**Weetwood Services Ltd**
info@weetwood.net

# Land to the North and East of Great Wymondley, Hertfordshire (Priory Farm Solar Array)

## Surface Water Drainage and Overland Flow Management Strategy

## Technical Note

| | |
|---|---|
| **Project ref:** | 5208 – Land to the North and East of Great Wymondley, Hertfordshire |
| **Prepared by:** | James Aldridge BEng (Hons) MSc MCIWEM Director<br>Flora Lockey MEnvSci Flood Risk Consultant<br>Kevin Tilford BSc (Hons) MSc (Eng) PhD MBA C.WEM FCIWEM CEnv *Managing Director* |
| **Approved by:** | Kevin Tilford BSc (Hons) MSc (Eng) PhD MBA C.WEM FCIWEM CEnv *Managing Director* |
| **Date:** | 30 May 2022 |
| **Version:** | Final v1.1 |

### Background

1. A planning application for the *"Proposed solar farm measuring 88 hectares with associated battery storage containers, transformers stations, storage buildings, fencing etc including means of access"* was submitted to North Hertfordshire District Council (local planning authority) on 14 December 2021. The application was validated with the planning reference 21/03380/FP.

2. The proposals are for the construction of a photovoltaic solar array and associated support frames; 22 no. co-located inverter/transformer stations and battery storage containers; a storage building, switchgear building and control building (also co-located); and maintenance access tracks.

3. The planning application was accompanied by a Flood Risk Assessment report prepared by Weetwood Services Ltd ("Weetwood") (Report ref: 5208/FRA/Final/v1.2/2022-02-15).

4. The lead local flood authority (LLFA) Hertfordshire County Council objected to the proposals by way of its consultation letter dated 14 February 2022. The letter concluded by stating that the LLFA was concerned that the development will increase flooding downstream, and that details of a sustainable surface water drainage scheme were required to manage flood risk from overland flows.

5. The basis for the LLFA objection principally relates to historic flooding in Little Wymondley. The source of flooding in Little Wymondley is Ash Brook, although an unnamed tributary, sometimes referred to as Priory Lane Stream, flows to the west of the application site and discharges into the Ash Brook in Little Wymondley.

6. The LLFA response states that Priory Lane Stream is fed by several tributaries (ordinary watercourses) and that the application site is located at the head of these watercourses. The LLFA is concerned that the solar farm would increase runoff rates and/or volumes to the aforementioned watercourses and in so doing would increase flood risk in Little Wymondley.

7. The response letter states:

   - The development must avoid the Priory Lane Stream/tributaries and their associated flood extents, as any changes to ground levels or impedance to flows may increase flood risk.
   - The LLFA will not remove its objection until it is demonstrated that the proposals will provide betterment to the existing flood risk from overland flows.
   - That a hydraulic assessment/site specific modelling will need to be undertaken to establish overland flow routes and flood extents (i.e. the LLFA will not accept reliance on the EA surface water modelling to identify the extent of watercourse/drains and as an indicator of the overland pathways
   - That ground truthing should be undertaken to confirm the location and condition of the ordinary watercourses.
   - A comprehensive scheme to manage surface water runoff from the development should be developed. (The response states that the LLFA regards solar panels as impermeable, and that managing runoff from the development by gravel tracks and grassland is not considered acceptable)

- Infiltration testing, ground investigations and groundwater monitoring would need to be undertaken, prior to determination, if infiltration is proposed as a means of managing runoff.

8. This document presents additional technical information relating to flood risk and runoff management and in so doing addresses the matters raised in the LLFA consultation letter. The information presented in this document supplements the information presented in the submitted Flood Risk Assessment report. Specifically:

    - 2D direct rainfall hydraulic modelling has been undertaken to accurately model overland flow routes (pathways) across the site
    - A site visit has been undertaken to validate existing on site drainage ditches and overland flow pathways
    - A scheme has been prepared to manage overland flows across the developed site. The scheme is based on the discharge of runoff to existing drainage ditches at controlled/restricted rates to reduce downstream flood risk.
    - The above analysis has informed a revision to the proposed site layout to mitigate the risk of obstructing overland flow pathways.

### Direct Rainfall Runoff Modelling

9. Overland flow across the site has been simulated using a 2D (TUFLOW) direct rainfall-runoff model with ground levels derived from Environment Agency LiDAR data.

10. The model has been run for a 6-hour duration rainfall event with the following annual exceedance probabilities (AEP): Present day 1:30 AEP event, Present day 1:100 AEP event, 1 in 30 AEP event plus 25% (Central allowance), 1 in 30 AEP event plus 35% (Upper end allowance), 1 in 100 AEP event plus 25% (Central allowance), and 1 in 100 AEP event plus 40% (Upper end allowance).

11. The climate change allowances are in accordance with the guidance released by the Environment Agency on 10 May 2022 and are for the Upper and Bedford Ouse management catchment to the year 2125 (103 years).

12. For the purposes of the modelling, the site is split into two land areas located to the north of Graveley Land ("the northern parcel"; 45.01 ha) and to the south of Graveley Land southern parcel ("the southern parcel"; 39.51 ha). The extent of each parcel is presented in **Figure 1**.

13. Outputs from the 2D rainfall-runoff modelling for the aforementioned events for the pre-panelled (baseline) scenario are presented in **Figure 2** (accumulated depth of runoff and flow velocity and direction respectively.

14. The model outputs, validated by a site visit indicate the following:

    Northern Parcel (refer **Figure 3**):

    - Land in the northern part of the parcel drains to the ditch that runs along the northern boundary (**Figure 3; 4a**). The ditch drains in a westerly direction to a brick chamber housing the inlet of a circa 300 mm diameter pipe (**Figure 4b**). The pipe conveys flow across the field to the south in a south-westerly direction, outfalling in the north-east corner of a wood located on the western boundary of the parcel. The pipe run is approximately 285 m. The drain is effectively the upper reach of the Old Priory Stream. (Refer also **Figure 2**).
    - Overland flow in the western part of the parcel drains to a defined overland flow pathway that broadly follows the route of the pipe. The flow pathway also receives runoff generated from the north-west corner of the parcel and from land to the north-west of the site (i.e. off-site). The open channel of the Old Priory Stream to the south of the pipe outlet also receives runoff from the lower western part of the site via multiple overland flow routes. A site visit determined that these routes are not well defined and no channels are present, aside from Old Priory Stream and one small drainage ditch corresponding to an existing field boundary. Flood depths along the flow pathway are <100 mm during all modelled events up to an including the 1 in 100 AEP event plus 40% climate change. (Refer **Figure 5** and **Figure 2**).
    - Land in the south-west part of the parcel drains to a defined overland flow pathway that runs adjacent to the southern boundary (Graveley Lane) as shown on **Figure 6a** (refer also **Figure 2**). The pathway flows into Old Priory Stream upstream of where the stream crosses under Graveley Lane in a culvert. A site visit determined that these routes are not defined and no channels are present (refer **Figure 6b** and **Figure 6c**). Flood depths

along the flow pathway are <100 mm during all modelled events up to an including the 1 in 100 AEP event plus 40% climate change. (Refer **Figure 2**).

Southern Parcel (refer **Figure 7**):

- Runoff from the northern part of the parcel drains to the western boundary and along an existing field boundary across the southern edge of the area. In the case of the former, an overland flow pathway drains in a south/south-westerly direction to a single "outlet" on the western boundary of the parcel, while the later flows in a west/north-westerly direction, converging on the same "outlet" (refer **Figure 2**; **Figure 8**). The flow pathway continues off-site in a west/south-westerly direction toward The Priory. A site visit determined that the overland flow routes are not defined and no defined channels are present. Flood depths along the flow pathway are generally <100 mm during all modelled events up to an including the 1 in 100 AEP event plus 40% climate change (Refer **Figure 5** and **Figure 2**).
- Overland flow from the southern area discharges to two "outlets" further south on the western boundary (Refer **Figure 9** and **Figure 2**). The flow pathways continue off-site in a west/north-westerly direction toward The Priory, and both converge with the off-site flow pathway described above at a location between the site boundary and The Priory. A site visit determined that the overland flow routes are not defined and no defined channels are present. Flood depths along the flow pathway are <100 mm during all modelled events up to an including the 1 in 100 AEP event plus 40% climate change. (Refer **Figure 5** and **Figure 2**).
- Overland flow in the south-east corner drains across the southern boundary of the parcel in a southerly direction. Flood depths along the flow pathway are <100 mm during all modelled events up to an including the 1 in 100 AEP event plus 40% climate change. (Refer **Figure 5** and **Figure 2**).

### Management of Overland Flow

15. The revised strategy for managing overland flows from the developed site is based on the following design principles:

- Runoff infiltrating into the internal site access tracks and ancillary equipment hardstanding areas will be positively managed by a surface water drainage scheme. The drainage scheme includes 3 No. surface water attenuation basins.
- Surface water runoff generated from the panelled part of the site (the "greenfield" areas of the solar farm) will by attenuated through the provision of 2 No. overland flow attenuation basins.

16. Further details follow below.

#### Access tracks and other areas of hardstanding

17. Northern Parcel:

- The internal site access tracks, and the hardstanding areas where the control room building, switchgear building, storage building, and circa 10 no battery storage container/inverter transformer stations is located, has an estimated surface area of (circa 0.43 ha).
- The access tracks and hardstanding will be constructed of 0.4 m deep Type 3 granular material.
- Rainfall infiltrating into the build-up of the access track and hardstanding areas would be conveyed by gravity within a perforated pipe located in the base of the build-up, to an outlet control manhole (reference S1) fitted with a 50 mm diameter orifice plate. The plate restricts the outflow rate and attenuates runoff whilst minimising the risk of blockage.
- The outlet from the control manhole is a solid pipe to a new outfall to the Old Priory Stream.
- An offline storage basin ("North Basin"; volume 298 cu m) is located adjacent to the access track. The basin has sufficient storage to attenuate runoff from the access track and hardstanding generated during the 1 in 100 AEP event plus 40% climate change event.
- The Microdrainage outputs for this element of the drainage scheme are provided in **Annex 1-1**.

18. Southern Parcel:

- The internal site access tracks, and the hardstanding areas where the control room building, switchgear building, storage building, and 11 no. battery storage container/inverter transformer stations is located, has an estimated surface area of (circa 0.50 ha).
- The access tracks and hardstanding will be constructed of 0.4 m deep Type 3 granular material.
- Rainfall infiltrating into the build-up of the access track along the northern boundary of the parcel and 2 no. battery storage container/inverter transformer stations would be conveyed by gravity within perforated pipe located in the base of the build-up, to an online detention basin ("South Basin 1"; volume 61 cu m). An outlet control manhole (reference S2) fitted with a 50 mm diameter orifice plate restricts the outflow rate from the basin and attenuates runoff whilst minimising the risk of blockage. The outlet from the control manhole is a solid pipe to a new swale that runs adjacent to the western boundary of the parcel. The Microdrainage outputs for this element of the drainage scheme are provided in **Annex 1-2**.
- Rainfall infiltrating into the build-up of the access track along the centre of the parcel and 9 no. battery storage container/inverter transformer stations would be conveyed by gravity within a perforated pipe located in the base of the build-up, and then to a solid pipe to an online detention basin ("South Basin 2"; volume 246 cu m). An outlet control manhole (reference S3) fitted with a 50 mm diameter orifice plate restricts the outflow rate from the basin and attenuates runoff whilst minimising the risk of blockage. The outlet from the control manhole is a solid pipe to a new swale that runs adjacent to the boundary of the parcel and discharges to an existing field drainage ditch. The Microdrainage outputs for this element of the drainage scheme are provided in **Annex 1-3**.
- The proposed discharge rates and attenuation volumes for the 1 in 100 AEP event plus a 40% climate change allowance for the areas described above are presented in **Table 1** below. A preliminary drainage layout is presented in **Annex 2**.

**Table 1: Summary of Proposed Surface Water Drainage Scheme**

| Parcel | Outfall reference | Impermeable Area (sq m) | Peak Discharge (l/s) | Attenuation Volume (cu m) |
|---|---|---|---|---|
| Northern | S1 | 4,320 | 5.0 | 298 |
| Southern | S2 | 1,250 | 5.0 | 61 |
| Southern | S3 | 3,710 | 5.0 | 246 |

### "Greenfield' Areas of the Solar Farm

19. According to published research into the impact of solar-farm panels on runoff rates and volumes (ref: 'Hydrologic Response of Solar Farms' (Cook LM and McCuen RH, American Society of Civil Engineers, 2013) solar panels do not have a significant impact on the hydrologic response of a site when the ground comprises of well managed vegetation such as good grass cover. In such an instance, the research cites a potential increase of up to 0.35% in runoff volume. This research is also referenced by Essex County Council (lead local flood authority) in its Sustainable Drainage System Design Guide for Solar Array Development.

20. The research recognises that not all solar farms have well managed vegetation beneath the solar panels and concludes that runoff volumes may increase by up to 7% compared to pre-panelled (greenfield) rates when the surface beneath the solar panels is bare earth.

21. The land at the solar farm would be managed as permanent grassland, and not bare earth. As such, the solar farm would not be expected to have a negative impact on the hydrologic response of the developed site and would almost certainly provide a reduction in the rate of runoff (and soil erosion) compared to the existing land use (arable cropping), particularly during the winter months when bare soils are currently exposed.

22. Notwithstanding the above, given the historic flooding issue downstream in Little Wymondley, modelling has been undertaken to identify how surface based features could be provided to reduce peak runoff rates following completion of the solar farm (proposed scenario). The basis of the modelling has been to increase the design rainfall referenced in the Direct Rainfall Runoff Modelling section of this document by 7% to simulate the effect of increased runoff volumes due to bare earth. This modelling is hypothetical and conservative for the reasons presented above.

23. Based on the modelling, 2 no. on-line surface-based storage basins are proposed to attenuate overland flow, one located in the northern parcel (526 cu m storage volume) and one located in the southern parcel (552 cu m). The location of the attenuation basins, and illustrative sizing are presented on **Figure 10**.

24. The basins would be formed by constructing low bunds (a maximum of 0.6 m high) in the location of the principal overland flow pathways within each parcel. The bunds are located along the low points and tie into the ground as levels increase.

25. The outflow from the basins would be restricted to 2 l/s/ha in accordance with CIRIA SuDS Manual using a suitable outlet control device such as a Hydrobrake. Each bund would have a constructed spillway at its lowest point to ensure that overtopping occurs in a controlled and safe manner.

26. The modelled flow hydrographs for the design events for the pre-development (Baseline) and post-development (Proposed) scenarios are presented in **Figure 11** and the model outputs are presented in **Table 2**.

27. The hydrographs show that for all the modelled events the basins delay the onset of the peak flow. In addition, the attenuation basins significantly reduce the peak flow for the present day 1 in 30 AEP rainfall event. As such, the modelling demonstrates that the risk of flooding downstream for events up to and including the 1 in 30 AEP event would be significantly reduced.

28. It is stressed that the model outputs relate to a scenario in which rainfall is increased by 7% to simulate bare earth conditions. In reality, the increase in peak flow would almost certainly be reduced for the reasons set out above. As such, for the situation whereby the land occupied by the solar panels comprises management grass, the provision of the attenuation storage would be expected to significantly reduce downstream flood risk for all modelled events.

**Table 2: Summary of Peak Flow Modelling**

| **Rainfall Event (AEP)** | **Northern Parcel** | | | **Southern Parcel** | | | **Total Site Difference (l/sec)** |
|---|---|---|---|---|---|---|---|
| | Peak Flow Baseline (l/sec) | Peak Flow Proposed (l/sec) | Difference (l/sec) | Peak Flow Baseline (l/sec) | Peak Flow Proposed (l/sec) | Difference (l/sec) | |
| Present day 1:30 | 413.4 | 307.4 | -106.0 | 234.7 | 194.9 | -39.8 | -145.8 |
| 1:30 (25% CC) | 497.2 | 502.2 | 5.0 | 314.4 | 306.5 | -7.9 | -2.9 |
| 1:30 (35% CC) | 576.5 | 575.2 | -1.3 | 347.2 | 348.5 | 1.3 | 0.0 |
| Present day1:100 | 547.6 | 550.5 | 2.9 | 335.2 | 334.2 | -1.0 | 1.9 |
| 1:100 (25% CC) | 768.4 | 766.3 | -2.1 | 446.2 | 452.8 | 6.6 | 4.5 |
| 1:100 (40% CC) | 940.9 | 935.3 | -5.6 | 517.7 | 523.7 | 6.0 | 0.4 |

### Summary and Conclusion

29. This document presents an overland runoff and surface water drainage strategy for the proposed development of land to the north and east of Great Wymondley, Hertfordshire, for a solar farm (planning reference 21/03380/FP).

30. The strategy includes a formal drainage system to manage surface water runoff from the access tracks and other areas of hardstanding, and attenuation basins to manage overland flows from the "greenfield" part of the site occupied by the solar panels.

31. The analysis demonstrates that the implementation of land management measures in addition to the surface water drainage scheme (for the access tracks and associated hardstanding) and overland flow strategy (for the greenfield part of the site occupied by the solar panels) would ensure that the proposal would not increase, and would actually reduce downstream flood risk.

32. It is concluded that the proposals comply with planning policy and relevant technical guidance.

*This document has been prepared solely as a Technical Note for Axis PED. This report is confidential to Axis PED and Weetwood Services Ltd accepts no responsibility or liability for any use that is made of this document other than by Axis PED for the purposes for which it was originally commissioned and prepared.*

# FIGURES

**Figure 1: Proposed Solar Farm Site**

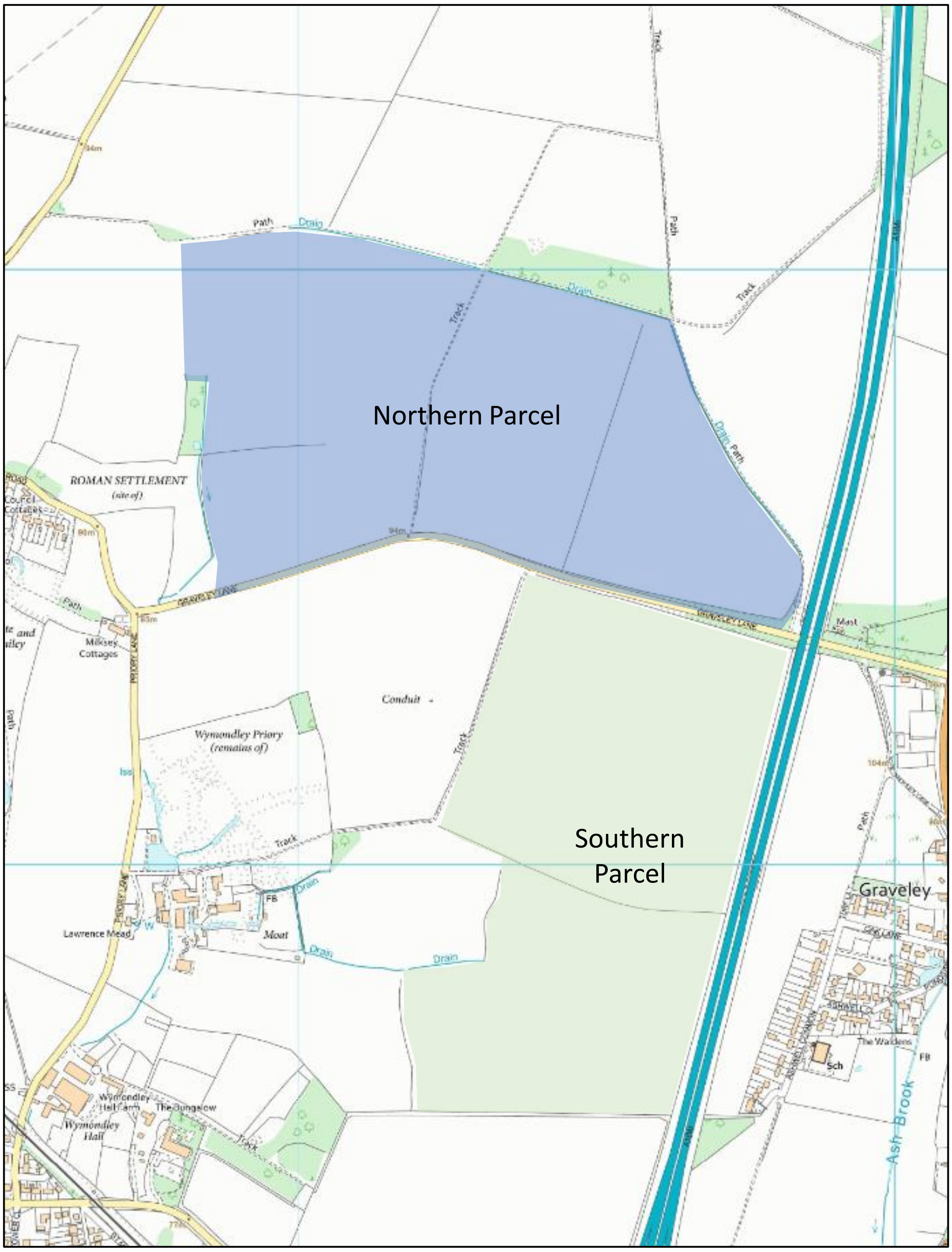
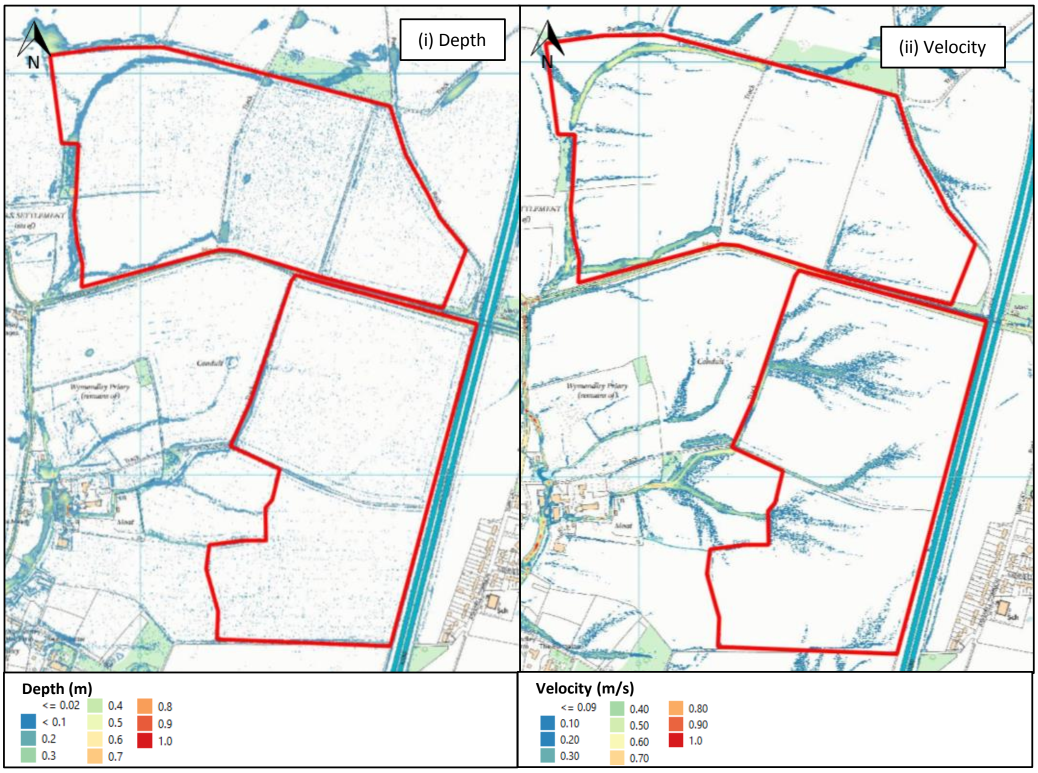
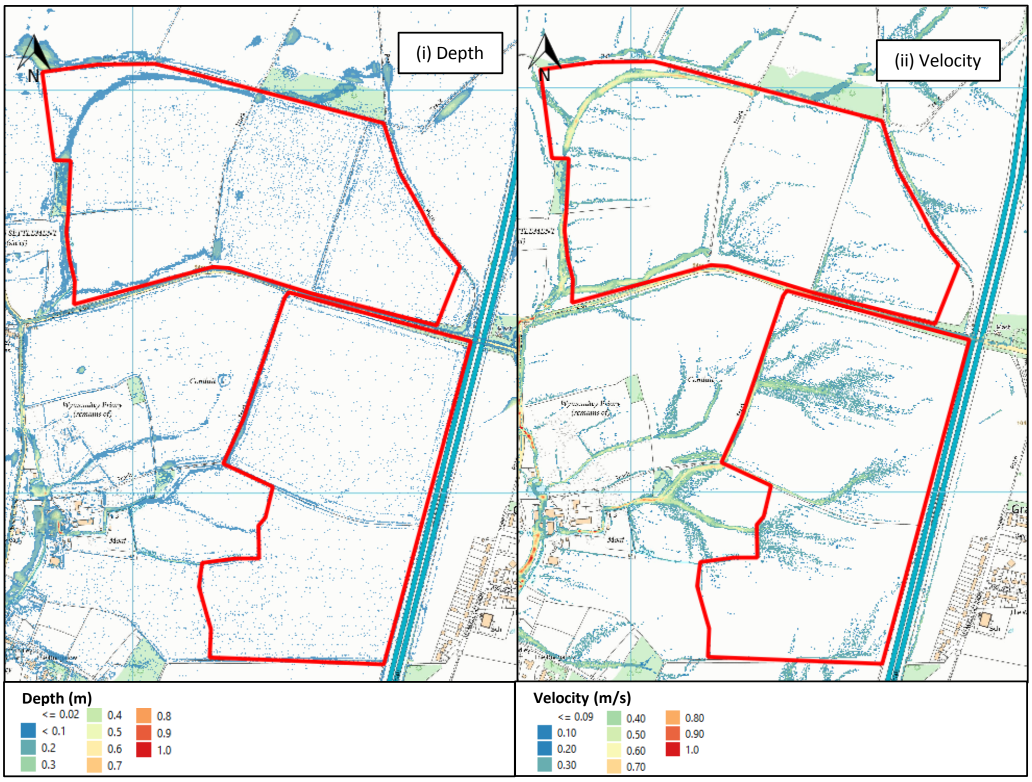


**Figure 2: 2D Direct Rainfall-Runoff Modelling Outputs**

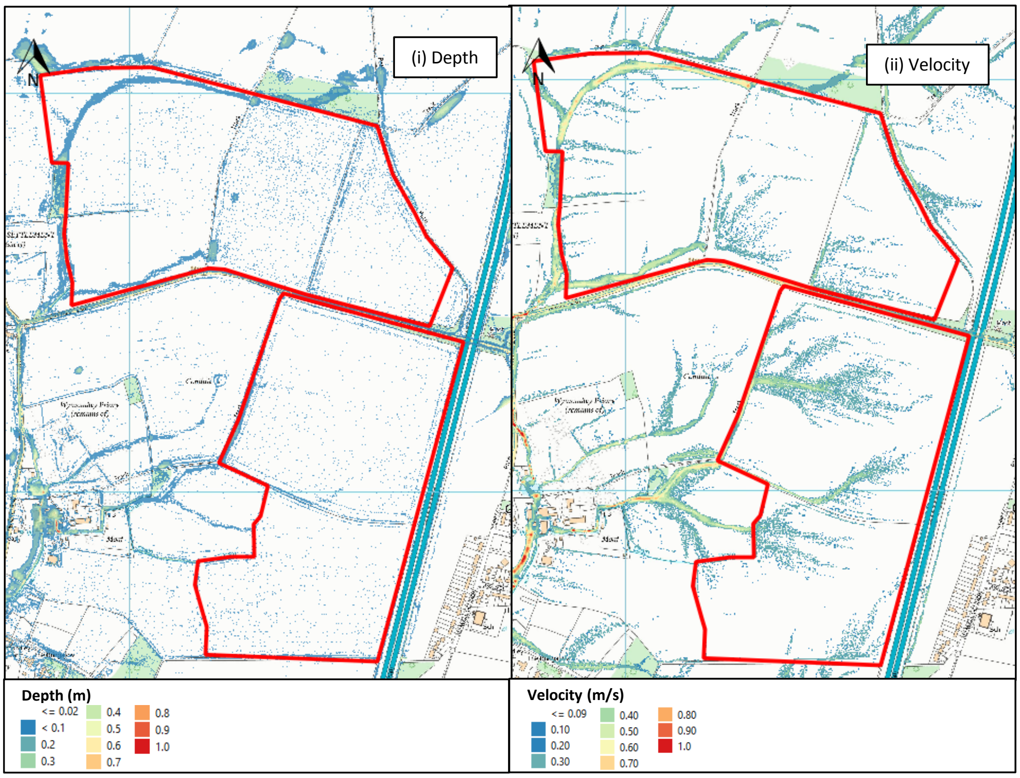
(a) Present Day 1 in 30 AEP Event



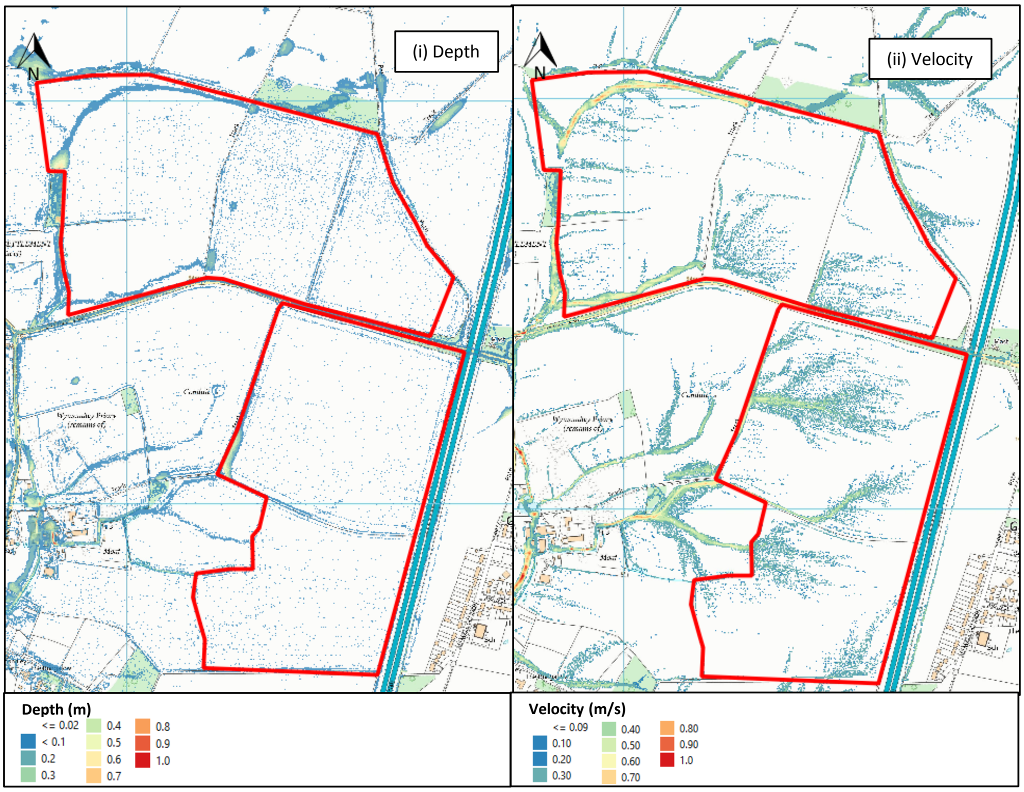

(b) 1 in 30 AEP Plus 25% Climate Change Event



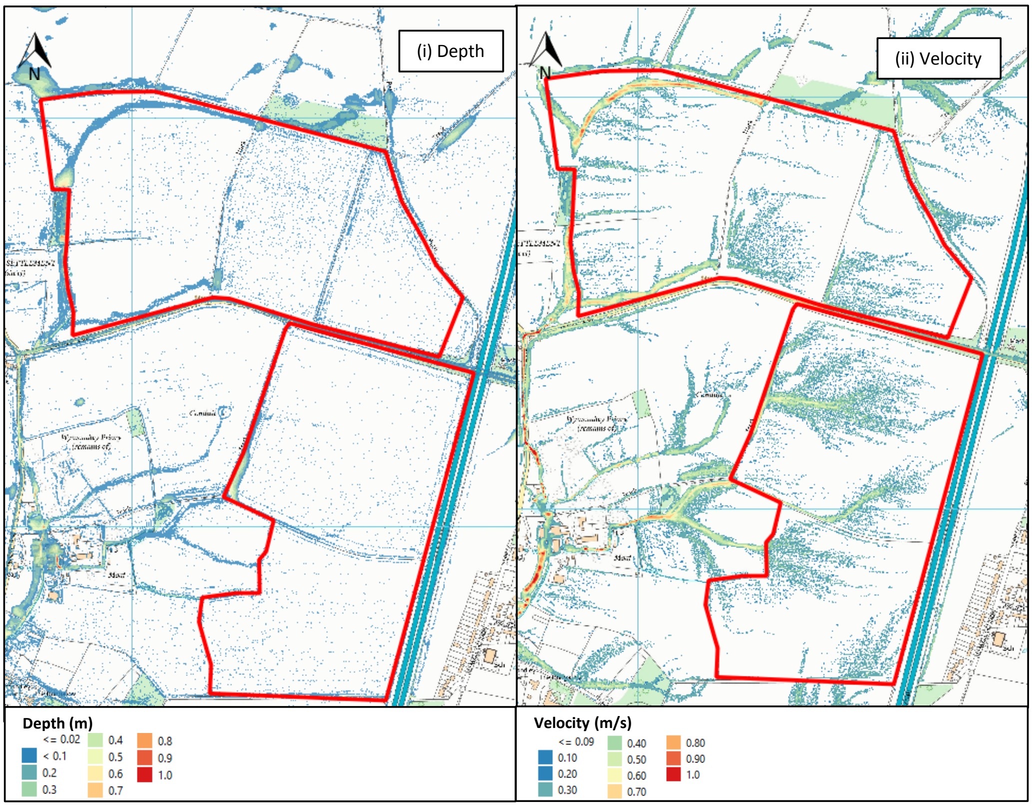
(c) 1 in 30 AEP Plus 35% Climate Change Event




(d) Present Day 1 in 100 AEP Event



(e) 1 in 100 AEP Event Plus 25% Climate Change




(f) 1 in 100 AEP Event Plus 40% Climate Change

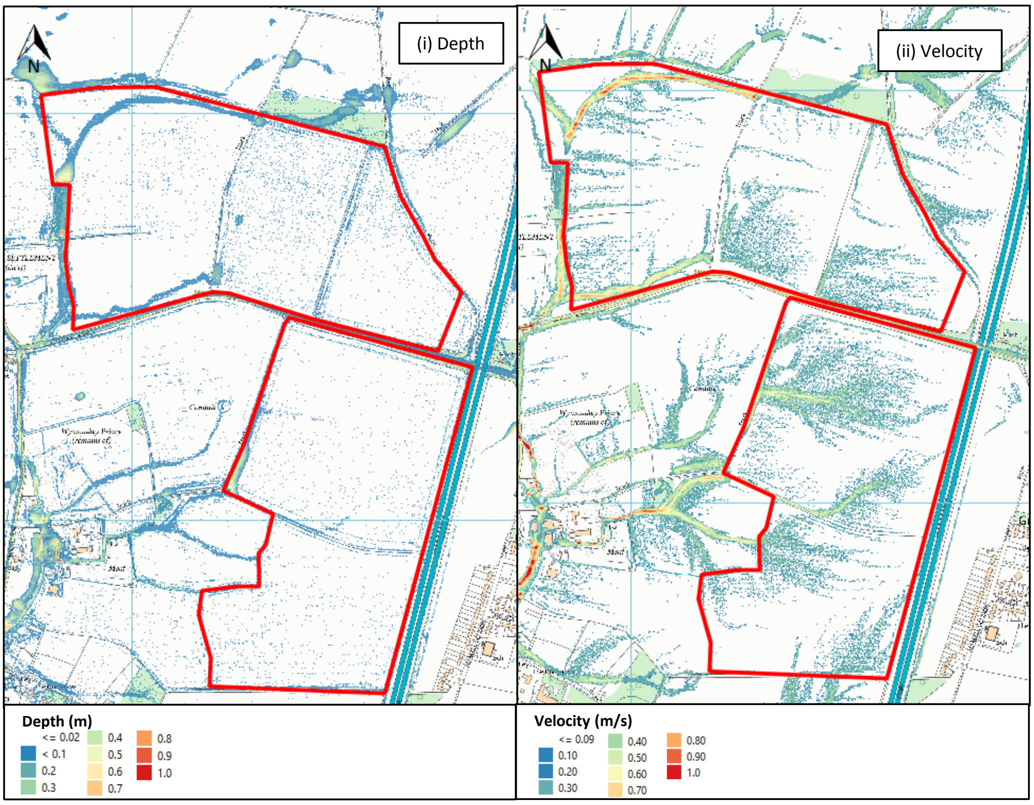


**Figure 3: Northern Parcel Looking West**

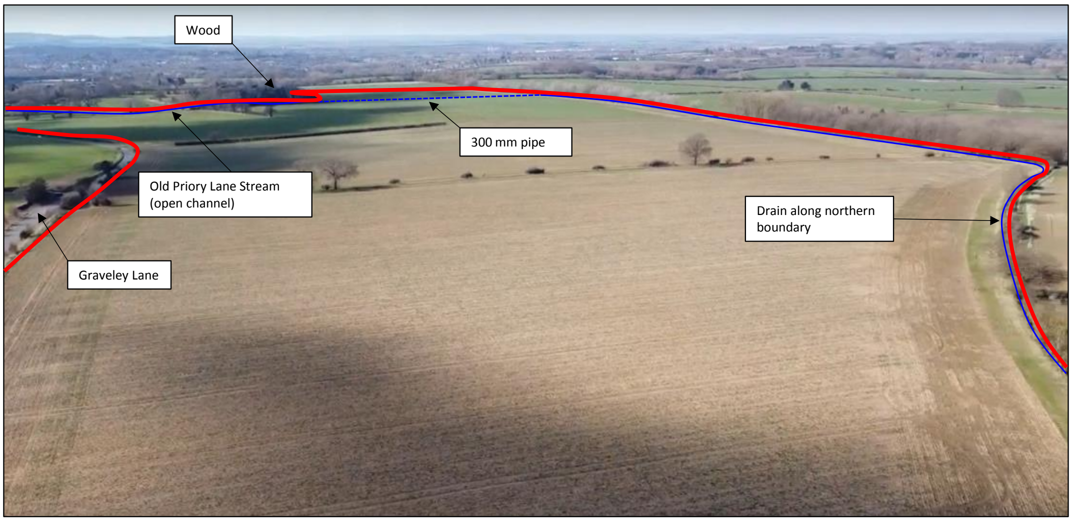



**Figure 4: Northern Parcel – Existing Drainage Features**

(a) Northern drainage ditch along northern boundary of northern parcel (looking west)

(b) Inlet to 300 mm pipe on Boundary of northern parcel

**Figure 5: North-West Part of Northern Parcel Looking North-West**

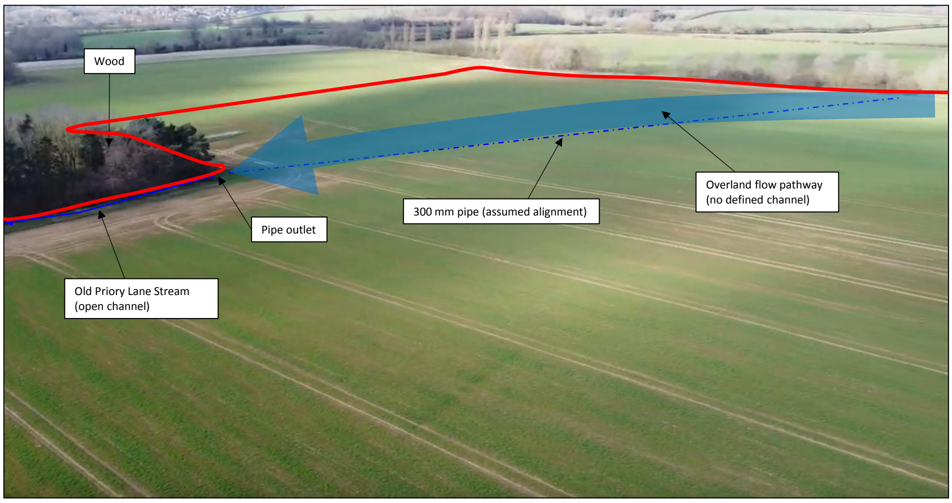



**Figure 6a: South-West Part of Northern Parcel Looking South**


**Figure 6b: South-West Part of Northern Parcel Looking East**

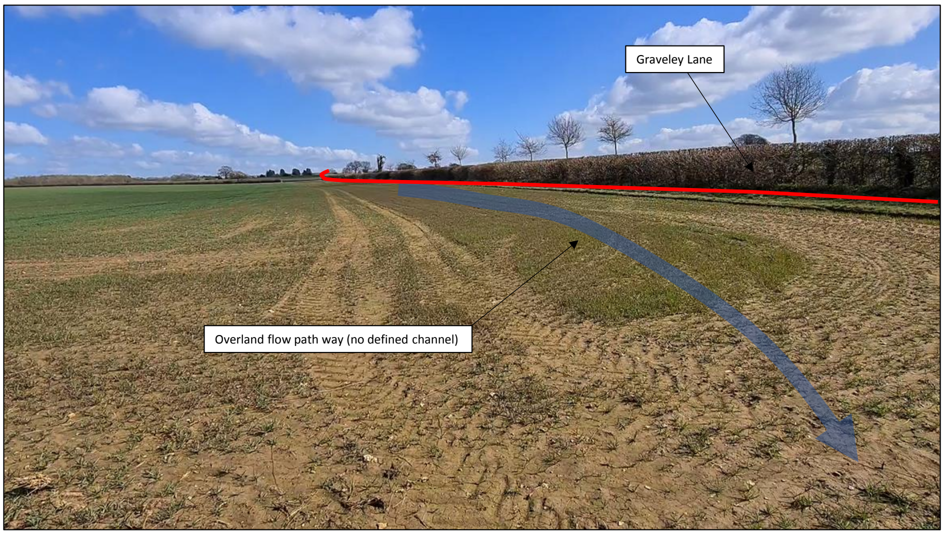


**Figure 6c: South-West Part of Northern Parcel Looking West Towards Old Priory Stream**


**Figure 7: Southern Parcel Looking South-West**

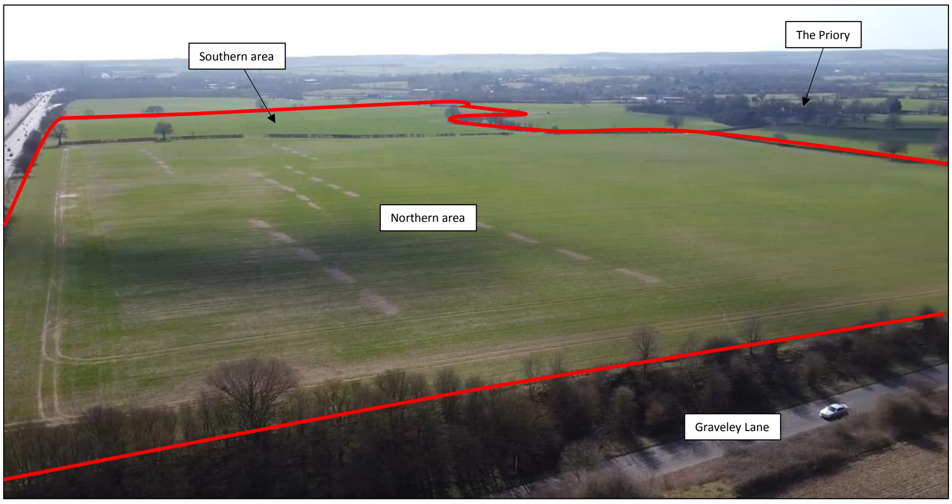



**Figure 8: Northern Part of Southern Parcel Looking West**

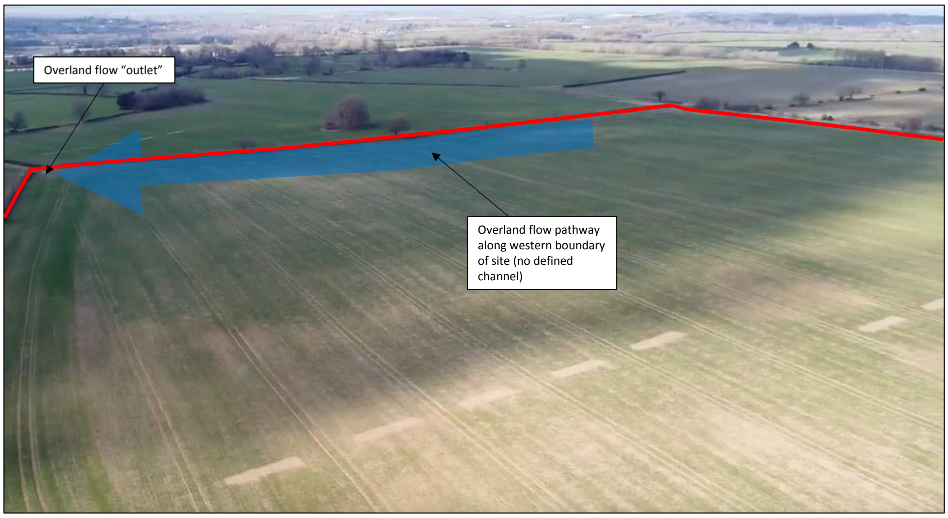


**Figure 9: Southern Part of Southern Parcel Looking West**

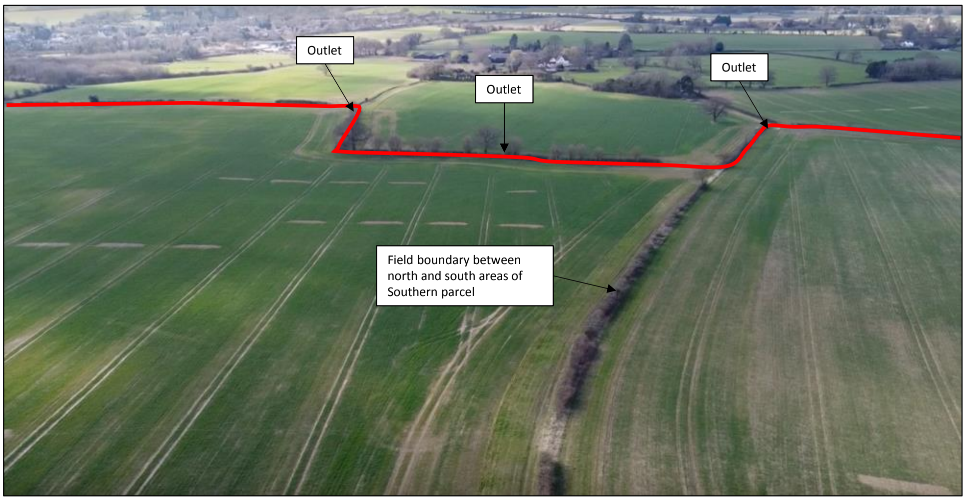



**Figure 10: Location of Attenuation Basins**

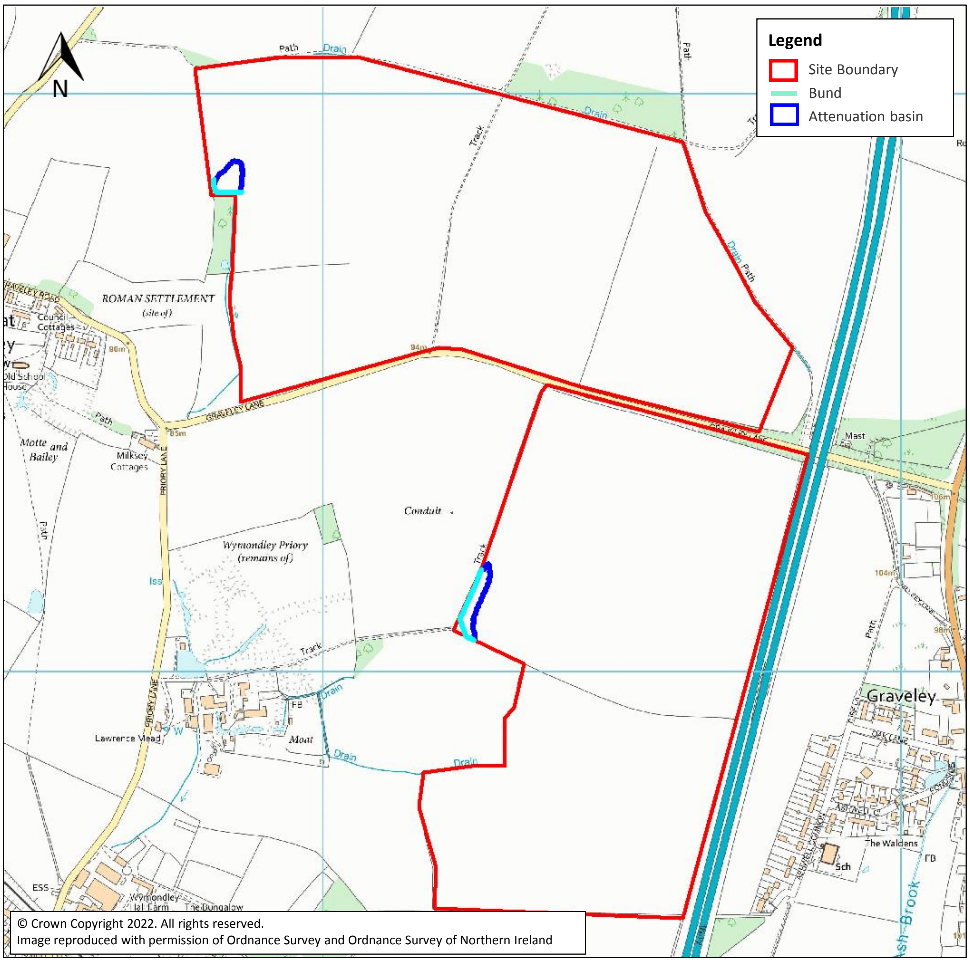
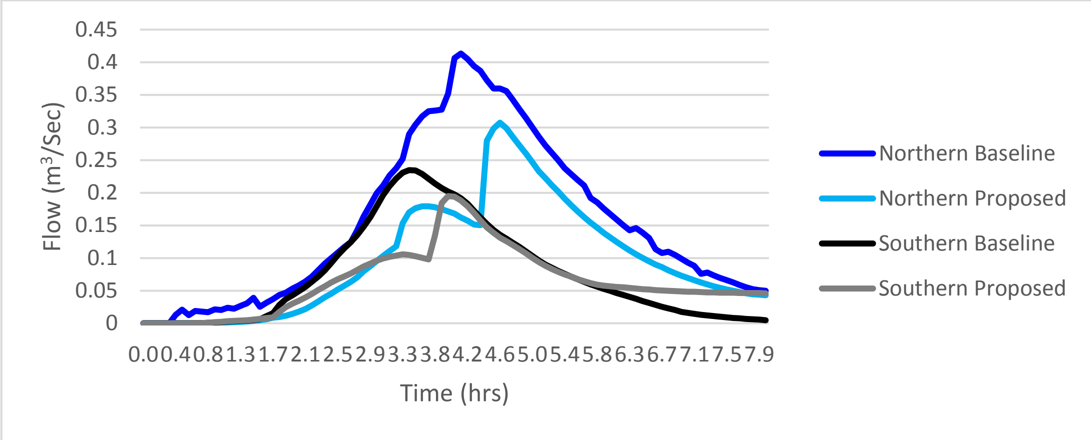
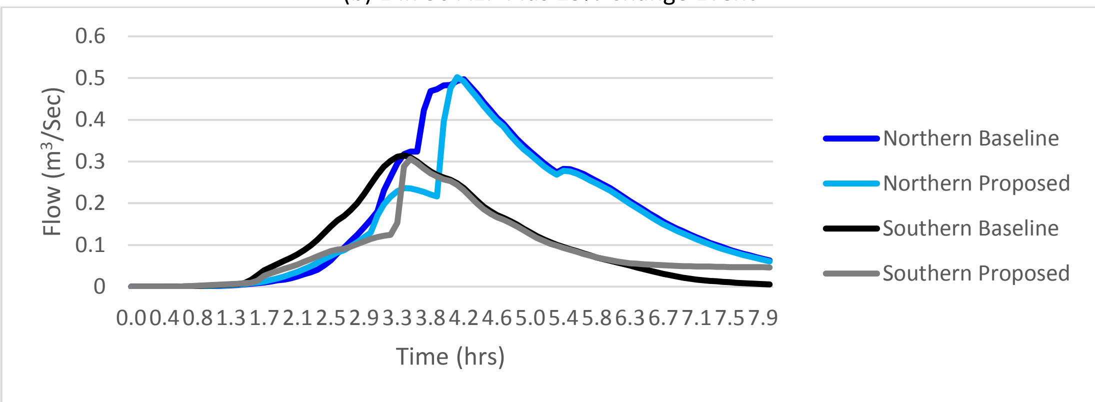


**Figure 11: Pre (Baseline) and Post Development (Proposed) Hydrographs**

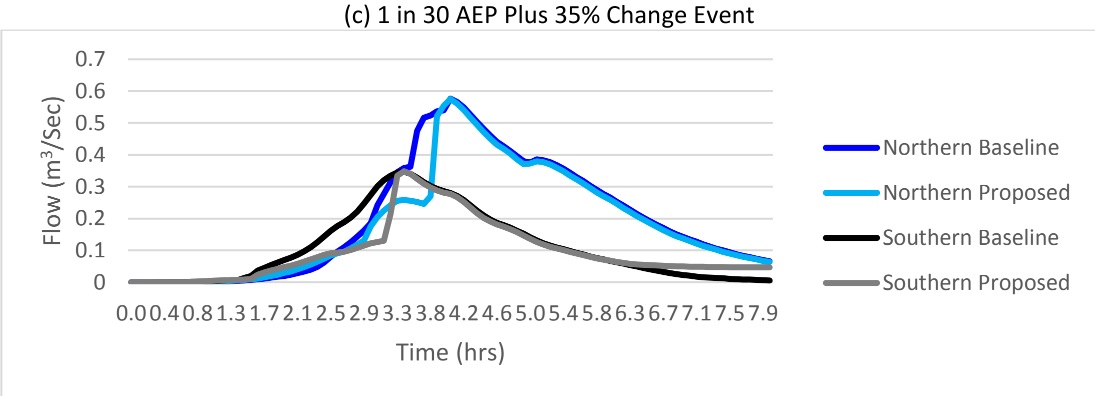
(a) Present Day 1 in 30 AEP Event



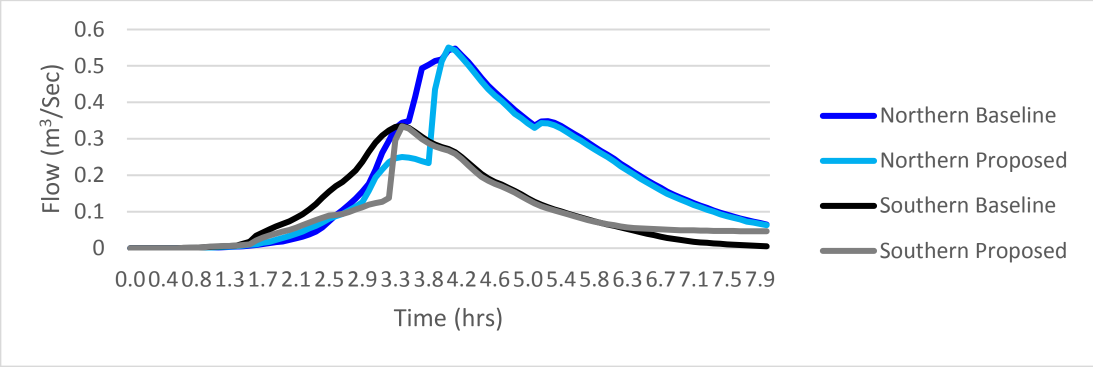

(b) 1 in 30 AEP Plus 25% Change Event



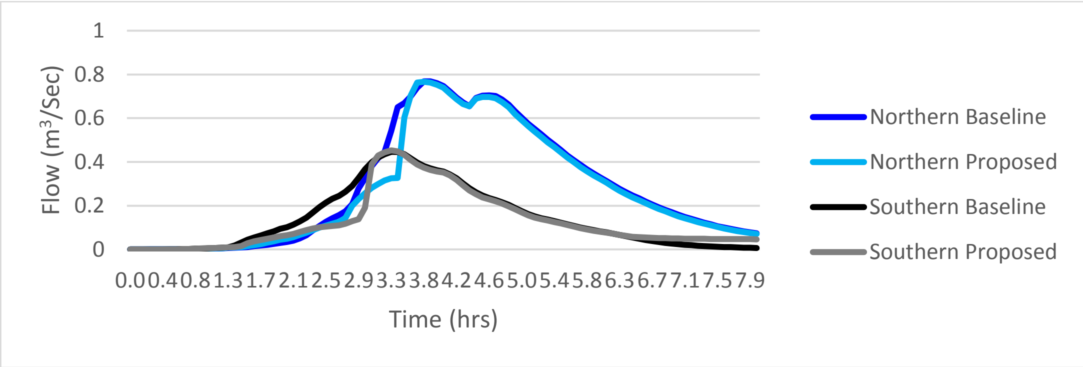

(c) 1 in 30 AEP Plus 35% Change Event



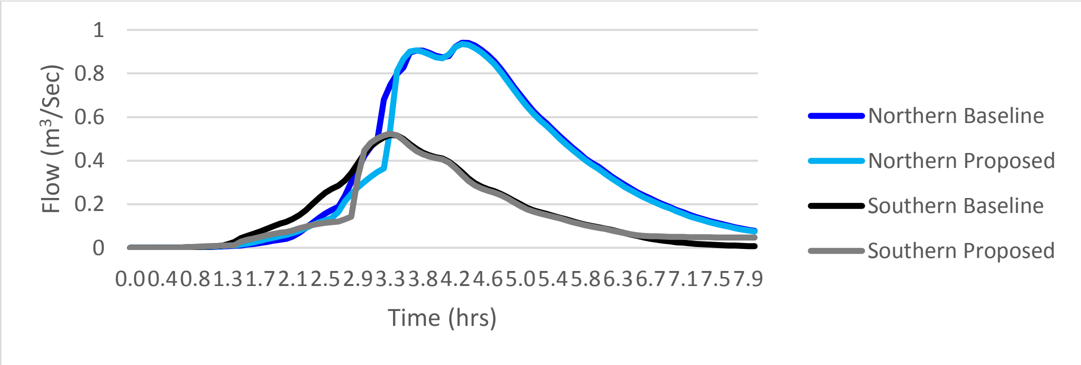
(d) Present Day 1 in 100 AEP




(e) 1 in 100 AEP Plus 25% Change Event




(f) 1 in 100 AEP Plus 40% Change Event



# ANNEXES

# ANNEX 1

**MicroDrainage Modelling of Access Track and Hardstanding**

## Summary of Results for 100 year Return Period (+40%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 91.544 | 0.544 | 3.8 | 150.5 | O K |
| 30 min Summer | 91.670 | 0.670 | 4.2 | 193.3 | O K |
| 60 min Summer | 91.783 | 0.783 | 4.5 | 234.2 | Flood Risk |
| 120 min Summer | 91.876 | 0.876 | 4.8 | 269.9 | Flood Risk |
| 180 min Summer | 91.916 | 0.916 | 4.9 | 285.6 | Flood Risk |
| 240 min Summer | 91.934 | 0.934 | 5.0 | 293.0 | Flood Risk |
| 360 min Summer | 91.943 | 0.943 | 5.0 | 296.6 | Flood Risk |
| 480 min Summer | 91.938 | 0.938 | 5.0 | 294.7 | Flood Risk |
| 600 min Summer | 91.932 | 0.932 | 5.0 | 292.1 | Flood Risk |
| 720 min Summer | 91.925 | 0.925 | 4.9 | 289.2 | Flood Risk |
| 960 min Summer | 91.908 | 0.908 | 4.9 | 282.3 | Flood Risk |
| 1440 min Summer | 91.867 | 0.867 | 4.8 | 266.3 | Flood Risk |
| 2160 min Summer | 91.803 | 0.803 | 4.6 | 241.7 | Flood Risk |
| 2880 min Summer | 91.743 | 0.743 | 4.4 | 219.3 | Flood Risk |
| 4320 min Summer | 91.639 | 0.639 | 4.1 | 182.4 | O K |
| 5760 min Summer | 91.555 | 0.555 | 3.8 | 154.1 | O K |
| 7200 min Summer | 91.486 | 0.486 | 3.5 | 132.0 | O K |
| 8640 min Summer | 91.429 | 0.429 | 3.3 | 114.3 | O K |
| 10080 min Summer | 91.382 | 0.382 | 3.1 | 100.0 | O K |
| 15 min Winter | 91.544 | 0.544 | 3.8 | 150.5 | O K |
| 30 min Winter | 91.671 | 0.671 | 4.2 | 193.4 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 141.688 | 0.0 | 148.8 | 23 |
| 30 min Summer | 91.882 | 0.0 | 192.4 | 38 |
| 60 min Summer | 56.713 | 0.0 | 243.5 | 68 |
| 120 min Summer | 33.838 | 0.0 | 290.6 | 126 |
| 180 min Summer | 24.703 | 0.0 | 318.3 | 186 |
| 240 min Summer | 19.656 | 0.0 | 337.6 | 246 |
| 360 min Summer | 14.176 | 0.0 | 365.2 | 364 |
| 480 min Summer | 11.248 | 0.0 | 386.2 | 440 |
| 600 min Summer | 9.394 | 0.0 | 403.1 | 494 |
| 720 min Summer | 8.104 | 0.0 | 417.1 | 558 |
| 960 min Summer | 6.416 | 0.0 | 439.8 | 686 |
| 1440 min Summer | 4.610 | 0.0 | 471.6 | 956 |
| 2160 min Summer | 3.308 | 0.0 | 513.6 | 1368 |
| 2880 min Summer | 2.611 | 0.0 | 540.5 | 1764 |
| 4320 min Summer | 1.869 | 0.0 | 579.6 | 2552 |
| 5760 min Summer | 1.473 | 0.0 | 610.5 | 3288 |
| 7200 min Summer | 1.224 | 0.0 | 634.1 | 4032 |
| 8640 min Summer | 1.052 | 0.0 | 653.7 | 4752 |
| 10080 min Summer | 0.925 | 0.0 | 670.1 | 5448 |
| 15 min Winter | 141.688 | 0.0 | 148.8 | 23 |
| 30 min Winter | 91.882 | 0.0 | 192.4 | 37 |

©1982-2019 Innovyze

## Summary of Results for 100 year Return Period (+40%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
| --- | --- | --- | --- | --- | --- |
| 60 min Winter | 91.784 | 0.784 | 4.5 | 234.4 | Flood Risk |
| 120 min Winter | 91.877 | 0.877 | 4.8 | 270.2 | Flood Risk |
| 180 min Winter | 91.918 | 0.918 | 4.9 | 286.3 | Flood Risk |
| 240 min Winter | 91.937 | 0.937 | 5.0 | 293.9 | Flood Risk |
| 360 min Winter | 91.948 | 0.948 | 5.0 | 298.4 | Flood Risk |
| 480 min Winter | 91.944 | 0.944 | 5.0 | 296.8 | Flood Risk |
| 600 min Winter | 91.932 | 0.932 | 5.0 | 292.2 | Flood Risk |
| 720 min Winter | 91.923 | 0.923 | 4.9 | 288.4 | Flood Risk |
| 960 min Winter | 91.901 | 0.901 | 4.9 | 279.4 | Flood Risk |
| 1440 min Winter | 91.845 | 0.845 | 4.7 | 257.7 | Flood Risk |
| 2160 min Winter | 91.759 | 0.759 | 4.5 | 225.0 | Flood Risk |
| 2880 min Winter | 91.678 | 0.678 | 4.2 | 196.1 | O K |
| 4320 min Winter | 91.545 | 0.545 | 3.8 | 150.8 | O K |
| 5760 min Winter | 91.443 | 0.443 | 3.4 | 118.6 | O K |
| 7200 min Winter | 91.365 | 0.365 | 3.0 | 95.1 | O K |
| 8640 min Winter | 91.305 | 0.305 | 2.8 | 77.9 | O K |
| 10080 min Winter | 91.258 | 0.258 | 2.5 | 65.0 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
| --- | --- | --- | --- | --- |
| 60 min Winter | 56.713 | 0.0 | 243.5 | 66 |
| 120 min Winter | 33.838 | 0.0 | 290.6 | 124 |
| 180 min Winter | 24.703 | 0.0 | 318.3 | 182 |
| 240 min Winter | 19.656 | 0.0 | 337.6 | 240 |
| 360 min Winter | 14.176 | 0.0 | 365.2 | 352 |
| 480 min Winter | 11.248 | 0.0 | 386.2 | 458 |
| 600 min Winter | 9.394 | 0.0 | 403.1 | 546 |
| 720 min Winter | 8.104 | 0.0 | 417.1 | 572 |
| 960 min Winter | 6.416 | 0.0 | 439.8 | 726 |
| 1440 min Winter | 4.610 | 0.0 | 471.7 | 1028 |
| 2160 min Winter | 3.308 | 0.0 | 513.6 | 1456 |
| 2880 min Winter | 2.611 | 0.0 | 540.5 | 1876 |
| 4320 min Winter | 1.869 | 0.0 | 579.6 | 2680 |
| 5760 min Winter | 1.473 | 0.0 | 610.6 | 3408 |
| 7200 min Winter | 1.224 | 0.0 | 634.1 | 4112 |
| 8640 min Winter | 1.052 | 0.0 | 653.7 | 4848 |
| 10080 min Winter | 0.925 | 0.0 | 670.2 | 5552 |

©1982-2019 Innovyze

## Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | FSR | Winter Storms | Yes |
| Return Period (years) | 100 | Cv (Summer) | 1.000 |
| Region | England and Wales | Cv (Winter) | 1.000 |
| M5-60 (mm) | 20.000 | Shortest Storm (mins) | 15 |
| Ratio R | 0.430 | Longest Storm (mins) | 10080 |
| Summer Storms | Yes | Climate Change % | +40 |

## Time Area Diagram

Total Area (ha) 0.432

| **Time From:** | **(mins) To:** | **Area (ha)** | **Time From:** | **(mins) To:** | **Area (ha)** |
|---|---|---|---|---|---|
| 0 | 4 | 0.000 | 4 | 8 | 0.432 |

©1982-2019 Innovyze

## Model Details

Storage is Online Cover Level (m) 92.000

## Tank or Pond Structure

Invert Level (m) 91.000

| Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|
| 0.000 | 230.0 | 1.000 | 419.6 |

## Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 91.000

©1982-2019 Innovyze

Summary of Results for 100 year Return Period (+40%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 98.732 | 0.732 | 4.4 | 41.2 | Flood Risk |
| 30 min Summer | 98.840 | 0.840 | 4.7 | 51.4 | Flood Risk |
| 60 min Summer | 98.910 | 0.910 | 4.9 | 58.5 | Flood Risk |
| 120 min Summer | 98.929 | 0.929 | 5.0 | 60.5 | Flood Risk |
| 180 min Summer | 98.920 | 0.920 | 4.9 | 59.6 | Flood Risk |
| 240 min Summer | 98.903 | 0.903 | 4.9 | 57.7 | Flood Risk |
| 360 min Summer | 98.861 | 0.861 | 4.8 | 53.4 | Flood Risk |
| 480 min Summer | 98.819 | 0.819 | 4.7 | 49.3 | Flood Risk |
| 600 min Summer | 98.779 | 0.779 | 4.5 | 45.5 | Flood Risk |
| 720 min Summer | 98.741 | 0.741 | 4.4 | 42.1 | Flood Risk |
| 960 min Summer | 98.672 | 0.672 | 4.2 | 36.1 | O K |
| 1440 min Summer | 98.556 | 0.556 | 3.8 | 27.3 | O K |
| 2160 min Summer | 98.426 | 0.426 | 3.3 | 18.8 | O K |
| 2880 min Summer | 98.335 | 0.335 | 2.9 | 13.7 | O K |
| 4320 min Summer | 98.222 | 0.222 | 2.3 | 8.2 | O K |
| 5760 min Summer | 98.161 | 0.161 | 1.9 | 5.6 | O K |
| 7200 min Summer | 98.123 | 0.123 | 1.6 | 4.2 | O K |
| 8640 min Summer | 98.099 | 0.099 | 1.4 | 3.3 | O K |
| 10080 min Summer | 98.083 | 0.083 | 1.3 | 2.7 | O K |
| 15 min Winter | 98.732 | 0.732 | 4.4 | 41.3 | Flood Risk |
| 30 min Winter | 98.842 | 0.842 | 4.7 | 51.5 | Flood Risk |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 141.688 | 0.0 | 44.2 | 22 |
| 30 min Summer | 91.882 | 0.0 | 57.4 | 36 |
| 60 min Summer | 56.713 | 0.0 | 70.9 | 66 |
| 120 min Summer | 33.838 | 0.0 | 84.6 | 106 |
| 180 min Summer | 24.703 | 0.0 | 92.6 | 138 |
| 240 min Summer | 19.656 | 0.0 | 98.3 | 170 |
| 360 min Summer | 14.176 | 0.0 | 106.3 | 240 |
| 480 min Summer | 11.248 | 0.0 | 112.5 | 308 |
| 600 min Summer | 9.394 | 0.0 | 117.4 | 374 |
| 720 min Summer | 8.104 | 0.0 | 121.6 | 438 |
| 960 min Summer | 6.416 | 0.0 | 128.3 | 566 |
| 1440 min Summer | 4.610 | 0.0 | 138.3 | 812 |
| 2160 min Summer | 3.308 | 0.0 | 148.8 | 1172 |
| 2880 min Summer | 2.611 | 0.0 | 156.7 | 1532 |
| 4320 min Summer | 1.869 | 0.0 | 168.2 | 2248 |
| 5760 min Summer | 1.473 | 0.0 | 176.8 | 2944 |
| 7200 min Summer | 1.224 | 0.0 | 183.6 | 3672 |
| 8640 min Summer | 1.052 | 0.0 | 189.3 | 4400 |
| 10080 min Summer | 0.925 | 0.0 | 194.3 | 5136 |
| 15 min Winter | 141.688 | 0.0 | 44.2 | 22 |
| 30 min Winter | 91.882 | 0.0 | 57.4 | 36 |

©1982-2019 Innovyze

Summary of Results for 100 year Return Period (+40%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 98.913 | 0.913 | 4.9 | 58.9 | Flood Risk |
| 120 min Winter | 98.930 | 0.930 | 5.0 | 60.7 | Flood Risk |
| 180 min Winter | 98.916 | 0.916 | 4.9 | 59.2 | Flood Risk |
| 240 min Winter | 98.893 | 0.893 | 4.9 | 56.7 | Flood Risk |
| 360 min Winter | 98.835 | 0.835 | 4.7 | 50.8 | Flood Risk |
| 480 min Winter | 98.776 | 0.776 | 4.5 | 45.3 | Flood Risk |
| 600 min Winter | 98.721 | 0.721 | 4.4 | 40.3 | Flood Risk |
| 720 min Winter | 98.668 | 0.668 | 4.2 | 35.9 | O K |
| 960 min Winter | 98.574 | 0.574 | 3.9 | 28.6 | O K |
| 1440 min Winter | 98.427 | 0.427 | 3.3 | 18.9 | O K |
| 2160 min Winter | 98.285 | 0.285 | 2.7 | 11.1 | O K |
| 2880 min Winter | 98.203 | 0.203 | 2.2 | 7.4 | O K |
| 4320 min Winter | 98.122 | 0.122 | 1.6 | 4.1 | O K |
| 5760 min Winter | 98.086 | 0.086 | 1.3 | 2.8 | O K |
| 7200 min Winter | 98.069 | 0.069 | 1.1 | 2.2 | O K |
| 8640 min Winter | 98.062 | 0.062 | 0.9 | 2.0 | O K |
| 10080 min Winter | 98.057 | 0.057 | 0.8 | 1.8 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 56.713 | 0.0 | 70.9 | 64 |
| 120 min Winter | 33.838 | 0.0 | 84.6 | 116 |
| 180 min Winter | 24.703 | 0.0 | 92.6 | 144 |
| 240 min Winter | 19.656 | 0.0 | 98.3 | 182 |
| 360 min Winter | 14.176 | 0.0 | 106.3 | 256 |
| 480 min Winter | 11.248 | 0.0 | 112.5 | 328 |
| 600 min Winter | 9.394 | 0.0 | 117.4 | 396 |
| 720 min Winter | 8.104 | 0.0 | 121.6 | 462 |
| 960 min Winter | 6.416 | 0.0 | 128.3 | 592 |
| 1440 min Winter | 4.610 | 0.0 | 138.3 | 838 |
| 2160 min Winter | 3.308 | 0.0 | 148.8 | 1192 |
| 2880 min Winter | 2.611 | 0.0 | 156.7 | 1532 |
| 4320 min Winter | 1.869 | 0.0 | 168.2 | 2212 |
| 5760 min Winter | 1.473 | 0.0 | 176.8 | 2936 |
| 7200 min Winter | 1.224 | 0.0 | 183.6 | 3600 |
| 8640 min Winter | 1.052 | 0.0 | 189.3 | 4328 |
| 10080 min Winter | 0.925 | 0.0 | 194.3 | 5104 |

©1982-2019 Innovyze

## Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | FSR | Winter Storms | Yes |
| Return Period (years) | 100 | Cv (Summer) | 1.000 |
| Region | England and Wales | Cv (Winter) | 1.000 |
| M5-60 (mm) | 20.000 | Shortest Storm (mins) | 15 |
| Ratio R | 0.430 | Longest Storm (mins) | 10080 |
| Summer Storms | Yes | Climate Change % | +40 |

## Time Area Diagram

Total Area (ha) 0.125

| **Time From:** | **(mins) To:** | **Area (ha)** | **Time From:** | **(mins) To:** | **Area (ha)** |
|---|---|---|---|---|---|
| 0 | 4 | 0.000 | 4 | 8 | 0.125 |

©1982-2019 Innovyze

## Model Details

Storage is Online Cover Level (m) 99.000

## Tank or Pond Structure

Invert Level (m) 98.000

| Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|
| 0.000 | 30.0 | 1.000 | 116.5 |

## Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 98.000

©1982-2019 Innovyze

Summary of Results for 100 year Return Period (+40%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 92.075 | 0.575 | 3.9 | 128.8 | O K |
| 30 min Summer | 92.203 | 0.703 | 4.3 | 165.1 | Flood Risk |
| 60 min Summer | 92.315 | 0.815 | 4.6 | 199.2 | Flood Risk |
| 120 min Summer | 92.404 | 0.904 | 4.9 | 228.0 | Flood Risk |
| 180 min Summer | 92.439 | 0.939 | 5.0 | 239.7 | Flood Risk |
| 240 min Summer | 92.452 | 0.952 | 5.0 | 244.1 | Flood Risk |
| 360 min Summer | 92.451 | 0.951 | 5.0 | 243.8 | Flood Risk |
| 480 min Summer | 92.444 | 0.944 | 5.0 | 241.4 | Flood Risk |
| 600 min Summer | 92.435 | 0.935 | 5.0 | 238.5 | Flood Risk |
| 720 min Summer | 92.425 | 0.925 | 5.0 | 235.1 | Flood Risk |
| 960 min Summer | 92.403 | 0.903 | 4.9 | 227.5 | Flood Risk |
| 1440 min Summer | 92.351 | 0.851 | 4.7 | 210.8 | Flood Risk |
| 2160 min Summer | 92.276 | 0.776 | 4.5 | 187.0 | Flood Risk |
| 2880 min Summer | 92.208 | 0.708 | 4.3 | 166.6 | Flood Risk |
| 4320 min Summer | 92.095 | 0.595 | 3.9 | 134.3 | O K |
| 5760 min Summer | 92.006 | 0.506 | 3.6 | 110.6 | O K |
| 7200 min Summer | 91.935 | 0.435 | 3.3 | 92.7 | O K |
| 8640 min Summer | 91.878 | 0.378 | 3.1 | 78.8 | O K |
| 10080 min Summer | 91.831 | 0.331 | 2.9 | 67.8 | O K |
| 15 min Winter | 92.075 | 0.575 | 3.9 | 128.8 | O K |
| 30 min Winter | 92.204 | 0.704 | 4.3 | 165.2 | Flood Risk |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 141.688 | 0.0 | 129.2 | 23 |
| 30 min Summer | 91.882 | 0.0 | 167.7 | 37 |
| 60 min Summer | 56.713 | 0.0 | 209.6 | 68 |
| 120 min Summer | 33.838 | 0.0 | 250.2 | 126 |
| 180 min Summer | 24.703 | 0.0 | 274.0 | 186 |
| 240 min Summer | 19.656 | 0.0 | 290.7 | 244 |
| 360 min Summer | 14.176 | 0.0 | 314.4 | 348 |
| 480 min Summer | 11.248 | 0.0 | 332.6 | 402 |
| 600 min Summer | 9.394 | 0.0 | 347.2 | 462 |
| 720 min Summer | 8.104 | 0.0 | 359.4 | 524 |
| 960 min Summer | 6.416 | 0.0 | 379.2 | 660 |
| 1440 min Summer | 4.610 | 0.0 | 408.2 | 930 |
| 2160 min Summer | 3.308 | 0.0 | 441.3 | 1344 |
| 2880 min Summer | 2.611 | 0.0 | 464.5 | 1736 |
| 4320 min Summer | 1.869 | 0.0 | 498.3 | 2508 |
| 5760 min Summer | 1.473 | 0.0 | 524.4 | 3232 |
| 7200 min Summer | 1.224 | 0.0 | 544.7 | 3960 |
| 8640 min Summer | 1.052 | 0.0 | 561.6 | 4672 |
| 10080 min Summer | 0.925 | 0.0 | 575.8 | 5352 |
| 15 min Winter | 141.688 | 0.0 | 129.2 | 23 |
| 30 min Winter | 91.882 | 0.0 | 167.7 | 37 |

©1982-2019 Innovyze

## Summary of Results for 100 year Return Period (+40%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 92.316 | 0.816 | 4.6 | 199.5 | Flood Risk |
| 120 min Winter | 92.405 | 0.905 | 4.9 | 228.5 | Flood Risk |
| 180 min Winter | 92.441 | 0.941 | 5.0 | 240.4 | Flood Risk |
| 240 min Winter | 92.455 | 0.955 | 5.0 | 245.2 | Flood Risk |
| 360 min Winter | 92.457 | 0.957 | 5.0 | 245.8 | Flood Risk |
| 480 min Winter | 92.445 | 0.945 | 5.0 | 241.7 | Flood Risk |
| 600 min Winter | 92.433 | 0.933 | 5.0 | 237.8 | Flood Risk |
| 720 min Winter | 92.420 | 0.920 | 4.9 | 233.4 | Flood Risk |
| 960 min Winter | 92.389 | 0.889 | 4.9 | 223.1 | Flood Risk |
| 1440 min Winter | 92.320 | 0.820 | 4.7 | 200.7 | Flood Risk |
| 2160 min Winter | 92.218 | 0.718 | 4.3 | 169.5 | Flood Risk |
| 2880 min Winter | 92.128 | 0.628 | 4.1 | 143.6 | O K |
| 4320 min Winter | 91.986 | 0.486 | 3.5 | 105.5 | O K |
| 5760 min Winter | 91.883 | 0.383 | 3.1 | 79.9 | O K |
| 7200 min Winter | 91.808 | 0.308 | 2.8 | 62.4 | O K |
| 8640 min Winter | 91.752 | 0.252 | 2.5 | 50.1 | O K |
| 10080 min Winter | 91.711 | 0.211 | 2.2 | 41.2 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 56.713 | 0.0 | 209.6 | 66 |
| 120 min Winter | 33.838 | 0.0 | 250.2 | 124 |
| 180 min Winter | 24.703 | 0.0 | 274.0 | 182 |
| 240 min Winter | 19.656 | 0.0 | 290.7 | 238 |
| 360 min Winter | 14.176 | 0.0 | 314.4 | 348 |
| 480 min Winter | 11.248 | 0.0 | 332.6 | 444 |
| 600 min Winter | 9.394 | 0.0 | 347.2 | 476 |
| 720 min Winter | 8.104 | 0.0 | 359.4 | 552 |
| 960 min Winter | 6.416 | 0.0 | 379.2 | 706 |
| 1440 min Winter | 4.610 | 0.0 | 408.2 | 1000 |
| 2160 min Winter | 3.308 | 0.0 | 441.3 | 1428 |
| 2880 min Winter | 2.611 | 0.0 | 464.5 | 1824 |
| 4320 min Winter | 1.869 | 0.0 | 498.3 | 2596 |
| 5760 min Winter | 1.473 | 0.0 | 524.4 | 3336 |
| 7200 min Winter | 1.224 | 0.0 | 544.7 | 4040 |
| 8640 min Winter | 1.052 | 0.0 | 561.6 | 4752 |
| 10080 min Winter | 0.925 | 0.0 | 575.9 | 5448 |

©1982-2019 Innovyze

## Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | FSR | Winter Storms | Yes |
| Return Period (years) | 100 | Cv (Summer) | 1.000 |
| Region | England and Wales | Cv (Winter) | 1.000 |
| M5-60 (mm) | 20.000 | Shortest Storm (mins) | 15 |
| Ratio R | 0.430 | Longest Storm (mins) | 10080 |
| Summer Storms | Yes | Climate Change % | +40 |

## Time Area Diagram

Total Area (ha) 0.371

| Time From: | (mins) To: | Area (ha) | Time From: | (mins) To: | Area (ha) |
|---|---|---|---|---|---|
| 0 | 4 | 0.000 | 4 | 8 | 0.371 |

©1982-2019 Innovyze

## Model Details

Storage is Online Cover Level (m) 92.500

## Tank or Pond Structure

Invert Level (m) 91.500

| **Depth (m)** | **Area (m²)** | **Depth (m)** | **Area (m²)** |
|---|---|---|---|
| 0.000 | 180.0 | 1.000 | 351.0 |

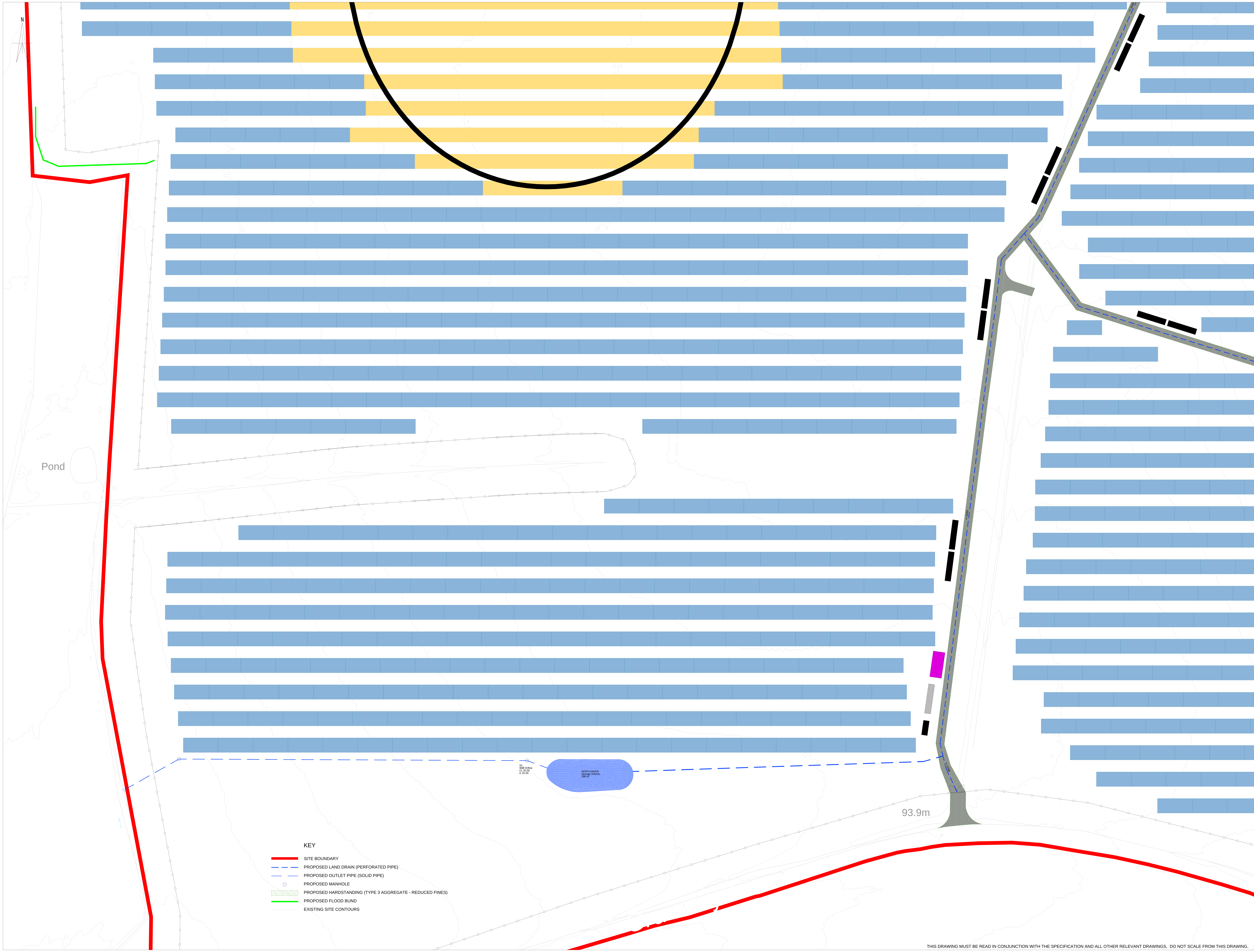
## Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 91.500

©1982-2019 Innovyze

# ANNEX 2

**Preliminary Drainage Layout**




THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WEETWOOD DRAWINGS.

| REV | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| P2 | 30.05.22 | SITE LAYOUT UPDATED | JA | KT |
| P1 | 24.05.22 | INITIAL ISSUE | JA | KT |


Weetwood
Development • Planning • Environment
Suite C22 Josephs Wells
Hanover Walk, Leeds
LS3 1AB
Tel 0113 244 1377
info@weetwood.net
www.weetwood.net


Client
AXIS PED

| | |
|---|---|
| Drawing Status: PLANNING | Date: MAY 2022 |
| | Scale (A0): 1:500 |
| Project: LAND EAST OF GREAT WYMONDLEY | Drawn: JA |
| | Checked: KT |
| | Project No: 5208 |
| Title: PROPOSED DRAINAGE LAYOUT SHEET 1 OF 5 | Drawing No: 100 |
| | Revision: P2 |


THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WEETWOOD DRAWINGS.

| REV | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| P2 | 30.05.22 | SITE LAYOUT UPDATED | JA | KT |
| P1 | 24.05.22 | INITIAL ISSUE | JA | KT |


Weetwood
Development • Planning • Environment
Suite C22 Josephs Wells
Hanover Walk, Leeds
LS3 1AB
Tel 0113 244 1377
info@weetwood.net
www.weetwood.net


Client
AXIS PED

| | |
|---|---|
| Drawing Status: PLANNING | Date: MAY 2022 |
| | Scale (A0): 1:500 |
| Project: LAND EAST OF GREAT WYMONDLEY | Drawn: JA |
| | Checked: KT |
| | Project No: 5208 |
| Title: PROPOSED DRAINAGE LAYOUT SHEET 2 OF 5 | Drawing No: 101 |
| | Revision: P2 |


NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WEETWOOD DRAWINGS.

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

| REV | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| P2 | 30.05.22 | SITE LAYOUT UPDATED | JA | KT |
| P1 | 24.05.22 | INITIAL ISSUE | JA | KT |


Weetwood
Development • Planning • Environment
Suite C22 Josephs Wells
Hanover Walk, Leeds
LS3 1AB
Tel 0113 244 1377
info@weetwood.net
www.weetwood.net


Client
AXIS PED

| | |
|---|---|
| Drawing Status: PLANNING | Date: MAY 2022 |
| | Scale (A0): 1:500 |
| Project: LAND EAST OF GREAT WYMONDLEY | Drawn: JA |
| | Checked: KT |
| | Project No: 5208 |
| Title: PROPOSED DRAINAGE LAYOUT SHEET 3 OF 5 | Drawing No: 102 |
| | Revision: P2 |


THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

## NOTES

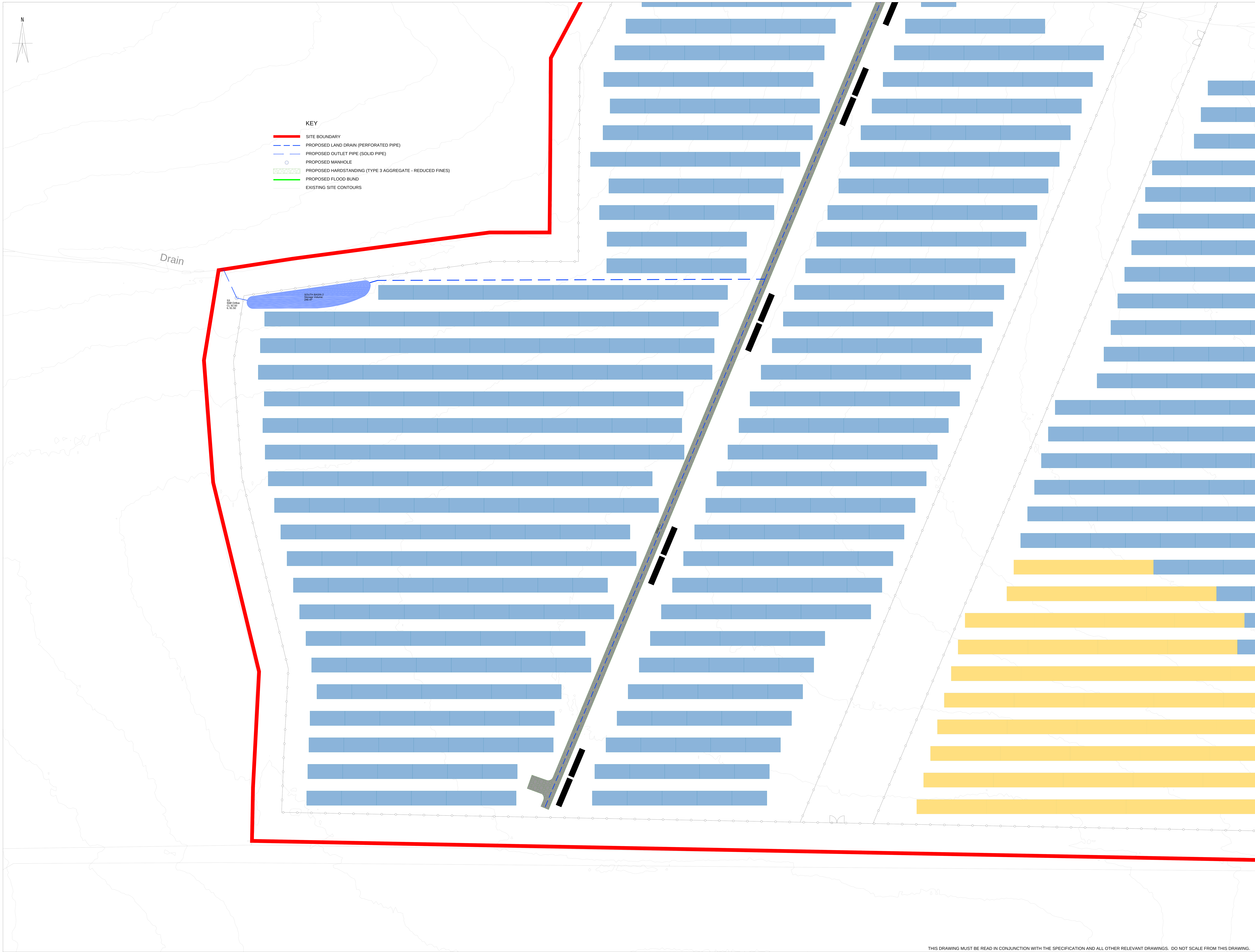
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WEETWOOD DRAWINGS.

| REV | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| P2 | 30.05.22 | SITE LAYOUT UPDATED | JA | KT |
| P1 | 24.05.22 | INITIAL ISSUE | JA | KT |

Weetwood
Development • Planning • Environment
Suite C22 Josephs Wells
Hanover Walk, Leeds
LS3 1AB
Tel 0113 244 1377
info@weetwood.net
www.weetwood.net

Client
AXIS PED

| | |
|---|---|
| Drawing Status: PLANNING | Date: MAY 2022 |
| | Scale (A0): 1:500 |
| Project: LAND EAST OF GREAT WYMONDLEY | Drawn: JA |
| | Checked: KT |
| | Project No: 5208 |
| Title: PROPOSED DRAINAGE LAYOUT SHEET 4 OF 5 | Drawing No: 103 |
| | Revision: P2 |




NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WEETWOOD DRAWINGS.

| REV | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| P2 | 30.05.22 | SITE LAYOUT UPDATED | JA | KT |
| P1 | 24.05.22 | INITIAL ISSUE | JA | KT |

Weetwood
Development • Planning • Environment
Suite C22 Josephs Wells
Hanover Walk, Leeds
LS3 1AB
Tel 0113 244 1377
info@weetwood.net
www.weetwood.net

Client
AXIS PED

| | |
|---|---|
| Drawing Status: PLANNING | Date: MAY 2022 |
| | Scale (A0): 1:500 |
| Project: LAND EAST OF GREAT WYMONDLEY | Drawn: JA |
| | Checked: KT |
| | Project No: 5208 |
| Title: PROPOSED DRAINAGE LAYOUT SHEET 5 OF 5 | Drawing No: 104 |
| | Revision: P2 |

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

Weetwood
Development • Planning • Environment


Delivering client focussed services nationally

Flood Risk Assessments
Flood Consequences Assessments
Surface Water Drainage
Foul Water Drainage
Environmental Impact Assessments
River Realignment and Restoration
Water Framework Directive Assessments
Environmental Permit and Land Drainage Applications
Sequential, Justification and Exception Tests
Utility Assessments
Expert Witness and Planning Appeals
Discharge of Planning Conditions

**www.weetwood.net**