Froxfield Community Meadow and Wetland

Design Statement

June 2018

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PR088/R1/V0/F

Quality Management

Report Title	**Froxfield Community Meadow and Wetland Design Statement**	
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Authorised by	**Director**	Robert McInnes

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1. Background

1.1. Location

1.1.1. Action for the River Kennet (ARK) has proposed the creation of a community meadow and wetland. The site of the proposed Froxfield Community Meadow and Wetland is in the village of Froxfield, Wiltshire. The site lies on the north bank of a small tributary stream of the River Dun and covers some 0.7 hectares. The approximate Ordnance Survey grid reference for the centre of the site is SU2982768029.

1.2. Summary of the current situation

1.2.1. The site is dominated by unmanaged woodland with an understory of bramble *Rubus fruticosus*, common nettle *Urtica dioica*, willowherb *Epilobium spp.* and locally wetland species such as reed sweet grass *Glyceria maxima*. The trees are largely mature with some self-set younger specimens. The main tree species are poplar *Populus spp,* horse chestnut *Aesculus hippocastanum,* goat willow *Salix caprea,* crack willow *Salix fragilis* , weeping willow *Salix x chrysicoma,* ash *Fraxinus excelsior,* alder *Alnus cordata* with occasional leylandii and eucalyptus.

1.2.2. The land is relatively flat, varying primarily between 108.3mAOD and 107.7mAOD. To the south of the area there is a small stream (tributary of the River Dun) which separates the site from housing. Towards the north of the site there is an existing drain which is fed from road drainage and drains towards the east of the site, exiting the site through a small culvert. Spoil from the excavation of this drain forms a mound, covered in common nettle, between the drain and the pavement (DWG#PR088/001).

1.2.3. The land may once have been used as a water meadow, even though evidence for this is now very limited. Old maps indicate that a drain ran from north to south across the site but evidence of this is not present suggesting that it has been infilled for a number of years.

1.3. Objectives

1.3.1. The overall design objective for the Froxfield Community Meadow and Wetland is to develop an area of habitat which will provide multiple benefits for the local community as well as benefitting local wildlife.

2. Design

2.1. Habitat design elements

2.1.1. The design incorporates several elements aimed at enhancing the existing social and ecological values of the site. The main design elements include:

- Wetlands including a channel, pools and ponds and damp grassland;
- Meadow grassland;
- Hedgerows;
- Managed woodland; and
- Stream improvements.

2.1.2. The overall concept is to utilise the existing water supply from the drain in the north of the site, in conjunction with relatively high water levels across the site (as evidenced by the occurrence of wetland plant species), to create attractive habitat features which will be accessible to the public. An area of more open wildflower meadow would be created adjacent to the wetland area. The overall concept design is shown in DWG#PR088/002. Illustrative cross-sections are shown in DWG#PR088/003 and DWG#PR088/004.

Wetlands including a channel, pools and ponds and damp grassland

2.1.3. Two wetland features are proposed. The first is an isolated ephemeral wetland that would excavated near to the proposed entry point to the site. This wetland area would be excavated to depth of approximately 106.7mAOD, or approximately 1.3m below current ground level at its deepest point. The wetland would be fed from near surface groundwater and rainfall, with water levels fluctuating naturally throughout the year. Water in this location is expected (based on an interpretation of the prevailing soil properties) to reach a maximum elevation of approximately 107.7mAOD during the wettest periods of the year. However, it's location within the Environment Agency (EA) Flood Zones 2 and 3 suggest that it may be become inundated at times of flood.

2.1.4. The second wetland feature would be created as an enhancement to the existing channel/drain feature. This would create a permanent wetland channel with associated ponds and pools. The channel would be realigned, with the old course being infilled. A more convoluted planform would be created with wider margins with variable slope gradients to allow a more diverse wetland plant community to develop. The base of the channel would have a variable profile with a maximum depth of excavation being approximately 1.5m below current ground level. The water levels in the channel would be controlled by the existing infrastructure. Currently there is an inlet culvert with an invert level of 107.46mAOD and at the eastern limit of the drain an outlet culvert with an invert level of 107.33mAOD. Water level, other than at periods of high rainfall, would operate within these limits and no new water control structures are proposed.

2.1.5. The wetland features would grade from permanent open water to emergent and seasonally damp communities. The recommendation is that the wetlands would be populated by local commonly occurring wetland plants such as the following:

- *Iris pseudacorus*
- *Juncus effuses*
- *Juncus inflexus*
- *Carex riparia*
- *Eleocharis palustris*
- *Sparganium emersum*
- *Glyceria maxima*
- *Equisetum fluviatile*
- *Scirpus lacustris*
- *Alsima plantago-aquatica*
- *Mentha aquatic*
- *Persicaria amphibian*
- *Veronica* beccabunga
- *Nasturtium officinale*
- Nuphar lutea

2.1.6. The intention is to create a diverse marsh community therefore the planting of common reed *Phragmites australis* should be deterred.

2.1.7. A combination of techniques would be used to establish the desired vegetation community. Some locally-sourced plants would be translocated for nearby receptor sites and introduced as turves, bare-rooted plants and rhizomes. Where appropriate, areas of wetland vegetation present on site would be carefully removed to temporary stockpiles and replaced in the wetland area. Commercially sourced plants may be purchased and planted by hand into the wetland. Plants would also become established from the existing seed-bank within the substrate.

Meadow grassland

2.1.8. Material excavated from the creation of the wetland features would be inverted in order to bury the more nutrient rich topsoils and to create a relatively lower nutrient level substrate for the creation of a meadow grassland community. All spoil would be disposed of outside of the mapped EA flood zones (Zones 2 and 3). Several trees will be removed or managed within the meadow grassland area to open the area up and to allow more light to penetrate.

Hedgerows

2.1.9. Hedgerows would be planted along the north western boundary of the site to screen the area from the road. These would be created using locally sourced and commonly occurring hedgerow species such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, dog rose *Rosa canina* and blackberry. The hedgerows would help to screen the site, reducing the impact of traffic noise as well as providing cover and food for wildlife. Smaller areas of hedgerow and scrub planting would be undertaken to screen the southern

and eastern boundaries of the wildflower meadow area and to reduce potential disturbance to the adjacent properties.

Managed woodland

2.1.10. Several trees across the site require management. As part of the habitat enhancement measures some trees would be totally removed, whilst limbs would be removed from others, particularly where these were considered to represent a risk to humans.

Stream improvements

2.1.11. Locally along the course of the existing stream opportunities would be taken to increase the diversity of the riverbank and to create different features, such as small areas of re-profiling and the insertion of coarse woody debris.

2.2. Infrastructure elements

Pond dipping platform and boardwalk

2.2.1. A footpath and boardwalk would be constructed from the existing pavement along Bath Road to connect back to the pavement and to also lead to the pond dipping platform and the wildflower meadow area. The boardwalk would allow access for all over damp or soft ground and would have handrails and trip guards to prevent ingress into areas of standing water.

2.2.2. A small pond dipping platform would be established on the margin of one of the pools on the enhanced channel wetland adjacent to the meadow. This would be a simple structure with handrails constructed from wood or recycled plastic. The structure would extend over the water to allow visitors to look directly into the water (see DWG#PR088/004). Examples of possible materials and designs for the footpaths and pond dipping platform are shown in DWG#PR088/005.

Spoil disposal

2.2.3. All material excavated material would be disposed of on-site outside of the EA flood zones. It has been estimated that the maximum amount of spoil to be generated should not exceed 500m^3.

2.2.4. The spoil would be used to back-fill the existing drain and it would also be graded into existing ground levels to create the meadow area beyond the limit of the indicative floodplain. The ground elevations in these areas would be raised by between approximately 0.25 and 0.5m above existing levels. No area would be elevated above the maximum ground elevation current present at the site.

3. Constraints and opportunties

3.1. Constraints

3.1.1. In developing the designs a series of constraints have been identified and addressed. The following have been considered:

Protected species

3.1.2. ARK has conducted surveys for protected species within the vicinity of the site. No protected species have been identified from the areas proposed for habitat creation works. Mitigation measures would be established to address any other protected species issues such bats and breeding birds

Designated sites

3.1.3. Freeman's Marsh SSSI approximately 2km to the east of the site. The River Kennet Site of Special Scientific Interest (SSSI) occurs approximately 900m downstream from the current confluence of the storm water drain and the River Kennet. Savernake Forest SSI lies some 850m to the south of the site.

Aviation hazard

3.1.4. No airports are present within the International Civil Aviation Authority's recommended standard 13km radius safeguard zone. RAF Lyneham, Upavon and Netheravon airports are all beyond the 13km cut off distance.

Nitrate Vulnerable Zone

3.1.5. The site lies within a Nitrate Vulnerable Zone. However, other than improving the quality of the storm water discharge no change to groundwater condition is expected.

Reservoirs Act 1975

3.1.6. The total volume of water to be held in the wetlands will be considerably less than 25,000m^3 limit specified in the Reservoirs Act, 1975.

Services

3.1.7. Several utilities and services are present within and immediately adjacent to the site:

- A Thames Water foul sewer crosses the area to the south of the proposed meadow area and a clean water main following the course of the pavement adjacent to the north boundary of the site.
- Virgin Media have a duct trench following the course of the pavement adjacent to the north boundary of the site.
- SSE has buried services following the course of the pavement adjacent to the north boundary of the site.

- BT has buried services linked by two manholes along the course of Bath Road and overhead cables at the far north east corner of the site.

3.1.8. The designs have been undertaken to ensure that none of the existing services would be impacted. Excavations in the vicinity of buried services are all proposed to be shallow and retain appropriate wayleaves. However, prior to commencing work on site utility operators would be contacted to arrange a site inspection to ascertain the precise location of services.

Archaeology

3.1.9. The site does not support any scheduled ancient monuments.

3.2. Opportunities

Water quality improvement

3.2.1. The objective for the Froxfield Community Meadow and Wetland is to develop an area of habitat which would provide multiple benefits for the local community as well as benefitting local wildlife. However, the wetland features would also provide a positive impact on water quality.

3.2.2. Currently the drain offers very limited attenuation of flow or opportunity for removal of water vectored contaminants which may be generated from the road. The road discharge would taken through a wetland area which will be planted with a dense stand of emergent plants prior to discharging into the existing culvert and wider drainage system. The wetland has been designed to maximise the residence time of water in order to facilitate the removal of water vectored contaminants.

Wildlife enhancement

3.2.3. The Froxfield Community Meadow and Wetland would provide multiple benefits for the local community as well as benefitting local wildlife. For instance, the wetland areas have been designed with a variety of depths and different micro-niches which would greatly enhance the local habitats and complement the stream. The meadow community would be planted with wildflowers and local grass species adding diversity to the existing woodland and scrub habitats. A range of wildlife, including water voles, bats, amphibians, dragonflies, bees, reptiles and birds would benefit from the new habitats.

Amenity and recreation

3.2.4. Currently there is very limited public access to the area. Access would be enhanced considerably after the construction of the habitats. The footpaths and boardwalks would provide ease of access for all to the area. The small dipping platform would provide access across areas of waterlogged ground and standing water. New paths would be constructed to facility improved access to the land The boardwalks would have handrails in the vicinity of

open water. The gradient of the boardwalk has been designed to facilitate access for all. Visual access from the pavement along the north eastern part of the site will be greatly enhanced, whilst hedgerow and scrub planting would ensure that the privacy of the residents to the south of site is maintained. Thickening up of the understorey vegetation, especially scrub areas, would be encouraged as part of the longer-term management of the site in order to ensure that the privacy of the residents in the properties to the south is maintained.

Other opportunities

3.2.5. In addition to the improvement of water quality, enhancements of local biodiversity and amenity/recreation benefits, the wetland, as part of a larger mosaic of habitats managed by ARK would also provide the following benefits for a variety of different local beneficiaries in and around Froxfield:

- Regulation of local climate and reduction of summer maximum temperatures.
- Pollination of local crops and gardens.
- Educational and learning opportunities.
- Art, drawing and painting opportunities.
- Physical and mental well-being benefits.
- Aesthetic enhancements.

4. Management and maintenance

4.1. Vegetation establishment

4.1.1. The wetland would either be planted with commercially grown plugs or locally-sourced, translocated material would be used. During planting it is essential that non-native invasive plants are not introduced therefore site supervision by a suitably qualified ecologist would be required. During establishment it may be necessary to erect temporary fencing to reduce grazing pressures from deer, rabbits and water birds such as coot.

4.1.2. The meadow would be sown with a wildflower mix and possibly enhanced with plug planting of certain species. The hedgerow would be planted with common, native species that provide both a screening role and a support to the wildlife on the site. Grazing control measures would be required to protect whips and plugs during the establishment phase.

4.2. Long-term management

Water level management

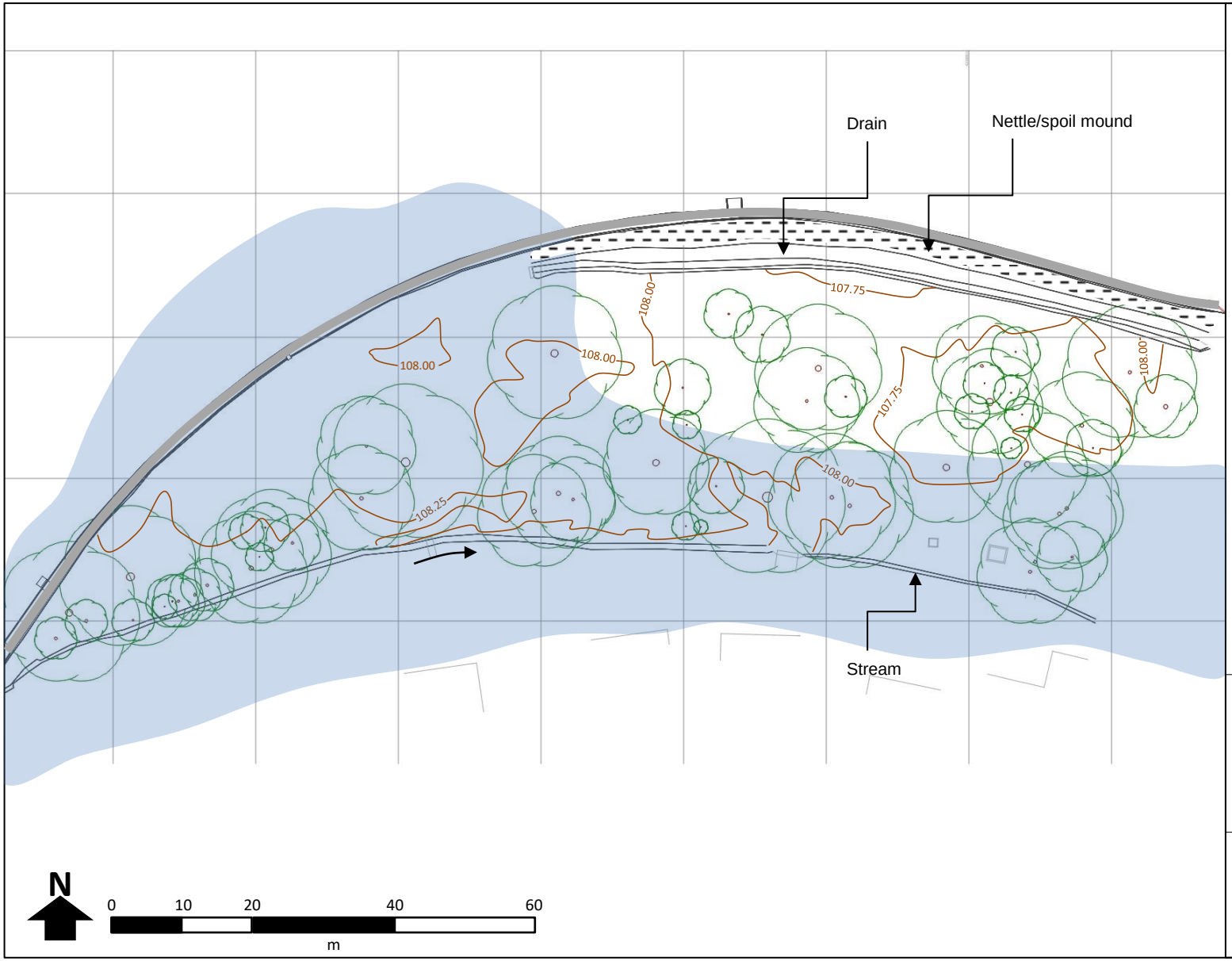
4.2.1. Normal operating water levels would be set and controlled by the existing culverts so no active water management would be required.

Vegetation management

4.2.2. The vegetation within the wetland should require minimal maintenance. Routine checks should be undertaken to ensure that significant die-off of plants has not occurred or that the area has been damaged by grazing pressure. If die-off has occurred then plants need to be replaced.

4.2.3. The meadow areas will require light mowing to prevent scrubbing up and to ensure the diversity of the sward is maintained.

5. Appendix 1 – Drawings



Existing Pavement

Existing trees

Approximate limit EA Flood Zones 2 and 3

Approximate extent of nettle covered spoil mound

Major contours (0.25m intervals - mAOD)

Project:
Froxfield Community Meadow & Wetland

Client:
ARK (Action for the River Kennet)

Title:
Current situation

DWG#:
PR088/001

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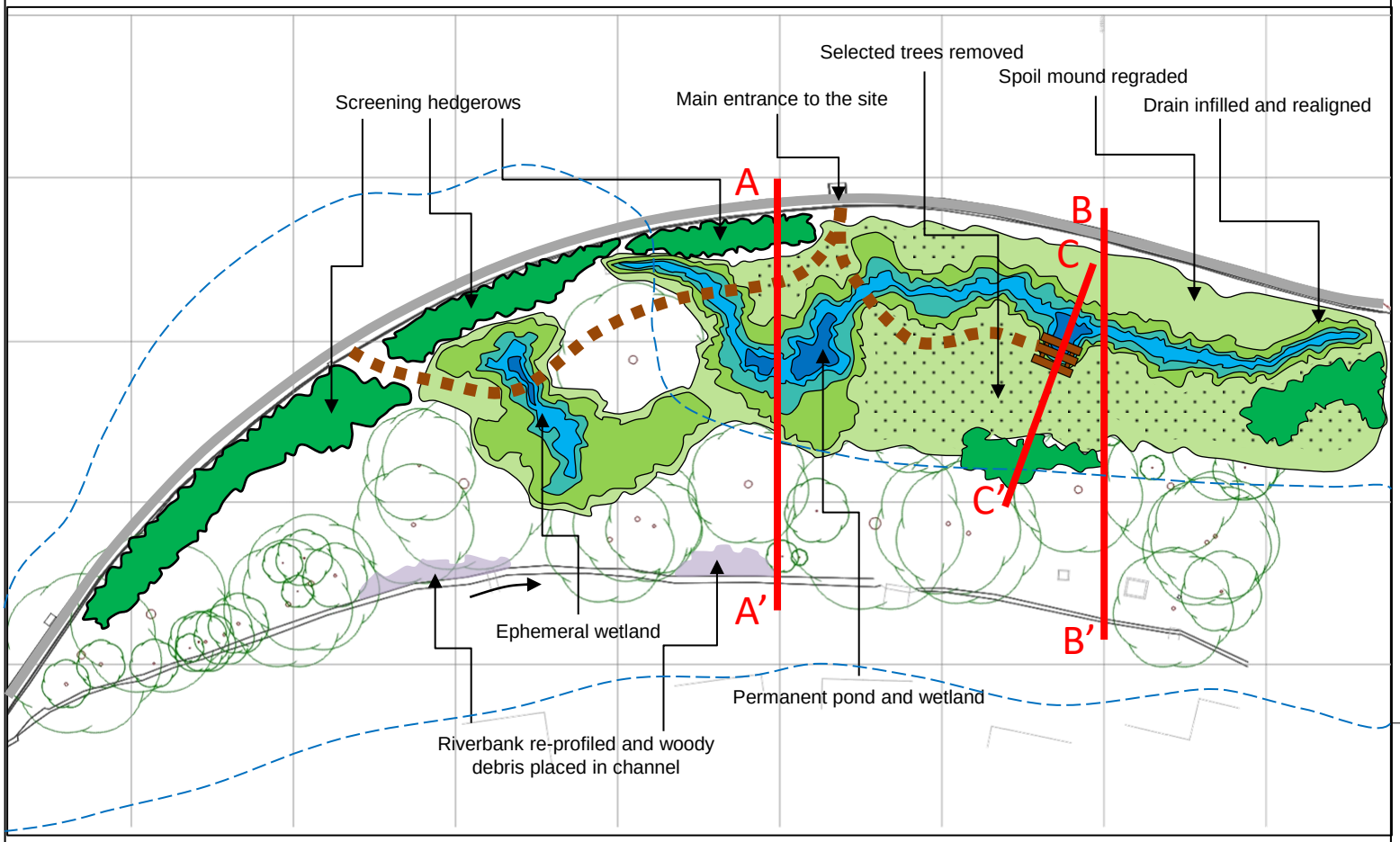

Existing Pavement

Existing trees

Boardwalk/footpath

Platform

Open water

Wetland vegetation

Meadow grassland

New hedgerow/scrub

Bank re-profiling and woody debris

Spoil disposal area

Approximate limit EA Flood Zones 2 and 3

N

0 10 20 40 60

m

Project:
Froxfield Community Meadow & Wetland

Client:
ARK (Action for the River Kennet)

Title:
Concept design

DWG#:
PR088/002

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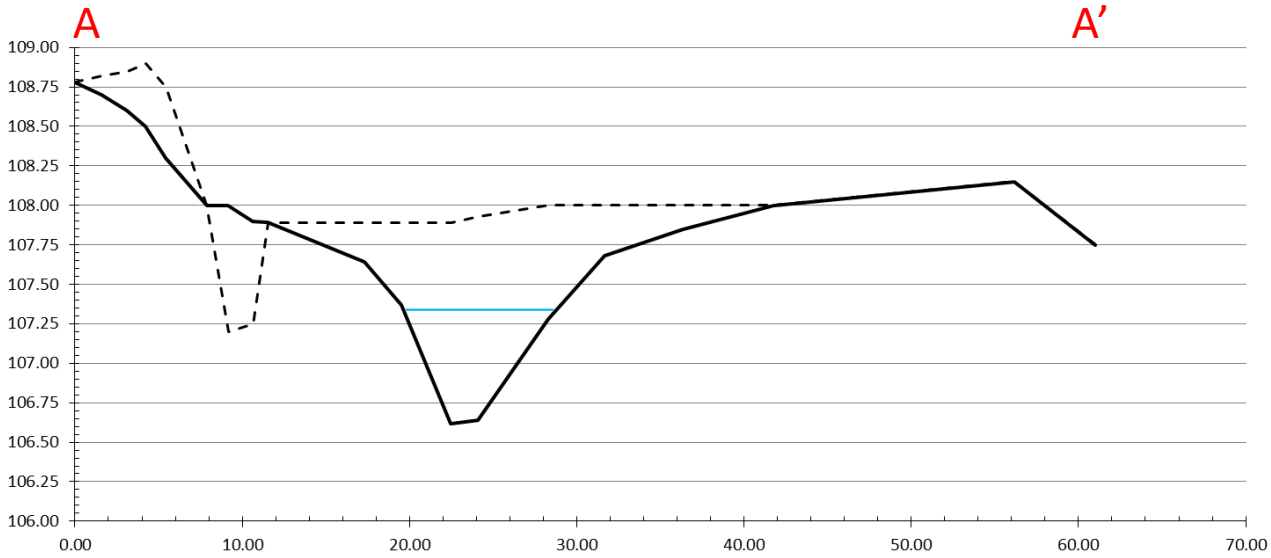

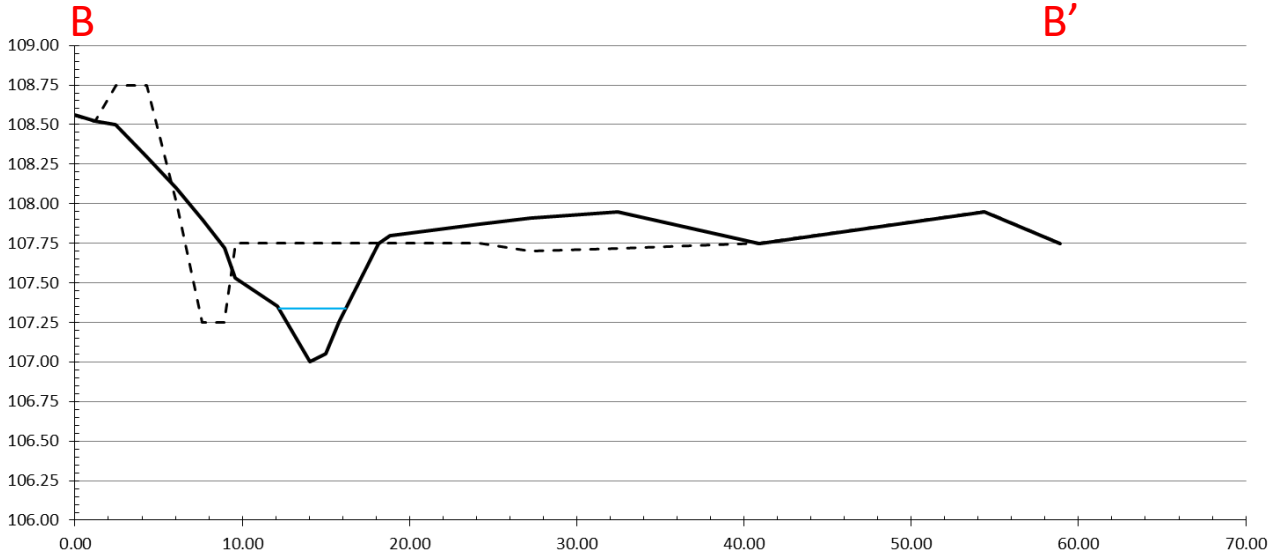

Notes:
1. x10 vertical exaggeration
2. Heights in mAOD
3. For location of sections see DWG#: PR088/002

Existing ground level

Proposed ground level

Approximate normal water level

Project:
Froxfield Community Meadow & Wetland

Client:
ARK (Action for the River Kennet)

Title:
Sections

DWG#:
PR088/003

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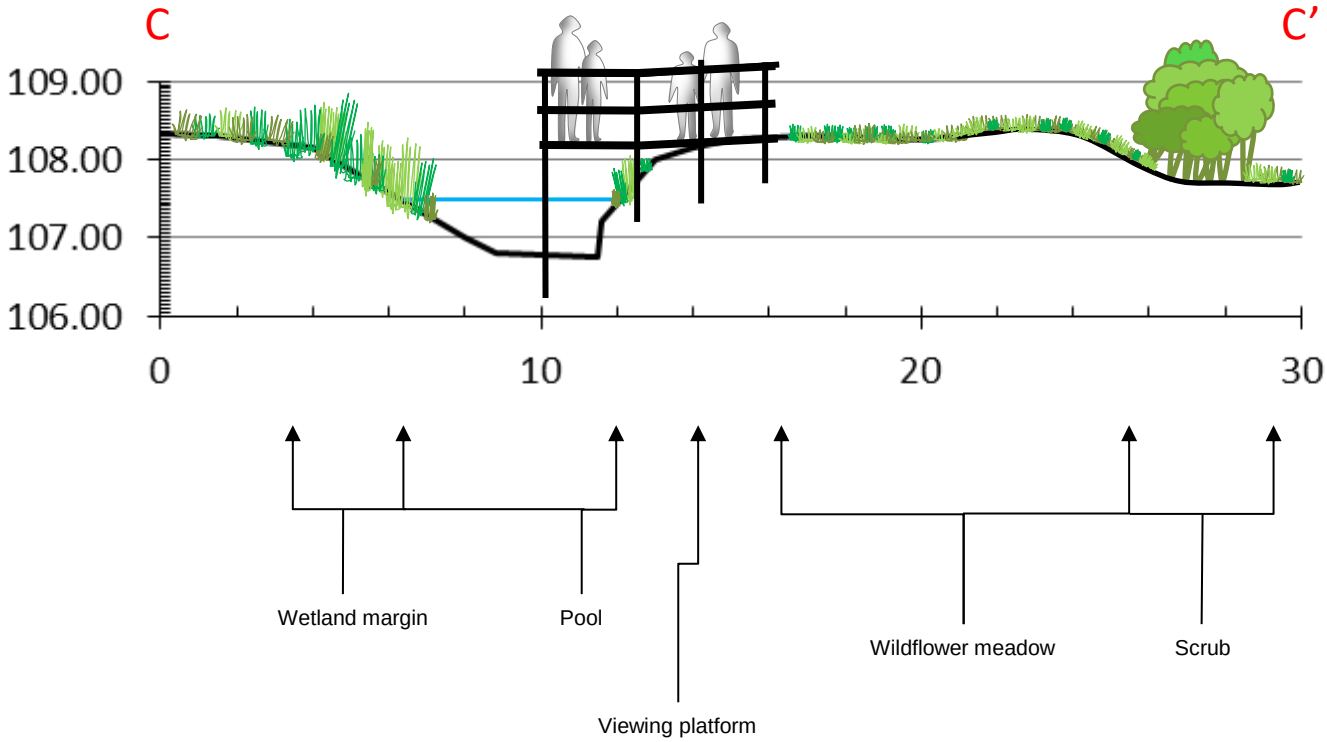

Notes:
1. x2 vertical exaggeration
2. Heights in mAOD
3. For location of sections see DWG#: PR088/002

Proposed ground level

Approximate normal water level

Project:
Froxfield Community Meadow & Wetland

Client:
ARK (Action for the River Kennet)

Title:
Viewing platform section

DWG#:
PR088/004

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Notes:

Project:
Froxfield Community Meadow & Wetland

Client:
ARK (Action for the River Kennet)

Title:
Examples of boardwalks and viewing platforms

DWG#:
PR088/005

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