
CRADDY PITCHERS DAVIDSON

CALCULATIONS

| Client | Project |
|-------------|-----------------|
| Aldi Stores | RDC, Goldthorpe |

| Calculation No | Calculation Title | Status |
|----------------|----------------------------------|----------|
| Drains 9206-01 | Stormwater Drainage Calculations | Approval |

| Notes |
|---|
| <ul style="list-style-type: none">• These calculations have been produced to discharge pre-commencement planning conditions with regard to stormwater drainage.• The drainage strategy incorporates soakaways, swales/ditch and filter drains to reduce the discharge rate from site into the existing watercourse (Highgate Lane Drain).• The drainage strategy utilises infiltration and attenuation to limit the discharge rate from site to a maximum of 4l/s/ha as outline in the Flood Risk Assessment prepared for the site by Ove Arup and Partners dated August 2007.• The calculations are presented as Microdrainage WinDes output.• Refer to the drainage layout for more information. (Craddy Pitchers Davidson Drawing reference 9206-1200) |

| Revision | Date | Notes | Author | Checked | Approved |
|----------|----------|-------------|--------|---------|----------|
| A | 17/08/12 | First Issue | LW | CSD | CSD |
| | | | | | |
| | | | | | |

1. INTRODUCTION/SITE DESCRIPTION

- 1.1. It is proposed to construct an Aldi Regional Office and Distribution Centre at Greenfield land located adjacent to the Goldthorpe Industrial Estate (Refer to appendix A for aerial photo/site location). The development consists of warehousing and offices with associated lorry layover and loading bays, a staff car park, a vehicle service area, refuse area, an access road and landscaping areas. The site is approximately 24Ha of which 10.7Ha will become impermeable as either hardstanding or roof area. The proposed development significantly increases hard standing areas (Refer to Appendix B for proposed development and drainage layout).
- 1.2. This document considers the stormwater drainage strategy for the proposed development.
- 1.3. The original planning application for the development considers two possible building sizes, a Phase 1 development (smaller building footprint) with a potential future expansion zone. This drainage strategy considers only the Phase 1 development.

2. DESIGN CRITERIA

- 2.1. The scheme design of the drainage system has been carried out in accordance with all relevant Codes of Practice and Design Guides. These include, but are not limited to the following:
 - A. CIRIA C697: SUDS manual (For environmental and sustainability assessment of different options and sizing of the swale, soakaways and filter drains)
 - B. The Approved Documents: Building Regulations 2000 Part H: Drainage and Waste Disposal (To adhere to UK building regulations)
 - C. BS 8301:1995: Code of Practice for Building drainage (To specify bedding materials)
 - D. BS EN124: Gully Tops and Manhole Tops for Vehicular and Pedestrian Areas (To specify manhole covers)

3. DRAINAGE PRINCIPLE

- 3.1. The main drainage principle, based on the SUDS management train, was to discharge surface water runoff from the building roof, lorry bays (and associated roads) into the existing water course at Greenfield run off rates (QBAR). Infiltration and attenuation techniques are adopted to reduce the peak rate and volume of run-off from site.
- 3.2. Soakaways are utilised where possible as a means of reducing run off rates and volumes. To date a limited number of soakaway tests have been carried out with infiltration rates being calculated as between 3.1×10^{-4} and 2.4×10^{-5} with infiltration rates in one location being insufficient to record a rate in accordance with BRE 365. For the purpose of the design presented in these calculations, an infiltration rate of 1×10^{-4} has been adopted in areas where we are more confident of infiltration rates based on the testing to date, and 1×10^{-5} has been assumed where the existing test results are less conclusive.

When access to the site becomes available in early to mid September 2012, we propose to carry out a programme of further soakaway testing in 10 no locations corresponding to the proposed soakaway locations. The drainage design will then be refined to reflect the infiltration rates calculated.

- 3.3. The stormwater drainage design has been developed in accordance with the recommendations of Pollution Prevention Guidelines PPG3. Surface water run-off is controlled using the following techniques:
 - A. Lorry bays / service yard area: Full retention interceptor provided.
 - B. Refuelling Area: A separate system is provided for the collection of surface water from
-

this area. Forecourt separator provided.

- C. Vehicle Washdown Area: A truck wash is provided. Waste water from the wash activities are generally recycled and stored locally below ground. Any overflow and / or sludge from these operations is discharged into the foul drainage system.
- D. Car park area: A bypass separator is provided.
- E. Access Road: In accordance with PPG3, no interceptor or separator is provided.
- F. Roofs: No interceptor or separator is provided.

4. DETAILED PROPOSALS

4.1. The surface water strategy for individual elements of the development are discussed below:

A. **Building roofs, western lorry layover/loading bays and wash down area.**

The building utilises a syphonic drainage system that will discharge the roof drainage into a trench soakaway located under the lorry layover and loading bay area. Qmax ACO drains will be used to collect surface water runoff from the lorry park and discharge into this soakaway via an oil interceptor. The granular trench soakaway has been sized to accommodate the 1 year storm event + 20% climate change, with no surface water discharging from site.

For storms greater than 1 year return period an overflow facility has been designed within the trench soakaway that discharges surface water into a dry swale. The swales invert level is within the sandstone strata which offer an infiltration rate within the region of 1×10^{-4} m/s as indicated by the initial ground investigation, further soakaway testing is to be conducted onsite for more accurate rates. The swale has been designed to convey surface water to the existing watercourse located in the northern region of the site, and discharge at an attenuated rate of 4 L/S via a Hydrobrake manhole. The swale is utilised as a means to attenuate, infiltration and convey surface water. The swale has been designed and sized to accommodate the 1 in 30 year storm event +20% climate change.

For the more extreme storm events, 100 year storm event + 20% climate change, the system has been designed to flood the surface. This flooding is designed to occur at the ACO drains (low point) and be contained within the extents of the lorry park.

B. **Northern lorry layover/loading bays and end of access road.**

The surface water runoff onto roads is collected by trapped road gully's and surface water onto the lorry park is collected by ACO Qmax channels. These systems discharge into a granular trench soakaway located under the lorry park via oil interceptors. The trench soakaway has been sized to accommodate the 1 year storm event + 20% climate change, with no surface water discharging from site.

For storms greater than 1 year return period an overflow facility has been designed within the trench soakaway that discharges surface water into the existing watercourse at an attenuated rate. The maximum flow rate from site is limited to 44 L/S using a Hydrobrake chamber. When combined with the swale system, this gives a maximum discharge rate from site of 48 L/S (Greenfield runoff rate given within flood risk assessment, see appendix C). The soakaway has been sized to accommodate the 30 year storm event + 20% climate change without any surface water flooding.

For the more extreme storm events, 100 year storm event + 20% climate change, the system has been designed to flood the surface. This flooding is designed to occur at the ACO drains (low point) and be contained within the extents of the lorry park.

C. **The access road**

The access road has been designed to contain all surface water onsite using infiltration

CRADDY PITCHERS DAVIDSON

Project RDC, Goldthorpe

Sheet Drains 9206 / 01 / 04 Rev A

Section Stormwater Drainage Calculations

By LW

Checked CSD

Date 17/08/12

techniques. The western lane adjacent to the footpath utilises a Beany Block drainage system to discharge surface water into 2 granular trench soakaways. The soakaways have been sized to accommodate the 1 in 30 year storm event +20% climate change.

The 100 year storm event has been designed to flood the surrounding landscaped surface, and is contained onsite.

The eastern lane has been designed to discharge into a swale that runs adjacent to the road using grips. The swales vertical gradient is aligned with the road (1:100 and 1:45) and has therefore been designed with check dams to contain the water as it flows to the low point located near the site entrance. The check dams have been spaced to suit the gradients and designed to contain the 30 year + 20% climate change storm event for each section of road, allowing surface water to infiltrate into the ground.

The 100 year storm event has been designed to over flow the check dams and will cause flooding at the low point. This flooding will cause ponding within the adjacent landscaped areas.

A lower infiltration rate of 1×10^{-5} m/s has been assumed as the initial soakaway tests were not conducted within this area. Further localised testing is to be undertaken.

D. The Office Car Park

Surface water runoff within the car park has been designed to discharge into a granular trench soakaway via an oil interceptor. The soakaway has been sized to accommodate storms up to 30 year return period plus 20% climate change. For more extreme storm events, 100 year return period, the system has been design to flood the surface. All the flooding will be contained within the extents of the car park.

E. Access road between lorry parks (adjacent to car park)

The roads longitudinal gradient is very flat and therefore a beany block drainage system is proposed for the inside kerb line. This system will discharge directly into the swale/ditch and then from site via the Hydrobrake.

F. Back road around building and refuse area

The road around the back of the building will discharge into a filter drain that runs alongside the length of the road. The filter drain has been sized to accommodate the 30 year return period plus 20% climate change.

The refuse area will discharge into a granular trench soakaway located behind the main building via an oil interceptor. The soakaway has been sized to accommodate storms up to 30 year return period + 20% climate change. The system has been design to allow flooding for the 100 year event onto the surrounding landscape areas.

5. Existing Stormwater Discharge Rate

5.1. The existing site is Greenfield and therefore the maximum allowable discharge rate from site has been calculated as a Greenfield run off rate outlined in the flood risk assessment, given as 4.5 L/S/Ha for QBAR (1 in 2 year storm event).

Total positively drained impermeable area onsite = 10.7 Ha

Maximum allowable discharge rate from site = 48.15 L/S

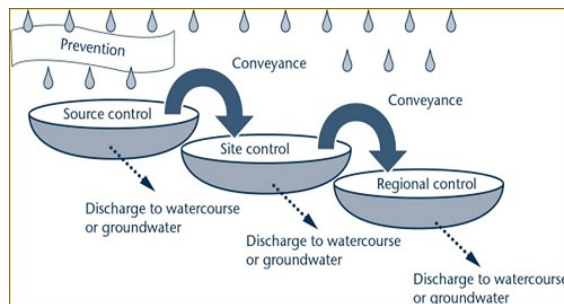
5.2. It is important to note that the flood risk assessment / drainage strategy provides a total allowable discharge from the site of 57l/s for the Phase 1 and Phase 2 development. The discharge rate calculated above takes account of the fact that only the smaller Phase 1 development is being considered as part of this assessment.

6. Proposed Discharge Rates

- 6.1. Total proposed hardstanding area = 107,025 square meters
- 6.2. For the 1 year return period + 20% climate change storm event, No surface water runoff will discharge from site
- 6.3. For all other storm return periods the discharge rates is as follows:
 - A. 72,900m² of harstanding area will discharge from the swale/ditch to the existing water course via Hydrobrake at an attenuated rate = 4 litres per second (1 in 100 year storm + 30% climate change).
 - B. 18,230m² of harstanding area will discharge from the northern lorry layover/loading bay trench soakaway to the existing water course via Hydrobrake at an attenuated rate = 44 litres per second (1 in 100 year storm + 30% climate change).
- 6.4. The access road, office car park and refuse area discharge to soakaways.
- 6.5. The road to the rear of the building discharges into filter drains.
- 6.6. Maximum discharge rate into the existing water course (Highgate Lane Drain) for 1 in 100 year + 20% climate change = 44 litres per second

7. SUDS Drainage Technique Selection.

- 7.1. The selection of surface water drainage techniques was based on the principles of the SUDS management train (see figure below) i.e. Prevention, source control and site control.



- 7.2. **Prevention.** The main source control principle used was prevention, implemented as follows:
 - minimising runoff (ensuring footpaths are drained into surrounding soils)
 - preventing silt from entering the system (using trapped-road gully's, silt traps to the ACO drains and Beany block systems).The site is suitable for infiltration and therefore stormwater will discharge to soakaways and swales to reduce the peak rate and volume of runoff.
 - 7.3. **Source and Site Control.** The source control techniques utilised are as follows:
 - A. The storm drainage systems utilises with soakaways and swales to reduce the peak rate and volume of runoff from site.
 - B. Hydrobrake chambers are used to ensure that the peak rate of runoff is equal to the Greenfield run off rate for the 1 in 100 years return period storm plus 20% climate change event.
 - 7.4. **Flood risk consideration.** The flood risk assessment (FRA) undertaken by Arup on August 2007 has identified that the site lies within flood zone 1 and is therefore at low risk of flooding. The nearest source of flooding is identified as the Highgate Lane Drain (watercourse) located in the northern sector of the site. The hardstanding surface areas around the building are set at around
-

Project RDC, Goldthorpe

Sheet Drains 9206 / 01 / 06 Rev A

Section Stormwater Drainage Calculations

By LW

Checked CSD

Date 17/08/12

26.7 mAOD, circa 3m above the existing ground levels at the top of the watercourse. The finish floor level of the building is set at 28.75, some 4m above the top of watercourse. This level difference provides adequate protection to the building against flooding.

The stormwater drainage system has been carefully designed to ensure that the maximum discharge rate from site is limited to Greenfield runoff rate Q_{bar} , as calculated in the FRA. This will ensure that the Aldi site will not increase the volume and rate of surface water runoff discharging into the watercourse and will reduce flood risk to wider locality. The drainage system has been designed to contain surface water flooding onsite for storms greater than the 30 year return period.

8. DRAINAGE DESIGN CALCULATIONS

Microdrainage Source control, WinDes System 1 and Simulation software were used to design the stormwater drainage systems. The simulation software was run for all the storm return periods and durations up to 1 in 100 year plus 20% for climate change to determine the critical design storms. The calculations in the appendix show the critical storm for 1, 30 and 100 year storm return periods.

9. APPENDICIES

A. Aerial Photo/ Site Location

B. Proposed Development

C. Flood Risk Assessment Extract

D. Building, West Lorry layover/loading bay drainage calculations

This drainage system has been modelled with the overflows from the trench soakaways to the swale/ditch and the Hydrobrake chamber.

E. North Lorry Layover/loading bay and end of access road drainage calculations

This drainage system has been modelled with the overflow from the trench soakaway to the Hydrobrake chamber.

F. Office car park drainage calculations

This drainage system has been modelled discharging to a trench soakaway.

G. Access road swale calculations

The swale is modelled in source control as sections between the check dams for both the 1:45 and 1:100 longitudinal gradients. The maximum water level is designed to be less than 200mm so that it does not break top of check dam level.

H. Access road soakaways calculations

The soakaways have been sized using source control.

I. Refuse area drainage calculations

This drainage system is modelled discharging to a trench soakaway.

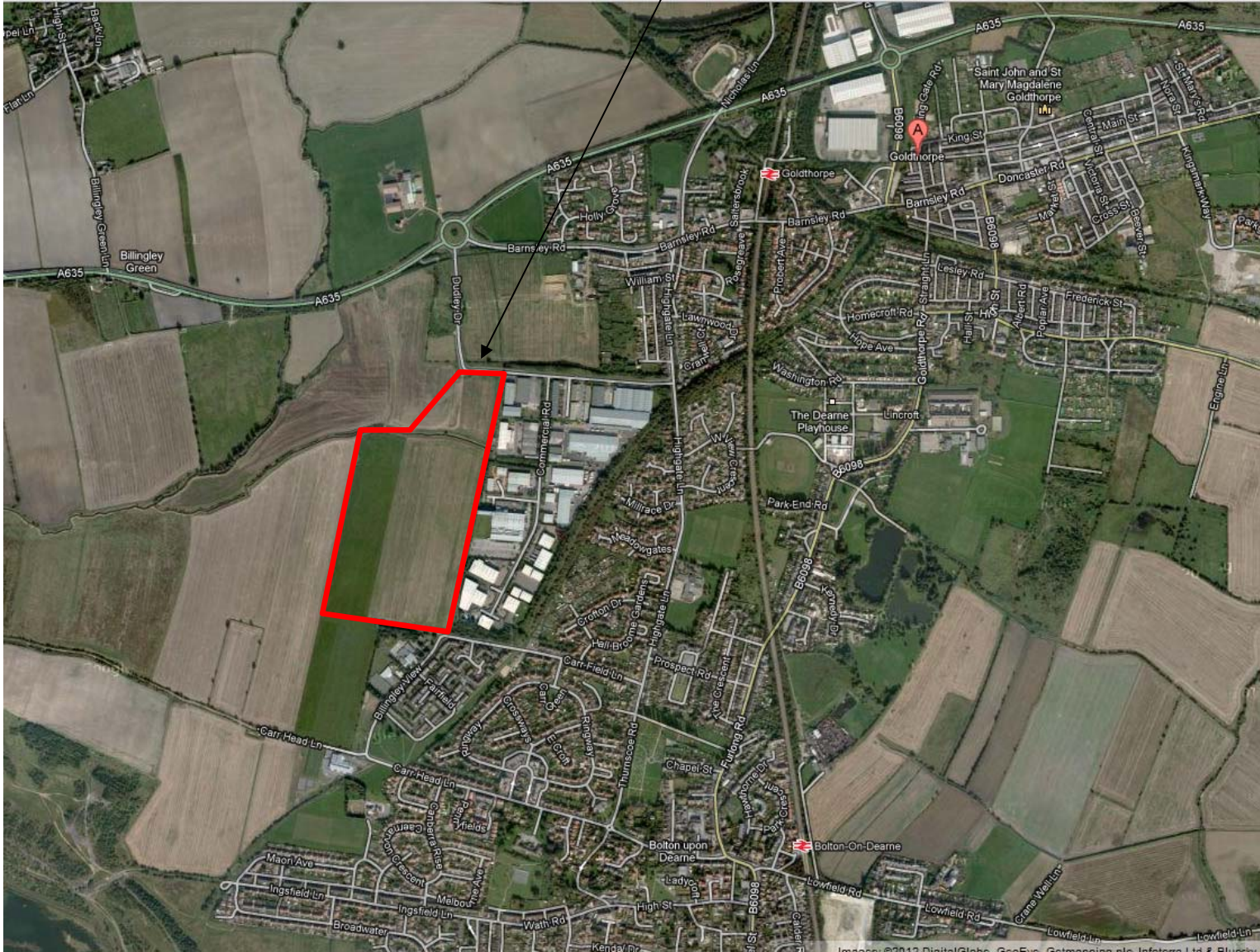
J. Rear access road drainage calculations

The filter drain has been sized using source control; this has been modelled as a 26m section of road.

APPENDIX A

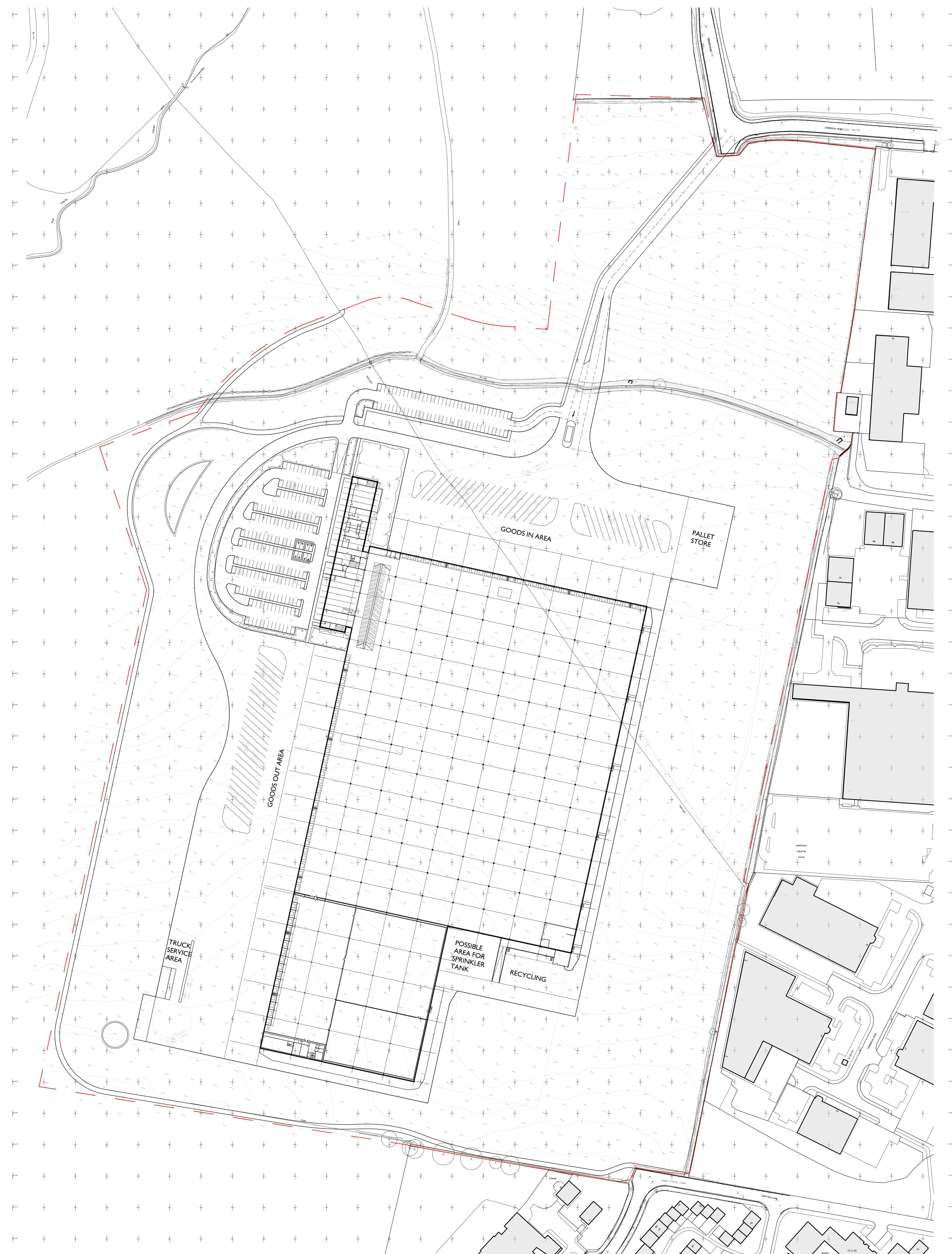
Aerial Photo/ Site Location

Approximate site boundary



APPENDIX B

Proposed Development



Key

| | | | |
|------|-----------------|-------|----------------------|
| BQL | ballard | XXXX | conifer screen |
| TCB | tel. call box | □ | pier |
| — | rock face | △ | triangular manhole |
| — | service cover | — | speedbump |
| — | bank line | — | stile |
| — | fence | — | fence |
| — | cutting or bank | — | fence |
| — | drain, channel | — | fence |
| — | gate | — | fence |
| — | hedge | — | fence |
| — | wall | — | fence |
| — | vegetation line | — | fence |
| — | edge of surface | — | fence |
| — | tree | — | fence |
| ER | earth rod | ER | earth rod |
| SC | stop cock | GP | gate post |
| MH | manhole | ELEC | electric |
| VP | vent pipe | FP | flue post |
| RE | roading eye | FP | flue post |
| BT | telephone | SH | shrub |
| WO | wash out | 50.00 | ground level |
| TV | television | BIG | back inlet gully |
| SV | water valve | | |
| GAS | gas | | |
| FH | fire hydrant | | |
| G | gully | | |
| BH | bore hole | | |
| TH | trial hole | | |
| FS | flag staff | | |
| LH | lamp hole | | |
| POST | post | | |
| PEG | peg | | |
| TL | traffic light | | |
| ST | stop top | | |
| WV | water valve | UTL | unable to lift |
| LB | letter box | S | cow service cover |
| RS | road sign | DPC | damp course level |
| BS | bus stop | FFL | finished floor level |
| LP | lamp post | E | electric |
| EP | electric pole | TV | television |
| TP | telegraph pole | T | telephone |

Levels shown along kerb lines are taken in the channel.

Levels are generally shown on the side of the detail to which it relates.

SURVEY IS RELATED TO NATIONAL GRID OSGR36(02), ESTABLISHED USING OBSERVATIONS FROM AN ORDINANCE SURVEY COMMERCIAL GPS RTK NETWORK CORRECTION SERVICE AND IS RELATED TO ORDINANCE DATUM VIA THE GEOID MODEL OSGMD2. NO SCALE FACTOR APPLIED.

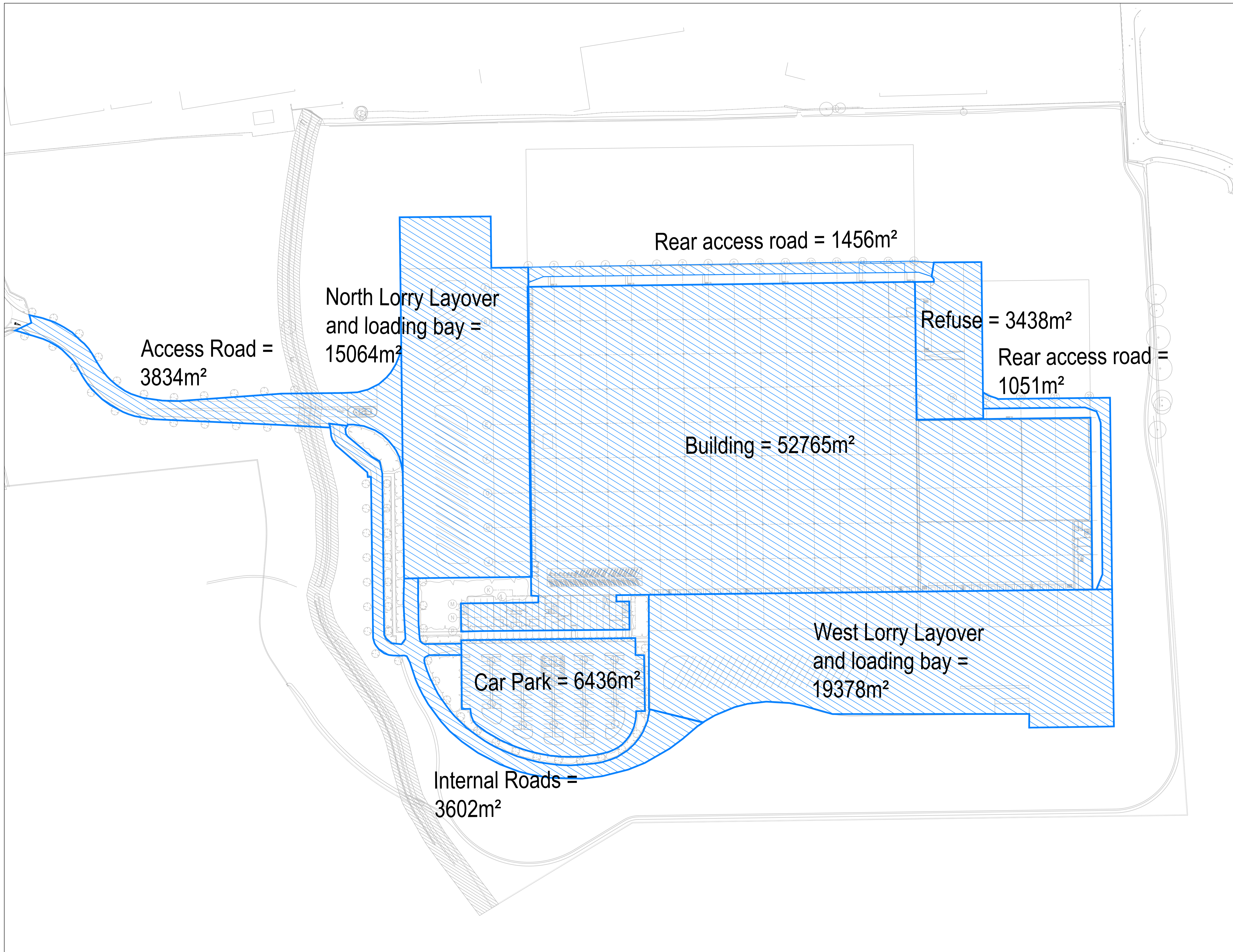
Note: Unable to survey on site manhole depths due to them being too deep and offset into the chamber.
 Station points can be found on switched off layer in model space.
 Information shown outside of boundary supplied by prosep and has not been surveyed.

Dalkin Scotton Partnership
 Architects Limited
PRELIMINARY ISSUE

| | | | |
|--|----------|-------|---------|
| Revised for preliminary issue | 22/04/12 | DJN | SB |
| Using new survey information provided by Site Data on 11/04/12 | 12/04/12 | DJN | SB |
| Reason | Date | Drawn | Checked |

DALKIN SCOTTON PARTNERSHIP
 ARCHITECTS LIMITED
 305 FORT DUNLOP FORT PARKWAY BIRMINGHAM B24 9FD
 TEL: 0121 747 1943
 FAX: 0121 747 1944
 www.dsparchitects.com

| | | | |
|---------|---|----------|-------------|
| CLIENT | ALDI STORES LTD. | | |
| PROJECT | GOLDTHORPE INDUSTRIAL ESTATE COMMERCIAL ROAD, GOLDTHORPE | | |
| TITLE | REGIONAL DISTRIBUTION CENTRE PROPOSED SITE PLAN | | |
| DATE | 28.02.12 | SCALE | 1:1000 @ A0 |
| DRAWN | DJN | CHECKED | SB |
| DWG No. | Y11A25-01-W004 | REVISION | B NORTH |



IF YOU HAVE A QUERY CALL US
 SCALING FROM THIS DRAWING OR OBTAINING DIMENSIONS ELECTRONICALLY MAY
 NOT PROVIDE ACCURATE INFORMATION AND SHOULD BE AVOIDED. WORK ONLY
 FROM FIGURED DIMENSIONS.

GENERAL NOTES

DRAWINGS AND SPECIFICATIONS: This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialists drawings together with the specification.

C D M : SIGNIFICANT HAZARDS

THE FOLLOWING HEALTH AND SAFETY HAZARDS ARE IDENTIFIED BY THE DESIGNER AS ABNORMAL IN PURSUANCE OF THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2007.

RISK DURING CONSTRUCTION:

- No abnormal risks have been identified relating to this design element.

OPERATION / MAINTENANCE RISKS:

- No abnormal risks have been identified relating to this design element.

RISKS DURING DEMOLITION / DECOMMISSIONING / DISMANTLING / ALTERATIONS:

- No abnormal risks have been identified relating to this design element.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY COMPETENT & ADEQUATELY RESOURCED CONTRACTOR(S) WORKING TO SAFE SYSTEMS OF WORK.

| | | |
|-----|------------------|----------|
| A | 1ST ISSUE | 17.08.12 |
| REV | REVISION DETAILS | DATE |

CRADDY PITCHERS DAVIDSON

EDEN LODGE STUDIOS, EDEN OFFICE PARK,
 CHAPEL PILL LANE, HAM GREEN
 BRISTOL, BS20 0BX
 TEL : 01275 371 333
 email : info@craddypitchers.co.uk www.craddypitchers.co.uk

THIS DRAWING IS THE COPYRIGHT OF THE CRADDY PITCHERS DAVIDSON AND MUST NOT BE COPIED, REPRODUCED OR SUBMITTED TO OTHER PARTIES WITHOUT THEIR PERMISSION.

PROJECT TITLE
**ALDI RDC
 GOLDTHORPE**

DRAWING TITLE
PROPOSED HARD STANDING AREAS

CLIENT
ALDI STORES

STATUS
INFORMATION

| | | | |
|--------|-------|---------|----------|
| SCALE | DRAWN | CHECKED | APPROVED |
| 1:1000 | LW | CSD | CSD |
| AT A1 | LW | CSD | CSD |

| | | |
|----------|----------------|-----|
| DRG SIZE | DRAWING NUMBER | REV |
| A1 | 9206-SK0043 | A |

APPENDIX C

Flood Risk Assessment Extract.

3.3 Probability of Flooding

The site is shown as being in Flood Zone 1 and the Environment Agency has no record of historic flooding on the site. No known flooding has taken place in the development location according to the Internal Drainage Board.

Therefore the probability of flooding in the area is considered to be low.

3.4 Climate Change

As discussed Barnsley MBC has not yet produced a Strategic Flood Risk Assessment (SFRA) and therefore they have not detailed the effects of climate change in any detail, although with the potential for increased flows in river and sewer systems it is expected that flooding will pose a higher risk to the site than under current climatic conditions.

Given that the land adjacent to Highgate Lane Drain does not experience flooding and that the proposed development is raised some 4m above the level of the drain bank top, the impact of climate change on flood risk to the development is considered to be low.

It is recommended that the site drainage system should be designed to take potential climate change impacts into account and the storage volume contained within the site to attenuate runoff should make a precautionary allowance of a minimum of 10%, assuming a 50 year design life.

3.5 Flood risk management measures

From the information gathered it would seem that the Aldi Goldthorpe Logistic Centre is not at any significant risk of flooding and therefore there are no flood risk management measures proposed with this development, other than ground raising. The site does have the potential to increase flood risk downstream and the runoff attenuation measures are required.

Greenfield runoff calculations indicate that the 1 in 2 year storm will need to be restricted to 4.5 l/s/ha of hardstanding; the 100 year storm to approximately 8 l/s/ha. The on-site storage volume should make a precautionary allowance for climate change of a minimum of 10%, assuming a 50 year design life. After 2055 peak rainfall intensities may increase further (guidance in PPS25 suggests an allowance of 20% (2055-2085) and 30% after 2085), and further consideration should be given to the implications of these further increases by the designers.

Attenuation will be achieved through the use of the attenuation pond proposed in the north west corner of the site together with storage in swales and within the below ground pipe network. The use of permeable pavement to attenuate runoff, and the associated maintenance requirements, should also be considered in detailed design.

3.6 Off site impacts

See 3.5 above.

3.7 Residual Risks

This flood risk assessment has been prepared on the basis of the available information, which suggests that there are no significant flood risk issues associated with the proposed development. However, residual flood risk could occur. These could include:

- Blockage of local drainage systems;
- Flooding due to an extreme flood event.

APPENDIX D

Building, West Lorry Layover/Loading Bay Drainage Calculations

Craddy Pitchers Limited

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Date 16/08/2012 14:02

File 9206 - main model with swale.mdx

CADS

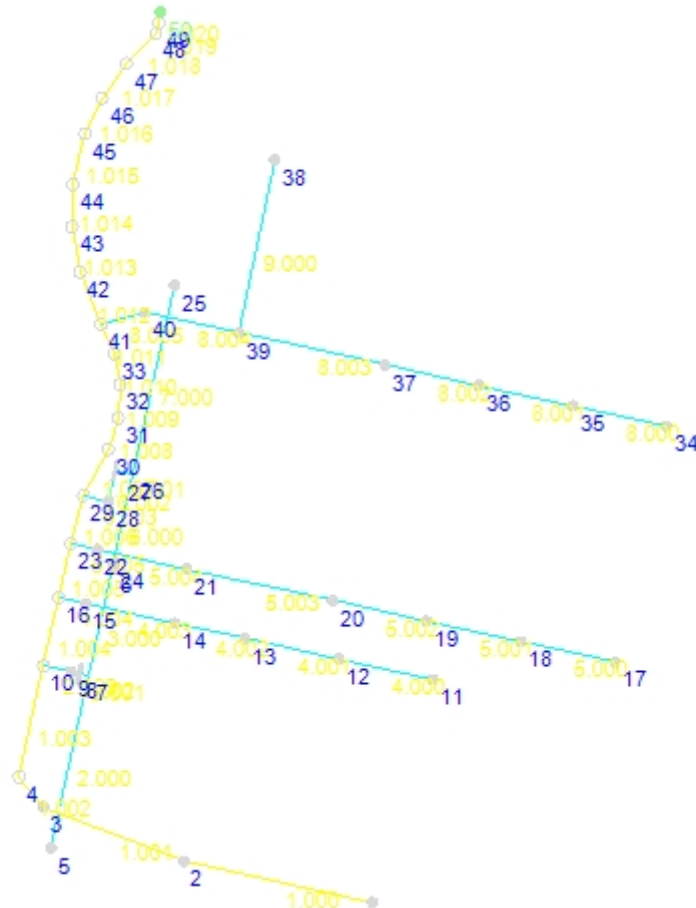
Page 1



Designed by Lee Westermann

Checked by

Network W.12.6.1



| | |
|--------------------------|--------------------------|
| Eden Lodge Studios | Aldi RDC |
| Ham Green | Goldthorpe |
| Bristol BS20 0ET | Storm - building + swale |
| Date 16/08/12 | Designed by LW |
| File 9206 - main mode... | Checked by |




CADS Network W.12.6.1

Existing Network Details for 9206 - MAIN MODEL.SWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 1.000 | 90.000 | 1.286 | 70.0 | 0.254 | 4.00 | 0.600 | o | 300 |
| 1.001 | 70.363 | 1.005 | 70.0 | 0.254 | 0.00 | 0.600 | o | 300 |
| 1.002 | 17.936 | 0.179 | 100.2 | 0.000 | 0.00 | 0.600 | oo | 41 |
| 1.003 | 53.276 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 2.000 | 82.551 | 0.000 | 0.0 | 0.465 | 4.00 | 0.600 | Q90 | -9 |
| 3.000 | 52.320 | 0.000 | 0.0 | 0.465 | 4.00 | 0.600 | Q90 | -9 |
| 2.001 | 4.440 | 0.111 | 40.0 | 0.000 | 0.00 | 0.600 | o | 525 |
| 2.002 | 4.093 | 0.041 | 100.0 | 0.000 | 0.00 | 0.600 | o | 525 |
| 2.003 | 13.075 | 0.131 | 100.0 | 0.000 | 0.00 | 0.600 | oo | 41 |
| 1.004 | 32.583 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 4.000 | 45.000 | 0.643 | 70.0 | 0.254 | 4.00 | 0.600 | o | 300 |
| 4.001 | 45.000 | 0.643 | 70.0 | 0.254 | 0.00 | 0.600 | o | 300 |
| 4.002 | 33.383 | 0.477 | 70.0 | 0.000 | 0.00 | 0.600 | o | 300 |
| 4.003 | 42.562 | 0.608 | 70.0 | 0.000 | 0.00 | 0.600 | o | 300 |
| 4.004 | 13.021 | 0.130 | 100.2 | 0.000 | 0.00 | 0.600 | oo | 41 |
| 1.005 | 25.953 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |

| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|------|---------------|
| 1.000 | 1 | 28.530 | 27.705 | 0.525 | 28.185 | 26.419 | 1.466 | | 1200 |
| 1.001 | 2 | 28.185 | 26.419 | 1.466 | 26.799 | 25.414 | 1.085 | | 1200 |
| 1.002 | 3 | 26.799 | 26.429 | 0.070 | 26.931 | 26.250 | 0.381 | | 1200 |
| 1.003 | 4 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 2.000 | 5 | 26.673 | 25.518 | 0.255 | 26.673 | 25.518 | 0.255 | | 525 |
| 3.000 | 6 | 26.673 | 25.518 | 0.255 | 26.673 | 25.518 | 0.255 | | 525 |
| 2.001 | 7 | 26.673 | 25.518 | 0.630 | 26.747 | 25.407 | 0.815 | | 700 x 700 |
| 2.002 | 8 | 26.747 | 25.407 | 0.715 | 26.815 | 25.366 | 0.824 | | 2550 x 9975 |
| 2.003 | 9 | 26.815 | 26.381 | 0.134 | 26.931 | 26.250 | 0.381 | | 1500 |
| 1.004 | 10 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 4.000 | 11 | 28.750 | 27.705 | 0.745 | 28.750 | 27.062 | 1.388 | | 1200 |
| 4.001 | 12 | 28.750 | 27.062 | 1.388 | 28.750 | 26.419 | 2.031 | | 1200 |
| 4.002 | 13 | 28.750 | 26.419 | 2.031 | 27.240 | 25.942 | 0.998 | | 1200 |
| 4.003 | 14 | 27.240 | 25.942 | 0.998 | 26.816 | 25.334 | 1.182 | | 1200 |
| 4.004 | 15 | 26.816 | 26.380 | 0.136 | 26.931 | 26.250 | 0.381 | | 1200 |
| 1.005 | 16 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |


| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 1 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Existing Network Details for 9206 - MAIN MODEL.SWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 5.000 | 45.000 | 0.469 | 96.0 | 0.511 | 4.00 | 0.600 | o | 600 |
| 5.001 | 45.000 | 0.469 | 96.0 | 0.511 | 0.00 | 0.600 | o | 600 |
| 5.002 | 45.000 | 0.469 | 96.0 | 0.511 | 0.00 | 0.600 | o | 600 |
| 5.003 | 69.591 | 0.725 | 96.0 | 0.511 | 0.00 | 0.600 | o | 600 |
| 5.004 | 42.500 | 0.443 | 96.0 | 0.000 | 0.00 | 0.600 | o | 600 |
| 5.005 | 13.119 | 0.066 | 200.0 | 0.000 | 0.00 | 0.600 | ooo | 46 |
| 1.006 | 23.257 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 6.000 | 42.928 | 0.000 | 0.0 | 0.465 | 4.00 | 0.600 | Q90 | -9 |
| 7.000 | 90.537 | 0.000 | 0.0 | 0.465 | 4.00 | 0.600 | Q90 | -9 |
| 6.001 | 8.463 | 0.212 | 40.0 | 0.000 | 0.00 | 0.600 | o | 525 |
| 6.002 | 14.993 | 0.150 | 100.0 | 0.000 | 0.00 | 0.600 | o | 525 |
| 6.003 | 11.992 | 0.120 | 100.0 | 0.000 | 0.00 | 0.600 | oo | 41 |
| 1.007 | 24.516 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 1.008 | 15.372 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 1.009 | 15.758 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 1.010 | 14.670 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |
| 1.011 | 14.900 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _ / | 1000 |

| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|-------------|---------------|
| 5.000 | 17 | 28.450 | 27.400 | 0.450 | 28.750 | 26.931 | 1.219 | | 1500 |
| 5.001 | 18 | 28.750 | 26.931 | 1.219 | 28.750 | 26.462 | 1.688 | | 1500 |
| 5.002 | 19 | 28.750 | 26.462 | 1.688 | 28.750 | 25.993 | 2.157 | | 1500 |
| 5.003 | 20 | 28.750 | 25.993 | 2.157 | 27.240 | 25.268 | 1.372 | | 1500 |
| 5.004 | 21 | 27.240 | 25.268 | 1.372 | 26.815 | 24.825 | 1.390 | | 1500 |
| 5.005 | 22 | 26.815 | 26.316 | 0.124 | 26.931 | 26.250 | 0.306 | | 1800 |
| 1.006 | 23 | 26.931 | 25.500 | 1.131 | 26.931 | 25.500 | 1.131 | | 0 |
| 6.000 | 24 | 26.673 | 25.518 | 0.255 | 26.673 | 25.518 | 0.255 | | 525 |
| 7.000 | 25 | 26.673 | 25.518 | 0.255 | 26.673 | 25.518 | 0.255 | | 525 |
| 6.001 | 26 | 26.673 | 25.518 | 0.630 | 26.814 | 25.306 | 0.983 | 700 x 700 | |
| 6.002 | 27 | 26.814 | 25.306 | 0.883 | 26.814 | 25.156 | 1.033 | 9975 x 2250 | |
| 6.003 | 28 | 26.814 | 26.370 | 0.144 | 26.931 | 26.250 | 0.381 | | 1500 |
| 1.007 | 29 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.008 | 30 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.009 | 31 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.010 | 32 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.011 | 33 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 | Designed by LW | |
| File 9206 - main mode... | Checked by | |
| CADS | | Network W.12.6.1 |

Existing Network Details for 9206 - MAIN MODEL.SWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) | |
|-------|---------------|--------------|----------------|----------------------|----------------|--------------|----------------------|--------------|---------------|
| 8.000 | 45.000 | 0.469 | 96.0 | 0.511 | 4.00 | 0.600 | o | 600 | |
| 8.001 | 45.000 | 0.469 | 96.0 | 0.511 | 0.00 | 0.600 | o | 600 | |
| 8.002 | 44.758 | 0.466 | 96.0 | 0.511 | 0.00 | 0.600 | o | 600 | |
| 8.003 | 69.908 | 0.728 | 96.0 | 0.511 | 0.00 | 0.600 | o | 600 | |
| 9.000 | 82.898 | 2.255 | 36.8 | 0.178 | 4.00 | 0.600 | o | 225 | |
| 8.004 | 44.677 | 0.465 | 96.0 | 0.000 | 0.00 | 0.600 | o | 600 | |
| 8.005 | 21.104 | 0.106 | 199.1 | 0.000 | 0.00 | 0.600 | ooo | 46 | |
| 1.012 | 26.416 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.013 | 21.705 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.014 | 19.890 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.015 | 24.308 | 0.000 | 0.0 | 0.078 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.016 | 18.366 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.017 | 19.734 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.018 | 19.746 | 0.000 | 0.0 | 0.070 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.019 | 5.266 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| 1.020 | 5.142 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | 2 _/\ | 1000 | |
| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
| 8.000 | 34 | 28.450 | 27.400 | 0.450 | 28.750 | 26.931 | 1.219 | | 1500 |
| 8.001 | 35 | 28.750 | 26.931 | 1.219 | 28.750 | 26.462 | 1.688 | | 1500 |
| 8.002 | 36 | 28.750 | 26.462 | 1.688 | 28.750 | 25.996 | 2.154 | | 1500 |
| 8.003 | 37 | 28.750 | 25.996 | 2.154 | 27.240 | 25.268 | 1.372 | | 1500 |
| 9.000 | 38 | 28.723 | 27.898 | 0.600 | 27.240 | 25.643 | 1.372 | | 1200 |
| 8.004 | 39 | 27.240 | 25.268 | 1.372 | 26.839 | 24.803 | 1.436 | | 1500 |
| 8.005 | 40 | 26.839 | 26.356 | 0.108 | 26.931 | 26.250 | 0.306 | | 1800 |
| 1.012 | 41 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.013 | 42 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.014 | 43 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.015 | 44 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.016 | 45 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.017 | 46 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.018 | 47 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.019 | 48 | 26.931 | 25.500 | 0.681 | 26.931 | 25.500 | 0.681 | | 0 |
| 1.020 | 49 | 26.931 | 25.500 | 0.681 | 26.602 | 25.500 | 0.352 | Hydro-Brake® | 0 |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Aldi RDC
Goldthorpe
Storm - building + swale



Date 16/08/12
File 9206 - main mode...

Designed by LW
Checked by

CADS Network W.12.6.1

Manhole Schedules for 9206 - MAIN MODEL.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|------------------------|-------|---------------------------|------------------------|---------------|
| 1 | 28.530 | 0.825 | Open Manhole | 1200 | 1.000 | 27.705 | 300 | | | | |
| 2 | 28.185 | 1.766 | Open Manhole | 1200 | 1.001 | 26.419 | 300 | 1.000 | 26.419 | 300 | |
| 3 | 26.799 | 1.385 | Open Manhole | | 1.002 | 26.429 | 41 | 1.001 | 25.414 | 300 | |
| 4 | 26.931 | 1.431 | Junction | | 1.003 | 25.500 | 1000 | 1.002 | 26.250 | 41 | 300 |
| 5 | 26.673 | 1.155 | Open Manhole | 525 | 2.000 | 25.518 | -9 | | | | |
| 6 | 26.673 | 1.155 | Open Manhole | 525 | 3.000 | 25.518 | -9 | | | | |
| 7 | 26.673 | 1.155 | Open Manhole | 700 x 700 | 2.001 | 25.518 | 525 | 2.000 | 25.518 | -9 | |
| | | | | | | | | 3.000 | 25.518 | -9 | |
| 8 | 26.747 | 1.340 | Open Manhole | 2550 x 9975 | 2.002 | 25.407 | 525 | 2.001 | 25.407 | 525 | |
| 9 | 26.815 | 1.449 | Open Manhole | | 2.003 | 26.381 | 41 | 2.002 | 25.366 | 525 | |
| 10 | 26.931 | 1.431 | Junction | | 1.004 | 25.500 | 1000 | 1.003 | 25.500 | 1000 | |
| | | | | | | | | 2.003 | 26.250 | 41 | 300 |
| 11 | 28.750 | 1.045 | Open Manhole | 1200 | 4.000 | 27.705 | 300 | | | | |
| 12 | 28.750 | 1.688 | Open Manhole | 1200 | 4.001 | 27.062 | 300 | 4.000 | 27.062 | 300 | |
| 13 | 28.750 | 2.331 | Open Manhole | 1200 | 4.002 | 26.419 | 300 | 4.001 | 26.419 | 300 | |
| 14 | 27.240 | 1.298 | Open Manhole | 1200 | 4.003 | 25.942 | 300 | 4.002 | 25.942 | 300 | |
| 15 | 26.816 | 1.482 | Open Manhole | | 4.004 | 26.380 | 41 | 4.003 | 25.334 | 300 | |
| 16 | 26.931 | 1.431 | Junction | | 1.005 | 25.500 | 1000 | 1.004 | 25.500 | 1000 | |
| | | | | | | | | 4.004 | 26.250 | 41 | 300 |
| 17 | 28.450 | 1.050 | Open Manhole | 1500 | 5.000 | 27.400 | 600 | | | | |
| 18 | 28.750 | 1.819 | Open Manhole | 1500 | 5.001 | 26.931 | 600 | 5.000 | 26.931 | 600 | |
| 19 | 28.750 | 2.288 | Open Manhole | 1500 | 5.002 | 26.462 | 600 | 5.001 | 26.462 | 600 | |
| 20 | 28.750 | 2.757 | Open Manhole | 1500 | 5.003 | 25.993 | 600 | 5.002 | 25.993 | 600 | |
| 21 | 27.240 | 1.972 | Open Manhole | 1500 | 5.004 | 25.268 | 600 | 5.003 | 25.268 | 600 | |
| 22 | 26.815 | 1.990 | Open Manhole | | 5.005 | 26.316 | 46 | 5.004 | 24.825 | 600 | |
| 23 | 26.931 | 1.431 | Junction | | 1.006 | 25.500 | 1000 | 1.005 | 25.500 | 1000 | |
| | | | | | | | | 5.005 | 26.250 | 46 | 825 |
| 24 | 26.673 | 1.155 | Open Manhole | 525 | 6.000 | 25.518 | -9 | | | | |
| 25 | 26.673 | 1.155 | Open Manhole | 525 | 7.000 | 25.518 | -9 | | | | |
| 26 | 26.673 | 1.155 | Open Manhole | 700 x 700 | 6.001 | 25.518 | 525 | 6.000 | 25.518 | -9 | |
| | | | | | | | | 7.000 | 25.518 | -9 | |
| 27 | 26.814 | 1.508 | Open Manhole | 9975 x 2250 | 6.002 | 25.306 | 525 | 6.001 | 25.306 | 525 | |
| 28 | 26.814 | 1.658 | Open Manhole | | 6.003 | 26.370 | 41 | 6.002 | 25.156 | 525 | |
| 29 | 26.931 | 1.431 | Junction | | 1.007 | 25.500 | 1000 | 1.006 | 25.500 | 1000 | |
| | | | | | | | | 6.003 | 26.250 | 41 | 300 |
| 30 | 26.931 | 1.431 | Junction | | 1.008 | 25.500 | 1000 | 1.007 | 25.500 | 1000 | |
| 31 | 26.931 | 1.431 | Junction | | 1.009 | 25.500 | 1000 | 1.008 | 25.500 | 1000 | |

| | |
|--|--|
| Eden Lodge Studios Ham Green Bristol BS20 0ET Date 16/08/12 File 9206 - main mode... | Aldi RDC Goldthorpe Storm - building + swale Designed by LW Checked by |
|--|--|



CADS Network W.12.6.1

Manhole Schedules for 9206 - MAIN MODEL.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN | Pipe Out Invert Level (m) | Diameter (mm) | PN | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|---------------|-------|---------------------------|---------------|---------------|
| 32 | 26.931 | 1.431 | Junction | | 1.010 | 25.500 | 1000 | 1.009 | 25.500 | 1000 | |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Aldi RDC
Goldthorpe
Storm - building + swale



Date 16/08/12

Designed by LW

File 9206 - main mode...


Checked by

CADS

Network W.12.6.1

Manhole Schedules for 9206 - MAIN MODEL.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | Pipes In PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|-------|---------------------------|------------------------|-------------|---------------------------|------------------------|---------------|
| 33 | 26.931 | 1.431 | Junction | | 1.011 | 25.500 | 1000 | 1.010 | 25.500 | 1000 | |
| 34 | 28.450 | 1.050 | Open Manhole | 1500 | 8.000 | 27.400 | 600 | | | | |
| 35 | 28.750 | 1.819 | Open Manhole | 1500 | 8.001 | 26.931 | 600 | 8.000 | 26.931 | 600 | |
| 36 | 28.750 | 2.288 | Open Manhole | 1500 | 8.002 | 26.462 | 600 | 8.001 | 26.462 | 600 | |
| 37 | 28.750 | 2.754 | Open Manhole | 1500 | 8.003 | 25.996 | 600 | 8.002 | 25.996 | 600 | |
| 38 | 28.723 | 0.825 | Open Manhole | 1200 | 9.000 | 27.898 | 225 | | | | |
| 39 | 27.240 | 1.972 | Open Manhole | 1500 | 8.004 | 25.268 | 600 | 8.003 | 25.268 | 600 | |
| | | | | | | | | 9.000 | 25.643 | 225 | |
| 40 | 26.839 | 2.036 | Open Manhole | | 8.005 | 26.356 | 46 | 8.004 | 24.803 | 600 | |
| 41 | 26.931 | 1.431 | Junction | | 1.012 | 25.500 | 1000 | 1.011 | 25.500 | 1000 | |
| | | | | | | | | 8.005 | 26.250 | 46 | 375 |
| 42 | 26.931 | 1.431 | Junction | | 1.013 | 25.500 | 1000 | 1.012 | 25.500 | 1000 | |
| 43 | 26.931 | 1.431 | Junction | | 1.014 | 25.500 | 1000 | 1.013 | 25.500 | 1000 | |
| 44 | 26.931 | 1.431 | Junction | | 1.015 | 25.500 | 1000 | 1.014 | 25.500 | 1000 | |
| 45 | 26.931 | 1.431 | Junction | | 1.016 | 25.500 | 1000 | 1.015 | 25.500 | 1000 | |
| 46 | 26.931 | 1.431 | Junction | | 1.017 | 25.500 | 1000 | 1.016 | 25.500 | 1000 | |
| 47 | 26.931 | 1.431 | Junction | | 1.018 | 25.500 | 1000 | 1.017 | 25.500 | 1000 | |
| 48 | 26.931 | 1.431 | Junction | | 1.019 | 25.500 | 1000 | 1.018 | 25.500 | 1000 | |
| 49 | 26.931 | 1.431 | Junction | 0 | 1.020 | 25.500 | 1000 | 1.019 | 25.500 | 1000 | |
| 50 | 26.602 | 1.102 | Open Manhole | 0 | | OUTFALL | | 1.020 | 25.500 | 1000 | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 6 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |
| CADS | | Network W.12.6.1 |


PIPELINE SCHEDULES for 9206 - MAIN MODEL.SWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | o | 300 | 1 | 28.530 | 27.705 | 0.525 | Open Manhole | 1200 |
| 1.001 | o | 300 | 2 | 28.185 | 26.419 | 1.466 | Open Manhole | 1200 |
| 1.002 | oo | 41 | 3 | 26.799 | 26.429 | 0.070 | Open Manhole | 1200 |
| 1.003 | 2 _ / | 1000 | 4 | 26.931 | 25.500 | 0.681 | Junction | |
| 2.000 | Q90 | -9 | 5 | 26.673 | 25.518 | 0.255 | Open Manhole | 525 |
| 3.000 | Q90 | -9 | 6 | 26.673 | 25.518 | 0.255 | Open Manhole | 525 |
| 2.001 | o | 525 | 7 | 26.673 | 25.518 | 0.630 | Open Manhole | 700 x 700 |
| 2.002 | o | 525 | 8 | 26.747 | 25.407 | 0.715 | Open Manhole | 2550 x 9975 |
| 2.003 | oo | 41 | 9 | 26.815 | 26.381 | 0.134 | Open Manhole | 1500 |
| 1.004 | 2 _ / | 1000 | 10 | 26.931 | 25.500 | 0.681 | Junction | |
| 4.000 | o | 300 | 11 | 28.750 | 27.705 | 0.745 | Open Manhole | 1200 |
| 4.001 | o | 300 | 12 | 28.750 | 27.062 | 1.388 | Open Manhole | 1200 |
| 4.002 | o | 300 | 13 | 28.750 | 26.419 | 2.031 | Open Manhole | 1200 |
| 4.003 | o | 300 | 14 | 27.240 | 25.942 | 0.998 | Open Manhole | 1200 |
| 4.004 | oo | 41 | 15 | 26.816 | 26.380 | 0.136 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 90.000 | 70.0 | 2 | 28.185 | 26.419 | 1.466 | Open Manhole | 1200 |
| 1.001 | 70.363 | 70.0 | 3 | 26.799 | 25.414 | 1.085 | Open Manhole | 1200 |
| 1.002 | 17.936 | 100.2 | 4 | 26.931 | 26.250 | 0.381 | Junction | |
| 1.003 | 53.276 | 0.0 | 10 | 26.931 | 25.500 | 0.681 | Junction | |
| 2.000 | 82.551 | 0.0 | 7 | 26.673 | 25.518 | 0.255 | Open Manhole | 700 x 700 |
| 3.000 | 52.320 | 0.0 | 7 | 26.673 | 25.518 | 0.255 | Open Manhole | 700 x 700 |
| 2.001 | 4.440 | 40.0 | 8 | 26.747 | 25.407 | 0.815 | Open Manhole | 2550 x 9975 |
| 2.002 | 4.093 | 100.0 | 9 | 26.815 | 25.366 | 0.824 | Open Manhole | 1500 |
| 2.003 | 13.075 | 100.0 | 10 | 26.931 | 26.250 | 0.381 | Junction | |
| 1.004 | 32.583 | 0.0 | 16 | 26.931 | 25.500 | 0.681 | Junction | |
| 4.000 | 45.000 | 70.0 | 12 | 28.750 | 27.062 | 1.388 | Open Manhole | 1200 |
| 4.001 | 45.000 | 70.0 | 13 | 28.750 | 26.419 | 2.031 | Open Manhole | 1200 |
| 4.002 | 33.383 | 70.0 | 14 | 27.240 | 25.942 | 0.998 | Open Manhole | 1200 |
| 4.003 | 42.562 | 70.0 | 15 | 26.816 | 25.334 | 1.182 | Open Manhole | 1200 |
| 4.004 | 13.021 | 100.2 | 16 | 26.931 | 26.250 | 0.381 | Junction | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 7 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1


PIPELINE SCHEDULES for 9206 - MAIN MODEL.SWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.005 | 2 _ / | 1000 | 16 | 26.931 | 25.500 | 0.681 | Junction | |
| 5.000 | o | 600 | 17 | 28.450 | 27.400 | 0.450 | Open Manhole | 1500 |
| 5.001 | o | 600 | 18 | 28.750 | 26.931 | 1.219 | Open Manhole | 1500 |
| 5.002 | o | 600 | 19 | 28.750 | 26.462 | 1.688 | Open Manhole | 1500 |
| 5.003 | o | 600 | 20 | 28.750 | 25.993 | 2.157 | Open Manhole | 1500 |
| 5.004 | o | 600 | 21 | 27.240 | 25.268 | 1.372 | Open Manhole | 1500 |
| 5.005 | ooo | 46 | 22 | 26.815 | 26.316 | 0.124 | Open Manhole | 1800 |
| 1.006 | 2 _ / | 1000 | 23 | 26.931 | 25.500 | 1.131 | Junction | |
| 6.000 | Q90 | -9 | 24 | 26.673 | 25.518 | 0.255 | Open Manhole | 525 |
| 7.000 | Q90 | -9 | 25 | 26.673 | 25.518 | 0.255 | Open Manhole | 525 |
| 6.001 | o | 525 | 26 | 26.673 | 25.518 | 0.630 | Open Manhole | 700 x 700 |
| 6.002 | o | 525 | 27 | 26.814 | 25.306 | 0.883 | Open Manhole | 9975 x 2250 |
| 6.003 | oo | 41 | 28 | 26.814 | 26.370 | 0.144 | Open Manhole | 1500 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.005 | 25.953 | 0.0 | 23 | 26.931 | 25.500 | 0.681 | Junction | |
| 5.000 | 45.000 | 96.0 | 18 | 28.750 | 26.931 | 1.219 | Open Manhole | 1500 |
| 5.001 | 45.000 | 96.0 | 19 | 28.750 | 26.462 | 1.688 | Open Manhole | 1500 |
| 5.002 | 45.000 | 96.0 | 20 | 28.750 | 25.993 | 2.157 | Open Manhole | 1500 |
| 5.003 | 69.591 | 96.0 | 21 | 27.240 | 25.268 | 1.372 | Open Manhole | 1500 |
| 5.004 | 42.500 | 96.0 | 22 | 26.815 | 24.825 | 1.390 | Open Manhole | 1800 |
| 5.005 | 13.119 | 200.0 | 23 | 26.931 | 26.250 | 0.306 | Junction | |
| 1.006 | 23.257 | 0.0 | 29 | 26.931 | 25.500 | 1.131 | Junction | |
| 6.000 | 42.928 | 0.0 | 26 | 26.673 | 25.518 | 0.255 | Open Manhole | 700 x 700 |
| 7.000 | 90.537 | 0.0 | 26 | 26.673 | 25.518 | 0.255 | Open Manhole | 700 x 700 |
| 6.001 | 8.463 | 40.0 | 27 | 26.814 | 25.306 | 0.983 | Open Manhole | 9975 x 2250 |
| 6.002 | 14.993 | 100.0 | 28 | 26.814 | 25.156 | 1.033 | Open Manhole | 1500 |
| 6.003 | 11.992 | 100.0 | 29 | 26.931 | 26.250 | 0.381 | Junction | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 8 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |
| CADS | | Network W.12.6.1 |


PIPELINE SCHEDULES for 9206 - MAIN MODEL.SWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.007 | 2 \ \ / | 1000 | 29 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.008 | 2 \ \ / | 1000 | 30 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.009 | 2 \ \ / | 1000 | 31 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.010 | 2 \ \ / | 1000 | 32 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.011 | 2 \ \ / | 1000 | 33 | 26.931 | 25.500 | 0.681 | Junction | |
| 8.000 | o | 600 | 34 | 28.450 | 27.400 | 0.450 | Open Manhole | 1500 |
| 8.001 | o | 600 | 35 | 28.750 | 26.931 | 1.219 | Open Manhole | 1500 |
| 8.002 | o | 600 | 36 | 28.750 | 26.462 | 1.688 | Open Manhole | 1500 |
| 8.003 | o | 600 | 37 | 28.750 | 25.996 | 2.154 | Open Manhole | 1500 |
| 9.000 | o | 225 | 38 | 28.723 | 27.898 | 0.600 | Open Manhole | 1200 |
| 8.004 | o | 600 | 39 | 27.240 | 25.268 | 1.372 | Open Manhole | 1500 |
| 8.005 | ooo | 46 | 40 | 26.839 | 26.356 | 0.108 | Open Manhole | 1800 |
| 1.012 | 2 \ \ / | 1000 | 41 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.013 | 2 \ \ / | 1000 | 42 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.014 | 2 \ \ / | 1000 | 43 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.015 | 2 \ \ / | 1000 | 44 | 26.931 | 25.500 | 0.681 | Junction | |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.007 | 24.516 | 0.0 | 30 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.008 | 15.372 | 0.0 | 31 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.009 | 15.758 | 0.0 | 32 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.010 | 14.670 | 0.0 | 33 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.011 | 14.900 | 0.0 | 41 | 26.931 | 25.500 | 0.681 | Junction | |
| 8.000 | 45.000 | 96.0 | 35 | 28.750 | 26.931 | 1.219 | Open Manhole | 1500 |
| 8.001 | 45.000 | 96.0 | 36 | 28.750 | 26.462 | 1.688 | Open Manhole | 1500 |
| 8.002 | 44.758 | 96.0 | 37 | 28.750 | 25.996 | 2.154 | Open Manhole | 1500 |
| 8.003 | 69.908 | 96.0 | 39 | 27.240 | 25.268 | 1.372 | Open Manhole | 1500 |
| 9.000 | 82.898 | 36.8 | 39 | 27.240 | 25.643 | 1.372 | Open Manhole | 1500 |
| 8.004 | 44.677 | 96.0 | 40 | 26.839 | 24.803 | 1.436 | Open Manhole | 1800 |
| 8.005 | 21.104 | 199.1 | 41 | 26.931 | 26.250 | 0.306 | Junction | |
| 1.012 | 26.416 | 0.0 | 42 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.013 | 21.705 | 0.0 | 43 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.014 | 19.890 | 0.0 | 44 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.015 | 24.308 | 0.0 | 45 | 26.931 | 25.500 | 0.681 | Junction | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 9 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |
| CADS Network W.12.6.1 | | |

PIPELINE SCHEDULES for 9206 - MAIN MODEL.SWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.016 | 2 _/\ | 1000 | 45 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.017 | 2 _/\ | 1000 | 46 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.018 | 2 _/\ | 1000 | 47 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.019 | 2 _/\ | 1000 | 48 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.020 | 2 _/\ | 1000 | 49 | 26.931 | 25.500 | 0.681 | Junction | |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.016 | 18.366 | 0.0 | 46 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.017 | 19.734 | 0.0 | 47 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.018 | 19.746 | 0.0 | 48 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.019 | 5.266 | 0.0 | 49 | 26.931 | 25.500 | 0.681 | Junction | |
| 1.020 | 5.142 | 0.0 | 50 | 26.602 | 25.500 | 0.352 | Open Manhole | 0 |

Simulation Criteria for 9206 - MAIN MODEL.SWS

| | | | |
|---------------------------------|-------|--|--------|
| Volumetric Runoff Coeff | 0.840 | Additional Flow - % of Total Flow | 20.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 240 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 4 |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 24 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | | | |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model | FSR | Profile Type | Winter |
| Return Period (years) | 1 | Cv (Summer) | 0.750 |
| Region | England and Wales | Cv (Winter) | 0.840 |
| M5-60 (mm) | 19.000 | Storm Duration (mins) | 120 |
| Ratio R | 0.375 | | |

| | |
|--------------------------|--------------------------|
| Eden Lodge Studios | Aldi RDC |
| Ham Green | Goldthorpe |
| Bristol BS20 0ET | Storm - building + swale |
| Date 16/08/12 | Designed by LW |
| File 9206 - main mode... | Checked by |




| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Online Controls for 9206 - MAIN MODEL.SWS

Hydro-Brake® Manhole: 49, DS/PN: 1.020, Volume (m³): 29.1

Design Head (m) 0.750 Diameter (mm) 89
 Design Flow (l/s) 4.0 Invert Level (m) 25.500
 Hydro-Brake® Type Md6 SW Only

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 2.6 | 1.200 | 5.0 | 3.000 | 7.8 | 7.000 | 12.0 |
| 0.200 | 3.6 | 1.400 | 5.3 | 3.500 | 8.5 | 7.500 | 12.4 |
| 0.300 | 3.4 | 1.600 | 5.7 | 4.000 | 9.0 | 8.000 | 12.8 |
| 0.400 | 3.3 | 1.800 | 6.1 | 4.500 | 9.6 | 8.500 | 13.2 |
| 0.500 | 3.4 | 2.000 | 6.4 | 5.000 | 10.1 | 9.000 | 13.6 |
| 0.600 | 3.6 | 2.200 | 6.7 | 5.500 | 10.6 | 9.500 | 13.9 |
| 0.800 | 4.1 | 2.400 | 7.0 | 6.000 | 11.1 | | |
| 1.000 | 4.5 | 2.600 | 7.3 | 6.500 | 11.5 | | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 11 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Storage Structures for 9206 - MAIN MODEL.SWS

Trench Soakaway Manhole: 3, DS/PN: 1.002

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Trench Width (m) | 9.0 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Trench Length (m) | 10.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.500 |
| Invert Level (m) | 24.929 | Cap Infiltration Depth (m) | 1.500 |

Swale Manhole: 4, DS/PN: 1.003

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 53.3 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Trench Soakaway Manhole: 9, DS/PN: 2.003

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Trench Width (m) | 7.0 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Trench Length (m) | 15.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.500 |
| Invert Level (m) | 24.816 | Cap Infiltration Depth (m) | 1.500 |


Swale Manhole: 10, DS/PN: 1.004

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 32.6 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Trench Soakaway Manhole: 15, DS/PN: 4.004

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Trench Width (m) | 7.0 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Trench Length (m) | 12.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.500 |
| Invert Level (m) | 24.816 | Cap Infiltration Depth (m) | 1.500 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 12 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Swale Manhole: 16, DS/PN: 1.005

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 26.0 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Trench Soakaway Manhole: 22, DS/PN: 5.005

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Trench Width (m) | 7.0 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Trench Length (m) | 48.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.500 |
| Invert Level (m) | 24.816 | Cap Infiltration Depth (m) | 1.500 |

Swale Manhole: 23, DS/PN: 1.006

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 23.3 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Trench Soakaway Manhole: 28, DS/PN: 6.003

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Trench Width (m) | 7.0 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Trench Length (m) | 15.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.500 |
| Invert Level (m) | 24.816 | Cap Infiltration Depth (m) | 1.500 |

Swale Manhole: 29, DS/PN: 1.007

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 24.5 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

| | |
|---|--|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |
| Date 16/08/12 | Designed by LW |
| File 9206 - main mode... | Checked by |



CADS Network W.12.6.1

Swale Manhole: 30, DS/PN: 1.008

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 15.4 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Swale Manhole: 31, DS/PN: 1.009

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 15.8 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Swale Manhole: 32, DS/PN: 1.010

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 14.7 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |


Swale Manhole: 33, DS/PN: 1.011

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 14.9 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Trench Soakaway Manhole: 40, DS/PN: 8.005

| | | | |
|--------------------------------------|---------|------------------|--------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Porosity | 0.30 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Invert Level (m) | 24.856 |
| Safety Factor | 2.0 | Trench Width (m) | 10.0 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 14 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Trench Soakaway Manhole: 40, DS/PN: 8.005

Trench Length (m) 40.0 Cap Volume Depth (m) 1.500
Slope (1:X) 0.0 Cap Infiltration Depth (m) 1.500

Swale Manhole: 41, DS/PN: 1.012

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr) 0.36000 Length (m) 26.4
Infiltration Coefficient Side (m/hr) 0.36000 Side Slope (1:X) 2.0
Safety Factor 2.0 Slope (1:X) 0.0
Porosity 1.00 Cap Volume Depth (m) 0.000
Invert Level (m) 25.500 Cap Infiltration Depth (m) 0.750
Base Width (m) 1.0 Include Swale Volume No

Swale Manhole: 42, DS/PN: 1.013

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr) 0.36000 Length (m) 21.7
Infiltration Coefficient Side (m/hr) 0.36000 Side Slope (1:X) 2.0
Safety Factor 2.0 Slope (1:X) 0.0
Porosity 1.00 Cap Volume Depth (m) 0.000
Invert Level (m) 25.500 Cap Infiltration Depth (m) 0.750
Base Width (m) 1.0 Include Swale Volume No

Swale Manhole: 43, DS/PN: 1.014


Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr) 0.36000 Length (m) 19.9
Infiltration Coefficient Side (m/hr) 0.36000 Side Slope (1:X) 2.0
Safety Factor 2.0 Slope (1:X) 0.0
Porosity 1.00 Cap Volume Depth (m) 0.000
Invert Level (m) 25.500 Cap Infiltration Depth (m) 0.750
Base Width (m) 1.0 Include Swale Volume No

Swale Manhole: 44, DS/PN: 1.015

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr) 0.36000 Length (m) 24.3
Infiltration Coefficient Side (m/hr) 0.36000 Side Slope (1:X) 4.0
Safety Factor 2.0 Slope (1:X) 2.0
Porosity 1.00 Cap Volume Depth (m) 0.000
Invert Level (m) 25.500 Cap Infiltration Depth (m) 0.750
Base Width (m) 1.0 Include Swale Volume No

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 15 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Swale Manhole: 45, DS/PN: 1.016

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 18.4 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Swale Manhole: 46, DS/PN: 1.017

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 19.7 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Swale Manhole: 47, DS/PN: 1.018

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 19.7 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |


Swale Manhole: 48, DS/PN: 1.019

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 5.3 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |

Swale Manhole: 49, DS/PN: 1.020


Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

| | | |
|---|--|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Swale Manhole: 49, DS/PN: 1.020

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Length (m) | 5.1 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Side Slope (1:X) | 2.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 25.500 | Cap Infiltration Depth (m) | 0.750 |
| Base Width (m) | 1.0 | Include Swale Volume | No |


| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 17 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Summary of Results for 120 minute 1 year Winter (9206 - MAIN MODEL.SWS)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF


| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | |
|-------|------------|-----------|------------|--------------------------|-------------|------------------|--------|------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow / (1/s) | | Flow (1/s) |
| 1.000 | 1 | 27.769 | -0.236 | 0.000 | 0.10 | 0.0 | 13.4 | OK |
| 1.001 | 2 | 26.512 | -0.207 | 0.000 | 0.21 | 0.0 | 26.7 | OK |
| 1.002 | 3 | 26.304 | -0.425 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.003 | 4 | 25.500 | -1.431 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 2.000 | 5 | 26.083 | -0.335 | 0.000 | 0.07 | 0.0 | 22.1 | OK |
| 3.000 | 6 | 26.083 | -0.335 | 0.000 | 0.07 | 0.0 | 22.0 | OK |
| 2.001 | 7 | 26.083 | 0.040 | 0.000 | 0.16 | 0.0 | 40.0 | SURCHARGED |
| 2.002 | 8 | 26.082 | 0.150 | 0.000 | 0.14 | 0.0 | 32.1 | SURCHARGED |
| 2.003 | 9 | 26.081 | -0.600 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.004 | 10 | 25.501 | -1.430 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 4.000 | 11 | 27.770 | -0.235 | 0.000 | 0.11 | 0.0 | 13.4 | OK |
| 4.001 | 12 | 27.156 | -0.206 | 0.000 | 0.21 | 0.0 | 26.7 | OK |
| 4.002 | 13 | 26.514 | -0.205 | 0.000 | 0.22 | 0.0 | 26.7 | OK |
| 4.003 | 14 | 26.301 | 0.059 | 0.000 | 0.21 | 0.0 | 26.6 | SURCHARGED |
| 4.004 | 15 | 26.291 | -0.389 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.005 | 16 | 25.502 | -1.429 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 5.000 | 17 | 27.481 | -0.519 | 0.000 | 0.04 | 0.0 | 26.9 | OK |
| 5.001 | 18 | 27.051 | -0.480 | 0.000 | 0.09 | 0.0 | 53.6 | OK |
| 5.002 | 19 | 26.607 | -0.455 | 0.000 | 0.13 | 0.0 | 80.3 | OK |
| 5.003 | 20 | 26.265 | -0.328 | 0.000 | 0.17 | 0.0 | 106.7 | OK |
| 5.004 | 21 | 26.258 | 0.390 | 0.000 | 0.16 | 0.0 | 96.4 | SURCHARGED |
| 5.005 | 22 | 26.251 | -0.440 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.006 | 23 | 25.503 | -1.428 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 6.000 | 24 | 26.072 | -0.346 | 0.000 | 0.08 | 0.0 | 22.1 | OK |
| 7.000 | 25 | 26.072 | -0.346 | 0.000 | 0.07 | 0.0 | 22.3 | OK |
| 6.001 | 26 | 26.072 | 0.029 | 0.000 | 0.12 | 0.0 | 40.7 | SURCHARGED |
| 6.002 | 27 | 26.070 | 0.239 | 0.000 | 0.10 | 0.0 | 28.3 | SURCHARGED |
| 6.003 | 28 | 26.068 | -0.602 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.007 | 29 | 25.505 | -1.426 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.008 | 30 | 25.507 | -1.424 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.009 | 31 | 25.510 | -1.421 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.010 | 32 | 25.514 | -1.417 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.011 | 33 | 25.518 | -1.413 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 8.000 | 34 | 27.481 | -0.519 | 0.000 | 0.04 | 0.0 | 26.9 | OK |
| 8.001 | 35 | 27.051 | -0.480 | 0.000 | 0.09 | 0.0 | 53.6 | OK |
| 8.002 | 36 | 26.607 | -0.455 | 0.000 | 0.13 | 0.0 | 80.3 | OK |
| 8.003 | 37 | 26.194 | -0.402 | 0.000 | 0.17 | 0.0 | 106.6 | OK |
| 9.000 | 38 | 27.948 | -0.175 | 0.000 | 0.11 | 0.0 | 9.4 | OK |
| 8.004 | 39 | 26.187 | 0.319 | 0.000 | 0.18 | 0.0 | 107.2 | SURCHARGED |
| 8.005 | 40 | 26.180 | -0.551 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.012 | 41 | 25.523 | -1.408 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.013 | 42 | 25.531 | -1.400 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.014 | 43 | 25.539 | -1.392 | 0.000 | 0.00 | 0.0 | 0.0 | OK |

| | | |
|--------------------------|--------------------------|---|
| Eden Lodge Studios | Aldi RDC |  |
| Ham Green | Goldthorpe | |
| Bristol BS20 0ET | Storm - building + swale | |
| Date 16/08/12 | Designed by LW | |
| File 9206 - main mode... | Checked by | |

| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Summary of Results for 120 minute 1 year Winter (9206 - MAIN MODEL.SWS)

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe Flow (1/s) | Status |
|-------|------------|-----------|-----------|-------------|-------------|----------------|---------|----|-----------------|--------|
| | | Level (m) | Depth (m) | Volume (m³) | Flow / Cap. | Overflow (1/s) | | | | |
| 1.015 | 44 | 25.547 | -1.384 | 0.000 | 0.00 | 0.0 | 0.7 | OK | | |
| 1.016 | 45 | 25.547 | -1.384 | 0.000 | 0.00 | 0.0 | 0.1 | OK | | |
| 1.017 | 46 | 25.547 | -1.384 | 0.000 | 0.00 | 0.0 | 0.0 | OK | | |
| 1.018 | 47 | 25.549 | -1.382 | 0.000 | 0.00 | 0.0 | 0.7 | OK | | |
| 1.019 | 48 | 25.549 | -1.382 | 0.000 | 0.00 | 0.0 | 0.3 | OK | | |
| 1.020 | 49 | 25.549 | -1.382 | 0.000 | 0.00 | 0.0 | 0.0 | OK | | |

| | | |
|---|--|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |


| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Simulation Criteria for 9206 - MAIN MODEL.SWS

| | | | |
|---------------------------------|-------|--|--------|
| Volumetric Runoff Coeff | 0.840 | Additional Flow - % of Total Flow | 20.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.500 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 120 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 2 |
| | | | |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 24 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | | | |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model | FSR | Profile Type | Winter |
| Return Period (years) | 30 | Cv (Summer) | 0.750 |
| Region | England and Wales | Cv (Winter) | 0.840 |
| M5-60 (mm) | 19.000 | Storm Duration (mins) | 60 |
| Ratio R | 0.375 | | |

| | | |
|---|--|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |

CADS Network W.12.6.1

Summary of Results for 60 minute 30 year Winter (9206 - MAIN MODEL.SWS)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe | Status |
|-------|------------|-----------------|----------------------|---------------------|-------------|----------------|------------|------------|
| | | | | | | | Flow (l/s) | |
| 1.000 | 1 | 27.837 | -0.168 | 0.000 | 0.39 | 0.0 | 50.4 | OK |
| 1.001 | 2 | 27.151 | 0.432 | 0.000 | 0.75 | 0.0 | 95.6 | SURCHARGED |
| 1.002 | 3 | 26.571 | -0.158 | 0.000 | 0.46 | 0.0 | 88.4 | FLOOD RISK |
| 1.003 | 4 | 26.490 | -0.441 | 0.000 | 0.01 | 0.0 | 79.6 | OK |
| 2.000 | 5 | 26.604 | 0.186 | 0.000 | 0.25 | 0.0 | 78.3 | FLOOD RISK |
| 3.000 | 6 | 26.602 | 0.184 | 0.000 | 0.27 | 0.0 | 79.8 | FLOOD RISK |
| 2.001 | 7 | 26.590 | 0.547 | 0.000 | 0.51 | 0.0 | 129.8 | FLOOD RISK |
| 2.002 | 8 | 26.576 | 0.644 | 0.000 | 0.54 | 0.0 | 128.5 | FLOOD RISK |
| 2.003 | 9 | 26.563 | -0.118 | 0.000 | 0.67 | 0.0 | 120.3 | FLOOD RISK |
| 1.004 | 10 | 26.490 | -0.441 | 0.000 | 0.00 | 0.0 | 43.1 | OK |
| 4.000 | 11 | 27.839 | -0.166 | 0.000 | 0.41 | 0.0 | 50.9 | OK |
| 4.001 | 12 | 27.492 | 0.130 | 0.000 | 0.75 | 0.0 | 93.9 | SURCHARGED |
| 4.002 | 13 | 27.130 | 0.411 | 0.000 | 0.76 | 0.0 | 92.3 | SURCHARGED |
| 4.003 | 14 | 26.859 | 0.617 | 0.000 | 0.74 | 0.0 | 92.0 | SURCHARGED |
| 4.004 | 15 | 26.523 | -0.157 | 0.000 | 0.47 | 0.0 | 84.8 | FLOOD RISK |
| 1.005 | 16 | 26.491 | -0.440 | 0.000 | 0.01 | 0.0 | 43.0 | OK |
| 5.000 | 17 | 27.565 | -0.435 | 0.000 | 0.17 | 0.0 | 102.5 | OK |
| 5.001 | 18 | 27.170 | -0.361 | 0.000 | 0.33 | 0.0 | 201.1 | OK |
| 5.002 | 19 | 27.064 | 0.002 | 0.000 | 0.46 | 0.0 | 277.7 | SURCHARGED |
| 5.003 | 20 | 26.967 | 0.374 | 0.000 | 0.58 | 0.0 | 367.9 | SURCHARGED |
| 5.004 | 21 | 26.721 | 0.853 | 0.000 | 0.61 | 0.0 | 366.4 | SURCHARGED |
| 5.005 | 22 | 26.553 | -0.138 | 0.000 | 0.76 | 0.0 | 341.7 | FLOOD RISK |
| 1.006 | 23 | 26.491 | -0.440 | 0.000 | 0.04 | 0.0 | 317.9 | OK |
| 6.000 | 24 | 26.616 | 0.198 | 0.000 | 0.30 | 0.0 | 80.0 | FLOOD RISK |
| 7.000 | 25 | 26.619 | 0.201 | 0.000 | 0.25 | 0.0 | 78.0 | FLOOD RISK |
| 6.001 | 26 | 26.605 | 0.562 | 0.000 | 0.36 | 0.0 | 127.7 | FLOOD RISK |
| 6.002 | 27 | 26.584 | 0.753 | 0.000 | 0.43 | 0.0 | 127.4 | FLOOD RISK |
| 6.003 | 28 | 26.552 | -0.118 | 0.000 | 0.69 | 0.0 | 119.1 | FLOOD RISK |
| 1.007 | 29 | 26.491 | -0.440 | 0.000 | 0.04 | 0.0 | 355.3 | OK |
| 1.008 | 30 | 26.491 | -0.440 | 0.000 | 0.04 | 0.0 | 287.3 | OK |
| 1.009 | 31 | 26.491 | -0.440 | 0.000 | 0.03 | 0.0 | 241.8 | OK |
| 1.010 | 32 | 26.491 | -0.440 | 0.000 | 0.02 | 0.0 | 195.5 | OK |
| 1.011 | 33 | 26.491 | -0.440 | 0.000 | 0.02 | 0.0 | 152.1 | OK |
| 8.000 | 34 | 27.565 | -0.435 | 0.000 | 0.17 | 0.0 | 102.5 | OK |
| 8.001 | 35 | 27.242 | -0.289 | 0.000 | 0.33 | 0.0 | 197.9 | OK |
| 8.002 | 36 | 27.197 | 0.135 | 0.000 | 0.44 | 0.0 | 265.6 | SURCHARGED |
| 8.003 | 37 | 27.107 | 0.511 | 0.000 | 0.56 | 0.0 | 354.0 | SURCHARGED |
| 9.000 | 38 | 28.001 | -0.122 | 0.000 | 0.42 | 0.0 | 35.5 | OK |
| 8.004 | 39 | 26.875 | 1.007 | 0.000 | 0.63 | 0.0 | 384.3 | SURCHARGED |
| 8.005 | 40 | 26.685 | -0.046 | 0.000 | 1.00 | 0.0 | 357.8 | FLOOD RISK |
| 1.012 | 41 | 26.491 | -0.440 | 0.000 | 0.06 | 0.0 | 461.9 | OK |
| 1.013 | 42 | 26.491 | -0.440 | 0.000 | 0.05 | 0.0 | 385.1 | OK |
| 1.014 | 43 | 26.491 | -0.440 | 0.000 | 0.04 | 0.0 | 319.2 | OK |


| | |
|---|--|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |
| Date 16/08/12 | Designed by LW |
| File 9206 - main mode... | Checked by |



| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Summary of Results for 60 minute 30 year Winter (9206 - MAIN MODEL.SWS)

| PN | US/MH Name | Water Surcharged | | | Flooded | | Pipe | | Status |
|-------|---------------|------------------|--------------|-----------------------------|----------------|-------------------|---------------|----|--------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | | |
| 1.015 | 44 | 26.491 | -0.440 | 0.000 | 0.03 | 0.0 | 269.0 | OK | |
| 1.016 | 45 | 26.490 | -0.441 | 0.000 | 0.03 | 0.0 | 193.5 | OK | |
| 1.017 | 46 | 26.490 | -0.441 | 0.000 | 0.02 | 0.0 | 135.4 | OK | |
| 1.018 | 47 | 26.491 | -0.440 | 0.000 | 0.01 | 0.0 | 81.0 | OK | |
| 1.019 | 48 | 26.491 | -0.440 | 0.000 | 0.00 | 0.0 | 21.0 | OK | |
| 1.020 | 49 | 26.491 | -0.440 | 0.000 | 0.00 | 0.0 | 4.0 | OK | |

| | | |
|---|--|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |


| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Simulation Criteria for 9206 - MAIN MODEL.SWS

| | | | |
|---------------------------------|-------|--|--------|
| Volumetric Runoff Coeff | 0.840 | Additional Flow - % of Total Flow | 20.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.500 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 240 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 4 |
| | | | |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 24 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | | | |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model | FSR | Profile Type | Winter |
| Return Period (years) | 100 | Cv (Summer) | 0.750 |
| Region | England and Wales | Cv (Winter) | 0.840 |
| M5-60 (mm) | 19.000 | Storm Duration (mins) | 120 |
| Ratio R | 0.375 | | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 1 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |  |
| Date 16/08/12 File 9206 - main mode... | Designed by LW Checked by | |
| CADS | | Network W.12.6.1 |

Summary of Results for 120 minute 100 year Winter (9206 - MAIN MODEL.SWS)

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | |
|-------|---------------|--------------|--------------|-----------------------------|----------------|-------------------|--------|---------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | | Flow (l/s) |
| 1.000 | 1 | 27.822 | -0.183 | 0.000 | 0.32 | 0.0 | 41.5 | OK |
| 1.001 | 2 | 26.983 | 0.264 | 0.000 | 0.65 | 0.0 | 82.2 | SURCHARGED |
| 1.002 | 3 | 26.795 | 0.066 | 0.000 | 0.39 | 0.0 | 74.7 | FLOOD RISK |
| 1.003 | 4 | 26.721 | -0.210 | 0.000 | 0.01 | 0.0 | 62.3 | FLOOD RISK* |
| 2.000 | 5 | 26.717 | 0.299 | 44.188 | 0.18 | 0.0 | 58.0 | FLOOD |
| 3.000 | 6 | 26.717 | 0.299 | 44.191 | 0.20 | 0.0 | 59.1 | FLOOD |
| 2.001 | 7 | 26.717 | 0.674 | 44.189 | 0.43 | 0.0 | 110.5 | FLOOD |
| 2.002 | 8 | 26.716 | 0.784 | 0.000 | 0.46 | 0.0 | 108.4 | FLOOD RISK |
| 2.003 | 9 | 26.716 | 0.035 | 0.000 | 0.55 | 0.0 | 99.9 | FLOOD RISK |
| 1.004 | 10 | 26.719 | -0.212 | 0.000 | 0.00 | 0.0 | 23.9 | FLOOD RISK* |
| 4.000 | 11 | 27.824 | -0.181 | 0.000 | 0.33 | 0.0 | 41.5 | OK |
| 4.001 | 12 | 27.279 | -0.083 | 0.000 | 0.66 | 0.0 | 82.2 | OK |
| 4.002 | 13 | 27.075 | 0.356 | 0.000 | 0.67 | 0.0 | 81.8 | SURCHARGED |
| 4.003 | 14 | 26.919 | 0.677 | 0.000 | 0.66 | 0.0 | 81.6 | SURCHARGED |
| 4.004 | 15 | 26.797 | 0.117 | 0.000 | 0.41 | 0.0 | 74.5 | FLOOD RISK |
| 1.005 | 16 | 26.747 | -0.184 | 0.000 | 0.00 | 0.0 | 23.7 | FLOOD RISK* |
| 5.000 | 17 | 27.648 | -0.352 | 0.000 | 0.14 | 0.0 | 83.5 | OK |
| 5.001 | 18 | 27.633 | 0.102 | 0.000 | 0.27 | 0.0 | 166.3 | SURCHARGED |
| 5.002 | 19 | 27.444 | 0.382 | 0.000 | 0.41 | 0.0 | 248.9 | SURCHARGED |
| 5.003 | 20 | 27.238 | 0.645 | 0.000 | 0.52 | 0.0 | 331.2 | SURCHARGED |
| 5.004 | 21 | 27.021 | 1.153 | 0.000 | 0.55 | 0.0 | 330.4 | FLOOD RISK |
| 5.005 | 22 | 26.815 | 0.124 | 0.234 | 0.68 | 0.0 | 304.5 | FLOOD |
| 1.006 | 23 | 26.761 | -0.170 | 0.000 | 0.03 | 0.0 | 257.1 | FLOOD RISK* |
| 6.000 | 24 | 26.734 | 0.316 | 61.470 | 0.21 | 0.0 | 57.2 | FLOOD |
| 7.000 | 25 | 26.734 | 0.316 | 61.466 | 0.18 | 0.0 | 55.4 | FLOOD |
| 6.001 | 26 | 26.734 | 0.691 | 61.474 | 0.20 | 0.0 | 70.6 | FLOOD |
| 6.002 | 27 | 26.734 | 0.903 | 0.000 | 0.23 | 0.0 | 69.8 | FLOOD RISK |
| 6.003 | 28 | 26.733 | 0.063 | 0.000 | 0.35 | 0.0 | 61.0 | FLOOD RISK |
| 1.007 | 29 | 26.745 | -0.186 | 0.000 | 0.03 | 0.0 | 241.5 | FLOOD RISK* |
| 1.008 | 30 | 26.743 | -0.188 | 0.000 | 0.02 | 0.0 | 181.7 | FLOOD RISK* |
| 1.009 | 31 | 26.742 | -0.189 | 0.000 | 0.02 | 0.0 | 143.0 | FLOOD RISK* |
| 1.010 | 32 | 26.742 | -0.189 | 0.000 | 0.01 | 0.0 | 103.8 | FLOOD RISK* |
| 1.011 | 33 | 26.742 | -0.189 | 0.000 | 0.01 | 0.0 | 67.2 | FLOOD RISK* |
| 8.000 | 34 | 27.549 | -0.451 | 0.000 | 0.14 | 0.0 | 83.5 | OK |
| 8.001 | 35 | 27.538 | 0.007 | 0.000 | 0.27 | 0.0 | 163.8 | SURCHARGED |
| 8.002 | 36 | 27.377 | 0.315 | 0.000 | 0.40 | 0.0 | 245.5 | SURCHARGED |
| 8.003 | 37 | 27.176 | 0.580 | 0.000 | 0.51 | 0.0 | 326.9 | SURCHARGED |
| 9.000 | 38 | 27.989 | -0.134 | 0.000 | 0.35 | 0.0 | 29.1 | OK |
| 8.004 | 39 | 26.959 | 1.091 | 0.000 | 0.58 | 0.0 | 354.7 | FLOOD RISK |
| 8.005 | 40 | 26.753 | 0.022 | 0.000 | 0.91 | 0.0 | 326.0 | FLOOD RISK |
| 1.012 | 41 | 26.743 | -0.188 | 0.000 | 0.04 | 0.0 | 352.8 | FLOOD RISK* |
| 1.013 | 42 | 26.724 | -0.207 | 0.000 | 0.04 | 0.0 | 288.4 | FLOOD RISK* |
| 1.014 | 43 | 26.716 | -0.215 | 0.000 | 0.03 | 0.0 | 235.4 | FLOOD RISK* |

| | |
|---|--|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm - building + swale |
| Date 16/08/12 | Designed by LW |
| File 9206 - main mode... | Checked by |



| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Summary of Results for 120 minute 100 year Winter (9206 - MAIN MODEL.SWS)

| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | |
|-------|---------------|--------------|--------------|-----------------------------|----------------|-------------------|--------|---------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | | Flow (l/s) |
| 1.015 | 44 | 26.712 | -0.219 | 0.000 | 0.03 | 0.0 | 202.0 | FLOOD RISK* |
| 1.016 | 45 | 26.706 | -0.225 | 0.000 | 0.02 | 0.0 | 144.2 | FLOOD RISK* |
| 1.017 | 46 | 26.704 | -0.227 | 0.000 | 0.01 | 0.0 | 99.3 | FLOOD RISK* |
| 1.018 | 47 | 26.703 | -0.228 | 0.000 | 0.01 | 0.0 | 61.8 | FLOOD RISK* |
| 1.019 | 48 | 26.702 | -0.229 | 0.000 | 0.00 | 0.0 | 16.8 | FLOOD RISK* |
| 1.020 | 49 | 26.702 | -0.229 | 0.000 | 0.00 | 0.0 | 4.4 | FLOOD RISK* |

APPENDIX E

North Lorry Layover/Loading Bay and End of Access Road Drainage Calculations

Craddy Pitchers Limited

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Date 16/08/2012 14:11
File 9206 - north goods area V2.mdx

CADS

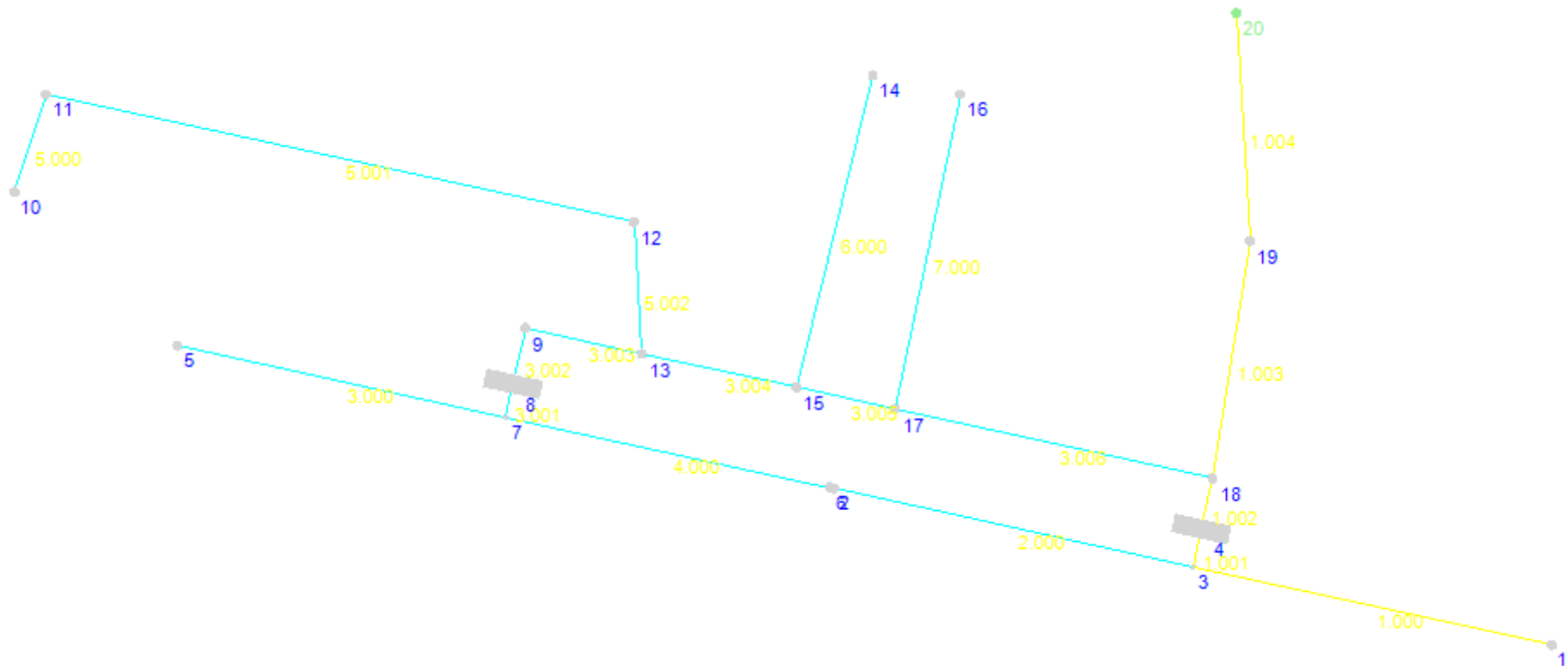
Page 1




Designed by Lee Westermann

Checked by


Network W.12.6.1



| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 0 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 | Designed by LW | |
| File 9206 - north goo... | Checked by | |
| CADS | | Network W.12.6.1 |

Existing Network Details for 9206 - NORTH GOODS AREA.ews

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) | |
|-------|---------------|--------------|----------------|----------------------|----------------|--------------|----------------------|-------------|---------------|
| 1.000 | 54.979 | 0.006 | 9996.3 | 0.392 | 4.00 | 0.600 | Q70 | -7 | |
| 2.000 | 54.979 | 0.006 | 9996.3 | 0.392 | 4.00 | 0.600 | Q70 | -7 | |
| 1.001 | 5.815 | 0.073 | 80.0 | 0.000 | 0.00 | 0.600 | o | 525 | |
| 1.002 | 7.804 | 0.098 | 79.6 | 0.000 | 0.00 | 0.600 | o | 525 | |
| 3.000 | 50.291 | 0.005 | 10058.1 | 0.392 | 4.00 | 0.600 | Q70 | -7 | |
| 4.000 | 49.645 | 0.005 | 9929.0 | 0.392 | 4.00 | 0.600 | Q70 | -7 | |
| 3.001 | 5.102 | 0.073 | 70.0 | 0.000 | 0.00 | 0.600 | o | 525 | |
| 3.002 | 8.590 | 0.098 | 87.6 | 0.000 | 0.00 | 0.600 | o | 525 | |
| 3.003 | 17.848 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| 5.000 | 15.357 | 0.102 | 150.0 | 0.073 | 4.00 | 0.600 | o | 150 | |
| 5.001 | 90.055 | 0.600 | 150.0 | 0.050 | 0.00 | 0.600 | o | 225 | |
| 5.002 | 19.768 | 0.132 | 150.0 | 0.030 | 0.00 | 0.600 | o | 225 | |
| 3.004 | 23.684 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| 6.000 | 48.206 | 0.505 | 95.5 | 0.054 | 4.00 | 0.600 | o | 225 | |
| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
| 1.000 | 1 | 26.673 | 25.723 | 0.250 | 26.673 | 25.718 | 0.256 | | 100 |
| 2.000 | 2 | 26.673 | 25.723 | 0.250 | 26.673 | 25.718 | 0.256 | | 100 |
| 1.001 | 3 | 26.673 | 25.718 | 0.430 | 26.770 | 25.645 | 0.600 | | 700 x 700 |
| 1.002 | 4 | 26.770 | 25.545 | 0.700 | 26.900 | 25.447 | 0.928 | | 2820 x 8675 |
| 3.000 | 5 | 26.673 | 25.723 | 0.250 | 26.673 | 25.718 | 0.255 | | 100 |
| 4.000 | 6 | 26.673 | 25.723 | 0.250 | 26.673 | 25.718 | 0.255 | | 100 |
| 3.001 | 7 | 26.673 | 25.718 | 0.430 | 26.758 | 25.645 | 0.588 | | 700 x 700 |
| 3.002 | 8 | 26.758 | 25.545 | 0.688 | 26.901 | 25.447 | 0.929 | | 2820 x 8675 |
| 3.003 | 9 | 26.901 | 24.947 | 1.504 | 26.900 | 24.947 | 1.503 | | 1500 |
| 5.000 | 10 | 26.999 | 26.056 | 0.793 | 27.067 | 25.954 | 0.963 | | 1200 |
| 5.001 | 11 | 27.067 | 25.879 | 0.963 | 27.170 | 25.279 | 1.666 | | 1200 |
| 5.002 | 12 | 27.170 | 25.279 | 1.666 | 26.900 | 25.147 | 1.528 | | 1200 |
| 3.004 | 13 | 26.900 | 24.947 | 1.503 | 26.901 | 24.947 | 1.504 | | 1500 |
| 6.000 | 14 | 27.377 | 25.952 | 1.200 | 26.901 | 25.447 | 1.229 | | 1200 |

| | | |
|---|--|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |

| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Existing Network Details for 9206 - NORTH GOODS AREA.eWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) | |
|-------|---------------|--------------|----------------|----------------------|----------------|--------------|----------------------|--------------|---------------|
| 3.005 | 15.116 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| 7.000 | 48.204 | 0.455 | 105.9 | 0.048 | 4.00 | 0.600 | o | 225 | |
| 3.006 | 48.632 | 0.000 | 0.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| 1.003 | 36.066 | 0.378 | 95.3 | 0.000 | 0.00 | 0.600 | o | 525 | |
| 1.004 | 34.239 | 0.570 | 60.1 | 0.000 | 0.00 | 0.600 | o | 300 | |
| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
| 3.005 | 15 | 26.901 | 24.947 | 1.504 | 26.901 | 24.947 | 1.504 | | 1500 |
| 7.000 | 16 | 27.327 | 25.902 | 1.200 | 26.901 | 25.447 | 1.229 | | 1200 |
| 3.006 | 17 | 26.901 | 24.947 | 1.504 | 26.900 | 24.947 | 1.503 | | 1500 |
| 1.003 | 18 | 26.900 | 25.447 | 0.928 | 27.000 | 25.069 | 1.406 | | 1500 |
| 1.004 | 19 | 27.000 | 25.069 | 1.631 | 26.000 | 24.499 | 1.201 | Hydro-Brake® | 1500 |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Aldi RDC
Goldthorpe
Storm north goods + SA



Date 16/08/12

Designed by LW

File 9206 - north goo...


Checked by

CADS

Network W.12.6.1

Manhole Schedules for 9206 - NORTH GOODS AREA.eWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN | Pipe Out Invert Level (m) | Diameter (mm) | PN | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|---------------|-------|---------------------------|---------------|---------------|
| 1 | 26.673 | 0.950 | Open Manhole | 100 | 1.000 | 25.723 | -7 | | | | |
| 2 | 26.673 | 0.950 | Open Manhole | 100 | 2.000 | 25.723 | -7 | | | | |
| 3 | 26.673 | 0.956 | Open Manhole | 700 x 700 | 1.001 | 25.718 | 525 | 1.000 | 25.718 | -7 | |
| | | | | | | | | 2.000 | 25.718 | -7 | |
| 4 | 26.770 | 1.225 | Open Manhole | 2820 x 8675 | 1.002 | 25.545 | 525 | 1.001 | 25.645 | 525 | 100 |
| 5 | 26.673 | 0.950 | Open Manhole | 100 | 3.000 | 25.723 | -7 | | | | |
| 6 | 26.673 | 0.950 | Open Manhole | 100 | 4.000 | 25.723 | -7 | | | | |
| 7 | 26.673 | 0.955 | Open Manhole | 700 x 700 | 3.001 | 25.718 | 525 | 3.000 | 25.718 | -7 | |
| | | | | | | | | 4.000 | 25.718 | -7 | |
| 8 | 26.758 | 1.213 | Open Manhole | 2820 x 8675 | 3.002 | 25.545 | 525 | 3.001 | 25.645 | 525 | 100 |
| 9 | 26.901 | 1.954 | Open Manhole | 1500 | 3.003 | 24.947 | 450 | 3.002 | 25.447 | 525 | 575 |
| 10 | 26.999 | 0.943 | Open Manhole | 1200 | 5.000 | 26.056 | 150 | | | | |
| 11 | 27.067 | 1.188 | Open Manhole | 1200 | 5.001 | 25.879 | 225 | 5.000 | 25.954 | 150 | |
| 12 | 27.170 | 1.891 | Open Manhole | 1200 | 5.002 | 25.279 | 225 | 5.001 | 25.279 | 225 | |
| 13 | 26.900 | 1.953 | Open Manhole | 1500 | 3.004 | 24.947 | 450 | 3.003 | 24.947 | 450 | |
| | | | | | | | | 5.002 | 25.147 | 225 | |
| 14 | 27.377 | 1.425 | Open Manhole | 1200 | 6.000 | 25.952 | 225 | | | | |
| 15 | 26.901 | 1.954 | Open Manhole | 1500 | 3.005 | 24.947 | 450 | 3.004 | 24.947 | 450 | |
| | | | | | | | | 6.000 | 25.447 | 225 | 275 |
| 16 | 27.327 | 1.425 | Open Manhole | 1200 | 7.000 | 25.902 | 225 | | | | |
| 17 | 26.901 | 1.954 | Open Manhole | 1500 | 3.006 | 24.947 | 450 | 3.005 | 24.947 | 450 | |
| | | | | | | | | 7.000 | 25.447 | 225 | 275 |
| 18 | 26.900 | 1.953 | Open Manhole | 1500 | 1.003 | 25.447 | 525 | 1.002 | 25.447 | 525 | |
| | | | | | | | | 3.006 | 24.947 | 450 | |
| 19 | 27.000 | 1.931 | Open Manhole | 1500 | 1.004 | 25.069 | 300 | 1.003 | 25.069 | 525 | |
| 20 | 26.000 | 1.501 | Open Manhole | 0 | | OUTFALL | | 1.004 | 24.499 | 300 | |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 3 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |
| CADS | | Network W.12.6.1 |


PIPELINE SCHEDULES for 9206 - NORTH GOODS AREA.eWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | Q70 | -7 | 1 | 26.673 | 25.723 | 0.250 | Open Manhole | 100 |
| 2.000 | Q70 | -7 | 2 | 26.673 | 25.723 | 0.250 | Open Manhole | 100 |
| 1.001 | o | 525 | 3 | 26.673 | 25.718 | 0.430 | Open Manhole | 700 x 700 |
| 1.002 | o | 525 | 4 | 26.770 | 25.545 | 0.700 | Open Manhole | 2820 x 8675 |
| 3.000 | Q70 | -7 | 5 | 26.673 | 25.723 | 0.250 | Open Manhole | 100 |
| 4.000 | Q70 | -7 | 6 | 26.673 | 25.723 | 0.250 | Open Manhole | 100 |
| 3.001 | o | 525 | 7 | 26.673 | 25.718 | 0.430 | Open Manhole | 700 x 700 |
| 3.002 | o | 525 | 8 | 26.758 | 25.545 | 0.688 | Open Manhole | 2820 x 8675 |
| 3.003 | o | 450 | 9 | 26.901 | 24.947 | 1.504 | Open Manhole | 1500 |
| 5.000 | o | 150 | 10 | 26.999 | 26.056 | 0.793 | Open Manhole | 1200 |
| 5.001 | o | 225 | 11 | 27.067 | 25.879 | 0.963 | Open Manhole | 1200 |
| 5.002 | o | 225 | 12 | 27.170 | 25.279 | 1.666 | Open Manhole | 1200 |
| 3.004 | o | 450 | 13 | 26.900 | 24.947 | 1.503 | Open Manhole | 1500 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 54.979 | 9996.3 | 3 | 26.673 | 25.718 | 0.256 | Open Manhole | 700 x 700 |
| 2.000 | 54.979 | 9996.3 | 3 | 26.673 | 25.718 | 0.256 | Open Manhole | 700 x 700 |
| 1.001 | 5.815 | 80.0 | 4 | 26.770 | 25.645 | 0.600 | Open Manhole | 2820 x 8675 |
| 1.002 | 7.804 | 79.6 | 18 | 26.900 | 25.447 | 0.928 | Open Manhole | 1500 |
| 3.000 | 50.291 | 10058.1 | 7 | 26.673 | 25.718 | 0.255 | Open Manhole | 700 x 700 |
| 4.000 | 49.645 | 9929.0 | 7 | 26.673 | 25.718 | 0.255 | Open Manhole | 700 x 700 |
| 3.001 | 5.102 | 70.0 | 8 | 26.758 | 25.645 | 0.588 | Open Manhole | 2820 x 8675 |
| 3.002 | 8.590 | 87.6 | 9 | 26.901 | 25.447 | 0.929 | Open Manhole | 1500 |
| 3.003 | 17.848 | 0.0 | 13 | 26.900 | 24.947 | 1.503 | Open Manhole | 1500 |
| 5.000 | 15.357 | 150.0 | 11 | 27.067 | 25.954 | 0.963 | Open Manhole | 1200 |
| 5.001 | 90.055 | 150.0 | 12 | 27.170 | 25.279 | 1.666 | Open Manhole | 1200 |
| 5.002 | 19.768 | 150.0 | 13 | 26.900 | 25.147 | 1.528 | Open Manhole | 1500 |
| 3.004 | 23.684 | 0.0 | 15 | 26.901 | 24.947 | 1.504 | Open Manhole | 1500 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 4 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |

CADS Network W.12.6.1

PIPELINE SCHEDULES for 9206 - NORTH GOODS AREA.eWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 6.000 | o | 225 | 14 | 27.377 | 25.952 | 1.200 | Open Manhole | 1200 |
| 3.005 | o | 450 | 15 | 26.901 | 24.947 | 1.504 | Open Manhole | 1500 |
| 7.000 | o | 225 | 16 | 27.327 | 25.902 | 1.200 | Open Manhole | 1200 |
| 3.006 | o | 450 | 17 | 26.901 | 24.947 | 1.504 | Open Manhole | 1500 |
| 1.003 | o | 525 | 18 | 26.900 | 25.447 | 0.928 | Open Manhole | 1500 |
| 1.004 | o | 300 | 19 | 27.000 | 25.069 | 1.631 | Open Manhole | 1500 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 6.000 | 48.206 | 95.5 | 15 | 26.901 | 25.447 | 1.229 | Open Manhole | 1500 |
| 3.005 | 15.116 | 0.0 | 17 | 26.901 | 24.947 | 1.504 | Open Manhole | 1500 |
| 7.000 | 48.204 | 105.9 | 17 | 26.901 | 25.447 | 1.229 | Open Manhole | 1500 |
| 3.006 | 48.632 | 0.0 | 18 | 26.900 | 24.947 | 1.503 | Open Manhole | 1500 |
| 1.003 | 36.066 | 95.3 | 19 | 27.000 | 25.069 | 1.406 | Open Manhole | 1500 |
| 1.004 | 34.239 | 60.1 | 20 | 26.000 | 24.499 | 1.201 | Open Manhole | 0 |


Simulation Criteria for 9206 - NORTH GOODS AREA.eWS

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

Number of Input Hydrographs 0 Number of Storage Structures 5
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales
Return Period (years) 1 M5-60 (mm) 19.000

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 5 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |
| CADS | Network W.12.6.1 | |

Synthetic Rainfall Details

Ratio R 0.374 Cv (Winter) 0.840
 Profile Type Summer Storm Duration (mins) 30
 Cv (Summer) 0.750

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Aldi RDC
Goldthorpe
Storm north goods + SA



Date 16/08/12

Designed by LW

File 9206 - north goo...

Checked by

CADS

Network W.12.6.1

Online Controls for 9206 - NORTH GOODS AREA.eWS

Hydro-Brake® Manhole: 19, DS/PN: 1.004, Volume (m³): 10.9

Design Head (m) 1.620 Diameter (mm) 245
Design Flow (l/s) 45.0 Invert Level (m) 25.069
Hydro-Brake® Type Md6 SW Only

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 8.1 | 1.200 | 41.4 | 3.000 | 59.3 | 7.000 | 90.6 |
| 0.200 | 22.3 | 1.400 | 42.6 | 3.500 | 64.1 | 7.500 | 93.8 |
| 0.300 | 35.3 | 1.600 | 44.5 | 4.000 | 68.5 | 8.000 | 96.9 |
| 0.400 | 42.9 | 1.800 | 46.5 | 4.500 | 72.6 | 8.500 | 99.8 |
| 0.500 | 44.7 | 2.000 | 48.8 | 5.000 | 76.6 | 9.000 | 102.7 |
| 0.600 | 44.7 | 2.200 | 51.0 | 5.500 | 80.3 | 9.500 | 105.6 |
| 0.800 | 42.7 | 2.400 | 53.1 | 6.000 | 83.9 | | |
| 1.000 | 41.3 | 2.600 | 55.3 | 6.500 | 87.3 | | |

| | |
|--------------------------|------------------------|
| Eden Lodge Studios | Aldi RDC |
| Ham Green | Goldthorpe |
| Bristol BS20 0ET | Storm north goods + SA |
| Date 16/08/12 | Designed by LW |
| File 9206 - north goo... | Checked by |



CADS Network W.12.6.1

Storage Structures for 9206 - NORTH GOODS AREA.eWS

Infiltration Trench Manhole: 9, DS/PN: 3.003

| | | |
|--|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) 0.36000 | Trench Width (m) | 3.5 |
| Infiltration Coefficient Side (m/hr) 0.36000 | Trench Length (m) | 20.0 |
| Safety Factor 2.0 | Slope (1:X) | 0.0 |
| Porosity 0.30 | Cap Volume Depth (m) | 1.750 |
| Invert Level (m) 23.697 | Cap Infiltration Depth (m) | 0.750 |

Infiltration Trench Manhole: 13, DS/PN: 3.004

| | | |
|--|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) 0.36000 | Trench Width (m) | 3.5 |
| Infiltration Coefficient Side (m/hr) 0.36000 | Trench Length (m) | 11.5 |
| Safety Factor 2.0 | Slope (1:X) | 0.0 |
| Porosity 0.30 | Cap Volume Depth (m) | 1.750 |
| Invert Level (m) 23.697 | Cap Infiltration Depth (m) | 0.750 |

Infiltration Trench Manhole: 15, DS/PN: 3.005


| | | |
|--|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) 0.36000 | Trench Width (m) | 3.5 |
| Infiltration Coefficient Side (m/hr) 0.36000 | Trench Length (m) | 19.0 |
| Safety Factor 2.0 | Slope (1:X) | 0.0 |
| Porosity 0.30 | Cap Volume Depth (m) | 1.750 |
| Invert Level (m) 23.697 | Cap Infiltration Depth (m) | 0.750 |

Infiltration Trench Manhole: 17, DS/PN: 3.006

| | | |
|--|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) 0.36000 | Trench Width (m) | 3.5 |
| Infiltration Coefficient Side (m/hr) 0.36000 | Trench Length (m) | 31.5 |
| Safety Factor 2.0 | Slope (1:X) | 0.0 |
| Porosity 0.30 | Cap Volume Depth (m) | 1.750 |
| Invert Level (m) 23.697 | Cap Infiltration Depth (m) | 0.750 |

Infiltration Trench Manhole: 18, DS/PN: 1.003

| | | |
|--|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) 0.36000 | Trench Width (m) | 3.5 |
| Infiltration Coefficient Side (m/hr) 0.36000 | Trench Length (m) | 26.0 |
| Safety Factor 2.0 | Slope (1:X) | 0.0 |
| Porosity 0.30 | Cap Volume Depth (m) | 1.750 |
| Invert Level (m) 23.697 | Cap Infiltration Depth (m) | 0.750 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 8 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |

CADS Network W.12.6.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 9206 - NORTH GOODS AREA.eWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480
Return Period(s) (years) 1, 30, 100
Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surchage | First Y Flood | First Z Overflow | O/F Act. | Lvl Exc. |
|-------|------------|---------------|----------------|------------------|----------------|------------------|----------|----------|
| 1.000 | 15 Winter | 1 | +20% | 30/120 Winter | 100/30 Summer | | | 12 |
| 2.000 | 15 Winter | 1 | +20% | 30/120 Winter | 100/30 Summer | | | 12 |
| 1.001 | 15 Winter | 1 | +20% | 30/60 Winter | 100/30 Winter | | | 9 |
| 1.002 | 15 Winter | 1 | +20% | 30/30 Winter | 100/120 Summer | | | |
| 3.000 | 15 Winter | 1 | +20% | 30/60 Winter | 100/30 Summer | | | 12 |
| 4.000 | 15 Winter | 1 | +20% | 30/60 Winter | 100/30 Summer | | | 12 |
| 3.001 | 15 Winter | 1 | +20% | 30/30 Winter | 100/30 Winter | | | 10 |
| 3.002 | 15 Winter | 1 | +20% | 30/30 Winter | | | | |
| 3.003 | 30 Winter | 1 | +20% | 30/15 Summer | | | | |
| 5.000 | 15 Winter | 1 | +20% | 30/15 Summer | | | | |
| 5.001 | 15 Winter | 1 | +20% | 30/15 Summer | | | | |
| 5.002 | 15 Winter | 1 | +20% | 30/15 Summer | | | | |
| 3.004 | 30 Winter | 1 | +20% | 30/15 Summer | | | | |
| 6.000 | 15 Winter | 1 | +20% | 30/30 Winter | | | | |
| 3.005 | 120 Winter | 1 | +20% | 30/15 Summer | 100/180 Summer | | | |
| 7.000 | 15 Winter | 1 | +20% | 30/30 Winter | | | | |
| 3.006 | 120 Winter | 1 | +20% | 30/15 Summer | 100/180 Summer | | | |
| 1.003 | 30 Winter | 1 | +20% | 30/30 Summer | 100/120 Summer | | | |
| 1.004 | 60 Winter | 1 | +20% | 30/15 Summer | 100/120 Summer | | | |

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|-------------------|-------------|-------------|--------------|------------|--------|
| | | Level (m) | Surch'd Depth (m) | Volume (m³) | Flow / Cap. | O'flow (l/s) | Flow (l/s) | |
| 1.000 | 1 | 26.079 | -0.344 | 0.000 | 0.36 | 0.0 | 58.0 | OK |
| 2.000 | 2 | 26.079 | -0.344 | 0.000 | 0.36 | 0.0 | 58.0 | OK |
| 1.001 | 3 | 25.966 | -0.277 | 0.000 | 0.45 | 0.0 | 112.6 | OK |
| 1.002 | 4 | 25.791 | -0.278 | 0.000 | 0.44 | 0.0 | 110.2 | OK |
| 3.000 | 5 | 26.080 | -0.343 | 0.000 | 0.37 | 0.0 | 58.4 | OK |
| 4.000 | 6 | 26.080 | -0.343 | 0.000 | 0.37 | 0.0 | 58.7 | OK |
| 3.001 | 7 | 25.969 | -0.274 | 0.000 | 0.46 | 0.0 | 114.0 | OK |
| 3.002 | 8 | 25.793 | -0.277 | 0.000 | 0.45 | 0.0 | 111.6 | OK |
| 3.003 | 9 | 25.360 | -0.037 | 0.000 | 1.01 | 0.0 | 54.4 | OK |
| 5.000 | 10 | 26.167 | -0.039 | 0.000 | 0.90 | 0.0 | 12.0 | OK |
| 5.001 | 11 | 25.985 | -0.119 | 0.000 | 0.41 | 0.0 | 16.8 | OK |
| 5.002 | 12 | 25.397 | -0.107 | 0.000 | 0.54 | 0.0 | 20.6 | OK |
| 3.004 | 13 | 25.250 | -0.147 | 0.000 | 0.78 | 0.0 | 45.2 | OK |
| 6.000 | 14 | 26.015 | -0.162 | 0.000 | 0.18 | 0.0 | 9.0 | OK |


| | |
|---|--|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |
| Date 16/08/12 | Designed by LW |
| File 9206 - north goo... | Checked by |



CADS Network W.12.6.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 9206 - NORTH GOODS AREA.eWS

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|---------------|--------------|-----------------------|-----------------------------|-----------------------------|---------------|-----|--------|
| | | Level (m) | Surch'ed Depth (m) | Volume (m ³) | Flow / O'flow Cap. (l/s) | Flow (l/s) | | |
| 3.005 | 15 | 25.071 | -0.326 | 0.000 | 0.16 | 0.0 | 9.3 | OK |
| 7.000 | 16 | 25.963 | -0.164 | 0.000 | 0.16 | 0.0 | 8.0 | OK |
| 3.006 | 17 | 24.626 | -0.771 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.003 | 18 | 25.190 | -0.782 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 1.004 | 19 | 25.069 | -0.300 | 0.000 | 0.00 | 0.0 | 0.0 | OK |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 10 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |

CADS Network W.12.6.1


30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 9206 - NORTH GOODS AREA.eWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480
Return Period(s) (years) 1, 30, 100
Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surchage | First Y Flood | First Z Overflow | O/F Act. | Lvl Exc. |
|-------|------------|---------------|----------------|------------------|----------------|------------------|----------|----------|
| 1.000 | 120 Winter | 30 | +20% | 30/120 Winter | 100/30 Summer | | | 12 |
| 2.000 | 120 Winter | 30 | +20% | 30/120 Winter | 100/30 Summer | | | 12 |
| 1.001 | 120 Winter | 30 | +20% | 30/60 Winter | 100/30 Winter | | | 9 |
| 1.002 | 120 Winter | 30 | +20% | 30/30 Winter | 100/120 Summer | | | |
| 3.000 | 120 Winter | 30 | +20% | 30/60 Winter | 100/30 Summer | | | 12 |
| 4.000 | 120 Winter | 30 | +20% | 30/60 Winter | 100/30 Summer | | | 12 |
| 3.001 | 120 Winter | 30 | +20% | 30/30 Winter | 100/30 Winter | | | 10 |
| 3.002 | 120 Winter | 30 | +20% | 30/30 Winter | | | | |
| 3.003 | 120 Winter | 30 | +20% | 30/15 Summer | | | | |
| 5.000 | 120 Winter | 30 | +20% | 30/15 Summer | | | | |
| 5.001 | 120 Winter | 30 | +20% | 30/15 Summer | | | | |
| 5.002 | 120 Winter | 30 | +20% | 30/15 Summer | | | | |
| 3.004 | 120 Winter | 30 | +20% | 30/15 Summer | | | | |
| 6.000 | 120 Winter | 30 | +20% | 30/30 Winter | | | | |
| 3.005 | 120 Winter | 30 | +20% | 30/15 Summer | 100/180 Summer | | | |
| 7.000 | 120 Winter | 30 | +20% | 30/30 Winter | | | | |
| 3.006 | 120 Winter | 30 | +20% | 30/15 Summer | 100/180 Summer | | | |
| 1.003 | 120 Winter | 30 | +20% | 30/30 Summer | 100/120 Summer | | | |
| 1.004 | 120 Winter | 30 | +20% | 30/15 Summer | 100/120 Summer | | | |


| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|-------------------|-------------|-------------------|--------------|-----------------|------------|
| | | Level (m) | Surch'd Depth (m) | Volume (m³) | Flow / Cap. (l/s) | O'flow (l/s) | Pipe Flow (l/s) | |
| 1.000 | 1 | 26.515 | 0.092 | 0.000 | 0.30 | 0.0 | 48.6 | FLOOD RISK |
| 2.000 | 2 | 26.515 | 0.092 | 0.000 | 0.30 | 0.0 | 48.6 | FLOOD RISK |
| 1.001 | 3 | 26.510 | 0.268 | 0.000 | 0.39 | 0.0 | 97.0 | FLOOD RISK |
| 1.002 | 4 | 26.504 | 0.434 | 0.000 | 0.38 | 0.0 | 94.3 | FLOOD RISK |
| 3.000 | 5 | 26.618 | 0.195 | 0.000 | 0.31 | 0.0 | 48.6 | FLOOD RISK |
| 4.000 | 6 | 26.618 | 0.195 | 0.000 | 0.31 | 0.0 | 48.6 | FLOOD RISK |
| 3.001 | 7 | 26.588 | 0.345 | 0.000 | 0.39 | 0.0 | 97.1 | FLOOD RISK |
| 3.002 | 8 | 26.537 | 0.467 | 0.000 | 0.36 | 0.0 | 90.6 | FLOOD RISK |
| 3.003 | 9 | 26.517 | 1.120 | 0.000 | 1.56 | 0.0 | 83.9 | SURCHARGED |
| 5.000 | 10 | 26.553 | 0.347 | 0.000 | 0.68 | 0.0 | 9.1 | SURCHARGED |
| 5.001 | 11 | 26.544 | 0.440 | 0.000 | 0.37 | 0.0 | 15.3 | SURCHARGED |
| 5.002 | 12 | 26.525 | 1.021 | 0.000 | 0.46 | 0.0 | 17.8 | SURCHARGED |
| 3.004 | 13 | 26.511 | 1.114 | 0.000 | 1.65 | 0.0 | 95.6 | SURCHARGED |
| 6.000 | 14 | 26.508 | 0.331 | 0.000 | 0.13 | 0.0 | 6.7 | SURCHARGED |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 11 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |

CADS Network W.12.6.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 9206 - NORTH GOODS AREA.eWS

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|---------------|--------------|-----------------------|-----------------------------|-----------------------------|---------------|------|------------|
| | | Level (m) | Surch'ed Depth (m) | Volume (m ³) | Flow / O'flow Cap. (l/s) | Flow (l/s) | | |
| 3.005 | 15 | 26.499 | 1.102 | 0.000 | 1.33 | 0.0 | 74.9 | SURCHARGED |
| 7.000 | 16 | 26.498 | 0.371 | 0.000 | 0.12 | 0.0 | 6.0 | SURCHARGED |
| 3.006 | 17 | 26.489 | 1.092 | 0.000 | 0.28 | 0.0 | 25.6 | SURCHARGED |
| 1.003 | 18 | 26.477 | 0.505 | 0.000 | 0.14 | 0.0 | 59.0 | SURCHARGED |
| 1.004 | 19 | 26.353 | 0.984 | 0.000 | 0.33 | 0.0 | 43.5 | SURCHARGED |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 12 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | Aldi RDC Goldthorpe Storm north goods + SA |  |
| Date 16/08/12 File 9206 - north goo... | Designed by LW Checked by | |

CADS Network W.12.6.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 9206 - NORTH GOODS AREA.eWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
 Analysis Timestep Fine Inertia Status ON
 DTS Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surchage | First Y Flood | First Z Overflow | O/F Act. | Lvl Exc. |
|-------|------------|---------------|----------------|------------------|----------------|------------------|----------|----------|
| 1.000 | 120 Winter | 100 | +20% | 30/120 Winter | 100/30 Summer | | | 12 |
| 2.000 | 120 Winter | 100 | +20% | 30/120 Winter | 100/30 Summer | | | 12 |
| 1.001 | 120 Winter | 100 | +20% | 30/60 Winter | 100/30 Winter | | | 9 |
| 1.002 | 30 Winter | 100 | +20% | 30/30 Winter | 100/120 Summer | | | |
| 3.000 | 120 Winter | 100 | +20% | 30/60 Winter | 100/30 Summer | | | 12 |
| 4.000 | 120 Winter | 100 | +20% | 30/60 Winter | 100/30 Summer | | | 12 |
| 3.001 | 120 Winter | 100 | +20% | 30/30 Winter | 100/30 Winter | | | 10 |
| 3.002 | 240 Winter | 100 | +20% | 30/30 Winter | | | | |
| 3.003 | 180 Winter | 100 | +20% | 30/15 Summer | | | | |
| 5.000 | 60 Winter | 100 | +20% | 30/15 Summer | | | | |
| 5.001 | 60 Summer | 100 | +20% | 30/15 Summer | | | | |
| 5.002 | 30 Winter | 100 | +20% | 30/15 Summer | | | | |
| 3.004 | 30 Winter | 100 | +20% | 30/15 Summer | | | | |
| 6.000 | 180 Summer | 100 | +20% | 30/30 Winter | | | | |
| 3.005 | 30 Winter | 100 | +20% | 30/15 Summer | 100/180 Summer | | | |
| 7.000 | 180 Summer | 100 | +20% | 30/30 Winter | | | | |
| 3.006 | 30 Winter | 100 | +20% | 30/15 Summer | 100/180 Summer | | | |
| 1.003 | 180 Winter | 100 | +20% | 30/30 Summer | 100/120 Summer | | | |
| 1.004 | 30 Winter | 100 | +20% | 30/15 Summer | 100/120 Summer | | | |

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|-------------------|-------------|-------------------|--------------|------------|------------|
| | | Level (m) | Surch'd Depth (m) | Volume (m³) | Flow / Cap. (l/s) | O'flow (l/s) | Flow (l/s) | |
| 1.000 | 1 | 26.696 | 0.273 | 23.094 | 0.37 | 0.0 | 59.3 | FLOOD |
| 2.000 | 2 | 26.696 | 0.273 | 23.094 | 0.37 | 0.0 | 59.3 | FLOOD |
| 1.001 | 3 | 26.691 | 0.449 | 18.243 | 0.44 | 0.0 | 108.2 | FLOOD |
| 1.002 | 4 | 26.696 | 0.626 | 0.000 | 1.00 | 0.0 | 248.6 | FLOOD RISK |
| 3.000 | 5 | 26.702 | 0.279 | 28.917 | 0.37 | 0.0 | 58.8 | FLOOD |
| 4.000 | 6 | 26.702 | 0.279 | 28.892 | 0.37 | 0.0 | 58.8 | FLOOD |
| 3.001 | 7 | 26.697 | 0.454 | 24.285 | 0.44 | 0.0 | 109.1 | FLOOD |
| 3.002 | 8 | 26.691 | 0.621 | 0.000 | 0.26 | 0.0 | 64.3 | FLOOD RISK |
| 3.003 | 9 | 26.731 | 1.334 | 0.000 | 1.28 | 0.0 | 68.5 | FLOOD RISK |
| 5.000 | 10 | 26.996 | 0.790 | 0.000 | 1.41 | 0.0 | 18.8 | FLOOD RISK |
| 5.001 | 11 | 26.897 | 0.793 | 0.000 | 0.83 | 0.0 | 34.5 | FLOOD RISK |
| 5.002 | 12 | 26.805 | 1.301 | 0.000 | 1.09 | 0.0 | 41.9 | SURCHARGED |
| 3.004 | 13 | 26.821 | 1.424 | 0.000 | 4.66 | 0.0 | 269.7 | FLOOD RISK |
| 6.000 | 14 | 26.742 | 0.565 | 0.000 | 0.17 | 0.0 | 8.6 | SURCHARGED |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Aldi RDC
Goldthorpe
Storm north goods + SA



Date 16/08/12

Designed by LW

File 9206 - north goo...

Checked by

CADS

Network W.12.6.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 9206 - NORTH GOODS AREA.eWS

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|--------------------|-------------|--------------------------|------------|-------|------------|
| | | Level (m) | Surch'ed Depth (m) | Volume (m³) | Flow / O'flow Cap. (l/s) | Flow (l/s) | | |
| 3.005 | 15 | 26.801 | 1.404 | 0.000 | 3.62 | 0.0 | 204.6 | FLOOD RISK |
| 7.000 | 16 | 26.720 | 0.593 | 0.000 | 0.17 | 0.0 | 8.0 | SURCHARGED |
| 3.006 | 17 | 26.768 | 1.371 | 0.000 | 0.84 | 0.0 | 76.0 | FLOOD RISK |
| 1.003 | 18 | 26.741 | 0.769 | 0.000 | 0.15 | 0.0 | 63.2 | FLOOD RISK |
| 1.004 | 19 | 26.856 | 1.487 | 0.000 | 0.33 | 0.0 | 43.6 | FLOOD RISK |

APPENDIX F

Office Car Park Drainage Calculations

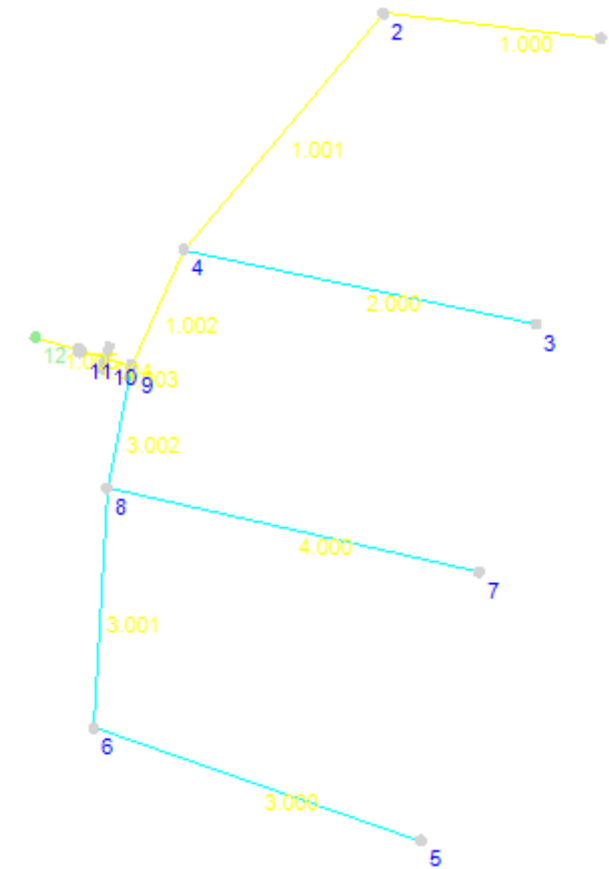
Craddy Pitchers Limited


Eden Lodge Studios
Ham Green
Bristol BS20 0ET

Date 16/08/2012 14:13
File 9206 - CAR PARK.mdx

CADS

Page 1



| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 0 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |  |
| Date 16/08/12 File 9206 - CAR PARK.mdx | Designed by LW Checked by | |

CADS Network W.12.6.1

Existing Network Details for 9206 - CAR PARK.SWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) | |
|-------|---------------|--------------|----------------|----------------------|----------------|--------------|----------------------|-------------|---------------|
| 1.000 | 25.562 | 0.320 | 80.0 | 0.055 | 4.00 | 0.600 | o | 150 | |
| 1.001 | 36.125 | 0.452 | 80.0 | 0.029 | 0.00 | 0.600 | o | 150 | |
| 2.000 | 42.047 | 0.738 | 57.0 | 0.188 | 4.00 | 0.600 | o | 225 | |
| 1.002 | 14.882 | 0.257 | 57.9 | 0.040 | 0.00 | 0.600 | o | 225 | |
| 3.000 | 40.384 | 0.475 | 85.0 | 0.069 | 4.00 | 0.600 | o | 150 | |
| 3.001 | 28.164 | 0.331 | 85.1 | 0.034 | 0.00 | 0.600 | o | 225 | |
| 4.000 | 44.563 | 0.847 | 52.6 | 0.195 | 4.00 | 0.600 | o | 225 | |
| 3.002 | 14.678 | 0.173 | 85.0 | 0.036 | 0.00 | 0.600 | o | 225 | |
| 1.003 | 3.089 | 0.039 | 79.2 | 0.000 | 0.00 | 0.600 | o | 375 | |
| 1.004 | 3.196 | 0.040 | 79.9 | 0.000 | 0.00 | 0.600 | o | 375 | |
| 1.005 | 5.374 | 0.067 | 80.2 | 0.000 | 0.00 | 0.600 | o | 375 | |
| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
| 1.000 | 1 | 27.905 | 26.555 | 1.200 | 27.482 | 26.235 | 1.097 | | 1200 |
| 1.001 | 2 | 27.482 | 26.235 | 1.097 | 27.201 | 25.784 | 1.267 | | 1200 |
| 2.000 | 3 | 27.902 | 26.447 | 1.230 | 27.201 | 25.709 | 1.267 | | 1200 |
| 1.002 | 4 | 27.201 | 25.709 | 1.267 | 27.149 | 25.452 | 1.472 | | 1200 |
| 3.000 | 5 | 27.856 | 26.506 | 1.200 | 27.229 | 26.031 | 1.048 | | 1200 |
| 3.001 | 6 | 27.229 | 25.956 | 1.048 | 27.154 | 25.625 | 1.304 | | 1200 |
| 4.000 | 7 | 27.897 | 26.472 | 1.200 | 27.154 | 25.625 | 1.304 | | 1200 |
| 3.002 | 8 | 27.154 | 25.625 | 1.304 | 27.149 | 25.452 | 1.472 | | 1200 |
| 1.003 | 9 | 27.149 | 25.302 | 1.472 | 27.098 | 25.263 | 1.460 | | 1500 |
| 1.004 | 10 | 27.098 | 25.238 | 1.460 | 27.044 | 25.198 | 1.446 | 1225 x | 3915 |
| 1.005 | 11 | 27.044 | 25.198 | 1.471 | 27.081 | 25.131 | 1.575 | Weir | 1800 |


| | |
|---|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |
| Date 16/08/12 | Designed by LW |
| File 9206 - CAR PARK.mdx | Checked by |



CADS Network W.12.6.1

Manhole Schedules for 9206 - CAR PARK.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN | Pipe Out Invert Level (m) | Diameter (mm) | PN | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|---------------|-------|---------------------------|---------------|---------------|
| 1 | 27.905 | 1.350 | Open Manhole | 1200 | 1.000 | 26.555 | 150 | | | | |
| 2 | 27.482 | 1.247 | Open Manhole | 1200 | 1.001 | 26.235 | 150 | 1.000 | 26.235 | 150 | |
| 3 | 27.902 | 1.455 | Open Manhole | 1200 | 2.000 | 26.447 | 225 | | | | |
| 4 | 27.201 | 1.492 | Open Manhole | 1200 | 1.002 | 25.709 | 225 | 1.001 | 25.784 | 150 | |
| | | | | | | | | 2.000 | 25.709 | 225 | |
| 5 | 27.856 | 1.350 | Open Manhole | 1200 | 3.000 | 26.506 | 150 | | | | |
| 6 | 27.229 | 1.273 | Open Manhole | 1200 | 3.001 | 25.956 | 225 | 3.000 | 26.031 | 150 | |
| 7 | 27.897 | 1.425 | Open Manhole | 1200 | 4.000 | 26.472 | 225 | | | | |
| 8 | 27.154 | 1.529 | Open Manhole | 1200 | 3.002 | 25.625 | 225 | 3.001 | 25.625 | 225 | 225 |
| | | | | | | | | 4.000 | 25.625 | 225 | 225 |
| 9 | 27.149 | 1.847 | Open Manhole | 1500 | 1.003 | 25.302 | 375 | 1.002 | 25.452 | 225 | 225 |
| | | | | | | | | 3.002 | 25.452 | 225 | 225 |
| 10 | 27.098 | 1.860 | Open Manhole | 1225 x 3915 | 1.004 | 25.238 | 375 | 1.003 | 25.263 | 375 | 375 |
| 11 | 27.044 | 1.846 | Open Manhole | 1800 | 1.005 | 25.198 | 375 | 1.004 | 25.198 | 375 | 375 |
| 12 | 27.081 | 1.950 | Open Manhole | 0 | | OUTFALL | | 1.005 | 25.131 | 375 | 375 |

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |  |
| Date 16/08/12 File 9206 - CAR PARK.mdx | Designed by LW Checked by | |
| CADS | | Network W.12.6.1 |

PIPELINE SCHEDULES for 9206 - CAR PARK.SWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | o | 150 | 1 | 27.905 | 26.555 | 1.200 | Open Manhole | 1200 |
| 1.001 | o | 150 | 2 | 27.482 | 26.235 | 1.097 | Open Manhole | 1200 |
| 2.000 | o | 225 | 3 | 27.902 | 26.447 | 1.230 | Open Manhole | 1200 |
| 1.002 | o | 225 | 4 | 27.201 | 25.709 | 1.267 | Open Manhole | 1200 |
| 3.000 | o | 150 | 5 | 27.856 | 26.506 | 1.200 | Open Manhole | 1200 |
| 3.001 | o | 225 | 6 | 27.229 | 25.956 | 1.048 | Open Manhole | 1200 |
| 4.000 | o | 225 | 7 | 27.897 | 26.472 | 1.200 | Open Manhole | 1200 |
| 3.002 | o | 225 | 8 | 27.154 | 25.625 | 1.304 | Open Manhole | 1200 |
| 1.003 | o | 375 | 9 | 27.149 | 25.302 | 1.472 | Open Manhole | 1500 |
| 1.004 | o | 375 | 10 | 27.098 | 25.238 | 1.460 | Open Manhole | 1225 x 3915 |
| 1.005 | o | 375 | 11 | 27.044 | 25.198 | 1.471 | Open Manhole | 1800 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 25.562 | 80.0 | 2 | 27.482 | 26.235 | 1.097 | Open Manhole | 1200 |
| 1.001 | 36.125 | 80.0 | 4 | 27.201 | 25.784 | 1.267 | Open Manhole | 1200 |
| 2.000 | 42.047 | 57.0 | 4 | 27.201 | 25.709 | 1.267 | Open Manhole | 1200 |
| 1.002 | 14.882 | 57.9 | 9 | 27.149 | 25.452 | 1.472 | Open Manhole | 1500 |
| 3.000 | 40.384 | 85.0 | 6 | 27.229 | 26.031 | 1.048 | Open Manhole | 1200 |
| 3.001 | 28.164 | 85.1 | 8 | 27.154 | 25.625 | 1.304 | Open Manhole | 1200 |
| 4.000 | 44.563 | 52.6 | 8 | 27.154 | 25.625 | 1.304 | Open Manhole | 1200 |
| 3.002 | 14.678 | 85.0 | 9 | 27.149 | 25.452 | 1.472 | Open Manhole | 1500 |
| 1.003 | 3.089 | 79.2 | 10 | 27.098 | 25.263 | 1.460 | Open Manhole | 1225 x 3915 |
| 1.004 | 3.196 | 79.9 | 11 | 27.044 | 25.198 | 1.446 | Open Manhole | 1800 |
| 1.005 | 5.374 | 80.2 | 12 | 27.081 | 25.131 | 1.575 | Open Manhole | 0 |

| | |
|--------------------------|----------------|
| Eden Lodge Studios | 9206 Aldi RDC |
| Ham Green | Goldthorpe |
| Bristol BS20 0ET | Storm car park |
| Date 16/08/12 | Designed by LW |
| File 9206 - CAR PARK.mdx | Checked by |




| | |
|------|------------------|
| CADS | Network W.12.6.1 |
|------|------------------|

Simulation Criteria for 9206 - CAR PARK.SWS

| | | | |
|---------------------------------|-------|--|-------|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coeffiecient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |
| | | | |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | | | |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model | FSR | Profile Type | Summer |
| Return Period (years) | 1 | Cv (Summer) | 0.750 |
| Region | England and Wales | Cv (Winter) | 0.840 |
| M5-60 (mm) | 19.000 | Storm Duration (mins) | 30 |
| Ratio R | 0.374 | | |


| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 4 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |  |
| Date 16/08/12 File 9206 - CAR PARK.mdx | Designed by LW Checked by | |

CADS Network W.12.6.1

Storage Structures for 9206 - CAR PARK.SWS

Trench Soakaway Manhole: 11, DS/PN: 1.005

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.36000 | Trench Width (m) | 4.5 |
| Infiltration Coefficient Side (m/hr) | 0.36000 | Trench Length (m) | 72.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.000 |
| Invert Level (m) | 24.198 | Cap Infiltration Depth (m) | 0.500 |

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 5 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |  |
| Date 16/08/12 File 9206 - CAR PARK.mdx | Designed by LW Checked by | |

CADS Network W.12.6.1


1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 9206 - CAR PARK.SWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960
Return Period(s) (years) 1, 30, 100
Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surcharge | First Y Flood | First Z Overflow | O/F Act. | Lvl Exc. |
|-------|-------|---------------|----------------|-------------------|---------------|------------------|----------|----------|
| 1.000 | 15 | Winter | 1 | +20% 30/15 | Summer | | | |
| 1.001 | 15 | Winter | 1 | +20% 30/15 | Summer | 100/15 | Summer | 3 |
| 2.000 | 15 | Winter | 1 | +20% 30/15 | Summer | 100/15 | Winter | 1 |
| 1.002 | 15 | Winter | 1 | +20% 30/15 | Summer | 100/30 | Winter | 6 |
| 3.000 | 15 | Winter | 1 | +20% 30/15 | Summer | 100/15 | Summer | 2 |
| 3.001 | 15 | Winter | 1 | +20% 30/15 | Summer | 100/15 | Winter | 1 |
| 4.000 | 15 | Winter | 1 | +20% 30/15 | Summer | 100/15 | Summer | 2 |
| 3.002 | 15 | Winter | 1 | +20% 1/15 | Summer | 100/30 | Summer | 9 |
| 1.003 | 15 | Winter | 1 | +20% 1/15 | Summer | 100/30 | Winter | 5 |
| 1.004 | 15 | Winter | 1 | +20% 1/15 | Summer | 100/30 | Winter | 1 |
| 1.005 | 30 | Winter | 1 | +20% 30/30 | Winter | 100/30 | Summer | 10 |

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|-------------------|-------------|-------------------|--------------|------------|------------|
| | | Level (m) | Surch'd Depth (m) | Volume (m³) | Flow / Cap. (l/s) | O'flow (l/s) | Flow (l/s) | |
| 1.000 | 1 | 26.628 | -0.077 | 0.000 | 0.48 | 0.0 | 9.1 | OK |
| 1.001 | 2 | 26.326 | -0.060 | 0.000 | 0.66 | 0.0 | 12.7 | OK |
| 2.000 | 3 | 26.556 | -0.116 | 0.000 | 0.47 | 0.0 | 31.0 | OK |
| 1.002 | 4 | 25.874 | -0.060 | 0.000 | 0.79 | 0.0 | 47.5 | OK |
| 3.000 | 5 | 26.591 | -0.065 | 0.000 | 0.61 | 0.0 | 11.4 | OK |
| 3.001 | 6 | 26.041 | -0.140 | 0.000 | 0.30 | 0.0 | 15.8 | OK |
| 4.000 | 7 | 26.581 | -0.116 | 0.000 | 0.47 | 0.0 | 32.2 | OK |
| 3.002 | 8 | 25.893 | 0.044 | 0.000 | 0.97 | 0.0 | 47.8 | SURCHARGED |
| 1.003 | 9 | 25.729 | 0.052 | 0.000 | 0.87 | 0.0 | 93.5 | SURCHARGED |
| 1.004 | 10 | 25.618 | 0.005 | 0.000 | 1.26 | 0.0 | 94.4 | SURCHARGED |
| 1.005 | 11 | 24.561 | -1.012 | 0.000 | 0.00 | 0.0 | 0.0 | OK |

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 6 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |  |
| Date 16/08/12 File 9206 - CAR PARK.mdx | Designed by LW Checked by | |

CADS Network W.12.6.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 9206 - CAR PARK.SWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960
Return Period(s) (years) 1, 30, 100
Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surcharge | First Y Flood | First Z Overflow | O/F Act. | Lvl Exc. |
|-------|-----------|---------------|----------------|-------------------|---------------|------------------|----------|----------|
| 1.000 | 15 Winter | 30 | +20% | 30/15 Summer | | | | |
| 1.001 | 15 Winter | 30 | +20% | 30/15 Summer | 100/15 Summer | | | 3 |
| 2.000 | 15 Winter | 30 | +20% | 30/15 Summer | 100/15 Winter | | | 1 |
| 1.002 | 60 Winter | 30 | +20% | 30/15 Summer | 100/30 Winter | | | 6 |
| 3.000 | 15 Winter | 30 | +20% | 30/15 Summer | 100/15 Summer | | | 2 |
| 3.001 | 15 Winter | 30 | +20% | 30/15 Summer | 100/15 Winter | | | 1 |
| 4.000 | 15 Winter | 30 | +20% | 30/15 Summer | 100/15 Summer | | | 2 |
| 3.002 | 60 Winter | 30 | +20% | 1/15 Summer | 100/30 Summer | | | 9 |
| 1.003 | 60 Winter | 30 | +20% | 1/15 Summer | 100/30 Winter | | | 5 |
| 1.004 | 60 Winter | 30 | +20% | 1/15 Summer | 100/30 Winter | | | 1 |
| 1.005 | 60 Winter | 30 | +20% | 30/30 Winter | 100/30 Summer | | | 10 |

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|-------------------|-------------|-------------------|--------------|------------|------------|
| | | Level (m) | Surch'd Depth (m) | Volume (m³) | Flow / Cap. (l/s) | O'flow (l/s) | Flow (l/s) | |
| 1.000 | 1 | 27.331 | 0.626 | 0.000 | 0.81 | 0.0 | 15.3 | SURCHARGED |
| 1.001 | 2 | 27.161 | 0.775 | 0.000 | 1.12 | 0.0 | 21.4 | SURCHARGED |
| 2.000 | 3 | 27.246 | 0.574 | 0.000 | 0.93 | 0.0 | 61.0 | SURCHARGED |
| 1.002 | 4 | 26.732 | 0.799 | 0.000 | 1.02 | 0.0 | 61.3 | SURCHARGED |
| 3.000 | 5 | 27.303 | 0.647 | 0.000 | 1.03 | 0.0 | 19.3 | SURCHARGED |
| 3.001 | 6 | 26.813 | 0.632 | 0.000 | 0.58 | 0.0 | 30.2 | SURCHARGED |
| 4.000 | 7 | 27.373 | 0.676 | 0.000 | 0.90 | 0.0 | 61.5 | SURCHARGED |
| 3.002 | 8 | 26.734 | 0.884 | 0.000 | 1.32 | 0.0 | 65.5 | SURCHARGED |
| 1.003 | 9 | 26.715 | 1.038 | 0.000 | 1.18 | 0.0 | 126.6 | SURCHARGED |
| 1.004 | 10 | 26.711 | 1.098 | 0.000 | 1.68 | 0.0 | 126.4 | SURCHARGED |
| 1.005 | 11 | 26.706 | 1.133 | 0.000 | 0.00 | 0.0 | 0.0 | SURCHARGED |

| | |
|---|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm car park |
| Date 16/08/12 File 9206 - CAR PARK.mdx | Designed by LW Checked by |



CADS Network W.12.6.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 9206 - CAR PARK.SWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
 Analysis Timestep Fine Inertia Status ON
 DTS Status OFF


Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surchage | First Y Flood | First Z O/F Overflow Act. | Lvl Exc. |
|-------|------------|---------------|----------------|------------------|---------------|---------------------------|----------|
| 1.000 | 15 Winter | 100 | +20% | 30/15 Summer | | | |
| 1.001 | 15 Winter | 100 | +20% | 30/15 Summer | 100/15 Summer | | 3 |
| 2.000 | 15 Winter | 100 | +20% | 30/15 Summer | 100/15 Winter | | 1 |
| 1.002 | 60 Winter | 100 | +20% | 30/15 Summer | 100/30 Winter | | 6 |
| 3.000 | 15 Winter | 100 | +20% | 30/15 Summer | 100/15 Summer | | 2 |
| 3.001 | 15 Winter | 100 | +20% | 30/15 Summer | 100/15 Winter | | 1 |
| 4.000 | 15 Winter | 100 | +20% | 30/15 Summer | 100/15 Summer | | 2 |
| 3.002 | 60 Winter | 100 | +20% | 1/15 Summer | 100/30 Summer | | 9 |
| 1.003 | 60 Winter | 100 | +20% | 1/15 Summer | 100/30 Winter | | 5 |
| 1.004 | 30 Winter | 100 | +20% | 1/15 Summer | 100/30 Winter | | 1 |
| 1.005 | 120 Winter | 100 | +20% | 30/30 Winter | 100/30 Summer | | 10 |

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|--------------------|-------------|-------------------|--------------|------------|------------|
| | | Level (m) | Surch'ed Depth (m) | Volume (m³) | Flow / Cap. (l/s) | O'flow (l/s) | Flow (l/s) | |
| 1.000 | 1 | 27.878 | 1.173 | 0.000 | 1.06 | 0.0 | 20.1 | FLOOD RISK |
| 1.001 | 2 | 27.483 | 1.098 | 1.479 | 1.42 | 0.0 | 27.3 | FLOOD |
| 2.000 | 3 | 27.903 | 1.231 | 0.531 | 1.09 | 0.0 | 71.8 | FLOOD |
| 1.002 | 4 | 27.208 | 1.275 | 7.486 | 1.25 | 0.0 | 75.2 | FLOOD |
| 3.000 | 5 | 27.856 | 1.200 | 0.419 | 1.18 | 0.0 | 22.1 | FLOOD |
| 3.001 | 6 | 27.229 | 1.048 | 0.194 | 0.65 | 0.0 | 34.0 | FLOOD |
| 4.000 | 7 | 27.899 | 1.202 | 1.665 | 1.00 | 0.0 | 68.7 | FLOOD |
| 3.002 | 8 | 27.175 | 1.326 | 21.216 | 1.63 | 0.0 | 80.9 | FLOOD |
| 1.003 | 9 | 27.152 | 1.475 | 3.059 | 1.45 | 0.0 | 155.4 | FLOOD |
| 1.004 | 10 | 27.098 | 1.485 | 0.289 | 2.69 | 0.0 | 202.4 | FLOOD |
| 1.005 | 11 | 27.067 | 1.494 | 23.120 | 0.02 | 0.0 | 1.6 | FLOOD |

APPENDIX G

Access Road Swale Calculations

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 1 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Road Swale |  |
| Date 16/08/12 File Access road swal... | Designed by LW Checked by | |


CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 169 minutes.

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m ³) | Status |
|------------------|---------------|---------------|------------------------|------------------------------|--------|
| 15 min Summer | 0.744 | 0.144 | 0.0 | 0.6 | O K |
| 30 min Summer | 0.761 | 0.161 | 0.1 | 0.8 | O K |
| 60 min Summer | 0.774 | 0.174 | 0.1 | 0.9 | O K |
| 120 min Summer | 0.781 | 0.181 | 0.1 | 1.0 | O K |
| 180 min Summer | 0.782 | 0.182 | 0.1 | 1.0 | O K |
| 240 min Summer | 0.783 | 0.183 | 0.1 | 1.0 | O K |
| 360 min Summer | 0.781 | 0.181 | 0.1 | 1.0 | O K |
| 480 min Summer | 0.779 | 0.179 | 0.1 | 1.0 | O K |
| 600 min Summer | 0.776 | 0.176 | 0.1 | 0.9 | O K |
| 720 min Summer | 0.773 | 0.173 | 0.1 | 0.9 | O K |
| 960 min Summer | 0.767 | 0.167 | 0.1 | 0.8 | O K |
| 1440 min Summer | 0.756 | 0.156 | 0.1 | 0.7 | O K |
| 2160 min Summer | 0.742 | 0.142 | 0.0 | 0.6 | O K |
| 2880 min Summer | 0.731 | 0.131 | 0.0 | 0.5 | O K |
| 4320 min Summer | 0.714 | 0.114 | 0.0 | 0.4 | O K |
| 5760 min Summer | 0.701 | 0.101 | 0.0 | 0.3 | O K |
| 7200 min Summer | 0.692 | 0.092 | 0.0 | 0.2 | O K |
| 8640 min Summer | 0.684 | 0.084 | 0.0 | 0.2 | O K |
| 10080 min Summer | 0.677 | 0.077 | 0.0 | 0.2 | O K |
| 15 min Winter | 0.752 | 0.152 | 0.1 | 0.7 | O K |
| 30 min Winter | 0.770 | 0.170 | 0.1 | 0.9 | O K |
| 60 min Winter | 0.783 | 0.183 | 0.1 | 1.0 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 15 min Summer | 84.476 | 18 |
| 30 min Summer | 55.634 | 33 |
| 60 min Summer | 35.085 | 62 |
| 120 min Summer | 21.491 | 112 |
| 180 min Summer | 15.963 | 142 |
| 240 min Summer | 12.869 | 174 |
| 360 min Summer | 9.461 | 242 |
| 480 min Summer | 7.605 | 312 |
| 600 min Summer | 6.416 | 380 |
| 720 min Summer | 5.582 | 448 |
| 960 min Summer | 4.478 | 580 |
| 1440 min Summer | 3.279 | 838 |
| 2160 min Summer | 2.397 | 1212 |
| 2880 min Summer | 1.918 | 1584 |
| 4320 min Summer | 1.400 | 2292 |
| 5760 min Summer | 1.118 | 3008 |
| 7200 min Summer | 0.939 | 3744 |
| 8640 min Summer | 0.814 | 4488 |
| 10080 min Summer | 0.722 | 5152 |
| 15 min Winter | 84.476 | 18 |
| 30 min Winter | 55.634 | 32 |
| 60 min Winter | 35.085 | 60 |


| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Road Swale |  |
| Date 16/08/12 File Access road swal... | Designed by LW Checked by | |

CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-----------------|--------|
| 120 min Winter | 0.791 | 0.191 | 0.1 | 1.1 | O K |
| 180 min Winter | 0.793 | 0.193 | 0.1 | 1.2 | O K |
| 240 min Winter | 0.793 | 0.193 | 0.1 | 1.2 | O K |
| 360 min Winter | 0.790 | 0.190 | 0.1 | 1.1 | O K |
| 480 min Winter | 0.786 | 0.186 | 0.1 | 1.1 | O K |
| 600 min Winter | 0.782 | 0.182 | 0.1 | 1.0 | O K |
| 720 min Winter | 0.778 | 0.178 | 0.1 | 1.0 | O K |
| 960 min Winter | 0.769 | 0.169 | 0.1 | 0.9 | O K |
| 1440 min Winter | 0.754 | 0.154 | 0.1 | 0.7 | O K |
| 2160 min Winter | 0.736 | 0.136 | 0.0 | 0.5 | O K |
| 2880 min Winter | 0.721 | 0.121 | 0.0 | 0.4 | O K |
| 4320 min Winter | 0.701 | 0.101 | 0.0 | 0.3 | O K |
| 5760 min Winter | 0.686 | 0.086 | 0.0 | 0.2 | O K |
| 7200 min Winter | 0.676 | 0.076 | 0.0 | 0.1 | O K |
| 8640 min Winter | 0.668 | 0.068 | 0.0 | 0.1 | O K |
| 10080 min Winter | 0.661 | 0.061 | 0.0 | 0.1 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 120 min Winter | 21.491 | 116 |
| 180 min Winter | 15.963 | 148 |
| 240 min Winter | 12.869 | 184 |
| 360 min Winter | 9.461 | 262 |
| 480 min Winter | 7.605 | 336 |
| 600 min Winter | 6.416 | 410 |
| 720 min Winter | 5.582 | 480 |
| 960 min Winter | 4.478 | 618 |
| 1440 min Winter | 3.279 | 880 |
| 2160 min Winter | 2.397 | 1256 |
| 2880 min Winter | 1.918 | 1640 |
| 4320 min Winter | 1.400 | 2336 |
| 5760 min Winter | 1.118 | 3056 |
| 7200 min Winter | 0.939 | 3752 |
| 8640 min Winter | 0.814 | 4488 |
| 10080 min Winter | 0.722 | 5152 |

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 1 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Road Swale |  |
| Date 16/08/12 File Access road swal... | Designed by LW Checked by | |


CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 171 minutes.

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m ³) | Status |
|------------------|---------------|---------------|------------------------|------------------------------|--------|
| 15 min Summer | 0.744 | 0.144 | 0.1 | 1.3 | O K |
| 30 min Summer | 0.761 | 0.161 | 0.1 | 1.7 | O K |
| 60 min Summer | 0.774 | 0.174 | 0.1 | 2.1 | O K |
| 120 min Summer | 0.782 | 0.182 | 0.1 | 2.3 | O K |
| 180 min Summer | 0.784 | 0.184 | 0.1 | 2.3 | O K |
| 240 min Summer | 0.784 | 0.184 | 0.1 | 2.3 | O K |
| 360 min Summer | 0.783 | 0.183 | 0.1 | 2.3 | O K |
| 480 min Summer | 0.780 | 0.180 | 0.1 | 2.2 | O K |
| 600 min Summer | 0.778 | 0.178 | 0.1 | 2.1 | O K |
| 720 min Summer | 0.775 | 0.175 | 0.1 | 2.1 | O K |
| 960 min Summer | 0.769 | 0.169 | 0.1 | 1.9 | O K |
| 1440 min Summer | 0.758 | 0.158 | 0.1 | 1.6 | O K |
| 2160 min Summer | 0.744 | 0.144 | 0.1 | 1.3 | O K |
| 2880 min Summer | 0.733 | 0.133 | 0.1 | 1.1 | O K |
| 4320 min Summer | 0.716 | 0.116 | 0.1 | 0.8 | O K |
| 5760 min Summer | 0.703 | 0.103 | 0.1 | 0.6 | O K |
| 7200 min Summer | 0.693 | 0.093 | 0.1 | 0.5 | O K |
| 8640 min Summer | 0.685 | 0.085 | 0.1 | 0.4 | O K |
| 10080 min Summer | 0.678 | 0.078 | 0.0 | 0.4 | O K |
| 15 min Winter | 0.752 | 0.152 | 0.1 | 1.5 | O K |
| 30 min Winter | 0.770 | 0.170 | 0.1 | 1.9 | O K |
| 60 min Winter | 0.784 | 0.184 | 0.1 | 2.3 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 15 min Summer | 84.476 | 21 |
| 30 min Summer | 55.634 | 35 |
| 60 min Summer | 35.085 | 62 |
| 120 min Summer | 21.491 | 116 |
| 180 min Summer | 15.963 | 144 |
| 240 min Summer | 12.869 | 176 |
| 360 min Summer | 9.461 | 246 |
| 480 min Summer | 7.605 | 314 |
| 600 min Summer | 6.416 | 382 |
| 720 min Summer | 5.582 | 450 |
| 960 min Summer | 4.478 | 582 |
| 1440 min Summer | 3.279 | 840 |
| 2160 min Summer | 2.397 | 1216 |
| 2880 min Summer | 1.918 | 1588 |
| 4320 min Summer | 1.400 | 2296 |
| 5760 min Summer | 1.118 | 3008 |
| 7200 min Summer | 0.939 | 3744 |
| 8640 min Summer | 0.814 | 4488 |
| 10080 min Summer | 0.722 | 5152 |
| 15 min Winter | 84.476 | 21 |
| 30 min Winter | 55.634 | 35 |
| 60 min Winter | 35.085 | 62 |

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Road Swale |  |
| Date 16/08/12 File Access road swal... | Designed by LW Checked by | |

CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-----------------|--------|
| 120 min Winter | 0.793 | 0.193 | 0.2 | 2.6 | O K |
| 180 min Winter | 0.794 | 0.194 | 0.2 | 2.6 | O K |
| 240 min Winter | 0.794 | 0.194 | 0.2 | 2.6 | O K |
| 360 min Winter | 0.792 | 0.192 | 0.2 | 2.5 | O K |
| 480 min Winter | 0.788 | 0.188 | 0.1 | 2.4 | O K |
| 600 min Winter | 0.784 | 0.184 | 0.1 | 2.3 | O K |
| 720 min Winter | 0.780 | 0.180 | 0.1 | 2.2 | O K |
| 960 min Winter | 0.771 | 0.171 | 0.1 | 2.0 | O K |
| 1440 min Winter | 0.756 | 0.156 | 0.1 | 1.6 | O K |
| 2160 min Winter | 0.738 | 0.138 | 0.1 | 1.2 | O K |
| 2880 min Winter | 0.723 | 0.123 | 0.1 | 0.9 | O K |
| 4320 min Winter | 0.702 | 0.102 | 0.1 | 0.6 | O K |
| 5760 min Winter | 0.688 | 0.088 | 0.1 | 0.5 | O K |
| 7200 min Winter | 0.677 | 0.077 | 0.0 | 0.3 | O K |
| 8640 min Winter | 0.669 | 0.069 | 0.0 | 0.3 | O K |
| 10080 min Winter | 0.663 | 0.063 | 0.0 | 0.2 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 120 min Winter | 21.491 | 118 |
| 180 min Winter | 15.963 | 150 |
| 240 min Winter | 12.869 | 188 |
| 360 min Winter | 9.461 | 264 |
| 480 min Winter | 7.605 | 338 |
| 600 min Winter | 6.416 | 412 |
| 720 min Winter | 5.582 | 482 |
| 960 min Winter | 4.478 | 620 |
| 1440 min Winter | 3.279 | 884 |
| 2160 min Winter | 2.397 | 1260 |
| 2880 min Winter | 1.918 | 1640 |
| 4320 min Winter | 1.400 | 2340 |
| 5760 min Winter | 1.118 | 3056 |
| 7200 min Winter | 0.939 | 3752 |
| 8640 min Winter | 0.814 | 4488 |
| 10080 min Winter | 0.722 | 5144 |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

9206 Aldi RDC
Goldthorpe
Road Swale



Date 16/08/12
File Access road swal...

Designed by LW
Checked by

CADS Source Control W.12.6.1

Model Details


Storage is Online Cover Level (m) 1.000

Swale Structure

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.03600 | Length (m) | 20.0 |
| Infiltration Coefficient Side (m/hr) | 0.03600 | Side Slope (1:X) | 3.0 |
| Safety Factor | 2.0 | Slope (1:X) | 100.0 |
| Porosity | 1.00 | Cap Volume Depth (m) | 0.000 |
| Invert Level (m) | 0.600 | Cap Infiltration Depth (m) | 0.150 |
| Base Width (m) | 1.0 | | |

APPENDIX H

Access Road Soakaways Calculations

| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 1 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 - Aldi RDC Goldthorpe storm - access RD trench |  |
| Date 16/08/12 File Trench for acces... | Designed by LW Checked by | |


CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 321 minutes.

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m ³) | Status |
|------------------|---------------|---------------|------------------------|------------------------------|--------|
| 15 min Summer | 8.049 | 0.549 | 0.5 | 9.9 | O K |
| 30 min Summer | 8.209 | 0.709 | 0.5 | 12.8 | O K |
| 60 min Summer | 8.361 | 0.861 | 0.6 | 15.5 | O K |
| 120 min Summer | 8.483 | 0.983 | 0.6 | 17.7 | O K |
| 180 min Summer | 8.522 | 1.022 | 0.6 | 18.4 | O K |
| 240 min Summer | 8.529 | 1.029 | 0.6 | 18.5 | O K |
| 360 min Summer | 8.521 | 1.021 | 0.6 | 18.4 | O K |
| 480 min Summer | 8.505 | 1.005 | 0.6 | 18.1 | O K |
| 600 min Summer | 8.483 | 0.983 | 0.6 | 17.7 | O K |
| 720 min Summer | 8.459 | 0.959 | 0.6 | 17.3 | O K |
| 960 min Summer | 8.412 | 0.912 | 0.6 | 16.4 | O K |
| 1440 min Summer | 8.323 | 0.823 | 0.6 | 14.8 | O K |
| 2160 min Summer | 8.205 | 0.705 | 0.5 | 12.7 | O K |
| 2880 min Summer | 8.103 | 0.603 | 0.5 | 10.8 | O K |
| 4320 min Summer | 7.939 | 0.439 | 0.4 | 7.9 | O K |
| 5760 min Summer | 7.817 | 0.317 | 0.4 | 5.7 | O K |
| 7200 min Summer | 7.724 | 0.224 | 0.4 | 4.0 | O K |
| 8640 min Summer | 7.654 | 0.154 | 0.3 | 2.8 | O K |
| 10080 min Summer | 7.602 | 0.102 | 0.3 | 1.8 | O K |
| 15 min Winter | 8.117 | 0.617 | 0.5 | 11.1 | O K |
| 30 min Winter | 8.299 | 0.799 | 0.6 | 14.4 | O K |
| 60 min Winter | 8.474 | 0.974 | 0.6 | 17.5 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 15 min Summer | 84.629 | 22 |
| 30 min Summer | 55.686 | 36 |
| 60 min Summer | 35.085 | 66 |
| 120 min Summer | 21.471 | 122 |
| 180 min Summer | 15.941 | 180 |
| 240 min Summer | 12.847 | 224 |
| 360 min Summer | 9.440 | 284 |
| 480 min Summer | 7.586 | 348 |
| 600 min Summer | 6.398 | 416 |
| 720 min Summer | 5.565 | 486 |
| 960 min Summer | 4.463 | 626 |
| 1440 min Summer | 3.266 | 898 |
| 2160 min Summer | 2.387 | 1300 |
| 2880 min Summer | 1.909 | 1680 |
| 4320 min Summer | 1.393 | 2424 |
| 5760 min Summer | 1.112 | 3168 |
| 7200 min Summer | 0.934 | 3888 |
| 8640 min Summer | 0.810 | 4584 |
| 10080 min Summer | 0.717 | 5248 |
| 15 min Winter | 84.629 | 22 |
| 30 min Winter | 55.686 | 36 |
| 60 min Winter | 35.085 | 64 |


| | | |
|---|---|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 - Aldi RDC Goldthorpe storm - access RD trench |  |
| Date 16/08/12 File Trench for acces... | Designed by LW Checked by | |

CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status |
|-----------------------|---------------|---------------|------------------------|-----------------|------------|
| 120 min Winter | 8.619 | 1.119 | 0.7 | 20.1 | O K |
| 180 min Winter | 8.672 | 1.172 | 0.7 | 21.1 | O K |
| 240 min Winter | 8.687 | 1.187 | 0.7 | 21.4 | O K |
| 360 min Winter | 8.673 | 1.173 | 0.7 | 21.1 | O K |
| 480 min Winter | 8.654 | 1.154 | 0.7 | 20.8 | O K |
| 600 min Winter | 8.625 | 1.125 | 0.7 | 20.3 | O K |
| 720 min Winter | 8.591 | 1.091 | 0.6 | 19.6 | O K |
| 960 min Winter | 8.519 | 1.019 | 0.6 | 18.3 | O K |
| 1440 min Winter | 8.386 | 0.886 | 0.6 | 16.0 | O K |
| 2160 min Winter | 8.214 | 0.714 | 0.5 | 12.8 | O K |
| 2880 min Winter | 8.071 | 0.571 | 0.5 | 10.3 | O K |
| 4320 min Winter | 7.855 | 0.355 | 0.4 | 6.4 | O K |
| 5760 min Winter | 7.703 | 0.203 | 0.4 | 3.7 | O K |
| 7200 min Winter | 7.599 | 0.099 | 0.3 | 1.8 | O K |
| 8640 min Winter | 7.549 | 0.049 | 0.3 | 0.9 | O K |
| 10080 min Winter | 7.544 | 0.044 | 0.3 | 0.8 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|-----------------------|---------------|------------------|
| 120 min Winter | 21.471 | 120 |
| 180 min Winter | 15.941 | 178 |
| 240 min Winter | 12.847 | 232 |
| 360 min Winter | 9.440 | 294 |
| 480 min Winter | 7.586 | 370 |
| 600 min Winter | 6.398 | 446 |
| 720 min Winter | 5.565 | 524 |
| 960 min Winter | 4.463 | 676 |
| 1440 min Winter | 3.266 | 966 |
| 2160 min Winter | 2.387 | 1384 |
| 2880 min Winter | 1.909 | 1784 |
| 4320 min Winter | 1.393 | 2548 |
| 5760 min Winter | 1.112 | 3240 |
| 7200 min Winter | 0.934 | 3896 |
| 8640 min Winter | 0.810 | 4320 |
| 10080 min Winter | 0.717 | 5104 |

| | | |
|---|---|---|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 - Aldi RDC Goldthorpe storm - access RD trench |  |
| Date 16/08/12 File Trench for acces... | Designed by LW Checked by | |

| | |
|------|-------------------------|
| CADS | Source Control W.12.6.1 |
|------|-------------------------|

Model Details

Storage is Online Cover Level (m) 10.000

Trench Soakaway Structure

| | |
|--|----------------------------------|
| Infiltration Coefficient Base (m/hr) 0.03600 | Trench Width (m) 2.0 |
| Infiltration Coefficient Side (m/hr) 0.03600 | Trench Length (m) 30.0 |
| Safety Factor 2.0 | Slope (1:X) 0.0 |
| Porosity 0.30 | Cap Volume Depth (m) 1.500 |
| Invert Level (m) 7.500 | Cap Infiltration Depth (m) 1.500 |

APPENDIX I

Refuse Area Drainage Calculations

Craddy Pitchers Limited

Page 1

Eden Lodge Studios
Ham Green
Bristol BS20 0ET



Date 16/08/2012 14:36

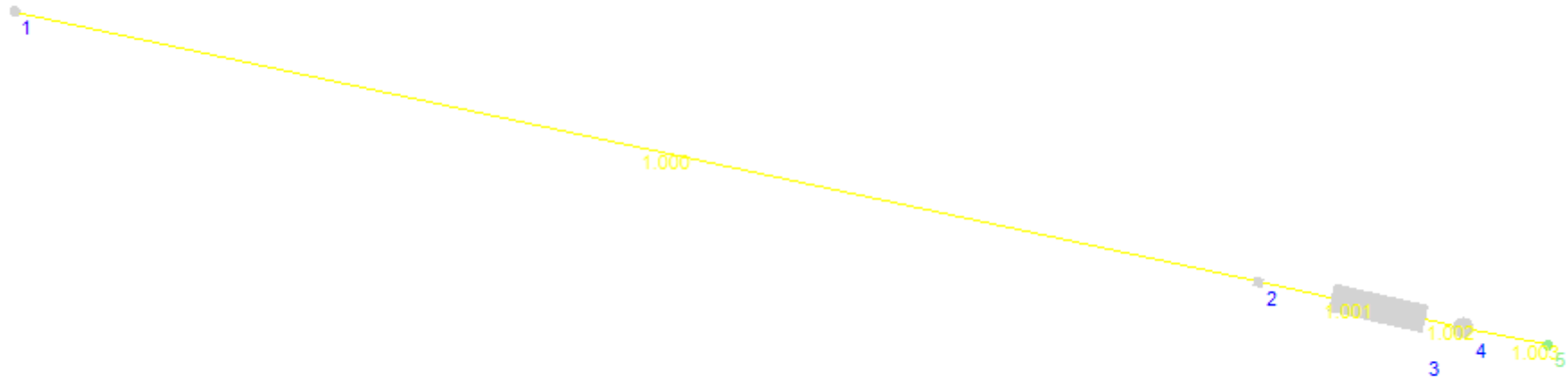
Designed by Lee Westermann


File 9206 - rear service area.mdx

Checked by

CADS

Network W.12.6.1



| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 0 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm refuse area |  |
| Date 16/08/12 File 9206 - rear serv... | Designed by LW Checked by | |

CADS Network W.12.6.1

Existing Network Details for 9206 - REAR SERVICE AREA.SWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) | |
|-------|---------------|--------------|----------------|----------------------|----------------|--------------|----------------------|-------------|---------------|
| 1.000 | 90.155 | 0.001 | 90155.0 | 0.333 | 4.00 | 0.600 | Q70 | -7 | |
| 1.001 | 8.697 | 0.109 | 80.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| 1.002 | 6.162 | 0.077 | 80.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| 1.003 | 6.126 | 0.077 | 80.0 | 0.000 | 0.00 | 0.600 | o | 450 | |
| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
| 1.000 | 1 | 27.450 | 26.500 | 0.250 | 27.450 | 26.499 | 0.251 | | 100 |
| 1.001 | 2 | 27.450 | 26.499 | 0.501 | 28.600 | 26.390 | 1.760 | | 700 x 700 |
| 1.002 | 3 | 28.600 | 26.390 | 1.760 | 28.600 | 26.313 | 1.837 | | 6850 x 2010 |
| 1.003 | 4 | 28.600 | 26.313 | 1.837 | 28.600 | 26.237 | 1.913 | Weir | 1500 |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

9206 Aldi RDC
Goldthorpe
Storm refuse area




Date 16/08/12
File 9206 - rear serv...

Designed by LW
Checked by

CADS Network W.12.6.1

Manhole Schedules for 9206 - REAR SERVICE AREA.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN | Pipe Out Invert Level (m) | Diameter (mm) | PN | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|---------------|-------|---------------------------|---------------|---------------|
| 1 | 27.450 | 0.950 | Open Manhole | 100 | 1.000 | 26.500 | -7 | | | | |
| 2 | 27.450 | 0.951 | Open Manhole | 700 x 700 | 1.001 | 26.499 | 450 | 1.000 | 26.499 | | -7 |
| 3 | 28.600 | 2.210 | Open Manhole | 6850 x 2010 | 1.002 | 26.390 | 450 | 1.001 | 26.390 | | 450 |
| 4 | 28.600 | 2.287 | Open Manhole | 1500 | 1.003 | 26.313 | 450 | 1.002 | 26.313 | | 450 |
| 5 | 28.600 | 2.363 | Open Manhole | 0 | | OUTFALL | | 1.003 | 26.237 | | 450 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm refuse area |  |
| Date 16/08/12 File 9206 - rear serv... | Designed by LW Checked by | |

CADS Network W.12.6.1

PIPELINE SCHEDULES for 9206 - REAR SERVICE AREA.SWS

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | Q70 | -7 | 1 | 27.450 | 26.500 | 0.250 | Open Manhole | 100 |
| 1.001 | o | 450 | 2 | 27.450 | 26.499 | 0.501 | Open Manhole | 700 x 700 |
| 1.002 | o | 450 | 3 | 28.600 | 26.390 | 1.760 | Open Manhole | 6850 x 2010 |
| 1.003 | o | 450 | 4 | 28.600 | 26.313 | 1.837 | Open Manhole | 1500 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 90.155 | 90155.0 | 2 | 27.450 | 26.499 | 0.251 | Open Manhole | 700 x 700 |
| 1.001 | 8.697 | 80.0 | 3 | 28.600 | 26.390 | 1.760 | Open Manhole | 6850 x 2010 |
| 1.002 | 6.162 | 80.0 | 4 | 28.600 | 26.313 | 1.837 | Open Manhole | 1500 |
| 1.003 | 6.126 | 80.0 | 5 | 28.600 | 26.237 | 1.913 | Open Manhole | 0 |


Simulation Criteria for 9206 - REAR SERVICE AREA.SWS

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

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

Synthetic Rainfall Details

Rainfall Model FSR Profile Type Summer
Return Period (years) 1 Cv (Summer) 0.750
Region England and Wales Cv (Winter) 0.840
M5-60 (mm) 19.000 Storm Duration (mins) 30
Ratio R 0.374

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 3 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm refuse area |  |
| Date 16/08/12 File 9206 - rear serv... | Designed by LW Checked by | |

CADS Network W.12.6.1

Storage Structures for 9206 - REAR SERVICE AREA.SWS

Trench Soakaway Manhole: 4, DS/PN: 1.003

| | | | |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.03600 | Trench Width (m) | 7.0 |
| Infiltration Coefficient Side (m/hr) | 0.03600 | Trench Length (m) | 41.0 |
| Safety Factor | 2.0 | Slope (1:X) | 0.0 |
| Porosity | 0.30 | Cap Volume Depth (m) | 1.000 |
| Invert Level (m) | 25.313 | Cap Infiltration Depth (m) | 1.000 |

| | |
|---|--|
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 Aldi RDC Goldthorpe Storm refuse area |
| Date 16/08/12 File 9206 - rear serv... | Designed by LW Checked by |



CADS Network W.12.6.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 9206 - REAR SERVICE AREA.SWS

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
 Analysis Timestep Fine Inertia Status ON
 DTS Status OFF


Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 20, 20, 20

| PN | Storm | Return Period | Climate Change | First X Surcharge | First Y Flood | First Z Overflow | O/F Act. | Lvl Exc. |
|-------|------------|---------------|----------------|-------------------|----------------|------------------|----------|----------|
| 1.000 | 600 Winter | 100 | +20% | 30/360 Winter | 100/120 Winter | | | 14 |
| 1.001 | 600 Winter | 100 | +20% | 30/180 Winter | 100/120 Winter | | | 14 |
| 1.002 | 480 Winter | 100 | +20% | 30/120 Winter | | | | |
| 1.003 | 480 Winter | 100 | +20% | 30/120 Winter | | | | |

| PN | US/MH Name | Water | | Flooded | | Pipe | | Status |
|-------|------------|-----------|-------------------|-------------|-------------------|--------------|-----------------|------------|
| | | Level (m) | Surch'd Depth (m) | Volume (m³) | Flow / Cap. (l/s) | O'flow (l/s) | Pipe Flow (l/s) | |
| 1.000 | 1 | 27.472 | 0.272 | 22.014 | 0.10 | 0.0 | 16.0 | FLOOD |
| 1.001 | 2 | 27.472 | 0.523 | 22.765 | 0.09 | 0.0 | 16.0 | FLOOD |
| 1.002 | 3 | 27.572 | 0.732 | 0.000 | 0.11 | 0.0 | 18.9 | SURCHARGED |
| 1.003 | 4 | 27.797 | 1.034 | 0.000 | 0.00 | 0.0 | 0.0 | SURCHARGED |

APPENDIX J

Rear Access Road Drainage Calculations

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 1 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 - Aldi RDC Goldthorpe Storm rear filter drain |  |
| Date 16/08/12 File FILTER DRAIN.srcx | Designed by LW Checked by | |


CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 144 minutes.

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m ³) | Status |
|------------------|---------------|---------------|------------------------|------------------------------|--------|
| 15 min Summer | 8.599 | 0.599 | 0.2 | 2.3 | O K |
| 30 min Summer | 8.764 | 0.764 | 0.3 | 3.0 | O K |
| 60 min Summer | 8.899 | 0.899 | 0.3 | 3.5 | O K |
| 120 min Summer | 8.967 | 0.967 | 0.3 | 3.8 | O K |
| 180 min Summer | 8.981 | 0.981 | 0.3 | 3.8 | O K |
| 240 min Summer | 8.977 | 0.977 | 0.3 | 3.8 | O K |
| 360 min Summer | 8.945 | 0.945 | 0.3 | 3.7 | O K |
| 480 min Summer | 8.905 | 0.905 | 0.3 | 3.5 | O K |
| 600 min Summer | 8.864 | 0.864 | 0.3 | 3.4 | O K |
| 720 min Summer | 8.824 | 0.824 | 0.3 | 3.2 | O K |
| 960 min Summer | 8.753 | 0.753 | 0.3 | 2.9 | O K |
| 1440 min Summer | 8.640 | 0.640 | 0.2 | 2.5 | O K |
| 2160 min Summer | 8.515 | 0.515 | 0.2 | 2.0 | O K |
| 2880 min Summer | 8.425 | 0.425 | 0.2 | 1.7 | O K |
| 4320 min Summer | 8.301 | 0.301 | 0.1 | 1.2 | O K |
| 5760 min Summer | 8.219 | 0.219 | 0.1 | 0.9 | O K |
| 7200 min Summer | 8.162 | 0.162 | 0.1 | 0.6 | O K |
| 8640 min Summer | 8.119 | 0.119 | 0.1 | 0.5 | O K |
| 10080 min Summer | 8.087 | 0.087 | 0.1 | 0.3 | O K |
| 15 min Winter | 8.674 | 0.674 | 0.2 | 2.6 | O K |
| 30 min Winter | 8.861 | 0.861 | 0.3 | 3.4 | O K |
| 60 min Winter | 9.015 | 1.015 | 0.3 | 4.0 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 15 min Summer | 84.553 | 24 |
| 30 min Summer | 55.660 | 37 |
| 60 min Summer | 35.085 | 64 |
| 120 min Summer | 21.481 | 104 |
| 180 min Summer | 15.952 | 136 |
| 240 min Summer | 12.858 | 170 |
| 360 min Summer | 9.451 | 238 |
| 480 min Summer | 7.595 | 308 |
| 600 min Summer | 6.407 | 374 |
| 720 min Summer | 5.574 | 442 |
| 960 min Summer | 4.470 | 574 |
| 1440 min Summer | 3.272 | 828 |
| 2160 min Summer | 2.392 | 1200 |
| 2880 min Summer | 1.914 | 1564 |
| 4320 min Summer | 1.396 | 2296 |
| 5760 min Summer | 1.115 | 3008 |
| 7200 min Summer | 0.937 | 3752 |
| 8640 min Summer | 0.812 | 4488 |
| 10080 min Summer | 0.720 | 5152 |
| 15 min Winter | 84.553 | 24 |
| 30 min Winter | 55.660 | 37 |
| 60 min Winter | 35.085 | 64 |

| | | |
|---|--|---|
| Craddy Pitchers Limited | | Page 2 |
| Eden Lodge Studios Ham Green Bristol BS20 0ET | 9206 - Aldi RDC Goldthorpe Storm rear filter drain |  |
| Date 16/08/12 File FILTER DRAIN.srcx | Designed by LW Checked by | |

CADS Source Control W.12.6.1

Summary of Results for 30 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-----------------|--------|
| 120 min Winter | 9.084 | 1.084 | 0.3 | 4.3 | O K |
| 180 min Winter | 9.092 | 1.092 | 0.3 | 4.3 | O K |
| 240 min Winter | 9.082 | 1.082 | 0.3 | 4.3 | O K |
| 360 min Winter | 9.036 | 1.036 | 0.3 | 4.1 | O K |
| 480 min Winter | 8.978 | 0.978 | 0.3 | 3.8 | O K |
| 600 min Winter | 8.918 | 0.918 | 0.3 | 3.6 | O K |
| 720 min Winter | 8.860 | 0.860 | 0.3 | 3.4 | O K |
| 960 min Winter | 8.761 | 0.761 | 0.3 | 3.0 | O K |
| 1440 min Winter | 8.609 | 0.609 | 0.2 | 2.4 | O K |
| 2160 min Winter | 8.453 | 0.453 | 0.2 | 1.8 | O K |
| 2880 min Winter | 8.348 | 0.348 | 0.2 | 1.4 | O K |
| 4320 min Winter | 8.214 | 0.214 | 0.1 | 0.8 | O K |
| 5760 min Winter | 8.133 | 0.133 | 0.1 | 0.5 | O K |
| 7200 min Winter | 8.079 | 0.079 | 0.1 | 0.3 | O K |
| 8640 min Winter | 8.049 | 0.049 | 0.1 | 0.2 | O K |
| 10080 min Winter | 8.044 | 0.044 | 0.1 | 0.2 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|------------------|--------------|------------------|
| 120 min Winter | 21.481 | 116 |
| 180 min Winter | 15.952 | 146 |
| 240 min Winter | 12.858 | 184 |
| 360 min Winter | 9.451 | 258 |
| 480 min Winter | 7.595 | 328 |
| 600 min Winter | 6.407 | 400 |
| 720 min Winter | 5.574 | 470 |
| 960 min Winter | 4.470 | 604 |
| 1440 min Winter | 3.272 | 868 |
| 2160 min Winter | 2.392 | 1244 |
| 2880 min Winter | 1.914 | 1620 |
| 4320 min Winter | 1.396 | 2340 |
| 5760 min Winter | 1.115 | 3064 |
| 7200 min Winter | 0.937 | 3752 |
| 8640 min Winter | 0.812 | 4344 |
| 10080 min Winter | 0.720 | 5096 |

Eden Lodge Studios
Ham Green
Bristol BS20 0ET

9206 - Aldi RDC
Goldthorpe
Storm rear filter drain



Date 16/08/12

Designed by LW

File FILTER DRAIN.srcx

Checked by

CADS

Source Control W.12.6.1

Rainfall Details

| | | | |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model | FSR | Winter Storms | Yes |
| Return Period (years) | 30 | Cv (Summer) | 0.750 |
| Region | England and Wales | Cv (Winter) | 0.840 |
| M5-60 (mm) | 19.000 | Shortest Storm (mins) | 15 |
| Ratio R | 0.375 | Longest Storm (mins) | 10080 |
| Summer Storms | Yes | Climate Change % | +20 |

Time / Area Diagram

Total Area (ha) 0.016

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|
| 0-4 | 0.005 | 4-8 | 0.005 | 8-12 | 0.005 |