

# Technical Note

Project:	SKIRTING AND WHANGS BECK FRMS <b>5166264</b>		
Subject:	Whangs Beck Access Track Drainage Strategy		
Author:	Chris Hall		
Date:	22/03/22	Project No.:	5166264
Distribution:	Representing:		

## Document history

Revision	Status	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	A1	Final DRAFT	CH	JR	SB	MK	22/03/22

## Client signoff

Client	Environment Agency
Project	SKIRTING AND WHANGS BECK FRMS
Project No.	5166264
Client signature / date	

---

# 1. Introduction

The introduction of access tracks at Whangs Beck (North of the Orgill estate) within Egremont will result in a minor change to the surface water run offs expected from within the site. Therefore, an assessment has been carried out at a high level to assess whether additional drainage measures are required to compensate.

Two flood storage areas have previously been constructed within this valley to act as attenuation during periods of heavy rainfall, acting to reduce the risk of flooding posed by Whangs Beck.

# 2. Existing situation

The construction of two reservoirs within the Whangs Beck valley will significantly reduce the surface water run off expected from this site, with water intercepted before reaching Baybarrow Road. The Upper reservoir empties into the existing Whangs bypass culvert, while the Lower is connected into the highway's drainage and releases water at 60l/s.

The two reservoirs combined provide an active storage of ~10000m<sup>3</sup>.

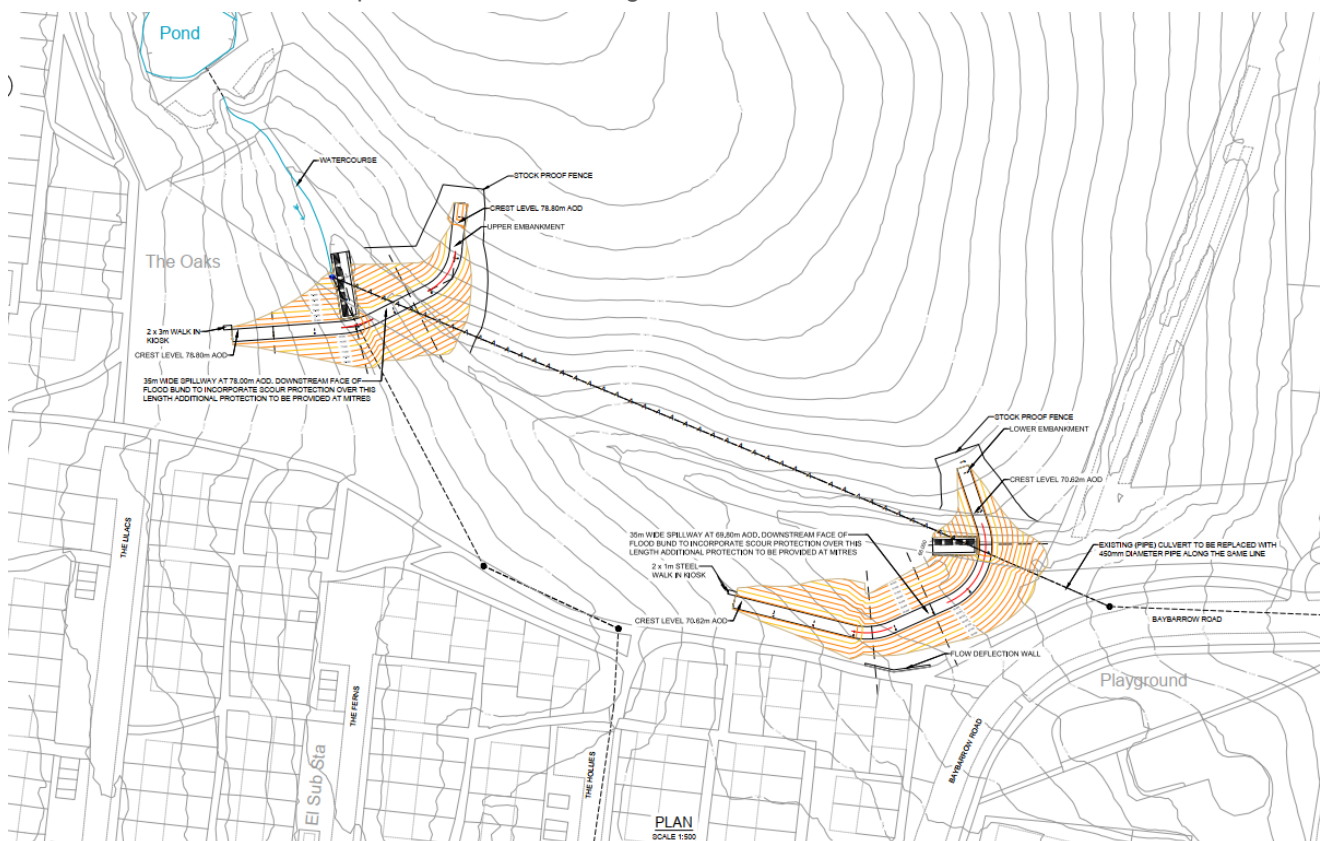


Figure 2-1 - Whangs Upper and Lower Reservoirs general arrangement

# 3. Proposed changes

In addition to the scheme mentioned in Section 2 two new access tracks have been proposed. The outline designs for these are shown in Figure 3-1 and Figure 3-2.

The aim of the scheme is to provide easy access for the Environment Agency to maintain their new embankments and to allow for quick mobilisation to site if needed during an event. A Planning application is being progressed, with a S278 agreement to follow.

### 3.1. Whangs Upper Access Track

The access track for the upper reservoir incorporates an existing concrete access track, requiring minimal changes to the highway. The majority of the new access track will be constructed from grasscrete to provide a reliable, hardwearing surface for maintenance vehicles. The grasscrete will impact the infiltration of surface water and is likely to nominally increase the surface run off; however, this does provide a significantly higher rate of infiltration when compared to tarmac or concrete which were both considered. Research<sup>1</sup> indicates that the surface water increase resulting from the installation of grasscrete was “exceedingly low”, with an infiltration of rate of approximately 90% of the original ground.

Due to the location of this track and the topography of the site, it is clear that any additional run off will be intercepted by the lower reservoir before being steadily released into the existing surface water network. The impact of this work is therefore expected to be negligible.

The upper access track would require the installation of 392m<sup>2</sup> of grasscrete, replacing the existing grass cover. Given the approximately 90% infiltration rate of grasscrete when compared to grass, the additional run off generated by this work is the equivalent of just 39.2m<sup>2</sup> of tarmac.

Using the Modified Rational Method (MRM) with a design rainfall intensity for a 30year 15min storm duration (+20% climate change) of 60.76mm/hr, produces a peak flow rate of 0.66l/s. This flow is negligible and will follow the track down towards the proposed area of attenuation so won't make any impact on local flood risk.

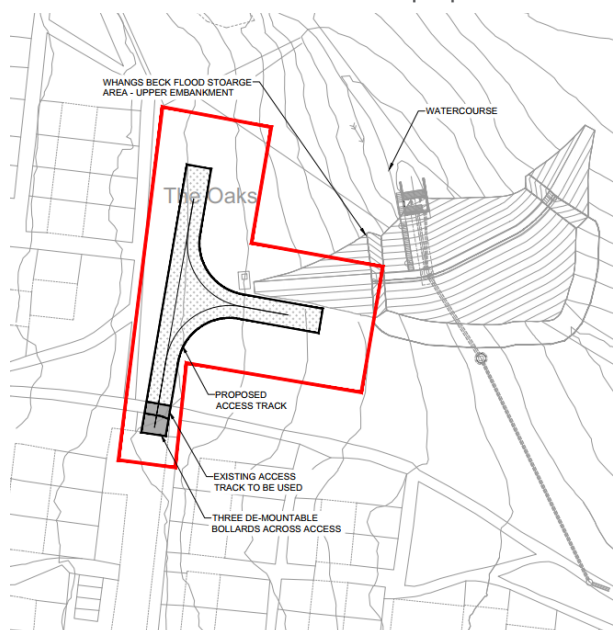


Figure 3-1 - Whangs Upper Reservoir - Proposed Grasscrete Access Track

### 3.2. Whangs Lower Access Track

Similarly, to the upper track, the lower access track is largely comprised of grasscrete, with the exception of where it clashes with existing footpaths. Any existing tarmac footpaths will be replaced to match the existing, including levels, gradients, and material, therefore not resulting in any change to surface run off.

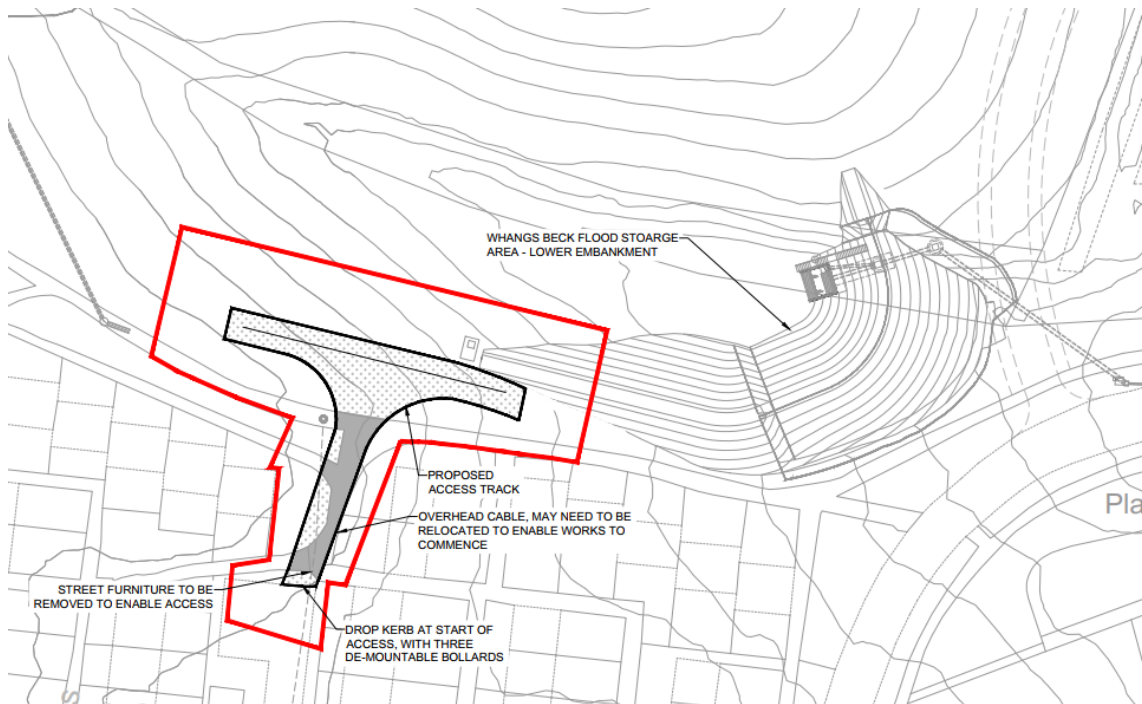
The grasscrete is expected to contribute nominally to the surface run off from the site due to its slightly lower infiltration rate compared to normal grass cover.

The proposed access track at Whangs lower has a total area of 454m<sup>2</sup>, of which 94m<sup>2</sup> is existing tarmac footpath. Therefore, the area of grass replaced by grasscrete is 360m<sup>2</sup>. With an infiltration rate of approximately 90% of grass the additional run off resulting from this work will be the equivalent of 36m<sup>2</sup> of tarmac.

<sup>1</sup> Grasscrete the environmental paving solution – Grass Concrete Limited

---

Using the Modified Rational Method (MRM) with a design rainfall intensity for a 30year 15min storm duration (+20% climate change) of 60.76mm/hr, produces a peak flow rate of 0.61l/s. This flow is negligible and will follow the track down towards the proposed area of attenuation so won't make any impact on local flood risk.



**Figure 3-2 - Whangs Lower Reservoir - Proposed Grasscrete Access Track**

## 4. Conclusions

In conclusion, as a result of the significant works undertaken on site as part of the Skirting and Whangs Flood Risk Management Scheme and the limited nature of the proposed access tracks, it is expected that there will be a negligible increase in surface water flows from the two access tracks. A significant percentage of which would be intercepted by the lower reservoir, before being slowly released into the existing surface water network.

---