

Technical Note

Description:	Fen Ditton Cycleway	To:	Fen Ditton Parish Council
Reference:	Paddock Retaining Solutions	From:	John Wetton
Date:	8 th January 2019	cc:	Vanessa Kelly, Grant Weller

1 Introduction

1.1 Background

The project aims to improve cycling and walking on Ditton Lane and Horningsea Road. This route is extensively used by cyclists heading to Newmarket Park & Ride and Marshalls. In the future, the new foot and cycleway is also likely to be used by those travelling to the Wing housing development by Newmarket Road.

The project consists of the creation of a shared use footway/cycleway on the East side of Ditton Lane, between Fison Road and High Ditch Road, 2.5m in width. This will require the regrading of the existing embankment adjacent to the paddock, along with slope stabilisation or gravity retaining solution. Between High Ditch Road and Fen Ditton Primary School, the shared use facility will be widened on both sides up to 2.5m.

The Hitch Ditch Road junction will be upgraded to include a raised table and vehicle over-run areas and well as crossing points relocated to the desire line. The Fison Road junction will amended to provide wider shared use facilities and all signal controlled crossings will be upgrade to toucan crossings.

1.2 Purpose

The solution chosen to retain the embankment and provide a sufficiently wide footway/cycleway adjacent to the paddock could have significant implications on cost, programme and disruption to road users/local residents. This note sets out the potential solutions and provides a high level analysis of the perceived benefits and risks, so that an informed decision can be made.

2 Options

2.1 Slope stabilisation

During the initial design phase, various parties, including the Parish Council, were consulted on the most appropriate solution for retaining the paddock, with a stabilised slope being the preferred. This was taken forward to detailed design and included in the construction package.

Slope stabilisation can be achieved in a number of ways, such as soil nails, ground anchors or a geogrid. They will result in a steepened embankment which, when combined with a topsoil retention system, can be seeded and would to all intent and purposes be a steeper version of the existing arrangement, thus maintaining the visual character of this part of the village.

The method of construction would vary depending on the solution chosen. If soil nails or ground anchors were preferred, a drilling rig would need to be sited at the bottom of the embankment and suitably sized holes drilled for the anchors/nails to be installed. The drilling rigs need around 5m of working room, therefore overnight closures of Ditton Lane would be required for around 4 weeks. If a geogrid solution was chosen, the current embankment would need to be excavated and built back up in layer using a geogrid membrane. Closure of Ditton Lane wouldn't be required, but there would be increased disruption to the paddock.



Figure 2.1 – Stabilised slope with topsoil retention

Benefits

- Results in green embankment which will maintain the visual character of this part of the village

Disbenefits

- Requires road closures. The A14 will be used as a diversion route and therefore closures cannot take place at the same time as works on the A14 project. Closures will need to be co-ordinated with Highways England, which may require a number of visits
- Potential noise impact during night time drilling works for nails/anchors and risk the Environmental Health Officer will intervene
- Requires an easement with the paddock land owner

2.2 Full height retained solution with planting

Another option would be to retain the paddock with a full height retaining structure which would allow some planting/climbers along the face, such as a crib wall or gabion baskets.

Gabion baskets are stone filled mesh baskets that are stacked to provide a gravity retaining solution. The type of stone used can be specified to match that of the surrounding area and small levels of climbers can be incorporated from the top or base. Crib walls are constructed from interlocking concrete, wood or plastic components which are then filled with stone. Planting can be incorporated into the voids on the face to improve the visual appearance.

Both of the above options would require the existing embankment to be cut back temporarily. The new crib wall/gabions would be installed from the footway/carriageway under temporary traffic lights during the day by either stacking and filling the crib units, or assembling, filling and stacking the gabion baskets on a prepared foundation. The retaining feature would then be backfilled and any planting included.



Figure 2.2 – Timber crib wall with planting

Benefits

- Doesn't require an easement with the paddock owner
- Low cost and simple to construct
- Can be constructed during normal working hours and without road closures, therefore Highways England do not need to be consulted

Disbenefits

- An engineered solution, albeit with some planting
- Limited crib materials (Concrete, wood or plastic)

2.3 Reduced height solid wall

The third option is to retain the embankment with a brick, block or concrete retaining wall. The reduced cross-sectional width of such a solution compared with a gabion/crib wall would mean that the wall could be shorter (a maximum of around 0.8m) and some of the existing embankment retained.

To construct the retaining wall, the existing embankment would be cut back temporarily. If using blockwork or other proprietary system, the units would be laid/installed as per the manufacturers' recommendations using a mortar/dowels on a prepared foundation. If a concrete solution was chosen, steelwork and formwork would need to be erected before concrete was poured to the relevant height. This solution could be installed from the footway/carriageway under temporary traffic lights due to the low height of the wall.

There are numerous products on the market with a variety of materials and colours. Therefore the wall can be specified to match existing materials in the area or something that complements the setting.



Figure 2.3 – Blockwork wall with embankment

Benefits

- Doesn't require an easement with the paddock owner
- Low cost and simple to construct
- Can be constructed during normal working hours and without road closures, therefore Highways England do not need to be consulted
- Large palette of materials for the retaining wall

Disbenefits

- An engineered solution, albeit with some of the existing embankment retained

3 Conclusion and Recommendations

There are a number of potential retaining solutions to enable the construction of the footway/cycleway adjacent to the paddock. All the options require an engineered solution which must balance complexity of construction and disruption against final visual appearance.

Although the preferred option in terms of visual appearance, slope stabilisation comes with a number of risks, particularly relating to securing sufficient night time road closures and the disruption to residents caused by the works throughout the night. On balance, it is therefore recommended that a full height crib/gabion or reduced height wall are taken forward. Views should be sought on the preferred wall type and materials/colours used.