



National Asset Delivery Technical Surveys and Testing

569243 - A46 NB SB Sixhills Geotech – Water Erosion

Site Information

1 SITE INFORMATION

1.1 Name of Contracts

The contract is A46 NB SB Sixhills Geotech – Water Erosion

1.2 Description of Sites

The site is situated on two embankments, on opposite sides of the A46 carriageway, just north of Sixhills.

Defective earthworks are identified on the Highways Agency Geotechnical Data Management System with the following earthwork ID's; 21538, 21560. The earthworks are situated on opposite sides of the carriageway to one another, between:

- Start NGR: 464537, 322031
- End NGR: 464553, 322202

The major defects on both earthwork are situated in close proximity to a culvert that is thought to be a major factor in the defects development due to the constant flow of water being carried by the culvert. The most prominent are outlined on drawing number HE569243-KIER-HSC-A46 SixHills-DR-EN-0600_02.

The location of the defective site is shown in

Figure 1. Photographs of the site, taken from Google Earth, is given in Figure 2.

Figure 1: A46 Sixhills Site Location

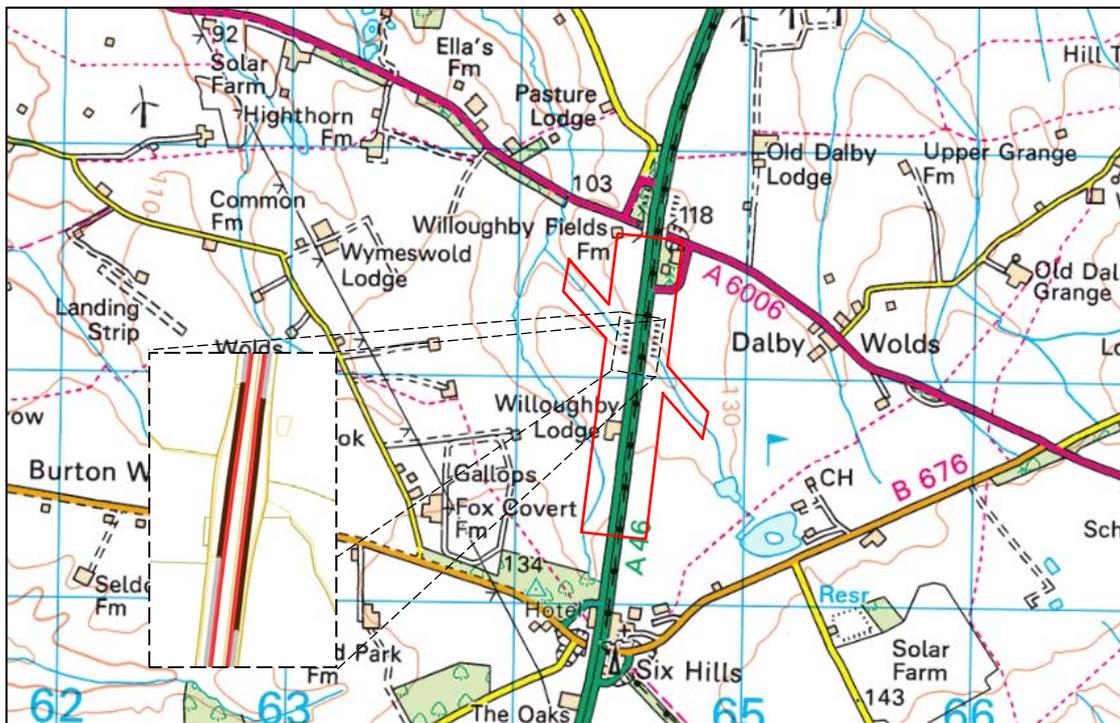


Figure 2-5: A46 Sixhills Site View





1.3 Known Earthwork Defects

Major Defect

Northbound Earthwork (EW: 21538)

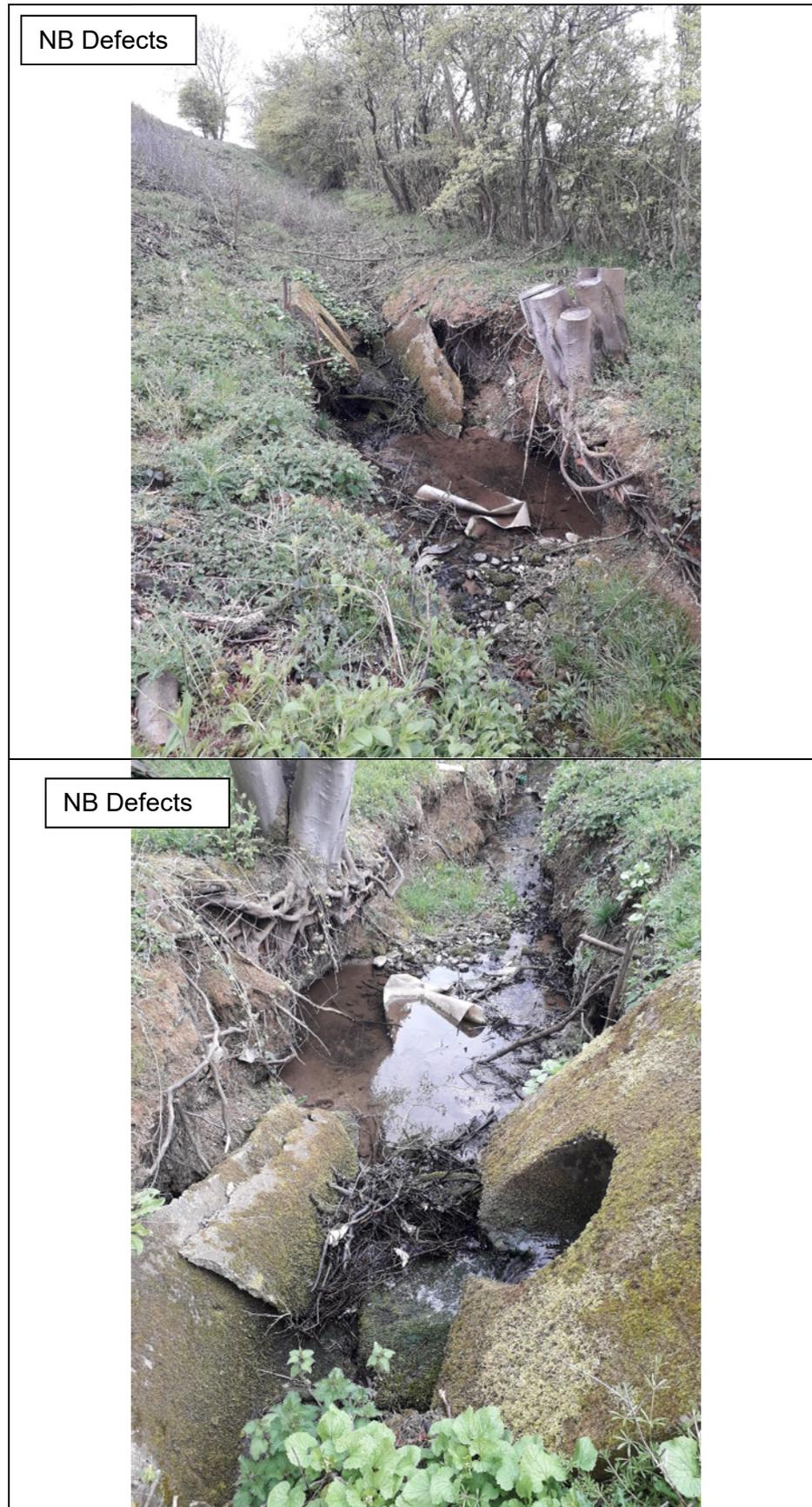
The northbound embankment hosts two significant earthwork defects. The first main defect relates to the defective drainage associated to the earthwork. A culvert outlet headwall has become undermined through water erosion due to the constant flow of a stream through the culvert that runs perpendicular to the earthwork, projecting the stream water directly onto the unlined ditch. Subsequently, the unlined ditch has become severely undermined on either side and resulted in the earthwork toe overhanging the ditch. The second main defect pertains to clay pipe drainage existing on the earthwork slope and has been subject to freeze-thaw over the years and shattered. The drainage water now flows out onto the earthwork toe and has resulted in a large gorge developing. The earthwork hosts geotechnical defects such as a soil bulge at the toe of the slope and substantial subsidence across the earthworks mid slope. It is not yet conclusive whether these defects have developed due to the defective drainage associated to the earthwork. Dense vegetation obscures the earthwork making the full extent of the defects uncertain.

Southbound Earthwork (EW: 21560)

The southbound embankment hosts two significant earthwork defects. Both defects consist of large 1m soil slips near the crest with the addition of tension cracks, animal burrows and soil bulging. The defects are located in close proximity to the culvert, which has caused issues on the northbound earthwork, and has therefore raised questions as to whether the southbound earthwork is in a similar condition which can only be investigated once vegetation is cleared. Historic observations of an “undermined pipe” have been recorded on the earthwork but could not be elaborated upon or confirmed whether it relates to the culvert inlet due to dense vegetation. There are also a number of observations relating to water erosion channels down the earthwork face.

Other defects may be present and revealed by the survey.

Figure 6-12: Photographs of major defects (Ratcliffe)



NB Defects



SB Defects





1.4 Main works proposed and purpose of this contract

A survey is required to provide information to facilitate the design of repairs to geotechnical defects observed on the earthwork and defective drainage pertaining to the earthworks.

1.5 Hazardous ground, land affected by contamination and notifiable and invasive weeds (Clauses 3.7.1 and 3.22)

Hazardous ground, ground contamination and invasive weeds are not recorded as present and are not anticipated, but cannot be ruled out.

There are no records of asbestos on this section of the network, but the presence cannot be ruled out.

1.6 Vegetation Constraints

Vegetation requires clearing from the site in order for the surveys and investigations to be carried out effectively. A vegetation clearance plan has been included in drawing HE569243-KIER-HSC-A45 Sixhills- DR-EN-600_02.

1.7 Information on services not shown on Contract drawings –

The Statutory Undertakers information has been combined into drawing HE569243-KIER-VUT-A46 Sixhills-DR-CE-0600_003 to 0600_012. Drainage layout is outlined in drawing: HE569243-KIER-HGT-A46 Sixhills-DR-CE-0600_001.

The HADDMS drainage inventory indicates:

- The carriageway surface water drainage is by kerb drainage on the southbound carriageway and open channel within the verge of the northbound carriageway.
- Unlined ditches are at the toe of both the north and southbound embankments with a culvert, passing beneath the A46, connecting the two ditches.
- A small watercourse also flows from the southbound ditch, through the culvert, and into the northbound ditch, where it is then diverted off network.

1.8 Protected species (Clause 3.7.4)

An environmental alert form has been submitted and awaiting an environmental survey on the site extents. Relevant information will be provided.

1.9 Archaeological remains (Clause 3.7.5)

None known.

1.10 Environmental Alerts

See the following document: HE569243-KIER-EGN-A46_SIXHILLS_Z-RP-LE-01_ENVIRONMENTAL_ALERT_FORM_RF, which forms part of the TST documents package.

1.11 Restricted working hours (Clause 3.13)

No local restrictions over and above that in the Works Information.

1.12 Hygiene facilities– depot locations

The nearest depot to the site is on the M1 at Junction 23, on the western side of the junction.

1.13 Access to site

Access to the site is off the A46 North and Southbound carriageways. Traffic management will be provided, closing lane 1.

1.14 Extents of survey (including reference to a drawing)

See drawings HE569243-KIER-VDS-A46_Z-DR-CD-0500_03.

1.15 Drawings Statutory Utility drawings (include the original returns)

C2 stats returns are included in drawing HE569243-KIER-VUT-A46 Sixhills-DR-CE-0600_003 to 0600_012.