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PROVISION OF CONSULTING ENGINEERING SERVICES

CHISHOLM PLAZA
20 HERITAGE DRIVE
CHISHOLM NSW 2322
STORMWATER MANAGEMENT PLAN REPORT

Prepared for: **Revelop Building and Developments Pty. Ltd.**
Suite 506, Level 5, 55 Phillip Street
PARRAMATTA NSW 2150

Prepared by: **Triaxial Consulting Pty Ltd**
Unit 1
3 Teamster Close
TUGGERAH NSW 2259

10 DECEMBER 2021

Document Control

Client	**Revelop Building and Developments Pty. Ltd.**		
Prepared By:	Triaxial Consulting Pty Ltd		
Report Author	Benjamin Koopman		
File Reference:	TX15901.00-01.SWMP [0]		
Report Date:	10 December 2021		
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0	B.K	B.W	08/12/2021

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10 December 2021

Revelop Building and Developments Pty. Ltd.
Suite 506, Level 5, 55 Phillip Street
PARRAMATTA NSW 2150

Re: Provision of Consulting Engineering Services
Chisholm Plaza 20 Heritage Drive, Chisholm NSW 2322
Stormwater Management Plan Report
Triaxial Reference: TX15901.00-01.SMPR

Revelop Building and Developments Pty. Ltd. (The Client) has engaged Triaxial Consulting to complete a conceptual Stormwater Management Plan and Report for the proposed Plaza Development at lot 1 DP 1224700, 20 Heritage Drive, Chisholm (Subject Site). Triaxial has prepared DA Engineering Drawings which should be referenced during review of this report. The Subject Site is located within the Maitland City Council LGA.

The Client proposes to construct a Commercial Center Plaza and associated infrastructure on the subject site as detailed in the architectural plans attached at Appendix A for reference. For developments of this type, Council requires stormwater to be managed both quantitatively and qualitatively prior to discharging into receiving water or receiving drainage infrastructure. This is to be undertaken both during and after construction and involves a number of modelling techniques to determine the measures required to achieve Council's targets outlined in their Manual of Engineering Standards and Development Control Plan.

During construction, implementation of water quality control as defined in the NSW Department of Housing Publication "Soils and Construction" (The Blue Book) is to be adopted to maximise the capture of sediments and minimise erosion of disturbed soils during the construction phase.

After construction, the development is expected to generate an increase in the amount of pollutants being transported by stormwater leaving the development. Council specifies within their Manual of Engineering Standards that pollutant reductions targets must be satisfied prior to approval of the development. The qualitative models prepared involved the inclusion of water quality improvement devices to treat stormwater runoff. These devices are detailed within the Triaxial Drawing Set accompanying this SMP Report. Modelling and designing of the On-Site Detention (OSD) was also carried out to address council's water quantity requirements.

This report summarises the modelling techniques employed, the results of the modelling, and provides recommendations of economical methods to achieve Council's design requirements. It will also provide a guideline to allow designers to provide detailed designs in the future.

1. EXISTING SITE

The Subject Site is located on the Eastern alignment of Heritage Drive. It is bounded on the North and East by Tigerhawk Drive and Settlers Boulevard respectively. The site is zoned B1: Neighbourhood Centre and is shown below in figure 1.

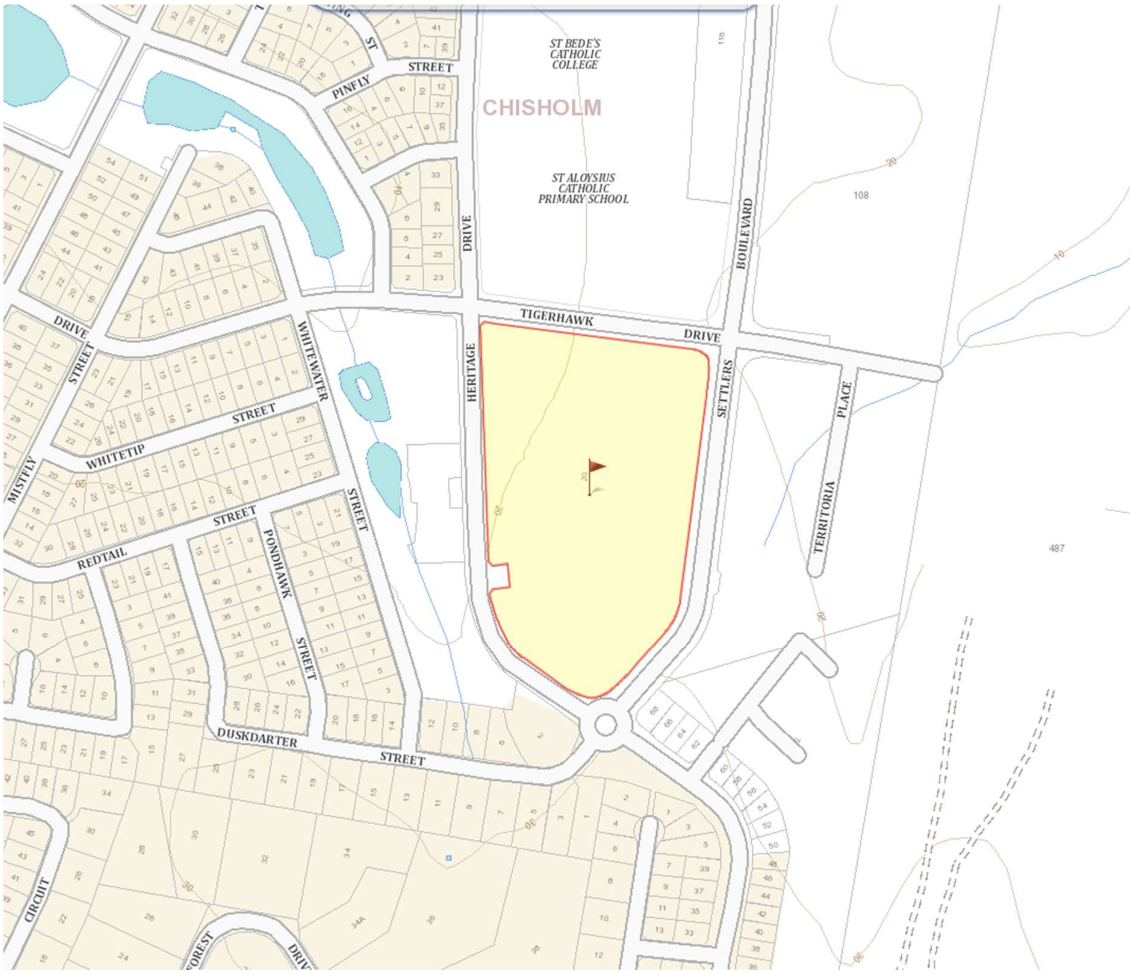


Figure 1 - Locality Map for 20 Heritage Drive, Chisholm NSW

(Source: https://maps.six.nsw.gov.au/)

The existing site is currently a vacant lot at shown on the detailed site survey attached at appendix B for reference. The Plaza development is proposed as Lot 11 of the site subdivision with future residential development to the proposed lot 12.

The existing natural ground exhibits a ridge line running North-South towards the eastern side of the lot. Gradients within the Subject Site are typically in the order of 4-6%, with slopes from the ridge line towards both the east and the west. The site contains no watercourses or major overland flows.

2. STORMWATER MANAGEMENT

2.1. Hydraulic Design

Preliminary hydraulic design of the proposed stormwater network was carried out in order to size the various elements of the stormwater system. Generally proposed development sub-catchment areas were determined and catchment flow path lengths were adopted from the proposed site layout.

Piped systems were sized to cater for the design storm being the 5% AEP (Annual Exceedance Probability) storm as per AS3500.3 'Plumbing and Drainage', and upsized where necessary to ensure 1% AEP flows are captured and directed into the OSD system. Piped outlets from the recessed loading docks were upsized to cater for the 1% AEP flowrate. The loading dock catchment bypasses the OSD system to prevent excessive ponding in the loading dock area. The OSD system was designed in the form of below ground tanks and surface storage located within the proposed carparking areas.

2.2. On-site Detention

The objectives of council's onsite detention target are to ensure future development does not increase the impact of rainfall events and that the stormwater management design demonstrates a consideration for the existing capacity of the public drainage system. Council's OSD policy is to ensure that the pre-development peak site discharge is not exceeded by the calculated post-development peak site discharge for the 100% Annual Exceedance Probability (AEP), 10% AEP and 1% AEP rainfall events.

The OSD system was modelled using a runoff-routing method. Therefore, calculations were performed using the "DRAINS" program to model and design the OSD system. As discussed above, a ridge line in the existing site creates two distinct catchments on the site. Therefore, it was deemed necessary to provide a separate OSD system for each of the catchments.

In accordance with the manual of engineering standards, the DRAINS model prepared adopts a Soil Type of '3', grassed depression storage of 5mm and a paved depression storage of 1mm. A roughness coefficient (n*) of 0.17 was adopted for pervious (grassed) areas and 0.012 for impervious (paved) areas.

The Triaxial Drawing Set reflects the OSD system size and location as per the DRAINS modelling carried out. The DRAINS output results for the development site are included within appendix C. Table 1 below provides a summary of the DRAINS modelling for the development proposed.

Table 1 - Summary of DRAINS modelling results

Summary of Drains Modelling Results				
	Eastern Catchment		Western Catchment	
AR&R 2019 STORM EVENT	**Pre-Development Discharge (m^3/s)**	**Post-Development Discharge (m^3/s)**	**Pre-Development Discharge (m^3/s)**	**Post-Development Discharge (m^3/s)**
1% EY	0.034	0.034	0.057	0.057
10% AEP	0.240	0.239	0.513	0.511
1% AEP	0.535	0.492	1.280	1.040

The low-level outlet for each tank was modelled as an orifice plate in order to tune the peak site discharge in the 1EY event to pre-development levels. High level piped outlets were also utilised to minimise overall tank volume whilst limiting peak site discharge to pre-development levels. High level weir overflows were utilised in order to control the 1% AEP storm event and limit surface ponding in the carpark to below 200mm as required in the Manual of Engineering Standards.

None of the predevelopment peak flows calculated are exceeded by the post development peak flows calculated for the proposal. Therefore, the requirements of Council have been achieved economically with regard to the quantitative measure's requirements.

2.3. Stormwater Quality

Stormwater quality was also managed in accordance with Council's Manual of Engineering Standards for developments. Rainwater reuse tanks were included into the model for the purposes of outdoor irrigation and non-potable usage, reuse rates were calculated to be approximately 5kL per day. Due to the client's water efficiency objectives, additional rainwater storage is to be provided in the form of 5x34,000L rainwater tanks.

Rainwater re-use tanks are to be installed with first-flush diverters, which capture the initial flow of stormwater from the roof areas, expected to contain the majority of pollutant runoff. The OSD tanks were also incorporated in the model for their storage properties to aid in the capture of suspended solids. Proprietary trash racks were added to the outlet structures of each tank to capture gross pollutants. It was also deemed necessary to incorporate bioretention basins to aid in the reduction of nitrogen and phosphates.

Figure 2 - MUSIC Model Schematic

Figure 2 above shows the MUSIC model schematic adopted for the simulation, the resulting pollutant reductions in regards to council's targets are summarised below in table 2.

A Detailed summary of the MUSIC modelling results can be found in Appendix D.

Table 2 - MUSIC Model Results

Pollutant	Target	Reduction
Total Suspended Solids (TSS)	80%	81.6%
Total Phosphorus (TP)	45%	67.7%
Total Nitrogen (TN)	45%	45.0%
Gross Pollutants (GP)	70%	99.7%

2.4. Sediment and Erosion Control

During construction, the implementation of water quality control as defined in the NSW Department of Housing Publication "Soils and Construction" (The Blue Book) is to be adopted, to maximise the capture of sediments and minimise erosion of disturbed soils during the construction phase. Under the Blue Book guidelines, if an area of up to 2,500m^2 of disturbance is proposed, sediment basin calculations are not required to be undertaken. Furthermore, if an area of greater than 2,500m^2 of disturbance can be shown to expect an annual soil loss of less than 150m^3, under the RUSLE method, a sediment basin is also deemed unnecessary. As the total maximum disturbed area of the works exceeds 2,500m^2, detailed RUSLE calculations were performed.

The soil landscape mapping available on the NSW Government eSPADE website was consulted for the subject site. Group C and B soil hydrologic group was adopted for calculations as the site is located in Beresfield (be) soil landscape. The formation contains type D and F sediment types with k-factors ranging from 0.017 to 0.048.

The RUSLE calculations performed result in an expected worst case soil loss of 240 tonnes per hectare annually (t/Ha/yr) for the Eastern catchment, equating to a soil loss class of '*3 – LOW-MOD*', a maximum soil loss of 185 (m^3/Ha/yr) and sediment basin storage volume of 30m^3. For the Western catchment a worst-case soil loss of 329 t/Ha/yr was calculated using the RUSLE method, with a corresponding soil loss class of '*3 – LOW-MOD*', a soil loss of 253 m^3/Ha/yr and a minimum sediment basin volume of 146m^3.

A settling zone volume of 59m^3 was calculated for the Eastern sediment basin, therefore the sediment basin servicing the eastern catchment of the site is to have a total volume of 89m^3. A settling zone volume of 146m^3 was calculated for the Western sediment basin, therefore the sediment basin servicing the Western catchment of the site is to have a total volume of 352m^3. Detailed sediment basin calculations are detailed on the conceptual erosion and sediment control plans within the drawing set.

The Blue Book's standard details for Type D and F sediment basins (Drawing SD6-4, p. 6-19) show than the type *"Earth Basin – Wet"* is required, as shown on the RGH Drawing Set. This type of sediment basin does not require a riser outlet and any maintenance procedures should be undertaken as follows:

- Regular flocculation and pumped removal of the sediment basin stored water to discharge as clean water into the existing watercourses adjacent to the ponds.
- Flocculation and pumping to occur after each storm event.
- After pumping, siltation and gross litter build up to be mechanically removed in preparation for the next storm and disposed of appropriately and accordingly.

Standard Blue Book details and provisions have been provided within the Triaxial Drawing Set and are specified to be installed during the construction phase of the project. It is considered that the sediment and erosion control measures detailed on the drawing set will adequately capture siltation and control sedimentation carried by stormwater to acceptable standards during the construction period.

2.5. Stormwater System Maintenance

The stormwater drainage system will need to be inspected and maintained at regular intervals. It is recommended that monitoring and recording of the performance of the stormwater system be undertaken regularly over a period of one year until such time as typical maintenance periods can be established. Initially, it is recommended that inspections be conducted at quarterly intervals and after large rainfall events until a suitable baseline can be estimated. Suitable intervals for maintenance work to be undertaken can then be programmed.

The OSD and bioretention systems and outlets should be cleared of debris whenever the site is visited by maintenance staff to ensure it functions as required. The bioretention basins should be cleared of foreign plant species. Table 2 below provides a schedule of maintenance procedures for the stormwater system.

Table 3 - Operation and Maintenance Intervals and Procedures

Item	Inspection Interval	Maintenance Interval	Task/Procedure
Pits and Pipes Network	Yearly	As required / Yearly	Remove and Dispose of Debris from Item
OSD and Outlet	Yearly	As required / Yearly	De-silt and Disposal of sediment
Rainwater Re-Use Tank	Yearly	5 Years Maximum	De-sludge and dispose of sediment
Bioretention Basins	Quarterly	5 Years Maximum	Replace sand filter media

3. CONCLUSIONS AND RECOMMENDATIONS

Revelop Building and Developments Pty. Ltd. has engaged Triaxial Consulting to complete a conceptual Stormwater Management Plan and Report for the proposed Plaza development at the subject site. Triaxial has prepared DA Engineering Drawings which should be referenced during review of this report. The Subject Site is located within the Maitland City Council LGA.

Management of stormwater is to occur both during and after construction. During construction, implementation of water quality control as defined in the NSW Department of Housing Publication "*Soils and Construction*" (The Blue Book) is to be adopted to maximise the capture of sediments and minimise erosion of disturbed soils during the construction phase. After construction, the inclusion of water quality improvement devices is needed to treat stormwater runoff to acceptable levels before discharging to the receiving drainage infrastructure.

The water quantity control was managed by providing On-Site Detention (OSD) systems to reduce the rate of stormwater runoff in the post-development condition from the Subject Site to be equal or less than the rates for the pre-development existing condition. The OSD systems were provided as a combination of below ground tanks and surface storage within the proposed carpark.

This report has summarised the modelling techniques employed, the results of the modelling, and subsequently presented the most economical method to achieve Council's design requirements. Therefore, it is the recommendation of Triaxial that the stormwater management measures suggested and described within this report and upon the Triaxial Drawing Set be implemented in order to satisfy Council's requirements for the development. We trust this report meets your current requirements and should you wish to discuss the matter further please do not hesitate to contact the undersigned.

Yours faithfully,

TRIAXIAL CONSULTING

Reviewed,

Benjamin Koopman
Civil Engineer
B.Eng.(Civil)(Hons) | GradIEAust.

Ben Williams
Civil Team Leader
BE (Hons) | MIEAust.

4. REFERENCES

NSW Department of Housing, ***"Soils and Construction"***, Vol.1, 4th Edition, 2004.

Pilgrim, D.H., ***"Australian Rainfall and Runoff"***, Engineers Australia, 2019.

Standards Australia, ***"AS3500.3 – Plumbing and Drainage"***, 2018.

Maitland City Council, ***"Manual of Engineering Standards"***

BMT WBM, **"NSW MUSIC Modelling Guidelines"**, August 2015.

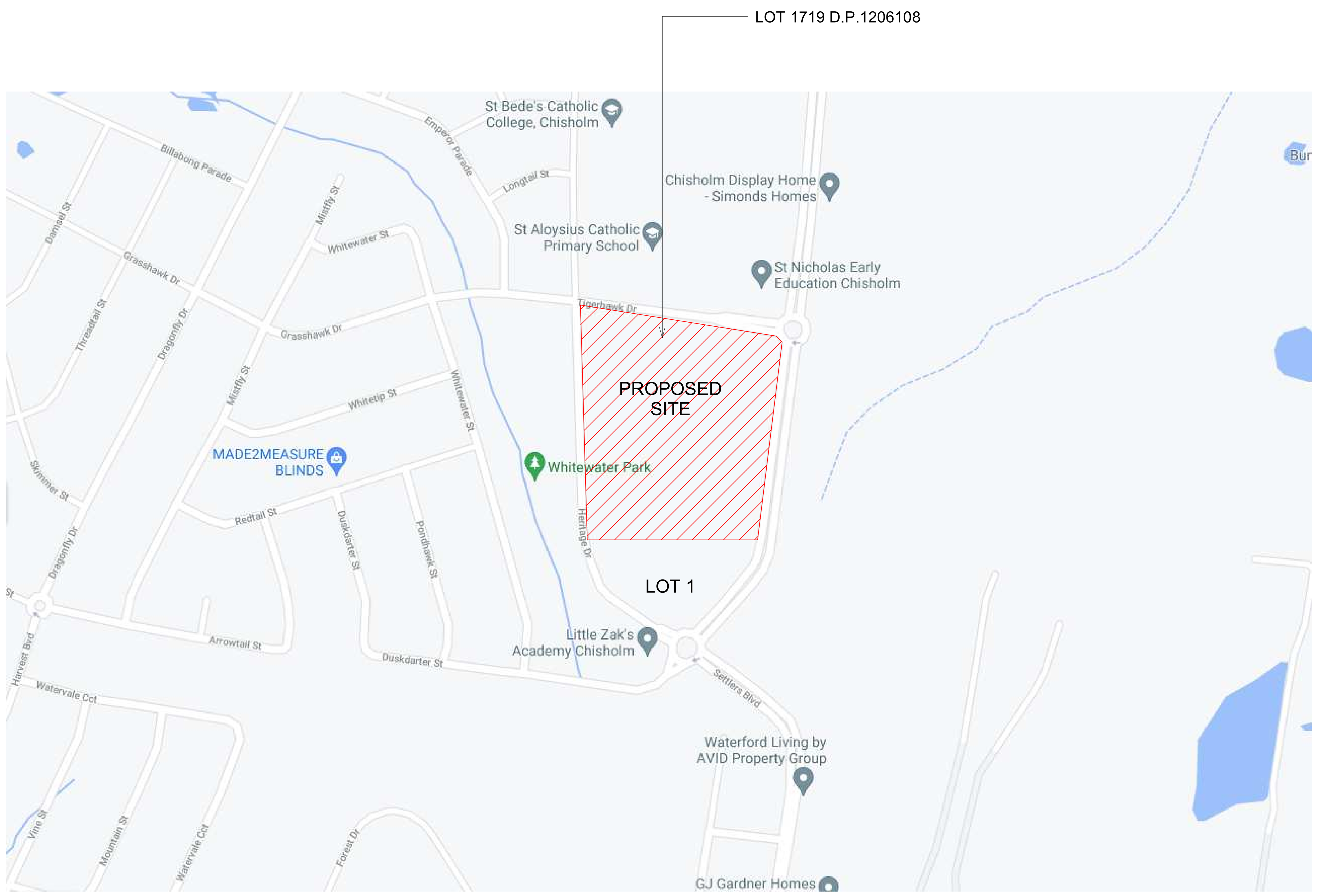
APPENDIX A – ARCHITECTURAL PLANS (BN ARCHITECTURE)

DEVELOPMENT APPLICATION

PROPOSED SHOPPING CENTRE

DEVELOPMENT APPLICATION

WATERFORD COUNTY
CHISHOLM NSW 2322



DRAWING LIST DA		
GROUP	Sheet Number	Sheet Name
	A100.01	PROPOSED MATERIAL BOARD
A00 SERIES - INFORMATION AND ANAYLYSIS		
A00 SERIES - INFORMATION AND ANAYLYSIS	A00.01	TITLE SHEET, LOCATION PLAN & DRAWING LIST
A00 SERIES - INFORMATION AND ANAYLYSIS	A00.05	SITE ANALYSIS
A00 SERIES - INFORMATION AND ANAYLYSIS	A00.20	GLAR & CARPARKING ANALYSIS
A00 SERIES - INFORMATION AND ANAYLYSIS	A00.80	SOLAR STUDY
A02 SERIES - GENERAL SITEPLANS		
A02 SERIES - GENERAL SITEPLANS	A02.01	PROPOSED SITE PLAN
A06 SERIES - FLOOR PLANS		
A06 SERIES - FLOOR PLANS	A06.01	PROPOSED BASEMENT FLOOR PLAN
A06 SERIES - FLOOR PLANS	A06.02	PROPOSED GROUND FLOOR PLAN
A06 SERIES - FLOOR PLANS	A06.03	PROPOSED ROOF PLAN
A06 SERIES - FLOOR PLANS	A06.04	PROPOSED CHILDCARE PLAN
A10 SERIES - ELEVATIONS		
A10 SERIES - ELEVATIONS	A10.01	NORTH ELEVATION
A10 SERIES - ELEVATIONS	A10.02	SOUTH ELEVATION
A10 SERIES - ELEVATIONS	A10.03	EAST ELEVATION
A10 SERIES - ELEVATIONS	A10.04	WEST ELEVATION
A10 SERIES - ELEVATIONS	A10.05	TIGERHAWK DRIVE STREET VIEW
A10 SERIES - ELEVATIONS	A10.09	ELEVATION CHILDCARE
A11 SERIES - SECTIONS		
A11 SERIES - SECTIONS	A11.01	SECTION 1
A11 SERIES - SECTIONS	A11.02	SECTION 2
A11 SERIES - SECTIONS	A11.03	SECTION 3
A11 SERIES - SECTIONS	A11.04	SECTIONS CHILDCARE
A80 SERIES - 3D VISUALISATIONS & PERSPECTIVES		
A80 SERIES - 3D VISUALISATIONS & PERSPECTIVES	A80.01	3D VISUALIZATION
A80 SERIES - 3D VISUALISATIONS & PERSPECTIVES	A80.02	PERSPECTIVES SHEET 1
A80 SERIES - 3D VISUALISATIONS & PERSPECTIVES	A80.03	PERSPECTIVES SHEET 2

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DEVELOPMENT APPLICATION

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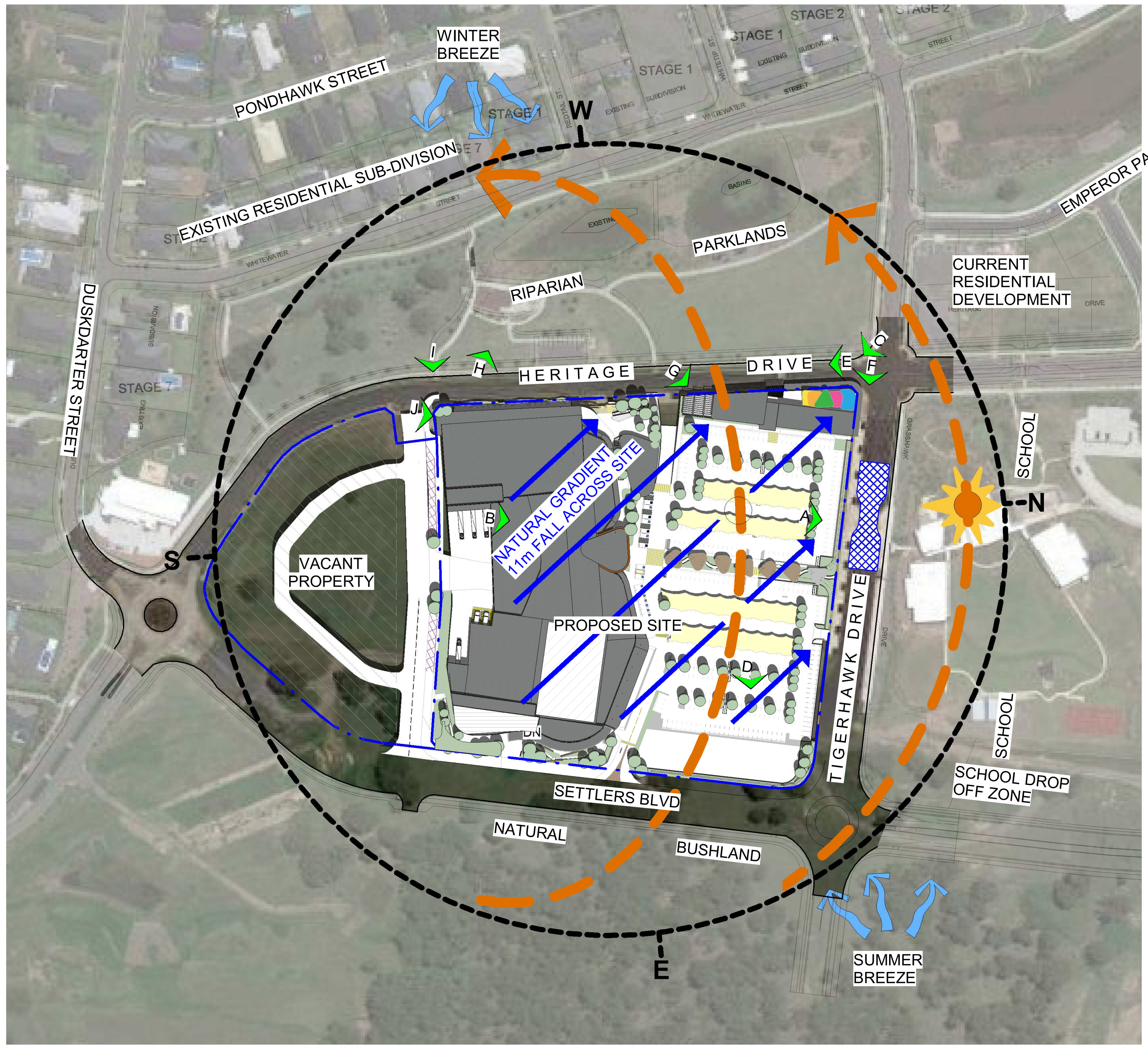
SITE ANALYSIS



CONTEXT PHOTOS


A) NORTHERN VIEW FROM PROPOSED SITE


B) NORTHERN VIEW FROM SOUTH OF PROPOSED SITE


C) SOUTH EAST VIEW FROM CORNER OF TIGERHAWK AND HERITAGE DRIVE


D) EASTERN VIEW FROM PROPOSED SITE OF NATURAL BUSHLAND


E) SOUTH EAST VIEW FROM CORNER OF TIGERHAWK AND HERITAGE DRIVE


F) EASTERN VIEW FROM CORNER OF TIGERHAWK AND HERITAGE DRIVE

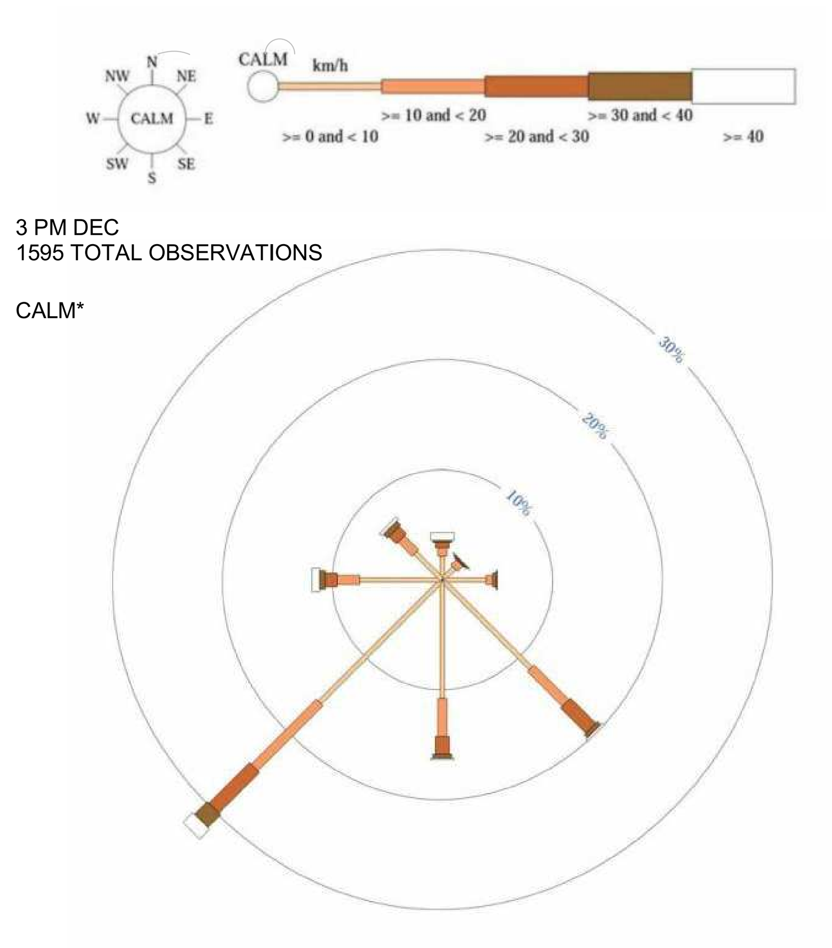

G) NORTH EASTERN VIEW FROM HERITAGE DRIVE

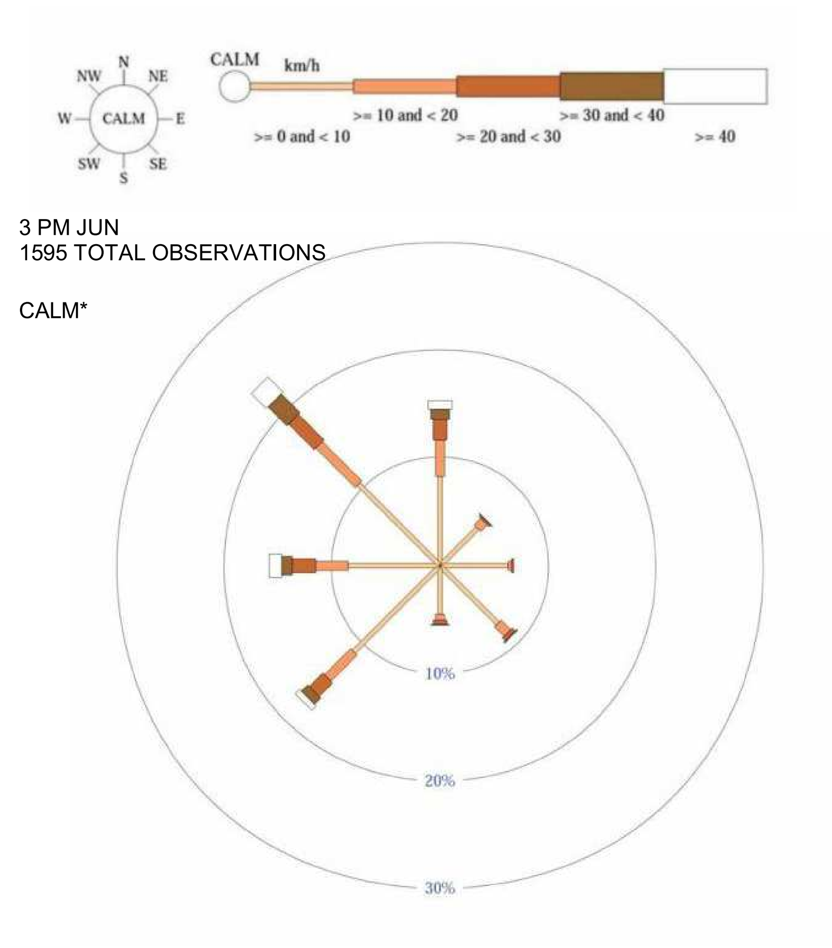

H) NORTH WESTERN VIEW OF RIPARIAN PARKLANDS FROM HERITAHE DRIVE

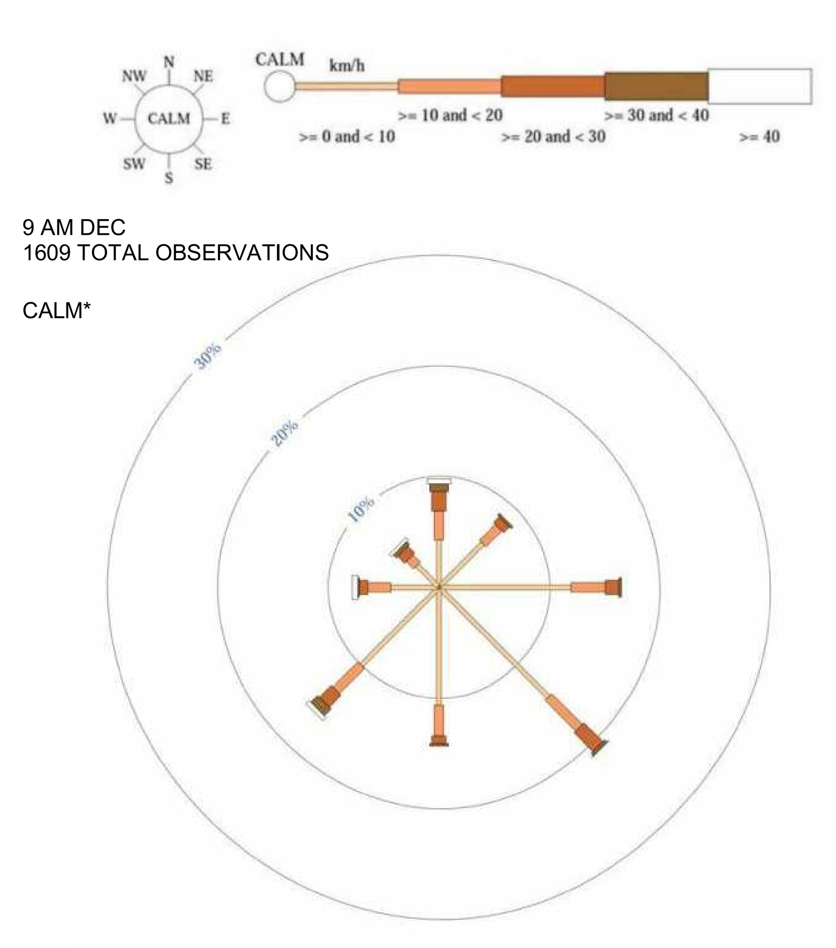

I) EASTERN VIEW OF PROPOSED SITE FROM HERITAGE DRIVE

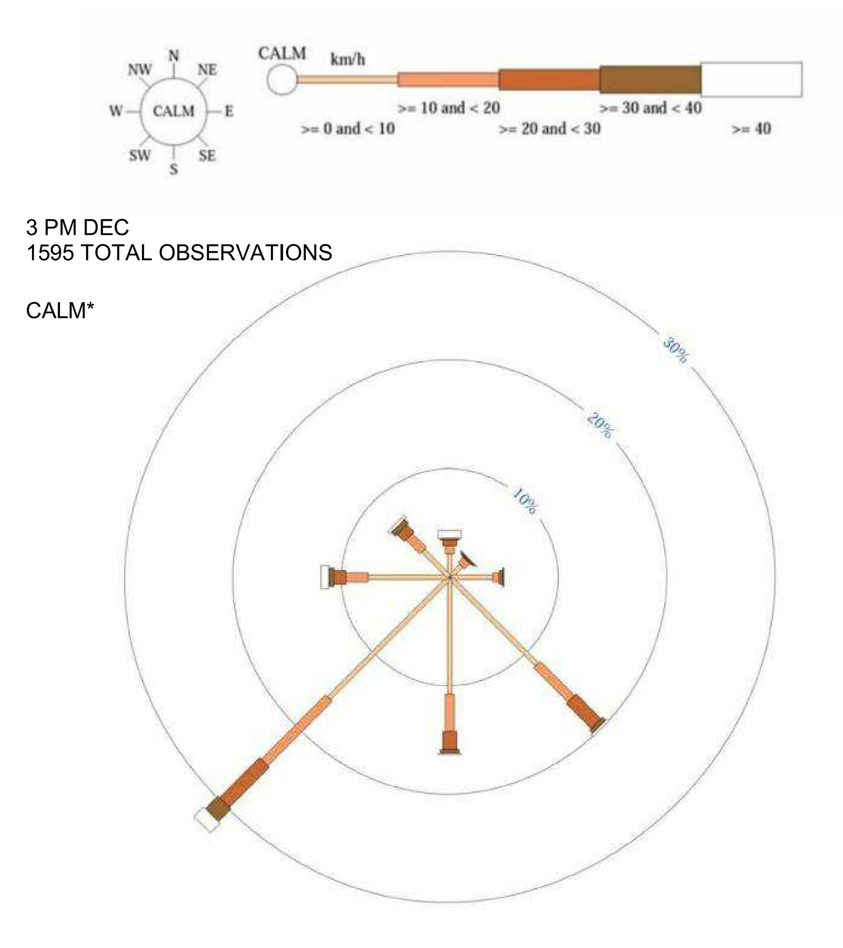

J) NORTHERN VIEW OF PROPOSED SITE FROM THE PROPOSED DRIVEWAY

WIND ROSE - MAITLAND VISITORS CENTRE
READING TAKEN FROM CLOSEST STATION AT MAITLAND VISITORS SENTRE









REVELOP

CHISHOLM SHOPPING CENTRE
HERITAGE DRIVE
CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
B	14-09-2021	DA ISSUE
C	05-10-2021	DA ISSUE
D	21-10-21	FOR REVIEW
E	08-11-21	FOR REVIEW

SITE ANALYSIS

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1:NTS @ A3

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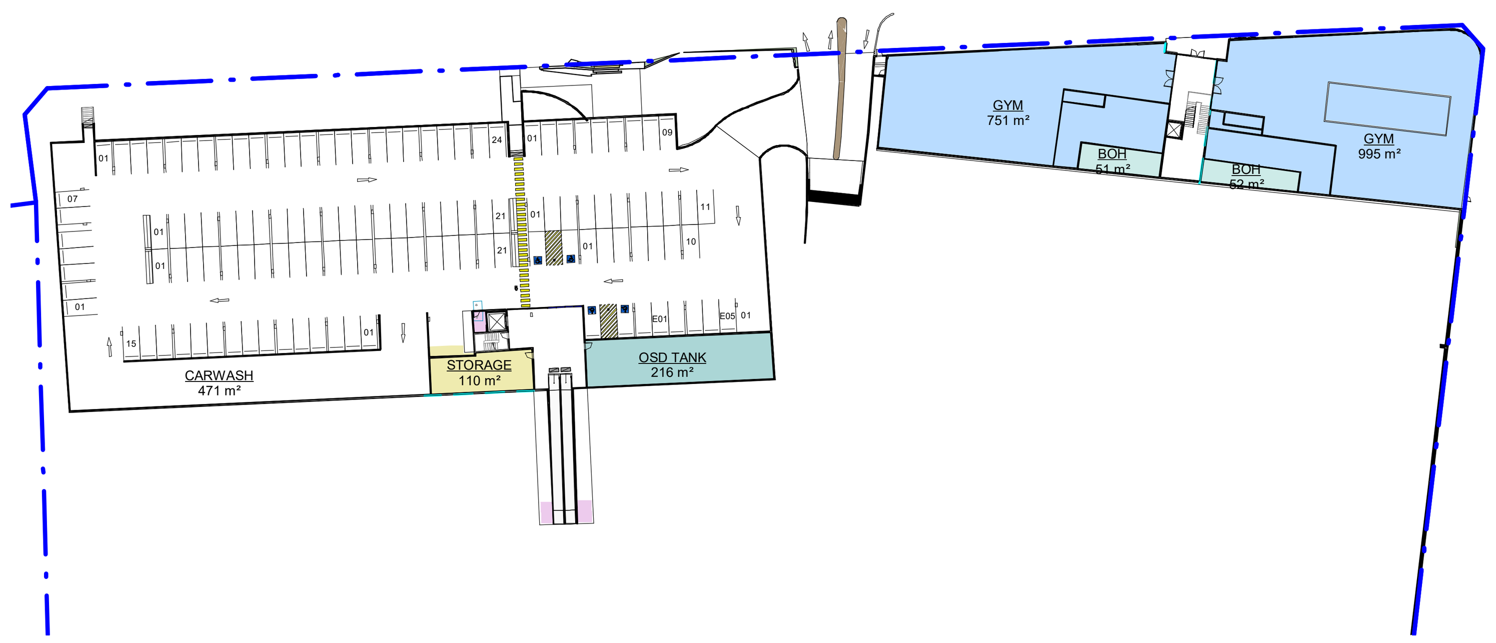
- AMENITIES
- BOH
- CARWASH
- CHILDCARE
- DTB
- GYM
- INTERNAL PLAZZA
- LIQUOR
- MEDICAL CENTRE
- MINI MAJOR
- MINI MAJOR BOH
- OSD TANK
- RETAIL
- RETAIL BOH
- SERVICE
- STORAGE
- SUPERMARKET
- SUPERMARKET BOH
- TAVERN
- TAVERN BOH



1 BASEMENT
1 : 1000

CAR PARKING SCHEDULE

PROPOSED BASEMENT LEVEL

CARPARKING 5400X 2600	116
DISABLED 5400X 2600	4
EV PARKING 5400X 2600	5
BIKE PARKING 5400X 2600	4
GRAND TOTAL	129

PROPOSED GROUND LEVEL

CARPARKING 5400X 2600	537
DISABLED 5400X 2600	10
PARENTS 5400X 2700	10
GRAND TOTAL	557

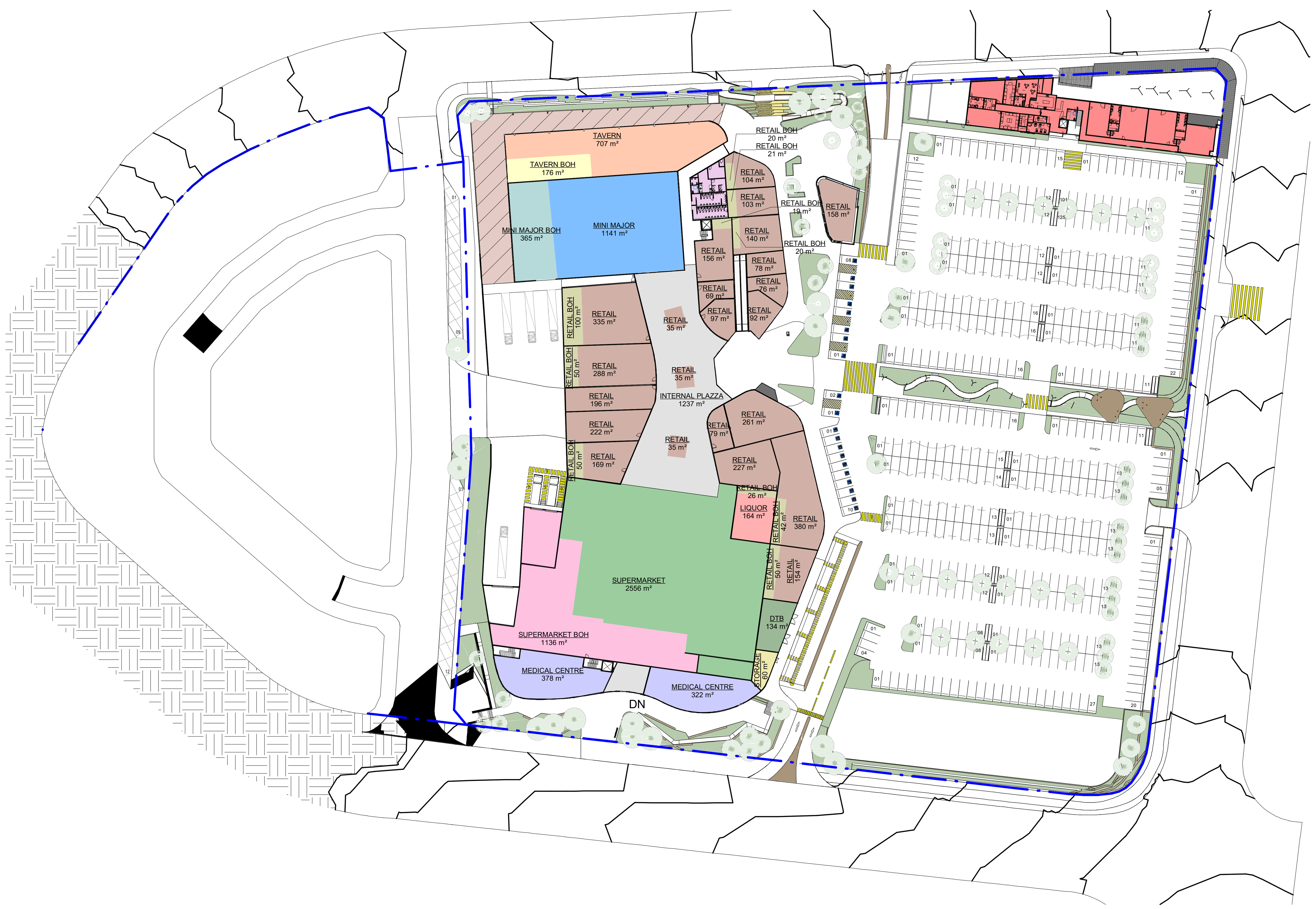
Area Schedule

Name	Area	BOH AREA
1		
LIQUOR	164 m²	
MINI MAJOR	1141 m²	365 m²
RETAIL	3491 m²	398 m²
SUPERMARKET	2556 m²	1136 m²
TAVERN	707 m²	176 m²
1: 28	8060 m²	2074 m²
2		
CHILDCARE	875 m²	
GYM	1747 m²	
MEDICAL CENTRE	700 m²	
2: 5	3322 m²	
3		
AMENITIES	198 m²	
INTERNAL PLAZZA	1328 m²	
3: 5	1526 m²	
Grand total: 38	12908 m²	

SITE AREA	43,940m²
PROPOSED FSR	1:0.29
REQUIRED FSR	1:0.30

TROLLEY CORRAL SCHEDULE

DESCRIPTION	No. OF TROLLY BAY	TROLLEYS PER BAY	No.OF TROLLEYS
1000 x 3000	33		
PROPOSED BASEMENT LEVEL			
SINGLE TROLLEY BAY	4	15	30
PROPOSED GROUND LEVEL			
SINGLE TROLLEY BAY	2	15	540
DOUBLE TROLLEY BAY	16	30	480
Grand total			



2 GROUND FLOOR(1)
1 : 1000

REVELOP

CHISHOLM SHOPPING CENTRE
HERITAGE DRIVE
CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
C	21-09-2021	DA ISSUE
D	05-10-2021	DA ISSUE
E	21-10-21	FOR REVIEW
F	08-11-21	FOR REVIEW

GLAR & CARPARKING ANALYSIS

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1:2000 @ A3

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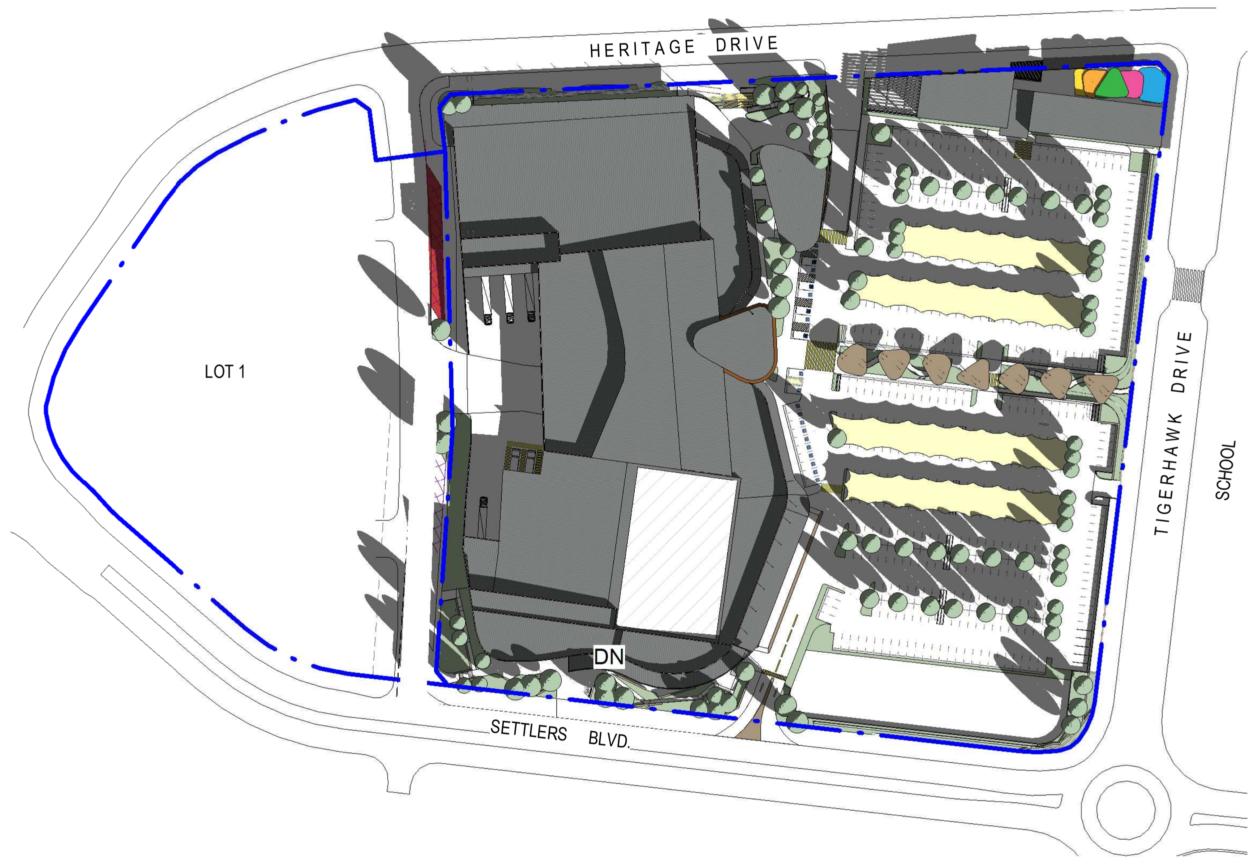

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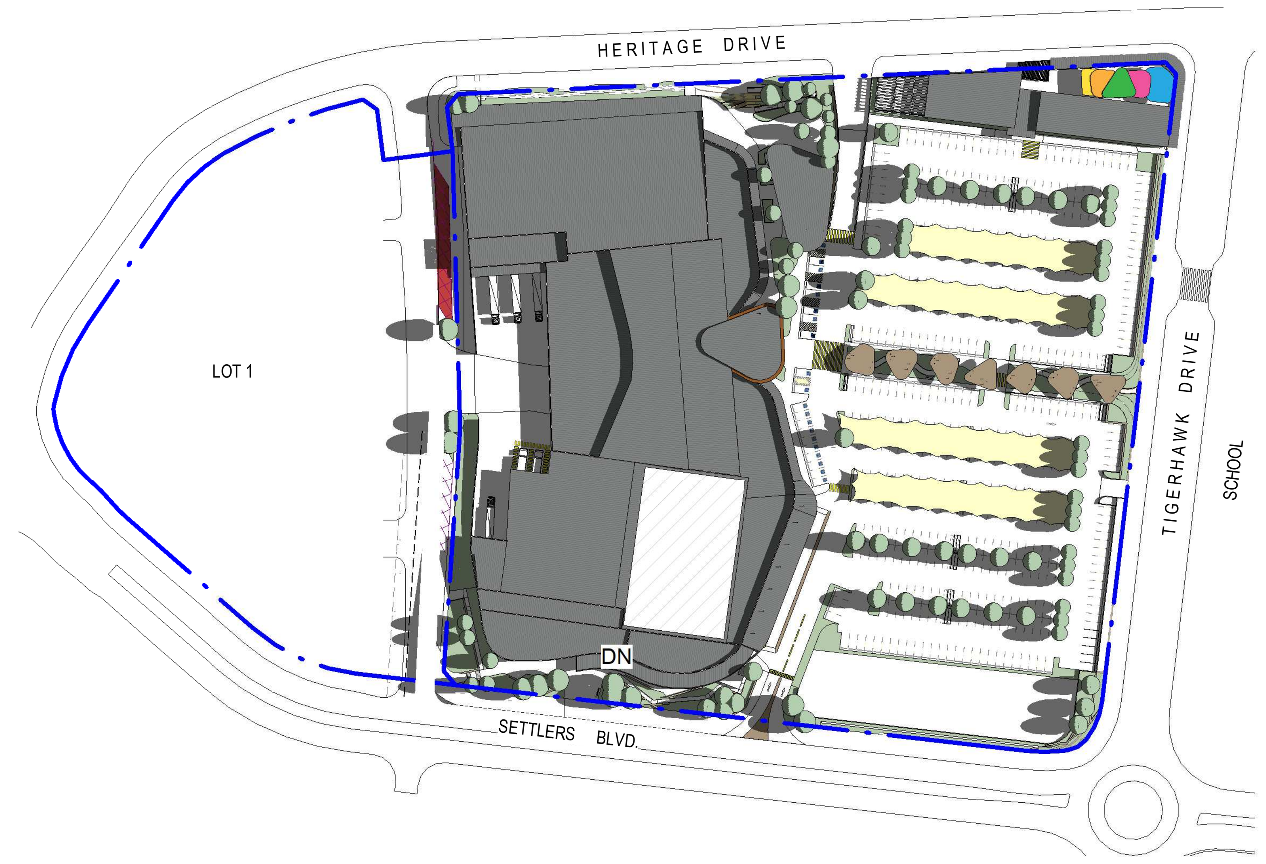

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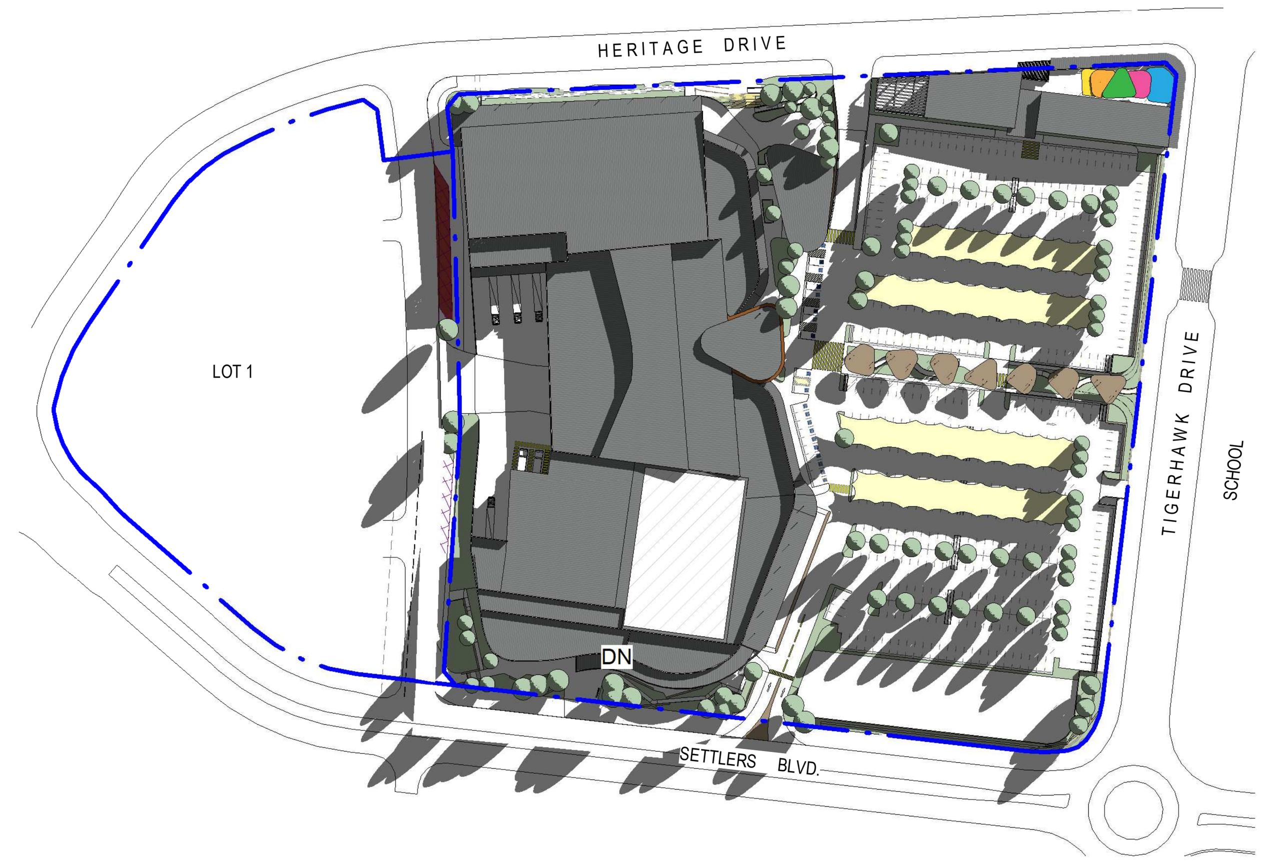

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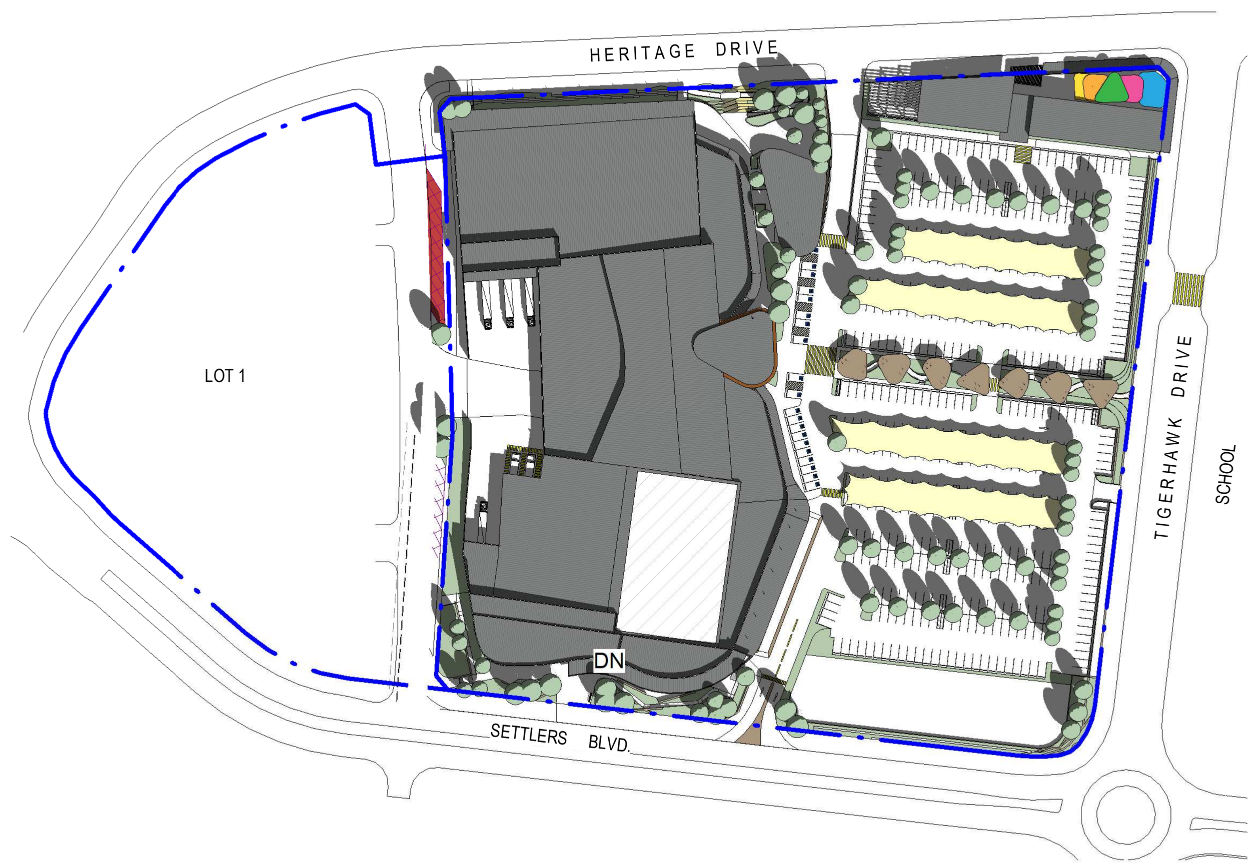

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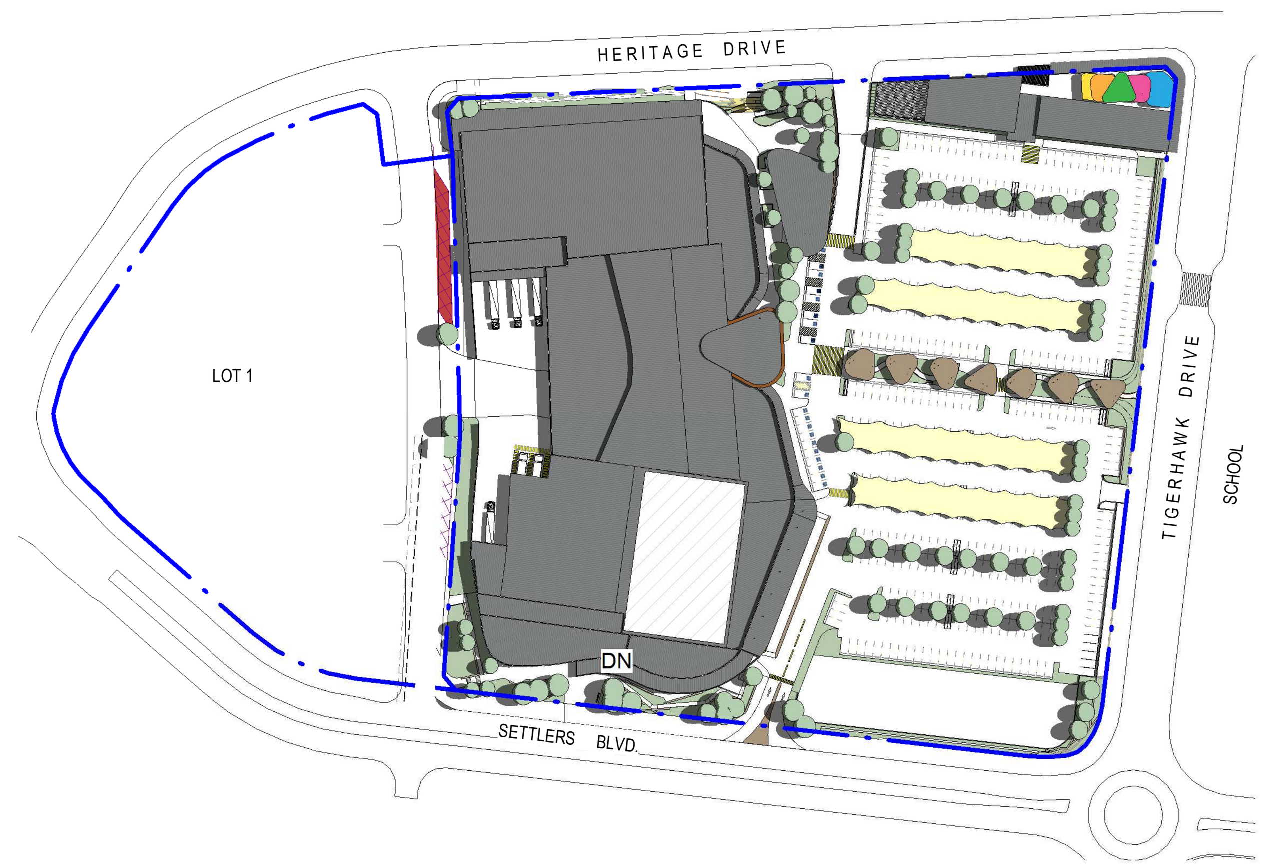

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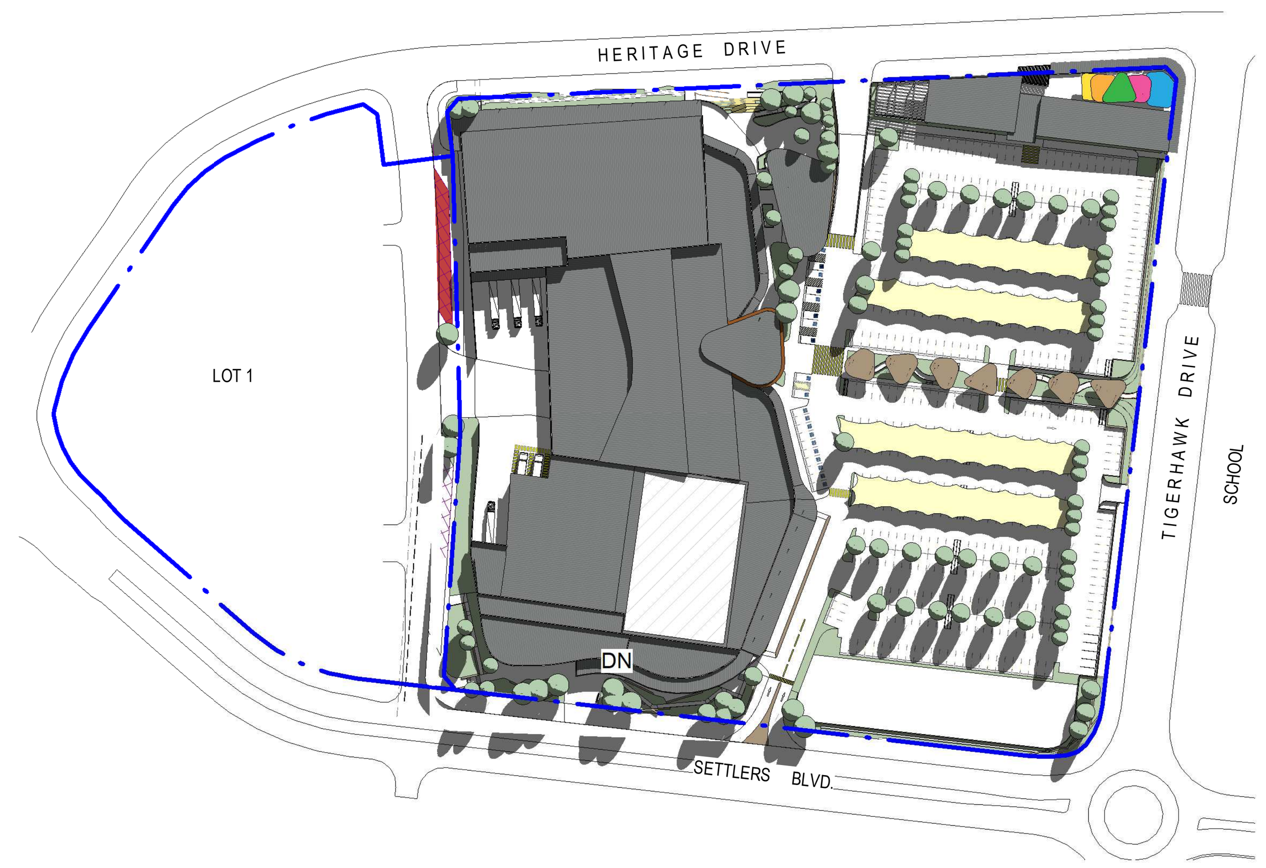

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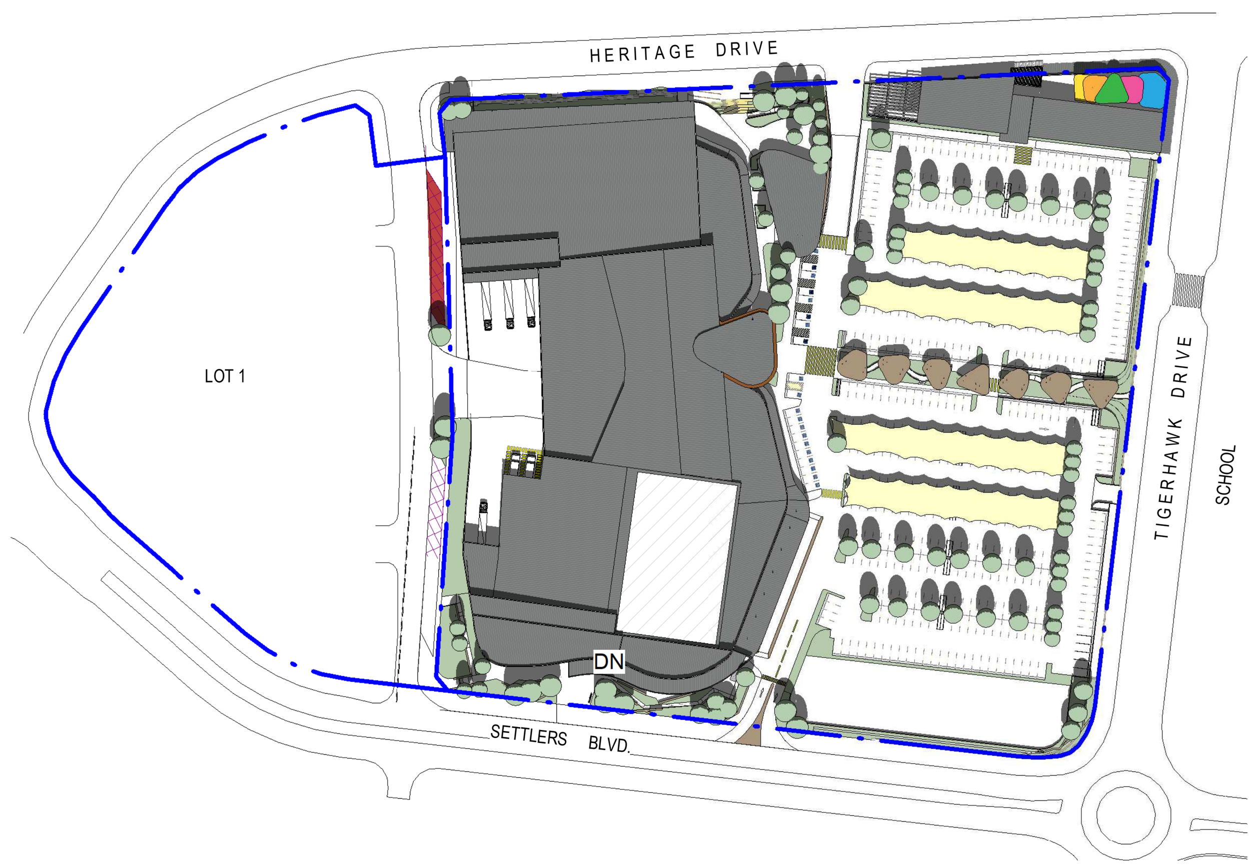

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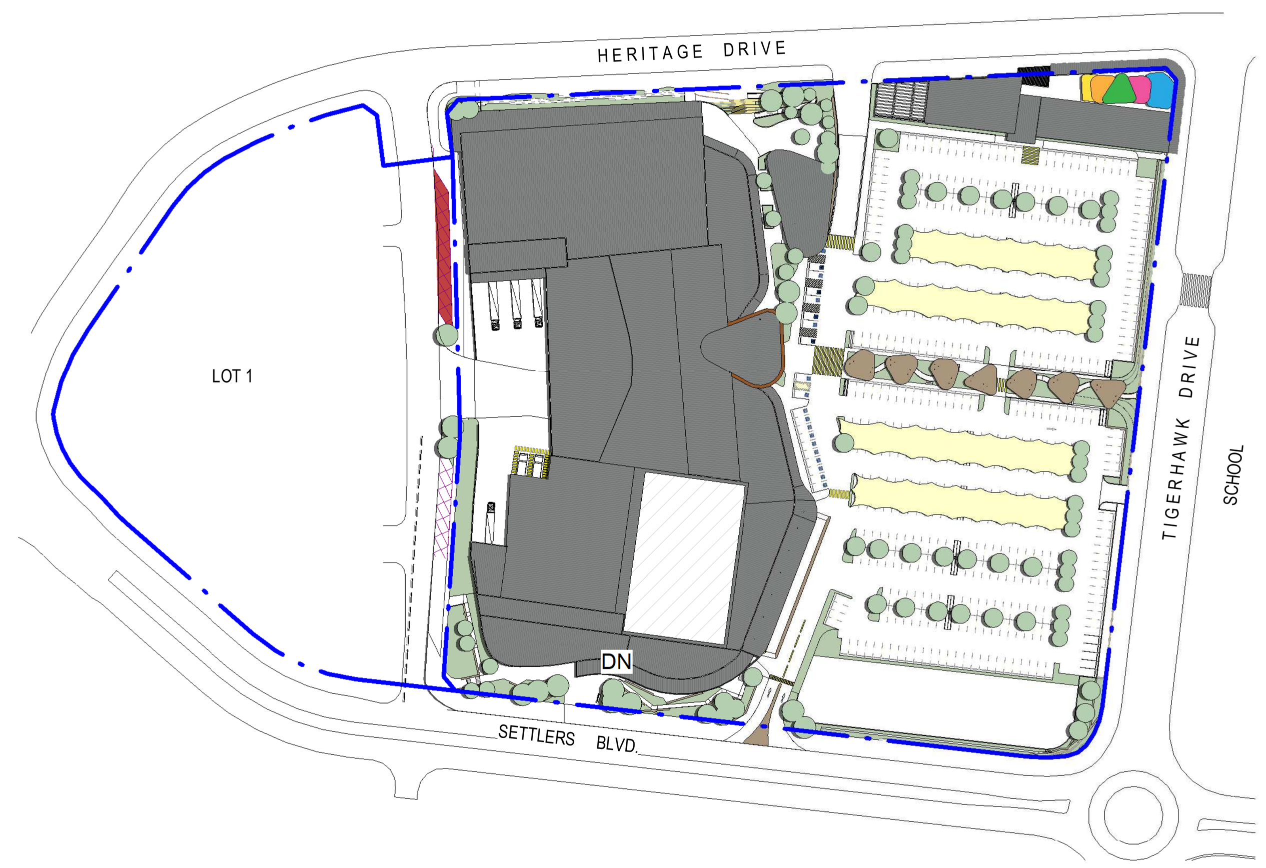

8 SUMMER SOLSTICE-12PM
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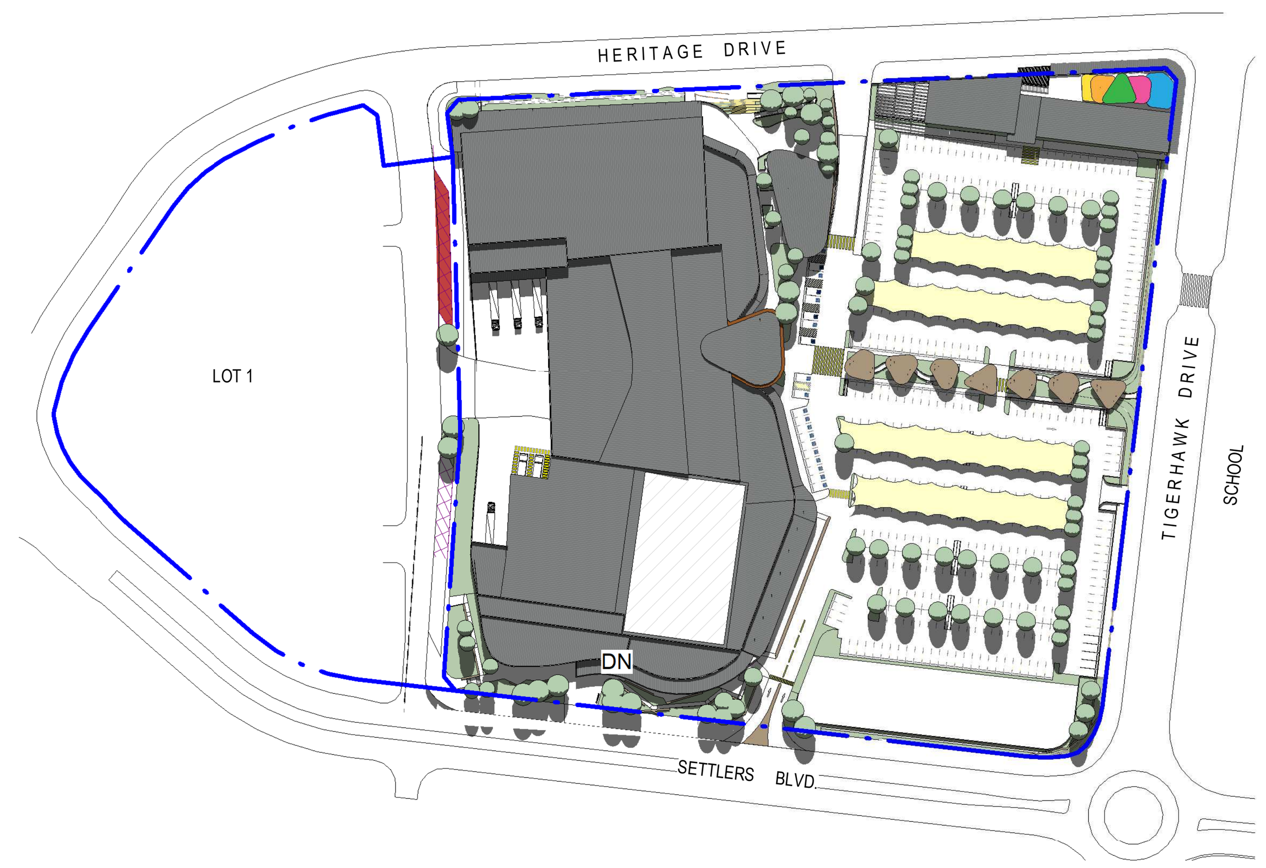

9 SUMMER SOLSTICE-3PM
1 : 2000

REVELOP

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CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
C	21-09-2021	DA ISSUE
D	05-10-2021	DA ISSUE
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SOLAR STUDY

A00.80 DA F
1:2000 @ A1
1:4000 @ A3

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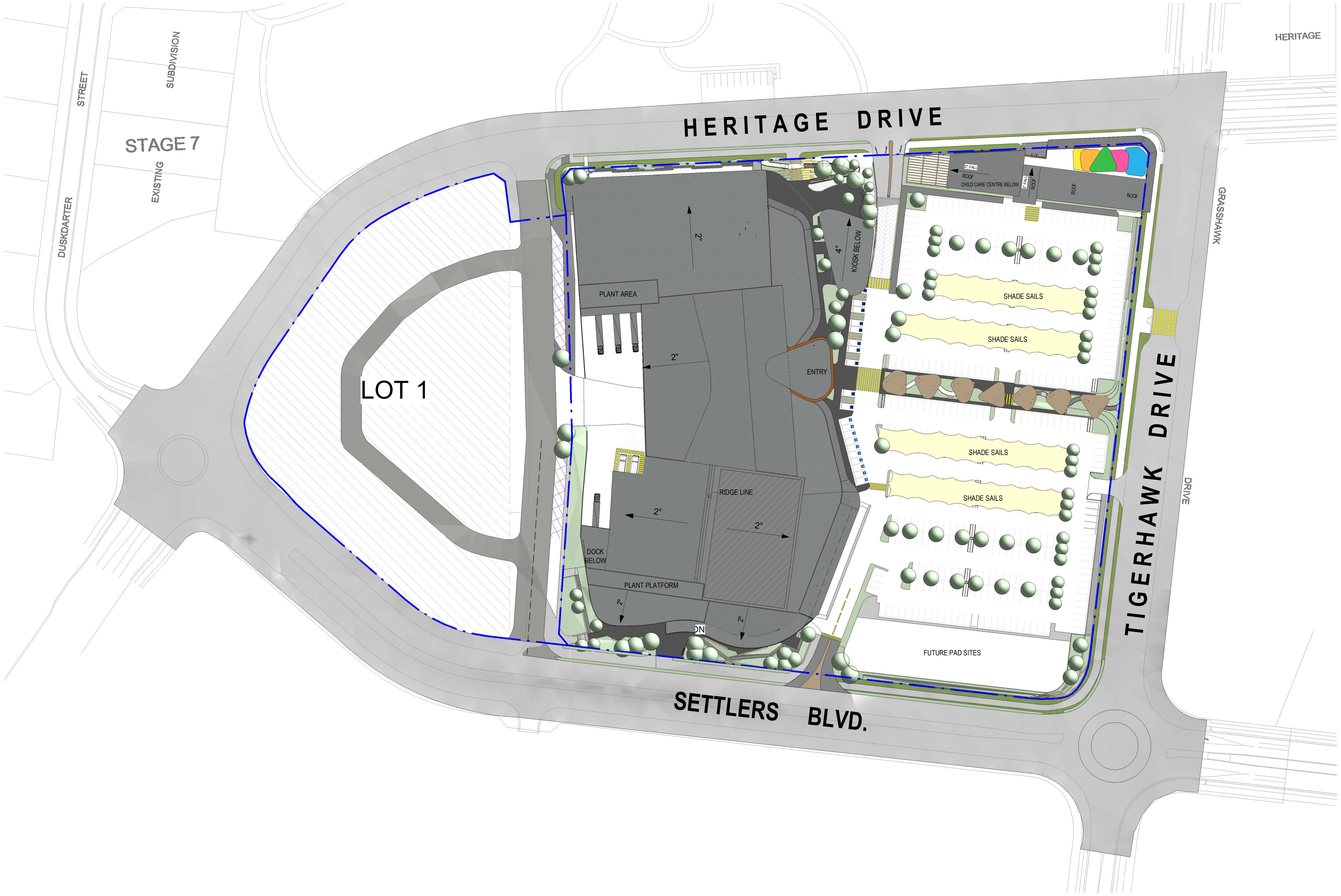

REVELOP

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C	21-09-2021	DA ISSUE
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PROPOSED SITE PLAN

A02.01 DA F
1:1000 @ A1
1:2000 @ A3

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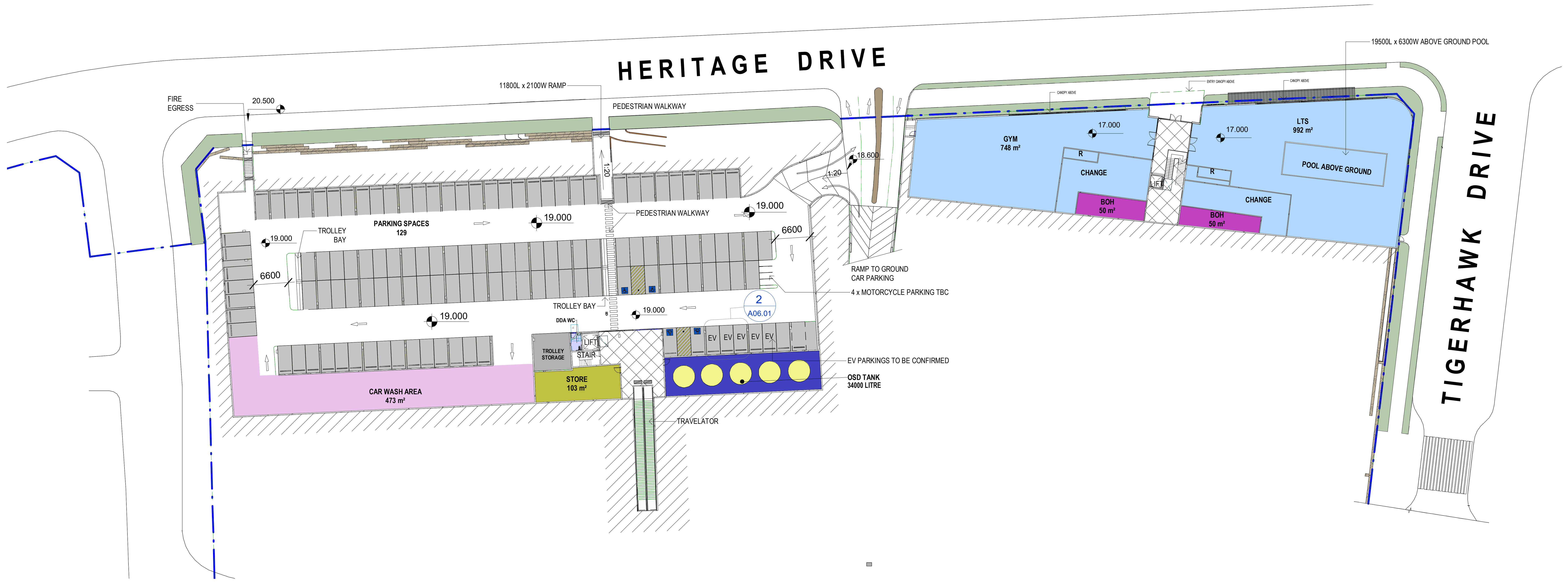
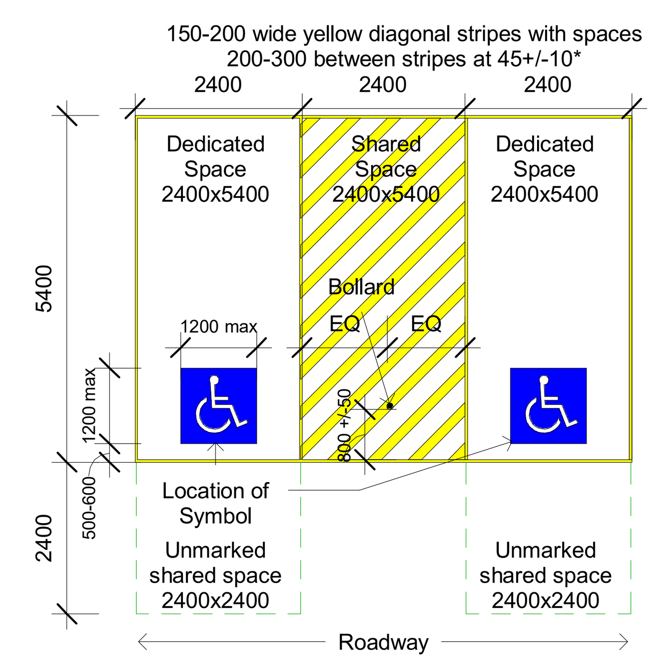


1 PROPOSED BASEMENT FLOOR PLAN
1 : 500



2 TYP. ACCESSIBLE PARKING BAY DETAIL
1 : 100

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PROPOSED BASEMENT FLOOR PLAN AND MEZZANINE FLOOR PLAN

A06.01 DA G

1:500 @ A1
1:1000 @ A3

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REVELOP

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PROPOSED GROUND FLOOR PLAN

A06.02 DA G
1:500 @ A1
1:1000 @ A3

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PROPOSED ROOF PLAN

A06.03 DA E

1:200 @ A1
1:400 @ A3

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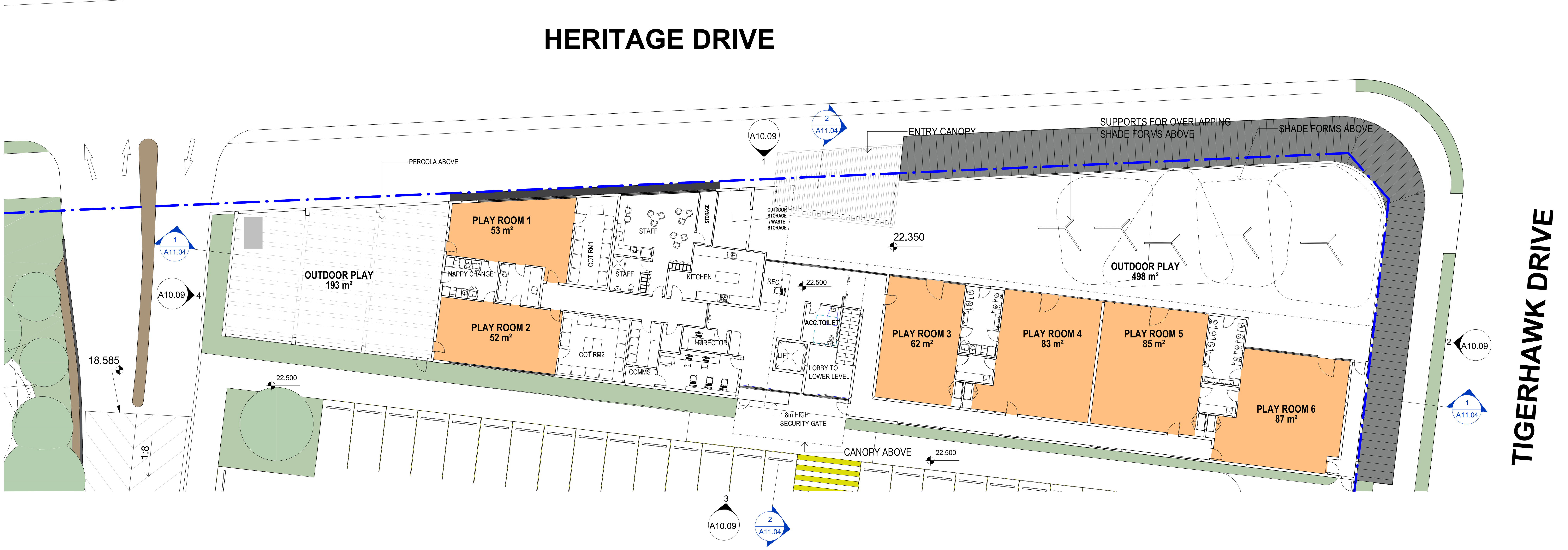

1 PROPOSED CHILDCARE GROUND FLOOR PLAN
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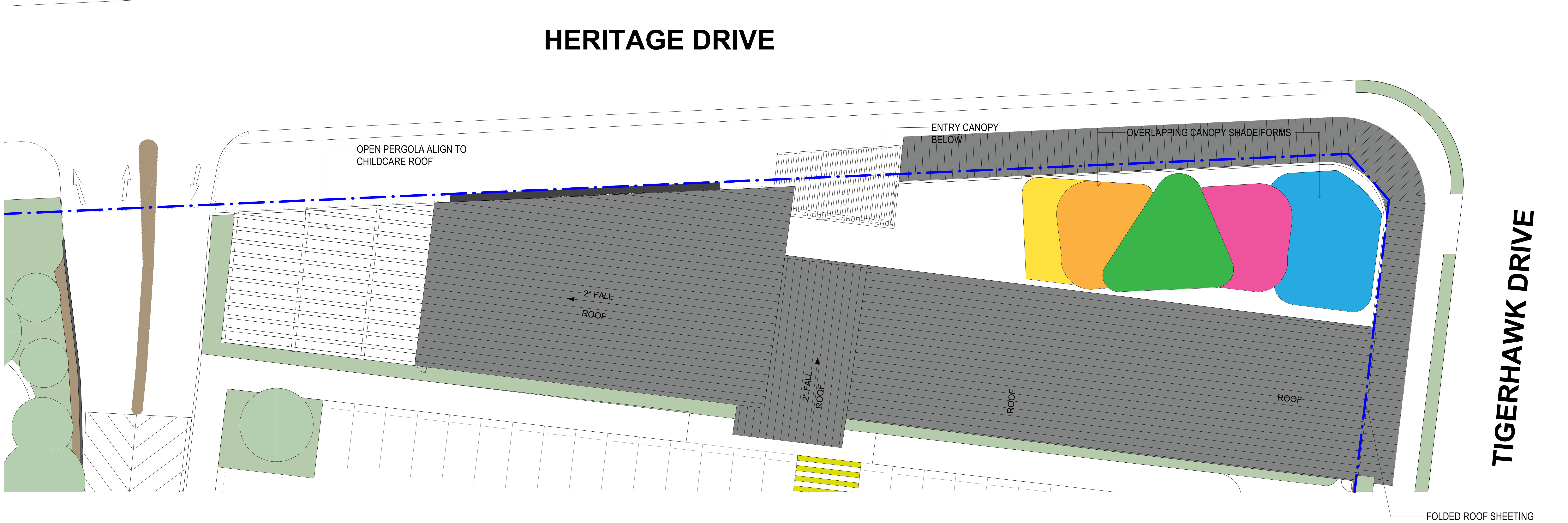

2 PROPOSED CHILDCARE ROOF PLAN
1 : 200

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PROPOSED CHILDCARE PLAN

A06.04 DA E
1:200 @ A1
1:400 @ A3

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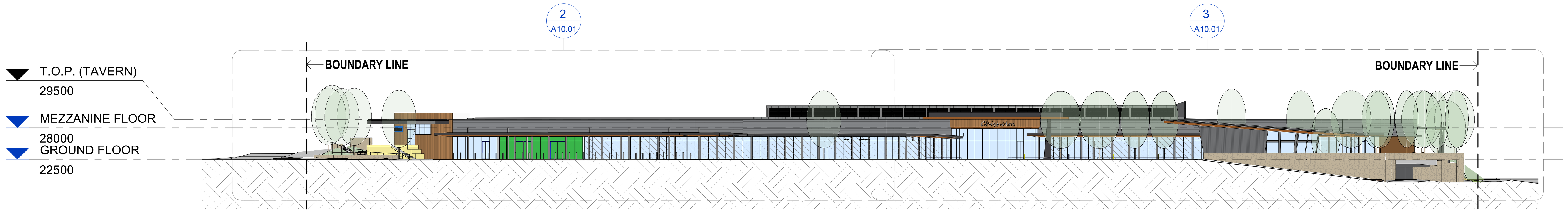

1 NORTH ELEVATION
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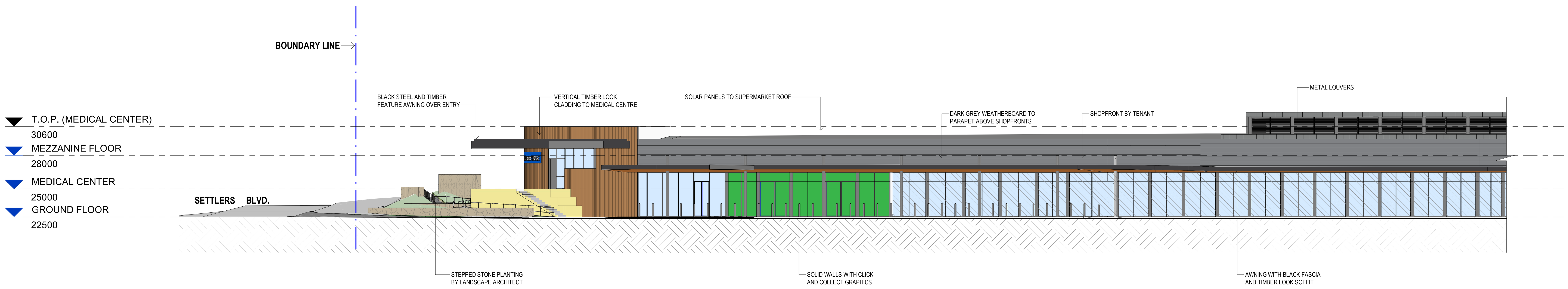
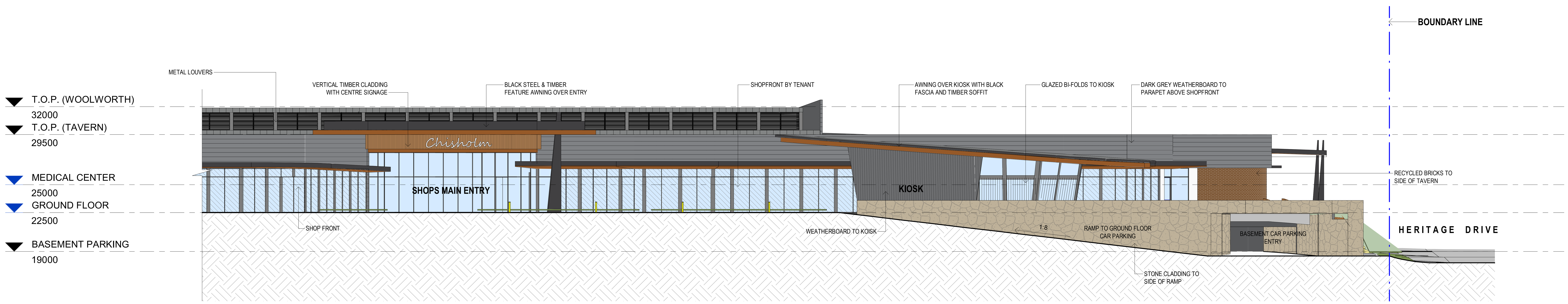


2 NORTH ELEVATION PART 1
1 : 200



3 NORTH ELEVATION PART 2
1 : 200

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NORTH ELEVATION

A10.01 DA F
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1:400 @ A3

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DEVELOPMENT APPLICATION

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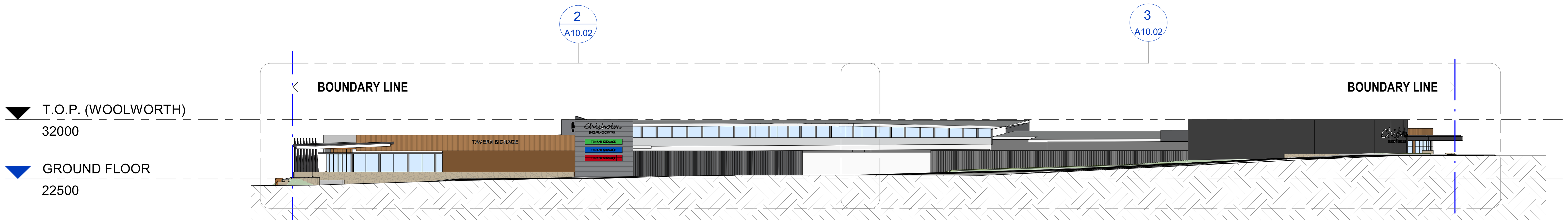

1 SOUTH ELEVATION
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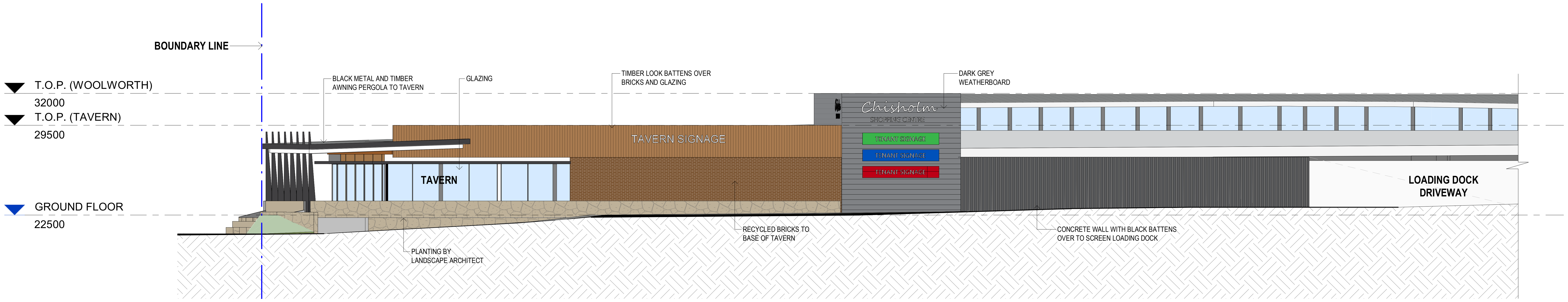

2 SOUTH ELEVATION PART 1
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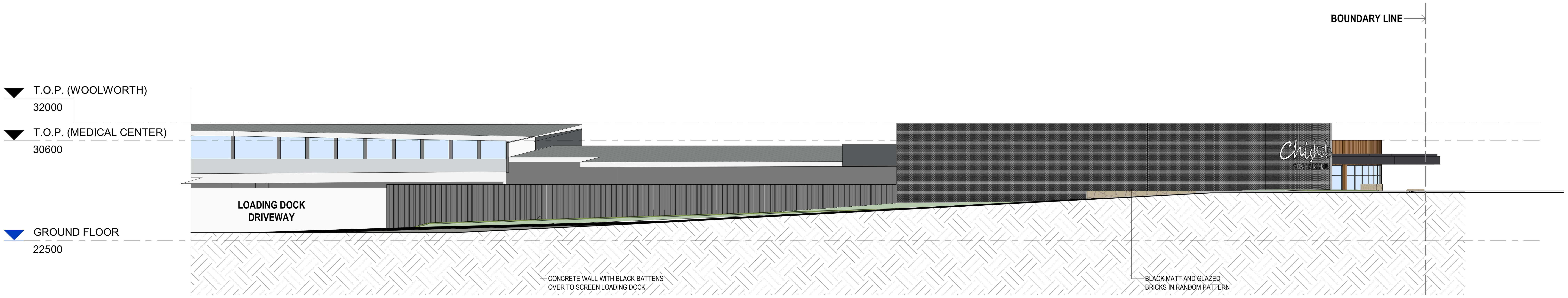

3 SOUTH ELEVATION PART 2
1 : 200

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SOUTH ELEVATION

A10.02 DA F
@ A1
@ A3

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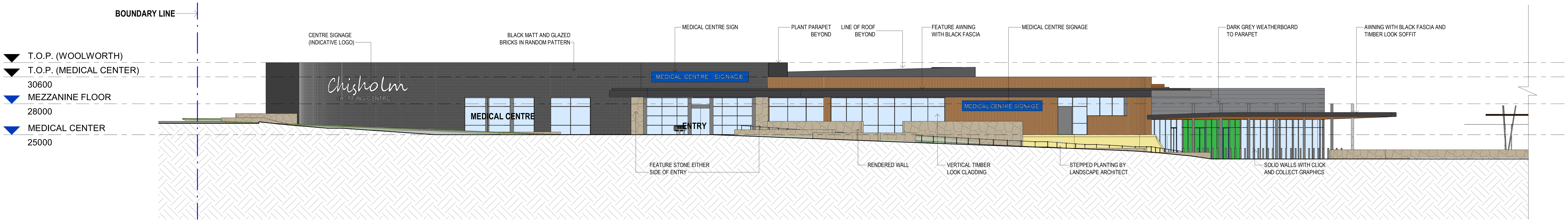
1 EAST ELEVATION
1 : 500



2 EAST ELEVATION PART 1
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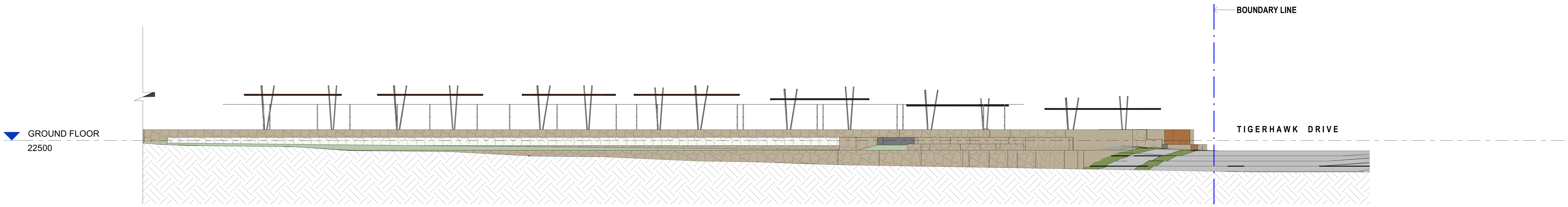

3 EAST ELEVATION PART 2
1 : 200

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EAST ELEVATION

A10.03 DA F
1:200 @ A1
1:400 @ A3

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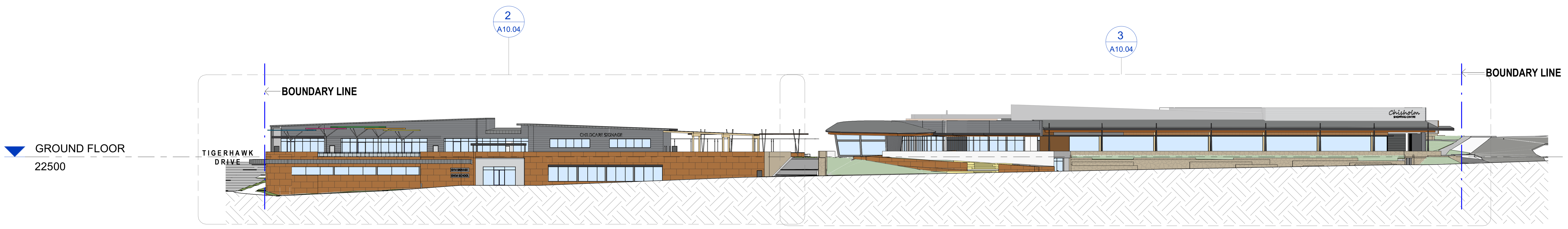
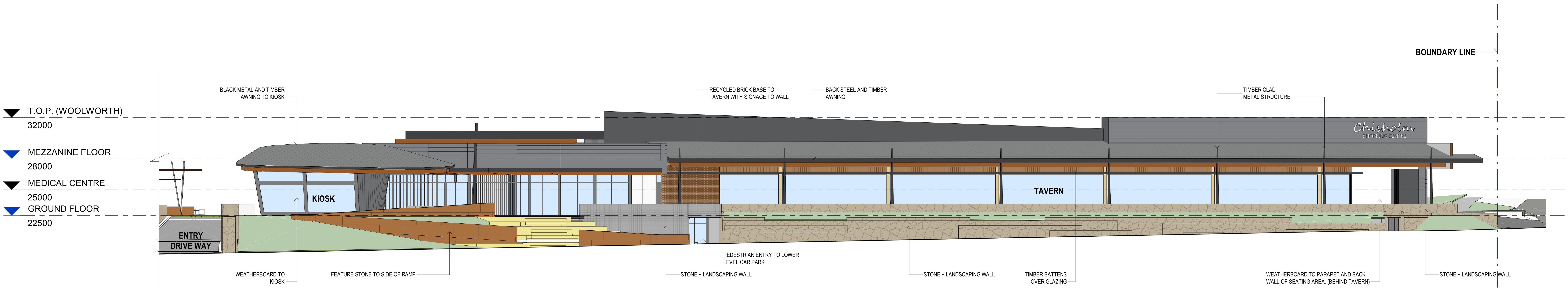


1 WEST ELEVATION
1 : 500

2 WEST ELEVATION PART 1
1 : 200



3 WEST ELEVATION PART 2
1 : 200

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WEST ELEVATION

A10.04 DA G
1:200 @ A1
1:400 @ A3

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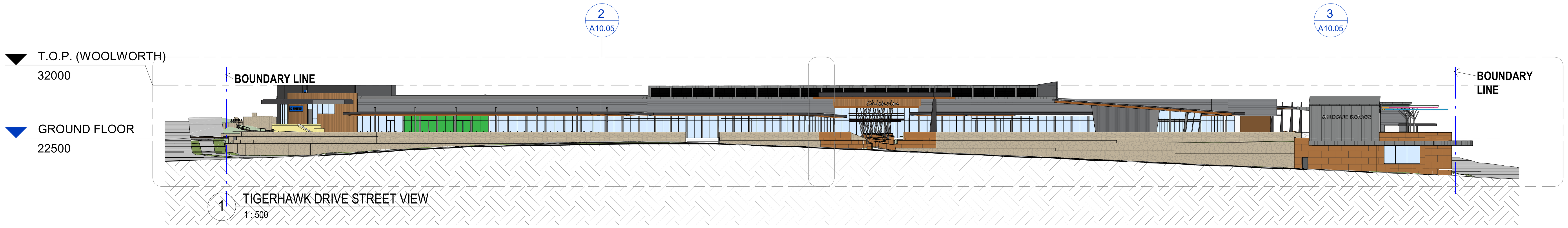

1 TIGERHAWK DRIVE STREET VIEW
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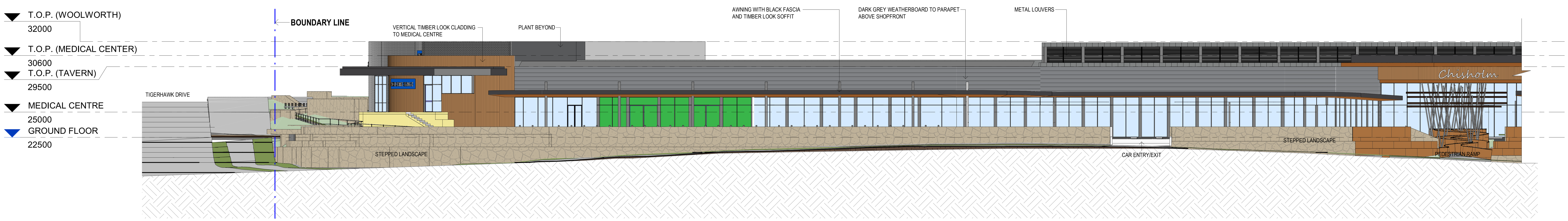
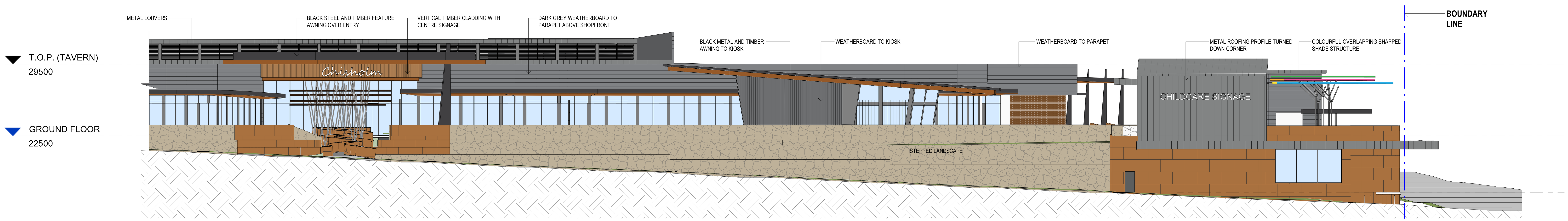


2 TIGERHAWK DRIVE STREET VIEW - PART 1
1 : 200



3 TIGERHAWK DRIVE STREET VIEW - PART 2
1 : 200

REVELOP

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TIGERHAWK DRIVE STREET VIEW

A10.05 DA F

1:200 @ A1
1:400 @ A3

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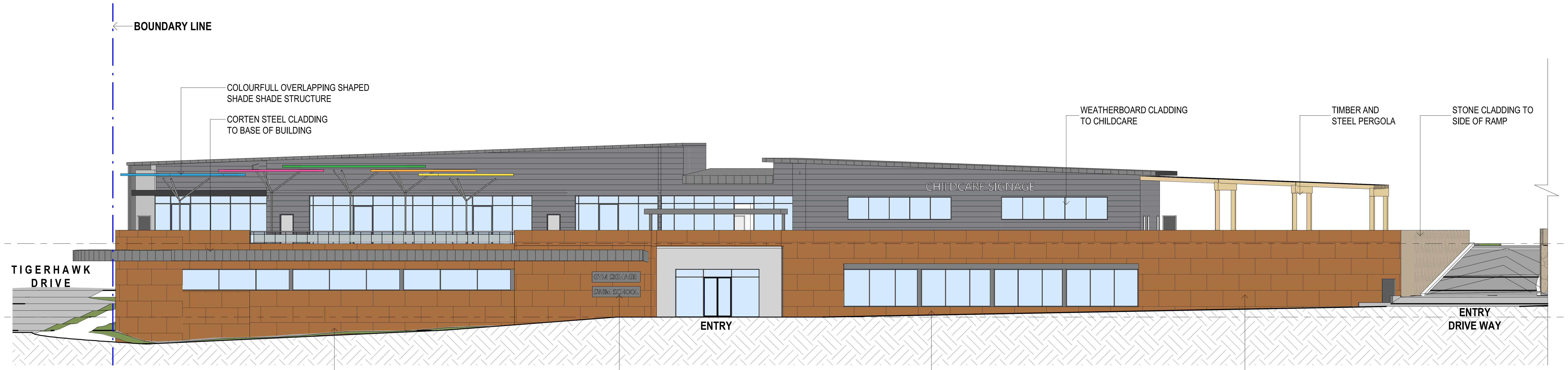

1 WEST ELEVATION CHILDCARE
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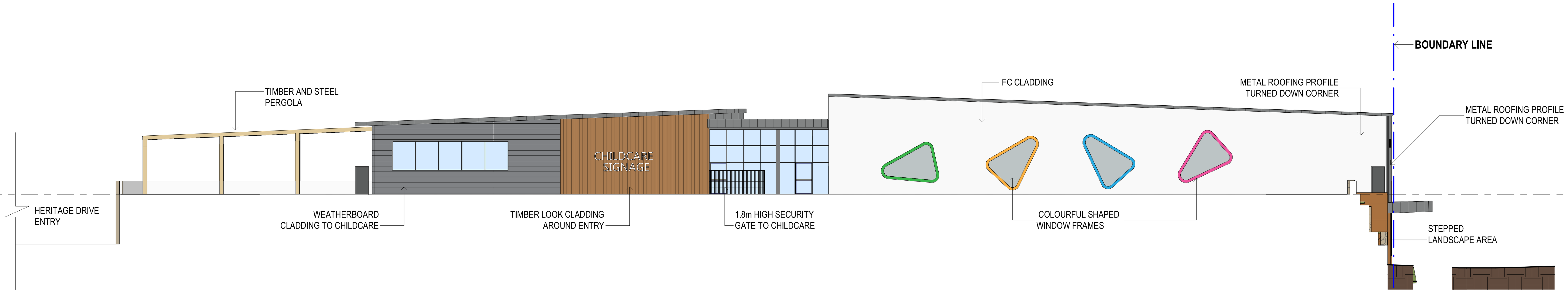
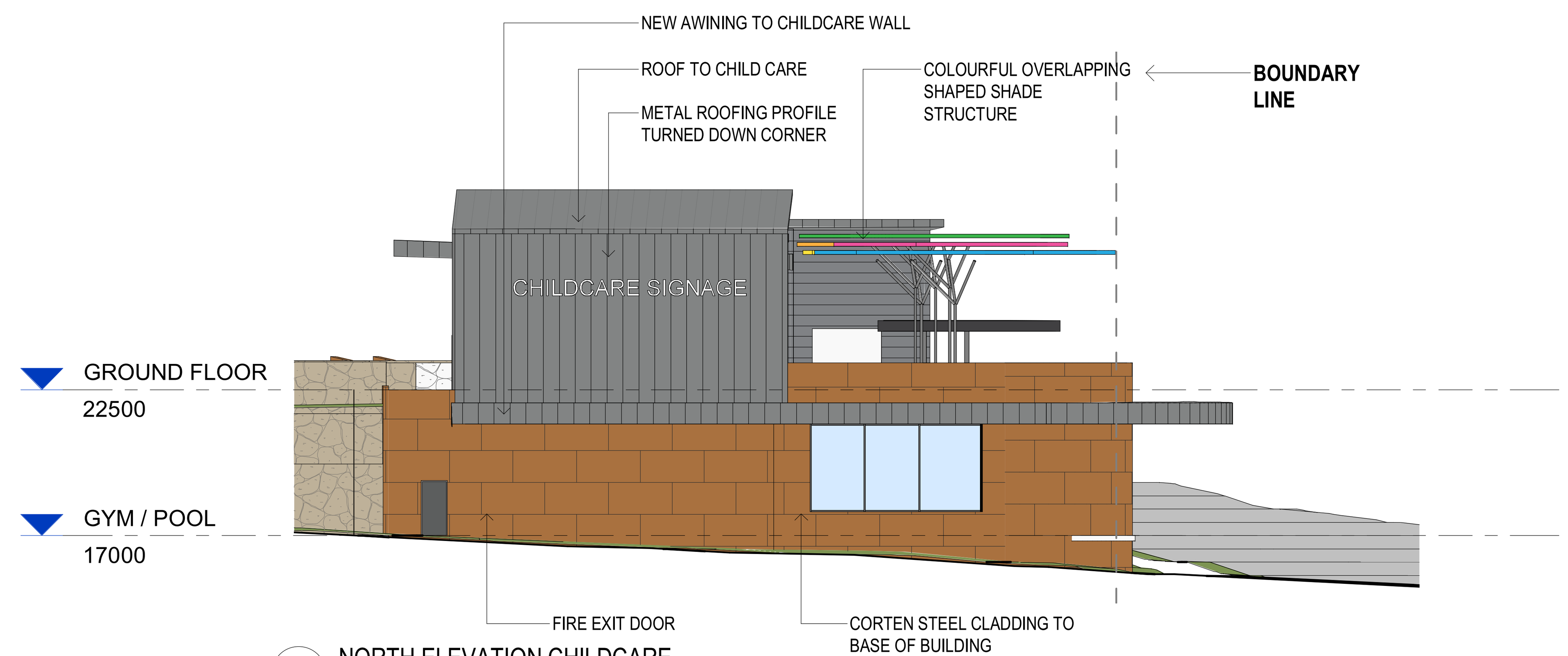


3 EAST ELEVATION CHILDCARE
1 : 200

4 SOUTH ELEVATION CHILDCARE
1 : 200



2 NORTH ELEVATION CHILDCARE
1 : 200

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ISSUE	DATE	DESCRIPTION
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ELEVATION CHILDCARE

A10.09 DA E
1:200 @ A1
1:400 @ A3

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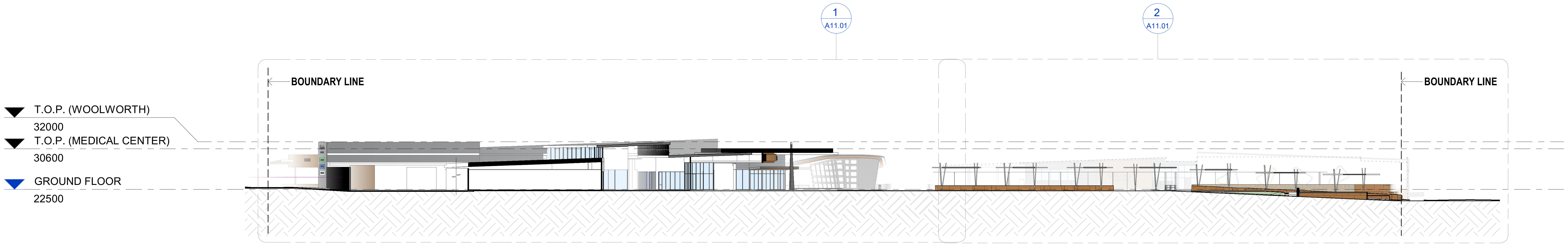

A SECTION A-A
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1 SECTION A-A_Part 1
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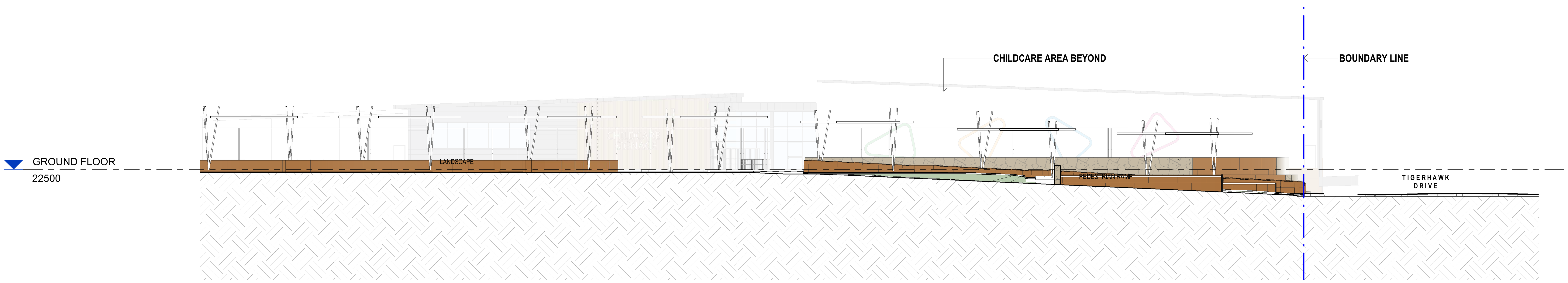

2 SECTION A-A_Part 2
1 : 200

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SECTION 1

A11.01 DA E
1:200 @ A1
1:400 @ A3

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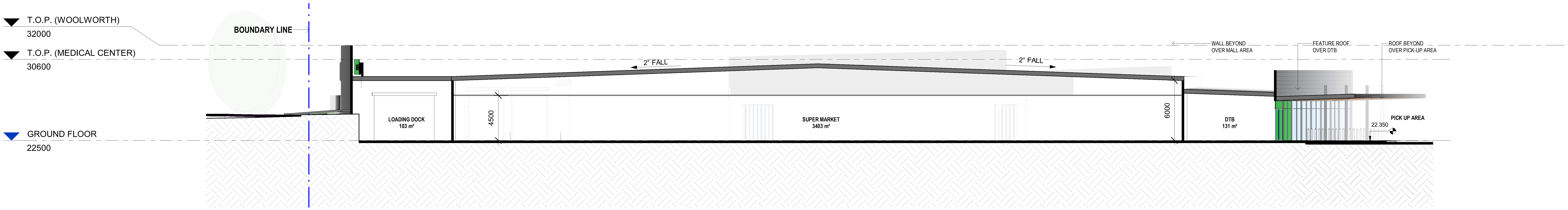

C SECTION C-C
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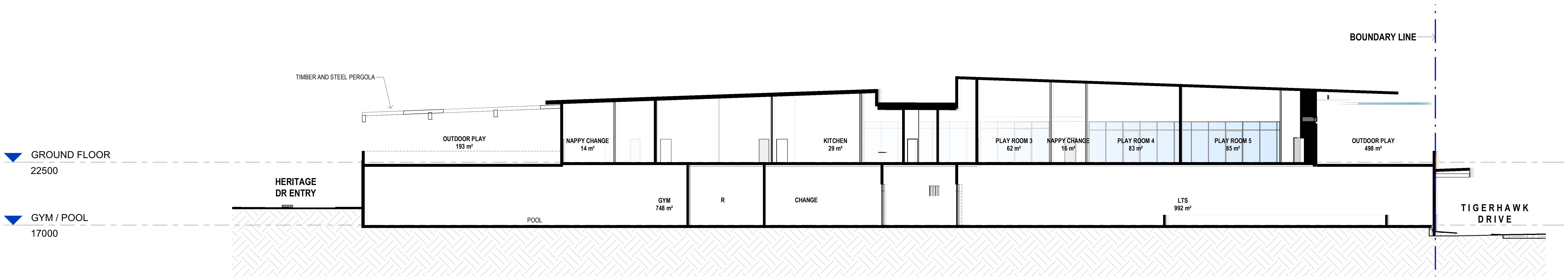
B SECTION B-B
1 : 200



E SECTION E-E
1 : 200

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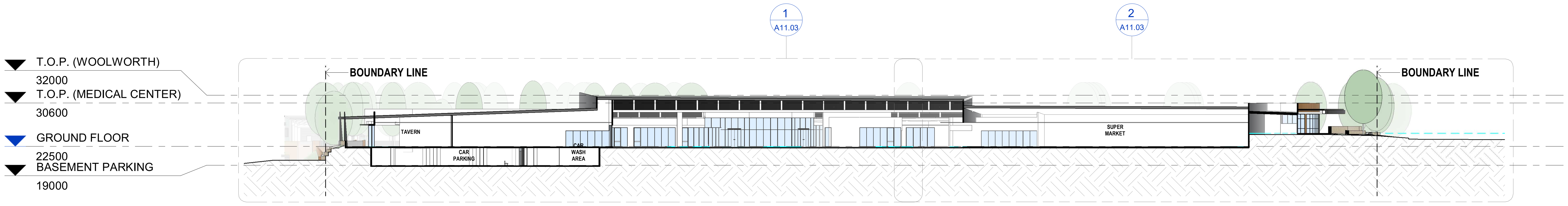

SECTION D-D
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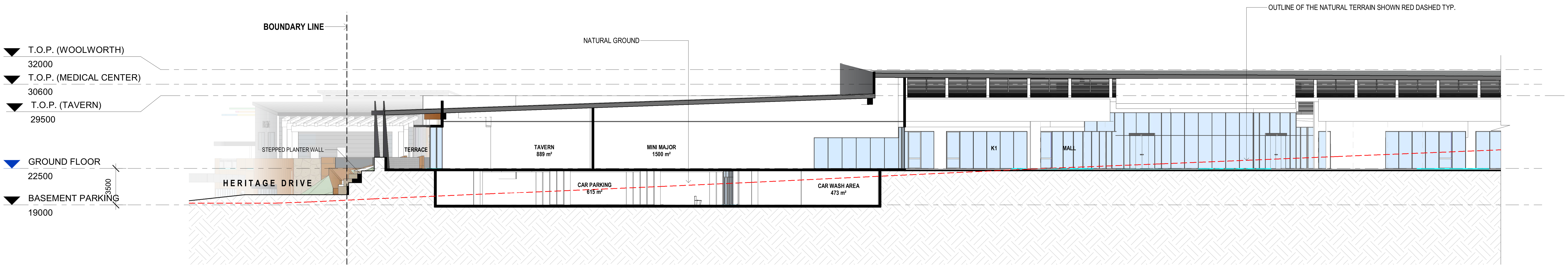

SECTION D-D_Part 1
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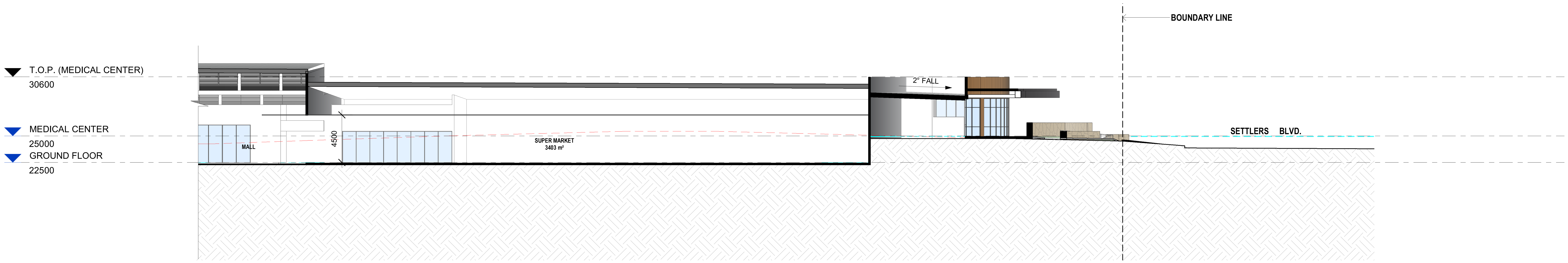

SECTION D-D_Part 2
1 : 200

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SECTION 3

A11.03 DA E
1:200 @ A1
1:400 @ A3

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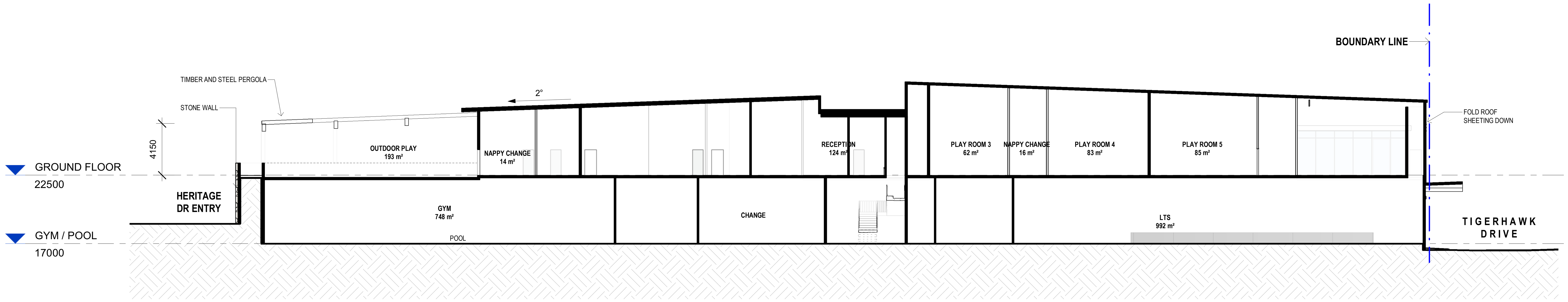

1 SECTION A
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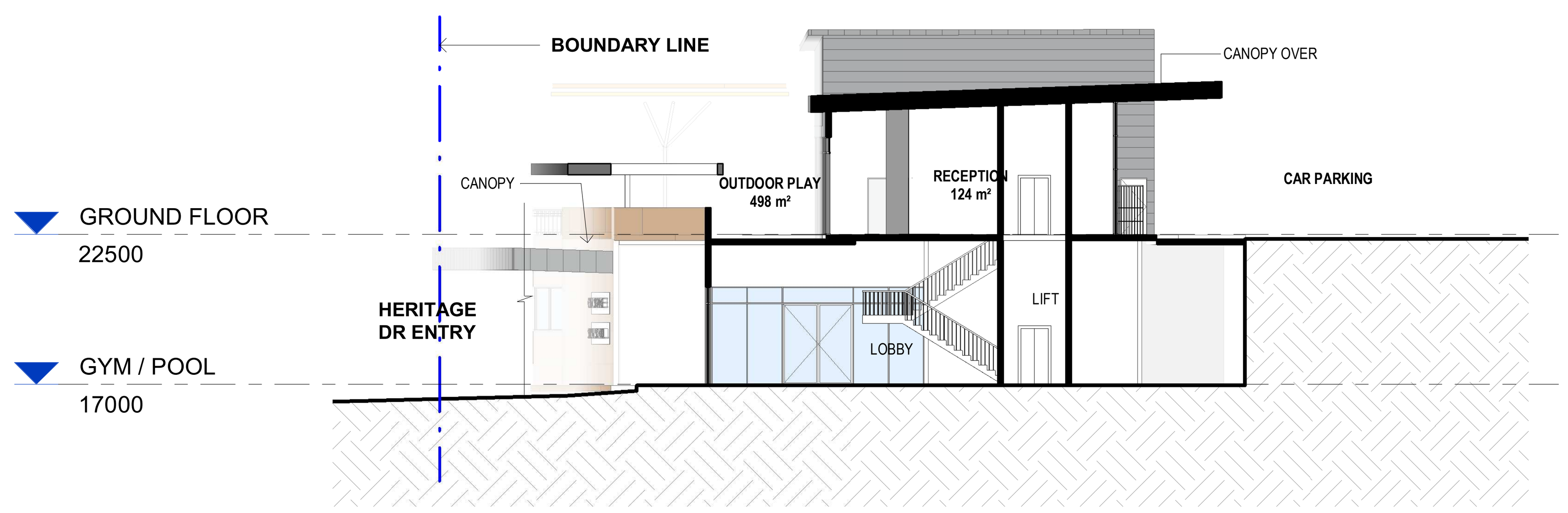

2 SECTION B
1 : 200

REVELOP

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SECTIONS CHILDCARE

A11.04 DA E
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1:400 @ A3

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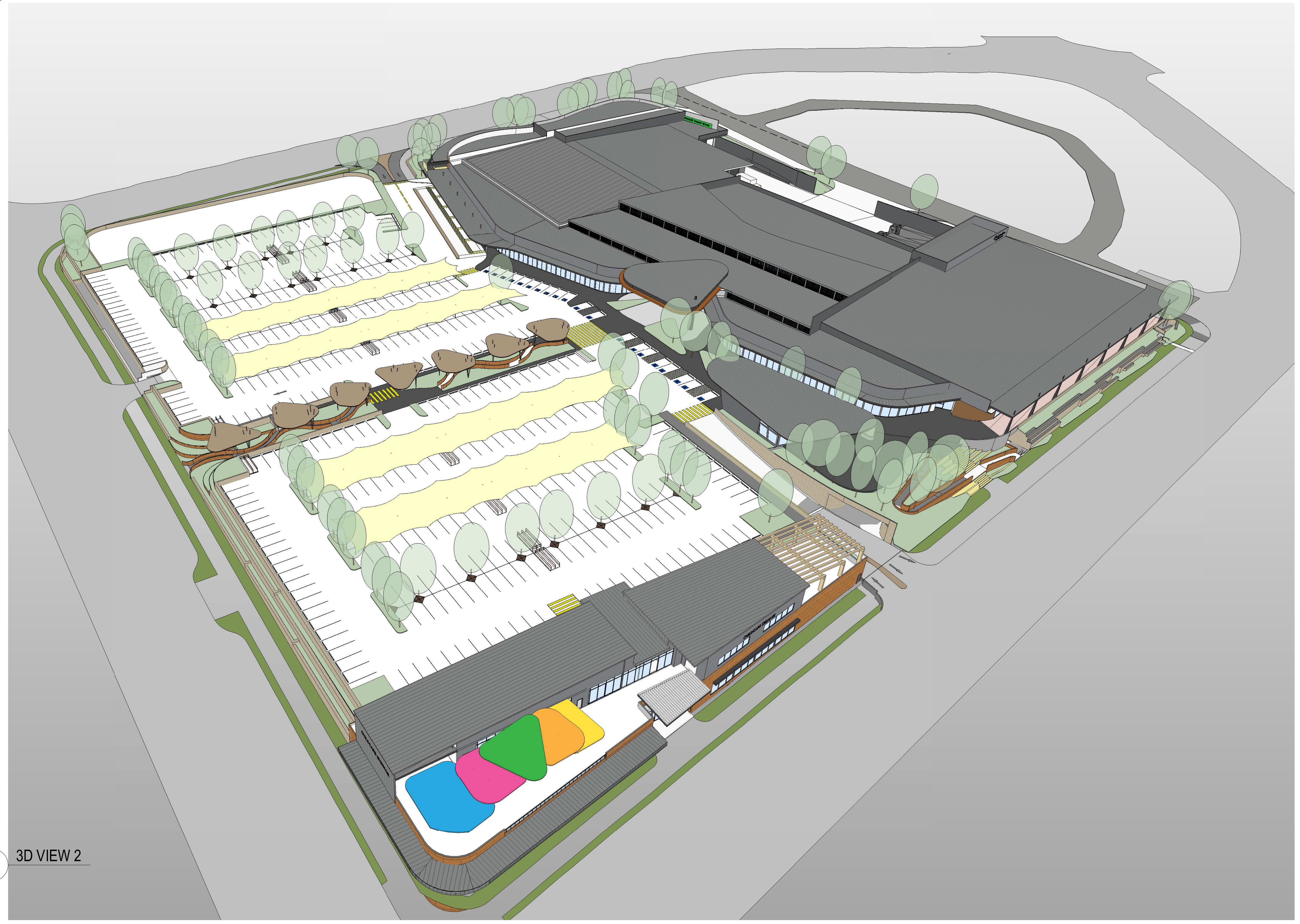
1 3D VIEW 1



2 3D VIEW 2

REVELOP

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3D VISUALIZATION

A80.01 DA F

1:NTS @ A1
1:NTS @ A3

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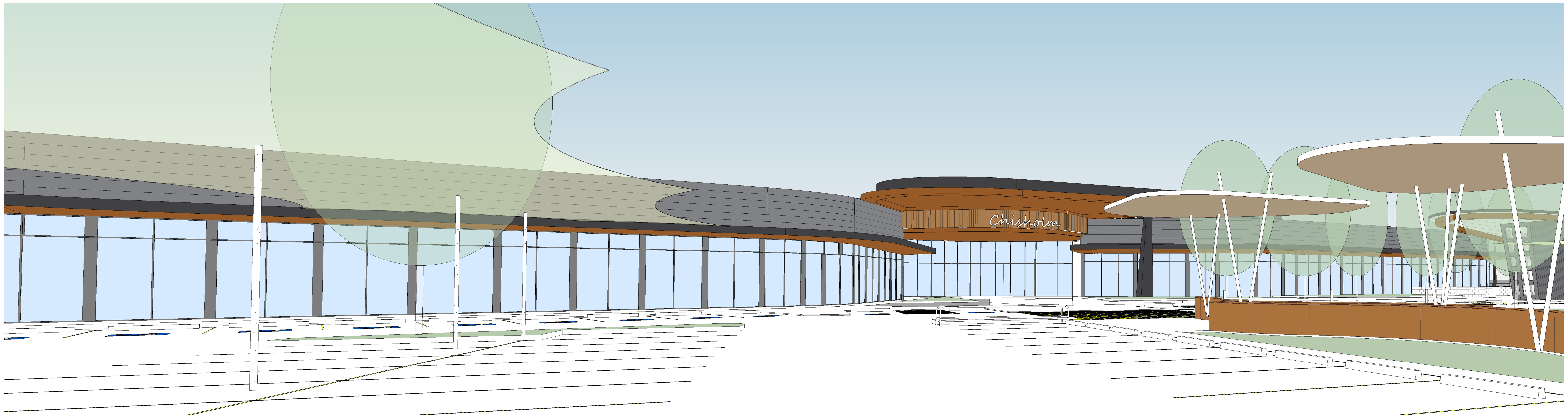

1 PERSPECTIVE 1

2 PERSPECTIVE 2

REVELOP

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PERSPECTIVES SHEET 1

A80.02 DA E

1:NTS @ A1
1:NTS @ A3

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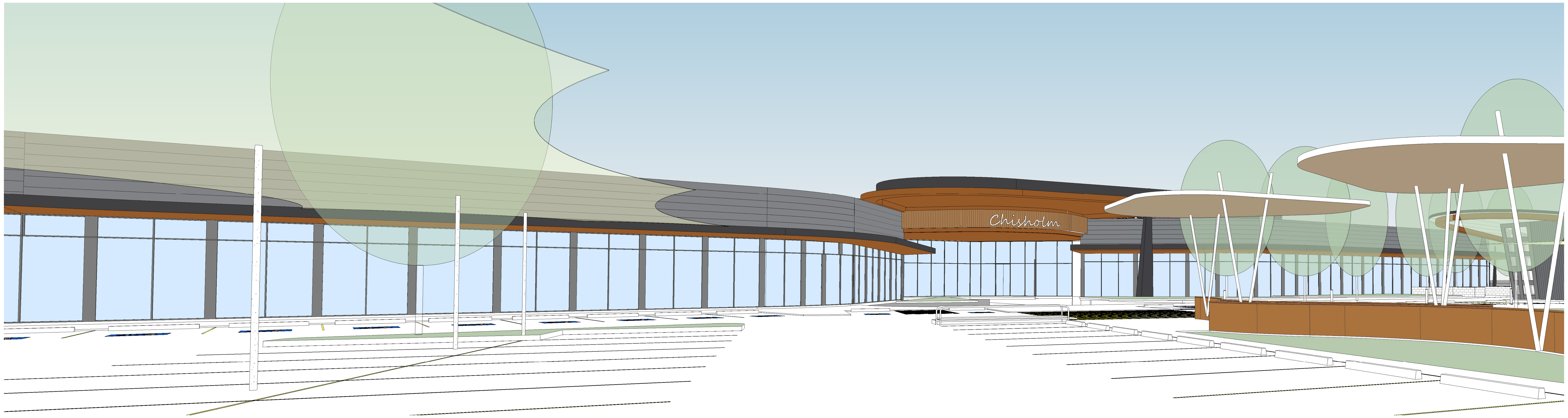
WORK IN PROGRESS
8/11/2021 12:06:30 PM



1 PERSPECTIVE 1

2 PERSPECTIVE 2

REVELOP

CHISHOLM SHOPPING CENTRE
HERITAGE DRIVE
CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
C	21-09-2021	DA ISSUE
D	05-10-2021	DA ISSUE
E	21-10-21	FOR REVIEW
F	08-11-21	FOR REVIEW

PERSPECTIVES SHEET 1

A80.02 DA F
1:NTS @ A1
1:NTS @ A3

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DEVELOPMENT APPLICATION

WORK IN PROGRESS
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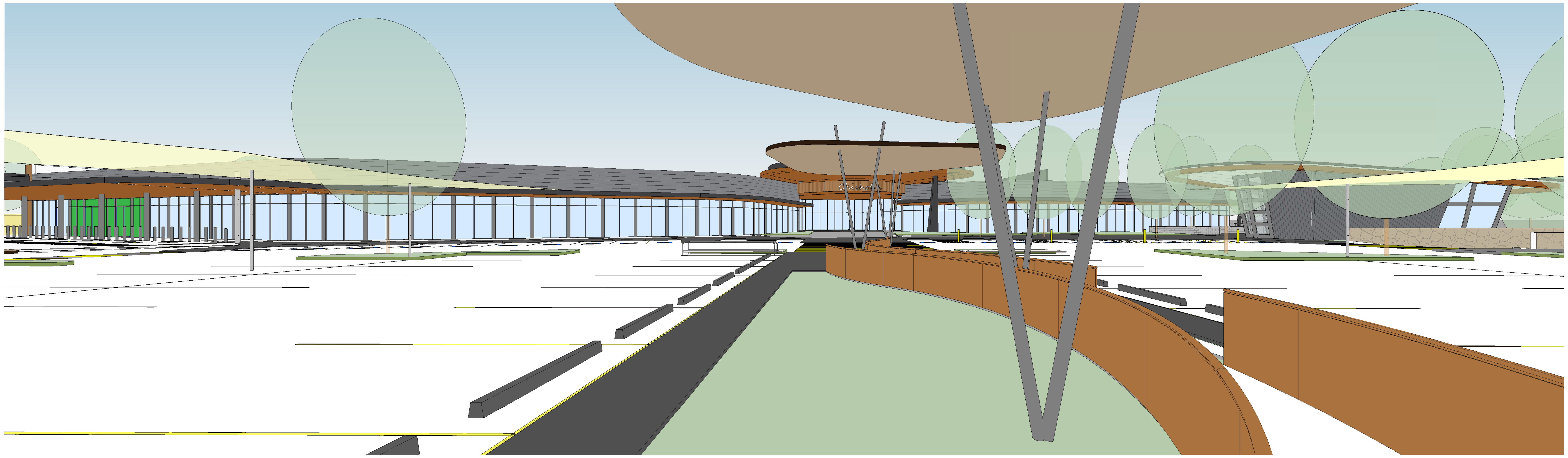
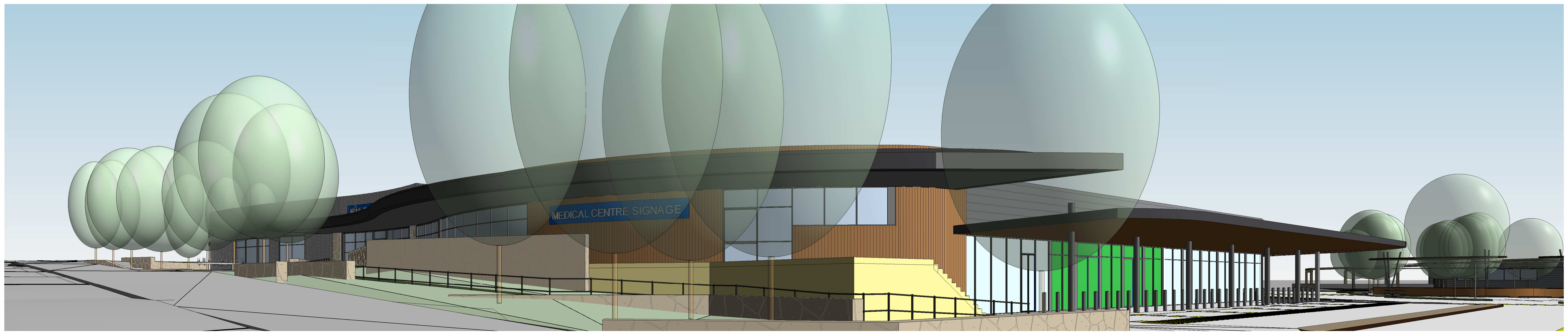


1 PERSPECTIVE 1



2 PERSPECTIVE 2

REVELOP

CHISHOLM SHOPPING CENTRE
HERITAGE DRIVE
CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
C	21-09-2021	DA ISSUE
D	05-10-2021	DA ISSUE
E	21-10-21	FOR REVIEW
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PERSPECTIVES SHEET 2

A80.03 DA F

1:NTS @ A1
1:NTS @ A3

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DEVELOPMENT APPLICATION

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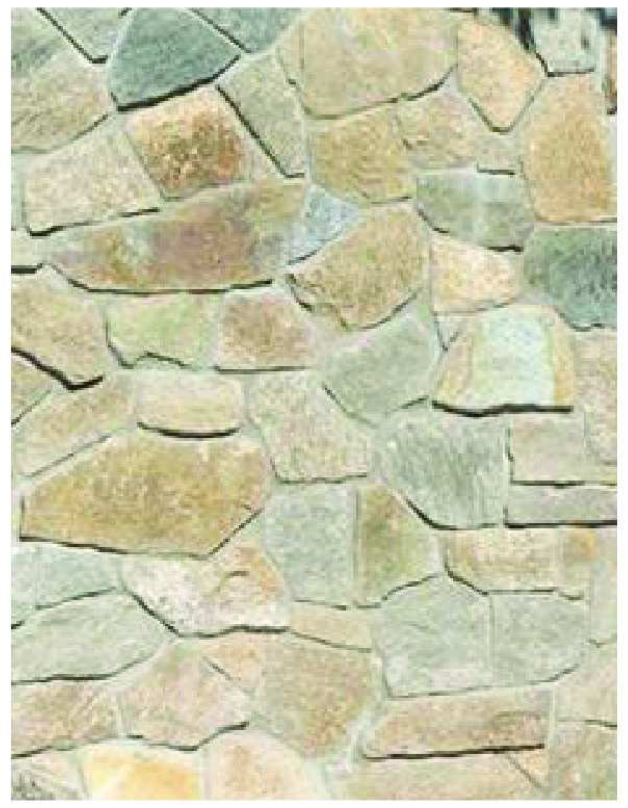
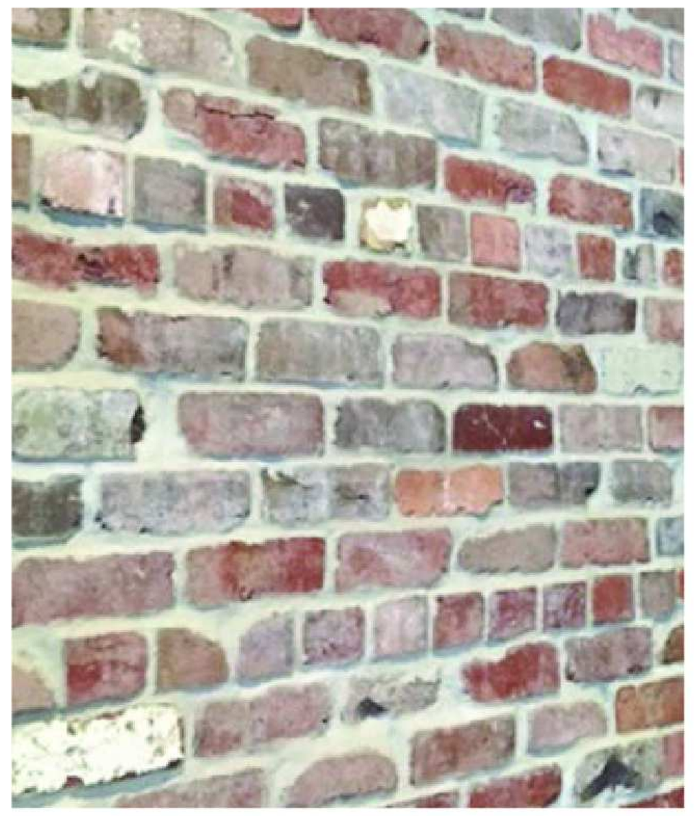
WF_01 BLACK MATT AND GLAZED BRICKS

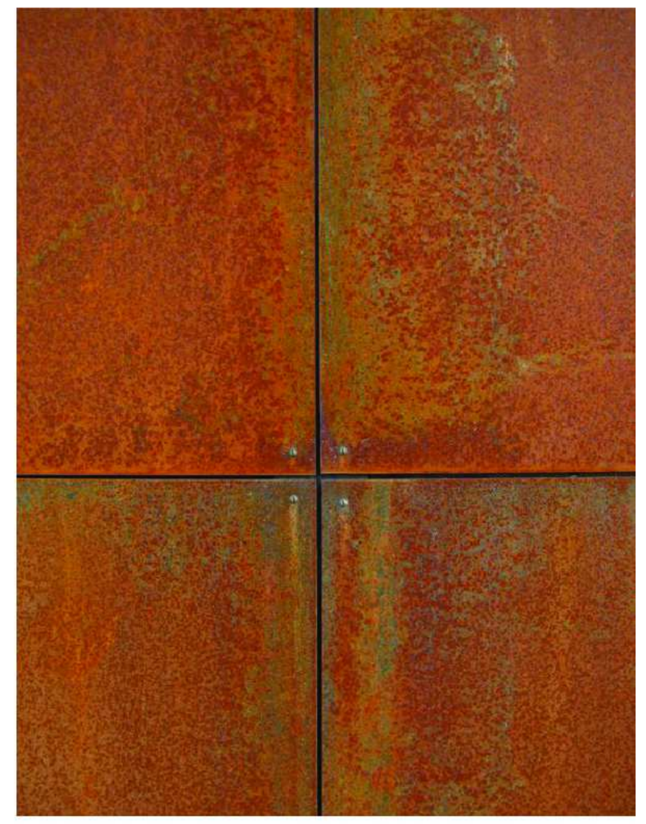

WF_02 MID GREY WEATHERBOARD LOOK FC CLADDING


WF_03 STONE CLADDING


WF_04 & WF_06 DARK GREY WEATHERBOARD LOOK FC CLADDING

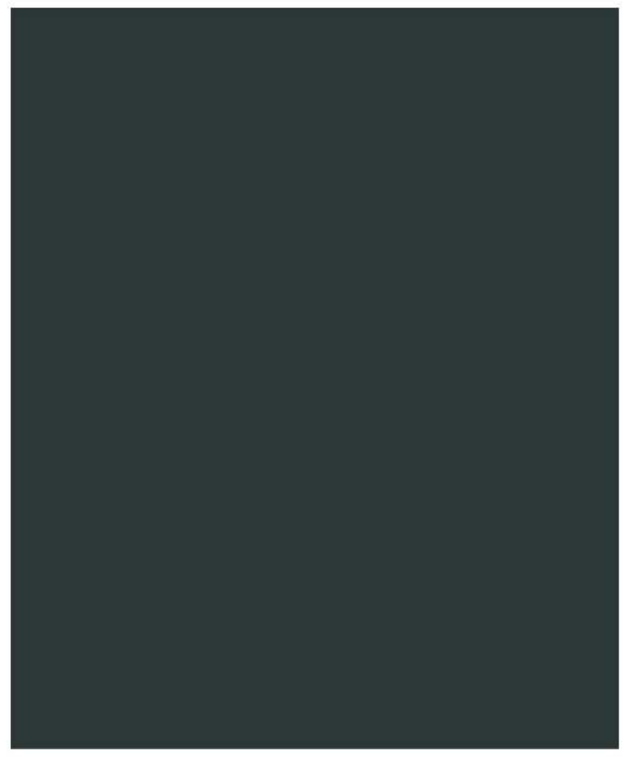

WF_05 RECYCLED BRICKS


MF_01 COLORBOND WINDSPRAY ROOFING

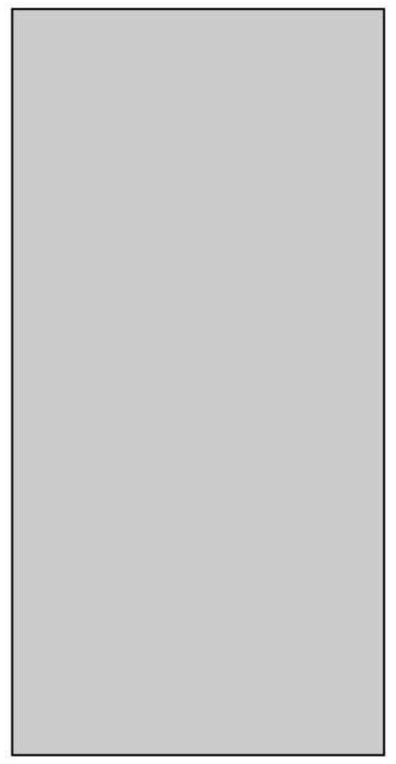

MF_02 CORTEN STEEL

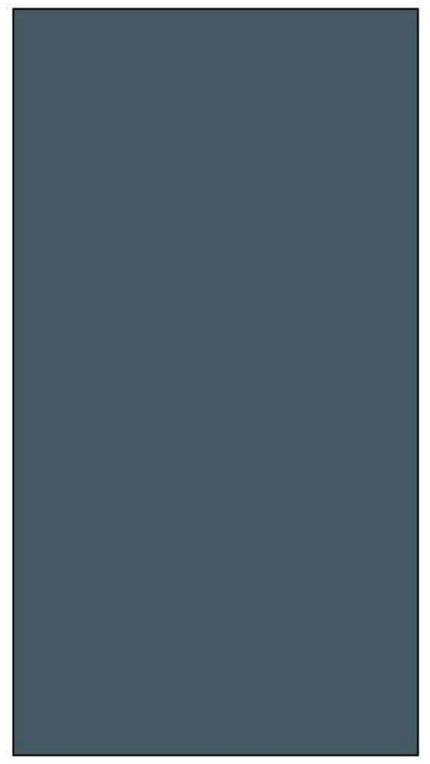

MF_03 & PF_02 BLACK BATTENS WITH GREY PAINT BEHIND

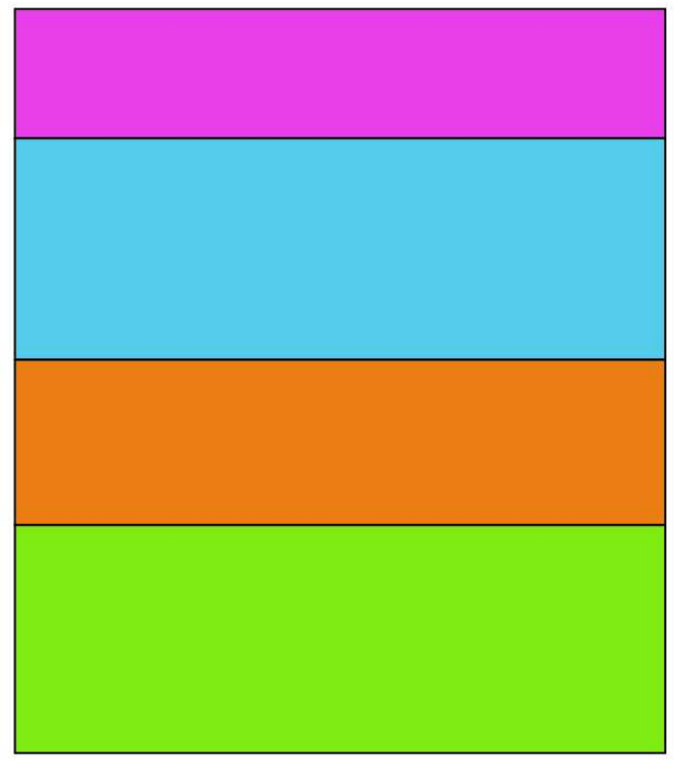

MF_04 DARK METAL CLADDING


MF_05, MF_06 & PF_01 COLORBOND MONUMENT AWNING FASCIA, GLAZING FRAMING & LOUVRES.

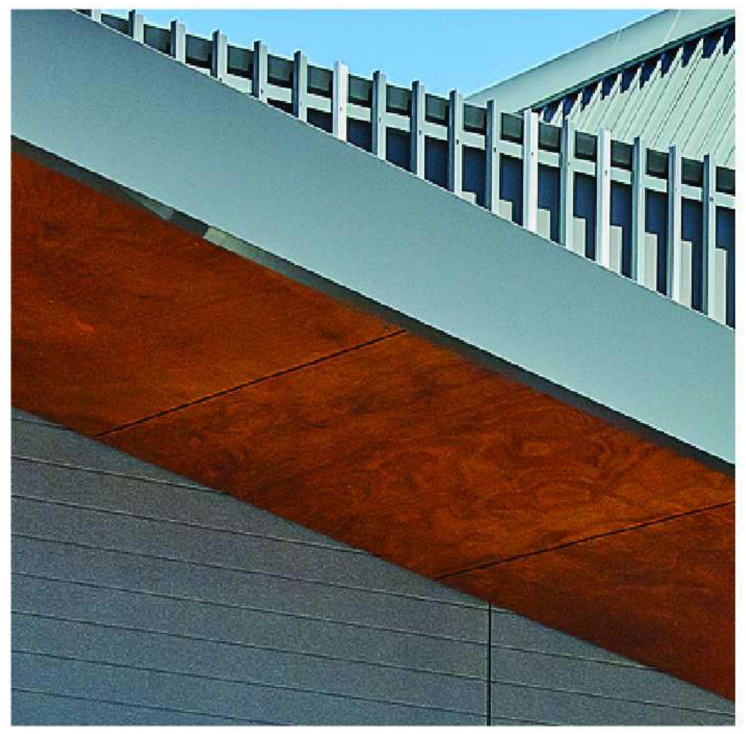

PF_03 PAINT FINISH TO RENDERED WALL

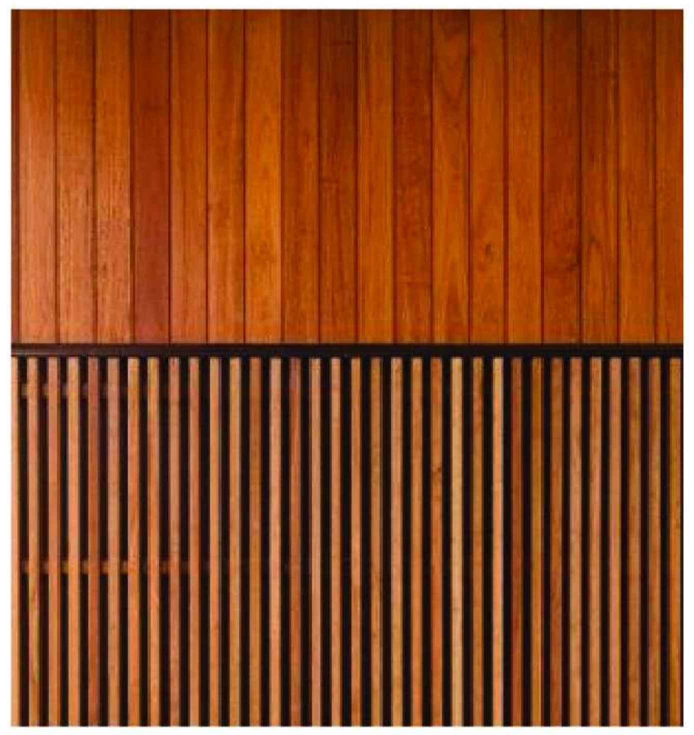

PF_04 PAINT FINISH


PF_05 PAINT FINISH


PF_06 - PF_09 COLOURFUL CHILDCARE WINDOW FRAMES


FX_02 - FX_06 COLOURFUL CHILDCARE SHADE SAILS


TF_01 TIMBER LOOK SOFFIT


TF_02, TF_05 & TF_06 TIMBER CLADDING


TF_03 TIMBER AWNING TO TAVERN


TF_04 TIMBER LOOK PERGOLA


TF_07 FEATURE TIMBER SHADE STRUCTURES


FX_01 CARPARK SHADE SAILS

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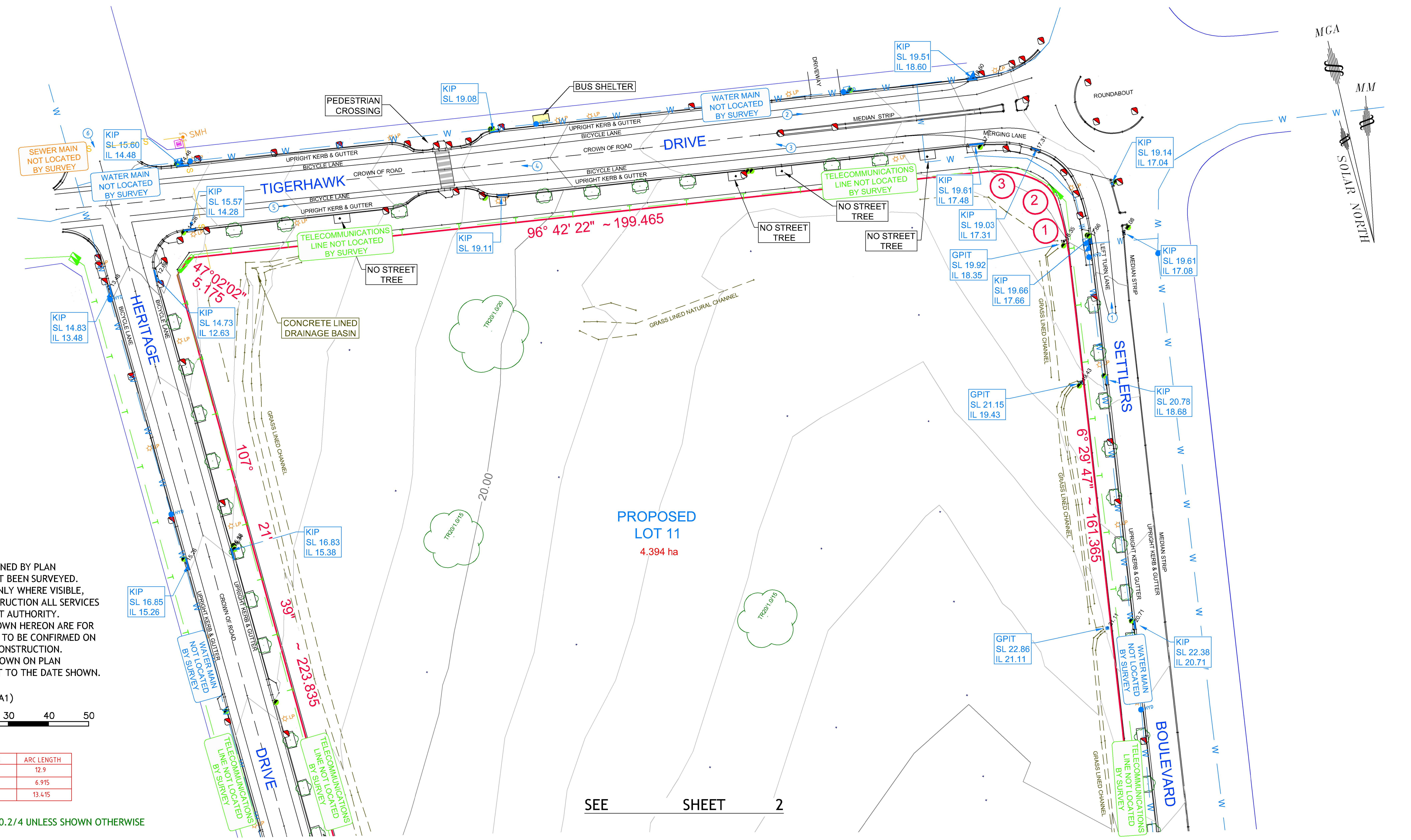
APPENDIX B – DETAILED SITE SURVEY PLAN (LDS)

LEGEND

- BOUNDARY LINE
- ADJACENT BOUNDARY
- EASEMENT
- FENCE LINE
- SEWERMAIN
- WATERMAIN
- OVERHEAD ELECTRICITY
- UNDERGROUND ELECTRICITY
- TELECOMMUNICATIONS LINE
- OPTIC FIBRE LINE
- GAS LINE
- MAJOR COUNTOUR LINE
- MINOR CONTOUR LINE
- TOP & TOE OF BANKS
- RETAINING WALLS
- BENCH MARK
- SIP — SEWER INSPECTION POINT
- SMH — SEWER MANHOLE
- SV — STOP VALVE
- HYD — HYDRANT
- WM — WATER METER
- GRATED PIT
- PP — POWER POLE
- LP — LIGHT POLE
- ET — ELECTRICAL TURRENT
- GAS METER
- TELECOMMUNICATIONS PIT
- TRAFFIC SIGNAL
- DENOTES PHOTO LOCATION
- STREET SIGN
- TR5/0.6/8 — DENOTES TREE HEIGHT/DIAMETER/SPREAD
- H 6.12 S 5.12 — DENOTES WINDOW GROUND FLOOR HOOD RL SILL RL
- H 16.12 S 15.12 — DENOTES WINDOW UPPER FLOOR HOOD RL SILL RL



NOTE:-

1. BOUNDARIES HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY, AND HAVE NOT BEEN SURVEYED.
2. SERVICES HAVE BEEN LOCATED ONLY WHERE VISIBLE, PRIOR TO EXCAVATION OR CONSTRUCTION ALL SERVICES ARE TO BE LOCATED BY RELEVANT AUTHORITY.
3. SPOT LEVELS AND CONTOURS SHOWN HEREON ARE FOR DESIGN PURPOSES ONLY AND ARE TO BE CONFIRMED ON SITE PRIOR TO EXCAVATION OR CONSTRUCTION.
4. APPROXIMATE SITE AREA IS AS SHOWN ON PLAN
5. DETAILS OF SURVEY ARE CORRECT TO THE DATE SHOWN. (14/10/2021)

SCALE 1:500 (A1)

10 0 10 20 30 40 50

SHORT LINE TABLE

LINE	BEARING	DISTANCE	RADIUS	ARC LENGTH
1	179°16'07"	12.87	54.05	12.9
2	150°32'47"	6.745	9.05	6.915
3	112°41'00"	13.24	24.05	13.415

ALL STREET TREES ARE A NOMINAL 4/0.2/4 UNLESS SHOWN OTHERWISE

PHOTOGRAPH 1

PHOTOGRAPH 2

PHOTOGRAPH 3

PHOTOGRAPH 4

PHOTOGRAPH 5

PHOTOGRAPH 6

Ed.	Details of Revisions	Date
A	INITIAL ISSUE	21/10/21

Client / Council Development Consent Number

Scale:	1:500 (A1),1:1000 (A3)	Datum:	AHD
Origin:	SSM171234	Contour Int:	1.0
Surveyor:	S.N.	Drawn:	S.F.
Checked:	S.C.	Approved:	J.H.
Job Number:	6636	Drawing File:	6636-DET

Registered Surveyor: ....

LAND DEVELOPMENT SOLUTIONS

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E-mail: mail@lds.net.au

ABN: 42 110 897 928

DETAIL SURVEY OF LOT 11 & 12, UNREGISTERED D.P, BEING SUBDIVIDED LOT 1, D.P. 1224700, CHISHOLM

Drawing Number: 1 Edition: A

Sheet. 1.. of.. 2

LEGEND

- BOUNDARY LINE
- ADJACENT BOUNDARY
- EASEMENT
- FENCE LINE
- SEWERMAIN
- WATERMAIN
- OVERHEAD ELECTRICITY
- UNDERGROUND ELECTRICITY
- TELECOMMUNICATIONS LINE
- OPTIC FIBRE LINE
- GAS LINE
- MAJOR COUNTOUR LINE
- MINOR CONTOUR LINE
- RETAINING WALLS
- BENCH MARK
- SIP SEWER INSPECTION POINT
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- SV STOP VALVE
- HYD HYDRANT
- WM WATER METER
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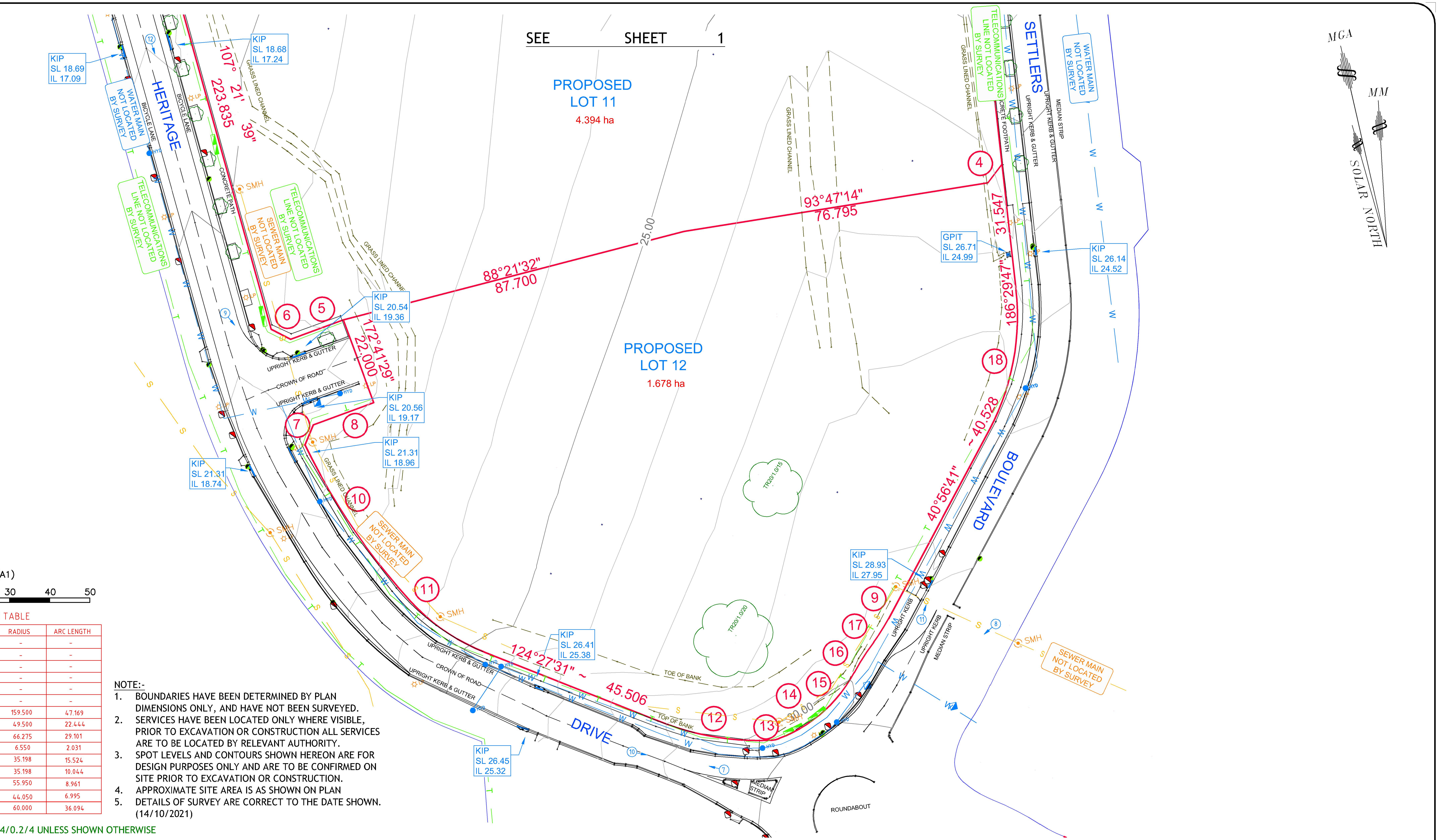
- TELECOMMUNICATIONS PIT
- TRAFFIC SIGNAL
- DENOTES PHOTO LOCATION
- STREET SIGN
- TR5/0.6/8 DENOTES TREE. HEIGHT/DIAMETER/SPREAD
- H 6.12 S 5.12 DENOTES WINDOW GROUND FLOOR HOOD RL SILL RL
- H 16.12 S 15.12 DENOTES WINDOW UPPER FLOOR HOOD RL SILL RL



SCALE 1:500 (A1)

10 0 10 20 30 40 50

SHORT LINE TABLE

LINE	BEARING	DISTANCE	RADIUS	ARC LENGTH
4	50°08'30"	5.795	-	-
5	82°41'29"	14.016	-	-
6	130°01'34"	5.422	-	-
7	35°22'11"	5.441	-	-
8	82°41'29"	16.037	-	-
9	40°57'50"	12.769	-	-
10	338°54'33"	46.997	159.500	47.169
11	317°26'53"	22.252	49.500	22.444
12	292°51'01"	28.868	66.275	29.101
13	271°23'15"	2.023	6.550	2.031
14	249°52'09"	15.398	35.198	15.524
15	229°03'36"	10.010	35.198	10.044
16	45°28'26"	8.952	55.950	8.961
17	225°30'47"	6.988	44.050	6.995
18	23°43'49"	35.553	60.000	36.094

ALL STREET TREES ARE A NOMINAL 4/0.2/4 UNLESS SHOWN OTHERWISE

NOTE:-

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PHOTOGRAPH 7

PHOTOGRAPH 8

PHOTOGRAPH 9

PHOTOGRAPH 10

PHOTOGRAPH 11

PHOTOGRAPH 12

Ed.	Details of Revisions	Date
A	INITIAL ISSUE	21/10/21

Client / Council Development Consent Number

Scale: 1:500 (A1),1:1000 (A3) Datum: AHD
Origin: SSM171234 Contour Int: 1.0
Surveyor: S.N. Drawn: S.F.
Checked: S.C. Approved: J.H.
Job Number: 6636 Drawing File: 6636-DET

Registered Surveyor: ....

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ABN: 42 110 897 928

DETAIL SURVEY OF
LOT 11 & 12, UNREGISTERED D.P.,
BEING SUBDIVIDED LOT 1, D.P. 1224700,
CHISHOLM

Drawing Number	Edition
1	A

Sheet. 2.. of.. 2

APPENDIX C – DRAINS MODELLING RESULTS

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Deptl (m)	Major Safe Pond Depth (m)
PRE-DEV W	Node							0		371866.9	6374849		8		No					
PRE-DEV E	Node							0		372274.3	6374829		9		No					
N9	Node					19.4		0		372190.9	6374923		19		No					
N8	Node					15		0		371971.6	6374946		18		No					
N28443	Node							0		371957.2	6374954		72073		No					
N28445	Node							0		372205.6	6374934		72082		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id
Basin2	19.8	0.81		Orifice		112	20			372175	6374911	No			16
	20	0.81													
	20.1	120													
	21.91	120													
	22	0.81													
	22.2	0.81													
	22.35	2500													
	22.4	2500													
Basin3	19.8	0.81		Orifice		150	20			371990.9	6374936	No			17
	20	0.81													
	20.1	350													
	21.91	350													
	22	0.81													
	22.2	0.81													
	22.35	8500													
	22.4	8500													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%) %	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowFactor	Rainfall Multiplier
Cat6	PRE-DEV W	3.3834	0	100	0	0	0	0	-1	190	-1	-1	5	-1	-1	0.17	-1	0				1
Cat7	PRE-DEV E	0.9675	0	100	0	0	0	0	-1	60	-1	-1	6	-1	-1	0.17	-1	0				1
POST-DEV I	Basin2	1.3968	82	18	0	0	0	0	280	270	-1	0.5	5	-1	0.012	0.17	-1	0				1
POST-DEV '	Basin3	2.7796	95	5	0	0	0	0	360	180	-1	0.5	5	-1	0.012	0.17	-1	0				1
uncap	N28443	0.2201	100	0	0	0	0	0	30	-1	-1	15	-1	-1	0.012	-1	-1	0				1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
Pipe2	Basin2	N9	10	19.85	19.75	1	Concrete, u	300	300	0.013	NewFixed	1	Basin2	0					
Pipe3	Basin3	N8	10	19.85	19.75	1	Concrete, u	300	300	0.013	NewFixed	1	Basin3	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Widtl (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Stor (m)	SafeDepth Minor Stor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %		id			
HIGH OUT	Basin2	N9	0.1	21.65			4 m wide p	0.3	0.15	0.4	1	0		38358			10

OF1	Basin2	N9	0.1	22.29	10	1.6	4 m wide p	0.3	0.15	0.4	5	0	40	10
OF15149	N9	N28445	0.1				4 m wide p	0.3	0.15	0.4	1	0	72077	1
OF9488	Basin3	N8	0.1	21.45			4 m wide p	0.3	0.15	0.4	1	0	54398	10
HIGH OUT '	Basin3	N8	0.1	21.45			4 m wide p	0.3	0.15	0.4	1	0	38361	10
OF2	Basin3	N8	0.1	22.23	15	1.6	4 m wide p	0.3	0.15	0.4	5	0	43	10
OF15145	N8	N28443	0.1				4 m wide p	0.3	0.15	0.4	1	0	72072	1

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
Pipe2	Concrete, ι	300	0.6	-0.68	Unsafe
Pipe3	Concrete, ι	300	0.6	-5.08	Unsafe

This model has no pipes with non-return valves

DRAINS results prepared from Version 2021.02

PIT / NODE DETAILS — Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N9	19.4		0.031				
N8	15		0.071				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat6	0.057	0	0.057	0	45.64	0	1EY AEP, 2 hour burst, Storm 8
Cat7	0.034	0	0.034	0	17.97	0	1EY AEP, 1 hour burst, Storm 6
POST-DEV I	0.181	0.178	0.003	14.03	33.75	0	1EY AEP, 15 min burst, Storm 5
POST-DEV '	0.37	0.368	0.002	17.27	28.01	0	1EY AEP, 20 min burst, Storm 6
uncap	0.052	0.052	0	1.12	0	0	1EY AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe2	0.034	1.24	20.877	19.873	1EY AEP, 1.5 hour burst, Storm 5
Pipe3	0.057	1.45	20.034	19.914	1EY AEP, 1.5 hour burst, Storm 2

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
HIGH OUT	0	0	0.908	0	0	0	0	
OF1	0	0	1.401	0	0	0	0	

OF15149	0.034	0.034	0.908	0.033	0.02	4	0.47	1EY AEP, 1.5 hour burst, Storm 5
OF9488	0	0	0.908	0	0	0	0	
HIGH OUT '	0	0	0.908	0	0	0	0	
OF2	0	0	1.401	0	0	0	0	
OF15145	0.057	0.057	0.908	0.04	0.02	4	0.57	1EY AEP, 1.5 hour burst, Storm 2

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2	21.58	182.4	0.034	0.034	0
Basin3	21.44	483	0.057	0.057	0

Run Log for TX15901.00_DRAINS MODEL run at 10:15:27 on 10/12/2021 using version 2021.02

Flows were safe in all overflow routes.

DRAINS results prepared from Version 2021.02

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N9	19.4		0.227				
N8	15		0.52				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat6	0.513	0	0.513	0	24.08	0	10% AEP, 30 min burst, Storm 9
Cat7	0.24	0	0.24	0	9.83	0	10% AEP, 15 min burst, Storm 6
POST-DEV I	0.434	0.412	0.022	9.91	23.84	0	10% AEP, 10 min burst, Storm 5
POST-DEV '	0.878	0.862	0.019	12.38	20.08	0	10% AEP, 15 min burst, Storm 6
uncap	0.103	0.103	0	0.85	0	0	10% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe2	0.04	1.31	21.35	19.885	10% AEP, 1 hour burst, Storm 3
Pipe3	0.071	1.5	20.056	19.94	10% AEP, 1 hour burst, Storm 3

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
HIGH OUT	0.199	0.199	0.908	0.069	0.06	4	0.93	10% AEP, 1 hour burst, Storm 3
OF1	0	0	1.401	0	0	0	0	

OF15149	0.239	0.239	0.908	0.074	0.07	4	1.01	10% AEP, 1 hour burst, Storm 3
OF9488	0.22	0.22	0.908	0.072	0.07	4	0.97	10% AEP, 1 hour burst, Storm 3
HIGH OUT '	0.22	0.22	0.908	0.072	0.07	4	0.97	10% AEP, 1 hour burst, Storm 3
OF2	0	0	1.401	0	0	0	0	
OF15145	0.511	0.511	0.908	0.11	0.15	4	1.35	10% AEP, 1 hour burst, Storm 3

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2	22.28	246.2	0.239	0.04	0.199
Basin3	22.22	658.9	0.511	0.071	0.44

Run Log for TX15901.00_DRAINS MODEL run at 10:16:55 on 10/12/2021 using version 2021.02

Flows were safe in all overflow routes.

DRAINS results prepared from Version 2021.02

PIT / NODE DETAILS				Version 8			
Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N9	19.4		0.511				
N8	15		1.093				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat6	1.284	0	1.284	0	17.86	0	1% AEP, 20 min burst, Storm 1
Cat7	0.535	0	0.535	0	7.43	0	1% AEP, 10 min burst, Storm 7
POST-DEV I	0.799	0.748	0.06	8.04	19.34	0	1% AEP, 10 min burst, Storm 1
POST-DEV '	1.708	1.667	0.042	9.35	15.17	0	1% AEP, 10 min burst, Storm 1
uncap	0.172	0.172	0	0.7	0	0	1% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe2	0.041	1.31	21.398	19.886	1% AEP, 25 min burst, Storm 9
Pipe3	0.072	1.5	20.057	19.942	1% AEP, 20 min burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
HIGH OUT	0.21	0.21	1.479	0.071	0.07	4	0.94	1% AEP, 25 min burst, Storm 9
OF1	0.242	0.242	1.401	0.052	0.09	4	1.64	1% AEP, 25 min burst, Storm 9

OF15149	0.492	0.492	1.479	0.108	0.14	4	1.32	1% AEP, 25 min burst, Storm 9
OF9488	0.231	0.231	1.479	0.073	0.07	4	0.99	1% AEP, 20 min burst, Storm 8
HIGH OUT '	0.231	0.231	1.479	0.073	0.07	4	0.99	1% AEP, 20 min burst, Storm 8
OF2	0.506	0.506	1.401	0.072	0.16	4	2.2	1% AEP, 20 min burst, Storm 8
OF15145	1.041	1.041	1.479	0.162	0.29	4	1.77	1% AEP, 20 min burst, Storm 8

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2	22.35	355.9	0.492	0.041	0.451
Basin3	22.3	798.5	1.041	0.072	0.969

Run Log for TX15901.00_DRAINS MODEL run at 10:18:56 on 10/12/2021 using version 2021.02

Flows were safe in all overflow routes.

APPENDIX D – MUSIC SUMMARY REPORT

Source nodes

Location	SUPER + TAVERN	CARPARK NORTH	SUPER	CARPARK EAST	SHOPS 3	CHILD	SHOPS 2	SHOPS 1	FAST 1	FAST 2	KIOSK	LOADING	CARPARK WEST	COURTYARDS	OUTDOOR	LANDSCAPE	LANDSCAPE
ID	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	24	25
Node Type	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode	UrbanSourceNode
Zoning Surface Type	Roof	Sealedroad	Roof	Sealedroad	Roof	Roof	Roof	Roof	Roof	Roof	Roof	Sealedroad	Sealedroad	Mixed	Mixed	Mixed	Mixed
Total Area (ha)	0.242	0.52	0.492	0.495	0.126	0.09	0.144	0.129	0.039	0.028	0.019	0.171	0.702	0.504	0.136	0.186	0.069
Area Impervious (ha)	0.242	0.52	0.492	0.495	0.126	0.09	0.144	0.129	0.039	0.028	0.019	0.171	0.702	0.504	0.136	0.037852388	0
Area Pervious (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.148147612	0.069
Field Capacity (mm)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Pervious Area Infiltration Capacity coefficient - a	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Pervious Area Infiltration Capacity exponent - b	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Impervious Area Rainfall Threshold (mm/day)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pervious Area Soil Storage Capacity (mm)	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Pervious Area Soil Initial Storage (% of Capacity)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Groundwater Initial Depth (mm)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Groundwater Daily Recharge Rate (%)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Groundwater Daily Baseflow Rate (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Groundwater Daily Deep Seepage Rate (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stormflow Total Suspended Solids Mean (log mg/L)	1.3	2.43	1.3	2.43	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.43	2.43	2.2	2.2	2.2	2.2
Stormflow Total Suspended Solids Standard Deviation (log mg/L)	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Stormflow Total Suspended Solids Estimation Method	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic
Stormflow Total Suspended Solids Serial Correlation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stormflow Total Phosphorus Mean (log mg/L)	-0.89	-0.3	-0.89	-0.3	-0.89	-0.89	-0.89	-0.89	-0.89	-0.89	-0.89	-0.3	-0.3	-0.45	-0.45	-0.45	-0.45
Stormflow Total Phosphorus Standard Deviation (log mg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Stormflow Total Phosphorus Estimation Method	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic
Stormflow Total Phosphorus Serial Correlation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.34	0.3	0.34	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.34	0.34	0.42	0.42	0.42	0.42
Stormflow Total Nitrogen Standard Deviation (log mg/L)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Stormflow Total Nitrogen Estimation Method	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic
Stormflow Total Nitrogen Serial Correlation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.1
Baseflow Total Suspended Solids Standard Deviation (log mg/L)	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Baseflow Total Suspended Solids Estimation Method	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic
Baseflow Total Suspended Solids Serial Correlation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.85	-0.82	-0.85	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.85	-0.85	-0.82	-0.82	-0.82	-0.82
Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Baseflow Total Phosphorus Estimation Method	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic
Baseflow Total Phosphorus Serial Correlation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.11	0.32	0.11	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.11	0.11	0.32	0.32	0.32	0.32
Baseflow Total Nitrogen Standard Deviation (log mg/L)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Baseflow Total Nitrogen Estimation Method	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic	Stochastic
Baseflow Total Nitrogen Serial Correlation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flow based constituent generation - enabled	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Flow based constituent generation - flow file																	
Flow based constituent generation - base flow column																	
Flow based constituent generation - pervious flow column																	
Flow based constituent generation - impervious flow column																	
Flow based constituent generation - unit																	
OUT - Mean Annual Flow (ML/yr)	3.26	7.01	6.63	6.67	1.7	1.21	1.94	1.74	0.526	0.378	0.256	2.31	9.47	6.8	1.83	1.19	0.318
OUT - TSS Mean Annual Load (kg/yr)	87	2.36E+03	172	2.27E+03	42.3	31.8	52.6	46.4	13.3	9.8	6.67	816	3.35E+03	1.35E+03	382	176	32.1
OUT - TP Mean Annual Load (kg/yr)	0.479	4.03	1.02	3.91	0.251	0.182	0.294	0.255	8.11E-02	5.78E-02	3.82E-02	1.41	5.52	2.77	0.757	0.418	9.22E-02
OUT - TN Mean Annual Load (kg/yr)	7.23	16.8	14.8	16	3.71	2.68	4.16	3.85	1.16	0.842	0.57	5.59	22.9	19.6	5.33	3.12	0.845
OUT - Gross Pollutant Mean Annual Load (kg/yr)	79	170	161	162	41.1	29.4	47	42.1	12.7	9.14	6.2	55.8	229	164	44.4	22.3	0
Rain In (ML/yr)	3.60482	7.74589	7.3288	7.37349	1.87689	1.34063	2.14501	1.92158	0.580942	0.417086	0.283023	2.54721	10.457	7.50755	2.02585	2.77064	1.02782
ET Loss (ML/yr)	0.341757	0.734355	0.694813	0.699048	0.17794	0.1271	0.20336	0.182176	0.055077	0.039542	0.026832	0.241489	0.991378	0.711758	0.192062	1.58411	0.710206
Deep Seepage Loss (ML/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseflow Out (ML/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.362293	0.167999
Imp. Stormflow Out (ML/yr)	3.26306	7.01153	6.63399	6.67444	1.69895	1.21354	1.94166	1.7394	0.525865	0.377544	0.256191	2.30572	9.46557	6.79579	1.83379	0.501594	0
Perv. Stormflow Out (ML/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.322653	0.149617
Total Stormflow Out (ML/yr)	3.26306	7.01153	6.63399	6.67444	1.69895	1.21354	1.94166	1.7394	0.525865	0.377544	0.256191	2.30572	9.46557	6.79579	1.83379	0.824247	0.149617
Total Outflow (ML/yr)	3.26306	7.01153	6.63399	6.67444	1.69895	1.21354	1.94166	1.7394	0.525865	0.377544	0.256191	2.30572	9.46557	6.79579	1.83379	1.18654	0.317616
Change in Soil Storage (ML/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-4.00E-06	-2.00E-06
TSS Baseflow Out (kg/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.91577	2.28047
TSS Total Stormflow Out (kg/yr)	86.9987	2357.31	172.126	2265.07	42.3432	31.8395	52.5999	46.3754	13.3369	9.79582	6.67048	816.003	3350.13	1345.38	382.176	171.111	29.7955
TSS Total Outflow (kg/yr)	86.9987	2357.31	172.126	2265.07	42.3432	31.8395	52.5999	46.3754	13.3369	9.79582	6.67048	816.003	3350.13	1345.38	382.176	176.026	32.076
TP Baseflow Out (kg/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.060464	0.027886
TP Total Stormflow Out (kg/yr)	0.478588	4.03089	1.01572	3.91037	0.251055	0.181878	0.294288	0.255115	0.081099	0.057805	0.038242	1.40547	5.51919	2.76585	0.756967	0.357292	0.064272
TP Total Outflow (kg/yr)	0.478588	4.03089	1.01572	3.91037	0.251055	0.181878	0.294288	0.255115	0.081099	0.057805	0.038242	1.40547	5.51919	2.76585	0.756967	0.417756	0.092158
TN Baseflow Out (kg/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.786809	0.36448
TN Total Stormflow Out (kg/yr)	7.23105	16.7858	14.7901	15.9951	3.70944	2.67505	4.15905	3.85457	1.15597	0.841714	0.56956	5.58922	22.8784	19.56	5.32878	2.33118	0.480656
TN Total Outflow (kg/yr)	7.23105	16.7858	14.7901	15.9951	3.70944	2.67505	4.15905	3.85457	1.15597	0.841714	0.56956	5.58922	22.8784	19.56	5.32878	3.11799	0.845136
GP Total Outflow (kg/yr)	78.9592	169.664	160.529	161.507	41.111	29.365	46.984	42.0898	12.7248	9.13578	6.19928	55.7935	229.047	164.444	44.3738	22.9119	0

No Imported Data Source nodes

USTM treatment nodes

Location	Detention Basin	Bioretention	Copy of Detention Basin	Copy of Bioretention	Rainwater Tank
ID	19	20	23	26	27
Node Type	DetentionBasinNode	BioRetentionNodeV4	DetentionBasinNode	BioRetentionNodeV4	RainWaterTankNode
Lo-flow bypass rate (cum/sec)	0	0	0	0	0
Hi-flow bypass rate (cum/sec)	100	100	100	100	100
Inlet pond volume	0		0		0
Area (sqm)	120	70	350	50	62.5
Initial Volume (m^3)					0
Extended detention depth (m)	2	0.2	2	0.2	0.2
Number of Rainwater tanks					5
Permanent Pool Volume (cubic metres)	0		0		170
Proportion vegetated	0		0		0
Equivalent Pipe Diameter (mm)	112		150		671
Overflow weir width (m)	10	2	16	2	10
Notional Detention Time (hrs)	1.61		2.62		7.40E-03
Orifice Discharge Coefficient	0.6		0.6		0.6
Weir Coefficient	1.7	1.7	1.7	1.7	1.7
Number of CSTR Cells	1	3	1	3	2
Total Suspended Solids - k (m/yr)	8000	8000	8000	8000	400
Total Suspended Solids - C* (mg/L)	20	20	20	20	12
Total Suspended Solids - C** (mg/L)	20		20		12
Total Phosphorus - k (m/yr)	6000	6000	6000	6000	300
Total Phosphorus - C* (mg/L)	0.13	0.13	0.13	0.13	0.13
Total Phosphorus - C** (mg/L)	0.13		0.13		0.13
Total Nitrogen - k (m/yr)	500	500	500	500	40
Total Nitrogen - C* (mg/L)	1.4	1.4	1.4	1.4	1.4
Total Nitrogen - C** (mg/L)	1.4		1.4		1.4
Threshold Hydraulic Loading for C** (m/yr)	3500		3500		0
Horizontal Flow Coefficient		3		3	
Reuse Enabled	Off	Off	Off	Off	On
Max drawdown height (m)					2.72
Annual Demand Enabled	Off	Off	Off	Off	Off
Annual Demand Value (ML/year)					
Annual Demand Distribution					
Annual Demand Monthly Distribution: Jan					
Annual Demand Monthly Distribution: Feb					
Annual Demand Monthly Distribution: Mar					
Annual Demand Monthly Distribution: Apr					
Annual Demand Monthly Distribution: May					
Annual Demand Monthly Distribution: Jun					
Annual Demand Monthly Distribution: Jul					
Annual Demand Monthly Distribution: Aug					
Annual Demand Monthly Distribution: Sep					
Annual Demand Monthly Distribution: Oct					
Annual Demand Monthly Distribution: Nov					
Annual Demand Monthly Distribution: Dec					
Daily Demand Enabled	Off	Off	Off	Off	On
Daily Demand Value (ML/day)					0.005
Custom Demand Enabled	Off	Off	Off	Off	Off
Custom Demand Time Series File					
Custom Demand Time Series Units					
Filter area (sqm)		70		50	
Filter perimeter (m)		30		28	
Filter depth (m)		0.3		0.3	
Filter Median Particle Diameter (mm)					
Saturated Hydraulic Conductivity (mm/hr)		100		100	
Infiltration Media Porosity		0.35		0.35	
Length (m)					
Bed slope					
Base Width (m)					
Top width (m)					
Vegetation height (m)					
Vegetation Type		Vegetated with Effective Nutrient Removal Plants		Vegetated with Effective Nutrient Removal Plants	
Total Nitrogen Content in Filter (mg/kg)		800		800	
Orthophosphate Content in Filter (mg/kg)		55		55	
Is Base Lined?		No		No	
Is Underdrain Present?		Yes		Yes	
Is Submerged Zone Present?		No		No	
Submerged Zone Depth (m)					
B for Media Soil Texture	-9999	13	-9999	13	-9999
Proportion of upstream impervious area treated					
Exfiltration Rate (mm/hr)	0	0	0	0	0
Evaporative Loss as % of PET	100	100	100	100	0
Depth in metres below the drain pipe					
TSS A Coefficient					
TSS B Coefficient					
TP A Coefficient					
TP B Coefficient					
TN A Coefficient					
TN B Coefficient					
Sfc		0.61		0.61	
S*		0.37		0.37	
Sw		0.11		0.11	
Sh		0.05		0.05	
Emax (m/day)		0.008		0.008	
Ew (m/day)		0.001		0.001	
IN - Mean Annual Flow (ML/yr)	15.5	7.82	33.4	14	1.94
IN - TSS Mean Annual Load (kg/yr)	2.44E+03	348	6.76E+03	1.53E+03	52.6
IN - TP Mean Annual Load (kg/yr)	5.2	1.43	13.1	3.83	0.294
IN - TN Mean Annual Load (kg/yr)	28.7	17.9	73.9	35.5	4.16
IN - Gross Pollutant Mean Annual Load (kg/yr)	183	183	472	333	47

OUT - Mean Annual Flow (ML/yr)	15.4	7.64	33.3	13.9	0.284
OUT - TSS Mean Annual Load (kg/yr)	809	118	1.80E+03	639	5.09
OUT - TP Mean Annual Load (kg/yr)	2.91	1.06	6.38	2.59	3.91E-02
OUT - TN Mean Annual Load (kg/yr)	28	9.84	67.8	26.2	0.544
OUT - Gross Pollutant Mean Annual Load (kg/yr)	0	0	0	0	0
Flow In (ML/yr)	15.5345	7.81944	33.4424	14.0376	1.94166
ET Loss (ML/yr)	0.118295	0.180942	0.105148	0.115932	0
Infiltration Loss (ML/yr)	0	0	0	0	0
Low Flow Bypass Out (ML/yr)	0	0	0	0	0
High Flow Bypass Out (ML/yr)	0	0	0	0	0
Orifice / Filter Out (ML/yr)	14.7542	4.45552	32.09	4.39427	0.284083
Weir Out (ML/yr)	0.660361	3.18317	1.24044	9.52704	0
Transfer Function Out (ML/yr)	0	0	0	0	0
Reuse Supplied (ML/yr)	0	0	0	0	1.65914
Reuse Requested (ML/yr)	0	0	0	0	1.82677
% Reuse Demand Met	0	0	0	0	90.8237
% Load Reduction	0.772081	2.31161	0.334785	0.828559	85.3691
TSS Flow In (kg/yr)	2438.65	348.147	6760.49	1532.86	52.5999
TSS ET Loss (kg/yr)	0	0	0	0	0
TSS Infiltration Loss (kg/yr)	0	0	0	0	0
TSS Low Flow Bypass Out (kg/yr)	0	0	0	0	0
TSS High Flow Bypass Out (kg/yr)	0	0	0	0	0
TSS Orifice / Filter Out (kg/yr)	724.981	9.88058	1645.28	11.6142	5.09001
TSS Weir Out (kg/yr)	84.4692	108.49	155.26	627.427	0
TSS Transfer Function Out (kg/yr)	0	0	0	0	0
TSS Reuse Supplied (kg/yr)	0	0	0	0	20.9888
TSS Reuse Requested (kg/yr)	0	0	0	0	0
TSS % Reuse Demand Met	0	0	0	0	0
TSS % Load Reduction	66.8074	65.9997	73.3667	58.3104	90.3232
TP Flow In (kg/yr)	5.20037	1.43341	13.0751	3.82793	0.294288
TP ET Loss (kg/yr)	0	0	0	0	0
TP Infiltration Loss (kg/yr)	0	0	0	0	0
TP Low Flow Bypass Out (kg/yr)	0	0	0	0	0
TP High Flow Bypass Out (kg/yr)	0	0	0	0	0
TP Orifice / Filter Out (kg/yr)	2.72302	0.541573	5.96995	0.559754	0.0390728
TP Weir Out (kg/yr)	0.189728	0.517333	0.409568	2.0264	0
TP Transfer Function Out (kg/yr)	0	0	0	0	0
TP Reuse Supplied (kg/yr)	0	0	0	0	0.217818
TP Reuse Requested (kg/yr)	0	0	0	0	0
TP % Reuse Demand Met	0	0	0	0	0
TP % Load Reduction	43.9896	26.1269	51.2086	32.4397	86.7229
TN Flow In (kg/yr)	28.6749	17.9077	73.8614	35.4684	4.15905
TN ET Loss (kg/yr)	0	0	0	0	0
TN Infiltration Loss (kg/yr)	0	0	0	0	0
TN Low Flow Bypass Out (kg/yr)	0	0	0	0	0
TN High Flow Bypass Out (kg/yr)	0	0	0	0	0
TN Orifice / Filter Out (kg/yr)	26.4213	2.73105	64.7702	3.09204	0.543861
TN Weir Out (kg/yr)	1.53875	7.10585	3.01993	23.1011	0
TN Transfer Function Out (kg/yr)	0	0	0	0	0
TN Reuse Supplied (kg/yr)	0	0	0	0	2.81114
TN Reuse Requested (kg/yr)	0	0	0	0	0
TN % Reuse Demand Met	0	0	0	0	0
TN % Load Reduction	2.49295	45.0688	8.21981	26.1508	86.9234
GP Flow In (kg/yr)	183.368	182.863	472.45	332.802	46.984
GP ET Loss (kg/yr)	0	0	0	0	0
GP Infiltration Loss (kg/yr)	0	0	0	0	0
GP Low Flow Bypass Out (kg/yr)	0	0	0	0	0
GP High Flow Bypass Out (kg/yr)	0	0	0	0	0
GP Orifice / Filter Out (kg/yr)	0	0	0	0	0
GP Weir Out (kg/yr)	0	0	0	0	0
GP Transfer Function Out (kg/yr)	0	0	0	0	0
GP Reuse Supplied (kg/yr)	0	0	0	0	0
GP Reuse Requested (kg/yr)	0	0	0	0	0
GP % Reuse Demand Met	0	0	0	0	0
GP % Load Reduction	100	100	100	100	100
PET Scaling Factor		2.1		2.1	

Generic treatment nodes

Location	Ecosol Trash Rack - 50mm	Copy of Ecosol Trash Rack - 50mm	Copy of Copy of Ecosol Trash Rack - 50mm
ID	21	22	28
Node Type	GPTNode	GPTNode	GPTNode
Lo-flow bypass rate (cum/sec)	0	0	0
Hi-flow bypass rate (cum/sec)	2	2	2
Flow Transfer Function			
Input (cum/sec)	0	0	0
Output (cum/sec)	0	0	0
Input (cum/sec)	10	10	10
Output (cum/sec)	10	10	10
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Input (cum/sec)			
Output (cum/sec)			
Gross Pollutant Transfer Function			
Enabled	TRUE	TRUE	TRUE
Input (kg/ML)	0	0	0
Output (kg/ML)	0	0	0
Input (kg/ML)	1000	1000	1000
Output (kg/ML)	70	70	70
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Input (kg/ML)			
Output (kg/ML)			
Total Nitrogen Transfer Function			
Enabled	TRUE	TRUE	TRUE
Input (mg/L)	0	0	0
Output (mg/L)	0	0	0
Input (mg/L)	1000	1000	1000
Output (mg/L)	700	700	700
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Total Phosphorus Transfer Function			
Enabled	TRUE	TRUE	TRUE
Input (mg/L)	0	0	0
Output (mg/L)	0	0	0
Input (mg/L)	1000	1000	1000
Output (mg/L)	650	650	650
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Total Suspended Solids Transfer Function			
Enabled	TRUE	TRUE	TRUE
Input (mg/L)	0	0	0
Output (mg/L)	0	0	0
Input (mg/L)	1000	1000	1000
Output (mg/L)	600	600	600
Input (mg/L)			

Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
Input (mg/L)			
Output (mg/L)			
TSS Flow based Efficiency Enabled	Off	Off	Off
TSS Flow based Efficiency			
TP Flow based Efficiency Enabled	Off	Off	Off
TP Flow based Efficiency			
TN Flow based Efficiency Enabled	Off	Off	Off
TN Flow based Efficiency			
GP Flow based Efficiency Enabled	Off	Off	Off
GP Flow based Efficiency			
IN - Mean Annual Flow (ML/yr)	33.3	15.4	2.31
IN - TSS Mean Annual Load (kg/yr)	1.80E+03	809	816
IN - TP Mean Annual Load (kg/yr)	6.38	2.91	1.41
IN - TN Mean Annual Load (kg/yr)	67.8	28	5.59
IN - Gross Pollutant Mean Annual Load (kg/yr)	0	0	55.8
OUT - Mean Annual Flow (ML/yr)	33.3	15.4	2.31
OUT - TSS Mean Annual Load (kg/yr)	1.08E+03	486	490
OUT - TP Mean Annual Load (kg/yr)	4.15	1.89	0.914
OUT - TN Mean Annual Load (kg/yr)	47.5	19.6	3.91
OUT - Gross Pollutant Mean Annual Load (kg/yr)	0	0	3.91
Flow In (ML/yr)	33.3305	15.4145	2.30572
ET Loss (ML/yr)	0	0	0
Infiltration Loss (ML/yr)	0	0	0
Low Flow Bypass Out (ML/yr)	0	0	0
High Flow Bypass Out (ML/yr)	0	0	0
Orifice / Filter Out (ML/yr)	0	0	0
Weir Out (ML/yr)	0	0	0
Transfer Function Out (ML/yr)	33.3305	15.4145	2.30572
Reuse Supplied (ML/yr)	0	0	0
Reuse Requested (ML/yr)	0	0	0
% Reuse Demand Met	0	0	0
% Load Reduction	0	0	0
TSS Flow In (kg/yr)	1800.54	809.437	816.003
TSS ET Loss (kg/yr)	0	0	0
TSS Infiltration Loss (kg/yr)	0	0	0
TSS Low Flow Bypass Out (kg/yr)	0	0	0
TSS High Flow Bypass Out (kg/yr)	0	0	0
TSS Orifice / Filter Out (kg/yr)	0	0	0
TSS Weir Out (kg/yr)	0	0	0
TSS Transfer Function Out (kg/yr)	1080.32	485.657	489.601
TSS Reuse Supplied (kg/yr)	0	0	0
TSS Reuse Requested (kg/yr)	0	0	0
TSS % Reuse Demand Met	0	0	0
TSS % Load Reduction	40.0004	40.0006	40.0001
TP Flow In (kg/yr)	6.37953	2.91269	1.40547
TP ET Loss (kg/yr)	0	0	0
TP Infiltration Loss (kg/yr)	0	0	0
TP Low Flow Bypass Out (kg/yr)	0	0	0
TP High Flow Bypass Out (kg/yr)	0	0	0
TP Orifice / Filter Out (kg/yr)	0	0	0
TP Weir Out (kg/yr)	0	0	0
TP Transfer Function Out (kg/yr)	4.14669	1.89332	0.913554
TP Reuse Supplied (kg/yr)	0	0	0
TP Reuse Requested (kg/yr)	0	0	0
TP % Reuse Demand Met	0	0	0
TP % Load Reduction	35.0001	34.9975	34.9999
TN Flow In (kg/yr)	67.7901	27.9597	5.58922
TN ET Loss (kg/yr)	0	0	0
TN Infiltration Loss (kg/yr)	0	0	0
TN Low Flow Bypass Out (kg/yr)	0	0	0
TN High Flow Bypass Out (kg/yr)	0	0	0
TN Orifice / Filter Out (kg/yr)	0	0	0
TN Weir Out (kg/yr)	0	0	0
TN Transfer Function Out (kg/yr)	47.4532	19.5722	3.91245
TN Reuse Supplied (kg/yr)	0	0	0
TN Reuse Requested (kg/yr)	0	0	0
TN % Reuse Demand Met	0	0	0
TN % Load Reduction	29.9998	29.9987	30.0001
GP Flow In (kg/yr)	0	0	55.7935
GP ET Loss (kg/yr)	0	0	0
GP Infiltration Loss (kg/yr)	0	0	0
GP Low Flow Bypass Out (kg/yr)	0	0	0
GP High Flow Bypass Out (kg/yr)	0	0	0
GP Orifice / Filter Out (kg/yr)	0	0	0
GP Weir Out (kg/yr)	0	0	0
GP Transfer Function Out (kg/yr)	0	0	3.90555
GP Reuse Supplied (kg/yr)	0	0	0
GP Reuse Requested (kg/yr)	0	0	0
GP % Reuse Demand Met	0	0	0
GP % Load Reduction	100	100	100

Other nodes

Location	Junction	Junction	Receiving Node
ID	1	2	3
Node Type	JunctionNode	JunctionNode	ReceivingNode
IN - Mean Annual Flow (ML/yr)	15.4	33.3	51.1
IN - TSS Mean Annual Load (kg/yr)	486	1.08E+03	2.06E+03
IN - TP Mean Annual Load (kg/yr)	1.89	4.15	6.95
IN - TN Mean Annual Load (kg/yr)	19.6	47.5	70.9
IN - Gross Pollutant Mean Annual Load (kg/yr)	0	0	3.91
OUT - Mean Annual Flow (ML/yr)	15.4	33.3	51.1
OUT - TSS Mean Annual Load (kg/yr)	486	1.08E+03	2.06E+03
OUT - TP Mean Annual Load (kg/yr)	1.89	4.15	6.95
OUT - TN Mean Annual Load (kg/yr)	19.6	47.5	70.9
OUT - Gross Pollutant Mean Annual Load (kg/yr)	0	0	3.91
% Load Reduction	1.92	5.36	4.11
TSS % Load Reduction	81.8	86	81.6
TN % Load Reduction	46.7	45.3	45
TP % Load Reduction	66	71.5	67.7
GP % Load Reduction	100	100	99.7

Links

Location	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link
Source node ID	2	1	6	23	21	19	22	7	13
Target node ID	3	3	20	21	2	22	1	19	19
Muskingum-Cunge Routing	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed
Muskingum K									
Muskingum theta									
IN - Mean Annual Flow (ML/yr)	33.3	15.4	6.63	33.3	33.3	15.4	15.4	6.67	0.378
IN - TSS Mean Annual Load (kg/yr)	1.08E+03	486	172	1.80E+03	1.08E+03	809	486	2.27E+03	9.8
IN - TP Mean Annual Load (kg/yr)	4.15	1.89	1.02	6.38	4.15	2.91	1.89	3.91	5.78E-02
IN - TN Mean Annual Load (kg/yr)	47.5	19.6	14.8	67.8	47.5	28	19.6	16	0.842
IN - Gross Pollutant Mean Annual Load (kg/yr)	0	0	161	0	0	0	0	162	9.14
OUT - Mean Annual Flow (ML/yr)	33.3	15.4	6.63	33.3	33.3	15.4	15.4	6.67	0.378
OUT - TSS Mean Annual Load (kg/yr)	1.08E+03	486	172	1.80E+03	1.08E+03	809	486	2.27E+03	9.8
OUT - TP Mean Annual Load (kg/yr)	4.15	1.89	1.02	6.38	4.15	2.91	1.89	3.91	5.78E-02
OUT - TN Mean Annual Load (kg/yr)	47.5	19.6	14.8	67.8	47.5	28	19.6	16	0.842
OUT - Gross Pollutant Mean Annual Load (kg/yr)	0	0	161	0	0	0	0	162	9.14

Location	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link
Source node ID	24	25	9	18	16	5	14	11	17
Target node ID	20	19	23	23	23	23	26	26	26
Muskingum-Cunge Routing	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed
Muskingum K									
Muskingum theta									
IN - Mean Annual Flow (ML/yr)	1.19	0.318	1.21	1.83	9.47	7.01	0.256	1.74	6.8
IN - TSS Mean Annual Load (kg/yr)	176	32.1	31.8	382	3.35E+03	2.36E+03	6.67	46.4	1.35E+03
IN - TP Mean Annual Load (kg/yr)	0.418	9.22E-02	0.182	0.757	5.52	4.03	3.82E-02	0.255	2.77
IN - TN Mean Annual Load (kg/yr)	3.12	0.845	2.68	5.33	22.9	16.8	0.57	3.85	19.6
IN - Gross Pollutant Mean Annual Load (kg/yr)	22.3	0	29.4	44.4	229	170	6.2	42.1	164
OUT - Mean Annual Flow (ML/yr)	1.19	0.318	1.21	1.83	9.47	7.01	0.256	1.74	6.8
OUT - TSS Mean Annual Load (kg/yr)	176	32.1	31.8	382	3.35E+03	2.36E+03	6.67	46.4	1.35E+03
OUT - TP Mean Annual Load (kg/yr)	0.418	9.22E-02	0.182	0.757	5.52	4.03	3.82E-02	0.255	2.77
OUT - TN Mean Annual Load (kg/yr)	3.12	0.845	2.68	5.33	22.9	16.8	0.57	3.85	19.6
OUT - Gross Pollutant Mean Annual Load (kg/yr)	22.3	0	29.4	44.4	229	170	6.2	42.1	164

Location	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link	Drainage Link
Source node ID	8	26	12	20	27	10	4	15	28
Target node ID	26	23	19	19	26	27	26	28	3
Muskingum-Cunge Routing	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed	Not Routed
Muskingum K									
Muskingum theta									
IN - Mean Annual Flow (ML/yr)	1.7	13.9	0.526	7.64	0.284	1.94	3.26	2.31	2.31
IN - TSS Mean Annual Load (kg/yr)	42.3	639	13.3	118	5.09	52.6	87	816	490
IN - TP Mean Annual Load (kg/yr)	0.251	2.59	8.11E-02	1.06	3.91E-02	0.294	0.479	1.41	0.914
IN - TN Mean Annual Load (kg/yr)	3.71	26.2	1.16	9.84	0.544	4.16	7.23	5.59	3.91
IN - Gross Pollutant Mean Annual Load (kg/yr)	41.1	0	12.7	0	0	47	79	55.8	3.91
OUT - Mean Annual Flow (ML/yr)	1.7	13.9	0.526	7.64	0.284	1.94	3.26	2.31	2.31
OUT - TSS Mean Annual Load (kg/yr)	42.3	639	13.3	118	5.09	52.6	87	816	490
OUT - TP Mean Annual Load (kg/yr)	0.251	2.59	8.11E-02	1.06	3.91E-02	0.294	0.479	1.41	0.914
OUT - TN Mean Annual Load (kg/yr)	3.71	26.2	1.16	9.84	0.544	4.16	7.23	5.59	3.91
OUT - Gross Pollutant Mean Annual Load (kg/yr)	41.1	0	12.7	0	0	47	79	55.8	3.91

Catchment Details

Catchment Name	TX15901
Timestep	6 Minutes
Start Date	1/01/1959
End Date	31/12/1959 23:54
Rainfall Station	66062 SYDNEY
ET Station	Monthly User Defined
Mean Annual Rainfall (mm)	1490
Mean Annual ET (mm)	1260