

MELBOURNE METRO RAIL PROJECT ENVIRONMENT EFFECTS STATEMENT
INQUIRY AND ADVISORY COMMITTEE

MMRA TECHNICAL NOTE

TECHNICAL NOTE NUMBER: 007

DATE: 26/07/2016

PRECINCT: All

EES/MAP BOOK REFERENCE: Section 19.5.4 of the EES

SUBJECT: Structures at which protective measures may be required.

Response to item 7 of the IAC request for information dated 13 July 2016

NOTE:

1. The ground movement impacts assessment involved two principal components:
 - a. Estimation of ground movements and Potential Zone of Influence (described in section 19.5.3 of the EES); and
 - b. Identification of the position of buildings, structures and underground services within the Potential Zone of Influence and assessment of potential impacts of Melbourne Metro on a representative sample of existing structures in varying ground conditions (described in section 19.5.4).
2. Section 19.5.4 outlines the three levels of assessment undertaken as part of the EES:
 - a. Level 1 Assessment identifies existing structures and civil infrastructure within the Potential Zone of Influence;
 - b. Level 2 Assessment provides a conservative assessment to identify structures that have potential for moderate or worse impacts (and therefore require a Level 3 assessment); and
 - c. Level 3 Assessment involved a more detailed review of information specific to particular structures (including but not limited to as-built information for the existing structures).

3. Protective measures are relevant for the purposes of section 19.5.4 in two contexts:
 - a. First, as a criterion to adopt a Level 3 Assessment; and
 - b. Second, as a possible outcome of a Level 3 Assessment.
4. Typically, the first option for protecting a structure, whether it is a residence, a commercial property, a piece of infrastructure, or a service utility, is to manage the tunnelling or excavation process to limit ground movements at source. The next option would be to improve the ground, firstly around the tunnels and then beneath the structure. If the risk remains, the next option would be to provide improved support for the structure (e.g., underpinning) and finally to strengthen the structure itself.
5. All of these options are effectively “protective measures” but for the purposes of responding to the IAC’s request, this Technical Note discusses protective measures that may be required to be implemented at the structure rather than at the point of excavation.
6. Based on the analysis conducted in respect of the Concept Design, two residential buildings were identified as locations at which protective measures may be required:
 - a. The first is a relatively recent four and five storey apartment building located at 8 Bond Street, South Yarra.

The feature that makes this building more vulnerable than the typical cases is a separate footing for the acute angled corner of the building (which supports balconies). MMRA does not have any details of the footing, only an indication of its form from the drawings submitted for planning approval. The footings at the rear of the property are adjacent to the modified embankment on the approaches to Chapel Street. The EES notes that the need to apply protective measures at this site would need to be reviewed upon receipt of more detailed information concerning the structure.
 - b. The second is a proposed residential development at 275 Abbotsford Street in North Melbourne (close to the corner of Arden Street and Abbotsford Street).

This development includes basements in an area of relatively low cover to the Melbourne Metro tunnels.
7. A number of additional structures were identified as part of the assessment of the Concept Design in respect of which protective measures of some form may be required. These structures are:
 - a. North Yarra Main Sewer, Kensington;
 - b. CityLink viaduct;

- c. MURL tunnels (City Loop);
 - d. Telstra Tunnels in or crossing Swanston Street;
 - e. Melbourne Water water mains and sewers in Swanston Street;
 - f. Melbourne Main Sewer under Flinders Street;
 - g. CityLink road tunnel; and
 - h. Utility in Osborne Street, South Yarra.
8. The EPRs formulated in respect of Ground Movement (GM1 – GM5) will require that detailed assessments of the impacts of the Project on all potentially-affected structures are undertaken prior to and during the detailed design and construction of the Project. It is noted in this respect that:
- a. GM2 requires that all permanent structures and temporary works be designed and constructed so as to limit ground movements to within acceptable limits; and
 - b. GM3 requires the development and implementation of a ground movement management plan based on the detailed design, which must among other things address the location of structures/assets which may be susceptible to damage, identify appropriate ground movement impact acceptability criteria, and identify mitigation measures to ensure acceptability criteria can be met.

ATTACHMENTS:

No Attachments