Westfield Warringah Mall

Section 96 Modification to DA2008/1741

April 2014

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Introduction

This report has been prepared by Urbis on behalf of Westfield Limited to accompany an application pursuant to Section 96(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This application seeks to modify DA2008/1741 in respect of the Deferred Commencement Approval for *'the partial demolition of existing buildings, and construction of new retail floorspace and a multi-level car park at Warringah Mall'*.

DA2008/1741 was approved by the Warringah Council on 28 April 2010, and documentation to comply with the deferred commencement conditions has been submitted to Council for consideration in satisfaction of the deferred commencement conditions for an operational consent to be issued by Council.

The key outcomes of the proposed Section 96(1A) are:

- Reconfiguration of the approved retail expansion area, remaining consistent with the volume of additional floorspace approved under the original application.
- Alterations to the design of the 'Palm Tree car park' including changes to the layout, vehicle circulation, external elevations and landscaping.
- Alterations to the 'Starfish car park' including reconfiguration of access driveway at the south-western corner of the site.

The result of these changes is modifications to the approved plans and the following conditions of consent:

- Condition 2 – Approved Plans and Supporting Documentation.
- Condition 7 – External Colours and Materials.
- Condition 9 – Location of Plant.
- Condition 23 – Flood Wall Barrier System.
- Condition 30 – Tree Protection.

Other conditions may require modification to ensure consistency with the approved development.

This report provides:

- A description of the proposed modifications.
- Consideration of the proposed changes against the provisions of Section 96(1A) of the EP&A Act.
- An assessment of the proposed modification against the matters for consideration pursuant to Section 79C of the EP&A Act.

It is noted that the assessment of the application outlined in this report clearly demonstrates the proposed modifications will result in substantially the same development as was originally approved.

The application is supported by the following documentation:

- Amended Architectural Plans and Design Statement prepared by Westfield Design and Construction (**Appendix A**).
- Revised Landscape Plans and Design Statement prepared by DEM (**Appendix B**).
- Amended Stormwater Plans prepared by Cardno (**Appendix C**).

- Revised Traffic Statement prepared by GTA Consultants (**Appendix D**).
- Tree Report prepared by TreeScan (**Appendix E**).
- Access Report prepared by Access Australia (**Appendix F**).
- Revised Fire Safety Engineering Report prepared by Defire (**Appendix G**).
- Revised BCA Compliance Statement prepared by McKenzie Group (**Appendix H**).
- Revised Sustainability Management Statement prepared by ARUP (**Appendix I**).
- *Warringah Development Control Plan 2011* Compliance Table (**Appendix J**).

1 Approved Development

1.1 DEVELOPMENT CONSENT

Development Application DA2008/1741 was submitted to Warringah Council on 18 December 2008, concurrently with two other applications:

- Warringah Mall Shopping Centre Development Control Plan Application; and
- DA2008/1742 for stormwater drainage works through the Warringah Mall site.

Development applications DA2008/1741 and DA2008/1742 have both been determined, and the Warringah Mall DCP has been adopted by Council and forms Part G4 of the *Warringah Development Control Plan 2011*.

DA2008/1741 obtained consent for the expansion of the retail offer in Warringah Mall and the associated new multi-level car park. These works are referred to as the 'Stage 1 Retail Expansion'.

A Deferred Commencement consent was issued by Council on 28 April 2010, with the deferred commencement condition relating to stormwater management for the approved works. Documentation was submitted to Council for consideration in satisfaction of this deferred commencement condition, and a letter advising that the Deferred Commencement conditions had been satisfied and the consent activated was issued by Council in August 2013.

1.2 APPROVED WORKS

The works approved under DA2008/1741 are for the partial demolition of existing buildings and construction of an extension to the existing Warringah Mall Shopping Centre buildings. These works also included redevelopment of the Palm Tree car park and modification to the Starfish car park.

The scope of the approved works are outlined in below:

- Reconfiguration of the existing shopping mall buildings, resulting in approximately an additional 8,000m^2 of gross lettable floor area and new mall connecting with David Jones;
- Redesign of Myer tenancy;
- Redevelopment of the 'Palm Tree' car park to accommodate a new multi-deck car park;
- Reconfiguration of the existing 'Starfish' car park to accommodate the new shopping mall expansion, and addition of new express ramps within car park;
- Creation of new rooftop car park above new retail floorspace;
- New landscaping along the Cross Street and Green Street frontages;
- Stormwater works associated with the approved development, including a twin barrelled culvert adjacent to Cross Street and Green Street;
- New external signage for future tenants and building identification signage; and
- Associated traffic management works.

2 Proposed Modifications

2.1 SUMMARY OF PROPOSED MODIFICATIONS

This Section 96(1A) modification seeks to amend the works approved under DA2008/1741. The application specifically seeks to make the following modifications to the approved development:

- Reconfiguration of the approved retail expansion area but with no increase in the volume of additional floorspace approved under the original application.
- Reconfiguration of the Myer store to create a smaller Myer tenancy and additional specialty tenancies.
- Alterations to the design of the 'Palm Tree car park' including changes to the layout, vehicle circulation external elevations and landscaping.
- Alterations to the 'Starfish car park' including reconfiguration of access driveway at the south-western corner of the site.

Each of these modifications is discussed in detail below.

2.2 RECONFIGURATION OF RETAIL EXPANSION AREA

This Section 96(1A) application seeks to reconfigure the new retail expansion area adjacent to the Starfish car park. The revised proposal will result in the approved 8,000m^2 of Gross Lettable Area (GLA) being redistributed throughout the new 'parallel' fashion mall at the ground floor and first floor. The reconfigured malls will comprise of:

- The new ground level 'parallel' fashion mall adjacent to the Starfish car park will comprise:
  - Reconfiguration of the Myer store to reduce the overall size of the tenancy.
  - 3 new mini-major tenancies.
  - Approximately 31 new specialty tenancies.
  - Approximately 15 new kiosks, food stores and restaurants.
- The reconfiguration of the first floor connecting to the Starfish car park and Palm Tree car park will comprise:
  - Reconfiguration of the Myer store to reduce the overall size of the tenancy.
  - 7 new mini-major tenancies.
  - Approximately 33 new specialty tenancies.
  - Approximately 6 new kiosks and restaurants.

The revised design of the parallel mall incorporates a revised skylight design which will improve natural ventilation and daylight into this space.

Due to the location of the new retail mall adjacent to the existing retail mall adjoining to the David Jones tenancy and the existing Starfish car park, part of the Starfish car park will be demolished and reconfigured. This is discussed in more detail below in **Section 2.4**.

It is noted that the proposed modification results in generally the same volume of GLA as was approved under the original application, with the new parallel mall situated in the same location as previously approved.

2.3 ALTERATIONS TO PALM TREE CAR PARKCAR PARK

Internal Layout

The proposed modification seeks to reconfigure the Palm Tree car park to improve parking efficiencies within the new multi-deck structure, and introduce express ramps for cars to access higher levels of the car park.

The redesign of the Palm Tree car park will leave the approved entry and exit points unchanged, however the inclusion of new express ramps will improve internal circulation within the car park, reducing any potential queuing at entries.

External Design and Landscaping

The car park redesign has included the removal of the external circulation ramps along Green Street resulting in a reduction in bulk along the eastern elevation. New circulation ramps, including the express ramps are proposed along the northern elevation adjacent to Cross Street, however the redesign of the Cross Street elevation of the car park includes a new façade treatment which comprising a mix of landscaping and batten panels which will largely screen these elements.

Incorporated in the revised Palm Tree car park is a redesigned 'centre identity treatment' which will punctuate the Green Street 'Gateway' entry into the centre. The redesign incorporates high-quality materials and modern lines to provide a contemporary architectural entry feature.

2.4 ALTERATIONS TO STARFISH CAR PARK

The proposed modifications seek to reconfigure the internal layout of the Starfish car park to accommodate the new retail expansion area. This will result in part of the eastern portion of the existing Starfish car parking being demolished to accommodate the new location and layout of the parallel mall.

Further, to improve efficiencies in vehicles entering and circulating through the car park, a new entry configuration is proposed to support the introduction of express ramps for cars to access higher levels of the car park. The revised car park design relocates the circulation ramps to the exterior side of the car park along the western elevation. This redesign increases the area within the car park to accommodate parking spaces reallocated from the parallel mall redesign. Due to existing development to the west of the Warringah Mall site, the new location of the car park ramps will have limited visual impact from surrounding sites or public spaces.

2.5 SIGNAGE

Consistent with the original application submitted for the Stage 1 works, signage zones have been indicated on the plans to provide guidance of the location and scale of signage on the new Palm Tree car park and northern elevation of the Warringah Mall site. Details of this strategy are illustrated on the architectural plans (DA01.5302) prepared by Westfield Design and Construction attached in **Appendix A**.

It is noted that Condition 4 of the Deferred Commencement consent requires a separate application for signage, and this modification application does not seek to alter this requirement.

3 Section 96(1A) Assessment

The proposed modification to the existing development consent is sought under Section 96(1A) of the *Environmental Planning and Assessment Act 1979*, which will have minimal environmental impacts as demonstrated through the assessment undertaken below.

Under s.96(1A) the consent authority may approve an application to modify a development consent where it is satisfied that the proposed modification will satisfy the four elements of s.96(1A), which the proposed modifications are assessed against below.

3.1 MINIMAL ENVIRONMENTAL IMPACTS

The proposed modifications to the approved Stage 1 expansion of Warringah Mall have been designed to improve the retail offer within the new parallel mall to meet contemporary retailing demands. The design integrates the following key improvements to the operations of the Mall:

- Reconfigure tenancy layout and size in new parallel mall to meet current retailing trends.
- Redesigned skylight in the new parallel mall which will improve access to natural light and ventilation.
- Express circulation ramps in the Palm Tree and Starfish car parks, which will improve efficiencies for vehicles to access higher parking levels.
- Modified landscaping treatment along the entry-way to the Starfish car park, which will replace the existing landscaping bays with larger landscaping verges planted with species suitable for the conditions of this location.
- Revised northern and eastern elevation of the Palm Tree car park which introduces new design elements and minimises visual clutter at this northern entry point.

Accordingly, as the proposal seeks to improve the retail offer and car park efficiencies without increasing the overall size of the Stage 1 mall expansion, it will have minimal environmental impacts beyond those of the original approved works.

3.2 SUBSTANTIALLY THE SAME DEVELOPMENT

The proposed modifications result in the overall scale of the Stage 1 development remaining unchanged. The modification will still deliver a new parallel mall with approximately 8,000sq.m of GLA and proposed the same number of parking spaces (however reconfigured) to be delivered in stages as approved under the original Stage 1 DA.

The changes to the Palm Tree car park façade will provide a modern streetscape presentation of the new car park structure which incorporates contemporary materials and landscaping treatments. However these changes will result in the car park envelope remaining unchanged.

Accordingly, while the proposed modification provide a more contemporary retail offer and built form design, the changes to the overall development outcomes are minor in nature, and will result in the delivery of substantially the same development as originally approved.

3.3 NOTIFICATION PROCESS

Under Part A.7 of the *Warringah DCP 2011*, Section 96(1A) applications do not require notification, However it is noted that Council have the discretion to notify any application it sees fit. The Applicant does not object to the notification of this Section 96(1A) application.

3.4 CONSIDERATION OF SUBMISSIONS

If the application is notified and submissions are received, these acknowledge that Council will consider the issues raised in the submissions as part of the assessment process.

4 Policy Assessment

4.1 POLICY OVERVIEW

The relevant planning policies applicable to the proposed modification are:

- *Warringah Local Environmental Plan 2011*.
- *Warringah Development Control Plan 2011*.

A summary of the assessment against each of these policies is outlined below.

4.2 WARRINGAH LOCAL ENVIRONMENTAL PLAN 2011

The *Warringah Local Environmental Plan 2011* (WLEP 2011) was gazetted on 9 December 2011. Accordingly the WLEP 2011 was not in force at the time of the original consent for the Stage 1 DA.

Under the WLEP 2011, the Warringah Mall site is zoned B3 Commercial Core, which includes the following as one of the four zone objectives:

- *To recognise and support the role of Warringah Mall as a retail centre of sub-regional significance.*

The proposed modifications seek to promote the status of Warringah Mall as a retail centre of sub-regional significance through improving the design of the centre to respond to more contemporary retailing trends. The redesigned Palm Tree car park façade provides a prominent gateway statement to the northern entry into Warringah Mall, incorporating contemporary materials and innovative design elements which will enhance the visual presentation of the shopping centre.

The components of the modification have already been approved, however it is noted that under the B3 Commercial Core zone, *'Commercial Premises'* which is the group definition including *'retail premises'* is expressly permissible, while *'car parks'* are also permissible within the B3 zone.

While the Warringah Mall site is identified as containing acid sulphate soils, these are not identified as affecting the part of the site where works are proposed.

4.3 WARRINGAH DEVELOPMENT CONTROL PLAN 2011

The *Warringah Development Control Plan 2011* (WDCP 2011) was adopted by Council in 2011 concurrently with the gazettal of the WLEP 2011.

An assessment of the proposed amendments has been undertaken against the relevant *WDCP 2011* controls and is contained in **Appendix J**. The assessment indicates that the proposed amendments are consistent with the objectives of the *WDCP 2011* controls.

5 Key Considerations

5.1 BUILT FORM AND URBAN DESIGN

A detailed architectural statement has been prepared by Westfield Design and Construction (**Appendix A**) which outlines the key design elements and rationale for the revised proposal.

The key changes to the built form and urban design proposed relate to the design of the Palm Tree car park. The proposed modifications do not alter the overall footprint of the Palm Tree car park, but rather reconfigure the parking spaces within the car park, and rationalise and relocate the circulation ramps from the eastern façade of the car park to the northern façade.

The northern façade treatment has been redesigned to incorporate a new façade treatment to 'wrap around' the ramps and car park structure to conceal the ramps which sit on the outside of the car park structure. The new façade treatment integrates a mix of both materials and landscape elements to provide a more dynamic façade than previously approved.

The façade treatment has been augmented to relate to the revised ramp layout and provided integrated screening to the substation. The new façade treatment utilised a composition and layering of 'porous veils' which capture and imply movement across and throughout the façade. This new design will create a dramatic moving façade to define the Cross Street and Green Street corner.

The façade treatment includes a 'green wall' growing in the landscape setback area, and being trained to grow up the external wall of the circulation ramp using tension cables. Details of the landscaping treatment of the Palm Tree car park façade are included in the landscape plans prepared by DEM Landscape Architects attached in **Appendix B**.

The new façade treatment provides a strong 'gateway' presentation for the Cross Street and Green Street entry into Warringah Mall. Accordingly, the built form and urban design of the proposed modifications are considered suitable for the site and generally consistent with the approved scheme.

5.2 TRAFFIC AND PARKING

Traffic experts, GTA Consultants have reviewed the revised plans and provided advice on the traffic and car parking implications of the modified design (attached in **Appendix D**). The key findings of the traffic review have been extracted below:

- *The current scheme is not proposing to alter the previously approved floor space area i.e. 8,000m^2 gross leasable floor area.*
- *The expected development traffic arising from the current Stage 1 scheme would be consistent with the previously approved development. As such, the surrounding road network would continue to operate well as originally planned.*
- *No change to the number of car parking spaces or staged delivery of the car parking spaces.*
- *The proposed modifications to access arrangements at the "Palm Tree" and "Starfish" car parks are considered to be acceptable.*
- *The proposed access arrangement is consistent with that shown in the Warringah DCP.*
- *All new parking spaces and associated car park elements are proposed to be designed in accordance with the requirements set out in the Australian Standard for car parking facilities.*

Overall, the traffic and parking effects of the proposed modifications to the approved Stage 1 would be satisfactory.

Based on the expert advice received it is considered that the proposed modifications to the car parking and access arrangements are satisfactory.

5.3 LANDSCAPING AND TREE MANAGEMENT

Proposed Landscaping

The revised landscape treatment for the Stage 1 development has been designed by DEM Landscape Architects. The landscape plans and design statement are attached in **Appendix B**. The aim of the proposed landscaping is to provide a suitable landscape treatment to address the local environment while also remaining in-keeping with the surrounding light industrial uses.

The landscaping along Cross Street is a combination of street trees, ground cover and plants to create the 'Green Wall' on the external ramps. The design of the landscaping along Cross Street has been design to provide a vegetated streetscape at pedestrian level, while also screening the external ramps proposed along this frontage.

The landscaping for the Palm Tree car park is proposed along Cross Street and Green Street. The landscaping along Green Street comprises drought-tolerant groundcovers and shrubs in mounded soil. All existing trees along Green Street within the verge will be retained, while the existing palm trees at the corner of Green and Cross Streets will be transplanted into the Green Street verge.

Overall, the proposal will enhance the landscaping along these street frontages and provide a more defined streetscape for both Cross and Green Streets and provides a positive contribution to the northern 'gateway' into Warringah Mall.

The changes to the landscaping along the existing driveway into the Starfish car park will replace the existing trees with more suitable species that can survive in the harsh conditions of this roadway. The proposed species are low water tolerant natives suitable for low-light conditions.

Proposed Tree removal

To accommodate the proposed changes to the roadway to the Starfish car park, 12 existing trees within the roadway are proposed to be removed. A Tree Report has been prepared by TreeScan (**Appendix E**) which assesses the health and anticipated life-span for each of the 42 trees within this roadway.

The report concludes:

> *The removal of ten trees would be necessary to enable the construction of the new roadway and access ramp. Most of these trees are of diminished value due to their confined locations within planter beds in the centre of the roadway.*
>
> *Trees proposed for retention would require protection, depending on their proximity to disturbance as the result of construction nearby. In most cases the protection of the site fencing along the edges of the roadway would be sufficient, but some trees may also require trunk armouring to protect trunks and lower branches from accidental contact with machinery.*

The trees proposed to be removed will be replaced with new small to medium size trees, native shrubs and ground covers in larger garden beds. Accordingly, while trees are proposed to be removed from within this part of the site, they are of low value due to their poor health and will be replaced by more suitable landscaping which considers the locational characteristics of the Starfish roadway.

5.4 PLANT ROOMS

The revised architectural plans prepared by Westfield Design and Construction (**Appendix A**) indicate three roof plant locations which have been identified through the design development process. Accordingly, it is requested that Condition 9 be deleted or modified to permit these structures.

It is noted that the plant room locations are substantially setback from the site boundaries, and will generally be screened from views off-site by the existing and proposed building structures on the Warringah Mall site. However, any plant structures protruding above the roof will be suitably screened to integrate with the building structure. Accordingly, the deletion or modification of Condition 9 will not result in any perceivable adverse impacts and is considered satisfactory.

5.5 STORMWATER AND FLOOD MANAGEMENT

Revised stormwater drainage plans have been prepared by Cardno and are attached in **Appendix C**. The stormwater works proposes some on-site regrading of roadways to minimise pooling of stormwater on these surfaces.

The stormwater design includes new flood barriers to limit the extent of flooding of habitable parts of the site. These works include flood protection for the ground floor car park areas, and have been designed in accordance with the flood management works submitted to Council in satisfaction of the deferred commencement condition.

5.6 SUSTAINABILITY

A review of the Sustainability Management Plan has been undertaken by Arup and is attached in **Appendix I**. The review identifies minor amendments to the Sustainability Management Plan, however the Arup review concludes that the overall sustainability outcomes of the development have minimal difference to the originally approved development, *'if not improved based on the current design development'.*

5.7 ACCESSIBILITY

An Access Report has been prepared by Access Australia and is attached at **Appendix F**. The report makes a series of recommendations to ensure compliance with the relevant access standards. As part of this Section 96(1A) application, Westfield is committed to adopting these recommendations and meeting the relevant access standards.

6 Conclusions

Based on the assessment outlined above and the support documentation attached in **Appendix A to J**, it is concluded that the proposal to modify Conditions 1, 7 and 9 of Deferred Commencement Consent DA2008/1741 may be approved under the provisions of section 96(1A) of the *Environmental Planning and Assessment Act 1979*.

In summary, we submit that the proposed amendment involves a revised built form design for the new parallel mall and Palm Tree car park as a consequence of detailed design development. These changes are entirely positive will not introduce any adverse social, economic or environmental impacts.

The amended design will enhance the quality and amenity of retail offer and provide improved car park circulation within the site. The redesign of the Palm Tree car park façade will provide a 'gateway' northern entry into Warringah Mall, which will improve and enhance the Green Street and Cross Street streetscapes.

Accordingly, the proposed modification is reasonable and will result in substantially the same development as originally approved. Therefore this request to modify the deferred commencement consent should be supported and approved by Warringah Council.

Disclaimer

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Appendix A

Amended Architectural Plans and Design Statement

29 April 2014

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Westfield Warringah Mall

Stage 1 Retail: Section 96 application

Architectural Design Statement

This application seeks to amend Development Approval DA2008/1741, the changes can be summarised as follows:

1. Retail Plan Rationalising
2. Palm Tree car park modifications
3. Star Fish car park revisions

As this statement will establish, the modifications sought are a marked improvement on the Development Approval, in that a superior solution is to be achieved without changing the Gross Leasable Area (GLA), stormwater augmentation, or the number of car parking spaces to be provided.

1. Retail Plan Rationalisation

The changes sought to the retail plan will bring the centre up to date with current and future retail requirements, whilst lessening the impact on the existing complex with greater retention of existing structures.

The Myer tenancy has been right sized, with the tenancies around its entrance reconfigured to incorporate Mini Major tenancies in order to accommodate the current retail market, and the Myer loading dock and its access entry is also to be modified to reflect the proposed retail changes In addition to this, the Ground Level of the Parallel Mall has been widened from 9m to 10m to reflect best practice retail design.

The above alterations result in a reduction of the Star Fish car park area, and subsequent loss of cars. However these losses have been accommodated for in other areas and via efficiency improvements, which will be elaborated on further in this statement.

As illustrated on the architectural drawings, it is proposed that the approved diagonal Cross Mall from the new Parallel Mall to existing David Jones entry is to be deleted, and that the southern diagonal Cross Mall from the existing Myer entry to the Centre Court has been reconfigured to integrate with the existing north (Myer) Cross Mall.

These alterations provided the opportunity to improve the performance of the skylight design in regards to natural ventilation and day lighting. A number of studies have been conducted in order to arrive at the proposed skylight form, and it is noted that this form enjoys a stronger relationship to the centre's existing skylights than that of the approved.

Some improvements to the approved access and Vertical Transport are proposed to both the Star Fish and Palm Tree car parks. These include minor alterations at Star Fish, and the Palm Tree car park travelators and lift shifted to be within the existing mall entry.

The net effect of the proposed rationalisation of the Retail Plan is a stronger solution than that of the approval that accommodates current and future retail requirements, with less demolition, improved access, and enjoys superior skylight performance. All without any change to the approved Gross Leasable Area (GLA), and wholly contained within the centre and thus, negligible effects on the surrounding context.

2. Palm Tree Car Park Modifications

This application seeks to modify the approved multi-deck Palm Tree car park in order to provide for future expansion and update the landscaping and elevations accordingly. The opportunity offered by these alterations was taken to elaborate and enrich the car park façades, resulting in an urban experience that is of substantial improvement over the development approval.

In provisioning for future expansion, it is proposed to consolidate the car park circulation ramps away from Cross and Green streets, and to provide an exit speed ramp to complement the entry speed ramp. The opportunity to improve the address point of the redevelopment was taken to increase the Green street setback, and offer greater soft landscaping than that of the approval.

It is noted that the above modifications have aided construction rationalisation, increased car parking efficiency (making up for some of car spaces reduced in rationalising the Retail Plan), and provided some welcome improvements to the car park access and internal arrangements. The details of which can be reviewed via the *Stage 1 s96 Application Traffic Review* conducted by *GTA Consultants* (submitted with this application), which provides a detailed assessment of the proposed alterations sought in regards to Traffic Management.

In revising the façade, the approved defining 'corner drum' element has been improved in form and detail. The form has been augmented to relate to the revised external car park ramps, and the detail elaborated from a singular expression, towards a composition and layering of "porous" veils. The geometry of these layered veils capture and imply movement across and throughout the façade, offering a far more dramatic defining corner element than that of the approval.

In addition, a green façade has been added to the Cross street elevation where it is proposed to provide an additional speed ramp to. It is envisaged that the green façade will be comprised of climbing plants on a tensioned cable substrate, which will span from the garden bed to the inclined speed ramp (please refer to the Landscape Architect's documentation for details). This green wall will aid the other landscaping in providing a softer and more varied Cross street elevation than that of the approval.

The body form of the car park remains much the same to that of the approval, as does the intent of the continuous 'porous' façade, which provides subtle articulation and natural ventilation. It is in the detail and materiality of how this is achieved that revisions are proposed in order to address construction and durability issues. The vertically mounted battens will now span from the Ground Mezzanine slab to the up-stand of Level 2 (instead of floor to floor), with the subtle articulation maintained by undulating the battens horizontally away from the body form of the car park. Finally, to address durability concerns, the approved recycled material of the vertical battens will be substituted for a pre-finished metal, which will be consistent with the approval. The result of these revisions is that the approved intent of the cladding to the body form of the car park remains largely unchanged, and that these revisions are a result of progressive elaboration through design development.

The net effect of the proposed Palm Tree car park modifications to the immediate local context, and indeed the viewer (in and around Cross street), is of great improvement on the approval. Indeed, the building form and design intent remain largely the same. However, it is in the revised details that greater depth and richness is achieved; through the deeper and softer Green street setback, a green façade for which Cross street to enjoy, and ultimately, the corner 'veil' which dramatically defines the corner, and offers a dynamic address point to the redevelopment.

3. Star Fish Car Park Revisions

It is sought to modify the approved alterations and additions to the Star Fish car park, to improve the efficiency, as well as accommodating the rationalising of the Retail Plan. These changes achieve a marked improvement on the Development Approval with negligible affects to neighbouring properties.

In an effort to increase the efficiency of the car park and rationalise the construction, it is proposed to relocate the approved speed ramp (Ground to Level 01 mezzanine) from its internal location to be external of the car park within the median of the west access road. The result of which is significant gains in car parking spaces, traffic management and safety. A detailed assessment of the proposed alterations sought in regards to Traffic Management can be reviewed in the *Stage 1 s96 Application Traffic Review* as previously mentioned.

As part of the proposed speed ramp relocation, the opportunity has been taken to address the landscaping of the access road. The result being an increase in soft landscaping over the existing conditions, and new trees in-lieu of the trees that are to be removed (a number of which are in poor condition and health). To review the proposed landscaping in detail, please refer to the Landscape Architects documentation submitted with this application. It is noted that there are no approved landscape works in this location, and as such these proposed works are a marked improvement over the approval, and indeed the existing conditions.

The outcome of accommodating the modifications to the Retail Plan is a reduction in car park area, however the development maintains the required amount of car parking spaces as well as a surplus for a future stage via the above mentioned improved efficiencies in the rooftop, Star Fish and Palm Tree car parks.

In regards to neighbouring properties, the affects to the adjacent "*Lifestyle Working"* commercial office complex are considered to be negligible given that there will be some distance between its east façade and the proposed speed ramp location. Further to this, it is noted that there is significant visual screening provided by the existing trees (please refer to the Landscape Architect's documentation for details) on the western verge of the access road. In addition, the adjacent commercial complex will enjoy the affects afforded by the provisioning of new landscaping works to the access road median associated with the speed ramp. The proposed position of the speed ramp is setback from the property boundary, comfortably more than the required variable boundary setback as suggested in the *Warringah Mall Development Control Plan*.

It is considered that the proposed revisions to the approved Star Fish car park alterations and additions provide important efficiency improvements and spatial accommodation whilst without adversely affecting neighbouring properties.

Conclusion

As this statement has established, the modifications sought in this section 96 application, are a significant improvement on the Development Approval. The net result of the changes provides a best practice retail solution that will deliver superior skylight performance, increased car park efficiency, and improved access. All of this is to be achieved with less demolition, with no affect to the Gross Leasable Area (GLA), stormwater augmentation, or the number of car parking spaces to be provided. Further, the redevelopments interface with the local context has been improved with greater landscaping, refined facades, and provisioned with a dynamic address point.

DRAWING REGISTER

WARRINGAH MALL DEVELOPMENT

FIRST STAGE RETAIL EXPANSION & ASSOCIATED CAR PARKING

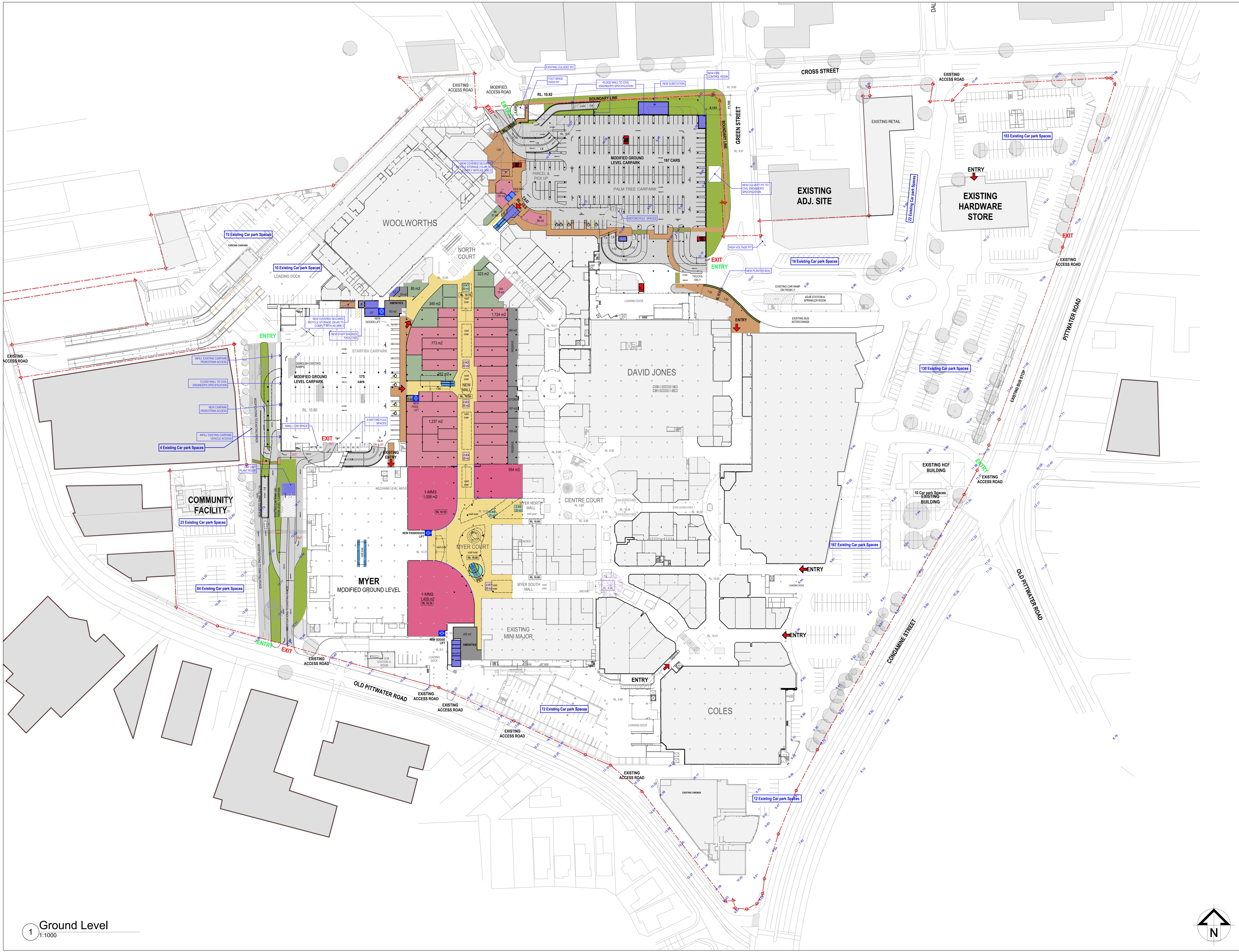
SECTION 96 APPLICATION

APRIL 2014

Westfield

Westfield RETAIL TRUST

AMP capital INVESTORS



1 Ground Level
1:1000

Proposed Ground Level
First Stage Retail Extension & Associated Carparking
WARRINGAH MALL

LEGEND: Area Types
- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

NOTES:
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Scheme 28d		11752 Project No

5200 Proposed Plans

Proposed Ground Level

DA 01.5201 Rev C

teamwork://AUPDC00-BIM01P/WR master plan

1 Ground Level Mezzanine
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL
First Stage Retail Extension & Associated Carparking
Proposed Ground Level Mezzanine

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5200 Proposed Plans

Proposed Ground Level Mezzanine

DA 01.5202 Rev C

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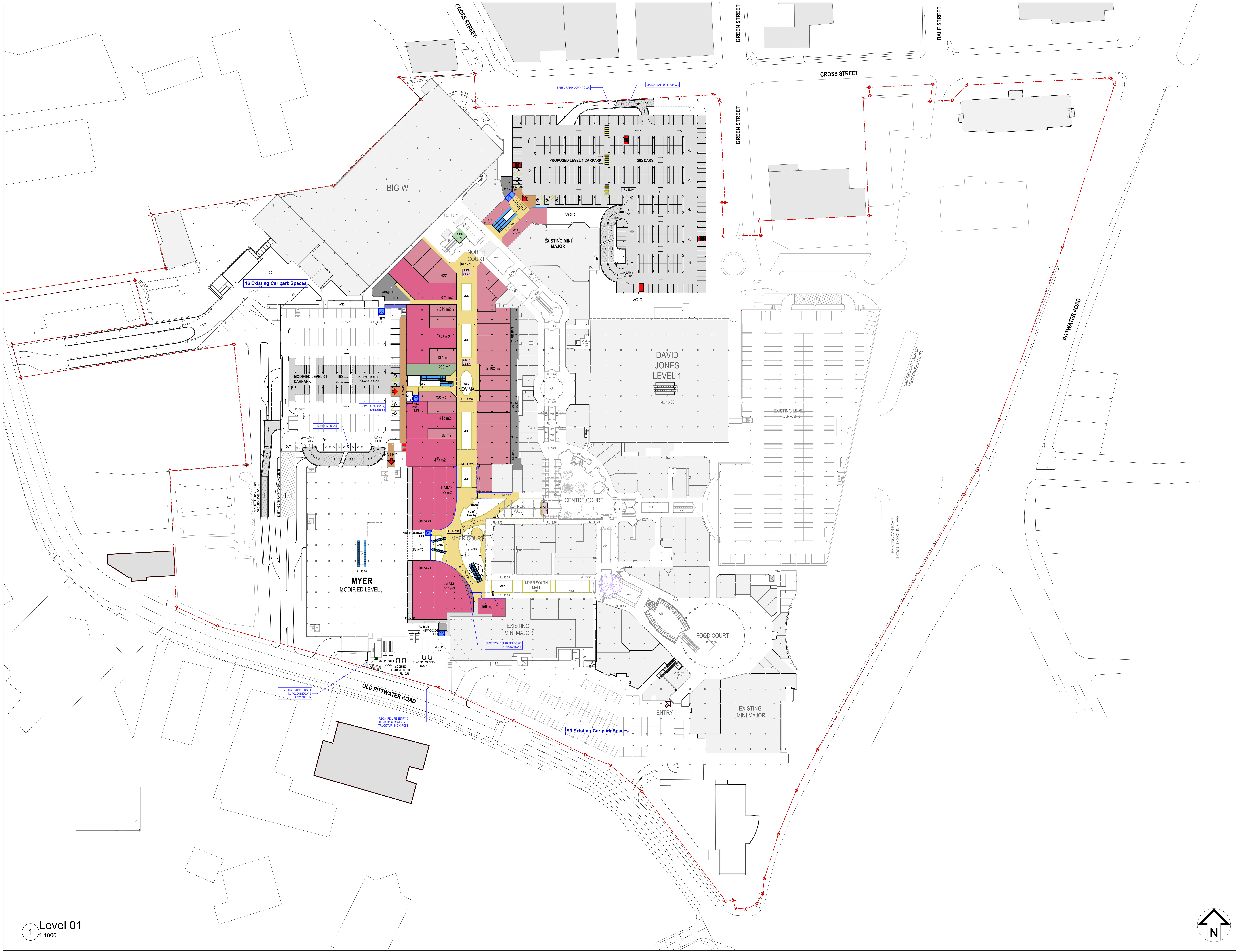

1 Level 01
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Proposed Level 01

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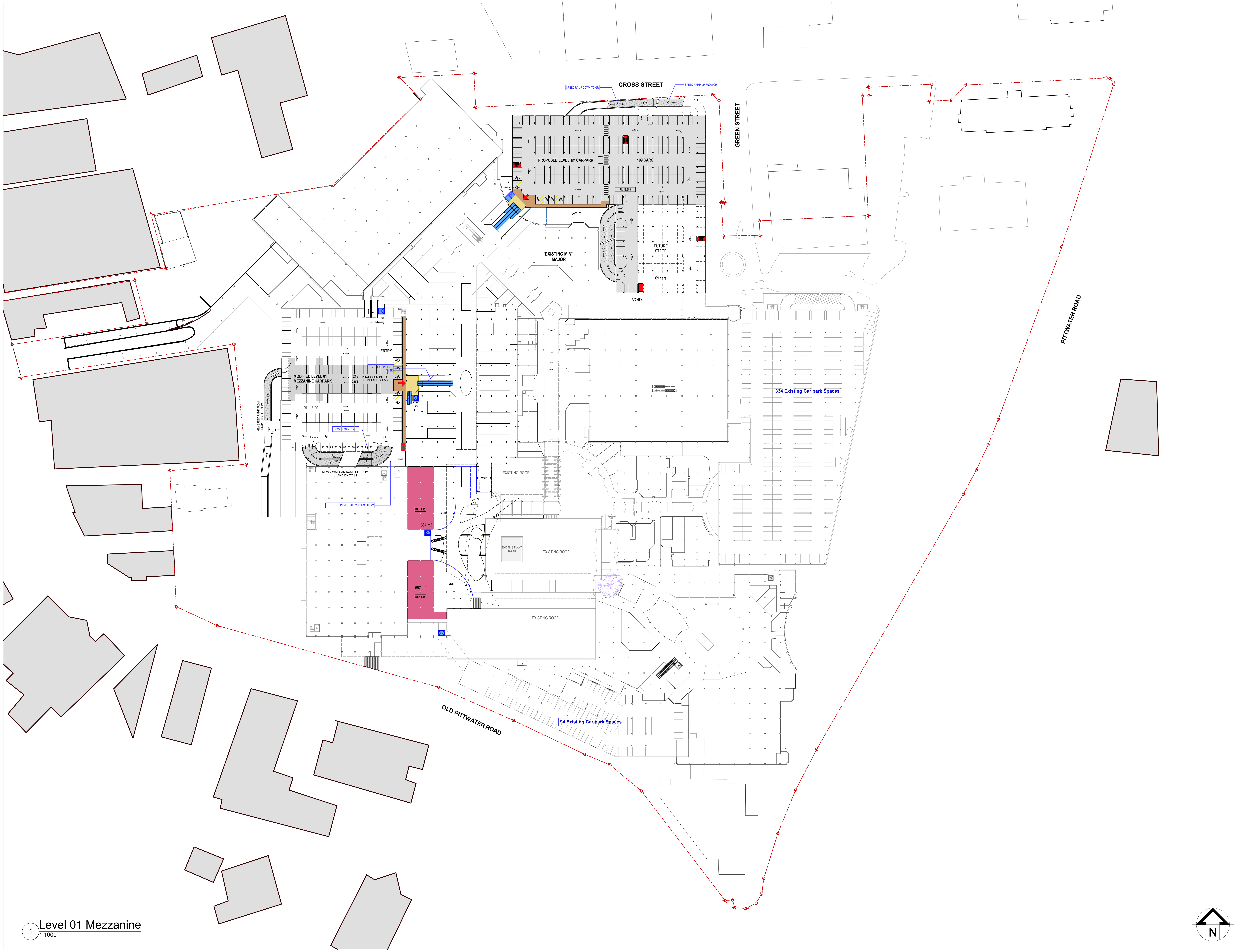
5200 Proposed Plans		
Proposed Level 01		
DA 01.5203		Rev C

N



1 Level 01 Mezzanine
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
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- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Proposed Level 01 Mezzanine

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5200 Proposed Plans

Proposed Level 01 Mezzanine

DA 01.5204 Rev C

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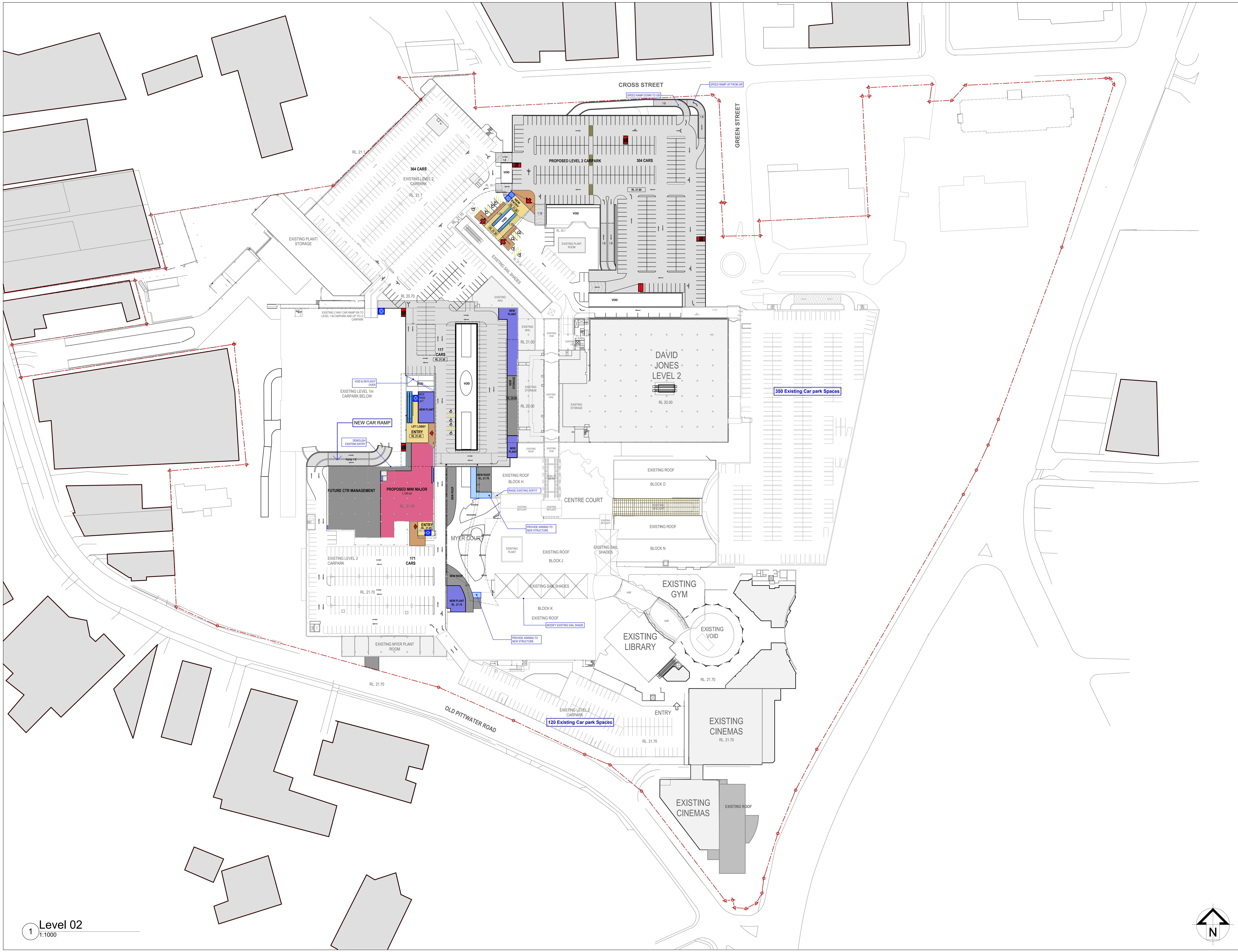

Level 02
1:1000

N

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Proposed Level 02

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5200 Proposed Plans

Proposed Level 02

DA 01.5205 Rev C

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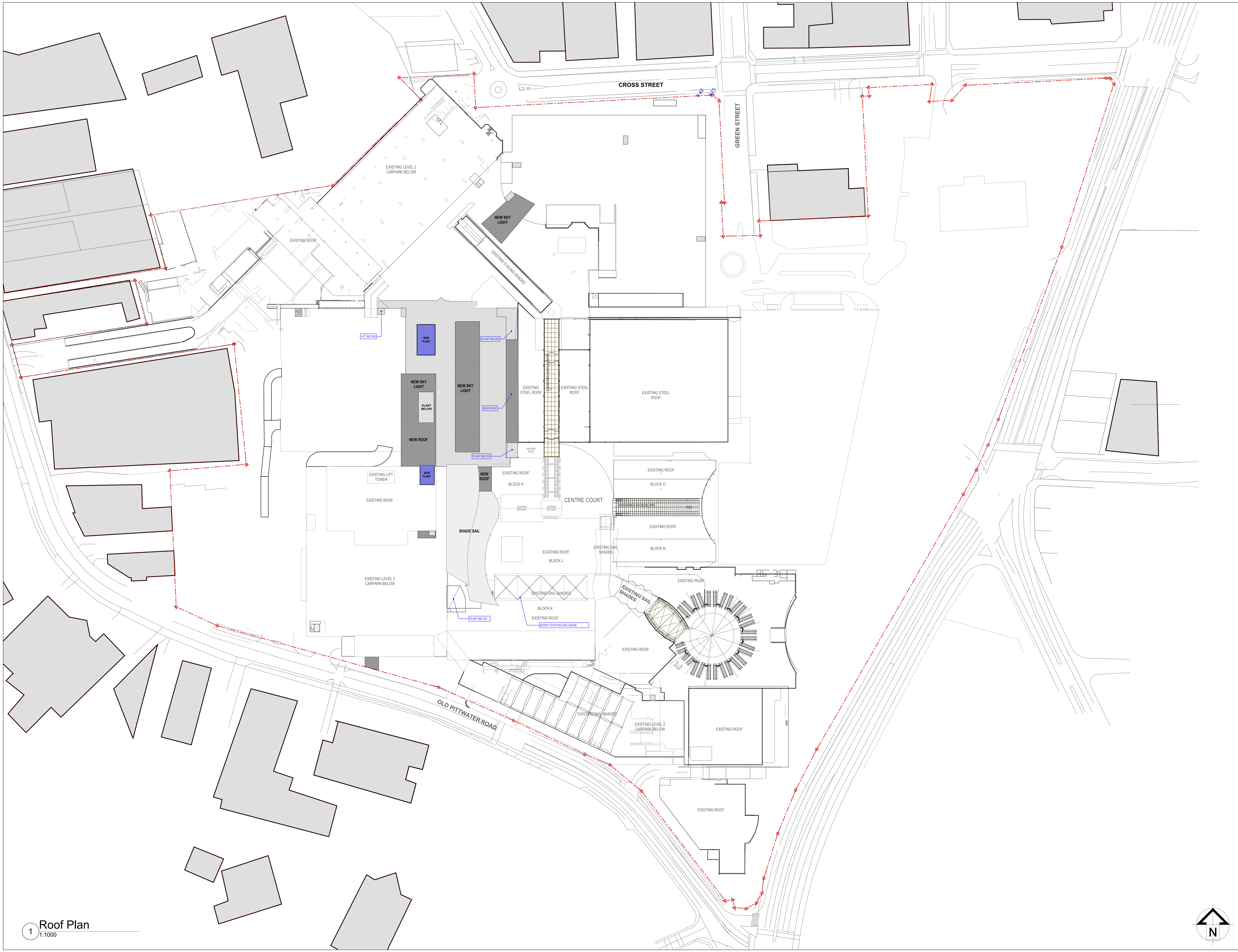

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Proposed Roof Plan

NOTES:
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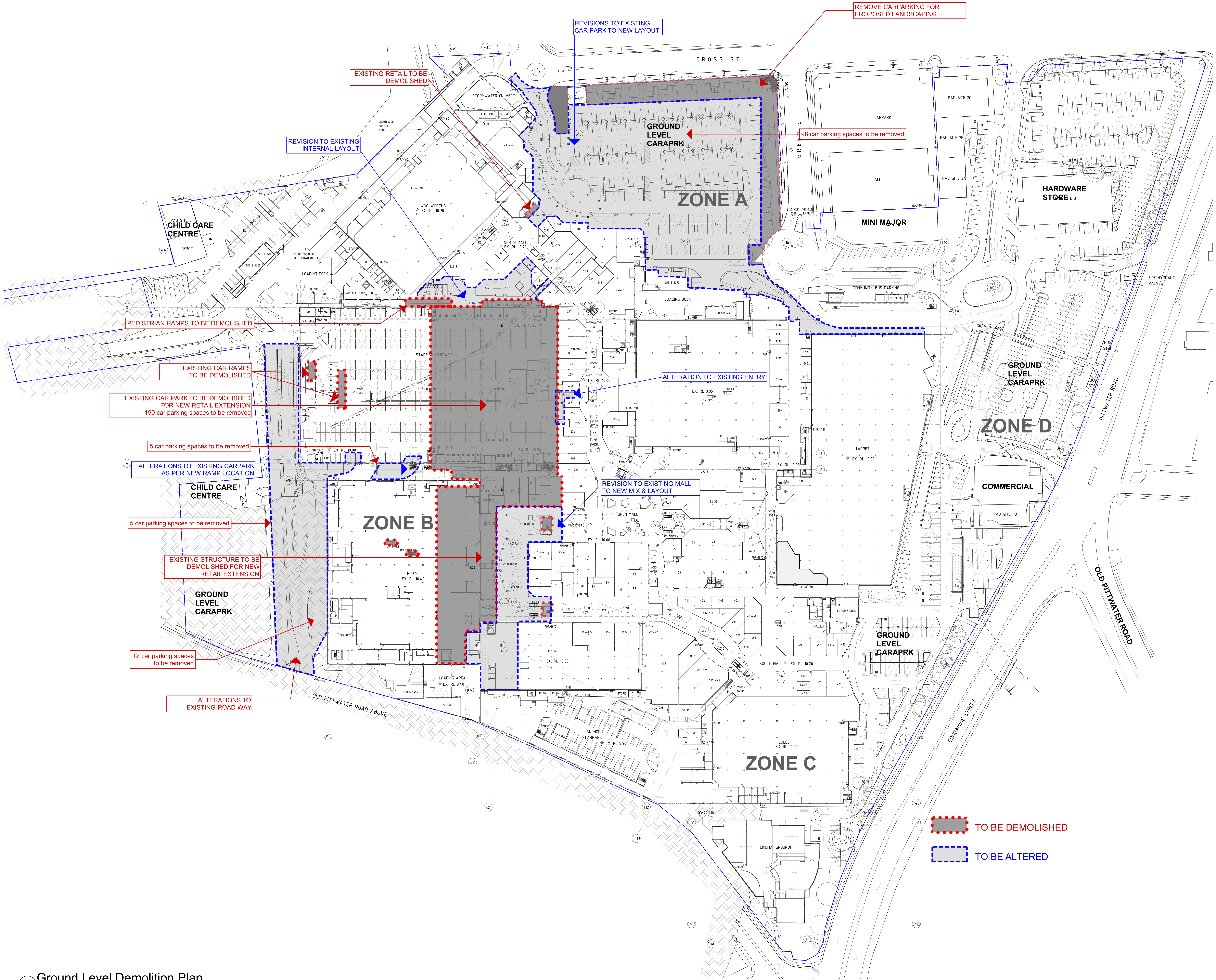
Scheme 28d		11752 Project No

5200 Proposed Plans

Proposed Roof Plan

DA 01.5206 Rev C

teamwork://AUPDC00-BIM01P/WR master plan



1 Ground Level Demolition Plan
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Demolition Plan- Ground Level

NOTES:
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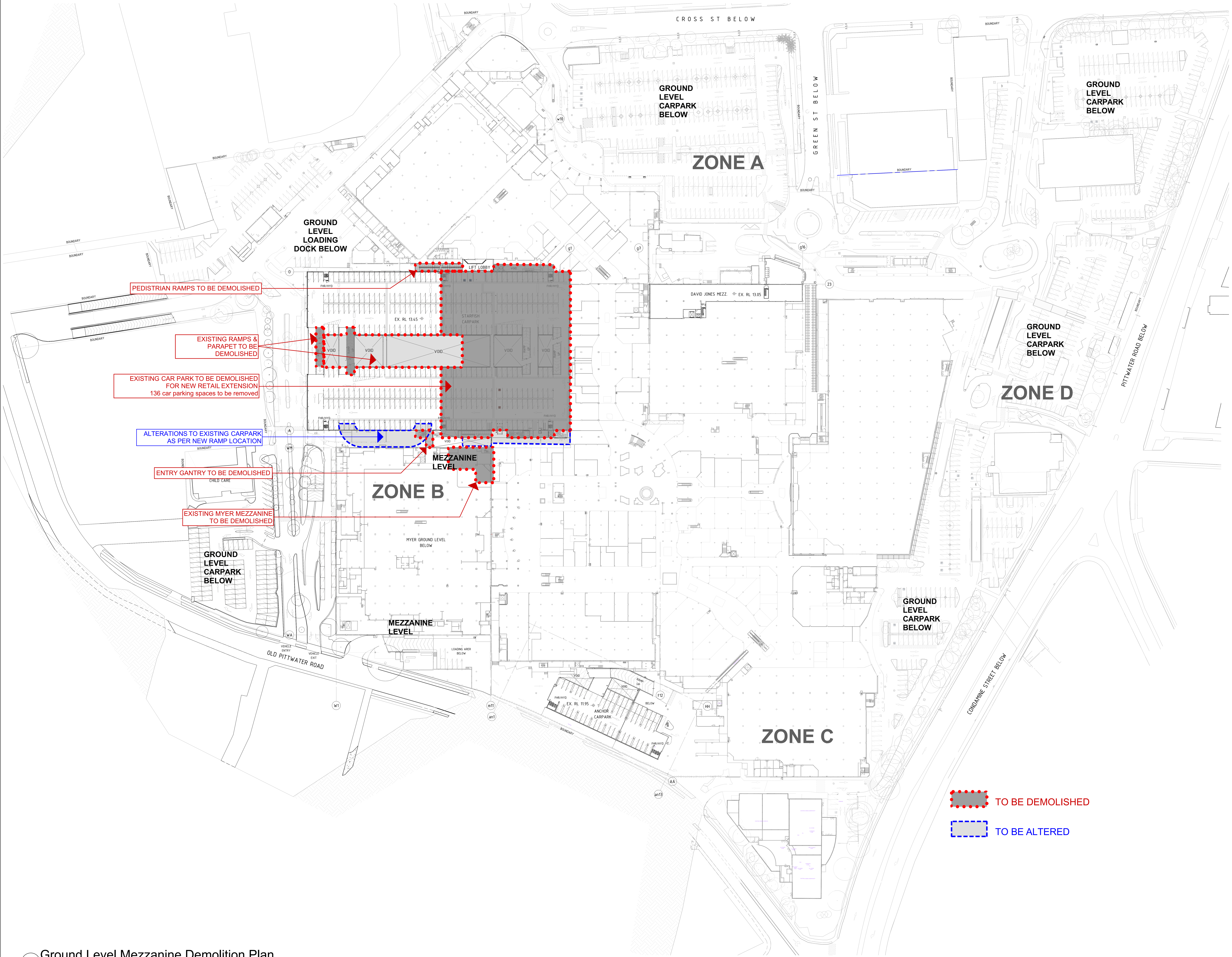
5250 Demolition Plans		
Demolition Plan- Ground Level		
DA 01.5251		Rev C



1 Ground Level Mezzanine Demolition Plan
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
- PROPOSED SERVICES
- PROPOSED PAVING
- PROPOSED LANDSCAPING

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Demolition Plan- Ground Level Mezzanine

NOTES:
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5250 Demolition Plans

Demolition Plan- Ground Level Mezzanine

DA 01.5252 Rev C

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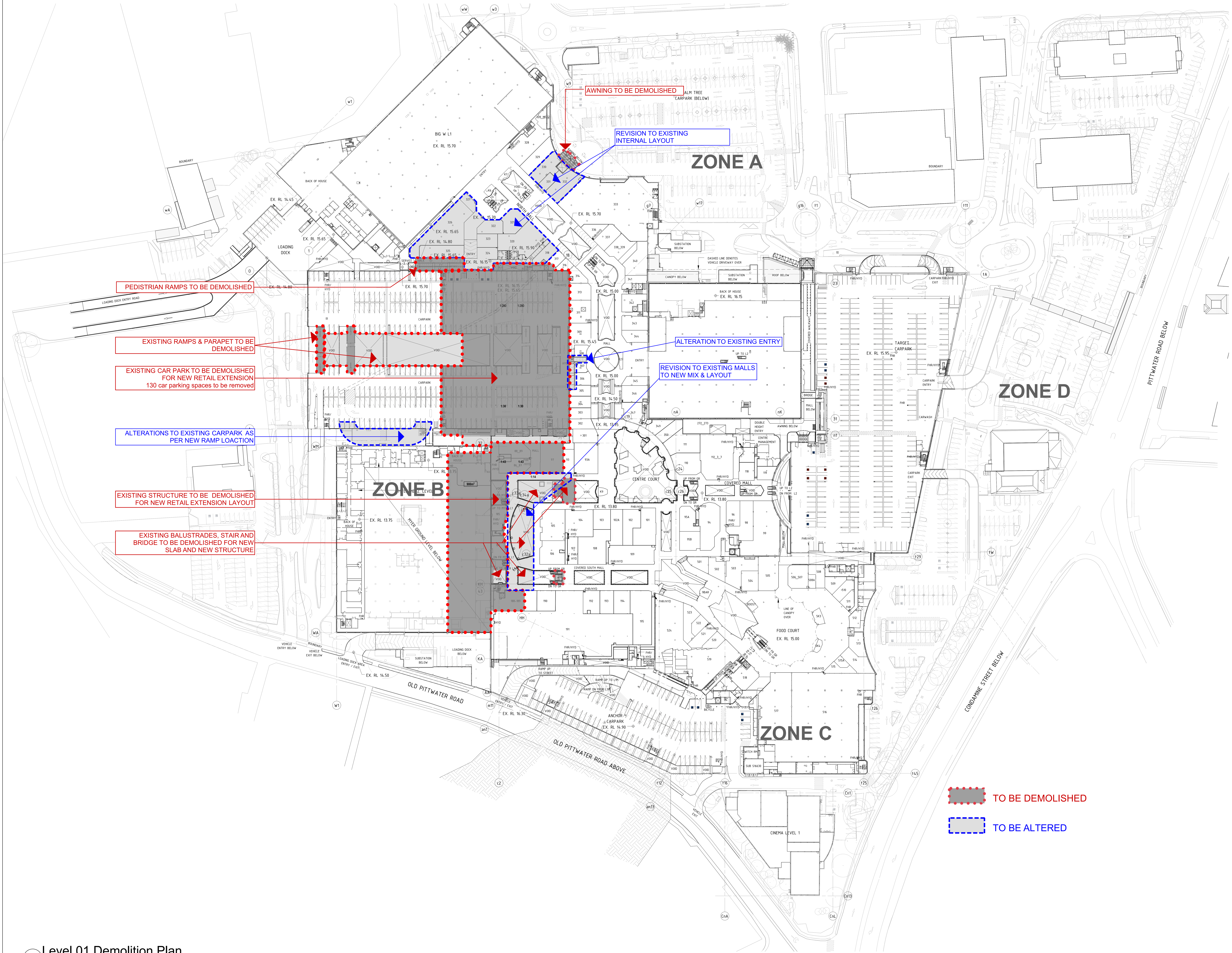

1 Level 01 Demolition Plan
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
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WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Demolition Plan- Level 01

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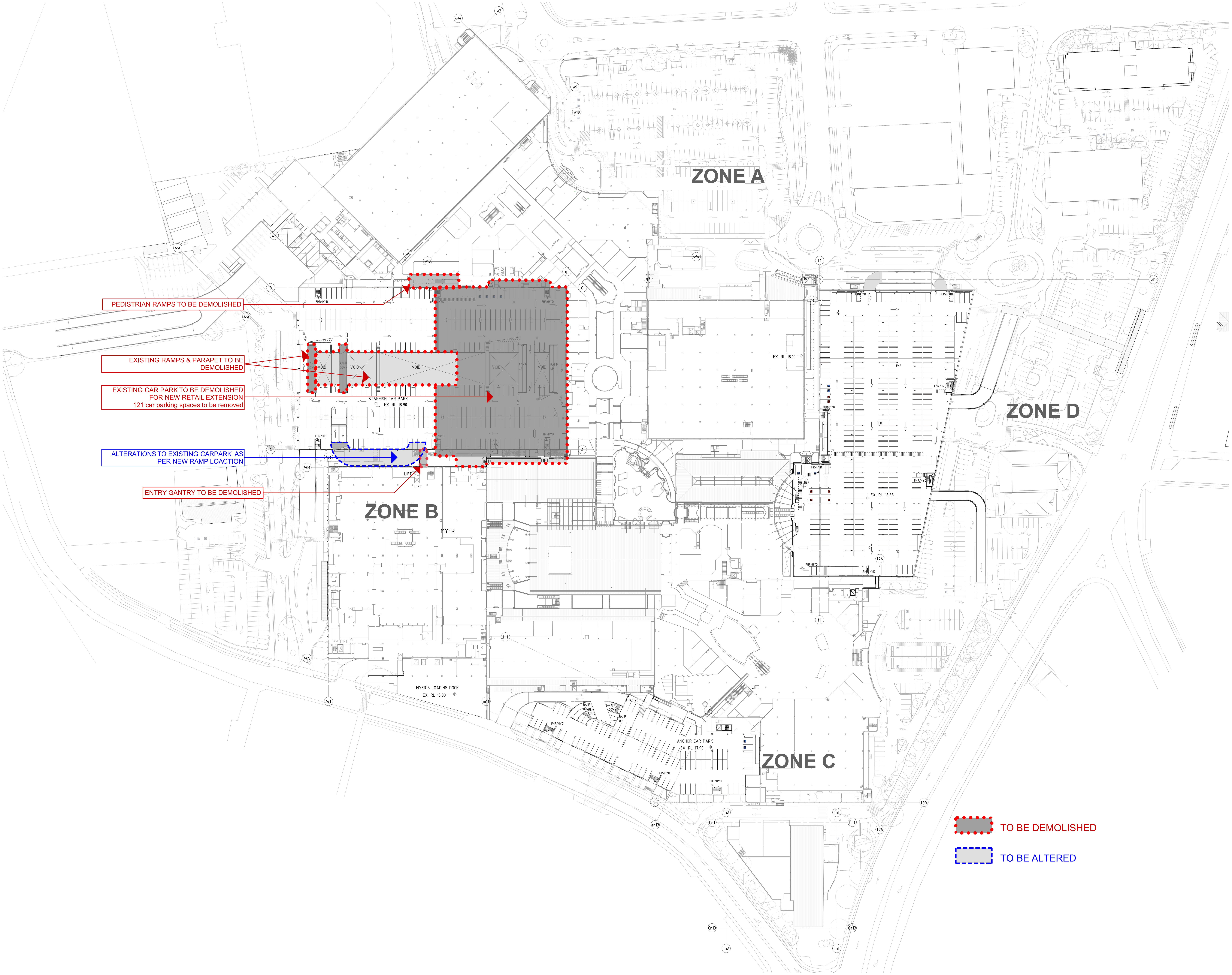
Scheme 28d		11752 Project No

5250 Demolition Plans

Demolition Plan- Level 01

DA 01.5253 Rev C



1 Level 01 Mezzanine Demolition Plan
1:1000

LEGEND: Area Types

- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
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WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Demolition Plan- Level 01 Mezzanine

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5250 Demolition Plans

Demolition Plan- Level 01 Mezzanine

DA 01.5254	Rev C

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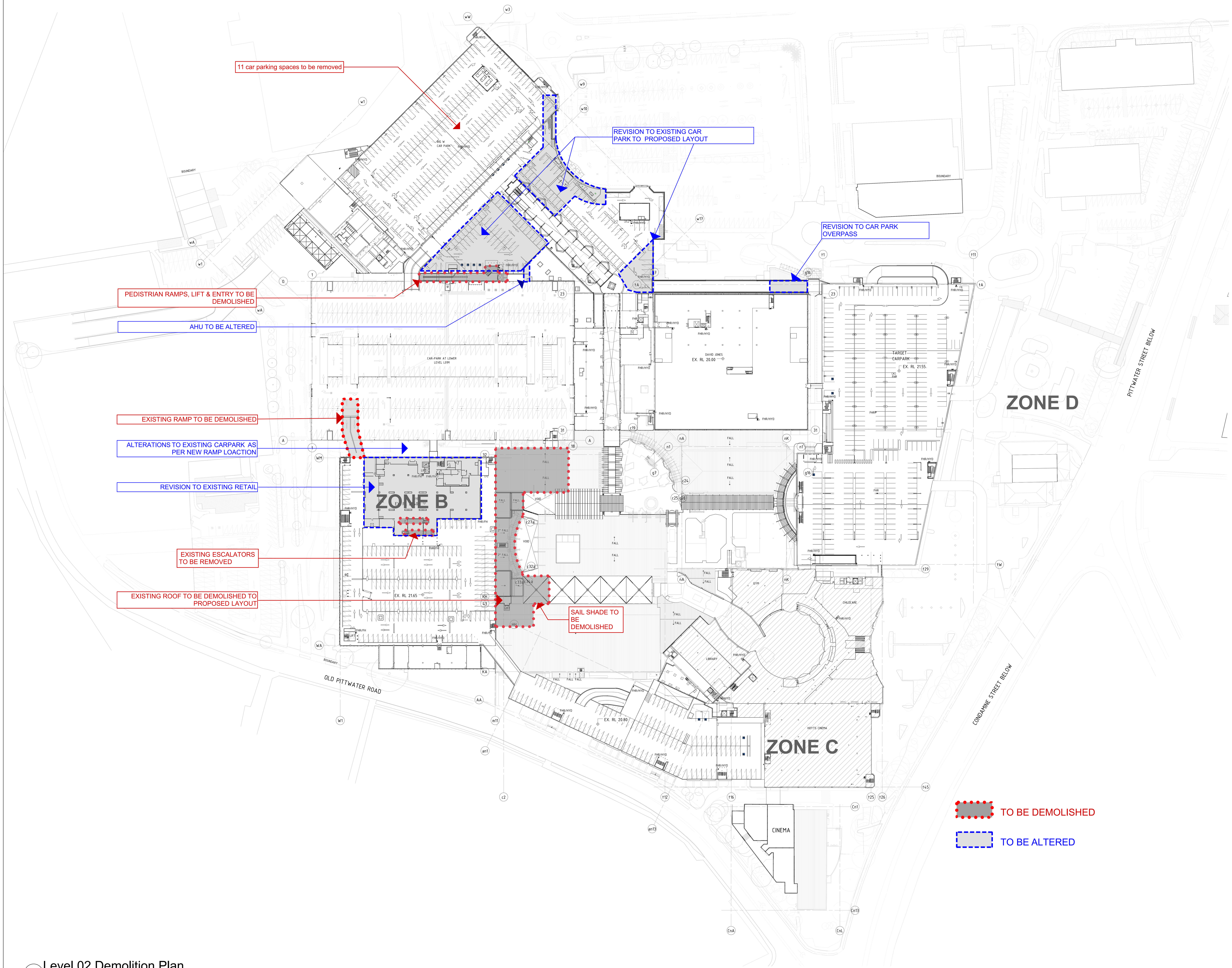

1 Level 02 Demolition Plan
1:1000

LEGEND: Area Types
- PROPOSED SPECIALTY SHOPS
- PROPOSED MINI MAJOR
- PROPOSED MAJOR
- PROPOSED FOOD SHOP/ RESTAURANT
- PROPOSED KIOSKS
- PROPOSED MALL
- PROPOSED CARPARK
- PROPOSED AMENITIES/ STORAGE
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WARRINGAH MALL
First Stage Retail Extension & Associated Carparking
Demolition Plan- Level 02

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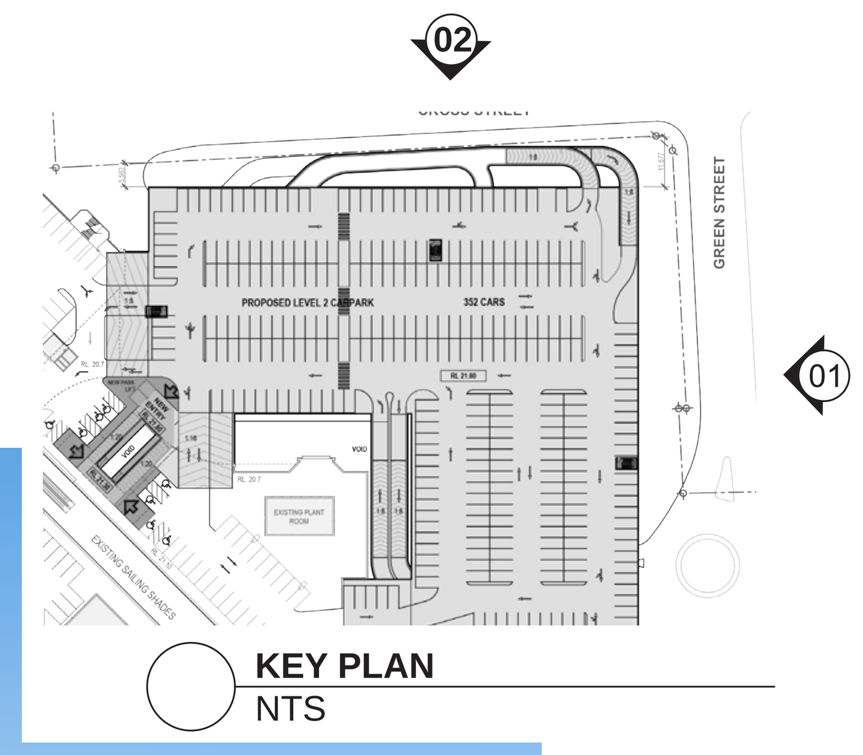
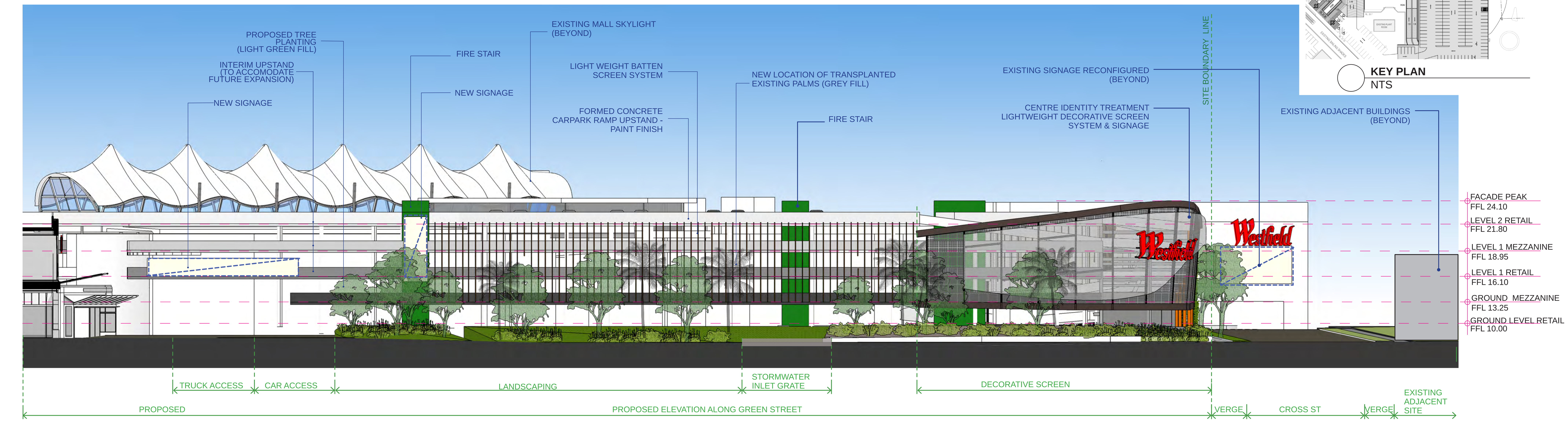
Scheme 28d		11752 Project No

5250 Demolition Plans

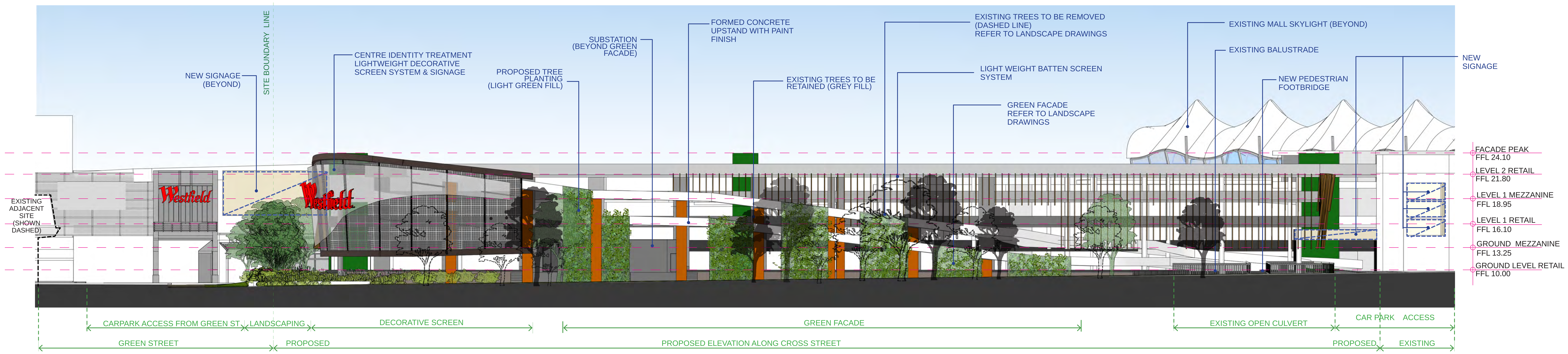
Demolition Plan- Level 02

DA 01.5255 Rev C





01 EAST ELEVATION - GREEN STREET
1:250



02 NORTH ELEVATION - CROSS STREET
1:250

Elevations
First Stage Retail Extension & Associated Carparking
WARRINGAH MALL

NOTES:
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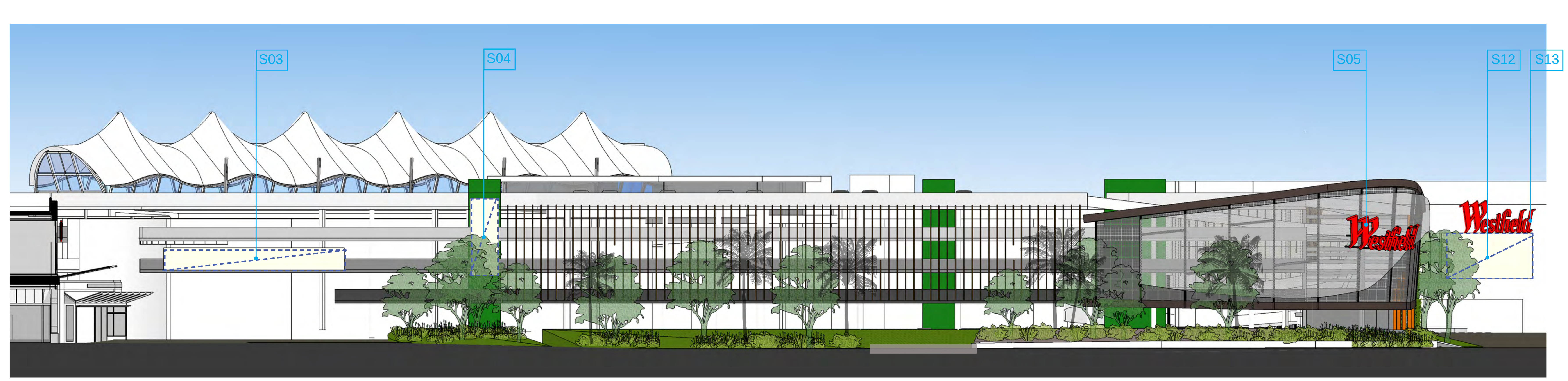
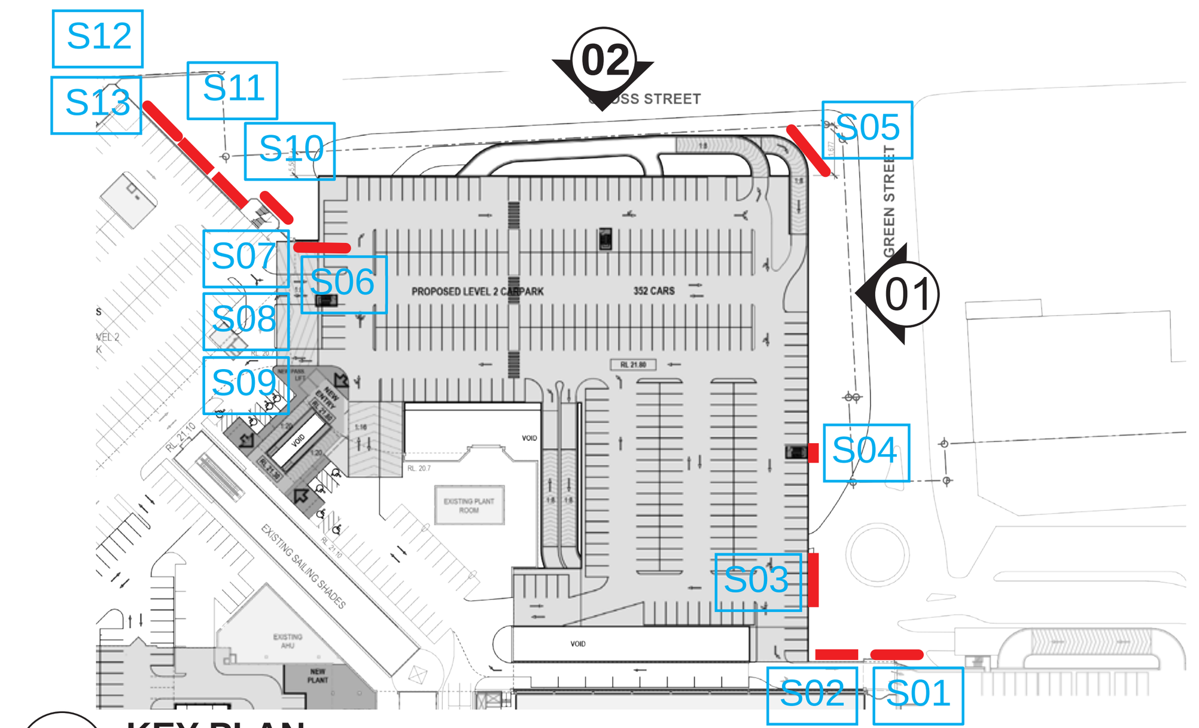
Scheme 28d		11752 Project No

5300 Elevations

Elevations

DA 01.5301 Rev C





KEY PLAN
NTS

01 EAST ELEVATION - GREEN STREET
1:250

02 NORTH ELEVATION - CROSS STREET
1:250

Sign No.	Sign Type	Overall Dimensions	Description
SD-01	External Identity Sign	7.3m x 2.4m high	***Westfield Logo:*** *Internally illuminated aluminium channel letters / signcase, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind.*
SD-02	Tenant Signage	12.0m x 5.0m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-03	Tenant Signage	18.0m x 2.0m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-04	Tenant Signage	2.5m x 7.0m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-05	External Identity Sign	9.0m x 3.0m high	***Westfield Logo:*** *Internally illuminated aluminium channel letters / signcase, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind.*
SD-06	Tenant Signage	9.4m x 1.2m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-07	Tenant Signage	4.5m x 1.2m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-08	Tenant Signage	4.5m x 1.2m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-09	Tenant Signage	4.5m x 1.2m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-10	Tenant Signage (existing reconfigured)	11.0m x 4.0m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-11	Tenant Signage (existing reconfigured	11.0m x 4.0m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-12	Tenant Signage (existing reconfigured	11.0m x 4.0m high	***Tenant Signage:*** *Internally illuminated aluminium channel letters / signcases, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind. Graphics to tenant corporate signage guidelines*
SD-13	External Identity Sign	9.4m x 2.8m high	***Westfield Logo:*** *Internally illuminated aluminium channel letters / signcase, 2pak paint finish, opal acrylic front face with translucent self adhesive vinyl. Signs to be mechanically fixed with hidden fixings to structure behind.*

Signage
First Stage Retail Extension & Associated Carparking
WARRINGAH MALL

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5300 Elevations

Signage

DA 01.5302 Rev C

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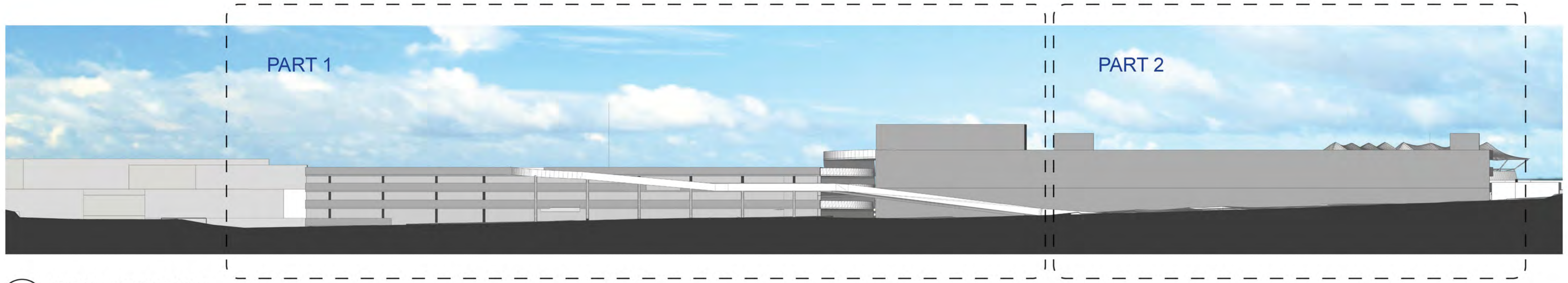
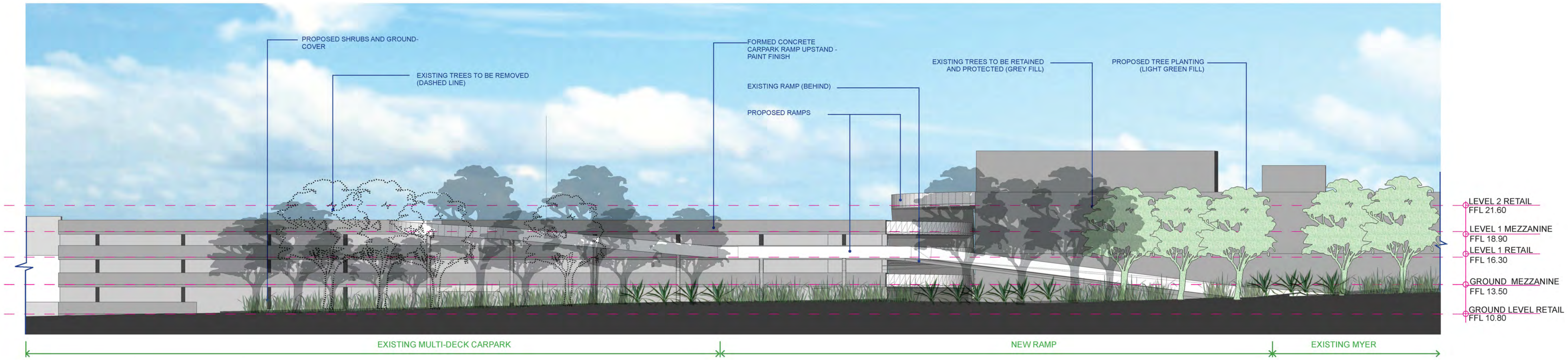
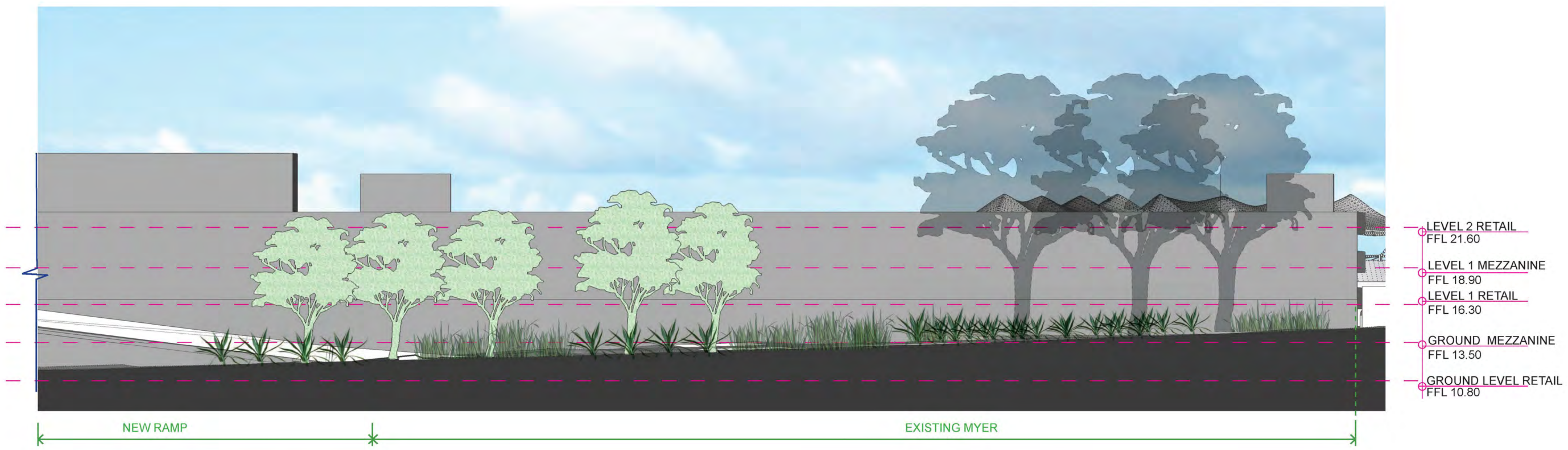


WEST ELEVATION
1:500

KEY PLAN
NTS



03 WEST ELEVATION - PART 1
1:250



03 WEST ELEVATION - PART 2
1:250

WARRINGAH MALL
First Stage Retail Extension & Associated Carparking
West Elevation

NOTES:
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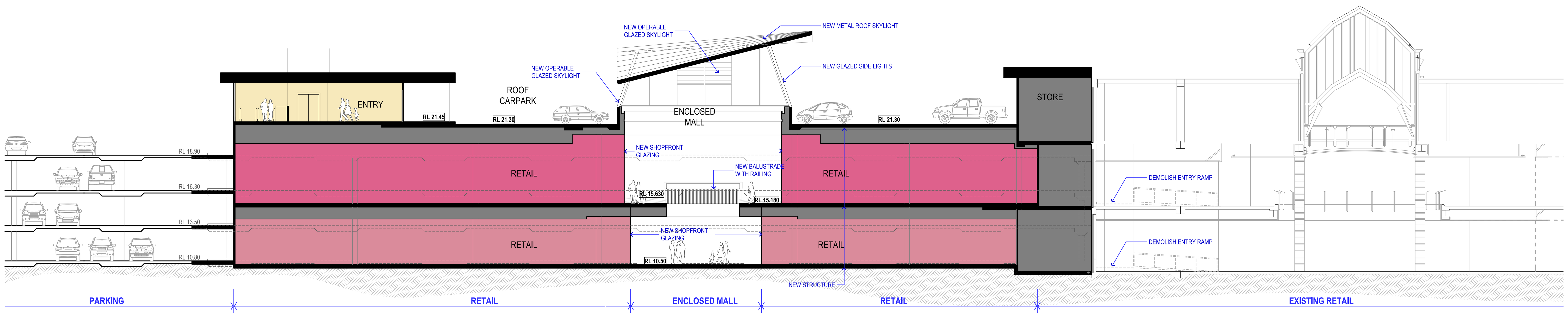
Scheme 28d		11752 Project No

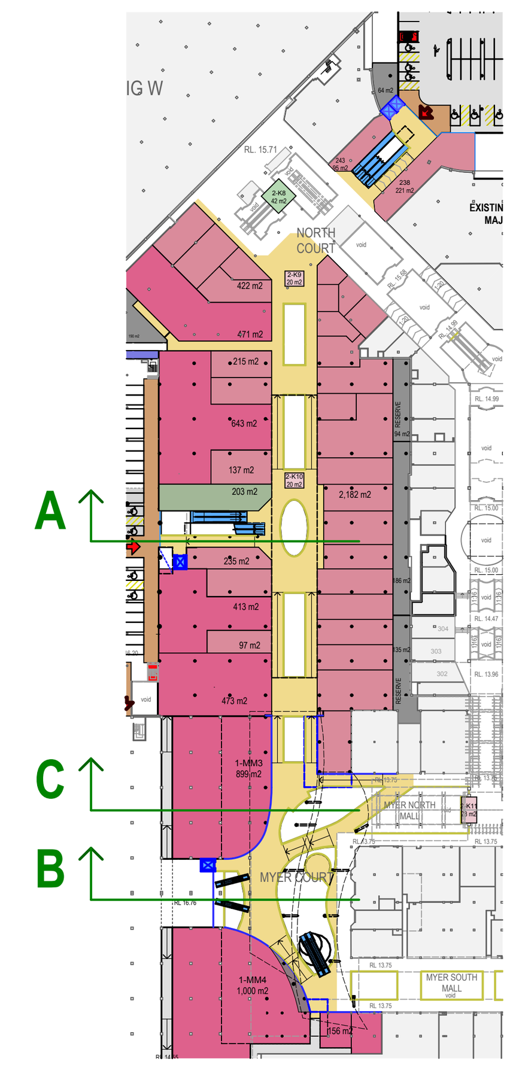
5300 Elevations

West Elevation

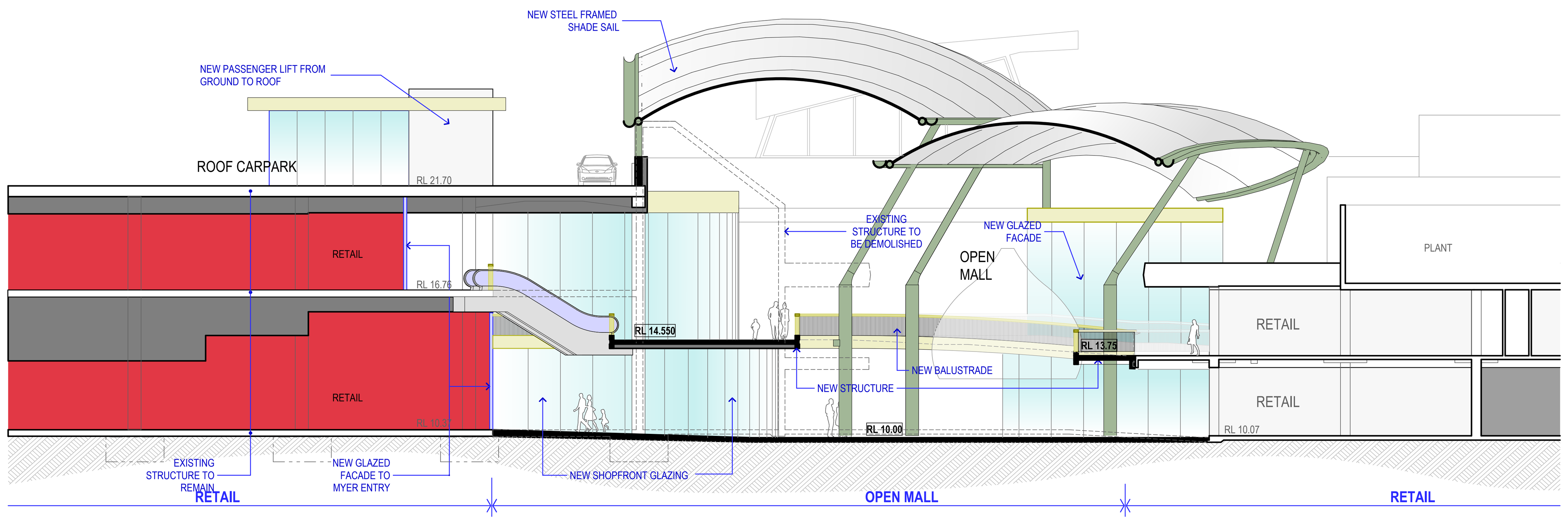
DA 01.5303 Rev C



SECTION - A
SCALE 1:200



1 Section Key



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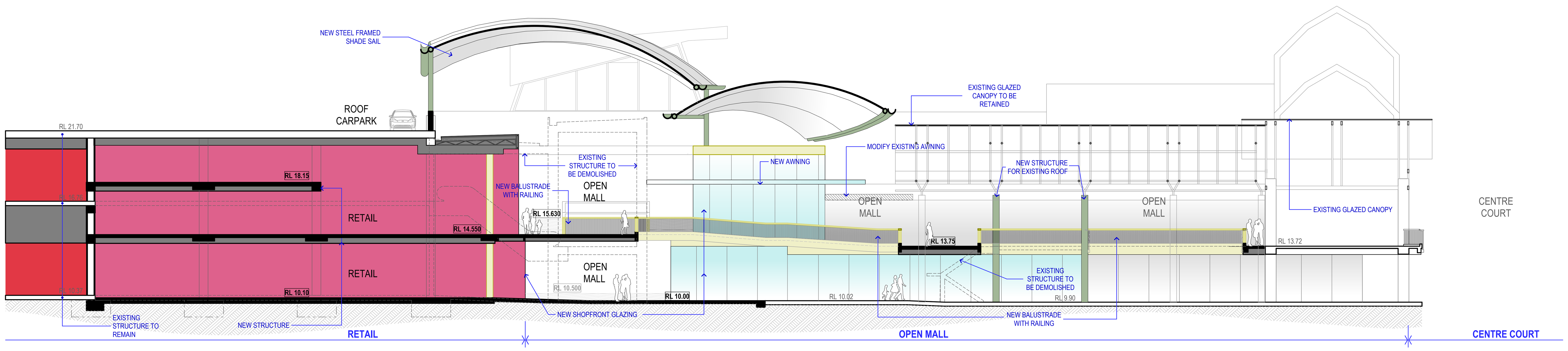

SECTION - C
SCALE 1:200

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Cross Sections

NOTES:
REFER TO LATEST PROJECT DOCUMENTATION FOR EXISTING PLANS, SECTIONS, ELEVATIONS, RL'S, SURVEY AND DETAILS

Westfield Retail Trust AMP CAPITAL

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ABN 000 267 285

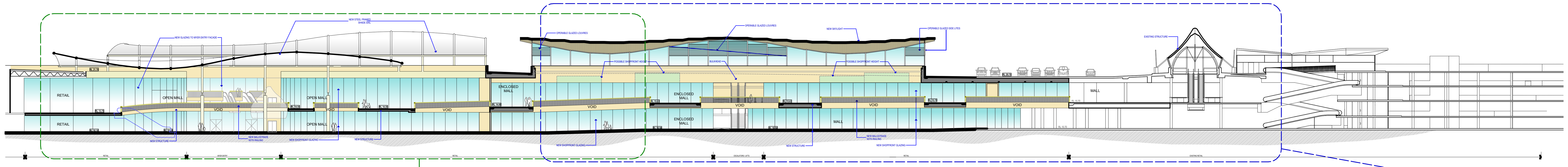
1:200, 1:2000 @ A1	NF, TS, RH, RJ Drawn	29/04/2014 Date
Scheme 28d		11752 Project No

5400 Sections

Cross Sections

DA 01.5401

Rev C



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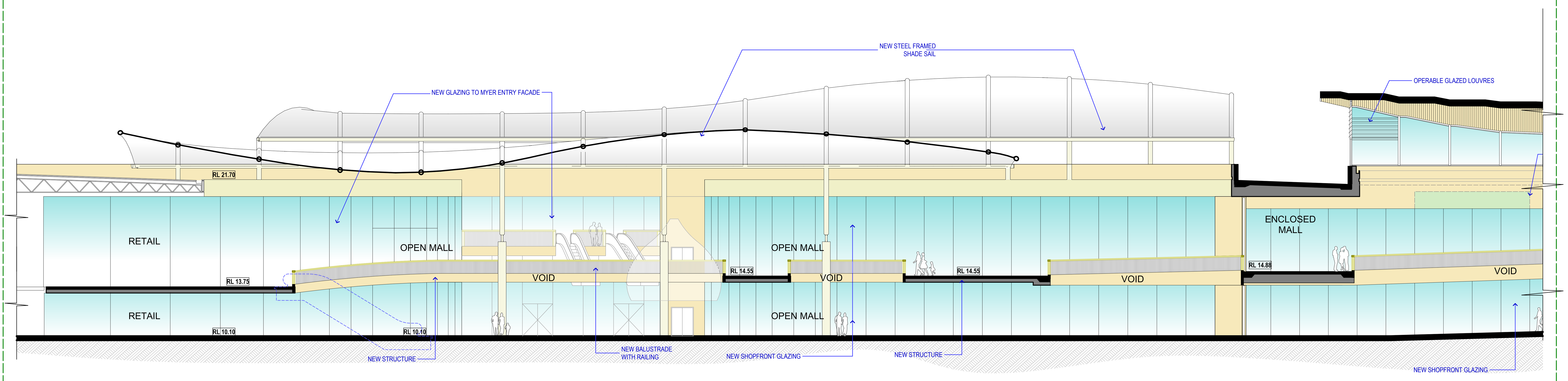
1:500



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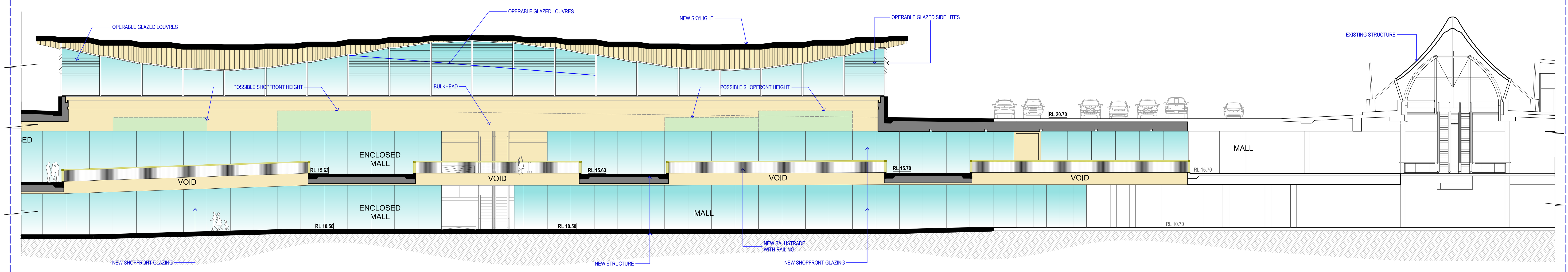
1:200



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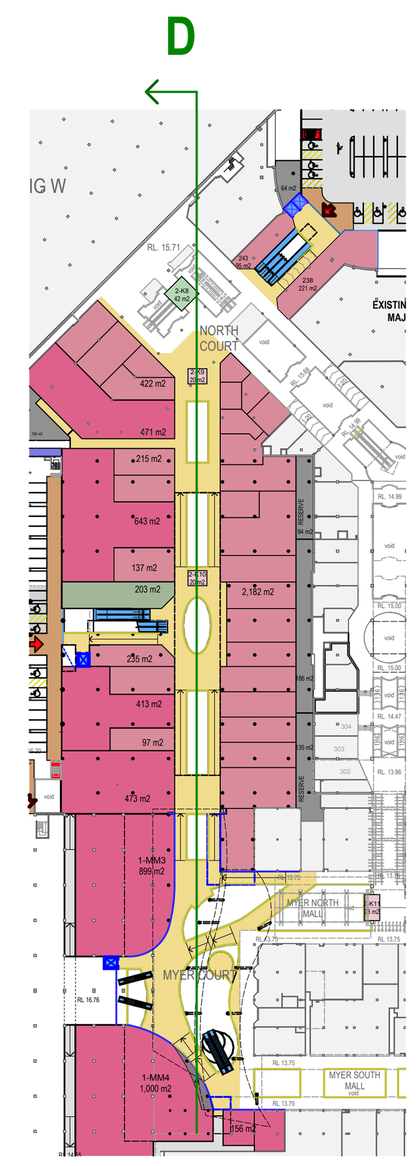

1 Section Key

WARRINGAH MALL
First Stage Retail Extension & Associated Carparking
Long Sections

NOTES:
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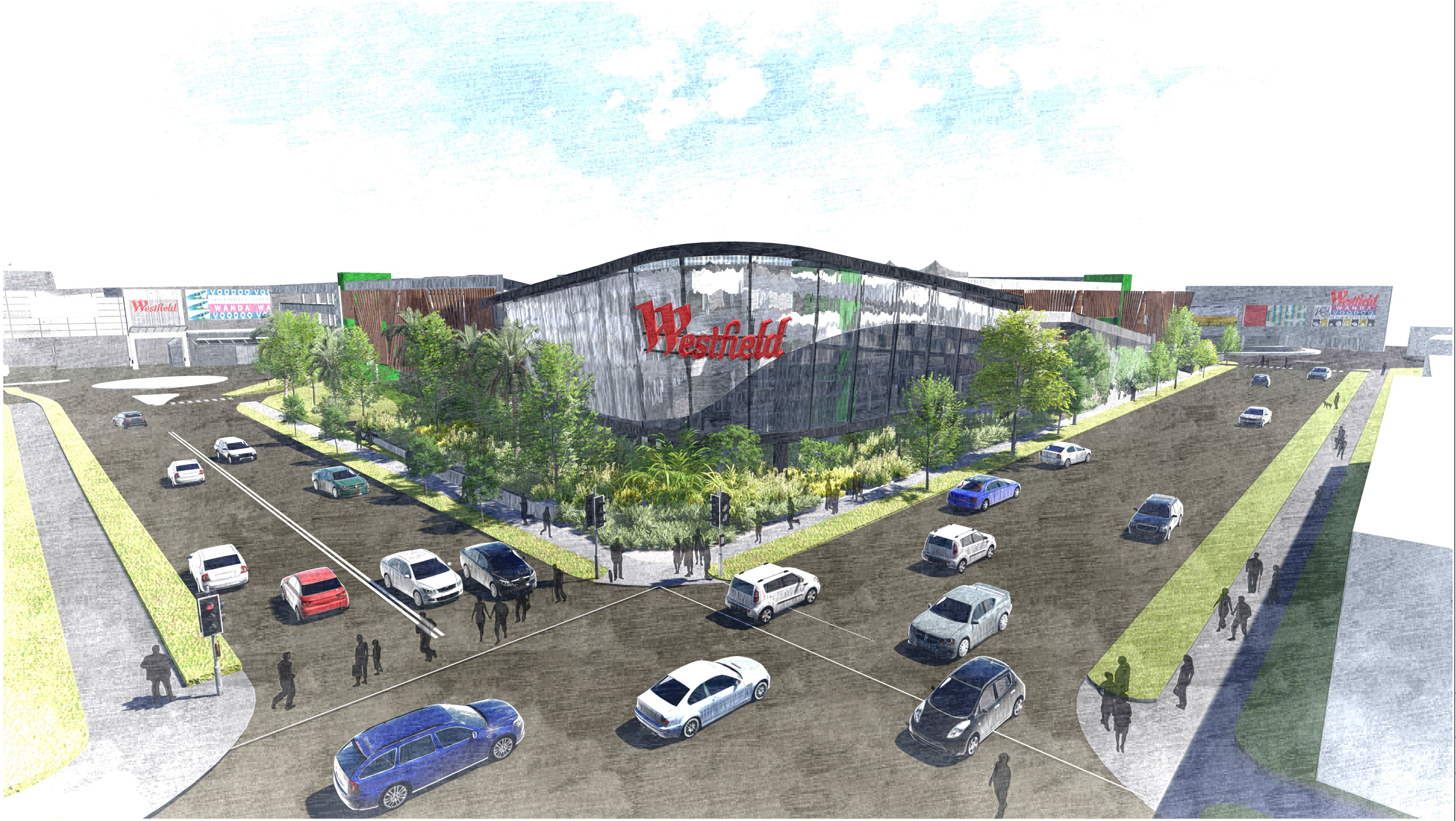
Sydney NSW 2000
ABN 000 267 265

1:500, 1:200, @	NF, TS, RH, RJ Drawn	29/04/2014 Date
Scheme 28d		11752 Project No

5400 Sections

Long Sections

DA 01.5402 Rev C



PERSPECTIVE - CORNER CROSS AND GREEN STREETS

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Artist Perspective

NOTES:
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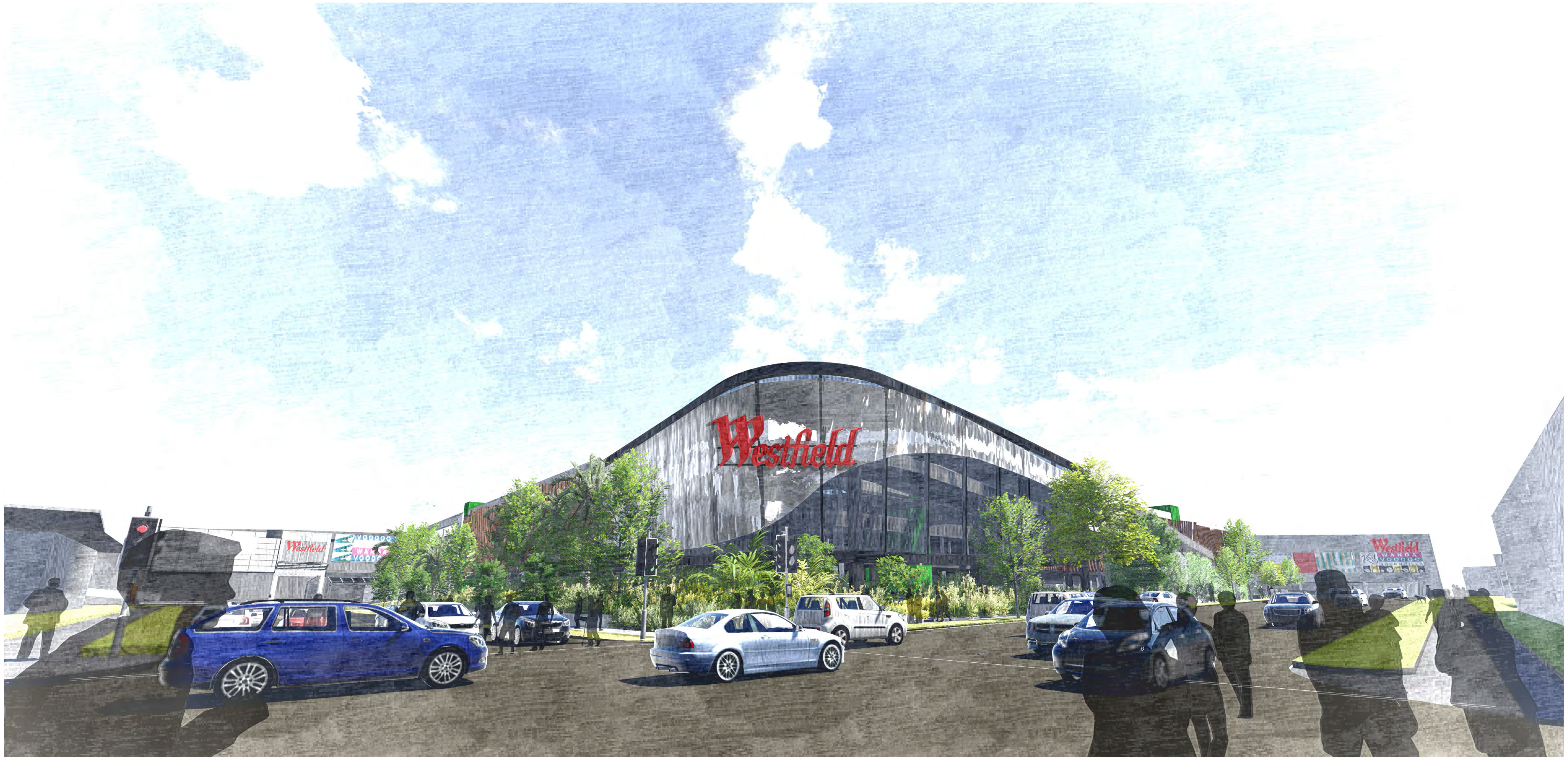
1:1 @ A1	NF, TS, RH, RJ Drawn	29/04/2014 Date
Scheme 28d		11752 Project No

5500 External Perspectives

Artist Perspective

DA 01.5501 Rev C

teamwork://AUPDC00-BIM01P/WR master plan



PERSPECTIVE - CORNER CROSS AND GREEN STREETS

WARRINGAH MALL

First Stage Retail Extension & Associated Carparking

Artist Perspective

NOTES:
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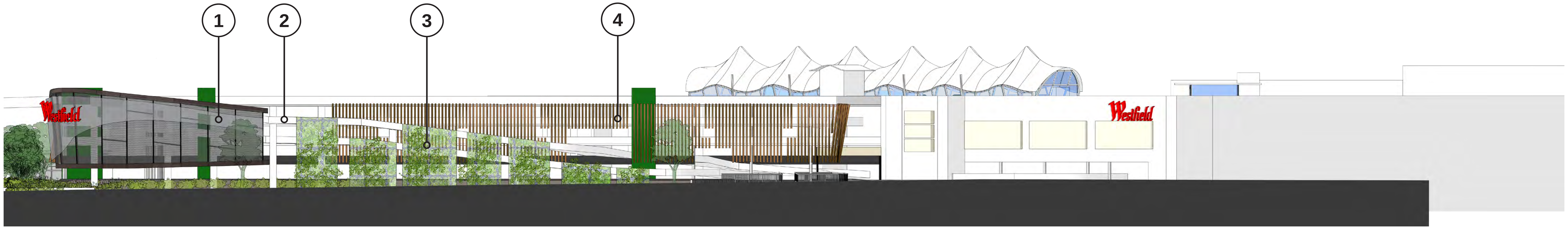
1:1 @ A1	NF, TS, RH, RJ Drawn	29/04/2014 Date
Scheme 28d		11752 Project No

5500 External Perspectives

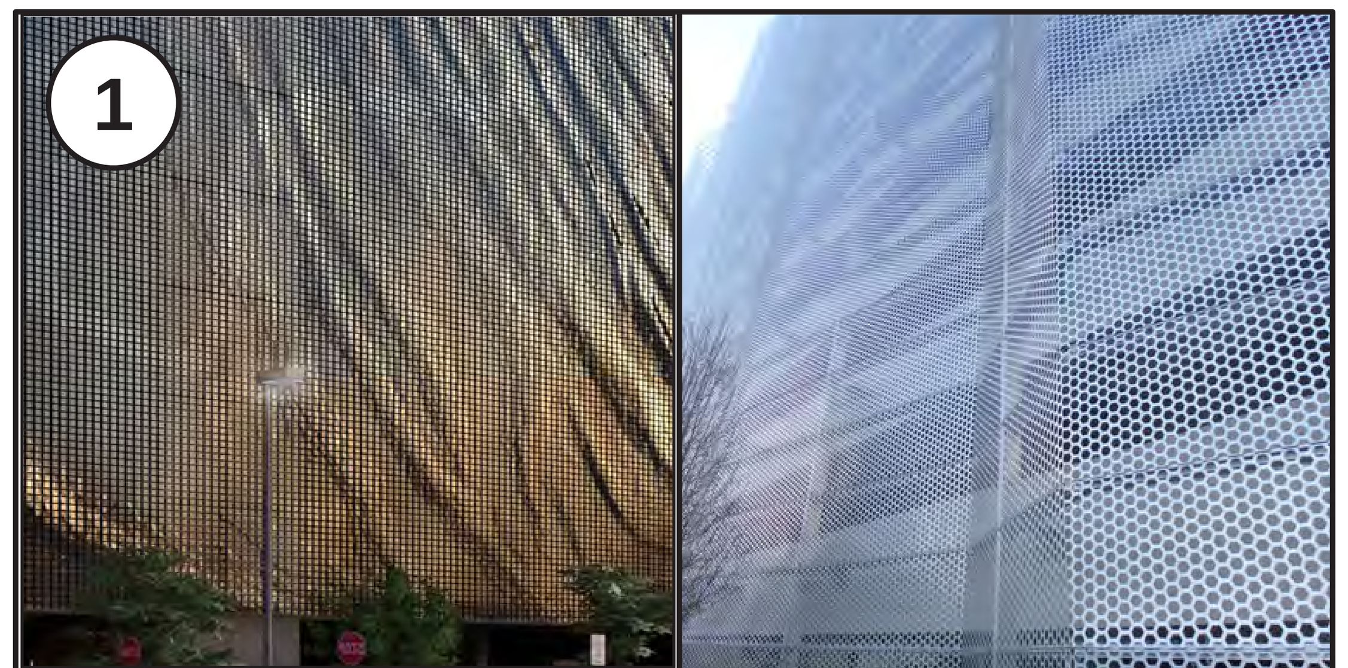
Artist Perspective

DA 01.5502 Rev C

teamwork://AUPDC00-BIM01P/WR master plan

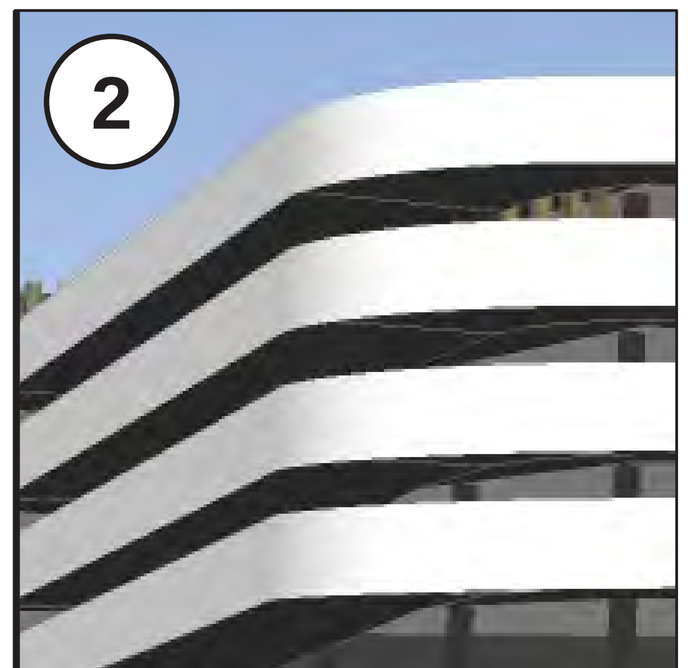


PROPOSED FINISHES & MATERIALS IMAGE BOARD



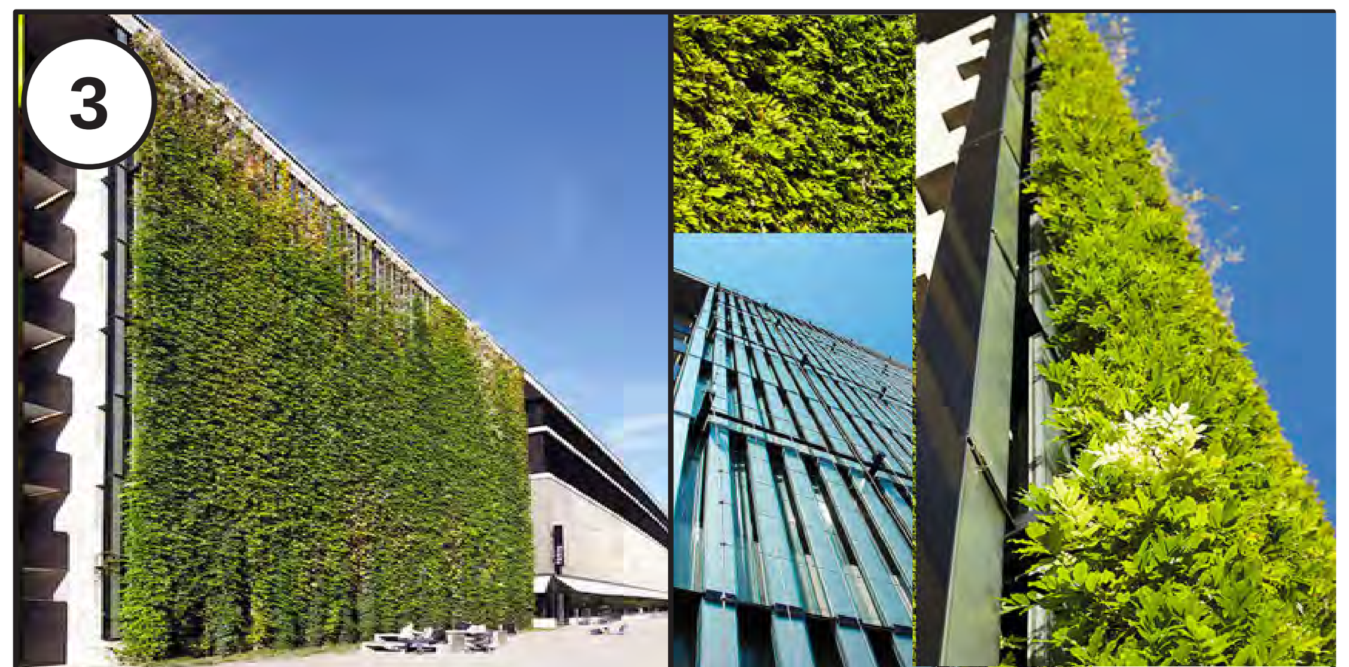
LIGHT WEIGHT DECORATIVE SCREEN

PERMEABLE METAL PANEL FIXED TO FRAMING SYSTEM



CARPARK & RAMP UPSTANDS

FORMED CONCRETE UPSTAND WITH SELECTED PAINT FINISH

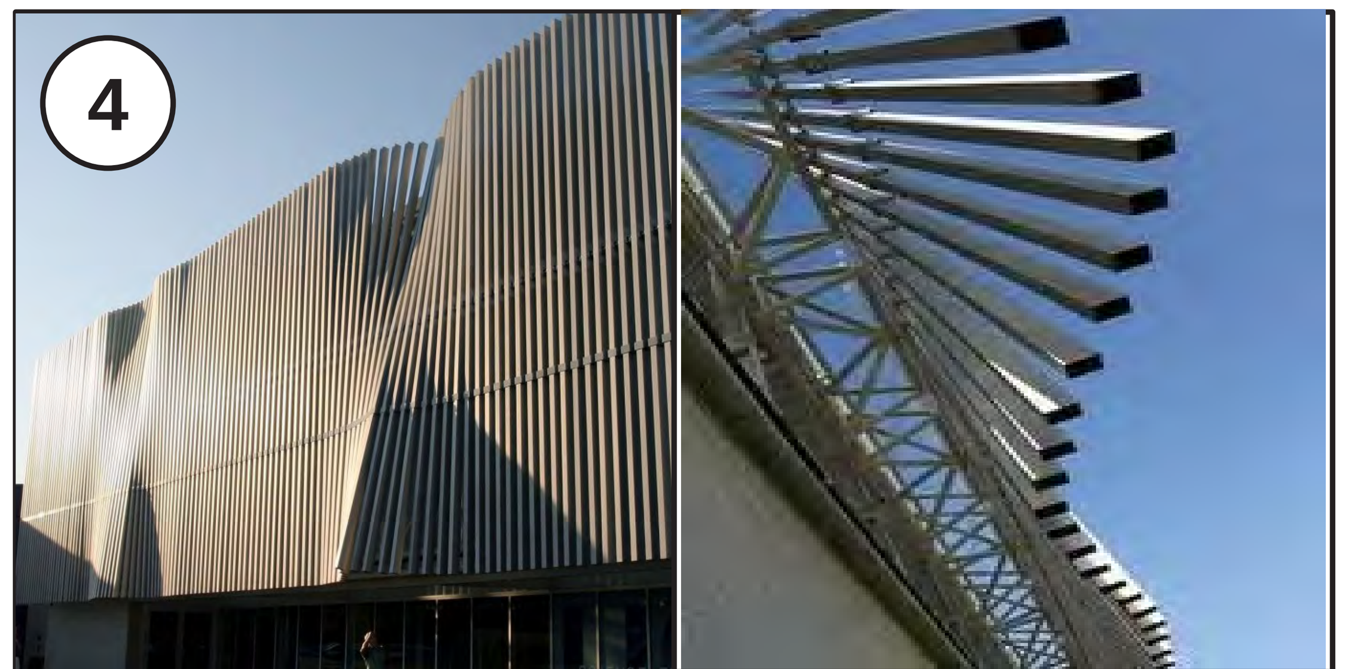


GREEN FACADE

CLIMBING PLANT IN GARDEN BED.

STAINLESS STEEL WIRE TENSION SUBSTRATE FIXED TO CARPARK STRUCTURE.

refer to landscape architect's documentation



CARPARK FACADE SCREEN SYSTEM

PRE-FINISHED METAL BATTENS FIXED TO FRAMING SYSTEM

Proposed Finishes & Materials Image Board
First Stage Retail Extension & Associated Carparking
WARRINGAH MALL

NOTES:
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1:1 @ A1	NF, TS, RH, RJ Drawn	29/04/2014 Date
Scheme 28d		11752 Project No

5700 Materials Board

Proposed Finishes & Materials Image Board

DA 01.5701 Rev C

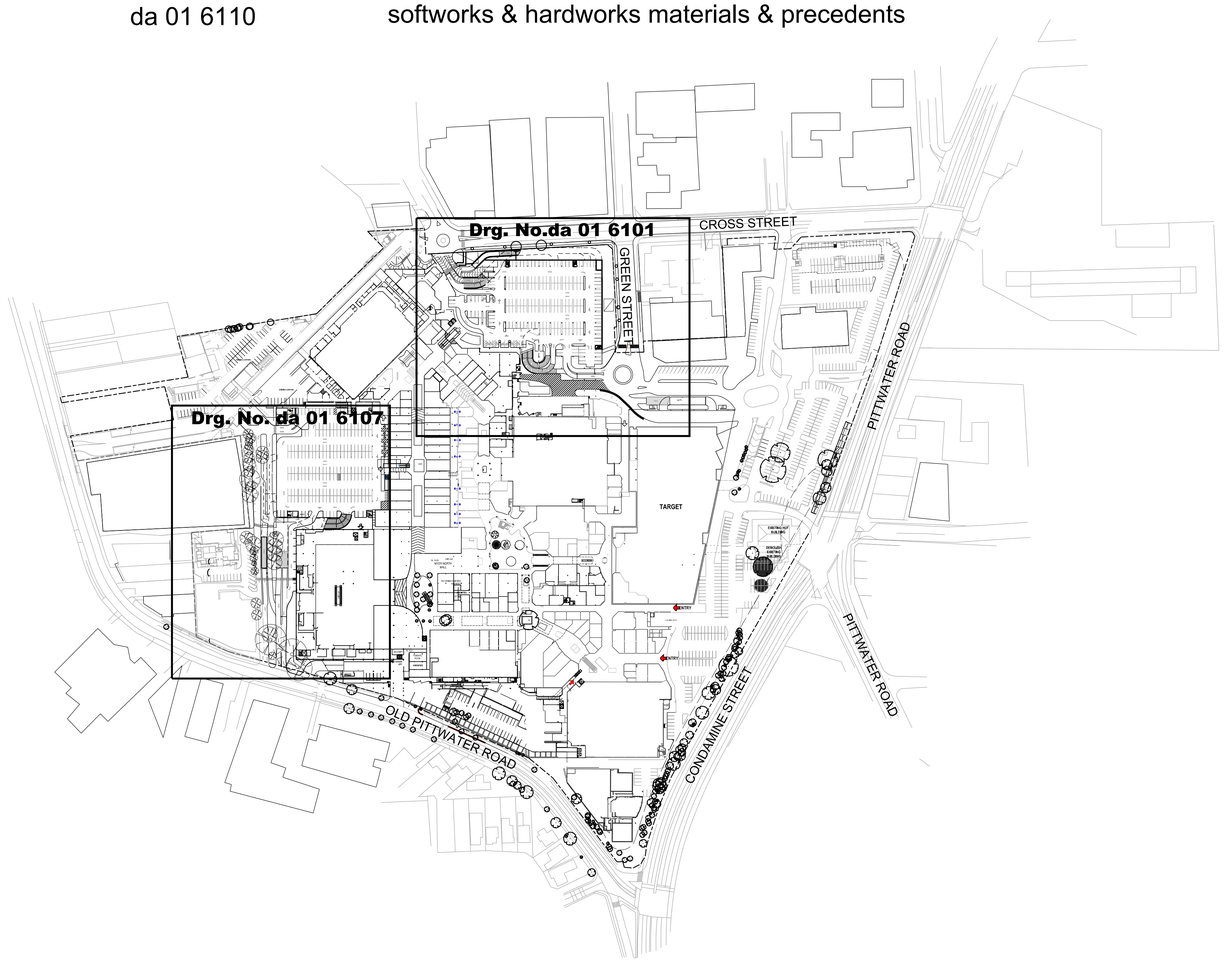
teamwork://AUPDC00-BIM01P/WR master plan

Appendix B Landscape Plans and Design Statement

Westfield
Warringah Mall Stage 01

LANDSCAPE ARCHITECTURAL DRAWINGS FOR SECTION 96 APPROVAL

drawing no.	drawing name
da 01 6100	cover and drawing list
da 01 6101	landscape plan sheet 1 of 2 ground level Palm Tree Car Park
da 01 6102	landscape sections Cross Street & Green Street
da 01 6103	landscape northern elevation Cross Street
da 01 6107	landscape plan sheet 2 of 2 ground level Star Fish Car Park
da 01 6108	landscape eastern elevation Green Street
da 01 6109	landscape western elevation Star Fish Car Park
da 01 6110	softworks & hardworks materials & precedents



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no.	date	amendment	by	chk'd	init	chk'd
a01	07.05.13	pre section 96 issue	jl	jl	ab	ab
a02	21.05.13	pre section 96 issue	jl	jl	jh	jh
a03	28.08.13	section 96 issue	jl	jl	ab	ab
a04	14.10.13	section 96 issue	pn	pn	ab	ab
a05	27.02.14	section 96 issue	pn	pn	ab	ab

north point

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project/client

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Warringah Mall
Stage 01

Westfield

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Sydney NSW 2000

consultant

drawing title

cover & drawing list

section 96

original	scale	drawn	project no.
b1	1:2000	JL	4296-00

drawing no. **da 01 6100** rev no. A05

plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016100.dgn

LEGEND

- EXTENT OF WORKS
- SITE BOUNDARY
- EXISTING & PROPOSED BUILDING/ RAMP OVER
- EXISTING CONTOURS & LEVELS
- EXISTING TREES TO BE REMOVED
- EXISTING TREES TO BE RETAINED & PROTECTED
- EXISTING PALMS TO BE TRANSPLANTED
- NEW LOCATION OF EXISTING PALMS
- PROPOSED TREE PLANTING
- PROPOSED SHRUBS & GROUNDCOVERS
- PROPOSED TURF
- PROPOSED PEDESTRIAN PAVING
- PROPOSED LANDSCAPE WALLING
- PROPOSED 'GREEN FACADE'
- PROPOSED CONTOURS & LEVELS
- PROPOSED STORMWATER CULVERTS TO ENGINEERS DETAILS
- PROPOSED CARPARK, KERBS & LEVELS TO ARCHITECTS DETAILS

amendments					verified	
no.	date	amendment	by	chk'd	init	chk'd
a01	05.11.08	preliminary for review	ab			
a02	17.11.08	preliminary for review	ab			
a03	28.11.08	coordination and review	ab		ab	
a04	03.12.08	client review & coordination	jh		ab	
a05	09.12.08	da issue	jh	jh	ab	ab
a06	21.07.09	preliminary for review	jh	jh	ab	ab
a07	14.08.09	da issue	jh	jh	ab	ab
a08	03.02.10	da issue	ab	ab	ab	ab
a09	15.03.10	da issue - soil depths increased	ab	ab	ab	ab
a10	07.05.13	pre - s96 issue	jl	jl	ab	ab
A11	21.05.13	pre section 96 issue	jl	jl	jh	jh
a12	28.08.13	section 96 issue	jl	jl	ab	ab
a13	14.10.13	section 96 issue	pn	pn	ab	ab
a14	27.02.14	section 96 issue	pn	pn	ab	ab

CROSS STREET

GREEN STREET

FLOOD WALL TO CIVIL ENGINEERS DETAILS

EXISTING STREET TREES TO BE RETAINED & PROTECTED

GRAVEL / MAINTENANCE PATH

SUBSTATION

FIRE CONTROL ROOM

ENTRY

EXIT

CROSS STREET FRONTAGE PLANTING

- 'GREEN FACADE' TO LOWER END OF SPEED RAMP WITH CLIMBING PLANTS OF:
  Hibbertia scandens (native)
  Trachlespermum jasminoides (exotic)
  Pandorea jasminoides (native)
  Pandorea pandorama (native)
- DECORATIVE , NATIVE, DROUGHT TOLERANT GROUNDCOVERS BENEATH STRUCTURAL SCREEN AND TO FOOTPATH/ BOUNDARY EDGE
- SHADE TOLERANT PLANTS TO BE PLANTED BETWEEN SPEED RAMP & BUILDING, BELOW MAIN CAR PARK RAMP
- SHADE TOLERANT NATIVE PLANTS & DECORATIVE GRAVEL BETWEEN STRUCTURAL SCREEN AND BUILDING

STORMWATER GULLY

OPEN STORMWATER GULLY PLANTING TO BE INMPROVED WITH INDIGENOUS SHRUB & GROUNDCOVER SPECIES. REFER PLANT SCHEDULE

PEDESTRIAN PAVING

SIMPLE, CONTEMPORARY PAVING FINISH WITH DETAIL TO PROMOTE BUILDING ENTRANCES

GREEN STREET LANDSCAPING

DECORATIVE BANDING OF DROUGHT TOLERANT GROUNDCOVERS & SHRUBS TO BE PLANTED BETWEEN BUILDING & BOUNDARY IN MOUNDED SOIL OVER STORMWATER CULVERT.
EXISTING PALMS FROM CORNER TO BE TRANSPLATED & MIXED WITH TREE PLANTING OF Eucalyptus, Angophora & Synacarpia glomulifera ALONG GREEN STREET FRONTAGE.
EXISTING TREES TO BE RETAINED & PROTECTED WITHIN VERGE.

GRATE TO STORMWATER CULVERT TO ENGINEERS DETAILS

PALM TREE CAR PARK

PARCEL & PICK UP

NEW PASS LIFT

TAXI

RL 10.60

EXISTING ADJ. SITE

DAVID JONES

LOADING DOCK

TRUCK ONLY

GROUNDCOVERS TO PLANTER ON SLAB

PLANT LIST

Botanic Name	Common Name	Height	Spread	Community
TREES				
Acmena smithii	Lilly Pilly	10m	6m	BGHF
Angophora costata	Sydney Red Gum	20m	12m	DFEC
Banksia integrifolia	Coastal Banksia	14m	8m	
Banksia serrata	Old Man Banksia	6m	3m	DFEC
Elaeocarpus reticulatus	Blueberry Ash	6m	3m	BGHF
Eucalyptus punctata	Grey Gum	20m	12m	STIF
Eucalyptus robusta	Swamp Mahogany	10-20m	4-8m	
Lophostemon confertus	Brush Box	15m	10m	
Syncarpia glomulifera	Turpentine	18m	8m	STIF
Tristaniopsis laurina 'Luscious'	Luscious Water Gum	6m	5m	
SHRUBS				
Banksia ericifolia	Heath Banksia	2m	2m	BASIX
Banksia spinulosa	Hairpin Banksia	1.5m	1.5m	DFEC
Correa alba	White Correa	1.5m	1m	BASIX
Callistemon 'Captain Cook'	Captain Cook	1.2m	1m	
Doryanthes excelsa	Gymea Lily	1.5m	1.5m	
Grevillea linearifolia	Linear Leaf Grevillea	2m	2m	
Grevillea sericea	Pink Spider Flower	1.5m	1m	
Grevillea speciosa	Red Spider Flower	1.5m	1.5m	
Lambertia formosa	Mountain Devil	1.5m	1.5m	
Leptospermum 'Pacific Beauty'	Pacific Beauty	2m	1.5m	
Syzygium 'Aussie Southern'	Dwarf Lilly Pilly	2.5m	2m	
Westringia fruticosa	Coastal Rosemary	2m	5m	
Westringia fruticosa 'Smokey'	Dwarf Westringia	0.8m	0.8m	
GROUNDCOVERS/CLIMBERS & SHADE TOLERANT PLANTS				
Asplenium australis	Birds Nest Fern	1m	1m	
Carex appressa	Tall Sedge	0.8m	0.6m	
Dianella caerulea 'Breeze'	Dianella Breeze	0.5m	0.5m	DFEC
Dianella caerulea 'Cassa Blue'	Cassa Blue	0.4m	0.4m	DFEC
Dianella caerulea 'Little Jess'	Little Jess	0.4m	0.4m	DFEC
Dianella 'Silver Streak'	Flax Lily	0.5m	0.4m	
Doodia aspera	Prickly Rasp Fern	0.3m	0.3m	
Grevillea 'Bronze Rambler'	Grevillea Bronze Rambler	0.3m	1.5m	
Hardenbergia 'Mini Ha-Ha'	Purple Coral Pea	0.3m	1.5m	STIF
Hibbertia scandens	Golden Guinea Vine	Climber		
Isolepis nodosa	Knobby Club Rush	0.8m	0.6m	
Lomandra longifolia	Lomandra	0.8m	1m	BGHF
Lomandra longifolia 'Tanika'	Tanika	0.4m	0.4m	BGHF
Pandorea jasminoides	Bower of Beauty	Climber		
Pandorea pandorana	Wonga Wonga Vine	Climber		
Pennisetum alopecuroides 'Nafray'	Nafray	0.6m	0.6m	
Poa labillardieri 'Eskdale'	Poa Eskdale	0.4m	0.4m	
Trachelospermum jasminoides	Star Jasmine	0.4m	1.5m	
DFEC	DUFFY'S FOREST ECOLOGICAL COMMUNITY			
STIF	SYDNEY TURPENTINE IRONBARK FOREST			
BGHF	BLUE GUM HIGH FOREST			
BASIX	WARRINGAH COUNCIL BASIX LIST			

north point

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project/client

Westfield Warringah Mall Stage 01

Westfield

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consultant

drawing title

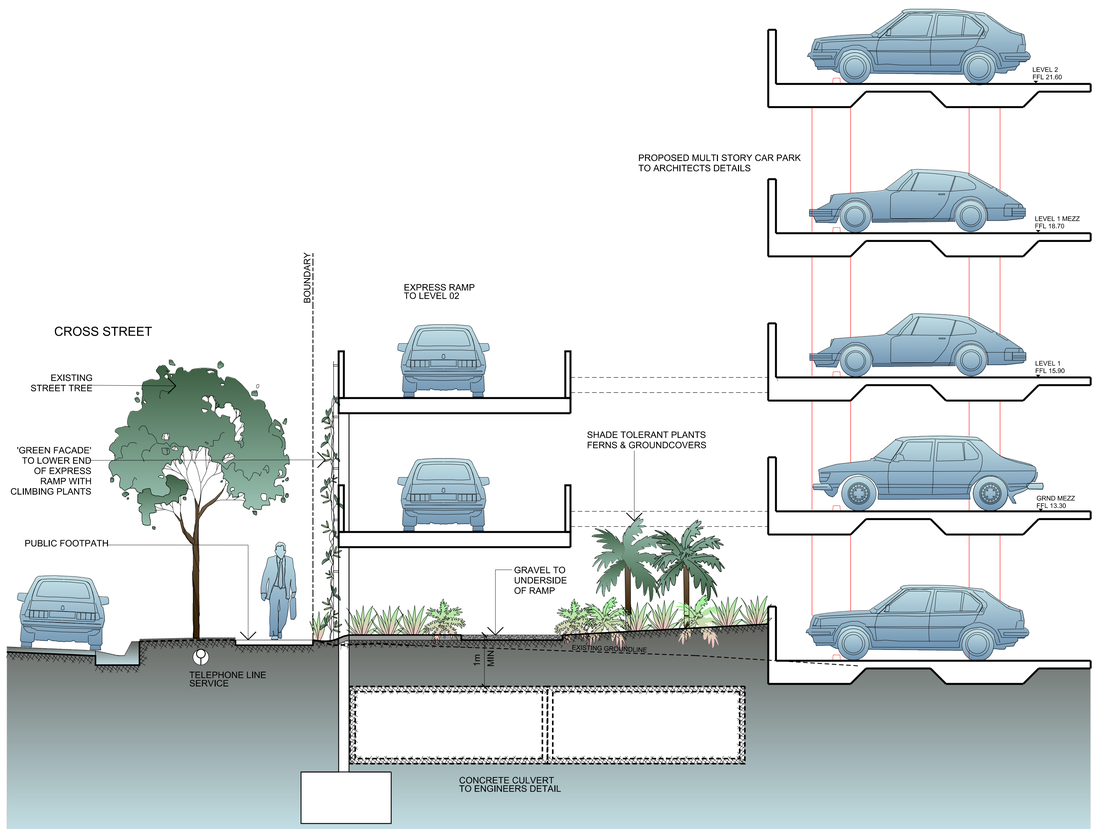
landscape plan sheet 1 of 2
ground level
Palm Tree Car Park

section 96

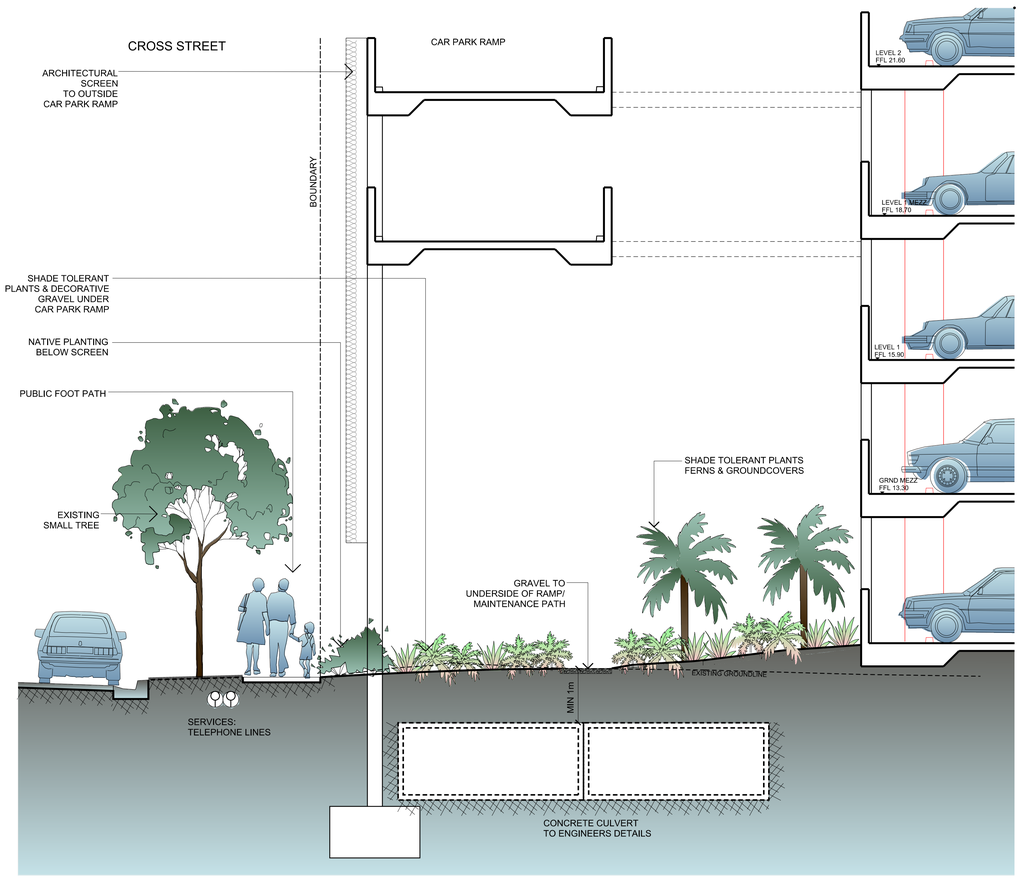
original	scale	drawn	project no.
b1	1:250	jl/ab	4296-00

drawing no. **da 01 6101** rev no. A14

plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016101.dgn



01 CROSS STREET SECTION (da01 0601) SCALE 1:50



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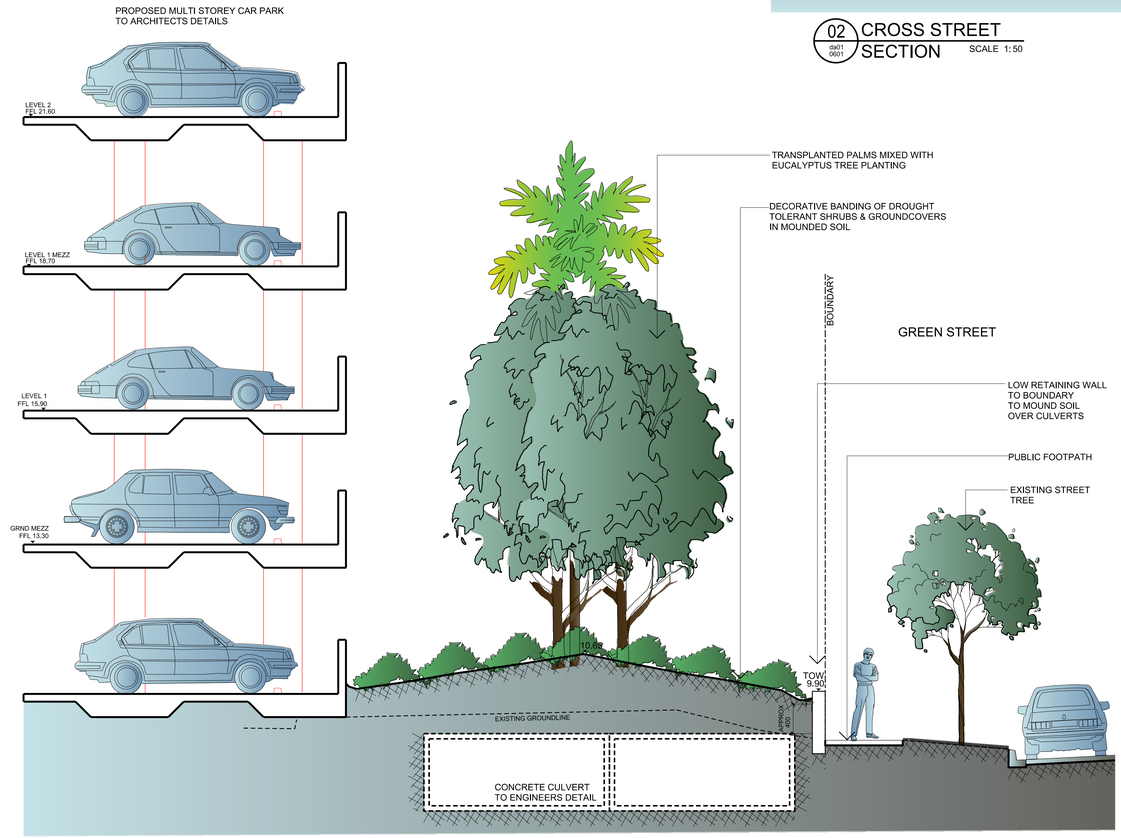

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amendments

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a02	17.11.08	preliminary for review	jh	ab		
a03	28.11.08	coordination and review	ab		ab	
a04	03.12.08	client review & coordination	ab		ab	
a05	09.12.08	da issue	jh	jh	ab	ab
a06	21.07.09	preliminary for review	jh	jh	ab	ab
a07	14.08.09	da issue	jh	jh	ab	ab
a08	03.02.10	da issue	ab	ab	ab	ab
a09	07.05.13	pre - S96 issue	jl	jl	ab	ab
a10	21.05.13	pre section 96 issue	jl	jl	jh	jh
a11	28.08.13	section 96 issue	jl	jl	ab	ab
a12	14.10.13	section 96 issue	pn	pn	ab	ab
a13	19.12.13	section 96 issue	pn	pn	ab	ab
a14	27.02.14	section 96 issue	pn	pn	ab	ab

north point

dem

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project/client

Westfield
Warringah Mall
Stage 01

Westfield

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consultant

drawing title

landscape sections
Cross Street & Green Street

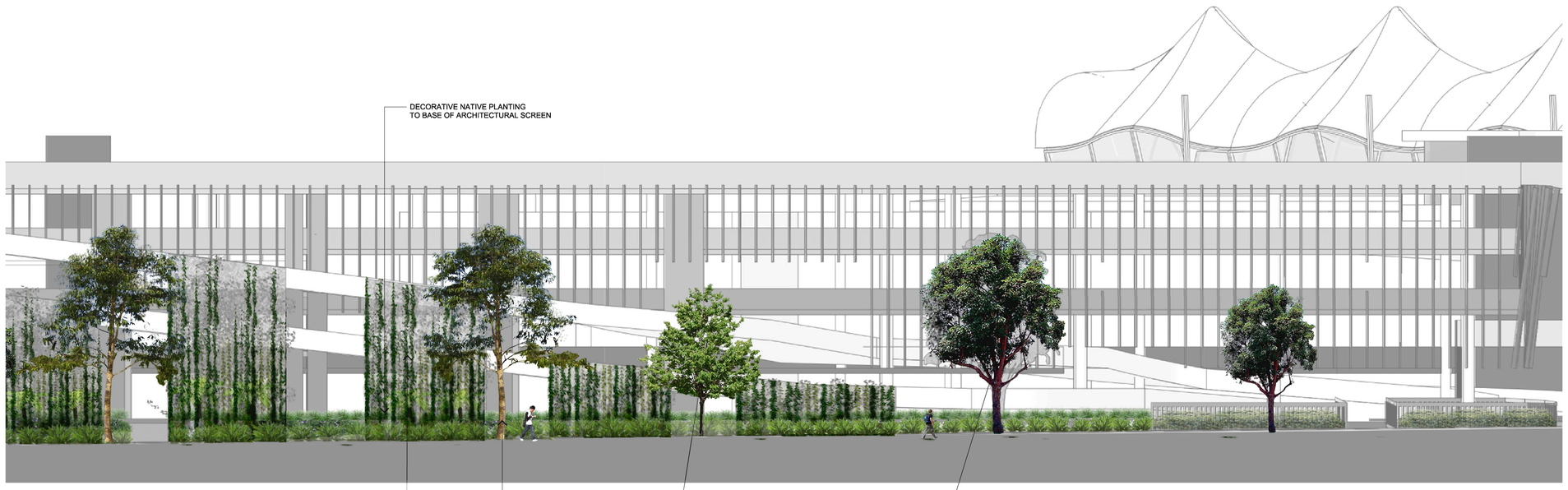
section 96

original	scale	drawn	project no.
b1	as shown	jl	4296-00

drawing no. **da 01 6102** rev no. a14

plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016102.dgn

CROSS STREET ELEVATION
NTS



CROSS STREET ELEVATION
NTS

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a02	28.11.08	coordination and review	ab		ab	
a03	03.12.08	client review & coordination	ab		ab	
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a05	21.07.09	preliminary for review	jh	jh	ab	ab
a06	14.08.09	da issue	jh	jh	ab	ab
a07	03.02.10	da issue	ab	ab	ab	ab
a08	15.03.10	da issue - soil depth increased	ab	ab	ab	ab
A09	07.05.13	pre - s96 issue	jl	jl	ab	ab
A10	21.05.13	pre section 96 issue	jl	jl	jh	jh
a11	28.08.13	section 96 issue	jl	jl	ab	ab
a12	14.10.13	section 96 issue	pn	pn	ab	ab
a13	19.12.13	section 96 issue	pn	pn	ab	ab
a14	27.02.14	section 96 issue	pn	pn	ab	ab

north point

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Stage 01

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consultant

drawing title

landscape northern elevation
Cross Street

section 96

original	scale	drawn	project no.
b1	as shown	jl	4296-00

drawing no. | rev no.

da 01 6103 | A14

plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016103.dgn

LEGEND

- EXTENT OF WORKS
- SITE BOUNDARY
- EXISTING & PROPOSED BUILDING/ RAMP OVER
- EXISTING CONTOURS & LEVELS
- EXISTING TREES TO BE REMOVED
- EXISTING TREES TO BE RETAINED & PROTECTED
- EXISTING PALMS TO BE TRANSPLANTED
- NEW LOCATION OF EXISTING PALMS
- PROPOSED TREE PLANTING
- PROPOSED SHRUBS & GROUNDCOVERS
- PROPOSED TURF
- PROPOSED PEDESTRIAN PAVING
- PROPOSED LANDSCAPE WALLING
- PROPOSED 'GREEN FACADE'
- PROPOSED CONTOURS & LEVELS (10.00 / 10.50)
- PROPOSED STORMWATER CULVERTS TO ENGINEERS DETAILS
- PROPOSED CARPARK, KERBS & LEVELS TO ARCHITECTS DETAILS (RL. 10.3)

amendments				verified	
no.	date	amendment	by	chk'd	init	chk'd
a01	07.05.13	pre - s96 issue	jl	jl	ab	ab
A02	21.05.13	pre section 96 issue	jl	jl	jh	jh
A03	28.08.13	section 96 issue	jl	jl	ab	ab
a04	14.10.13	section 96 issue	pn	pn	ab	ab
a05	27.02.14	section 96 issue	pn	pn	ab	ab

north point

dem

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project/client

Westfield
Warringah Mall
Stage 01

Westfield

Westfield Design & Construction Pty Ltd
85 Castlereagh Street
Sydney NSW 2000

consultant

drawing title

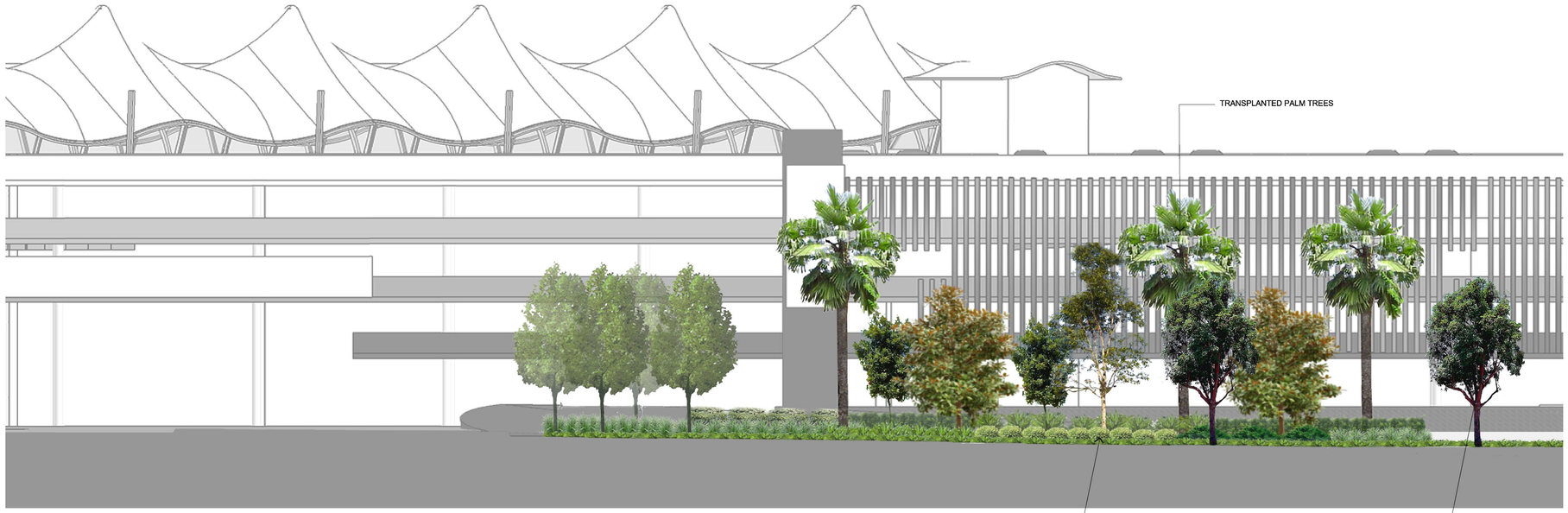
Landscape Plan Sheet 2 of 2
Ground Level
Star Fish Car Park

section 96

original	scale	drawn	project no.
b1	1:250	JL	4296-00

drawing no. **da 01 6107** rev no. A05

plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016107.dgn



GREEN STREET ELEVATION
NTS

PLANTED PALM TREES

GREEN STREET ELEVATION
NTS

amendments					verified	
no.	date	amendment	by	chk'd	init	chk'd
a01	20.05.13	preliminary issue, for review	JL	JL	JH	JH
a02	28.08.13	section 96 issue	jl	jl	ab	ab
a03	14.10.13	section 96 issue	pn	pn	ab	ab
a04	19.12.13	section 96 issue	pn	pn	ab	ab
a05	27.02.14	section 96 issue	pn	pn	ab	ab

north point

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drawing title

landscape elevation
Green street

section 96

original	scale	drawn	project no.
b1	NTS	JL	4296-00

drawing no. | rev no.

da016108 | a05

plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016108.dgn

STARFISH CARPARK ELEVATION
NTS

STARFISH CARPARK ELEVATION
NTS

amendments					verified	
no.	date	amendment	by	chk'd	init	chk'd
a01	22.05.13	preliminary issue, for review	JL	JL	JH	JH
a02	28.08.13	section 96 issue	jl	jl	ab	ab
a03	14.10.13	section 96 issue	pn	pn	ab	ab
a04	27.02.14	section 96 issue	pn	pn	ab	ab

north point

dem

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Westfield
Warringah Mall
Stage 01

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drawing title

landscape elevation
Starfish Carpark

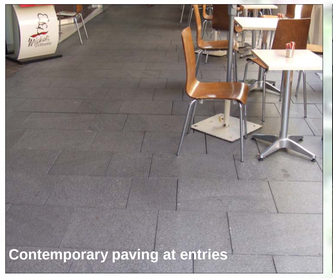
section 96

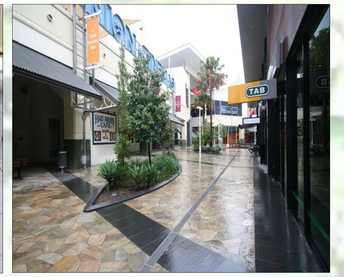
original	scale	drawn	project no.
b1	NTS	JL	4296-00

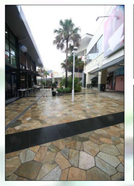
drawing no. **da 01 6109** rev no. A04

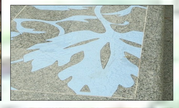
plotted: 27/02/2014 plotted by: PNaidu file: P:\4296-00-WarMall\00Cad\Sheets\da016109.dgn

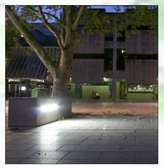
Hardworks Materials and Furniture Elements


Contemporary paving at entries










Contemporary furniture elements


Urbum

Lighting elements

Bike racks, bins and bollards

Green Facade Precedent Images

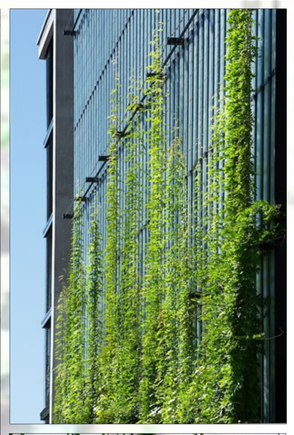
TRELLIS SYSTEM TO FACADE OF PROPOSED CARPARK UP TO 7 METRES IN HEIGHT


Bondi Apartments 14 m high green facade by Tensile Design & Construct. Climber species: Pandorea jasminoides


Amarco Apartments 5 metre tall Green Facade by Landscan DEM. Photo Taken 1.5 to 2 years after planted. Plant species: Trachelospermum jasminoides

Trachelospermum jasminoides


Amarco Apartments 5 metre tall Green Facade by Landscan DEM. Photo Taken 1 to 1.5 years after planted. Plant species: Trachelospermum jasminoides



Pandorea jasminoides

Planting Images


Turpentine

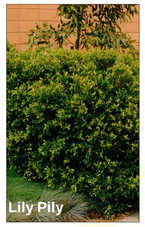

Blue Berry Ash


Banksia


Coastal Banksia


Smooth Barked Apple


Brush Box


Lily Pily


Coastal Rosemary

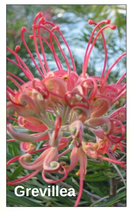

Fox Tail Grass


Bottle Brush


Viola


Mass Planting


Shade Tolerant Plants - Doodia


Grevillea


Star Jasmine


Native Grasses

Stage 1 - Westfield Warringah Mall

Softworks and Hardworks Materials & Precedents

Sheet replaces da016105 and da016106

date 27.02.14
scale NTS
drwg no. da016110
proj.no. 4296-00
rev no. a05

planning, urban design, architecture, landscape architecture, interior design
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Landscape Architecture Report
for
Section 96
Stage 1, AMP Warringah Mall, Brookvale NSW

for
Westfield Design & Construction Pty Ltd

Issue F

27 February 2014

project no: 4296-00

landscan
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issue register

Date of Issue	Reason for Issue	Prepared by	Checked by	Signed
19 Nov 2008	Preliminary Issue A	A Beeston	C M^{c}Lay	
03 Dec 2008	Preliminary Issue B	A Beeston	C M^{c}Lay	
09 Dec 2008	Da Issue C	A Beeston	A Beeston	
13 Aug 2009	Da Issue D	A Beeston	A Beeston	
04 Feb 2010	Da Issue E	A Beeston	A Beeston	
27 Feb 2014	Issue F – Section 96	A Beeston	A Beeston	

dem

contents

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1 Landscape Design Philosophy

1.1 Aim

The landscape design has been prepared to address the environmental and community requirements of the site. This is achieved by providing a mixed plant palette of indigenous trees, mixed shrubs and low maintenance groundcovers to fragment the new carpark building to the surrounding light industrial areas. Species have been selected that are suitable for planting in the Warringah Council area. The landscape design has been successful in the overall brief to compliment the architectural facade of the proposed carpark.

1.2 Cross Street – Palm Tree Carpark

Cross Street has an existing character of light industrial. The existing landscape is a mix of street trees plantings in grass verges. The landscape design aims to compliment the proposed carpark, by framing the designed architectural facade and signage to the corner of Cross Street and Green Street. Further to the west the landscape design will screen the lower levels completely with the use of the Green Facade along the vehicular ramp.

A mix of decorative native shrubs and groundcovers are proposed at ground level to the eastern end of Cross Street to enhance the pedestrian's experience in front of the carpark.

To the western end of Cross Street a Green Facade is proposed from ground level staggered up to approximately 7 metres along the facade of the proposed Carpark. Stainless steel structural Wire mesh is proposed and fixed as a structural element to the carpark facade. Climbing species of plants for example Pandorea species, Trachelospermum species, Hibbertia scandens and Hardenbergia violacea have been selected based on their potential growth height, growth rate and reliability. All have a medium to fast growth rate and should provide good coverage of the facade within the first few years. The plants will be planted within an on–grade garden bed, in a mix of imported and site soils. The area as with the rest of the soft landscaping will be watered by an automated dripper irrigation system. The landscape maintenance and selection of climber grown plants will be important in the first year to maximise this growth. Landscape maintenance will be ongoing to maintain the appearance of the facade in the future.

All existing trees within the proposed carpark envelope including trees 57 and 58 will be removed. Trees located over or near the proposed stormwater culvert will also be removed which includes trees 48, 49, 50, 51, 52 & 55. Where trees are not impacted by the development they will be retained and protected. Refer to the Arborist's report for tree details.

1.3 Green Street - Palm Tree Carpark

Green Street provides an access to Warringah Mall and other commercial areas to the North East of the site. The landscape planting to the eastern side of the carpark will soften and screen the building. This will be achieved by providing a mixed plant palette of indigenous trees, transplanted palms, shrubs and groundcovers. The depth of planting media where trees are shown will be mounded to provide extra soil depth of approx 1000mm over the culvert. The majority of this planting will be over the culvert and therefore is more an on-slab planting area. A mix of smaller 10 metre or less trees will be used within this area. The 1000mm depth of planting media should be adequate for these smaller trees to grow satisfactorily. The existing palms currently located at the corner of Cross St and Green St will be transplanted to the the soil mounding on Green Street.

Shrub and low maintenance groundcover planting will provide a decorative understorey for pedestrians. Species have been selected from Duffy's Forest Ecological Community, Sydney Turpentine Ironbark Forest, Blue Gum High Forest and Warringah Council Basix List.

1.4 Starfish Carpark

The layout of the access road from Old Pittwater Road to the Starfish Carpark has been modified. A new ramp to the upper level and a rearrangement of existing roads will involve the removal of some existing trees. Existing trees highlighted for removed are: 1, 16, 17, 26, 27, 27a, 28, 29, 30, 31 and 32. Refer to the Arborist Report for additional information.

The landscape design aims to revitalise the degraded garden beds below retained existing trees with decorative low water tolerant, native plantings. New garden beds will be planted with small to medium sized trees and native shrubs and groundcovers. Shade tolerant plants are proposed beneath the proposed ramp. An automated dripper irrigation system is proposed for the garden beds.

1.5 ESD Principles

The proposed indicative plant schedule for the site is shown on the landscape plan. Principles of ESD have been incorporated into the design including plant selection with low maintenance and low water demand will be used for proposed planting. An automated dripper irrigation system will be use with rain sensors to manage irrigation.

Species have been selected that are suitable for planting in the Warringah City Council Area.

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1.6 Plant List

Botanic Name	Common Name	Height	Spread	Community
TREES				
Acmena smithii	Lilly Pilly	10m	6m	BGHF
Angophora costata	Sydney Red Gum	20m	12m	DFEC
Banksia integrifolia	Coastal Banksia	14m	8m	
Banksia serrata	Old Man Banksia	6m	3m	DFEC
Elaeocarpus reticulatus	Blueberry Ash	6m	3m	BGHF
Eucalyptus punctata	Grey Gum	20m	12m	STIF
Eucalyptus robusta	Swamp Mahogany	10-20m	4-8m	
Lophostemon confertus	Brush Box	15m	10m	
Syncarpia glomulifera	Turpentine	18m	8m	STIF
Tristaniopsis laurina 'Luscious'	Luscious Water Gum	6m	5m	
SHRUBS				
Banksia ericifolia	Heath Banksia	2m	2m	BASIX
Banksia spinulosa	Hairpin Banksia	1.5m	1.5m	DFEC
Correa alba	White Correa	1.5m	1m	BASIX
Callistemon 'Captain Cook'	Captain Cook	1.2m	1m	
Doryanthes excelsa	Gymea Lily	1.5m	1.5m	
Grevillea linearifolia	Linear Leaf Grevillea	2m	2m	
Grevillea sericea	Pink Spider Flower	1.5m	1m	
Grevillea speciosa	Red Spider Flower	1.5m	1.5m	
Lambertia formosa	Mountain Devil	1.5m	1.5m	
Leptospermum 'Pacific Beauty'	Pacific Beauty	2m	1.5m	
Syzygium 'Aussie Southern'	Dwarf Lilly Pillly	2.5m	2m	
Westringia fruticosa	Coastal Rosemary	2m	5m	
Westringia fruticosa 'Smokey'	Dwarf Westringia	0.8m	0.8m	
GROUNDCOVERS/CLIMBERS & SHADE TOLERANT PLANTS				
Asplenium australis	Birds Nest Fern	1m	1m	
Carex appressa	Tall Sedge	0.8m	0.6m	
Dianella caerulea 'Breeze'	Dianella Breeze	0.5m	0.5m	DFEC
Dianella caerulea 'Cassa Blue'	Cassa Blue	0.4m	0.4m	DFEC
Dianella caerulea 'Little Jess'	Little Jess	0.4m	0.4m	DFEC
Dianella 'Silver Streak'	Flax Lily	0.5m	0.4m	
Doodia aspera	Prickly Rasp Fern	0.3m	0.3m	
Grevillea 'Bronze Rambler'	Grevillea Bronze Rambler	0.3m	1.5m	
Hardenbergia 'Mini Ha-Ha'	Purple Coral Pea	0.3m	1.5m	STIF
Hibbertia scandens	Golden Guinea Vine	Climber		
Isolepis nodosa	Knobby Club Rush	0.8m	0.6m	
Lomandra longifolia	Lomandra	0.8m	1m	BGHF
Lomandra longifolia 'Tanika'	Tanika	0.4m	0.4m	BGHF
Pandorea jasminoides	Bower of Beauty	Climber		
Pandorea pandorana	Wonga Wonga Vine	Climber		

Pennisetum alopecuroides 'Nafray'	Nafray	0.6m	0.6m	
Poa labillardieri 'Eskdale'	Poa Eskdale	0.4m	0.4m	
Trachelospermum jasminoides	Star Jasmine	0.4m	1.5m	

DFEC	DUFFY'S FOREST ECOLOGICAL COMMUNITY
STIF	SYDNEY TURPENTINE IRONBARK FOREST
BGHF	BLUE GUM HIGH FOREST
BASIX	WARRINGAH COUNCIL BASIX LIST

TREESCAN

URBAN FOREST MANAGEMENT

Tree Report

Westfield Warringah Mall

For DEM Australia Pty Ltd

June 2013

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Table of Contents

Tree Report
Westfield Warringah Mall

For DEM Australia Pty Ltd
June 2013

Introduction
It is proposed to reconstruct and realign parts of the existing entry/exit roadway to Warringah Mall shopping centre off Brookvale. Many trees are located on the site and some would be affected by the proposed construction. This report assesses the trees on the site and comments on the effects of the proposal. Twelve trees are proposed for removal while the others are to be retained and protected during construction.

Plans considered are:

- Proposed ground level floor plan 03.02 Rev CP1 dated 9 April 2013 prepared by Westfield Design & Construction Pty Ltd
- Tree survey dated 20 April 2013 prepared by RPS Australia East Pty Ltd
- DEM markup plan dated 31 May 2013 relating to Trees 14 and 15

The site
The site is aligned approximately north/south and consists of the existing roadway off Old Pittwater Rd and adjoining areas. Trees planted in rows are located to either side of the roadway and are also located in central islands. The land is within the local government area of Warringah Council.

Present state of the trees
The site trees are assessed in Table 1 below; tree numbers are noted on the plan attached. Trees were inspected on 2 May 2013 from the ground only and no aerial or subterranean inspections were carried out. Observations of tree structure, tree health and root zone conditions were made during the assessment. Tree dimensions of trunk diameter, height and crown spread were taken from the Tree Survey.

In general the trees are in good health with full foliage cover of the crowns. Their structural condition however is often compromised by poor scaffold formation and in particular by confinement of the root systems due to the proximity of trees to the roadway and other structures.

All trees are of commonly planted native species, evidently part of the landscape plan installed at the construction of the roadway. There are no trees present which are remnants of an original vegetation community of the site.

Discussion

Tree retention

The trees along the edges of the roadway and some of those in the central island areas are proposed for retention. Protection of the trunks and lower branches during construction would be required.

Tree 14 *Eucalyptus tereticornis* (Forest Red Gum) and Tree 15 *Melaleuca quinquenervia* (Broad-leaved Paperbark) are in a central raised bed surrounded by retaining walls; Tree 14 is leaning and may be unstable. Tree 15 is in poor structural condition due to a weak junction in the trunk. These trees would be retained although Tree 15 may be affected by the construction of a ramp to the south of the trunk.

In general the trees and their root zones would be protected by site safety fencing installed along the edges of the roadway and the new construction. Additional trunk armouring may be required where trees are close to construction. Trees in the central island area should be fenced along the kerblines.

Tree removal

Trees proposed for removal are in the central island areas where new roadways and ramps are proposed to be constructed. The ten trees affected are:

Tree 16 *Eucalyptus microcorys* (Tallowwood)
Tree 17 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 26 *Lophostemon confertus* (Brushbox)
Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 27a *Callistemon viminalis* (Weeping Bottlebrush)
Tree 28 *Eucalyptus robusta* (Swamp Mahogany)
Tree 29 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 30 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 31 *Eucalyptus robusta* (Swamp Mahogany)
Tree 32 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

These trees are confined within island planter beds in the centre of the roadway. In most cases their root systems have reached the limits of the available soil volume within the planters and in some areas are already causing uplift of kerbs and cracking of surfaces as roots extend from the planters.

Comments on trees proposed for removal are noted below:

Tree 16 *Eucalyptus microcorys* (Tallowwood) is a fair specimen although the root system is confined by kerbs to either side.

Tree 17 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 26 *Lophostemon confertus* (Brushbox) are stressed and have sparse leaf coverage.

Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark) is a very large specimen which is causing damage to the kerb due to root activity.

Tree 27a *Callistemon viminalis* (Weeping Bottlebrush) is poor and suppressed.

Tree 28 *Eucalyptus robusta* (Swamp Mahogany) has advanced crown dieback and is declining.

Tree 29 *Melaleuca quinquenervia* (Broad-leaved Paperbark) has a weak junction near the base and the root system is likely to cause damage in the near future.

Tree 30 *Melaleuca quinquenervia* (Broad-leaved Paperbark) is likely to cause damage in the near future.

Tree 31 *Eucalyptus robusta* (Swamp Mahogany) has major surface roots which have been deformed by the adjacent kerbs. Damage is likely in the near future.

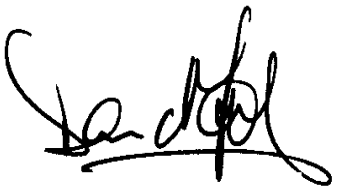
Tree 32 *Melaleuca quinquenervia* (Broad-leaved Paperbark) has already caused damage to the kerb and the road surface. Additional damage is likely in the future.

These trees are assessed with short safe useful life expectancy, 5 to 15 years, due to the likelihood of their removal for safety or nuisance reasons within this timespan.

Conclusions

The removal of ten trees would be necessary to enable the construction of the new roadway and access ramp. Most of these trees are of diminished value due to their confined locations within planter beds in the centre of the roadway.

Trees proposed for retention would require protection, depending on their proximity to disturbance as the result of construction nearby. In most cases the protection of the site fencing along the edges of the roadway would be sufficient, but some trees may also require trunk armouring to protect trunks and lower branches from accidental contact with machinery.



David Ford, Adv Dip Land Management, Dip Horticulture (Arboriculture), Cert Horticulture, Cert Bush Regeneration, MAIH

Consulting Arborist

References

Barrell, J. 1993, 'Preplanning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression', *Arboricultural Journal* 17:1, February 1993, pp. 33-46.

Barrell, J. 1995, 'Pre-development Tree Assessments', in *Trees & Building Sites, Proceedings of an International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings*, International Society of Arboriculture, Illinois, USA, pp. 132-142.

Standards Australia 2009, Australian Standard AS 4970 *Protection of trees on development sites*, Standards Australia, Sydney.

Tree protection during construction

The following measures should be undertaken to reduce the possible effects of construction on the trees.

Services should be designed so that no trenching is required within 5m of the trees.

Excavation in the vicinity of trees should be done initially by hand. Any roots encountered <50mm in diameter should be cut cleanly with a hand saw. Any roots encountered >50mm in diameter should retained intact and referred to the site arborist for advice.

Prior to the start of construction trees should be fenced (in groups where possible) to a radius of 5m from each trunk except where access is required for construction, to form tree protection zones. Fences should be chainlink 1.8m high supported by steel posts.

Where access is required within these radii for building purposes, the fence should be set back 1.5m from the building face and the soil surface between the fence and the building should be protected by plywood sheets or strapped planking.

Where not otherwise protected trunks should be armoured with 2m lengths of 50x100mm hardwood timbers spaced at 150mm centres and secured by 8 gauge wires or steel strapping at 300mm spacing. The trunk protection should be maintained intact until the completion of all work on the site.

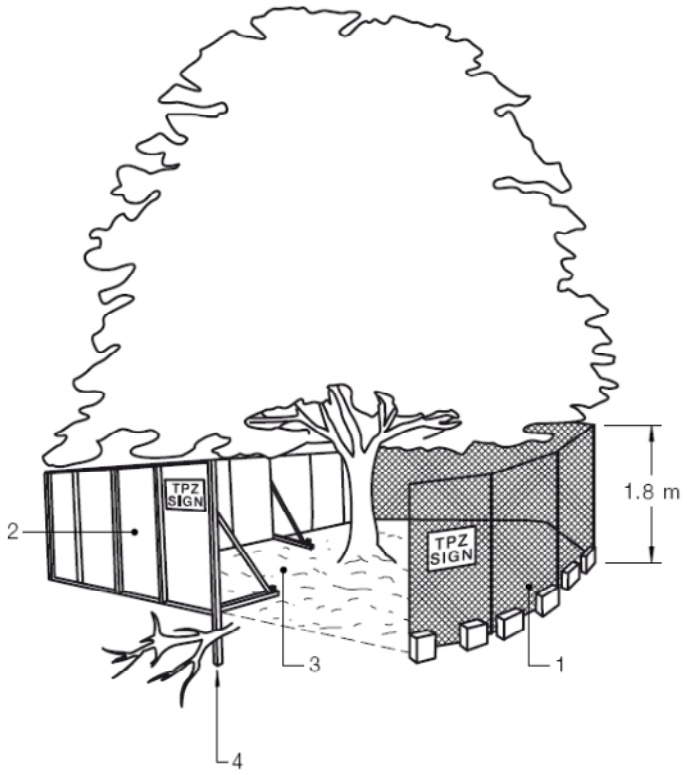
There should be no pedestrian or vehicular access to the tree protection zones. No building activities should take place within the tree protection zones, including storage or stockpiling. Runoff from the site should not be allowed to enter the tree protection zones.

A site arborist should be appointed to supervise any activities in the vicinity of trees, including fencing, excavation and root pruning, and make periodic visits and reports to monitor the state of the trees. Inspection should take place after installation of the fencing, at initial hand excavation and root pruning, during any works within the tree protection zones, at completion of the construction. A photographic record should be maintained of site inspections, including the state of the trees and any injury inflicted.

In the event of any tree to be retained becoming damaged during construction, the site arborist should be informed to inspect and provide advice on remedial action.

At the end of construction all retained trees should be pruned to remove deadwood and weak branches. All pruning should be done in accordance with Australian Standard AS4373- *Pruning of Amenity Trees*.

Guidelines for tree protection are noted in Australian Standard AS4970-2009 *Protection of Trees on Development Sites*. Figures below show fencing, ground protection and scaffold fencing details.



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

FIGURE 3 PROTECTIVE FENCING

4.5.2 Trunk and branch protection

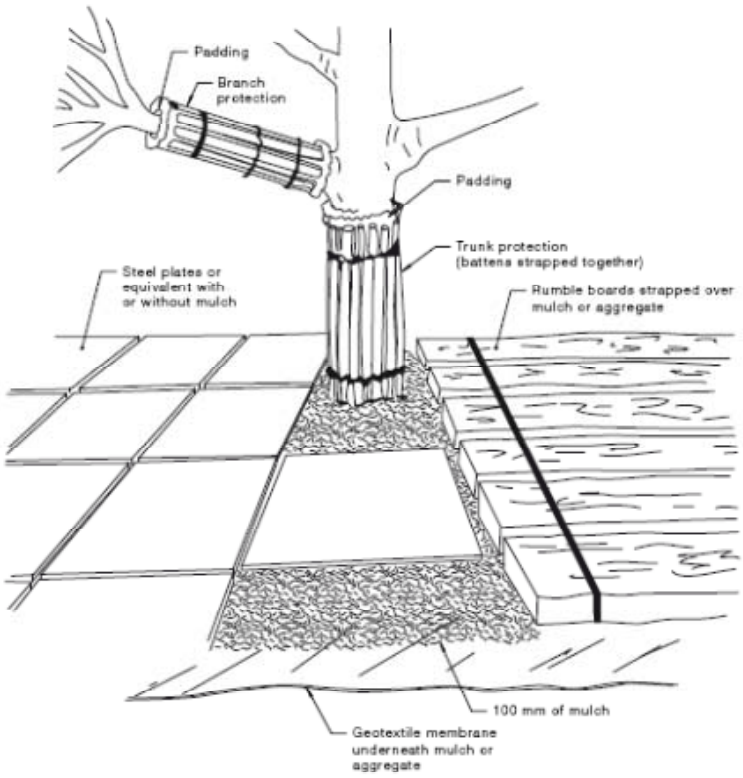
Where necessary, install protection to the trunk and branches of trees as shown in Figure 4. The materials and positioning of protection are to be specified by the project arborist. A minimum height of 2 m is recommended.

Do not attach temporary powerlines, stays, guys and the like to the tree. Do not drive nails into the trunks or branches.

4.5.3 Ground protection

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards as per Figure 4.

These measures may be applied to root zones beyond the TPZ.

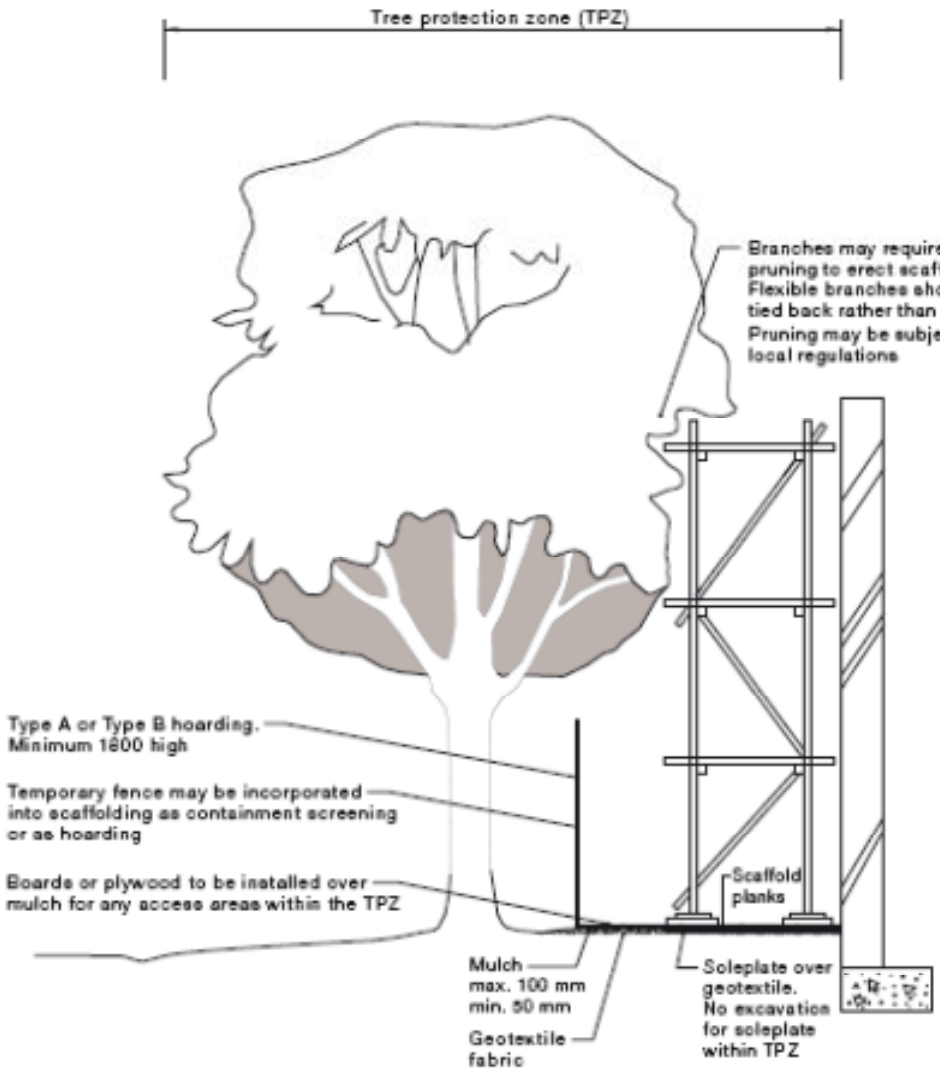


NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

FIGURE 5 INDICATIVE SCAFFOLDING WITHIN A TPZ

Table 1: Site trees

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
1	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	6	300	Good	Fair	2D	Root system confined by road	Retention
2	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	8	300	Good	Fair	3B	Trunk in contact with retaining wall	Retention
3	*Cinnamomum camphora* (Camphor Laurel)	7	6	300	Good	Fair	4C	Weed species	Retention
4	*Melaleuca bracteata* (Black Tea Tree)	10	8	300	Good	Fair	3B	Trunk in contact with retaining wall	Retention
5	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	10	6	400	Good	Good	2B	Weak junction at 5m height	Retention
6	*Melaleuca bracteata* (Black Tea Tree)	6	6	300	Good	Poor	3D	Trunk lean Weak junction near base	Retention
7	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	8	300	Good	Fair	3B	Multiple subtrunks Poor form	Retention
8	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	8	300	Good	Fair	3B	Multiple subtrunks Poor form	Retention
9	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	12	10	500	Good	Fair	3B	Weak junction with big ears defect at 2m height	Retention
10	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	8	400	Good	Fair	3C	Suppressed Weak junction at 2m height	Retention

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
11	*Eucalyptus microcorys* (Tallowwood)	14	16	800	Good	Fair	3B	Weak junction at 3m height Small ears defect Epicormic shoots on trunk Root system confined by road Termite workings on trunk	Retention
12	*Eucalyptus microcorys* (Tallowwood)	8	8	400	Good	Fair	2B	Weak junction at 2m height Leaning Codominant subtrunks	Retention
13	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	12	400	Good	Fair	3B	Multiple subtrunks Poor form	Retention
14	*Eucalyptus tereticornis* (Forest Red Gum) ?	8	10	400	Good	Fair	3B	Root system confined by road to 2 sides in narrow planter bed Leaning Possibly unstable	Retention
15	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	10	400	Good	Poor	3B	Weak junction at 3m height Root system confined by road to 2 sides in narrow planter bed	Retention
16	*Eucalyptus microcorys* (Tallowwood)	10	10	300	Good	Fair	2B	Straight form Root system confined by road to 2 sides in narrow planter bed	Removal
17	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	6	300	Fair	Fair	3A	Sparse crown Stressed	Removal
18	*Lophostemon confertus* (Brushbox)	12	10	300	Good	Fair	3A	Root system confined by road and carpark Codominant crown	Retention
19	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	12	12	1000	Good	Poor	3B	Weak junctions at base Root system confined by road carpark and stormwater pit	Retention

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
20	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	6	300	Good	Poor	3B	Weak junctions at base Root system confined by road carpark and stormwater pit	Retention
21	*Callistemon viminalis* (Weeping Bottlebrush)	5	6	Multi	Fair	Poor	3A	Sparse crown Poor form	Retention
22	*Callistemon viminalis* (Weeping Bottlebrush)	5	4	multi	Fair	Poor	3A	Sparse crown Poor form	Retention
23	*Lophostemon confertus* (Brushbox)	5	6	200	Good	Fair	2D	Good specimen with confined root system	Retention
24	*Lophostemon confertus* (Brushbox)	7	8	300	Good	Fair	2B	Root system confined by road carpark and stormwater pipe	Retention
25	*Lophostemon confertus* (Brushbox)	7	8	300	Good	Fair	2B	Root system confined by road carpark and stormwater pipe	Retention
26	*Lophostemon confertus* (Brushbox)	4	6	200	Fair	Poor	3A	Sparse crown Stressed	Removal
27	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	13	12	1000	Good	Poor	3B	Root system confined by road to 2 sides Kerb damage	Removal
27a	*Callistemon viminalis* (Weeping Bottlebrush)	3	2	200	Poor	Poor	4A	Suppressed Declining	Removal
28	*Eucalyptus robusta* (Swamp Mahogany)	5	4	300	Poor	Poor	4A	Crown dieback Declining	Removal
29	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	6	400	Good	Poor	3B	Leaning Weak junction at base Confined root system	Removal

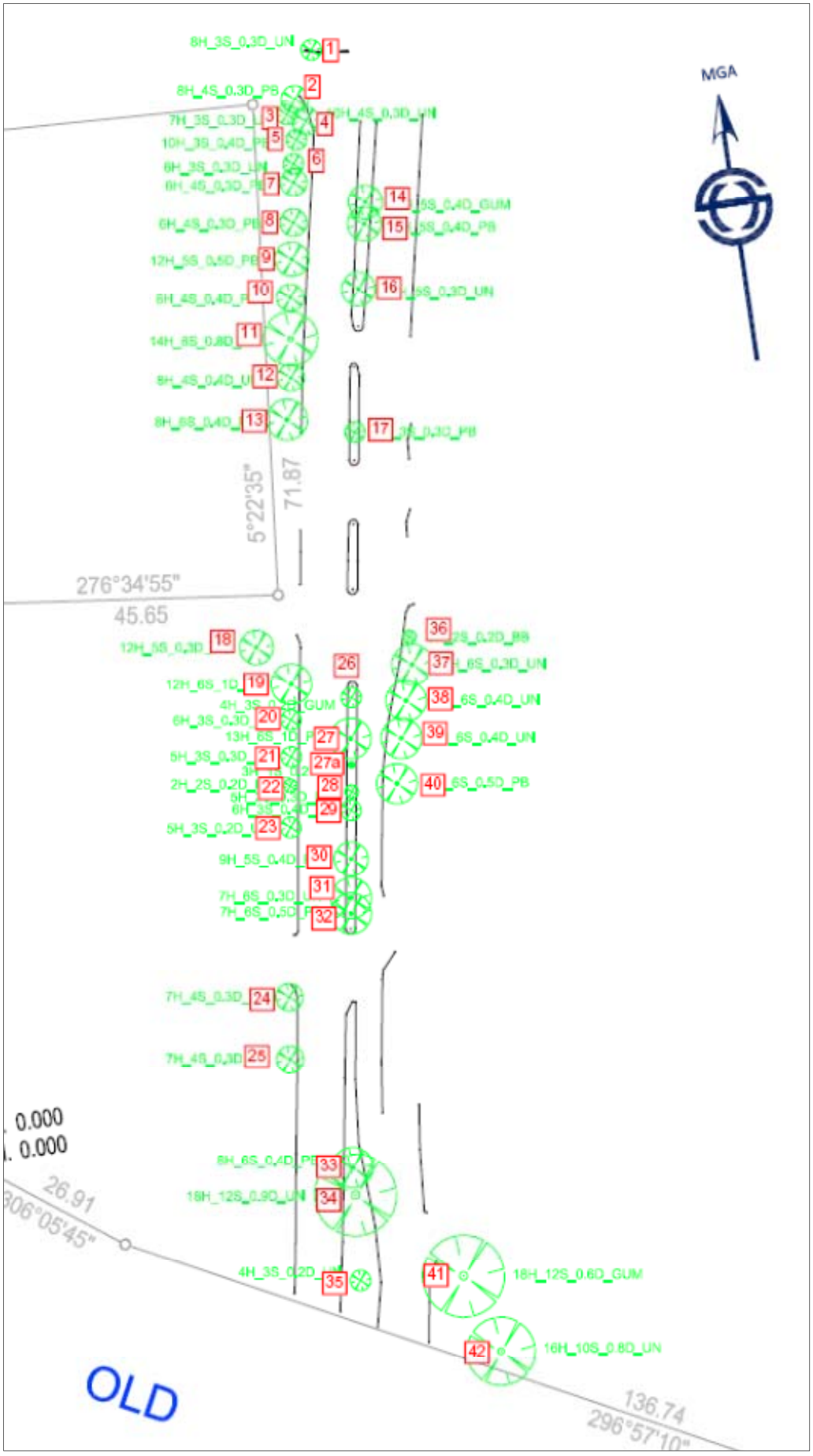
Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
30	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	9	10	400	Good	Fair	3B	Root system confined by road to 2 sides	Removal
31	*Eucalyptus robusta* (Swamp Mahogany)	7	12	300	Good	Poor	3B	Trunk wounds Massive root system confined by road to 2 sides	Removal
32	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	7	12	500	Good	Poor	3B	Leaning Damage to road Confined root system	Removal
33	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	12	400	Good	Fair	3B	Suppressed One-sided crown Root system confined by road	Retention
34	*Eucalyptus microcorys* (Tallowwood)	18	24	900	Fair	Fair	2D	Weak junctions at 4m height Root system confined by road to 2 sides Hydrant nearby	Retention
35	*Jacaranda mimosifolia* (Jacaranda)	4	6	200 x 2	Good	Poor	3D	Weak junction at base Codominant subtrunks	Retention
36	*Callistemon viminalis* (Weeping Bottlebrush)	5	4	200	Good	Poor	4A	Leaning One-sided crown Root system confined by road and footpath	Retention
37	*Melaleuca bracteata* (Black Tea Tree)	6	12	300	Good	Fair	3B	Multi-stemmed form Weak junctions Root system confined by road	Retention
38	*Melaleuca bracteata* (Black Tea Tree)	8	12	400	Good	Fair	3B	Multi-stemmed form Weak junctions Root system confined by road	Retention
39	*Melaleuca bracteata* (Black Tea Tree)	8	12	400	Good	Fair	3B	Multi-stemmed form Weak junctions Root system confined by road	Retention

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
40	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	18	24	600	Fair	Fair	3B	Sparse crown Stressed Weak junction at 1m height Root system confined by road and ramp	Retention
41	*Eucalyptus microcorys* (Tallowwood)	8	12	500	Good	Fair	2D	Straight form Root system confined by footpath and retaining wall Termite workings on trunk	Retention
42	*Eucalyptus microcorys* (Tallowwood)	16	20	800	Good	Fair	2D	Codominant subtrunks Epicormic shoots on lower branches Root system confined by ramp building and footpath Termite workings on trunk	Retention

Table 2: SULE categories (after Barrell 1995)

	1	2	3	4
	Long: Appeared to be retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance.	Medium: appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance.	Short: appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance.	Transient: trees which should be removed within the next 5 years.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees which may only live between 15 and 40 years.	Trees which may only live between 5 and 15 years.	Dead, dying, suppressed or declining trees.
B	Trees which could be made suitable for long-term retention by remedial care.	Trees which may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees which may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through damage, structural defect, instability or recent loss of adjacent trees. Urgent removal may be required if near assets.
C	Trees of special significance which would warrant extraordinary efforts to secure their long-term retention.	Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees which may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.
D		Trees which could be made suitable for retention in the medium term by remedial care.	Trees which require substantial remediation and are only suitable for retention in the short term.	Trees which are damaging or may cause damage to existing structures within the next 5 years.

Tree location plan



Ground level floor plan

Plates

Plate 1: right to left Tree 4 *Melaleuca bracteata* (Black Tea Tree), Tree 5 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 6 *Melaleuca bracteata* (Black Tea Tree)

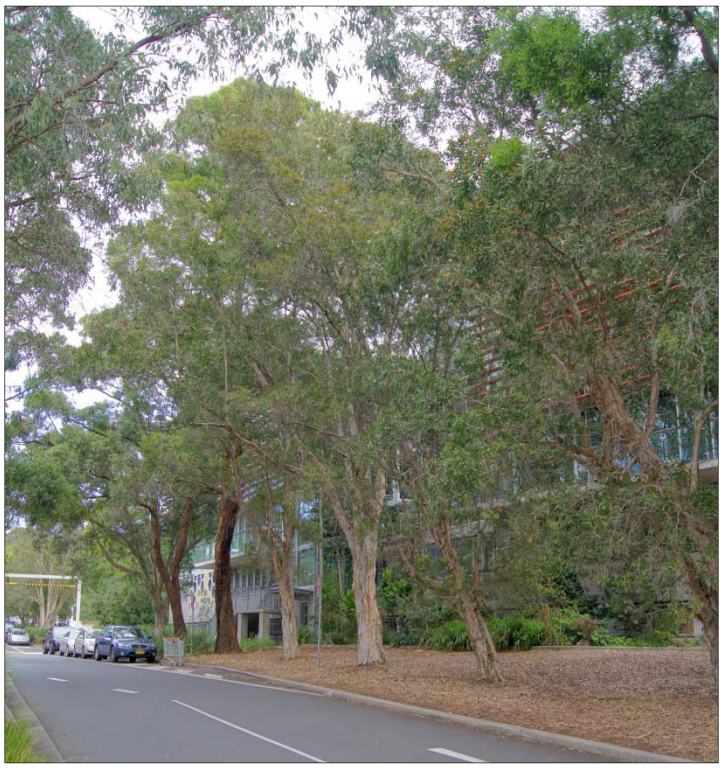


Plate 2: right to left Trees 7 to 10 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Trees 11 and 12 *Eucalyptus microcorys* (Tallowwood)

Plate 3: Tree 14 *Eucalyptus tereticornis* (Forest Red Gum), Tree 15 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and at rear Tree 16 *Eucalyptus microcorys* (Tallowwood)

Plate 4: central section viewed from the north showing left to right:
Tree 36 *Callistemon viminalis* (Weeping Bottlebrush) , Tree 37 *Melaleuca bracteata* (Black Tea Tree), Tree 26 *Lophostemon confertus* (Brushbox), Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 26 *Lophostemon confertus* (Brushbox)

Plate 5: Trees 24 and 25 *Lophostemon confertus* (Brushbox)

Plate 6: right to left Tree 26 *Lophostemon confertus* (Brushbox), Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark), Tree 27a *Callistemon viminalis* (Weeping Bottlebrush), Tree 28 *Eucalyptus robusta* (Swamp Mahogany), Trees 29 and 30 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

Plate 7: left to right
Tree 31 *Eucalyptus robusta* (Swamp Mahogany) and Tree 32 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

Plate 8: left to right
Tree 41 *Eucalyptus microcorys* (Tallowwood), Tree 33 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and at rear Tree 34 *Eucalyptus microcorys* (Tallowwood)

Plate 9: Tree 33 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 34 *Eucalyptus microcorys* (Tallowwood)

Plate 10: left to right Tree 36 *Callistemon viminalis* (Weeping Bottlebrush), Trees 37 to 39 *Melaleuca bracteata* (Black Tea Tree) and Tree 40 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

Plate 11: Old Pittwater Rd entry showing Tree 34 *Eucalyptus microcorys* (Tallowwood) and Tree 35 *Jacaranda mimosifolia* (Jacaranda)

Plate 12: Old Pittwater Rd entry showing Trees 41 and 42 *Eucalyptus microcorys* (Tallowwood)

Terminology used in the report

Age classes (I) *Immature* refers to a well-established but juvenile tree. (S) *Semimature* refers to a tree at growth stages between immaturity and full size. (M) *Mature* refers to a full sized tree with some capacity for further growth. (O) *Overmature* refers to a tree about to enter decline or already declining.

Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.

Condition refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils), and the state of the scaffold (ie trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Health	
Good	In good vigour with full leaf coverage of the crown; deadwood if present is internal and a normal feature of the species
Fair	Generally vigorous but shows symptoms of stress or decline, leaf coverage thinner than normal for the species; deadwood of smaller diameter may be present
Poor	Shows symptoms of advanced stress or decline including sparse crown with twig and branch dieback, lack of response to pests or disease
Structural condition	
Good	Has well-spaced branches and strong branch collars; form and habit typical of the species; good example of the species with low probability of significant failure
Fair	Has structural defects of moderate severity with low propensity for failure which could be remediated by pruning or modification of its environment
Poor	Has structural defects which have already failed and/or have a high propensity for failing in the future

Safe Useful Life Expectancy (SULE). In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. SULE is a system designed to classify trees into a number of defined categories so that information regarding tree retention can be concisely communicated in a non-technical manner. SULE categories are easily verifiable by experienced personnel without great disparity. A tree's SULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give safe life expectancy), then by economics (ie cost of maintenance; retaining trees at an excessive management cost is not normally acceptable), effects on better trees, and sustained amenity (ie establishing a range of age classes in a local population). SULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with short SULE may at present be making a contribution to the landscape but their value to the local amenity will decrease rapidly towards the end of this period, prior to their being removed for safety or aesthetic reasons. For details of SULE categories see Table 2, adapted from Barrell (1993 and 1995).

Decay is the result of invasion by fungal diseases through a wound.

Decline is the response of the tree to a reduction of energy levels resulting from **stress**. Recovery from a decline is difficult and slow; is usually irreversible.

Epicormic shoots are sprouts produced from dormant buds in the bark. Production can be triggered by fire, pruning or root damage but may also be as a result of stress or decline.

Sparse crown refers to reduced leaf density, often a precursor to dieback and may imply stress or decline. Also possibly a response to drought or root damage.

Stress refers to the response of the tree to a reduction of energy levels resulting from adverse influences such as altered soil conditions (compaction, poor nutrition, reduced oxygen or moisture levels), root damage, toxicity, drought, waterlogging; may be reversible given good arboricultural practices but may lead to **decline**.

Theoretical tree protection zone is the 'tree protection zone radius' as calculated from Australian Standard 4970-2009 *Protection of Trees on Development Sites*. However root mapping investigations increasingly show that the tree protection zone calculation of 12x trunk diameter is seldom relevant in practice and the theoretical tree protection zone may be considerably larger than the actual root zone or radically different in disposition.

Weak junctions are points of possible failure in the scaffold. They are usually caused by the trunk or branch bark being squeezed within the junction so that the necessary interlocking of the wood fibres does not occur and the junction is forced open by the annual increments in growth. This is often a genetic problem.

Disclaimer

All care has been taken to assess potential hazard but trees are always inherently dangerous. This assessment was carried out from the ground, and covers what was reasonably able to be assessed and available to the assessor at the time of inspection. No aerial or subterranean inspections were carried out and structural weakness may exist within roots, trunk or branches.

Any protection or preservation methods recommended are not a guarantee of tree survival or safety but are designed to improve vigour and reduce risk. Timely inspections and reports are necessary to monitor the trees' condition. No responsibility is accepted for damage or injury caused by the trees and no responsibility is accepted if the recommendations in this report are not followed.

Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, and directly attached to that submission, report or presentation.

Assumptions

Care has been taken to obtain information from reliable resources. All data have been verified insofar as possible; however, Treescan Urban Forest Management can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of inspection: and

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Appendix C Stormwater Plans

CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
SECTION 96 APPLICATION

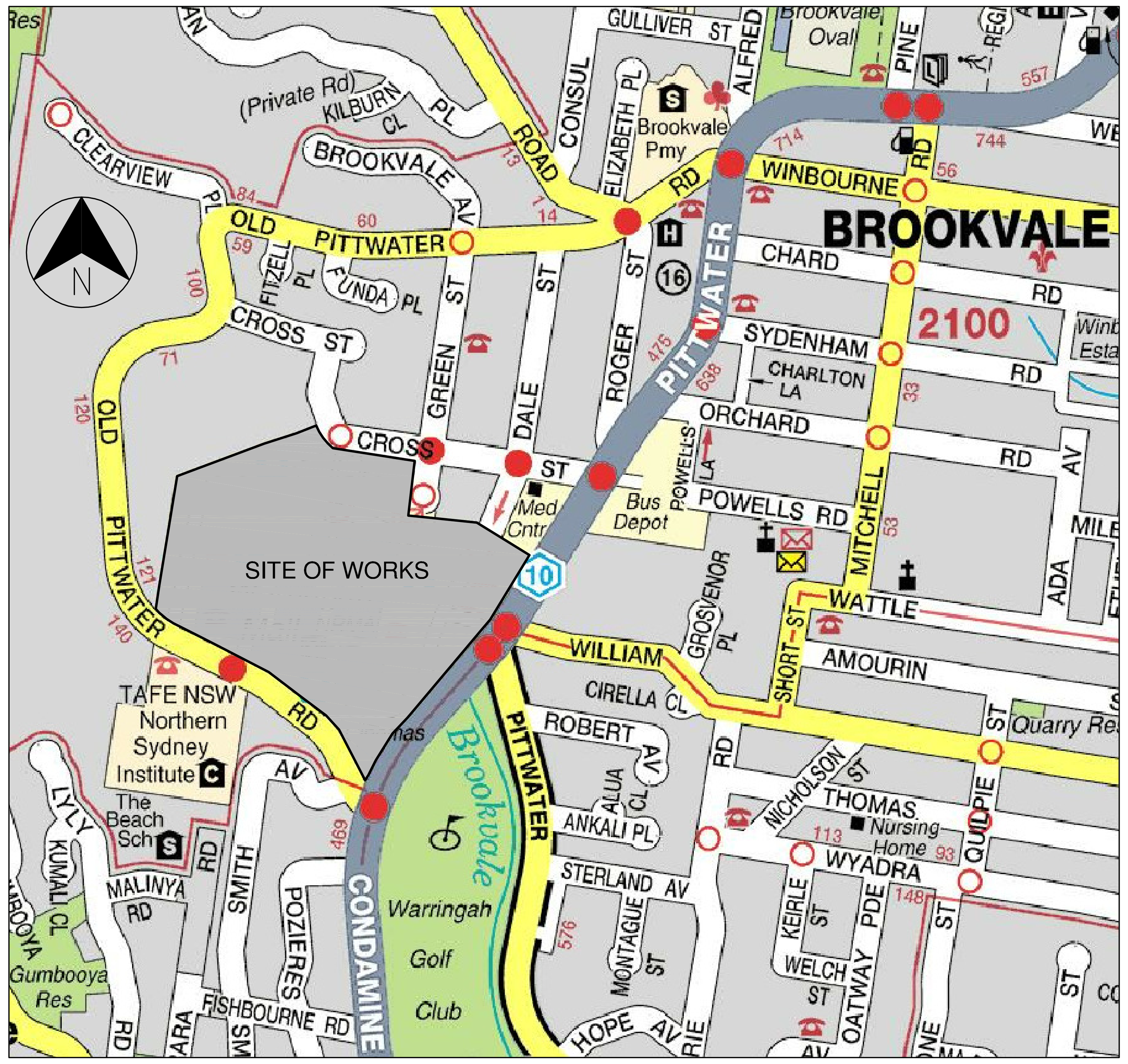
WARRINGAH MALL, BROOKVALE

DATE PLOTTED: 30 August, 2013 - 5:01pm

DRAWING SCHEDULE

W4548-300	COVER SHEET, GENERAL NOTES AND DRAWING SCHEDULE
W4548-301	GENERAL ARRANGEMENT PLAN - STAGE 1 EXPANSION WORKS
W4548-310	DETAIL ARRANGEMENT PLAN - CROSS STREET & BROOKVALE CREEK
W4548-311	WOOLWORTHS LOADING DOCK
W4548-312	DETAIL ARRANGEMENT PLAN - STARFISH CARPARK
W4548-313	DETAIL ARRANGEMENT PLAN - CROSS AND GREEN STREETS
W4548-314	DETAIL ARRANGEMENT PLAN - CROSS AND GREEN STREETS SECTIONS
W4548-315	DETAIL ARRANGEMENT PLAN - CROSS STREET ROUNDABOUT - PLAN
W4548-316	DETAIL ARRANGEMENT PLAN - CROSS STREET ROUNDABOUT - DETAILS
W4548-317	TARGET ENTRY - CONCRETE PLANTER BOX
W4548-318	GENERAL ARRANGEMENT PLAN - STAGE 1 EXPANSION WORKS
W4548-319	DAVID JONES LOADING DOCK LAYOUT
W4548-320	STORMWATER LONGSECTIONS
W4548-330	EROSION & SEDIMENT CONTROL PLAN SHEET 1 OF 3
W4548-331	EROSION & SEDIMENT CONTROL PLAN SHEET 2 OF 3
W4548-332	EROSION & SEDIMENT CONTROL PLAN SHEET 3 OF 3
W4548-333	EROSION & SEDIMENT CONTROL DETAILS

C



MAP REPRODUCED WITH PERMISSION OF UBD.
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LOCALITY PLAN
NOT TO SCALE

GENERAL NOTES

CG1. THE INFORMATION CONTAINED ON THESE DRAWINGS IS FOR CIVIL ENGINEERING PURPOSES ONLY. ALL DISCREPANCIES WITH OTHER CONSULTANTS DOCUMENTATION THAT COULD RESULT IN CHANGES TO THE CIVIL ENGINEERING DETAILS SHALL BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

CG2. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS FOR THESE WORKS AND/OR AS DIRECTED BY THE SUPERINTENDENT.

CG3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND PROTECT AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE AND/OR ADJUST IF NECESSARY. INFORMATION GIVEN ON THE DRAWINGS IN RESPECT TO SERVICES IS FOR GUIDANCE ONLY IS NOT GUARANTEED COMPLETE NOR CORRECT.

CG4. CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE PERMISSION OF THE OWNER AND SUPERINTENDENT.

CG5. CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES AND DEBRIS, ETC. TO THE EXTENT SPECIFIED.

CG6. ALL SITE REGRADING AREAS SHALL BE FINALLY GRADED TO THE SATISFACTION OF THE SUPERINTENDENT.

CG7. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED OR REMOVED FROM SITE.

CG8. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING.

CG9. ANY QUANTITIES GIVEN ARE FOR GUIDANCE ONLY.

CG10. PLANS ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL PLANS BY WESTFIELD

REV	DATE	REVISIONS	DRN	CHK
C	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

Westfield Design & Construction Pty Limited
100 William Street, Sydney NSW 2011
Phone (02) 9358 7000 Fax (02) 9358 7373
GPO Box 4004 Sydney NSW 2001
ABN 000 267 265

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

APPROVED: PROJECT DIRECTOR DATE
REVIEWED: PROJECT MANAGER DATE

Cardno (NSW) Pty Ltd
ABN: 95 001 145 035
Level 3, 910 Pacific Highway, Gordon, NSW Australia 2072
Phone (+61 2) 9496 7700 Fax (+61 2) 9499 3902
Email: sydney@syd.cardno.com.au Web: www.cardno.com.au

WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
COVER SHEET, GENERAL NOTES AND DRAWING SCHEDULE

DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-300
REV: C

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

XREF's: X-BORDER; X-Services; X-Drainage; X-Carpark; X-Architect__New; X-Survey
CAD FILE: N:\Projects\805\FY14\500__599 Other Cardno Business Units\89914004 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\TeW4548-301(E).dwg

DATE PLOTTED: 16 October, 2013 - 5:39pm

NOTE:
LOCATION AND LEVEL OF ALL SERVICES TO BE CONFIRMED ON SITE

REV	DATE	REVISIONS	DRN	CHK
E	16/10/2013	LAYOUT AMENDMENTS	NDK	SGB
D	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
C	17/06/2013	COUNCIL AMENDMENTS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

Westfield
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100 William Street. Sydney NSW 2011
Phone (02) 9358 7000 Fax (02) 9358 7373
GPO Box 4004 Sydney NSW 2001
ABN 000 267 285

APPROVED:
PROJECT DIRECTOR .... DATE

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

REVIEWED:
PROJECT MANAGER .... DATE

Cardno
Cardno (NSW) Pty Ltd
ABN: 95 001 145 035
Level 3, 910 Pacific Highway, Gordon, NSW Australia 2072
Phone (+61 2) 9496 7700 Fax (+61 2) 9499 3902
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WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
GENERAL ARRANGEMENT PLAN - STAGE 1 EXPANSION WORKS

DRAWING STATUS:
NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-301
REV: E

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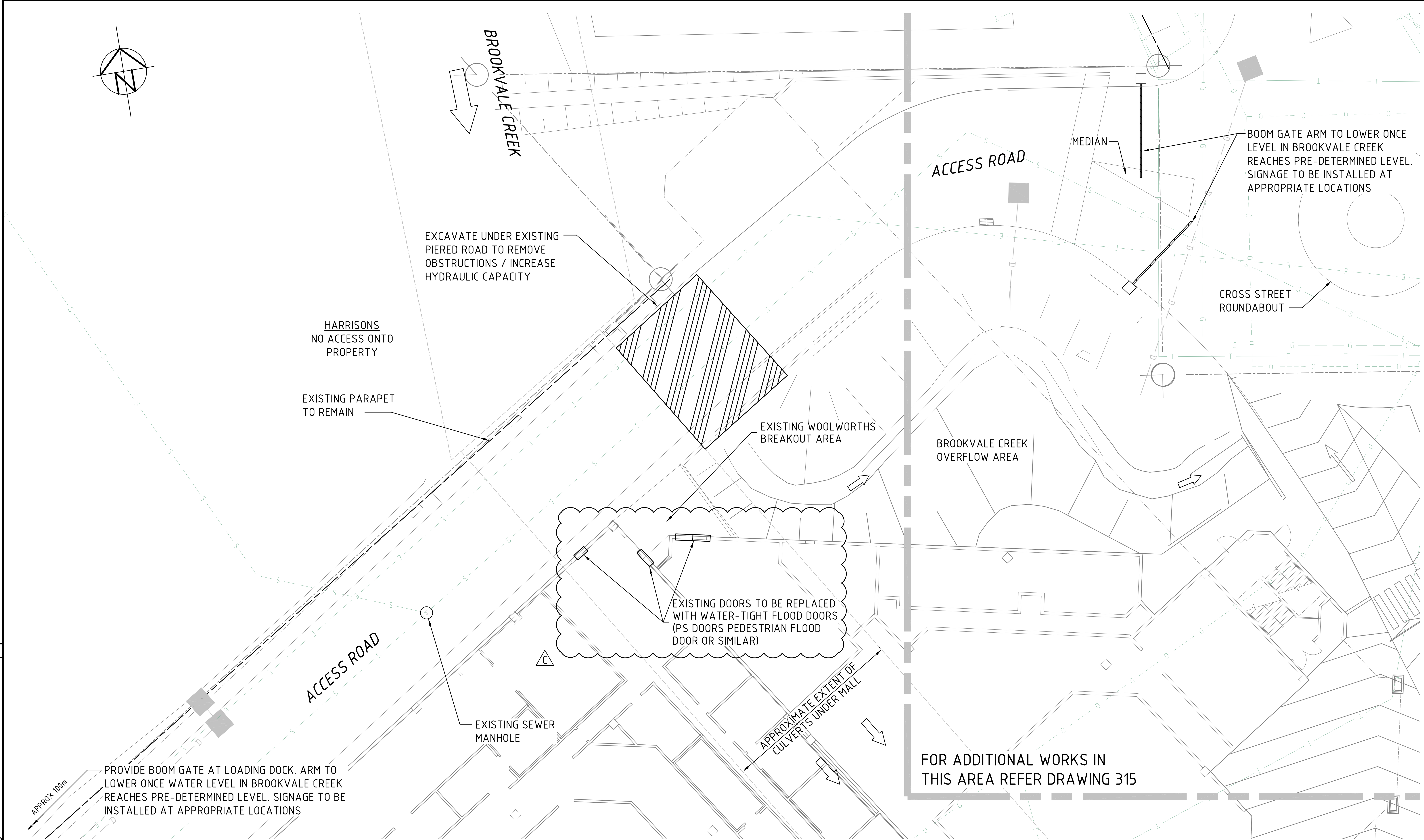
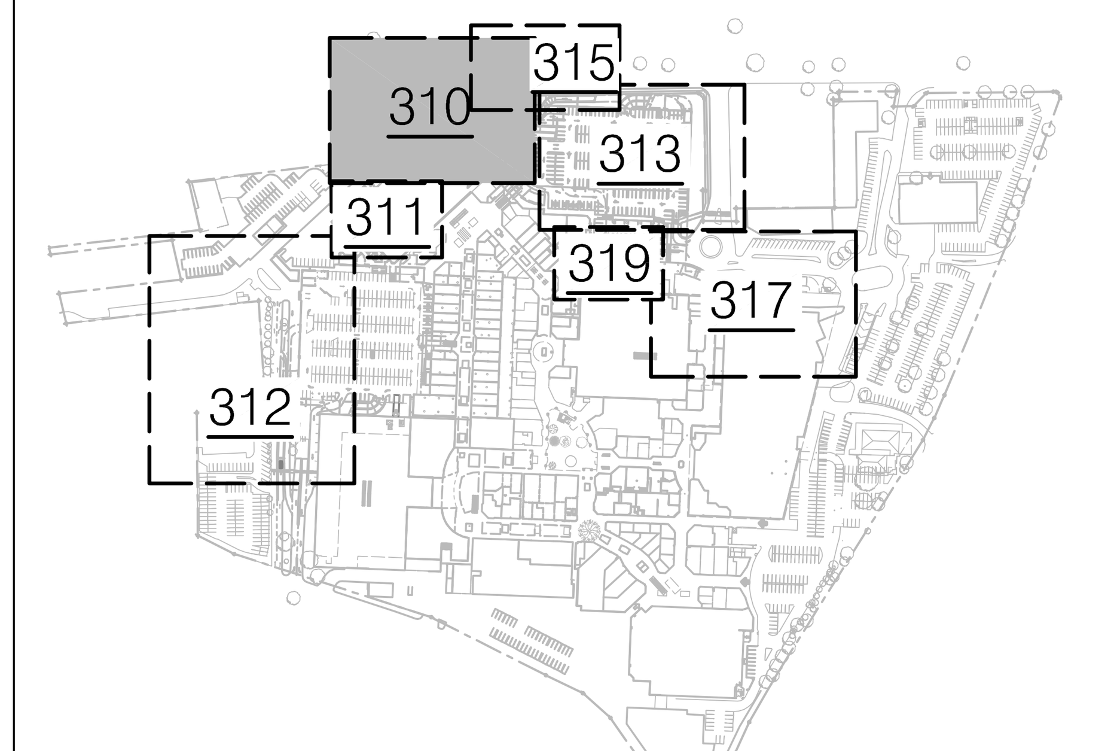


PLAN
SCALE 1:150



KEY TO DETAIL SHEETS
SCALE 1:5000

LEGEND

- APPROXIMATE AREA OF REGRADING
- FLOOD BARRIER
- BOOM GATE ARM
- DIRECTION OF FLOW

SERVICES

- ELECTRICITY
- GAS
- OPTICAL FIBRE
- OPTUS
- SEWER
- TELSTRA
- WATER

NOTE: ALL SERVICE LOCATIONS ARE INDICATIVE ONLY

SCALE OF METRES (1:100 BEFORE REDUCTION)

SCALE OF METRES (1:150 BEFORE REDUCTION)

DATE PLOTTED: 30 August, 2013 - 5:03pm

REV	DATE	REVISIONS	DRN	CHK
C	17/06/2013	COUNCIL AMENDMENTS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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ABN 000 267 265

APPROVED: PROJECT DIRECTOR DATE
REVIEWED: PROJECT MANAGER DATE

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

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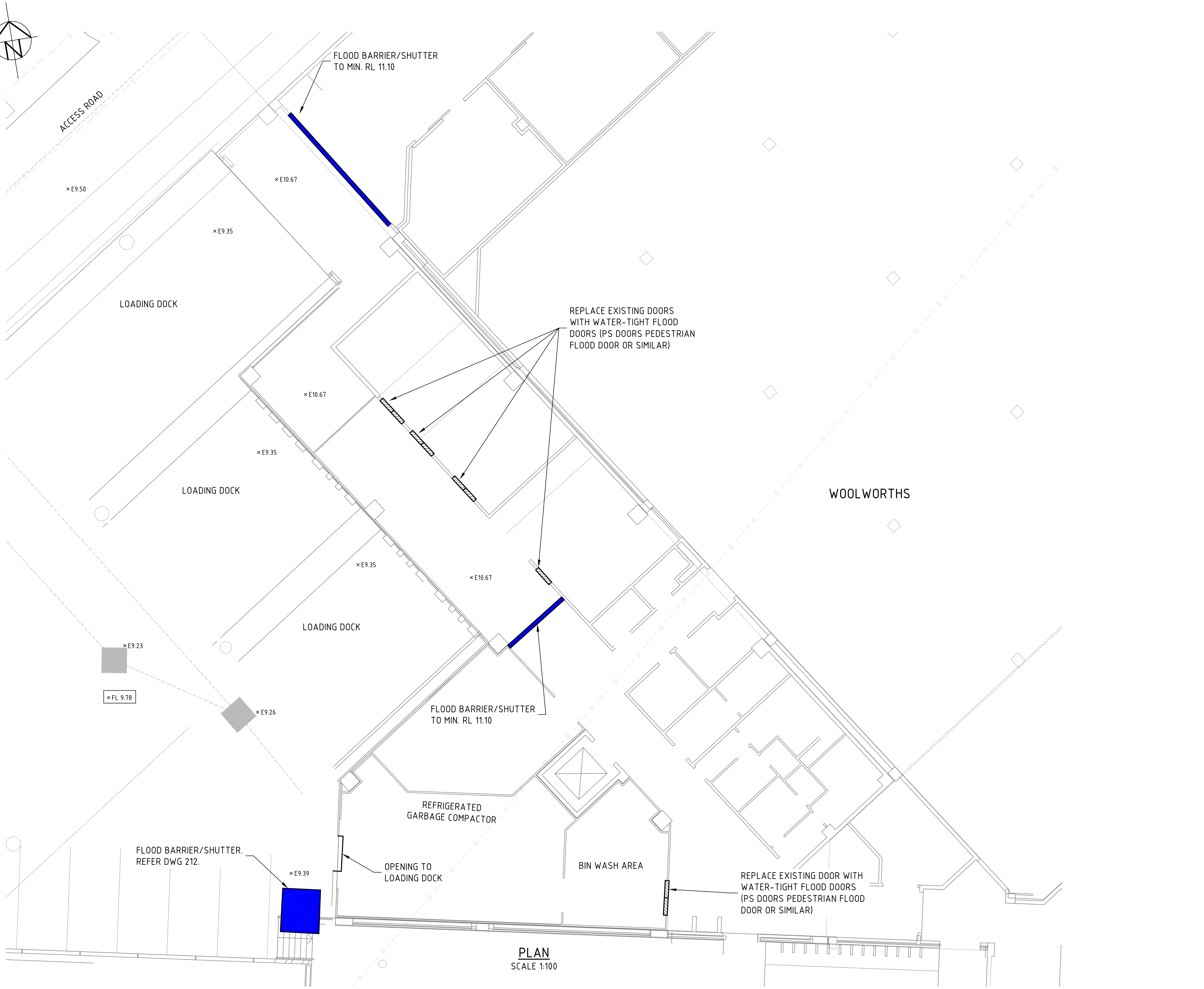
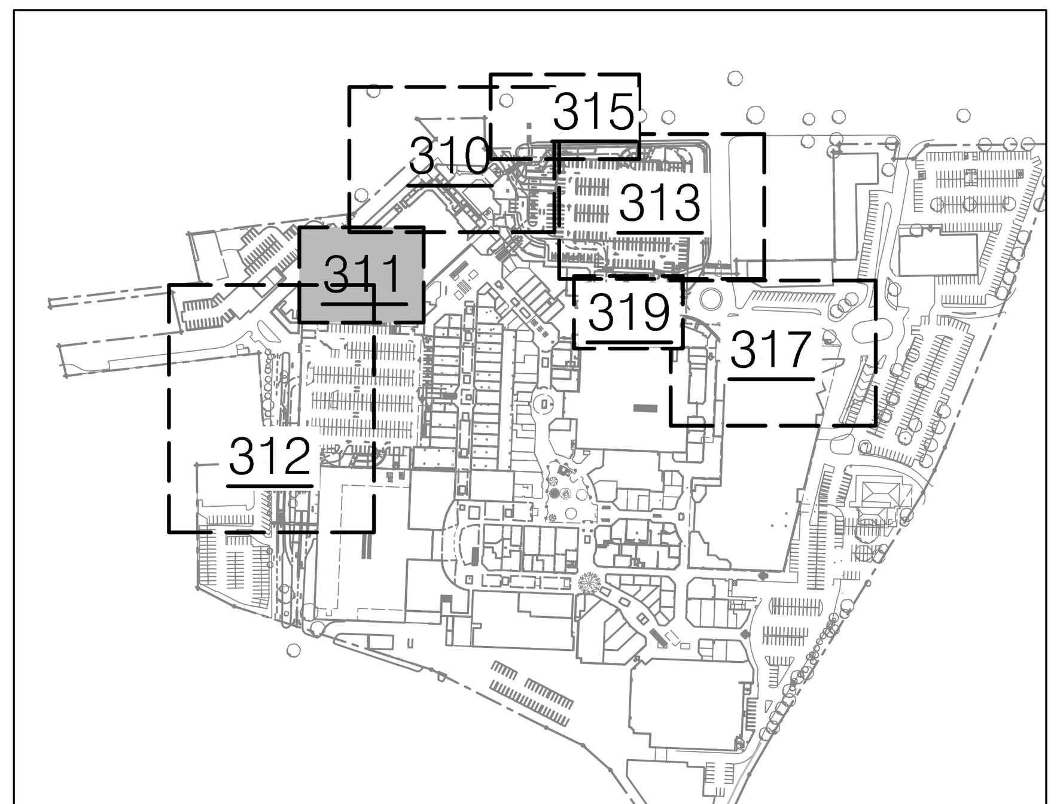
WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DETAIL ARRANGEMENT PLAN - CROSS STREET & BROOKVALE CREEK

DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-310
REV: C

A1 ON ORIGINAL



PLAN
SCALE 1:100



KEY TO DETAIL SHEETS
SCALE 1:5000

LEGEND

EXISTING

× E10.87	EXISTING LEVEL
	EXISTING LOCAL DRAINAGE

PROPOSED

× 11.00	PROPOSED LEVEL
× FL 10.03	100 YEAR ARI FLOOD LEVEL (m AHD)
	PROPOSED FLOOD BARRIER/SHUTTER
	PROPOSED WATER-TIGHT FLOOD DOOR

SERVICES

E	ELECTRICITY
G	GAS
F	OPTICAL FIBRE
O	OPTUS
S	SEWER
T	TELSTRA
W	WATER

NOTE: ALL SERVICE LOCATIONS ARE INDICATIVE ONLY

0 2000 4000 6000 8000 10000mm
SCALE 1:100

REV	DATE	REVISIONS	DRN	CHK
A	30/08/2013	LAYOUT AMENDMENT - SHEET ADDED	NDK	SGB

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APPROVED: PROJECT DIRECTOR DATE

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DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

REVIEWED: PROJECT MANAGER DATE

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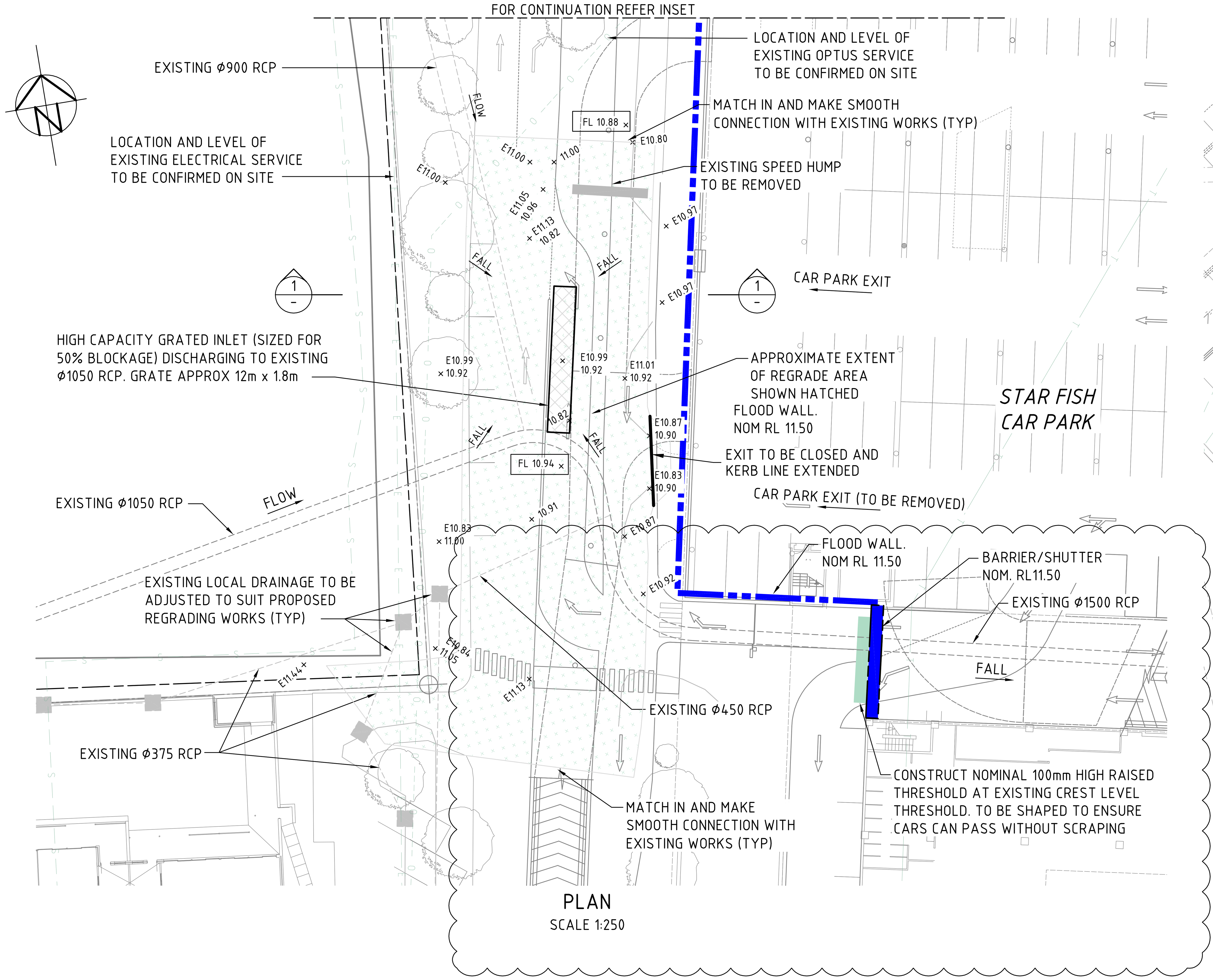
WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
WOOLWORTHS LOADING DOCK WORKS

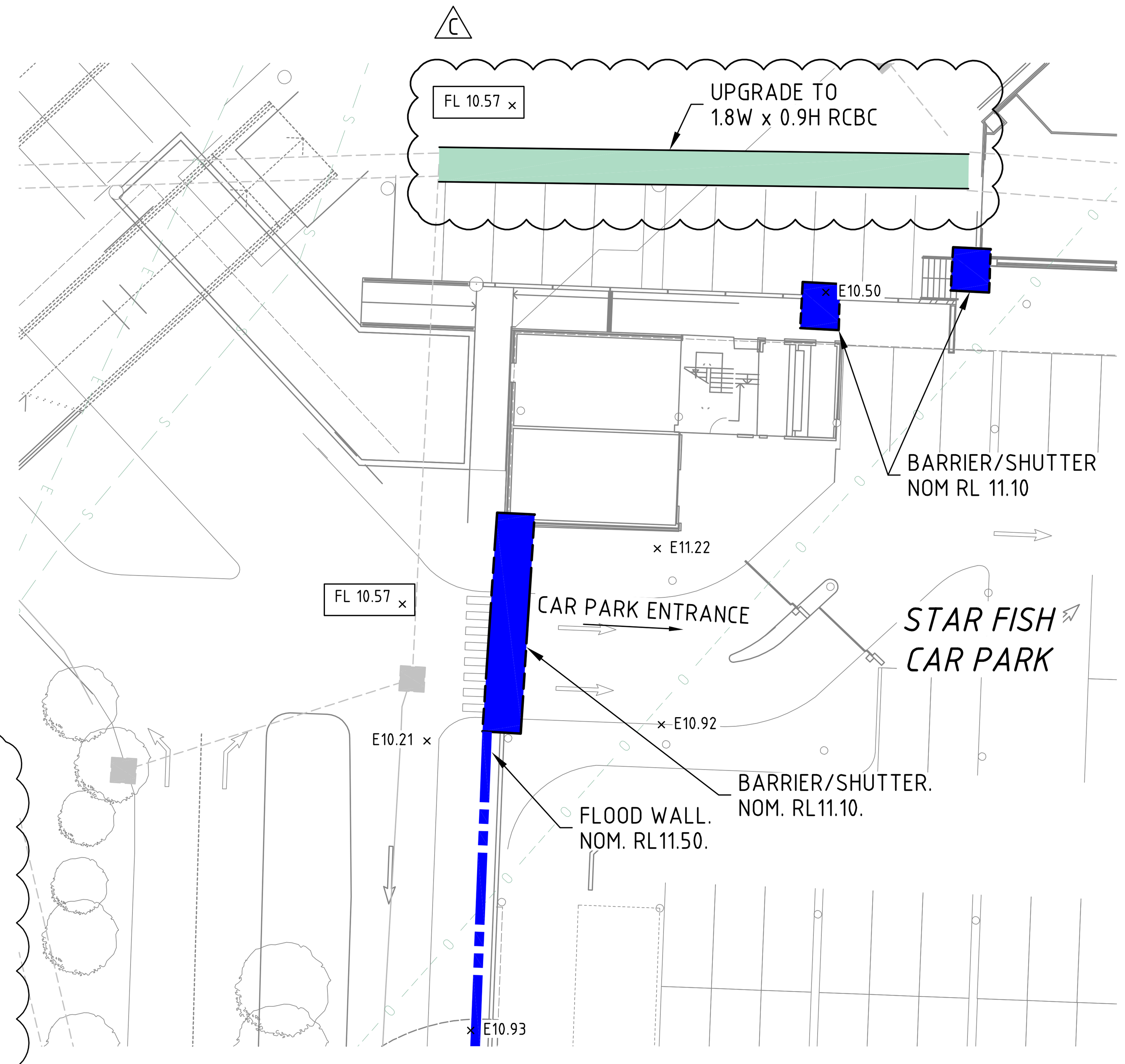
DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-311
REV: A

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

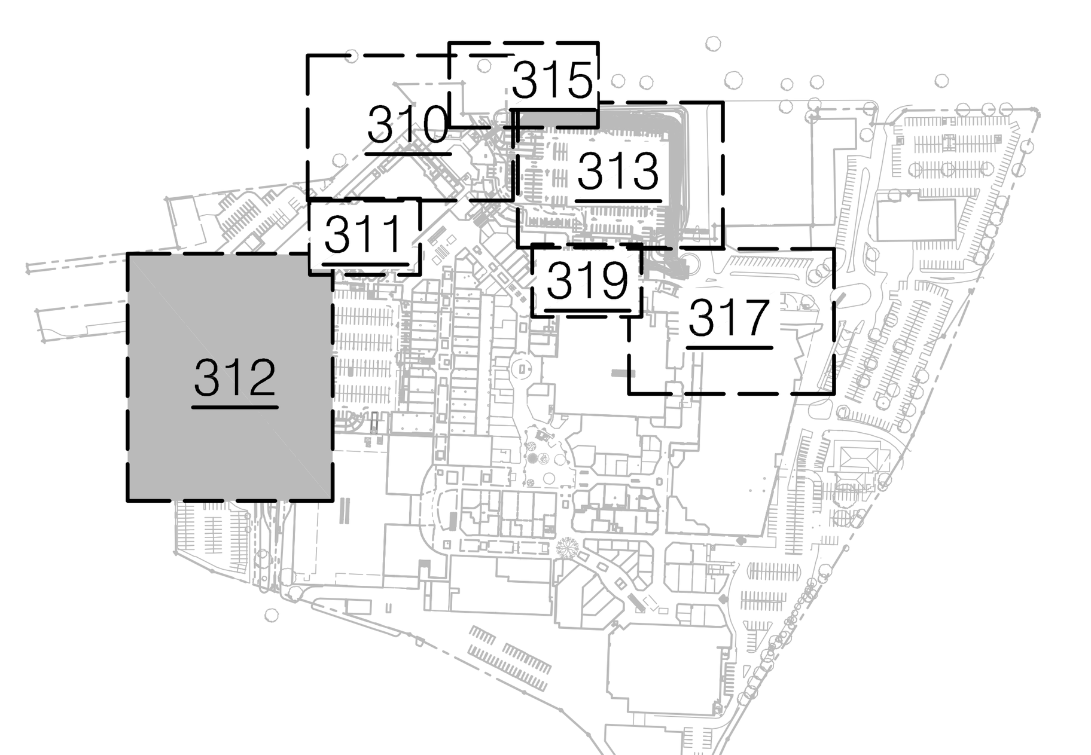
DATE PLOTTED: 30 August, 2013 - 5:03pm
XREF's: X-BORDER; X-Services; X-Drainage; X-Survey; X-Architect; X-Carpark
CAD FILE: N:\Projects\805\FY14\500_599 Other Cardno Business Units\80914006 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\W4548-311(A).dwg



PLAN
SCALE 1:250



INSET
SCALE 1:250



KEY TO DETAIL SHEETS
SCALE 1:5000

LEGEND

EXISTING

- × E10.87 EXISTING LEVEL
- EXISTING LOCAL DRAINAGE

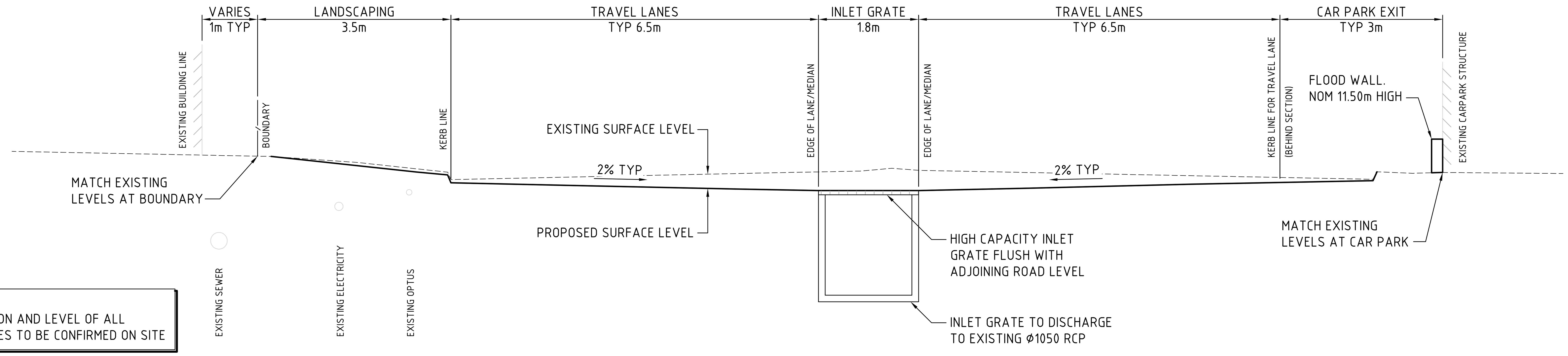
PROPOSED

- × 11.00 PROPOSED LEVEL
- PROPOSED BOLLARD
- × FL 10.03 100 YEAR ARI FLOOD LEVEL (m AHD)
- APPROXIMATE AREA OF REGRADE
- PROPOSED HIGH CAPACITY GRATE
- PROPOSED RAISED THRESHOLD
- PROPOSED FLOOD WALL
- PROPOSED FLOOD BARRIER/SHUTTER

SERVICES

- ELECTRICITY
- GAS
- OPTICAL FIBRE
- OPTUS
- SEWER
- TELSTRA
- WATER

NOTE: ALL SERVICE LOCATIONS ARE INDICATIVE ONLY



NOTE:
LOCATION AND LEVEL OF ALL SERVICES TO BE CONFIRMED ON SITE

SECTION 1
SCALE 1:50

SCALE OF METRES (1:50 BEFORE REDUCTION)

SCALE OF METRES (1:250 BEFORE REDUCTION)

DATE PLOTTED: 30 August, 2013 - 5:43pm

REV	DATE	REVISIONS	DRN	CHK
D	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
C	17/06/2013	COUNCIL AMENDMENTS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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APPROVED:

PROJECT DIRECTOR DATE

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DESIGNED:	SGB	BP
DRAWN:	NDK	SGB
REVIEWED:		

PROJECT MANAGER DATE

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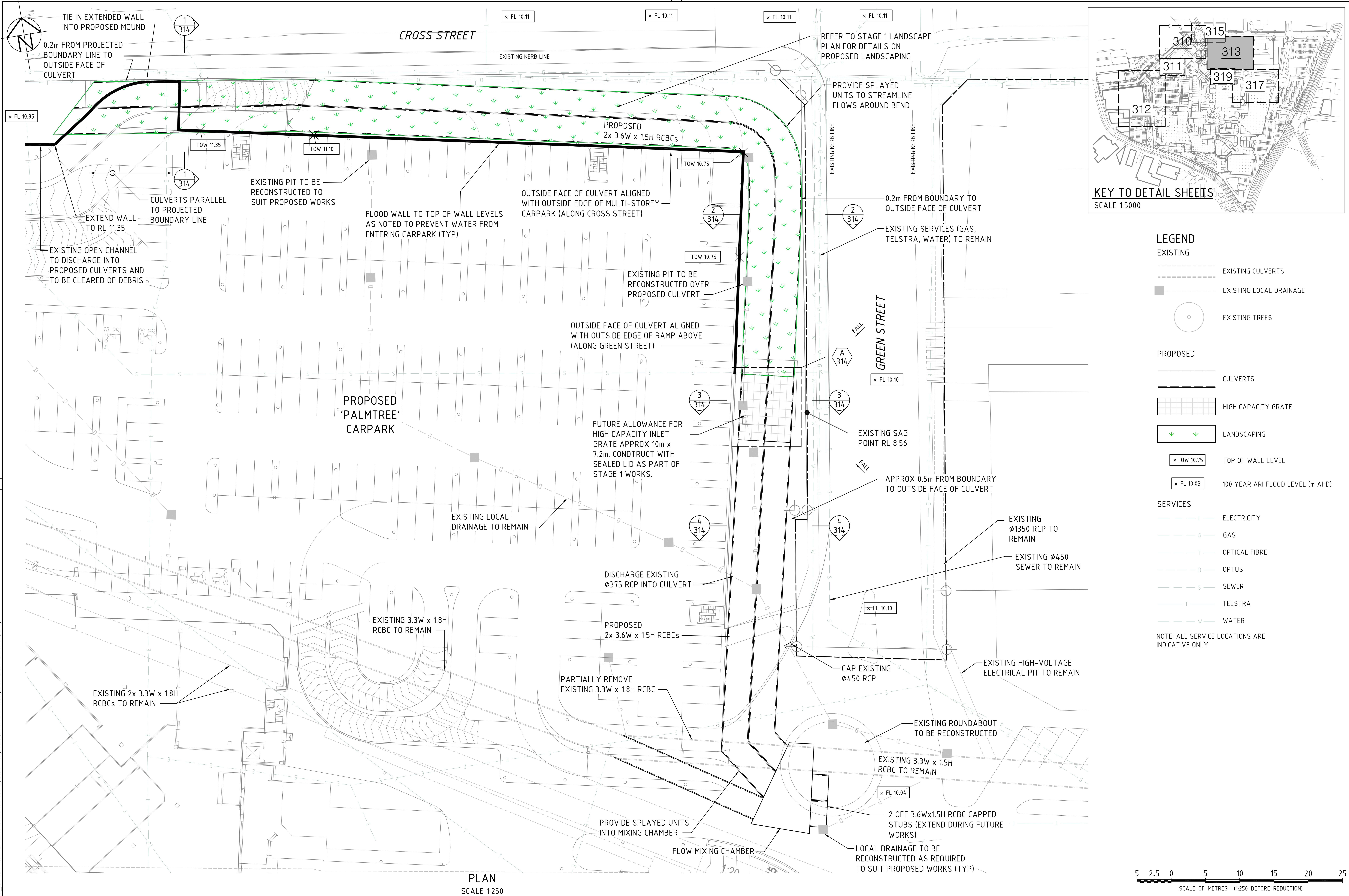
WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DETAIL ARRANGEMENT PLAN - STARFISH CARPARK

DRAWING STATUS: NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-312 REV: D

A1 ON ORIGINAL



TIE IN EXTENDED WALL INTO PROPOSED MOUND
0.2m FROM PROJECTED BOUNDARY LINE TO OUTSIDE FACE OF CULVERT
CROSS STREET
EXISTING KERB LINE
× FL 10.11
× FL 10.85
REFER TO STAGE 1 LANDSCAPE PLAN FOR DETAILS ON PROPOSED LANDSCAPING
PROVIDE SPLAYED UNITS TO STREAMLINE FLOWS AROUND BEND
PROPOSED 2x 3.6W x 1.5H RCBCs
TOW 11.35
TOW 11.10
TOW 10.75
EXISTING PIT TO BE RECONSTRUCTED TO SUIT PROPOSED WORKS
CULVERTS PARALLEL TO PROJECTED BOUNDARY LINE
EXTEND WALL TO RL 11.35
FLOOD WALL TO TOP OF WALL LEVELS AS NOTED TO PREVENT WATER FROM ENTERING CARPARK (TYP)
OUTSIDE FACE OF CULVERT ALIGNED WITH OUTSIDE EDGE OF MULTI-STOREY CARPARK (ALONG CROSS STREET)
0.2m FROM BOUNDARY TO OUTSIDE FACE OF CULVERT
EXISTING SERVICES (GAS, TELSTRA, WATER) TO REMAIN
EXISTING OPEN CHANNEL TO DISCHARGE INTO PROPOSED CULVERTS AND TO BE CLEARED OF DEBRIS
EXISTING PIT TO BE RECONSTRUCTED OVER PROPOSED CULVERT
EXISTING KERB LINE
GREEN STREET
FALL
OUTSIDE FACE OF CULVERT ALIGNED WITH OUTSIDE EDGE OF RAMP ABOVE (ALONG GREEN STREET)
× FL 10.10
PROPOSED 'PALMTREE' CARPARK
FUTURE ALLOWANCE FOR HIGH CAPACITY INLET GRATE APPROX 10m x 7.2m. CONDTRUCT WITH SEALED LID AS PART OF STAGE 1 WORKS.
EXISTING SAG POINT RL 8.56
APPROX 0.5m FROM BOUNDARY TO OUTSIDE FACE OF CULVERT
EXISTING LOCAL DRAINAGE TO REMAIN
EXISTING Ø1350 RCP TO REMAIN
EXISTING Ø450 SEWER TO REMAIN
DISCHARGE EXISTING Ø375 RCP INTO CULVERT
EXISTING 3.3W x 1.8H RCBC TO REMAIN
PROPOSED 2x 3.6W x 1.5H RCBCs
CAP EXISTING Ø450 RCP
EXISTING HIGH-VOLTAGE ELECTRICAL PIT TO REMAIN
EXISTING 2x 3.3W x 1.8H RCBCs TO REMAIN
PARTIALLY REMOVE EXISTING 3.3W x 1.8H RCBC
EXISTING ROUNDABOUT TO BE RECONSTRUCTED
EXISTING 3.3W x 1.5H RCBC TO REMAIN
× FL 10.04
2 OFF 3.6Wx1.5H RCBC CAPPED STUBS (EXTEND DURING FUTURE WORKS)
PROVIDE SPLAYED UNITS INTO MIXING CHAMBER
FLOW MIXING CHAMBER
LOCAL DRAINAGE TO BE RECONSTRUCTED AS REQUIRED TO SUIT PROPOSED WORKS (TYP)
1 314
2 314
3 314
4 314
A 314
310
315
313
311
319
317
312
KEY TO DETAIL SHEETS
SCALE 1:5000
LEGEND
EXISTING
EXISTING CULVERTS
EXISTING LOCAL DRAINAGE
EXISTING TREES
PROPOSED
CULVERTS
HIGH CAPACITY GRATE
LANDSCAPING
× TOW 10.75 TOP OF WALL LEVEL
× FL 10.03 100 YEAR ARI FLOOD LEVEL (m AHD)
SERVICES
ELECTRICITY
GAS
OPTICAL FIBRE
OPTUS
SEWER
TELSTRA
WATER
NOTE: ALL SERVICE LOCATIONS ARE INDICATIVE ONLY
5 2.5 0 5 10 15 20 25
SCALE OF METRES (1:250 BEFORE REDUCTION)

PLAN
SCALE 1:250

REV	DATE	REVISIONS	DRN	CHK
F	16/10/2013	LAYOUT AMENDED	NDK	SGB
E	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
D	20/06/2013	AMENDED FLOOD LEVELS	LDB	SGB
C	17/06/2013	COUNCIL AMENDMENTS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

APPROVED: PROJECT DIRECTOR DATE
REVIEWED: PROJECT MANAGER DATE

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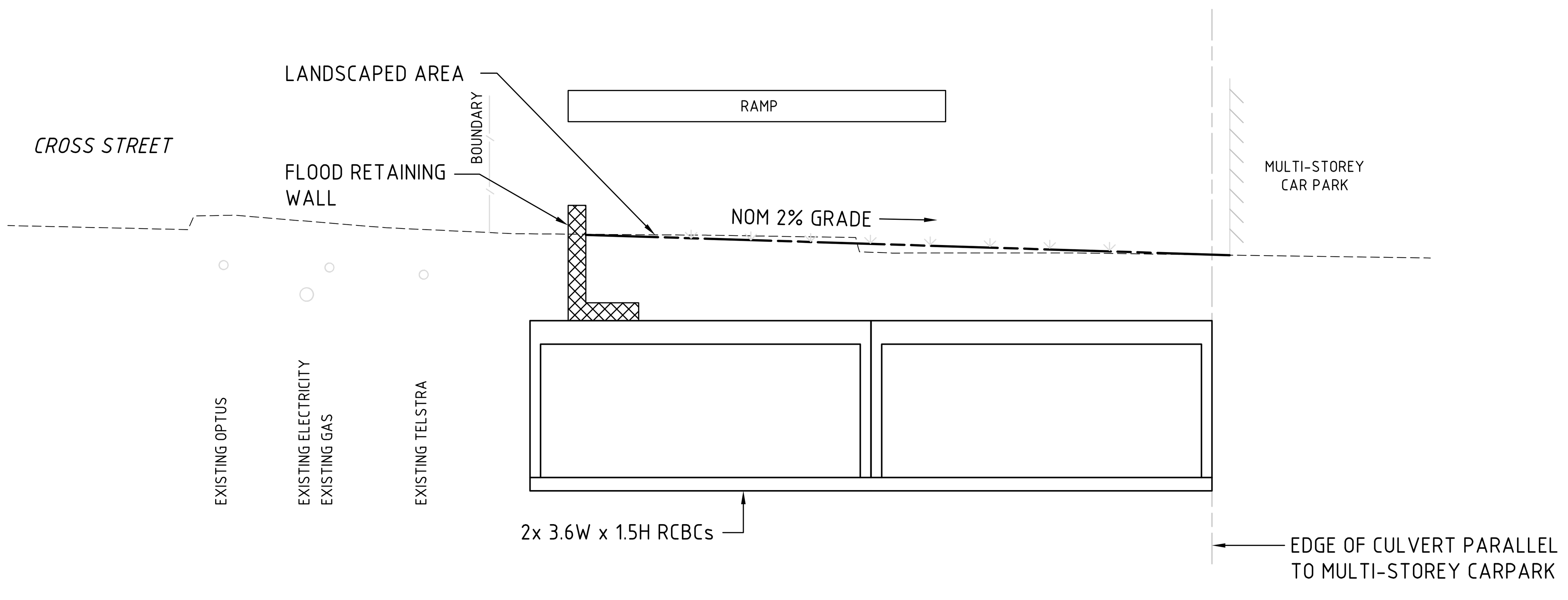
WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DETAIL ARRANGEMENT PLAN - CROSS AND GREEN STREETS

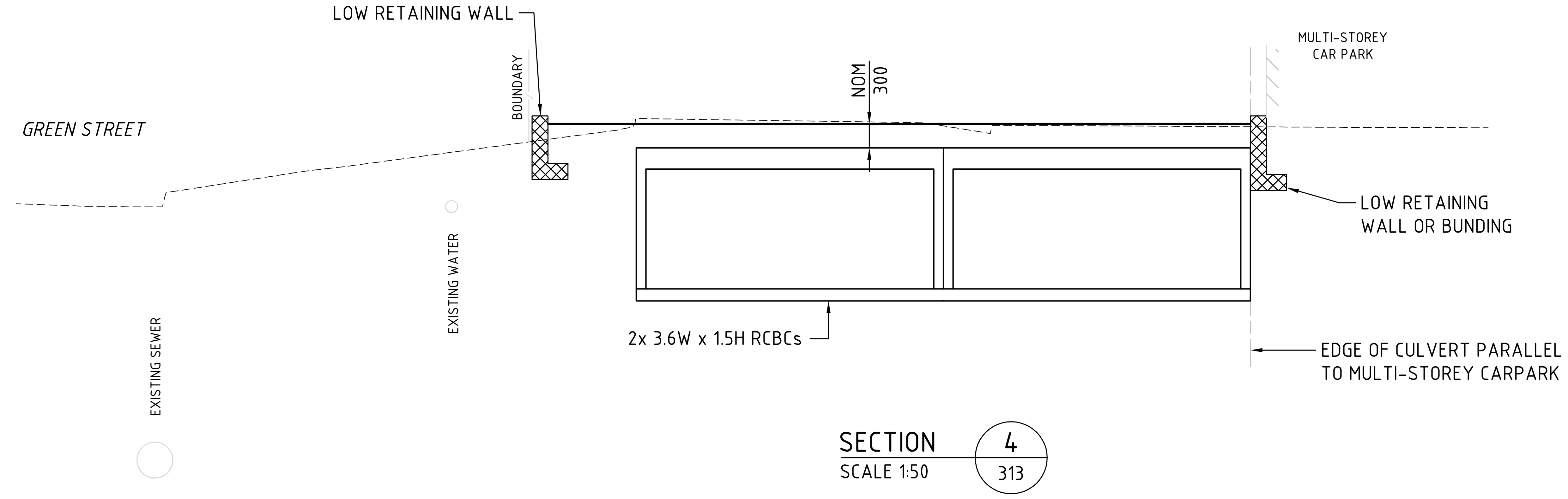
DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-313
REV: F

A1 ON ORIGINAL

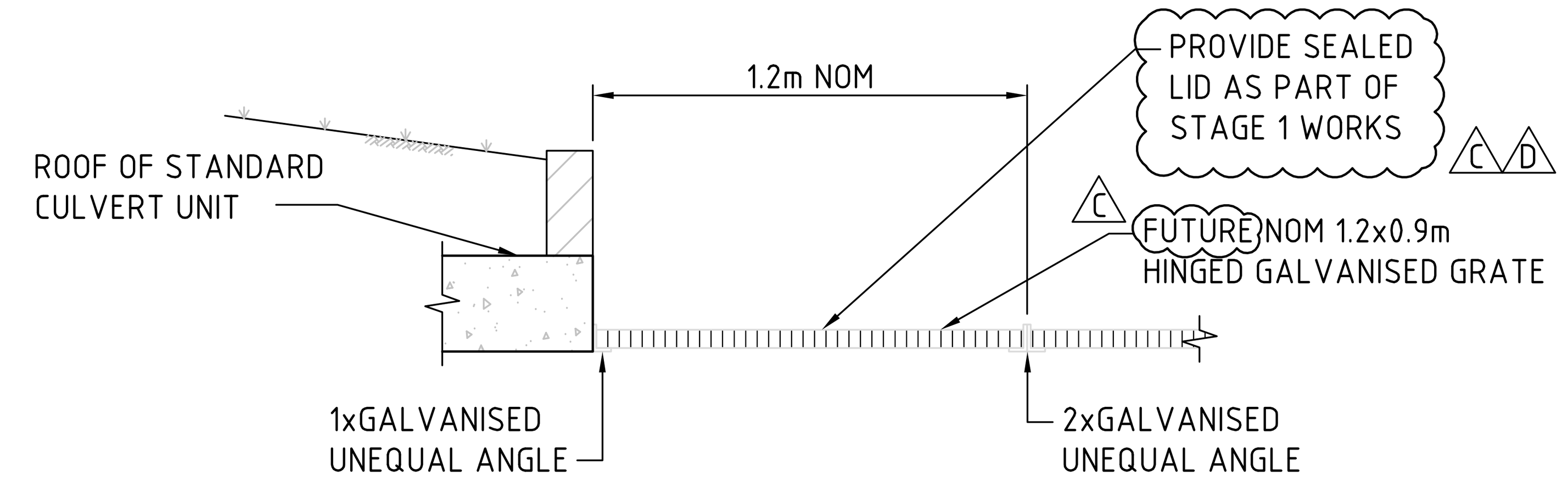
DATE PLOTTED: 16 October, 2013 - 5:40pm



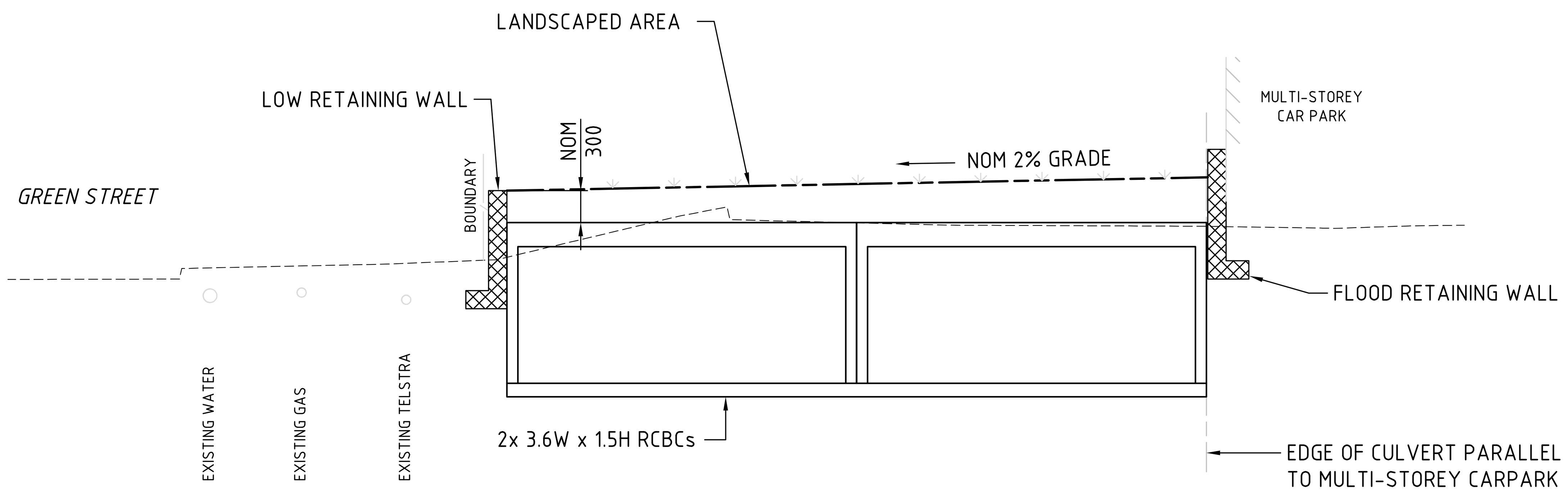
SECTION 1
SCALE 1:50 313



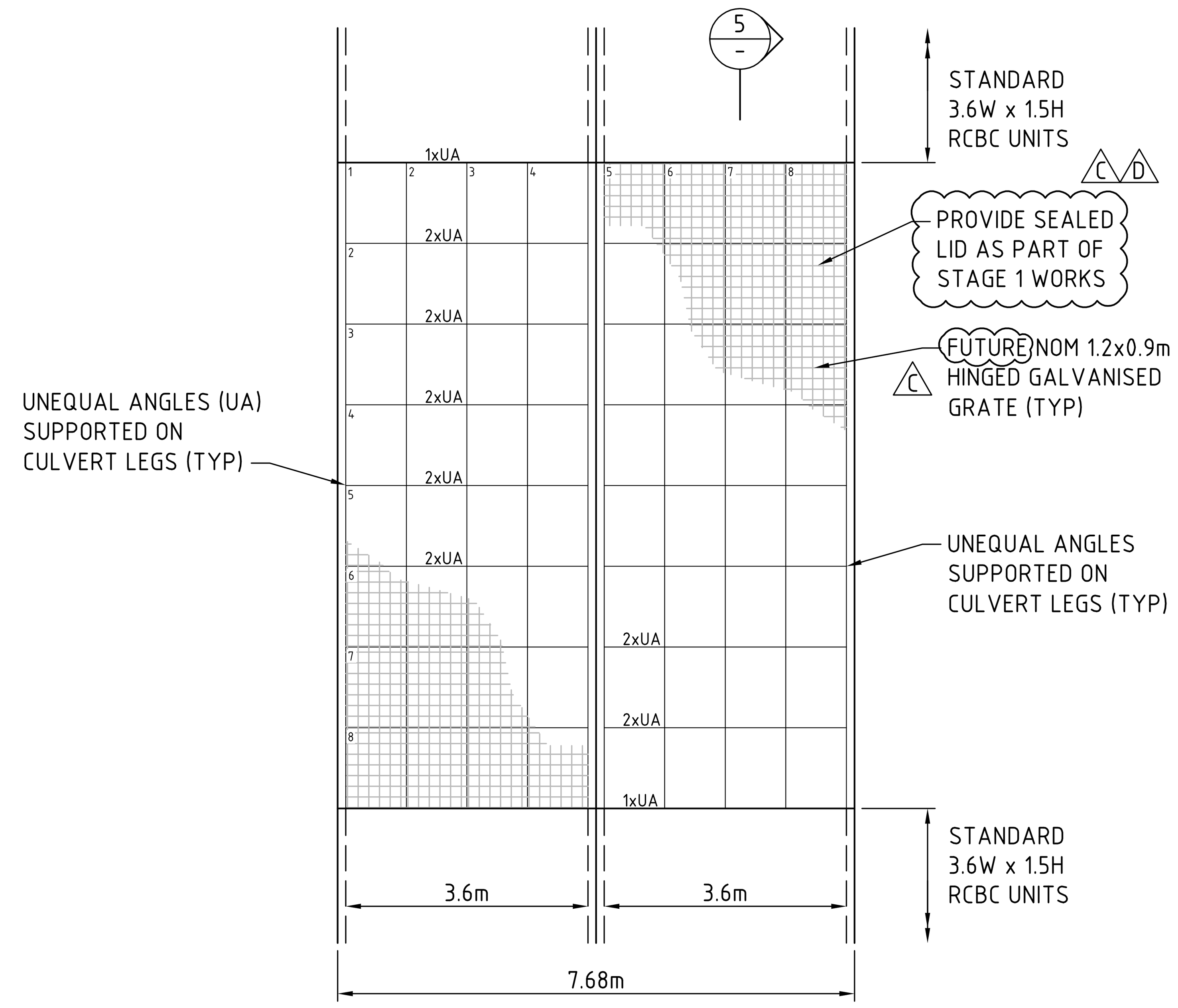
SECTION 4
SCALE 1:50 313



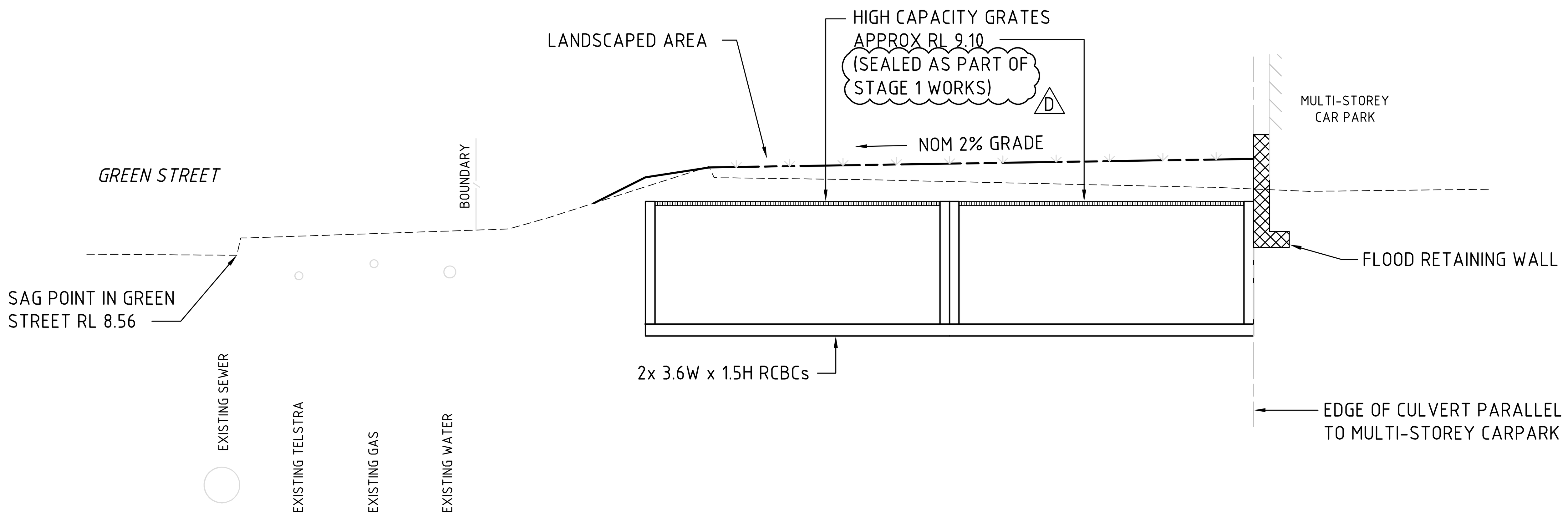
SECTION 5
NOT TO SCALE -



SECTION 2
SCALE 1:50 313



DETAIL A
SCALE 1:75 313



SECTION 3
SCALE 1:50 313

1.5 1 0.5 0 1.5 3 4.5 6 7.5
SCALE OF METRES (1:75 BEFORE REDUCTION)

1 0.5 0 1 2 3 4 5
SCALE OF METRES (1:50 BEFORE REDUCTION)

DATE PLOTTED: 30 August, 2013 - 5:04pm

REV	DATE	REVISIONS	DRN	CHK
D	25/06/2013	NOTES AMENDED	LDB	SGB
C	17/06/2013	COUNCIL AMENDMENT	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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REVIEWED: PROJECT MANAGER DATE

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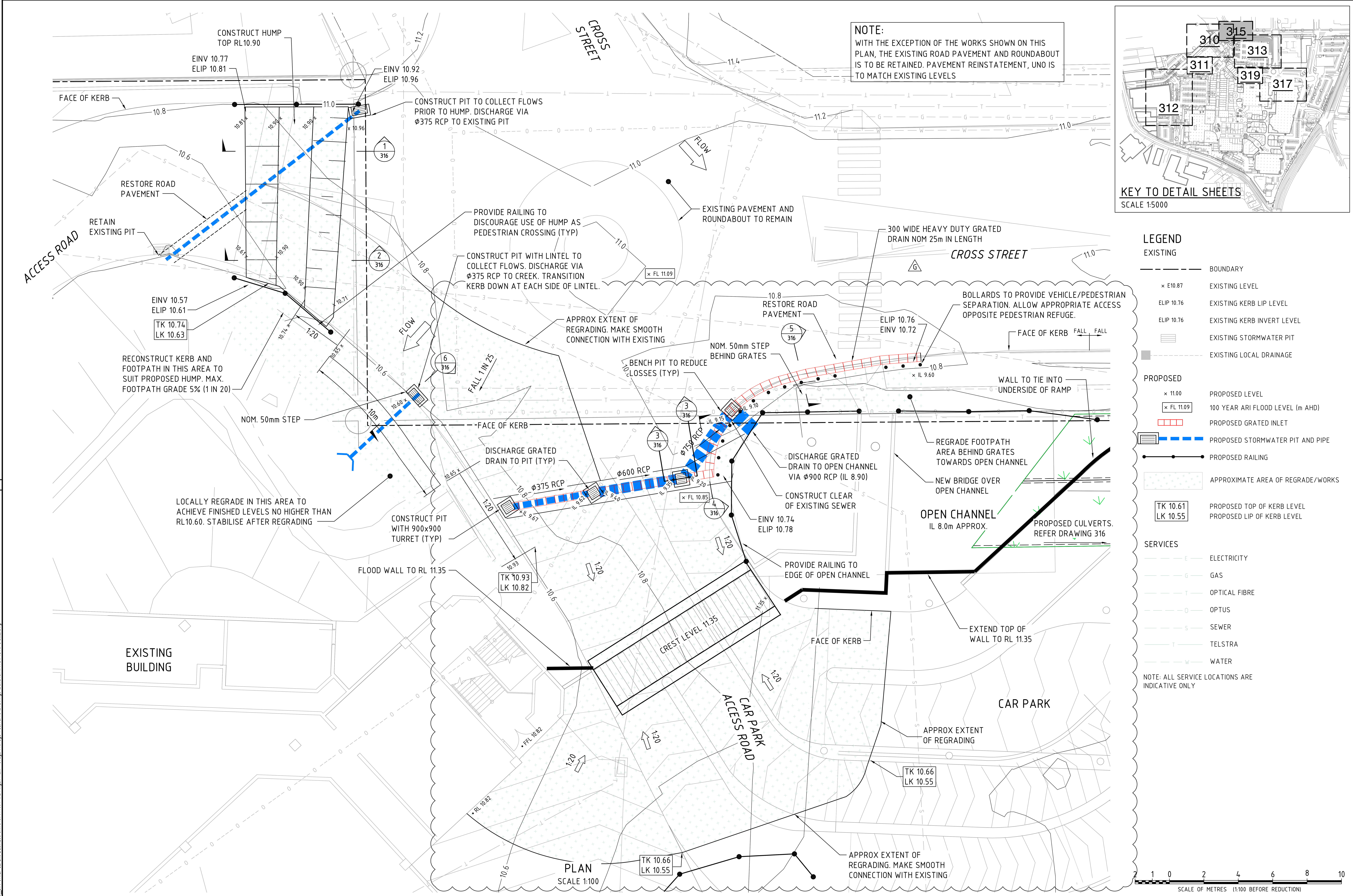
WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DETAIL ARRANGEMENT PLAN - CROSS AND GREEN STREETS SECTIONS

DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-314
REV: D

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL


NOTE:
WITH THE EXCEPTION OF THE WORKS SHOWN ON THIS PLAN, THE EXISTING ROAD PAVEMENT AND ROUNDABOUT IS TO BE RETAINED. PAVEMENT REINSTATEMENT, UNO IS TO MATCH EXISTING LEVELS
KEY TO DETAIL SHEETS
SCALE 1:5000
LEGEND
EXISTING
BOUNDARY
EXISTING LEVEL
EXISTING KERB LIP LEVEL
EXISTING KERB INVERT LEVEL
EXISTING STORMWATER PIT
EXISTING LOCAL DRAINAGE
PROPOSED
PROPOSED LEVEL
100 YEAR ARI FLOOD LEVEL (m AHD)
PROPOSED GRATED INLET
PROPOSED STORMWATER PIT AND PIPE
PROPOSED RAILING
APPROXIMATE AREA OF REGRADE/WORKS
PROPOSED TOP OF KERB LEVEL
PROPOSED LIP OF KERB LEVEL
SERVICES
ELECTRICITY
GAS
OPTICAL FIBRE
OPTUS
SEWER
TELSTRA
WATER
NOTE: ALL SERVICE LOCATIONS ARE INDICATIVE ONLY
CROSS STREET
ACCESS ROAD
CONSTRUCT HUMP TOP RL10.90
CONSTRUCT PIT TO COLLECT FLOWS PRIOR TO HUMP. DISCHARGE VIA Ø375 RCP TO EXISTING PIT
RESTORE ROAD PAVEMENT
RETAIN EXISTING PIT
PROVIDE RAILING TO DISCOURAGE USE OF HUMP AS PEDESTRIAN CROSSING (TYP)
CONSTRUCT PIT WITH LINTEL TO COLLECT FLOWS. DISCHARGE VIA Ø375 RCP TO CREEK. TRANSITION KERB DOWN AT EACH SIDE OF LINTEL.
EXISTING PAVEMENT AND ROUNDABOUT TO REMAIN
300 WIDE HEAVY DUTY GRATED DRAIN NOM 25m IN LENGTH
RECONSTRUCT KERB AND FOOTPATH IN THIS AREA TO SUIT PROPOSED HUMP. MAX. FOOTPATH GRADE 5% (1 IN 20)
APPROX EXTENT OF REGRADING. MAKE SMOOTH CONNECTION WITH EXISTING
BOLLARDS TO PROVIDE VEHICLE/PEDESTRIAN SEPARATION. ALLOW APPROPRIATE ACCESS OPPOSITE PEDESTRIAN REFUGE.
NOM. 50mm STEP BEHIND GRATES
BENCH PIT TO REDUCE LOSSES (TYP)
WALL TO TIE INTO UNDERSIDE OF RAMP
NOM. 50mm STEP
FACE OF KERB
DISCHARGE GRATED DRAIN TO PIT (TYP)
REGRADE FOOTPATH AREA BEHIND GRATES TOWARDS OPEN CHANNEL
DISCHARGE GRATED DRAIN TO OPEN CHANNEL VIA Ø900 RCP (IL 8.90)
NEW BRIDGE OVER OPEN CHANNEL
CONSTRUCT CLEAR OF EXISTING SEWER
OPEN CHANNEL
IL 8.0m APPROX.
PROPOSED CULVERTS. REFER DRAWING 316
LOCALLY REGRADE IN THIS AREA TO ACHIEVE FINISHED LEVELS NO HIGHER THAN RL10.60. STABILISE AFTER REGRADING
CONSTRUCT PIT WITH 900x900 TURRET (TYP)
FLOOD WALL TO RL 11.35
PROVIDE RAILING TO EDGE OF OPEN CHANNEL
EXTEND TOP OF WALL TO RL 11.35
CREST LEVEL 11.35
EXISTING BUILDING
CAR PARK ACCESS ROAD
CAR PARK
APPROX EXTENT OF REGRADING
APPROX EXTENT OF REGRADING. MAKE SMOOTH CONNECTION WITH EXISTING
PLAN
SCALE 1:100
SCALE OF METRES (1:100 BEFORE REDUCTION)

REV	DATE	REVISIONS	DRN	CHK
G	16/10/2013	LAYOUT AMENDMENTS	NDK	SGB
F	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
E	27/06/2013	ADDED FLOOD BARRIER	LDB	SGB
D	25/06/2013	AMENDED SITE BOUNDARY	LDB	SGB
C	17/06/2013	COUNCIL AMENDMENTS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	06/05/2013	SECTION 96 APPLICATION	NDK	SGB

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APPROVED:
PROJECT DIRECTOR DATE

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DRAWN:	NDK	SGB

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WESTFIELD DESIGN & CONSTRUCTION

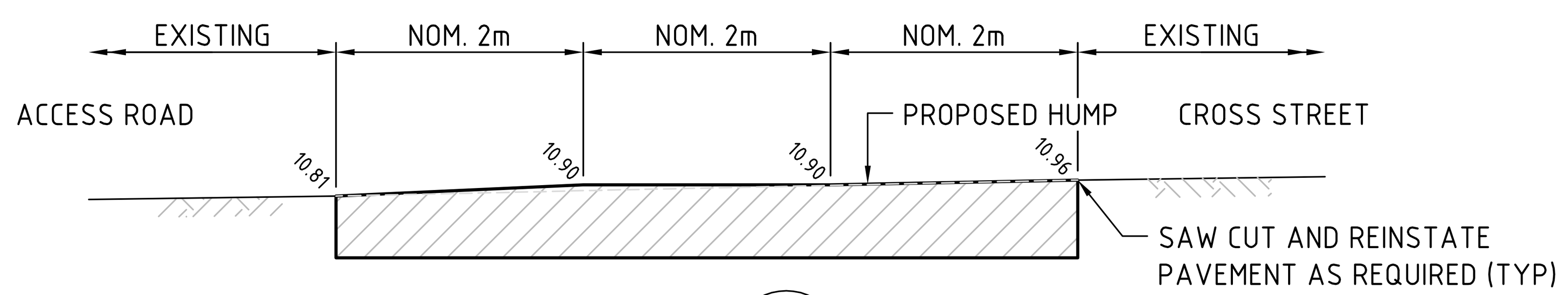
WARRINGAH MALL

CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DETAIL ARRANGEMENT PLAN - CROSS STREET ROUNDABOUT - PLAN

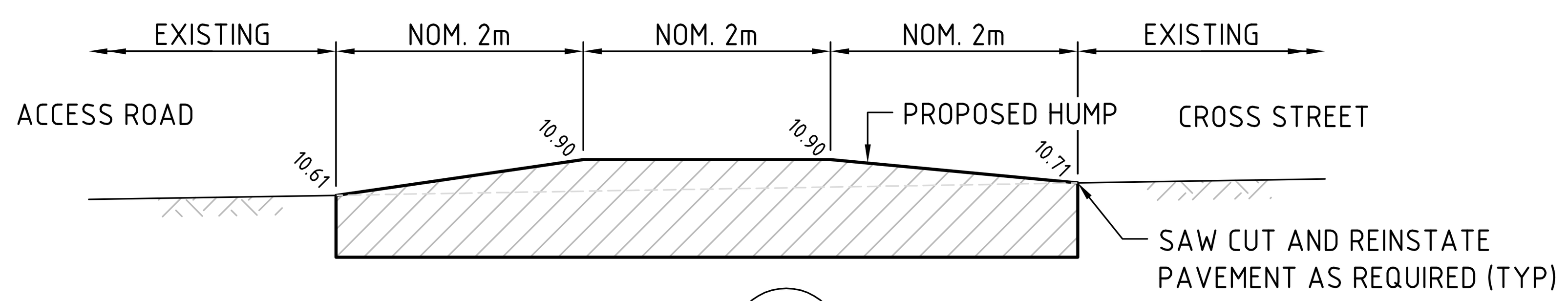
DRAWING STATUS: NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-315 REV: G

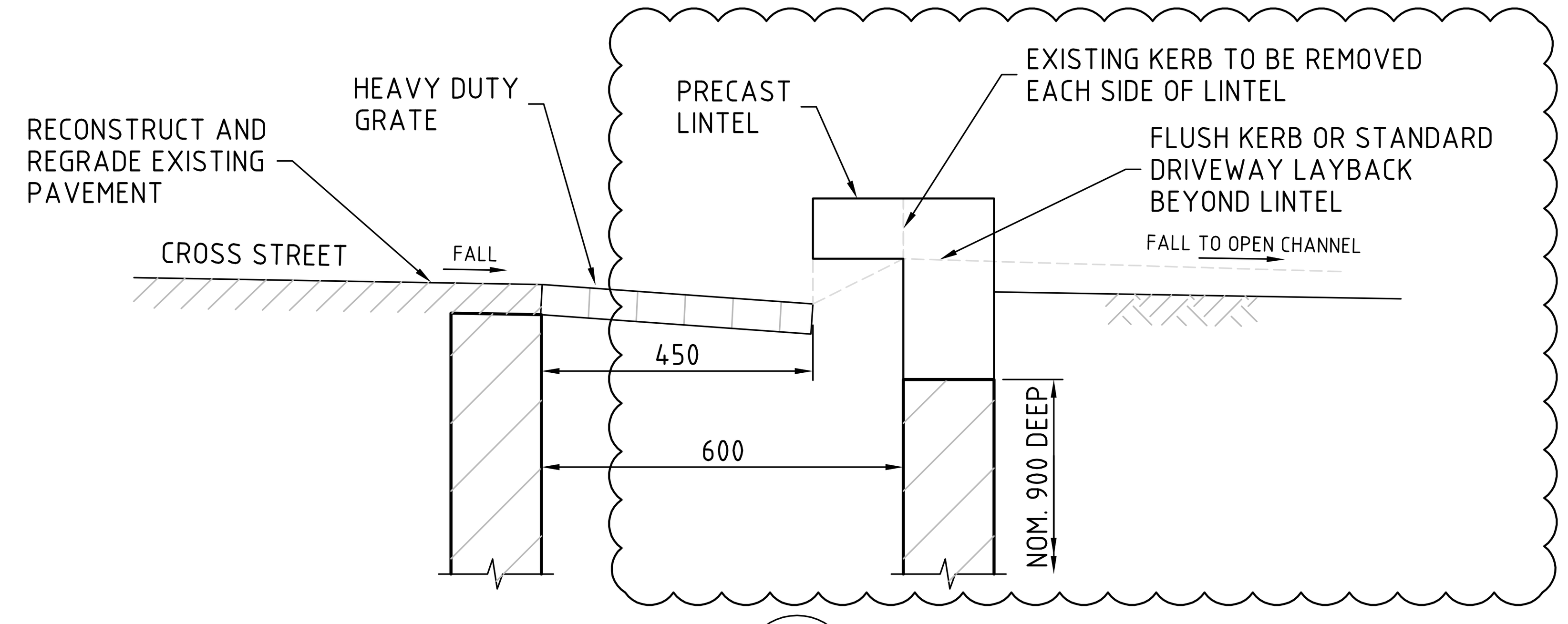
A1 ON ORIGINAL



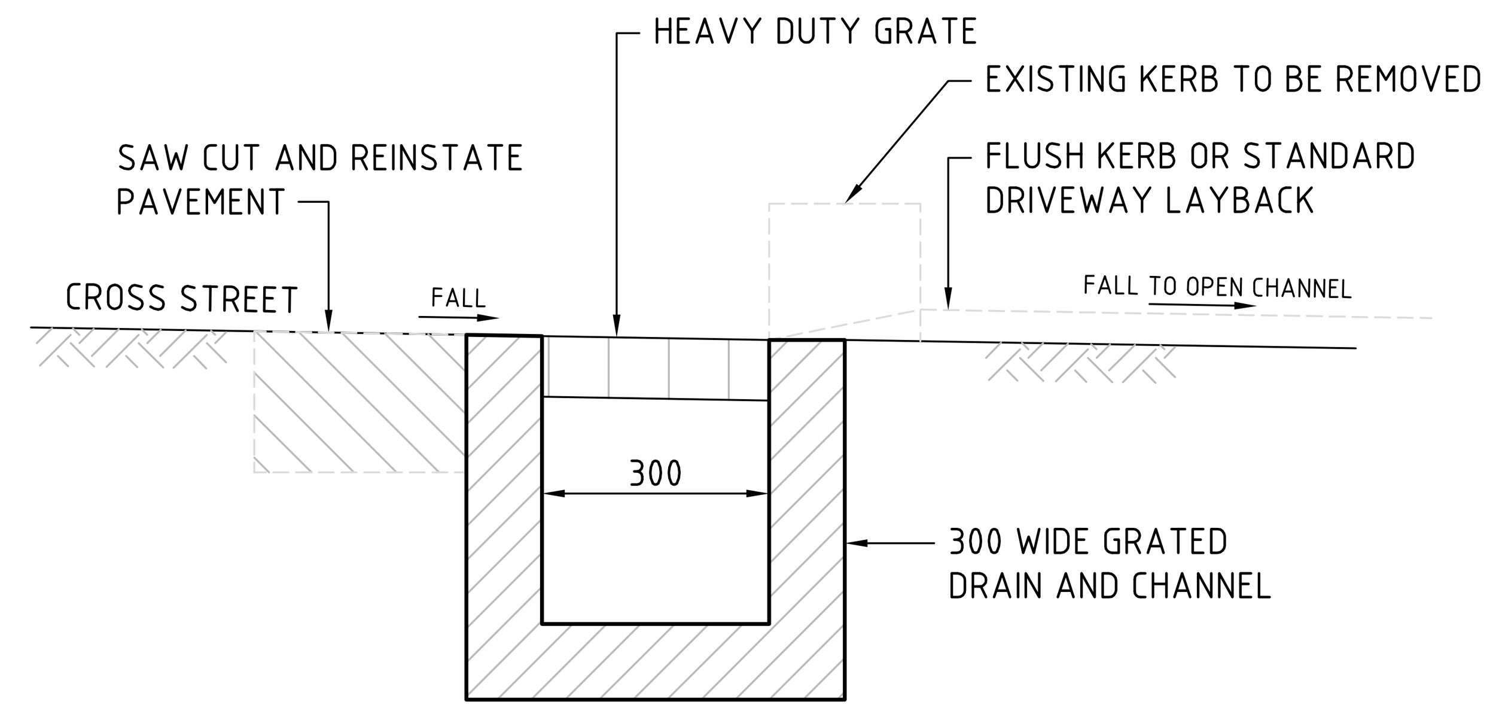
SECTION 1 / 315
SCALE 1:50



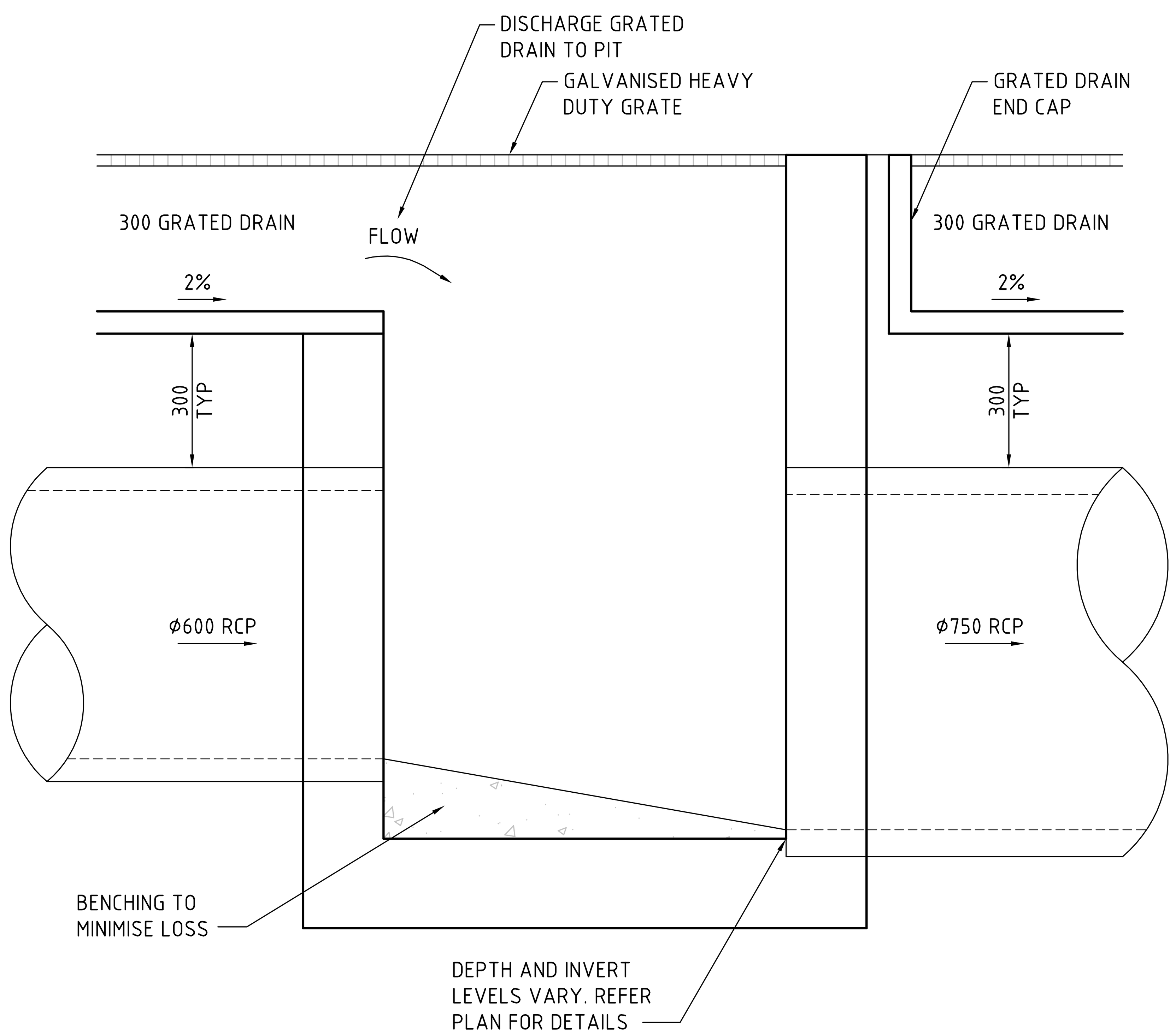
SECTION 2 / 315
SCALE 1:50



SECTION 6 / 215
SCALE 1:10

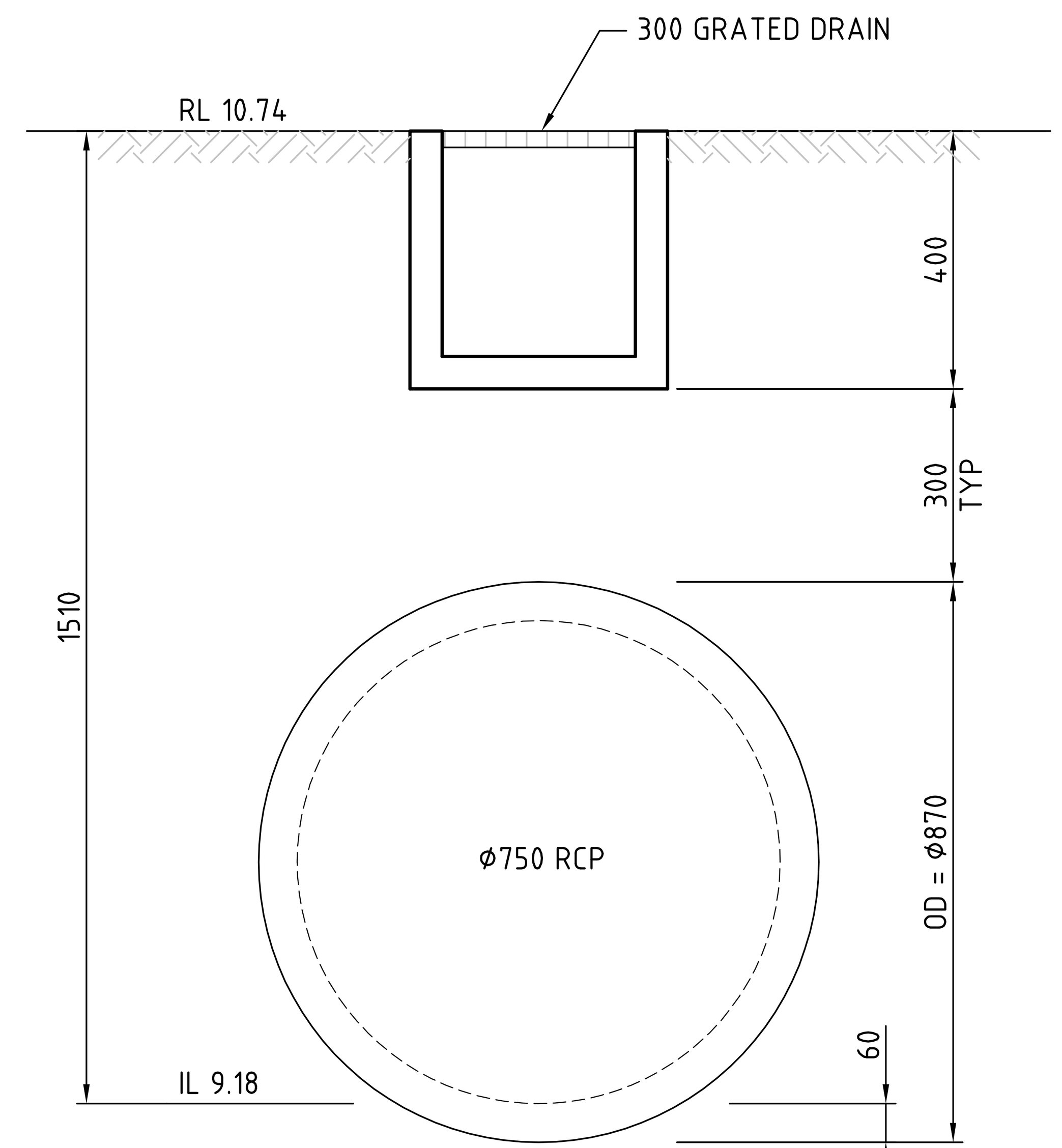


SECTION 5 / 315
SCALE 1:10



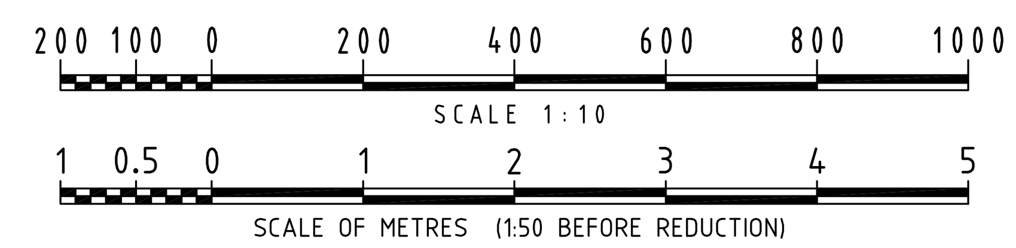
TYPICAL SECTION THROUGH PIT
AND GRATED DRAIN

SECTION 3 / 315
SCALE 1:10



TYPICAL SECTION THROUGH
GRATED DRAIN AND PIPE

SECTION 4 / 315
SCALE 1:10



REV	DATE	REVISIONS	DRN	CHK
C	17/06/2013	COUNCIL AMENDMENT	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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APPROVED:
PROJECT DIRECTOR . . . DATE

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

REVIEWED:
PROJECT MANAGER . . . DATE

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WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DETAIL ARRANGEMENT PLAN - CROSS STREET ROUNDABOUT - DETAILS

DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-316
REV: C

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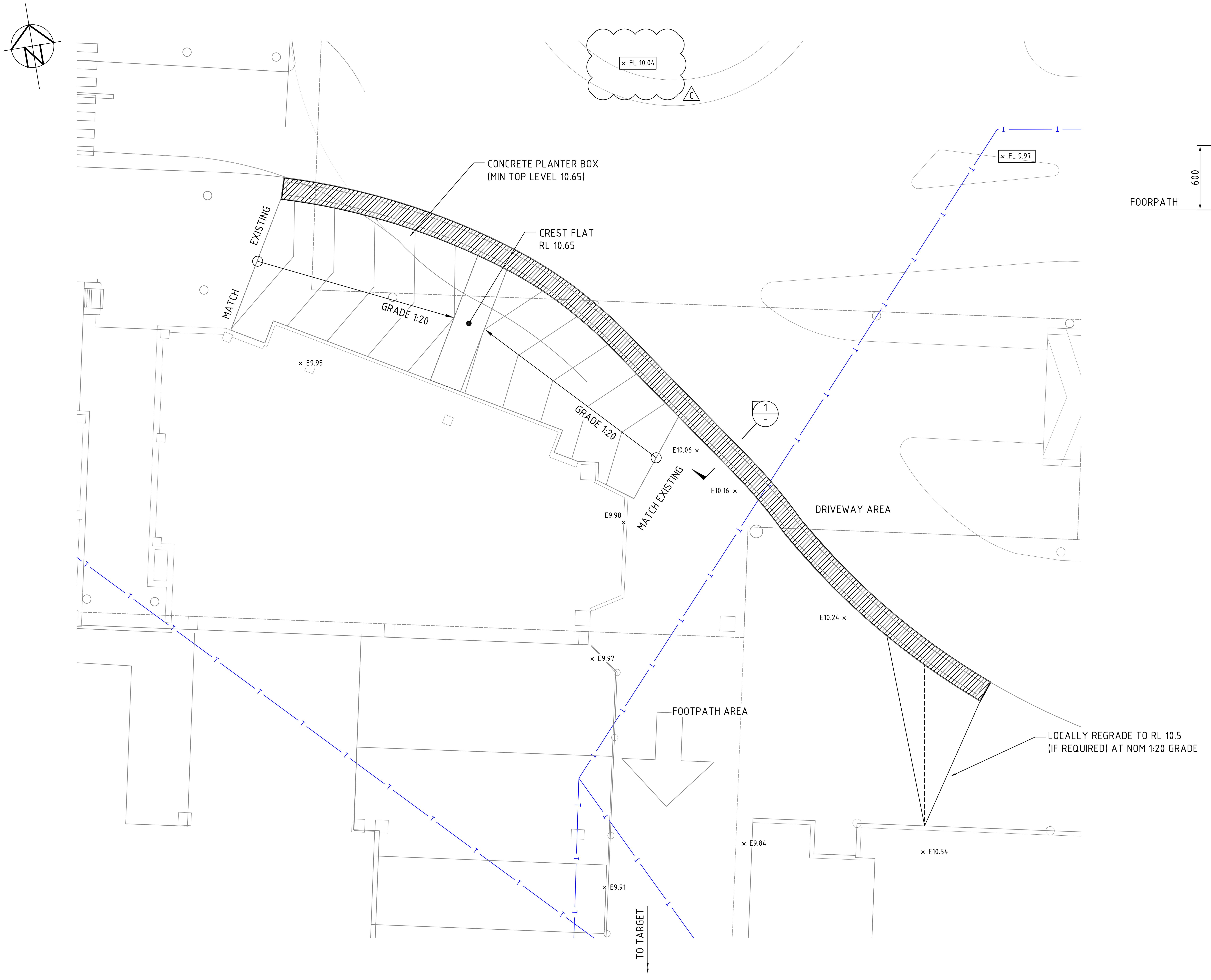
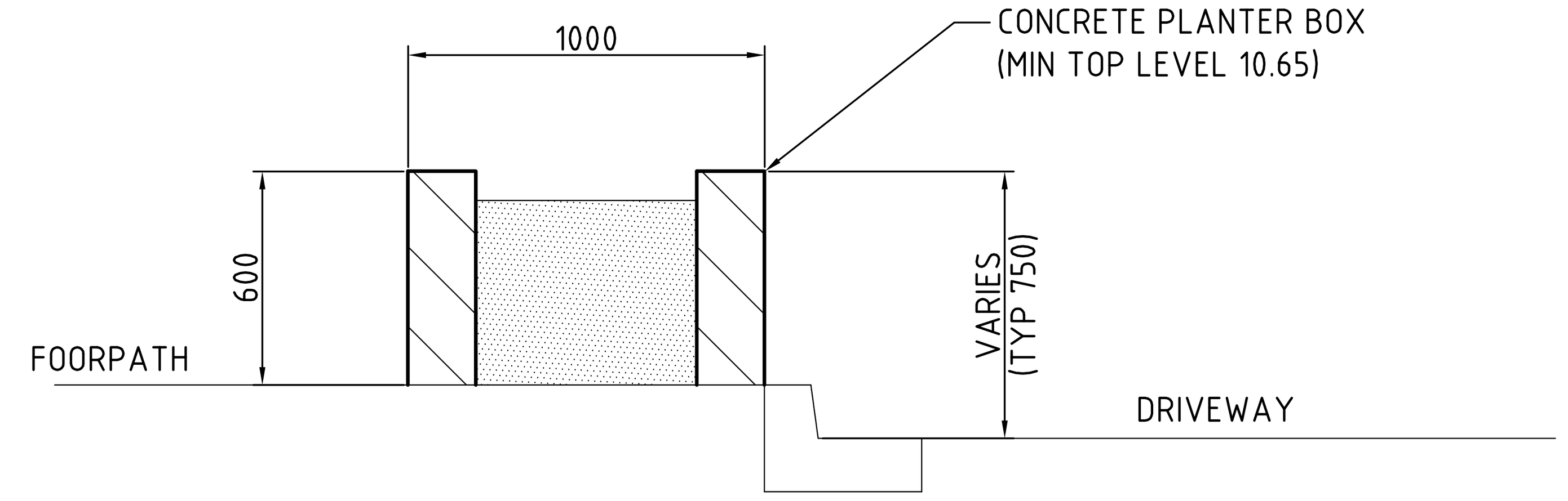
DATE PLOTTED: 30 August, 2013 - 5:09pm
XREF's: X-BORDER
CAD FILE: N:\Projects\89514004 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\Tex\W4548-316(C).dwg



PLAN
SCALE 1:100



SECTION 1
SCALE 1:20

LEGEND

EXISTING

× E10.24	EXISTING LEVEL
× FL 11.09	100 YEAR ARI FLOOD LEVEL (m AHD)

0 500 1000 1500 2000mm
SCALE 1:20

0 2000 4000 6000 8000 10000mm
SCALE 1:100

DATE PLOTTED: 30 August, 2013 - 5:09pm

XREF's: X-BORDER; X-Services; X-Drainage; X-Survey; X-Carpark; X-Architect_New
CAD FILE: N:\Projects\805\FY14\500_599 Other Cardno Business Units\8891406\ Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\TeW4548-317(C).dwg

REV	DATE	REVISIONS	DRN	CHK
C	20/06/2013	AMENDED FLOOD LEVELS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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ABN 000 267 265

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

APPROVED: PROJECT DIRECTOR DATE

REVIEWED: PROJECT MANAGER DATE

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WESTFIELD DESIGN & CONSTRUCTION
WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
TARGET ENTRY - CONCRETE PLANTER BOX

DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-317
REV: C

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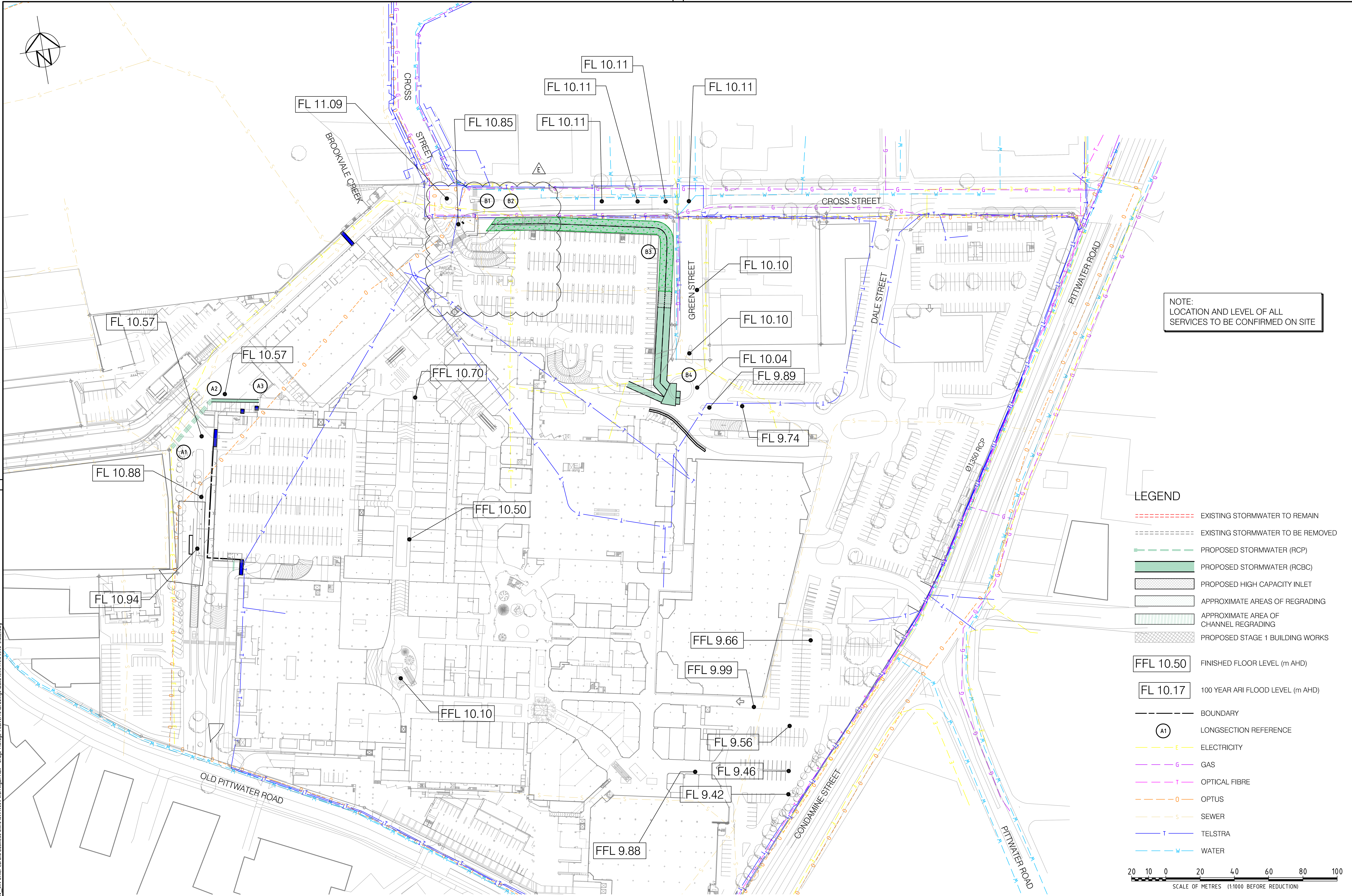

FL 10.11
FL 10.11
FL 10.11
FL 11.09
FL 10.85
FL 10.11
CROSS STREET
BROOKVALE CREEK
CROSS STREET
GREEN STREET
DALE STREET
PITTWATER ROAD
FL 10.10
FL 10.10
FL 10.04
FL 9.89
FL 9.74
FL 10.57
FL 10.57
FFL 10.70
FL 10.88
FFL 10.50
FL 10.94
FFL 9.66
FFL 9.99
FFL 10.10
FL 9.56
FL 9.46
FL 9.42
FFL 9.88
OLD PITTWATER ROAD
CONDAMINE STREET
PITTWATER ROAD
Ø1350 RCP
B1
B2
B3
B4
A1
A2
A3
NOTE:
LOCATION AND LEVEL OF ALL SERVICES TO BE CONFIRMED ON SITE
LEGEND
EXISTING STORMWATER TO REMAIN
EXISTING STORMWATER TO BE REMOVED
PROPOSED STORMWATER (RCP)
PROPOSED STORMWATER (RCBC)
PROPOSED HIGH CAPACITY INLET
APPROXIMATE AREAS OF REGRADING
APPROXIMATE AREA OF CHANNEL REGRADING
PROPOSED STAGE 1 BUILDING WORKS
FFL 10.50 FINISHED FLOOR LEVEL (m AHD)
FL 10.17 100 YEAR ARI FLOOD LEVEL (m AHD)
BOUNDARY
LONGSECTION REFERENCE
ELECTRICITY
GAS
OPTICAL FIBRE
OPTUS
SEWER
TELSTRA
WATER
20 10 0 20 40 60 80 100
SCALE OF METRES (1:1000 BEFORE REDUCTION)

DATE PLOTTED: 16 October, 2013 - 5:45pm

REV	DATE	REVISIONS	DRN	CHK
E	16/10/2013	LAYOUT AMENDMENTS	NDK	SGB
D	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
C	20/06/2013	AMENDED FLOOD LEVELS	LDB	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

APPROVED: PROJECT DIRECTOR DATE

REVIEWED: PROJECT MANAGER DATE

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL

CONCEPT DRAINAGE AUGMENTATION WORKS

STAGE 1 EXPANSION WORKS

GENERAL ARRANGEMENT PLAN - STAGE 1 EXPANSION WORKS

DRAWING STATUS: NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-318

REV: E

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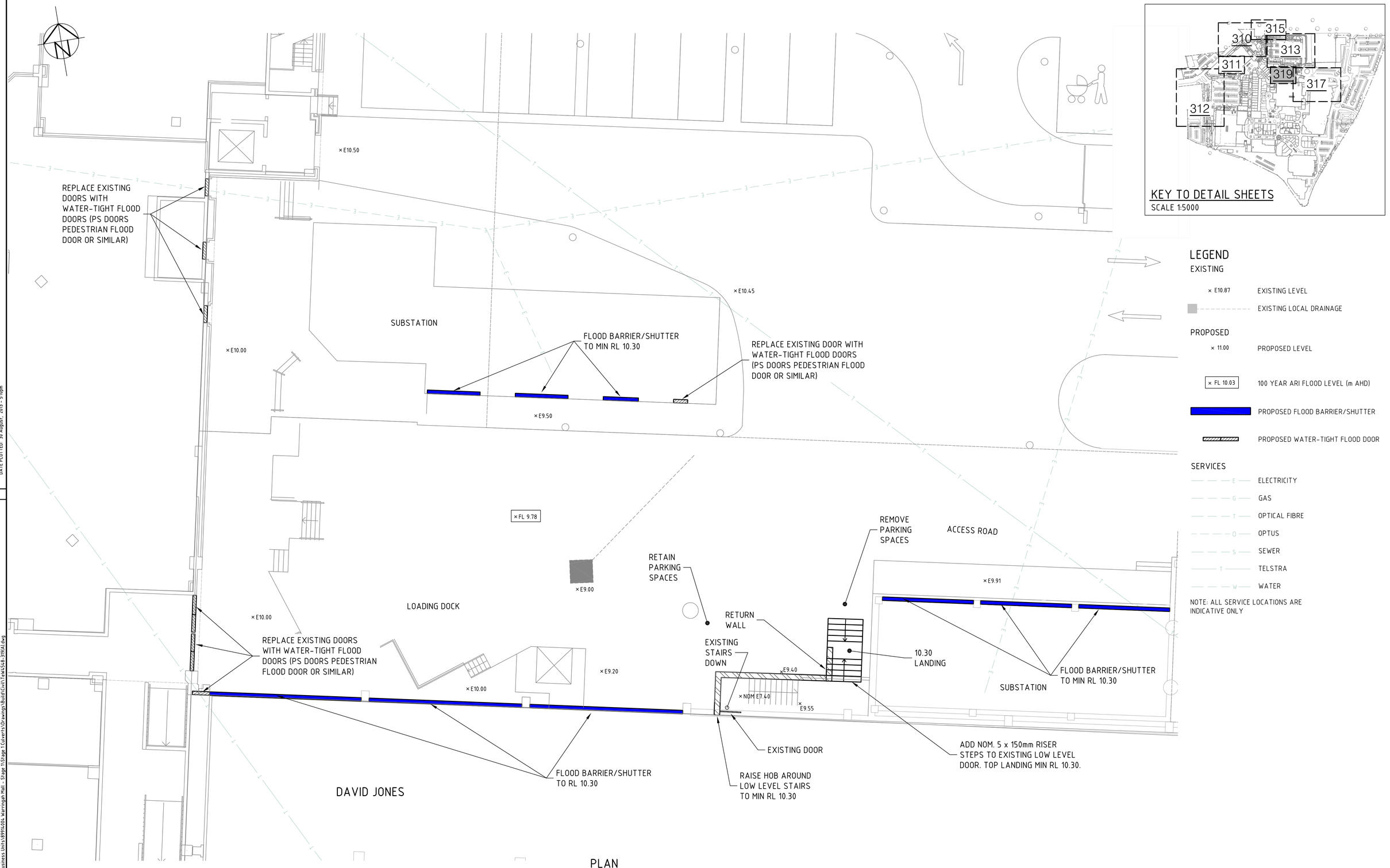

KEY TO DETAIL SHEETS
SCALE 1:5000

LEGEND

EXISTING

× E10.87 EXISTING LEVEL

EXISTING LOCAL DRAINAGE

PROPOSED

× 11.00 PROPOSED LEVEL

× FL 10.03 100 YEAR ARI FLOOD LEVEL (m AHD)

PROPOSED FLOOD BARRIER/SHUTTER

PROPOSED WATER-TIGHT FLOOD DOOR

SERVICES

E ELECTRICITY

G GAS

T OPTICAL FIBRE

O OPTUS

S SEWER

T TELSTRA

W WATER

NOTE: ALL SERVICE LOCATIONS ARE INDICATIVE ONLY

PLAN
SCALE 1:100

0 2000 4000 6000 8000 10000mm
SCALE 1:100

DATE PLOTTED: 30 August, 2013 - 5:10pm

XREFs: X-BORDER, X-Services, X-Drainage, X-Survey, X-Carpark, X-Architect_New
CAD FILE: N:\Projects\895\PTY\LSD_599 Other Cardno Business Units\899\400K Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\Tek\548-319A1.dwg

REV	DATE	REVISIONS	DRN	CHK
A	30/08/2013	ADDED DRAWINGS 311 AND 319	NDK	SGB

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	PREPARED	CHECKED
DESIGNED:	RC	BP
DRAWN:	DPT	SGB

APPROVED: ..... PROJECT DIRECTOR ..... DATE

REVIEWED: ..... PROJECT MANAGER ..... DATE

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
DAVID JONES LOADING DOCK WORKS

DRAWING STATUS: NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-319 REV A

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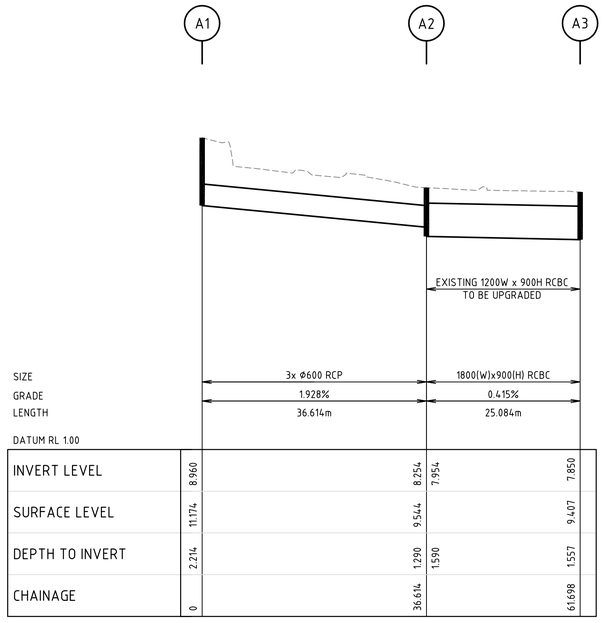
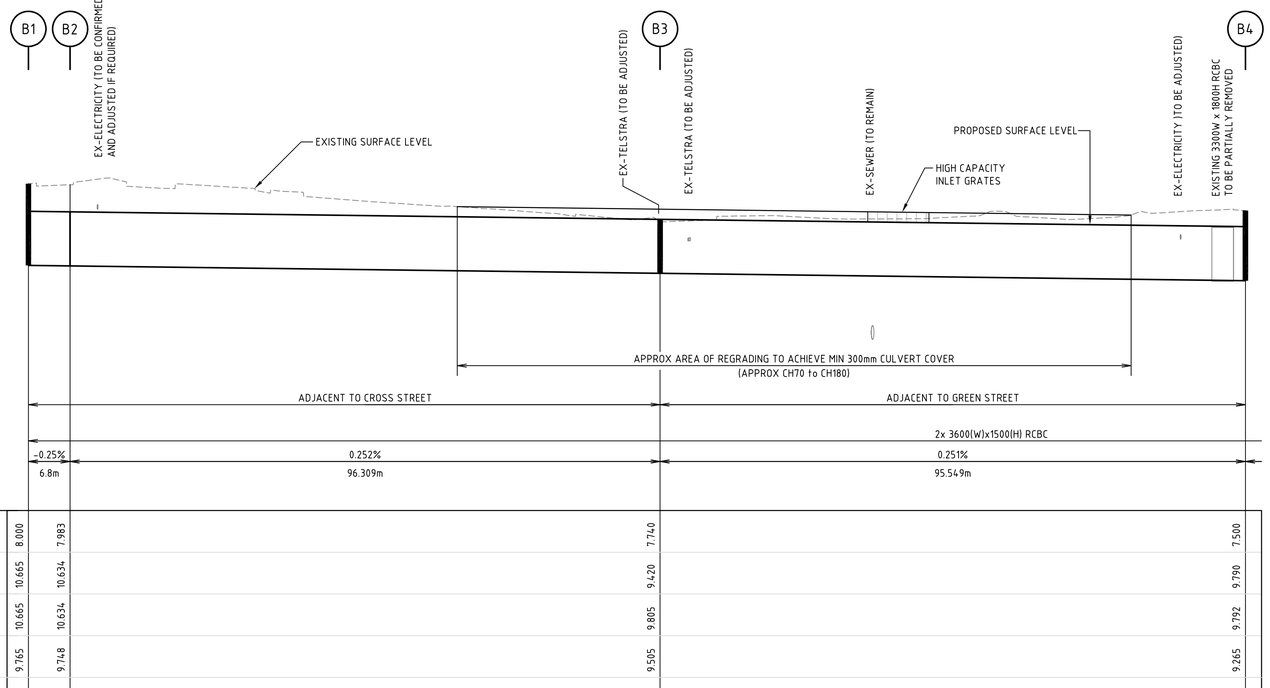


SIZE		3x Φ600 RCP	1800(W)x900(H) RCBC
GRADE		1.928%	0.415%
LENGTH		36.614m	25.084m
DATUM RL 1.00			
INVERT LEVEL	8.960	8.254	7.954	7.850
SURFACE LEVEL	11.174	9.544	9.407
DEPTH TO INVERT	2.214	1.290	1.590	1.557
CHAINAGE	0	36.614	61.698

LONGITUDINAL SECTION PIT A1-A3

SCALE 1:500(H) 1:100(V)



SIZE			2x 3600(W)x1500(H) RCBC	
GRADE		-0.25%	0.252%	0.251%
LENGTH		6.8m	96.309m	95.549m
DATUM RL 0.00				
INVERT LEVEL	8.000	7.983	7.740	7.500
EXISTING SURFACE LEVEL	10.665	10.634	9.420	9.790
PROPOSED SURFACE LEVEL	10.665	10.634	9.805	9.792
TOP OF CULVERT ROOF	9.765	9.748	9.505	9.265
DEPTH TO INVERT	2.665	2.651	1.680	2.290
DEPTH OF CUT/FILL	0.000	0.000	0.385	0.000
CULVERT COVER (PROPOSED SURFACE LEVEL LESS TOP OF CULVERT ROOF)	0.900	0.886	0.300	0.527
CHAINAGE	0	6.8	103.109	198.657

LONGITUDINAL SECTION PIT B1-B4

SCALE 1:500(H) 1:100(V)

NOTE:
LOCATION AND LEVELS OF ALL SERVICES IS INDICATIVE ONLY. SERVICES TO BE LOCATED AND POTHOLED PRIOR TO CONSTRUCTION

0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500 (HORI)

0 2 4 6 8 10m
2 1
SCALE 1:100 (VERT)

REV	DATE	REVISIONS	DRN	CHK
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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ABN 000 267 285

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

APPROVED: ..... PROJECT DIRECTOR DATE

REVIEWED: ..... PROJECT MANAGER DATE

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
STORMWATER LONGSECTIONS

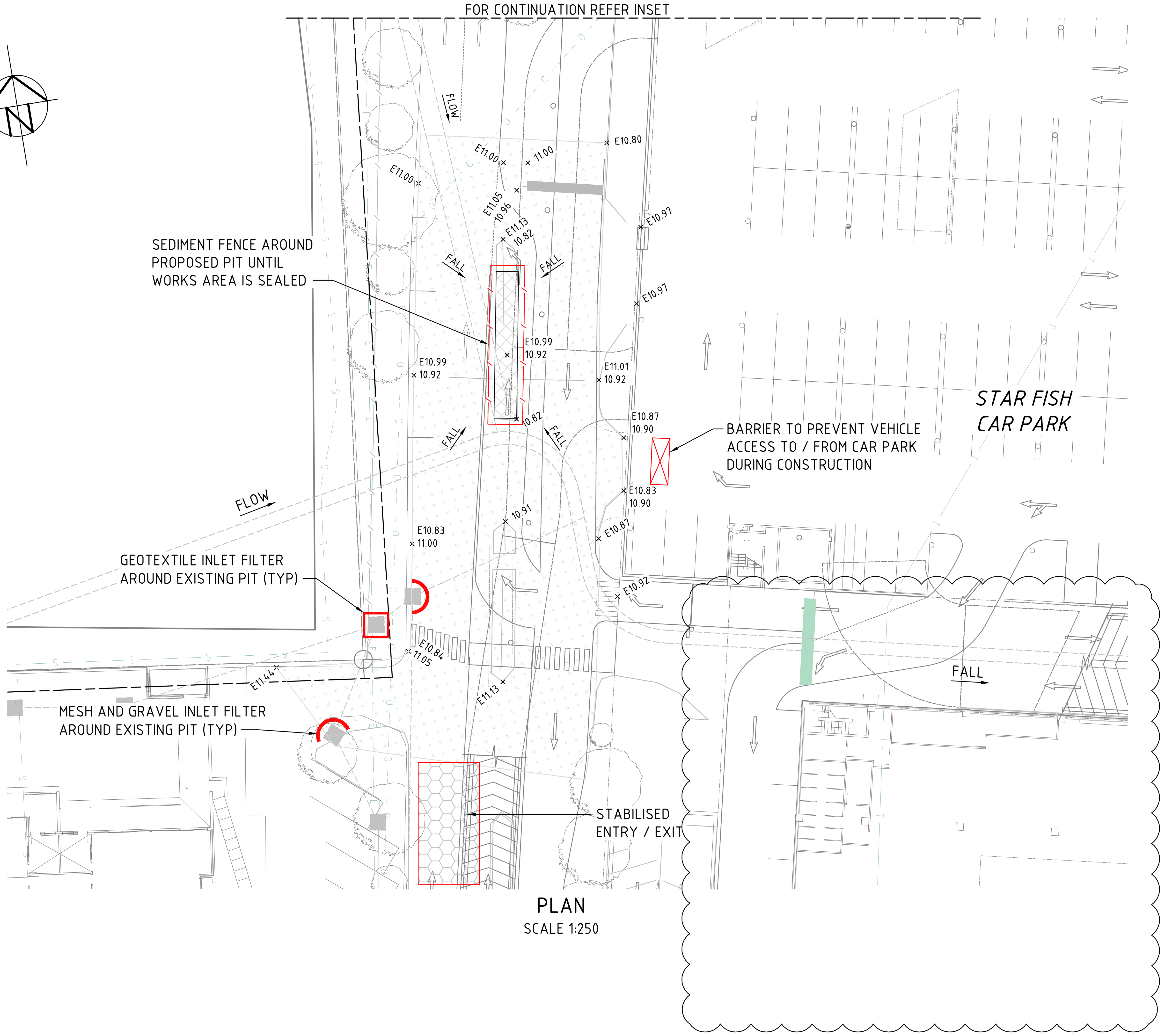
DRAWING STATUS: NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-320

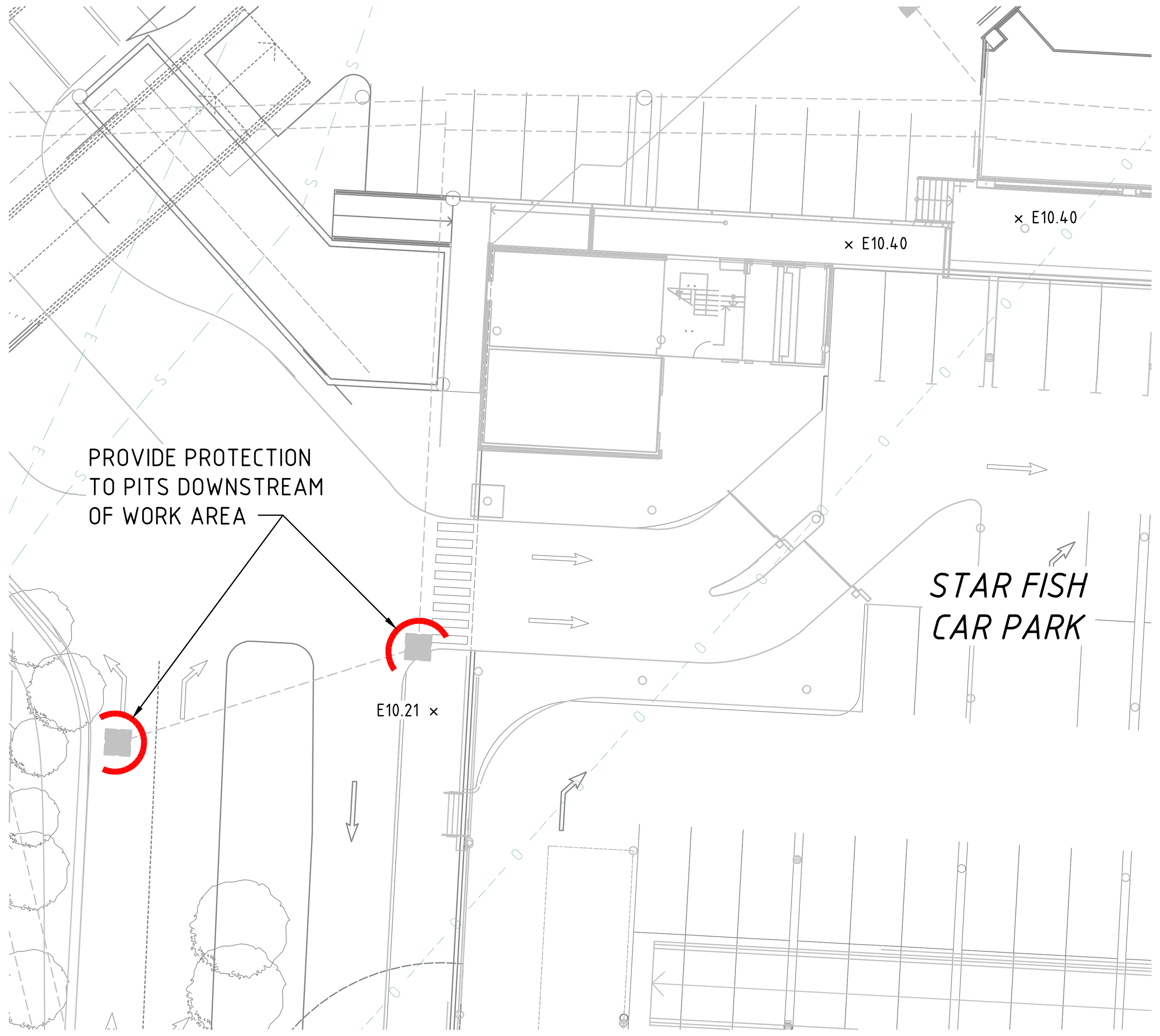
REV: B

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

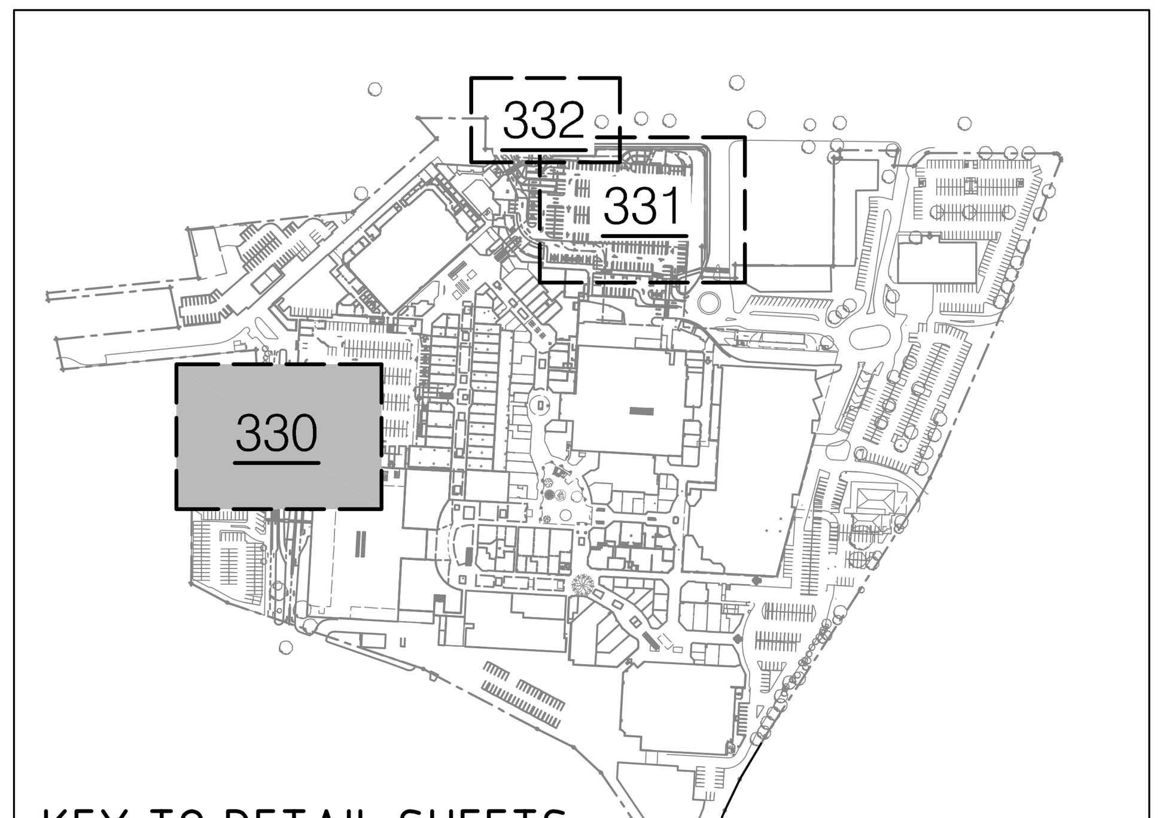
XREF's: X-BORDER
CAD FILE N:\Projects\1085\FY14\S00_599 Other Cardno Business Units\89914004 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\Tew4548-320IB.dwg
DATE PLOTTED: 30 August, 2013 - 5:10pm



PLAN
SCALE 1:250



INSET
SCALE 1:250



KEY TO DETAIL SHEETS
SCALE 1:5000

LEGEND

- × E10.87 — EXISTING LEVEL
- EXISTING LOCAL DRAINAGE
- APPROXIMATE AREA OF REGRADE
- MESH AND GRAVEL INLET FILTER
- GEOTEXTILE INLET FILTER
- SEDIMENT FENCE AROUND PROPOSED PIT
- STABILISED ENTRY / EXIT
- BARRIER

NOTE
LOCATION OF STOCKPILES TO BE CONFIRMED ON SITE

5 2.5 0 5 10 15 20 25
SCALE OF METRES (1:250 BEFORE REDUCTION)

DATE PLOTTED: 30 August, 2013 - 5:11pm

XREF's: X-BORDER, X-Services, X-Architect, X-Survey, X-Carpark
CAD FILE: N:\Projects\8914004 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\TeW\W4548-330[C].dwg

REV	DATE	REVISIONS	DRN	CHK
C	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

Westfield
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ABN 000 267 265

APPROVED:

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

REVIEWED:
PROJECT DIRECTOR DATE
PROJECT MANAGER DATE

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
EROSION & SEDIMENT CONTROL PLAN SHEET 1 OF 3

DRAWING STATUS: NOT FOR CONSTRUCTION
DRAWING NUMBER: W4548-330
REV: C

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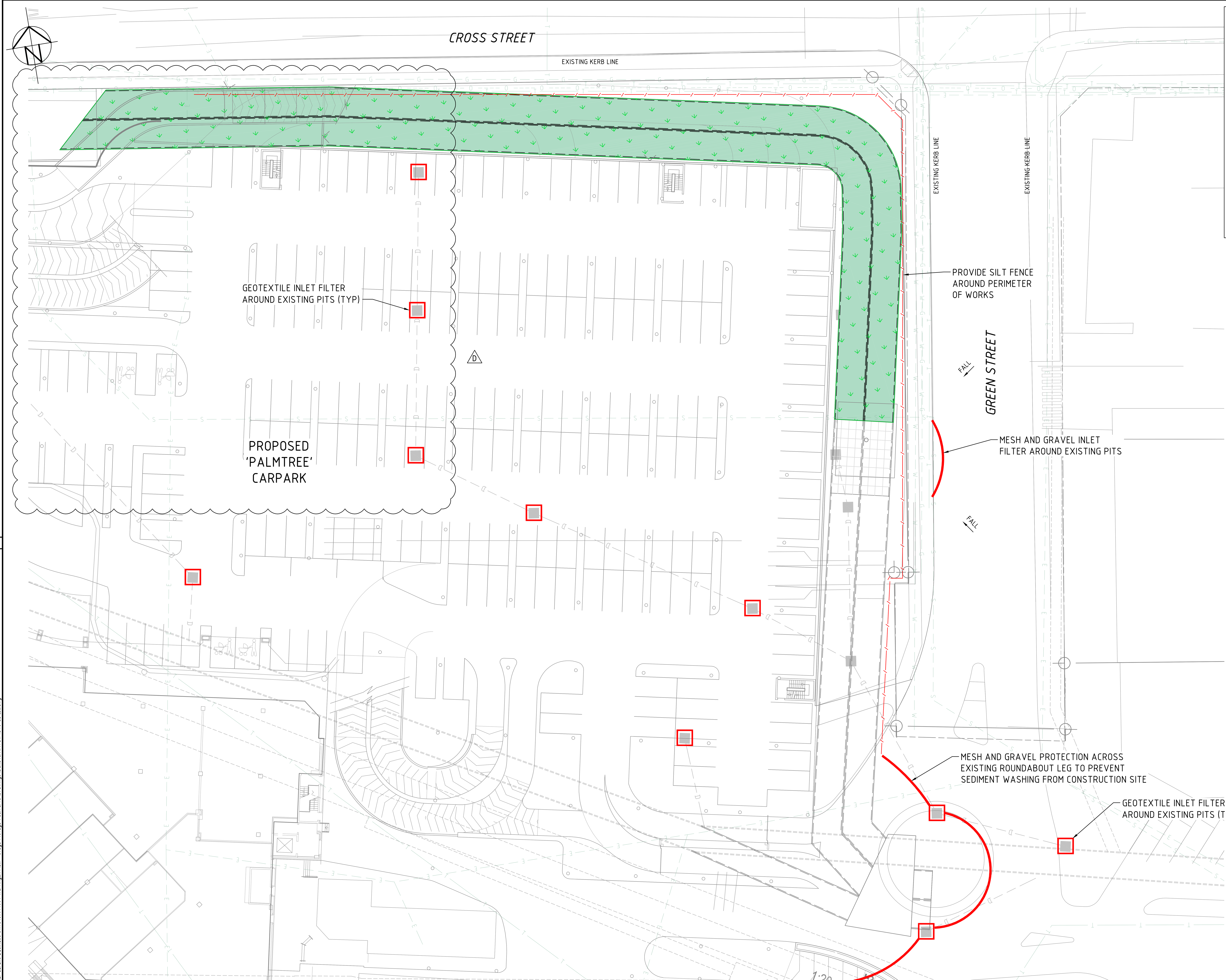
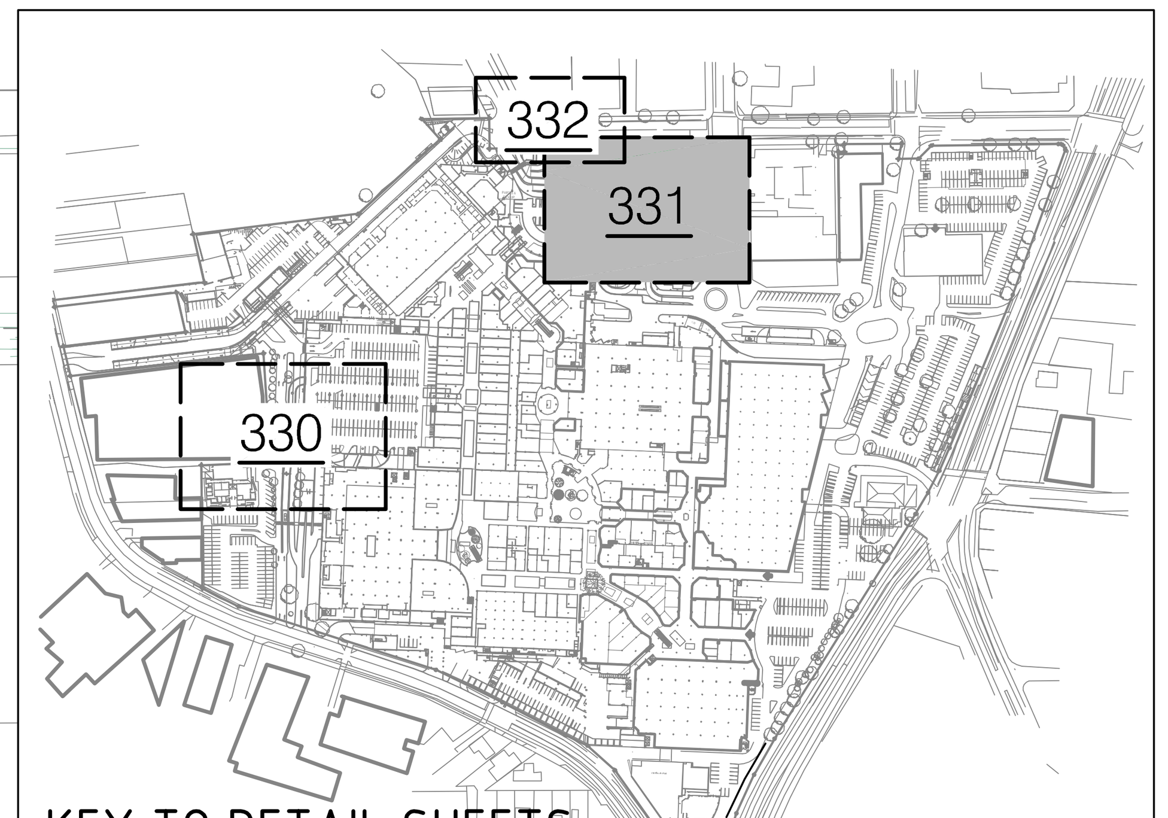


PLAN

SCALE 1:250



KEY TO DETAIL SHEETS

SCALE 1:5000

LEGEND

- × E10.87 — EXISTING LEVEL
- EXISTING LOCAL DRAINAGE
- MESH AND GRAVEL INLET FILTER
- GEOTEXTILE INLET FILTER
- SILT FENCE

NOTE

1. LOCATION OF STOCKPILES TO BE CONFIRMED ON SITE
2. LOCATION OF STABILISED ENTRY/EXIT TO BE CONFIRMED ON SITE

5 2.5 0 5 10 15 20 25

SCALE OF METRES (1:250 BEFORE REDUCTION)

REV	DATE	REVISIONS	DRN	CHK
D	16/10/2013	LAYOUT AMENDMENTS	NDK	SGB
C	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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APPROVED: PROJECT DIRECTOR DATE

REVIEWED: PROJECT MANAGER DATE

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DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL

CONCEPT DRAINAGE AUGMENTATION WORKS

STAGE 1 EXPANSION WORKS

EROSION & SEDIMENT CONTROL PLAN SHEET 2 OF 3

DRAWING STATUS: NOT FOR CONSTRUCTION

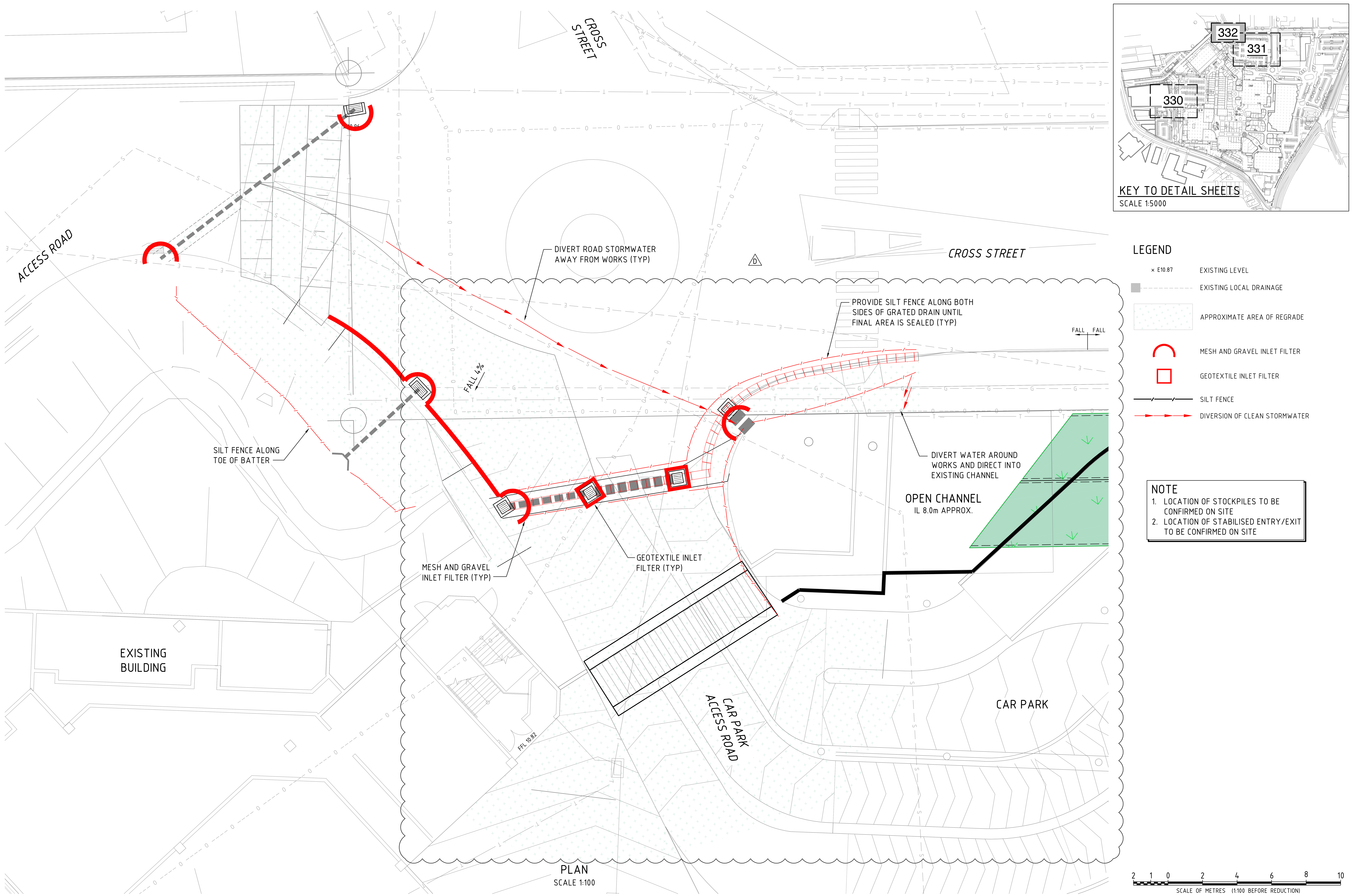
DRAWING NUMBER: W4548-331

REV: D

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

DATE PLOTTED: 16 October, 2013 - 5:46pm

XREF's: X-BORDER; X-Services; X-Drainage; X-Carpark; X-Survey; X-Architect



PLAN
SCALE 1:100

NOTE

1. LOCATION OF STOCKPILES TO BE CONFIRMED ON SITE
2. LOCATION OF STABILISED ENTRY/EXIT TO BE CONFIRMED ON SITE

REV	DATE	REVISIONS	DRN	CHK
D	16/10/2013	LAYOUT AMENDMENTS	NDK	SGB
C	30/08/2013	LAYOUT AMENDMENTS	NDK	SGB
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

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ABN 000 267 285

APPROVED: PROJECT DIRECTOR DATE

REVIEWED: PROJECT MANAGER DATE

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL
CONCEPT DRAINAGE AUGMENTATION WORKS
STAGE 1 EXPANSION WORKS
EROSION & SEDIMENT CONTROL PLAN SHEET 3 OF 3

DRAWING STATUS: NOT FOR CONSTRUCTION

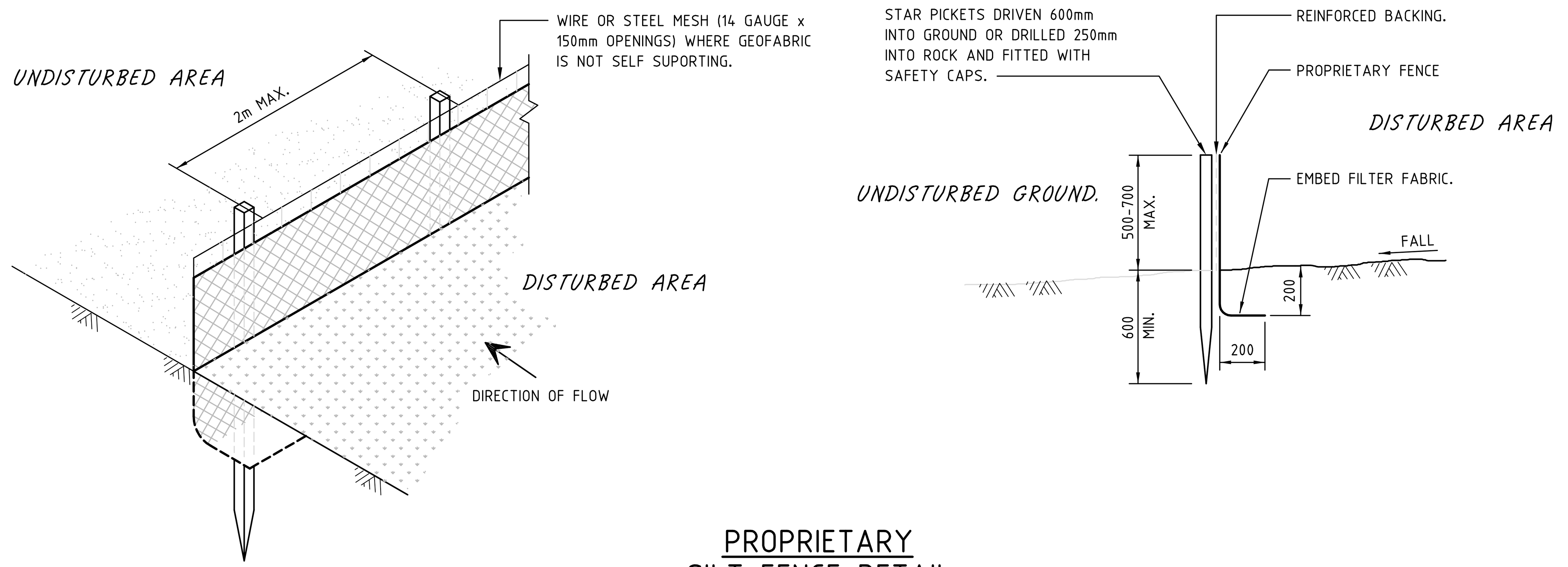
DRAWING NUMBER: W4548-332

REV: D

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

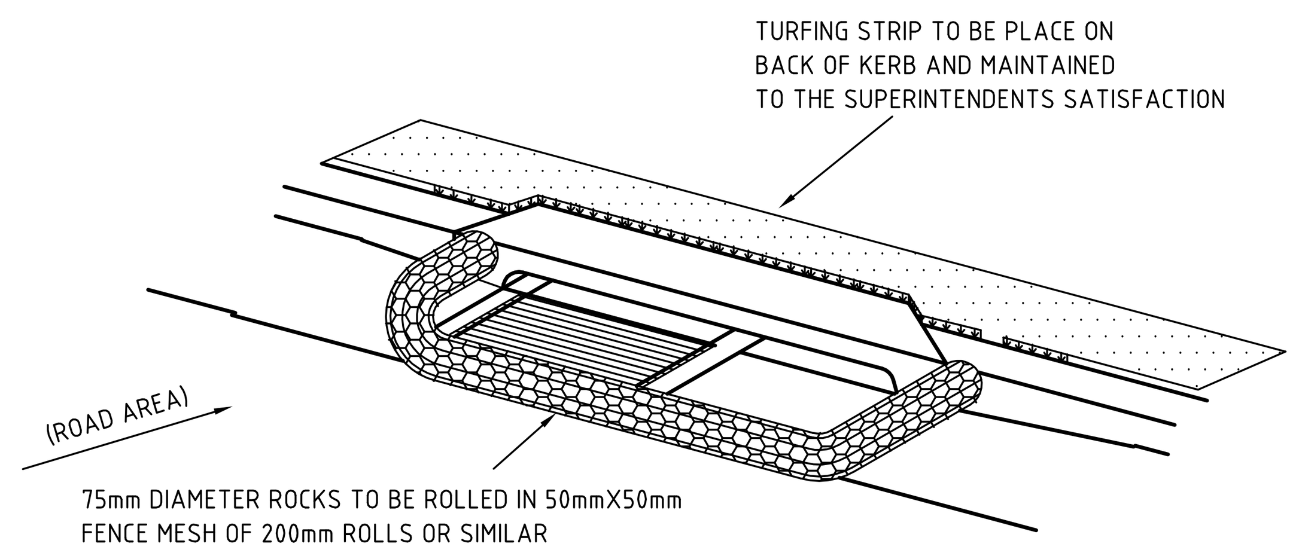
DATE PLOTTED: 16 October, 2013 - 5:46pm

XREF's: X-BORDER; X-Survey; X-Services; X-Drainage; X-Architect; X_Additional Detail Cross St RAB
CAD FILE: N:\Projects\805\FY14\500_599 Other Cardno Business Units\8991400 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\W4548-332(D).dwg



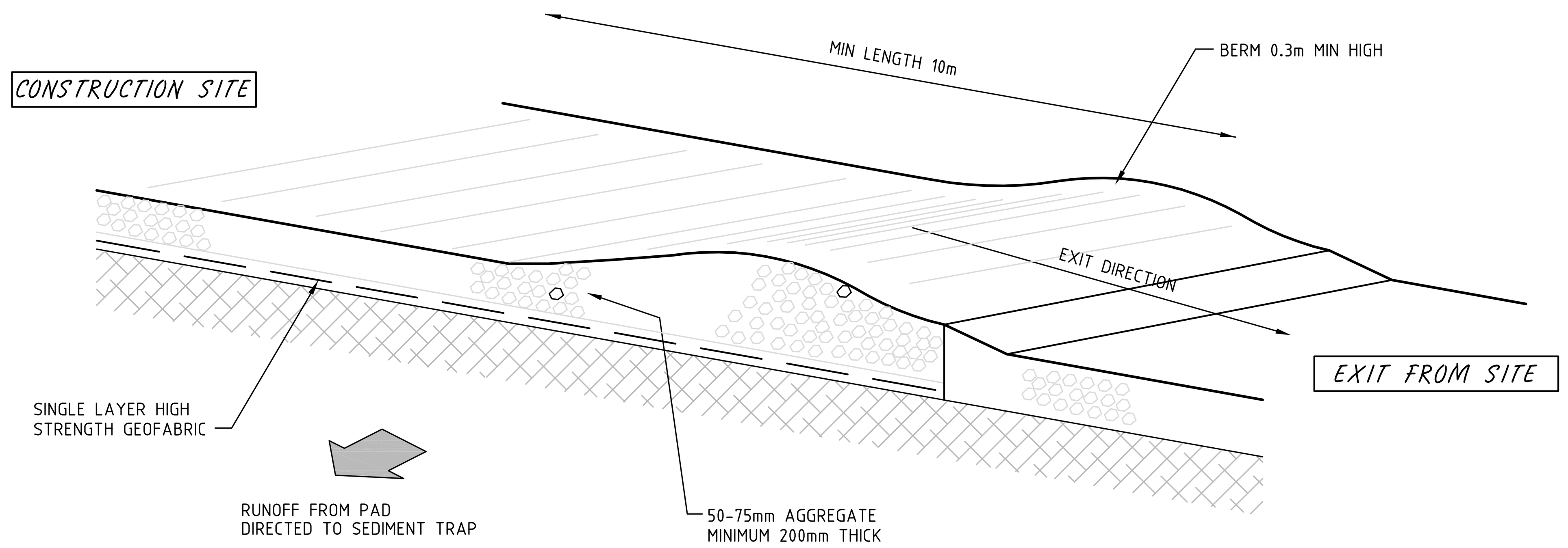
PROPRIETARY
SILT FENCE DETAIL

NOT TO SCALE



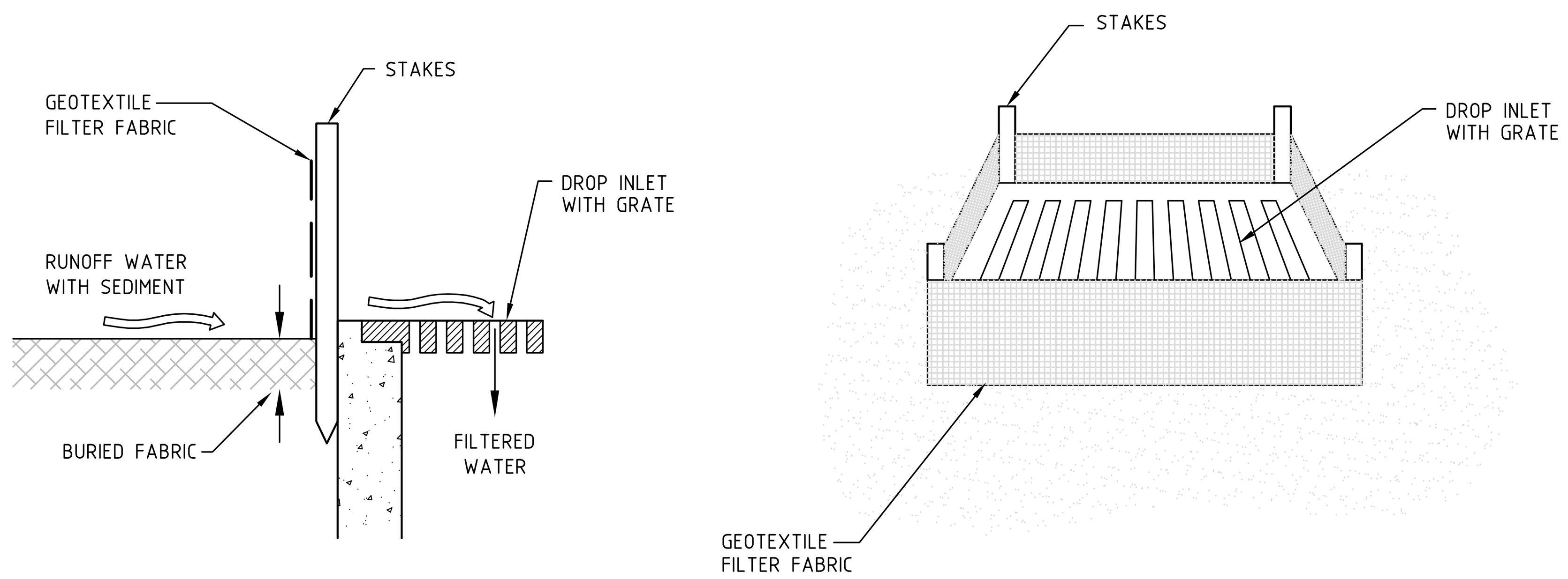
DETAIL OF MESH AND GRAVEL INLET
SEDIMENT TRAP

NOT TO SCALE



TEMPORARY CONSTRUCTION VEHICLE EXIT

NOT TO SCALE



GOETEXTILE FILTER
SEDIMENT TRAP

NOT TO SCALE

DATE PLOTTED: 30 August, 2013 - 5:12pm

XREF's: X-BORDER; X-Survey; X-Services; X-Drainage; X-Architect; X_Additional Detail Cross St RAB
CAD FILE: N:\Projects\805\FY14\500_599 Other Cardno Business Units\8991406 Warringah Mall - Stage 1\Stage 1 Culverts\Drawings\Build\Civil\TeW\W4548-333(B).dwg

REV	DATE	REVISIONS	DRN	CHK
B	22/05/2013	CLIENT AMENDMENTS	NDK	SGB
A	07/05/2013	SECTION 96 APPLICATION	NDK	SGB

Westfield Design & Construction Pty limited
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ABN 000 267 285

APPROVED: PROJECT DIRECTOR DATE

REVIEWED: PROJECT MANAGER DATE

	PREPARED	CHECKED
DESIGNED:	SGB	BP
DRAWN:	NDK	SGB

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WESTFIELD DESIGN & CONSTRUCTION

WARRINGAH MALL

CONCEPT DRAINAGE AUGMENTATION WORKS

STAGE 1 EXPANSION WORKS

EROSION & SEDIMENT CONTROL DETAILS

DRAWING STATUS: NOT FOR CONSTRUCTION

DRAWING NUMBER: W4548-333

REV: B

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

Appendix D Traffic Statement

GTAconsultants

Our Ref: 13S1311000

17 April 2014

Westfield Design & Construction Pty Limited
85 Castlereagh Street
SYDNEY NSW 2000

Attention: Mr Roland Wong

Dear Roland

RE: WESTFIELD WARRINGAH MALL – STAGE 1 S96 APPLICATION TRAFFIC REVIEW

As requested, GTA Consultants has conducted a traffic and parking review in relation to a proposed Section 96 (S96) application seeking consent to modify an approval for a proposed Stage 1 expansion of the Westfield Warringah Mall shopping centre.

This traffic statement presents the findings of the review.

Approved Stage 1 Development

In April 2010 Warringah Council granted an approval for a Stage 1 expansion of Warringah Mall. The approved Stage 1 expansion allows an additional development of some 8,000m^2 of gross leasable area (GLA) with a total of 526 additional car parking spaces to be provided, exceeding the DCP requirement of 328 by 198 car parking spaces. It is noted that the delivery of these car parking spaces was staged; with 336 at the completion of Stage 1 and 190 in the future.

The traffic assessment report prepared by consultant Colston Budd Hunt & Kafes Pty Ltd (which included a Paramics micro-simulation traffic model) that accompanied the original Stage 1 development application concluded that the road network would be able to accommodate additional traffic arising from the proposed Stage 1 development.

Proposed S96 Modifications to Stage 1 Development

The proposed S96 application is not proposing to change the previously approved floor space area (8,000m^2). However, this application is seeking approval to alter the approved internal arrangements of the "Palm Tree" and "Starfish" car parks.

Modifications to the approved "Palm Tree" entry and egress consist of refining both the Cross Street and Green Street access points. Access at Cross Street has been modified to one egress lane instead of two, and direct access to the Level 2 speed ramp has been provided. No changes are proposed to the Green street access, in terms of number of ingress and egress points, only separation of the loading dock truck traffic from the car park traffic is proposed.

In regards to the existing "Starfish" car park, it is proposed to relocate the approved internal entry speed ramp (to Level 1 Mezzanine), to be an external ramp (accessing Levels 1 & 1M) within the west access road from Old Pittwater Road.

The proposed modifications in this S96 application would not affect bus movements to and from the site. Existing access arrangement for buses would be maintained.

Access for service vehicles would be as per existing (i.e. at existing locations off Old Pittwater Road).

The proposed works is generally consistent with the previous approved Stage 1 proposed expansion.

Finally, this S96 application does not propose any changes to the number of car parking spaces to be provided, nor to the staged delivery of the car parking spaces.

Traffic Implications of Proposed Modifications

As indicated previously, it is not proposed to change the approved floor space area for Stage 1 expansion; therefore traffic generation for the current scheme would be consistent with those arising from the approved scheme. As such, the surrounding road network would continue to operate well as originally planned.

Parking Effects of Proposed Modifications

The Warringah Mall DCP stipulates a parking rate of 4.1 spaces per 100m^2 of GLA. Based on a proposed additional area of 8,000m^2 in Stage 1, the required parking provision is 328 parking spaces.

It is proposed to provide 336 additional car parking spaces to serve Stage 1 expansion plus an additional 69 parking spaces for a future stage.

Internal Parking Arrangements

Any new car parking spaces and other proposed car park associated elements are proposed to be designed in accordance with the Australian Standard for car parking facilities, namely AS2890.1:2004.

The proposed changes of the internal ramp system and circulation, shown in the architectural plans (Scheme 28d Drawing Nos. DA 01.5201 to DA 01.5205 Rev C dated 6 March 2014) are considered to be satisfactory.

In relation to the access changes at the "Palm Tree" and "Starfish" car parks, it is also considered these would be acceptable.

Conclusion

This traffic statement relates to a proposed S96 application seeking consent to modify an existing approval for Stage 1 development at the Warringah Mall shopping centre.

The salient findings from this traffic and parking review are as follows:

- The current scheme is not proposing to alter the previously approved floor space area i.e. 8,000m^2 gross leasable floor area.
- The expected development traffic arising from the current Stage 1 scheme would be consistent with the previously approved development. As such, the surrounding road network would continue to operate well as originally planned.
- No change to the number of car parking spaces or staged delivery of the car parking spaces.
- The proposed modifications to access arrangement at the "Palm Tree" and "Starfish" car parks are considered to be acceptable.
- The proposed access arrangement is consistent with that shown in the Warringah DCP.
- All new parking spaces and associated car park elements are proposed to be designed in accordance with the requirements set out in the Australian Standard for car parking facilities.

Overall, the traffic and parking effects of the proposed modifications to the approved Stage 1 would be satisfactory.

We trust the above is to your satisfaction. Naturally, should you have any questions or require any further information, please do not hesitate to contact me or my colleague Michael Lee in our Sydney office on (02) 8448 1800.

Yours sincerely

GTA CONSULTANTS

Ken Hollyoak
Director

encl.

Appendix E Tree Report

TREESCAN

URBAN FOREST MANAGEMENT

Tree Report

Westfield Warringah Mall

For DEM Australia Pty Ltd

June 2013

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Tree Report
Westfield Warringah Mall

For DEM Australia Pty Ltd
June 2013

Introduction
It is proposed to reconstruct and realign parts of the existing entry/exit roadway to Warringah Mall shopping centre off Brookvale. Many trees are located on the site and some would be affected by the proposed construction. This report assesses the trees on the site and comments on the effects of the proposal. Twelve trees are proposed for removal while the others are to be retained and protected during construction.

Plans considered are:

- Proposed ground level floor plan 03.02 Rev CP1 dated 9 April 2013 prepared by Westfield Design & Construction Pty Ltd
- Tree survey dated 20 April 2013 prepared by RPS Australia East Pty Ltd
- DEM markup plan dated 31 May 2013 relating to Trees 14 and 15

The site
The site is aligned approximately north/south and consists of the existing roadway off Old Pittwater Rd and adjoining areas. Trees planted in rows are located to either side of the roadway and are also located in central islands. The land is within the local government area of Warringah Council.

Present state of the trees
The site trees are assessed in Table 1 below; tree numbers are noted on the plan attached. Trees were inspected on 2 May 2013 from the ground only and no aerial or subterranean inspections were carried out. Observations of tree structure, tree health and root zone conditions were made during the assessment. Tree dimensions of trunk diameter, height and crown spread were taken from the Tree Survey.

In general the trees are in good health with full foliage cover of the crowns. Their structural condition however is often compromised by poor scaffold formation and in particular by confinement of the root systems due to the proximity of trees to the roadway and other structures.

All trees are of commonly planted native species, evidently part of the landscape plan installed at the construction of the roadway. There are no trees present which are remnants of an original vegetation community of the site.

Discussion

Tree retention

Most of the trees along the edges of the roadway are proposed for retention, although a few may be affected by changes to the kerbline in their vicinity.

Trees 33 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 34 *Eucalyptus microcorys* (Tallowwood) are close to the line of a new kerb, losing approximately 600mm and 500mm respectively to the west of the trunks. The existing kerb is approximately 1.5m from the trunks so that the additional excavation required may cause impact on the root systems. Before a decision can be made regarding the retention of these two trees, a root investigation would be required. The trees would be retained if no significant roots are found within the area. If significant roots need to be severed close to the trunk the trees may become unstable and require removal. Alternatively if significant roots are encountered it may be feasible to retain the existing kerbline in the vicinity of the trees.

Other trees along the sides of the roadway are not affected by the proposed changes and would be retained. Protection of the trunks and lower branches during construction would be required.

Tree 14 *Eucalyptus tereticornis* (Forest Red Gum) and Tree 15 *Melaleuca quinquenervia* (Broad-leaved Paperbark) are in a central raised bed surrounded by retaining walls; Tree 14 is leaning and may be unstable. Tree 15 is in poor structural condition due to a weak junction in the trunk. These trees would be retained although Tree 15 may be affected by the construction of a ramp to the south of the trunk.

In general the trees and their root zones would be protected by site safety fencing installed along the edges of the roadway and the new construction. Additional trunk armouring may be required where trees are close to construction.

Tree removal

Trees proposed for removal are in the central island areas where new roadways and ramps are proposed to be constructed. The ten trees affected are:

Tree 16 *Eucalyptus microcorys* (Tallowwood)
Tree 17 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 26 *Lophostemon confertus* (Brushbox)
Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 27a *Callistemon viminalis* (Weeping Bottlebrush)

Tree 28 *Eucalyptus robusta* (Swamp Mahogany)
Tree 29 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 30 *Melaleuca quinquenervia* (Broad-leaved Paperbark)
Tree 31 *Eucalyptus robusta* (Swamp Mahogany)
Tree 32 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

These trees are confined within island planter beds in the centre of the roadway. In most cases their root systems have reached the limits of the available soil volume within the planters and in some areas are already causing uplift of kerbs and cracking of surfaces as roots extend from the planters.

Comments on trees proposed for removal are noted below:

Tree 16 *Eucalyptus microcorys* (Tallowwood) is a fair specimen although the root system is confined by kerbs to either side.

Tree 17 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 26 *Lophostemon confertus* (Brushbox) are stressed and have sparse leaf coverage.

Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark) is a very large specimen which is causing damage to the kerb due to root activity.

Tree 27a *Callistemon viminalis* (Weeping Bottlebrush) is poor and suppressed.

Tree 28 *Eucalyptus robusta* (Swamp Mahogany) has advanced crown dieback and is declining.

Tree 29 *Melaleuca quinquenervia* (Broad-leaved Paperbark) has a weak junction near the base and the root system is likely to cause damage in the near future.

Tree 30 *Melaleuca quinquenervia* (Broad-leaved Paperbark) is likely to cause damage in the near future.

Tree 31 *Eucalyptus robusta* (Swamp Mahogany) has major surface roots which have been deformed by the adjacent kerbs. Damage is likely in the near future.

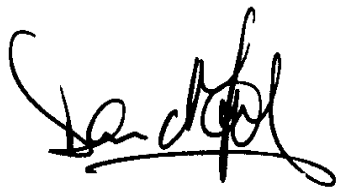
Tree 32 *Melaleuca quinquenervia* (Broad-leaved Paperbark) has already caused damage to the kerb and the road surface. Additional damage is likely in the future.

These trees are assessed with short safe useful life expectancy, 5 to 15 years, due to the likelihood of their removal for safety or nuisance reasons within this timespan.

Conclusions

The removal of ten trees would be necessary to enable the construction of the new roadway and access ramp. Most of these trees are of diminished value due to their confined locations within planter beds in the centre of the roadway.

Trees proposed for retention would require protection, depending on their proximity to disturbance as the result of construction nearby. In most cases the protection of the site fencing along the edges of the roadway would be sufficient, but some trees may also require trunk armouring to protect trunks and lower branches from accidental contact with machinery.



David Ford, Adv Dip Land Management, Dip Horticulture (Arboriculture), Cert Horticulture, Cert Bush Regeneration, MAIH

Consulting Arborist

References

Barrell, J. 1993, 'Preplanning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression', *Arboricultural Journal* 17:1, February 1993, pp. 33-46.

Barrell, J. 1995, 'Pre-development Tree Assessments', in *Trees & Building Sites, Proceedings of an International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings*, International Society of Arboriculture, Illinois, USA, pp. 132-142.

Standards Australia 2009, Australian Standard AS 4970 *Protection of trees on development sites*, Standards Australia, Sydney.

Tree protection during construction

The following measures should be undertaken to reduce the possible effects of construction on the trees.

Services should be designed so that no trenching is required within 5m of the trees.

Excavation in the vicinity of trees should be done initially by hand. Any roots encountered <50mm in diameter should be cut cleanly with a hand saw. Any roots encountered >50mm in diameter should retained intact and referred to the site arborist for advice.

Prior to the start of construction trees should be fenced (in groups where possible) to a radius of 5m from each trunk except where access is required for construction, to form tree protection zones. Fences should be chainlink 1.8m high supported by steel posts.

Where access is required within these radii for building purposes, the fence should be set back 1.5m from the building face and the soil surface between the fence and the building should be protected by plywood sheets or strapped planking.

Where not otherwise protected trunks should be armoured with 2m lengths of 50x100mm hardwood timbers spaced at 150mm centres and secured by 8 gauge wires or steel strapping at 300mm spacing. The trunk protection should be maintained intact until the completion of all work on the site.

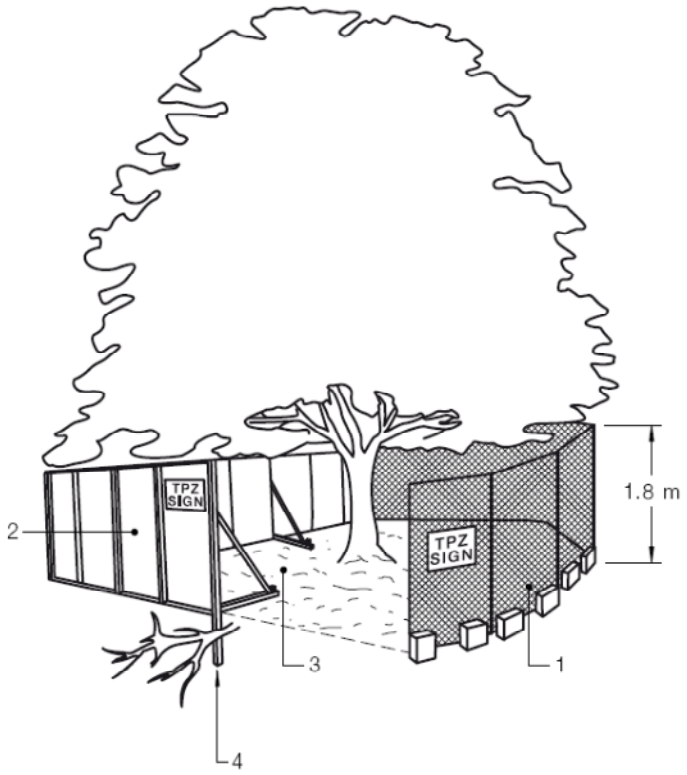
There should be no pedestrian or vehicular access to the tree protection zones. No building activities should take place within the tree protection zones, including storage or stockpiling. Runoff from the site should not be allowed to enter the tree protection zones.

A site arborist should be appointed to supervise any activities in the vicinity of trees, including fencing, excavation and root pruning, and make periodic visits and reports to monitor the state of the trees. Inspection should take place after installation of the fencing, at initial hand excavation and root pruning, during any works within the tree protection zones, at completion of the construction. A photographic record should be maintained of site inspections, including the state of the trees and any injury inflicted.

In the event of any tree to be retained becoming damaged during construction, the site arborist should be informed to inspect and provide advice on remedial action.

At the end of construction all retained trees should be pruned to remove deadwood and weak branches. All pruning should be done in accordance with Australian Standard AS4373- *Pruning of Amenity Trees*.

Guidelines for tree protection are noted in Australian Standard AS4970-2009 *Protection of Trees on Development Sites*. Figures below show fencing, ground protection and scaffold fencing details.



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

FIGURE 3 PROTECTIVE FENCING

4.5.2 Trunk and branch protection

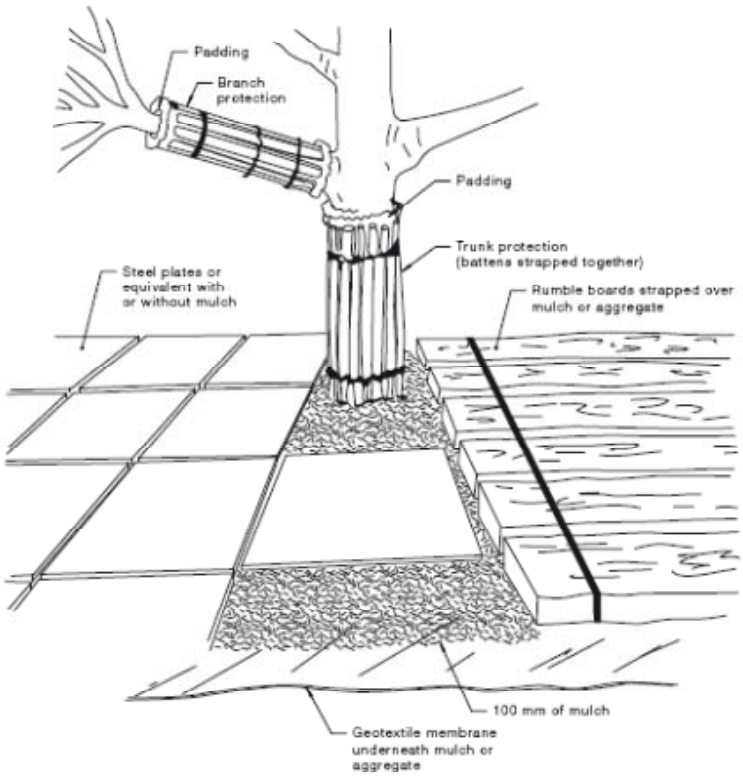
Where necessary, install protection to the trunk and branches of trees as shown in Figure 4. The materials and positioning of protection are to be specified by the project arborist. A minimum height of 2 m is recommended.

Do not attach temporary powerlines, stays, guys and the like to the tree. Do not drive nails into the trunks or branches.

4.5.3 Ground protection

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards as per Figure 4.

These measures may be applied to root zones beyond the TPZ.

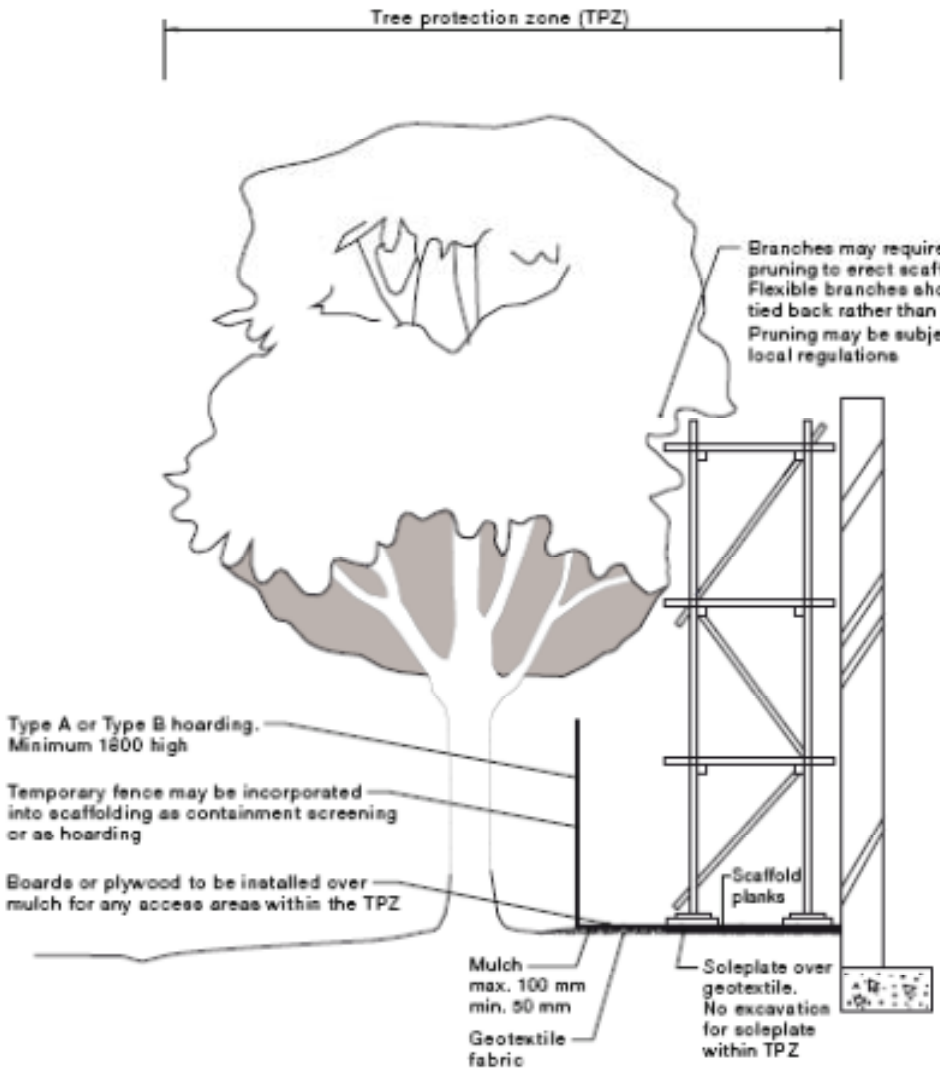


NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

FIGURE 5 INDICATIVE SCAFFOLDING WITHIN A TPZ

Table 1: Site trees

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
1	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	6	300	Good	Fair	2D	Root system confined by road	Retention
2	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	8	300	Good	Fair	3B	Trunk in contact with retaining wall	Retention
3	*Cinnamomum camphora* (Camphor Laurel)	7	6	300	Good	Fair	4C	Weed species	Retention
4	*Melaleuca bracteata* (Black Tea Tree)	10	8	300	Good	Fair	3B	Trunk in contact with retaining wall	Retention
5	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	10	6	400	Good	Good	2B	Weak junction at 5m height	Retention
6	*Melaleuca bracteata* (Black Tea Tree)	6	6	300	Good	Poor	3D	Trunk lean Weak junction near base	Retention
7	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	8	300	Good	Fair	3B	Multiple subtrunks Poor form	Retention
8	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	8	300	Good	Fair	3B	Multiple subtrunks Poor form	Retention
9	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	12	10	500	Good	Fair	3B	Weak junction with big ears defect at 2m height	Retention
10	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	8	400	Good	Fair	3C	Suppressed Weak junction at 2m height	Retention

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
11	*Eucalyptus microcorys* (Tallowwood)	14	16	800	Good	Fair	3B	Weak junction at 3m height Small ears defect Epicormic shoots on trunk Root system confined by road Termite workings on trunk	Retention
12	*Eucalyptus microcorys* (Tallowwood)	8	8	400	Good	Fair	2B	Weak junction at 2m height Leaning Codominant subtrunks	Retention
13	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	12	400	Good	Fair	3B	Multiple subtrunks Poor form	Retention
14	*Eucalyptus tereticornis* (Forest Red Gum) ?	8	10	400	Good	Fair	3B	Root system confined by road to 2 sides in narrow planter bed Leaning Possibly unstable	Retention
15	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	10	400	Good	Poor	3B	Weak junction at 3m height Root system confined by road to 2 sides in narrow planter bed	Retention
16	*Eucalyptus microcorys* (Tallowwood)	10	10	300	Good	Fair	2B	Straight form Root system confined by road to 2 sides in narrow planter bed	Removal
17	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	6	300	Fair	Fair	3A	Sparse crown Stressed	Removal
18	*Lophostemon confertus* (Brushbox)	12	10	300	Good	Fair	3A	Root system confined by road and carpark Codominant crown	Retention
19	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	12	12	1000	Good	Poor	3B	Weak junctions at base Root system confined by road carpark and stormwater pit	Retention

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
20	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	6	300	Good	Poor	3B	Weak junctions at base Root system confined by road carpark and stormwater pit	Retention
21	*Callistemon viminalis* (Weeping Bottlebrush)	5	6	Multi	Fair	Poor	3A	Sparse crown Poor form	Retention
22	*Callistemon viminalis* (Weeping Bottlebrush)	5	4	multi	Fair	Poor	3A	Sparse crown Poor form	Retention
23	*Lophostemon confertus* (Brushbox)	5	6	200	Good	Fair	2D	Good specimen with confined root system	Retention
24	*Lophostemon confertus* (Brushbox)	7	8	300	Good	Fair	2B	Root system confined by road carpark and stormwater pipe	Retention
25	*Lophostemon confertus* (Brushbox)	7	8	300	Good	Fair	2B	Root system confined by road carpark and stormwater pipe	Retention
26	*Lophostemon confertus* (Brushbox)	4	6	200	Fair	Poor	3A	Sparse crown Stressed	Removal
27	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	13	12	1000	Good	Poor	3B	Root system confined by road to 2 sides Kerb damage	Removal
27a	*Callistemon viminalis* (Weeping Bottlebrush)	3	2	200	Poor	Poor	4A	Suppressed Declining	Removal
28	*Eucalyptus robusta* (Swamp Mahogany)	5	4	300	Poor	Poor	4A	Crown dieback Declining	Removal
29	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	6	6	400	Good	Poor	3B	Leaning Weak junction at base Confined root system	Removal

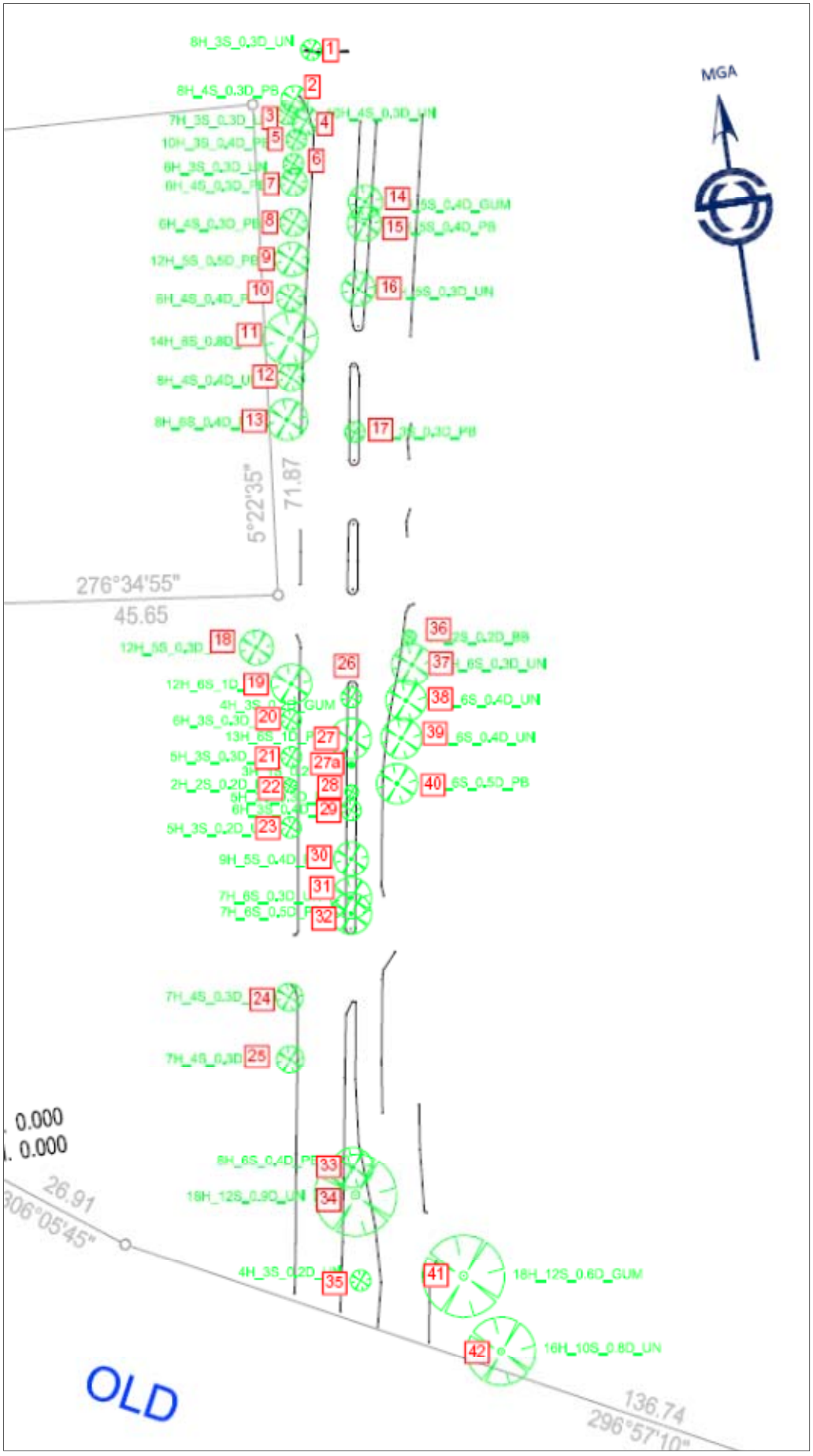
Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
30	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	9	10	400	Good	Fair	3B	Root system confined by road to 2 sides	Removal
31	*Eucalyptus robusta* (Swamp Mahogany)	7	12	300	Good	Poor	3B	Trunk wounds Massive root system confined by road to 2 sides	Removal
32	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	7	12	500	Good	Poor	3B	Leaning Damage to road Confined root system	Removal
33	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	8	12	400	Good	Fair	3B	Suppressed One-sided crown Root system confined by road	Retention
34	*Eucalyptus microcorys* (Tallowwood)	18	24	900	Fair	Fair	2D	Weak junctions at 4m height Root system confined by road to 2 sides Hydrant nearby	Retention
35	*Jacaranda mimosifolia* (Jacaranda)	4	6	200 x 2	Good	Poor	3D	Weak junction at base Codominant subtrunks	Retention
36	*Callistemon viminalis* (Weeping Bottlebrush)	5	4	200	Good	Poor	4A	Leaning One-sided crown Root system confined by road and footpath	Retention
37	*Melaleuca bracteata* (Black Tea Tree)	6	12	300	Good	Fair	3B	Multi-stemmed form Weak junctions Root system confined by road	Retention
38	*Melaleuca bracteata* (Black Tea Tree)	8	12	400	Good	Fair	3B	Multi-stemmed form Weak junctions Root system confined by road	Retention
39	*Melaleuca bracteata* (Black Tea Tree)	8	12	400	Good	Fair	3B	Multi-stemmed form Weak junctions Root system confined by road	Retention

Tree no	Species	Approx height m	Approx crown spread m	Approx trunk dbh mm	Health	Condition	SULE	Comment	Effect of proposed development
40	*Melaleuca quinquenervia* (Broad-leaved Paperbark)	18	24	600	Fair	Fair	3B	Sparse crown Stressed Weak junction at 1m height Root system confined by road and ramp	Retention
41	*Eucalyptus microcorys* (Tallowwood)	8	12	500	Good	Fair	2D	Straight form Root system confined by footpath and retaining wall Termite workings on trunk	Retention
42	*Eucalyptus microcorys* (Tallowwood)	16	20	800	Good	Fair	2D	Codominant subtrunks Epicormic shoots on lower branches Root system confined by ramp building and footpath Termite workings on trunk	Retention

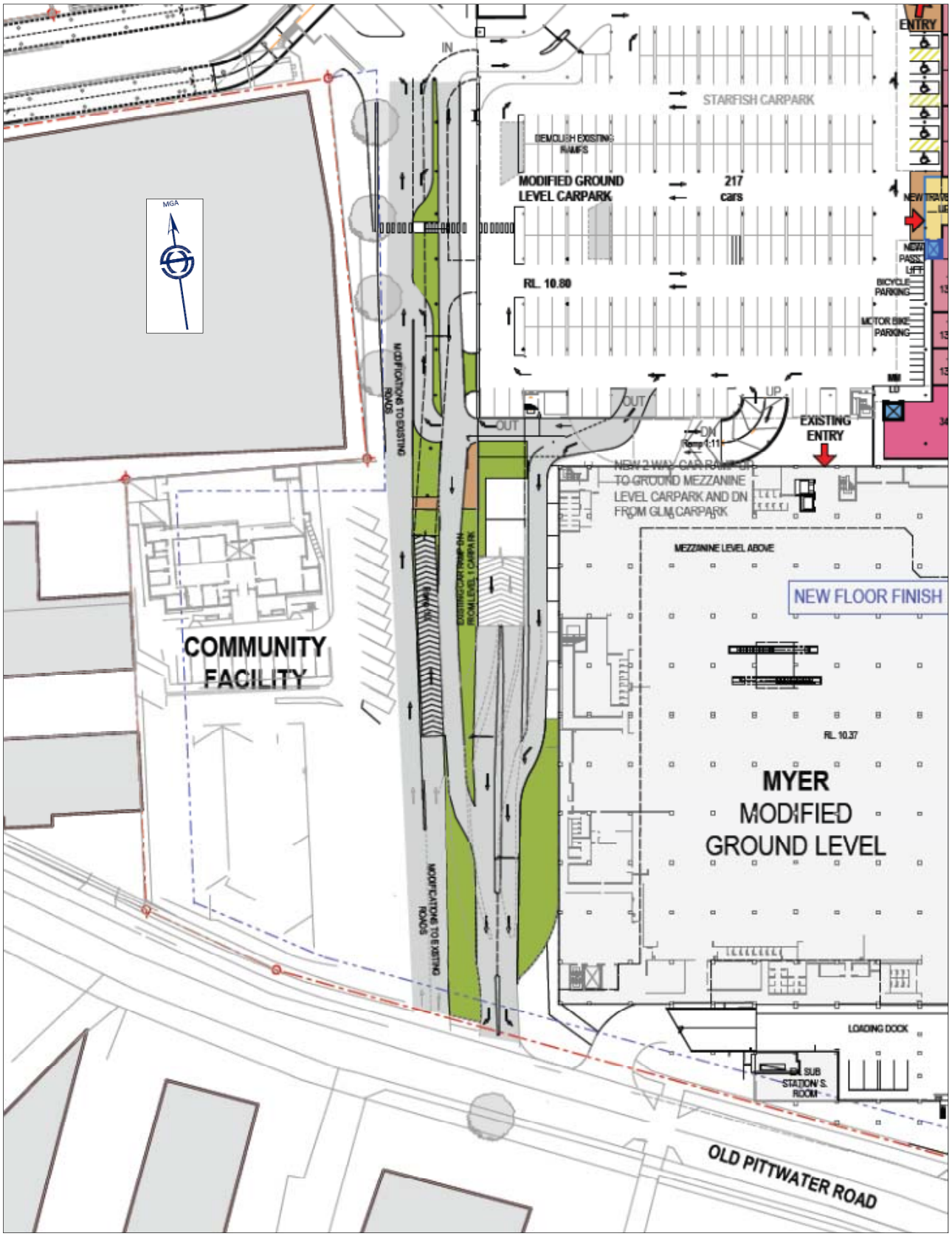
Table 2: SULE categories (after Barrell 1995)

	1	2	3	4
	Long: Appeared to be retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance.	Medium: appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance.	Short: appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance.	Transient: trees which should be removed within the next 5 years.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees which may only live between 15 and 40 years.	Trees which may only live between 5 and 15 years.	Dead, dying, suppressed or declining trees.
B	Trees which could be made suitable for long-term retention by remedial care.	Trees which may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees which may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through damage, structural defect, instability or recent loss of adjacent trees. Urgent removal may be required if near assets.
C	Trees of special significance which would warrant extraordinary efforts to secure their long-term retention.	Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees which may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.
D		Trees which could be made suitable for retention in the medium term by remedial care.	Trees which require substantial remediation and are only suitable for retention in the short term.	Trees which are damaging or may cause damage to existing structures within the next 5 years.

Tree location plan



Ground level floor plan



Plates

Plate 1: right to left Tree 4 *Melaleuca bracteata* (Black Tea Tree), Tree 5 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 6 *Melaleuca bracteata* (Black Tea Tree)

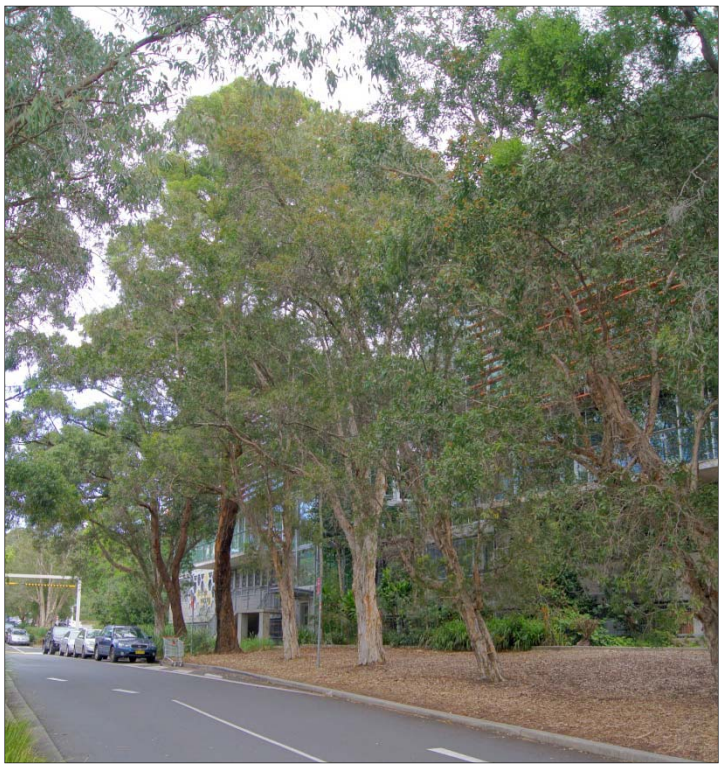


Plate 2: right to left Trees 7 to 10 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Trees 11 and 12 *Eucalyptus microcorys* (Tallowwood)

Plate 3: Tree 14 *Eucalyptus tereticornis* (Forest Red Gum), Tree 15 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and at rear Tree 16 *Eucalyptus microcorys* (Tallowwood)

Plate 4: central section viewed from the north showing left to right:
Tree 36 *Callistemon viminalis* (Weeping Bottlebrush) , Tree 37 *Melaleuca bracteata* (Black Tea Tree), Tree 26 *Lophostemon confertus* (Brushbox), Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 26 *Lophostemon confertus* (Brushbox)

Plate 5: Trees 24 and 25 *Lophostemon confertus* (Brushbox)

Plate 6: right to left Tree 26 *Lophostemon confertus* (Brushbox), Tree 27 *Melaleuca quinquenervia* (Broad-leaved Paperbark), Tree 27a *Callistemon viminalis* (Weeping Bottlebrush), Tree 28 *Eucalyptus robusta* (Swamp Mahogany), Trees 29 and 30 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

Plate 7: left to right
Tree 31 *Eucalyptus robusta* (Swamp Mahogany) and Tree 32 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

Plate 8: left to right
Tree 41 *Eucalyptus microcorys* (Tallowwood), Tree 33 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and at rear Tree 34 *Eucalyptus microcorys* (Tallowwood)

Plate 9: existing kerbline near Tree 33 *Melaleuca quinquenervia* (Broad-leaved Paperbark) and Tree 34 *Eucalyptus microcorys* (Tallowwood)

Plate 10: left to right Tree 36 *Callistemon viminalis* (Weeping Bottlebrush), Trees 37 to 39 *Melaleuca bracteata* (Black Tea Tree) and Tree 40 *Melaleuca quinquenervia* (Broad-leaved Paperbark)

Plate 11: Old Pittwater Rd entry showing Tree 34 *Eucalyptus microcorys* (Tallowwood) and Tree 35 *Jacaranda mimosifolia* (Jacaranda)

Plate 12: Old Pittwater Rd entry showing Trees 41 and 42 *Eucalyptus microcorys* (Tallowwood)

Terminology used in the report

Age classes (I) *Immature* refers to a well-established but juvenile tree. (S) *Semimature* refers to a tree at growth stages between immaturity and full size. (M) *Mature* refers to a full sized tree with some capacity for further growth. (O) *Overmature* refers to a tree about to enter decline or already declining.

Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.

Condition refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils), and the state of the scaffold (ie trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Health	
Good	In good vigour with full leaf coverage of the crown; deadwood if present is internal and a normal feature of the species
Fair	Generally vigorous but shows symptoms of stress or decline, leaf coverage thinner than normal for the species; deadwood of smaller diameter may be present
Poor	Shows symptoms of advanced stress or decline including sparse crown with twig and branch dieback, lack of response to pests or disease
Structural condition	
Good	Has well-spaced branches and strong branch collars; form and habit typical of the species; good example of the species with low probability of significant failure
Fair	Has structural defects of moderate severity with low propensity for failure which could be remediated by pruning or modification of its environment
Poor	Has structural defects which have already failed and/or have a high propensity for failing in the future

Safe Useful Life Expectancy (SULE). In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. SULE is a system designed to classify trees into a number of defined categories so that information regarding tree retention can be concisely communicated in a non-technical manner. SULE categories are easily verifiable by experienced personnel without great disparity. A tree's SULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give safe life expectancy), then by economics (ie cost of maintenance; retaining trees at an excessive management cost is not normally acceptable), effects on better trees, and sustained amenity (ie establishing a range of age classes in a local population). SULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with short SULE may at present be making a contribution to the landscape but their value to the local amenity will decrease rapidly towards the end of this period, prior to their being removed for safety or aesthetic reasons. For details of SULE categories see Table 2, adapted from Barrell (1993 and 1995).

Decay is the result of invasion by fungal diseases through a wound.

Decline is the response of the tree to a reduction of energy levels resulting from **stress**. Recovery from a decline is difficult and slow; is usually irreversible.

Epicormic shoots are sprouts produced from dormant buds in the bark. Production can be triggered by fire, pruning or root damage but may also be as a result of stress or decline.

Sparse crown refers to reduced leaf density, often a precursor to dieback and may imply stress or decline. Also possibly a response to drought or root damage.

Stress refers to the response of the tree to a reduction of energy levels resulting from adverse influences such as altered soil conditions (compaction, poor nutrition, reduced oxygen or moisture levels), root damage, toxicity, drought, waterlogging; may be reversible given good arboricultural practices but may lead to **decline**.

Theoretical tree protection zone is the 'tree protection zone radius' as calculated from Australian Standard 4970-2009 *Protection of Trees on Development Sites*. However root mapping investigations increasingly show that the tree protection zone calculation of 12x trunk diameter is seldom relevant in practice and the theoretical tree protection zone may be considerably larger than the actual root zone or radically different in disposition.

Weak junctions are points of possible failure in the scaffold. They are usually caused by the trunk or branch bark being squeezed within the junction so that the necessary interlocking of the wood fibres does not occur and the junction is forced open by the annual increments in growth. This is often a genetic problem.

Disclaimer

All care has been taken to assess potential hazard but trees are always inherently dangerous. This assessment was carried out from the ground, and covers what was reasonably able to be assessed and available to the assessor at the time of inspection. No aerial or subterranean inspections were carried out and structural weakness may exist within roots, trunk or branches.

Any protection or preservation methods recommended are not a guarantee of tree survival or safety but are designed to improve vigour and reduce risk. Timely inspections and reports are necessary to monitor the trees' condition. No responsibility is accepted for damage or injury caused by the trees and no responsibility is accepted if the recommendations in this report are not followed.

Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, and directly attached to that submission, report or presentation.

Assumptions

Care has been taken to obtain information from reliable resources. All data have been verified insofar as possible; however, Treescan Urban Forest Management can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of inspection: and

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Appendix F Access Report

ACCESS
AUSTRALIA

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www.accessaustralia.com.au

17 April 2014

Westfield Warringah Mall

S96 DA Access Report

Methodology

This Access Australia (AA) DA Access Report relates to instructions and documents received to date from Westfield regarding proposed alterations and additions to Warringah Mall Shopping Centre, Brookvale NSW.

AA reports and recommendations relate to the ABCB (Australian Building Codes Board) 2010 DDA Access to Premises Standard (APS) and current BCA access requirements. The intent of the APS is to harmonise BCA access provisions with the complaints based DDA.

Access provisions are to comply with relevant Australian Standards, including current AS1428.1, AS1428.2, AS1428.4, AS1735.12, AS2890.6 and Warringah Council (WC) access requirements as applicable.

DDA complaints can be lodged in relation to existing and or proposed buildings and services. Accordingly AA provides a risk management approach, and recommends access modifications / retrofit to existing premises in conjunction with accessible new works and services.

Scope & Criteria

Revised DA2008/1741 was approved by Warringah Council on 13 May 2010 – and includes *'partial demolition of existing buildings, construction of extensions … including 2 levels of retail floor space, a multi-level car park and associated storm water works'.*

This AA access report is based on review of the following Westfield documents for **Scheme 28d, revision C** received to date

- Ground DA01.5201
- Ground / Mezzanine DA01.5202
- Level 1 DA01.5203
- Level 1 / Mezzanine DA01.5204
- Level 2 DA01.5205
- Roof DA01.5206

Access related conditions and references in the revised DA include

Condition 5	All building works to comply with the BCA
Condition 8	Separate DAs to be submitted for uses other that shops and for fit-out of shops
Condition 11	Comply with relevant standards including AS2890.1-2004 and AS1428.2-1992
Condition 20	Pedestrian crossings at Cross & Green Sts to be deleted and existing crossing *on the site at the end of Cross St* to be retained
Advisory Notes	The DA does not ensure compliance with the DDA – and applicants are *strongly advised to investigate requirements under the Act*

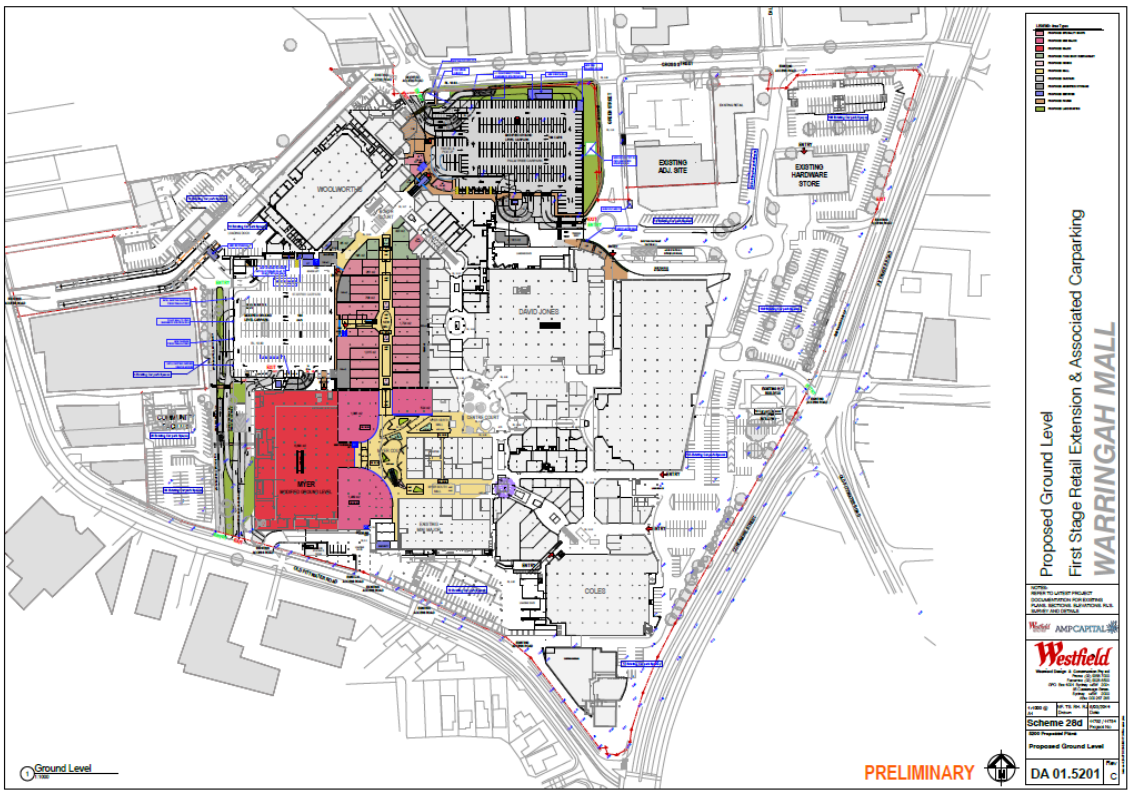
This AA Report should be read in conjunction with AA 2008 Existing Centre Access Report. This AA report should also be read in conjunction with AA 2008 DA Report.

The APS and BCA requirements for Class 6 retail premises include access *'To and within all areas normally used by the occupants'* and one accessible parking space for every 50 carparking spaces up to 1,000 spaces and 1 accessible space per 100 in excess of 1,000 spaces.

1 Ground

1.1 Car parks

New north car park at Cross & Green Sts includes NW and SE vehicle entries and exits, 197 car spaces including 5 accessible parking spaces, generally complying with AS2890.6, adjacent to SW mall entry, travelators and new lift.



Modified west car park includes west vehicle entries, exits and parking for 180± cars. Provide minimum 4 accessible parking spaces, generally complying with AS2890.6, adjacent to east mall entry, travelators and lift.

Recommendations

Accessible parking spaces to comply with BCA and AS2890.6 including accessible paths of travel, minimum 2.2m clear driveway height, minimum 2.5m clear accessible parking space height, shared space between accessible spaces, ground, vertical and directional signage

New passenger lifts to comply with the APS including audio announcements, tactile and Braille signage

Notes

Travelators and escalators do not form part of an accessible path of travel.

1.2 Mall

New east Mall connects north Woolworths, south Myers and mini major with ramped entries, and east David Jones with new specialty shops fronting the Mall.

Walkways between 12m± wide Mall, majors, voids and car parks have generally 1:34± gradient. South Myer Court includes ramps and walkways with handrails as applicable.

New lifts are located at north Palm Tree car park (2), west centrally at east Starfish car park (1) and south Myer Court (1) – together with goods lifts.

> ***Recommendations***
> *Provide level or ramped access within Mall and retail areas, and complying pedestrian walkways*
>
> *New and refurbished passenger lifts to comply with the APS including audio announcements, tactile and Braille signage*

1.3 Amenities

Amenities are located north adjacent to Woolworths and south amenities adjacent to Myers. New amenities are to replace existing.

> ***Recommendations***
> *Accessible unisex toilets to be adjacent to gender specific toilets and comply with the BCA and AS1428.1 including minimum 1400 clear between WCs and encroachments, WC backrest and shelf*
>
> *Install one PAD cubicles (to assist people with ambulant disabilities) in each in each gender specific toilet*

2 Ground Mezzanine

2.1 Car parks

New north car park provides 194 car spaces including 4 accessible parking spaces, and access to SW mall entry via travelators and lifts.

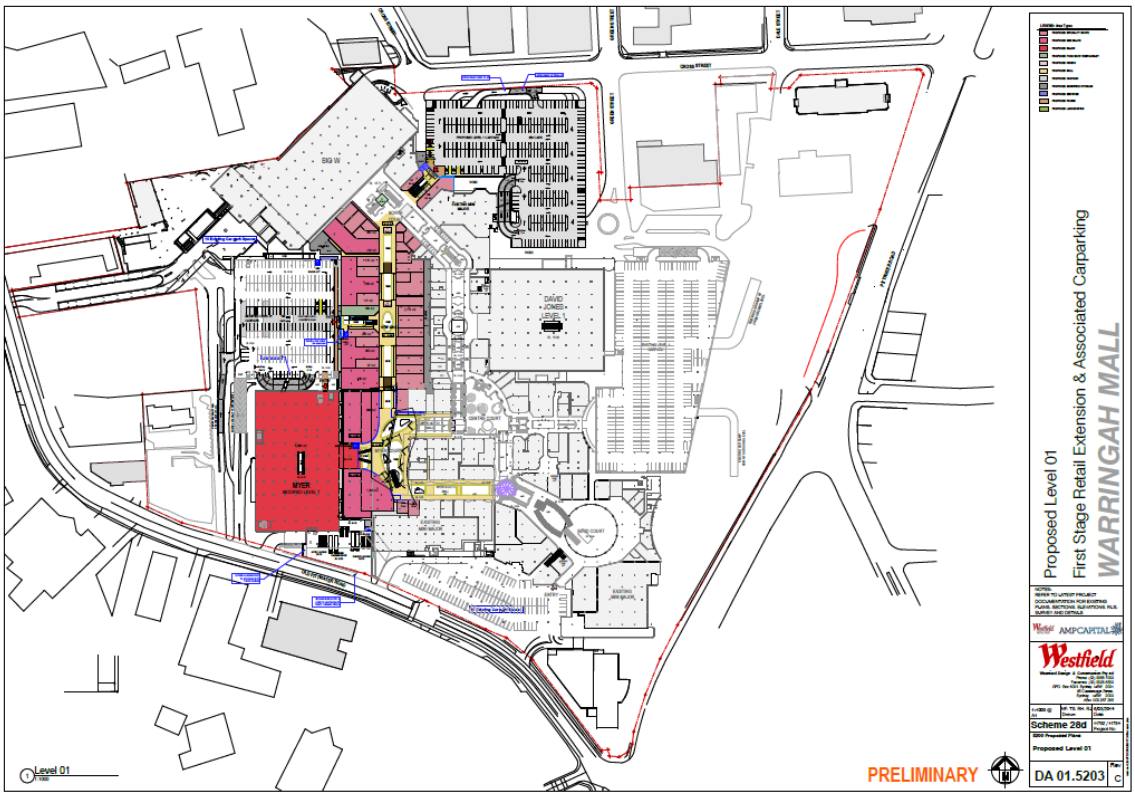
Modified west car park provides 204 car spaces. Provide minimum 5 accessible parking spaces, generally complying with AS2890.6, adjacent to east mall entry, travelators & lift.

Recommendations
Accessible parking spaces to comply with BCA and AS2890.1 including ground, vertical and directional signage – refer 1.1 above

3 Level 1

3.1 Car parks

New north car park provides 264 car spaces including 6 accessible parking spaces, and access to SW mall entry via travelators and lift.



Modified west car park provides 192± car spaces. Provide minimum 4 accessible parking spaces, generally complying with AS2890.6, adjacent to east mall entry, travelators & lift.

Recommendations
Accessible parking spaces to comply with BCA and AS2890.1 including ground, vertical and directional signage – refer 1.1 above

3.2 Mall

New east Mall connects north Big W, south Myers and mini major with ramped entries, and east David Jones with new specialty shops fronting the Mall.

Walkways between 12m± wide Mall, majors, voids and car parks have generally 1:34± gradient. South Myer Court includes ramps and walkways with handrails as applicable.

New lifts are located at north Palm Tree car park (2), west centrally at east Starfish car park (1) and south Myer Court (1) – together with goods lifts.

Recommendations
Provide level or ramped access within Mall and retail areas, and complying pedestrian walkways

New and refurbished passenger lifts to comply with the APS including audio announcements, tactile and Braille signage

3.3 Amenities

Amenities are located north adjacent to Woolworths and Big W and south amenities are adjacent to Myers.

Recommendations
Accessible unisex toilets to be adjacent to gender specific toilets and comply with the BCA and AS1428.1 including minimum 1400 clear between WCs and encroachments, WC backrest and shelf

Install one PAD cubicles (to assist people with ambulant disabilities) in each in each gender specific toilet

4 Level 1 Mezzanine

4.1 Car parks

New north car park level provides 196 car spaces, and 69 future stage cars, including 6 accessible parking spaces, and access to SW mall entry via travelators and lift.

Modified west car park provided 220 car spaces. Provide minimum 5 accessible parking spaces, generally complying with AS2890.6, adjacent to east mall entry, travelators and lift.

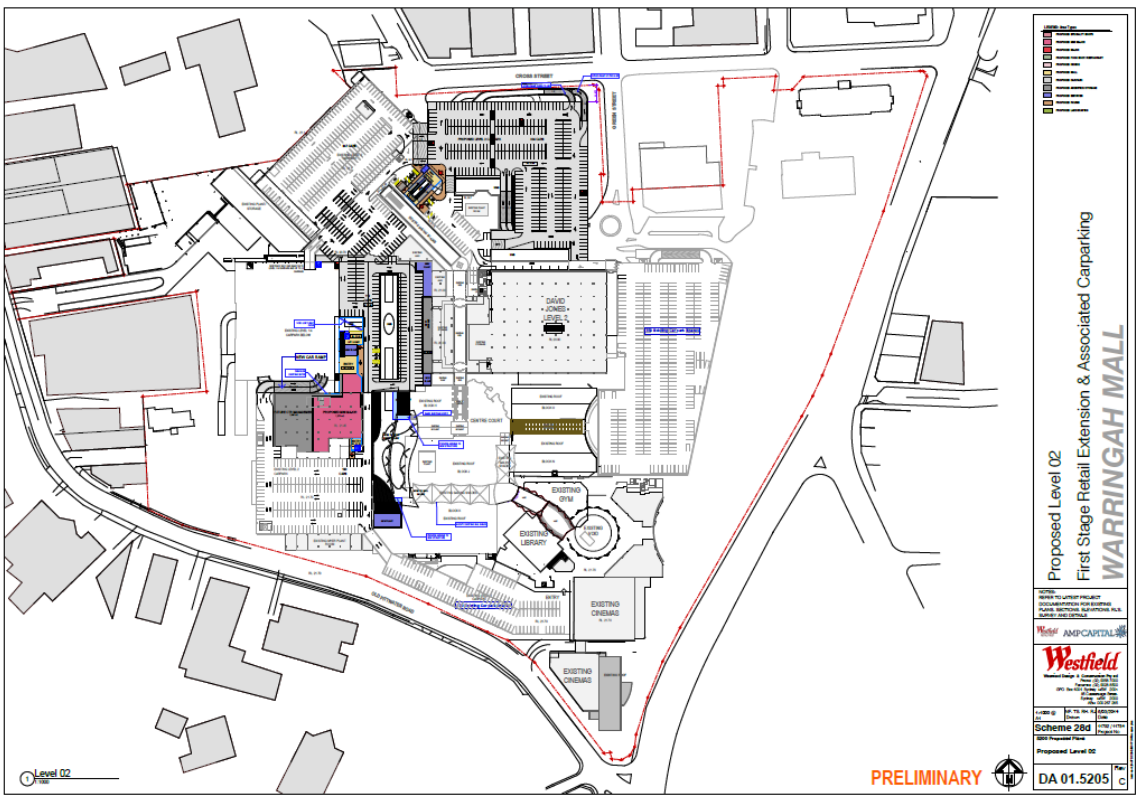
Recommendations
Accessible parking spaces to comply with BCA and AS2890.1 including ground, vertical and directional signage – refer 1.1 above

5 Level 2

Amenities are not provided at Level 2.

5.1 Car parks

New north car park provides 304 car spaces. Provide minimum 7 accessible parking spaces, and access to SW mall entry via travelators and lift.



New and modified west car park provides a total of 288 car spaces, including parallel Mall roof and Myers roof top parking. Provide minimum 6 accessible parking spaces, generally complying with AS2890.6, adjacent to east mall entry, travelators and lift.

Recommendations
Accessible parking spaces to comply with BCA and AS2890.1 including ground, vertical and directional signage – refer 1.1 above

5.2 Mini Major

New central lift and travelators provide access to Ground and Level 1 Mall.

A new Mini Major is located south of the Mall with south frontage lift access to Myer Court at Ground and Level 1.

Recommendations
Provide accessible paths of travel between parking, Mini Major and lift lobbies

New passenger lifts to comply with the APS including audio announcements, tactile and Braille signage

Access Compliance

AA Access Reports provide assessments and recommendations during design, documentation and construction, regarding access to and within the built environment.

Access compliance requires access inspections during construction, to review, assess and report on access compliance or non-compliance. Access Certification and sign-off can be provided on satisfactory resolution and completion of all access related issues.

Appendix G Fire Safety Engineering Report

Defire

Review of fire safety engineering issues for section 96 application

Warringah Mall Extension – Stage 1

Client Westfield Design & Construction

Report number 20070088

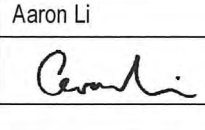
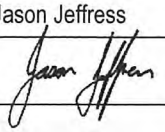
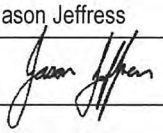
Revision DA1.7

Report issued April 2014

Defire (NSW) Pty Ltd | ABN 30 099 090 089 | T 2 9211 4333 | F 2 9211 4366
Suite 3, Level 4, 83-97 Kippax Street, Surry Hills

Amendment schedule

Version	Date	Information relating to report			
DA1.0	02/12/08	Reason for issue	Report issued to architect, client and BCA consultant.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
		Signature			
DA1.1	05/12/08	Reason for issue	Report updated to include client comments. Report re-issued to architect, client and BCA consultant.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
		Signature			
DA1.1	09/12/08	Reason for issue	Report updated to include minor comments from client. Report re-issued to architect, client and BCA consultant.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
		Signature			
DA1.3	07/05/2013	Reason for issue	Report updated for the section 96 submission and reissued to Westfield.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
		Signature			
DA1.4	03/09/2013	Reason for issue	Report updated due to minor changes to the section 96 drawings and reissued to Westfield.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
DA1.5	22/10/2013	Reason for issue	Report updated based on scheme 28b section 96 drawings and reissued to Westfield.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
DA1.6	11/11/2013	Reason for issue	Report updated based on scheme 28c section 96 drawings and reissued to Westfield.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress

Version	Date	Information relating to report			
DA1.7	15/04/2014	Reason for issue	Report updated based on scheme 28d section 96 drawings and reissued to Westfield.		
			Prepared by	Reviewed by	Approved by
		Name	Aaron Li	Jason Jeffress	Jason Jeffress
					

Executive summary

This report documents the findings of a preliminary fire safety engineering review of the proposed alterations and additions to the existing Warringah Mall shopping complex. The review was undertaken to form part of the section 96 submission.

The intent of the review is to determine whether it is feasible to undertake a fire safety engineering assessment to develop alternative solutions to the deemed-to-satisfy (DTS) provisions of the National Construction Code 2013 Volume One – Building Code of Australia (BCA) for the new works. Defire undertook the review at the request of Westfield Design and Construction.

The existing Warringah Mall shopping centre has a gross lettable area (GLA) of approximately 124,000m^2 located over three storeys and approximately 4500 car spaces. Its main tenants include David Jones, Myer, Target, Big W, Woolworths, Coles, Rebel Sport, JB Hi Fi, Dick Smith Powerhouse and Hoyts Cinema in addition to over 300 specialty stores.

The proposed stage 1 works include alterations to the layout of the existing mall, addition of new specialty tenancies, minor reduction of the existing Myer tenancy and conversion of a portion of the Starfish carpark to retail use. The new works will add approximately 8,000m^2 GLA over three retail storeys and 336 additional carparking spaces over three storeys.

Defire considers that it is possible to develop alternative solutions to the DTS provisions of the BCA related the issues identified within section 5 for the new works demonstrating compliance with the relevant performance requirements of the BCA.

The specific details of the proposed alternative solutions are subject to the development of a comprehensive list of fire safety measures and the outcomes of the required fire safety engineering assessment. These details will be developed as part of the on-going design and development process.

Contents

1. Introduction

This report documents the findings of a preliminary fire safety engineering review of the proposed alterations and additions to the existing Warringah Mall shopping complex. The review was undertaken to form part of the section 96 submission.

The intent of the review is to determine whether it is feasible to undertake a fire safety engineering assessment to develop alternative solutions to the deemed-to-satisfy (DTS) provisions of the National Construction Code 2013 Volume One – Building Code of Australia (BCA)[1] for the new works. Defire undertook the review at the request of Westfield Design and Construction.

2. Description of building

2.1 Building description

The existing Warringah Mall shopping centre has a gross lettable area (GLA) of approximately 124,000m^2 located over three storeys and approximately 4500 car spaces. Its main tenants include David Jones, Myer, Target, Big W, Woolworths, Coles, Rebel Sport, JB Hi Fi, Dick Smith Powerhouse and Hoyts Cinema in addition to over 300 specialty stores.

The proposed stage 1 works include alterations to the layout of the existing mall, addition of new specialty tenancies, minor reduction of the existing Myer tenancy and conversion of a portion of the Starfish carpark to retail use. The new works will add approximately 8,000m^2 GLA over three retail storeys and 336 additional carparking spaces over three storeys.

The proposed works will interface with existing centre on all levels and it is not intended to separate the new works from the existing building.

A description of the main characteristics of the new portions of the centre for the purpose of determining compliance with the BCA is given in Table 1. The proposed use and classification of the building or part in accordance with clause A3.2 of the BCA is described in Table 2.

Characteristic	BCA clause	Description
Effective height	A1.1	Less than 25m
Type of construction required	C1.1	Type A
Rise in storeys	C1.2	Three

Table 1 Main building characteristics

Part of building	Use	Classification (A3.2)
Ground level	Retail and carparking	Classes 6 and 7a
Ground mezzanine level	Carparking	Class 7a
Level 1	Retail and carparking	Classes 6 and 7a
Level 1 mezzanine	Carparking	Class 7a
Level 2	Retail and carparking	Classes 6 and 7a

Table 2 Use and classification

[1] National Construction Code 2013 Volume One – Building Code of Australia, Australian Building Codes Board, Australia, 2013.

2.2 Occupant characteristics

A description of the characteristics of the occupants expected to be within the building is given in Table 3.

Characteristic	Description
Familiarity:	Retail – Occupants are expected to be primarily shoppers who may not be familiar with the layout of the building and location of fire exits. A limited number of staff are also expected to be present which are familiar with the layout of the building. Carpark – Occupants are mainly expected to be primarily shoppers and be within the carpark for short periods.
Awareness:	Occupants are expected to be awake and alert to a potential emergency event such as a fire in the building.
Mobility:	Occupants are assumed to have the same level of mobility as the general population. This may include a limited proportion of mobility impaired occupants. These occupants may require crutches, a wheelchair or similar to evacuate on their own or need assistance from other occupants.
Age:	Occupants of all ages may be present within the building.
Language:	Although occupants may have English as their second language, they are expected to understand signs and verbal instructions in English to the degree necessary to not adversely impact upon evacuation.
Occupant load:	Population densities used in this assessment are proposed to be based upon Project 6 report 'Fire Safety in Shopping Centres' [2] – a. 6 m²/person in individual retail tenancies b. 6 m²/person in mall areas at ground level with direct egress to open space c. 10 m²/person in mall areas on other levels

Table 3 Occupant characteristics

3. Scope and assumptions

- This report is limited to the new works to the Warringah Mall. This report excludes detailed assessment of existing mall areas, specialty shops, major tenancies and carparks. It is to be shown that the current level of life safety for occupants in these areas is not reduced as a result of the proposed works and fire scenarios within the existing centre are to be considered when assessing the level of safety in the new extension.
- The scope of our works is limited to considering evacuation and fire safety issues for people with disabilities to the same degree as the DTS provisions of the BCA.
- This report is limited to compliance with the performance requirements of the BCA for the new works.
- Fire engineering analysis will be in accordance with standard industry practice and the Society of Fire Safety (SFS) Code of Practice.
- The documentation that forms the basis for this report is listed within Appendix A.
- The existing building complies with the applicable building standard at the time of construction except for the alternative solutions in the reports identified within section 4.2.

[2] Fire Safety in Shopping Centres, Project 6, Fire Code Reform Centre (FCRC), Sydney 1998.

4. Preliminary review of design

4.1 Proposed fire safety strategy for new works

The new works are proposed to comply with the performance requirements of the BCA. This will be achieved by a combination of compliance with the DTS provisions of the BCA and alternative solutions where appropriate based upon a fire safety engineering assessment of the design. The fire safety systems are to comply with the current BCA and relevant Australian standards.

The main alternative solutions for the new works relate to the smoke hazard management design and evacuation provisions. As the design is still at an early stage further design development is likely to identify additional minor alternative solutions.

The evacuation and smoke hazard management strategy for the new works is to be consistent with the previous fire safety engineering assessments prepared for the existing centre.

4.2 Review of existing centre

The interface between new works and the existing centre will be designed so that the new building does not reduce the level of safety of the existing centre. As a result the existing centre is not proposed to be upgraded to comply with today's Australian standards nor the current BCA. It is to be demonstrated that the current level of fire safety afforded will not be decreased as a result of the proposed alterations and additions to the centre.

It is understood the development of the original centre commenced in 1963. It included a three storey shopping centre with a multi-deck carpark, specialty shops and a cinema complex.

Two major redevelopments of the mall have occurred from 1997 to 2002. These are referred to as stage 1 and stage 2. It is understood that these stages of works included the following:

Stage 1: The development comprised an expansion of retail floor space to accommodate a new supermarket, a discount department store, a food court, six additional mini majors and approximately 133 additional specialty shops. A refurbishment of the existing retail facilities was also undertaken.

The existing two storey shopping mall between David Jones and the Starfish carpark was rebuilt as a two storey retail arcade and extended to the northwest. The new Woolworths and Big W major tenancies were located to the northwest and a new food court located at the southern end of the new mall.

Stage 2: The existing buildings in the southeast corner of the shopping centre were demolished – including Woolworths which was relocated to the northern mall – and replaced by retail arcade from the centre court area. A new Coles and a first floor food court were developed. Additional carparking was created and the cinema expanded. In addition, a library and community centre was added on level 2.

The existing building has been the subject of previous fire safety engineering assessments by Scientific Services Laboratory (SSL). The major alternative solution reports prepared for the existing centre are listed as follows:

- Report no XR0074/R4 dated August 1997 prepared by SSL. This report was prepared in relation to the stage 1 works.
- Report no XR0165/R2 dated August 1998 prepared by SSL. This report was prepared in relation to the stage 2 works.
- Report no XR0534/R1 dated November 2001 prepared by SSL. This report was prepared in relation to the proposed addition of fabric canopies over the mall.

- We also understand that several minor fire safety engineering assessments have been compiled since completion of the centre.

In addition to the fire safety engineering assessments, a document was also developed for the existing centre setting out the main fire safety measures for the centre and the associated maintenance procedures. This document is known as the 'Warringah Mall Essential Fire Safety Measures Protocol' which was prepared for AMP Henderson Global Investors Limited. The protocol document is to be updated to include the new extension and the associated fire safety measures that will be required prior to completion of the new works and occupation of the building.

The findings of the previous alternative solution reports and the requirements of the essential fire safety measures protocol are not considered to impact upon the fire safety strategy documented within this report for the following reasons:

- The new works are proposed to be contained in smoke reservoirs separated from the existing parts of the building. The new mall areas and major tenancies are to be provided with independent smoke hazard management systems. The smoke hazard management systems in the new mall and major tenancy are to be designed to maintain tenability for occupants to safely evacuate and to limit smoke spread to the existing centre and adjacent smoke zones. In case of fire in the existing centre the smoke hazard management system in the new mall is to be designed to maintain tenable conditions in the new mall areas.
- Adequate aggregate exit widths are proposed to be provided in the new areas based upon the incremental increase in floor area to cater for the additional population created by the extension and thereby not reducing the existing level of safety. The total exit width serving the new mall and specialty shops is to be designed to be equal to the total width of exits required to serve the altered existing areas plus the width required to serve the additional population resulting from the new retail areas.

4.2.1 Consideration of flood evacuation plan

The existing centre is situated in an area that may be subjected to flooding in the event of a 1 in 100 year flood. A flood intervention plan has been developed for the existing centre to evacuate occupants to a place of relative safety. The overall flood evacuation strategy involves directing occupants to the level 1 carpark areas of the shopping centre away from the flooded areas at ground level. The flood evacuation strategy is not considered to impact upon the fire evacuation strategy. It is noted that the flood evacuation strategy will need to be updated as a result of the proposed new works.

5. Review of the main alternative solutions for the new works

5.1 Smoke hazard management and evacuation provisions

The smoke hazard management system in the new retail areas of the shopping centre is proposed to be designed from first principles, based on sprinkler controlled fires, to maintain an adequately smoke-free environment and visibility to allow for the mall to be used as an escape route and a place of relative safety. This is considered to be consistent with the strategy adopted in the fire safety engineering assessments for the existing centre. It is intended to treat the new works as separate smoke exhaust zones and provide separation from the existing systems through smoke baffles near the interface between the new and existing works.

The evacuation strategy for the building will be designed upon the premise that the mall is a place of relative safety and most people will evacuate through it. The major tenancies will form separate smoke zones using fixed baffles / downstands or operable shutters at the mall entrance. This will limit the risk of smoke spread to and from these tenancies and allow occupants to move away from a fire to a place of relative safety in the mall.

Computational fluid dynamics (CFD) modelling will be used to design the mall smoke control system. CFD modelling allows the designer to account for the air movements and three-dimensional aspects of the building design to adequately design the smoke control system and determine the required smoke exhaust capacity and location of extract point to achieve the design objectives for the project.

The available safe evacuation time (ASET) is to be estimated from the CFD modelling and be compared with the required safe evacuation time (RSET) for the occupants within the retail areas. An appropriate safety factor will be applied to account for uncertainties in the input data.

5.2 Travel distances from specialty tenancies

The sprinkler system is expected to limit fire spread to the area of fire origin and reduced the production of heat and smoke. The provision of a sprinkler system is therefore expected to significantly improve and extend the tenability within a specialty tenancy compared to an unsprinklered building which would have identical DTS requirements in relation to maximum travel distances.

The provisions of an automatic sprinkler system – limiting the growth rate and peak fire size – is also considered to reduce the risk of a fire reaching a critical size blocking the escape path and preventing occupants from safely evacuating past the fire out into the mall.

This beneficial impact of automatic sprinkler systems on occupant safety is acknowledged in a range of building codes and fire safety guidelines around the world by – amongst other – allowing an increase in the travel distance to a point of choice or single exit by 30-50% in sprinkler protected occupancies [3,4,5].

Although there is no smoke exhaust provided with individual specialty tenancies smaller than 1,000m^2, the smoke hazard management system in the mall areas is expected to increase the tenability in the mall areas and specialty tenancies by removing heat and smoke produced by a fire.

In addition to this, the open layout of the public sales area of a specialty tenancy – ie no or very limited solid partitions and obstructions – means that the shop entrance is visible from the majority of the tenancy. This will significantly reduce the risk of occupant becoming trapped by a fire before reaching the mall.

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[3] NFPA 101 – Life Safety Code, NFPA, US 2012.
[4] Acceptable solution C/AS1 Part 3: Means of Escape, Compliance Document for New Zealand Building Code Clauses C1, C2, C3, C4: Fire Safety, Department of Building and Housing, NZ, October 2011.
[5] Section 5 – Safety in case of fire, BBR19, BFS 2011-26 (Swedish Building Regulations), 2011.

5.3 Travel distances within the carpark areas

The fire hazards associated with carparks are generally low. International and Australian research have demonstrated that carpark occupancies inherently present a low risk to life safety. In a survey conducted by Harris [6] of 1,233 parking buildings and 105 fires in the US and Canada no fatalities were reported. In a more recent study carried out by Denda [7] of 404 fires in US parking buildings over the period from 1986-1988, no fatalities were reported.

Similarly, in Australia no fatalities have been reported from the fire incident data collected by the Melbourne Metropolitan Fire and Emergency Services Board [8] for carparks during the period between 1991-2000. As stated by the BHP research in to fire safety in carparks [9] – 'Carparks represent little risk to life or of injury, and very low monetary losses, possibly because of a very low frequency of fire starts in this type of building'.

Occupants of the carpark are most likely to be customers of the mall. Although the occupants may be relatively unfamiliar with the carpark, the open layout is considered to significantly simplify the wayfinding required to locate an exit compared to a building with enclosed rooms and corridors.

5.4 Fire ratings

In some areas such as separation between carpark and retail areas the requirements for fire separation will be assessed on a performance basis.

It is intended to demonstrate that the separations proposed between areas are sufficient to protect occupants from a fire based on the active systems provided within the building – ie sprinkler and smoke exhaust systems.

6. Summary of the review

Defire considers that it is possible to develop alternative solutions to the DTS provisions of the BCA related the issues identified within section 5 for the new works demonstrating compliance with the relevant performance requirements of the BCA.

The specific details of the proposed alternative solutions are subject to the development of a comprehensive list of fire safety measures and the outcomes of the required fire safety engineering assessment. These details will be developed as part of the on-going design and development process.

[6] LM Harris 1979, 'Update of the Survey of Fire Experience in Automobile Parking Structures in the United States and Canada', Marketing Research Associates, American Iron and Steel Institute.
[7] Dale F Denda 1992, Parking Garage Fires – A Statistical Analysis of Parking Garage Fires in the US:1986-1988.
[8] MFB Fire Incidents in Parking Complexes 1991-2000, 2002 MFESB.
[9] Fire Safety in Carparks – BHP – February 1992.

Appendix A Drawings and information

Drawing title	Dwg no	Date	Drawn
Proposed ground level	Scheme 28d DA 01.5201 C	08/04/2014	Westfield Design & Construction
Proposed ground level mezzanine	Scheme 28d DA 01.5202 C	08/04/2014	Westfield Design & Construction
Proposed level 1	Scheme 28d DA 01.5203 C	08/04/2014	Westfield Design & Construction
Proposed level 1 mezzanine	Scheme 28d DA 01.5204 C	08/04/2014	Westfield Design & Construction
Proposed level 02	Scheme 28d DA 01.5205 C	08/04/2014	Westfield Design & Construction
Proposed roof plan	Scheme 28d DA 01.5206 C	08/04/2014	Westfield Design & Construction

Appendix H BCA Compliance Statement

30 April 2014 Ref: 064175-03CL

McKenzie Group Consulting (NSW) Pty Ltd
ACN: 093 211 995
Level 6, 189 Kent St, Sydney NSW 2000
Tel: 02 8298 6800 Fax: 02 8298 6899
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Westfield Design & Construction Pty Ltd
85 Castlereagh Street
Sydney NSW 2000

Attention: Renn Holland

Dear Renn,

Re: Warringah Mall redevelopment – Stage 1.
145 Old Pittwater Road, Brookfield

Further to our BCA compliance report dated 11 December 2008, Please note we have reviewed the following architectural drawings prepared by Westfield Design & Construction Pty Ltd, numbered; DA 01.5201, DA 01.5202, DA 01.5203, DA 01.5204, DA 01.5205, DA 01.5206.

It is anticipated that due to the size and nature of the building, there will be alternate solutions that address non-compliances with the deemed to satisfy provisions of the BCA. The alternate solutions will be assessed against the relevant Performance Requirements of the BCA by suitably qualified persons.

Where items for which an alternate solution is prepared relate to Category 2 items under the Environmental Planning & Assessment Regulation 2000, approval will be required by the NSW Fire Brigade as part of the Construction Certificate process.

The review of the design has demonstrated that the proposed works are capable of complying with the BCA.

Yours faithfully

Giby Koonammavu
per
Stephen Natilli
Director
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 995

Appendix I Sustainability Management Statement Warringah

Your ref
Our ref 229734/AMH
File ref ESD

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Renn Holland
Westfield Design and Construction Pty Ltd
85 Castlereagh Street
Sydney NSW 2001

17 March 2014

Dear Renn

Westfield Warringah Mall Extension -
Section 96 Sustainability Management Plan Review

Arup have reviewed the Sustainability Management Plan (SMP) included as part of the Development Application DA2008/1741 to Warringah Council. The updated design documents for the works noted in the DA, as shown in Scheme 28d maintain the intent of the SMP. Some minor amendments are noted below.

- Indoor/Outdoor Environment Quality: The roof geometry has been optimised to improve access to daylight and provide more efficient natural ventilation of the mall space.

Generally, the intent of the Sustainability Management Plan remains unchanged. The overall sustainability outcomes for the development are at minimum equivalent, if not improved based on the current design development.

Yours sincerely

Tim Elgood
Principal

Enc Warringah Council DA2008/1741, Sustainability Management Plan (Rev D, 10 Dec 2008)

Appendix J DCP 2011 Compliance Table

TABLE 1 – WARRINGAH DEVELOPMENT CONTROL PLAN 2011 COMPLIANCE TABLE

CONTROL	COMPLINACE	COMMENT
Built Form		
Design Quality & Excellence	Yes	The redesign of the Palm Tree car park on the northern perimeter of the site has been designed to positively contribute to the Green Street and Cross Street streetscapes. The built form defines the street edge and incorporates strong corner features and high quality contemporary materials. The new parallel fashion mall incorporates a large skylight to provide solar access and natural ventilation into the space.
Building Setback & Street Frontages	No	Setback of the Palm Tree car park to Cross Street is varied and generally consistent with original consent, with the exception of circulation ramps which are proposed to be screened through a contemporary façade treatment. Overall the setback along Green Street varies, with a minor reduction in the setback at the north-western corner of the Palm Tree car park to 5.58m, however at the north-eastern corner the setback has remained unchanged at 11.6m. Accordingly, due to the angle of the car park structure and the façade design incorporating a 'green wall' at this point can achieve the objective of the front setback control and will not adversely impact on the Green Street streetscape. The revised design will result in the removal of external ramps from the Green Street elevation of the car park, providing a greater built form setback and improved landscape strategy. The redesign of the Palm Tree car park incorporates modern façade materials to create a contemporary northern 'gateway'.
Building Height	Yes	The overall height of the Palm Tree car park is RL24.10, and meets the RL25.0 height control.
Floor Space	Yes	The proposed modification will result in the same volume of floor area as originally approved for the Stage 1 works.
Landscaping	Yes	A comprehensive landscape strategy has been incorporated into the streetscape design of the Palm Tree car park. Refer to **Section 6.3** of this report and **Appendix B**.
Amenity of Surrounding Residential Properties	N/A	
Public Art	Yes	The revised Palm Tree façade incorporates modern materials which respond to light and wind, and create a dramatic kinetic wall, incorporating the key elements of

CONTROL	COMPLINACE	COMMENT
		public art.
Advertising & Signage	Yes	Signage zones have been incorporated on the revised plans. However, signage details will be subject to a separate application.
Safety & Security	Yes	Can comply
Social Impacts	Yes	Can comply
Access & Movement	Yes	Refer to **Section 6.2** of this report and the Traffic Report attached in **Appendix D**.
Pedestrian Access	Yes	Pedestrian footpaths are proposed along the perimeter of the proposed works and into the mall in accordance with Figure 11 of the WDCP 2011.
Public Transport	Yes	Can comply and adopts pedestrian paths in accordance with Figure 11 of the WDCP 2011.
Parking Facilities	Yes	Refer to **Section 6.2** of this report and the Traffic Report attached in **Appendix D**.
Stormwater Management	Yes	Refer to **Section 6.4** of this report and the Traffic Report attached in **Appendix C**.
Sustainability	Yes	Refer to the Sustainability Management Statement attached in **Appendix I.**

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