



Structure Plan

177(Lot 13) Booth Street, Collie

DOCUMENT CONTROL

ISSUE	DATE	ISSUE DETAILS	APPROVED
Draft	7 November 2022	Client review	KH
Draft V2	15 February 2023	Client review	KH
Original	26 May 2023	Lodged to Shire of Collie	KH
Version 1	18 March 2024	Final updates for WAPC approval	KH

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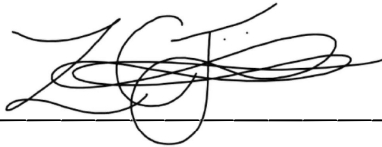
ENDORSEMENT PAGE

This structure plan is prepared under the provisions of the Shire of Collie Local Planning Scheme
Number 6.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN
AUSTRALIAN PLANNING COMMISSION ON:

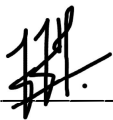
22 April 2024

Signed for and on behalf of the Western Australian Planning Commission:



An officer of the Commission duly authorised by the Commission pursuant to section 24 of the
Planning and Development Act 2005 for that purpose, in the presence of:

Witness:



Date:

22 April 2024

Date of Expiry:

22 April 2034

Table of Amendments

Amendment No.	Summary of the Amendment	Amendment Type	Date approved by the WAPC

Executive Summary

Planned Focus has been engaged by the landowners, Gary and Jenny French to prepare a Structure Plan for their property at Lot 13 (177) Booth Street, Collie. The subject land comprises a single lot which is located approximately 2.5 kilometres north-east of the Collie town centre.

This Structure Plan provides the planning framework to guide and facilitate the subdivision and development of this land for residential purposes and has been prepared in accordance with the provisions of the Shire of Collie Local Planning Scheme No. 6 and the strategic recommendations of the Shire of Collie Local Planning Strategy 2020.

The Structure Plan includes two stages. The short term and initial stage will facilitate a 2-lot subdivision. A dwelling is anticipated on the vacant lot to be created.

The longer-term outlook relies upon the availability of infill sewerage to the area and is proposed to be enable retention of the existing homes on each lot, as well as further subdivision generally at a residential density of R15.

The Structure Plan supersedes the North Collie Structure Plan as it presently applies to this land and forms part of the future residential growth area of Collie. The Structure Plan is cognisant of the residential development potential of the adjoining landholdings.

Item	Data		Structure Plan Ref (section no.)
Total area covered by the structure plan	1.01 hectares		
Estimated number of dwellings	Short term	2 dwellings	
	Long term (with reticulated sewer)	9 dwellings	
Estimated residential site density	9 dwellings per hectare (if 9 lots created)		
Estimated population (at 2.5 persons /dwelling)	22 persons (if 9 lots created)		

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Part 1

Implementation

1.1 Structure Plan Area

This Structure Plan applies to Lot 13 (177) Booth Street, Collie as shown in Figure 1.

1.2 Operation

The Structure Plan commences operation on the date it is approved by the Western Australian Planning Commission and is valid for 10 years from such time.

Due regard to this Structure Plan shall be given when considering future subdivision and development of the land.

1.3 Staging

The subject land will be developed in multiple stages, dependent on landowner aspiration, and ultimately the future availability of reticulated sewer.

Short term

It is the intention of the Structure Plan to facilitate in the immediate short term, the subdivision of the subject land into 2 lots.

One lot is proposed to retain the existing dwelling, its associated outbuildings and effluent disposal system. The second lot will also facilitate the future development of a single house, its associated outbuildings and on-site effluent disposal system.

The subdivision of the subject land into 2 lots with onsite effluent disposal is supported by the Soil and Site Evaluation contained in Appendix 2.

Long term

The longer-term outlook of this Structure Plan seeks to demonstrate, and eventually facilitate, further residential R15 subdivision. This is contingent upon the ability to connect to reticulated sewerage.

It is unlikely reticulated sewer will become available in the short or even medium term, hence the longer-term outlook. Given this uncertainty, future long term development potential is depicted around retention of the 2 single houses on large lots.

Development of the subject land can proceed as set out without impacts or reliance upon the adjoining properties, such as necessity to create shared roads, noting:

- The subject land has access easement rights along the western boundary. Logically, in conjunction with adjoining properties this may become a shared road in the future.
- The provision of reticulated sewer is effectively contingent on development closer to the Collie town centre advancing first.

1.4 Subdivision and development requirements

1.4.1 Residential

The subject land is zoned Urban Development in accordance with the strategic recommendations of the Shire of Collie Local Planning Strategy.

The initial stage of the Structure Plan will facilitate the subdivision of 2 lots and include the development of one additional dwelling and associated outbuildings with effluent disposal system, positioned within the Development Envelope depicted on the Structure Plan.

With consent of the Responsible Authority, the Development Envelope can be varied.

The Structure Plan provides for an indicative final subdivision outcome of at least 9 lots designed around retention of the existing dwellings, noting potentially more lots were any of these indicative lots developed as Grouped Housing sites. This longer-term outlook is dependent upon the R-code specified by the Planning Scheme at that time (presently R15), as well as the availability of infill sewerage. This longer-term horizon should not limit the positioning or layout for the development of the proposed additional lot in the short term.

The subject land has road frontage and sufficient width to enable separate vehicular access from Booth Street for the existing home and for the new lot in the short term.

Longer-term, the subdivision potential of both lots can generally accord with the residential density targets prescribed by the Shire of Collie Local Planning Strategy for land to the North of the Collie town centre as a range of lot sizes and housing options can be achieved.

1.5 Additional information

The following additional information is required at the subdivision and development stage:

1. Effluent disposal for the short term to satisfy the Government Sewerage policy, to the satisfaction of the Shire of Collie.
2. Any further subdivision beyond the short-term creation of 2 lots, is to be connected to a reticulated sewerage system.
3. Trees worthy of retention identified and retained at subdivision stage, noting that separate approvals may be required for any clearing.
4. Consider provision of public open space (or cash-in-lieu contribution) for any subdivision that occurs after the initial 2-lot subdivision.
5. The indicative long term subdivision layout for Lot 1 on the Structure Plan map is contingent on the existing adjacent access easement to the west being formalised as road reserve. An alternative layout will be required if this road reserve is not present at the time of the further subdivision.¹





Part 2

Explanatory Report

1 Planning background

1.1 Introduction and purpose

Planned Focus has been engaged by the landowners, Gary and Jenny French to prepare a Structure Plan for Lot 13 (177) Booth Street, Collie.

This Structure Plan provides the planning framework to guide and facilitate the development of this land for residential purposes and has been prepared in accordance with the provisions of the Shire of Collie Local Planning Scheme No. 6 and the strategic recommendations of the Shire of Collie Local Planning Strategy 2020.

The Structure Plan includes a short term and a long-term outlook, facilitating in the immediate future a 2-lot subdivision, followed by further subdivision potential that is subject to the availability of infill reticulated sewerage in the area.

1.2 Land Description

The subject land comprises 1.01 hectares. The Certificate of Title is provided at Appendix 1.

1.2.1 Location

The subject land is located approximately 2.5 kilometres to the north-east of the Collie townsite. The subject land has a 90-metre frontage to Booth Street. The surrounding area contains Rural Residential style lots in the vicinity of 1 hectare however a variety of larger lot sizes is evident.

Refer Figure 2: Location Plan.

1.2.2 Area and Land Use

The subject land has historically been cleared for animal grazing and lifestyle purposes and contains only a small number of mature trees.

There is an existing dwelling as well as associated outbuildings in the south-western portion of the lot. A Building Permit has recently been issued for another shed. Access to the existing development is from Booth Street.

The subject site was the result of an earlier subdivision which enabled the division of the former lot (Lot 1130) into two even sized 1-hectare parcels, one adjacent to Booth Street and the other at the rear via a battle axe style driveway arrangement. An accessway with an easement in favour of Lot 13 (177) Booth Street, the subject land, is in place to facilitate access.

The lot is serviced by a reticulated power and water supply however wastewater is provided by an existing on-site wastewater system.

1.3 Planning framework

1.3.1 Shire of Collie Local Planning Scheme No. 6

The subject land is presently zoned Urban Development by the Shire of Collie Local Planning Scheme No. 6. Refer Figure 3: Scheme extract plan

The objective of the Urban Development zone is:

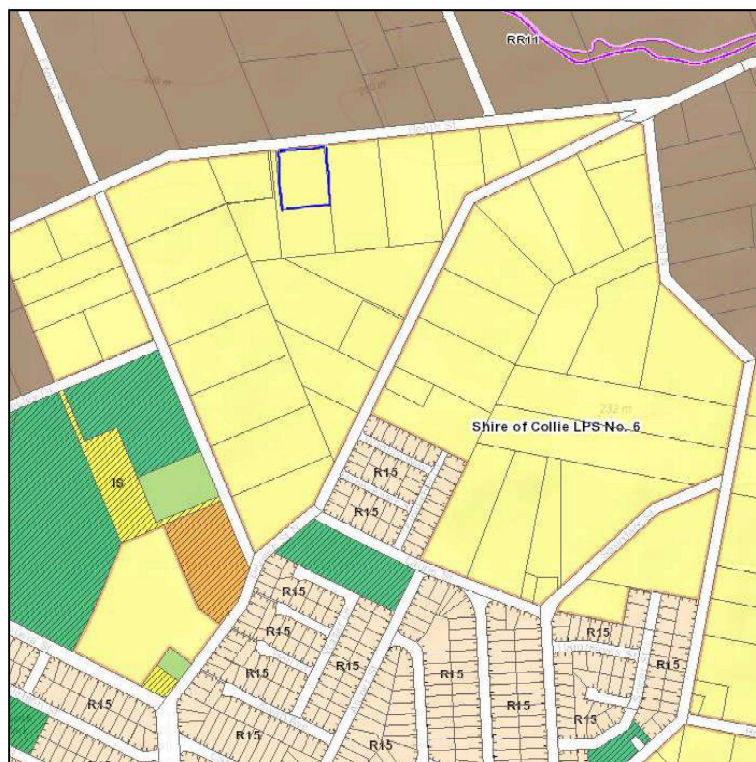
- *To provide an intention of future land use and a basis for more detailed structure planning in accordance with the provisions of this Scheme.*
- *To provide for a range of residential densities to encourage a variety of residential accommodation.*
- *To provide for the progressive and planned development of future urban areas for residential purposes and for commercial and other uses normally associated with residential development. (Shire of Collie, 2021 p. 11).*

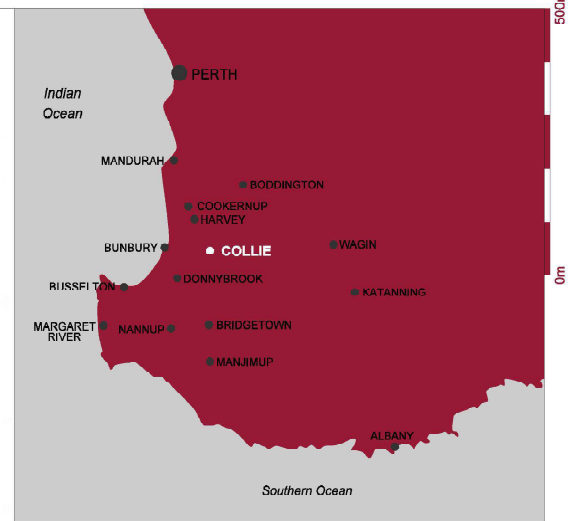
Clause 33.7 of the Scheme includes the development and subdivision requirements for land within the Urban Development zone, requiring a structure plan to be prepared and approved in accordance with Part 4 of the Deemed Provisions.

Generally, these Scheme provisions do not allow the approval of any substantial development or subdivision unless it is generally in accordance with a Structure Plan that has been prepared and approved pursuant to the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Furthermore, residential development within the zone shall comply with the requirements of the Residential Design Codes as determined by the provisions of an approved Structure Plan.

Figure 3: Scheme extract plan





LEGEND

SUBJECT LAND



1.3.2 Shire of Collie Local Planning Strategy

The Shire of Collie Local Planning Strategy was approved by the Western Australian Planning Commission (WAPC) in April 2020. The Strategy identifies the subject land as Urban Development with recognition of its inclusion within the North Collie Structure Plan.

The Strategy notes that the area was subdivided into mostly 1-hectare rural residential lots, resulting:

‘...in rural residential land close to the town, which represents an under-utilisation of land which would be more appropriately used for denser residential subdivision (e.g., R15)’.

Clause 6.2 of the Strategy includes the following planning implications for the subject land:

- Land use constraints results in an urban growth front to the north of Collie.
- Existing 'Residential Development' zone areas are to be used for Residential (i.e. R15) and not for low density residential or rural residential.

Clause 6.3 of the Strategy includes the following planning response:

Support the subdivision/development of land identified as urban development subject to proponent satisfying relevant zoning, structure planning, environmental, fire management and other planning considerations.

Applicable actions identified by the Strategy are:

12. Unless specifically provided for in the Local Planning Strategy, all land identified as Urban shall be zoned and reserved under proposed Local Planning Scheme 6 consistent with its current zoning under existing Local Planning Scheme 5.

15. Land zoned in the current Scheme as 'Residential Development' is to be zoned 'Urban Development' in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*.

This Structure Plan seeks to guide future subdivision and development of the subject land at a residential density of R15 in accordance with the strategic recommendations of the Shire of Collie Local Planning Strategy.

Although the initial stage of the Structure Plan is to facilitate the subdivision of the subject land into 2 lots, this will not impact on the future, intended use of the land for residential subdivision at a density of R15.

1.3.3 North Collie Structure Plan

The North Collie Structure Plan was endorsed by the WAPC in 2004. The subject land is included within the East section which is mostly unvegetated and plans for lot sizes in the vicinity of 1 hectare. Whilst some lots have been subdivided to the minimum of 1 hectare as indicated by the Structure Plan, it is noted that several have not.

The North Collie Structure Plan refers to future planning noting that subdivision at a density higher will require comprehensive structure planning to address future road networks, infrastructure, and the provision of public open space.

Furthermore, it states applications for subdivision within the structure plan area are to be accompanied by a Geotechnical Report demonstrating the capacity of the land to accommodate further development.

The North Collie Structure Plan has provided a framework for future detailed planning of the area for the last 18 years. However, with the endorsement of the more recent Shire of Collie Local Planning Strategy in 2020, the identification of land in this area north of the Collie town centre for future residential expansion at a density of R15 represents a significant shift and therefore the current Structure Plan over the subject land will be superseded by this and perhaps other new Structure Plans in due course.

This Structure Plan demonstrates the capability of the site to accommodate 2 lots and associated infrastructure, including onsite effluent disposal in the short term, as well as protecting and demonstrating the potential in the long term for a higher density when reticulated sewer becomes available. The subject land has a reasonable frontage to Booth Street which allows for the first stage of the Structure Plan to be developed utilising the existing road and access network.

It is noted that when enquiries were made, the Shire of Collie does not presently have the appetite or resources available to undertake the broader collective Structure Plan process that maybe the Local Planning Strategy aspires to across the broader North Collie area.

Given the many landowners involved, and the layout of existing lots, there is also limited opportunity or benefit (other than in some circumstances where shared new roads may increase yield and efficiency) for all landowners joining together. Effectively it is contingent on most individual landowners to advance a Structure Plan over their own parcel of land.

At a broader level, wholesale implications around other infrastructure, such as public open space, road networks and utilities, would be considered. Undertaking Structure Plans for individual lots without this strategic view will mean some assumptions have to be made.

In this regard, it is assumed:

- Subdivisions of 5 or more lots will attract either a land or cash contribution equivalent to 10%.
- For cash contributions, the WAPC and the Shire will determine where to expend this money to provide an adequate level of Public Open Space infrastructure suited to the Collie North community.
- There is existing public open space in vicinity of Collie North, including 2 large parks, as well as Public Purpose areas on Prinsep Street North, which may well be sufficient to service an expanded population.
- The existing road reserve and road standard on Booth Street are ample to cater for an increase of 1 lot. They also appear sufficient to cater for an increase in traffic that may result from further subdivision in the future.
- Other utility servicing will be at the discretion of individual servicing authorities, with reticulated sewer discussed elsewhere in this report.

1.3.4 State Planning Policies

State Planning Policies that are applicable to the Structure Plan are:

- *State Planning Policy No. 3.0 – Urban Growth and Settlement*

The Structure Plan addresses the objectives of SPP 3.0 through the application of the strategic recommendations of the Shire of Collie's Local Planning Strategy for this area.

Development of land for residential purposes within the northern extent of Collie will enable an existing community to be built upon and concentrate investment into the improvement of services and infrastructure, along with enhancing the quality of life within the community.

- *Development Control Policy 2.2 – Residential Subdivision*

The Structure Plan has regard to DC 2.2, which provides general guidance to subdivision in Western Australia. Whilst there is potential for battle-axe lots in the indicative future subdivision layout shown, these lots also lend themselves to Grouped Dwelling sites. Alternatively, and were the existing dwelling/s to be removed, there are other lot configurations that may be pursued, and the discretion afforded by Structure Plans would enable this to be duly considered.

In any event, DC 2.2 does not prohibit battle axe layouts, particularly where they are the most efficient layout that can be achieved.

In this instance, narrow, long lots are sought to be avoided and given the transition that will occur across Collie North into the future, a range of lots sizes and configurations will be necessitated. The indicative lot layout demonstrates a 4m minimum wide battle axe driveway can be achieved for the proposed new lot, which mimics the common driveway arrangement that exists in this locality. This is also what would be required for Grouped Dwelling sites under the R-Codes.

- *Draft Liveable Neighbourhoods 2015 and Residential Design Codes (R-Codes)*

The indicative future subdivision layout reflects present Liveable Neighbourhood and R-Code expectations for subdivision. Whilst this is predicated around retention of the 2 single houses, it demonstrates typical R15 style potential for the balance lots which achieve the minimum R15 lot size of 580m² and average lot size of 666m².

It is noted there is a level of flexibility afforded for the existing dwelling. With reticulated sewer this could remain on a larger lot with the existing outbuilding, or alternatively, the outbuilding could be excised to a separate lot.

- *Potential impacts on adjoining lots*

Figure 4 demonstrates potential subdivision layout over the adjoining properties.

This confirms that the short- and longer-term subdivision proposed for the subject land will not prevent these adjoining lots from being developed (should they wish to) in a similar manner. There will be economy in sharing a new road to the west however this will require shared agreement with the abutting landowners to realise the strategic R15 aspirations of the Local Planning Strategy.



LEGEND

- SUBJECT LAND
- INDICATIVE FUTURE SUBDIVISION LAYOUT (WITH RETICULATED SEWER)
- SHORT TERM PROPOSED SUBDIVISION (LOT 13) (WITH RETICULATED SEWER)
- INDICATIVE LONG TERM PROPOSED SUBDIVISION (LOT 13) (WITH RETICULATED SEWER)
- EXISTING BUILDING TO BE RETAINED

DRAFT

Planned Focus

Town planning & strategy
www.plannedfocus.com.au
Kanelis Hope Pty Ltd
ACN 650 552 466

INDICATIVE FUTURE DEVELOPMENT PLAN

Lot 13 Booth Street, Collie

Plan No: 1104-2-002

Date: 22.10.2022
Rev: A
Scale: A3 @ 1:1,250
Co-ords: MGA 50, GDA 94
Aerial: 24/4/2021





LEGEND

- SUBJECT LAND
- INDICATIVE FUTURE SUBDIVISION LAYOUT (WITH RETICULATED SEWER)
- SHORT TERM PROPOSED SUBDIVISION (LOT 13)
- INDICATIVE LONG TERM PROPOSED SUBDIVISION (LOT 13) (WITH RETICULATED SEWER)
- EXISTING BUILDING TO BE RETAINED

DRAFT

INDICATIVE FUTURE DEVELOPMENT PLAN

Lot 13 Booth Street, Collie

Plan No: 1104-2-002

Date: 22.10.2022

Rev: A

Scale: A3 @ 1:1 250

Co-ords: MGA 50, GDA 84

Asat: 24/2/2021



2 Site conditions and constraints

2.1 Environment

The subject land is predominately cleared with only a small number of existing trees on site located closest to Booth Street.

The site is not prone to flooding and is located approximately 300 metres from the Collie River.

The site is not identified as Bushfire Prone under the Department of Fire and Emergency maps. For this reason, State Planning Policy 3.7 has not been applied.

2.2 Site and Soil Evaluation

A Site and Soil Evaluation (SSE) has been undertaken for the subject land to understand the on-site wastewater disposal capability of the whole parcel, and particularly the eastern portion of the lot which forms the first stage of subdivision.

This concludes the subject land can contain onsite wastewater disposal.

The report acknowledges the testing occurred in November, noting WML have undertaken other assessments in this area in winter with no concerns. The WAPC also recently approved a similar Structure Plan at 327 Prinsep Street, Collie North in similar circumstances.

3 Conclusion

The Collie North area is presently a low density Rural Residential neighbourhood however areas to the south of the subject land, such as the former Drive-in site (corner Laurie Street and Prinsep Street North), are beginning to transition into a more typical R15 character where the reticulated sewer system has been readily extended.

This transition from low density to R15 will result in some compromises around existing development and current landowner aspiration, and a gradual shift north as the sewer is extended.

The sewer has a considerable distance to travel to the subject land, and it is not expected to reach the subject land in the short to medium term. This said, the subject land can readily accommodate a second onsite wastewater system in the interim, and this 2-lot subdivision will not preclude a higher, generally R15 density being achieved in the future, once reticulated sewer becomes available.

This Structure Plan has been prepared within the context of the statutory and strategic planning framework relevant to Collie North.

Overall, noting the site's context and location, the strategic recommendations of the Shire of Collie Local Planning Strategy, potential layout options, and the conclusions of the supporting Site and Soil Evaluation, the subject land is considered suitable for the purpose and layout proposed by the Structure Plan.

Appendices

Technical Appendices

No.	Document title	Approval required or supporting document	Approval agency	Approval status
1	Certificate of Title	Supporting		
2	WML Site and Soil Evaluation	Yes	Shire	
3	Collie North Structure Plan	Supporting		

References

Shire of Collie, (2021) Shire of Collie Local Planning Scheme No. 6. Department of Planning Lands and Heritage, Perth Western Australia.

Shire of Collie, (2020) Shire of Collie Local Planning Strategy. Department of Planning Lands and Heritage, Perth, Western Australia.

Shire of Collie (2004) North Collie Structure Plan, Planning South West, Busselton, Western Australia

Appendix 1: Certificate of Title

WESTERN



AUSTRALIA

REGISTER NUMBER

13/DP401839DUPLICATE
EDITION
N/A

DATE DUPLICATE ISSUED

N/AVOLUME
2874FOLIO
600

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BG Roberts
REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 13 ON DEPOSITED PLAN 401839

REGISTERED PROPRIETOR: (FIRST SCHEDULE)

GARY JOHN FRENCH
JENNIFER MAUREEN FRENCH
BOTH OF 179 BOOTH STREET, COLLIE
AS JOINT TENANTS

(AF N019276) REGISTERED 4/6/2015

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. *M049744 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 18/9/2012.
2. *EASEMENT BENEFIT CREATED UNDER SECTION 136C T.L.A. FOR RIGHT OF CARRIAGEWAY PURPOSES - SEE DEPOSITED PLAN 401839.
3. *N019277 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. LODGED 4/6/2015.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP401839
PREVIOUS TITLE: 1425-798
PROPERTY STREET ADDRESS: 177 BOOTH ST, COLLIE.
LOCAL GOVERNMENT AUTHORITY: SHIRE OF COLLIE

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M049744

Appendix 2: WML Site & Soil Evaluation

LOT 1130 (147) BOOTH STREET, COLLIE

SITE-AND-SOIL EVALUATION (SSE)

December 2022
10934-G-R-001-0



WML
Consulting Engineers

Document History and Status				
Revision	Prepared By	Reviewed By	Purpose of Issue	Date
0	B Bajgain	P. Taylor	Client issue	19/12/2022

Issued to:	Josh Graffin
WML Project Number:	10934
Document Name:	10934-G-R-001-0

WML Consultants Pty Ltd

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Geotechnical Engineer
Author

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Reviewer

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1 INTRODUCTION

Josh Graffin (Client) engaged WML Consultants (WML) to undertake a Site-and-Soil Evaluation (SSE) report to support the future development of Lot 1130 (147) Booth Street, Collie.

This report presents the findings of the Site-and-Soil Evaluation and provides a summary of the works performed on-site, a visual assessment of the sub-surface and surrounding site conditions, and a summary of the geo-environmental laboratory testing together with an assessment of the suitability of the site for on-site effluent disposal. This assessment has been prepared with reference to the Government Sewerage Policy 2019 (GSP19) and AS/NZS 1547:2012 '*On-site domestic-wastewater management*.'

WML has used suitably experienced staff to undertake the field investigation and prepare this report.

1.1 Site Description

The site is located approximately 50 km east of Bunbury within the Shire of Collie, Western Australia. The site has a total approximate area of 0.5 ha and is gently sloping towards the north (approx. 2 – 5% gradient) and covered with grass. The site consists of a large tree on the northern edge beside Booth Street. An existing monitoring well is located within the Lot, which was utilized to obtain the groundwater level. Isolated cobble and boulder-sized lateritic rock fragments were noted in the middle of the site.

1.2 Objectives of this Report

The objectives of the SSE were to:

- Assess the sub-surface soil conditions across the site.
- Conduct laboratory testing to determine the geotechnical and geo-environmental properties of the site's soil,
- Assess the site's suitability for effluent disposal in accordance with Government Sewerage Policy 2019 (GSP, 2019) and AS/NZS 1547:2012.
- Provision of setback distances in accordance with the above policies.
- Recommended wastewater treatment systems and application methods.

2 SITE ASSESSMENT

A desktop study of published and available information was undertaken to identify the site's key features in relation to the effective management of effluent at the site. The results of the study are summarised in Table 1; however, the critical points are provided below:

- The site is not located within a sewerage-sensitive area.
- The site is not located within a public drinking water source area or 100 m of a public drinking water source area.
- The site is not within 100 m of any known DWER-mapped watercourses or significant wetlands. The closest DPIRD-mapped watercourse is Collie River, a mainstream water course approximately 500 m to the north.
- The lot has an approximate total area of 5000 m².
- The site is not within an Annual Exceedance Probability AEP (1% or 10%) Floodway and Flood Fringe Area. The closest DWER-mapped floodway zone is Collie River, a mainstream water course approximately 400 m to the north.

Table 1: Site Assessment

Feature	Description	Level of Constraint	Mitigation Measures
Sewerage sensitive areas	The site is not located within the sewerage-sensitive area in accordance with GSP 2019.	Low	NN
Climate	Average annual rainfall 931 mm (BOM Collie Comparison Climate Station No 009628). Estimated average annual pan evaporation 1400 mm (BOM pan evaporation maps)	Low	NN
Drainage	The site is generally classified as a sandy GRAVEL with clay and moderate in-situ drainage. The top 100 mm of topsoil is silty SAND covered with root fibres. Some clay content was found at depths of 1 - 2 m.	Low	NN
Surface water	A private dam is located approximately 150 m to the southeast but at a higher elevation. The closest surface water from a watercourse is Collie River, 500 m to the north. Historical satellite imagery indicates potential for perched groundwater to the northeast of the site	Low	LAA should be placed to maximise separation from this area.
Exposure & Aspect	The site is covered with short grass. A large tree is present to the north.	Low	NN
Groundwater	The existing monitoring well measured the static groundwater level—GW at 1.8 m. However, previous site investigations in July 2013 did not encounter groundwater at a depth of 2.5 mbgl. GW may be higher than that measured on-site, and further readings should be taken to determine the peak expected groundwater	Low	NN
Imported Fill	No imported fill was noted during the site investigation.	Low	NN

Landform and slope	The site slopes towards the north (2 – 5% gradient)	Low	NN
Run-on & Run-off	The site is on lower RL and has possible catchment area run-off from SE (hills). However, the landform in the area is typically of low slope gradients (approx. 3%). The geological map indicates that the hill in the SE consists of adamellite and granite with scattered microcline megacrysts.	Low	NN
Vegetation	Short grass and weeds are present throughout the site. A large tree is present to the north.	low	NN

Note: *NN: not needed,

2.1 Site Assessment Results

Based on information to date, the site can be considered capable of sustainably managing onsite effluent treatment and disposal, with limited constraining features noted from the site assessment. Key areas of note are:

1. The site is not within any sewerage-sensitive areas defined by the Department of Planning, Lands and Heritage, allowing the treatment of generated effluent from the site at a primary level.
2. Satellite imagery from November 2018 indicates a trend of potential perched water to the site's northeast. However, as groundwater data has only been gathered during the end of the spring season, groundwater may be located at shallower depths and perched water located within 50 m of the property boundary. Therefore, further investigation for maximum expected groundwater levels should be conducted over the wet season to assess whether adequate vertical separation is achieved.

3 SOIL ASSESSMENT

3.1 Fieldwork summary

Fieldwork was carried out on the 24th of November 2022 by a qualified WML geotechnical engineer and comprised:

- A site walkover to observe existing site features and to take record photographs.
- Two (2) solid auger boreholes were drilled using a hand auger, extending to depths of 1.4 – 2.0 m, designated HA1 to HA2.
- Two (2) Dynamic cone penetrometer (DCP) tests adjacent to each hand auger borehole.
- Hand Shear Vane tests were undertaken within the cohesive soils.
- Collection of representative soil samples from boreholes for laboratory testing.

3.1.1 Encountered in-situ sub-surface profile

The 1:250,000 scale Geological Map 'Collie' indicates that the site is underlain by Qrc: Colluvium, including valley-fill deposits, variably lateritized and podzolized. Based on the encountered sub-surface profile, the site is typically consistent with the geological maps. A generalized sub-surface profile was determined based on the soil logs (presented in Appendix A), general landform and in-situ testing. Table 2 presents the generalized soil profile.

Table 2: Sub-surface soil profile

Soil/rock layer	Depth (m)	Description
TOPSOIL; Silty SAND	0.0 – 0.1 m	dark black; fine to medium grained SAND; moist; low plastic silt; trace fine to medium roots
Sandy GRAVEL	0.1 – 1.1 m	dark orange; fine to medium grained subrounded GRAVEL; moist; dense to medium dense; with low plastic clay; gravel is lateritic orange mottled brown
Sandy Clayey GRAVEL	1.1 – 1.6 m	dark orange; fine to coarse grained subrounded gravel; moist; low plastic clay; fine to medium grained sand; dense
Gravelly CLAY	1.6 – 2.0 m	dark orange; low plastic; fine to medium grained subrounded gravel; with fine to medium grained sand; stiff

3.1.2 In-situ Permeability

An in-situ permeability test was undertaken adjacent to HA2 using the constant head Talsma-Hallam method in accordance with AS/NZS 1547:2012. A borehole 90 mm in diameter and 600 mm deep was excavated and filled with water to saturate the surrounding soil. A constant head of water was then applied, and a known volume of water was timed to dissipate.

A test zone, 150 mm from the base of the hand-augured borehole, was applied, and measurements were taken at regular intervals to aim for a consistent flow rate. An in-situ permeability of 2.31×10^{-6} m/s (0.2 m/day) was achieved. This value is similar to previous permeability testing undertaken at the site by Structerre (Report no. J135059) in July 2013, with 0.1 m/day noted.

The in-situ sandy gravel ground materials should be considered low to moderately permeable.

3.2 Laboratory soil testing

Samples of representative materials were submitted to Construction Science and EATS, NATA-accredited laboratories for Particle Size Distribution (PSD), Atterberg limits (PI), and Phosphorous Retention Index tests (PRI). The laboratory test results are summarised below, with the certificates presented in Appendix B.

Table 3: Summary of soil classification testing

Location ID	Depth (m)	PSD			Atterberg Limits's				Soil Classification (USCS)
		Fines (%)	Sand (%)	Gravel (%)	LL (%)	PL (%)	PI (%)	LS (%)	
HA1	0.6 – 0.8	6	25	69	24	14	10	5	GRAVEL (GW)
HA1	1.1– 1.4	14	38	48	27	15	12	4.5	Sandy GRAVEL (GW)

Note: PSD – Particle Size Distribution; PI – Plasticity Index; LS – Linear Shrinkage; NP – Non-Plastic

Table 4: Summary of the geo-environmental laboratory testing

Location ID	Depth (m)	PRI	Emerson Class number
HA1	0.6 – 0.8	514	4

Note: PRI – Phosphorous Retention Index.

The Phosphorous Retention Index (PRI) can be defined as the ratio of phosphorus absorbed to the phosphorus remaining when the soil is left in contact with a standard phosphorus solution under standard conditions. It is generally used to measure a soil's ability to strip an applied effluent of phosphorus and prevent leaching or contamination into the groundwater. In sandy soils, the Phosphorus Retention Index is usually less than 5. Very strongly absorbing soils include lateritic loams, iron-rich peats, and Karri loams with PRI >70. A negative value indicates the soil can no longer absorb any more phosphorus and, as such, would leach through the layer easily. Based on the soil logs and laboratory test results, the soil profile encountered in all tests contains a high phosphorus retention ability and a low chance of dispersion.

3.3 Summary of the soils

Based on the generalised sub-surface soil profile presented in Section 3.1.1, an assessment of the soil suitability and capability to manage effluent has been undertaken. The assessment is summarised in Table 5 below.

Table 5: Soil assessment of the Northbound and Southbound soils.

Feature	Assessment	Level of Constraint	Mitigation Measures
Phosphorous Retention Index	Sandy GRAVEL with clay: PRI = 514	Low	Very strongly absorbing, NN
Emerson Class	Subsoil: EC = 4 The subsoil may generally be classified as low-dispersive soil.	Low	NN
Rock Fragments	Isolated cobble and boulder-sized lateritic rock fragments were noted in the middle of the site	Medium	Place LAA away from rocky outcrops. Recommend the southern end of the lot be utilised where clear land is located.
Soil depth	Topsoil: <100 mm	Low/Medium	NN
	'A' Horizon – Sandy GRAVEL (with fines): 100 – 1100 mm Subsoil –Sandy Clayey GRAVEL: 1100 - 1600 mm, overlaying Gravelly CLAY: >1600 mm.	Low	NN

Feature	Assessment	Level of Constraint	Mitigation Measures
Soil Category	Sandy GRAVEL with clay; Weakly structured = Category 3	Low	Employ appropriate horizontal and vertical setbacks.
Soil Permeability	Sandy GRAVEL with clay: Saturated hydraulic conductivity (k_{sat}) = 0.2m/day	Low	Soils have a low to moderate drainage potential. Place LAA on highest, flattest part of the site

NN = Not Needed

*Typical soil category based on soil texture and structure in accordance with AS/NZS 1547 Table 5.1

3.4 Soil assessment results

Based on the soils encountered during the investigation, the overall capability of the soil to suitably manage effluent is not constrained, and no major mitigation measures are required. However, the following measures summarise Table 5 above and are recommended to ensure that the risk of environmental contamination is reduced to a satisfactory level in accordance with the GSP19 and AS/NZS 1547.

- The treatment of the generated effluent to a primary level is acceptable. Considerations should be made based on available land for LAA, and recommended boundary setbacks detailed in Table 6.
- The in-situ sandy GRAVEL with clay has a low to moderate permeability.
- Establishing high nutrient uptake vegetation to increase the evapotranspiration rate can be beneficial.

4 RECOMMENDATIONS

The following sections provide an overview of a suitable on-site wastewater management system. Detailed design for the system should be undertaken at the time of the building application and submitted to the local government.

4.1 Setback distances

Setback buffer distances from effluent land application areas and treatment systems are required to help prevent human contact, maintain public amenities, and protect sensitive environments. The following recommendations have been made in general accordance with GSP 2019 and AS / NZS 1547:2012. The recommended minimum setback distances have been based on a sub-surface application system disposing of a primary treated or a secondary treated effluent through a Category 3 soil.

Based on the size and shape of the lot, maintaining adequate setback distances from property boundaries using a primary treatment system may be overly constraining. As a result, the use of a secondary treatment system may be suitable to alleviate these constraints, and therefore recommendations for these systems have been included. The final selection of the system should take all elements of the project into consideration to ensure safe, effective management of effluent is maintained.

Table 6: Relevant setback distances in accordance with GSP 2019 and AS / NZS 1547:2012

Feature	Setback distance	
	Primary Treatment System	Secondary Treatment System
Private bore for household/drinking water purposes	30 m	
A drainage system that discharges directly into a waterway or wetland without treatment	100 m	
Waterway/watercourse (measured from the edge of the wetland vegetation)	100 m	
<u>Vertical</u> distance to peak groundwater levels	0.9 m	0.8 m
Property boundary	10 m	2.5 m
Buildings/houses	3.5 m	2.5 m
Surface water	40 m	30 m
Recreational areas (children's play areas, swimming pools and so on)	8.5 m	4.5 m
In-ground water tank	9.0 m	5.5 m
Retaining wall and embankments, escarpments, cuttings	3 m or 45° angle from the toe of the wall (whichever is greatest)	3 m or 45° angle from the toe of the wall (whichever is greatest)

4.2 Wastewater management system

A detailed design of the site's wastewater management system is beyond this report's scope. However, based on the results of the SSE investigation, treatment of the generated wastewater to a primary or secondary level utilising a sub-surface application system can be considered satisfactory if the appropriate setbacks and mitigation measures detailed within this report are adhered to. The client should undertake the final selection of the system from the list of approved Department of Health Secondary Treatment Systems.

- The lot is not located within a sewerage-sensitive area, as defined by the Department of Planning, Lands and Heritage.
- The general landform of the proposed lot is that of a flat to gently sloping plateau with a typical gradient of 2 - 5%.
- The land application area should be placed on the lots highest, flattest part where practicable.
- For a typical 6-person residential household with a design loading rate of 120 L/person/day, and utilising conversion factors provided in Section 2 of Schedule 2 of the GSP 2019:
 - A land application area of 345 m² is required based on primary treatment of effluent through a Category 3 soil.
 - A land application area of 180 m² is required based on secondary treatment of effluent through a Category 3 soil.
 - It should be noted, that where the proposed development includes reticulation/is serviced by scheme water, the design loading rate should be reassessed. Typically, the design loading is 150 L/person/day. The LAA should be recalculated if this is the case, utilising the conversion factors provided in Section 2 of Schedule 2 of the GSP 2019. The above areas should be considered a guide only.
- Where an approved Secondary Treatment System (STS) with nutrient removal utilising a sub-surface application system is utilised, the system should achieve a minimum nutrient output of
 - 20 mg/L of Biochemical Oxygen Demand (BOD)
 - 30 mg/L of Total Suspended Solids (TSS)
 - 10 cfu/100mL of Escherichia (E) coli

It is recommended that the design and installation of the effluent management system are carried out by a suitably qualified, licensed plumber or drainer experienced with on-site wastewater disposal systems and an irrigation expert familiar with effluent irrigation equipment to provide further design advice if required. The irrigation plan must ensure the even application of effluent throughout the entire application area.

4.3 Monitoring, Operation and Maintenance

Maintenance is to be carried out in accordance with the DOH Approval of the selected secondary treatment system and manufacturers' recommendations. The treatment system will only function adequately if appropriately and regularly maintained.

To ensure the treatment system functions adequately, residents must:

- Have a suitably qualified maintenance service technician for the secondary treatment system at the frequency required by the manufacturer under the local government permit to use.
- Use household cleaning products that are suitable for septic tanks or ATUs.
- Keep as much fat and oil out of the system as possible; and
- Conserve water (AAA-rated fixtures and appliances are recommended).

To ensure the land application system functions adequately, residents must:

- Regularly harvest/mow vegetation within the application area to maximise the uptake of nutrients.
- Monitor and maintain the application system following the manufacturer's recommendations, including flushing the drainage lines; and
- Regularly clean in-line filters.

5 CLOSURE

We trust that the information provided satisfies your present requirements and meets with your approval. Should you have any queries, please do not hesitate to contact the author.

We draw your attention to the attached "*Report Limitations*" included with this report. This information sheet is intended to provide additional information about this report and information included within it. This information is provided not to reduce the level of responsibility accepted by WML but to ensure that all parties that rely on this report, and the information contained herein, are aware of the responsibilities that each assumes in so doing.



LIMITATIONS

REPORT LIMITATIONS



WML have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, documents and information supplied, and previous experience. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the Client to transmit the information and recommendations of this report to the appropriate organisations or people involved in design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers.

We performed our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty, expressed or implied, is made as to the professional advice included in this report.

Any data provided by third parties including, but not limited to: sub-consultants, published data, and the Client, may not be verified and WML assumes no responsibility for the adequacy, incompleteness, inaccuracies, or reliability of this information. WML does not assume any responsibility for assessments made partly or entirely based on information provided by third parties.

This report has been prepared based on investigation locations which are explicitly representative of the specific sample or test points. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and there are unknowns or variations in ground conditions between test locations that cannot be inferred or predicted.

This report is based upon field and other conditions encountered at the time of report preparation. If unexpected subsurface conditions are encountered, WML shall be notified immediately to review those conditions and provide additional and/or modified recommendations, as necessary.

Our services did not include any contamination or environmental assessment of the site or adjacent sites. The nature of geotechnical investigation differs from the environmental investigation practice. If you require any environmental considerations to be applied to your project, WML can advise on further steps to be undertaken.

Geotechnical assessments are typically based on judgment of the investigation data and visual observations of the site and materials.

This document must not be subject to unauthorised use that is, reusing without written authorisation of WML. Such authorisation is essential because it requires WML to evaluate the document's applicability given new circumstances, not the least of which is passage of time.



DRAWINGS

10934-G-001

Geotechnical Test Locations - Lot 1130 (147) Booth Street, Collie - SSE



Legend

- Hand Auger
- Site

Booth St

Booth St

HA2

HA1



60 m

Google Earth



APPENDIX A

LOGS



CLIENT: Josh Graffin HOLE DEPTH: 2.00m CONTRACTOR: WML Consultants
PROJECT: Lott 1130 Booth St, Collic-SSE COORDINATES: 422094.0 m E, 6311085.0 m N, MGA94 Zone 51 EQUIPMENT: Hand-Auger
JOB NO.: 10934 LOGGED: BB START DATE: 24/11/2022
LOCATION: Booth ST, Collic INCLINATION: -90° CHECKED: AH END DATE: 24/11/2022

Drilling				Field Material Description				IN SITU TESTING	SAMPLE	DCP TEST Blows per 150 mm				
METHOD	WATER	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION							
110 mm Auger Drilling	Not Encountered	0.0			SP	TOPSOIL; Silty SAND, fine to medium grained, dark black; silt is low plasticity; trace root fibre, trace organics; moist; loose.	M	L						
		0.10			GP		M	D						
		0.30			GP	Sandy GRAVEL, fine to coarse grained, subrounded, dark orange; sand is fine to medium grained; moist; dense; <i>Fm grained subrounded lateritic orange mottled brown gravel</i>								
		0.5				GRAVEL, fine to coarse grained, subrounded, dark orange; with fine to medium grained sand, trace clay; moist; very dense; <i>Fm grained subrounded lateritic orange mottled brown gravel</i>	M	VD		D 0.40-0.60 m				
		1.0								2D 0.60-0.80 m				
		1.10			GW	Sandy Clayey GRAVEL, fine to coarse grained, subrounded, dark orange; clay is low plasticity; moist; dense.	M	D		D 1.10-1.40 m				
		1.5												
		1.60			CI	Gravelly CLAY, low to medium plasticity, dark orange; gravel is fine to medium grained, subrounded; with fine to medium grained sand; moist; stiff.	M	St						
		2.0				Hole Terminated at 2.00 m								
		2.5												

Sketch & Other Observations



CLIENT: Josh Graffin HOLE DEPTH: 1.30m CONTRACTOR: WML Consultants
PROJECT: Lott 1130 Booth St, Collic-SSE COORDINATES: 422090.0 m E, 6311133.0 m N, MGA94 Zone 51 EQUIPMENT: Hand-Auger
JOB NO.: 10934 LOGGED: BB START DATE: 24/11/2022
LOCATION: Booth ST, Collic INCLINATION: -90° CHECKED: AH END DATE: 24/11/2022

Drilling				Field Material Description				IN SITU TESTING	SAMPLE	DCP TEST Blows per 150 mm
METHOD	WATER	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION			
90 mm Auger Drilling	Not Encountered	0.0			SP	TOPSOIL ; Silty SAND, fine to medium grained, dark black; silt is low plasticity; trace root fibre, trace organics; moist; loose.	M	L		
		0.10			GP	Sandy GRAVEL , fine to coarse grained, subrounded, dark orange; sand is fine to medium grained; with clay; moist; dense; <i>Fm grained subrounded lateritic orange mottled brown gravel</i>	M	D		
		0.50			GW	Sandy GRAVEL , fine to medium grained, subrounded; sand is fine to medium grained; trace clay; moist; medium dense; <i>Fm grained subrounded lateritic orange mottled brown gravel</i>	M	MD		
		1.30				Hole Terminated at 1.30 m				
		1.5								
		2.0								
		2.5								

Sketch & Other Observations





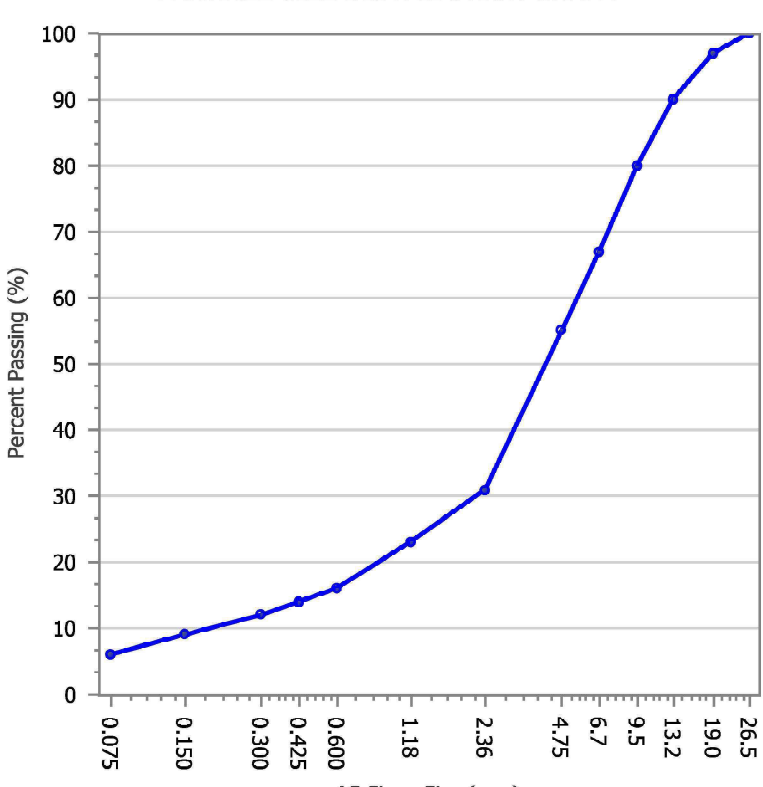
APPENDIX B

LABORATORY TESTING


PARTICLE SIZE DISTRIBUTION REPORT

Client:	WML Consultants	Report Number:	5022/R/59595-1
Client Address:	1st Floor 62 Wittenoom Street, Bunbury	Project Number:	5022/P/1661
Project:	Job No. 10934	Lot Number:	HA 1 Depth 0.6-0.8m
Location:	South West WA	Internal Test Request:	5022/T/17705
Supplied To:	n/a	Client Reference/s:	Job No. 10934
Area Description:		Report Date / Page:	30/11/2022 Page 1 of 1

Test Procedures:	AS1289.3.6.1	Test Request	
Sample Number	5022/S/96514	Area	
Sampling Method	Tested As Received	Location	
Date Sampled	24/11/2022	Sample No.	
Sampled By	Client	Material Source	Hand Auger
Date Tested	28/11/2022	Material Type	Brown Gravel
Prep / Drying Method	n/a	Specification	-
Prep > 53mm (%)	-		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)	PARTICLE SIZE DISTRIBUTION GRAPH 
26.5		100		
19.0		97		
13.2		90		
9.5		80		
6.7		67		
4.75		55		
2.36		31		
1.18		23		
0.600		16		
0.425		14		
0.300		12		
0.150		9		
0.075		6		

Remarks	Results apply to the sample/s as received.,
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NATA Accredited for compliance with ISO/IEC 17025 – Testing Accreditation Number: 1986 Corporate Site Number: 5022		 Approved Signatory: Janine Fischer Form ID: W9Rep Rev 3
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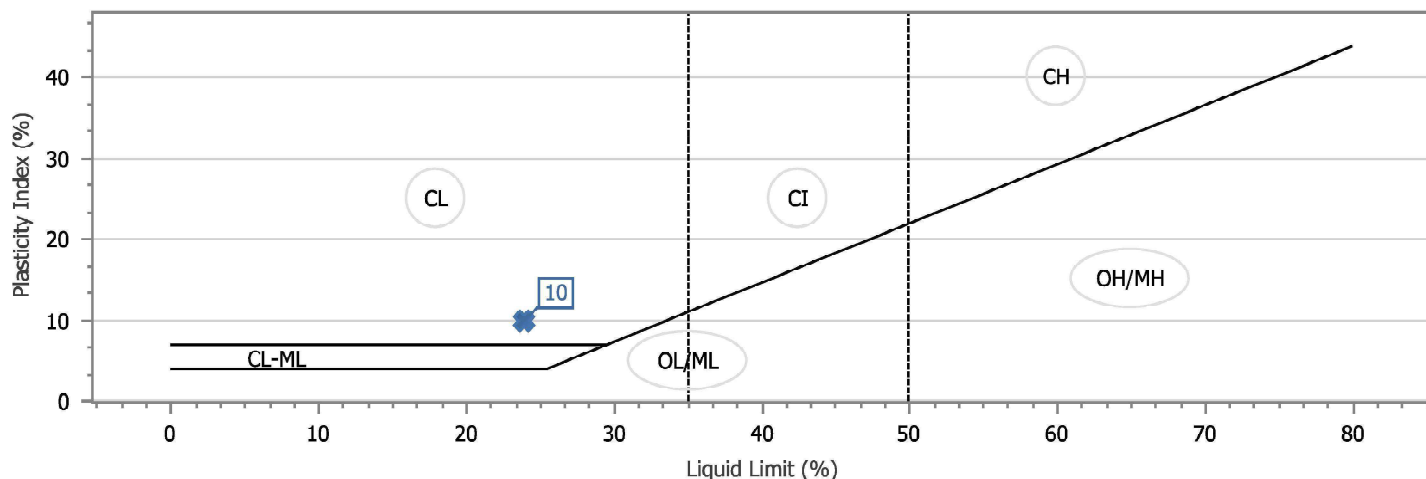
ATTERBERG LIMITS REPORT

Client:	WML Consultants	Report Number:	5022/R/59603-1
Client Address:	1st Floor 62 Wittenoom Street, Bunbury	Project Number:	5022/P/1661
Project:	Job No. 10934	Lot Number:	HA 1 Depth 0.6-0.8m
Location:	South West WA	Internal Test Request:	5022/T/17705
Supplied To:	n/a	Client Reference/s:	Job No. 10934
Area Description:		Report Date / Page:	30/11/2022 Page 1 of 1

Test Procedures:	AS1289.3.1.1, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1726 (Tables 9/10)		
Sample Number	5022/S/96514	Sample Location	
Sampling Method	Tested As Received	Test Request	
Date Sampled	24/11/2022	Area	
Sampled By	Client	Location	
Date Tested	29/11/2022	Sample No.	
Drying / Prep Method	Oven Dried / Dry Sieved	Material Source	Hand Auger
LL Water Type	Other	Material Type	Brown Gravel
LL Device Type	Cassagrande	Prep Mat > 53mm (%) -	
Material Description	Brown GRAVEL		

Atterberg Limit	Specification Minimum	Test Result	Specification Maximum
Liquid Limit (%)		24	
Plastic Limit (%)		14	
Plasticity Index (%)		10	
Linear Shrinkage (%)		5.0	
Linear Shrinkage Defects:	-		

Atterberg Limits 'A-Line' Graph



Remarks	Results apply to the sample/s as received.,
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Accredited for compliance with ISO/IEC 17025 – Testing

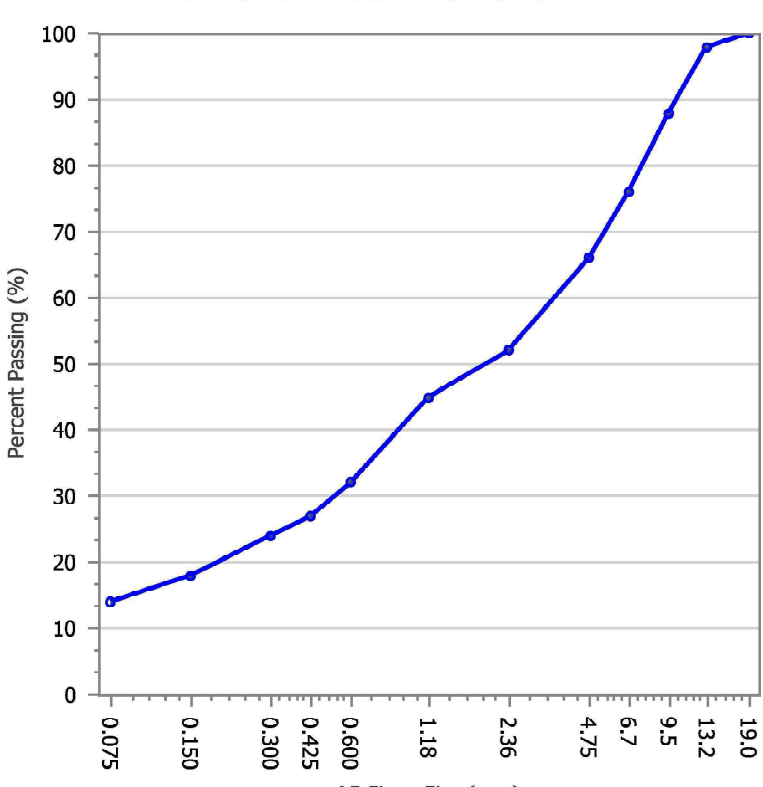
Accreditation Number: 1986
Corporate Site Number: 5022

Approved Signatory: Janine Fischer
Form ID: W11Rep Rev 2



PARTICLE SIZE DISTRIBUTION REPORT

Client:	WML Consultants	Report Number:	5022/R/59596-1
Client Address:	1st Floor 62 Wittenoom Street, Bunbury	Project Number:	5022/P/1661
Project:	Job No. 10934	Lot Number:	HA 1 Depth 1.1-1.4m
Location:	South West WA	Internal Test Request:	5022/T/17705
Supplied To:	n/a	Client Reference/s:	Job No. 10934
Area Description:		Report Date / Page:	30/11/2022 Page 1 of 1

Test Procedures:	AS1289.3.6.1	Test Request	
Sample Number	5022/S/96515	Area	
Sampling Method	Tested As Received	Location	
Date Sampled	24/11/2022	Sample No.	
Sampled By	Client	Material Source	Hand Auger
Date Tested	28/11/2022	Material Type	Brown Clayey GRAVEL
Prep / Drying Method	n/a	Specification	-
Prep > 53mm (%)	-		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)	PARTICLE SIZE DISTRIBUTION GRAPH 
19.0		100		
13.2		98		
9.5		88		
6.7		76		
4.75		66		
2.36		52		
1.18		45		
0.600		32		
0.425		27		
0.300		24		
0.150		18		
0.075		14		

Remarks	Results apply to the sample/s as received.,
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		Accredited for compliance with ISO/IEC 17025 – Testing Accreditation Number: 1986 Corporate Site Number: 5022	 Approved Signatory: Janine Fischer Form ID: W9Rep Rev 3
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ATTERBERG LIMITS REPORT

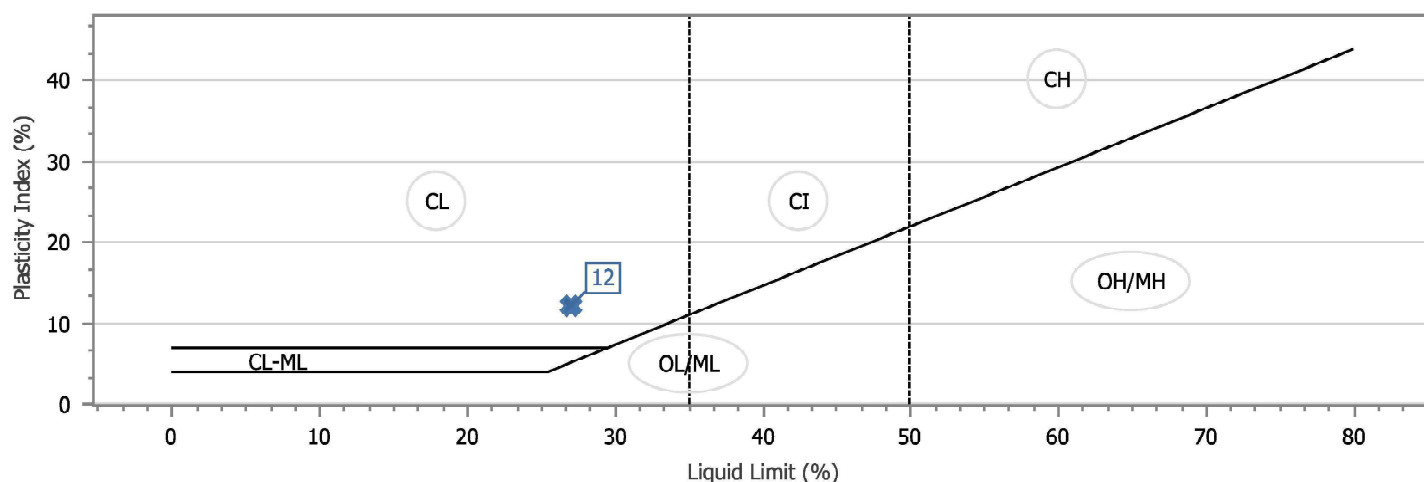
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Client Address:	1st Floor 62 Wittenoom Street, Bunbury	Project Number:	5022/P/1661
Project:	Job No. 10934	Lot Number:	HA 1 Depth 1.1-1.4m
Location:	South West WA	Internal Test Request:	5022/T/17705
Supplied To:	n/a	Client Reference/s:	Job No. 10934
Area Description:		Report Date / Page:	30/11/2022

Page 1 of 1

Test Procedures:	AS1289.3.1.1, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1726 (Tables 9/10)		
Sample Number	5022/S/96515	Sample Location	
Sampling Method	Tested As Received	Test Request	
Date Sampled	24/11/2022	Area	
Sampled By	Client	Location	
Date Tested	29/11/2022	Sample No.	
Drying / Prep Method	Oven Dried / Dry Sieved	Material Source	Hand Auger
LL Water Type	Other	Material Type	Brown Clayey GRAVEL
LL Device Type	Cassagrande	Prep Mat > 53mm (%) -	
Material Description	Brown Clayey GRAVEL		

Atterberg Limit	Specification Minimum	Test Result	Specification Maximum
Liquid Limit (%)		27	
Plastic Limit (%)		15	
Plasticity Index (%)		12	
Linear Shrinkage (%)		4.5	
Linear Shrinkage Mould Length / Defects:	Mould Length: 249.0mm / -		

Atterberg Limits 'A-Line' Graph



Remarks	Results apply to the sample/s as received.,
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Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 5022

Approved Signatory: Janine Fischer
Form ID: W11Rep Rev 2



EMERSON CLASS NUMBER REPORT

Client:	WML Consultants	Report Number:	5022/R/59565-1
Client Address:	1st Floor 62 Wittenoom Street, Bunbury	Project Number:	5022/P/1661
Project:	Job No. 10934	Lot Number:	HA 1 Depth 0.6-0.8m
Location:	South West WA	Internal Test Request:	5022/T/17705
Supplied To:	n/a	Client Reference/s:	Job No. 10934
Area Description:		Report Date / Page:	29/11/2022 Page 1 of 1

Test Procedures:	AS1289.3.8.1
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Sample Number	5022/S/96514			
ID / Client ID	-			
Lot Number	HA 1 Depth 0.6-0.8m			
Date / Time Sampled	24/11/2022			
Date Tested	28/11/2022			
Material Source	Hand Auger			
Material Type	-			
Sampling Method	Tested As Received			
Prep Material > 53mm (%)	-			
Water Type	Distilled			
Water Temperature (°C)	21			
Test Request				
Area				
Location				
Sample No.				
Soil Description	Brown GRAVEL			
Emerson Class Number	4			

Remarks	Results apply to the sample/s as received.,
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		Accredited for compliance with ISO/IEC 17025 – Testing	
Accreditation Number:	1986		
Corporate Site Number:	5022		
			Approved Signatory: Janine Fischer Form ID: W22Rep Rev 3

Certificate of Analysis

Client Name:	WML Consultants		
Address:	PO Box 2023, Bunbury, WA, 6231		
Phone No:	9722 3544	Email:	bbajgain@wml.com.au
Lab No:	14042	Order No:	Job 10934
Date samples received:	24/11/2022	Report date:	29/11/2022

Sample details: One soil sample for phosphorus retention index, collected from by WML Consultants, labelled 'WML 10934 1 x HA1 (0.6-0.8)'.

Test Methods: Samples are tested on an as received basis using EATS method 033. Results are expressed on a dry weight basis.

Test Results:

Sample	Moisture (%)	Phosphorus Retention Index (PRI)
1 x HA1 (0.6-0.8) Job No. 10934	7.5%	514



Rachel Lancaster
BSc (Hort), PgDip (Agribusiness)
End of report

Appendix 3: Collie North Structure Plan

NORTH COLLIE STRUCTURE PLAN



SCHEDULE OF PLANNING PROVISIONS

The Structure Plan provides a framework for future detailed planning at the subdivision and development stage.

The Structure Plan and Schedule of Planning Provisions, provide planning criteria for the purposes of development control under the operative Town Planning Scheme.

1. Building Envelopes
All development on lots containing significant vegetation within the western part of the plan is to be contained within Building Envelopes depicted on this plan.

2. Fire Management
Building Envelopes may be varied at the approval of the Shire of Collie and can be approved with out the need to vary this Structure Plan.

3. Vegetation Protection
Applications for Subdivision are to be submitted with a Fire Management Plan compliant with FESWA and WAPC guidelines - Planning for Bush Fire Protection

4. Geotechnical Analysis
Applications for subdivision within the Structure Plan Area are to be submitted with a Geotechnical Report, demonstrating the capacity of the land to accommodate further development.

5. Future Planning
Subdivision at a density higher than that depicted by this Structure Plan will require comprehensive structure planning to address future road networks, infrastructure, and provision of Public Open Space.

6. Development Approvals
The issue of planning consent and building licences within the structure plan area are to be issued by Council with regard to the proposed subdivision. The issue of building licences is to be issued by the Department of Building and Construction with regard to the proposed subdivision. The issue of building licences is to be issued by the Department of Building and Construction with regard to the proposed subdivision.

7. Subdivision Approvals
This plan depicts possible subdivision boundaries and should not be construed as subdivision approval. Applications for subdivision approval are required to be lodged with the WA Planning Commission.

8. Full Scheme Contributions
Lots proposed to be 1/2a or greater in area will be subject to the full cost of connecting to Water Corporation Services.

9. Road Construction
At the subdivision stage, landowners of lots 1455 and 1454 will be required to contribute towards the construction of the unnamed road reserve in order to enable the construction of the unnamed road. Road construction is to be of a standard to the satisfaction of the Shire Engineer.

10. Building Lots
Alternative lot configurations to those shown on this Structure Plan which obviate the need for the creation of building lots will be encouraged. Consideration should be given at the subdivision stage to providing road access to the lots via potential subdivisional roads shown on Figure 2 - Possible Future Road Layouts to eliminate the reliance upon building lots configurations.

ENDORSED STRUCTURE PLAN
To provide a framework for future detailed planning at the subdivision and development stage.

Date 23/8/04 C. H. H. H.
Delegated under s.20 of WAPC Act 1985

ADOPTED BY COUNCIL ON 25/3/2003
CHIEF EXECUTIVE OFFICER ENDORSED [Signature]
DATE 24/8/2004
WA PLANNING COMMISSION ENDORSED _____
DATE _____



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NORTH COLLIE STRUCTURE PLAN
SHIRE OF COLLIE

SCALE
A 2 1:1200
Level Datum
Horizontal Datum
ASSUMED
JOB NUMBER
O405.012
REV
5

COUNCIL REF: LUP/005
WAPC REF: 801-6-8-2

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