

Attachment AP

Quarry Pit Backfilling

Guidelines for construction of controlled fill

Our ref: JM/C11596

24 June 2021

BLOC

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Attention: David Murphy

**CANBERRA BRICKWORKS REDEVELOPMENT - QUARRY PIT BACKFILLING
GUIDELINES FOR CONSTRUCTION OF CONTROLLED FILL**

1 Introduction

At the request of BLOC, ACT Geotechnical Engineers Pty Ltd are pleased to provide guidelines for the construction of controlled fill to meet the requirements of AS2870 "Residential slabs and footings" and AS3798 "Guidelines on Earthworks for Commercial & Residential Developments". The controlled fill will support the residential structures. It is understood that up to 7m height of controlled fill is to be placed to backfill some sections of the old quarry pit, and the site is expected to be a "M" (moderately reactive) site classification to AS2870.

2 Fill Construction Procedure

To enable an "M" classification to AS2870 and meet the requirements of AS2870 and AS3798 "Guidelines on Earthworks for Commercial & Residential Developments", the following procedure is recommended for the construction of controlled fill on the site:

- (1) Areas be fully stripped of any debris on the base and sides of the quarry pit, and any moisture-affected soils, to expose in-situ weathered bedrock. As the sides of the quarry pit are quite steep, terraces will have to be cut into the sloping sides to enable proper compaction close to the sides of the old pit.
- (2) Soil foundations must be proof-rolled by a heavy vibratory pad-foot roller (preferably of not less than 9 tonne static mass) to check for any weak or wet areas that would require replacement. The proof-rolling must be viewed by a geotechnical engineer prior to placing fill (**hold point**). In-situ weathered bedrock foundations do not need to be proof-rolled, but must be inspected by a geotechnical engineer to confirm suitability. It is recommended that spot levels or a survey be taken of the stripped foundation. If the foundation is dry, it may have to be cross-rippled, sprayed with water, and compacted with a pad-foot roller to ensure lamination between the natural ground and newly placed fill does not occur.
- (3) Controlled fill comprising suitable on-site excavated or imported materials of not greater than 75mm maximum particle size, be compacted in not greater than 150mm layers to not less than 95%ModMDD at about OMC.
- (4) The fill material must be inspected by a geotechnical engineer for prior approval, and ideally comprise a low to medium plasticity sandy clay, gravelly sandy clay, clayey sand, gravelly clayey sand, or sandy clayey gravel, with a maximum particle size of 75mm. Suitable materials would classify as CL, SC, or GC in accordance with the USCS. One sample from each source of the placed fill material should be lab tested for soil classification (particle size distribution and Atterberg limits).
- (5) A geotechnical engineer should overview the fill placement (regular engineering inspections and Level 1 supervision), to ensure that correct compaction equipment/methods are employed and to check material properties and moisture content.
- (6) Field density testing should be carried out at a frequency of 1 test per 500m³. The locations of the density tests should be noted and marked on a plan.
- (7) Fill placement and control testing be overviewed and certified by a geotechnical engineer at Level 1 involvement of AS3798 - 1996 "Guidelines on Earthworks for Commercial & Residential Developments".
- (8) Pad and/or strip footings for the new building, as well as groundslabs and access roads/driveways, can then be founded in the controlled fill. The site would be a Class "M" for slab and footing design (provided only low-reactive fill material is used).
- (9) Fill batters must be formed at no steeper than 2(H):1 (V), and protected against erosion by grassing, vegetation, geofabric (such as 'jute mesh), or similar. If the fill batters are stabilised (by stone pitching, reinforced shotcrete, 'Geoweb', or similar, then the batters could be steepened to 1 (H):1 (V). Steeper slopes could be supported by retaining walls, gabions, crib walls, or similar.

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