

Rotherwas Access Road

Archaeology Method Statement

Issue 2

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Part of Amey plc



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1. Introduction

Following the discovery of the feature the necessity to avoid damage to the feature was established.

Giffords were commissioned by Herefordshire Council to complete a preliminary design of a protective layer.

Owen Williams reviewed this design and, using the depths of protection required, raised the alignment of the road and associated roadside features by approximately 1m. Owen Williams then developed the detailed design and issued to English Heritage for approval.

Following comment back from English Heritage and discussions with the Contractor, the design was developed further and a method for construction established.

2. Design

The voids within the feature such as the Roman Trench and the fire pits need to be filled to prevent voids being created below the first layer of Geotextile. This fill material should have similar strength and permeability qualities as the surrounding ground to avoid differential settlement.

The first geotextile layer should have the same permeability as the overlying sand. Teram 1000 is specified which has a permeability of 10^{-3}m.s^{-1} , similar to that of sand.

The sand shall be naturally-occurring clean sharp sand graded to BS 7533-3, Annex D, Category IV.

- Free from deleterious salts, contaminants and cement.
- Obtained from only one source and ensure that all sand supplied has consistent grading.
- Maintained at even moisture content which will give maximum compaction. Sand squeezed in the hand should show no free water and bind together when pressure is released.
- The thickness of sand layers is to be approximately 150mm with the total depth of the sand layer not falling below 250mm. Maximum thickness will vary to suit local ground undulations.

The overall thickness of the sand shall be not less than 250mm. The sand layer will accommodate a settlement monitoring device of a type to be confirmed.

The Geogrid shall be Tensar TX160 or SS30 depending upon material availability.

The granular fill shall be 150mm 6F2 imported capping material, this is different to the Type 1 material specified by Giffords. We believe the capping material will better distribute the loads.

A further layer of Geogrid above the 6F2 material shall again be either Tensar TX160 or SS30.

Additional 6F2 fill shall be added above the last Geogrid layer to the bottom of the first bound carriageway layer. The minimum depth shall be 150mm as per the roadbase thickness for the road.

A summary of the layers above the archaeological feature can be seen in Table 1 below.

Layer Description	Minimum Layer Thickness
Carriageway Surface Course (Bound material)	35mm
Carriageway Binder Course (Bound Material)	60mm
Base (Bound Material)	255mm
Type 1 Sub-base Material	150mm
Tensar TX160 or SS30 Geogrid	0mm
6F2 Imported Capping Material	150mm
Tensar TX160 or SS30 Geogrid	0mm
Clean Sharp Sand	250mm
Teram 1000 Geotextile	0mm
Total Minimum thickness	900mm

Table 1 – Protective Layers

A calculation of the maximum loading on the carriageway combined with the total overburden gives a pressure on the surface of the archaeological feature of 70kPa.

We do not believe that under these loading conditions there will be any deformation of the ground. However, strength tests will be undertaken adjacent to the feature prior to the protection works being undertaken to confirm the bearing capacity of the ground.

3. Method Statement

This method statement is for the protection of the archaeological feature found at chainage 2300. It is to be read in association with drawing number 550370-SK-204 revision C.

3.1 General Guidance

All work will be completed under the close supervision of the Archaeologists from Worcestershire Council Historic Environment and Archaeological Services.

No plant will be allowed to track on the surface of the archaeological feature until the first geotextile layer and first layer of sand is laid. At this point only the approved compaction equipment will be allowed to track over the feature.

Personnel will not be allowed to walk on the feature until the first geotextile layer has been laid. Prior to this stage access onto the feature will only be allowed via the routes agreed with the Archaeologist on site (along routes already removed due to the roman ditch and land drains).

3.2 Activities

1. Divert two land drains away from the feature. This must be done without the excavation or damage to the feature itself.
2. backfill the Roman ditch, fire pits and other severe excavations to create a relatively flat surface to avoid the geotextile bridging any holes to create voids. Backfill material to be sourced locally and place using an excavator arm long enough to reach without encroaching on the feature, if this is not possible the material will be brought in by wheel barrow. Take care to avoid

spilling fill on the exposed feature. Compact fill under strict guidance of the Archaeologist using hand held compaction equipment only.

3. Undertake a level survey of the surface for use later to ensure required protection depths are constructed.
4. Lay the first layer of geotextile (Terram 1000) starting from north end and rolling uphill. Leave 3m at the northern end to be wrapped over sand layer. Ensure overlaps of at least 300mm between geotextile sheets. Roll as far south as the diverted field drains allow.
5. Construct chambers for monitoring stations.
6. Place 150mm of the sand adding greater depth to a maximum of 250mm to even out undulations. Compact with a deadweight Bomag 120 roller (2.3Tonnes). Check levels and add sand as necessary.
7. ITM Limited to lay casing from monitoring chambers.
8. Place a further 100mm of sand adding greater depth to a maximum depth of 250mm to further even out undulations. Compact with a deadweight 4 Tonne roller. Check levels and add sand as necessary.
9. Wrap over the 3m of geotextile onto the top of the sand layer. Lay Geogrid (Tensar TX160 or SS30) onto sand layer starting from the North and roll south to the limit of the current sand layer.
10. Place 150mm 6F2 material and compact with a vibrating Bomag 120 roller. 6F2 material to overlap the end of the sand layers by 2m. Check levels and add 6F2 as necessary.
11. Lay final layer of geogrid from the North and roll south to the limit of the Type 1 layer.
12. Overlay with at least 500mm of general fill and compact as necessary, then open north end of feature up as a haul road.
13. Excavate for ditch at the south end of the protection layer to pick up the land drains. Install impermeable layer to sides of the ditch. Utilise the existing trench though the feature, cut during the early archaeological investigation, to minimise damage to the feature. Remove the temporary land drains.
14. Repeat activities 3 to 11 above until the whole feature is covered and protected but with the addition of the settlement monitoring equipment into the sand layer (details to follow).

4. Monitoring

The method for the future monitoring of the feature for settlement following the opening of the road has been investigated. Soil Instruments Ltd specialise in precise settlement monitoring equipment and advise the best produce would be a Horizontal Digital Inclinometer System. This could be installed at the top of the feature within the sand layer and would monitor settlement to an accuracy of 2mm.

Monitoring will take place during construction of the protection layers, haul road and permanent carriageway.

Monitoring will continue from the opening of the road to traffic for two years with readings taken on a 3 monthly basis.