

## LNW Civils Package 606 Earthworks (Gubberford Lane, Hollins Lane, Low House Cutting)

**Client:** Network rail  
**Designers:** Leeke Associates  
**Date:** June—Oct 2012  
**Value:** £950k

Package 606 is a Design & Construct contract involving stabilisation, earthworks and drainage improvements to embankments and cuttings on 3 separate sites across the North West rail network.

### 1. Gubberford Lane Embankment.

The site is situated on the Preston Ribble Junction to Cove Level Crossing Line (CGJ6). It is adjacent to the M6 motorway approximately 2km north of Garstang and 12km south of Lancaster. The overall objective of the scheme was to re-grade and secure the embankment to achieve minimum FOS of 1.3 complete with toe drain along full length and reinstatement of the embankment shoulder and safe ccess walkway along full length of fix, ensuring the walkway was directed around the rear of the gantries where necessary. Working with designers Leeke Associates our solution for the scheme was based on a soil nailing methodology.

The work was undertaken from private gardens and we had to carefully remove walls, fences, garden sheds and planting to allow installation of the main access, haul road and working area to the base of the embankment. In addition we had to bridge over a pet cemetery at the end of one garden and work around several mature trees in the gardens. Track safety fence (Vortok) was established in a Safeguarded Green Zone during a T3 possession. It was installed along the entire length of the required work site adjacent to the Down Main side of the track at a 1.25m offset from the cess rail to provide a Separated Green Zone protection for the embankment earthworks programme.

The work involved de-vegetation and tree felling along the embankment followed by stabilisation of the Down Side embankment slope using a system of soil nails and slope netting to reinforce the existing steep earthwork and provide additional lateral support to the OLE gantries. New drainage was provided by installing a granular filter drain at the toe of the embankment, outfalling into the existing culvert and adjacent watercourse along Gubberford Lane. A compliant safe ccess was constructed at the crest of the stabilised slope using compacted granular fill and the S&T troughing raised and repositioned where required. Grondomat piles were installed around gantries to provide walkway support and also to construct a 10m long ballast retention structure at the tie in to Gubberford Lane Bridge.

The soil nails were 6m long hollow bars grouted into 120mm diameter holes at approximate 1.75m spacings over a 240m length of embankment followed by placing netting and galvanised soil nail head plates. A series of test nails were installed and pull-out tested to prove the design. Soil nails were installed with a combination of Klemm tracked geotechnical drilling rig and long reach excavator with soil nailing feed beam. 24 hr track monitoring was carried out for the duration of the works.



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### 2. Hollins Lane Drainage – Up

The site location is on the CGJ6 line (ELR: 13m 1210yds to 13m 1580yds. The track runs approximately North to South and is a twin track with an Up main and Down main.

The scheme was carried out to intercept surface/near surface water flows at the crest of the cutting and maintain a lower ground water level at the crest with new crest and slope drains with particular emphasis on concentration features along the crest of the cutting. Post and plank retention reinstatement was required in a localised area.

Approximately 300m of crest drainage with perforated pipe and geotextile separator was installed during normal operation of the line with catch pits installed to allow future maintenance of the drainage run.

A number of standard detail rubble slope drains discharging into either Cess drains or catchpits were installed down the embankment during Rules of the Route night time weekend possessions.

Form C Temporary Works Designs were produced to satisfy the loadings produced from the construction plant on the embankment



### 3. SAC Low House Cutting Drainage - Down

Low House Cutting is located in Cumbria, approximately 2.5km to the north of Armathwaite and 18km to the south east of Carlisle. The Cutting carries the LNW Settle to Carlisle (SAC) line and the works area is between 299m 552yds and 299m 1210yds.

The drainage improvement works includes installation of a new crest drain to intercept rapid surface water runoff from adjacent pasture land. The new drainage ditch feeds into an existing stone culvert which was cleaned out and a new downstream balancing pond was constructed to reinstate capacity and functionality. A soakaway was provided to the southern outfall and a carrier drain culvert provided underneath an existing farm track to maintain continuity of the crest ditch.

