

**Toga Central Developments Pty Ltd**  
**Level 5/45 Jones Street**  
**Ultimo, NSW 2007**

86884.04  
16 December 2022  
R.003.Rev0

Email: dspringford@toga.com.au

Attention: David Springford

**Geotechnical Comment on Proposed Drained Basement**  
**Proposed Development**  
**2-8a Lee Street, Haymarket**

At the request of Toga Central Developments Pty Ltd, this letter provides comments in relation to geotechnical and groundwater related items in response to the letter from Department of Planning and Environment, Ref OUT22/13728, dated 29 September 2022. In particular comments are provided in relation to the proposed drained basement.

The Toga Central Development (Toga site) is located between the Western Gateway Precinct Block A to the east and the Central Place Sydney Block B to the south. Douglas Partners Pty Ltd (DP) has carried out various geotechnical and groundwater investigations for all three projects and also groundwater modelling for Block A and the Toga site and is very familiar with the geotechnical and hydrogeological conditions.

It is understood that the Block A site has received approval for a drained basement and that the Block B site is in the process of obtaining approval for a drained basement. The proposed basement on the Toga site extends one level deeper than the adjacent proposed basements on the Block A and Block B sites. The additional basement on the Toga site will be excavated into medium to high strength Hawkesbury Sandstone. All three basements will be interconnected via shared vehicle driveways.

DP carried out numerical modelling for the Toga site and prepared a Dewatering Management Plan (Project 86684.02.R.006.Rev1, dated 21 June 2022). The modelling assumed a horizontal permeability of  $5.3 \times 10^{-7}$  m/s for the fractured Mittagong Formation rock and  $1.3 \times 10^{-7}$  m/s for the less fractured Hawkesbury Sandstone. It was predicted that about 12 ML/year seepage may occur in the first year reducing to 3 ML/year in the longer term. It was noted that these are predictions and allowances for higher flows should be considered. It was concluded that from a geotechnical point of view that a drained basement is feasible without any significant impact on surrounding groundwater systems or property.

It is important to note that the above groundwater modelling included a drained basement for the Block A basement, which was assumed to have been completed prior to the Toga site but the model did not include the proposed basement for the Block B site. The presence of a drained basement on the Block B site would further reduce the inflow into the Toga basement and therefore the predicted inflows for the Toga site would be less.

DP was involved with more detailed pumping/step tests on the CPS site to further assess the soil and rock mass permeability. It is understood that this testing was requested by DPE as part of the drained basement approval. The permeability testing undertaken on all three sites has been considered and therefore there is a reasonable level of confidence in the predicted inflows.

It is understood that Toga has applied for Water Access Shares for the Sydney Basin Central Groundwater Source under the recent Controlled Allocation Order 2022 with sufficient shares to cover the predicted inflow during construction of 12 ML/year. Additional shares, if required, will be obtained on the market via a Water Broker. Therefore it is expected that there will be sufficient groundwater entitlement to support a Water Access License associated with the proposed drained basement.

If groundwater inflows are greater than predicted then measures will be taken to comply with the approval conditions. This may include application for an extension to the Water Access License and obtaining additional Water Access Shares, grouting of the rock to reduce the permeability and inflow, or tanking of the lower basement floor level.

In our opinion construction of a tanked basement between two drained basements is impractical, uneconomical and unnecessary from a geotechnical and hydrogeological point of view. It is considered that a drained basement can be constructed on the Toga site without significant impact to surrounding groundwater systems and property. If inflows are higher than expected measures will be put in place to reduce inflows to comply with relevant approvals. All monitoring requirements outlined in the DPE letter will be implemented during construction.

Please contact the undersigned if you require anything further.

Yours faithfully

**Douglas Partners Pty Ltd**



**Scott Easton**  
Principal

Reviewed by

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**Joel Huang**  
Senior Associate