

Reference: 15042-KINGSGROVE-EIS-L05.DOCX

28 January, 2015

Mr Eran Rimmer
CRK Pty Ltd
Level 10, 1 Alfred Street,
SYDNEY NSW 2000

Dear Eran,

14-26 COMMERCIAL ROAD KINGSGROVE REVIEW OF NEW M5 PROJECT ENVIRONMENTAL IMPACT ASSESSMENT (EIS)

We refer to our recent email and provide you this letter of advice regarding the review of the EIS documents for the new M5 project.

1 INTRODUCTION

We understand One AR Pty Ltd ATF The Stamford Kingsgrove Property Trust owns a property at 14-26 Commercial Road Kingsgrove which is currently zoned industrial. Further that CRK Pty Ltd is the managing agent for rezoning the site.

We understand you require information regarding:

1. The subsurface stratum
2. Existing easements
3. Flooding impacts and treatment
4. Future buildability issues for development of the site into a future high density mixed used development

We note we have done a limited review of some of the EIS and relevant documents including some documents found on the Westconnex web site.

2 THE SITE

The subject development area is located in the suburb of Kingsgrove within the Hurstville City Council (HCC) Local Government Area. The site is bounded by the M5 motorway to the North and Commercial Road to the South as shown in Figure 1 below;

The subject site comprises the following:

- One and two storey concrete and fibro factory and offices
- Wolli Creek open stormwater channel along the Northern Boundary of the site
- Easements for a transmission line as well as sewer.
- Multiple stormwater drainage outlets to Wolli Creek Stormwater Channel

3 THE PROPOSED M5 PROJECT

The new M5 extension is proposed to be developed by the Westconnex Development Authority (WDA) and comprises 3 stages. Stage 2 of WestConnex – The New M5 – will run from the existing M5 East corridor at Beverly Hills via tunnel to St Peters, providing improved access to the airport, south Sydney and Port Botany precincts.

Key features of the New M5 include:

- new twin tunnels which are higher, wider and flatter, which will more than double capacity along the M5 East corridor and provide motorway access to north of Sydney Airport
- a new interchange at an industrial site at St Peters, which reduces the impact on nearby residential areas
- connections from the interchange to key roads in the area, including Campbell Road/Street, Euston Road and across the canal to Bourke Road
- widening of Campbell Road/Street and Euston Road through existing road widening reservations
- western tunnel entry and exit points at Kingsgrove.

The NSW Department of Planning and Environment has placed the New M5 Environmental Impact Statement (EIS) on exhibition until Friday, 29 January 2016.

Based on the known geological conditions along the project corridor (refer to EIS Section 19.2), the length of the main alignment tunnels and the advantages and disadvantages of the tunnel construction methods, excavation of the main alignment tunnels using road headers was identified as the preferred excavation method, with conventional excavation (excavators) and drill and blast excavation methods also used for secondary locations such as cross passages, benches and trenches. As the excavation advances, ground support would be installed behind the excavation face. The support could be permanent or temporary and would normally include rock bolts, steel mesh and sprayed concrete.

Indicative tunnel dimensions from the western portal to the southern extension caverns are shown in EIS Table 6-21 as:

- Width of tunnel floor: 12.4m
- Width of arched tunnel roof: 14.1m
- Height: 6.5m

However widths etc may vary subject to detail design and geological conditions.

Immediately west of your site it is also proposed to construct a Construction compound known as Commercial Road Compound. Further west of the compound is another works compound, Kingsgrove Operations centre and ventilation facility.

The Commercial Road construction compound would be located on the southern side of the existing M5 East Motorway, within a private property used for commercial business purposes between Tallawalla Street and Commercial Road, Kingsgrove. The Commercial Road construction compound would be mainly used as a tunnelling support site.

The location of the construction compound and an indicative layout for the site are shown in Figure 2.

Key construction activities carried out at the Commercial Road construction compound would include:

- Demolition of existing structures, including buildings and noise barriers
- Site establishment, including site offices, amenities, water treatment plant and non-acoustic shed installation
- Construction and sinking of a shaft for tunnelling works
- Excavation of the westbound main alignment tunnel using a roadheader and associated construction activities, including stockpiling of material and spoil haulage
- Excavation of benches and cross passages by drilling and controlled blasting
- Civil tunnel fit-out (which would include pavement and drainage works) and mechanical and electrical installation.

Heavy vehicle and light vehicle access to and from the Commercial Road construction compound would be via an existing access point off Commercial Road.

A shaft would be constructed to launch a road header for construction of the westbound main alignment tunnel. A shed no more than 20 metres high would be established which would contain the shaft entry, a spoil stockpile area and sufficient space for one heavy vehicle to be loaded with spoil.

Additional infrastructure within the site external to the non-acoustic shed would include an electrical substation, Ausgrid supply point, parking, workshop container site offices, crib rooms and an ablutions block, sedimentation tanks and a containerised water treatment plant. A four metre high hoarding would be installed along the eastern, southern and western boundaries of the site to provide noise attenuation and to minimise impacts to visual amenity. A chainlink fence would be installed along the northern boundary of the site, which abuts the existing M5 East Motorway.

Spoil handling would be carried out 24 hours per day, seven days per week. Where practical, spoil would be moved during the day, outside of peak periods. Feasible and reasonable management strategies would be investigated to minimise the number of heavy vehicle movements at night. Any spoil removal outside standard construction hours would meet the relevant noise criteria. Excavated spoil from tunnelling would only be stockpiled within the shed.

The Commercial Road construction compound would be located in an area potentially affected by overland flow from a 20 year and 100 year ARI flood event, and would be within 50 metres of Wolli Creek, which runs parallel to the southern boundary of the site. A flood management plan / strategy for the construction compound would be prepared during detailed design, including localised drainage and bunding requirements. The design of drainage and bunding throughout the site would be determined during detailed design.

An indicative program for works to be conducted within the Commercial Road construction compound shows site establishment to occur in Q4 of 2016. Tunnelling is to occur from Q1 2017 to Q4 2018 and will operate 24 hours a day and 7 days a week. Site demobilisation and rehabilitation will occur from Q2 2018 to Q4 2019.

4 SUBSURFACE ACQUISITION STRATUM

We advise there is limited information available in the EIS regarding the subsurface acquisition stratum. The EIS documents show generally the location of the tunnel at this stage. More detailed design documents will be available after the project has planning approval. At which time Westconnex will consult with owners regarding the acquisition stratum.

We note however the EIS shows the west bound tunnel to be directly under your site as shown in Figure 2 and 4. Further the EIS shows the eastbound tunnel near your site to be about 30m below the surface as shown in Figure 6 (EIS Appendix C). However the Westconnex interactive map on their web site shows the tunnel to be about 10-18m below your site. Given this inconsistency in the information, we have called and sent an email to WDA to clarify this but have not got a reply as yet.

The EIS also mentions the Land and Acquisition (just Term Compensation) Act 1991 (NSW) provides that compensation is not payable for the majority of subsurface acquisition of land and easements unless specific circumstances as detailed in the Act apply. We would recommend you seek further advice on this matter.

5 EXISTING EASEMENTS ON SITE

We note the EIS documents do not show specific easements and survey details for your development site. We have obtained a survey subdivision plan for the site which shows the existing easements as shown in Figure 7.

The plan shows a 6.095m easement for sewer which traverses the middle of the site, a variable width easement for transmission along the rear boundary and an easement for stormwater (channel) along the rear boundary.

Figure 8 shows the Sydney Water plan and services. In particular we note the 750 RCP sewer mains which traverses the middle of the site. Please note that future development of this site main require the relocation or protection of the main subject to Sydney Water requirements or they may require the building to be suspended on piers over the main.

6 FLOODING IMPACTS

We note the EIS provides a reasonable amount of information on flooding in the area. WDA have undertaken a flood study for the project (ie EIS Appendix P) and have predicted / reported the existing and future flood impacts based on the proposed M5 project.

WDA propose to maintain existing surface flows and drainage corridors where possible such as major culvert, channel creeks etc. It is therefore proposed to provide drainage for the motorway and tunnel and discharge these to existing water courses and infrastructure and manage surface flows which would otherwise enter the tunnel etc. WDA propose to maintain the open channel and floodway at the northern side of the site to convey flows east. WDA has therefore done flood modelling for the existing stormwater flows and proposed stormwater flows.

We note the site is located adjacent to a major stormwater channel as previously reported in our letter to you last year dated 18 June 2015. We note the site is also located in an existing flood zone as shown in Figure 9. WDA have modelled the proposed motorway works and indicated

there will be minimal impact of flooding at the site with an afflux (increase in water level) of -0.1 to 0.01m variance as shown in Figure 10.

Further consultation, design and modelling of flooding will be done by WDA during the detail design phase of the project.

7 IMPACTS ON EXISTING STRUCTURES

We note however the EIS does note the tunnel will be shallow under your site as the tunnel in other areas is up to 60m below ground surface. As such settlement is likely to occur nearest the tunnel entry areas and under your building. This settlement is reported to be small and likely to occur soon after or during tunnelling. Other minor settlement is likely to occur over a longer time due to groundwater draw down due to the tunnel drainage. The EIS indicates that prior to and after construction of the tunnel, a building dilapidation survey and report will be done and provided to the property owners. In the event that small settlement occurs WDA are of the view the resulting minor damage and cracks could be repaired.

Due to the proximity of the CRK site to the tunnels, ground settlement is very likely.

The EIS report, section 19, identifies the CRK site as building B1 in Table 19-11 and predicts a settlement of some 12.1mm. Whilst the EIS considers the resulting damage to be “negligible” we would question this and recommend a number of measures be taken to monitor any damage caused by tunnelling works.

WDA have indicated that dilapidation surveys will be undertaken on buildings likely to be damaged due to settlement or construction activities associated with the tunnel construction. We would recommend CRK undertake a thorough, independent pre-construction dilapidation survey as a check against their report. This report would be used in any future claim to verify the pre-construction status of your buildings and facilities. Diversi Consulting are qualified to undertake such a survey.

In addition, we would recommend a number of survey benchmark points (6-10, say) be established around your site by a registered surveyor which would be monitored before, during and after tunnelling activities. This would establish “actual” settlement for any future claims.

It is important that the above surveys be undertaken with a view that the resulting reports may be used in any claim.

8 FUTURE DEVELOPMENT OF THE SITE

We note you propose to develop the site in the future however are not certain what this may comprise. For now we understand this may be a high density development with mixed use and a basement car park over several levels.

We note the location of the tunnel proposed in the EIS may limit the depth of basement car parks on your site and available space for foundations for a future building. It is possible the building could bridge over the west bound tunnel and bear on rock on either side of the tunnel. It is likely the tunnel will be contained within an easement / strata which will include structural

zones for the tunnel. On other projects this has been typically 8-10m but is site specific and to be determined and advised by WDA. At this stage there is no information in the EIS which identifies where the future strata will be exactly or any future construction loads which may or may not be applied to the tunnel etc. It is reported and likely this information will be determined and discussed with property owners during the detailed design stage once EIS/ planning approval has been obtained.

Any future development on the CRK site will be limited by restrictions related to:

- Tunnel size and the spacing between them relative to the CRK site above;
- Tunnel depth;
- Zone of influence (exclusion) above tunnel structure.

Whilst there are general plans showing the approximate 'plan' position of the tunnels, we have no dimensional information to use in our assessment. Further, we have conflicting information regarding the depth to the tunnels around the CRK site being from 10m to 30m.

We understand these issues will be clarified during final design, after planning approval, thus limiting what meaningful advice we can give you currently. Regardless, we make the following observations:

- A tunnel depth of only 10m will probably exclude the possibility of basement carpark as this will bring heavy rock breaking equipment within 7m of the tunnel roof.
- With a tunnel depth of 30m it is feasible to construct a 2-3 level basement. It may be necessary to "hang" the basement from the ground floor level where it sits directly over the tunnel if authorities say this zone cannot be used as load bearing.
- As mentioned above, supporting any development above the tunnel is subject to obtaining accurate plans for the tunnel route.

Typically exclusion zones of about 8-10m applies beyond the sides and top of a tunnel cavern for maintaining the rock bolts and structural integrity of the tunnel. However at this stage it is not possible to determine the exclusion zone and load capacity of the tunnel roofs which will need to be confirmed by West Connex Engineers during detail design phase for the tunnel. If the load from the future building exceeds the load capacity of the tunnel roof, ground beams spanning over the tunnel could be constructed to transfer the building loads to bed rock either side of the tunnel by providing foundation either side of the tunnel or piling down outside this exclusion zone on each side of the tunnel. Notwithstanding this, the cost of the structure would be more expensive than normal building foundations.

However, for this to be feasible for the CRK site, our beams would span north-south which would ideally see:

1. the southern boundary of CRK's site, along commercial Road, would have to be greater than 10m from the southern boundary exclusion zone of the West bound tunnel.
2. permission must be granted from WDA to pile down between the tunnels on the north side of CRK and yet, still be within CRK property.

If for some reason the tunnel depth is quite shallow, say 10m, and one of the above piling locations cannot be accessed, this would provide further challenges to supporting a significant structure.

Regrettably our advice on this issue is limited by the lack of layout information available in the EIS or from WDA at this stage. As such further information will need to be obtained and confirmed by WDA during the detailed design stage of the M5 tunnel works.

We trust this letter / report provides some useful information and meets your requirements.

Should you require further information please call me on 0421 484 152 or (02) 8883 1113.

Yours faithfully

Diversi Consulting



Phil Diversi
Director

Encl

ATTACHMENT A

14-26 COMMERCIAL ROAD KINGSGROVE

REVIEW OF WESTCONNEX M5 STAGE 2 PROJECT INFORMATION AND EIS



Figure 1 – Locality plan (source SixMaps)

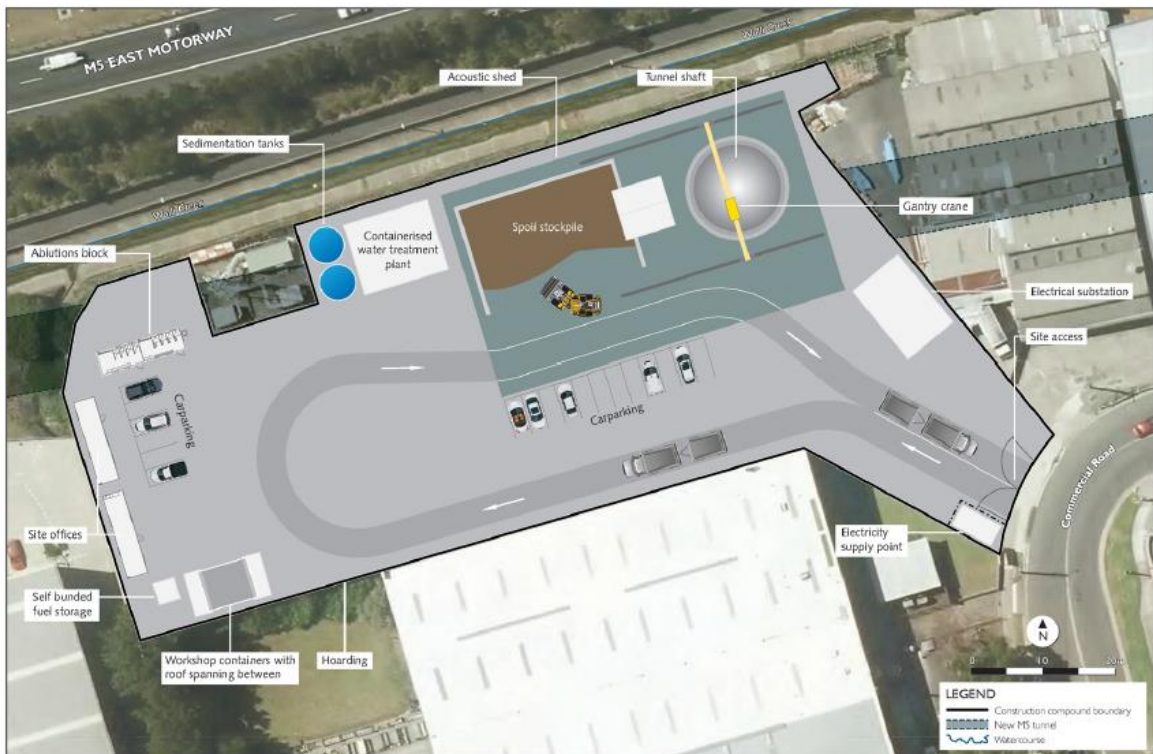


Figure 6-8 Commercial Road construction compound (C3) layout

Figure 2 – Westconnex Commercial Road compound

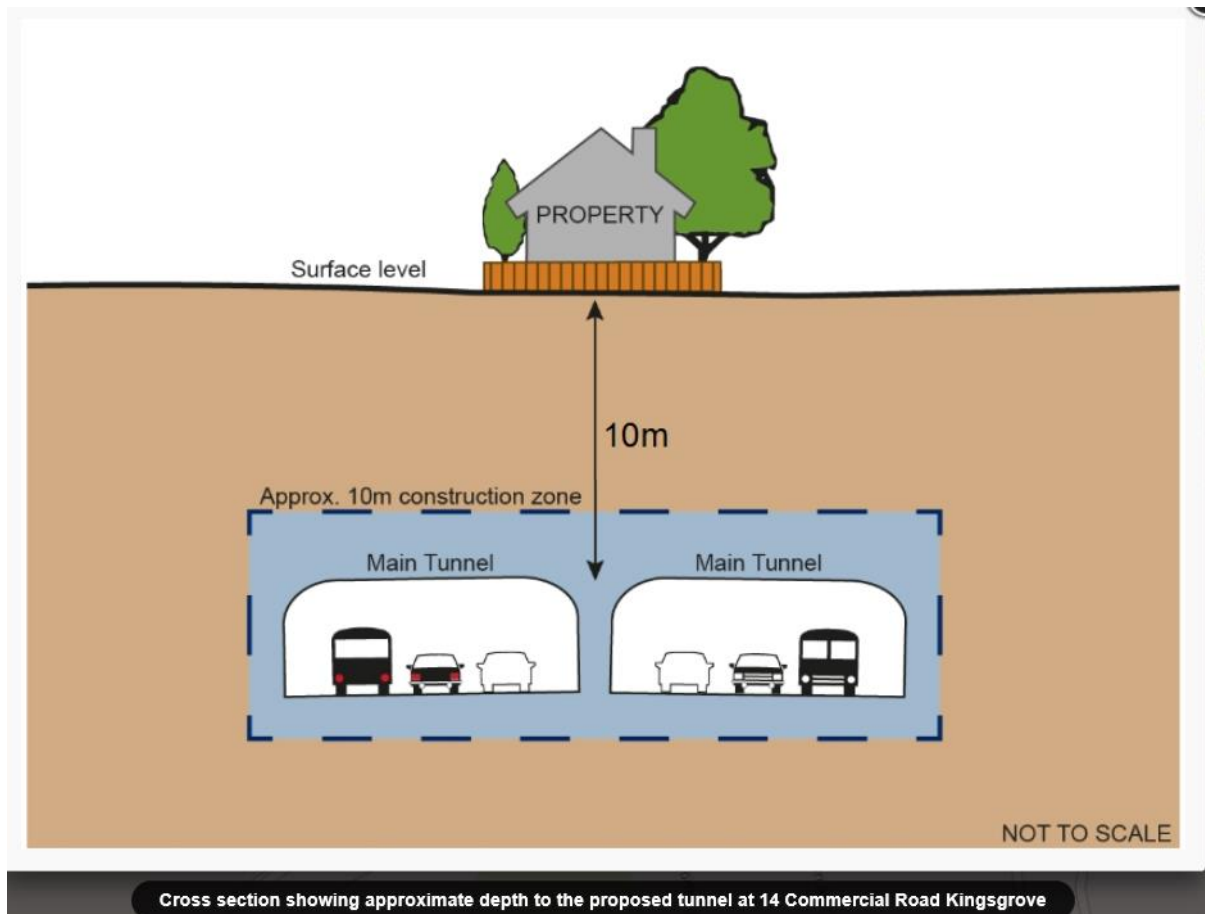
Artist's impression of the Western entry and exit to the New M5 tunnel, Kingsgrove looking east towards Arncliffe. Concept only.



Figure 3 – M5 East entry and exit portals looking east



Figure 4 – M5 East extension tunnel locations (Source: Westconnex interactive map)



Cross section showing approximate depth to the proposed tunnel at 14 Commercial Road Kingsgrove

Figure 5 – M5 East extension tunnel section (Source: Westconnex interactive map)

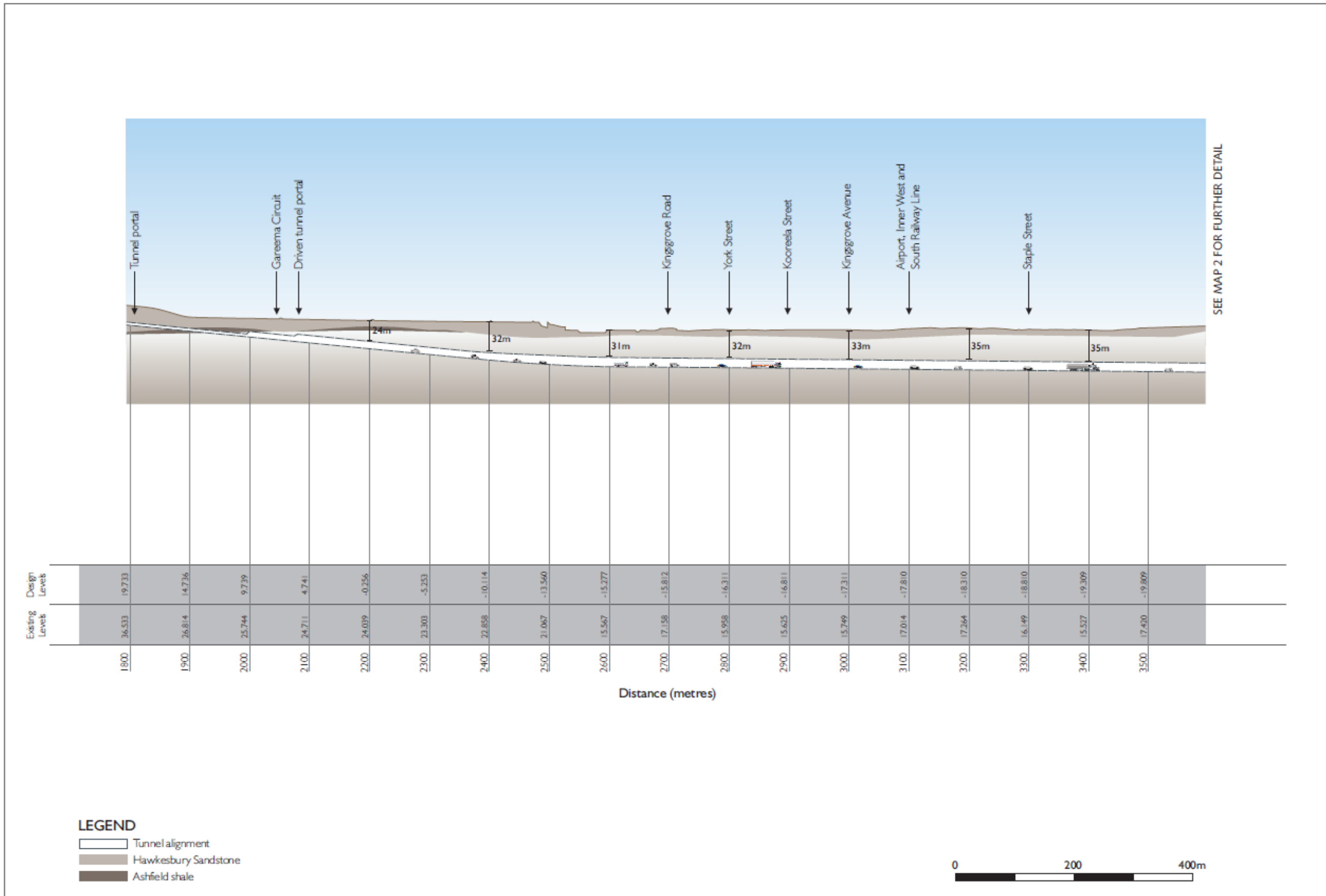


Figure 6 – M5 East bound tunnel longitudinal section (Source: EIS Appendix C)

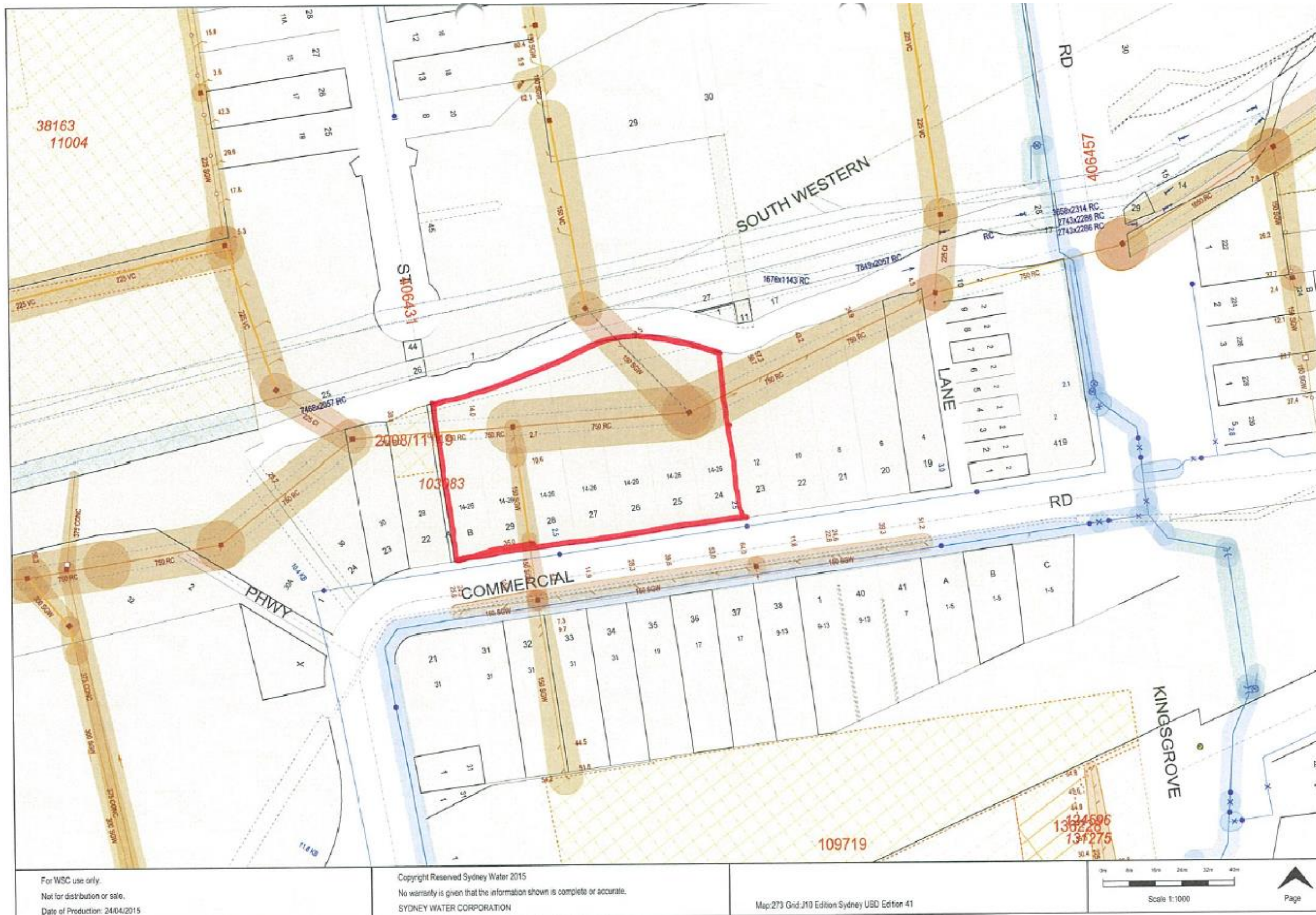


Figure 8 – Sydney Water services

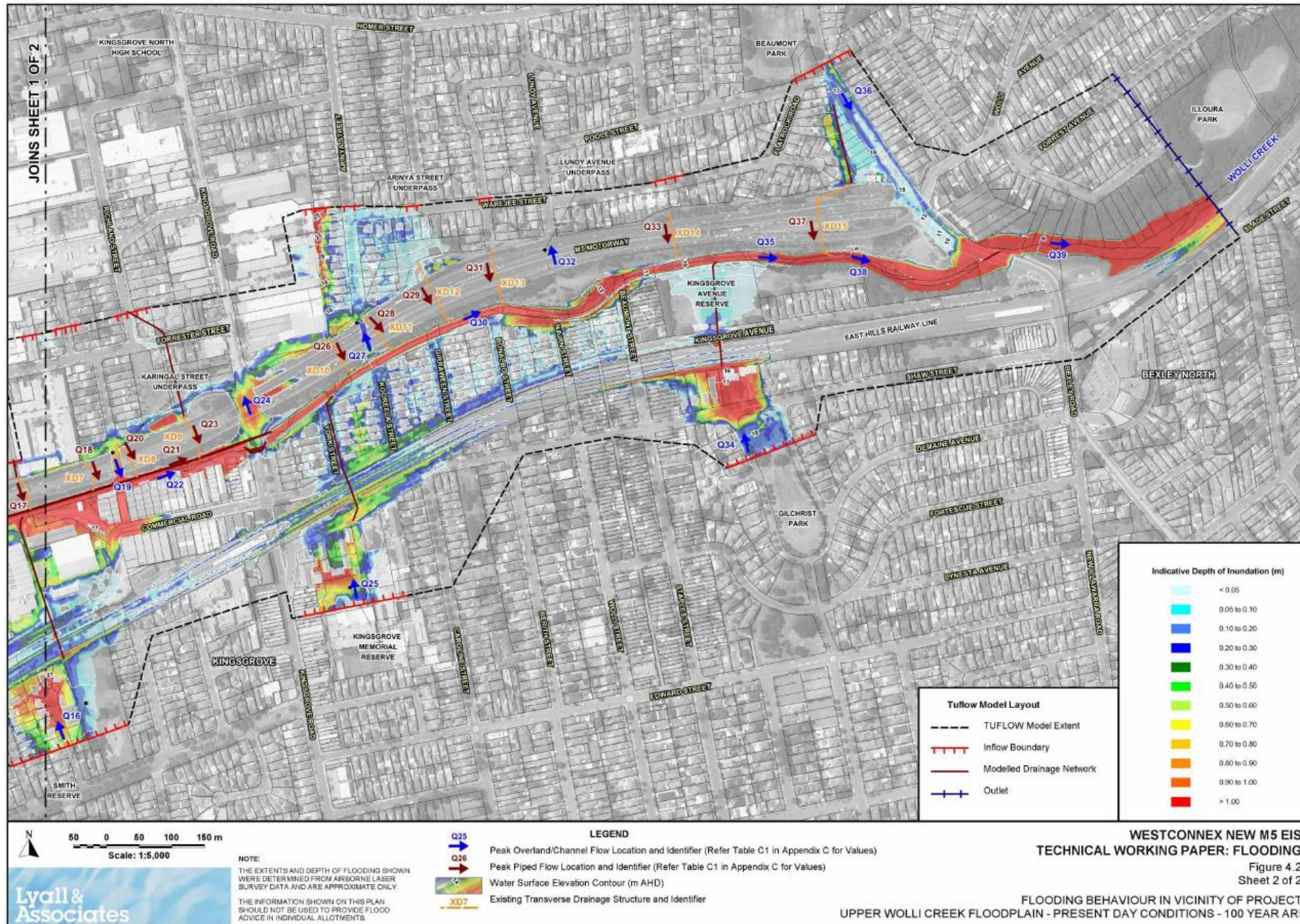


Figure 9 – Existing flood behaviour (100 year ARI)

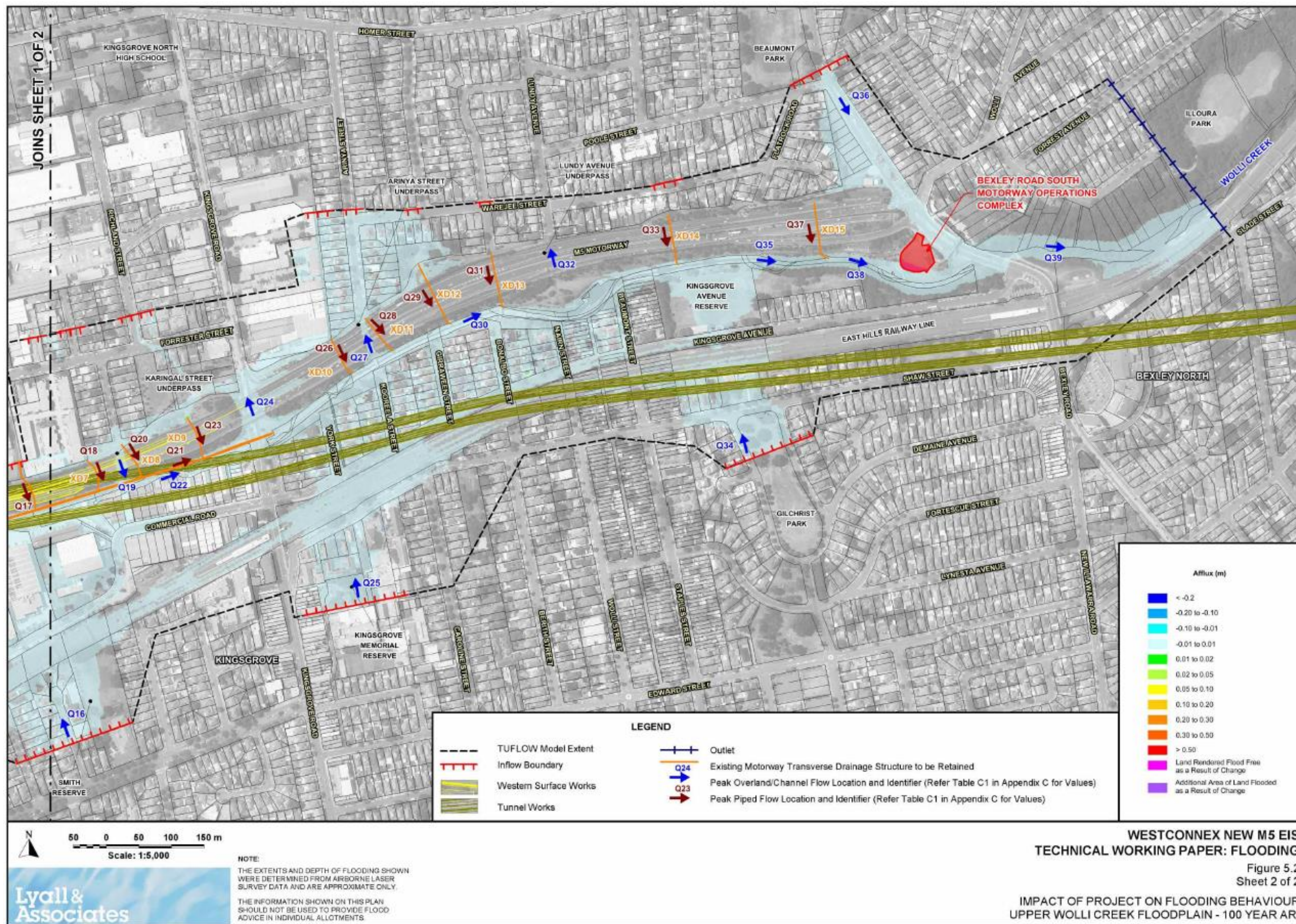


Figure 10 – Impact of project on flooding (100 year ARI)