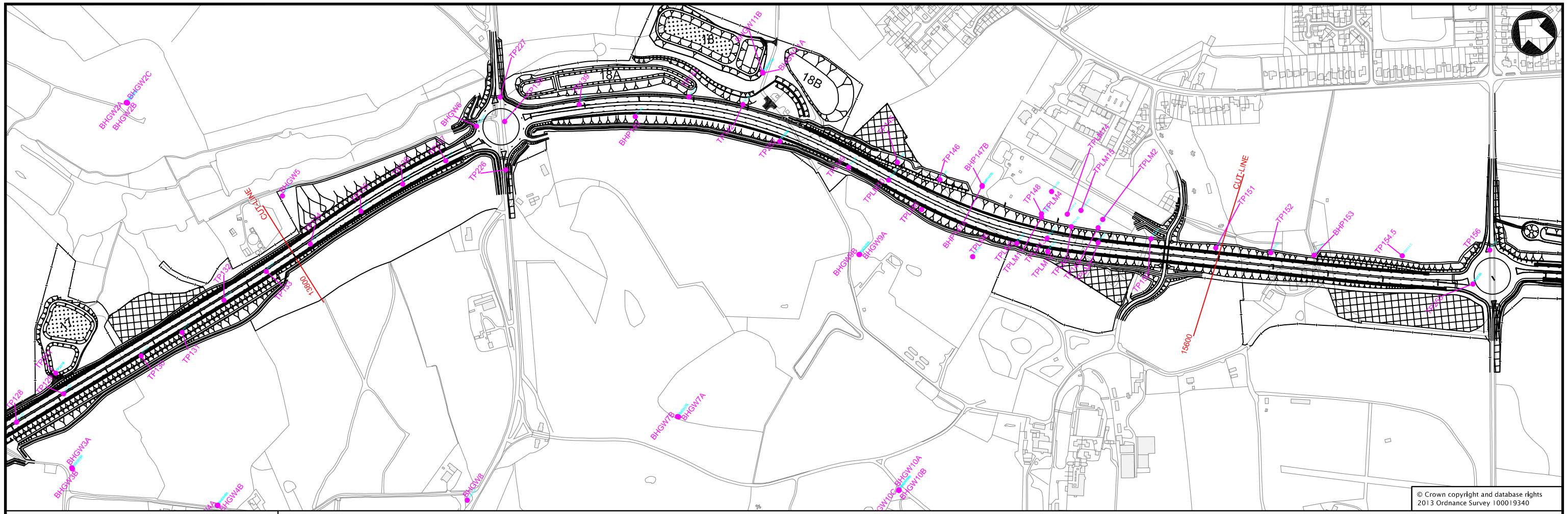

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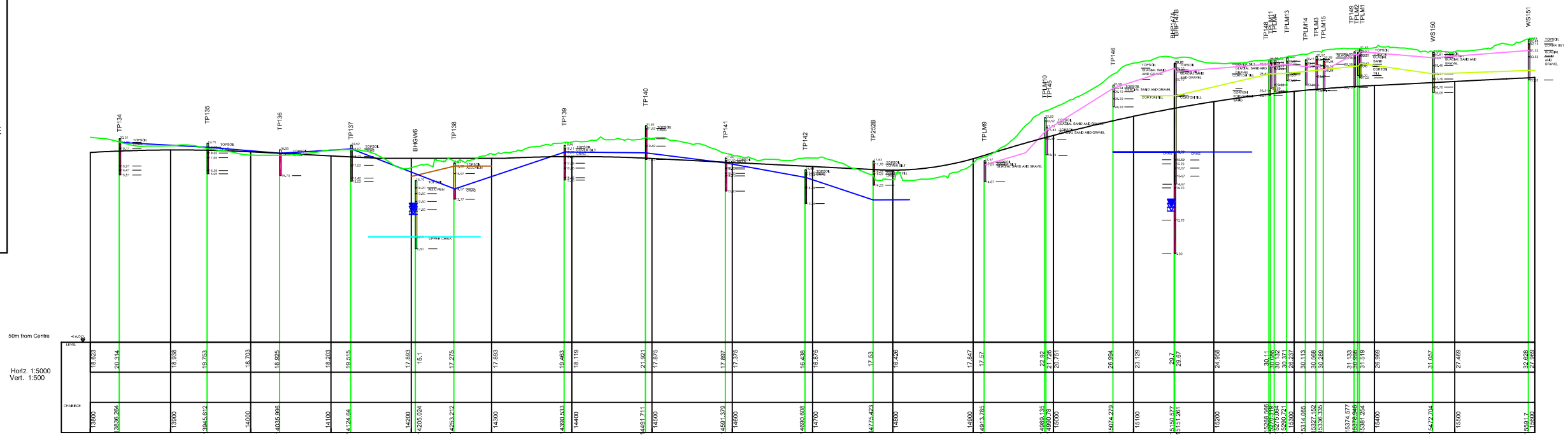

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Geological Long Section
Within 50m of NDR

9 of 13

Drawing Number

MMD-233906-DT-0823

Drawn	AW
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Approved	SA
Scale at A3	NTS
Rev	P1
Status	PRE

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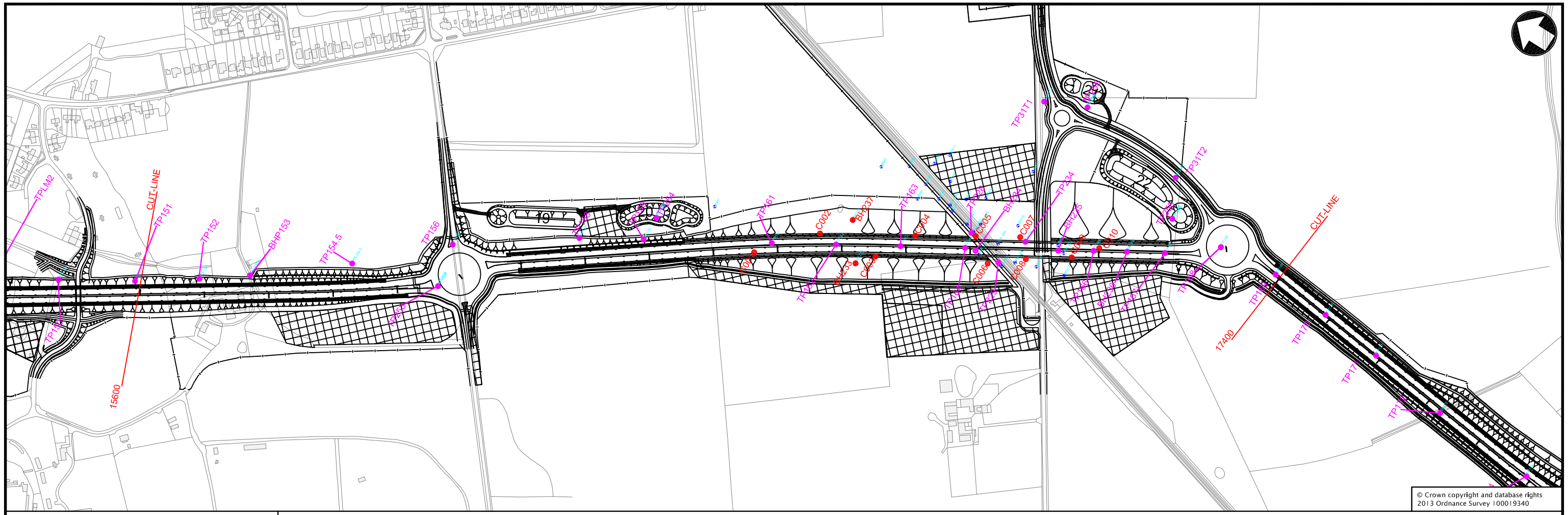

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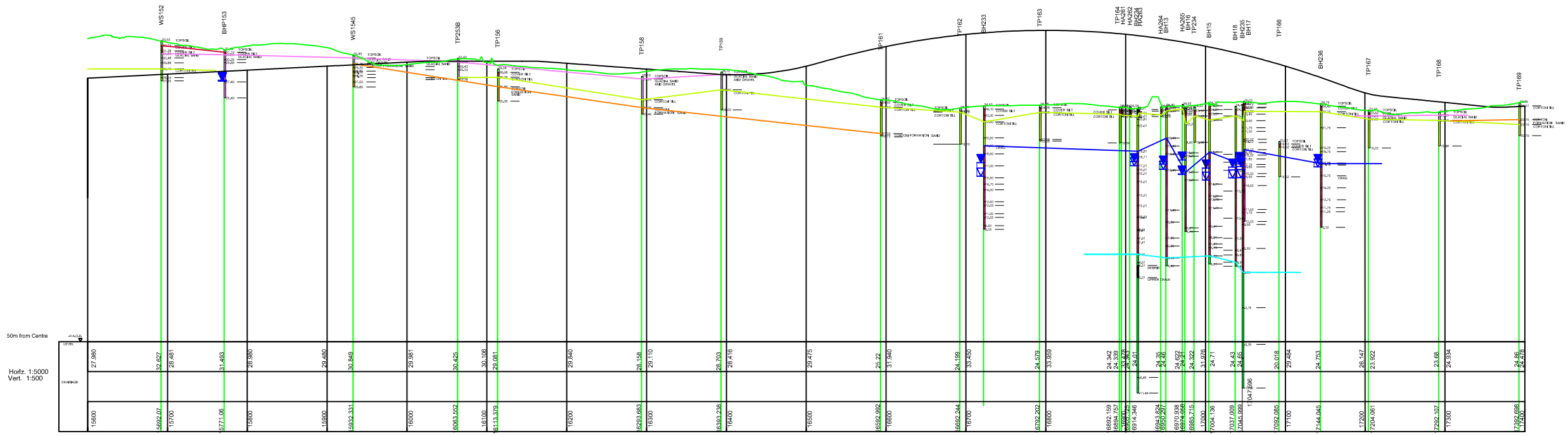

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Geological Long Section
Within 50m of NDR

10 of 13

Drawing Number

MMD-233906-DT-0824

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS
Rev	P1
Status	PRE

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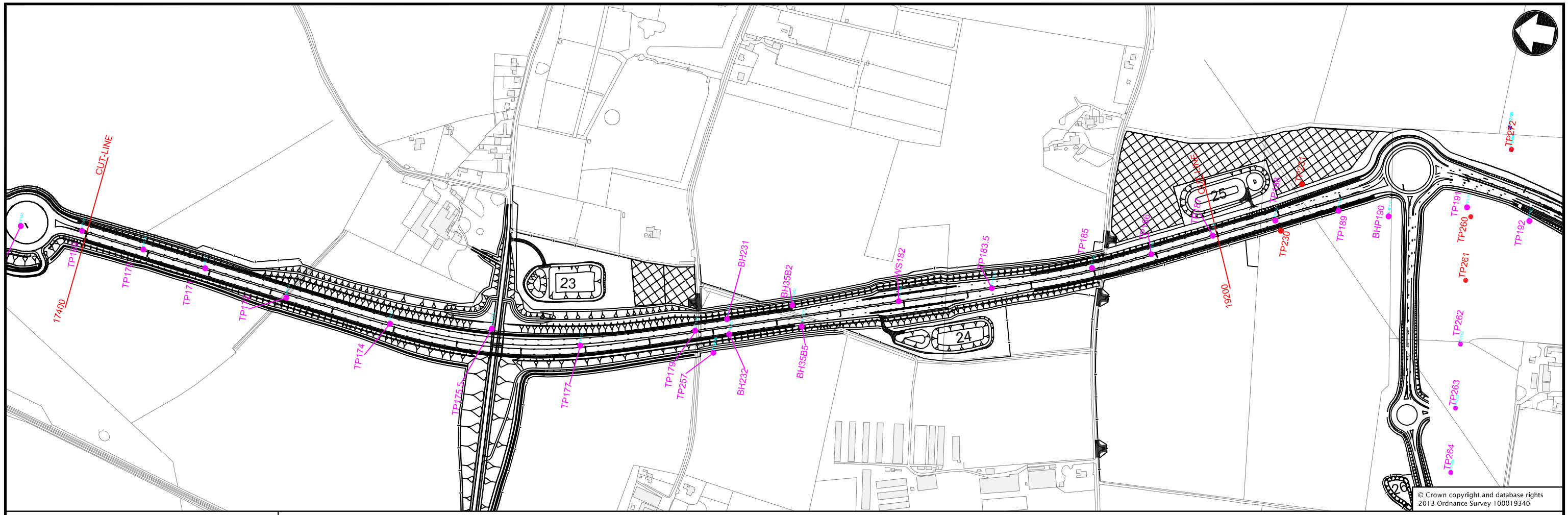

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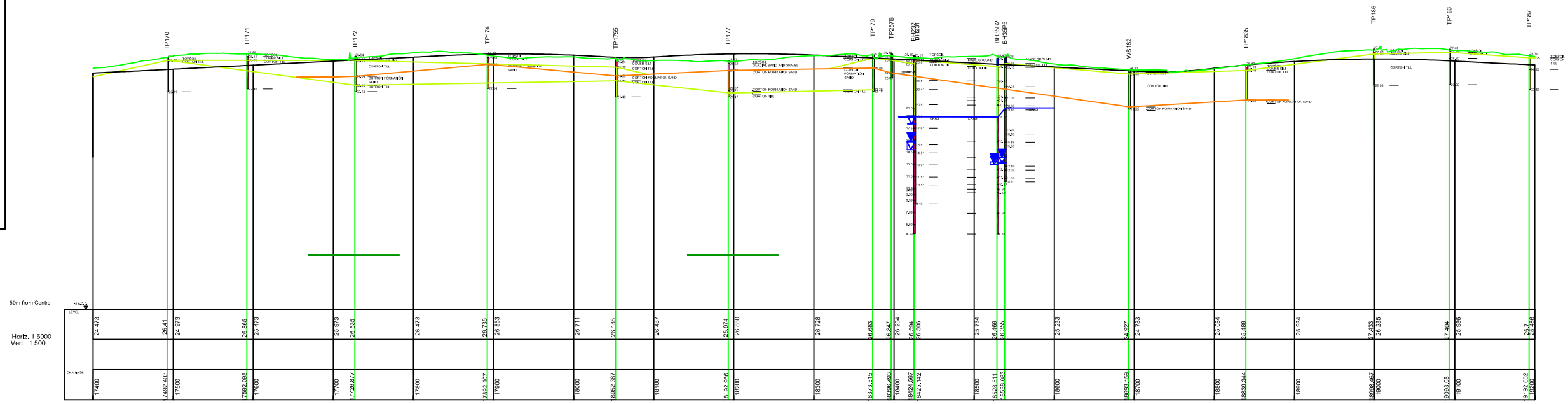

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Geological Long Section
Within 50m of NDR

11 of 13

Drawing Number

MMD-233906-DT-0825

Drawn	AW
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Approved	SA
Scale at A3	NTS
Rev	P1
Status	PRE

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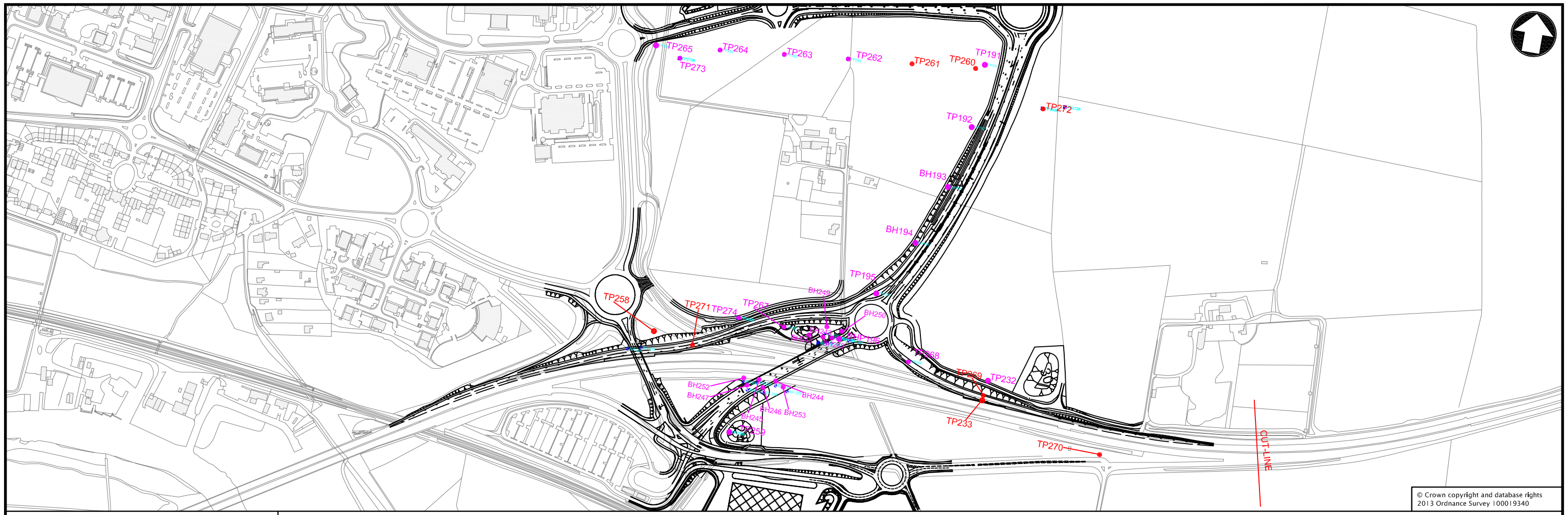

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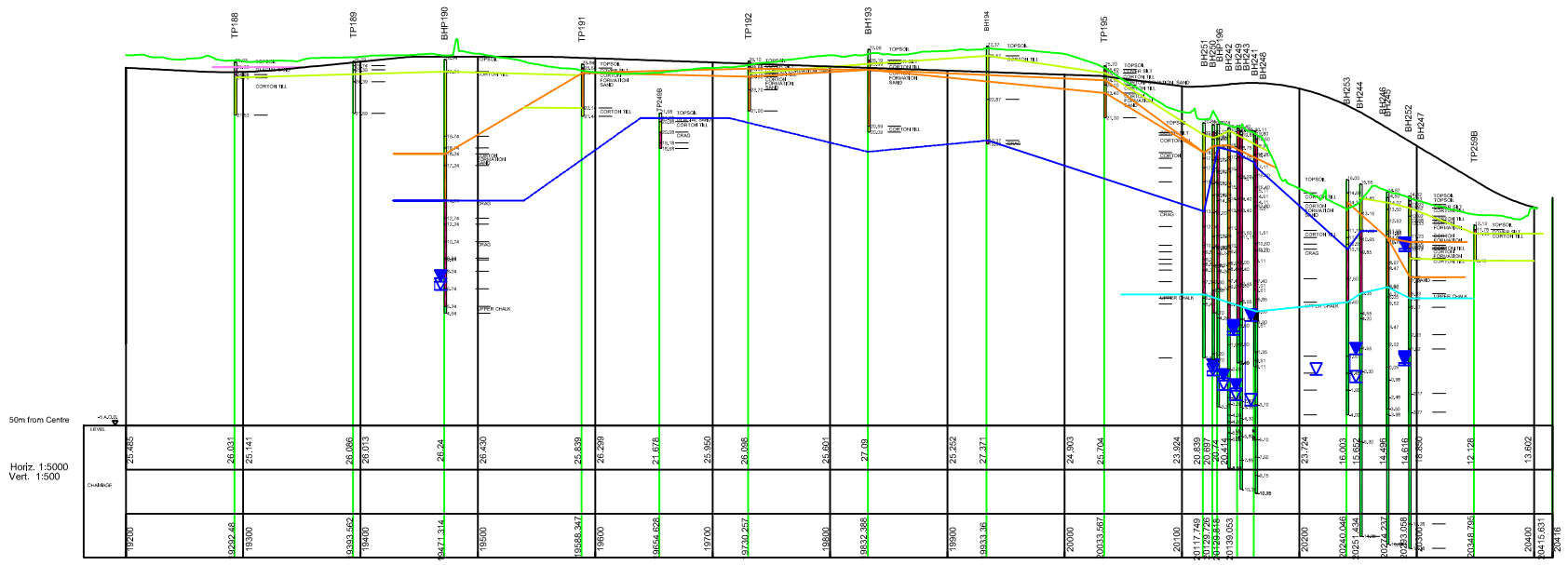

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12 of 13

Drawn	AW
Checked	BD
Approved	SA
Scale at A3	NTS
Drawing Number	MMD-233906-DT-0826
Rev	P1
Status	PRE

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Drawing Number

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Status	PRE

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