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Attention: Jayne Klein

## Tamworth Rural Referral Hospital, Stage 2 Foundation and Site Stability and Suitability

The proposed stage 2 development of the Tamworth Rural Referral Hospital is located on the site of the existing hospital and will require the demolition of some existing buildings. The development in its final configuration will have links to the adjacent Brudelin, 1883 and Linen stores buildings.

An extensive geotechnical report including core samples, strength assessments, and reviews of previous investigations has been carried out on the site by Douglas Partners, (ref: report number 75393 dated April 2012).

### GROUND CONDITIONS

The results of the site investigations indicate typical profiles of

Filling / topsoil :	Up to 0.5m depth
Clay :	Stiff to hard, depths of 0.5-2.5m
Siltstone:	Extremely low strength increasing to high strength at approximately 5.5m depth

Structural  
Civil  
Traffic  
Facade  
Engineers

Excavations will require conventional equipment until the low to medium strength rock is encountered. If high strength rock is to be excavated, then heavy rock breaking and rock sawing is likely. It is expected that sections of the lower ground and ground floors will require excavation of hard siltstone. The existing water table is below the level of the lowest floor for the proposed development.

There is no evidence on site of previous foundation or retaining problems. Slip failures and other type of foundation material failures are not believed to be an issue for this site. The risk of geotechnical failure on the site is considered very low.

### FOUNDATIONS

Based on a review of the geotechnical information and available existing drawings, it is anticipated that the new foundations will comprise mainly shallow pad footings in the siltstone, with some short bored piers into the high strength siltstone required in the dock/entry road area.

The foundations for the existing Brudelin Building are shown to be typically square pad footings throughout the building. The new construction therefore continues to use this solution which is site specific and demonstrated as buildable. The relevant extract of geotechnical report is provided for reference.

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## Extract of Geotechnical Report – 75393

### 9.9 Foundations

#### 9.9.1 High Level Footings

It is understood that the anticipated working loads for the Acute Care Building will be in the order of 4,000 kN (ultimate load of 5,400 kN).

Based on conditions encountered in the bores and the proposed earthworks, the conditions exposed at bulk excavation level will be a combination of residual clay soils, bedrock ranging in strength from extremely low to high strength and engineered filling.

It is preferable that all footings found on material of similar stiffness, (ie all footings to bear on the bedrock). Careful consideration of detailing and articulation of the structures would be needed during the design to allow the structures to tolerate the differential movements which could result from founding on materials of differing stiffness, such as bedrock and clay or filling.

Spread footings founded within the relevant strata should be designed for the following ultimate limit state bearing pressures:

- Extremely low strength or stronger meta-siltstone 1800 kPa;
- Medium strength metasiltstone 5000 kPa.

Settlements for pad or pile footings apportioned in accordance with the maximum allowable bearing pressure given above are not expected to exceed a few millimetres.

**RETAINING STRUCTURES**

Where excavations are required, the method of retention shall consist of a mix of permanent retaining walls and permanent batters.

The external retaining walls to the new loading dock will be designed as either a contiguous piled shoring wall or a soil nailed retaining wall depending on cost and constructability. Both options have been used previously in similar situations.

During the bulk earthworks temporary batters will be formed in accordance with the advice of the Geotechnical Engineer.

The risk of failure of the battered solution or permanent retaining walls is considered low. Inspections will occur during the excavation and construction process to monitor the works of the contractor and confirm that the foundation material agrees with the recommendations contained in the Geotechnical report.

Extract of Geotechnical Report – 75393

**Table 6 – Suggested Preliminary Temporary Safe Batter Slopes**

<b>Material</b>	<b>Safe Temporary Batter Slope (H:V)</b>
Filling and stiff (or weaker) clay	2:1
Very stiff or stronger clay	1:1
Extremely low and very low strength rock	1:1
Low and medium strength rock	0.75:1*
High strength rock	0.5:1*

\* - subject to detailed inspection by an engineering geologist during construction

Authorised by:  
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