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Catriona Ryan
National Monuments Service
Department of the Environment, Heritage and Local Government
Dún Scéine
Harcourt Lane
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7 April 2008
07 5071 80251.L01

RE: NRA CRIB WALLING CONCEPTUAL DESIGN FOR RATH LUGH

Dear Catriona,

I refer to the slope steepening solution currently proposed for the Rath Lugh National Monument near Lismullen in Co.Meath.

INTRODUCTION

We acknowledge receipt of the following documents which we have reviewed as per your request;

- Letter from Kevin O'Rourke of the NRA to Finian Mathews of the National Monuments Service, dated 14 March 2008;
- "Report on Proposed Crib Walling Treatment of Esker within M3 Motorway Landtake adjacent Rath Lugh", dated 14 March 2008 which incorporates 3 No. drawings as follows;
 - Phase 1 Road Excavation at Rath Lugh;
 - Section showing Road at nearest Point to Monument;
 - Limit of Excavation & Crib Walling.
- Letter from Dr. Eric Farrell of AGL Consulting Engineers to Kevin O'Rourke of the NRA, dated 13 March 2008.

COMMENTS ON REVIEW

We note that these documents provide a conceptual design for the retaining wall solution and further detailed design will be needed prior to construction. Such design work would often be carried out by the supplier of the retaining wall system. We also note from the method statement that the Permacrib system has been proposed in this instance. Permacrib is a structurally engineered crib walling system, utilising an inclined gravity wall concept. The patented lightweight interlocking timber crib walling components form a series of open cell modules. These are then filled with well graded stone to create the mass required to counteract the earth pressures and surcharge loadings. Structural integrity is achieved through the interaction of the crib elements and the granular fill. The main design issues relating to such wall systems will be to ensure that the completed wall structure will be safe against sliding, overturning and settlement and that all the components of the system are will constructed and will provide long term serviceability. One positive feature of these types of crib wall systems is that they can support the growth of vegetation and so their appearance improves over time as they tend to blend into the landscape.

Information available on these crib systems suggest that the timber selection and treatment process is guaranteed for 60 years against degradation by fungi and insect attack and provides a stated design life in excess of 125 years (source: www.phiiireland.ie). We have attached a brochure for the Permacrib walling system which may provide more information on what is proposed (source: www.phiiireland.ie).

We consider that the proposed crib walling system is an appropriate solution to resolve the slope steepening issue at Rath Lugh. We would however, like to raise the following points for consideration as part of the detailed design. We note that the majority of these items would normally be considered as part of the detailed design in any case but we feel it prudent to mention the following items although this list is not exhaustive;

- The design should include a filter layer between the in situ materials in the slope and the granular wall backfill material. This will be required to prevent the fines from the slope being washed out into through the wall system. It is possible that the granular backfill material itself may be capable of acting as a filter between the native soils and the crib fill material however this would require testing of the various materials and additional quality control of the gradings of the materials used during construction;
- As recommended by Dr. Farrell, the global stability of the completed slope and wall system needs to be confirmed. In addition it needs to be confirmed that the wall system will have an adequate factor of safety against sliding, overturning and excessive deformation;
- The bearing capacity for the concrete foundation along the length of the proposed wall system should be confirmed. The competence of the foundation should be adequate to prevent any differential settlement or tilting of the base under load;
- The drainage measures on the drawings are noted and considered important, in conjunction with the filter system noted above. Some consideration should be given to control of surface water drainage down the slope of the esker;
- The inclusion of a safety fence at the top of the slope should also be considered.

CONCLUSIONS

The proposed timber crib wall system is considered an appropriate technical solution for Rath Lugh. The ability of this system to support plantings will enhance its appearance over time. The detailed design of the wall system should consider the stability checks and other items noted above. The comments made by Dr. Farrell regarding the health and safety considerations are also important and it is imperative that the detailed design and method statements consider these aspects.

Yours sincerely,

GOLDER ASSOCIATES IRELAND

Peter Corrigan BA BAI C.Eng. MIEI
Chartered Geotechnical Engineer

Attachments: Permacrib brochure (from www.phiiireland.ie)

PC/MLJM/pc