Proposed extensions to waste transfer buildings at Kettering MRF

Flood Risk Assessment

Ref: 4522
Date: September 2010
Shanks Waste Management Ltd: Proposed extensions to waste transfer buildings at Kettering MRF
Flood Risk Assessment Report

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                Project Engineer            Director
Signed:               Date:       1/9/10
                Date:       1/9/10
1 INTRODUCTION

1.1 Stirling Maynard has been engaged by Shanks Waste Management Ltd to undertake a Flood Risk Assessment (FRA) for proposed extensions to waste transfer buildings. The proposed redevelopment is to be located on the existing Materials Recycling Facility (MRF) site on Furnace Park, Old Telford Way, Kettering, Northamptonshire.

1.2 The current development is a commercial operation with a total site area of approximately 2.1 hectares. Buildings and hard paved areas occupy approximately 90% of the site.

1.3 The proposed redevelopment will comprise the construction of a new canopy over the Redox plant and an extension of the DWES Tipping Hall building. It is required to expand and improve the existing waste recycling operation that is currently run by Shanks Waste Management Ltd on this site.

1.4 The site is located outside the High or Medium Probability Flood Zones, as defined in Planning Policy Statement 25 (PPS 25) “Development and Flood Risk”.

1.5 The content of this report is intended solely for the purpose for which it was commissioned, and the findings of this assessment should not be used for any other purpose without the written consent of the originator.
2 BACKGROUND INFORMATION

2.1 Site Location and Description

2.1.1 The overall site is located on Furnace Park to the north west side of Kettering at National Grid Reference SP 860 802 and is accessed off Old Telford Way. A site location plan is contained in Appendix A of this report.

2.1.2 The overall site is situated on a north east facing slope at the northern end of Telford Way Industrial Estate and is bounded by commercial uses to the north, south and west and by the Midland Mainline London to Leicester railway to the east.

2.1.3 The overall site is approximately rectangular in plan and is operated by Shanks Waste Management Ltd. A plan of the existing development is contained in Appendix B of this report.

2.2 Topography and Site Survey

2.2.1 A topographical survey of the overall site has been carried out, which shows that the majority of the site is at approximately 88m AOD. The access off Old Telford Way is at a higher level of approximately 91.5m AOD.

2.3 Ground Conditions

2.3.1 In May 2003 and prior to the construction of the existing DWES Tipping Hall building, Norwest Holst Soil Engineering Ltd produced a Phase 2 Environmental Geotechnical Investigation report which showed that the site comprised depths of up to 2.5m of made ground overlying slightly gravelly/sandy clay.

2.3.2 A further intrusive Environmental Geotechnical investigation has been undertaken, but the complete findings of this investigation are not yet available.

2.4 Description of Floodplain

2.4.1 Information from the Environment Agency’s website shows that the site lies within Flood Zone 1, which has a low probability of flooding. Planning Policy Statement 25 (PPS 25) defines Flood Zone 1 as land having a less than 1 in 1,000 annual probability of flooding. Copies of the indicative flood maps from the Environment Agency’s website are contained in Appendix C.

2.4.2 The River Ise (a main river) runs to the north and east of the site, in a generally southerly direction, at a distance of approximately 2.5km. The OS map shows that this section of river is below the 70m AOD contour.

2.4.3 The Slade Brook (a main river) runs to the north and east of the site, in a generally southerly direction, at a distance of approximately 250m. From the 1:50,000 Ordnance Survey map of the area, the stretch of brook nearest to the redevelopment site is below the 80m AOD contour.
2.4.4 A tributary of the Slade Brook (a main river), which receives flows from Thorpe Malsor and Cransley reservoirs, is located approximately 1.75km to the south west of the site. The OS map shows that this section of the tributary is below the 80m AOD contour.

2.4.5 As can be seen from the flood maps, the redevelopment site is remote from the floodplains of the River Ise and Slade Brook and its tributaries.

2.5 Other Investigations

2.5.1 The local Statutory Drainage Undertaker (Anglian Water) was approached to ascertain the presence of Water Authority assets in the vicinity of the site and a copy of an asset plan and Pre-development Report are contained in Appendix D of this report. Anglian Water asset plans confirm the following:

- There is a 180mm MDPE water main running along the west side of Old Telford Way
- There is a 225mm diameter foul water sewer in Telford Way and also 225mm diameter and 900mm diameter surface water sewers, which all run eastwards then southwards adjacent to the railway.

2.5.2 No enquiries have been made to determine the presence of assets owned by gas, electricity and telecommunication companies.
3  PROPOSED REDEVELOPMENT

3.1 The northern half of the overall site is occupied by the existing MRF building and DWES Tipping Hall.

3.2 The proposed redevelopment site is approximately rectangular in plan and occupies the southern half of the overall site where the existing Redox plant and external waste processing areas are currently situated.

3.3 The redevelopment site is relatively flat and its plan area is approximately 0.9 hectares.

3.4 The site has an industrial past and was previously occupied by railway sidings that served the Kettering furnaces.

3.5 Photographs of the existing site are contained in Appendix E of this report.

3.6 The proposed redevelopment will comprise the construction of a new canopy over the Redox plant and an extension of the DWES building.

3.7 The canopy over the Redox processing equipment and part of the yard area will provide a shelter for the operations and containment of any waste that escapes during the processing of waste through the plant. The plan dimensions of the canopy will be approximately 65m x 22m.

3.8 The proposed building extension of the Tipping Hall is designed to accommodate an integrated arrangement of specialised waste sorting and processing equipment, which will significantly improve the efficiency of the sorting of waste. This will enable the recovery of a greater proportion of the inputs for recycling elsewhere. The plan dimensions of the extension will be approximately 50m x 40m.

3.9 An outline sketch plan for the proposed redevelopment is contained in Appendix F of this report.

3.10 The finished floor levels of the new buildings and of the external hardstanding will be similar to the existing ground levels. There are no basements or pits in the proposed scheme.

4  FLOODING RISK

4.1 Flood Mechanisms

4.1.1 In general, the main sources of flood risk are:

- Fluvial/Tidal
- Alterations to the floodplain
- Groundwater
- Surface Flows
- Sewers/Drains
Water mains

4.1.2 For the redevelopment in question, the main concern is the disposal of surface water drainage in a manner that minimises the risk of flooding both to the proposed redevelopment and to other properties.

4.2 Fluvial/Tidal Flooding

4.2.1 The site is elevated well above the floodplains of the River Ise and Slade Brook and its tributaries.

4.2.2 The site is an inland site and is not within any tidal or coastal floodplain.

4.2.3 The risks from fluvial or tidal flooding are very low.

4.3 Alterations to the Floodplain

4.3.1.1 The proposed redevelopment does not impact upon the existing floodplain.

4.4 Groundwater

4.4.1 Flooding from groundwater is caused when the water table rises above ground level (or when the floor levels of basements are not adequately protected against groundwater). From the site topography and current geological information, it appears that the risk of flooding from this source would appear to be small. Groundwater has not been encountered in any of the boreholes or trial pits undertaken at the site to date.

4.5 Surface Flows

4.5.1 Flooding from surface flows is caused when rainfall flows off of a site onto a neighbouring site. Given the topography of the site and its surrounds, it appears unlikely that any significant surface flows from outside the redevelopment could constitute a significant risk to the redevelopment site. Surface flows could enter the site via the access off Old Telford Way, although this has not been reported to us as a problem.

4.5.2 Currently, the site is mostly hard paved and is drained to either an existing drain or soakaways. We are not aware of any instances where this site has caused flooding of any adjacent sites.
4.6 Water mains

4.6.1 Burst water mains are a potential source of flooding. Provided that mains are constructed to the requirements of the Water Undertaker, then the risks should be acceptably low. There are no special circumstances that would increase the risk to this site compared to any other development.
5 STORM DRAINAGE

5.1 Information from Anglian Water

5.1.1 There are no public sewers or other assets owned by Anglian Water within the boundary of the redevelopment site.

5.2 Existing Drainage

5.2.1 A plan showing the existing site drainage system is contained in Appendix G of this report.

5.2.2 An existing 325mm diameter drain runs across the site from west to east and then under the railway line. Currently, the surface water runoff from all roofs discharges into this existing drain. It is estimated that approximately 56l/s discharges to this drain from the existing roof areas, based upon the normal gutter design criteria of a 1 in 1 year storm event.

5.2.3 Surface water runoff, from hard standings currently on the site, flows into a piped system and then outfalls to on-site soakaways via an interceptor, located immediately to the south of the existing DWES Tipping Hall.

5.3 Redevelopment Drainage Strategy

5.3.1 An ineffective drainage system can result in localised flooding, as surface water cannot be efficiently discharged from the site. In addition, if drainage is permitted to freely discharge from the site, then there may be an increased risk to flooding to other sites and properties.

5.3.2 Building Regulations require that disposal of rainfall should be by one of the following means (in order of priority):

- To soakaways or other form of infiltration
- To a watercourse
- To a sewer

5.3.3 In order to ensure that the proposed redevelopment does not increase the risk of flooding elsewhere in the catchment, the following outline drainage strategy has been defined:

Surface Water Drainage from Roofs:

- The existing roof areas drain to the existing 325mm diameter pipe referred to in 5.2.2 above. It is proposed that the new roof areas will also ultimately drain to this pipe.
So as to minimise flood risk, the drainage system will be designed so that the rate of discharge from the redevelopment into the existing drain is no greater than the current rate of discharge. This will require attenuation of runoff from both the new roof areas and part of the existing roof area.

The drainage system serving the eastern side of the existing DWES tipping hall roof (an area of approximately 1240m$^2$) lends itself to being readily diverted to an attenuation facility. The surface water runoff from this area is approximately 13l/s, based upon the normal gutter design criteria of a 1 in 1 year storm event. This would reflect the likely capacity of the eaves gutter system and hence the maximum discharge of the existing roof drainage system serving this area of roof to the 325mm diameter drain, referred to in 5.2.2 above.

Drainage from this area of roof will be collected in a dedicated drainage system, along with runoff from the new roof areas, and taken to an underground tank.

Preliminary calculations show that by restricting the outfall from this attenuation tank to the existing drain to a rate of 13 litres/second, the tank would require a capacity in the order of between 210 and 301m$^3$ for a 1 in 100 year rainfall event, including a 20% allowance for climate change.

Surface Water Drainage from Hardstandings:

The site now operates under an Environmental Permit issued by the Environment Agency (EA). When this permit was issued, it included an improvement condition relating to the surface water drainage. At present all hardstanding drainage outfalls to soakaway via an interceptor. The EA is concerned about this because of the high BOD and COD content of the surface water runoff. To address this concern, Shanks has agreed with the EA that high risk areas will be drained separately from the remaining hardstanding areas.

The high risk areas are associated with the Redox Plant and adjacent external processing areas. These hardstanding areas (approximately 4280m$^2$) will be drained to an underground tank, which can be pumped out periodically to tankers and the effluent taken offsite to a treatment plant. The perimeter of these areas will be bunded to contain runoff.

The underground tank will be designed to hold a 1 in 30 year storm with full retention and no outflow. Preliminary calculations show that the tank would require a capacity in the order of 450m$^3$. The underground tank will be need to be emptied periodically and the water removed off-site by tanker. Shanks will have operating procedures in place to ensure that sufficient capacity is maintained in the tank to cope with the volume of water generated during a 1 in 30 year storm.
Runoff from a 1 in 100 year storm will be collected on the surface of the hardstanding and contained within the perimeter bund. Preliminary calculations show that 560m$^3$ of storage would be required for this rainfall event. On the assumption that there would be in the order of 10m$^3$ storage in the pipes and manholes of the associated drainage system, then 100m$^3$ would need to stored on the surface of the hardstanding. This would equate to 23mm over the area of approximately 4280m$^2$.

The remaining hardstanding areas will continue to be drained to soakaway as per the existing strategy, although due to the footprint of the proposed DWES building extension, it will be necessary to relocate the existing interceptor and soakaways to immediately south of the MRF building. The volumes of water dealt with by the relocated soakaway will be significantly less than the existing, due to the large area of hardstanding that will be taken to the holding tank described above. The area drained to soakaway will be reduced from 7125m$^2$ to 4278m$^2$ with this proposal.

5.3.4 An Outline Drainage Strategy sketch illustrating these proposals is contained in Appendix H, along with preliminary storage calculations (using Micro Drainage’s WinDes design software). These calculations use FEH rainfall estimates and include a 20% factor to allow for climate change, in accordance with Table B2 of PPS 25.

5.3.5 Provided attenuation features and control devices are designed, constructed and maintained in accordance with the recommendations of “The SUDS Manual”, published by CIRIA (C697), the residual risks of surface water flooding should be low. As with any drainage system, chambers, catchpits, silt traps and attenuation devices should be routinely inspected and debris and silt removed.

5.3.6 Provided the surface water drainage systems for the proposed redevelopment are properly designed, constructed and maintained, then there should not be any surface flows generated by the redevelopment.
6 FOUL DRAINAGE

6.1 Information from Anglian Water

6.1.1 There are no public sewers or other assets owned by Anglian Water within the boundary of the development site.

6.1.2 The foul sewers in Telford Way are currently operating close to capacity and as a result Anglian Water would not be able to accept trade flows of the volume quoted on the pre development form.

6.1.3 If the development proposal includes any discharge of "Trade Effluent" to the public sewerage system, then prior written Consent to Discharge from Anglian Water must be obtained as detailed under Section 118 of the Water Industry Act 1991.

6.1.4 The foul drainage from this development will be treated at Broadholme Sewage Treatment Works that at present has available capacity for these flows.

6.2 Existing Drainage

6.2.1 Currently, there is a foul drainage system taking domestic foul sewage from the site welfare facilities to a Klargester septic tank near the weighbridge office. Flows from the septic tank are drained to two nearby soakaways.

6.3 Redevelopment Drainage Strategy

6.3.1 The existing Klargester and its associated soakaways are sufficiently clear from the proposed new building and can be retained. Hence, the foul drainage will continue to be drained as per the existing strategy.
CONCLUSIONS AND RECOMMENDATIONS

7.1 The site of the proposed redevelopment is located within Flood Zone 1, as defined in PPS 25 and is assessed as having a low (i.e. less than 1 in 1,000 year annual) probability of flooding from a watercourse.

7.2 The main risks of flooding to the redevelopment or resulting from the redevelopment relate to the surface water drainage from the site. An ineffective drainage system can result in localised flooding, as surface water cannot be efficiently discharged from the site or effectively stored within the site. In addition, if drainage is permitted to freely discharge from the site, then there may be an increased risk to flooding to neighbouring sites and properties.

7.3 The existing site is approximately 90% impermeable and the proposed redevelopment will not create significantly more runoff than is currently the case. The proposed surface water drainage systems for this redevelopment will be as follows:

**Roof Drainage:**

The drainage system will be designed so that the rate of discharge from the redevelopment into the existing drain is no greater than the current rate. This will require attenuation of runoff from both the new roof areas and part of the existing roof area. Runoff will be collected in a dedicated drainage system and taken to an underground tank serving the new roofs and part of the existing roofs.

The outfall from this tank will discharge to the existing drain at a rate of approximately 13 litres/second for a 1 in 100 year rainfall event. Preliminary calculations show that the tank would require a capacity in the order of between 210 and 301m³, which includes a 20% allowance for climate change.

**Hardstanding Drainage:**

Shanks has agreed with the EA that high risk areas will be drained separately from the remaining hardstanding areas. The remaining hardstanding areas will continue to be drained to soakaway as per the existing strategy but volumes of water to be accommodated will be significantly less due to the new separate system for the high risk areas.

The high risk hardstanding areas (approximately 4280m²) will be drained to an underground tank, which can be pumped out periodically to tankers and the effluent taken offsite to a treatment plant. The perimeter of these areas will be bunded to contain runoff.

The underground tank will be designed to hold a 1 in 30 year storm with full retention and no outflow. Preliminary calculations show that the tank would require a capacity in the order of 450m³. The underground tank will be need to have level alarms and be emptied periodically and the water removed off-site by tanker. Shanks will have operating procedures in place to ensure sufficient capacity is always maintained in the storage tank.
Excess runoff from storms that cannot be contained in the storage tank will be collected on the surface of the hardstanding and contained within perimeter bunds.

7.4 Provided attenuation features and control devices are designed, constructed and maintained in accordance with the recommendations of “The SUDS Manual”, published by CIRIA (C697), the residual risks of surface water flooding should be low. As with any drainage system, chambers, catchpits, silt traps and attenuation devices should be routinely inspected and debris and silt removed.
APPENDIX A

Site location plan
Site location plan
APPENDIX B

Plan of existing development
Shanks Waste Management Ltd: Proposed extensions to waste transfer buildings at Kettering MRF
Flood Risk Assessment Report

Plan of existing development
APPENDIX C

Floodplain maps
Shanks Waste Management Ltd: Proposed extensions to waste transfer buildings at Kettering MRF
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Environment Agency floodplain maps
APPENDIX D

Correspondence from Anglian Water
PRE DEVELOPMENT REPORT PREPARED FOR:

Mr Duncan Morris
shanks group plc.
Dunedin House
Auckland Park
Mount Farm
Milton Keynes
MK1 1BU

Land at Kettering MRF Furnace Park Old Telford Way, Kettering
Proposal: waste materials to sewer
Your ref: KETMRF

Prepared by: Keith Simpson
Date: 23 December 2009

If you would like to discuss any of the points in this report please contact me on 01733 414570 or email planningliaison@anglianwater.co.uk

Important Notice
This report is based on the best current information available. This may change if there is further development in the area or for other reasons. You are advised therefore to renew your enquiry should there be a delay in submitting your application for water supply/sewer connection to re-confirm the situation. The information contained in this report may be used to support an application for planning permission.
Contents

1. Extract of Anglian Water Assets

2. Assets within or close to the boundary of the site

3. Water supply

4. Drainage

5. Budget costs

6. Water efficiency

7. Request for refund of pre development enquiry fee form
1. EXTRACT OF ANGLIAN WATER ASSETS

1.1. An extract from our records showing the development site and any Anglian Water assets in the vicinity of the site is attached for your information. However, a more comprehensive plan will be sent direct from our Asset Data Management Centre.

1.2. This plan is provided by Anglian Water pursuant its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but the position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, record at all, the location of any water main, discharge pipe, sewer or drain or disposal main or any item of apparatus. This information is valid for the date printed. The plan is produced by Anglian Water Services Limited, trading as Geodesys from Ordnance Survey © Crown Copyright, WU 298492. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other use of the map data or further copies are not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.
2. **ASSETS WITHIN OR CLOSE TO THE BOUNDARY OF THE SITE**

2.1. Our records show that there are no public sewers or other assets owned by this company within the boundary of the development site. However, you need to be aware that the site may contain private water mains, sewers or other water installations not shown on our records and subsequently are not Anglian Water’s responsibility but that of the landowners.
3. WATER SUPPLY

3.1. Information relating to the water supply to this development site was not requested with this enquiry. However, should you require this information at a later date please contact us to discuss on 01733 414690.
4. **DRAINAGE**

4.1. If you would like the opportunity to discuss this development given the constraints highlighted below, please contact Martin Kitchener the Developer Account Manager for this development on 08457 626784.

4.2. For foul water you must make a formal application under Section 106 of the Water Industry Act 1991 prior to commencement of works to obtain the approved method and location of connection.

4.3. Sewers intended for adoption must be constructed in accordance with ‘Sewers for Adoption, Sixth Edition’ a copy is available from the publisher; Water Research Centre, Frankland Road, Blagrove, Swindon, Wilts. SN5 8YF. Before commencement of any works you are advised to make a formal application under Section 104 of the Water Industry Act 1991. The application form may be downloaded from the website: www.anglianwater.co.uk, developers page, go to developers, application forms, sewerage application forms - application for the adoption of a new sewer form ($104) or alternatively we can post to you on request.

**Foul**

4.4. The foul sewers in Telford Way are currently operating close to capacity and as a result we would not be able to accept trade flows of the volume quoted on the pre development form. It is noted from your calculations that the area of 20,968 m² includes highway and roofed areas which should utilise the existing surface water arrangements and have no impact on the public foul water sewerage system.

4.5. If the development proposal includes any discharge of “Trade Effluent” to the public sewerage system, then prior written Consent to Discharge from Anglian Water must be obtained as detailed under Section 118 of the Water Industry Act 1991.

4.6. The Catchment Quality Scientist for the development is Tim Blackmore and he is available on telephone number 01908 453178. You are advised to contact him before any work commences in order to discuss your proposed trade or waste process. This will ensure you are made aware of the above provisions and their obligations under the Duty of Care provisions of the Environmental Protection Act. The “Consent” of Anglian Water for the discharge of trade effluent to the foul sewer as a result of this development is not implied by these observations.

**Wastewater Treatment**

4.7. The foul drainage from this development will be treated at Broadholme Sewage Treatment Works that at present has available capacity for these flows.
Surface Water

4.8. The maximum surface water discharge we could accept as trade flow without significant upgrades is 3 litres per second up to a storm event of 1 in 30 years and will require some form of on-site attenuation; the details will need to be agreed with the Local Planning Authority/Internal Drainage Board/Environment Agency. You should also be aware that Anglian Water will not adopt an open balancing pond, although we would consider the adoption of oversized pipes.
5. **BUDGET COSTS**

Please note that any costs indicated in this report are a current estimate and for budget purposes only.

On receipt of applications for supply and connection a quotation will be provided.

A summary of charges 2009/10 can be found at www.anglianwater.co.uk, developers page, go to developers - summary of charges.
6. WATER EFFICIENCY

The Code for Sustainable Homes replaced the Ecobuild Standard on 1 April 2007. This code provides guidance on how certain levels of water efficiency can be achieved.

We would encourage you to consider ways in which reductions in water consumption can be achieved so that the impact on this precious resource and the environment can be reduced.

Some areas to be considered:

- Dual flush toilets
- Showers with flow rates in the order of 8-10 litres per minute
- Low-flow/spray taps at Wash hand basins
- Appliances such as washing machines and dishwashers selected for water efficiency as well as energy efficiency
- Efficient pipe work design to ensure domestic hot water appliances (cylinder or combination boiler etc) is located as close as possible to points of use thus ensuring the amount of water needed to be drawn off before hot water is delivered at the required temperature is minimised.
- Water butts/ rainwater collection
# Shanks Waste Management Ltd: Proposed extensions to waste transfer buildings at Kettering MRF
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### anglianwater

**REQUEST FOR REFUND OF PRE DEVELOPMENT ENQUIRY FEE**
(form to be submitted once water and or wastewater scheme has progressed)

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<td></td>
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<td>Milton Keynes</td>
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<td>MK1 1BU</td>
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To be completed by the applicant once water and or wastewater scheme has progressed

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I.e. work order no. or sewer connection ref no.

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Please sign and return completed form to:
Anglian Water, Planning & Equivalence, PO Box 1067, PETERBOROUGH, PE1 9JG

Pre Development, Planning & Equivalence v4 08/09
22/12/09 page 10 of 10 Reference 1104/PA103(001)
APPENDIX E

Site photographs
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Redox plant viewed from the south
MRF building and DWES tipping hall viewed from the south
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DWES tipping hall viewed from the south
APPENDIX F

Plan of proposed redevelopment
Plan of proposed redevelopment
APPENDIX G

Existing drainage systems
APPENDIX H

Outline drainage strategy sketch and indicative drainage calculations
WinDes Quick Storage Estimate for Hardstandings

1:30 year return period
Full retention (no outflow)
Allowance for 20% climate change
Approximate storage required is 450m³
WinDes Quick Storage Estimate for Roofs

1:100 year return period
13 l/s allowable discharge rate
Allowance for 20% climate change
Approximate storage required is between 210 m³ and 301 m³