



SMITHS BEACH PROJECT

Engineering Report

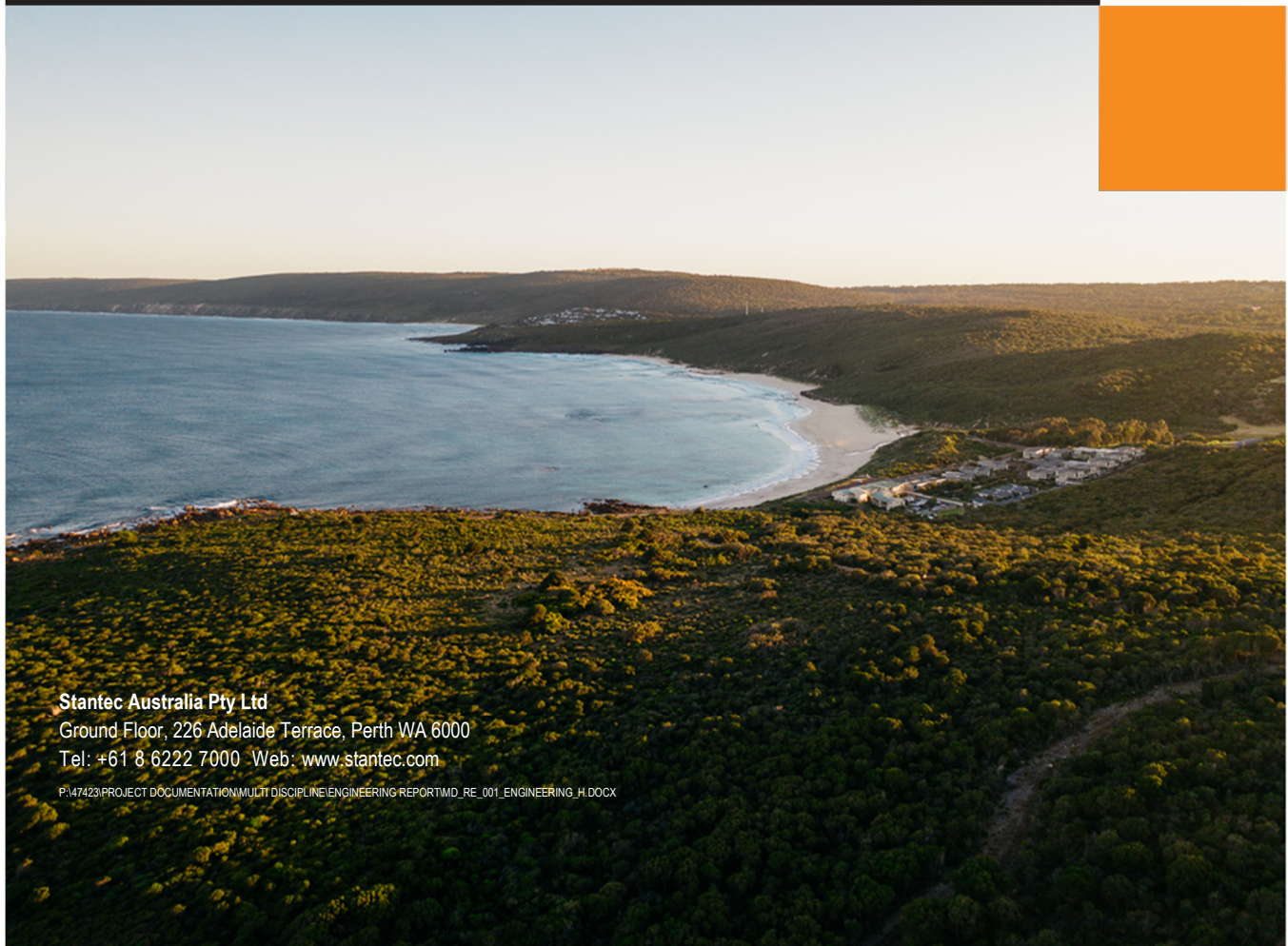
For Development Application

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Executive Summary

The Smiths Beach Project vision is to create a coastal village deeply rooted in place and culture that provides tourism, community and economic benefits. This incorporates an ecologically sensitive and landscape led design approach that prioritises the site's unique natural elements.

The engineering strategy and concepts have been developed with the project vision front of mind namely by ensuring a light ecological footprint.

Clearing and earthworks are to be minimised and no general bulk earthworks are proposed. A balance of cut to fill will be attempted to minimise soil movements to and from site.

The dominant philosophy for the roadworks is to achieve a safe, pedestrian oriented road network which provides access to all lots whilst also minimising earthworks and vegetation disturbance. Due to the existing gradient, in limited instances earthworks within the roadways will be required but treatments such as swales and reinforced batters will be selected to minimise such earthworks and disturbance.

Onsite wastewater treatment and land application systems will be installed throughout in accordance with the site and soil evaluation procedure as a proactive mitigated risk strategy for the development. Secondary treatment with nutrient retentive systems has been selected as the minimum treatment level to ensure that the treated effluent exceeds suitability for the land.

The development will be serviced with a fully reticulated potable water supply that is proposed to be sourced from reliable existing Water Corporation infrastructure located to the east of Yallingup. The off-site water main route will be carefully selected during detailed design to minimise disturbance to existing vegetation. Dedicated storage for fighting bush fires and for fire protection of buildings will be provided and sourced from the potable water supply.

The stormwater strategy for the development will be consistent with WAPC's Better Urban Water Management. The drainage design will be strongly integrated with the landscape design and with the natural hydrology of the site with a focus on treatment and infiltration close to source. Impacts on the natural hydrology of the site will be minimised and large events will be controlled to protect public and private assets.

As a result of adopting the Community Title framework, an innovative renewable energy microgrid system will be developed that combines high reliance on renewable energy combined with energy storage to dramatically reduce emissions and have a positive impact on the grid. The pole height and the type of fittings for lighting will be selected to minimise light spill and minimise any direct effect on wildlife. To support sustainability initiatives of reducing energy supply from fossil fuels, gas reticulation will not be provided for the development.



1. Introduction

This report considers the required servicing infrastructure and engineering considerations as part of the proposed development on Lot 4131 Smiths Beach Road, Yallingup. Figure 1 illustrates the site.

It sets out the scope and philosophy of the servicing to be provided and provides preliminary details of proposed solutions to be adopted.

Whilst there is infrastructure serving the site and the existing adjacent tourism facilities, it is limited, and upgrading is necessary to cater for the demands of the proposed development.

The development yields, density of development and lot titling arrangements have been selected to optimise infrastructure requirements.

The engineering concept incorporates an ecologically sensitive and landscape led design approach that prioritises the site's unique natural elements.



2. Geotechnical

According to the Geological Survey of WA's 1:50 000 Environmental Geology Map Series, the site is characterised as Sand (S7) pale and olive-yellow medium to coarse-grained sub-angular quartz moderately sorted in the east, and medium-grained mesocratic Gneiss (GN) in the west. A copy of the mapping is included as Figure 2.

A geotechnical investigation for the site was undertaken by Golder Associates in December 2020 and March 2021 and their subsequent reporting (Golder Associates, 2021) also considered geotechnical testing historically completed by others. The Geotechnical reporting delineated the site into seven areas that have been replicated within Figure 3. An extract of the report describing the seven areas, as well as the preliminary site classifications determined by Golder Associates, is as follows:

Area 1 - Shallow Rock (Class S)

- Silty SAND (SM), fine to medium grained, generally about 15% low plasticity fines, generally loose becoming medium dense to dense with depth, brown becoming pale brown orange and pale brown grey, extending to depths of between about 0 m (rock outcrops) and 1.9 m, overlying
- Inferred GNEISS/GRANITE cobbles, boulders or bedrock, causing refusal at depths between 0.2 m and 1.9 m.

Area 2 - Shallow Clay (Class M)

- Silty SAND (SM) or Sandy GRAVEL (GP), fine to medium grained sand, fine to coarse lateritised gneiss gravel, generally about 15% low plasticity fines, medium dense to dense with depth, brown, extending to depths of between about 0.4 m and 0.5 m, overlying
- Sandy CLAY(CI/CH), medium to high plasticity, very stiff to hard, brown, orange and red, extending to the maximum depth investigated of 1.0 m.

Area 3 - Sand (Class A)

- SAND (SP), fine to medium grained, with silt in parts, loose becoming medium dense to dense with depth, orange brown to red brown, extending to the maximum depth investigated of 3.0 m.

Area 4 - Sand over Clayey Sand (Class S)

- SAND (SP), fine to medium grained, with silt, loose becoming medium dense to dense with depth, orange brown to grey brown, extending to depths of between about 1.5 m and 2.1 m, overlying
- Clayey SAND (SC), fine to coarse grained, about 15% to 25% low plasticity fines, dense to very dense, orange brown, orange yellow and yellow grey, containing a sand layer between 2.5 m and 3.0 m at HA31, extending to the maximum depth investigated of 3.0 m.

Area 5 - Silty Sand (Class S)

- Silty SAND (SP), fine to medium grained, about 10% to 20% low plasticity fines, loose becoming medium dense to dense with depth, red brown to brown, extending to the maximum depth investigated of 2.0 m.

Area 6- Silty Sand over Clay (Class M)

- SAND/Silty SAND (SP/SM), fine to medium grained, about 10% to 15% low plasticity fines, loose becoming medium dense to dense with depth, brown, extending to depths of between about 0.8 m and 1.4 m, overlying
- Clayey SAND/Sandy CLAY(SC/CI/CH), medium to high plasticity, very stiff to hard, brown, orange brown and grey, extremely weathered rock, extending to the maximum depth investigated of 2.6 m.

Area 7 - Shallow Rock (Class S)

- SAND/Silty SAND/Silty Gravelly SAND (SM), fine to medium grained, generally about 15% to 20% low plasticity fines, generally loose becoming medium dense to dense with depth, brown and red brown, fine to coarse gneiss gravel and cobbles, extending to depths of between about 0 m (rock outcrops) and 1.1 m, overlying
- Inferred GNEISS/GRANITE cobbles, boulders or bedrock, causing refusal at depths between 0.3 m and 1.3 m



3. Earthworks

Given the philosophy that clearing, and earthworks are to be minimised, no general earthworks are proposed. A balance of cut to fill will be attempted to minimise soil movements to and from site.

Earthworks will require stabilisation and management and this will be undertaken in conjunction with rehabilitation and landscaping works. It is recognised that there is a potential for scour, particularly in the early phases of development, and steps will be taken to mitigate the effects, including possibly the use of hemp mats. Energy dissipation structures will be incorporated along swale drains and steep sections will be rock pitched.

The presence of rock on site will be acutely analysed as part of detailed design with levels and alignment of infrastructure adjusted to suit.

A copy of the Earthworks Concept Plan is attached within Appendix 1.



4. Roadworks

The dominant philosophy for the roadworks is to achieve a safe, pedestrian oriented road network which provides access to all lots whilst minimising earthworks and vegetation disturbance.

The access road adjacent the southern boundary is proposed to be vested to the Local Authority. All other roads within the development will be the responsibility of the Community Corporation.

Long-sections will typically follow the natural landform. Due to the existing gradients, earthworks within the roadways will be required but the treatments selected will minimise such earthworks and disturbance.

Roads will generally be cut into the high side and use one-way cross falls in order to minimise low side earthworks. Such a detail also achieves a low visual impact in elevation. This principle will be challenged where near surface rock exists.

Road long-sections will be at a maximum 10% grade in accordance with IPWEA guidelines, however, minor sections less than 50m in length at maximum 1 in 7 grade may be required to avoid excessive earthworks subject to bushfire vehicular access requirements.

In selected steeper areas, the construction extent will be minimised by steepening the batter utilising stone pitching for stabilisation. This will be consistent with the landscaping theme, as well as maximising vegetation retention.

Road widths and vegetation will be as tight as practical to self-enforce a low-speed environment.

Refer to Appendix 1 for Roads Concept Long Sections and Roads Concept Cross Sections.



5. Sewerage System

5.1 General

It is proposed that the entire Smiths Beach development is serviced via onsite wastewater treatment and land application systems and will be undertaken in accordance with the Government Sewerage Policy 2019. The Combined Methodologies for Sussex Location 413 dated February 2004 did not make provision for the 2019 Sewer Policy with the main implication being a Water Corporation solution is no longer proposed.

The site wastewater loading has been assessed based on the uses throughout the development in a conservative nature based on the level of detail provided at this stage of the development.

- Holiday Homes
 - Western Holiday Homes
 - Eastern Holiday Homes
- Campground
 - Separate Green Title Lot
- Hotel & Community Hub

5.1.1 Eastern Holiday Homes

Each lot will typically provide secondary treatment at minimum and dispose of effluent within its own lot area in accordance with the minimum requirements defined by the project site and soil evaluation and as approved by the relevant Authority bodies.

Should detailed investigations identify specific locations are not suitable for on-site effluent disposal, a system similar to the Western Residences will be locally adopted.

5.1.2 Campground

The campground will treat and dispose of effluent within its own green title lot area in accordance with the minimum requirements defined by the project site and soil evaluation and as approved by the relevant Authority bodies.

5.1.3 Western Holiday Homes

The western holiday homes are characterized by near surface rock, potentially making disposal on its own lot difficult. Subject to further geotechnical analysis currently under investigation the western holiday home systems typically consists of normal elements namely:

- Pipe reticulation
- Where able based on final geotechnical investigations, disposal within its own lot in accordance with the minimum requirements defined by the project site and soil evaluation and as approved by the relevant Authority bodies.
- Where unable based on final geotechnical investigations, connection to Pumping Station and Wastewater Treatment System as outlined in 5.1.4

5.1.4 Hotel & Community Hub

The system consists of normal elements namely:

- Separation of Waste Streams (Trade Waste)
 - Inclusion of appropriate pre-treatment devices prior to connection to the primary sewer stream
- Pipe reticulation
- Pumping Station and Rising Main



- Wastewater Treatment System
 - Secondary Treatment Plant with additional consideration of higher treatment level for re-use
- Disposal of Treated Effluent within Open Space

5.2 Engineering Studies

To select the most appropriate effluent collection, treatment and disposal system, engineering, hydrological, geotechnical and environmental studies have been completed which are then assessed against a risk framework. Additional site perched water modelling and geotechnical investigations for winter permeability are currently being developed to further support and refine the design as a part of the detailed design process.

The outcome of the risk framework process, also identified as a site and soil evaluation, is to recommend the minimum level of treatment required as well as appropriate options for land application systems.

5.3 Sewerage Reticulation

Where sewerage reticulation is proposed, namely the Hotel, Community Hub and western holiday homes, the systems consist of normal PVC sewer pipe (150mm), precast access chambers and where applicable lot connection junctions. Due to the topography of the site, the system would be a gravity installation, falling to a pumping station at the lowest level of the site. Pipework depths would be minimised as much as possible and likely to be in the order of 1m to 2m in depth throughout.

Note that the Hotel and Community Hub precincts would have a private internal reticulation system in accordance with AS3500.2, which would then connect into the main wastewater treatment plant via a sewer pump station and rising main.

5.4 Tenure Plan

The development is to be operated under a community scheme as a subdivision of the freehold green title land parcel into a community scheme as a part of the implementation of the *Community Titles Act 2018* (CT Act).

As it relates to the on-site wastewater treatment and land application systems, the following outlines the operational intent:

- The Community Corporation is responsible for the maintenance and management of individual holiday home treatment and land application systems (Holiday Homes) and the wastewater treatment plants and land application systems (Western Holiday Homes, Hotel & Community Hub). The City of Busselton and/or the Department of Health will have a contract directly with the Community Corporation to address any concerns or actions, not individual owners.
- The Community Corporation will arrange necessary monitoring, maintenance, and reporting to Authorities of systems on behalf of the owners in line with any approval conditions.
- Levies are payable to the Community Corporation for the ongoing monitoring, maintenance and reporting of each system which will be payable by the individual Hotel & Community Hub Owner and Holiday Home owners.
- Holiday Home treatment and land application systems are located on each holiday home lot under the private ownership of the owner, where the lot has appropriate conditions for effluent to be discharged on lot with required setbacks, it will. Where effluent discharge can't occur on lot due to unfavourable conditions the community scheme will facilitate irrigation within open space areas.
- Through by-laws, the Community Corporation will have the power to access any lot to carry out routine monitoring, inspection and maintenance.
- Liability for the failure of any treatment system will be jointly on the Community Corporation and the respective owner with the Community Corporation addressing and rectifying any issues/concerns and seeking reimbursement via the owner.
- The Campground will reside on a separate Green Title Lot and the management of this is able to be incorporated into the management agreements through the Community Corporation.



6. Water supply

6.1 General

The Smiths Beach development will be serviced with a fully reticulated potable water supply.

Water Corporation has the licence to supply water to the development area, however, the site is not currently considered within its water planning. Subject to a review of the current Dunsborough Groundwater Scheme, the Water Corporation will consider the scope of works required to provide the proposed development on Lot 4131 Smiths Beach Resort with water services compliant with the Water Corporations Operating License. The Developer has entered into an agreement with Water Corporation for the review to be undertaken.

Figure 4 represents the existing water reticulation to the east of Yallingup that will be connected into.

Attached in Appendix 1 is the Water Concept Plan indicatively illustrating location of proposed supply infrastructure, potable reticulation and fire reticulation network further described below.

6.2 Demand

The total daily water demand generated from the development and peak flow rate is expected to be 113kL/day and 6.3L/sec respectively. The abutting Canal Rocks Apartments and Smiths Beach Resort would benefit from the Water Corporation potable water supply. In this instance, the estimated combined demand generated and peak flow rate inclusive of the existing abutting land uses would be 130kL day and 7.2L/sec.

6.3 Supply Infrastructure

The current preference of the Water Corporation and the Developer is to extend the Corporation's network to the site to provide a direct service. The off-site water works will be delivered by the Developer for acquisition, operation and maintenance by the Corporation under a Developer Funded & Constructed Works Agreement process. The scope and the design will be undertaken by the proponent.

The off-site water main route will extend approximately 6km to existing mains located east of Yallingup. The route is subject to review by the Water Corporation and will adopt routes to minimise vegetation disturbance and align with existing cleared access ways likely via local roads and accessways.

As the development will be a non-standard supply arrangement of substantial quantity, a Major Consumer Agreement will be entered into with the Water Corporation. The Agreement will define the capacity and consumption charges to apply to cover any upstream capacity investment and the ongoing operational and maintenance costs.

Preliminary advice provided by Water Corporation suggests sufficient capacity is available within its headworks supply infrastructure, however, pressure and quality issues may exist due to the distance between the site and the water source.

The potential pressure issue can be addressed by the provision of balancing tanks. The size of the balancing tanks will be determined in iteration with the off-site water main design and the off-site water network. The location and elevation of the balancing tanks may provide sufficient pressure to the reticulation network within the development, alternatively, the pressure can be increased by incorporating booster pumps prior to the reticulation within the development. To address potential quality issues, an integrated chlorine treatment system may be adopted prior to the potable reticulation to the site. The location of the tanks and associated infrastructure has been indicatively shown along the new southern road but is subject to Water Corporation negotiation during detailed design.

6.4 Reticulation

Downstream of the balancing tanks and pumps, internal reticulation throughout the development is intended to be installed within roads/pathways in accordance with standard sub-division and typical Water Corporation requirements. Each individual Lot will be provided with isolation, metering and backflow prevention in line with the requirements of connection to an Authority water network broken up into the following:

- Individual Eastern Holiday Home
- Individual Western Holiday Home
- Hotel & Community Hub

A separate Authority service will reticulate to the Campground green title lot as well as provide a service to neighbouring properties.

6.5 Fire Supply

The fire supply system is separated dependant on use throughout the development. Requirements of the Bushfire Management Plan have been incorporated into the infrastructure design and further details can be referenced in the project Bushfire Management Plan (BMP).

Fire services for the residential development will be via the reticulated water main network and will consider the principles of Water Corporation's No.63 Water Reticulation standard. As a minimum, the maximum distance between a hydrant and the rear of a building envelope, (or in the absence of a building envelope the rear of the lot) shall be 120m. The Department of Fire and Emergency Services will be able to access street hydrants which are supported by water balance tanks with a minimum 200kL of overall water storage capacity with 100kL reserve for bushfire fighting.

An additional 50kL standalone break tank is provided adjacent to the potable water break tanks with a standpipe for remote filling of truck-based tanks for additional bushfire fighting purposes.

The Hotel & Community Hub will access a fire water supply from the reticulated water mains and provide stand-alone fire water storage as is required under the NCC. This will be in addition to the previously mentioned water storage. The tank capacity at this location will be no less than 225kL overall and be set out in accordance with the BMP for the development. Wet fire systems will be installed to the Hotel & Community Hub in accordance with the requirements of the current NCC, relevant Standards and any Fire Engineering Solutions developed as a part of the detailed design process. External fire hydrants and external fire hose reels are to be installed from this system as per the BMP (which will include FHR coverage as per ABCB Design and Construction of Community Bushfire Refuges Handbook).

The campgrounds will access a fire water supply from the reticulated water mains and provide hydrants and hose reels in accordance with the requirements of the current NCC, relevant Standards and any Fire Engineering Solutions developed as a part of the detailed design process. A standalone fire hose reel system for the campground will be provided, with the design and coverage to comply with the Caravan Parks and Camping Ground Regulations and AS 2441. As a minimum, coverage shall be provided around the perimeter of both buildings and to each of the proposed tent platforms.

7. Stormwater

The stormwater strategy for the development will be consistent with WAPC's Better Urban Water Management. The strategy will also be consistent with the intent of the Combined Methodologies for Sussex Location 413 dated February 2014. A Stormwater Concept Plan is included in Appendix 1. The underlying principles for various rainfall intensities are as follows:

a) First Flush

- To minimise environmental impact, infiltration of stormwater close to source is preferred. It is accepted that 99% of potential pollutants are contained within rainfall events smaller than 1 in 1 year occurrence events.
- Retention or management of the "first flush" rainfall event (nominally first 15mm of a rainfall event) generated from impervious surfaces within residential lots. This will typically be undertaken via soakwells located within sites containing free draining sands. In areas where soakwells are not appropriate, runoff will be diffused and conveyed to the road network where available or incorporated within rainwater tanks where provided.
- "First flush" rainfall from trafficable pavements will be treated within bioretention swales located in areas of free draining soils. Roadside swales will be typically located on the low side of pavements with relatively flat gradients where retention volumes can be more effectively provided. The roadside swales will have intermittent rock pitched weir structures to retain stormwater. Where roadside swales are not appropriate or provided, stormwater will be conveyed to bioretention swales that will typically be located parallel to contours.

b) Minor Storm Event

- Trafficable pavements will typically be designed to cater for a 20% Annual Exceedance Probability (AEP) or 1in5 year Average Recurrence Interval (ARI) minor storm event. Conveyance will be either via traditional pit and pipe networks for sections of kerbed pavements or via roadside swales. For roadside swales with underlying free draining soils providing bioretention treatment, the conveyance will be over weir structures. For roadside swales not supporting infiltration, conveyance will be within the swale and dissipated via permeable rock pitching spaced to suit the gradient of the roadway.
- Retention of the 20%AEP event will be typically within sub-surface infiltration structures.

c) Major Storm Event

- Extreme events will be controlled or directed to protect public and private assets.
- The stormwater generated from the 1% AEP event within lots will be typically conveyed via overland flow following the existing landform. The overland flow will typically be directed to roadways or will be directed away from sensitive structures.
- The 1% AEP stormwater within roadways will be flood routed within roadways and designated swale drains to flood attenuation areas.
- Retention of 1% AEP stormwater will be via additional capacity with the sub-surface infiltration structures or temporary flooding to an acceptable level of appropriate land uses (the car park to the south of existing Canal Rocks Apartments).
- Events larger than 1% AEP will discharge overland via the northern car park and access way (west of Canal Rocks Apartments) to Smiths Beach Road. The pollutant load of any stormwater leaving the site would be minimal as the annual first flush event usually carries the highest pollutant loads. The volume of flow exiting the site is less than that which would currently discharge to the ocean from the existing undeveloped site.



The water sensitive design practices will be tailored to suit the characteristics of the site that include the gradients, irregularity of geotechnical conditions, retention of remnant vegetation, spatial restrictions and safety. Consistent with the principles outlined above, specific treatments for the different situations encountered are summarised as follows:

a) Eastern Cell

- The entry roads and curved sections of pavements are relatively steep. To minimise clearing extents, improve safety around bends and to avoid steep swale drains susceptible to erosion, these sections will be kerbed and drained via a pit and pipe system.
- The east-west sections of road are relatively flat and swale drains retaining the first flush will be adopted. The swale drains will convey stormwater into the piped network for 20% AEP events.
- The piped network will also convey 20% AEP events through the camping site to subsurface infiltration structures within the northern car park.
- Major storm events will be overland flood routed through the roadways to low points to the north-west and north-east of the cell. From both low points, swale drains will provide overland flood routing to the flood storage within the northern car park.

b) Western Cell

- The area is characterised by near surface rock. Pavements will be drained via roadside swales. A section of the southernmost road has underlying sands and suitable to retain the first flush. Other roadside swales will only convey stormwater.
- The section of the southern road falling and connecting midway along the north-south road will have 20% AEP events accommodated within sub-surface infiltration structures.
- Excluding a portion of the southern road referred above, pavements are flood routed to the northern car park and will be piped under the north-south entry road.

c) North-South Entry Road

- Kerb breakouts will be regularly incorporated to direct stormwater to bioretention swales within the abutting open space areas.
- To promote at source infiltration and to avoid a piped network, stormwater generated from the 20% AEP event will be retained within sub-surface structures beneath the bioretention swales.
- 1% AEP events will overland flood route to the northern car park.

d) Northern Car Park

- The northern car park and access road will be drained via a pit and pipe network. First flush events will be directed off-line to a bioretention swale.
- Sub-surface infiltration structures will be installed beneath the pavement. The catchment of the structures includes the northern car park, north-south entry road, western cell and eastern cell. The structures will be sized for the 20% AEP and 1% AEP less any flood storage provided above ground.
- A contingency overland flood relief will be provided via the access way to the west of the Canal Rocks Apartments to Smiths Beach Road and ultimately to the foreshore reserve.

e) Hotel and Community Hub

- The Community Hub is proposed to retain its stormwater on-site via sub-surface structures.
- The hotel complex is located in areas typically containing shallow rock limiting the ability of on-site infiltration. Stormwater will be diffused to maintain pre-development flows to the foreshore reserve.

f) Southern Road

- The new southern road will be drained via roadside swales that will retain the first flush event.
- For the eastern catchment, the 1% AEP event will be flood routed and retained at the low point approximately 140m west of Smiths Beach Road via sub-surface infiltration structures and storage within the swale. The southern verge low point will also retain overland flow from the catchment to the south.

An Urban Water Management Plan has been prepared by Hyd2o (refer DA Appendix P) that should be referred to for further details.



8. Power

Existing Infrastructure

An analysis of Western Powers DFIS system has been conducted to determine the existing power supply configuration surrounding the development. The existing Western power network surrounding the site consists of a single 22kV overhead HV cable that originates from the Busselton Zone substation. This feeder MR1/1A feeds the Margaret River and Yallingup areas. The existing site (Lot 4131) does not appear to have a current Western Power connection. The existing power infrastructure is illustrated in Figure 5.

Western Power Methodology

Western Power's Underground Distribution Scheme (UDS) policy details that all new land developments are provided with an authority point of connection via an underground power service. New residential subdivisions within the Yallingup area are normally provided with a minimum load allocation of 6.2kVA per single residence, with mini pillars installed on every second lot to provide the lots with a point of connection. Group housing/Apartment lots are provided with a load allocation of 4kva per apartment. Any lot with a power allocation of greater than 226kVA requires the installation of a Transformer within the lot to provide the point of connection.

The HV distribution system is reticulated via 11 or 22kV cables to switchgears at various points throughout the subdivision where each switchgear can feed between 2 -3 transformers per unit via a fused cable. Each transformer steps down the voltage to 415V and provides the LV distribution system to the development via low voltage cables.

This equipment is typically installed within the developed lots as an extension of road reserve and are required to be placed 0.5mtrs above the 1 in 100 year flood level.

Community Title Distribution

Where traditional subdivision of land occurs, and the Developer creates new lots then the Developer is the applicant of the Electricity Infrastructure works and pays and installs the required distribution infrastructure which is then handed over to Western Power at the completion of works.

For the proposed development utilising Community Titles, an authority connection via a Transformer and switchgear is provided to provide the necessary supply. The internal power distribution within the development will be via a private embedded electrical network which is an initiative that is made feasible under adoption of Community Titles. Behind the meter Distributed Energy Resources (DER) are proposed to be installed throughout the development. The DER will consist of solar PV. A single electrical connection point and master meter will be sourced from Western Power. This connection point is currently proposed as high voltage, with both high voltage and low voltage private distribution within the development. Community lighting and power will be provided and maintained by the embedded network operator.

Development Electrical Load

The overall Development load was calculated based on Western power's Design After Diversity Maximum Demand Calculator (DADMD). This is the maximum demand which the electrical distribution network (local transformer) is capable of supplying expressed as an average per home. Based on this and the provided yield the overall maximum demand was calculated at 1MVA and was applied to the proposed development as follows:

Lot	Rooms	Sites	Lots	Sqm	kVA	VA/Sqm Load	Total kVA
Hotel	65				4		260
Camping Sites		36			3.5		126
Holiday Homes			61		6.2		378.2
Cape to Cape Welcome Centre				110		90	10
Reception Hall				292		140	41
Restaurant				432		140	60
Wellness Centre				401		140	56
Rec. Lounge & Bar				356		140	50
Hire Shop				70		140	10
Surf Club				377		140	53
Cafe				255		140	36
General Store				127		140	18
Totals	65	36	61	2420			1097.2

Initial Conceptual Solutions

Based on the above yields we have estimated the maximum demand load to the precinct to be in the order of 1MVA.

It is anticipated that a HV Ringmain cable would be terminated up the existing overhead poles along the western side of Smiths Beach Road and run into a new Switchgear within the site. A 1MVA Non MPS Transformer would also be installed adjacent to the switchgear where a customer main switchboard is installed to distribute the necessary power around the site.

A review of the Network distribution mapping tool has indicated that there is currently 15-20MVA of capacity within the Busselton Zone substation which reduces to 10-15MVA in 2026, likely due to natural load growth. This indicates that the existing zone substation within the area will be able to accommodate the capacity to the development. A feasibility study with Western Power has been requested to confirm that the existing HV can accommodate the 1MVA load and this report will be updated once the information has been received.

Lighting

The lighting to the new internal roadways and car-parking will be designed to meet the levels of performance outlined in Australian 1158.3.1:2020 Lighting for roads and public spaces: Part 3.1: Pedestrian area (Category PR) lighting – Performance and Design requirements & Part 1.1: Vehicular traffic (Category V) lighting Performance and Design requirements.

LED Street lighting will be provided consistent with the pedestrian focus of the network.

The public areas at the beach front and mixed-use precinct will be lit to standards consistent with the tourist focus and using lighting furniture compatible with the landscaping design.

For the roadways, pole height and the type of fittings will be selected to minimise light spill which will be a focus in relation to minimising visual impacts and impacts to fauna. The kelvin rating will also be selected to minimise any direct effect on wildlife.



9. Communications

The existing NBN service within the area is via a Satellite service "Sky Muster". A fixed line service is not currently within the 1km distance required to facilitate an extension without cost. There is however existing Telstra Infrastructure within Smiths Beach Road.

New legislation has been passed having NBN listed as a clearing authority and will require Developers to fund and install a pit and pipe system to NBN requirements. The ownership of this infrastructure is transferred to NBN via the execution of a Developers Agreement in exchange for the provision of data infrastructure.

A development application with NBN will need to be placed to establish the costs associated with hauling fibre to the site, due to the development being in excess of 1km away from a fibre connection. Should these costs be excessive the alternative will be to secure a connection from Telstra. Either way the operator will take over ownership of the pit and pipe infrastructure provided as part of the development.



10. Gas

To support sustainability initiatives of reducing energy supply from fossil fuels, natural or LP gas reticulation will not be provided for the development.

Holiday Homes that wish to utilise LPG for hot water, cooking, etc. may do so through the installation of gas cylinders. The use of induction/electrical cooktops and heating will be encouraged.

Facilities within the commercial premises is expected to warrant and require gas use. Supply would be provided in the form of replaceable/refillable LPG cylinders within the back of house service zone. These final layouts will be developed through the detailed design of the development.



Figures

1. **Site Plan**
2. **Environmental Geology Map**
3. **Geotechnical Areas**
4. **Existing Water Infrastructure**
5. **Existing Power Infrastructure**

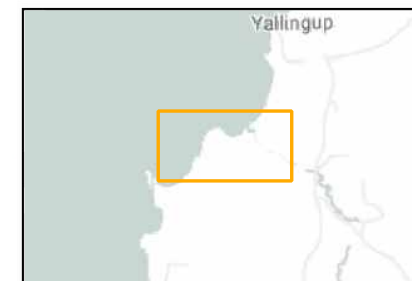


Figure 1 - Site Plan

Client: Smiths 2014 Pty Ltd
 Project: Smiths Beach
 Project Code: 47423

Basemap Service Credits: Aerial Latest (SLIP Locate)
 Map displayed in EPSG:28350
 Author: Malone, Daniel (Perth), Stantec (2021-07-14)

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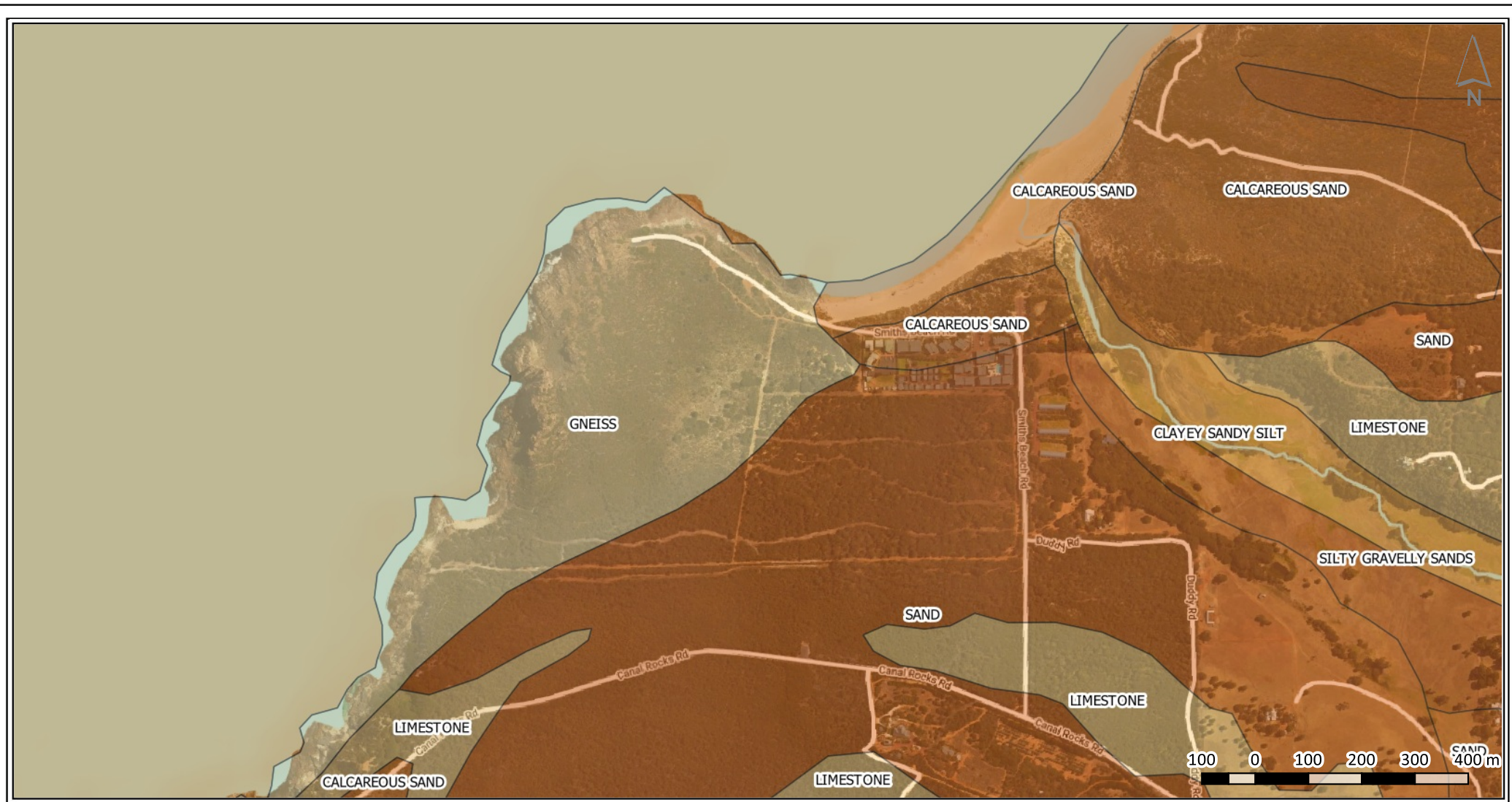


Figure 2 - Environmental Geology Map

Client: Smiths 2014 Pty Ltd
 Project: Smiths Beach
 Project Code: 47423

Basemap Service Credits: Aerial Latest (SLIP Locate)
 Map displayed in EPSG:28350
 Author: Malone, Daniel (Perth), Stantec (2021-07-14)

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LEGEND

Geoscience

1:50,000 Geological Series

Surface Geology (most areas)

- GN
- LS1
- Msc1
- Ocean
- S1
- S2
- S5
- S7
- Sgm2

WA Local Base Map

Google Terrain Hillshade copy

Google Basemap (SnazzyMap)

Aerial Latest (SLIP Locate)



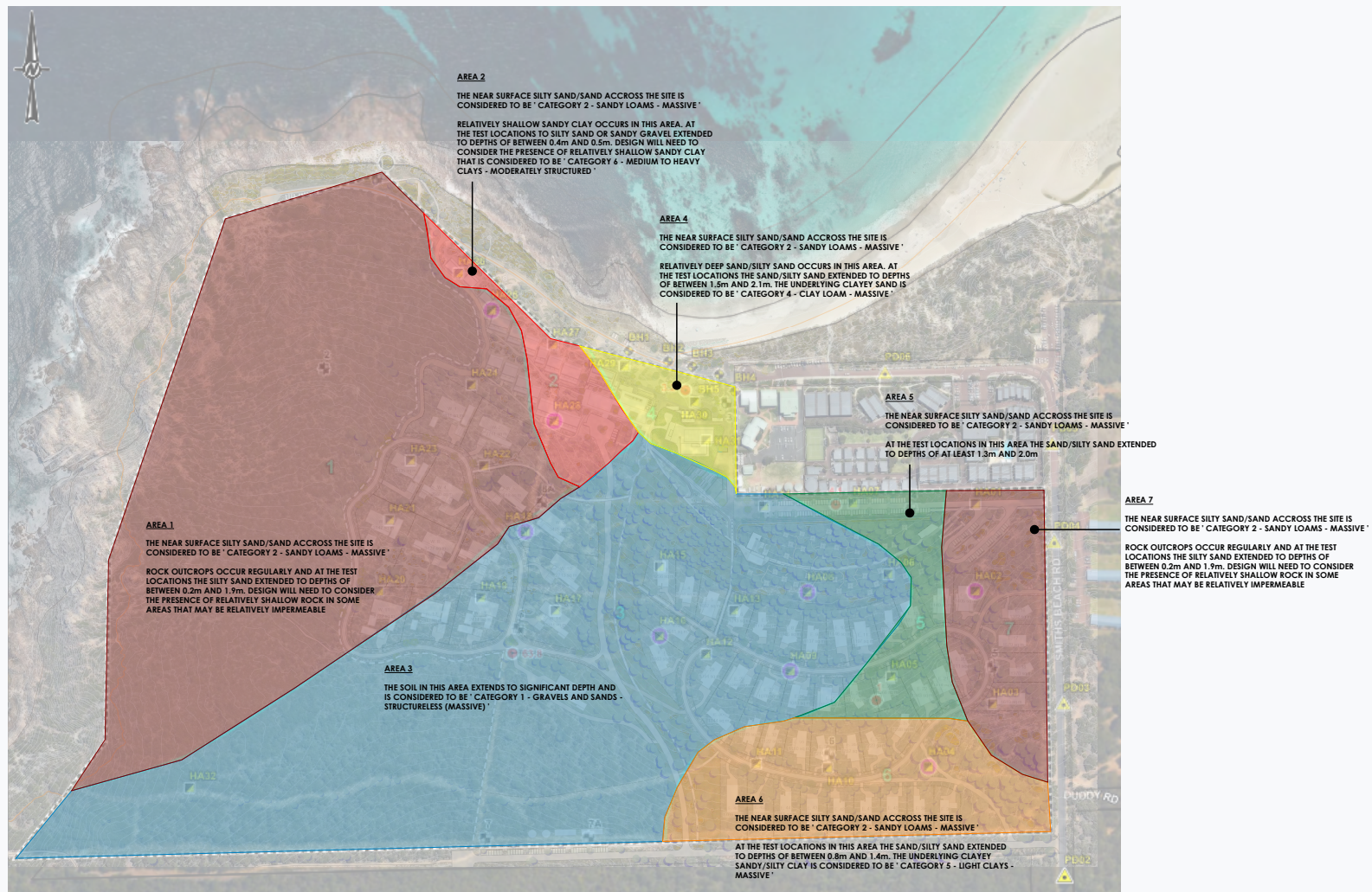


Figure 3 - Geotechnical Areas

Client: Smiths 2014 Pty Ltd
Project: Smiths Beach
Project Code: 47423

Basemap Service Credits: Aerial Latest (SLIP Locate)
Map displayed in EPSG:28350
Author: Malone, Daniel (Perth), Stantec (2021-07-14)

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Figure 4 - Existing Water Infrastructure

Client: Smiths 2014 Pty Ltd
 Project: Smiths Beach
 Project Code: 47423

Basemap Service Credits: Aerial Latest (SLIP Locate)
 Map displayed in EPSG:28350
 Author: Malone, Daniel (Perth), Stantec (2021-07-14)

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Figure 5 - Existing Power Infrastructure

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Project: Smiths Beach
Project Code: 47423

Basemap Service Credits: Aerial Latest (SLIP Locate)
Map displayed in EPSG:28350
Author: Malone, Daniel (Perth), Stantec (2021-07-14)

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LEGEND

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- Electrical_Transformers__WP-039_
- Electrical_Pillars__WP-041_
- Electrical_Enclosures__WP-040_
- Distribution_Overhead_Powerlines__WP-031_
- Distribution_Underground_Cables__WP-034_
- Distribution_Pole__WP-029_
- High_Voltage_Distribution_Lines



Appendix 1 – Concept Plans

Earthworks Concept Plan

Roads Concept Cross Sections

Roads Concept Long Sections

Sewer Concept Plan

Water Concept Plan

Drainage Concept Plan




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Revision	Rev	By	Appd	YYYY.MM.DD

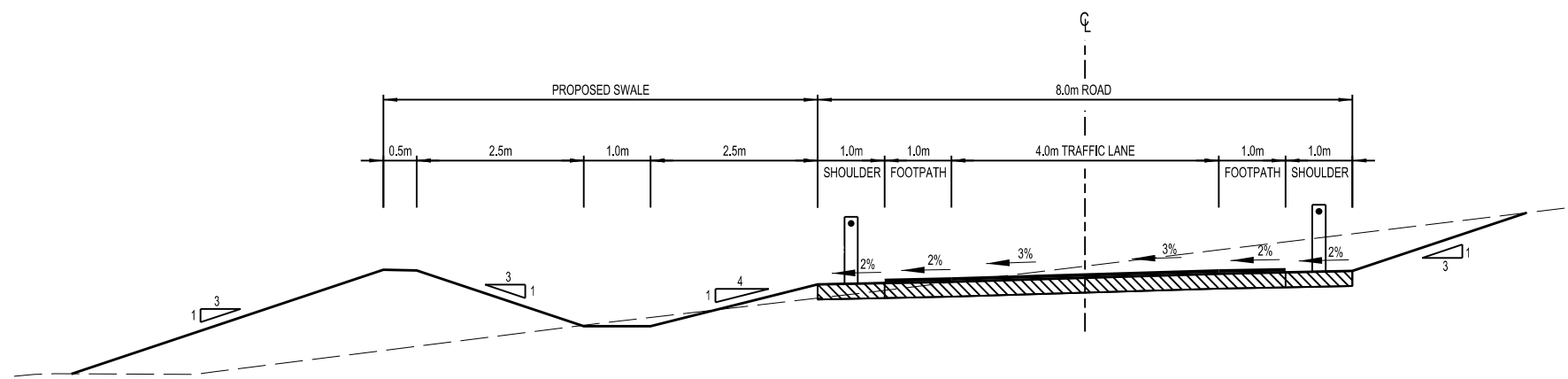
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- EXTENT OF EARTHWORKS BOUNDARY
- EXISTING CONTOURS - 1.0m INTERVAL
- DESIGN CONTOURS - 1.0m INTERVAL
- PROPOSED ROAD KERB
- PROPOSED SWALE
- PROPOSED RETAINING WALL

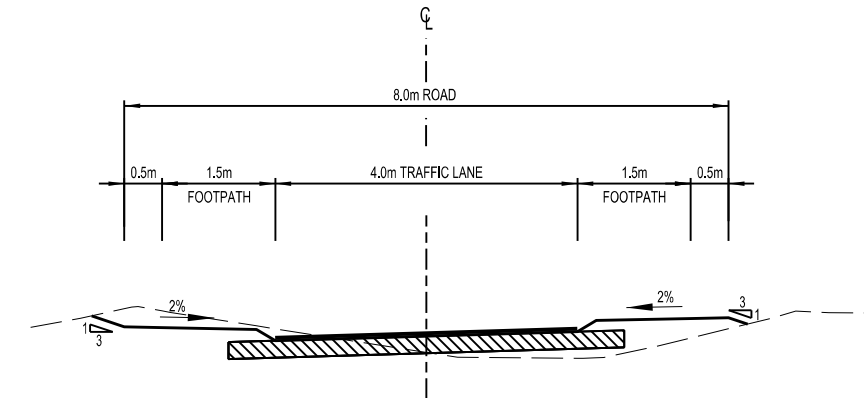
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74,921m2



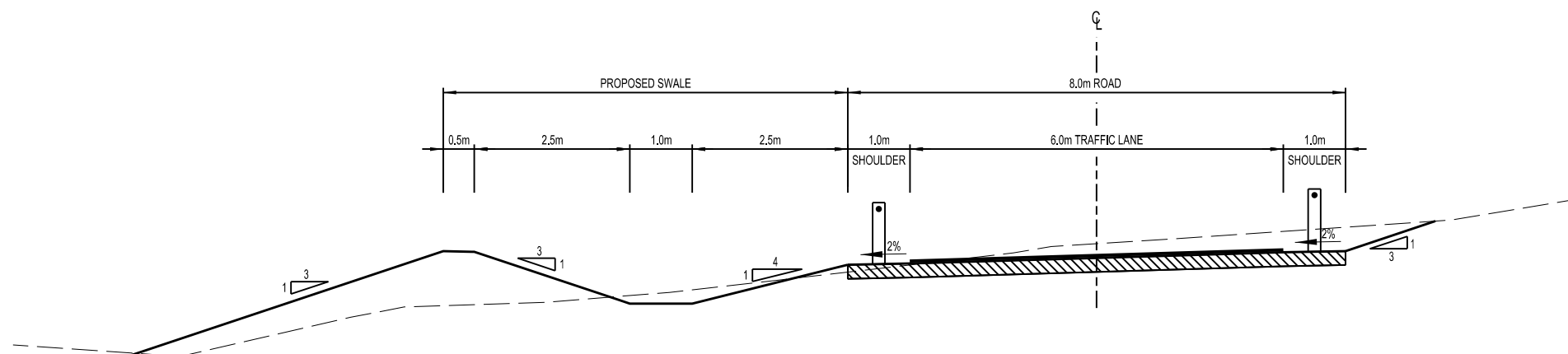
 STANTEC PERTH Ground Floor, 226 Adelaide Terrace, Perth, WA, 6000 Tel: +61 8 6222 7000 www.stantec.com	Paper Size/Scale Bar A3 1:1250 12.5 0 12.5 25 37.5 50 62.5 A1 1:2500	Issue Status PRELIMINARY NOT FOR CONSTRUCTION This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.	Client/Project: Smiths 2014 PTY LTD SMITHS BEACH Project No.: 301247423	Title EARTHWORKS CONCEPT PLAN Revision: B Date: 2021.08.17 Drawing No. C1EW-P1C
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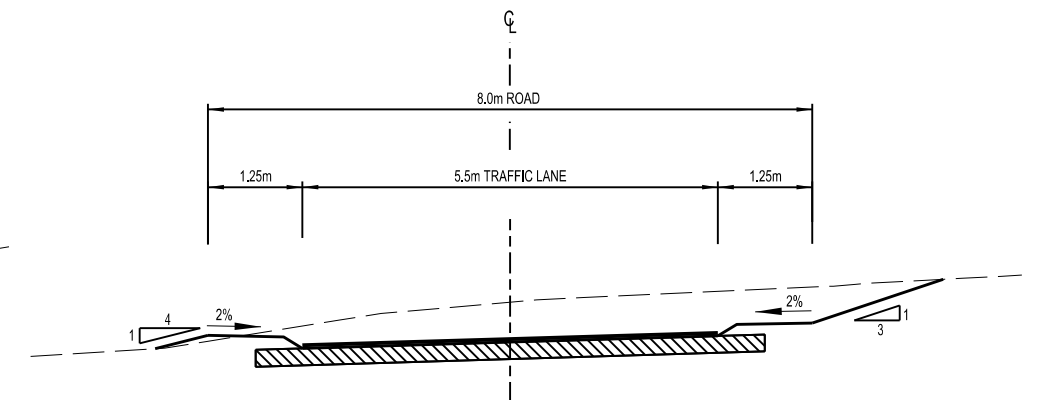
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SCALE 1:100



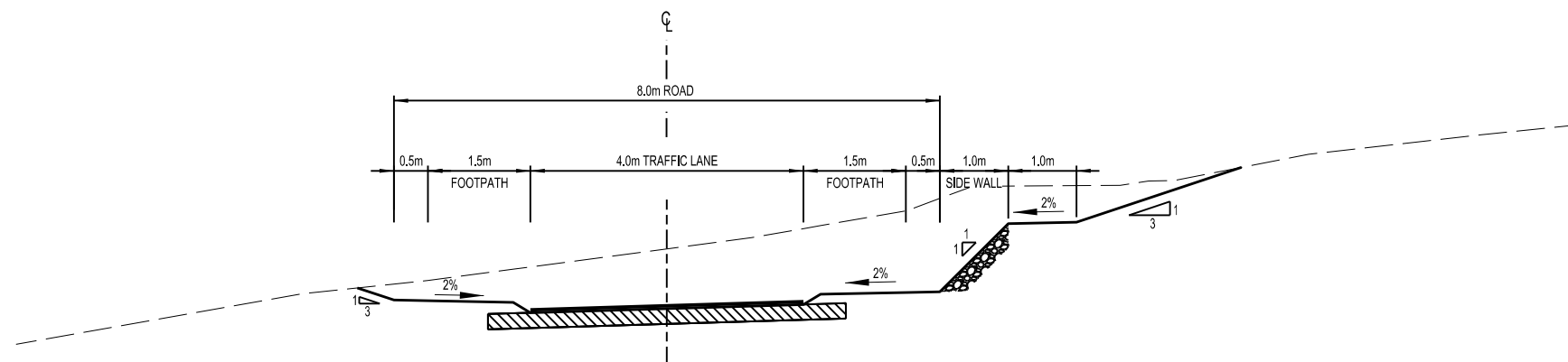
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SCALE 1:100



TYPICAL ROAD CROSS SECTION - TWO WAY - UNKERBED
SCALE 1:100

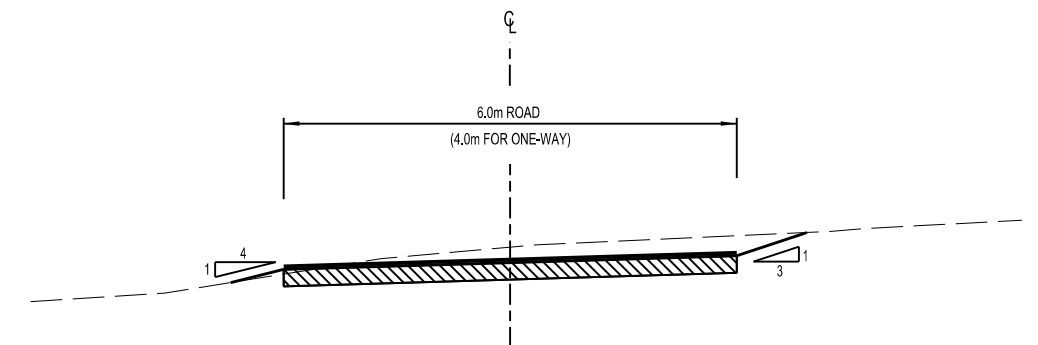


TYPICAL ROAD CROSS SECTION - TWO WAY - KERBED
SCALE 1:100



TYPICAL SIDE WALL DETAIL (ONE WAY KERBED AS EXAMPLE)
SCALE 1:100

VERGE TO BE WIDENED TO
ACCOMMODATE PATH IF REQUIRED.



TYPICAL EMERGENCY ACCESS WAY - TWO WAY
SCALE 1:100

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1:100 A3

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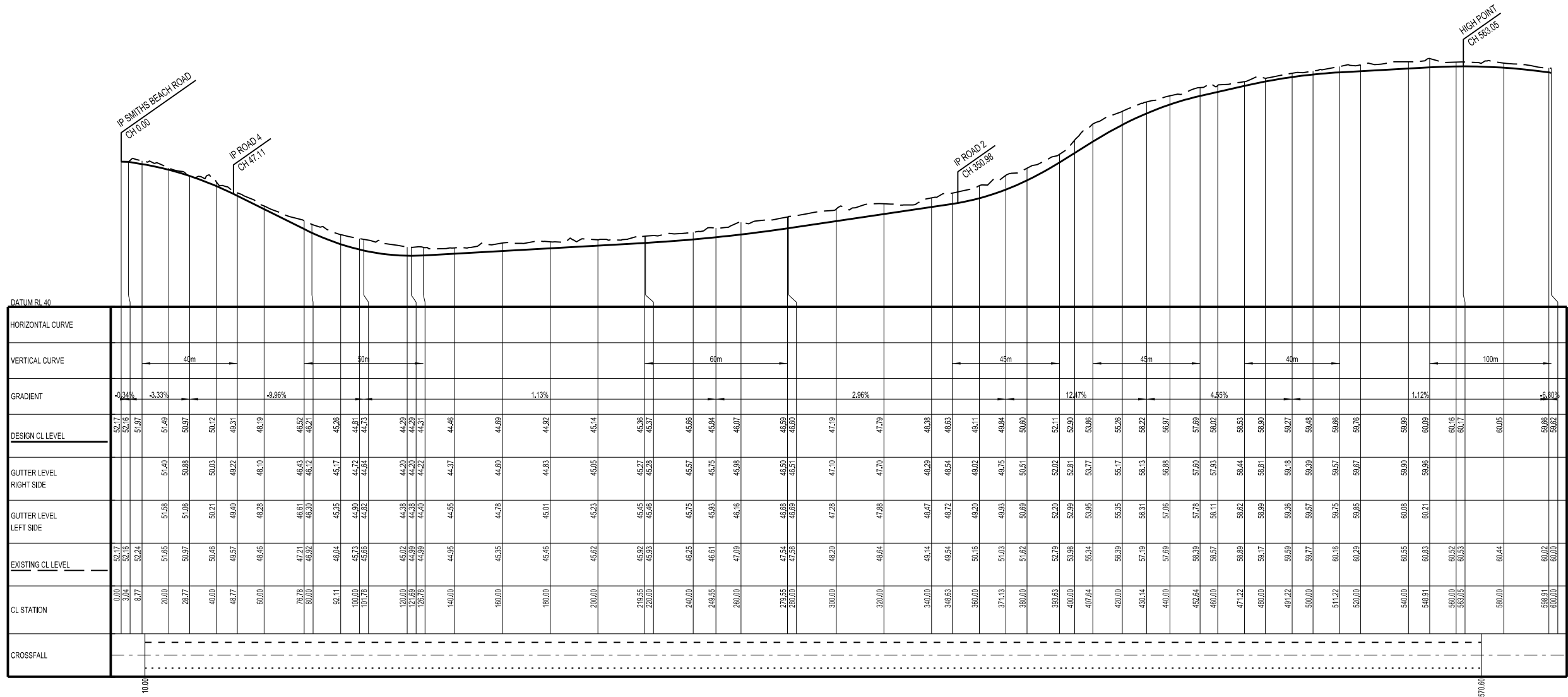
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ROAD CONCEPT CROSS
SECTIONS

Revision:
B

Date:
2021.08.17

Drawing No.
CHD-C1C



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H 1:2000 @ A3

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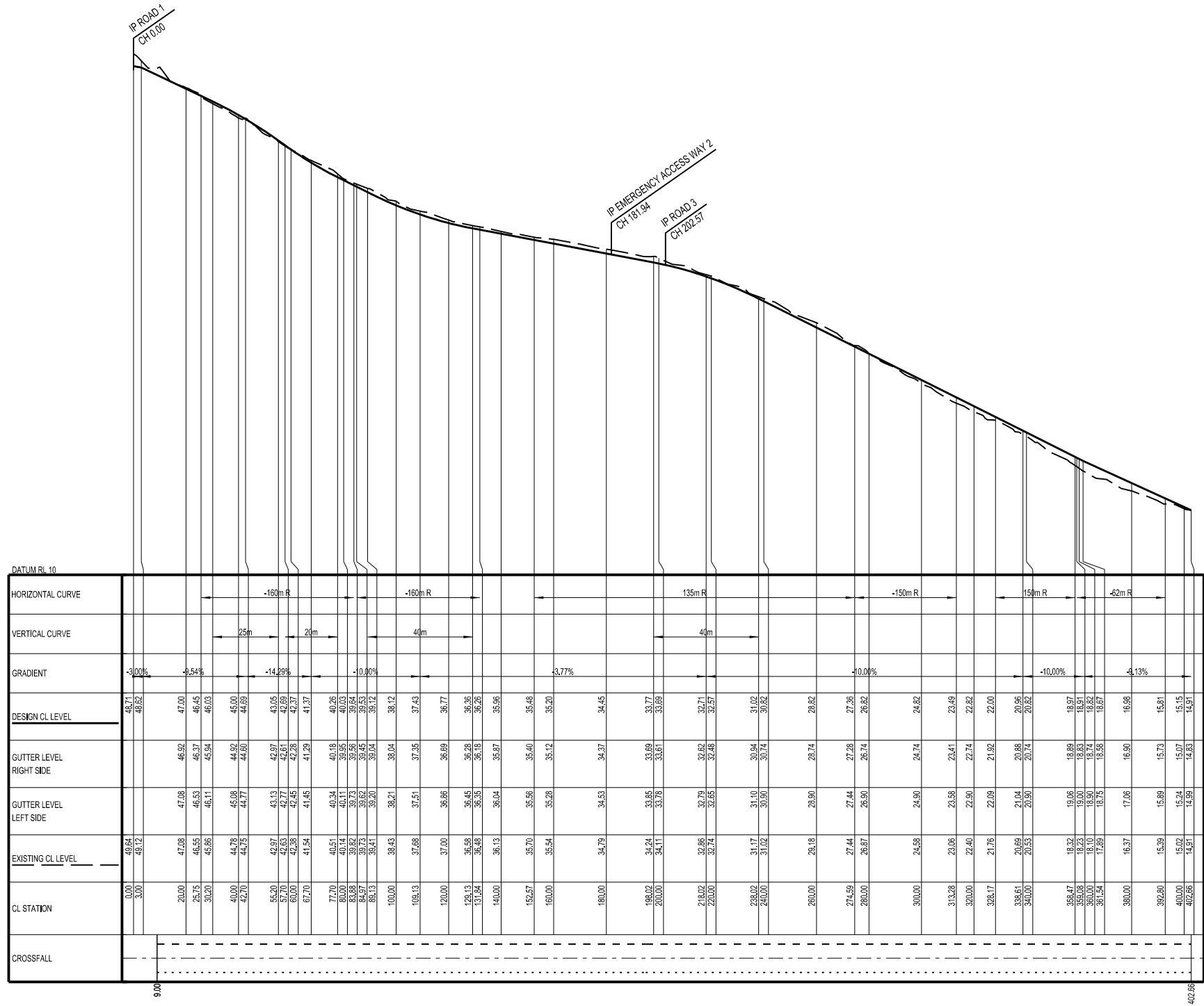
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ROAD CONCEPT LONG
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Revision:
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Date:
2021.07.15

Drawing No.
CHRD-L1C



ROAD 2

SCALE V 1:400 @ A3
H 1:2000 @ A3

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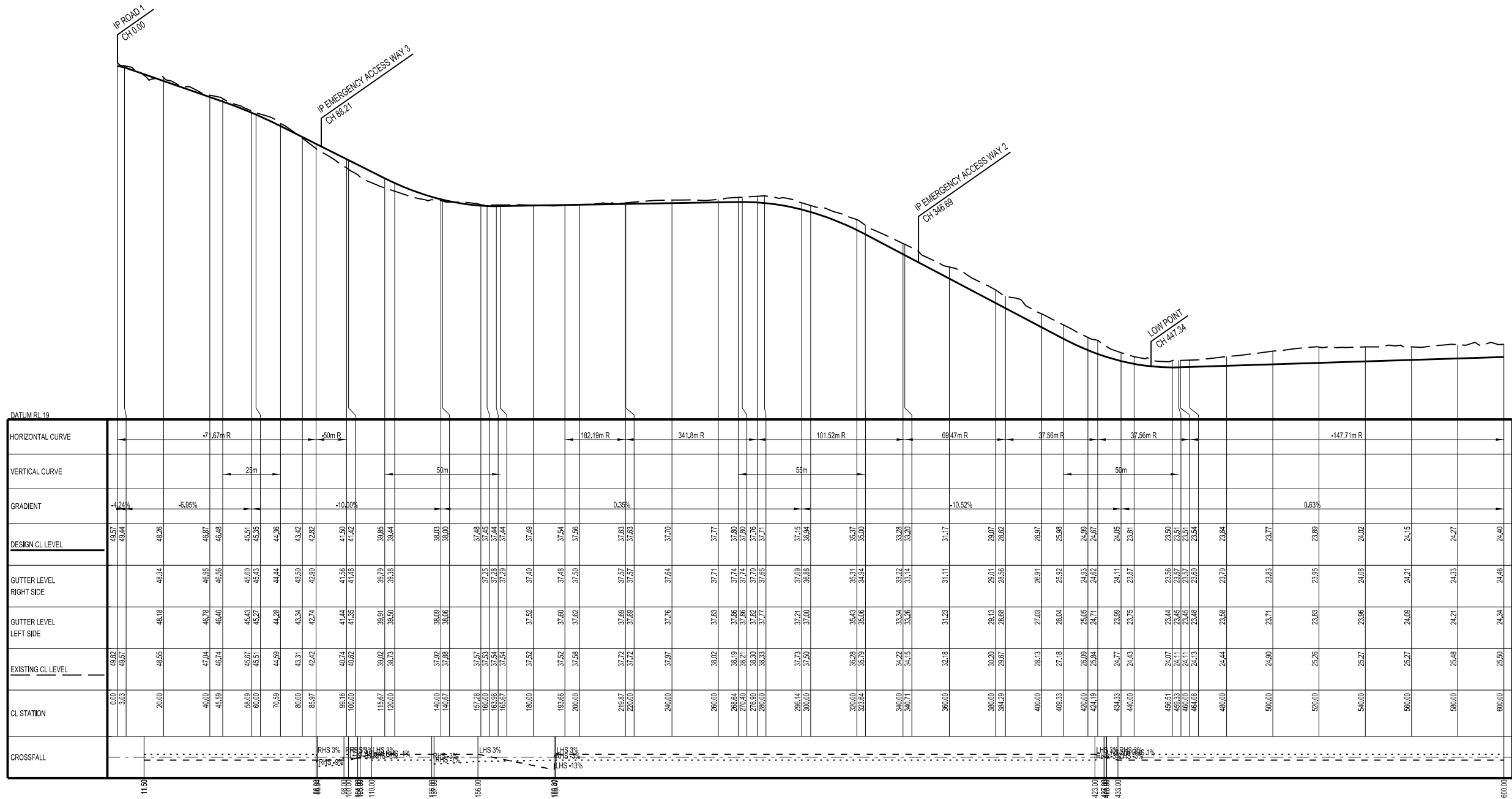
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Revision:
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Date:
2021.07.15

Drawing No.
CIRD-L3C



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H 1:200 @ A3

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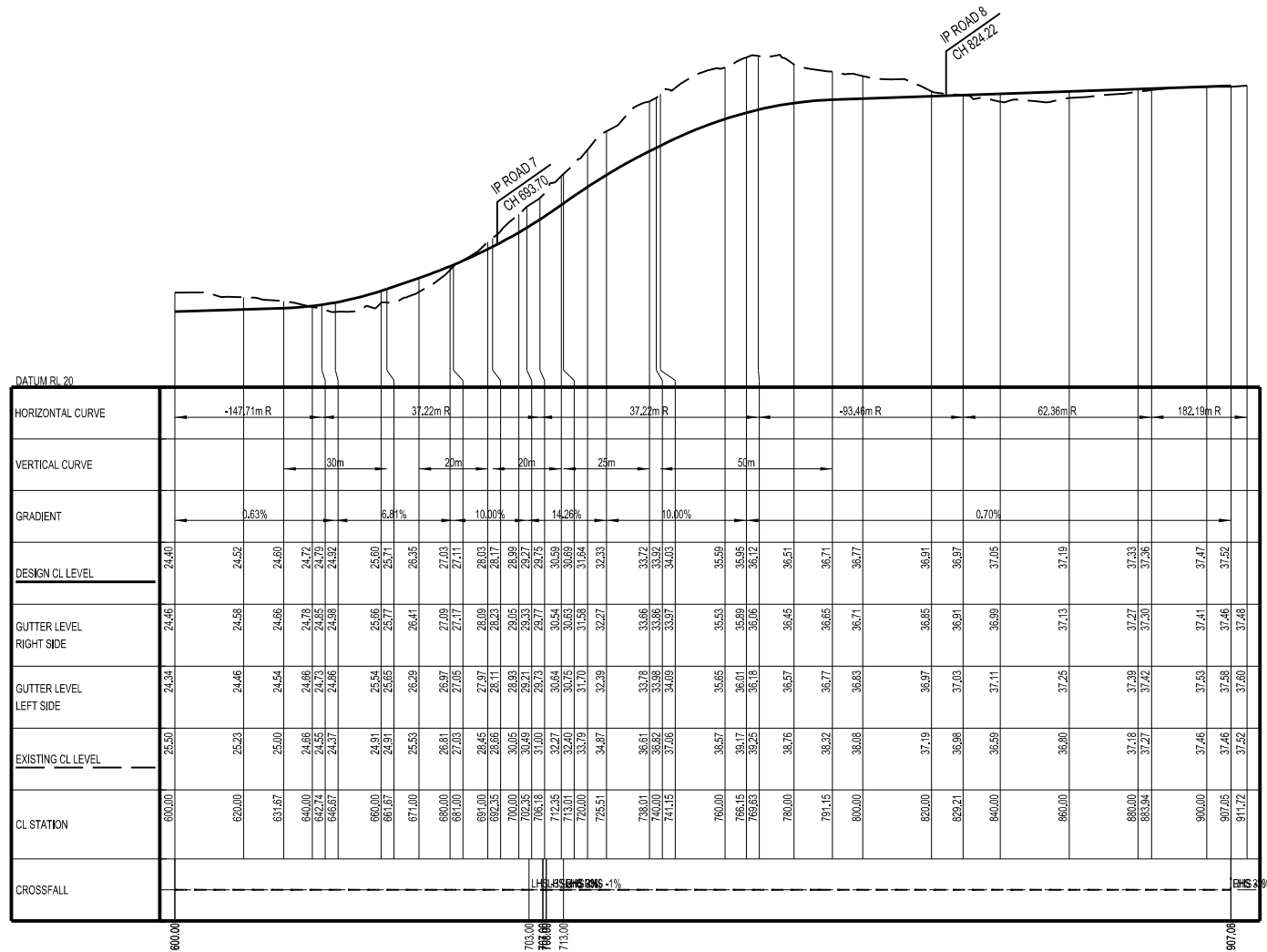
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ROAD CONCEPT LONG
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Revision:
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Date:
2021.07.15

Drawing No.
CHRD-L5C



ROAD 4 (CONTINUED)

SCALE V 1:1400 @ A3

H 1:200 @ A3

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A1 A3

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ROAD CONCEPT LONG
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Revision:

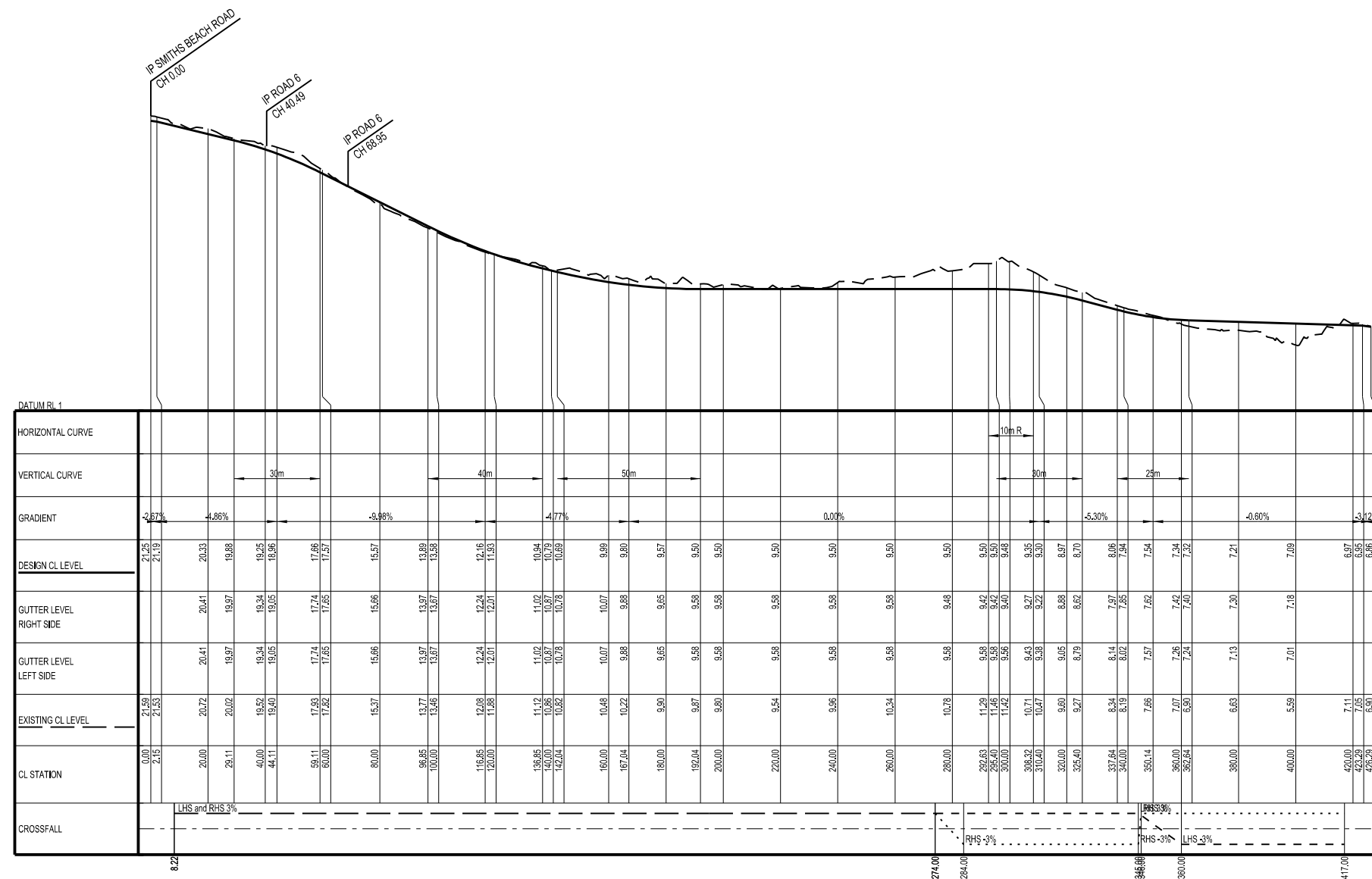
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2021.07.15

Drawing No.

CHRD-L6C



ROAD 5
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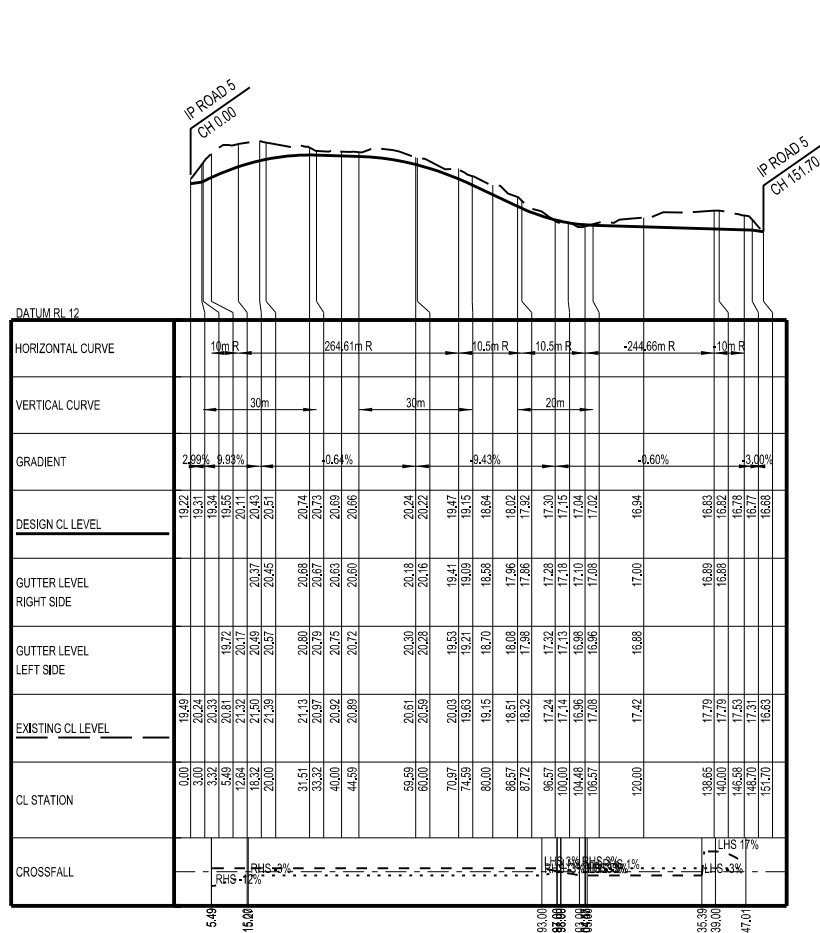
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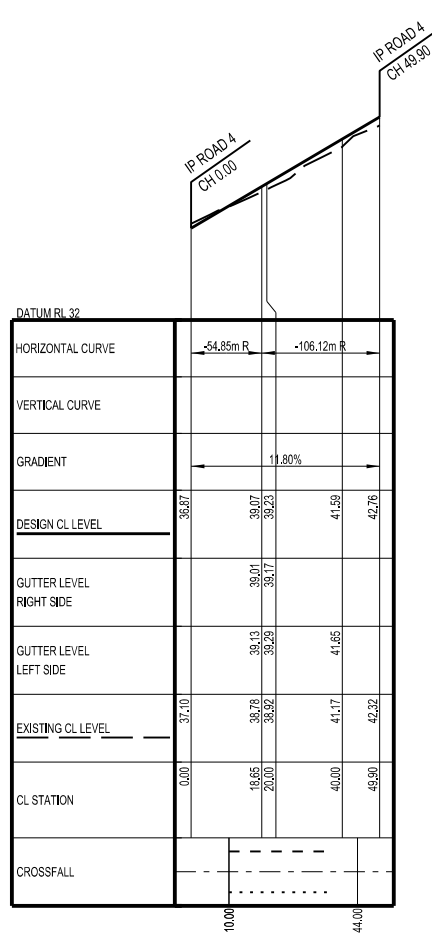
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Revision: A Date: 2021.07.15 Drawing No. CIRD-L7C



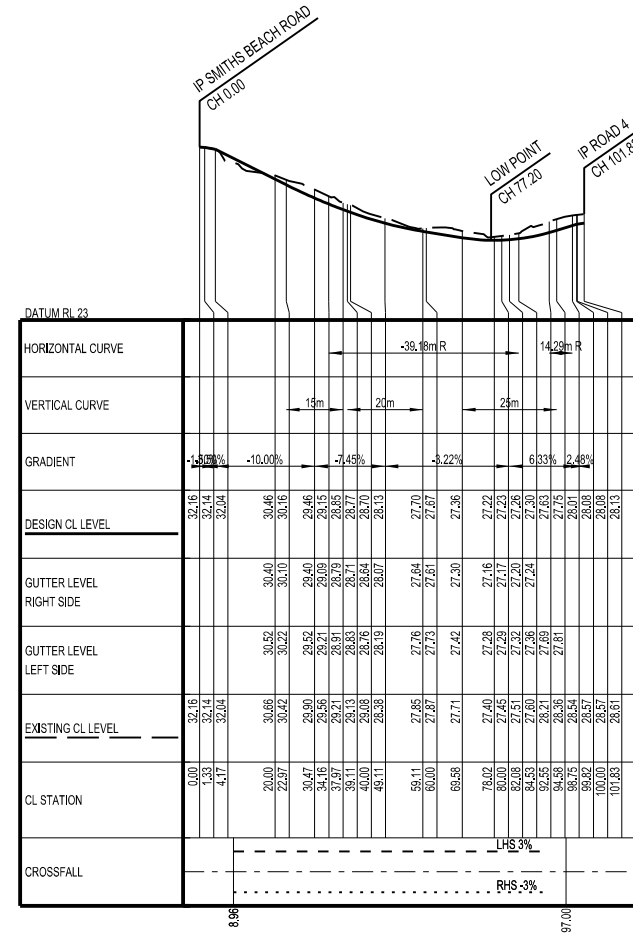
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ROAD 7

SCALE V 1:1400 @ A3
H 1:200 @ A3



EMERGENCY ACCESS WAY 3

SCALE V 1:1400 @ A3
H 1:200 @ A3

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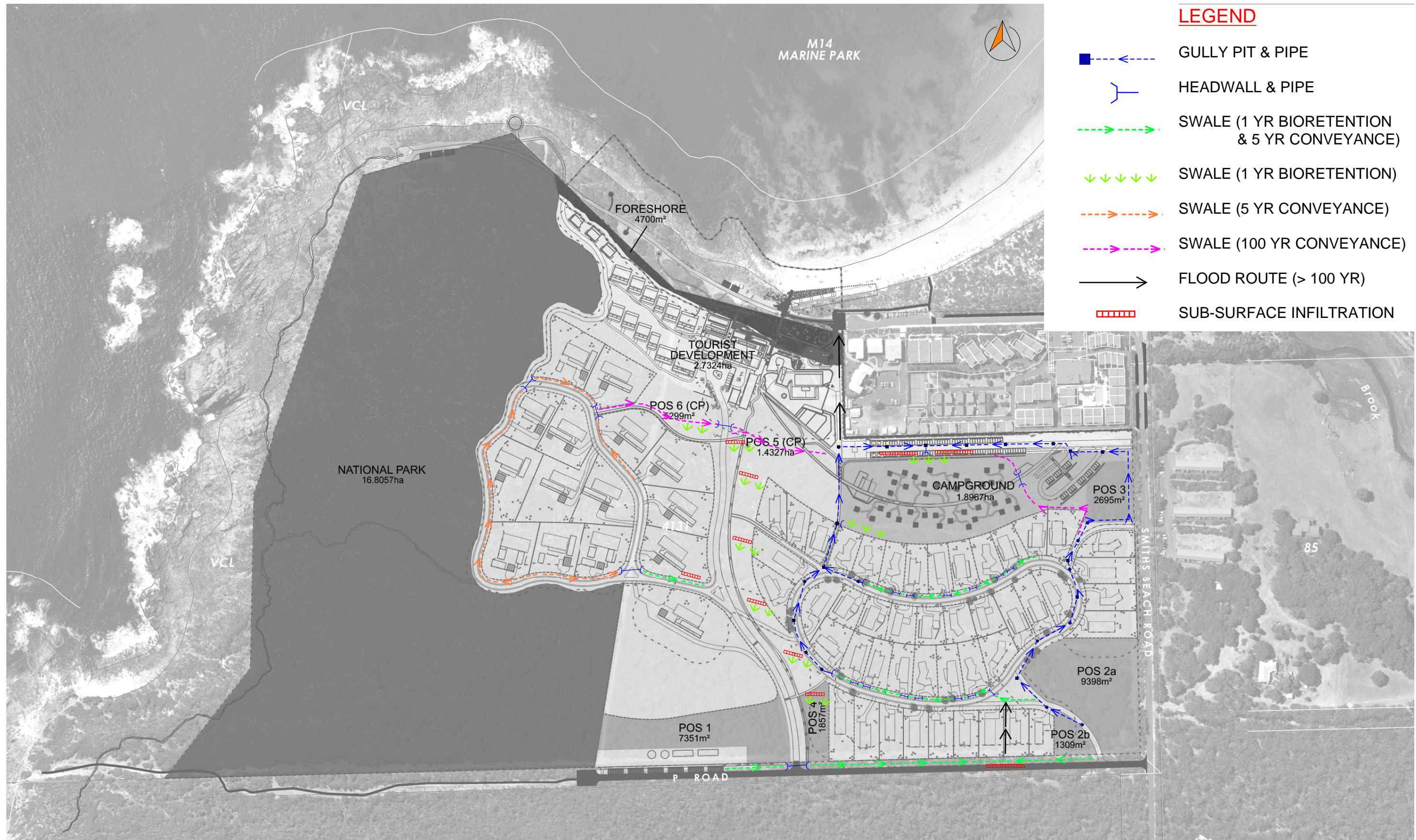
Smiths 2014 PTY LTD
SMITHS BEACH

Project No.:
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




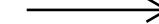

Title

ROAD CONCEPT LONG
SECTIONS - SHEET 8

Revision: A Date: 2021.07.15 Drawing No. CIRD-L8C



LEGEND

-  GULLY PIT & PIPE
-  HEADWALL & PIPE
-  SWALE (1 YR BIORETENTION & 5 YR CONVEYANCE)
-  SWALE (1 YR BIORETENTION)
-  SWALE (5 YR CONVEYANCE)
-  SWALE (100 YR CONVEYANCE)
-  FLOOD ROUTE (> 100 YR)
-  SUB-SURFACE INFILTRATION



Notes

SCALE: NTS

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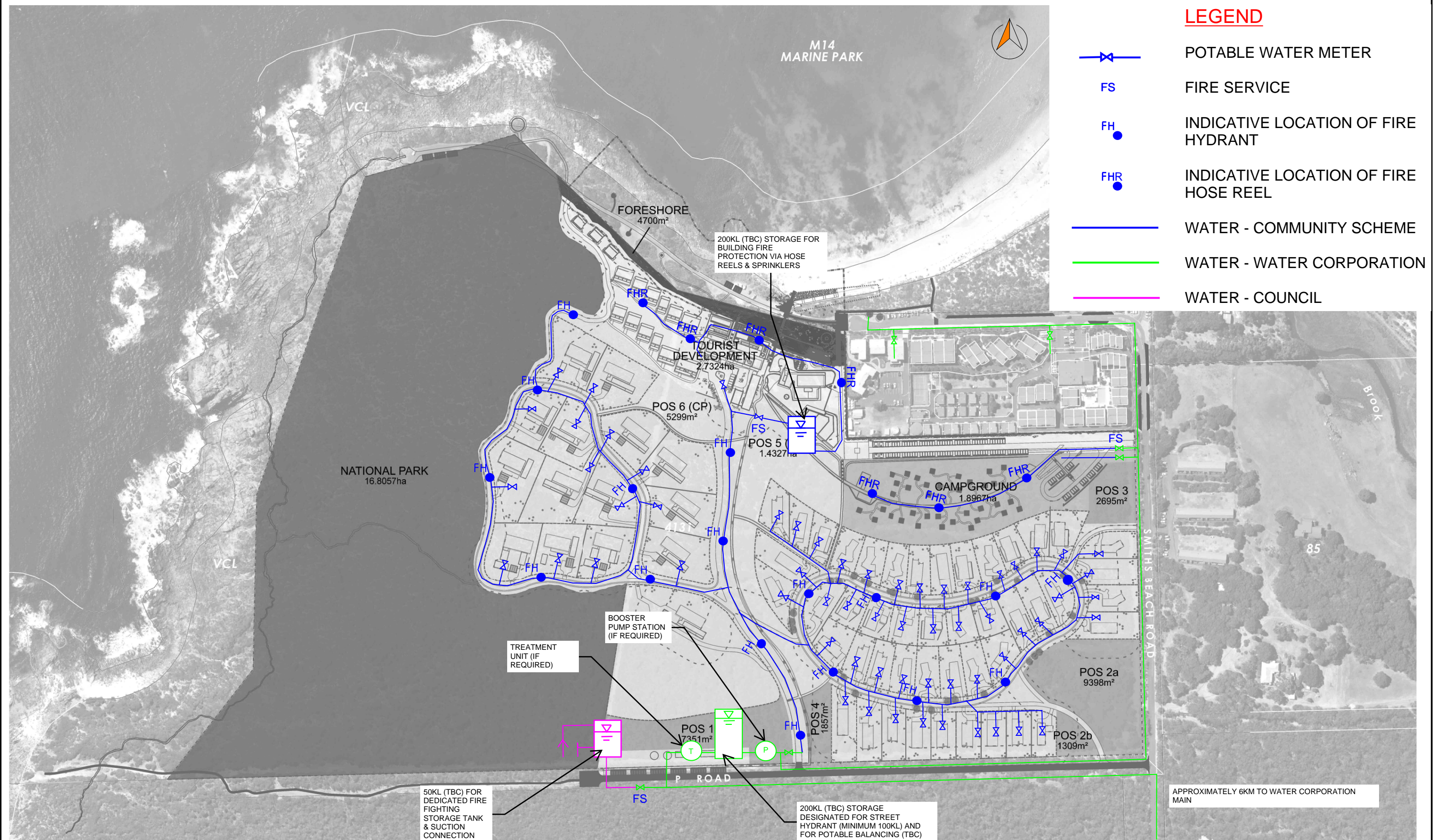
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Title

Reference Sheet

Date

Figure No.



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