APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

Applicant:	Minister for Health and Wellbeing
Development Number:	292/V002/19 App 4092
Nature of Development:	Construction of an extension to the existing multi-deck carpark building associated with Lyell McEwin Hospital
Type of development:	State Agency Development
Zone / Policy Area:	Suburban Activity Node Zone and Lyell McEwin Health Node Policy Area 23
Subject Land:	Lot 1, Hayward Road, Elizabeth Vale (Allotment 1, FP126908: CT 6171 Folio 913).
Contact Officer:	Sarah Elding
Phone Number:	08 7109 7006
Start Date:	29 May 2019
Close Date:	26 June 2019
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered, faxed or emailed to the State Commission Assessment Panel (SCAP). A representation form is provided as part of this pdf document.

Any representations received after the close date will not be considered.

Postal Address:
The Secretary
State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

Street Address:
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE

Email Address: scapadmin@sa.gov.au
Fax Number: (08) 8303 0753

Government of South Australia

Department of Planning, Transport and Infrastructure

DEVELOPMENT ACT 1993

NOTICE OF APPLICATION FOR CONSENT TO DEVELOPMENT

SECTION 49 – STATE AGENCY DEVELOPMENT

Notice is hereby given that an application has been made by the **Minister for Health** to construct a five level extension to an existing multi-deck carpark associated with the Lyell McEwin Hospital. **Development Number 292/V002/19.**

The subject land is situated within the existing Lyell McEwin Hospital complex, with the multi-deck carpark located on the corner of Mark and Trembath Roads, Elizabeth Vale, (being Allotment 1, FP126908: CT 6171 Folio 913).

The development site is located within the Suburban Activity Node Zone and Lyell McEwin Health Node Policy Area 23 of the Playford Council Development Plan (Consolidated 27 June 2017).

The application may be examined during normal office hours at the office of the State Commission Assessment Panel, Level 5, 50 Flinders Street, Adelaide and at the office of Playford Council Civic Centre, 10 Playford Boulevard, Elizabeth. Application documentation may also be viewed on the State Commission Assessment Panel (SCAP) website: www.saplanningcommission.sa.gov.au/scap/public_notices

Any person or body who desires to do so may make representations concerning the application by notice in writing delivered to the Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide 5001 by **NO LATER THAN 26 June 2019.** Submissions can also be emailed to: scapreps@sa.gov.au [Please note individual emails and attachments should not be more than 5MB in size].

Each person or body making a representation should state the reason for the representation and whether that person or body wishes to be given the opportunity to appear before the SCAP to further explain the representation.

Submissions may be made available for public inspection.

Should you wish to discuss the application and the public notification procedure please contact **Sarah Elding** on **(08) 7109 7006.**

Alison Gill
SECRETARY
STATE COMMISSION ASSESSMENT PANEL

PN3843

www.sa.gov.au

PN3843
21x2 (63mm)
North Weekly Messenger
Adelaide Advertiser
Wednesday 29 May 2019
APPROVAL REQUIRED BY 4PM THURSDAY 23 MAY 2019

DEVELOPMENT ACT, 1993
S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Minister for Health and Wellbeing
Development Number:	292/V002/19 App 4092
Nature of Development:	Construction of an extension to the existing multi-deck carpark building associated with Lyell McEwin Hospital
Zone / Policy Area:	Suburban Activity Node Zone and Lyell McEwin Health Node Policy Area
Subject Land:	Lot 1, Haydown Road, Elizabeth Vale (Allotment 1, FP126908: CT 6171 Folio 913)
Contact Officer:	Sarah Elding
Phone Number:	08 7109 7006
Close Date:	26 June 2019

My name:_____

My phone number: _____

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address:_____

_____Postcode_____

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

My interests are:
[ ] owner of local property
[ ] occupier of local property
[ ] a representative of a company/other organisation affected by the proposal
[ ] a private citizen

The address of the property affected is .....Postcode.....

The specific aspects of the application to which I make comment on are: .....

.....

.....

.....

.....

.....

.....

I
[ ] wish to be heard in support of my submission
[ ] do not wish to be heard in support of my submission
(Please tick one)

by
[ ] appearing personally
[ ] being represented by the following person : .....
(Cross out whichever does not apply)

Date: ..... Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapadmin@sa.gov.au

SECTION 49 & 49A – CROWN DEVELOPMENT
DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: CITY OF PLAYFORD

APPLICANT: MINISTER FOR HEALTH

ADDRESS: CITI CENTRE BUILDING
11 HINDMARSH SQ. ADELAIDE

CROWN AGENCY: SA. HEALTH

FOR OFFICE USE

DEVELOPMENT No: _____

PREVIOUS DEVELOPMENT No: _____

DATE RECEIVED: / /

CONTACT PERSON FOR FURTHER INFORMATION

Name: SCOTT SUTER

Telephone: 84311144 [work] 0414 324409 [Ah]

Fax: _____ [work] _____ [Ah]

Email: ssuter@cheesman.com.au.

☐ Complying	Decision: _____
☐ Merit	Type: _____
☐ Public Notification	Finalised: / /
☐ Referrals	

NOTE TO APPLICANTS:

(1) All sections of this form must be completed. The site of the development must be accurately identified and the nature of the proposal adequately described. If the expected development cost of this Section 49 or Section 49A application exceeds $100,000 (excl. fit-out) or the development involves the division of land (with the creation of additional allotments) it will be subject to those fees as outlined in Item 1 of Schedule 6 of the *Development Regulations 2008.* Proposals over $4 million (excl. fit-out) will be subject to an advertising fee. (2) Three copies of the application should also be provided.

	Decision required	Fees	Receipt No	Date
Planning:				
Land Division:				
Additional:				
Minister's Approval				

EXISTING USE: MULTI-DECK CARPARK AT THE LYELL McEWIN HOSP.

DESCRIPTION OF PROPOSED DEVELOPMENT: 5 LEVEL HORIZONTAL EXTENSION TO THE WESTERN SIDE OF THE EXISTING MULTI-DECK CARPARK

LOCATION OF PROPOSED DEVELOPMENT: LYELL McEWIN HOSPITAL Lot 1 Hamdam

House No: _____ Lot No: ____ Street: MARK ROAD Town/Suburb: ELIZABETH VALE

Section No [full/part] _____ Hundred: _____ Volume: 5231 Folio: 323

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

LAND DIVISION:

Site Area [m²] _____ Reserve Area [m²] _____ No of existing allotments _____

Number of additional allotments [excluding road and reserve]: _____ Lease: **YES** ☐ **NO** ☐

DEVELOPMENT COST [do not include any fit-out costs]: $ 8.3M

POWERLINE SETBACKS: Pursuant to Schedule 5 (2a)(1) of the *Development Regulations 2008,* if this application is for a building it will be forwarded to the Office of the Technical Regulator for comment unless the applicant provides a declaration to confirm that the building meets the required setback distances from existing powerlines. The declaration form and further information on electricity infrastructure and clearance distances can be downloaded from sa.gov.au.

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the *Development Act 1993* and meet the requirements for lodgement under s.49 of the Development Act 1993.

SIGNATURE: _____ Dated: 08/04/2019

Cheesman Architects

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Kensington
South Australia 5068
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F 08 8331 9442
E info@cheesman.com.au
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ABN 90 008 154 407 ACN 008 154 407

Architecture
Interior Design
Master Planning
Urban Design
Landscape Architecture
Facilities Planning

08 April 2019

Mr. Simon Neldner
Department of Planning Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE, 5000

Dear Sir,

Lyell McEwin Hospital Redevelopment
Proposed Extension to the existing Deck Car Park Building
Development Plan Consent

Pursuant to Section 49 of the Development Act 1993 please find attached details of the proposed new extension to the existing Deck Carpark Building on the LMH site which are hereby submitted on behalf of the Department of Health and Northern Adelaide Local Health Network for Development Plan Consent.

We provide 3 bound coloured copies of the submission, a traffic report prepared by Frank Siow, an Arborist Report, Stormwater Management Report and a completed application form.

The estimated construction cost for this stage of the development is $8.5 million.

The proposed development is planned for commencement of construction in the last quarter of 2019. We would certainly appreciate any assistance available to complete the assessment of this submission with this timeframe in mind.

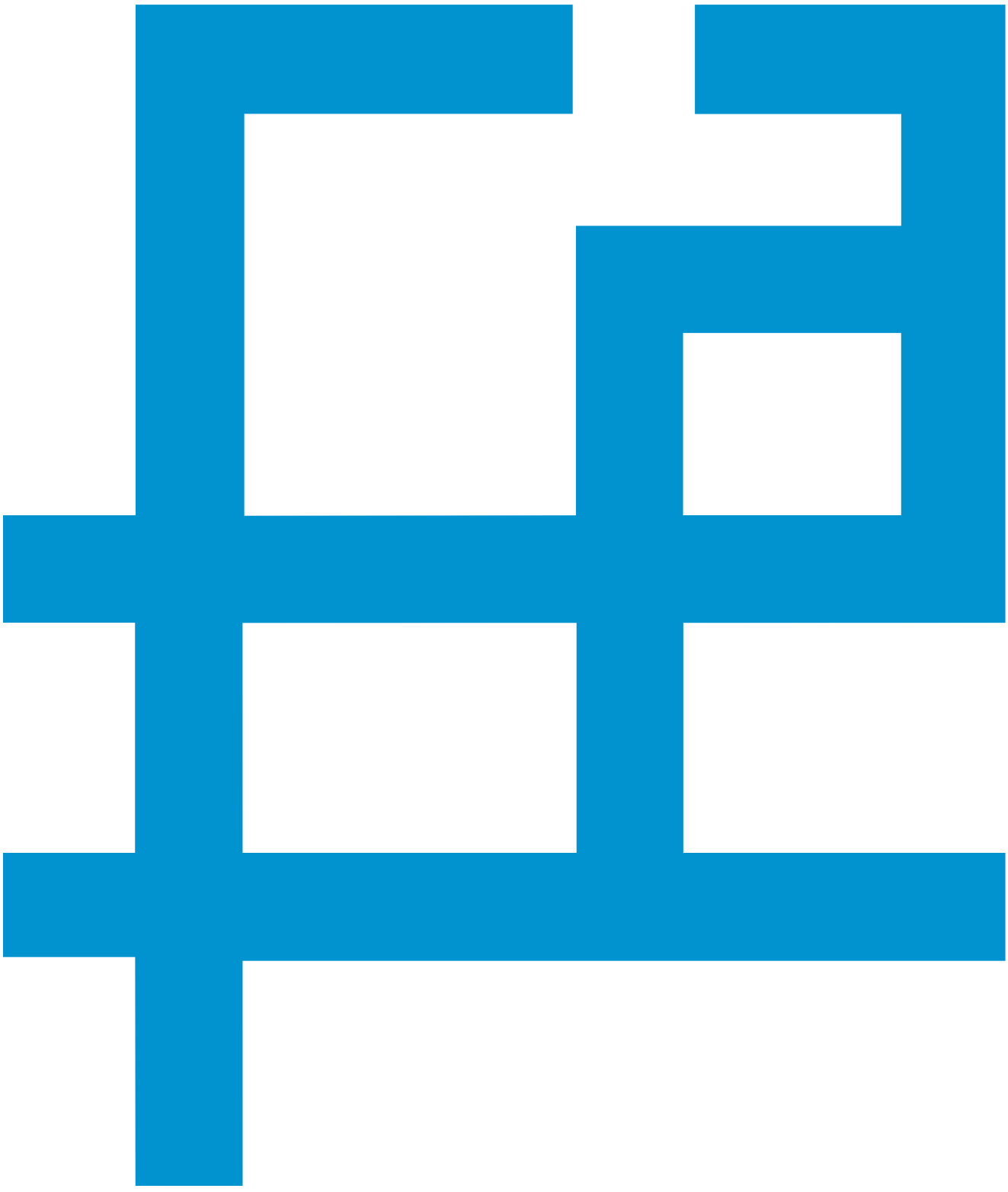
Initial discussions have occurred with the South Australian Metropolitan Fire Service to discuss the project and in principal support has been verbally provided.

Please do not hesitate to contact me should you have any queries in relation to the attached.

Yours sincerely

Scott Suter
Principal

Cheesman Architects



Cheesman Architects

Lyell McEwin Hospital
Multi-Deck Car Park Extension

Development Assessment Report

17192
08 April 2019

Contents

Proposed Development - Overview and Objectives

Multi-deck Carpark Extension - Development Background and Objectives

In 2017 the State Budget approved the redevelopment of the Lyell McEwin Hospital Emergency Department. This project represented the second of 2 phases of work for the redevelopment, the first being some internal refurbishment. This phase of work includes the provision of approximately 2880sqm of additional floor area consisting of;

- Level 1 (ground) - addition to existing clinical spaces
- Level 2 - new emergency administration accommodation and central plant
- Level 3 – 8 bed Short Stay Mental Health Unit.

During the Concept Design it became clear that the project would have both a direct and indirect impact on existing site car parking that would need to be addressed. The footprint of the proposed new build would displace approximately 81 existing car park spaces and as per the advice received from the Traffic Consultant, would generate an additional demand of 115 spaces.

Following the above advice, the client directed the team to investigate how the project could best accommodate the 196 carparks spaces (displaced and generated) and the final agreed solution was for an extension to the existing Multi-deck Carpark.

Multi-deck Carpark Extension

Located in the South West corner of the Lyell McEwin Site is the existing Multi-Deck Car Park (1 half level below ground and 5 levels above ground) that accommodates 1,249 spaces and 120 bike parks. Access to the car park is off Mark Road via two off entry lanes and 2 off exit lanes both with associated Car Parking Control devices. Vertical transportation is provided by 4 off Fire Isolated Stair Cases and 2 off lifts. The rainwater that falls on the existing carpark roof is captured, treated and used on site, with only extreme weather events resulting in overflow from the existing rainwater tanks to a detention basin on the western side of the building.

The proposed new carpark is a horizontal extension to each of the 5 above ground levels on the western elevation and will provide an additional 205 carparks. No new vertical transportation or firefighting infrastructure will be required, instead the extension will make use of the existing provisions. The proposed new extension will be built over the top of the existing detention basin allowing it to continue to function unaffected.

Development Programme/Timeframe

The different design and documentation progress of the Multi-deck Car Park and the Main ED Redevelopment project along with the different approval pathways for each, will allow possible early commencement of the construction of the carpark relative to the ED. This will help minimise construction activities on site with only a small overlap of construction.

At time of writing this report it is proposed that the Multi-Deck Car Park extension will commence construction in the last quarter of 2019.

Proposed Development – Site Details

Development Location & Site Details

The planned facility is located on the existing site of the Lyell McEwin Hospital. The identified site is in keeping with the preferred site development strategy of the site developed during Stage A in 2000 and subsequently reviewed and updated in Stages B and C.

Site Address

Lyell McEwin Hospital, Mark Road, Elizabeth Vale, South Australia, 5112

Existing Conditions & Development

The proposed development is located on the Western side of the site adjacent to the corner of Mark and Trembath Road.

Topography & Vegetation

The site topography is characterised by an existing detention basin with low level plantings of native grasses and sedges and some exotic and native trees. Two egress paths from the existing fire isolated stairs straddle the site to the north and south and make their way from the existing building to the site boundary via a small flight of external stairs.

The western side of the existing Multi-deck Car Park is approximately 1.5m below the natural ground level on the Mark Road Boundary

Existing Site Development

The Lyell McEwin Hospital is one of South Australia's three major acute hospital sites with significant specialised and post-disaster roles within the overall health system.

The majority of the existing site is comprised of single and double storey construction with very little remaining undeveloped land. The two exceptions to this are the subject site and the existing plaza carpark.

Siting Rationale

In keeping with the masterplan strategies developed for the site and in recognition of the lack of future potential development opportunities, it was decided that the logical location for the new carpark would be an extension to the existing Multi-deck facility. This siting provided the following advantages;

- Construction could occur with minimal impact on the existing parking facility.
- Construction could occur simultaneously with the ED works whilst maintaining the vast majority of the existing Plaza Car Park
- Future potential development opportunities close to the existing main entry not closed out.
- The duplication of carpark management devices, road crossovers, vertical circulation etc are avoided by utilising those already provided by the existing carpark.

Proposed Development - Description

Proposed Development Use

It is proposed that Multi-deck Car Park extension will be utilised largely by long term staff parking, freeing up spaces closer to the main vehicular and pedestrian vertical transportation nodes for casual public parking.

The proposed development intended is consistent with the planning objectives of the City of Playford Development Plan for the site.

Proposed Development Elements

The proposed development encompasses the following key components and elements:

A new five level Multi Deck Car Park in the South-Western corner of the Lyell McEwin site of encompassing:

- A nett increase of 205 new car park spaces. Appropriate disabled car park / secure bicycle parking provisions are accommodated within the existing building in closer proximity to the carpark entry and circulation nodes.
- Access will be via the existing carpark circulation ramps with 3 off existing spaces on each level deleted to provide access to the new extension.
- Car Parking control devices (such as boom gates / ticket machines) to manage parking control are currently in use and the extension will not require additional installations.
- Roof to the top floor with collection of the rainwater reticulated to the existing harvesting/ reuse infrastructure.

New soft landscaping to general environs of the new building works.

- Temporary works as required to facilitate contained, safe and effective construction of the planned works with minimal disruption and inconvenience to neighbouring functions on the hospital site and the nearby area.
- On completion of the work it is proposed that the native sedges and grasses removed during construction are replaced and the existing irrigation where affected by the works are made good.

New Building Architectural Form & Materials

The proposed multi-deck carpark comprises a five-level decked configuration with a roof to the top floor. The general architectural language of the building looks to continue with that already developed for the existing building. This comprises of red brick with feature contrasting banding on the main corners of the building acting as a counterpoint to the galvanised and powdercoated finish to the main framing and perforated screening.

The main framed screen panels are faced with powder coated aluminium “picperf” screens that change in aperture frequency and openness, with the most dense pattern employed at the lower headlight zone, whilst still providing enough overall openness so as to not impact on the natural ventilation requirements of the building.

The screen cladding is terminated above the ground creating an underlining shadow appearance. In addition by terminating the cladding well below the eaves line, a strong shadow -line or floating roof effect is achieved.

Environmentally Sustainable Development

The South Australian Government Department of Health and Ageing has a demonstrated commitment to the incorporation of industry-leading ESD principles in health building design and construction.

The government of South Australia were an early financial partner of the Green Building Council of Australia (GBCA) for the development of a'Greenstar' design rating tool for health buildings in Australia.

Recent completed projects at FMC, Noarlunga, TQEH, Modbury and Lyell McEwin Hospital sites are amongst the greenest health facilities in Australia in terms of construction and on-going operation. Most recent projects at FMC and Noarlunga achieved a national 5 star Greenstar rating, whilst the previous Stage C work at LMH achieved an unprecedented 6 star rating.

In recent times SA Health has developed its own IGRAT (Inhouse Green Rating Assessment Tool) for rating health buildings which builds upon the GBCA tool experience to achieve higher relevant outcomes which far exceed regulatory and standard industry practice levels.

The proposed Multi-deck Carpark has been designed and will be constructed and operated to exceed the requirements of a 5 star IGRAT rating.

The proposed development will incorporate significant ESD initiatives including the below noted items;

- Material selection based on minimising long-term life-cycle environmental consequences including maintenance requirements
- Minimising energy usage by effective use of natural lighting and ventilation
- Cladding on the western façade of the existing building to be carefully removed and reused on the western façade of the new building.
- Siting and planning of the building to make use of the existing fire isolated staircase and lifts.
- Minimising ongoing utilisation of energy and resources through use of highly efficient systems and practices which minimise use and maximise recycling of resource inputs
- Construction methodology and practices shall minimise environmental impact and support the building lifecycle objectives
- The new development is designed and constructed to facilitate alternative sources of energy without destructive modification including the engineering of the roof structure to support the installation of photovoltaic cells.
- The new development will encourage use of alternative transport including bicycles through provision of bike parking.
- Minimise the discharge rate of stormwater into the existing council infrastructure through the capture, treatment and reuse of rainwater and the retention of the existing detention basin.
- Minimise the use of power by the use of LED lighting.
- Portland cement reduced by 30% with 50% recycled water content.
- Use of steel with recycled content.
- Minimising intra-carpark travel by demarking the extension as long-term staff parking only.

Landscaping

Existing Trees

The proposed development will require the removal of several trees from the site but only two off are classified as Regulated. No Significant trees will require removal. Please refer to the attached Arborist Report prepared by Arborcare in Appendix D.

New Landscaping

On the completion of the works the existing sedges, grasses and irrigation removed from the site as a result of the construction activities will be reinstated.

Transport

The proposed development encompasses new transport elements to enable effective access to the new health services being located on the LMH site and to improve pre-existing transport arrangements on the hospital site.

The transport provisions associated with the proposed development are detailed by a traffic engineering assessment report prepared by Frank Siow and Associates and is contained by APPENDIX B of this document.

Key aspects of the proposed development encompass the following;

Pedestrian Access

Existing pedestrian access from the existing LMH Main Building complex to the Multi-deck carpark is largely undercover. DDA compliant pedestrian connections are also provided from to the Main Building from the carpark.

The siting of the main vertical transportation nodes have been located in consideration of the longer term site masterplan initiatives. This includes a future fully enclosed pedestrian bridge link to future expansion zones of the site that will alleviate potential public/ staff circulation clashes.

Bicycle Access

The new development is well served by an existing high-level secure bicycle storage facility adjacent to the main carpark pedestrian entry and support facilities including change facilities and showers to encourage increased use of bicycles

Parking Areas

The design, layout and capacity of the proposed new multi-deck carpark and associated access roads has been determined in order that:

- The number of parking spaces fully replaces existing on-grade parking spaces displaced by the new development
- The carpark provides new additional spaces that exceed the demand generated by the proposed development

Construction Considerations

The proposed development will be constructed on the site of an operational acute hospital and near other properties. The proposed development zone has been selected to intentionally provide separation between the new buildings and existing buildings on the campus and other nearby sites to assist in the effective management of potential construction phase issues.

The construction will be undertaken with strict environmental control measures implemented to ensure that noise, dust and other potentially disruptive aspects of construction are managed and minimised. Dust is a significant challenge to hospital infection control and accordingly measures to minimise dust at point of generation and control movement will be implemented.

The standards required in a hospital environment exceed those normally determined to be acceptable in other development environments.

Measures will also be implemented to prevent transfer of soil and spill from the site onto adjacent roads by vehicles leaving the site in accordance with industry best-practice.

Places of Historical Significance

Review of the Playford City Council Development Plan historical register indicates that there are no items of local or state historical significance on the sites of the proposed development or on adjacent sites.

Contamination

Assessment of site history and desk-top assessment of physical evidence from recent developments in proximity to the proposed development area indicates minimum likelihood of site contamination. Standard industry monitoring and management requirements will be implemented during the construction process.

Stormwater Management

A Site Stormwater Management Plan report has been prepared by Wallbridge Gilbert Aztec which details the proposed stormwater works associated with the proposed development and is contained by APPENDIX C of this document.

Appendix A

Copy of Development Application Form

SECTION 49 & 49A – CROWN DEVELOPMENT
DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: CITY OF PLAYFORD

APPLICANT: MINISTER FOR HEALTH

ADDRESS: CITI CENTRE BUILDING
11 HINDMARSH SQ. ADELAIDE

CROWN AGENCY: SA HEALTH

FOR OFFICE USE

DEVELOPMENT No: _____

PREVIOUS DEVELOPMENT No: _____

DATE RECEIVED: / /

CONTACT PERSON FOR FURTHER INFORMATION

Name: SCOTT SUTER

Telephone: 84311144 [work] 0414 324409 [Ah]

Fax: _____ [work] _____ [Ah]

Email: ssuter@cheesman.com.au.

☐ Complying	Decision: _____
☐ Merit	Type: _____
☐ Public Notification	Finalised: / /
☐ Referrals	

NOTE TO APPLICANTS:

(1) All sections of this form must be completed. The site of the development must be accurately identified and the nature of the proposal adequately described. If the expected development cost of this Section 49 or Section 49A application exceeds $100,000 (excl. fit-out) or the development involves the division of land (with the creation of additional allotments) it will be subject to those fees as outlined in Item 1 of Schedule 6 of the *Development Regulations 2008.* Proposals over $4 million (excl. fit-out) will be subject to an advertising fee. (2) Three copies of the application should also be provided.

	Decision required	Fees	Receipt No	Date
Planning:				
Land Division:				
Additional:				
Minister's Approval				

EXISTING USE: MULTI-DECK CARPARK AT THE LYELL McEWIN HOSP.

DESCRIPTION OF PROPOSED DEVELOPMENT: 5 LEVEL HORIZONTAL EXTENSION TO THE WESTERN SIDE OF THE EXISTING MULTI-DECK CARPARK

LOCATION OF PROPOSED DEVELOPMENT: LYELL McEWIN HOSPITAL

House No: _____ Lot No: ____ Street: MARK ROAD Town/Suburb: ELIZABETH VALE

Section No [full/part] _____ Hundred: _____ Volume: 5231 Folio: 323

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

LAND DIVISION:

Site Area [m²] _____ Reserve Area [m²] _____ **No of existing allotments** _____

Number of additional allotments [excluding road and reserve]: _____ **Lease:** **YES** ☐ **NO** ☐

DEVELOPMENT COST [do not include any fit-out costs]: $ 8.3M

POWERLINE SETBACKS: Pursuant to Schedule 5 (2a)(1) of the ***Development Regulations 2008,*** **if this application is for a building it will be forwarded to the Office of the Technical Regulator for comment unless the applicant provides a declaration to confirm that the building meets the required setback distances from existing powerlines. The declaration form and further information on electricity infrastructure and clearance distances can be downloaded from sa.gov.au.**

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the *Development Act 1993* and meet the requirements for lodgement under s.49 of the Development Act 1993.

SIGNATURE: _____ Dated: 08/04/2019

Appendix B

Traffic Engineering & Transport Report

FRANK SIOW & ASSOCIATES

Traffic and Parking Consultants

P.O. Box 253
Kensington Park SA 5068
Tel: (08) 8364 1351
Email: frank@franksiow.com.au

9 April 2019

Mr Scott Suter
Cheesman Architects
304 The Parade
KENSINGTON SA 5048

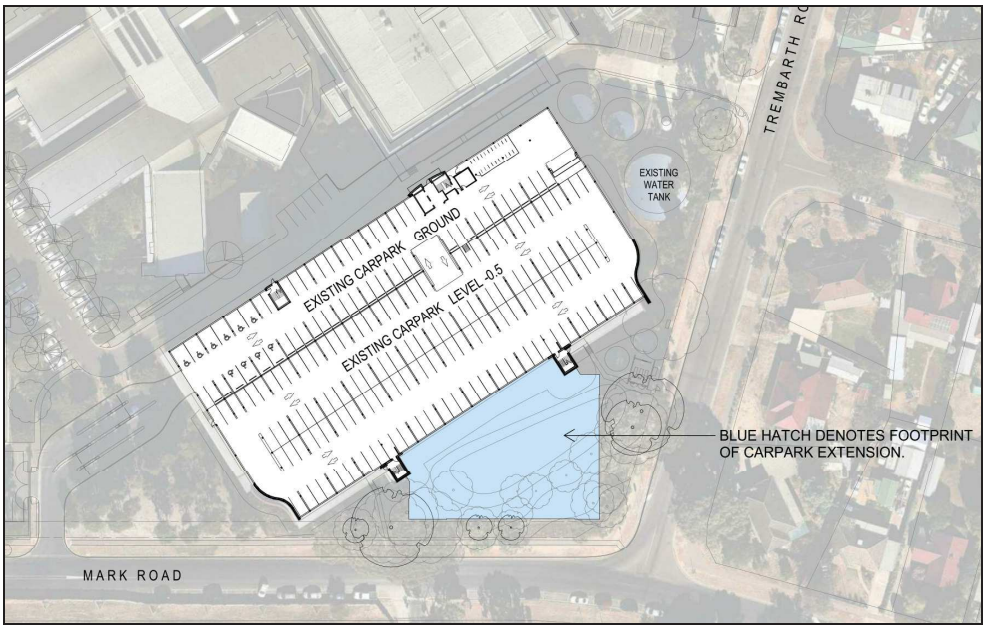
Dear Mr Suter,

LYELL McEWIN HOSPITAL (LMH) CAR PARK EXTENSION TRAFFIC AND PARKING ASSESSMENT

As requested, we have undertaken a traffic and parking assessment of the proposed Lyell McEwin Hospital (LMH) car park extension.

1.0 BACKGROUND

The current LMH multi-storey car park has 1,249 parking spaces, spread over the ground level and 5 levels above. It is a car park that is used by staff and visitors to the hospital. The multi-storey car park has been operating for a number of years. The proposed car park extension is identified in the Site Plan below.



Site Plan

The car park extension is proposed as part of the staging plan to increase parking at the site, which would then allow new facilities and buildings to be constructed at the main hospital site, in accordance with the Master Plan developed for the hospital site.

More particularly, it is envisaged that the next stages of the LMH Master Plan would involve additions to the Emergency Department (ED), the Mental Health Short Stay Unit (MHSSU) and redevelopment of the Ambulance facilities. These new buildings and facilities would encroach into the at-grade car park of the main hospital site and would result in the loss of car parking.

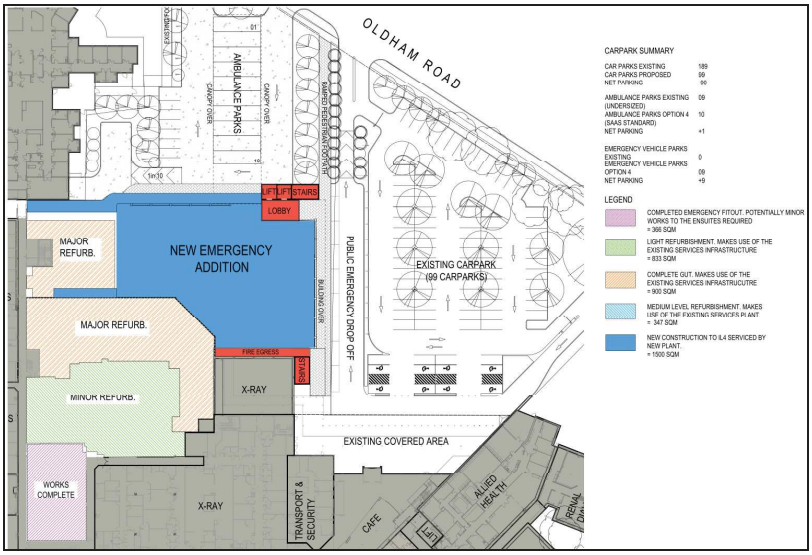
The proposed extension to the multi-storey car park would therefore replace the parking spaces affected by the new developments and would also provide additional new parking that would support the additional developments on the hospital site.

The next stages of the development, ie the Emergency Department/ Mental Health Short Stay Unit and redevelopment of the Ambulance facilities, would be the subject of future separate development applications to the relevant planning authority.

The proposed car park extension comprises of 45 new spaces added per level to the existing car park from Level 1 to Level 5. To accommodate the aisleways for the extended parking areas, 4 spaces of the existing car park would be removed for each level. The extension would add 205 new parking spaces overall to the hospital site.

2.0 PRELIMINARY PARKING ASSESSMENT OF FUTURE DEVELOPMENTS

While the new buildings for the hospital site would be the subject of separate future development applications to the relevant planning authority, we provide a brief overview of the future proposals below to assist in describing the planning and parking context associated with the car park extension.



Indicative concept only

We are advised that the above developments associated with the ED, MHSSU and Ambulance facilities would potentially add approximately 2,880m2 to the floor area of the hospital site. The indicative concept also shows that the new developments would potentially result in a net loss of 81 parking spaces to the existing at-grade car park in Oldham Road.

The hospital site is located in the *Suburban Activity Node* (SAN) zone of the Playford Council. The applicable parking rates for medical type land uses listed in Table Play/3 are:

- Consulting room in SAN zone - 5 spaces per 100m2 floor area
- Hospital in SAN zone - 4 spaces per 100m2

As the future proposals involve an expansion to the existing hospital, we are of the opinion that the hospital parking rate of 4 spaces per 100m2 would be appropriate for assessing the parking requirement.

The LMH enjoys long-standing use as a hospital land use on the subject site. The proposed development represents only a minor increase in floor area, compared to the overall floor area of the existing hospital.

In our experience, we believe that existing use rights would be applicable for the existing hospital. In this regard, we are of the opinion that the parking assessment should have regard only to the net increase in floor areas.

The parking implications would be as follows:

- Net increase in floor area – 2,880m2 (estimate only)
- Net loss of parking spaces – 81 spaces to be replaced elsewhere (estimate only)
- Parking required for new floor area – 2,880m2 @ 4 spaces per 100m2 = 115 spaces
- **TOTAL PARKING REQUIRED 81+115 = 196 spaces**

The proposed extension to the LMH multi-storey car park would result in approximately 205 new parking spaces provided on the hospital site, which would exceed the requirement (preliminary estimate) to support the new developments and to replace the loss of car parking from the at-grade car park.

3.0 PRELIMINARY ESTIMATES OF TRAFFIC IMPACT

In preliminary traffic analysis work that we had undertaken for the developments associated with the ED, MHSSU and Ambulance facilities (see details in Section 2.0), we had also collected peak hour traffic counts (morning and afternoon periods) at the junctions of John Rice Avenue/Haydown Road, John Rice Avenue/Trembath Road and John Rice Avenue/Mark Road in September/October 2018.

The traffic counts were then used in the traffic impact analyses (SIDRA analyses) for these junctions, to compare the existing conditions with the future conditions when the developments are completed.

3.1 Trip rates

The peak hour trip rates adopted were based on the DPTI standard and also previous DPA work that we had undertaken for Playford Council for the LMH Precinct.

1) DPTI *Trip generation rates for assessment of development proposals*
   - Hospital land use: Weighted average 2.31 trips per hour per bed (Peak hour)

2) Previous DPA traffic analysis work for Playford Council
   - Medical clinic/consulting rooms: 5 trips per hour per 100m2 (Peak hour)

3.2 Assumptions of trip distribution for the LMH precinct

The trip distribution adopted was based on our previous DPA work that we had undertaken for Playford Council for the LMH Precinct.

1) Previous DPA traffic analysis work for Playford Council
   - Trips not using John Rice Avenue: 50%
   - Trips to and from John Rice Avenue: 50%
     Trip splits: 30% Haydown Rd; 10% Trembath Rd; 10% Mark Road

3.3 Estimated peak hour trips generated

- Additional new beds: 40 (estimated)
- Additional new beds MHSSU: 8 beds (estimated)
- Peak hour trips generated based on DPTI model: 110 vph
- Peak hour trips based on previous DPA model (2,880m2 floor area increase): 144 vph
- Average of the two models: 127 vph

3.4 SIDRA analyses

The SIDRA analysis was based on:

- Turning counts of traffic flows at the junctions collected in September/October 2018
- Future traffic flows added to existing traffic flows

JOHN RICE AVENUE/HAYDOWN ROAD JUNCTION

Degree of saturation*	AM peak	PM peak	Comment
Existing flows	0.417	0.491	
With LMH Proposal	0.459	0.616	Extg junction can operate satisfactorily

*a junction is considered to be operating at or close to capacity when the degree of saturation >0.85- 0.9

JOHN RICE AVENUE/TREMBATH ROAD JUNCTION

Degree of saturation*	AM peak	PM peak	Comment
Existing flows	0.234	0.392	
With LMH Proposal	0.236	0.429	Extg junction can operate satisfactorily

*a junction is considered to be operating at or close to capacity when the degree of saturation >0.85- 0.9

JOHN RICE AVENUE/MARK ROAD JUNCTION

Degree of saturation*	AM peak	PM peak	Comment
Existing flows	0.193	0.556	
With LMH Proposal	0.196	0.592	Extg junction can operate satisfactorily

*a junction is considered to be operating at or close to capacity when the degree of saturation >0.85- 0.9

The assessment above indicates that the existing junctions can operate satisfactorily with the future traffic flows, without any major upgrade work required to the junctions.

4.0 CAR PARK LAYOUT

Four (4) existing parking spaces per level would be removed to allow a new aisleway to be provided to service the extended car park.

Table 1.1 of *AS/NZS 2890.1-2004* refers to hospital parking as being of User Class 3. FIGURE 2.2 of *AS/NZS 2890.1-2004* identifies User Class 3 as requiring 2.6m wide spaces and serviced by a minimum aisleway width of 5.8m.

We understand that there are significant complexities and constraints to be considered when undertaking extension work to an existing multi-storey car park and, during the design process, the following issues were considered:

- The constraints of the site, the limited space available for extension and the need to meet clearance requirements with existing floor to floor heights are best dealt with by repeating the existing grid spacing and parking widths.
- The re-use of elements of the existing carpark is possible if the grid spacing is repeated.
- The aisle widths provided of 6.1m are greater than the minimum set out in the standard and allow for enhanced manoeuvrability, notwithstanding the reduced space width.
- The majority of parking in the existing carpark is undertaken by staff and would be considered long-term, which would only require a 2.4m space width.
- Parking spaces in the extension are best suited for staff given the distance of the extension from the main entrance and there is potential for the hospital to manage the use of these spaces, therefore the 2.5m space width would comply with the parking standard for this category of users.

As a consequence of these factors, we understand that the parking space width for the extended car park would be kept at 2.5m, notwithstanding that the parking standard (*AS/NZS 2890.1-2004*) identifies the User Category as requiring 2.6m wide spaces.

In response, we make the following comments:

- If the parking spaces for the proposed extension were to be for 'staff' parking only, the proposed 2.5m space width and 6.1m aisleways would exceed the requirements of *AS/NZS 2890.1-2004*.

- If the parking spaces for the proposed extension were to be for hospital 'visitor' parking, the proposed 2.5m space width would not comply with the requirement of *AS/NZS 2890.1-2004*, however, the 6.1m aisleway width would exceed the requirement.

Accepting that the proposed design dimensions are to be remain for the design reasons stated previously, there would appear to be two potential options to enable the proposed parking layout to comply with *AS/NZS 2890.1-2004*:

1. Allocate the new parking spaces for 'staff' parking. We note that the proposed layout has only one 'entrance' to the new parking spaces for each level. It would then be relatively easy to install signage at the 'entrance' to advise that this part of the car park is for 'staff' parking only. It is not unreasonable or uncommon to allocate parking spaces that are furthest away from the building for use as staff parking.

2. Adjust the line marking to provide a mix of SMALL CAR space (2.3m width) and two standard 'visitor' spaces (2.6m width). This would fit within the proposed column to column grid spacing of 7.5m. That is, without altering the grid spacing, it would be possible to make the parking spaces

comply with *AS/NZS 2890.1-2004*. We would estimate that for each level, there would be 10 SMALL CAR spaces resulting, which would total approximately 50 spaces overall. Over the entire LMH car park of approximately 1,454 spaces, the SMALL CAR provision would represent less than 4% of the overall car park. In our experience, it is not unreasonable or uncommon to allocate up to 10% of parking spaces in a car park as SMALL CAR spaces.

Based on the above assessment, we are of the opinion that the parking space layout within the car park extension area would be capable of satisfying the requirements of the parking standard (*AS/NZS 2890.1-2004*) by setting aside these spaces as STAFF SPACES, or adjusting the spaces (combination of Small Car/Standard Car spaces), which would allow the proposed column grid to remain.

There would be no changes to the proposed entrance to the car park from Mark Road. Access to the car park extension would be via the existing aisleways of the current car park.

5.0 CONCLUSIONS

The proposed development comprises of an extension to the existing LMH multi-storey car park. The proposed extension would result in an increase of 205 parking spaces to the hospital site.

The increase in parking spaces is intended to facilitate the next stages of the LMH development, which would include additions to the Emergency Department, the Mental Health Short Stay Unit and redevelopment of the Ambulance facilities.

Our preliminary parking assessment of the future developments indicate that the number of new parking spaces provided (205 spaces) would be able to: (1) replace the loss of parking spaces at the at-grade car park in Oldham Road and (2) to meet the additional parking requirements of the proposed new floor areas at the hospital site.

Our preliminary traffic assessment also indicate that the traffic impact of the new developments would not result in capacity issues arising at the key junctions of John Rice Avenue with Haydown Road, Trembath Road and Mark Road.

The new car park extension would have proposed space widths of 2.5m. The proposed parking layout for the new car park extension would be capable of meeting the requirements of the parking standard, by either designating the extended car parks for each level for STAFF PARKING, or by adjusting the line marking to include a combination of Small Car/Standard Car spaces, whilst still retaining the proposed column grids.

On the basis of the above assessment, we are of the opinion that the proposed car park extension would be supportable from a traffic and parking perspective.

Yours sincerely,

Frank Siow

FRANK SIOW
Principal Consultant

Appendix C

Stormwater Management Report

WALLBRIDGE GILBERT
AZTEC

Cheesman Architects Pty Ltd

Lyell McEwin Hospital – Car Park Extension

STORMWATER MANAGEMENT PLAN

Project No.171581
Doc No. WGA171581-RP-CV-0001
Rev A
05 April 2019

Revision History

Rev	Date	Issue	Originator	Checker	Approver
A	05/04/2019	Approval Issue	CH	CH	

CONTENTS

Appendices

1 INTRODUCTION

1.1 BACKGROUND

WGA has been engaged by Cheesman Architects to prepare a Stormwater Management Plan for the proposed car park extension at the Lyell McEwin Hospital, Elizabeth Vale.

This report is intended to conceptually outline the stormwater management design for the proposed development and detail the stormwater management methodology. A final detailed design should be carried out to provide construction documentation and incorporate the stormwater design principles outlined in this report. The final documentation is considered to be beyond the scope of this report.

1.2 SCOPE OF THE ASSESSMENT

The preparation of the plan comprises the scope of services listed below:

- Liaise with the City of Playford (Council) to determine appropriate stormwater requirements for the site.
- Review existing site conditions and as-built drawings.
- Prepare a Stormwater Management Plan detailing the proposed method of collection and the disposal of site generated stormwater runoff.

1.2.1 Documentation

The client has provided a preliminary Architectural site plan for the development and an engineering survey.

2 DETAILED REPORT

2.1 DEVELOPMENT DESCRIPTION

The proposed development is located on the north-east corner of Mark Road and Trembath Road, Elizabeth Vale. The development is to be an extension of the existing multi-storey car park within the Lyell McEwin Hospital. Refer to Appendix A for Cheesman Architect's site plan for the proposed development.

2.2 CATCHMENT DESCRIPTION

The proposed car park extension covers an approximate area of 1,390m² and is currently occupied by landscaping. The predominant feature of the existing site is a detention basin that was constructed as part of the existing multi-deck car park. This basin covers approximately 60% of the site. A current aerial photograph is shown in Appendix B.

The site is quite flat with only slight fall from south to north (approximately 0.5m fall over 50m). A copy of the current engineering survey is attached in Appendix C.

2.3 EXISTING STORMWATER DRAINAGE

As noted earlier, a large portion of the proposed development site is occupied by a stormwater detention basin. The basin volume is approximately 225m³. The stormwater runoff from the existing multi-deck car discharges into above ground rainwater tanks which then overflow into the basin where it is detained for a short period of time before discharging out through a 225mm dia stormwater pipe. This pipe connects to a 375mm dia pipe that ultimately connects to the 750mm dia Council stormwater pipe located in Mark Road.

A copy of the as-built drawings for the existing multi-deck car park and a copy of the Council drainage system is attached in Appendix D

2.4 COUNCIL REQUIREMENTS

Recent advice from the City of Playford for the proposed development on the opposite side of Mark Road indicated that:

1. Development should include a stormwater management system to protect it from damage during a minimum 1-in-100 year storm event.
2. All excess stormwater runoff, up to the 1 in 100 year ARI storm event shall be detained on site and discharged into the existing Council stormwater system at a flow rate no greater than the pre-development 1 in 10 year ARI storm event.
3. Stormwater quality treatment shall be up to EPA standards (i.e. 80% reduction in TSS, 60% reduction in TP, 45% reduction in TN and 90% reduction in gross pollutants)
4. Finished Floor Levels shall typically be a minimum of 300mm above the adjacent top of kerb level.
5. No flood mapping for the 1 in 100 year storm events exists for the area.

2.5 STORMWATER MANAGEMENT METHODOLOGY

The following stormwater management methodology is proposed.

It is noted that the previous calculations undertaken for the existing multi-deck car park required a minimum detention storage of 83m³ to reduce the peak flows from the developed site (in a 1 in 100 year storm event) to 80l/s (the pre-development flow rate). The current volume of the detention basin is approximately 225m³.

In order to reduce the peak outflow from the developed site (in a 1 in 100 year storm event) to the peak outflow from the undeveloped site (in a 1 in 10 year storm event), a theoretical additional detention volume of 50m³ is required (for a total volume of 133m³). Given that the basin is already 225m³ in volume, it is not considered necessary to increase the size of the existing basin.

It is also noted that there is considerable capture and re-use of stormwater runoff collected across the entire Hospital site. Retention tanks (both underground and above ground) are used to store the collected water. The existing detention basin is only required when the adjacent above ground tanks overflow (which is rare).

Downpipes from the car park extension will connect into the existing siphonic drainage system for the existing multi-deck car park.

It is noted that there is an existing stormwater pipe running along the southern side of the existing structure that collects runoff from the earthworks batter and also from two downpipes adjacent the existing stairs. This pipe runs to a pump chamber that connects to the basin outlet pipe. The pile caps for the new structure will impact on the existing pipe and as such it will be relocated slightly further south. The pump chamber and associated pumping main will remain in place.

The stormwater runoff from the site is all generated from the new roof and as such, no stormwater quality improvement is proposed, noting that the detention basin itself will still provide a measure of improvement.

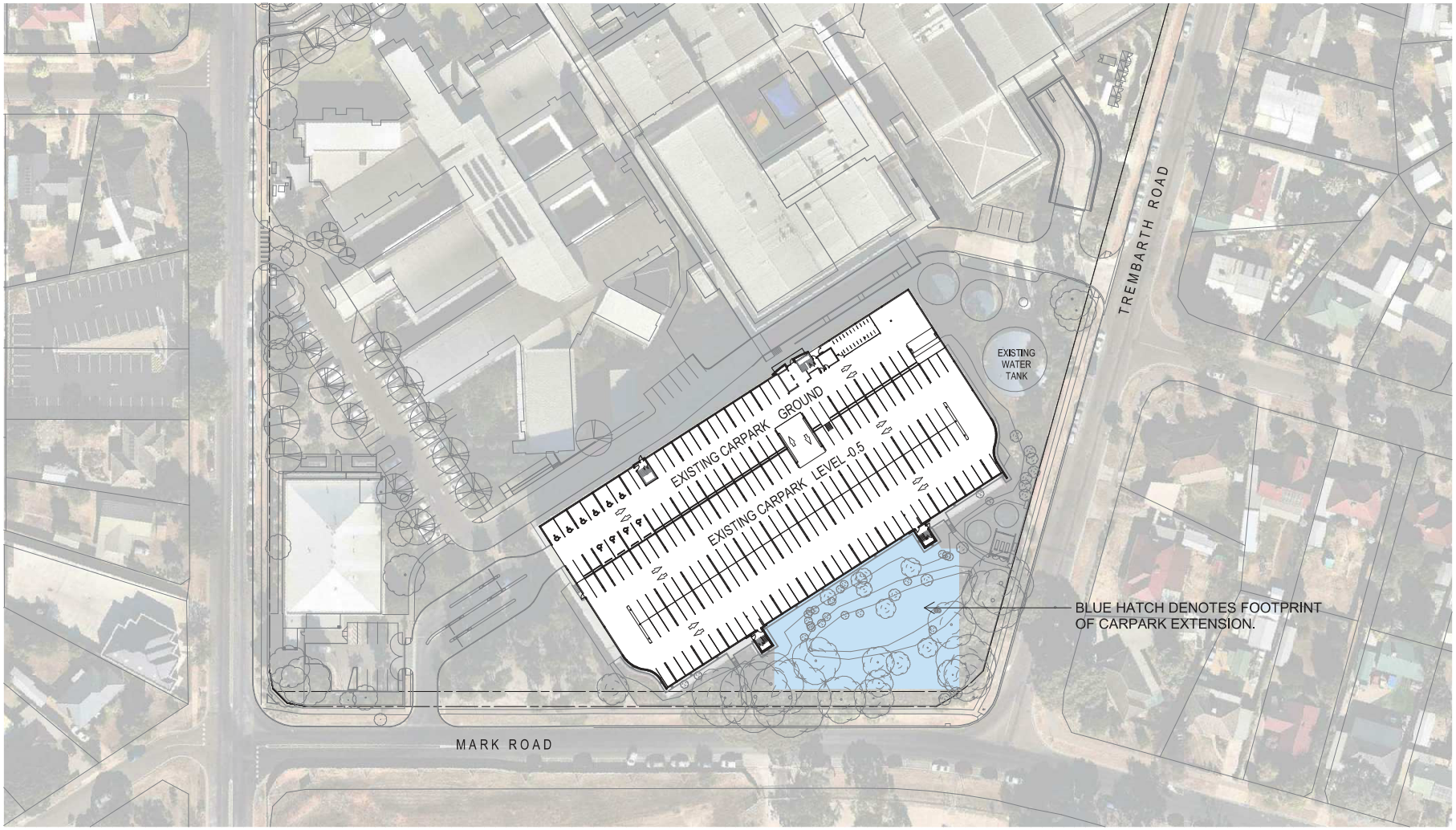
Refer to Appendix E for a copy of the stormwater calculations and Appendix F for a copy of the proposed civil drawing.

2.6 SUMMARY

The preliminary sketch plan contained within this report has been prepared to demonstrate the philosophy behind the proposed treatment of the stormwater runoff from this development. The information provided is preliminary and will be subject to detailed design and documentation.

APPENDIX A

PRELIMINARY SITE PLAN



	Existing car park spaces	Additional car park spaces	Total car park spaces
Ground -0.5 to 0.0	199	0	199
Level 1 0.5 to 1.0	210	41	251
Level 2 1.5 to 2.0	210	41	251
Level 3 2.5 to 3.0	210	41	251
Level 4 3.5 to 4.0	210	41	251
Level 5 4.5 to 5.0	210	41	251
Total	**1249**	**205**	**1454**

@ A3

FOR APPROVAL

Project: LMH CARPARK EXTENSION

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tel: +61 8 8431 1144
fax: +61 8 8331 9442

Drawing: EXISTING SITE & LOCATION PLAN

Scale: 1 : 1000

Date: 05/04/2019

Drawing no.: 17192 CP SD001

Revision: E

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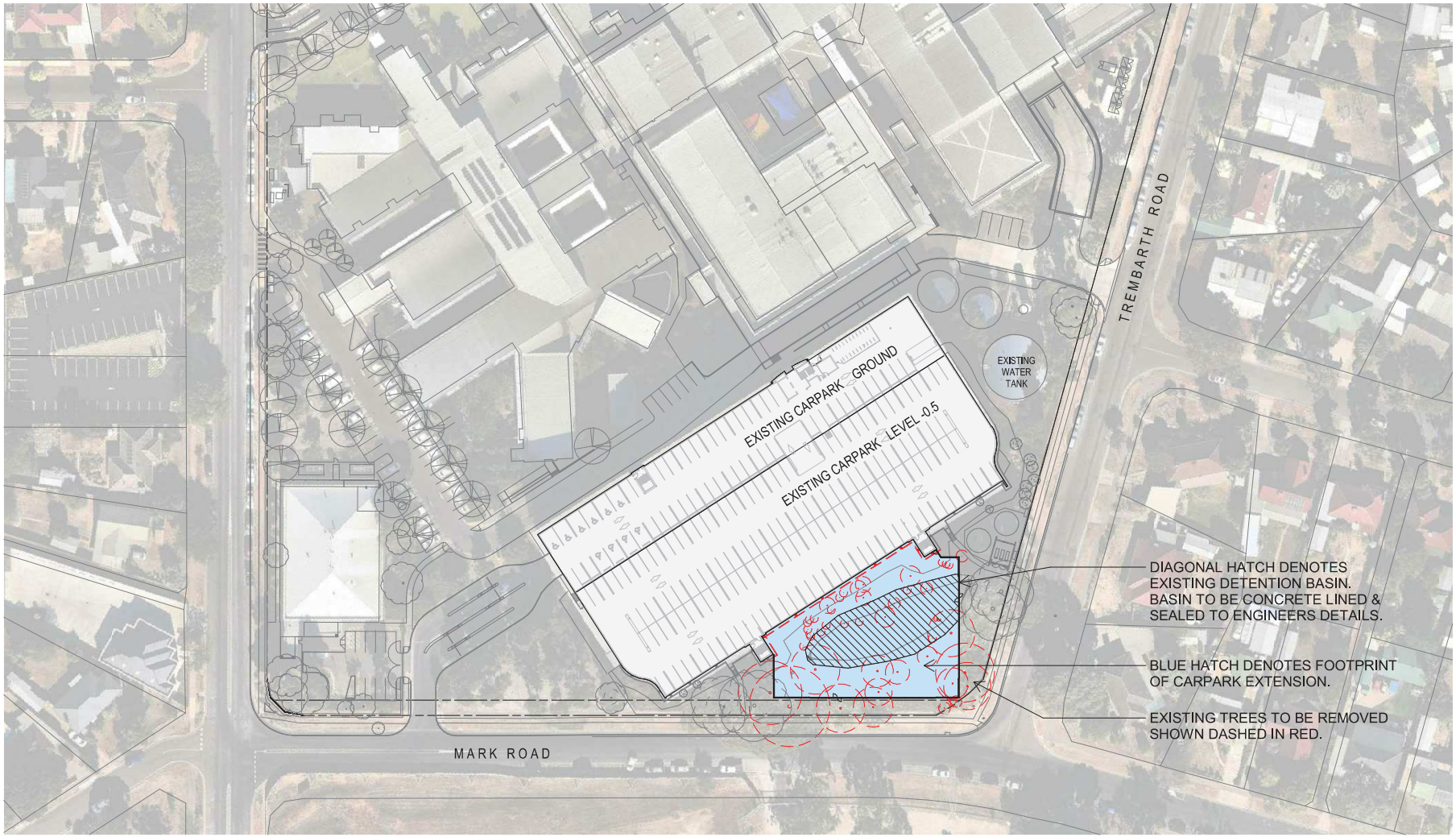

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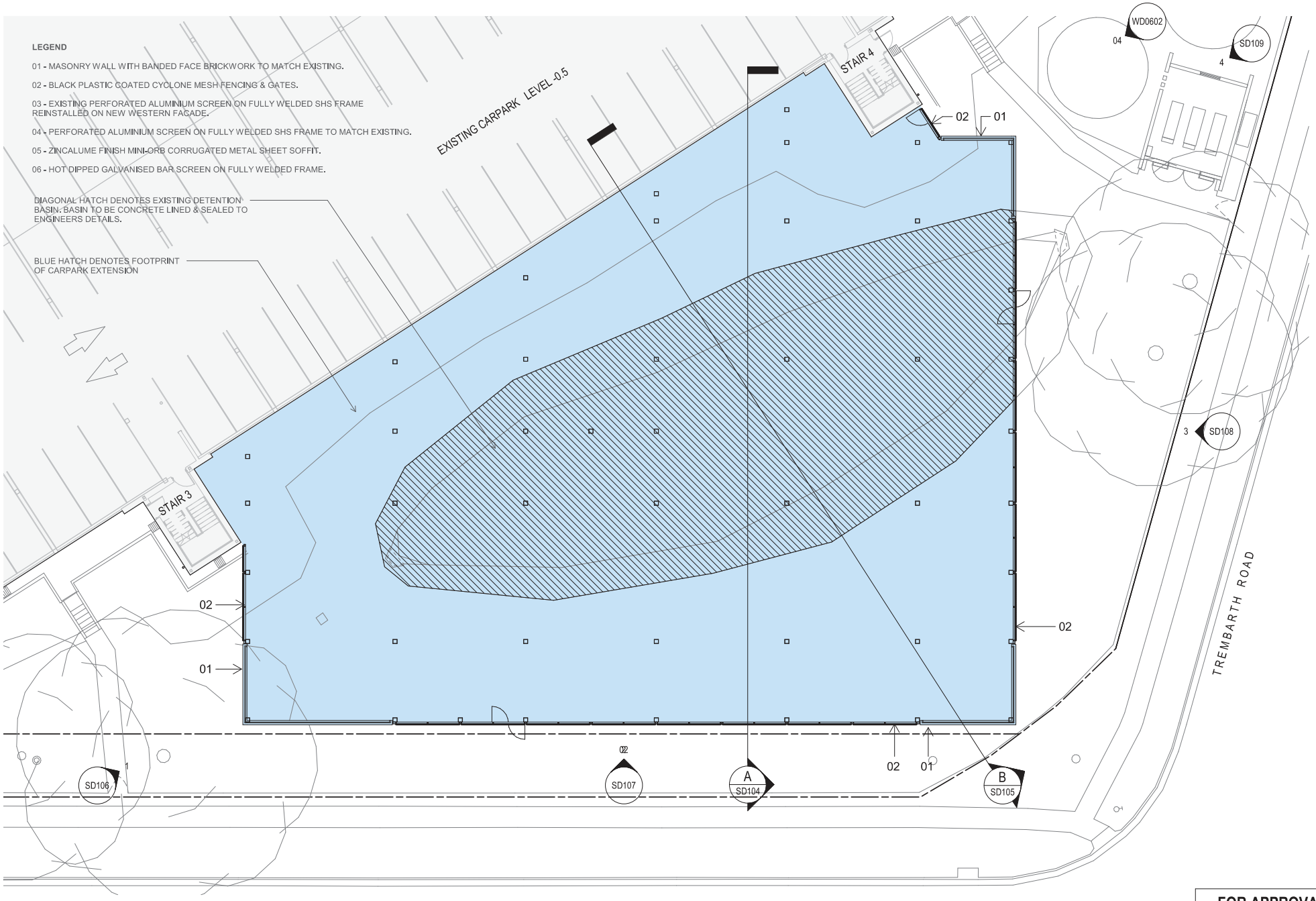

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FOR APPROVAL

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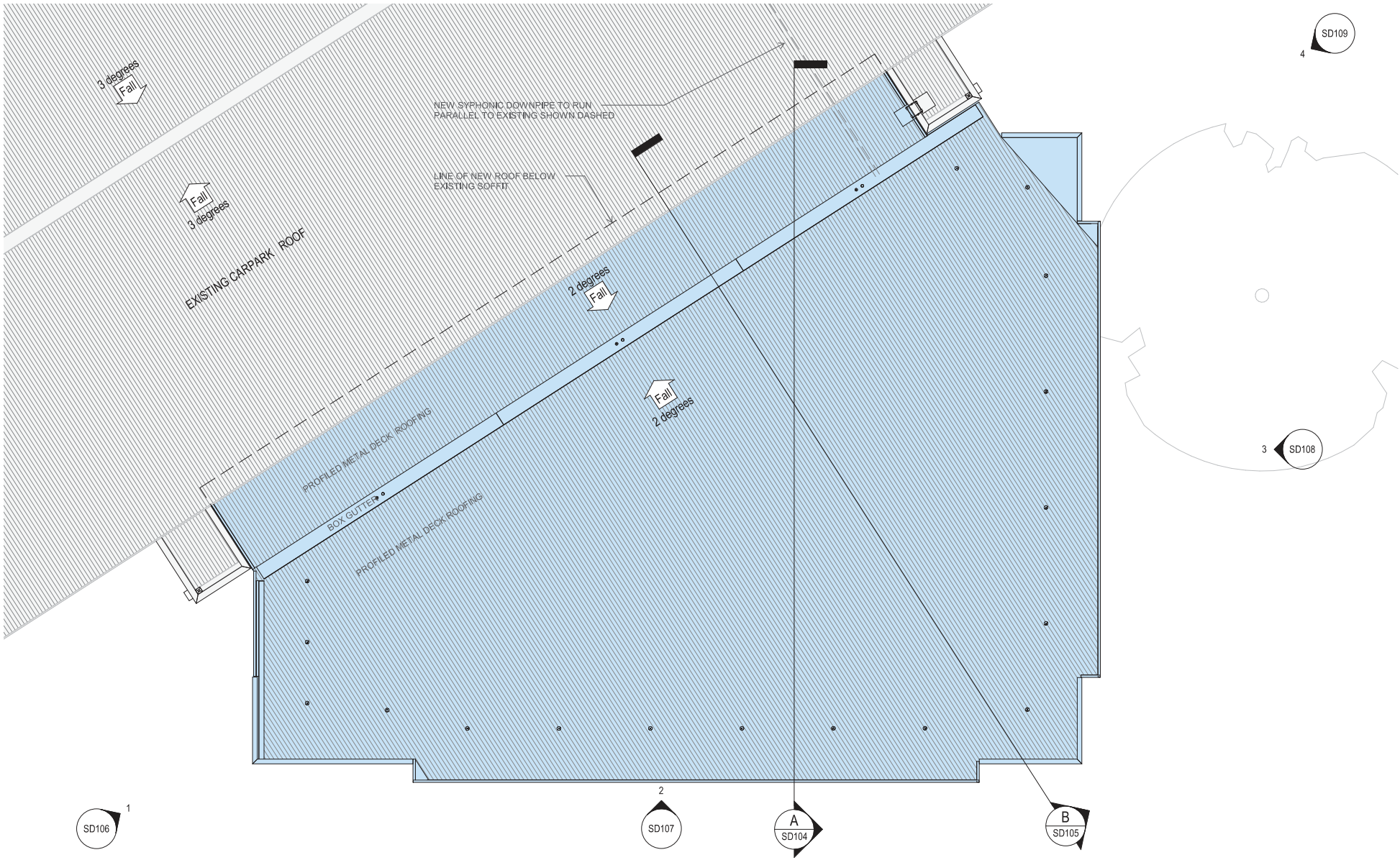

FOR APPROVAL

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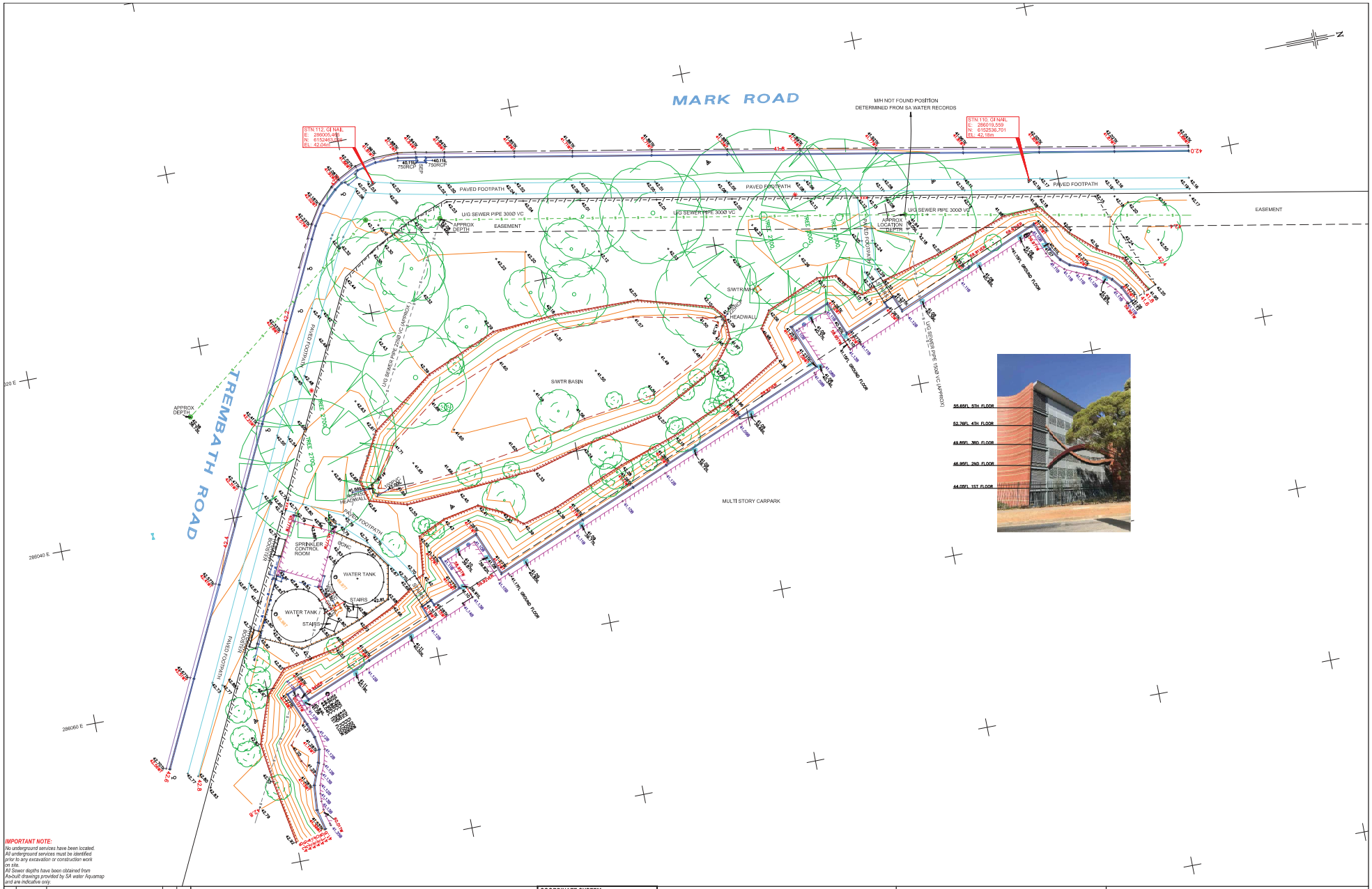
APPENDIX B

AERIAL PHOTOGRAPH

Aerial Photo - 2019

APPENDIX C

ENGINEERING SURVEY



IMPORTANT NOTE:
No underground services have been located. All underground services must be identified prior to any excavation or construction work on site.
All Sewer depths have been obtained from As-built drawings provided by SA water Aquamap and are indicative only.

REV	DATE	DESCRIPTION	CALC	FIELD
ADDITIONS, AMENDMENTS AND APPROVALS				

LEGEND

47.51TK TOP KERB
47.28VER VERANDAH EDGE OF GUTTER
47.28WT WATER TABLE
47.21EB EXTERNAL BLDG LEVEL AT GROUND
46.79FL FLOOR LEVEL
47.21TW TOP OF WALL
45.23IL INVERT LEVEL
TOP OF TANK
WATER METER
SPRINKLER / BSNS VALVE
HYDRANT
DOMESTIC OUTLET
DOWNPIPE
DOMESTIC SUMP
STORMWATER MHOLE
SEP / GRATING
PSM
PEG / TBM
TEL. COMM. PILLAR / PIT
SURVEY MARKS
TRAFFIC LIGHT
BOREHOLE
SIGN / BUS SIGN
LITTER BIN
POWER / LIGHT POLE
MAIL BOX / SIGNAL BOX
CABLE MARKER
TICKET MACHINE
STOBIE / WOODEN POLE
ROAD / ELEC. SERVICE
POST / BOLLARD
WATER SV / FP
SEWER MH / IO / SP
ELEC. / GAS METER
UNKNOWN POINT / SERVICE
GAS SERVICE
TAP
EDGE OF VEGETN
ROAD SIGN / HOARD
TREE / SHRUB
Possible REGULATED / SIGNIFICANT TREE by measurement only (trunk greater than 3m circumference). Professional advice from council / arborist required.
CONCRETE
BOTTOM OF BANK
TOP OF BANK
CHANGE OF GRADE
DRAIN
SEWER PIPE U/G
SEWER PIPE U/G DIGITIZED ALIGNMENT
TEL. COMM. U/G
WATER PIPE U/G
BUILDING
WALL
GEBUILDING
FENCE
GATE

COORDINATE SYSTEM	
VERTICAL:	AHD
HORIZONTAL:	GROUND PLANE ORIENTED TO: MGA 94 ZONE 54
SCALE: GROUND	(CSF = 1.00015672)

ADOPTED STATION & AUTHORITY			
PSM 6628/21348	RL:	41.959	SDB
PSM 6628/21348	E:	285995.717	SDB
	N:	6152438.340	SDB

SDB denotes SA Government survey data base

0 2 4 8 12 16 20 m

1:200

ORIGINAL SHEET SIZE A1

Notes:
Property boundaries shown hereon have been compiled from the government records and have not been verified by field survey.

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DRAWN:	TLH	21.03.2019
CHECKED:	CB	21.03.2019

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Alexander Symonds Surveying Consultants

DETAIL AND LEVEL SURVEY
MULTI STORY CARPARK
LYELL MCEWIN HOSPITAL

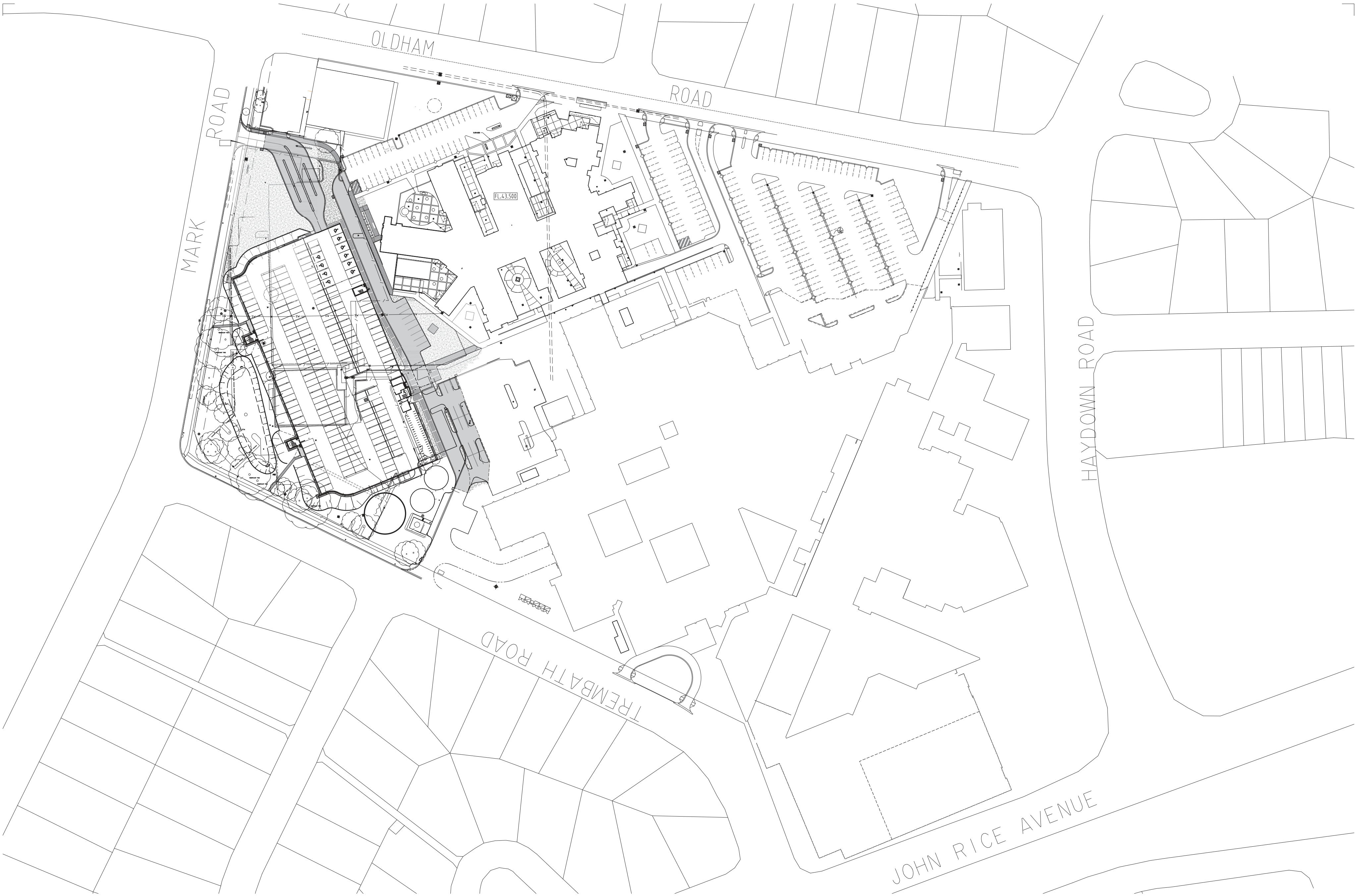
DRAWING No. A025919 DET(0) MGA94

SHEET 1 OF 1

REVISION 0

APPENDIX D

COUNCIL STORMWATER INFRASTRUCTURE AND AS-BUILT CIVIL DRAWINGS



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ISSUED FOR INFORMATION	EJS	11/04/08	B
PRELIMINARY ISSUE	EJS	9/04/08	A
	checked	date	rev.

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Government of South Australia

Central Northern Adelaide Health Service

The Lyell McEwin Hospital
Haydown Raod, Elizabeth Vale SA, 5113
telephone: 61 8182 9353
facsimile: 61 8182 9489

Government of South Australia
Department for Transport, Energy and Infrastructure

CONTRACT EXECUTION

CONTRACTOR DATE

WITNESS DATE

CONTRACT NAME
Lyell McEwin Health Service
Multi-deck Carpark

ADDRESS
The Lyell McEwin Hospital
Haydown Road, Elizabeth Vale, SA 5113

DRAWING TITLE
SITE PLAN

File:I:\2007\07July2007\C070772-Lyell McEwin Car Park\C070772-C01.dwg

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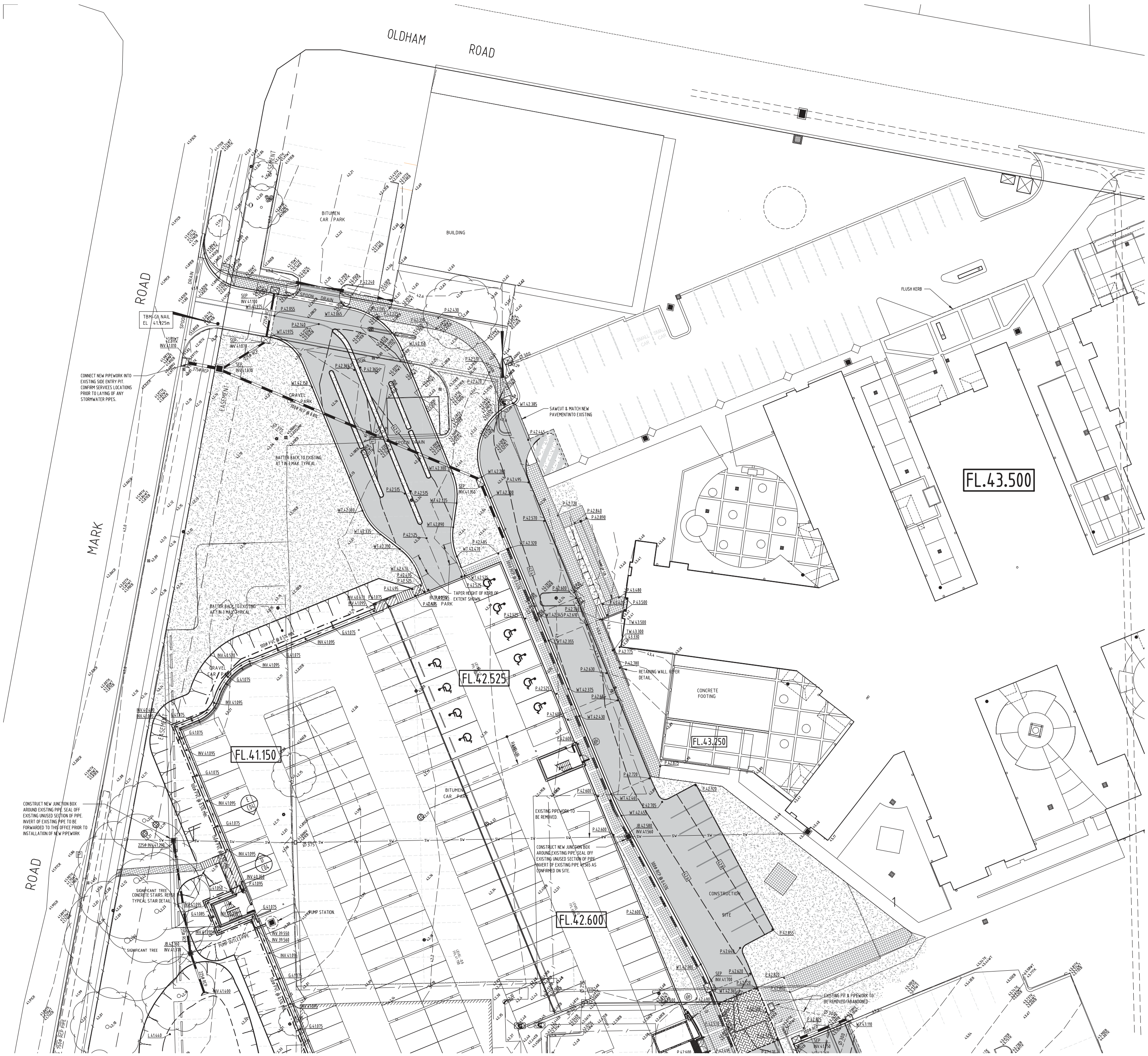

LEGEND:

- EXISTING LEVELS
- EXISTING CONTOURS
- DESIGN LEVELS — P- PAVEMENT, G- GRATE, L- LANDSCAPE
- DESIGN CONTOURS
- STORMWATER PIPE - RCP
- STORMWATER PIPE - uPVC
- DOWNPIPE CONNECTION
- DIRECTION OF FALL TO PAVEMENT
- KERB ONLY
- KERB & GUTTER
- SPOON DRAIN
- SIDE ENTRY PIT (SEP.)
- GRATED INLET PIT (G.)
- JUNCTION BOX (JB.)
- A.C. PAVEMENT
- BLOCK PAVING - HEAVY DUTY
- BLOCK PAVING - LIGHT DUTY TYPE A 300x300x40 BORAL PROMENADE (CHARCOAL) STACK BOND PATTERN. REFER TO ARCHITECTURAL LANDSCAPE DRAWINGS FO SETOUT
- BANDING - LIGHT DUTY TYPE B 500x500x40 BEST NEW DIMENSION (NATURAL) STACK BOND PATTERN - CUT TO SUIT. REFER TO ARCHITECTURAL LANDSCAPE DRAWINGS FOR SETOUT
- CONCRETE PAVEMENT - LIGHT DUTY
- LANDSCAPING (BY ARCHITECT)

NOTES:

1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS, OTHER CONSULTANTS DRAWINGS & THE SPECIFICATION.
2. ALL UPVC STORMWATER PIPES ARE TO BE SEWER CLASS 'SN4'.
3. ALL R.C. STORMWATER PIPES ARE TO BE CLASS '2' WITH BEDDING TYPE 'HS2'. U.N.O.
4. ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
5. CONTRACTOR TO CONFIRM INVERTS OF ALL EXISTING PIPES & SUMPS PRIOR TO CONNECTING & LAYING OF ALL NEW PIPEWORK.

AS BUILT

AS BUILT	MSG	11.05.10	K
STORMWATER PIPEWORK REVISED	MSG	30.04.09	J
BUILDING LOCATION REVISED	MSG	17.08.08	H
CONTRACT ISSUE	EJS	14.08.08	G
PREIMETER FOOTPATH REMOVED	EJS	5/08/08	F
ISSUED FOR BUILDING APPROVAL	EJS	30/06/08	E
KERB LAYOUT & PAVING EXTENT REVISED, STAIR & FOOTPATH ADDED	EJS	28/05/08	D
ISSUED FOR INFORMATION	EJS	11/04/08	B
PRELIMINARY ISSUE	EJS	9/04/08	A
	checked	date	rev.

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Central Northern Adelaide Health Service
The Lyell McEwin Hospital
Haydown Raod, Elizabeth Vale SA, 5113
telephone: 61 8182 9353
facsimile: 61 8182 9489

Government of South Australia
Department for Transport, Energy and Infrastructure

CONTRACT EXECUTION
CONTRACTOR DATE
WITNESS DATE
CONTRACT NAME
Lyell McEwin Health Service
Multi-deck Carpark

ADDRESS
The Lyell McEwin Hospital
Haydown Road, Elizabeth Vale, SA 5113

DRAWING TITLE
CIVILWORKS PLAN
SHEET 1 OF 2

File:I:\2007\07July2007\C070772-Lyell McEwin Car Park\C070772-C02.dwg

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PSC JOB NO. C070772-C02
SCALE AND SHEET SIZE 1 : 200 @ A0
DTEI ASSET NO. 27.01
DTEI DRAWING NO. 5184-SD-2010
REVISION K
Plotted:09 November 2010 15:41

LEGEND:

- EXISTING LEVELS
- EXISTING CONTOURS
- DESIGN LEVELS — P- PAVEMENT, G- GRATE, L- LANDSCAPE
- DESIGN CONTOURS
- STORMWATER PIPE - RCP
- STORMWATER PIPE - uPVC
- DOWNPIPE CONNECTION
- DIRECTION OF FALL TO PAVEMENT
- KERB ONLY
- KERB & GUTTER
- SPOON DRAIN
- SIDE ENTRY PIT (SEP.)
- GRATED INLET PIT (G.)
- JUNCTION BOX (JB.)
- A.C. PAVEMENT
- BLOCK PAVING - HEAVY DUTY
- BLOCK PAVING - LIGHT DUTY TYPE A 300x300x40 BORAL PROMENADE (CHARCOAL) STACK BOND PATTERN. REFER TO ARCHITECTURAL LANDSCAPE DRAWINGS FOR SETOUT
- BANDING - LIGHT DUTY TYPE B 500x500x40 BEST NEW DIMENSION (NATURAL) STACK BOND PATTERN - CUT TO SUIT. REFER TO ARCHITECTURAL LANDSCAPE DRAWINGS FOR SETOUT
- CONCRETE PAVEMENT - LIGHT DUTY
- LANDSCAPING (BY ARCHITECT)

NOTES:

1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS, OTHER CONSULTANTS DRAWINGS & THE SPECIFICATION.
2. ALL UPVC STORMWATER PIPES ARE TO BE SEWER CLASS 'SN4'.
3. ALL R.C. STORMWATER PIPES ARE TO BE CLASS '2' WITH BEDDING TYPE 'HS2'. U.N.O.
4. ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
5. CONTRACTOR TO CONFIRM INVERTS OF ALL EXISTING PIPES & SUMPS PRIOR TO CONNECTING & LAYING OF ALL NEW PIPEWORK.

AS BUILT

AS BUILT	MSG	11.05.10	K
STORMWATER PIPEWORK REVISED	MSG	30.04.09	J
BUILDING LOCATION REVISED	MSG	17.08.08	H
CONTRACT ISSUE	EJS	14.08.08	G
PREIMETER FOOTPATH REMOVED	EJS	5/08/08	F
ISSUED FOR BUILDING APPROVAL	EJS	30/06/08	E
PAVING EXTENT REVISED, STAIRS & FOOTPATHS ADDED	EJS	28/05/08	D
ISSUED FOR INFORMATION	EJS	11/04/08	B
PRELIMINARY ISSUE	EJS	9/04/08	A
	checked	date	rev.

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Government of South Australia
Central Northern Adelaide Health Service
The Lyell McEwin Hospital
Haydown Raod, Elizabeth Vale SA, 5113
telephone: 61 8182 9353
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Government of South Australia
Department for Transport, Energy and Infrastructure

CONTRACT EXECUTION	
CONTRACTOR	DATE
WITNESS	DATE
CONTRACT NAME	Lyell McEwin Health Service Multi-deck Carpark
ADDRESS	The Lyell McEwin Hospital Haydown Road, Elizabeth Vale, SA 5113
DRAWING TITLE	CIVILWORKS PLAN SHEET 2 OF 2
CONTRACT NO.	C070772
DRAWN BY - CHECKED BY	MWRJ MWRJ
PSC JOB NO.	C070772-C03
SCALE AND SHEET SIZE	1 : 200 @ A0
DTEI ASSET NO.	27.01
DTEI DRAWING NO.	5185-SD-2010
REVISION	K

File:I:\2007\07July2007\C070772-Lyell McEwin Car Park\C070772-C03.dwg
Plotted:11 May 2010 11:56


900 RCP
300 RCP
900 RCP
825 RCP
750 RCP
750 RCP

APPENDIX E

STORMWATER CALCULATIONS

WGA

WALLBRIDGE GILBERT AZTEC

Job Number 171581
Designer CH
Date 3/4/19
Page Number 1

Lyell McEwin Hospital - Car Park Extension - Stormwater

- Previous design (April 2008) proposed a min $83m^3$ detention basin. This was based on limiting post-development 1 in 100yr peak flow to pre-development 1 in 10yr peak flow
  - Catchment area = $5500m^2$
  - Limiting flow = 80 l/s (allowed for runoff coeff pre-dev of 0.70 - mostly impervious)

- New development
  - additional catchment area = $1390m^2$
  - "pre-development" impervious area = $(5500 \times 0.7) + (1390 \times 0.1)$
    $= 3989\ m^2$
    time of conc, t_c = 10 mins
    $\rightarrow I_{10} = 73$ mm/hr
    $\therefore$ Limiting flow rate = $2.78 \times 73 \times 0.3989$
    $= 81$ l/s

$\rightarrow$ Detention Volume = $133\ m^3$

Wallbridge and Gilbert
60 Wyatt Street
Adelaide SA 5000

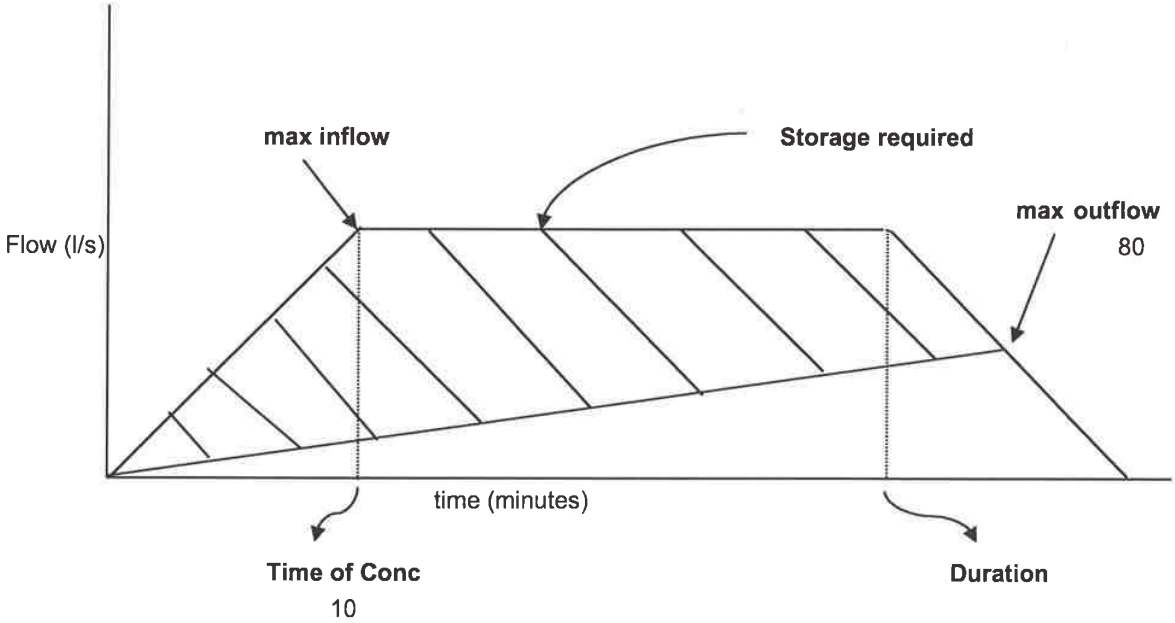
Basic Stormwater Detention Assessment

Title: Lyell McEwin Multi Deck

Date: 8/04/08
Job No: C070772

Area	5500	m²
Coeff Permeability	0.9	
Time of conc.	10	min
ARI Storm	100 Year	
Max Outflow Qp	80	l/sec

Duration min	Intensity mm/hr	Inflow rate Ip l/sec	Inflow Vol Vi m3	Max Storage Smax m3
5	186	255.8	76.73	40.73
10	136	187.0	112.20	64.20
20	94	129.3	155.10	83.10
40	61	83.9	201.30	81.30
60	46.6	64.1	230.67	62.67
90	35.5	48.8	263.59	23.59
120	29.1	40.0	288.09	-23.91
150	24.9	34.2	308.14	-75.86
180	21.9	30.1	325.22	-130.79
210	19.7	27.1	341.30	-186.70
240	17.9	24.6	354.42	-245.58
300	15.4	21.2	381.15	-362.85
360	13.5	18.6	400.95	-487.05



Print Date : 4/04/2019

Wallbridge and Gilbert
60 Wyatt Street
Adelaide SA 5000

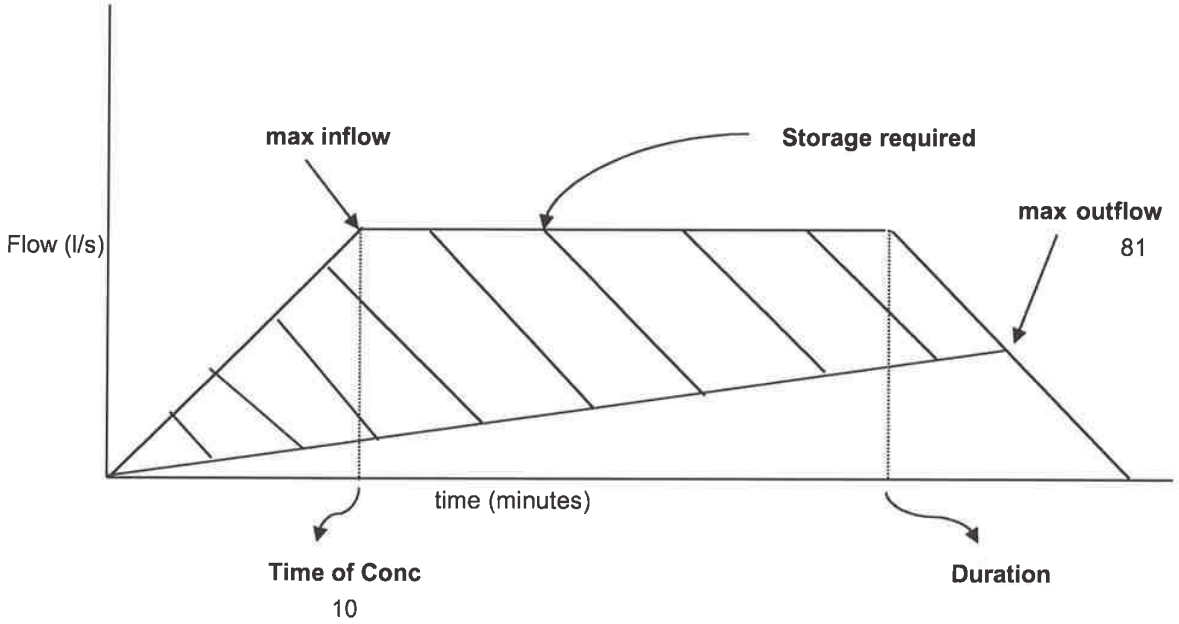
Basic Stormwater Detention Assessment

Title: Lyell McEwin Multi Deck

Date: 03/04/19
Job No: 171581

Area	6910	m²
Coeff Permeability	0.9	
Time of conc.	10	min
ARI Storm	100 Year	
Max Outflow Qp	81	l/sec

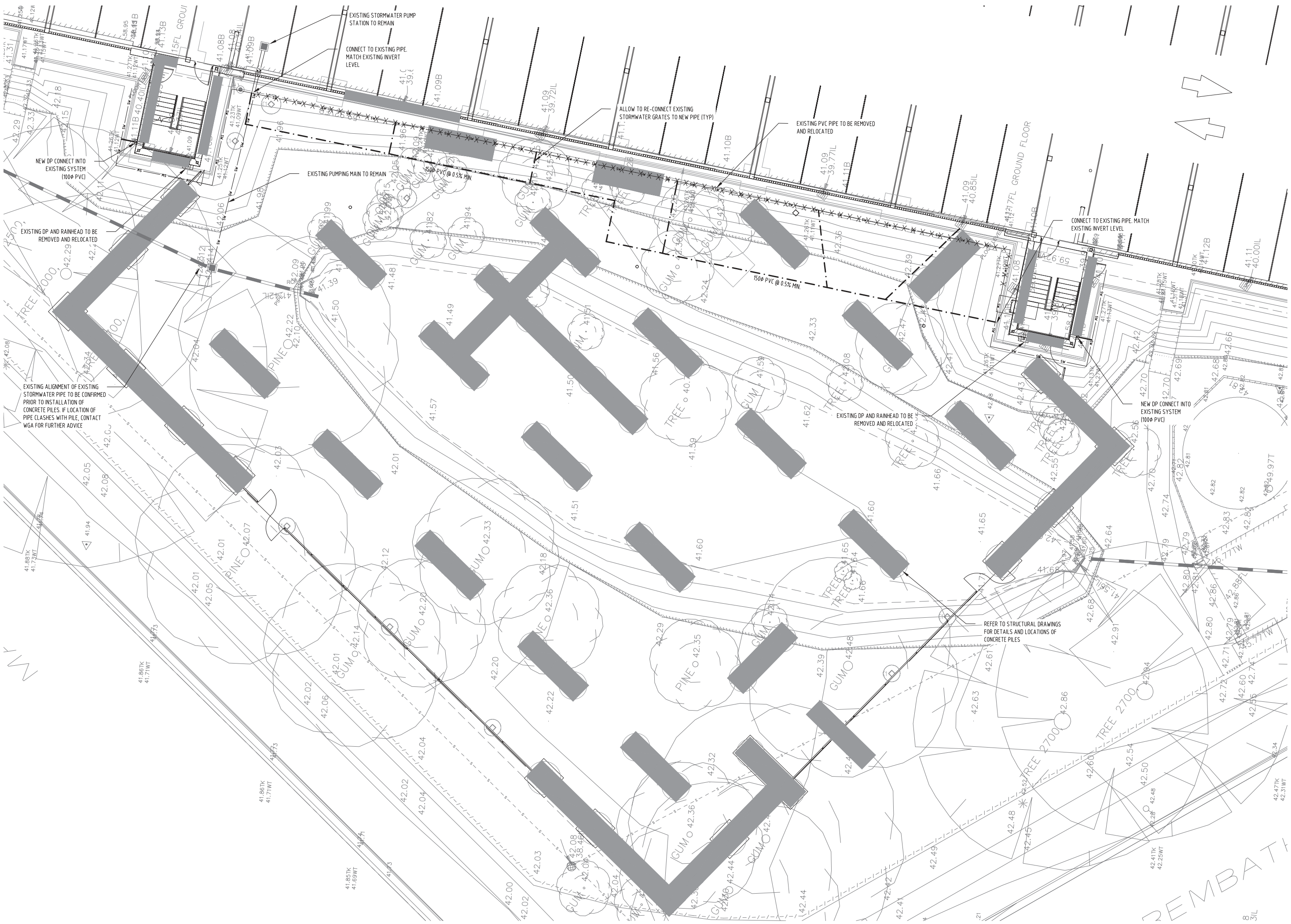
Duration min	Intensity mm/hr	Inflow rate Ip l/sec	Inflow Vol Vi m3	Max Storage Smax m3
5	186	321.3	96.39	59.94
10	136	234.9	140.96	92.36
20	94	162.4	194.86	121.96
30	74	127.8	230.10	132.90
35	67	115.7	243.06	133.71
40	61	105.4	252.91	131.41
45	57	98.5	265.86	132.21
50	53	91.6	274.67	128.87
60	46.7	80.7	290.43	120.33
90	35.5	61.3	331.16	88.16
120	29.2	50.4	363.19	47.29



Print Date : 4/04/2019

APPENDIX F

CIVIL DRAWING



LEGEND:

146.96	EXISTING LEVELS
19.0	EXISTING CONTOURS
	STORMWATER PIPE - PVC
	EXISTING STORMWATER RCP
SW	EXISTING STORMWATER PVC
SW	EXISTING STORMWATER TO BE REMOVED
	DOWNPIPE CONNECTION

NOTES:

1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS, OTHER CONSULTANTS DRAWINGS & THE SPECIFICATION.
2. ALL UPVC STORMWATER PIPES ARE TO BE SEWER CLASS 'SN4'.
3. ALL R.C. STORMWATER PIPES ARE TO BE CLASS '2' WITH BEDDING TYPE 'HS2'. U.N.O.
4. **ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.**
5. **CONTRACTOR TO CONFIRM INVERTS OF ALL EXISTING PIPES & SUMPS PRIOR TO CONNECTING & LAYING OF ALL NEW PIPEWORK.**
6. WALLBRIDGE GILBERT AZTEC ARE NOT RESPONSIBLE FOR DIMENSIONAL SET OUT AND THESE DRAWINGS ARE BASED ON BACKGROUNDS PRODUCED BY OTHER PARTIES. WE ACCEPT NO RESPONSIBILITY FOR ERRORS AND OMISSIONS RELATED TO DIMENSIONAL SET-OUT.

SITE PREPARATION:

PRIOR TO APPILICATION OF 50mm SHOTCRETE (REFER STRUCTURAL DRAWINGS), ALLOW TO STRIP ALL EXISTING TOPSOIL AND ORGANIC MATTER FROM EXISTING BASIN. COMPACT EXPOSED SURFACE TO MIN 95% STD MDD.

Scale Bar Units in Millimetres

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HEALTH PLANNER / INTERIOR DESIGNER

CIVIL / STRUCTURAL ENGINEER

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REV.	DATE	AMENDMENTS	INITIAL
A	05.04.19	COORDINATION ISSUE	C. HILL

Government of South Australia
Department of Planning, Transport and Infrastructure

CONTRACT EXECUTION
CONTRACTOR DATE
WITNESS DATE

CONTRACT NAME
LYELL MCEWIN EMERGENCY DEPARTMENT

SITE ADDRESS
MARK ROAD, ELIZABETH VALE
SA 5112

DRAWING TITLE
CIVIL PLAN

CONTRACT NO.	DRAWN BY - CHECKED BY
XXXX-A-XXXX	ASF C.HILL
PSC JOB NO.	SCALE - SHEET SIZE
Project Number	As Indicated @ B1
DPTI ASSET NO.	SHEET NO.
03270	C01
DPTI DRAWING NO.	REVISION
XXXX	A

Colin Hill
SENIOR CIVIL ENGINEER

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Whyalla SA 5600
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WALLBRIDGE GILBERT AZTEC
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Appendix D

Arborist Report

Arborcare Tree and Garden Solutions **ABN: 98 473 285 873**

PO Box 1061
PASADENA 5042

M: 0430 432 007
E: david@arborcaresolutions.com.au
W: www.arborcaresolutions.com.au

Inspected 1st March 2019
Tree Report 19th March 2019

Tree Report 3321

Scott Suter
Principal
ssuter@cheesman.com.au

Cheesman Architects

304 The Parade, Kensington, South Australia 5068
T 08 8431 1144 F 08 8331 9442 M 0414 324 409
www.cheesman.com.au

Re: Proposed multi-deck carpark extension at the Lyell Mc Ewin Hospital

Brief

I was asked to inspect and assess those trees identified abutting from ground level in relation to the proposed development of the multi-deck carpark extension at the Lyell Mc Ewin Hospital. This tree report will assess the general condition, structure, health and vitality of the designated trees to be assessed for either removal; and or retention and to be pruned to prolong the life of a tree(s) as an asset on the western side of the current multi-deck carpark and the proposed development; considering tree protections methods to minimise any direct impact upon the trees retained during development. (**See aerial map and site plan Appendix 1**)

Management Options available

1. What is the health and condition the tree and whether the tree is impacting upon the existing and causing damage to a structure of value and if there are alternative remedial treatments that can be implemented to avoid damage to the tree and or if the proposed dwelling(s) will have an impact upon the tree in allowing reasonable development? Whether pruning and or complete removal of the tree is recommended to avoid further damage to a structure of value and or injury/death could be caused to persons below the tree.

2. Whether there are any alternative measures that could be implemented to retain the tree and the appropriate solutions of implementing each of those non-tree damaging activities (should any be available). In order to determine the reasonableness of alternative measures:
   - Look at the structural integrity and or defects of the tree;
   - Determine the extent and long-term effect of damage associated with the tree remaining;
   - Identified and define the appropriate
     - Structural Root Zone (SRZ)
     - Tree Protection Zone (TPZ) for the tree;
   - Suggest appropriate treatments to be used within the Tree Protection Zones that will assist in the longer-term preservation of the tree if any;
   - Determined any encroachments within the tree protection zones and suitable engineering techniques that can be used to reduce impacts on the built environs caused by the tree.

3. Crown reduction, thinning and shaping; retaining a balanced canopy by a qualified arborist level 3 and above in accordance with AS4373-2007 “Pruning of Amenity Trees” (If applicable); and or

4. Veteran tree management (VTM) options if appropriate from a pruning methodology in accordance with AS4373-2007 “Pruning of Amenity Trees” (If applicable); to

5. Removal of the tree and stump.

Tree Information

Listed Trees 1-18 are categorised into the following listings.

(See Image 1 for site location and trees within the proposed multi-deck carpark **and Table 1)**

Exempt trees: 13 and 14 Pinus radiata (Monterey Pine).

Non-Regulated trees: 3, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11**, **12** and **18**

Regulated trees: 1, **2**, **15**, **16**, **17**,

Significant trees: None

Therefore, the following information needs to be considered as part of the development: -

See Principals of Development Control (PDC) for Playford Council Consolidated – 27 June 2017 pages 620- 626 and Location Zone Map Play/33

- Crown land listing;
- Trees are not heritage listed;
- The area is zoned Hospital (**H**) building site **is not** within the City of Playford therefore the protection of Regulated and Significant trees[1] under the **Development Act 1993** does apply[1.] However; the trees are located on government (Crown) land;
- Site located within a Suburban Activity Node (SAN) allotment **A1** see page 624 of the City of Playford Location Zone Map Play/33 ***consolidated – 27th June 2017***.
    - Hospital, accommodation and other habitable buildings should be:
    - sited on the flatter portion of allotments using existing infrastructure to minimise impact on the surrounding structures.
    - have a dedicated and accessible water supply available at all times for firefighting.
- Therefore, those plants which do not require council consent could be removed to comply with the minister in charge of Crown land Titles; and the council’s PDC’S. However, I would discuss this with council prior to development.
- Proposed multi-deck carpark and building envelope (**See attached plan**).
- Trees on site have been categorised into: -
    - Private tree(s);
    - Classification as either Pest Plants, Non-Regulated, Regulated and or Significant trees as a guide to the Development Act 1993;
    - Tree assessment and appropriate management of those trees identified within the tree report from Non-Regulated, Regulated and or Significant trees to be either removed and or retained to enhance the overall development. (**See image 1,** and attached site plan and Tables 1- 2 for further detail)

All tree(s) retained; should have a safe useful life expectancy (S.U.L.E.) to minimise and reduce risk to persons and property; those trees retained must be protected prior to, during and post development. Therefore, the trees will be assessed against the current provisions of the Development Act 1993 relating to “Regulated and Significant “trees[1].

The proposed development will need to consider and allow for the “*Protection of Trees on Development sites*” AS4970-2009[2] and a tree management plan integral with “*Pruning of Amenity Trees*”[3] AS4373-2007 by qualified arborists level 4 and above to retain the tree structure and aesthetics with a balanced canopy for future growth.

A tree inspection may be required on completion of the development to ascertain any changes within the trees retained as part of the overall risk and hazard mitigation of the site and then every two years.

Image 1: the proposed multi-story carpark to be located within this water shed area.

Executive Summary

However; the proposed future plans to develop the multi-deck car-parking complex is to accommodate the demand from visitors and staff attending the hospital. The proposed development has large foundations that require adequate ground to support the engineered structure onto the existing multi-deck carparking facility.

Bored piles proposed along the edge of the building are 4000mm deep and 1050mm in diameter. The structural engineer has requested a zone 750mm from grids along the edge of the building for piles and footings (shown in red in the attached mark-up plan- see attachment appendix 2).

The Monterey pine tree is classified as a non-regulated tree and is listed as an exempt tree species; within the Development (Regulated trees) Variation Regulations 2011 under the Development Act 1993 that can be removed as an exempt tree species.

Tree Management for each tree as follows:

- **Non-Regulated trees to be removed: Trees 3, 4, 5**, **6**, **7**, **8**, **9**, **10**, **11 and 12**
- **Exempt tree species to be Removed: Tree 13 and 14**
- **Non-Regulated Trees to be Pruned:** (**Green**) identified as **Trees 18**
- **Regulated Tree Trees to be Pruned:** (**Green**) identified as **Trees 1 and 2**
- **Regulated Trees:** to be Removed (**Red**) identified as **Trees 15 and 16.**
- **Regulated Trees:** to be Retained Veteran Tree Management (VTM) (**Orange**) **Tree 17.**

Significant trees: None

Conclusions

The two Monterey pine trees are classified as a non-regulated tree and is listed as an exempt tree species; within the Development (Regulated trees) Variation Regulations 2011 under the Development Act 1993 that can be removed as an exempt tree species. **Exempt trees: 13 and 14** They are not protected and can be removed without council consent.

All the small Non-Regulated trees (plantation trees) can be removed and are identified as trees too close; and within the footprint and or in line with the outer edge of the multi-deck car-parking complex; these trees are identified as numerous self-seeded upright trees (gums, Corymbia's, Casuarina's and other tree species).

Small; but larger trees identified as all **Non-Regulated trees: 3, 4, 5**, **6**, **7**, **8**, **9**, **10**, **11 and 12.** There are about 50 smaller saplings against the edge of the existing car park and water detention pond that also can be removed without council consent.

Those trees retained will have to allow for their structural root zone (SRZ) and the tree protection zone (TPZ) that may be encroached by 10%

Those trees retained have been identified as the following trees; **Trees 1, 2, 17 and 18** and can either be pruned; allowing reasonable clearances and or as habitat tree(s) Veteran Tree Management (VTM), all those trees retained have the potential to grow into more mature trees to Veteran trees.

However; their potential future structural root zone (SRZ) will be limited on the eastern root plate by the proposed multi-deck dwelling closest reference point to a tree will be 1.58 metres away to a maximum of 2.56 metres. The tree species are either Eucalypts and or Corymbia that have the potential to double in size and will impact upon the multi-deck car-parking complex.

The planting of more appropriate trees around the multi-deck car-parking complex will allow for new plant species that will enhance, promote and be an ecological landscape using water sensitive design (WSUD); retaining those trees that will provide future aesthetics, amenity and habitat.

Those trees retained within the landscape are structurally sound; and will be maintained regularly by a qualified arborist level 4 and above. Any proposed landscaping will be maintained with suitable plant species enhancing the existing ecology and will not threaten and or pose a risk and or hazard to staff, contractors and visitors to the carpark facility.

Tree protection zones (TPZ) and the permeable surface area within the trees' root zone will not adversely affect the trees' ability to absorb water, nor will the proposal affect tree stability. As identified within **Table 1** the maximum tpz =15 metres; encroachments within the tree protection zone are allowable as identified within the Australian Standards AS4970-2009 Protection of trees on Development sites" with non-invasive soil disturbances.

The protection criteria outlined within the report; the following can/will be attached to the application's consent as conditions;

1. The Regulated gum trees have a maximum radius of 15 metres for the TPZ from the trunk centre (**See Table 1**). This boundary of this radius can be encroached by 10 percent of the total area in line with the Australian Standard for Protection of Trees on Development Sites AS4970-2009 provided tree friendly designs are implemented within these areas.

2. Excavation within the TPZ is to be carried out non-destructively with the use of air spade or hydrovac. These techniques are to be used to achieve the swales and rain gardens depicted on the plan provided within the tree protection zone. Tree roots greater than 50mm in diameter are to remain in-situ.

3. Fill soil is to be kept to a minimum within the TPZ, alternative design as pictured (**Appendix 4**) are to be used where levels are to be changed and to prevent soil compaction.

4. The multi-story carpark surface within the TPZ (as identified in condition 1) is too preserve the tree root structure with a pervious surface to the reasonable satisfaction of Council.

Staff, visitors and contractors will park their cars within the proposed multi-deck carpark through the existing carpark entrance on the eastern side. **See site map and appendix 1.**

Only 1 **Non-regulated tree** remains **Tree 18** as the tree is on the north western side of the proposed multi-deck carpark and will not be affected by the proposed development classified as listed as exempt tree species; within the Development (Regulated trees) Variation Regulations 2011 under the Development Act 1993 that can be removed without council consent.

Trees that require further attention are all the Regulated trees identified as the following classification as **Regulated trees: 1, 2, 17 and tree 18** a (Non-Regulated tree).

Site plan – Aerial Image.

Image 2: The trees tagged within and or abutting the proposed carpark at the Lyell Mc Ewin Hospital. (**See Tables 1 - 2**).

Images 3 and 4: Street perspective of the current site and then within the water detention pond looking North out of the proposed multi-deck carpark.

Please Note: With **Tree 1** and then especially **Trees 2 and 17;** the trees will be close to the proposed development and the arborist will need to consider a Veteran Tree management (VTM) program; encroachments into the tpz will occur. The use of tree investigation techniques are recommended. If too large a root system is evident (**uncovered**) then further investigation will be warranted if the root(s) to be cut and or severed is greater than 50mm to protect the tree roots and canopy in accordance with AS4970–2009 "*Protection of Trees on Development sites*"[2].

Table 1 Structural root zone and tree protection areas near the proposed multi-deck car-parking complex. Regulated trees: 1, 2, 15, 16, 17 Non-Regulated trees: 18

Criteria	Tree 1	Tree 2	Tree 15	Tree 16	Tree 17	Tree 18
Tree Species	Sugar gum	Sugar gum	River Red gum	River Red gum	River Red gum	Swamp Mallet
Tree Category	Regulated tree	Regulated tree	Regulated tree	Regulated tree	Regulated tree	Non-Regulated tree
Tree Height Tree width (Radius)	14 x 7 metres Asymmetrical	16 x 7 metres Asymmetrical	18 x 7 metres	18 x 7 metres	16 x 7 metres	14 x 4 metres Asymmetrical
Circumference metres **(M)**	2530mm	2610mm	2930mm	2110mm	2420mm	1320mm
Structural root zone (**SRZ**) metres **(M)**	3.65 m	3.97 m	3.85 m	3.35m	3.45m	2.75m
Diameter at Breast Height (DBH) millimetres (mm)	.845mm	.978mm	.920mm	.684mm	.726mm	.410mm
Tree Protection Zone DBH X 12 (**AS4970-2009**) **Maximum TPZ is 15 metres.**	10.14 metres	11.73 metres	11.04 metres	8.208 metres	8.712 metres	4.92 metres
Total area of the tree protection zone M x M x 3.142 =m^2	323.05 m^2	432.53 m^2	382.95 m^2	211.26 m^2	238.47 m^2	76.05 m^2
Distance from the proposed Multi-deck carpark **SAFE** **WARNING Potentially HAZARDOUS** **UNREASONABLE DANGEROUS**	10480mm Outside of the (TPZ) by .3 metre **SAFE** Still need to preserve the north eastern root plate with minimal impact upon the tree; implement a TPZ area fenced off area around the tree.	8482mm North eastern root plate affected by 3.3 metres into the TPZ. **WARNING Potentially HAZARDOUS** Need to confirm the **Total %** of encroachment by the development	2052mm Eastern root plate affected by 8.988 metres into the TPZ. **Unreasonable DANGEROUS** Need to confirm the **Total %** of total encroachment by the development	.811mm Southern root plate affected by 7.397 metres into the TPZ. **Unreasonable DANGEROUS** Need to confirm the **Total %** of total encroachment by the development	5105mm Southern root plate affected by 3.60 metres into the TPZ. **WARNING Potentially HAZARDOUS** Need to confirm the **Total %** of encroachment by the development	8475mm Outside of the (TPZ) by .3 metre **SAFE** Still need to preserve the root plate with minimal impact upon the tree; implement a TPZ area fenced off area around the tree.
Encroachment into the Tree Protection Zone (**TPZ**) by 10% of the total tree area.	**Allowable** **32.30 m^2**	**Allowable** **43.25 m^2**	**Allowable** **38.29 m^2**	**Allowable** **21.12 m^2**	**Allowable** **23.84 m^2**	**Allowable** **7.60 m^2**
Recommendation	**Prune Tree 1** by a qualified arborist; Level 4 and above. Still need to preserve the root plate with minimal impact upon the tree implement a fenced off **TPZ** area around the tree.	**Prune Tree 2** by a qualified arborist; Level 4 and above. **Root exploration may be required to ascertain if there are any major tree roots greater than 50mm near the proposed multi-storey carpark.**	**Remove Tree 15** Unreasonable DANGEROUS. I estimate the loss of over 40% of the root plate to the proposed development **(Describe)**	**Remove Tree 16** Unreasonable DANGEROUS. I estimate the loss of over 40% of the root plate to the proposed development **(Describe)**	**Prune Tree 17** by a qualified arborist; Level 4 and above. **Root exploration may be required to ascertain if there are any major tree roots greater than 50mm near the proposed multi-storey carpark.**	**Prune Tree 18** by a qualified arborist; Level 4 and above. Still need to preserve the root plate with minimal impact upon the tree implement a fenced off **TPZ** area around the tree.

Table 2 Non-Regulated and Exempt Tree species

- **Non-Regulated trees to be removed: Trees 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12**
- **Exempt tree species to be Removed: Tree 13 and 14**

Criteria	Tree Category	Circumference metres **(M)**	Diameter at Breast Height Millimetres **(MM)**	Tree Protection Zone DBH X 12 (**AS4970-2009**) **Maximum TPZ is 15 metres.**	**Recommendation** *All of these trees are either poor specimens, within and or on the edge of the proposed carpark and would be unsuitable to be retained.*
Tree 3 River Red Gum	Non-Regulated tree	1.53 m	.475mm	5.7 metres	**Removal**
Tree 4 Scott's Pine	Non-Regulated tree	1.11 m	.426mm	5.1 metres	**Removal**
Tree 5 Lemon Scented gum	Non-Regulated tree	1.44 m	.430mm	5.16 metres	**Removal**
Tree 6 Lemon Scented gum	Non-Regulated tree	1.08 m	.344mm	4.12 metres	**Removal**
Tree 7 Lemon Scented gum	Non-Regulated tree	.830m	.262mm	3.144 metres	**Removal**
Tree 8 ***3 small*** Lemon Scented gums	Non-Regulated tree	.900m	.286mm	3.437 metres	**Removal**
Tree 9 Scott's Pine	Non-Regulated tree	1.18m	.375mm	4.5 metres	**Removal**
Tree 10 Strickland's gum	Non-Regulated tree	1.09m	.347mm	4.16 metres	**Removal**
Tree 11 Lemon Scented gum	Non-Regulated tree	.880m	.265mm	3.18 metres	**Removal**
Tree 12 Iron Bark	Non-Regulated tree	1250m	.387mm	4.64 metres	**Removal**
Tree 13 Monterey Pine	Non-Regulated tree	1610m	.494mm	5.928 metres	**Removal**
Tree 14 Monterey Pine	Non-Regulated tree	1680m	.500mm	6.0 metres	**Removal**

There are about 50 smaller saplings against the edge of the existing car park and water detention pond that also can be removed without council consent to allow reasonable development.

The other dominant trees are near and or abutting the proposed multideck car park development; all the trees are Eucalypts; these trees will require further attention as part of the overall management of the trees within the development process. The trees are classified as **Regulated trees: 1, 2, 17 and tree 18** a (Non-Regulated tree).

Tree Protection Zone for the trees on site

To preserve tree roots. No machinery is allowed on bare earth ground within the structural root zone (SRZ) and (TPZ); of any tree unless specific excavation is done by hand and or the use of non-invasive excavation equipment such as a hydro-vac that do not abrade the tree roots or use equipment at a reduced pressure for an air spade to remove soil to the required depth retaining as many tree roots; without cutting any tree root greater than 50mm to protect the tree roots and canopy in accordance with AS4970–2009 "*Protection of Trees on Development sites*"[2].

Soil contamination due to spillage and run-off from building activities (cement washings) waste disposal (liquid waste) and waste storage, must be avoided within the TPZ.

A must; all mulch from each tree species to be used under that tree, with no cross contamination of mulch to the different genus of tree; providing Light Leaf Matter (LLM). This is critical to avoiding damage to the root system for both the pines and the massive mature gum tree. The natural slope of the land allows the trees some natural protection within the site, and this will provide beneficial root growth and deep water for the trees not affected by the development.

Each tree retained **MUST** be protected during development with no earth works within the structural root zones (SRZ), minimal to no earth works (Excavation), parking, storage and or dumping of excess building and or waste materials under the tree protection zone (TPZ) as this will damage the fine roots of the trees by compaction, poor soil aeration and water to the root systems (**See Appendix 4**).

Under section 3.3 of AS4970-2009 it is recommended that major encroachment (excavation & trenching) avoids the TPZ if possible and or is restricted to less than 10% of the total area of the (TPZ) and encroachment should not extend into the SRZ. Design issues will need to be considered prior to the final plan.

Tree Recommendations

Trees 1 and 2: Eucalyptus cladocalyx (Sugar Gums) **Recommendation Prune tree 1 and 2.**

Trees 1 and 2 are located on the edge between the large firefighting holding tank and pump station off Trembath Road on the southern boundary fence near the proposed multi-deck carpark. The trees act as 1 tree. **See Image 1 aerial map with tagged trees.**

These trees can be managed, retained and pruned. The proposed carpark is set back off the eastern boundary fence; approximately 1.5-4 metres off the boundary fence. The distance from the trees to the proposed multi-deck carpark (survey and to be pegged and confirmed) is approximately 8.4-10.4 metres from the proposed development.

Tree 1: The Southern root plate of the Sugar gum is outside of the tree protection zone (TPZ) at 10.48 metres by .3 metre **SAFE**. Still need to preserve the north eastern root plate if the tree root system is not preserved and fenced off during development. The root plate will be impacted, and the tree will suffer from neglect. The architect will Need to confirm the **Total %** of encroachment by the development to protect the tree roots and canopy in accordance with AS4970–2009 "*Protection of Trees on Development sites*"[2].

Tree 2: The Southern root plate of the Sugar gum is will be affected as the proposed development is within the (TPZ) by 3.3 metres into the TPZ. A note of **WARNING Potentially HAZARDOUS** for the root plate if the tree root system is not preserved and fenced off during development.

The architect will Need to confirm the **Total %** of encroachment by the development to protect the tree roots and canopy in accordance with AS4970–2009 "*Protection of Trees on Development sites*"[2].

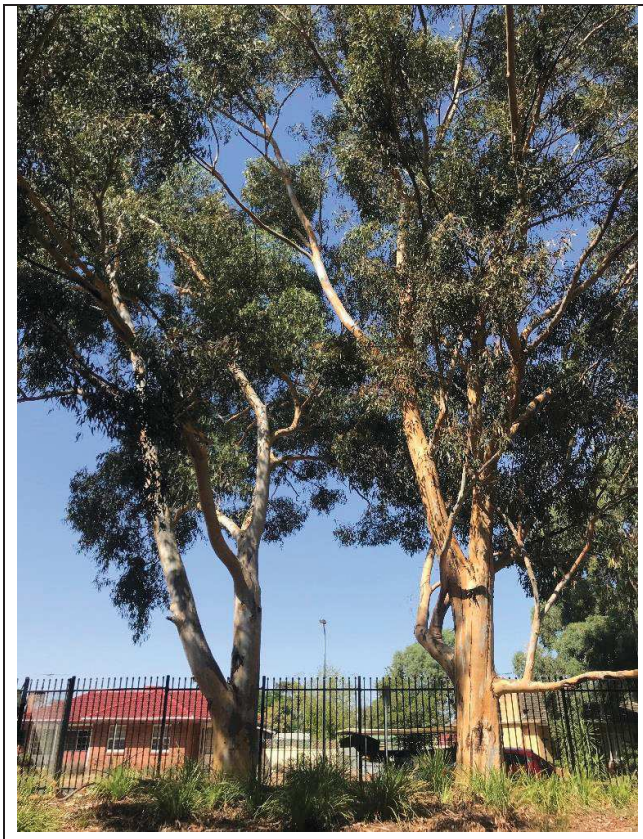
Soil contamination due to spillage and run-off from building activities (cement washings) waste disposal (liquid waste) and waste storage, must be avoided within the TPZ.

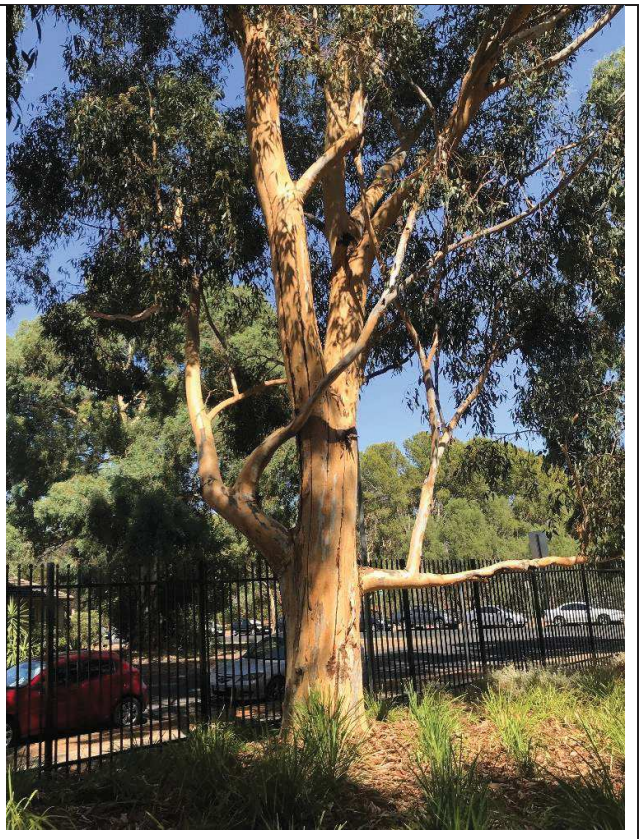
Both trees provide and act together as one tree; therefore, clearances of the proposed development is required to sustain both all structures: -

- careful crown thinning and reduction at best option by 10-15% depending on the branch;
- reduction of the bias lateral branches at best option by 10-15% depending on the branch;
- retaining a balanced canopy;
- Remove major dead wood over 20mm in diametre;
- Climbing arborist to check trunk unions and branch structures for faults unseen from the ground.

Recommendation Prune trees 1 and 2.

Images 5 and 6: The Sugar gums within the current landscape.





Images 7 and 8: The two Sugar gums **Trees 1 and 2** within the current landscape near Trembath Road.

Tree 17: Eucalyptus camaldulensis (River Red Gum) **Recommendation Prune tree 17.**

Trees 17 is located on the edge of the landscaped fenced off area and Mark Road; between the fence and the existing multi-deck carparking near the western fence. **See Image 1 aerial map with tagged trees.**

This tree can be managed, retained and pruned. This section of the proposed carpark is set back off the north western boundary fence; approximately 1.5-2 metres off the boundary fence. The distance from the tree to the proposed multi-deck carpark (survey and to be pegged and confirmed) is approximately 5.105 metres from the proposed development. The Southern root plate affected by 3.60 metres into the TPZ. A note of **WARNING** Potentially HAZARDOUS for the root plate if the tree root system is not preserved and fenced off during development. Architect will Need to confirm the **Total %** of encroachment by the development

This tree is in a group of three (3) trees and do provide and act together as one tree; therefore, clearances of the proposed development is required to sustain both all structures: -

- careful crown thinning and reduction at best option by 10-15% depending on the branch;
- reduction of the bias lateral branches at best option by 10-15% depending on the branch;
- retaining a balanced canopy;
- Remove major dead wood over 20mm in diametre;
- Climbing arborist to check trunk unions and branch structures for faults unseen from the ground.

Images 9 and 10: Tree 17 The River Red gum within the current landscape near Trembath Road to be retained and pruned by a qualified arborist.

Image 11: Looking south along Mark Road and the centre of the green area to be the proposed multi-deck carpark.

Red =Removal Yellow = Hazardous (Root Intrusion) Green = Prune and retain

Tree 18 a Eucalyptus spathulata (Swamp mallet)

Is a single trunked tree with low co-dominant trunk; with bias lateral branches dominating the canopy to the north west and eastern canopy. The trunk has been damaged by previous development at the base of the trunk. Minor deadwood otherwise a tough resilient tree.

Images 12 and 13: The Swamp Mallet with die back only on the eastern trunk with numerous epicormic shoots.

Principals of Development Control (PDC'S)

Listed Trees 1-18 are categorised into the following listings. **(See Image 1** for site location and trees within the proposed multi-deck carpark **and Table 1)**

Tree Management for each tree as follows:

- **Significant trees:** None
- **Non-Regulated trees to be removed: Trees 3, 4, 5**, **6**, **7**, **8**, **9**, **10**, **11 and 12**
- **Exempt tree species to be Removed: Tree 13 and 14**
- **Non-Regulated Trees to be Pruned:** (**Green**) identified as **Trees 18**
- **Regulated Tree Trees to be Pruned:** (**Green**) identified as **Trees 1 and 2**
- **Regulated Trees:** to be Removed (**Red**) identified as **Trees 15 and 16.**
- **Regulated Trees:** to be Retained Veteran Tree Management (VTM) (**Orange**) **Tree 17.**

PDC1: **Development should preserve the following attributes where a regulated tree demonstrates at least one of the following attributes:**

(a) makes an important contribution to the character or amenity of the local area; or **Yes**

(b) is indigenous to the local area and its species is listed under the *National Parks and Wildlife Act 1972* as a rare or endangered native species **No**

(c) represents an important habitat for native fauna **Yes**

(d) is part of a wildlife corridor of a remnant area of native vegetation (**Trees 1 and 2**) **Yes**

- ❖ Planted trees along with the other plants. **No**

(e) is important to the maintenance of biodiversity in the local environment **Yes**

(f) forms a notable visual element to the landscape of the local area. **Yes**

PDC 2: Development should be undertaken so that it has a minimum adverse effect on the health of a regulated tree. **Yes**

In developing the design and due to the size and the existing multiple levelled carpark across the allotment, the plans to extend onto the multi-level carpark is the best location using the existing infrastructure to the outer edges of the carpark. (**See aerial map Image 1 and Appendix 1: page 1** for the proposed site plan).

This tree can be managed, retained and pruned. This section of the proposed carpark is set back off the north western boundary fence; approximately 1.5-2 metres off the boundary fence. The distance from the tree to the proposed multi-deck carpark (survey and to be pegged and confirmed) is approximately 5.105 metres from the proposed development. The Southern root plate affected by 3.60 metres into the TPZ.

A note of **WARNING;** Potentially HAZARDOUS for the root plate if the tree root system is not preserved and fenced off during development. Architect will Need to confirm the **Total %** of encroachment by the development

PDC 3: Regulated trees should be preserved and tree damaging activity should not be undertaken unless: **No**

(a) in the case of tree removal, where at least one of the following apply:

(i) the tree is diseased, and its life expectancy is short **No**

(ii) the tree represents an unacceptable risk to public or private safety **No**

- ➢ Trees have been pruned to reduce further sudden limb failure (S.L.F.)

(iii) the trees are within 20 metres of a proposed multi story dwelling carpark for a hospital on crown land for medical residential accommodation and is not within a Bushfire Prone Area **No**

(b) the tree is shown to be causing or threatening to cause substantial damage to a substantial building or structure of value **YES**

- The proposed development will be out of the structural root zone (SRZ)[7] for most of the trees and on the outer edge of the tree protection zone (TPZ)[8]. The plans have been designed to avoid the trees, with minimal impact as indicated allowing reasonable design. (**See Appendix 1**)

- The proposed development requires egress onto the site which **will not** encroach into the structural root zone (SRZ)[6] of the trees to be retained **Tree 1, 2 17 and 18;** however, the bored piles proposed along the edge of the building are 4000mm deep and 1050mm in diameter. The structural engineer has requested a zone 750mm from grids along the edge of the building for piles and footings (shown in red in the attached mark-up). The building will not have a paved apron.
-

- This is the best option for the siting the multi-story carpark. Screen planting to be used to create privacy and screening. (**See Appendix 1: page 1** for the proposed site plan).

(c) all other reasonable remedial treatments and measures have been determined to be ineffective **Yes**

In developing the design and due to the size and the existing multiple levelled carpark across the allotment, the plans to extend onto the multi-level carpark is the best location using the existing infrastructure to the outer edges of the carpark. (**See aerial map Image 1 and Appendix 1: page 1** for the proposed site plan).

(d) it is demonstrated that all reasonable alternative development options and design solutions have been considered to prevent substantial tree-damaging activity occurring. **Yes**

In developing the design and due to the size and the existing multiple levelled carpark across the allotment, the plans to extend onto the multi-level carpark is the best location using the existing infrastructure to the outer edges of the carpark. (**See aerial map Image 1 and Appendix 1: page 1** for the proposed site plan).

PDC 4: Development involving ground work activities such as excavation, filling, and sealing of surrounding surfaces (whether such work takes place on the site of a significant tree or otherwise) should only be undertaken where the aesthetic appearance, health and integrity of a significant tree, including its root system, will not be adversely affected. **Yes**

- The proposed development requires egress onto the site which **will not** encroach into the structural root zone (SRZ)[6] of the trees to be retained **Tree 1, 2 17 and 18;** however, the bored piles proposed along the edge of the building are 4000mm deep and 1050mm in diameter. The structural engineer has requested a zone 750mm from grids along the edge of the building for piles and footings (shown in red in the attached mark-up). The building will not have a paved apron.

PDC5: Land should not be divided or developed where the division or development would be likely to result in a substantial tree-damaging activity occurring to a significant tree. **No**

Hazard identification

To assist with a hazard evaluation and decision making I have used a recognized table to determine the level of risk associated with the potential of failure.

The likelihood of failure (failure potential) and the size of the part concerned are determined from the table.

The frequency of use of the target area is then identified and added into the formula. Adding together the values provides a hazard rating out of 12. A higher rating indicates a greater hazard.

Failure Potential	Size of Part	Target Rating	Hazard Rating
1= Low 2=Medium 3=high 4=Severe	1=15 cm diameter **2= 15-45 cm** 3= 45-75 cm 4=75 cm+	1= Occasional use 2= intermittent use **3=frequent use** 4= constant use	In this case an average rating **6** out of **12** is indicated

(This formula is taken from Matheny and Clark. *Evaluation of hazard trees in Urban areas.* International Society of Arboriculture, Illinois, 1994.pp59)

Total Risk Rating Can Be Summarized as Follows:

A high number does not necessarily mean the tree must be automatically removed. There are a number of Arboriculture management techniques (e.g. pruning, limb removal, weight reduction and even cabling) which can effectively reduce the failure and size of the limb to an acceptable level.

The target rating can also be effectively lowered by excluding persons from the site (fenced off once completed and only open to authorised personnel. I am of the opinion this is the safest option considering the location of the will only increase once development occurs; therefore, the trees have been pruned to reduce potential hazards and risks to persons and existing structures within the rear garden by a qualified arborist level 4 and above.

Tree Pruning

Damage to all the trees is inevitable either naturally occurring genetically, environmental, insect, pathogen and or human and or a combination of several factors affecting the form, habit, structure, longevity and or environmental factors, drought, water and or mechanical means can greatly shorten the safe useful life expectancy S.U.L.E. of a tree.

Pruning cannot correct all the imbalance of the tree growing as a solitary specimen and or within a group of trees affected by each trees habit, form, allelopathy and or phototropism and pruning natural/human intervention; which is now entirely determined by the response from each tree through Compartmentalisation of Decay in Trees (C.O.D.I.T.) of their wounds.

There are recommended techniques AS4373-2007 pruning of Amenity Trees. If practical, branches should be removed back to their point of origin. If a branch must be shortened, it should be cut back to a lateral that is large enough to assume the terminal role. A rule of thumb is to cut back to a lateral that is at least one-third the diameter of the limb being removed.

Table 1: INDICATIVE STAGES IN DEVELOPMENT AND THE TREE MANAGEMENT PROCESS

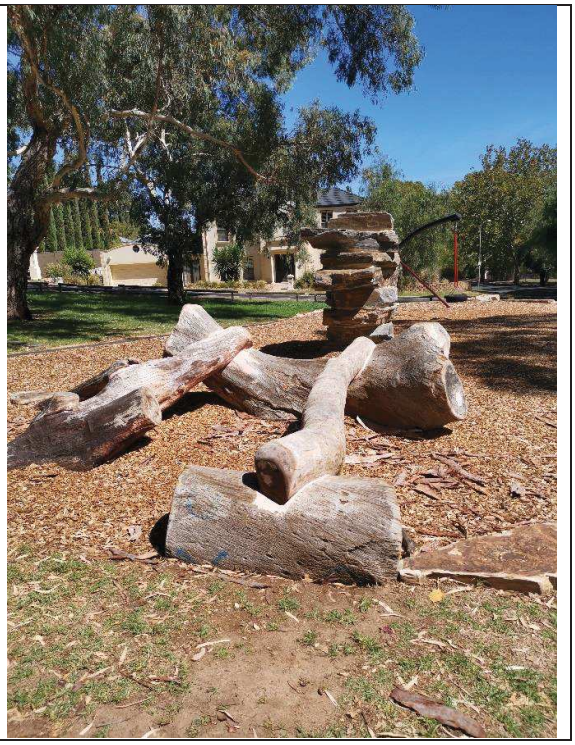
Stage in Development	Tree Management Process at Lyell Mc Ewin Hospital multi story carpark.	
	Matters for consideration	**Actions and Certification**
Planning (Sections 2 & 3)		**Trees 2 and 3**
Preliminary Development Tree Assessment	Council plans and policies and planning regulations, Tree species to be removed and or retained. Those trees retained require protective control measures during development.	Arborist report with TPZ that guides development for council to assess; including conditions and compliance(s) council will specify in the development approval to the applicant.
Preliminary Development Design	Engineer specifications and soil report.	Design for the proposed car park should be engineered to minimise and accommodate any impacts or related tree growth "Tree Effects" the use of non-invasive intrusion onto the soil surface allowing for the maturity of vegetation can be shown in the landscape plan by a qualified engineer.
	Location of the carpark envelope including, services to the multi-story level carpark identified in the plan sewer, storm water, electrical and fibre optic	All services **must not** be inside of the srz but may be within the tpz if this is the case the engineer can design. If unavoidable; then hand dig and or use non-destructive excavation methods are stipulated e: g Hydro-vac to directional boring depending on service at their appropriate depth within the tree protection zone. All contractors to provide documentation of services prior to installation. **Certification of Tree protection Measures.**
	Level changes within the (TPZ).	Design to have minimal disturbance and impact on tree(s) with minimal soil changes in tpz.
Pre-Construction (Sections 4 & 5)		
Initial site preparation	Specifications for tree protection measures	Establish and delineate tpz; Install protective measures (fencing) on site. **Certification of Tree protection Measures.**
Site Establishment	Provide, install engineering strategies across the (TPZ);	Fence off tpz; cut and slash grass and pest plants. Signage on fencing of tpz. Non-invasive digging (Hydro-vac) if required. No root greater than 50mm to be severed. Notification to arborist. **Certification of tree protection measures.**
Construction (Sections 4 & 5)		
Construction Work	Liaison with site supervisor/manager	Maintain and amend protective measures. Induct workers regarding TPZ; Supervision and monitoring. No storage, dumping of waste on tpz.
	All contractors to be inducted onto work site regarding non-use of the tpz during construction.	See attached documentation "Tree Protection Zone" and the reasons for tpz.
		The use of eco-cell and porous pavers for the carpark should also be for paved areas in the front of the trees.
Post Construction (Sections 4 & 5)		
Defects liability/maintenance	Tree vigour and structure	**Final certification of tree condition**

Proposed landscaping

The owner's expressed aim is to enhance the property in maintaining and nurturing appropriate trees which will add to the value and amenity of the site. One aim of tree assessment is to identify appropriate trees for retention in order that the best options for prolonging the life of each tree with inter-planting around those trees to be monitored and assessed in the future.

A final combined aim of tree assessment and landscape planning is to provide an attractive environment in which vegetation will add to the local amenity and environment without threatening or compromising safety of persons or property.

The owner has considered the streetscape and amenity of the area and sought the advice of a horticulturalist with regard to the site. A focus of the proposed landscaping is to retain and enhance those plants that can be retained within the allotment and sustainability; with consideration of water wise species suited to the local climate and projected climatic change.



Images 14 and 15: I believe that the trees retained can be incorporated into water sensitive design (WSUD) landscapes adapting the landscapes around **Trees 2, 3, 17 and 18.** The trees retained should have a further assessment during and after the completion of the development and then at least an inspection every two years to ascertain tree health, structure and appropriate tree management actions, if required to remediate those issues.

All tree work if completed must be done by a suitably qualified arborist. Please contact me if you require more information on 0430 432 007.

Yours sincerely,

David M. G. Mably (Electronic signature 19th March 2019)

David M. G. Mably

ISA Certified Arborist AU- 0285A
Ad Dip Hort (Arb) Aust.
Ass Dip. App Sci. (Park Management) Aust.
Cert Tree Surgery U.K.

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Endnotes

1. ***Part 2 Amendment of Development Act 1993 4 Amendment of Section 4.*** Sub regulations (1) and (2) The Act controls "tree damaging activities' in relation to a regulated tree and or 'significant tree' by defining it to be 'Development'. Trunk circumference of 2.0 metres or more; are measured 1.0 metre above natural ground level within the metropolitan Adelaide and townships in the Adelaide Hills qualify as 'Regulated trees.

Trees with a trunk circumference of 3.0 metres or more, measured 1.0 metre above natural ground level within the metropolitan Adelaide and townships in the Adelaide Hills qualify as 'significant trees. Trees with multiple trunks and have an average stem size of 625mm >.

Part 2 Variations of Development Regulations 2008 4 Sub regulations (1) and (2) do not apply Regulated and Significant trees (8) 'Tree damaging activities' in section 4(1) of the Act, pruning-

(a) That does not remove more than 30% of the crown of the tree; and

(b) that is required to remove-

(i) dead or diseased wood;

(ii) branches that pose a material risk to a building; or

(ii) branches to a tree that is located in an area frequently used by people and the branches pose a material risk to such people, is excluded from the ambit of that definition. Breaches of the act can incur a fine up to $60,000.00.

2. The Australian Standard: AS4373 – 2007 *'Pruning of Amenity Trees'* provides a minimum pruning standard based on the widely accepted theories of compartmentalisation of decay/dysfunction in trees (CODIT) that must be applied for all trees. Pruning should only be carried out by trained and experienced Arboricultural technicians under the supervision of an AQF level 4 or higher qualified Arborist.

3. The minimum Arboricultural qualification required to enable effective decision making with regard to tree health, stability and safety issues is AQF (Australian Qualification Framework) Level 3. As with all professions, a level of experience proportionate with the task being undertaken is essential, regardless of qualifications.

4. Planting of trees should be avoided near the foundations of the house or neighbouring house on reactive sites as they can cause damage due to the drying out of the clay at substantial distances. To reduce, but not eliminate the possibility of damage, tree planting should be restricted to a distance from the house of:

1. 1.5 x mature height for class E (extremely reactive) sites.
2. 1 x mature heights for class H (highly reactive) sites.
3. 0.75 x mature height for class M (moderately reactive) sites.

AS2870-1996 Residential slabs and footings – Construction p53

5. Root protection zone (RPZ) A specified area below ground and at a given distance from the trunk set aside for the protection of tree roots to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development. **NOTE:** Establishment of these areas may include root investigation and mapping, root pruning and installation of root barriers or other protection measures at the edge of the RPZ to prevent conflict between roots and works.

6. Structural root zone (SRZ) The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright, so the entire profile (depth) of the root zone is included in the structural root zone. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

7. Tree protection zone (TPZ) The combined area of the root protection zone (RPZ) and crown protection zone (CPZ) as an area set aside for the protection of a tree.

8. Vigour is the ability of a tree to sustain its life processes, as used in the Standard for calculating the minimum RPZ. NOTE: The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'.

9. Included Bark Crotches are potential structural weaknesses that occur in trees between the main stem and a branch or between leaders of equal size (co dominant stems). Bark between the stems turns downwards and prevents the interlocking of wood fibres rather than upwards (as in structurally sound crotches) to form a branch bark ridge. This defect is under genetic control and may be repeated throughout the tree or occur in only one crotch. The position of an included bark crotch may be more serious than those higher in a tree. Depending upon the severity of the defect, the trees age and the species involved, it may be possible to prune the affected portion and or install protective cables in trees with bark inclusions in order to reduce the risk of failure. Bark inclusions that do not display signs of structural instability and or are in trees at sheltered locations are unlikely to present an unacceptable level of risk and may not warrant Arboricultural intervention.

10. Sudden Limb Failure (SLF) is a common problem for many species of trees including exotic trees. It almost always affects limbs held in a horizontal or near horizontal plane, though more upright limbs have also failed due to SLF. Predisposing factors include a low angle of attachment, reduced limb taper, relative branch exposure, limb over-extension and, a concentration of weight towards the end of the limb.

Defects do not have to be present, though when wounds or decay are present, they exacerbate the risk of SLF. The mechanisms involved in SLF are complex and relate to the production of Phenols and Turpenes produced as part of the CODIT process (Compartmentalization of Decay in Trees) in Wall 4 by the trees internal chemical protection system. Trigger factors include prior strong winds and usually, though not always, the likelihood of failure is influenced by increased in temperature and moisture stress. SLF remains one of the highest risk elements in tree management and is certainly the least well understood. Expert advice and careful crown management can significantly reduce the risk of SLF where tree structure is suitable for well targeted pruning.

11. The Landscape Below Ground 11 proceedings of an international Workshop on tree Root Development in Urban Soils. Dr. Dan Neely Dr. Gary W. Watson

12. It is commonly thought that a healthy tree tolerates the removal of up to one third of its root as noted by Harris 1992 and Helliwell 1985 as cited in Matheny and Clark 1998 Trees and Development A Technical Guide to Preservation of Trees During land Development (International Society of Arboriculture, Indiana) p72. It is also stated that healthy trees are more tolerant to root disturbance while trees with low vigour are less tolerant.

13. Trees and Development A Technical Guide to preservation of Trees During Land Development Nelda Matheny and James R Clark Pages 84 and 85

14. Windthrow Tree failure and collapse when a force exerted by wind against the crown and trunk overcomes resistance to that force in the root plate, such that the root plate is lifted from the soil on one side as the tree tips over.

Disclaimer

This report only covers identifiable defects and issues present at the time of inspection. The author accepts no responsibility or can be held liable for any structural defects or unforeseen event/weather conditions that may occur after the time of the inspection and assessment, unless clearly specified within timescales detailed within the report.

The author cannot guarantee trees contained within the report will be structurally sound under all circumstances and cannot guarantee that the recommendations made will categorically result in the tree being made safe.

Unless specifically mentioned, this report will only be concerned with issues above ground and are undertaken visually. It is suggested that trees are living entities and as such are subject to forces and influences out of the control of the author. The recommendations are made on the basis of what can be reasonably identified at the time of the inspection; therefore, the author accepts no liability for any recommendations made.

Care has been taken to provide information that is based on sound arboriculture practices and standards. The author accepts no liability for actions undertaken by third parties in undertaking any of the arboriculture work as recommended. All data has been verified and based on sound arboriculture standards, however the author cannot guarantee nor is responsible for the accuracy of information supplied by third parties.

Note: This report is valid for three months from the report date.

Appendix 1: **Site plan with the existing built environs.**

Appendix 2: **Site plan; proposed development and the tree protection zones.**

Appendix 3: **Use of Ecocell and 20mm aggregate with no fines where tree roots are a concern.**

Use of Eco cell structure over the driveway using 20mm gravel (Non-Fines) between cells.

Porous paver design

Appendix 3 continued: Previous development near a River Red gum in the city of Mitcham

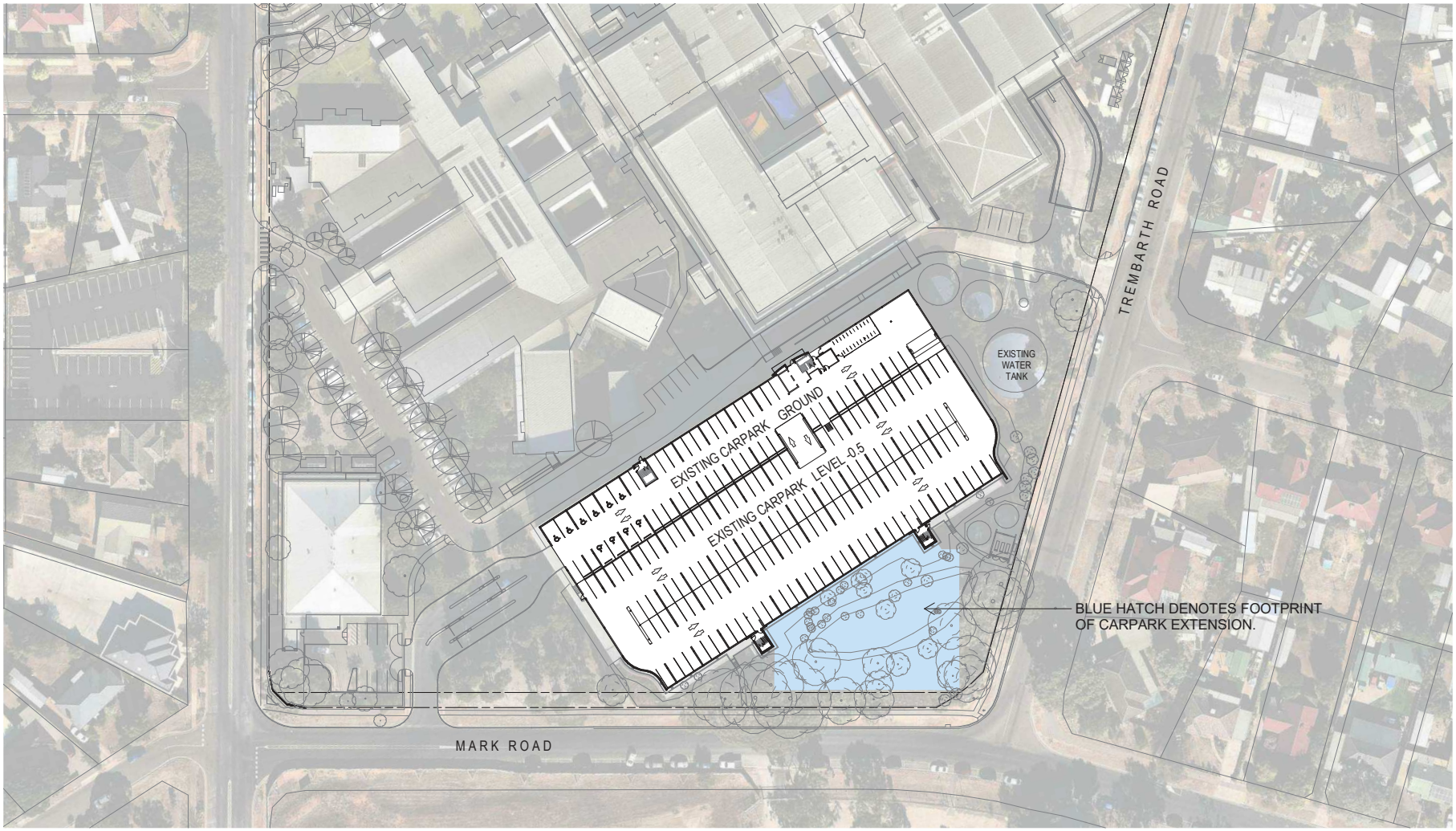
Development under a large River red gum using structural soils, Geo-fabrics and porous pavers in the City of Mitcham

Appendix E

Drawings

The following A3 format drawings detail the proposed development.

17192_CP_SD001	Existing Site and Location Plan
17192_CP_SD002	Proposed Site Plan
17192_CP_SD100	Proposed Ground Floor Plan
17192_CP_SD101	Proposed Levels 1-4
17192_CP_SD102	Proposed Level 5
17192_CP_SD103	Proposed Roof Plan
17192_CP_SD104	Section A
17192_CP_SD105	Section B
17192_CP_SD106	Elevation 1
17192_CP_SD107	Elevation 2
17192_CP_SD108	Elevation 3
17192_CP_SD109	Elevation 4
17192_CP_SD200	Materials



	Existing car park spaces	Additional car park spaces	Total car park spaces
Ground -0.5 to 0.0	199	0	199
Level 1 0.5 to 1.0	210	41	251
Level 2 1.5 to 2.0	210	41	251
Level 3 2.5 to 3.0	210	41	251
Level 4 3.5 to 4.0	210	41	251
Level 5 4.5 to 5.0	210	41	251
Total	**1249**	**205**	**1454**

@ A3

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Project: LMH CARPARK EXTENSION

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fax: +61 8 8331 9442

Drawing: EXISTING SITE & LOCATION PLAN

Scale: 1 : 1000

Date: 05/04/2019

Drawing no.: 17192 CP SD001

Revision: E

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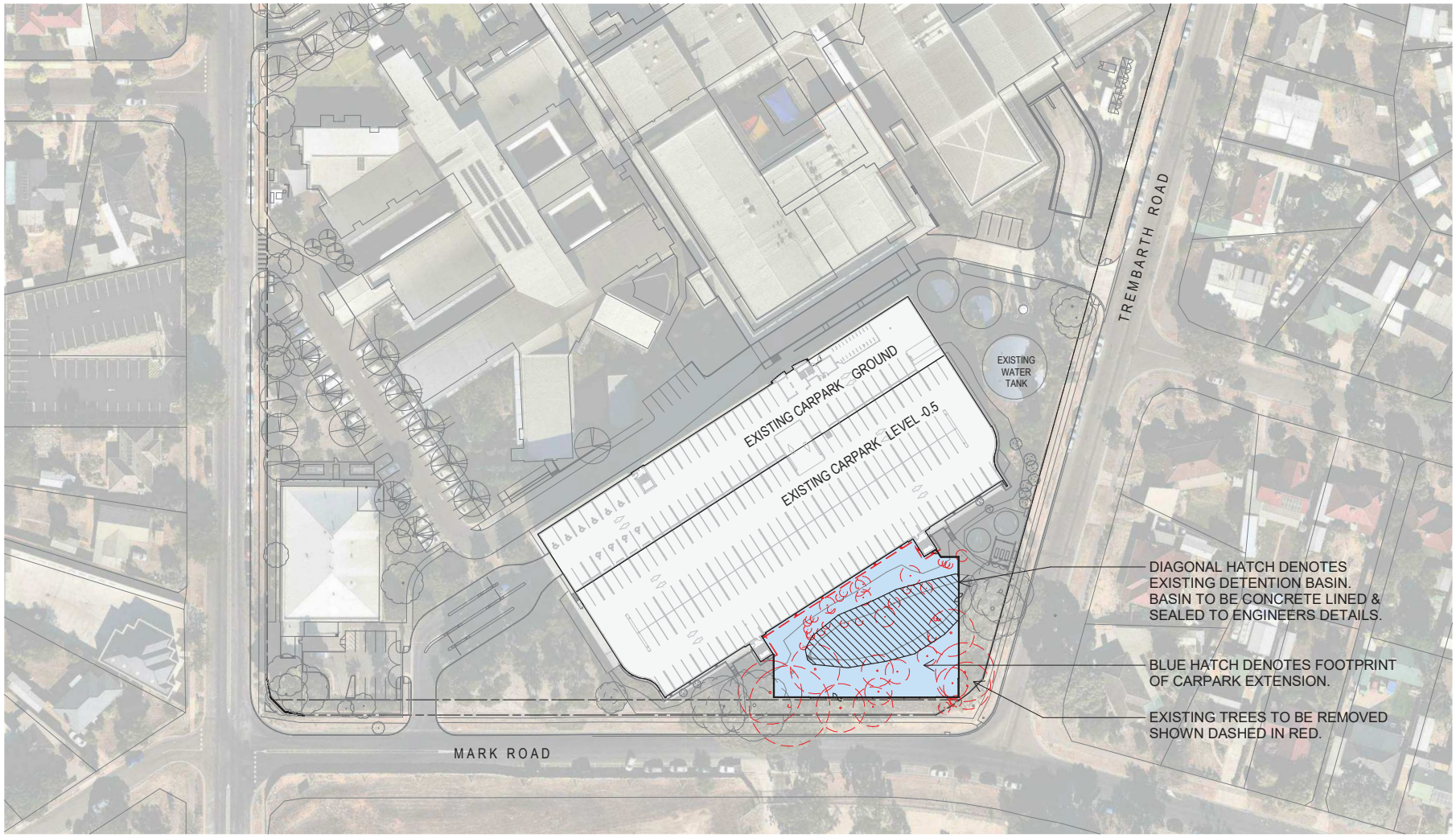

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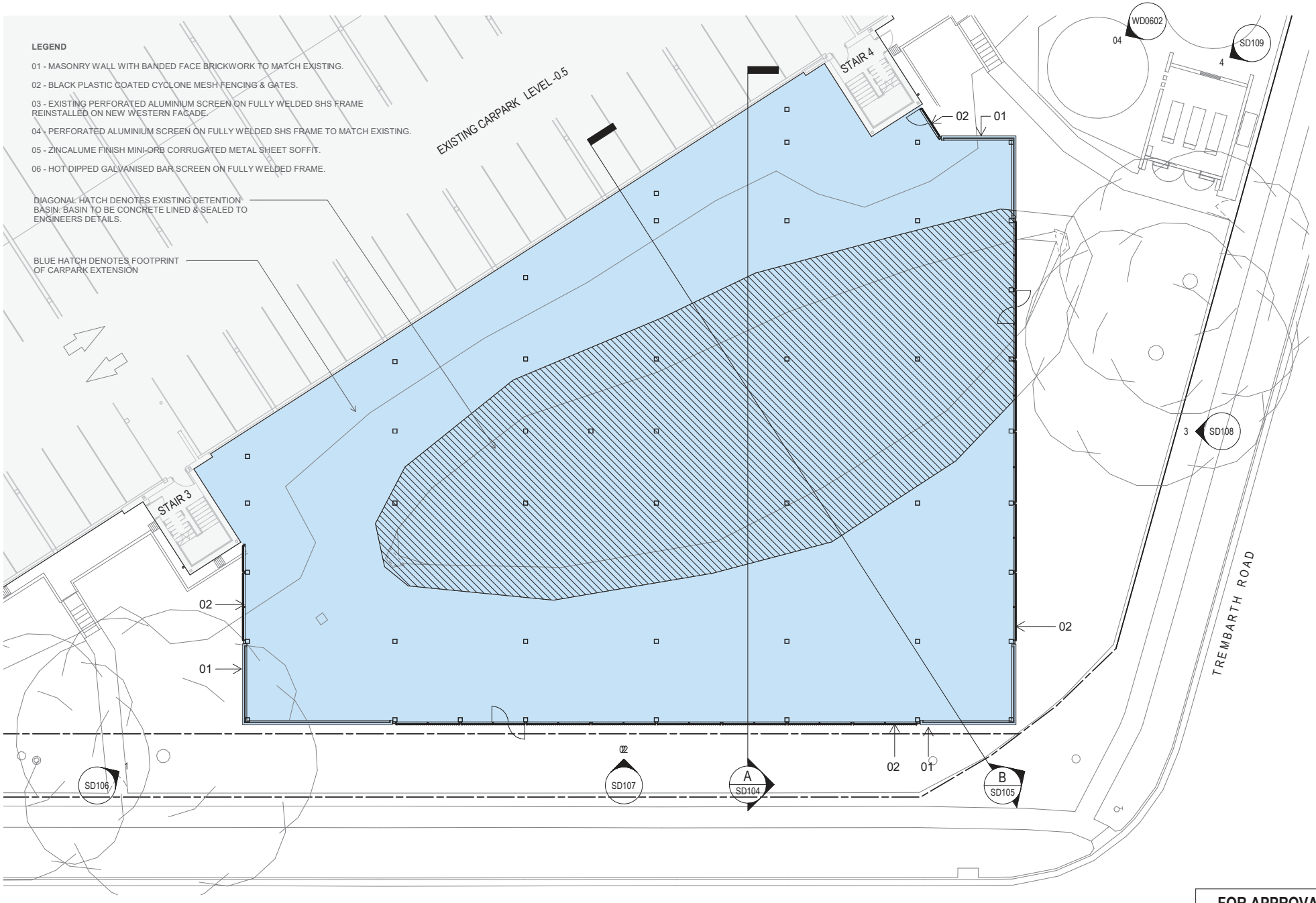

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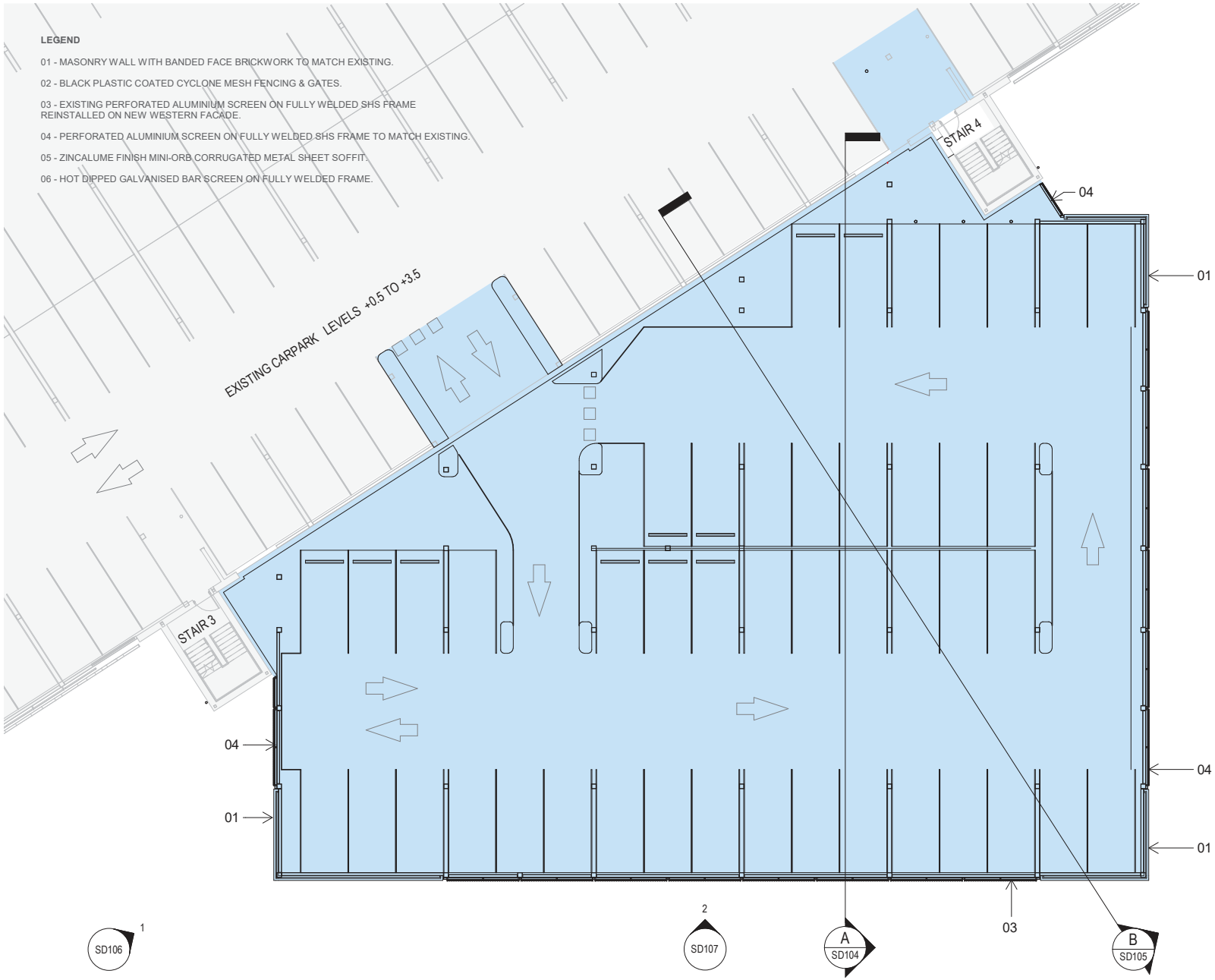

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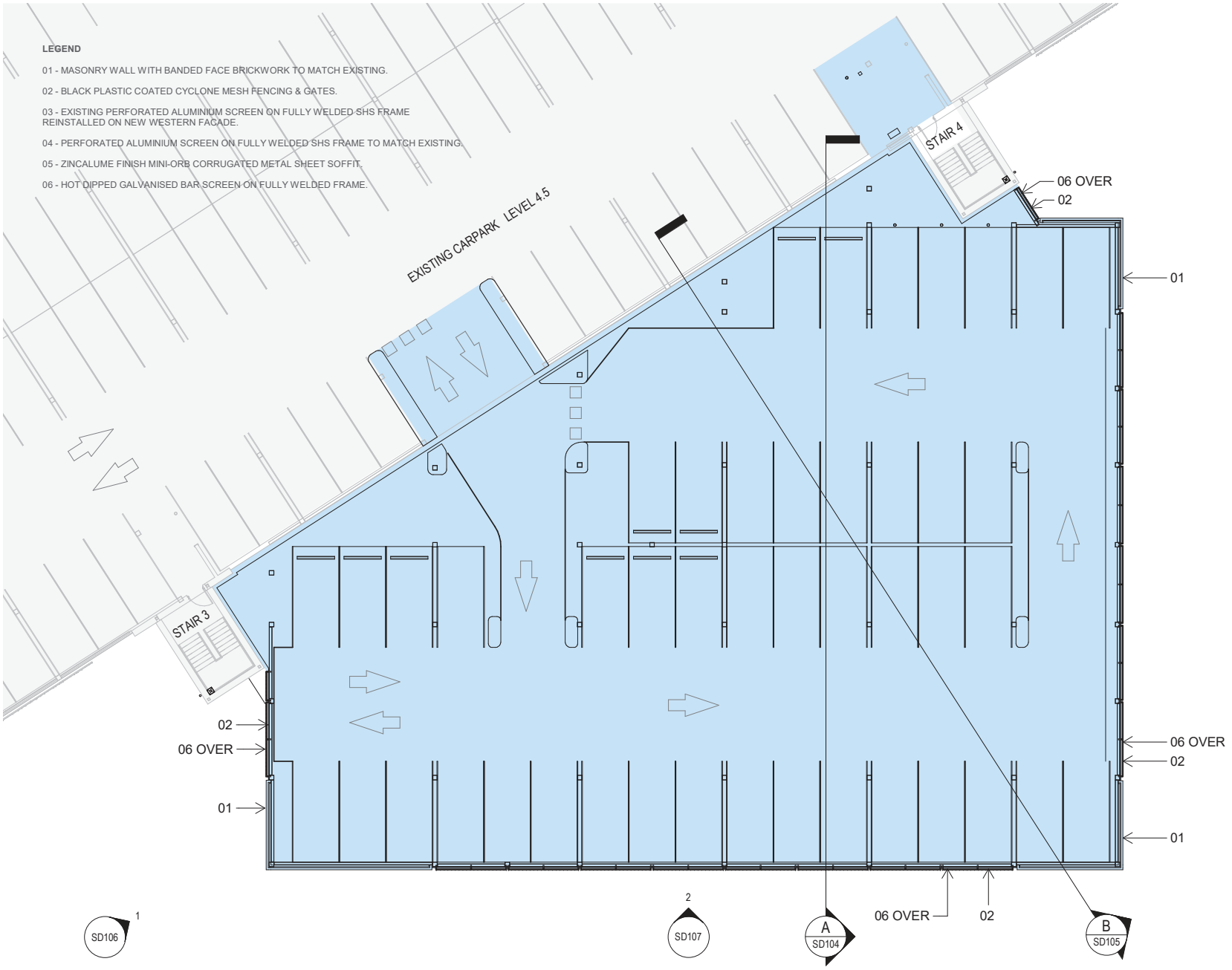

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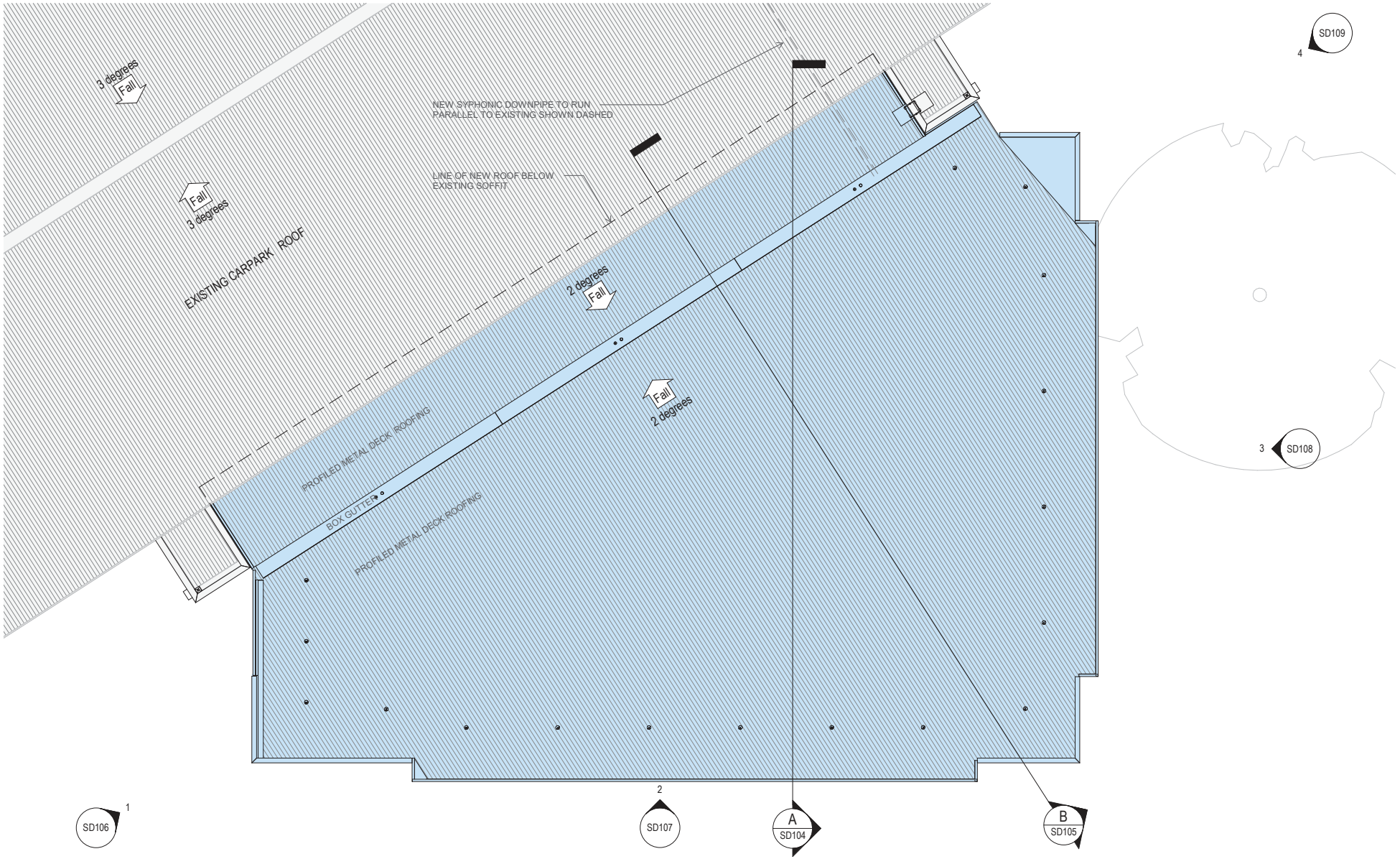

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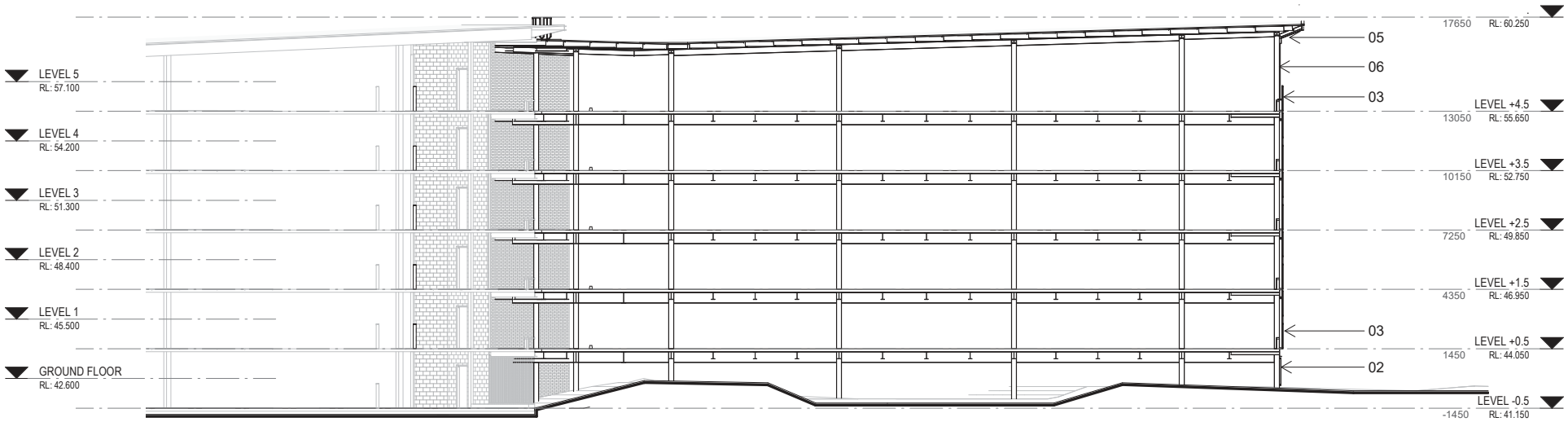

LEGEND

01 - MASONRY WALL WITH BANDED FACE BRICKWORK TO MATCH EXISTING.

02 - BLACK PLASTIC COATED CYCLONE MESH FENCING.

03 - EXISTING PERFORATED ALUMINIUM SCREEN ON FULLY WELDED 50SHS FRAME TO BE REMOVED & REINSTALLED ON NEW WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED 50SHS FRAME TO MATCH EXISTING.

05 - MINI-ORB CORRUGATED METAL SHEET SOFFIT - ZINCALUME FINISH.

06 - HOT DIPPED GALVANISED CIRCULAR BAR SCREEN ON FULLY WELDED 'EA' FRAME.

FOR APPROVAL

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Project: LMH CARPARK EXTENSION

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Drawing: SECTION A

Scale: 1 : 200

Date: 05/04/2019

Drawing no.: 17192 CP SD104

Revision: E

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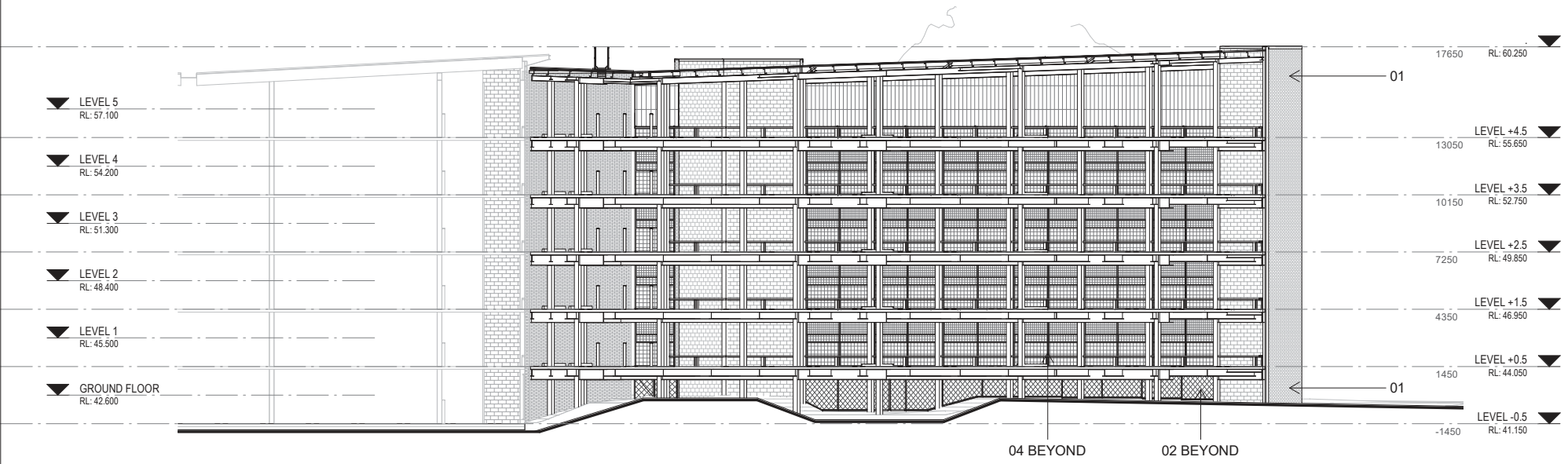

LEGEND

01 - MASONRY WALL WITH BANDED FACE BRICKWORK TO MATCH EXISTING.

02 - BLACK PLASTIC COATED CYCLONE MESH FENCING.

03 - EXISTING PERFORATED ALUMINIUM SCREEN ON FULLY WELDED 50SHS FRAME TO BE REMOVED & REINSTALLED ON NEW WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED 50SHS FRAME TO MATCH EXISTING.

05 - MINI-ORB CORRUGATED METAL SHEET SOFFIT - ZINCALUME FINISH.

06 - HOT DIPPED GALVANISED CIRCULAR BAR SCREEN ON FULLY WELDED 'EA' FRAME.

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Project: LMH CARPARK EXTENSION

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Drawing: SECTION B

Scale: 1 : 200

Date: 05/04/2019

Drawing no.: 17192 CP SD105

Revision: E

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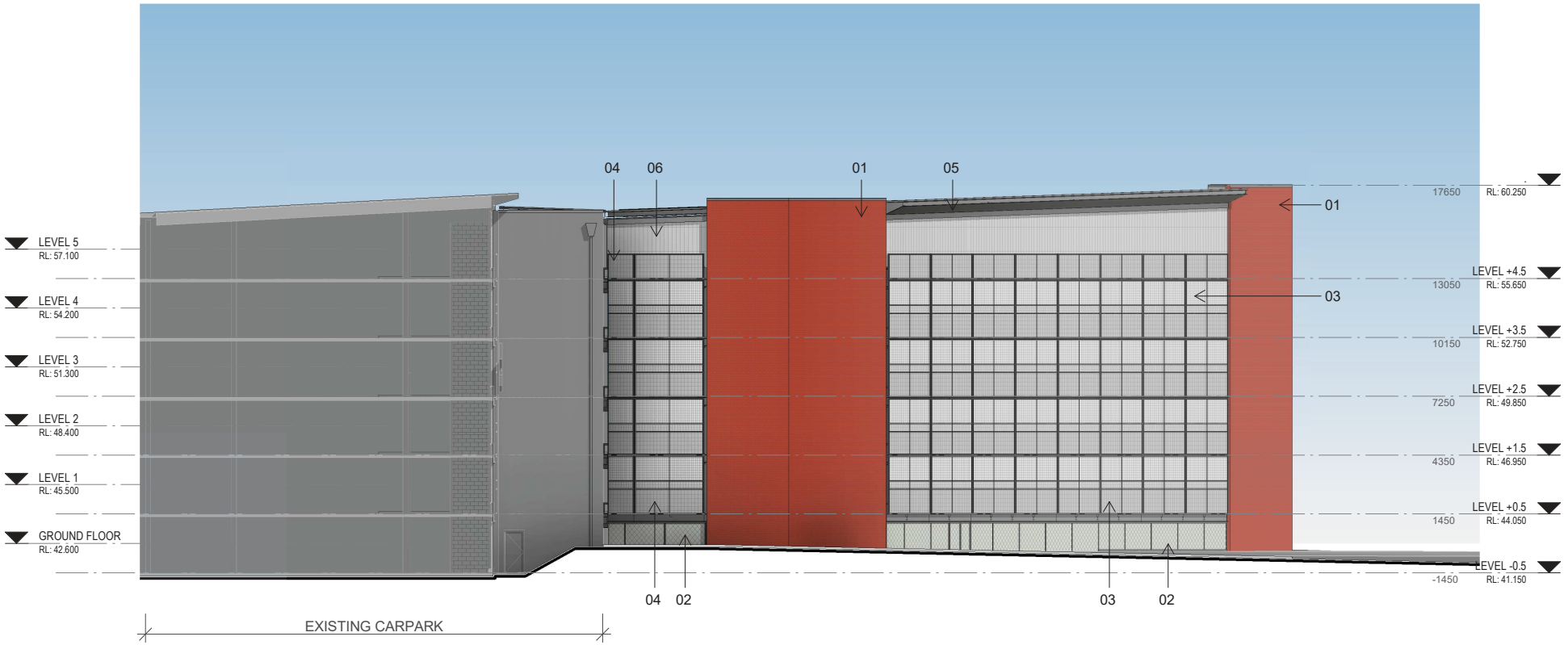

LEGEND

01 - MASONRY WALL WITH BANDED FACE BRICKWORK TO MATCH EXISTING.

02 - BLACK PLASTIC COATED CYCLONE MESH FENCING & GATES.

03 - EXISTING PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME REINSTALLED ON NEW WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME TO MATCH EXISTING.

05 - ZINCALUME FINISH MINI-ORB CORRUGATED METAL SHEET SOFFIT.

06 - HOT DIPPED GALVANISED BAR SCREEN ON FULLY WELDED FRAME.

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Project: LMH CARPARK EXTENSION

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Drawing: ELEVATION 1

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Date: 05/04/2019

Drawing no.: 17192 CP SD106

Revision: E

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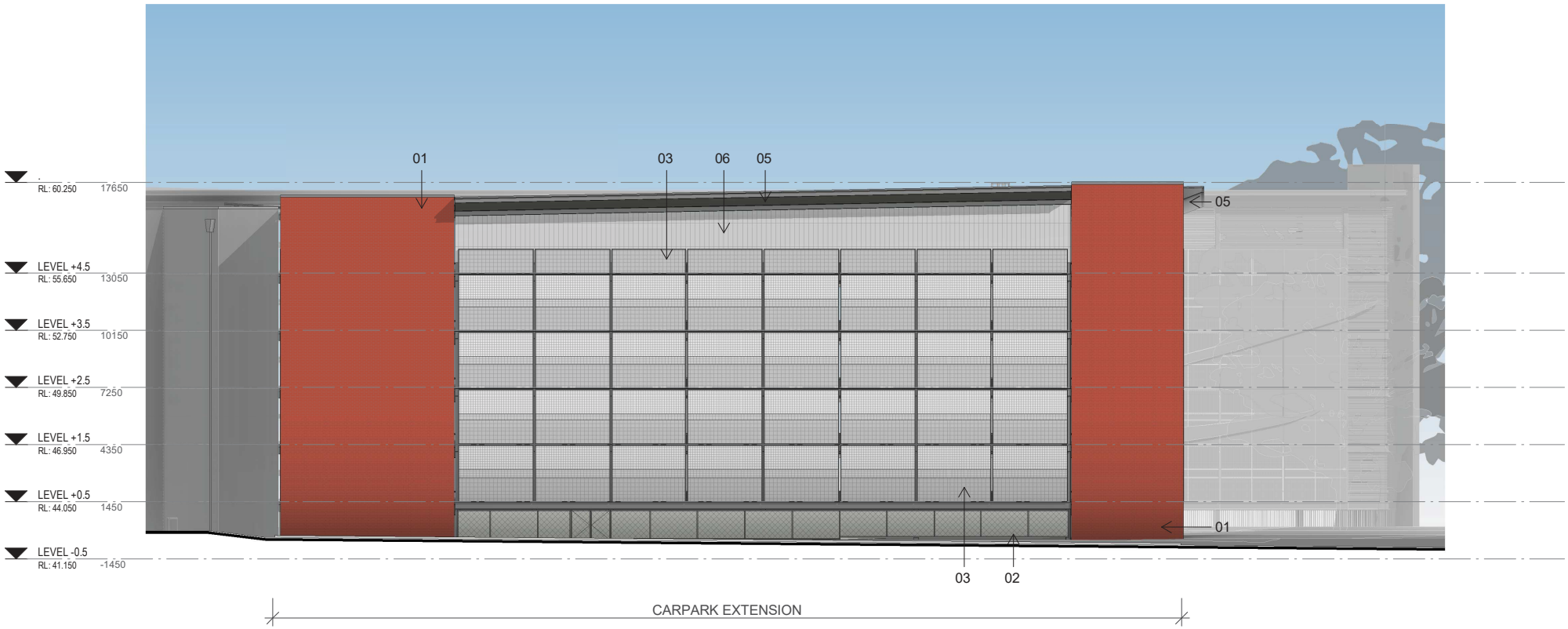

LEGEND

01 - MASONRY WALL WITH BANDED FACE BRICKWORK TO MATCH EXISTING.

02 - BLACK PLASTIC COATED CYCLONE MESH FENCING & GATES.

03 - EXISTING PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME REINSTALLED ON NEW WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME TO MATCH EXISTING.

05 - ZINCALUME FINISH MINI-ORB CORRUGATED METAL SHEET SOFFIT.

06 - HOT DIPPED GALVANISED BAR SCREEN ON FULLY WELDED FRAME.

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Drawing: ELEVATION 2

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Date: 05/04/2019

Drawing no.: 17192 CP SD107

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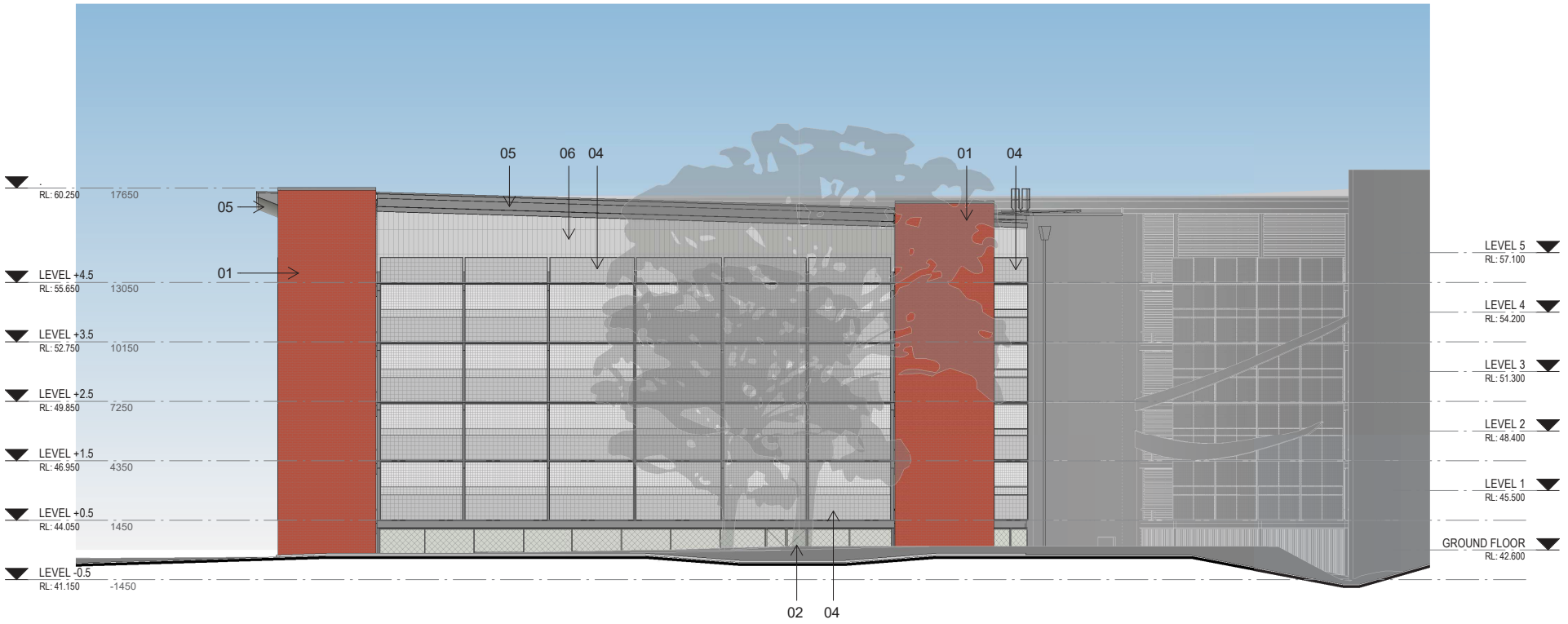

LEGEND

01 - MASONRY WALL WITH BANDED FACE BRICKWORK TO MATCH EXISTING.

02 - BLACK PLASTIC COATED CYCLONE MESH FENCING & GATES.

03 - EXISTING PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME REINSTALLED ON NEW WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME TO MATCH EXISTING.

05 - ZINCALUME FINISH MINI-ORB CORRUGATED METAL SHEET SOFFIT.

06 - HOT DIPPED GALVANISED BAR SCREEN ON FULLY WELDED FRAME.

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Project: LMH CARPARK EXTENSION

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Drawing: ELEVATION 3

Scale: 1 : 200

Date: 05/04/2019

Drawing no.: 17192 CP SD108

Revision: E

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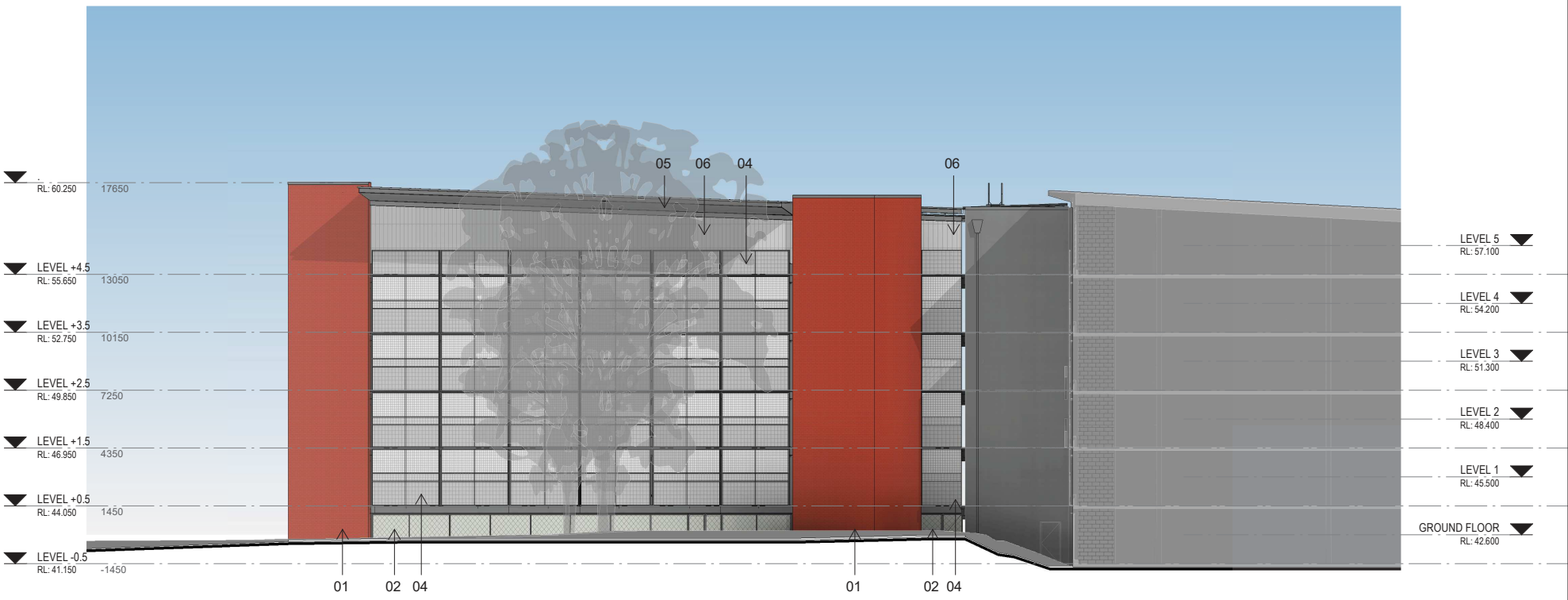

LEGEND

01 - MASONRY WALL WITH BANDED FACE BRICKWORK TO MATCH EXISTING.

02 - BLACK PLASTIC COATED CYCLONE MESH FENCING & GATES.

03 - EXISTING PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME REINSTALLED ON NEW WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME TO MATCH EXISTING.

05 - ZINCALUME FINISH MINI-ORB CORRUGATED METAL SHEET SOFFIT.

06 - HOT DIPPED GALVANISED BAR SCREEN ON FULLY WELDED FRAME.

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Drawing: ELEVATION 4

Scale: 1 : 200

Date: 05/04/2019

Drawing no.: 17192 CP SD109

Revision: E

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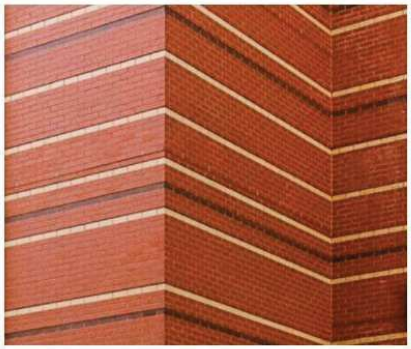
EXISTING MULTI-DECK CARPARK



01 - BRICK FACINGS WTH BANDING TO MATCH EXISTING BRICKWORK

06 - HOT DIPPED GALVANISED BAR SCREEN ON FULLY WELDED STEEL FRAME

05 - ZINCALUME FINISH MINI-ORB CORRUGATED METAL SHEET SOFFIT

03 - EXISTING PERPERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME REINSTALLED ON WESTERN FACADE.

04 - PERFORATED ALUMINIUM SCREEN ON FULLY WELDED SHS FRAME TO MATCH EXISTING

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Project	Drawing	Scale	Date	Drawing no.	Revision
LMH CARPARK EXTENSION	MATERIALS		05/04/2019	17192 CP SD200	E

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