

Appendix E

Flood Risk Assessment

Adwick washlands habitat creation – planning application supporting information

Adwick Washlands Habitat Creation Scheme Flood Risk Assessment

For planning

October 2010

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Revision History

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October 2010	-	DVGH (for approval before planning)
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Contract

This report describes work commissioned by RSPB, on behalf of Dearne Valley Green Heart partnership. DVGH's representative for the contract was Pete Wall of RSPB. Mike Williamson and Andy Wood of JBA Consulting carried out this work.

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Purpose

This document has been prepared as a Flood Risk Assessment for the planning submission of Adwick Washlands Habitat Creation Scheme for the Dearne Valley Green Heart partnership. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

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Executive Summary

A scheme is proposed for wetland and habitat creation over approximately 60 hectares (ha) at Adwick Washlands. The scheme is being developed by the Dearne Valley Green Heart (DVGH) which is a partnership between the Royal Society for the Protection of Birds (RPSB), Natural England (NE) and the Environment Agency (EA). The site for the proposed scheme is to the north of the River Dearne. It is located to the east of Bolton-upon-Deerne in South Yorkshire.

A Design Basis Memorandum, prepared by JBA Consulting in September 2010, presents the basis and the outline of the proposed scheme.

The washland provides flood storage for the River Dearne. The design level to determine the washland storage capacity has been based on the 2007 flood level. Prevention of loss of washland flood storage has been essential in the design of the scheme and this has been achieved in the scheme design.

There is a small net loss of storage capacity that is caused by flooding the drainage ditches and open water in the new wetland to higher water levels than in the current operating case. The net loss in storage can be compensated for by moving earth out of the washland and placing it above the 2007 design flood level on a small area to the north of the site. A small overall gain in the Adwick washland flood storage has been attained in the design.

Scheme operation will need to maintain groundwater levels close to the proposed levels in Zone 1 and Zone 2. This will maintain the open water to the designed area, avoid pond formation and prevent a loss of flood storage in pre-storm conditions. It is proposed that the existing drainage pumps will be used for the scheme. However, the EA may review the necessity for pump operation in the future.

The proposed levels of the structures in existing ditches will not impact water levels in the IDB drainage system upstream of the site.

The scheme does not address the flood risk to the houses on Lowfield Lane. However, the design ensures that the flood risk to these properties may be slightly reduced because of the small increase in the storage capacity of the washland.

This flood risk assessment (FRA) will accompany the submission for planning application in October 2010.

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2010s4268-020	Adwick Washland Habitat Creation, Site Location
2010s4268-021	Adwick Washland Habitat Creation, Washland Extents
2010s4268-022	Adwick Washland Habitat Creation, Drainage System
2010s4268-023	Adwick Washland Habitat Creation, Site Demarcation Zones
2010s4268-027A	Adwick Washland Habitat Creation, Proposed drainage system
2010s4268-028 A	Adwick Washland Habitat Creation, Proposed earth movement
2010s4268-029A	Adwick Washland Habitat Creation, Proposed General Arrangement

Note: all drawings are A3 size apart from 2010s4268-001 which is A1 size.

Abbreviations

DTM	Digital terrain model
DVGH	Dearne Valley Green Heart
EA	Environment Agency
ELP	Ecology Land and People
FRA	Flood risk assessment
ha	Hectare
IDB	Internal drainage board
km	Kilometre
LIDAR	Light Detection and Ranging
m	Metre
mAOD	Metres above Ordnance Datum
mm	Millimetre
RSPB	Royal Society for the Protection of Birds

Definitions

Levels in the report are quoted in metres above ordnance datum (mAOD)

1. Introduction

1.1 Adwick Washlands Habitat Creation Scheme

A scheme is proposed for wetland and habitat creation over approximately 60 hectares (ha) at Adwick Washlands. The scheme is being developed by the Dearne Valley Green Heart (DVGH) which is a partnership between the Royal Society for the Protection of Birds (RPSB), Natural England (NE) and the Environment Agency (EA).

The site for the proposed scheme is to the north of the River Dearne. It is located to the east of Bolton-upon-Dearne in South Yorkshire. The national grid reference (NGR) of the site is 446800 402600. The location of the site and the site boundary are shown on Drawing 2010s4268-020.

The scheme was developed to a feasibility level by Ecology Land and People (ELP, 2010)¹. The feasibility design was reviewed by JBA (JBA 2010²) and was found not to meet criteria set by the EA. The scheme has since been redesigned and the new proposed scheme is presented in a Design Basis Memorandum (JBA 2010³).

This flood risk assessment (FRA) will accompany the submission for planning application in October 2010.

1.2 Land use

The land at Adwick Washlands has previously been an open cast coal mine and the area is shown on Drawing 2010s4268-028. The open cast mine was backfilled with colliery spoil and low levels of contamination are present in this area.

The land is currently used for agriculture and it has an extensive gravity and pumped drainage system to maintain optimum water levels for growing crops.

1.3 Washland operation

The proposed site for the wetland currently operates as a washland during flood events. It is likely that the EA will continue to operate the washland at Bolton-upon-Dearne into the foreseeable future. A study is currently being conducted by the EA to evaluate the Don and Dearne washlands but the results of this study are not expected for another 18 months. The existing washland is necessary to provide flood storage capacity on the River Dearne.

The level of the flood defence on the left bank of the River Dearne is approximately 16.25 mAOD. The inlet for the washland is set at approximately 15.50 mAOD. When floodwater in the River Dearne exceeds this level, the river spills over the grassed bank and into the washland at the inlet. During the flood recession there are two outlet sluices that let floodwater back into the river. There is a low gravity sluice (sluice 1) that is set at 12.85 mAOD and a second high level gravity sluice (sluice 2). The sluices are fitted with flap valves and penstock valves. The washland inlet, the design washland extent and the outlet sluices are shown on Drawing 2010s4268-021.

The main criteria for the FRA is that loss of storage volume for the washland operation will not be permitted under the proposed scheme. This was confirmed in a meeting with the EA on 19 July 2010 (refer to minutes in Appendix A). This FRA presents the basis of the calculation of flood storage and wetland operation to maintain the washland at its current operating standard.

¹ Ecology Land and People (March 2010), Adwick Greenspace Redesign of Stage 2

² JBA Consulting (August 2010), Adwick Washlands Habitat Creation Scheme, Scheme Review

³ JBA Consulting (September 2010), Adwick Washlands Habitat Creation Scheme, Design Basis Memorandum

1.4 2007 flood event

Although the site is designed to operate as a washland and provide flood storage for the River Dearne, houses in the locality of the washland on Lowfield Lane are at flood risk. Several properties were flooded in 2007 from the River Dearne, however, this flood event was above the design level for the washland and was also above the flood defence level on the River Dearne. The extent of the 2007 flood and the houses that were flooded are also shown on Drawing 2010s4268-021. The extent was developed using light distance and ranging (LIDAR) data to create a digital terrain model (DTM).

In the meeting with the EA (19 July 2010), owing to the flood risk, the EA wishes to use the 2007 flood level as the basis for the washland volume storage calculation rather than the design level. The EA provided a level for this flood which is 16.34 mAOD (email L Barrett, EA, 4 August 2010).

The site boundary is also shown in Drawing 2010s4268-021. It is apparent that the 2007 event flooded most of the proposed site for the wetland apart from two small areas in the northernmost part of the site.

The scheme does not address the flood risk to the houses on Lowfield Lane. However, the design ensures that the flood risk will not be any worse.

1.5 Existing land drainage

There is a high level and a low level drainage system at Adwick. These systems are shown on Drawing 2010s4268-022 in blue and green respectively. The high level system drains by gravity through a set of flap valves to the River Dearne. The low level system is pumped.

There are two 15 hp pumps for the low level system. They were installed to prevent damage to crops rather than being part of the operation of the washland and they are controlled by floats. The floats were not set to specific design levels, but the position of the floats were adjusted arbitrarily after observation of water levels in the drainage ditches. The lower float was set to allow for about 300 mm in the drain to avoid pumping mud. The second pump only starts when the water level in the drain rises significantly and is threatening to damage crops.

A topographical survey was carried out by JBA in August 2010 of the typical cross sections of the existing drainage ditches which are shown in Drawing 2010s4268-001.

1.6 Outline of proposed scheme

An outline of the proposed scheme is presented in the Design Basis Memorandum (JBA 2010).

The scheme has been designed as wet grassland with a small area of open water. The scheme comprises two site demarcation zones for the control of water levels; Zone 1 is to the north of Crane Well Dike, Zone 2 is to the south of Crane Well Dike. The demarcation zones are shown in Drawing 2010s4268-023.

The scheme has been designed to achieve an earth cut and fill balance to retain the existing operating volume for the washland. Drawing 2010s4268-021 demonstrates that there is minimal opportunity to place fill above the 2007 flood level within the boundary of the site. However, the need to remove spoil off site, with the high costs for disposal of contaminated spoil, has been avoided in the design. Deep permanent ponds and open water, that were included in the feasibility design, have been reduced to minimise the inevitable loss of flood storage so that the existing storage volume can be retained.

The main earth movement is cut from Zone 1 and fill to Zone 2. Across the site water levels will be at or immediately below ground level apart from in open ditches and the open water in Zone 2. The existing pumps at Adwick will continue to operate for the foreseeable future in order to control groundwater levels, albeit at higher operating levels than at present. The general arrangement of the scheme is shown in Drawing 2010s4268-029A.

2. Washland flood storage

2.1 Existing site

The storage capacity of the existing basin has been taken above the surface of the ground. Storage capacity below ground level (when groundwater levels are low) is not deemed to be included in the available storage. This was agreed in a meeting with the EA on 19 July 2010.

Storage capacity loss and gain volume calculations for the scheme design were within the boundary of the site. The stated volumes are therefore less than the overall available washland volume which extends beyond the boundary of the site. However, in the scheme no changes are proposed outside the site boundary as shown on Drawing 2010s4268-021.

A new DTM was developed for the redesign of the scheme within the site boundary. This was based on the topographic survey obtained by ELP. Comparison of the LIDAR and this new DTM shows that levels are similar. The volume of storage below the 16.34 mAOD design level was assessed using this new DTM and was estimated to be 1,515,100 m³ within the boundary of the site.

2.2 Proposed site

2.2.1 Fill to Zone 2

In Zone 2 there are low lying areas and it is proposed that ground levels are raised to a mean 13.00 mAOD level. This will provide an approximately level area for the wet grassland. However, proposed ground levels will undulate approximately 100 mm from the mean level to create a diversity of habitat. In the centre of the open water area no filling is proposed, so that the existing habitat can be retained and allowed to populate the new wetland locally.

The general volume of fill required in Zone 2 to raise ground levels is 37,800 m³. In Zone 2 ground water levels will be controlled to approximately 13.00 mAOD. This is a higher level than under the current land drainage regime. The fill material will be obtained by excavation from Zone 1.

This cut and fill is below the 16.34 mAOD design level so that there is a balance in earth material and flood storage. Compaction of placed fill material is proposed and there will be long term consolidation so there will be no loss in flood storage caused by soil bulking.

2.2.2 Ditch filling and excavation

Partial backfilling of low level system

A survey of the typical profile of the existing low level system was carried out. This is shown in Drawing 2010s4268-024.

It is proposed that all existing deep drains in the low level system will be partly backfilled to create ditch profiles that are more beneficial for habitat creation. An indicative section for the backfilling is shown in Figure 2-1. The estimated volume required is 28,500 m³.

It is proposed that the fill material is obtained from Zone 1 and Zone 2. 13,400 m³ will be taken from Zone 1 to provide the fill material for the lowest levels in the ditch. The balance of 15,100 m³ will be taken from the topsoil and agricultural land from Zone 2 to provide a capping layer in the ditches above the potentially contaminated material from Zone 1.

Figure 2-1 Backfilling of existing deep ditches

New feeder drains and foot drains

To feed water into the new wetland from the existing high level drainage system 500 m of new feeder ditches are required. The layout of these new drains is shown on Drawing 2010s4268-027. It is proposed that the excavated material is placed and spread locally to the ditches. The total estimated volume of cut and fill locally is approximately 1,400 m³.

New footdrains will ensure that the wet grassland is maintained at the optimum wetness. The proposed density of the foot drains is at 200 m/ha so that the total length of the drains is 4,000 m. It is proposed that the excavated material is placed and spread locally to the ditches. The estimated volume of cut and fill locally is approximately 3,600 m³.

2.3 Ditch flooding

2.3.1 Loss in flood storage

In Zone 1 the proposed wetland water level is 13.61 mAOD. In Zone 2 the proposed wetland water level is 13.00 mAOD. The existing partially-backfilled and the new feeder drains and foot drains will be flooded to these proposed water levels.

An estimate was made of the loss in flood storage by operating the ditches to the new water levels in both Zone 1 and Zone 2. The loss in flood storage on the existing low level drains was estimated to be 1,700 m³ based on typical water levels in the current ditch system in Zone 2. The estimated loss from flooding the feeder drains in Zone 1 and Zone 2 is 1,400 m³ and the estimated loss from flooding the foot drains is 3,600 m³ in both zones. The loss of flood storage in the new open water is 3,600 m³.

This volume equates to a loss of flood storage compared to the existing basin which is 10,300 m³.

2.3.2 Compensation

To compensate for the loss of flood storage it is proposed that 11,500 m³ additional earth material is excavated from Zone 1 and that this material is placed in the fill area to the north of the site. This area is above the 16.34 mAOD washland design flood level. This area is shown on Drawing 2010s4268-028. The fill area to the north of the site will be raised by approximately 2 m to 18.2 mAOD level.

The final mean excavated level for Zone 1 is estimated to be 13.61 mAOD. As for Zone 2, final levels will deviate from this mean level by 100 mm to provide a diversity of habitat.

2.4 Summary of storage balance

Table 2-1 summarises the washland earth cut and fill balance. The table also summarises the washland storage loss and gain balance and it demonstrates that there is a small gain in the washland storage of approximately 1,200 m³ from the scheme.

Table 2-1 Washland earth cut and fill and storage volume loss and gain balance (m ³)				
	Earth moving		Washland storage	
	Fill	Cut	Loss	Gain
Earthmoving				
Fill to Zone 2 to 13.00 mAOD level	37,800		37,800	
Excavation from Zone 1		37,800		37,800
Fill to existing deep ditches	28,500		28,500	
Excavation from Zone 1 for ditches		13,400		13,400
Excavation from Zone 2 for ditches (topsoil)		15,100		15,100
Construct new feeder ditches		1,400		1,400
Place feeder drain excavated material locally	1,400		1,400	
Construct new foot drains		3,600		3,600
Place foot drain excavated material locally	3,600		3,600	
Ditch flooding				
Flood existing ditches Zone 2 to 13.00 mAOD			1,700	
Flood feeder drains to ground level			1,400	
Flood foot drains to ground level			3,600	
Flood open water Zone 2 to 13.00 mAOD			3,600	
Loss and compensation				
Excavate Zone 1 for net loss		11,500		11,500
Fill above 16.34 mAOD flood storage level	11,500			
Totals	82,800	82,800	81,600	82,800
Net gain				1,200

2.5 Flood bund

There has been discussion about the provision of a flood bund to mitigate some of the flood risk to the houses on Lowfield Road. The bund is not part of the wetland creation. It was considered that the construction of a bund would use some of the spoil material from the scheme.

However, the provision of a bund is not considered to be an advantageous use of surplus spoil because it lies within the 2007 flood extent. A bund would cause further loss of washland storage for flood events below the crest level of the bund and this would therefore require flood storage compensation elsewhere. Owing to site restraints, stemming from the high 2007 design flood level, it would be very difficult to provide this compensation within the boundary of the EA owned site at Bolton-upon-Dearne.

3. Water level operation and management

3.1.1 Overview

To avoid loss of flood storage from the washland it will be necessary to manage the water levels on the site to avoid the formation of permanent deep ponds other than the open water designed. However, groundwater levels must be sufficiently high to maintain the wet grassland in an optimum condition for the proposed habitat creation.

3.1.2 Proposed Zone 1 water levels

The groundwater level in Zone 1 will be managed by an adjustable weir structure across the high level drain West Moor Dike (Weir 2). The invert level of the weir will be approximately 13.61 mAOD. The position of this weir is shown in Drawing 2010s4268-027.

At the north end of the wet grassland in Zone 1 it is proposed that a second weir and sluice be installed at 13.71 mAOD (Weir 1, Side Orifice 1). This will provide a positive head to enable flow through the wetland. Feeder drains will be constructed from the second weir into the wetland area.

3.1.3 Proposed Zone 2 water levels

Low level gravity drainage

It is proposed that a means to drain the low level system by gravity is provided under the new scheme for Zone 2. This is because gravity drainage may help to reduce pump demand at times when water levels are low in the high level drainage system and flow into the low level system is generally insufficient to trigger pump operation. A set of culverts with flap valves from the low to the high level system will be provided close to the high level outlet at the river (Outlet 2) with a level of 13.00 mAOD.

A schematic diagram showing the proposed operating pump levels and the gravity outlet for Zone 2 is shown in Figure 3-1.

Weir and sluice

At the north end of Zone 2 a weir and sluice is proposed on West Moor Dike at approximately 13.10 mAOD (Weir 3, Side Orifice 3).

Pump operation

The existing pumps at Adwick Bridge will continue to operate under the proposed scheme for the foreseeable future but at higher water levels. It is proposed that the float levels are raised so that the grassland is maintained in a wet condition. For the scheme the pumps may need to operate over a narrower depth range than at present to maintain the grassland at an optimum wetness and avoid excessive ponding that would cause a loss in flood storage.

In Zone 2 the proposed level of the wet grassland is at a mean level of 13.00 mAOD. The upper start float for pump 1 will need to be at approximately 13.10 mAOD to avoid deep ponds forming on the site. For pump 1 the lower pump stop float will be set at 13.00 mAOD to avoid lowering ground water levels below the optimum level required for the wet grassland.

The upper start float for pump 2 will need to start at a slightly higher level than 13.10 mAOD to provide additional pump capacity as in the current land drainage situation. The stop float for pump 2 will be set at the same level as pump 1 which is 13.00 mAOD.

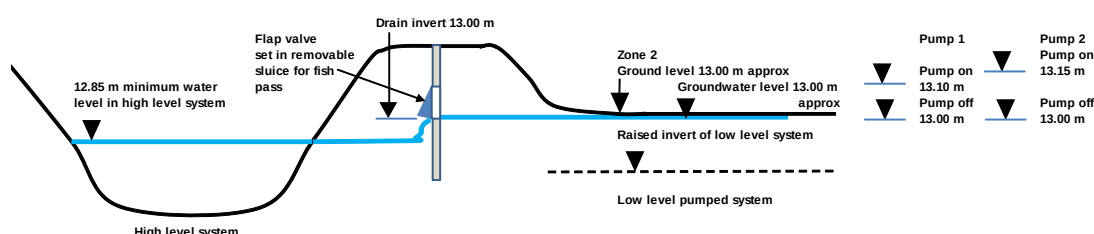
It is expected that pump floats may need to be adjusted during the first couple of years of operation of the scheme to achieve the optimum wetness in the grassland.

Since Zone 2 may gravitate at certain times the pump operation may be less than in the present operating regime.

It is understood that the EA Asset Systems Management would prefer to decommission the pumps at some point in the future. This would lead to higher water levels across the site at times when river levels are high and gravity drainage to 13.00 mAOD is not possible. This

would potentially change flood antecedent conditions. Based on the current constraint to maintain flood storage, acceptance of this solution is likely to require a reassessment of the flood risk as well as the potential environmental impacts to bird breeding in particular.

Figure 3-1 Proposed gravity drainage at Outlet 2 and pump operating levels for Zone 2



3.2 Dove and Dearne IDB drainage

3.2.1 Maintenance requirement

The Dove and Dearne IDB expressed their concerns with regard to the scheme in a letter to the EA on 25 September 2009. These concerns were that:

- That there should be no impact on water levels in the watercourses upstream of the site.
- That the Board should continue to maintain the high level drainage system in order to ensure continued drainage standards to land upstream.
- That access for this maintenance is retained. The Bye Laws state no obstructions within 9 m of the drain bank top. This can be reduced in certain circumstances with prior consent from the Board.
- That the decommissioning of the pumping station will not have any effect on drainage standards in land outside the site.

Minimal alteration is proposed to the profile of the West Moor and Crane Well Dikes. These channels are very trapezoidal in shape. Owing to the depth of these drains, to create margins more suitable for habitat along these drains would result in a loss of washland storage and it is not therefore proposed.

It is proposed that the bank conditions are also maintained as in the present condition within the required 9 m access strip. The Board maintains Crane Well Dike and West Moor Dike which consists of flail mowing the banks and removing aquatic vegetation from the bed. This is to ensure that the drainage standard of land upstream is maintained.

In the area of excavation for Zone 1 land will be lowered on both sides of West Moor Dike. To retain the capacity of the dike and prevent more frequent flooding of the wetland it is proposed that flood bunds are retained on both banks of West Moor Dike. It is proposed that the top of these bunds will be at existing ground level and have widths of 9 m for maintenance access. These bunds are shown on Drawing 2010s4268-027.

Access arrangements around the proposed structures will need to be agreed with the IDB.

3.2.2 Water levels

Water levels in the IDB drainage system upstream of the site boundary are not expected to be affected by the design proposals even under high flow conditions.

- For Zone 2 the highest proposed weir in West Moor Dike will be approximately 13.71 mAOD. The invert level of this dike at the site boundary is approximately 16.90 mAOD which is more than 3 m above the proposed weir.
- For Zone 1 the highest proposed weir in West Moor Dike will be 13.10 mAOD. The invert level of the west side of Crane Well Dike at the boundary of the site was surveyed in September 2010 at two locations. The lowest level was 13.58 mAOD at a point above Lowfield Farm.
- For Zone 1 the invert level of the east side of Crane Well Dike at the boundary of the site was surveyed as 13.53 mAOD. Also, land rises steeply to the north away from this ditch and from the site boundary.
- It is concluded that the proposed water levels for the scheme operation will not impact the IDB drainage water levels and land drainage levels upstream of the scheme.

3.3 Control structures

The control structures will be set into simple sheet piled weirs. The weirs will have simple orifice control structures for adjustment of the water levels. An orifice is preferable to a side weir since this will prevent excess flow from entering the wetland when flows in the high level drainage system are below top of bank/bund. A typical arrangement is shown in Figure 3-2.

Figure 3-2 Weir and orifice control to feeder ditches

3.4 Discharge to the River Dearne

The level of the sluice outlet surveyed by ELP is 12.85 mAOD. The ELP updated hydrology study using the Adwick gauging station has a reported mean monthly water level of 13.00 m at the outlet. The outlet level and the design water level of Zone 2 has been set using this mean monthly water level.

4. Conclusions

The loss and gain balance in flood storage capacity has been undertaken in the design of the scheme. Overall, a small gain in the Adwick washland flood storage has been attained. This may help reduce the flood risk to the existing properties by a small degree.

There is a net loss in storage capacity caused by operating the wetland to higher water levels than is currently the case for agricultural crop growing. The net loss can be compensated for by moving earth out of the washland and placing it above the 16.34 mAOD design flood level on a small area to the north of the site.

Scheme operation will need to maintain groundwater levels close to ground level in Zone 1 and Zone 2. This will reduce the likelihood of deep pond formation and loss of flood storage in pre-storm conditions.

The scheme is not considered to impact water levels in the IDB drainage system upstream of the site.

It is understood that the EA Asset Systems Management would prefer to decommission the pumps at some point in the future. This would lead to higher water levels across the site at times when river levels are high and gravity drainage to 13.00 mAOD is not possible. This would potentially change flood antecedent conditions. Based on the current constraint to maintain flood storage, acceptance of this solution is likely to require a reassessment of the flood risk as well as the potential environmental impacts to bird breeding in particular.

Appendices

- A. Appendix A - minutes of meeting with E A on 19 July 2010



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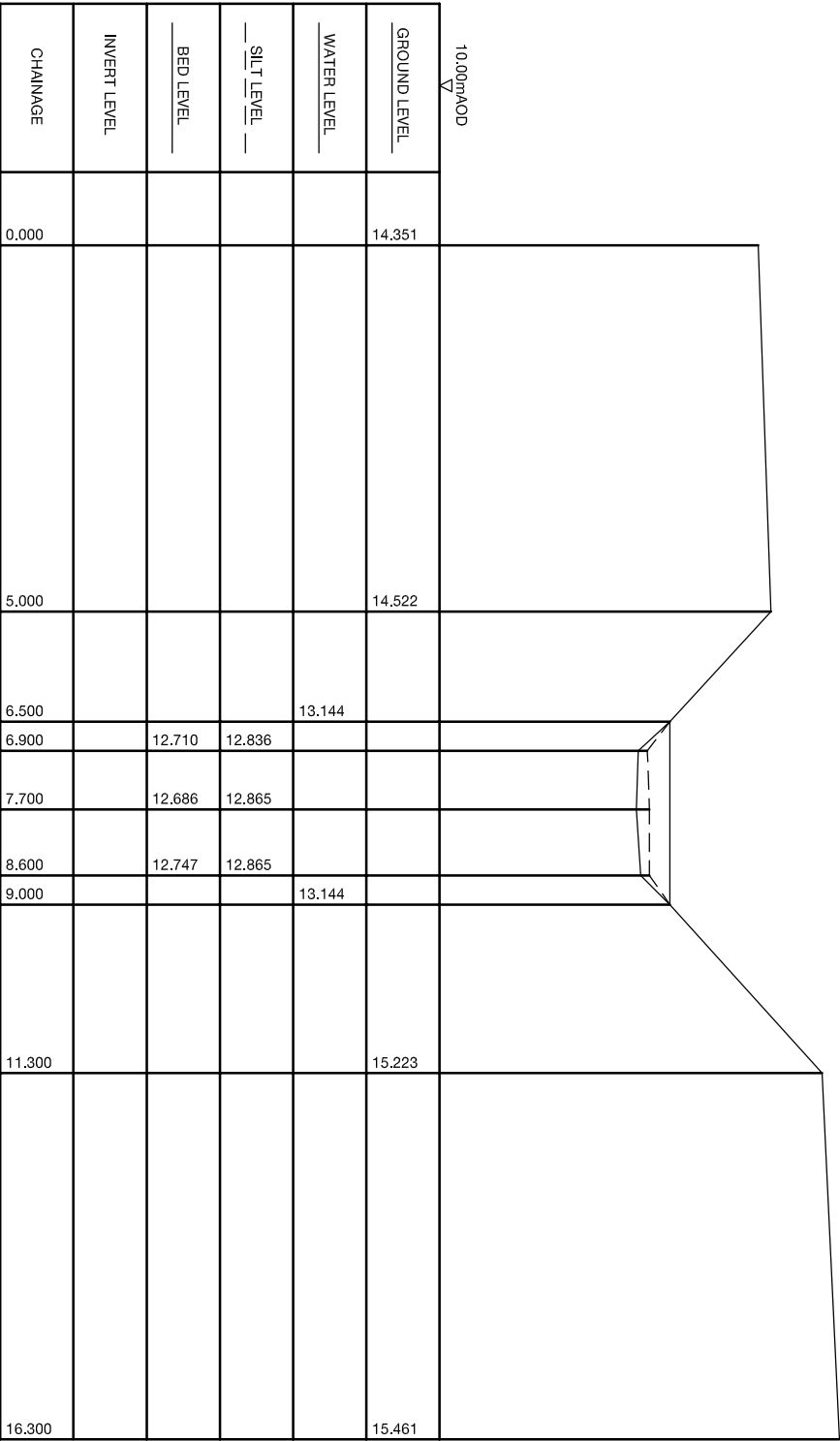
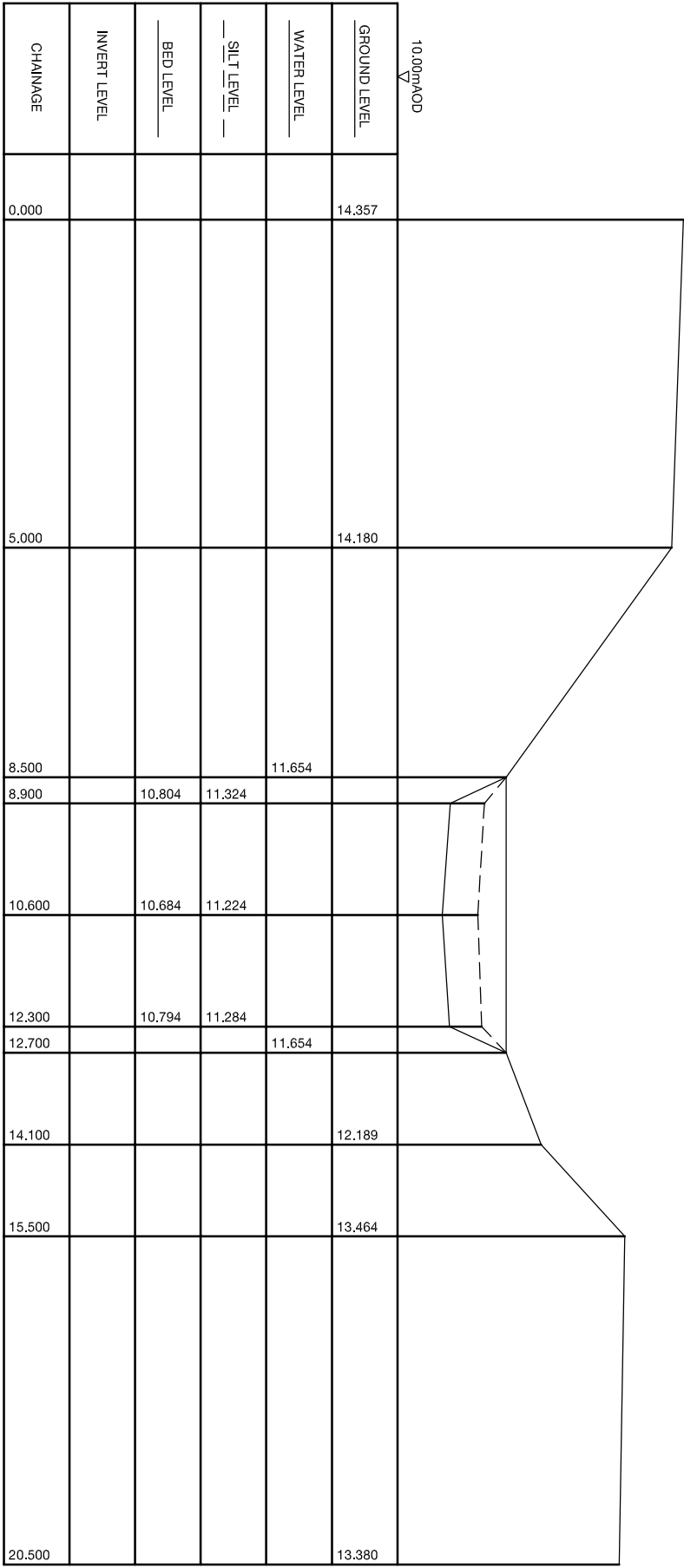
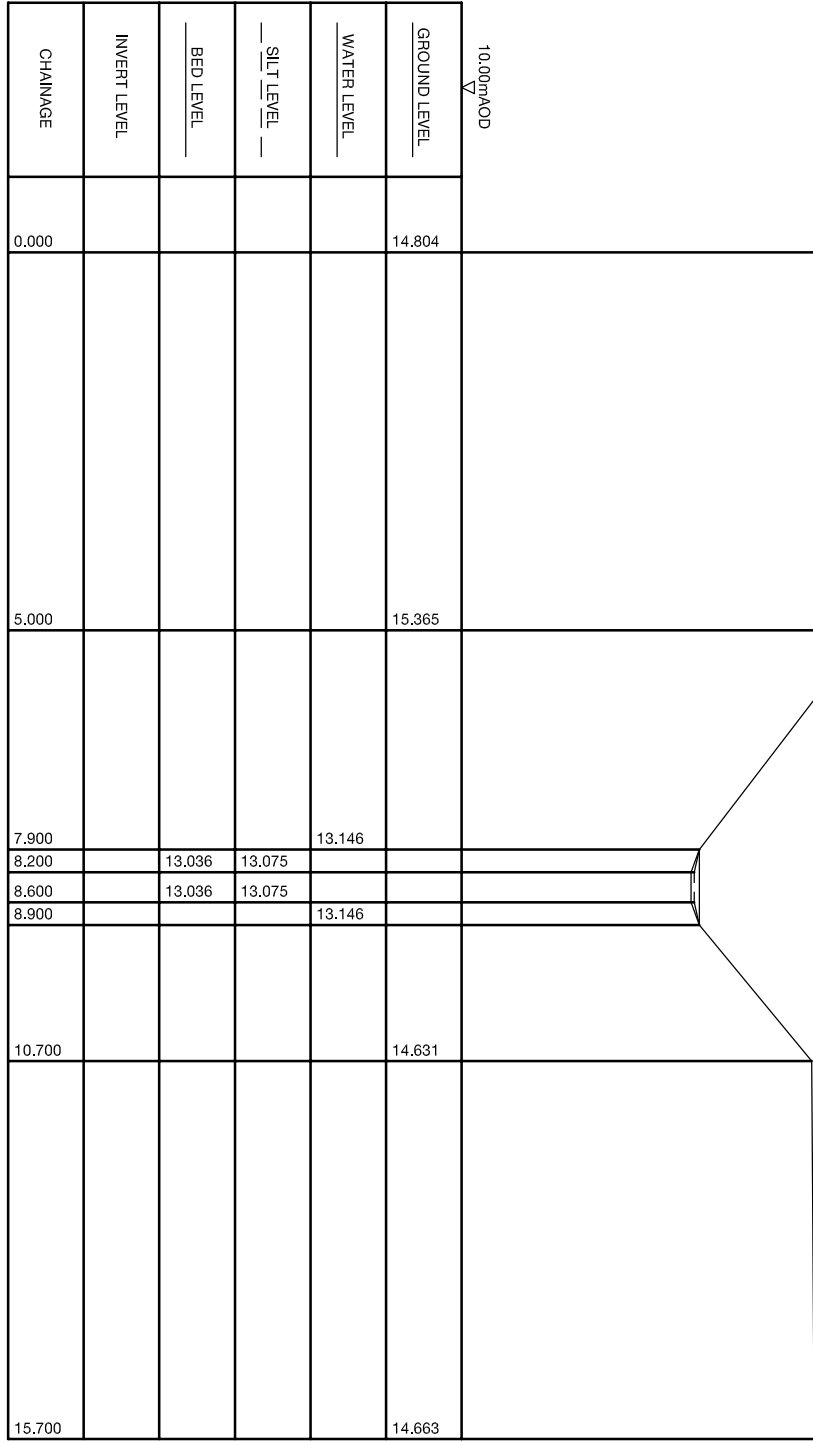
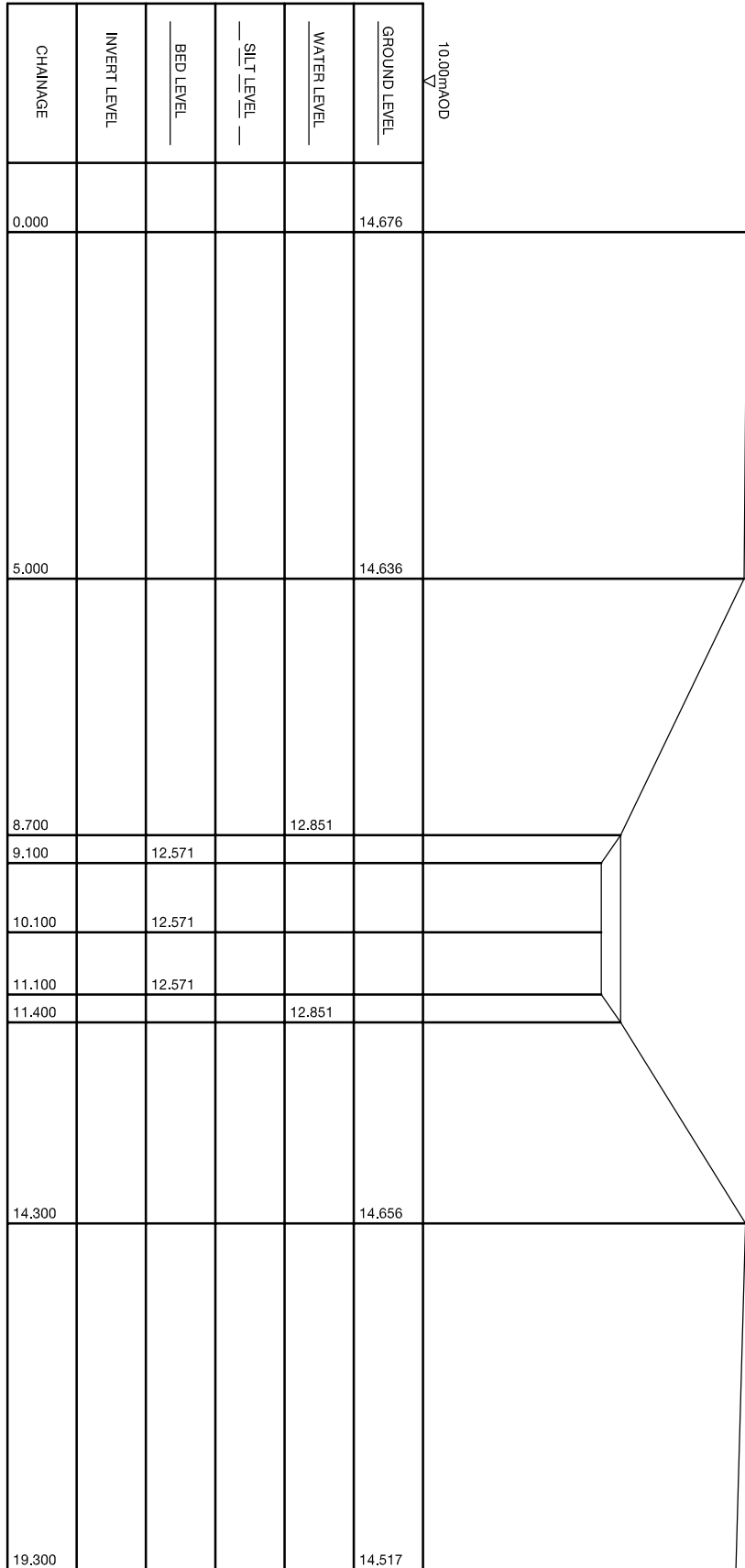
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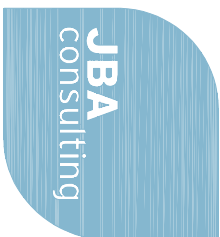


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General Notes

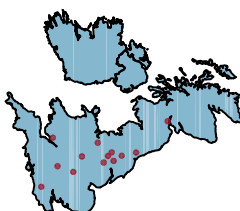
1. All dimensions shown are in metres unless otherwise stated and levels in metres to Ordnance Datum, this drawing is to be checked/verified on site.
2. Dimensions shown are to be read in conjunction with TO BE COMPLETED WITH RELEVANT INFORMATION.
3. This drawing is to be read in conjunction with TO BE COMPLETED WITH RELEVANT INFORMATION.
4. Any discrepancies noted on site are to be reported to the Engineer immediately, adhering to Pollution Prevention Guidelines.
5. All works affecting flood defences, main watercourses and/or ordinary watercourses will be subject to Consent for Permanent and Temporary Works under the Land Drainage Act 1991.
6. This drawing is not to be used for setting out.





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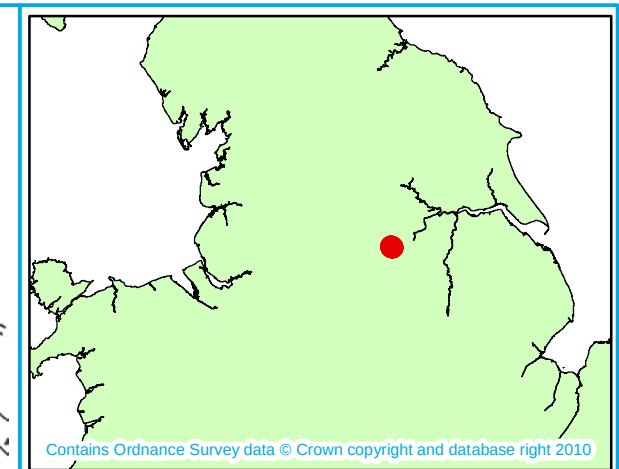
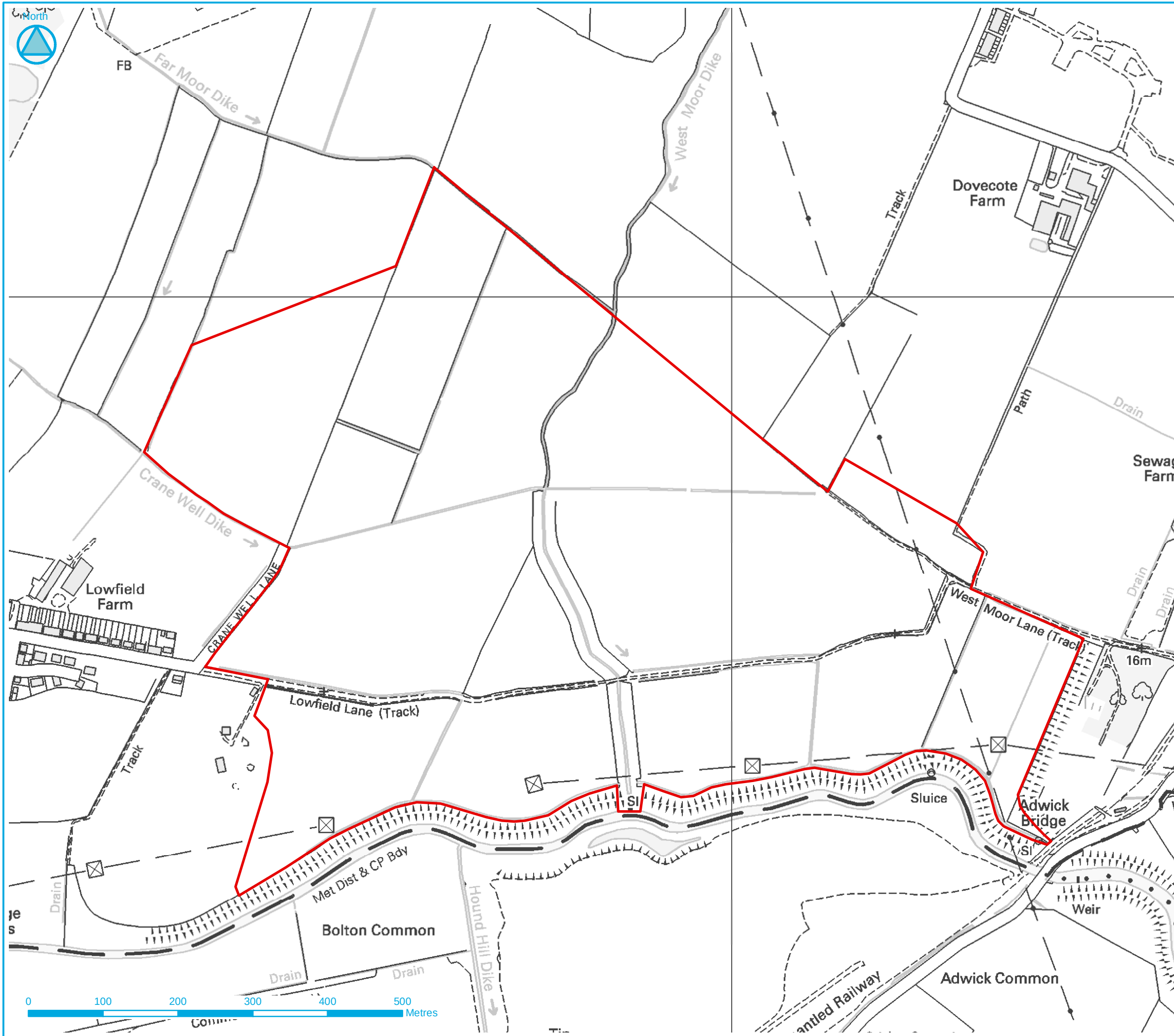
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RSPB
Adwick Washland - Habitat Creation
Existing Drain Cross Sections

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Scale:	Drawn:	J.S. O'Malley	31/03/10
As Stated @ A1	Checked:		
Approved:			
Digital File Name:	2010a4268-001	Sheet No.:	Status:
Drawing Number:	Rev.:	1 of 1	Draft
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 Site boundary

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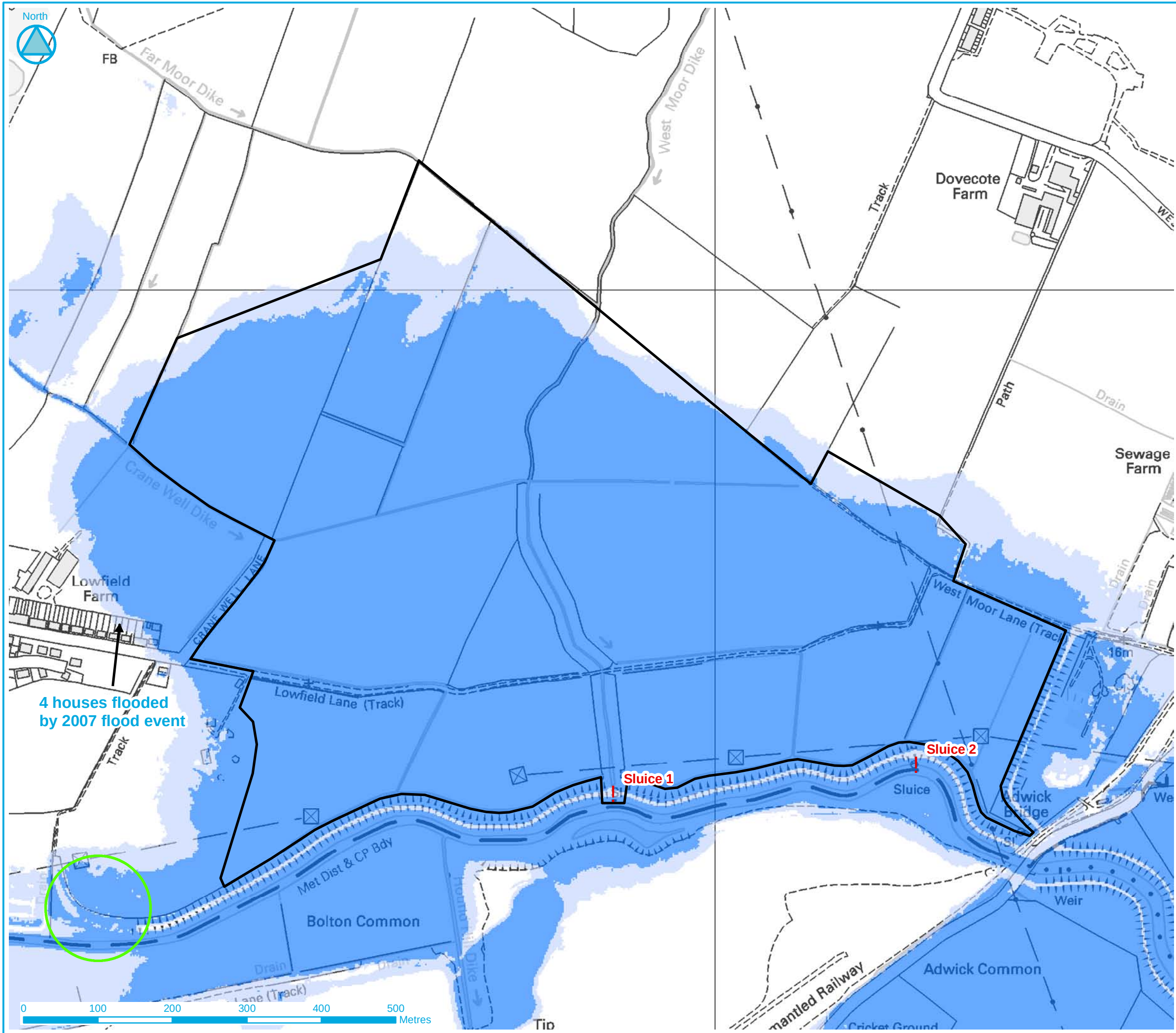
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Adwick Washland Habitat Creation

Site Location

Drawn by: Mike Williamson	Scale: 1:5,000 Original @ A3
Date: 02/09/2010	
Status: FOR PLANNING	
File Name: N:\2010\Projects\2010s\4268 - RSPB - Adwick Washland - Habitat Creation Implementation Plan\Graphical Data\ArcView\Projects\FRA Drawings\Site Location.mxd	
Drawing Number: 2010s4268-020 - Rev A	



- ! Sluice
- Site boundary
- 15.50 mAOD washland area
- Indicative 2007 flood level (16.34 mAOD)
- Inlet to washland

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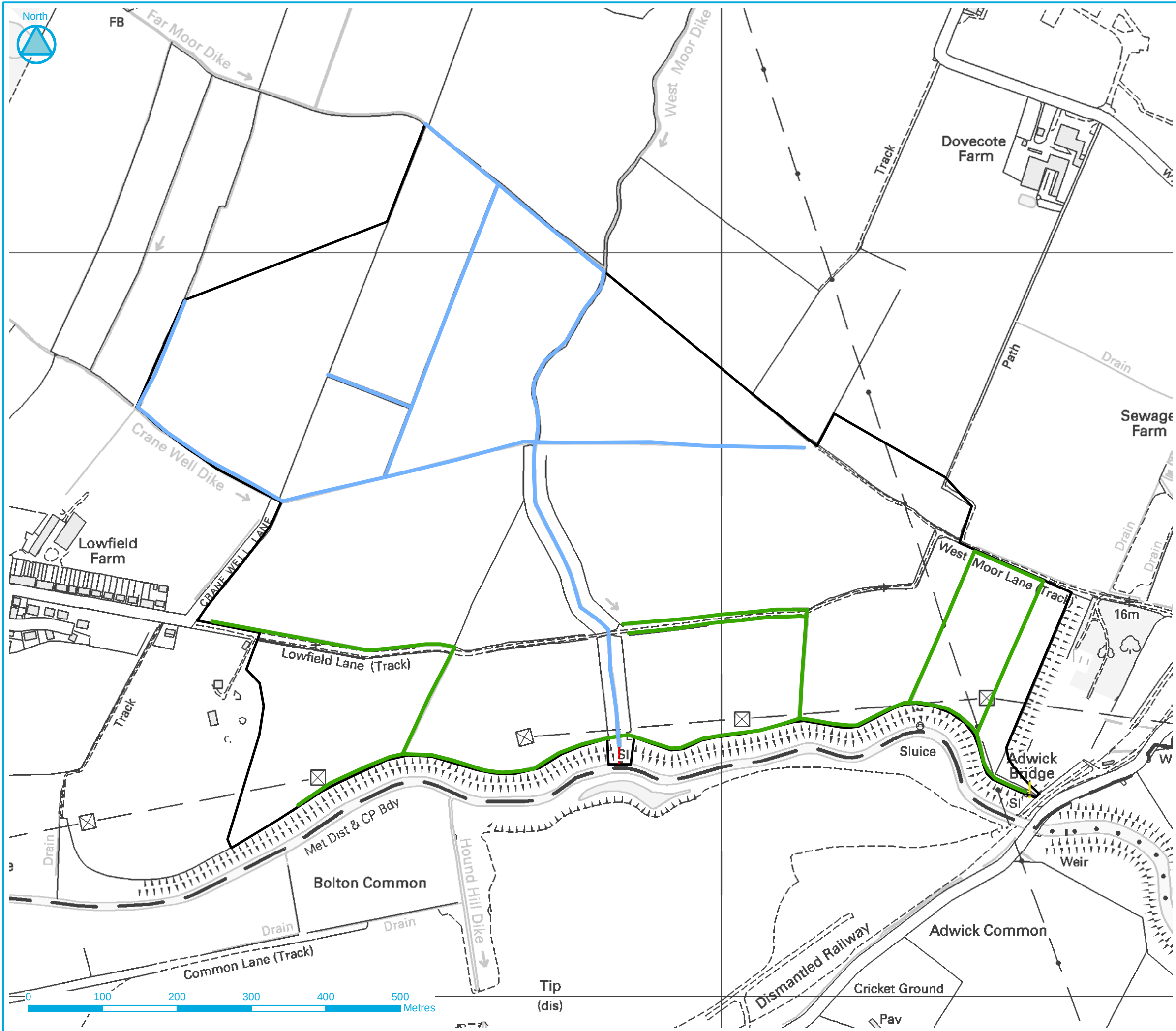
for

RSPB

Adwick Washland Habitat Creation

Washland Extents

Drawn by: Mike Williamson	Scale: 1:5,000
Date: 28/09/2010	
Status: FOR PLANNING	
Original @ A3	
File Name: N:\2010\Projects\2010s\4268 - RSPB - Adwick Washland - Habitat Creation Implementation Plan\Graphical Data\ArcView\Projects\FRA Drawings\Washland Levels.mxd	
Drawing Number: 2010s4268-021 - Rev A	



Site boundary

Structures

Sluice 1

Pumping station

Existing Ditches

High level gravity

Low level pumped

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Adwick Washland Habitat Creation

Drainage System

Drawn by: Mike Williamson

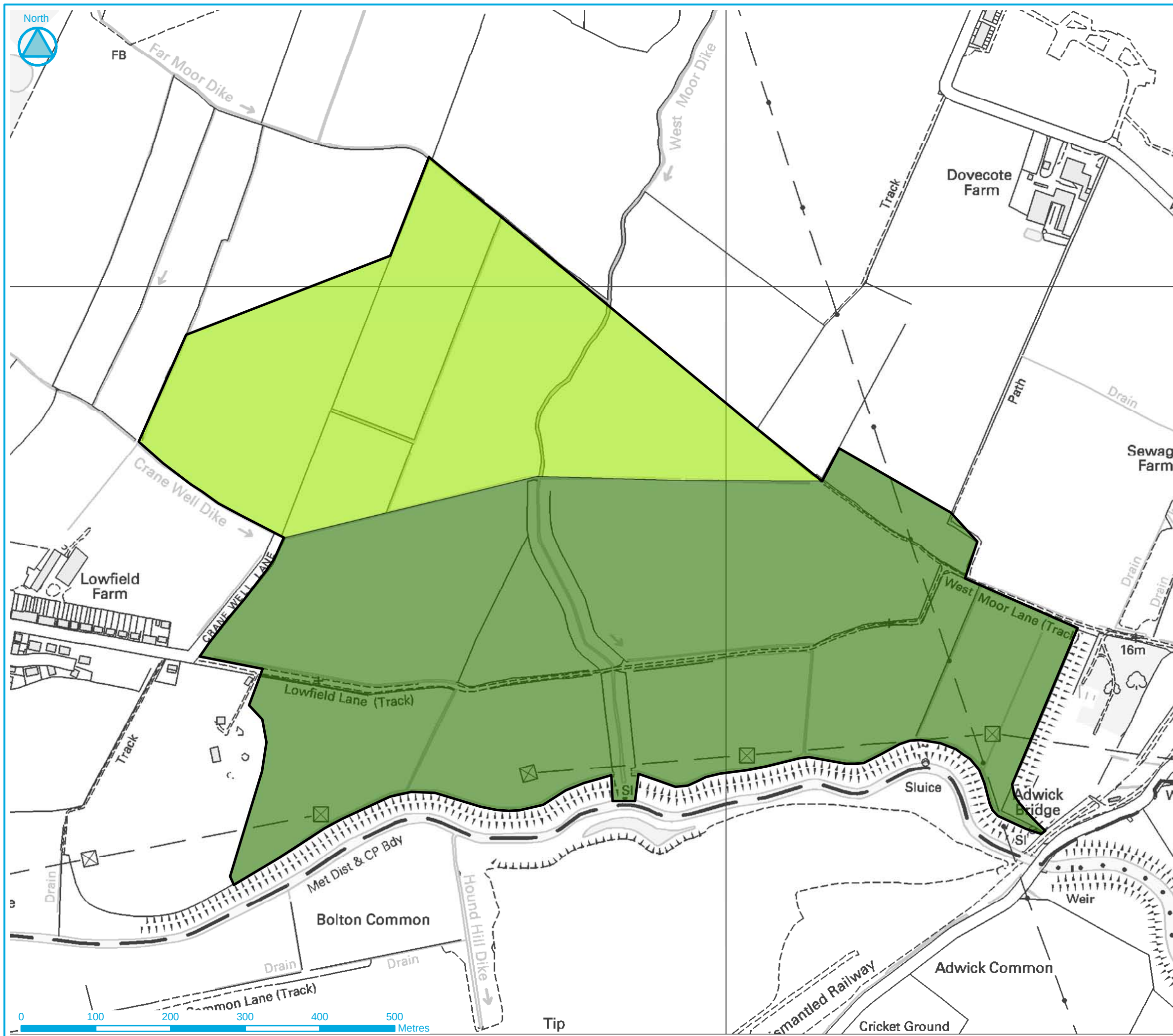
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Drawing Number: 2010s4268-022 - Rev A

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Original @ A3



- Site boundary
- Zone1
- Zone2

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Adwick Washland Habitat Creation

Site Demarcation Zones

Drawn by: Mike Williamson

Date: 31/08/2010

Status: FOR PLANNING

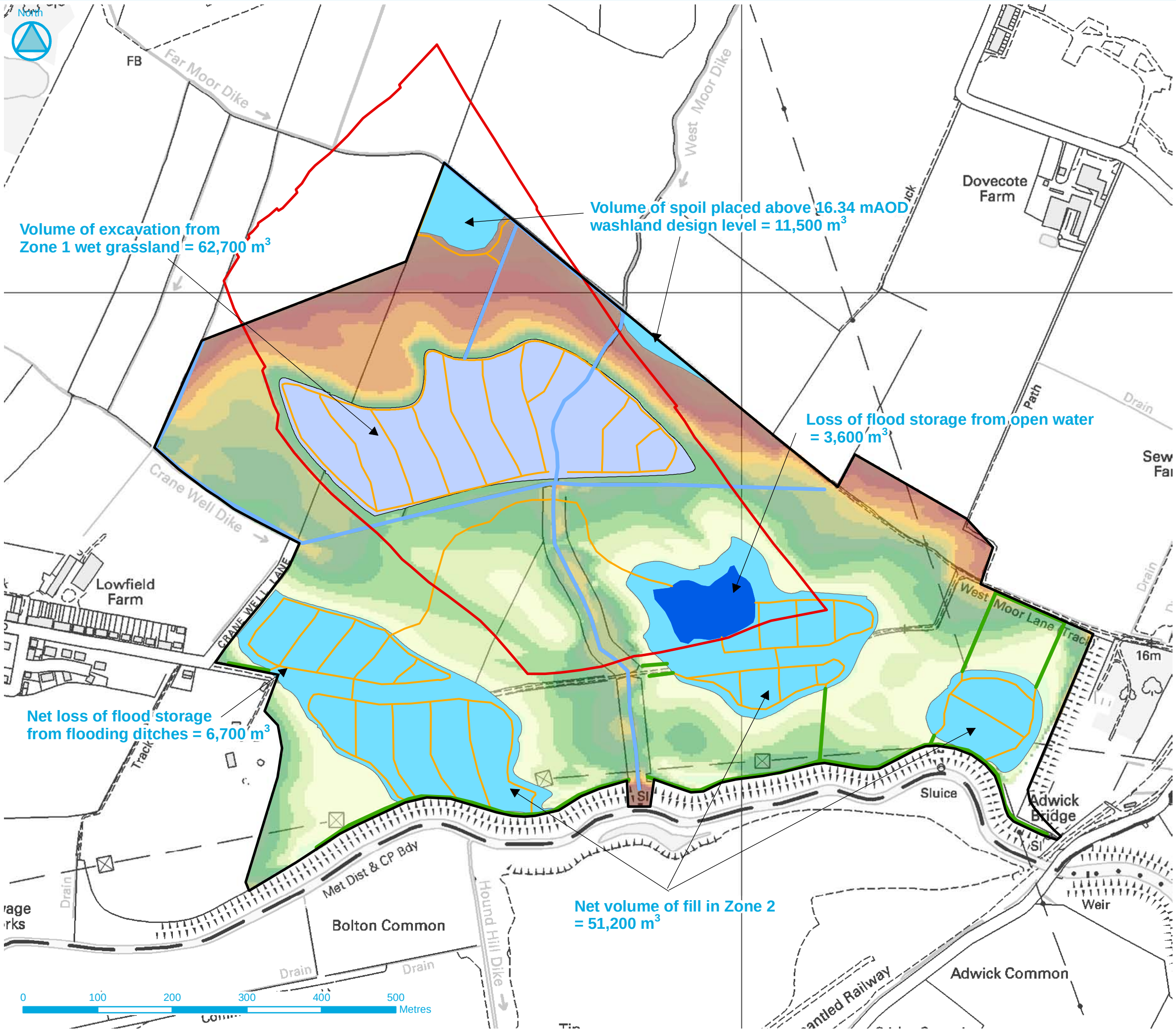
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Drawing Number: 2010s4268-023 - Rev A

Scale:

1:5,000

Original @ A3



Site boundary

Area of mine spoil

Open water

Ditches

High level gravity

Low level pumped

Proposed feeder ditches and foot drains

Proposed Earth Movement

Earth removal

Earth deposition

Elevation (mAOD)

<13.00

13.25 - 13.50

13.50 - 13.75

13.75 - 14.00

14.00 - 14.25

14.25 - 14.50

14.50 - 14.75

14.75 - 15.00

15.00 - 15.25

15.25 - 15.50

15.50 - 15.75

15.75 - 16.00

16.00 - 16.25

16.25 - 16.50

16.50 - 16.75

16.75 - 17.00

17.00 - 17.25

>18.30

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Proposed Earth Movement

Drawn by: Mike Williamson

Date: 28/09/2010

Status: FOR PLANNING

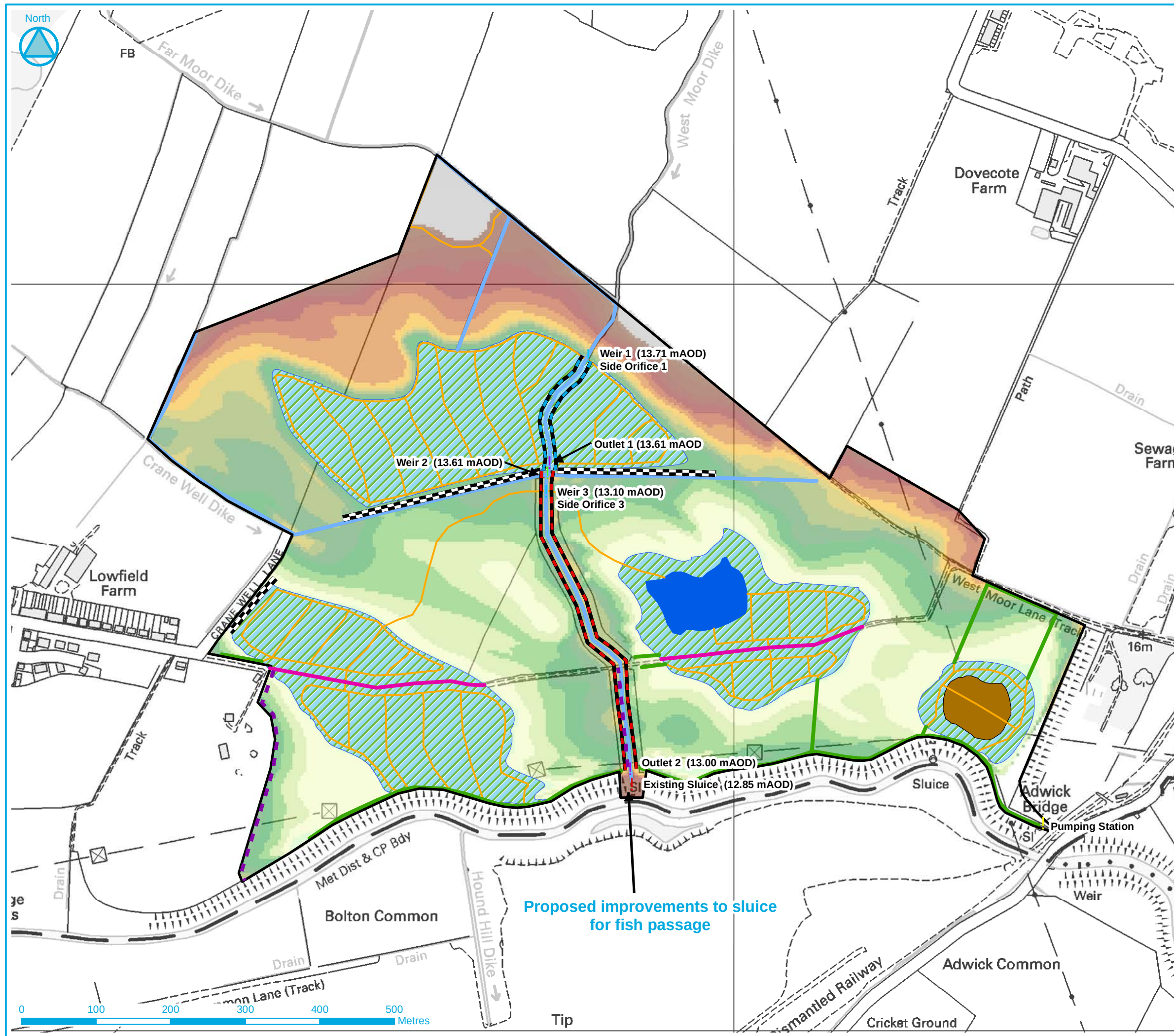
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Drawing Number: 2010s4268-028 - Rev A

Scale:

1:5,000

Original @ A3



Site boundary

Wet grassland

Open water

Fen / Reed bed

Existing sluice

Proposed outlet with flap valve

Pumping Station

Proposed weir

Proposed weir and side orifice

Proposed bund

Existing embankment

Proposed embankment

Proposed raised trackway

Proposed river link path

High level gravity

Low level pumped

Proposed feeder ditches and foot drains

Proposed Ground Elevation (mAOD)

<13.00

13.25 - 13.50

13.50 - 13.75

13.75 - 14.00

14.00 - 14.25

14.25 - 14.50

14.50 - 14.75

14.75 - 15.00

15.00 - 15.25

15.25 - 15.50

15.50 - 15.75

15.75 - 16.00

16.00 - 16.25

16.25 - 16.50

16.50 - 16.75

16.75 - 17.00

17.00 - 17.25

>18.30

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Adwick Washland Habitat Creation

Proposed General Arrangement

Drawn by: Mike Williamson

Date: 28/09/2010

Status: FOR PLANNING

File Name: N:\2010\Projects\2010s\4268 - RSPB - Adwick Washland - Habitat Creation Implementation Plan\Graphical Data\ArcView\Projects\FRA Drawings\Proposed General Arrangement.mxd

Drawing Number: 2010s4268-029 - Rev A

Scale:

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Original @ A3

RECORD OF MEETING



Status:

JBA Project Code 2010s4268
Contract Adwick Washland - Habitat Creation implementation Plan
Client RSPB
Day, Date and Time Monday 19/07/2010 14:00
Meeting Environment Agency
Issues for the Flood Risk Assessment
Venue Phoenix House, Leeds

Attending	Jerome Masters EA	JM
	Gary Cliff EA	GC
	Lesley Slaney	LS
	Lindsey Barrett	LB
	Sally Leng	SL
	Stuart Jenkinson EA	SJ
	Andy Wood JBA Consulting	ACW
	Mike Williamson JBA Consulting	MW
	<i>Notes/Minutes taken by JBA</i>	

Item	Action
------	--------

1 Apologies

1.1 Apologies were received from Mark Chapman (EA).

2 Existing site

Historic flooding

5~6 houses were flooded at the east end of Lowfield Lane in the 2007 flood. The flood filled the washland basin but did not overtop the Dearne flood banks. The houses were flooded for about 2 days. It is thought that there may have been an operational problem with the washland regulator sluices which delayed the emptying of the basin.

Surface water flooding occurred in 2010 on Lowfield Lane.

The EA has ongoing consultation with the local residents about the historic flooding problems and the proposed scheme.

Lindsey Barrett is to provide information (photos and estimated flood level) on the 2007 flood event for inclusion in the FRA.

LB (EA)

Dearne defences

Defence standards vary along the Dearne but notionally have a standard of 1 in 10 years at the location of the site.

Washland operation

The inlet to the washland is a spillway set into the embankment. The outlet is via the existing sluices that are to the south of the proposed wetland area.

The existing pumping station takes very small flows from land drainage. The pumping station is closed off in a flood event.

A washland study was carried out in 1980. The EA intend to operate the site as a washland in the foreseeable future. They are looking at a new 18 month study into the whole of the Don and Dearne washland operation. The proposed operating decisions will take some time.

3 Proposed site

Decommission of pumps

The wetland scheme is to be designed with no loss of washland storage. For the FRA the EA proposed that the 2007 flood level be used as the capacity level for the flood storage basin.

RECORD OF MEETING



Status:

JBA Project Code 2010s4268
Contract Adwick Washland - Habitat Creation implementation Plan
Client RSPB
Day, Date and Time Monday 19/07/2010 14:00
Meeting Environment Agency
Issues for the Flood Risk Assessment
Venue Phoenix House, Leeds

Item	Action
Based on the current scheme design by Ecology Land and People (ELP) the loss in floodplain volume is approximately 1.6%. They have used a level of 12.85 m for the flooded level in Zone 2 when the land drainage pumps are switched off but state in their report that 13.0 m is a more likely level from their later river level estimation. JBA estimate that with the new 13.0 m level the loss may be in reality around 3 to 4%. This is currently being checked from the existing and proposed levels. It is possible that some spoil will have to be taken off site to avoid the loss in flood volume. The EA did suggest a site on the old maggot farm near Adwick Bridge and this requires confirmation that this site is outside the washland operating flood area. Flood bund for houses The EA are considering a bund for the houses on Lowfield Road at approximately the same level as the existing Dearne defences. However, a bund will take volume from flood storage and this will require further compensation and spoil removal. JBA mentioned the potential surface water flood risk from Lowfield Lane behind the proposed bund. The EA may need to provide some storage to allow for this. Individual house resilience may be preferable to a bund and this would avoid loss of storage volume. Stuart Jenkinson is meeting residents again this week. The bund would be an EA asset with the EA responsible for ongoing maintenance. Flood protection for ancient monument Flooding to the gun battery is not expected to be worse than now. The basements are currently flooded. A protection bund is unlikely to be required but is in any case to be discouraged since this will remove more flood volume from the storage basin which would in turn require more compensatory storage. The IDB has been contacted by JBA. The main concern is the ability to maintain the main drainage systems in the long term and avoid flooding land upstream from the proposed scheme. JBA will check this out as part of the FRA. YW sewer overflow into site There is currently a foul stormwater overflow into the site. Bob Smith at Yorkshire Water is a possible contact to discuss this. The sewage farm to the east of the site is no longer operational. The EA will need to verify that construction of the bund will not cause a sewer backing up problem during washland operation. Bridges and culverts The EA have previously requested bridges in the scheme design across the bridleway. Oversize culverts would also be acceptable providing a natural bed is formed and is sustainable for ecology.	
4 Information Required	
4.1	JBA have requested flood and River Dearne information from the EA though the normal procedures.