

Attachment 3

Surface Water and Drainage Management Plan



Report on
SURFACE WATER AND DRAINAGE
MANAGEMENT PLAN
PROPOSED CHILDCARE CENTRE
40 MARLBORO ROAD
SWAN VIEW, WA

Submitted to:

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TABLE OF CONTENTS

1. Introduction	2
1.1 Overview	2
1.2 Site Details.....	2
1.3 Landform and Topography.....	3
1.4 Geology and Soils	3
1.5 Hydrology and Hydrogeology.....	3
1.6 Erosion Risk Receptors	4
1.7 Guidelines and Previous Local and Regional Studies	4
2. Site Development Review	4
2.1 Existing Infrastructure	4
2.2 Proposed Development	4
3. Erosion Impact Assessment	5
3.1 Overview	5
3.2 Impervious Area	5
3.3 Drainage Volume.....	5
3.4 Land Slope	5
3.5 Landscaping.....	6
3.6 Location of Development.....	6
3.7 Construction.....	6
3.8 Conclusion.....	6
4. Construction Erosion Risk Reduction Methods.....	7
5. Compliance Monitoring Program.....	7
6. Closure	7

APPENDICES

APPENDIX A: SITE DRAWINGS AND SUPPLIED INFORMATION

APPENDIX B: UNDERSTANDING YOUR REPORT

1. INTRODUCTION

1.1 Overview

This surface water and drainage management plan (SWDMP) summarises the potential effects (if any) and management strategy for the mitigation of sediment associated with the proposed childcare centre located at 40 Marlboro Road, Swan View (“the site”).

It is understood that the developer Charter Hall is submitting a development application (DA) for the proposed childcare centre. Based on the information provided to us, in order to submit the application an environmental review to determine the effects of the proposed development on the watercourse located north-east of the site is required. The designs have been assessed against the following requirements from the Local Planning Scheme No. 4 (LSP4) with reference to the following conditions of section 5.7.5:

5.7.5.3

The natural flow of water within watercourses shall be maintained, and no development which would prevent the natural flow of water shall be approved, unless that development would, in the opinion of the Shire, restore or enhance the environmental health of the watercourse.

5.7.5.4

Development adjacent to watercourses shall incorporate appropriate measures to minimise runoff and erosion and to protect water quality, including:

- a) provision of contour banks to intercept and safely dispose of stormwater runoff; and*
- b) planting of local native vegetation to provide nutrient stripping and to act as a barrier to seepage and runoff.*

Such measures should be commensurate with the scale of the development and the level of potential adverse impact on the watercourse.

Supplied information/drawings are presented in Appendix A.

1.2 Site Details

The site is located in the Shire of Mundaring, approximately 20 km northeast of the Perth CBD. The site is irregular in shape and approximately 1202 m³ in size. The site consists of approximately 625 m³ building and infrastructure, and 577 m³ outdoor play areas, plus associated parking and outdoor storage facilities.

The site is located in what is currently a carpark associated with a commercial shopping centre. We understand that a portion of the car park will be demolished to make way for the proposed childcare centre. The proposed development includes the construction of a childcare centre with an 82-person capacity consisting of the following:

- ✦ 5 group rooms varying from 40 m³ to 56 m³;
- ✦ 3 outdoor, grassed play areas between approximately 86 m² to 280 m²;
- ✦ updated car parks adjacent to the southern and western portions of the building;
- ✦ two outdoor storage areas; and
- ✦ associated services and bin store.

1.3 Landform and Topography

The majority of the footprint of the proposed structure is on a flat area currently occupied by sealed pavements and includes a triangular shaped area of landscaping. The surface grades down to a watercourse to the north and east of the site. According to a feature survey plan provided, the surface grades down at a maximum slope of about 1 V:3H (south-east corner). However, elsewhere the slope is significantly flatter.

A geotechnical study conducted by Galt Geotechnics ref J2101323 001 R Rev0 dated 21 December 2021 (Galt 2021) indicated the following:

- ☞ The sealed surface of the car park appeared to be in reasonable condition with only minor cracking noted.
- ☞ The exposed slope appeared to be stable with minor erosion rills noted.
- ☞ No signs of surface movement such as tension cracking or downslope movement of tree trunks was noted in the slope.

1.4 Geology and Soils

The Perth sheet of the 1:50,000 scale Environmental Geology series map indicates that the area is underlain by soils of the Guildford Formation described as *PEBBLY SILT – strong brown silt with common, fine to occasionally coarse grained, sub-rounded laterite quartz, heavily weathered granite pebble, some fine to medium grained quartz sand, of alluvial origin.*

Findings of Galt 2021 show relatively consistent subsurface conditions across the site. The generalised conditions comprised:

- ☞ FILL: Clayey Gravelly SAND (SC): fine to medium grained, sub-rounded to sub-angular, red brown, fine to medium grained lateritic gravel, generally 25-30% medium plasticity fines, generally dry, very stiff to hard, extending from the surface to depths ranging from 1.5 m (Borehole BH06) to the maximum depth investigated of 2.0 m; overlying
- ☞ Clayey SAND (SC): medium to coarse grained, angular to sub-angular, brown, low plasticity fines, dry, very stiff, extending to the maximum depth investigated of 2.0 m.

We note that a walkover survey at the time of investigation indicated that the car park area is located entirely on fill, which sloped down north-east to the watercourse.

1.5 Hydrology and Hydrogeology

Rainfall from the area as assessed from long term measurements from the Bureau of Meteorology (BOM) (Perth Airport Station 009021) indicate the long-term average rainfall is 759.7 mm/yr. (1944 to 2023) with the wettest months being June July and August, with July recording the highest average of 155.2 mm.

Surface runoff from the site will be through existing drains located in the carpark. In the area north and east of the carpark, currently any runoff from this area drains directly into the watercourse.

The Perth Groundwater Atlas (1997), showing historical maximum groundwater levels, does not extend to the study area. Groundwater was not encountered in any of the boreholes advanced in the Galt Geotechnics study to the maximum investigated depth of 2.0 m. Given the elevation of the site, it is expected that true groundwater will be at least 5 m below the current ground surface, which is at, or below the level of water in the watercourse.

1.6 Erosion Risk Receptors

The current site layout is shown on Figure 1. The unnamed watercourse to the northeast is located approximately 8 m to 15 m downgradient of the site and is the sole erosion risk receptor.

The area between the site and the watercourse is vegetated with dense grass, large trees and small scrub.

The watercourse is likely a part of the water corporation drainage structure network, with the likely downstream output in the Swan River approximately 5km west of the site.

1.7 Guidelines and Previous Local and Regional Studies

This report has been prepared in accordance with recommendations and guidelines documented in the Eastern Metropolitan Regional Council (EMRC) and Swan River Trust (SRT) Policy and Guidelines for Local Government by the Local Government Natural Resources Management Policy Development Project as part of the Swan River Trust Swan-Canning Clean-up Program.

These guidelines review best practice in Eastern and Western Australia and provide recommendation for sedimentation and erosion control based on local soil and rainfall conditions.

2. SITE DEVELOPMENT REVIEW

2.1 Existing Infrastructure

The majority of the site will be constructed in the location of the existing asphalt carpark. The carpark is outlined by a concrete curb which together with the asphalt surface, form an impervious surface and provide the catchment area for the carpark stormwater drainage system. The outfall of the drainage system is deposited to the north of the site in the watercourse adjacent to the site.

The area northeast of the carpark to the creek in the northeast of the site is currently bushland, with thick bushland, and sparse grass.

2.2 Proposed Development

Based on the drawings provided to us, the key changes in infrastructure of the area as it pertains to potential sedimentation can be summarised as:

- ☞ The proposed childcare building primarily located on the area consisting of the existing asphalted surface, with some of the eastern portion extending into the existing bushland.
- ☞ Outdoor play areas 1 and 2 to the east of the site, covering areas of the existing carpark and extending to the top of the embankment to the creek. The play areas are to be built up to the surrounding surface level, and incorporated into the existing carpark drainage catchment. Two additional trees are to be planted in this area.
- ☞ An additional drainage pit to be built in the south-eastern corner of the site to capture runoff from the existing carpark. This will connect to the existing drainage system underneath play areas 1 and 2 with an outlet to the north of the site in the watercourse.
- ☞ A limestone retaining wall approximately 0.99 m high on the boundary of play areas 1 and 2, bordering the embankment to the rear of the building.
- ☞ Outdoor play area 3 to the north. As shown in the Civil Drawings provided in Appendix A, there will be a retaining wall on the eastern and part of the north-eastern boundary. Beyond the retaining wall the area will

blend in with the existing levels. It is anticipated limited earthworks in this area will be required. Existing site surface levels to be predominately maintained with a slope down toward the creek. We note that the embankment in this area is less than the eastern portion of the site.

- ✦ An outdoor storeroom to be constructed on the northern boundary of the site.
- ✦ Two additional trees to be planted in play area 3.
- ✦ The area will be landscaped, likely with grass suitable for a play area.

3. EROSION IMPACT ASSESSMENT

3.1 Overview

A qualitative erosion impact assessment was carried out given the current, construction, and final site conditions described above. The impact assessment is comparatively based on before and after development conditions. These were compared against the criteria as outlined in LSP4 sections 5.7.5.3 and 5.7.5.4 which are primarily concerning watercourse flow, environmental health and runoff and erosion reduction.

3.2 Impervious Area

The area consisting of the carpark, the building, as well as play areas 1 and 2 will be hard stand and act as an impervious barrier to the subsurface soils. The impervious area forms part of the existing carpark drainage catchment. This area will increase by approximately 657 m² and reduce runoff across exposed soil/grassed areas and down the embankment. The effect of this is a reduced possibility of erosion and increased flow into the drainage system.

The effect of changes of the impervious area is not likely to impact the natural flow of the watercourse, will minimise run-off and have no change on water quality.

3.3 Drainage Volume

Due to the increased impervious area, a net increase in stormwater drainage flow through the drainage system is expected. The net increase, based on a 1% annual exceedance probability for a 24-hour event, will cause a maximum increased flow rate of water in the catchment area of 0.99 L/s. The existing design capacity plus additional and updated drainage infrastructure associated with the proposed building are designed to be able to handle this increase in flow. In the event of a 1-in-10 year storm the overflow will flow towards the street and the local stormwater system.

The effect of changes of drainage volume are not likely to impact the natural flow of the watercourse, will minimise run-off and have no change on water quality.

3.4 Land Slope

The slope above the embankment will be largely unchanged. Design levels near that area will be closer to the design levels of the current carpark. This will act to reduce flow over the embankment area. The embankment itself will remain largely unchanged as the development does not extend over the edge of the embankment. The portion of the site in the east and north-east are to contain a retaining wall. Finished levels in this area will be approximately 1m above the existing ground level. Land slope in the play area 3 will remain largely unchanged.

The effect of changes of land slope are not likely to impact the natural flow of the watercourse, will minimise run-off and have no change on water quality.

3.5 Landscaping

Approximately 4 large trees are proposed to be removed where an existing tree overlaps the planned infrastructure. This land will be occupied by the proposed childcare building and will have the effect of diverting the water flow away from the embankment, this is likely to reduce runoff and have no effect on sedimentation.

5 additional trees are proposed in the future play spaces, which will help to protect the natural surface from erosion. Furthermore, in proposed play space 3 where the land is occupied by bushland and sparse grassland, the area will be maintained to a higher standard of grass surface. This will serve to decrease sedimentation and enhance the natural environment.

3.6 Location of Development

The location of the building and infrastructure do not affect in any way the natural flow of the watercourse. Due to the relatively small-scale size of the development and its location above the embankment and will have no impact on the runoff and erosion.

3.7 Construction

The demolition of the existing carpark, and the laying of hardstand has the potential for minor increase run-off during this time period. Given the small site footprint and the short period of time surface soils are expected to be exposed it is recommend to follow erosion risk reduction methods as set out in section 4 below. Following these methods will act to reduce run-off to ensure negligible erosion at the site.

3.8 Conclusion

Based on the erosion impact assessment we can conclude the following:

- ⚡ An increase in the hardstand area will divert stormwater away from erosion sensitive areas and into the stormwater system.
- ⚡ The stormwater drainage system has the capacity to handle the increased flow. In the event of a 1-in-10-year storm, water will then flow into the local stormwater system.
- ⚡ The land slope will remain largely unchanged, and will have no effect on the watercourse, sedimentation of erosion.
- ⚡ Additional trees as well as improved landscaping is likely to reduce erosion in the affected areas and will provide possible increased nutrient stripping.
- ⚡ The location and size of the development do not affect the natural flow of the water course and will, if anything, have a positive impact.
- ⚡ There is a minor potential impact of increasing erosion during construction. As such, erosion risk reduction methods as described in Section 4 should be implemented.

4. CONSTRUCTION EROSION RISK REDUCTION METHODS

The following methods are recommended during construction:

- ✦ establish new drainage and kerb lines prior to the main earthworks in order to reduce runoff from the hardstand;
- ✦ site disturbance works should be timed around low rainfall periods;
- ✦ minimise vehicular access to site; and
- ✦ good housekeeping practices on site.

We note that limestone walls will be constructed in specified areas on the boundaries of the site. This will likely reduce the potential for sediment flow to off-site receptors in those areas. These works are expected to be conducted early in the development process.

5. COMPLIANCE MONITORING PROGRAM

In order to ensure ongoing compliance with LSP4 the following monitoring program will be adhered to:

- ✦ Yearly visual inspection of the area between the eastern portion of the site, and the watercourse for signs of erosion and sedimentation; and
- ✦ inspection after large rainfall events where the drainage system is visibly unable to accept the waterflow (1 in 10 year event).

The routine compliance inspections shall be documented photographically.

Should any noticeable changes be reported, the Shire of Mundaring must be contacted and informed, and a sedimentation and soil stabilisation plan be enacted.

6. CLOSURE

We draw your attention to Appendix B of this report, "Understanding your Report". The information provided within is intended to inform you as to what your realistic expectations of this report should be. This information is provided not to reduce the level of responsibility accepted by Galt, but to ensure that all parties who rely on this report are aware of the responsibilities each assumes in so doing.

Yours Faithfully,

GALT ENVIRONMENTAL PTY LTD



Brad Palmer
Environmental Scientist



Michael Lori
Environmental Scientist

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Appendix A: Site Drawings and Supplied Information

PROPOSED CHILDCARE CENTRE

40 MARLBORO ROAD, SWAN VIEW, WA



DRAWING REGISTER PLANNING

SHEET NUMBER	SHEET NAME	ISSUE	DESCRIPTION	DATE
DA00	COVER SHEET	C	UDPATED DA SUBMISSION SET	17/04/2023
DA01	EXISTING CONDITIONS / DEMOLITION PLAN	C	UDPATED DA SUBMISSION SET	17/04/2023
DA02	SITE PLAN	C	UDPATED DA SUBMISSION SET	17/04/2023
DA03	FLOOR PLAN	C	UDPATED DA SUBMISSION SET	17/04/2023
DA04	ELEVATIONS	C	UDPATED DA SUBMISSION SET	17/04/2023
DA05	SECTIONS	C	UDPATED DA SUBMISSION SET	17/04/2023

ISSUE	DESCRIPTION	DATE
C	UDPATED DA SUBMISSION SET	17/04/2023
B	DA SUBMISSION SET	15/03/2023
A	PRELIMINARY DA SET	02/03/2023

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CLIENT:
CHARTER HALL

PROJECT:
PROPOSED CHILDCARE CENTRE (82 places)

LOCATION:
40 MARLBORO RD, SWAN VIEW, WA

DRAWING TITLE:
COVER SHEET

SCALE: DATE: APR 23

DRAWN: CW/SS PRINTED: 17/04/2023 1:05:05 PM

CHECKED: AH JOB No.: J0000811

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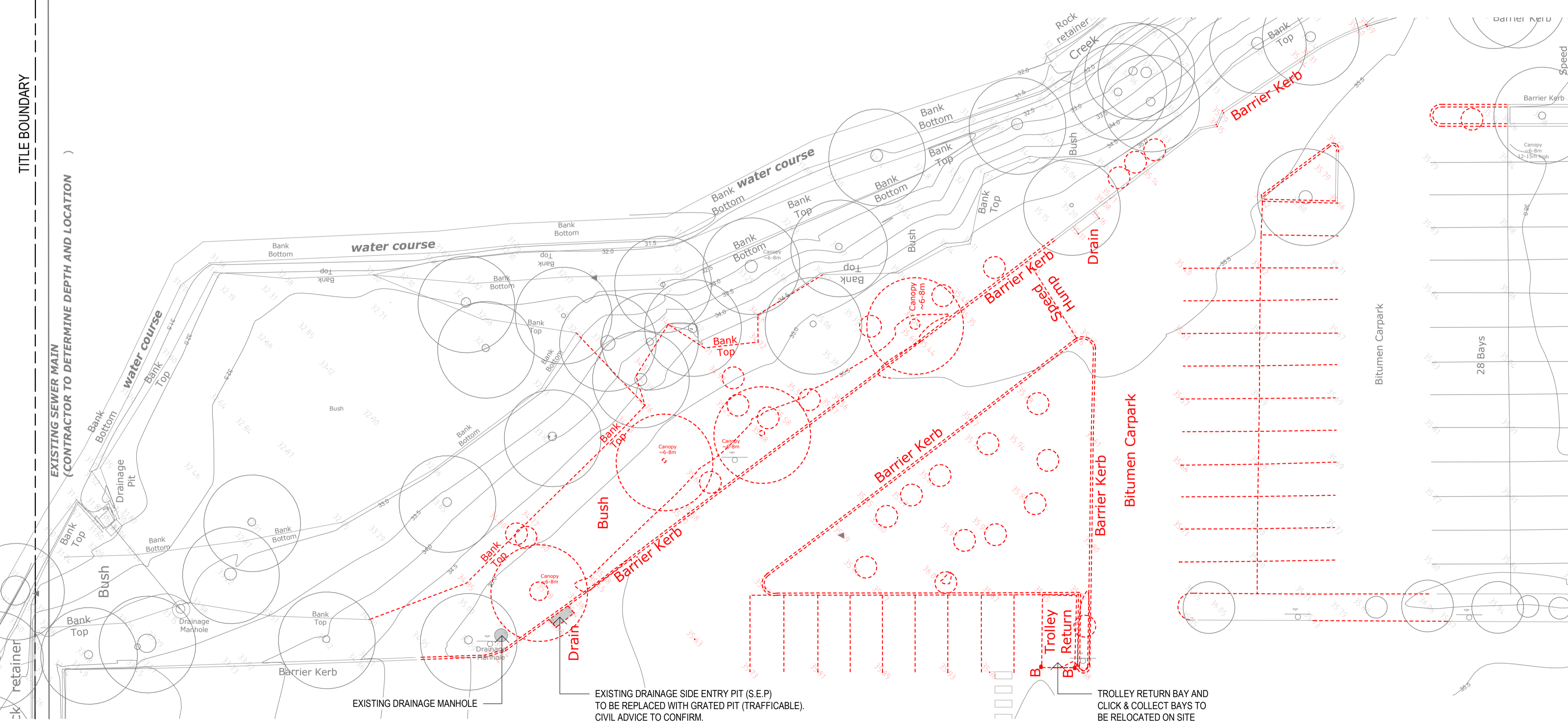
DA00/c

D/A ISSUE

NOTE:
EXISTING CONDITIONS INFORMATION OBTAINED FROM SURVEY PREPARED BY ST SPATIAL CONSULTING SURVEYORS - DWG. NO: 20086-01 DATED 10/06/2020



Strata Lots (SP 33115)
Brick & tiles Residences
Brick & Tiles Building
Fibro Fence
Brick & Tiles Building



1 SITE AERIAL
1:1000

2 DEMOLITION PLAN (part site)
1:200

- LEGEND**
- EXISTING TREE TO BE RETAINED & PROTECTED
 - EXISTING SMALL TREE TO BE RETAINED & PROTECTED
 - EXISTING TREE TO BE REMOVED
 - EXISTING SMALL TREE TO BE REMOVED
 - EXISTING STRUCTURE TO BE DEMOLISHED

GENERAL NOTES		
DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT. PREPARATION OF SHOP DRAWINGS OR MANUFACTURING FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALING.		
VERIFY LOCATION OF EXISTING SERVICES BEFORE COMMENCEMENT.		
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE NATIONAL CONSTRUCTION CODE OF AUSTRALIA, BUILDING ACT 1975 AS AMENDED STANDARD BUILDING BY-LAWS AND RELEVANT AUSTRALIAN STANDARDS.		
ISSUE	DESCRIPTION	DATE
C	UPDATED DA SUBMISSION SET	17/04/2023
B	DA SUBMISSION SET	15/03/2023
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CLIENT:
CHARTER HALL

PROJECT:
PROPOSED CHILDCARE CENTRE (82 places)

LOCATION:
40 MARLBORO RD, SWAN VIEW, WA

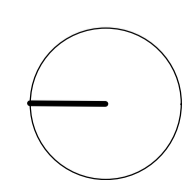
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EXISTING CONDITIONS / DEMOLITION PLAN

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DA01_{IC}

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NOTE:
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CHILDCARE CENTRE ANALYSIS

OPERATION HOURS 6:30am to 6:30pm Monday to Friday with up to four days open on the weekend for open days

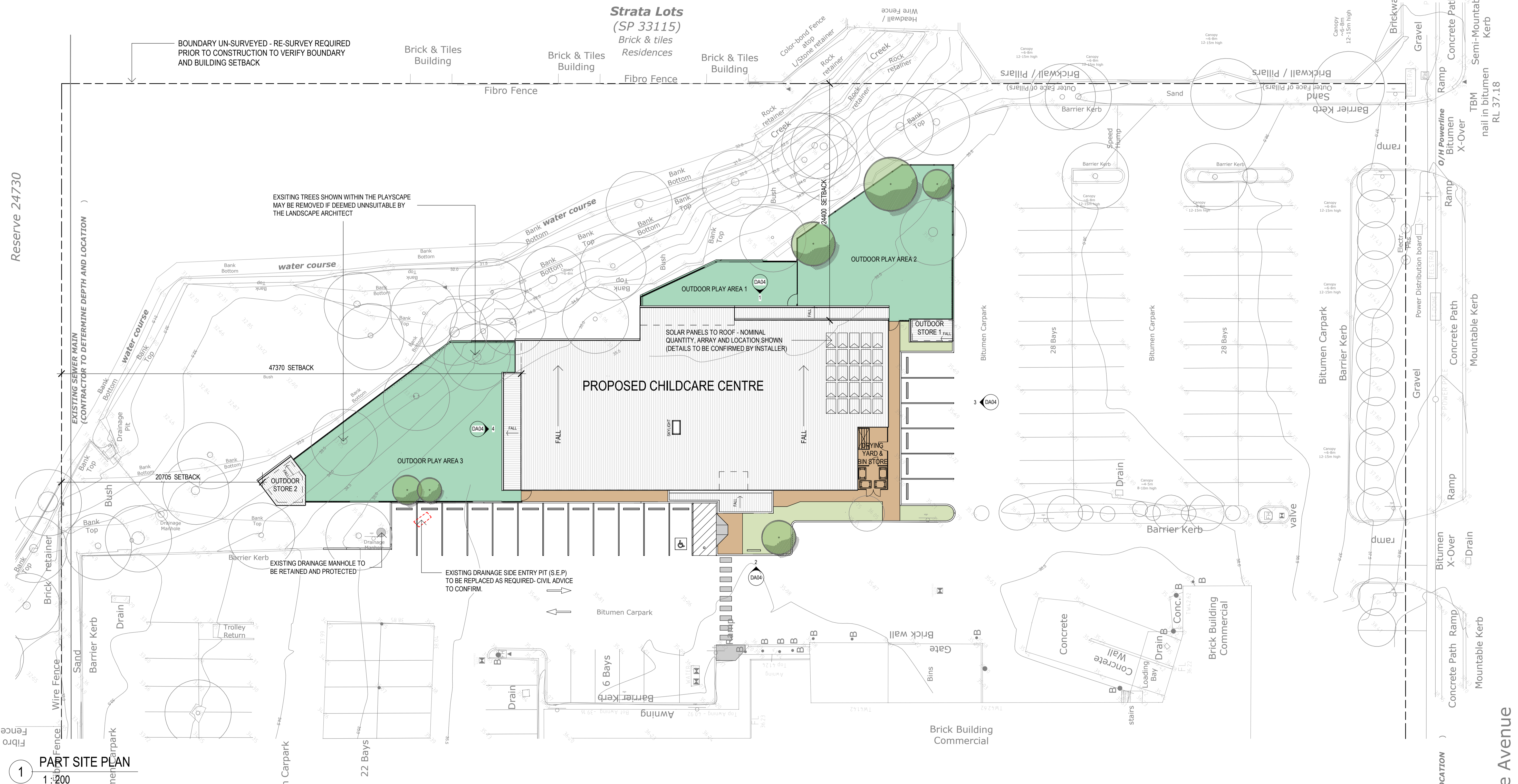
GROUP ROOM 1	0-24months	12 PLACES	3 EDUCATORS
GROUP ROOM 2	24-36months	15 PLACES	3 EDUCATORS
GROUP ROOM 3	24-36months	15 PLACES	3 EDUCATORS
GROUP ROOM 4	36+ months	20 PLACES	2 EDUCATORS
GROUP ROOM 5	36+ months	20 PLACES	2 EDUCATORS
			+ 2 STAFF
			82 PLACES 15 STAFF (minimum at capacity)

AREA ANALYSIS

OVERALL SITE AREA 20230m²
SITE COVERAGE 625m²
BUILDING AREA 580m² gross leaseable area

LEGEND

- UNENCUMBERED PLAYSPACE
- LANDSCAPING
- BUILDING AREA
- CAR PARK
- PAVING or similar
- PROPOSED TREE nominal location shown
- EXISTING TREE TO BE RETAINED & PROTECTED
- EXISTING SMALL TREE TO BE RETAINED & PROTECTED
- PROPOSED FLOOR FINISHED LEVEL



PART SITE PLAN
1:200

GENERAL NOTES

DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT. PREPARATION OF SHOP DRAWINGS OR MANUFACTURING FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALING.

VERIFY LOCATION OF EXISTING SERVICES BEFORE COMMENCEMENT.

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE NATIONAL CONSTRUCTION CODE OF AUSTRALIA. BUILDING ACT 1973 AS AMENDED. STANDARD BUILDING BY-LAWS AND RELEVANT AUSTRALIAN STANDARDS.

ISSUE	DESCRIPTION	DATE
C	UPDATED DA SUBMISSION SET	17/04/2023
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CLIENT:
CHARTER HALL

PROJECT:
PROPOSED CHILDCARE CENTRE (82 places)

LOCATION:
40 MARLBORO RD, SWAN VIEW, WA

DRAWING TITLE:
SITE PLAN

SCALE: As indicated @A1 DATE: APR 23

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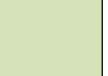


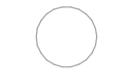



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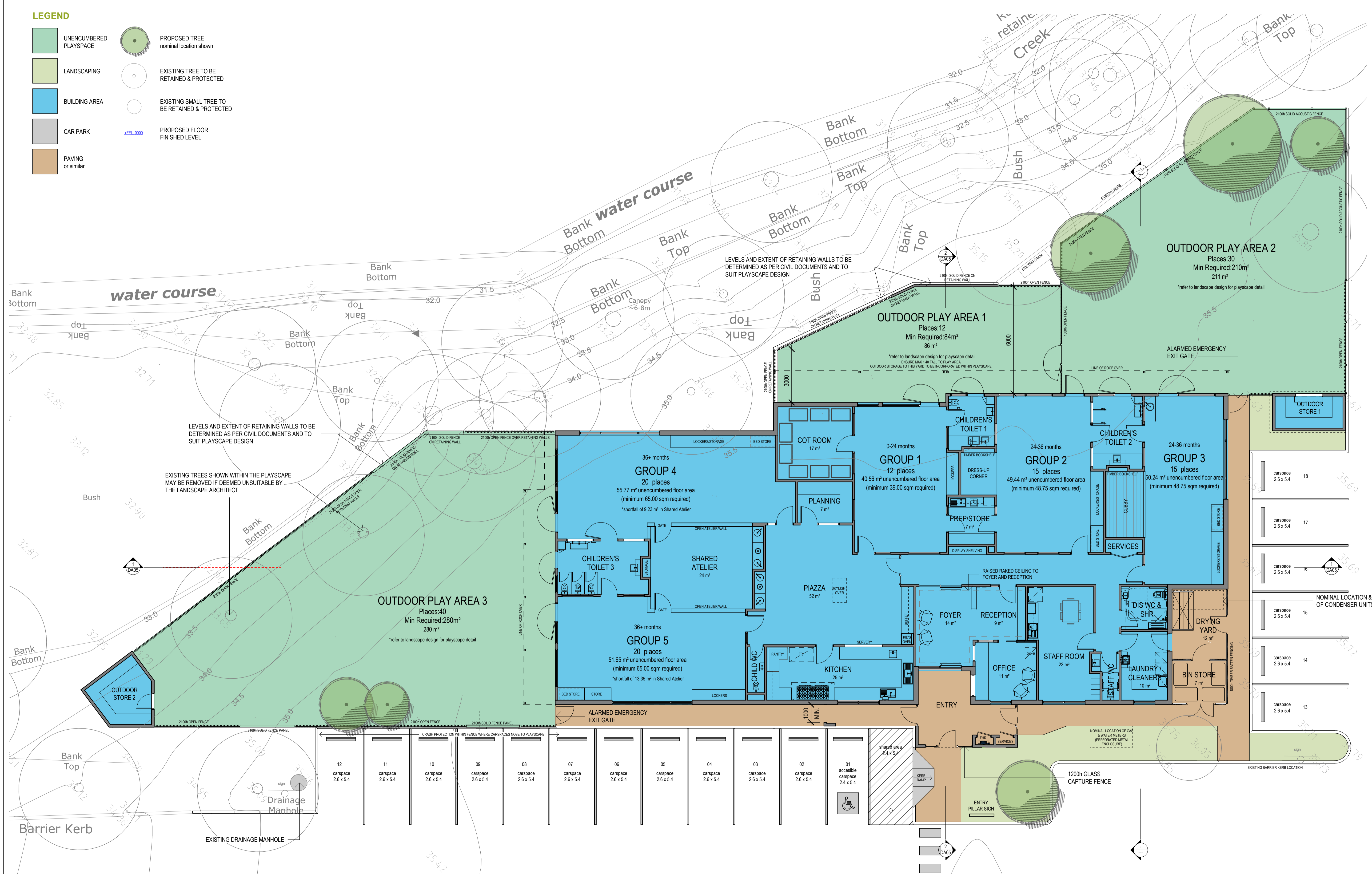
DA02

DA ISSUE

Glastonbury Avenue

LEGEND

	UNENCUMBERED PLAYSAPCE		PROPOSED TREE nominal location shown
	LANDSCAPING		EXISTING TREE TO BE RETAINED & PROTECTED
	BUILDING AREA		EXISTING SMALL TREE TO BE RETAINED & PROTECTED
	CAR PARK		PROPOSED FLOOR FINISHED LEVEL
	PAVING or similar		



1 FLOOR PLAN
1 : 100

GENERAL NOTES

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CLIENT:
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LOCATION:
40 MARLBORO RD, SWAN VIEW, WA

DRAWING TITLE:
FLOOR PLAN

SCALE: 1:100@A1
DATE: APR 23

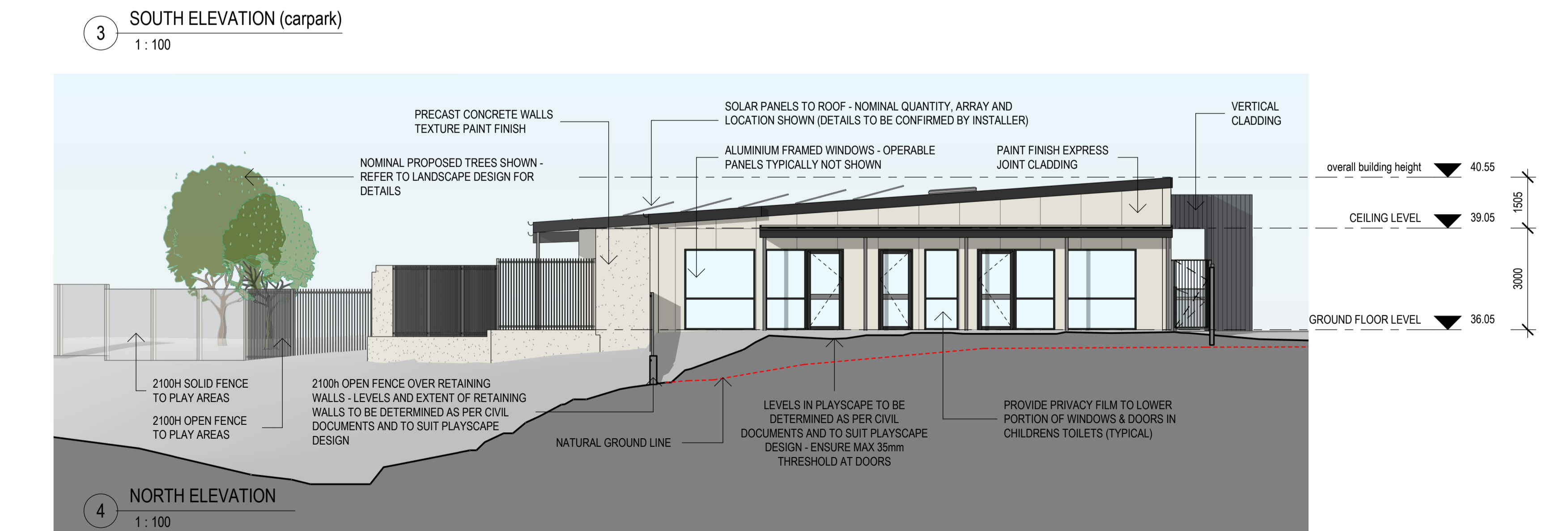
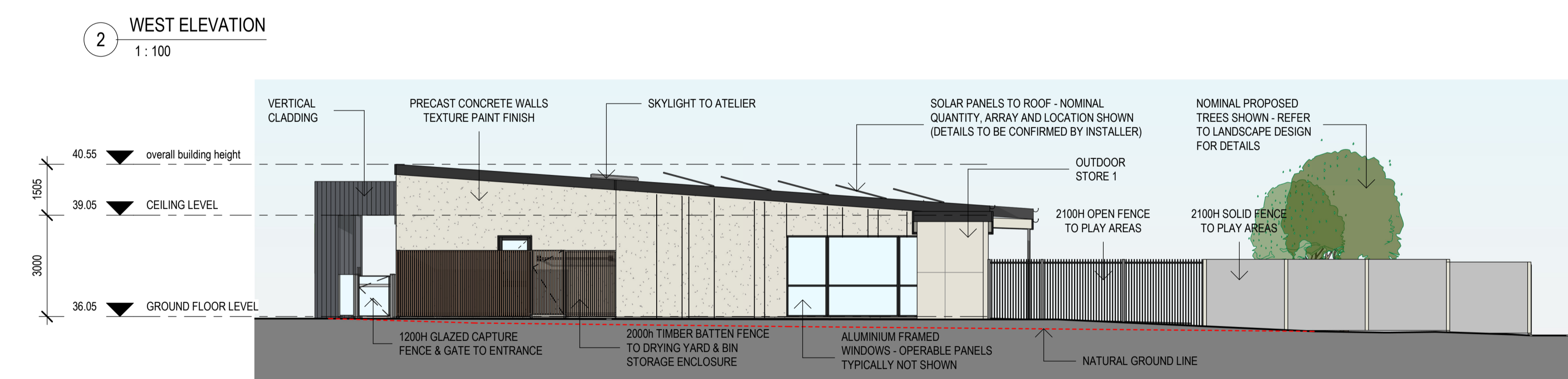
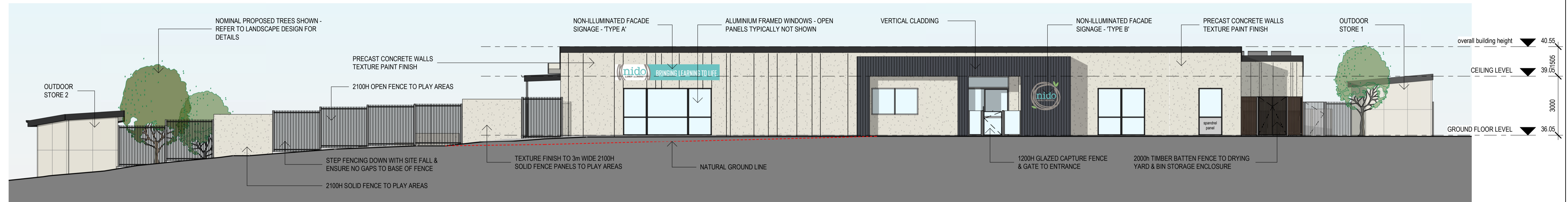
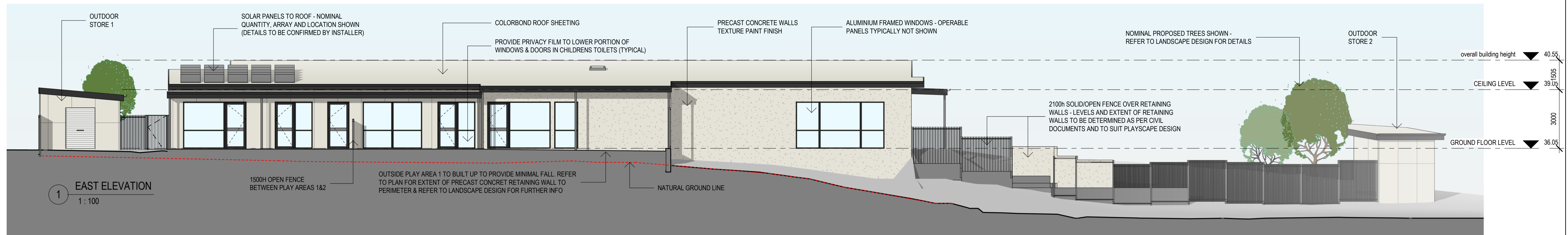
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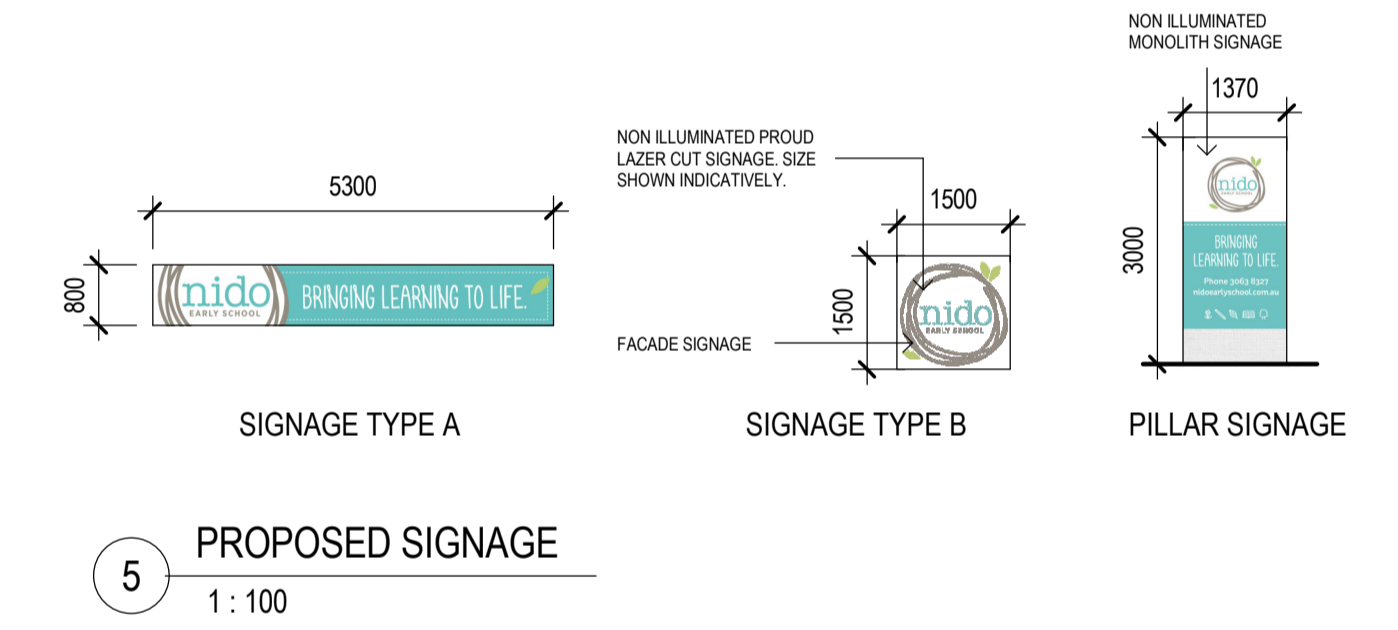
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DA03_c

D/A ISSUE



FENCE HEIGHT
ENSURE ALL PLAYSCAPE FENCING COMPLIES WITH AS1926.1 WITH MINIMUM INTERNAL HEIGHT OF 2.1m AND MINIMUM EXTERNAL HEIGHT OF 1.2m.



5 PROPOSED SIGNAGE
1:100

MATERIALS PALETTE



GENERAL NOTES

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nido EARLY SCHOOL

CLIENT:
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PROPOSED CHILDCARE CENTRE (82 places)

LOCATION:
40 MARLBORO RD, SWAN VIEW, WA

DRAWING TITLE:
ELEVATIONS

SCALE: As indicated @A1 **DATE:** APR 23

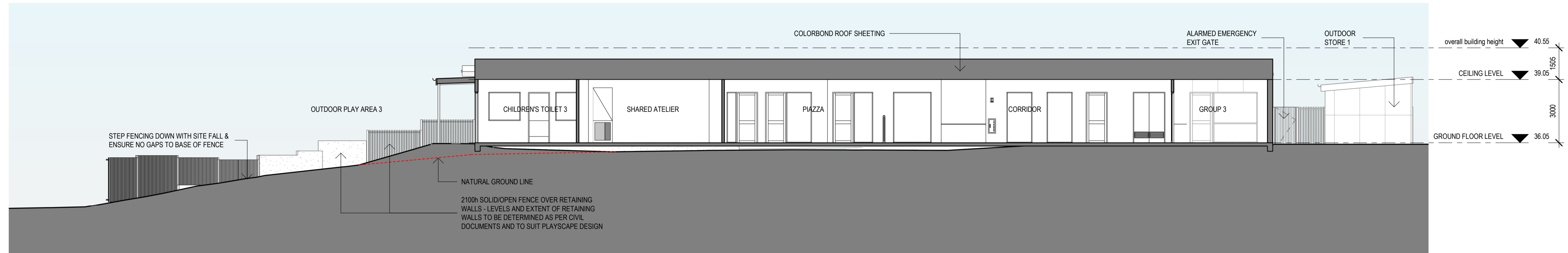
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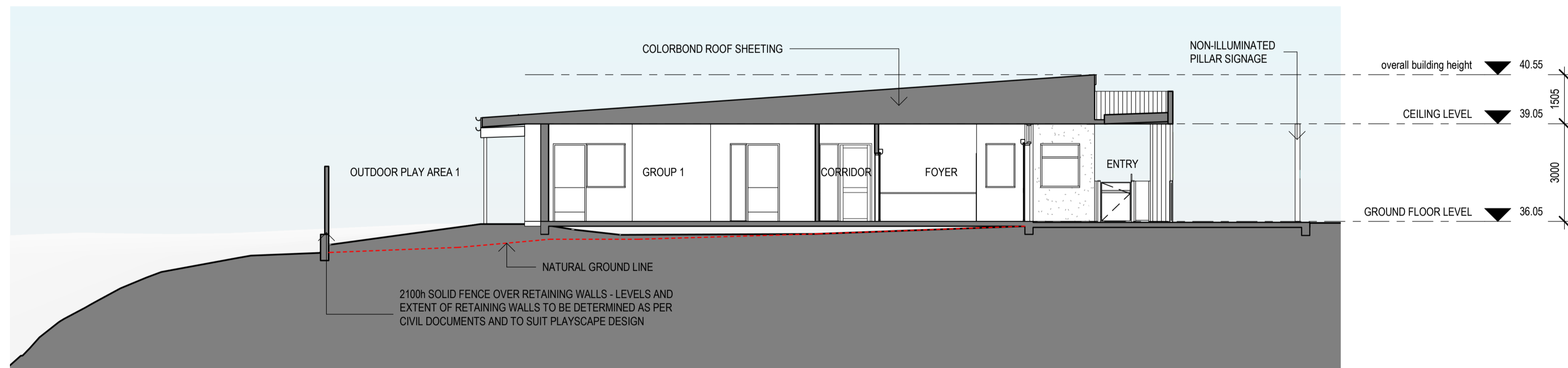
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DA04/c

D/A ISSUE



1 SECTION 1
1:100



2 SECTION 2
1:100

GENERAL NOTES		
DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT. PREPARATION OF SHOP DRAWINGS OR MANUFACTURING FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALING.		
VERIFY LOCATION OF EXISTING SERVICES BEFORE COMMENCEMENT.		
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE NATIONAL CONSTRUCTION CODE OF AUSTRALIA BUILDING ACT 1975 AS AMENDED, STANDARD BUILDING BY-LAWS AND RELEVANT AUSTRALIAN STANDARDS.		
ISSUE	DESCRIPTION	DATE
C	UPDATED DA SUBMISSION SET	17/04/2023
B	DA SUBMISSION SET	15/03/2023
A	PRELIMINARY DA SET	02/03/2023

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ARCHITECTS

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CLIENT:
CHARTER HALL

PROJECT:
PROPOSED CHILDCARE CENTRE (82 places)

LOCATION:
40 MARLBORO RD, SWAN VIEW, WA

DRAWING TITLE:
SECTIONS

SCALE: 1:100@A1 DATE: APR 23

DRAWN: CW/SS PRINTED: 17/04/2023 1:05:34 PM

CHECKED: AH JOB No.: J0000811

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DA05_{IC}

D/A ISSUE



Appendix B: Understanding Your Report

UNDERSTANDING YOUR REPORT

GALT FORM PMP29 Rev3

1. EXPECTATIONS OF THE REPORT

This document has been prepared to clarify what is and is not provided in your report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with the conditions on site.

Geotechnical engineering and environmental science are less exact than other engineering and scientific disciplines. We include this information to help you understand where our responsibilities begin and end. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of projects and we can help you to manage your risk.

2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following:

- ✦ the project objectives as we understood them and as described in this report;
- ✦ the specific site mentioned in this report; and
- ✦ the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this report if any of the following conditions apply:

- ✦ the report was not written for you;
- ✦ the report was not written for the site specific to your development;
- ✦ the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- ✦ the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the project team. Furthermore, we recommend that we be able to review work produced by other members of the project team that relies on information provided in our report.

3. DATA PROVIDED BY THIRD PARTIES

Where data is provided by third parties, it will be identified as such in our reports. We necessarily rely on the completeness and accuracy of data provided by third parties in order to draw conclusions presented in our reports. We are not responsible for omissions, incomplete or inaccurate data associated with third party data, including where we have been requested to provide advice in relation to field investigation data provided by third parties.

4. SOIL LOGS

Our reports often include logs of intrusive and non-intrusive investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

5. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party because of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

6. CHANGE IN SUBSURFACE CONDITIONS

The recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including anthropogenic events (such as construction or contaminating activities on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

7. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use professional judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from professional judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

8. ENVIRONMENTAL AND GEOTECHNICAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not addressed in geotechnical reports. Similarly, geotechnical issues are not addressed in environmental reports. The investigation techniques used for geotechnical investigations can differ from those used for environmental investigations. It is the client's responsibility to satisfy themselves that geotechnical and environmental considerations have been taken into account for the site.

Geotechnical advice presented in a Galt Environmental report has been provided by Galt Geotechnics under a sub-contract agreement. Similarly, environmental advice presented in a Galt Geotechnics report has been provided by Galt Environmental under a sub-contract agreement.

Unless specifically noted otherwise, no parties shall draw any inferences about the applicability of the Western Australian state government landfill levy from the contents of this document.

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