



# *Lake Ainsworth Foreshore Improvement Works*

## **» Engineering Services Report**

*By Ballina Shire Council*

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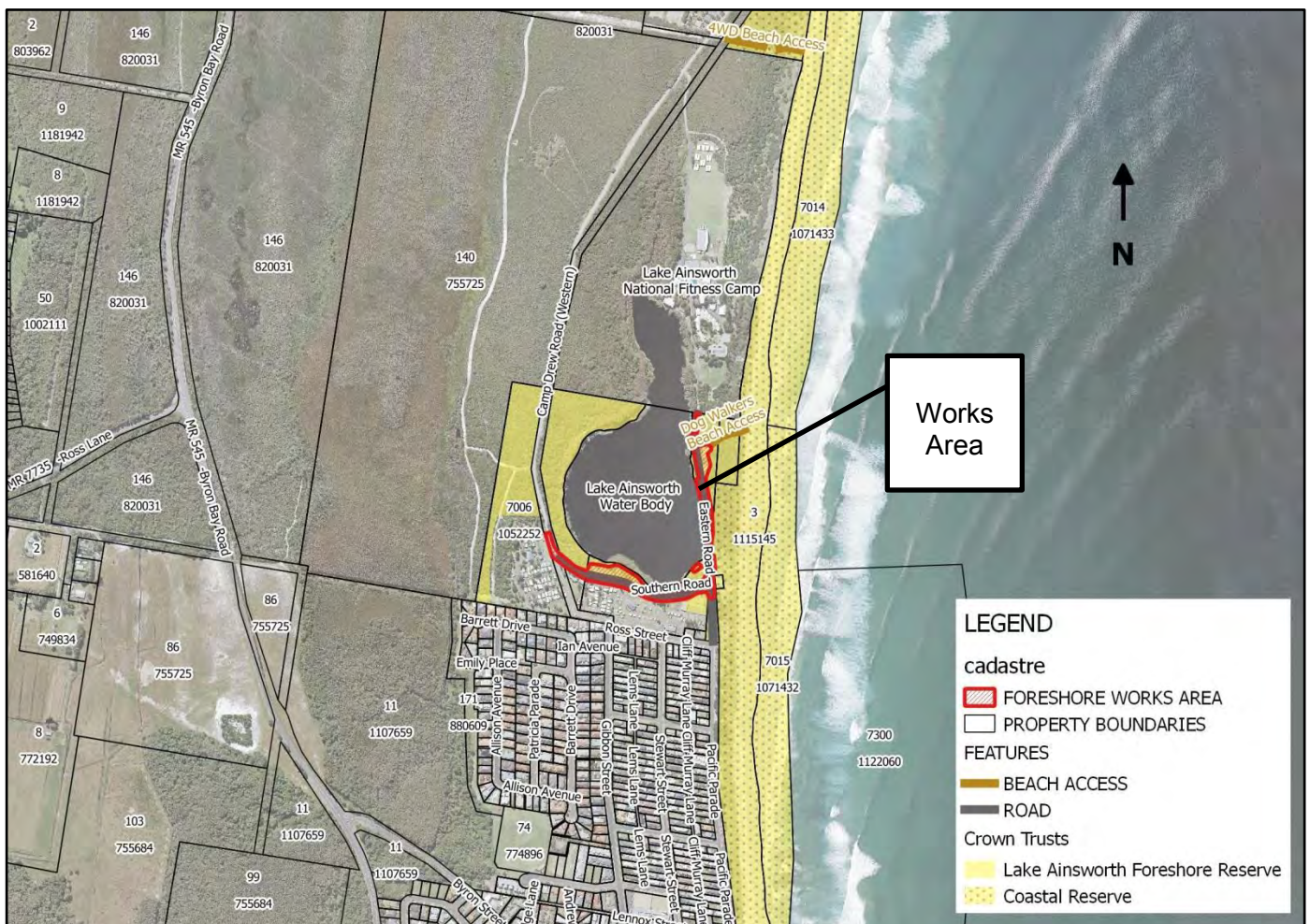
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# 1 Introduction

Ballina Shire Council Engineering Design and Survey services team has prepared this Engineering Services Report to accompany a Part V assessment for the foreshore improvement works at Lake Ainsworth, Lennox Head NSW within the Ballina Local Government Area. The proposed works lie within land parcels described as Lot 62 DP 755725, Lot 7016 DP 1113629, Lots 1, 2 and 3 DP 1115145, Lot 7022 DP 1052251 and the Camp Drew road reserve (western road). Figure 1 below shows the locality of the foreshore improvement works.



**Figure 1: Lake Ainsworth Foreshore Improvement locality plan**

This report relates to the engineering design, traffic and stormwater requirements of the foreshore improvement works. The scope of the project is for works within the public recreational park land around the Lake Ainsworth foreshore. These works include extending the existing parkland, installation of new additional seating and picnic/BBQ facilities and bank stabilisation. The objectives of this report are to demonstrate the proposed new engineering modifications meet the appropriate level of engineering service.

## 2 Background

Lake Ainsworth is a freshwater coastal lake at Lennox Head, NSW. It is a unique natural water body and provides educational and recreational opportunities for local residents and visitors, especially during the warmer months of the year. It is valued highly by the wider community and the management of the lake and surrounding foreshore has been challenging in maintaining the balance in the preservation of the environmental value of the lake and its recreational usage. There have been numerous studies undertaken and management plans prepared in recent years to help guide the decisions regarding the management of the lake.

*The Lake Ainsworth Lake Processes Study* (LALPS) was completed in 1996 by Australian Water and Coastal Studies et al. (AWACS, 1996) which was commissioned support the preparation of the subsequent management plan. The process study is considered to be the most comprehensive scientific study undertaken for Lake Ainsworth and looked to quantifying and understanding the complex environmental processes including bathymetric survey of the lake bed, sediment sampling, water quality sampling and monitoring, flora and fauna survey, groundwater quantity and level monitoring and core hole drilling for interpretation of local stratigraphy.

*Lake Ainsworth Management Plan* (LAMP) was subsequently prepared in 2002 as the plan of management applicable to Lake Ainsworth and its immediate surrounds. The LAMP seeks to implement and regulate actions within the Lake Ainsworth area to ensure that competing uses and processes are managed so the quality of the lake is ultimately improved. The LAMP was adopted by Council, however does not expressly refer to the Crown Lands Act.

The *Ballina Coastal Reserve Plan of Management* (BCR PoM) was first prepared in 2003, and then revised in 2011 with the primary objective of rationalising all vacant Crown lands and existing Crown Reserves into a single coastal reserve for the notified purpose of Public Recreation and Coastal Environmental Protection with the appointment of Ballina Shire Council as Reserve Trust Manager. The BCR PoM (2012) makes reference to implementation of the LAMP (2002).

Since the LAMP (2002) was adopted by Council, the *Lake Ainsworth Crown Reserve Master Plan* (LACRMP) was prepared in 2005 by Connell Wagner for the foreshore improvement of Lake Ainsworth. This master plan document was the first iteration of plans to close the eastern road to public vehicular access and varied from the LAMP (2002) whereby it:

- a) Supports the closure of the eastern road (apart from emergency/maintenance provisions)
- b) Rehabilitates the existing eastern road with a shared path suitable for emergency access provisions to the NSW Sport and Recreational Centre and maintenance access from Council
- c) Provides for a new road through the middle of the caravan park (through the existing road reserve) connecting Ross Street to Camp Drewe Road (the western road).

Since the preparation of LACRMP, there has been considerable debate and divided views in the community regarding the most appropriate strategy regarding vehicular access and closure/ realignment of roads in the Lake Ainsworth precinct and the LACRMP has not been implemented.

In 2014, Complete Urban Pty Ltd was engaged by Ballina Shire Council to prepare a master plan of the *Provision for Design of the Lennox Head Surf Club and Surrounding Precinct*. It incorporated redevelopment of the surf club building and the surrounding Lake Ainsworth precinct. The options provided by Complete Urban Pty Ltd was publicly exhibited and community consultation was undertaken for three broad options:

1. Eastern road closure (except to emergency vehicles) with through traffic to the western road (Camp Drew Road) via the southern road;
2. Eastern road reconstruction to allow public vehicle access to the Lake Ainsworth Sport and Recreation Centre only (no parking provisions) along the eastern road with through traffic to the western road (Camp Drew Road) maintained via the southern road; and
3. Eastern road closure (except to emergency vehicles) with through traffic to the western road (Camp Drew Road) from Ross Street through the Lake Ainsworth Caravan Park. The southern road is then turned into a no through road (parking provisions only)

Following the completion of the community consultation, at the 18 December 2014 Ordinary meeting Council then resolved (Item 11.1 Lake Ainsworth – South Eastern Precinct - consultation):

*That the eastern road be closed and the area be converted to public open space to improve the amenity of the area and to reduce erosion and stormwater runoff entering the Lake.*

In response to the Council resolution, Council engaged Design Team Inc. to prepare a *Concept plan of the Lake Ainsworth Recreation Precinct Works*. The preparation of the plan was undertaken with Council's engineering design team *and* in direct consultation with elected Councillors during two briefing sessions. The Concept Plan was adopted by Council resolution at the 24 March 2016 general meeting (Item 11.1 Lake Ainsworth South Eastern Precinct Upgrade – Concept Plan). The details within the concept plan included the future surf club redevelopment to ensure that surrounding landscape works is conducive to what will be an "ultimate state".

A Part V assessment of stage 1 of the concept plan was undertaken by Council in 2016. Stage 1 included the eastern road closure and eastern foreshore works and an intersection upgrade. Council have not undertaken any works under this assessment and have now extended the scope of stage 1 to include the Southern Road and foreshore works and have undertaken further studies to accompany this Part V which will supersede the previous Part V assessment undertaken in 2016.



## 3 Traffic Assessment

### 3.1 Traffic Generation

Existing traffic generators in the Lake Ainsworth precinct are identified in this study as being:

- Recreation use of Lake Ainsworth and patrolled section of Seven Mile Beach
- Alstonville and Lennox Head Surf Lifesaving Club
- Lake Ainsworth Sport and Recreation Centre
- Camp Drewe
- 4WD vehicles accessing Seven Mile Beach
- Pegasus Park Equestrian Centre Beach Riding
- Lake Ainsworth Holiday Park – Overflow traffic generated during periods of high patronage

The Eastern Road, north of the intersection with the Southern Road currently provides public vehicular and emergency access on a 5-6m wide bitumen seal road to the Lake Ainsworth Sport and Recreation Centre and provides road side parking to the eastern side of Lake Ainsworth. The Sport and Recreation Centre also has a secondary driveway access off Camp Drewe Road, however the primary public access is currently off the Eastern Road. The secondary access in the past has been used when the Eastern Road has been inundated and cut off by flooding from Lake Ainsworth.

The proposed foreshore improvement works including the closure of the Eastern Road will not directly generate additional traffic, however the works will result in redirection of existing traffic. The redirection of traffic will include:

- Through traffic to the Lake Ainsworth Sport and Recreation Centre currently along the Southern Road and Camp Drewe Road to the existing secondary driveway access;
- Local recreational traffic looking to park lake side to alternative parking along the Southern Road or alternative car parks; and
- Local dog walkers accessing seven mile beach 'off leash' area to alternative parking.

Access to the Lake Ainsworth Sport and Recreation Centre will be impacted by the Eastern Road closure as the existing main entrance will no longer facilitate access for public vehicles. The secondary entrance to the Camp Drewe Road is a legal access to Council's road network, however adds approximately 1.2km journey to the Sport and Recreation Centre, part of which will be via an unsealed section of road. This is an acceptable level of service, however would generally be seen as a reduced level of service for the Lake Ainsworth Sport and Recreation Centre when compared to that currently available via the Eastern Road.



A portion of the vehicles accessing the Lake Ainsworth Sport and Recreation Centre are heavy vehicles which will require a left/right turn manoeuvre at the intersection between Pacific Parade and the Southern Road and the secondary driveway access to the Sport and Recreation Centre (off the Camp Drewe Road). Turn path analysis has been undertaken to confirm adequate clearances and provisions have been made for heavy vehicles performing left/right manoeuvres at the new intersection and existing secondary driveway. Refer to drawings in Appendix A.

Emergency vehicle access is being maintained to the Sport and Recreation Centre via the eastern corridor. The landscape and engineering design of the eastern corridor involves removing the road pavement and replacing with a 3m wide reinforced concrete pathway designed to accommodate heavy vehicle loading. The pathway follows a 6m wide clear corridor for emergency access linking Pacific Parade and the Lake Ainsworth Sport and Recreation Centre. This allows passage of persons and vehicles with adequate width clear of obstructions to allow two vehicles to pass safely.

The redirection of traffic generated by dog walkers that currently access the off leash section of Seven Mile Beach park is uncertain, as it is subject to Council's policy relating to where dogs are permitted in the crown reserve areas. Two alternatives are currently available to dog walkers:

- Alternative parking in the south eastern Lake Ainsworth precinct (in and around the surf club). Access to Seven Mile Beach via existing access to the north of the surf club;
- Driving up the Western Road to the north side of the lake and parking near the 4WD beach access.

Both possible scenarios are considered in this study.

### 3.2 Traffic Volume Counts

The main traffic generator in the Lake Ainsworth precinct is local recreational users of the Lake, surf club and surf beaches. Local traffic is highly variable depending on the recreational demand for the lake and beaches which coincides with a pronounced peak during school holidays and long weekends, especially in the summer months. Through traffic along the Eastern Road to the Lake Ainsworth Sport and Recreation Centre and through traffic along Camp Drewe Road is less variable and is a small proportion of the volume during peak periods.

Metrocount Traffic Classifiers were set for a period of 5.5 weeks covering the 2017 Easter Qld and NSW school holidays and a period of 1-2 weeks before and after the school holiday period to establish baseline Average Daily Traffic (ADT) volumes for the Lake Ainsworth precinct. The objective of undertaking the traffic count was to quantify existing traffic volumes and assess the anticipated effect of the redirection of traffic will have on the existing road network.

The school holiday period including the Easter and ANZAC day long week end has historically been one of the busiest periods for Lake Ainsworth precinct and is considered to be an appropriate representation of a “peak” period. Extending the traffic count period into the school term either side of the holiday period was done to quantify comparison volumes during an “off peak” period.

The three classifier locations were used to segregate through traffic along the Eastern Road and Camp Drewe Road from the local recreational traffic volume. The location of the counters is shown in Figure 2 and described as follows:

1. **Pacific Parade** (between Ross Street and Southern Road Intersections) – This is a ‘total’ count of the combined traffic load of through traffic to Sport and Rec, Camp Drewe Road, and local traffic accessing the lake and beach. The only movements not captured by this counter are the traffic exiting the beach side car park, however this traffic would not be redirected by the eastern road closure.
2. **Eastern Road** north of the existing turn area – This is the ‘through’ traffic to the Sport and Recreation Centre. It is likely to overestimate the through traffic as a proportion of this traffic turns around at the gate entrance; however for the purposes of the traffic study is considered an appropriate conservative count of traffic volume that will be redirected along Camp Drewe Road with the Eastern Road closure.
3. **Camp Drewe Road** – Counts ‘through’ traffic along the Camp Drewe Road (Western Road).

The local recreational traffic for beach/lake users was calculated by subtracting counts 2 and 3 from count 1 for each day in the period. Similarly, the traffic volumes along Camp Drewe Road with the redirection of traffic resulting from the closure of the Eastern Road was estimated by adding count 2 and 3 for each day in the period.

Due to regional flooding leading up to Easter, the traffic volumes during the first week of Qld school holidays was substantially less than would be expected. Historically, occupancy rates at Lake Ainsworth Holiday Park have been a good indicator of holiday visitors to Lennox Head and consultation with the park managers showed occupancy rates were low and there were a number of cancellations of booked sites resulting from the flooding event. Therefore the week (from 1/4/2017 – 7/4/2017) was discarded from the calculated averages in the table below. As such for the purposes of the study, the logged “Peak” period includes only the two weeks of NSW school holiday period including the Easter long weekend. The results of the daily log are presented in Figure 3 and Table 1 summarises the existing and estimated proposed traffic volumes based on those counts.



Figure 2: Location of Traffic Counters

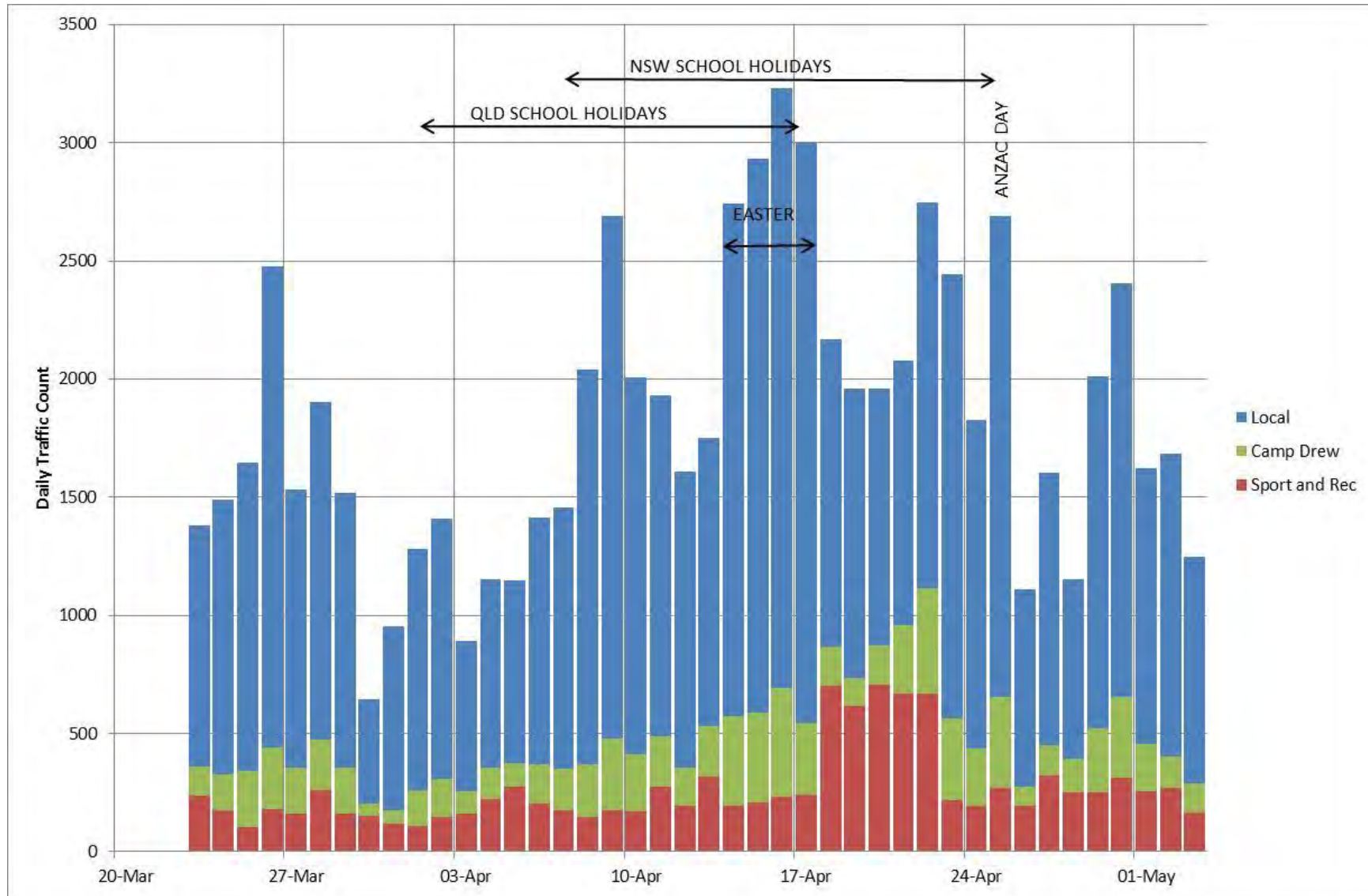


Figure 3: Daily Traffic Count for Lake Ainsworth Precinct (23/3/2017-3/5/2017)



**Table 1: Average Daily Traffic (ADT) volume (both directions) (23/3/2017-3/5/2017)**

<b>3.3 Location</b>	<b>3.4 Existing</b>			<b>3.5 Proposed</b>		
	Off Peak Period	Peak Period	Period Daily Maximum	Off Peak Period	Peak Period	Period Daily Maximum
<b>Pacific Parade – Total (Counter 1)</b>	1640	2280	3230	1640	2280	3230
<b>Local Recreational Traffic</b>	1240	1670	2540	1240	1670	2540
<b>Eastern Road Through to Lake A Sport and Recreation Centre</b>	220	340	700	-	-	-
<b>Camp Drewe Road</b>	190	280	460	400	610	1120

The results of the traffic Counts show the total Average Daily Traffic (in both directions) to the Lake Ainsworth precinct is 1640 vpd during the monitored off peak period and 2280 vpd during the peak period with a daily maximum of 3230 vpd coinciding with a weekend during the NSW school holidays. Of the total traffic volume, approximately 6%-35% was through traffic to the Lake Ainsworth Sport and Recreation Centre, 6%-15% was through traffic along Camp Drewe Road and 55-80% is local recreational traffic.

For the period of traffic counting, the effect of traffic redistribution would increase ADT along Camp Drew Road from 190 to 400 vpd and 280 to 610 vpd for off-peak and peak periods respectively. The maximum day volume increases from 460 to 1120 vpd which coincide with special events at Camp Drewe and The Sport and Recreation Centre during school holidays. These numbers exclude potential traffic redirection along the Western Road generated by dog walkers accessing Seven Mile Beach, north of Lake Ainsworth. Quantifying existing volume of traffic generated by 'dog walkers' cannot be easily distinguished from other traffic movements using conventional survey methods because the parking is common with other usage. Based on qualitative field observations and local experience, an allowance of 10% applied to the volumes indicated above would be conservative for the purposes of this assessment.

The Christmas school holiday period has historically been the time of year when the highest traffic demands are placed on the Lake Ainsworth precinct, however the peak demands are predominantly local recreational traffic with the demands being placed on parking rather than through traffic. The traffic generation for the redirected through traffic along the Camp Drewe Road is not likely to differ significantly from those logged over the Easter peak and off-peak periods.

Based on the estimated volumes (including allowances for dog walkers), the existing formation and road reserve widths are adequate for the anticipated redirected traffic volumes ancillary to closure of the Eastern Road. The additional volume and heavy vehicle component will require more frequent maintenance/regrading of the unsealed section of road, especially the section south of the secondary entrance to the Sport and Recreation Centre. The life cycle costs of additional maintenance of the unsealed road will most likely exceed the upfront cost of sealing. The actual traffic volumes and maintenance costs will be monitored following the Eastern Road closure to consider if sealing in the future is the most cost effective wearing surface for Camp Drewe Road. There is no engineering basis in which Council is required to seal the road to meet a minimum acceptable level of service, however a sealed wearing surface would generally be considered to provide a higher level of service to the road users as compared to an unsealed road.

### 3.6 Parking

The majority of parking in the Lake Ainsworth precinct is informal parking and the quantity of parking available is not clearly defined. Managing parking during days where demands exceed available parking has historically resulted in illegal parking and often causes conflict between vehicles and pedestrians. Ballina Shire Council and the local traffic committee have over recent years regulated parking with signage. Enforcing parking is an ongoing challenge for Council.

Complete Urban in conjunction with Ballina Shire Council estimated the quantity of existing car spaces when preparing the master plan of the *Provision for Design of the Lennox Head Surf Club and Surrounding Precinct* (2014). The parking was quantified by visual inspection during a high demand day during summer when all the available car spaces were occupied along the Eastern Road. A total of **68 informal car parking spaces** were counted along the section of the Eastern Road that would be removed with the road closure. Parking counts along the southern road was not undertaken for this masterplan. It should be noted that historically the number of cars parking along the eastern road will ignore the signage at times during peak periods when demand exceeds parking provisions and the number of cars parked in the past has exceeded this number. The count of 68 spaces is based on the number of available car parking when parked legally, following the regulatory signage.

The proposed foreshore improvement works includes the formalisation of existing roadside parking along the Southern Road (Refer to drawings in Appendix A) which is a combination of 90 degree and parallel parking. The only removal of existing parking consists of an 18m of unmarked car parking at the turnaround area located at the western end of the Southern Road. Although there is incrementally very little change in the parking footprint between the existing and proposed parking arrangement along the Southern Road, historically cars parked in informal parking areas are spaced out more and there is wider space between cars compared with formal car parking. This means in practice the formalisation of parking generally yields more capacity than informal parking. Based on car park dimensions of 2.6m wide for 90 degree and 6.5m long for parallel parking (AS2890.5) the proposed works includes formalisation of **140 spaces**.

The new car park (completed September 2015) located on the eastern edge of the Lake Ainsworth Holiday Park (between the holiday park and Pacific Parade) has achieved an additional **36 spaces**. The construction of the new car parking bays along Ross Street (completed June 2016) has formalised and created new spaces to achieve a total of **34 spaces**. This has yielded a total of **70 spaces** to offset the loss of informal car parking spaces when the eastern road is closed. The balance of offset parking provisions exceeds the 68 parking spaces lost with the proposed Eastern Road closure; however the location of the newly created offset parking adds considerable walking distance to persons accessing the lake compared to what currently exists along the Eastern Road and parking preference by users would be based on proximity to the lake and the existing off leash access point.

The new (offset) parking is located immediately adjacent to the Lake Ainsworth Holiday Park, with its proximity is convenient for patrons of the holiday park. It is therefore recommended that timed parking be considered to deter overflow parking from the Holiday Parking occupying the public parking spaces and encouraging turnover to make the public parking freely available for visitors accessing the beach and lake. Timed parking is an issue that would be considered by the Ballina Local Traffic Committee and does not form part of this consent.

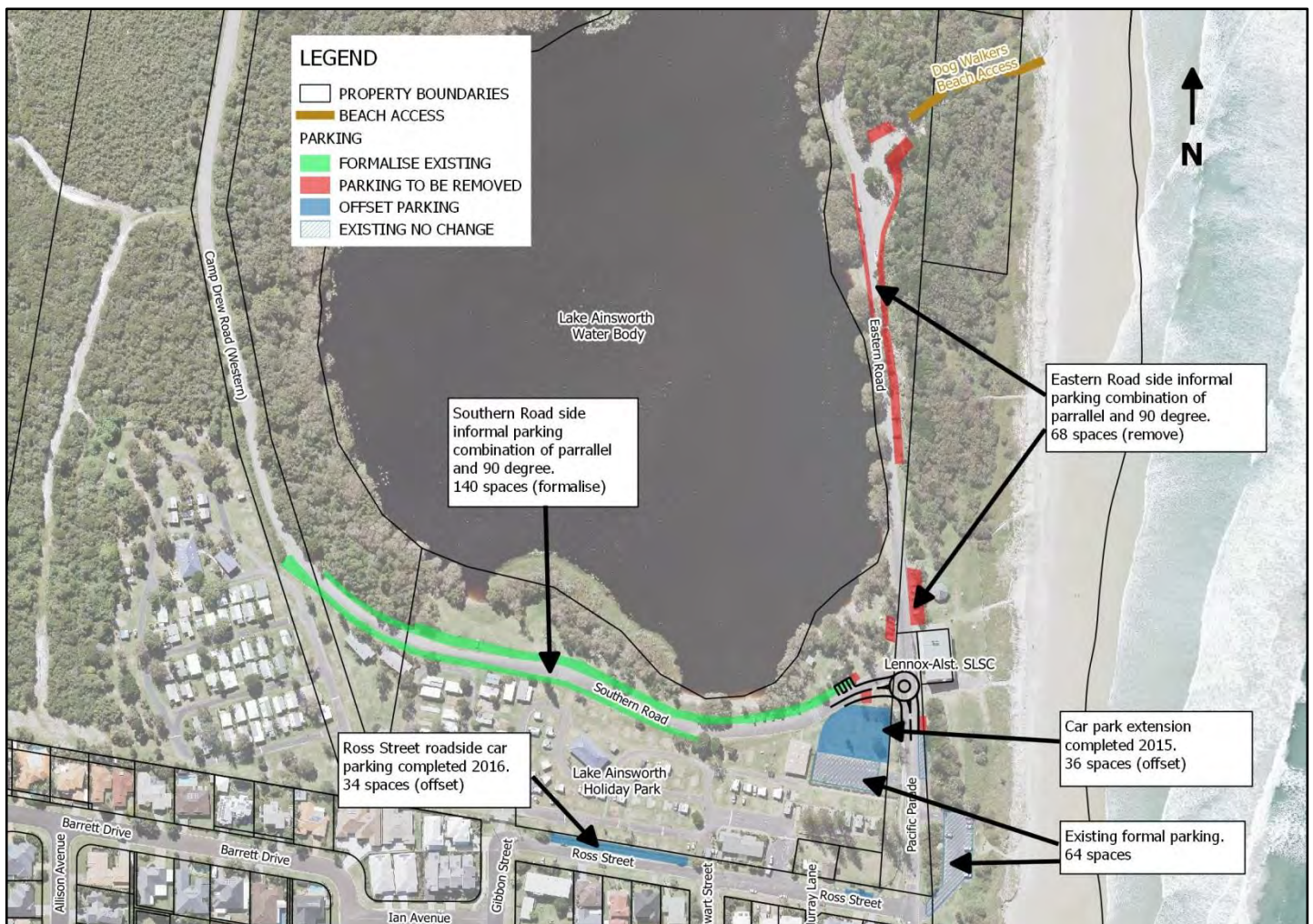


Figure 4: Plan of existing parking alterations



Designated parking for persons with a disability is currently provided on the eastern road immediately adjacent to the surf club and the off street car park opposite the surf club. There are no dedicated spaces at the northern end of the Eastern Road or along the Southern Road. Despite this, it is understood persons with disabilities currently utilise the existing road side parking provisions, especially along the flatter sections of the Eastern Road with close proximity to the lake and the lake ingress/egress is the most forgiving for a person with limited mobility. The proposed formalisation of the southern road includes 4 dedicated spaces for persons with disabilities. This would increase the total provisions from 3 to 6.

In summary, there is no net loss in total parking provisions resulting from the eastern road closure and foreshore improvement works with the inclusion of the new car park extension including the Ross Street on street parking upgrade. However, the quantity of lake side parking will be reduced and the effect of walking distance to access the offset parking will most likely result in parking priority to fill more frequently along the Southern Road more frequently than currently occurs. There is currently adequate parking for the current usage throughout the year, however there are periods in the warmer months during school holidays when demand exceeds the available spaces and this will continue to occur. The advantage with formalising the parking in the Lake Ainsworth precinct is parking can be enforced and the incidence of illegal parking is likely to reduce, however it should be anticipated that excess parking will at times spill onto the Western Road and the adjacent residential areas during these peak periods.

### **3.7 Pedestrian Access**

Existing footpaths along Pacific Parade currently provide off street pedestrian access linking the south eastern corner of Lake Ainsworth and the surf club building with the Lennox Head pathway network. Refuge islands are provided with crossing points across the intersection between Pacific Parade and the Southern Road. The existing off-street pathways link to the surf club building, however pathways terminate at the intersection. North of the intersection along the Eastern Road and west of the intersection along the Southern Road, no path ways are currently provided and pedestrians currently walk either on the road edge or along the grassed open space. The existing parking around the lake edge means during off-peak times pedestrians accessing the beach and lake generally park close to the desired destination. However, during peak periods when parking demands are high, the combination of lake users forced to park some distance away and local vehicular movements has historically resulted in some conflict between pedestrians and vehicular movements along the roadway.



The works proposed in the attached Engineering and Landscape drawings (Refer to Appendix A) incorporate an extension of the pathway network along the eastern shore area. The removal of the road provides a more pedestrian friendly environment along the eastern foreshore and improves the disability access along the shore, however does increase the walking distance between car parking and the eastern shore. There is considerable demand for passive recreational space around the lake foreshore area and the main benefit is more open space available free from vehicular movements.

The southern shore area which is fringed by the Southern Road, is largely grassed open space which is segregated by pockets of riparian vegetation. The vegetation areas are fenced which directs pedestrians walking east-west onto the road side parking areas to walk around the pockets of vegetation. During off-peak times this generally does not conflict with vehicles as the parking spaces are often vacant and people generally park close to where they want to access the lake, however during peak periods when parking demands are high, pedestrians are high along the bitumen road carriageway. The works proposed in the attached Engineering and Landscape drawings (Refer to Appendix A) incorporate low impact boardwalk linkages through the pockets of vegetation. Although no pathway is proposed along the southern foreshore area, the board walks provide off-street pedestrian linkage between the existing open spaces and improve pedestrian access and safety.

Council has installed traffic calming devices along the Eastern and Southern Road to reduce driver speed where there is high pedestrian activity. Reconstruction of the Southern Road will reinstate the speed humps to provide traffic calming. The spacing of the humps has been to a design speed of 40km/hr and the location of humps has been positioned away from pedestrian desire lines where possible to avoid confusion with pedestrian right of way crossings. This is to comply with RMS technical directions.

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## 4 Stormwater Management

### 4.1 Regional Hydrology

The annual average rainfall at Lennox Head is 1780 mm which varies seasonally. The Northern region of NSW typically experiences a wet season with the majority of rainfall occurring between January and June, and a dry spring. Annual rainfall also varies considerably from year to year often corresponding to *el nino* and *la nina* periods.

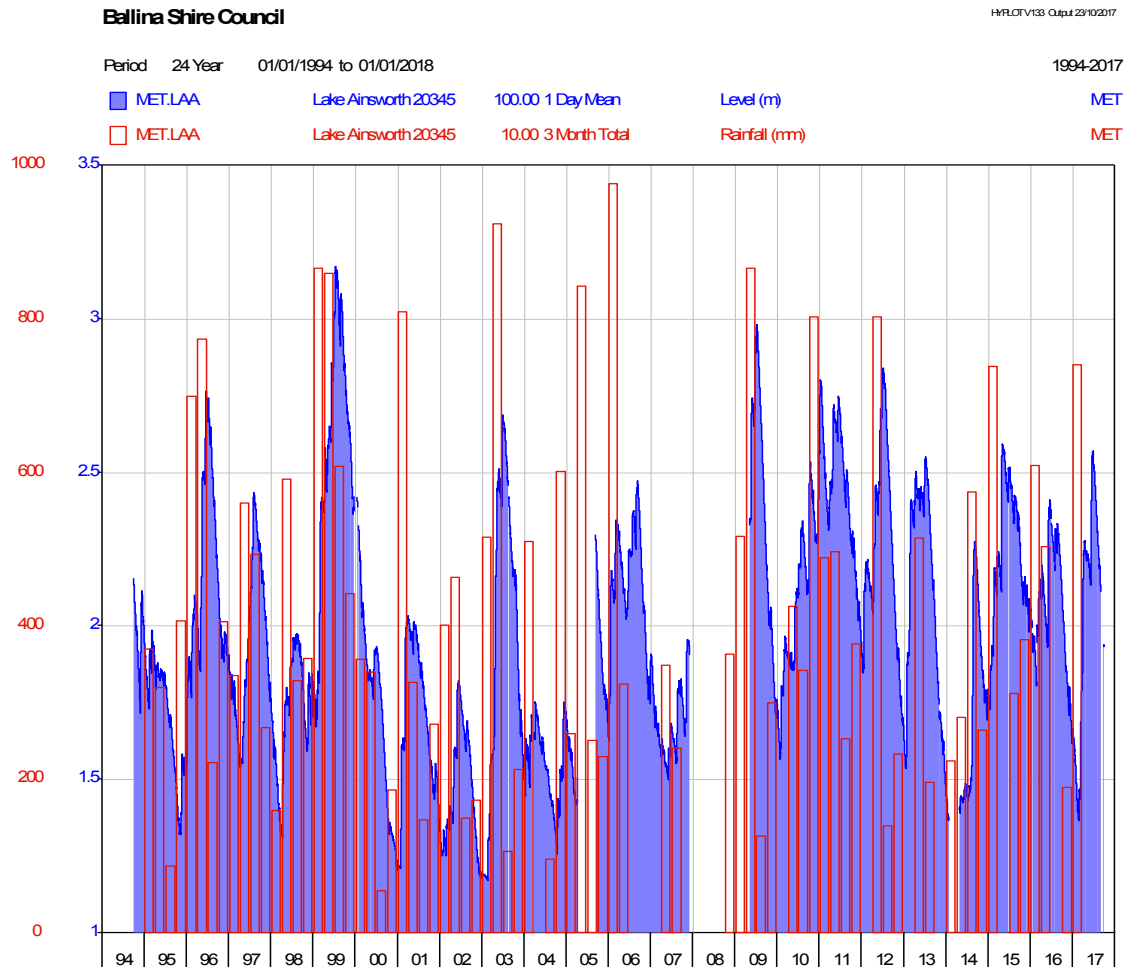
The Lake Ainsworth morphology consists of a deep main basin 8-9m deep with a shallow arm extending northward along a swale within the ridge-swale system of the local dunes. The surface and groundwater processes are complex and not entirely understood. The most comprehensive holistic study of Lake Ainsworth processes is the LALPS (1996).

Groundwater flows into the lake predominantly from the west and south, and flows out of the lake through the eastern dunes into the ocean. The standing water level of the Lake reflects the groundwater flow gradient. The lake water balance is determined by a balance between inflows due to direct rainfall and groundwater, and outflows due to evaporation and through groundwater. Estimates from the LALPS (1996) indicated rainfall and evaporation to be the most important to maintaining lake levels while groundwater flows tends to balance the continuity of input to equal output.

Water levels and rainfall is monitored by the Manly Hydraulic Laboratory Lake Ainsworth gauging station 203455. The gauging station was installed in 1994 and has logged real time data to date, however there are some gaps and missing records over the period. The data has been used to review water level fluctuations for planning purposes and has informed the design of the foreshore improvement works. A plot of the gauged lake water level and annual rainfall for the period from 1994 to 2017 is shown in Figure 5.

The 22 year period of data shows the lake levels fluctuate considerably seasonally and climatically (over long periods of wet and dry periods). The water level varies by up to 2m with the highest level logged as **RL3.2m AHD (July 1999)** and the lowest level of **RL1.2m AHD (Feb 2003)**. There have been a number of times over data record when the lake water level inundated the Eastern Road. The lowest point of the Eastern Road is currently RL2.7m AHD and the most severe flood record by the gauging station in July 1999 inundated the road by up to 0.5m at the lowest point and cut off access for several months until flood water receded.

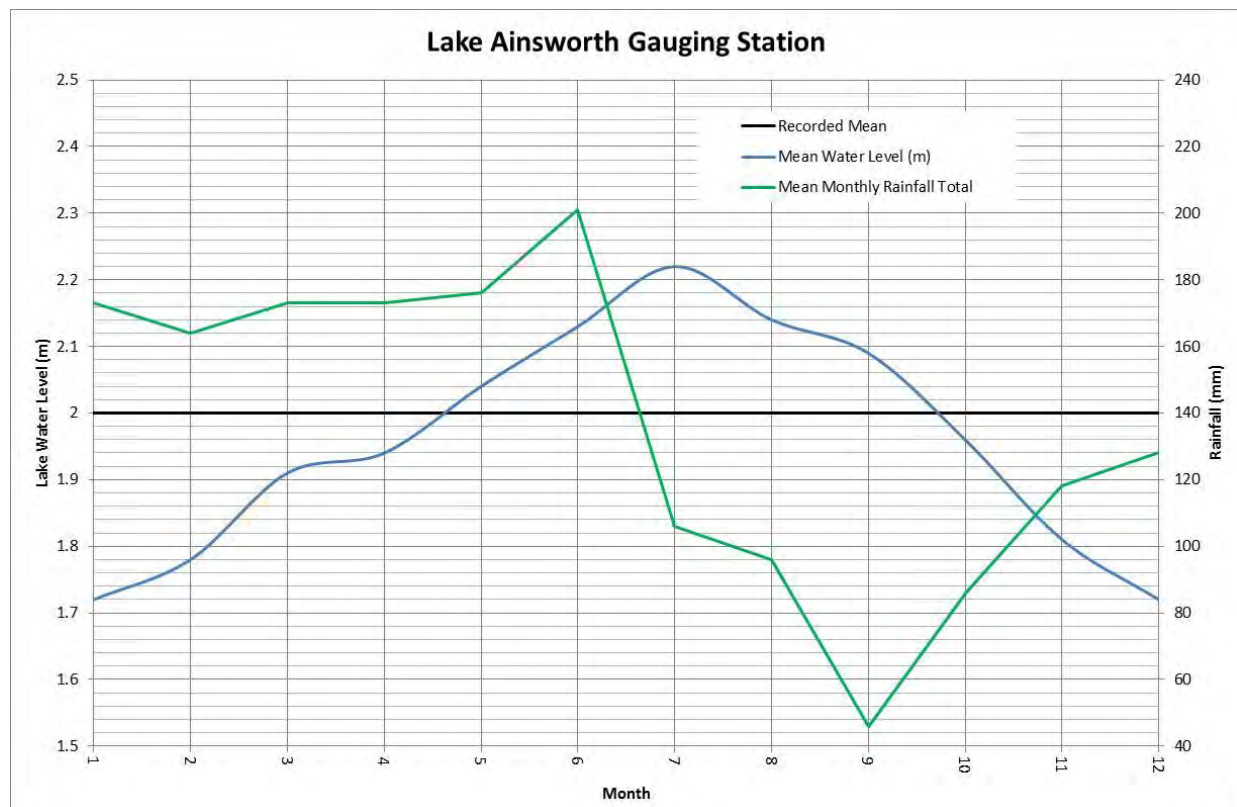
The high water level of 1999 has been adopted as the high water level. The design of the new pathway along the eastern road that doubles for emergency access has a minimum **RL3.0m AHD** which would reduce the depth of inundation for emergency access to 0.2m for the 1999 lake level. This is shallow enough for the passage of vehicles. Similarly, furniture and other facilities proposed below this flood level should be flood compatible.



**Figure 5: Plot of Lake Water Level and annual rainfall (Source MHL station 203455)**

The seasonal variation can be observed in Figure 6 which shows the mean lake levels and rainfall for each calendar month. Figure 6 shows average lake levels to fluctuate by 0.5m over the period of a calendar year by normal seasonal variation. Based on the gauging data, January has the lowest lake mean level of RL1.7m AHD which increases steadily during first 6 months of the calendar year, which is typically when the majority of the annual rainfall occurs. July has the highest monthly mean level of RL2.2m AHD which decreases over the second 6 months of the calendar year which is typically the dry period of the year. The water level decreases more steadily during the warmer months (November to December) when evaporation is higher.

Lake water quality and the physico-chemical processes is complex; however studies indicate water quality is strongly influenced by stratification as a balance between thermal energy inputs (solar radiation) and mixing due to wind or convection. During stratified periods the deeper waters become depleted in dissolved oxygen which produces favourable conditions for algae (LALPS, 1996). Algal blooms have historically occurred and in severe cases has resulted in the lake being closed to the public for periods due to blue-green algae levels being unsafe for recreational activities.



**Figure 6: Plot of Mean Monthly Lake Level and Rainfall**

## 4.2 Existing Topography and Surface Drainage

The majority of the eastern road falls westerly toward the lake and stormwater runoff laterally sheets directly to the lake. There is no existing pit and pipe drainage system for the disposal of stormwater drainage from the eastern road.

The majority of the southern road falls to the north toward the lake and stormwater runoff laterally sheets onto the adjacent grassed areas. This grassed area generally buffers the runoff of lateral drainage from the southern road. Existing pit and pipe drainage systems cross under the road, however it principally drains the Lake Ainsworth Holiday Park and a small catchment of residential area to the south. The southern side of crowned sections of the southern road drain to roadside swales with pits located in road sags and drain via the pit and pipe system. The piped minor system currently discharges directly to the lake in three locations. The major system stormwater runoff in excess of the piped capacity overtops the crown of southern road at the sag points and flows overland through the reserve into the lake.

The pervious area and greenspace surrounding the lake foreshore area is generally sandy and does not generate significant runoff. The majority of stormwater runoff is generated by impervious surfaces. Stormwater runoff to the lake as overland flow is generally from impervious surfaces during significant rainfall events.



### 4.3 Design objectives for Stormwater Drainage

#### 4.3.1 Stormwater Quantity

The project proposes to remove the Eastern Road pavement and replace with a concrete footpath and formalize parking with grassed permeable paving. The end result will be a reduction in impervious footprint. The reduced impervious area will result in a reduction of storm water quantity from the foreshore works. The grading of the southern road reconstruction will ensure there will be no redirection of stormwater drainage and the crown of the road at sag points have been established to ensure no afflux in flooding by overland flow. As such no augmentation of the existing piped drainage system is required for storm water quantity management of the foreshore works.

#### 4.3.2 Stormwater Quality

The areas of proposed improvement works drain to the Lake Ainsworth freshwater basin. The works have been designed incorporating Water Sensitive Urban Design (WSUD) 'best practise' principles to reduce the pollutants generated by impervious surfaces through the use of:

- Bioretention swales to capture and treat runoff from the proposed pathway along the eastern foreshore;
- Rain gardens (bioretention) to capture and treat runoff primarily from road surfaces;
- Permeable paving (turfcell) to infiltrate rainfall and reduce the impervious footprint of the car park and reduce pollutant generation to surface water;
- Grassed buffering pave surfaces and eliminating direct drainage of paved surfaces; and
- Infiltration measures – to maintain a natural water balance

The strategy adopted in the WSUD of the foreshore works has been to 'disconnect' impervious surfaces from the lake water body. That is, to intercept runoff from pave surfaces and direct them to a variety of infiltration devices to capture and treat the 'first flush' rainfall event which generally contains the majority pollutants 'washing off' sediment accumulation on the pavement. Refer to design drawing LHR.061 for the location and arrangement of the devices.

The WSUD elements have been designed to achieve the pollutant removal rates specified in the *Ballina Shire Council Development Control Plan* (2012). The design of storm water treatment devices has been to achieve the pollutant load removal rates contained in Table 2:

**Table 2: Stormwater Treatment Targets**

<b>4.4 Parameters</b>	<b>4.5 BSC DCP Removal Rate (%)<sup>1</sup></b>
<b>Total Suspended Solids (TSS)</b>	80
<b>Total Phosphorous (TP)</b>	60
<b>Total Nitrogen (TN)</b>	45
<b>Gross Pollutants (GP)</b>	90

Note:

1. Removal Rates is the pollutants captured through treatment as a percentage of total pollutants generated in the proposed form.

It should be noted that the stormwater treatment system and pollutant removal targets apply only to the impervious surfaces within the footprint of the project. The pollutant removal targets outlined above are those in the Ballina DCP (2012) and are consistent with the requirements imposed on all development within Ballina Shire Council. The area treated is only a very small proportion of the lake catchment (<2%) and the pollutant loads being removed from stormwater runoff draining to the lake is incrementally very small compared to the pre-existing water quality issues in the lake. However applying water sensitive design measures are low cost when undertaken in conjunction with the landscaping works and ensures the foreshore works do not exacerbate existing water quality issues in the lake or contribute to a cumulative effect not realised in previous process studies.

## 4.6 MUSIC Modelling

The performance of the WSUD elements has been modelled using the Model for Urban Storm water Improvement Conceptualizing (MUSIC V6.1.0). The MUSIC modelling methodology, inputs, sizing and catchment parameters are adopted in accordance with *Ballina Shire Council Stormwater Management Standards for Development* (2016) (refer to Appendix C for adopted parameters). A schematic of the MUSIC model is provided in Figure 7.

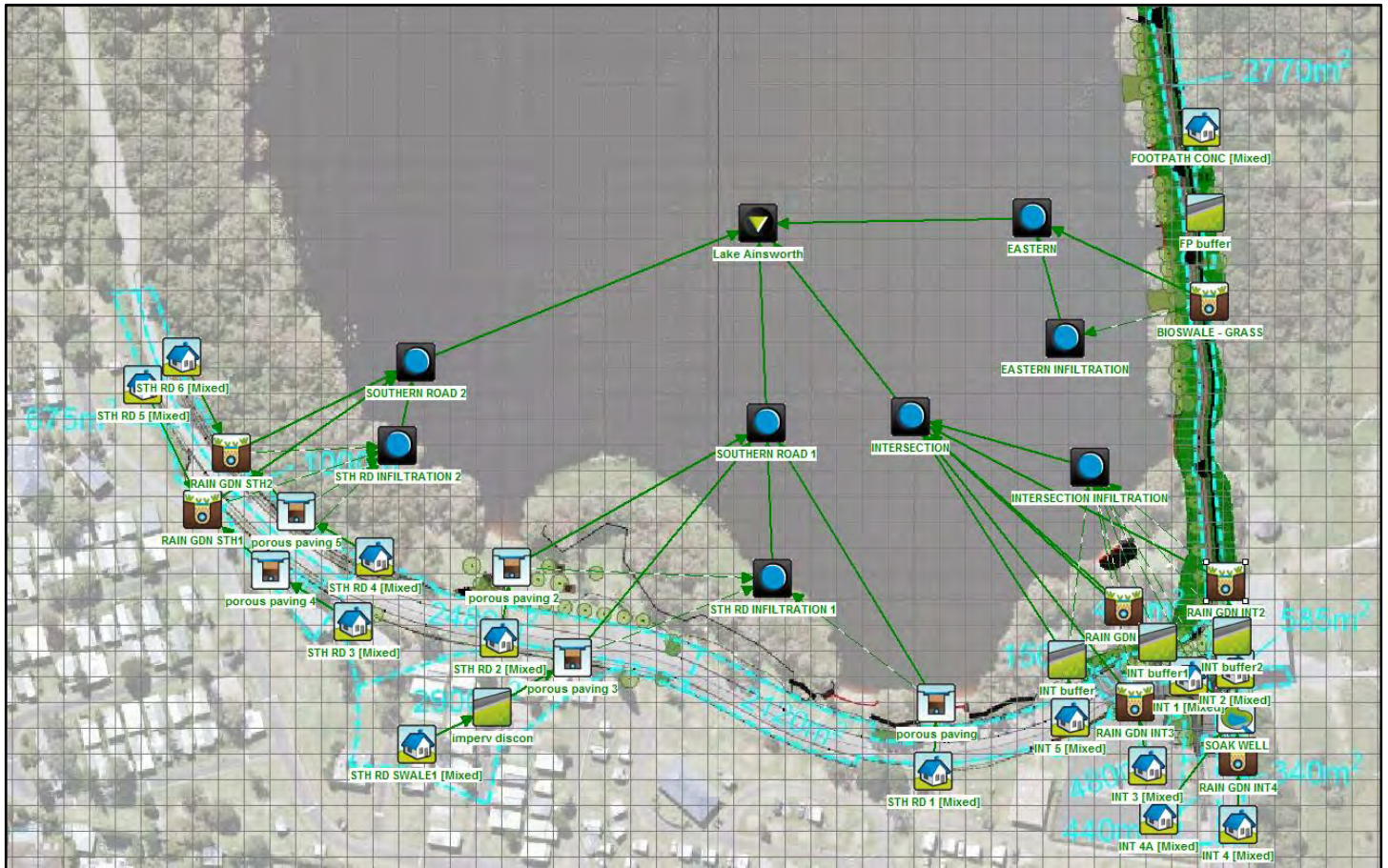


Figure 7: MUSIC model schematic

The MUSIC modelling included existing external catchment areas from the Lake Ainsworth Holiday Park where existing runoff from the holiday park area is laterally collected by road side swale drains.

Table 3 is a summary of the MUSIC modelling results and compares the modelled pollutant load removal rates of the proposed works with the target removal rates adopted from BSC DCP (2012).

**Table 3: Summary of MUSIC results**

<b>4.7 Parameters</b>	<b>4.8 BSC DCP 4.9 Removal Rate 4.10 (%)<sup>1</sup></b>	<b>4.11 MUSIC Modelling 4.12 Removal Rates achieved 4.13 (%)<sup>1</sup></b>
<b>Total Suspended Solids (TSS)</b>	80	<b>88</b>
<b>Total Phosphorous (TP)</b>	60	<b>66</b>
<b>Total Nitrogen (TN)</b>	45	<b>50</b>
<b>Gross Pollutants (GP)</b>	90	<b>99</b>

Note:

1. Removal Rates is the pollutants captured through treatment as a percentage of total pollutants generated in the proposed form.

The MUSIC modelling results in Table 3 above shows WSUD elements incorporated in the foreshore improvement works provide pollutant removal in excess of the BSC DCP (2012) required criteria and provides a considerable reduction in pollutant loads generated from the roads and ancillary foreshore paved surfaces.



## 5 Construction Sediment and Erosion Control

<b>5.1 Purpose</b>	<p>To mitigate or reduce the potential environmental impacts resulting from construction activities. These include:</p> <ul style="list-style-type: none"> <li>• Topsoil stripping</li> <li>• Pavement profiling/excavation</li> <li>• Bank Stabilisation</li> <li>• Construction of road and pathways</li> <li>• Spillage during handling of materials</li> </ul>
<b>5.2 Reporting and Responsibilities</b>	<p>The site coordinator or authorised representative is to undertake the following measures during construction:</p> <ul style="list-style-type: none"> <li>• Regularly inspect the storm water management devices, particularly prior to forecasted wet weather and following major rainfall events to ensure that these devices are in good working order.</li> <li>• Ensure that drains and paved surfaces are kept free of wastes or other material, especially materials which may impact on runoff water quality.</li> <li>• Prepare water monitoring records if and when required by the regulatory authority.</li> </ul>
<b>5.3 Stormwater Drainage measures</b>	<p>General storm water drainage measures include:</p> <ul style="list-style-type: none"> <li>• Wherever reasonable and practicable, stormwater runoff entering the Site from external areas, and non-sediment laden (clean) stormwater runoff entering a work area or area of soil disturbance, must be diverted around or through that area in a manner that minimises soil erosion and the contamination of that water for all discharges up to the specified design storm discharge.</li> <li>• Inlets and outlets of storm water drainage pits and pipes shall be kept clear of silt and debris.</li> <li>• Achieve vegetative cover to disturbed area as soon as practicable upon final profile/grading.</li> </ul>
<b>5.4 Stockpile Management</b>	<ul style="list-style-type: none"> <li>• Stockpiling to onsite to be generally avoided. Excavated material to generally be directly to trucks and removed from site. Similarly imported material shall be clean confirming material delivered in place.</li> <li>• Where stockpiling is necessary, the erosion and sediment control shall generally be installed in accordance with the 'blue book'</li> </ul>
<b>5.5 Erosion and sediment control</b>	<p>The following strategies/mitigation measures for the management of erosion and sediment transport from the Site:</p> <p><b>5.5.1 Sediment Control</b></p>

<p><b>measures</b></p>	<ul style="list-style-type: none"> <li>• The site in general should be kept in a manner that maximises the vegetative cover to prevent mobilisation of sediments. Clearly delineating vehicular tracks and minimising vegetation stripping and spraying.</li> <li>• Site exit points must be appropriately managed to minimise the risk of sediment being tracked onto sealed, public roadways.</li> <li>• Wetting of unsealed internal access roads shall be undertaken to suppress dusts during dry weather</li> <li>• Efforts shall be employed to trap sediment within the Site, and as close as practicable to its source.</li> <li>• Sediment traps must be installed on the downstream limit of the site intercepting runoff prior to draining to the lake.</li> </ul>
<p><b>5.6 Monitoring Investigation Indicators</b></p>	<p>The following indicators are to be used to identify if the objectives of the SWMP are being met:</p> <ul style="list-style-type: none"> <li>• Visible evidence of deterioration of baseline water quality in the Lake Ainsworth that is directly attributable to the Site.</li> <li>• Visible significant erosion.</li> <li>• Failure of control measures.</li> </ul> <p>The triggering of an investigation indicator will require the following remedial actions:</p> <ul style="list-style-type: none"> <li>• Locate the source of water quality deterioration.</li> <li>• Prevent continuing deterioration with temporary controls.</li> <li>• Repair existing controls, construct additional controls or modify procedures to prevent future deterioration in water quality.</li> </ul>
<p><b>5.7 Maintenance</b></p>	<ul style="list-style-type: none"> <li>• All erosion and sediment control measures, including drainage control measures, must be maintained in proper working order at all times for the duration of works.</li> <li>• Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm.</li> <li>• Mowing must be done in a manner that maintains healthy ground coverage and does not damage the profile of formed, soft edges, such as the crest of earth embankments.</li> <li>• Maintenance of sedimentation ponds shall be undertaken during dry weather where practicable and the frequency of desilting shall be undertaken in conjunction with monitoring to determine an appropriate frequency of desilting according to sediment loads depositing in the storage zones of ponds.</li> </ul>

## 6 Conclusions

Ballina Shire Council has prepared this Engineering Services Report to support the Part V assessment of the Lake Ainsworth Foreshore Improvement Works. The summary of our conclusions is as follows:

- The closure of the Eastern Road will redirect traffic along the Southern Road and Camp Drewe Road. The existing road network has adequate capacity for the increase traffic volume.
- The car park extension and Ross Street road side parking upgrades compensates in quantity for the loss in road side car parking spaces resulting from the closure of the Eastern Road.
- The proposed foreshore works maintains linkage along the eastern foreshore for emergency vehicles.
- Off street pathways improve pedestrian accessibility and pedestrian safety in and around the lake foreshore area and provide improved connectivity to the Lennox Head pathway network.
- The proposed works will not increase stormwater quantity generated by the proposed foreshore improvement works. Water sensitive design measures integrated in the landscape design provide stormwater treatment to meet the criteria in Ballina Shire Council DCP (2012)

## 7 References

Anderson, P. Howells, L and van Senden, D. (1996) *Lake Ainsworth Processes Study* by Australian Water and Coastal Studies in association with The Ecology Lab Pty Ltd.

Ballina Shire Council (2003, revised 2011) *Ballina Coastal Reserve Plan of Management*

Ballina Shire Council (2016) *Ballina Shire Council Stormwater Management Standards for Development*

Complete Urban Pty Ltd (2014) *Provision for Design of the Lennox Head Surf Club and Surrounding Precinct*

Connell Wagner (2005) *Lake Ainsworth Crown Reserve Master Plan*

Design Team Inc. (2016) *Concept plan of the Lake Ainsworth Recreation Precinct Works*

Geolink and NSW Dept. of Public Works and Services (2002) *Lake Ainsworth Management Plan*

LANDCOM (2004) *Managing Urban Stormwater – Soils and Construction Volume 1*

# Appendix A

Drawings



# FORESHORE IMPROVEMENT WORKS LAKE AINSWORTH, LENNOX HEAD

DRAWING No: LHR30.061

NOVEMBER 2017

## GENERAL WORKS DRAWINGS

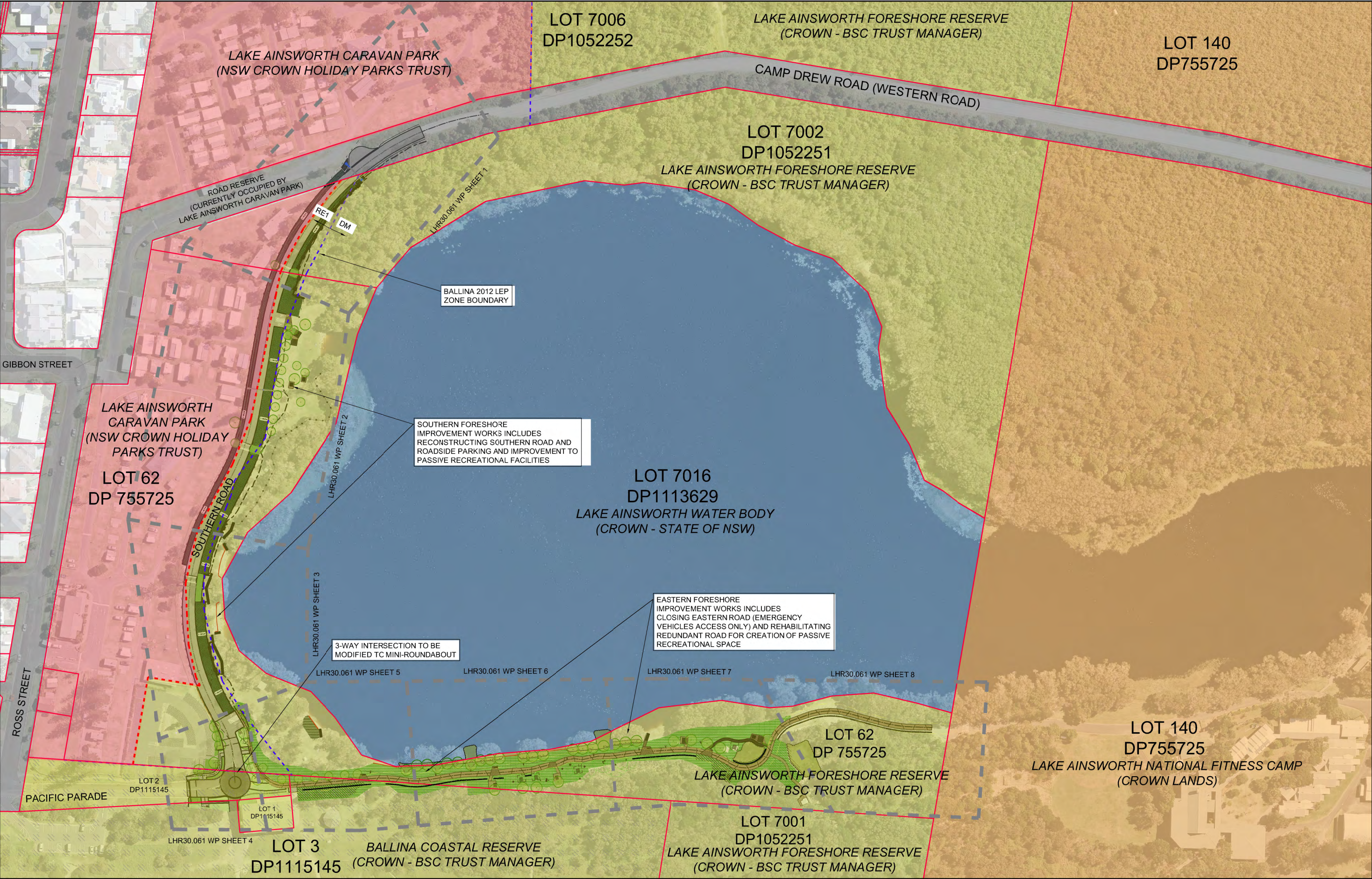
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LHR30.061/OP	1 OF 1	B	3/11/2017	OVERALL PLAN
LHR30.061/WP	1 OF 8	B	3/11/2017	SOUTHERN FORESHORE GENERAL WORKS PLAN (CH0 TO CH105)
LHR30.061/WP	2 OF 8	B	3/11/2017	SOUTHERN FORESHORE GENERAL WORKS PLAN (CH105 TO CH255)
LHR30.061/WP	3 OF 8	B	3/11/2017	SOUTHERN FORESHORE GENERAL WORKS PLAN (CH255 TO CH380)
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LHR30.061/WP	5 OF 8	B	3/11/2017	EASTERN FORESHORE GENERAL WORKS PLAN AND LONGITUDINAL SECTION (CH0 TO CH120)
LHR30.061/WP	6 OF 8	B	3/11/2017	EASTERN FORESHORE GENERAL WORKS PLAN AND LONGITUDINAL SECTION (CH120 TO CH240)
LHR30.061/WP	7 OF 8	B	3/11/2017	EASTERN FORESHORE GENERAL WORKS PLAN AND LONGITUDINAL SECTION (CH240 TO CH360)
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LHR30.061/LS	1 OF 2	B	3/11/2017	SOUTHERN ROAD ALIGNMENT PLAN AND LONGITUDINAL SECTION (CH0 TO CH300)
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### LOCALITY PLAN

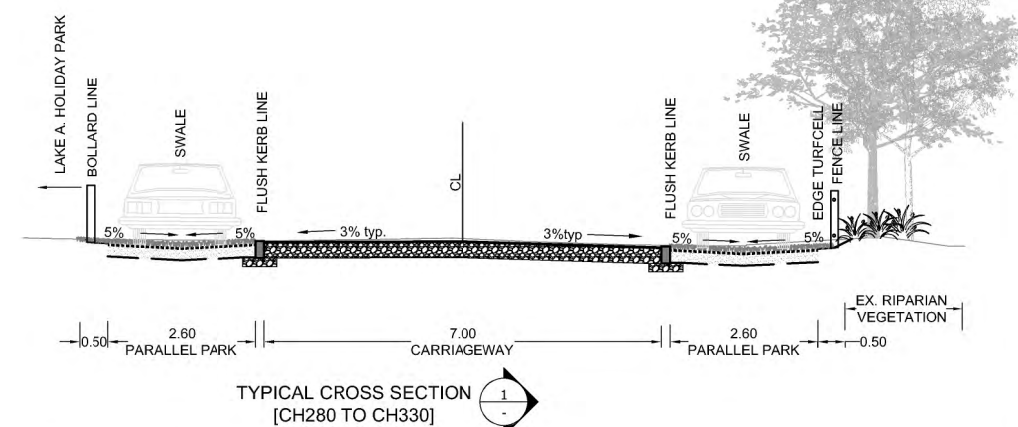
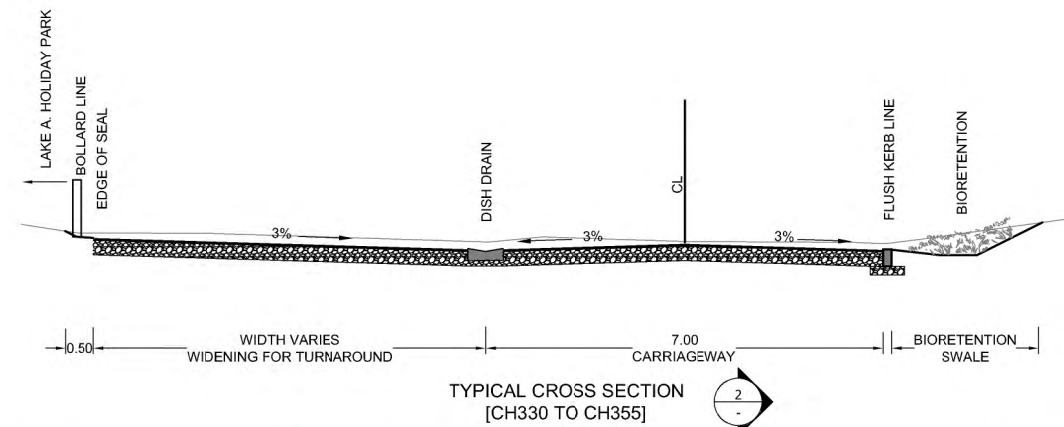
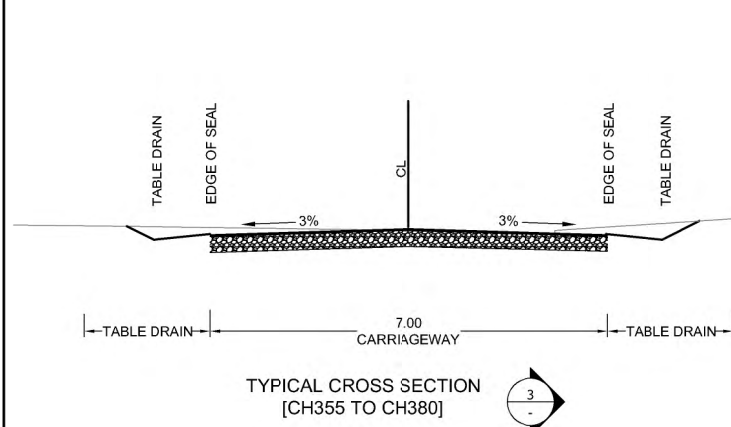
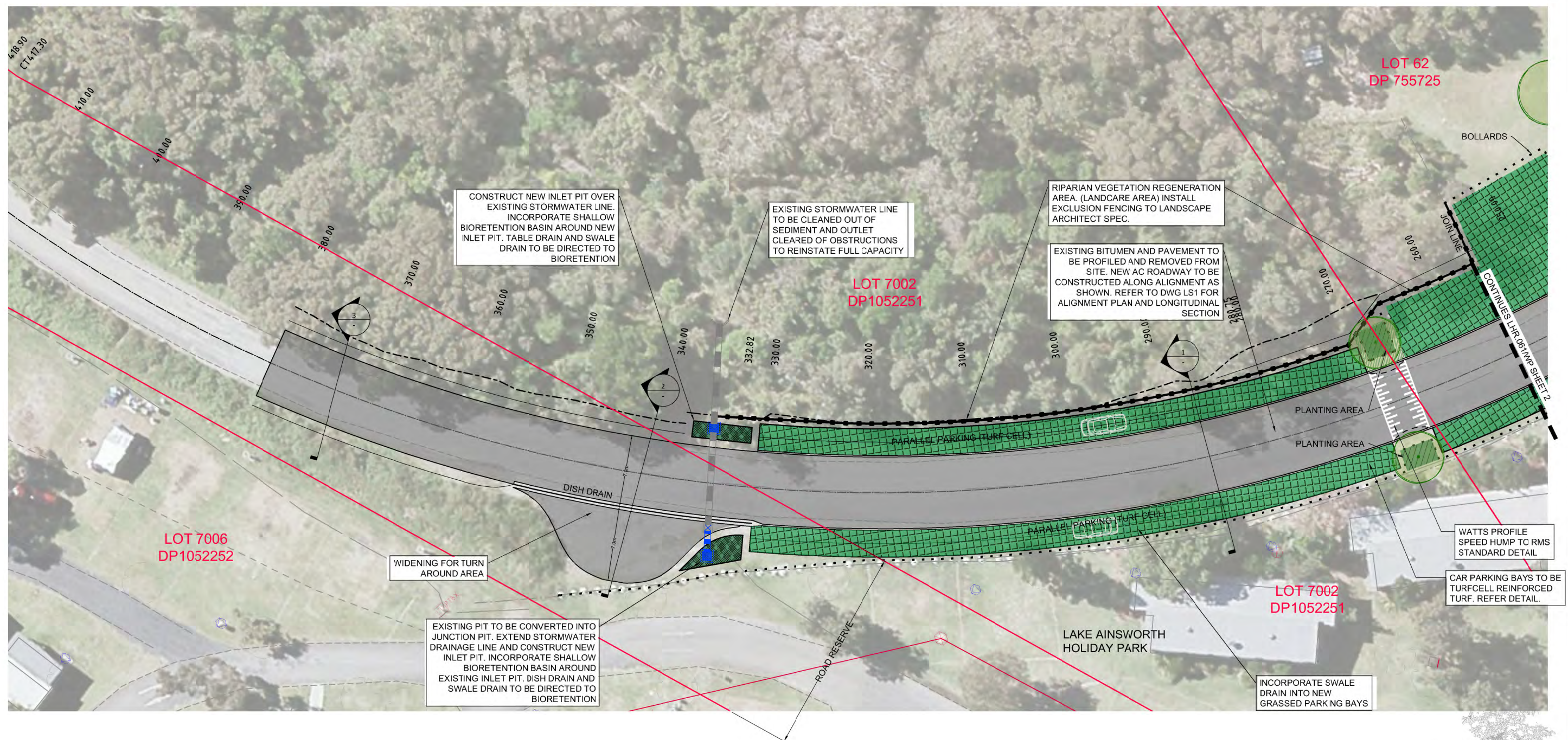






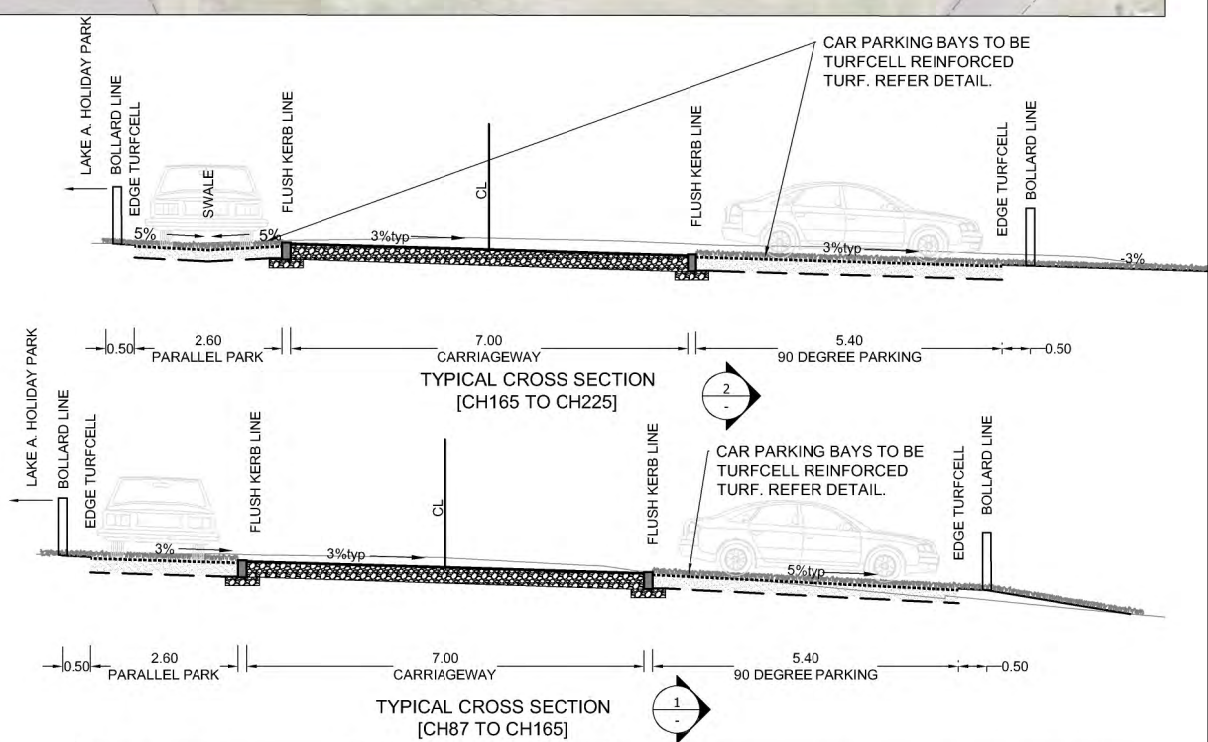
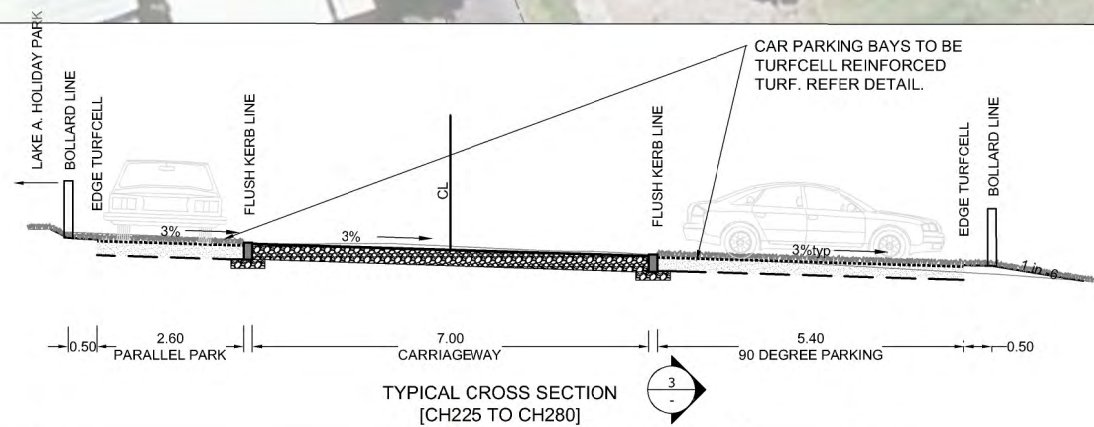
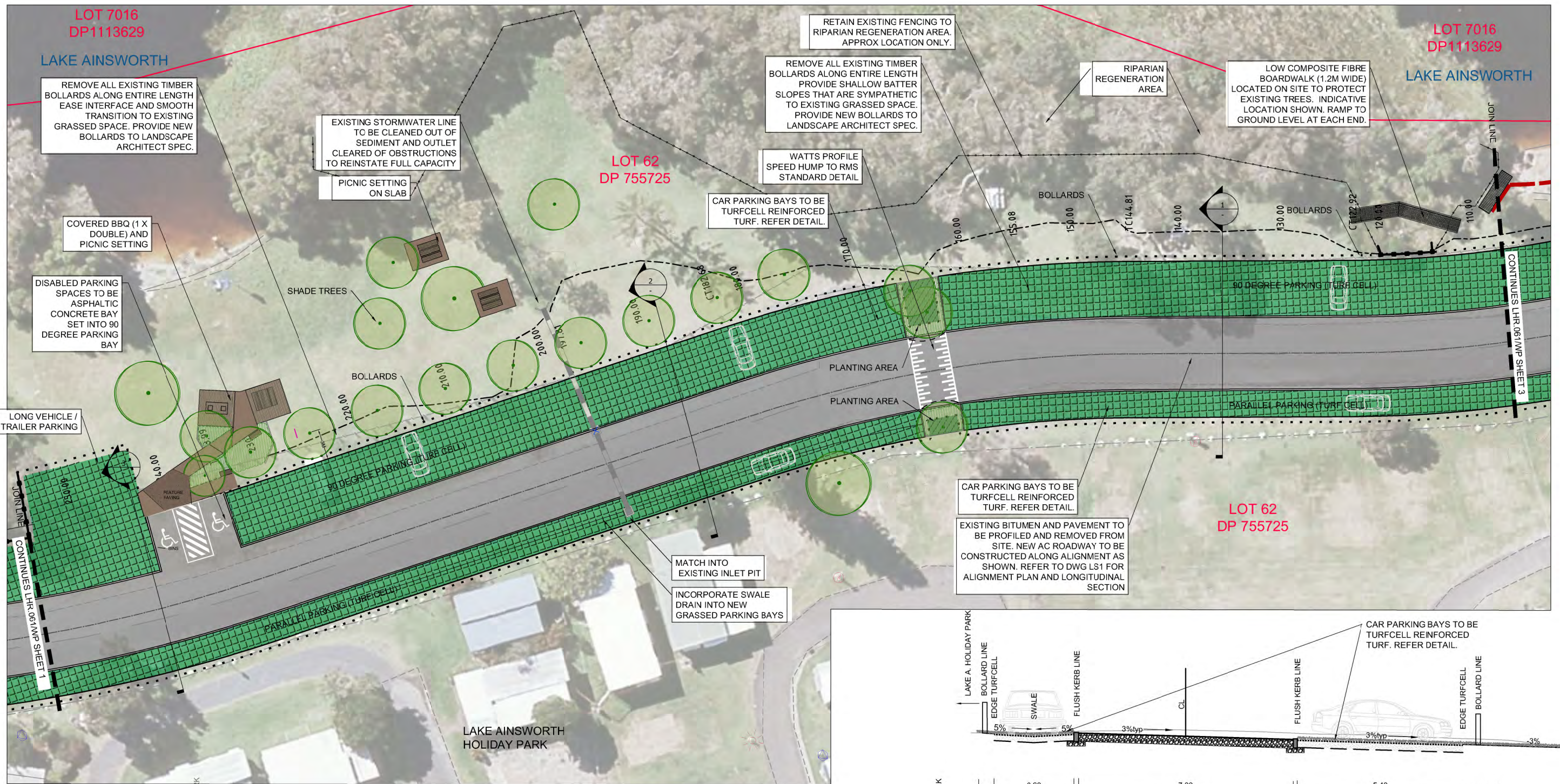
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						SHEET 1 OF 1							





	<b>LEGEND</b> TELSTRA FIBRE OPTIC CABLE TELSTRA CABLE UNDER GROUND ELECTRICITY OVER HEAD ELECTRICITY SEWER (GRAVITY) SEWER RISING MAIN (EXISTING) STORMWATER PIPE (EX) WATER (EX) FENCE (EX) EDGE OF BITUMEN (EX)		SIGN STOP VALVE HYDRANT TELSTRA PIT POWER POLE STAY POLE STN/GIN SSM/PM		STORMWATER PIPE (NEW) LANDSCAPE FENCE (NEW) BOLLARD LINE (NEW) BOLLARD LINE (EXISTING) BOUNDARY FK 4.95 FINISHED SURFACE RL		BIORETENTION TURFCELL CAR PARKING AC SEAL LANDSCAPING		B 3/11/17 PJB A 27/10/17 PJB No. Date By Change X'd Amendments				SURVEY BSC DATE JULY 2017 F.B. L.B. DATUM AHD DRAWING LHR 30_061 LAKE A FORESHORE DA.dwg SHEET 1 OF 8		DESIGNED PJB DRAWN PJB CHECKED APPROVED		<b>BALLINA SHIRE COUNCIL</b> <b>LAKE AINSWORTH FORESHORE WORKS</b> <b>SOUTHERN FORESHORE GENERAL WORKS PLAN</b> <b>AND TYPICAL DETAILS</b> Scale 1:200 Plan No. LHR30.061/WP A1	
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# LEGEND

TELSTRA FIBRE OPTIC CABLE	SIGN	STORMWATER PIPE (NEW)
TELSTRA CABLE	STOP VALVE	LANDSCAPE FENCE (NEW)
UNDER GROUND ELECTRICITY	HYDRANT	BOLLARD LINE (NEW)
OVER HEAD ELECTRICITY	TELSTRA PIT	BOLLARD LINE (EXISTING)
SEWER (GRAVITY)	POWER POLE	BOUNDARY
SEWER RISING MAIN (EXISTING)	STAY POLE	FK 4.95 FINISHED SURFACE RL
STORMWATER PIPE (EX)	STN/GIN	BIORETENTION
WATER (EX)	SSM/PM	TURFCELL
FENCE (EX)		LANDSCAPING
EDGE OF BITUMEN (EX)		AC SEAL

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A	27/10/17	PJB	DRAFT FOR REVIEW	
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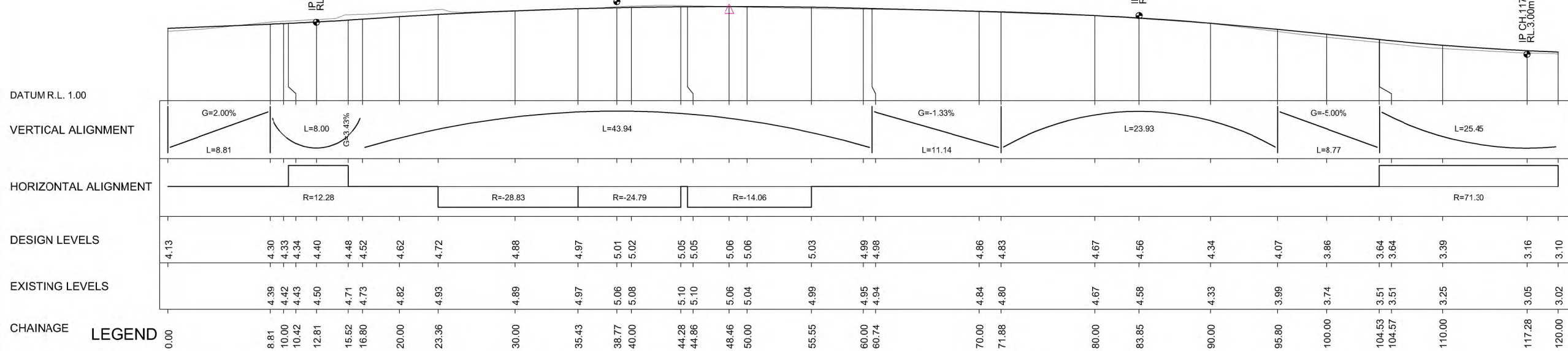
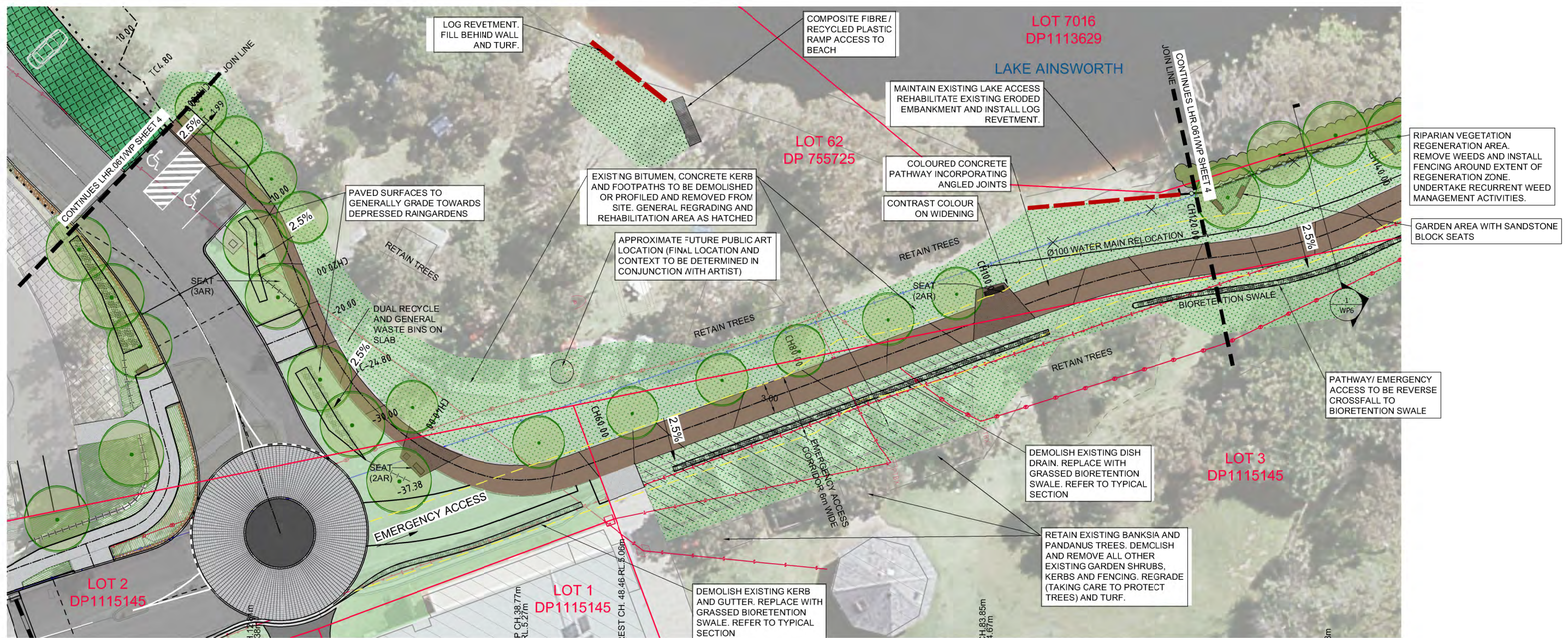












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- LANDSCAPING - TURF
- PAVEMENT REHAB AND REGRADING
- TREE (EXISTING RETAIN)
- TREE (EXISTING REMOVE)
- TREE (NEW)
- BITUMEN (NEW)
- COLOURED CONCRETE PATH
- COBBLE GRANITE (GREY)
- COBBLE GRANITE (BLACK)
- BENCH SEAT

**LEGEND**

- TELSTRA FIBRE OPTIC CABLE
- TELSTRA CABLE
- UNDER GROUND ELECTRICITY
- OVER HEAD ELECTRICITY
- SEWER (GRAVITY)
- SEWER RISING MAIN (EXISTING)
- STORMWATER PIPE (EX)
- STORMWATER PIPE (NEW)
- FENCE (NEW)
- FENCE (EXISTING)
- EXISTING EDGE OF BITUMEN
- SIGN
- STOP VALVE
- HYDRANT
- TELSTRA PIT
- POWER POLE
- STAY POLE
- STN/GIN
- SSM/PM
- WATER MAIN (NEW)
- WATER MAIN (EXISTING)
- FK 4.95 FINISHED SURFACE RL
- FK- FLUSH KERB
- K&G - KERB AND GUTTER
- DISH - DISH DRAIN
- TK- TOP OF KERB
- FS FINISHED SURFACE

**ISSUED FOR PART V ASSESSMENT**

**DRAFT FOR REVIEW**

**Change**

**Amendments**

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SHEET 5 OF 8

**BALLINA SHIRE COUNCIL**

**LAKE AINSWORTH FORESHORE WORKS**

**EASTERN FORESHORE GENERAL WORKS**

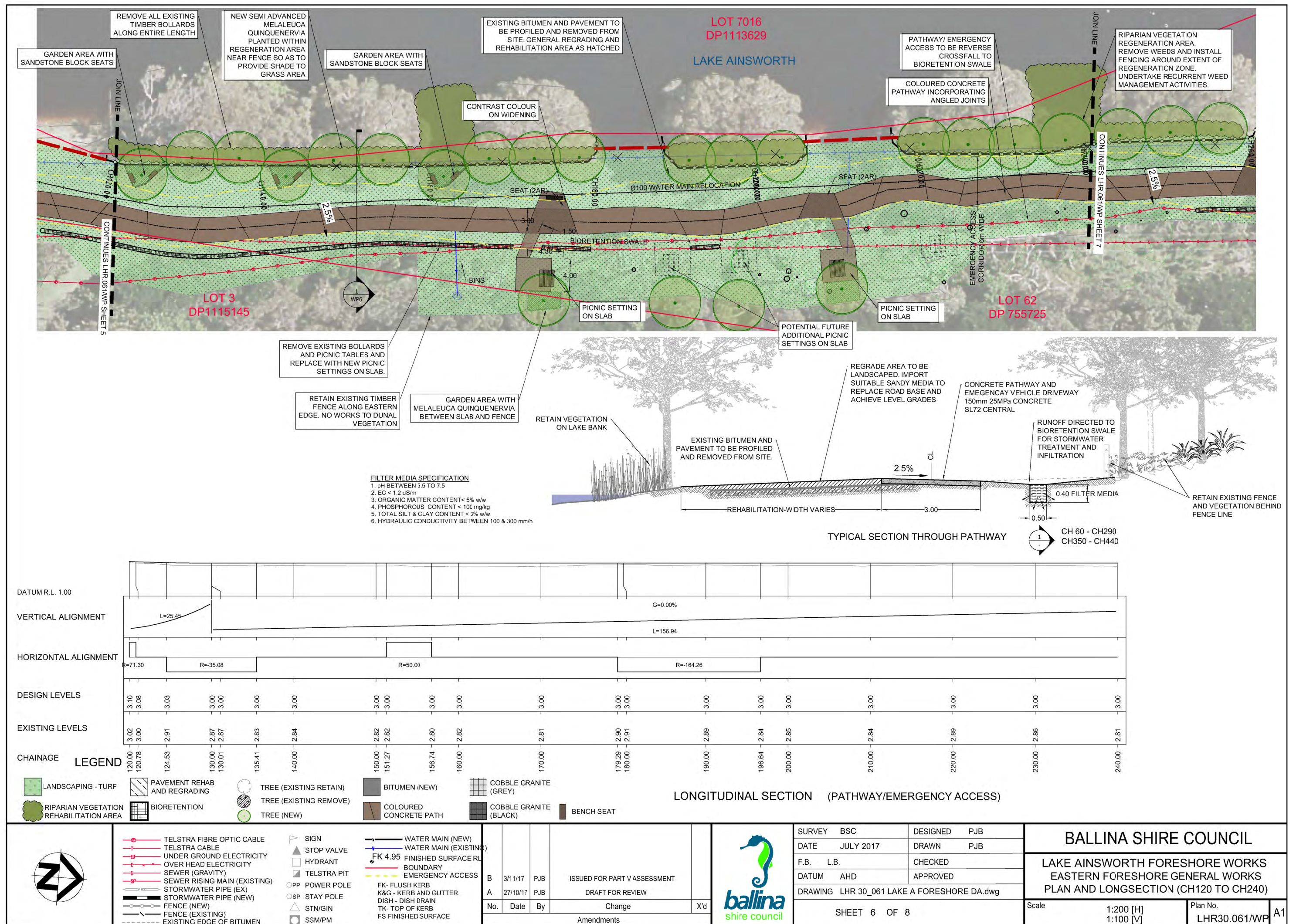
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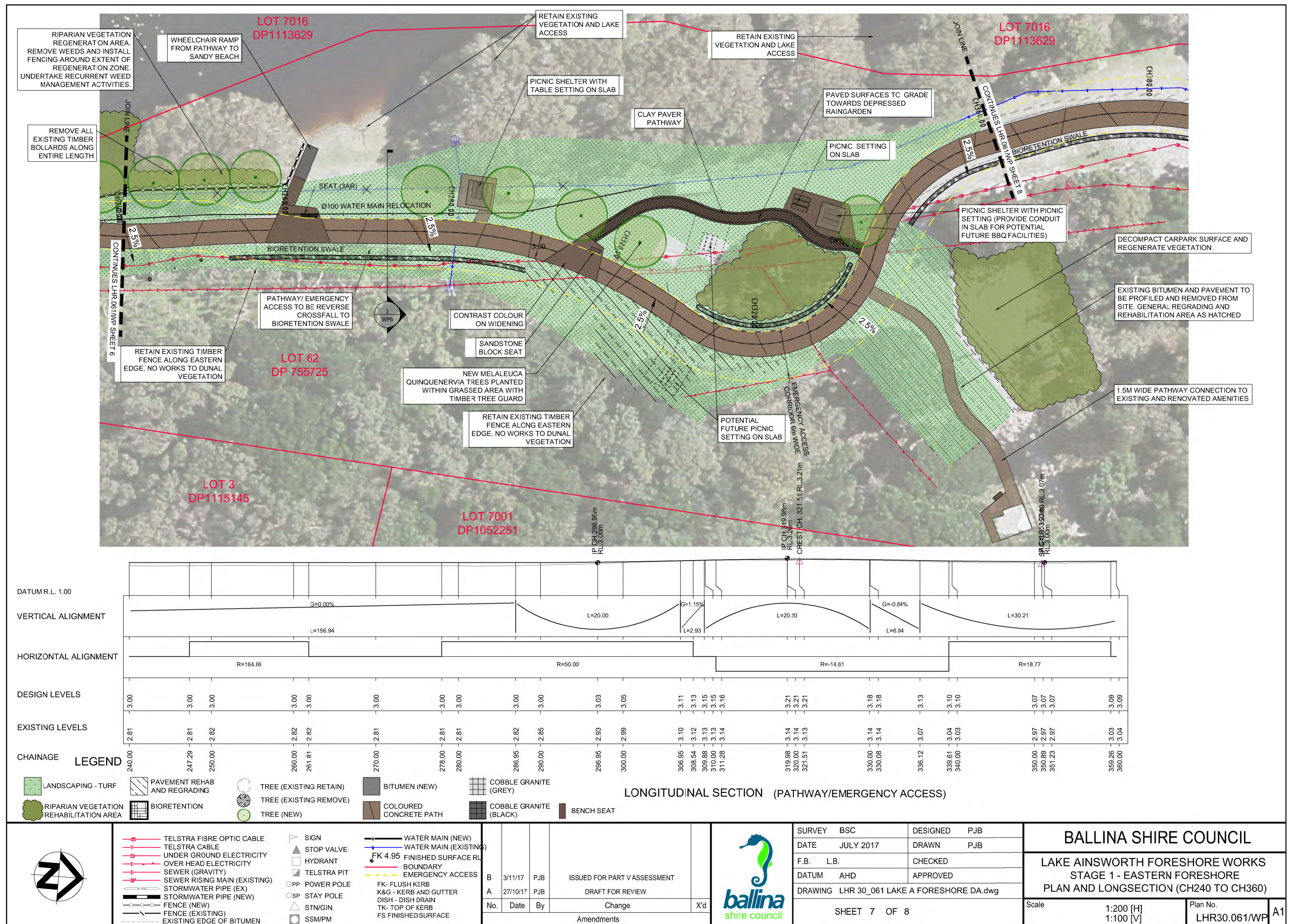
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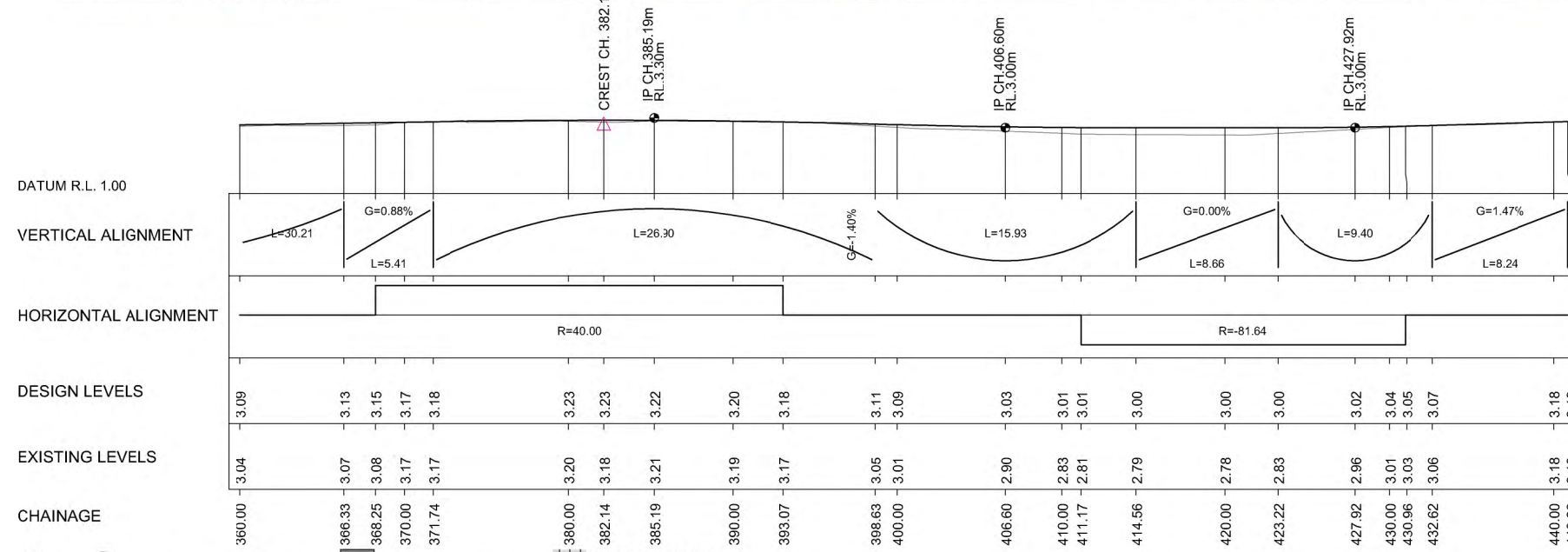
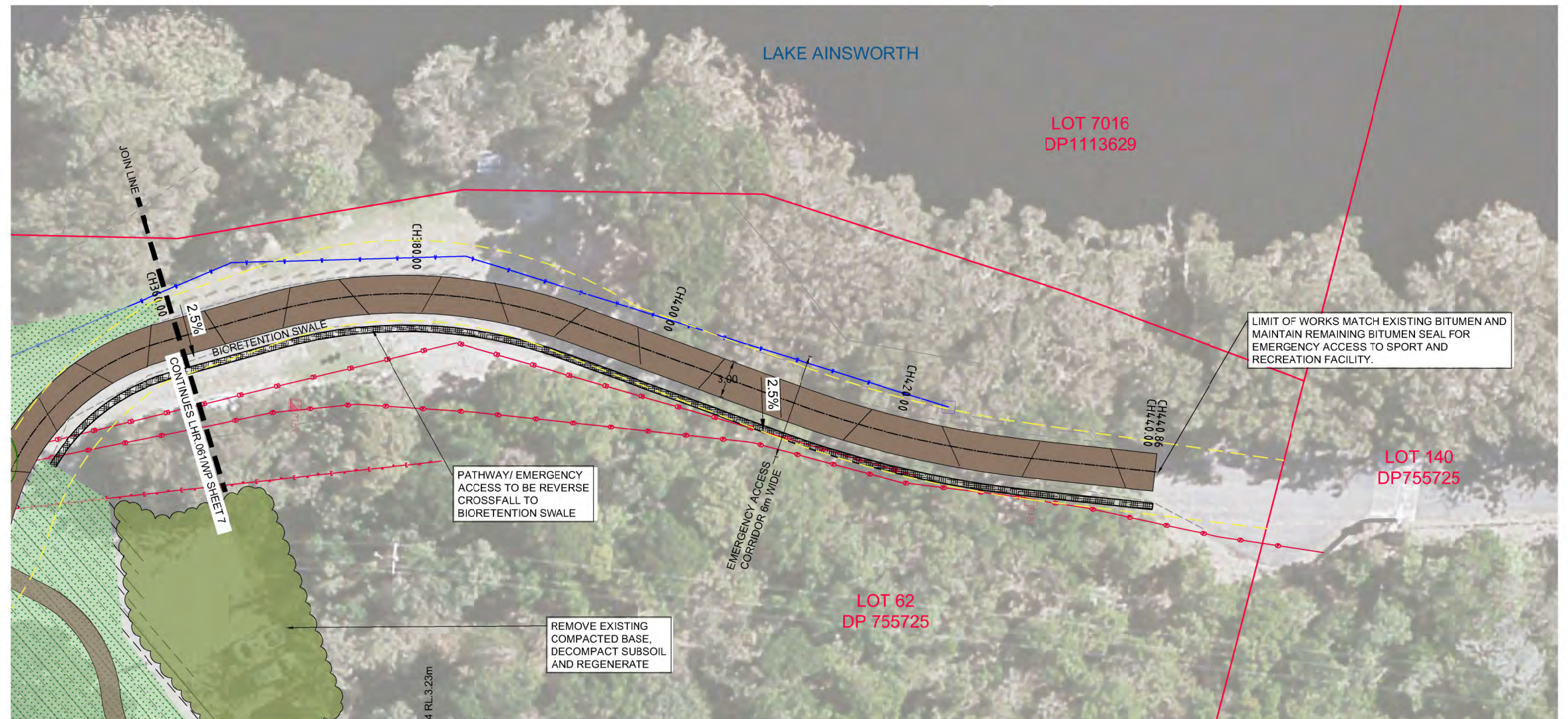












LONGITUDINAL SECTION (PATHWAY/EMERGENCY ACCESS)

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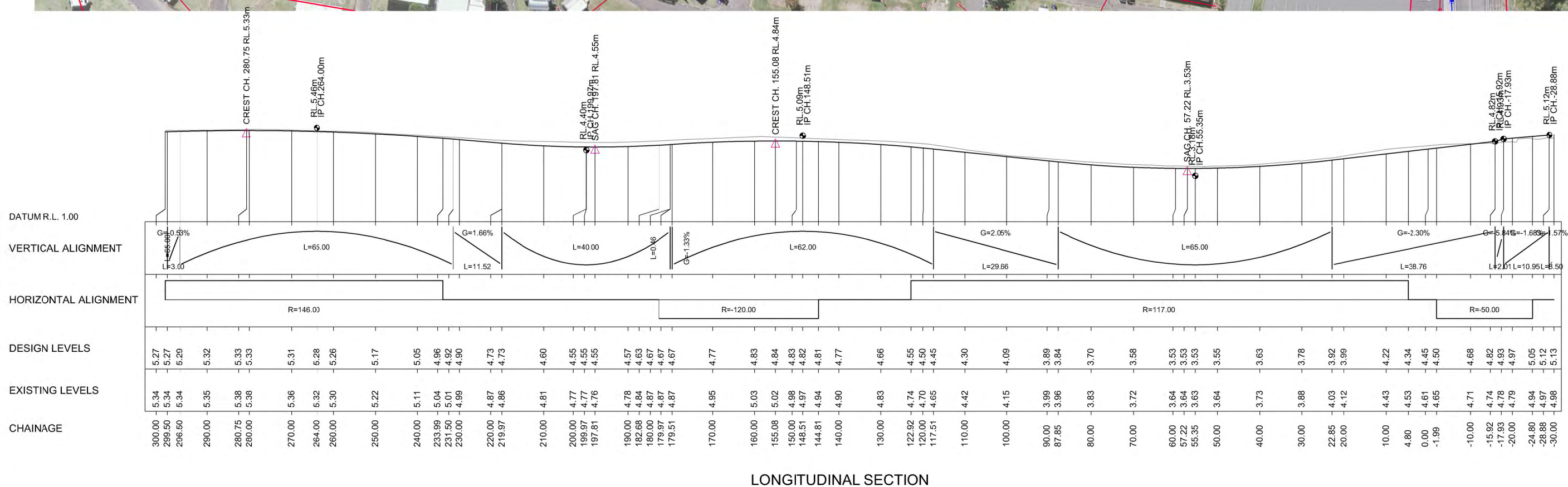
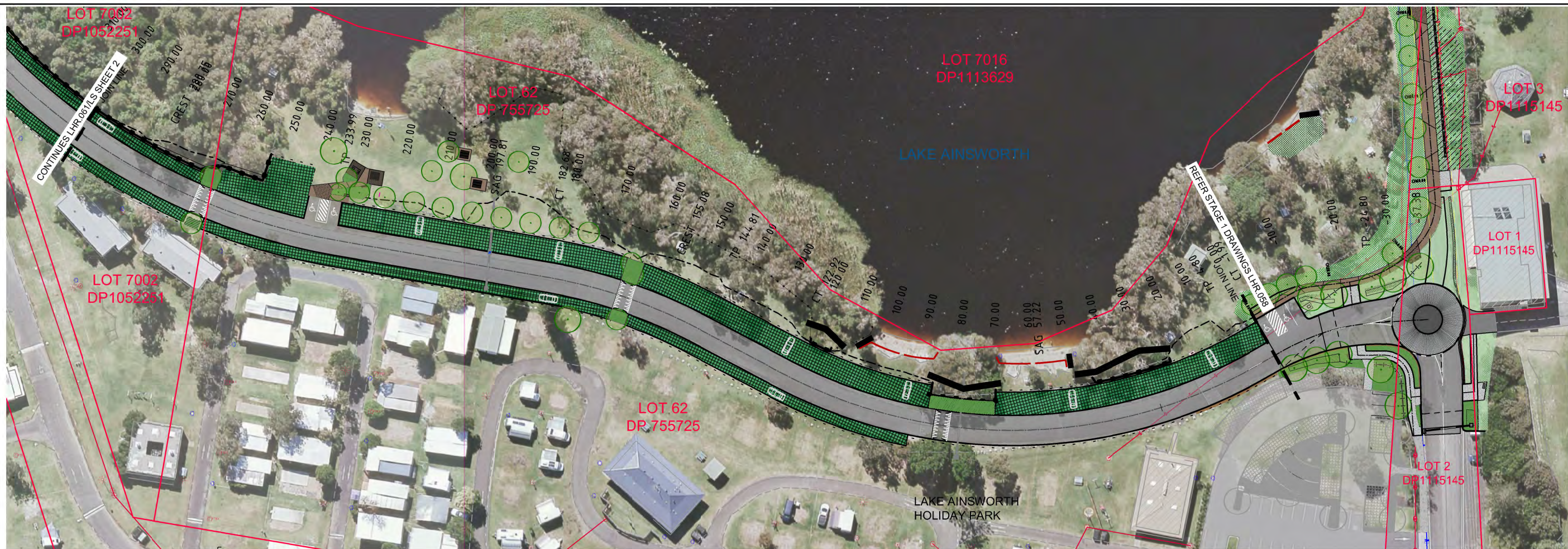


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LONGITUDINAL SECTION



LEGEND

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	TELSTRA CABLE		STOP VALVE		LANDSCAPE FENCE (NEW)
	UNDER GROUND ELECTRICITY		HYDRANT		BOLLARD LINE (NEW)
	OVER HEAD ELECTRICITY		TELSTRA PIT		BOLLARD LINE (EXISTING)
	SEWER (GRAVITY)		POWER POLE		BOUNDARY
	SEWER RISING MAIN (EXISTING)		STAY POLE		FK 4.95 FINISHED SURFACE RL
	STORMWATER PIPE (EX)		STN/GIN		BIORETENTION
	WATER (EX)		SSM/PM		TURFCELL
	FENCE (EX)				LANDSCAPING
	EDGE OF BITUMEN (EX)				AC SEAL

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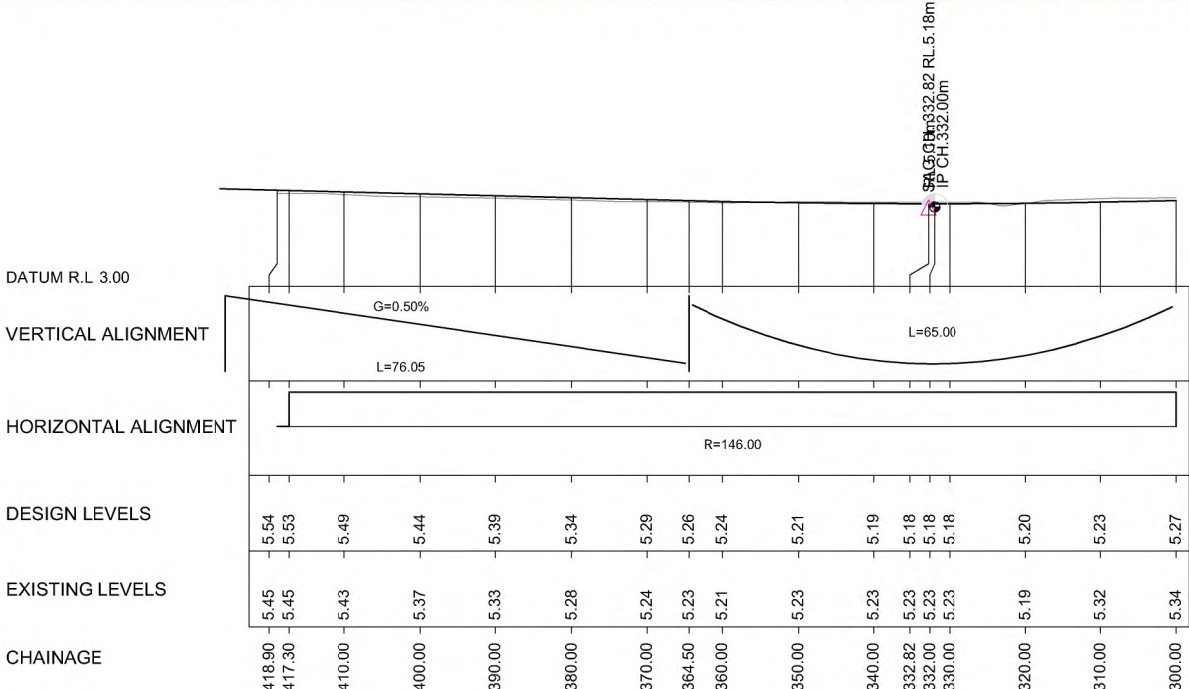
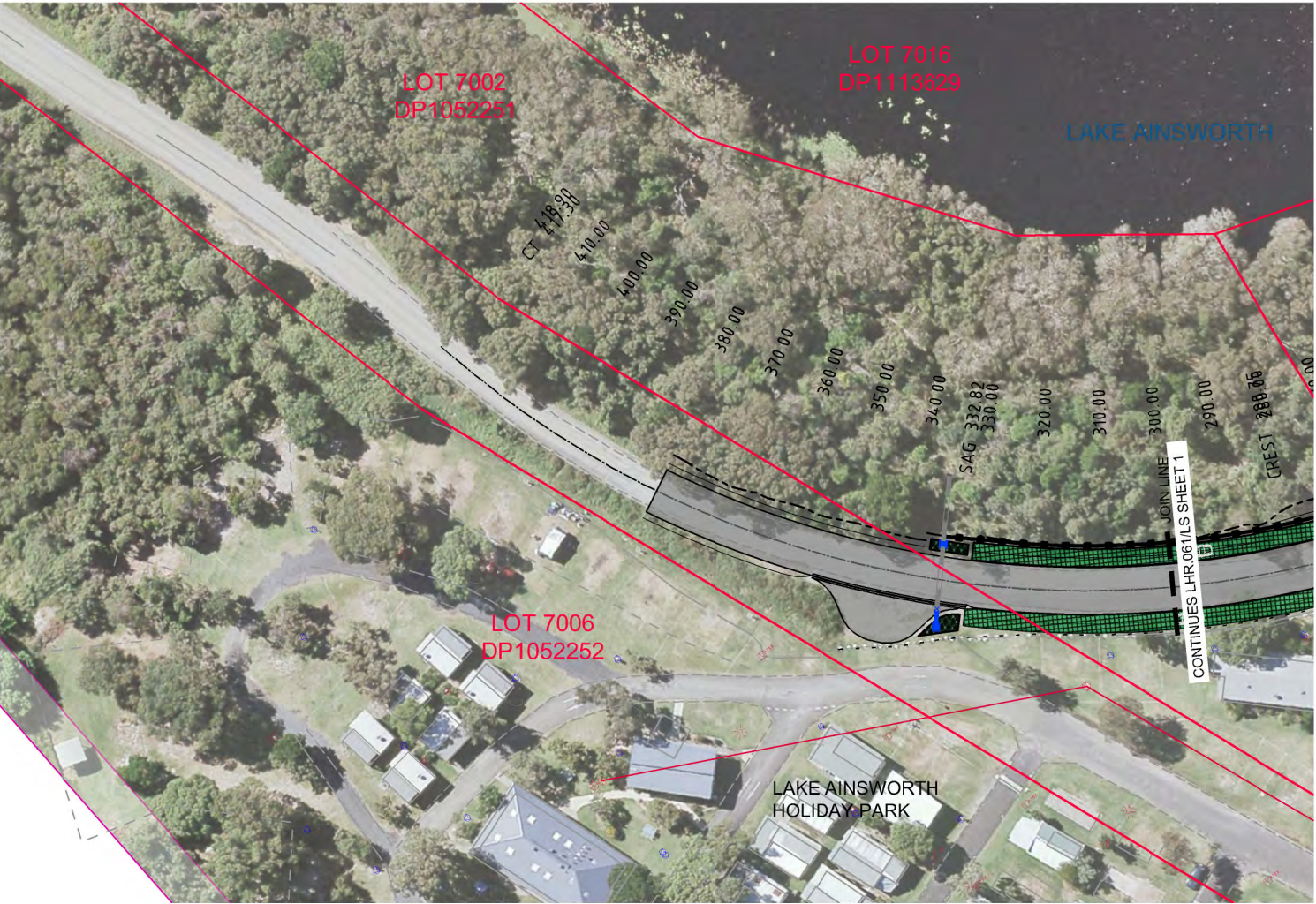
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DATUM	AHD	APPROVED	
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BALLINA SHIRE COUNCIL

LAKE AINSWORTH FORESHORE WORKS  
SOUTHERN ROAD ALIGNMENT  
PLAN AND LONGSECTION (CH0 - 300)

Scale	1:500 [H] 1:100 [V]	Plan No. LHR30.061/LS	A1
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LONGITUDINAL SECTION



LEGEND

	TELSTRA FIBRE OPTIC CABLE		SIGN		STORMWATER PIPE (NEW)
	TELSTRA CABLE		STOP VALVE		LANDSCAPE FENCE (NEW)
	UNDER GROUND ELECTRICITY		HYDRANT		BOLLARD LINE (NEW)
	OVER HEAD ELECTRICITY		TELSTRA PIT		BOLLARD LINE (EXISTING)
	SEWER (GRAVITY)		TELSTRA POLE		BOUNDARY
	SEWER RISING MAIN (EXISTING)		POWER POLE		FK 4.95 FINISHED SURFACE RL
	STORMWATER PIPE (EX)		STAY POLE		BIORETENTION
	WATER (EX)		STN/GIN		TURFCELL CAR PARKING
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	EDGE OF BITUMEN (EX)				AC SEAL

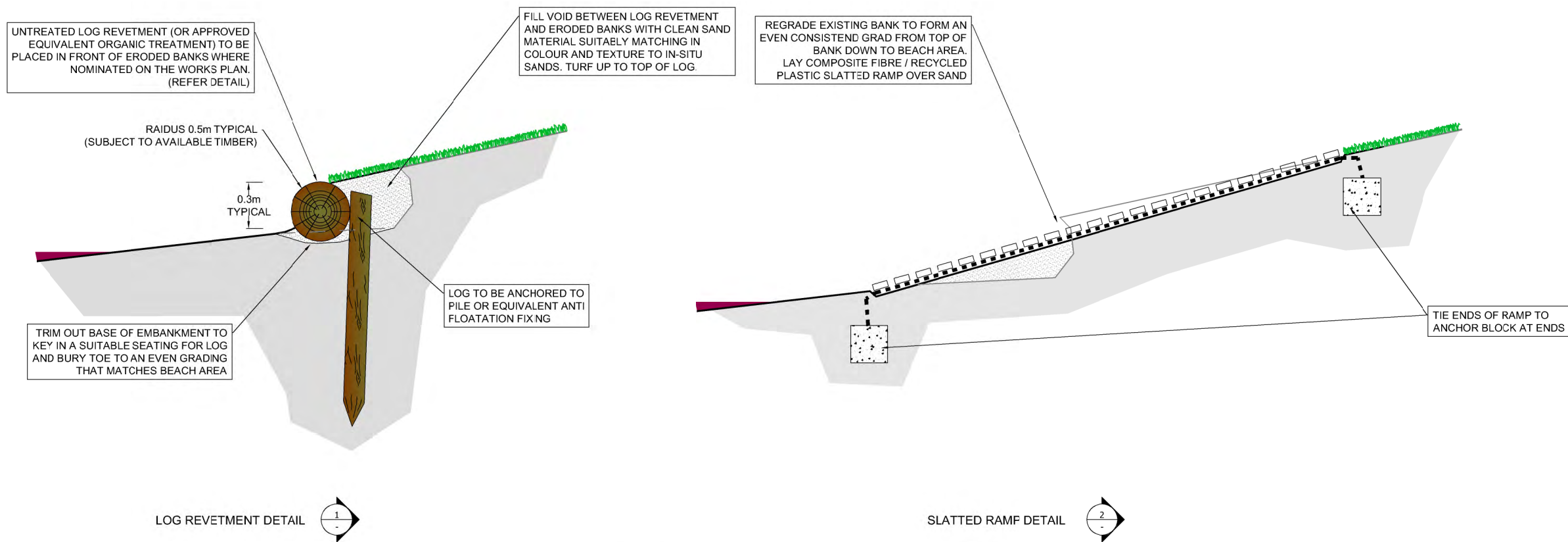
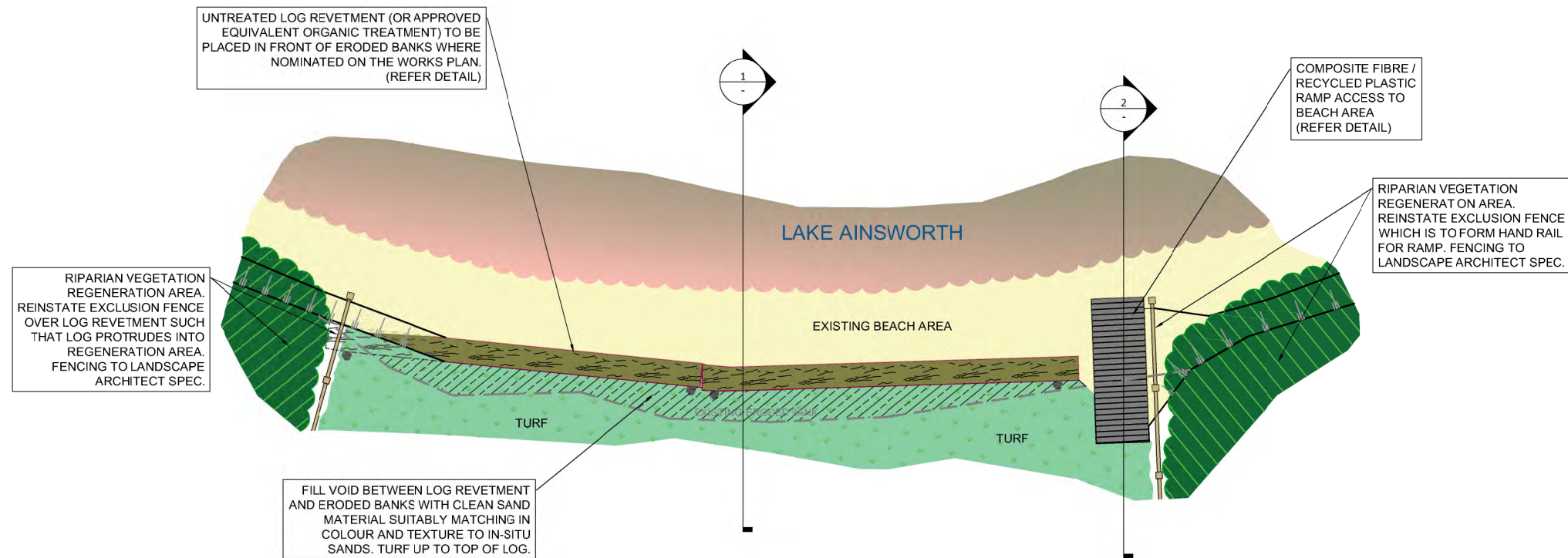
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No.	Date	By	Change	X'd
Amendments				



SURVEY	BSC	DESIGNED	PJB
DATE	JULY 2017	DRAWN	PJB
F.B.	L.B.	CHECKED	
DATUM	AHD	APPROVED	
DRAWING	LHR 30_061 LAKE A FORESHORE DA.dwg		
SHEET 2 OF 2			

BALLINA SHIRE COUNCIL			
LAKE AINSWORTH FORESHORE WORKS SOUTHERN ROAD ALIGNMENT PLAN AND LONGSECTION (CH300 - 380)			
Scale	1:500 [H] 1:100 [V]	Plan No.	LHR30.061/LS
			A1





B	3/11/17	PJB	ISSUED FOR PART V ASSESSMENT	
A	27/10/17	PJB	DRAFT FOR REVIEW	
No.	Date	By	Change	X'd
Amendments				



SURVEY	BSC	DESIGNED	PJB
DATE	JULY 2017	DRAWN	PJB
F.B.	L.B.	CHECKED	
DATUM	AHD	APPROVED	
DRAWING	LHR 30_061 LAKE A FORESHORE DA.dwg		
SHEET 1 OF 1			

## BALLINA SHIRE COUNCIL

### LAKE AINSWORTH FORESHORE WORKS LOG REVETMENT AND BEACH ACCESS RAMP TYPICAL DETAILS

Scale	NOT TO SCALE	Plan No.	LHR30.061/DT	A1
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## Appendix B

Metrocount Traffic Classifier data

## **MetroCount Traffic Executive** **Daily Classes**

### **DailyClass-535 -- English (ENA)**

#### **Datasets:**

**Site:** [13125] PACIFIC PARADE,LENNOX HEAD ,BETWEEN ROSS ST & RD TO CAMP  
**DREWE – LOCATION 1**  
**Attribute:** LENNOX HEAD  
**Direction:** 5 - South bound A>B, North bound B>A. **Lane:** 0  
**Survey Duration:** 11:09 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017,  
**Zone:**  
**File:** 13125 0 2017-05-04 1402.EC0 (Plus )  
**Identifier:** K663GTVH MC56-6 [MC55] (c)Microcom 02/03/01  
**Algorithm:** Factory default axle (v4.06)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017 (43.1608)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = North  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 78525 / 78652 (99.84%)

## Daily Classes

### DailyClass-535

**Site:** 13125.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD , BETWEEN ROSS ST & RD TO CAMP DREWE  
**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Monday, 20 March 2017

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed*</b>	929	1	37	3	1	0	1	0	0	0	0	0	972
(%)	95.6	0.1	3.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	1305	3	68	1	2	2	2	0	0	0	0	0	1383
(%)	94.4	0.2	4.9	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	1383	8	90	8	0	2	0	0	0	0	0	0	1491
(%)	92.8	0.5	6.0	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	1567	4	70	2	3	0	1	0	0	0	0	0	1647
(%)	95.1	0.2	4.3	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	2390	10	72	1	2	0	1	0	0	0	0	0	2476
(%)	96.5	0.4	2.9	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

### Average daily volume

#### Entire week

	1661	5	74	2	1	1	0	0	0	0	0	0	1748
(%)	95.0	0.3	4.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	

#### Weekdays

	1344	5	79	4	0	2	1	0	0	0	0	0	1436
(%)	93.6	0.3	5.5	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	

#### Weekend

	1978	6	71	1	2	0	0	0	0	0	0	0	2061
(%)	96.0	0.3	3.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-535****Site:** 13125.0.1SN**Description:** PACIFIC PARADE, LENNOX HEAD ,BETWEEN ROSS ST & RD TO CAMP DREWE**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017**Scheme:** Vehicle classification (AustRoads94)**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)**Monday, 27 March 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	1427	8	89	6	2	1	2	0	0	0	0	0	1535
(%)	93.0	0.5	5.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	1820	9	69	3	2	0	2	0	0	0	0	0	1905
(%)	95.5	0.5	3.6	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	1454	3	53	4	2	0	3	0	0	0	0	0	1519
(%)	95.7	0.2	3.5	0.3	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	569	4	65	3	4	0	0	0	0	0	0	0	645
(%)	88.2	0.6	10.1	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	915	1	35	2	0	0	0	0	0	0	0	0	953
(%)	96.0	0.1	3.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	1247	4	26	1	1	0	0	0	0	0	0	0	1279
(%)	97.5	0.3	2.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	1366	6	38	1	0	0	0	0	0	0	0	0	1411
(%)	96.8	0.4	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	1256	4	53	2	0	0	0	0	0	0	0	0	1320
(%)	95.2	0.3	4.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	1236	5	61	2	2	0	0	0	0	0	0	0	1311
(%)	94.3	0.4	4.7	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	1306	5	32	1	0	0	0	0	0	0	0	0	1344
(%)	97.2	0.4	2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**

## Daily Classes

### DailyClass-535

**Site:** 13125.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD , BETWEEN ROSS ST & RD TO CAMP DREWE  
**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 3 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	839	3	42	5	2	0	0	0	0	0	0	0	891
(%)	94.2	0.3	4.7	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	1072	3	69	7	2	1	0	0	0	0	0	0	1154
(%)	92.9	0.3	6.0	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	1067	4	68	6	0	0	1	0	0	0	0	0	1146
(%)	93.1	0.3	5.9	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	1339	8	60	4	3	0	1	0	0	0	0	0	1415
(%)	94.6	0.6	4.2	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	1384	3	63	4	1	0	2	0	0	0	0	0	1457
(%)	95.0	0.2	4.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	1950	4	75	4	2	2	2	0	0	0	0	0	2039
(%)	95.6	0.2	3.7	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	2580	5	97	3	3	2	1	1	0	0	0	0	2692
(%)	95.8	0.2	3.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	

### Average daily volume

#### Entire week

	1461	3	67	4	1	0	1	0	0	0	0	0	1541
(%)	94.8	0.2	4.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	

#### Weekdays

	1139	3	60	4	1	0	0	0	0	0	0	0	1212
(%)	94.0	0.2	5.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

#### Weekend

	2265	4	85	3	2	2	1	0	0	0	0	0	2365
(%)	95.8	0.2	3.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete



**Daily Classes****DailyClass-535**

**Site:** 13125.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD ,BETWEEN ROSS ST & RD TO CAMP DREWE  
**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 10 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	1893	12	89	6	4	1	1	0	0	0	0	0	2006
(%)	94.4	0.6	4.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	1833	10	77	6	3	0	3	0	1	0	0	0	1933
(%)	94.8	0.5	4.0	0.3	0.2	0.0	0.2	0.0	0.1	0.0	0.0	0.0	
<b>Wed</b>	1514	11	75	2	4	0	1	0	0	0	0	0	1607
(%)	94.2	0.7	4.7	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	1641	15	90	2	4	1	0	0	0	0	0	0	1753
(%)	93.6	0.9	5.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	2641	7	88	2	2	0	2	0	1	0	0	0	2743
(%)	96.3	0.3	3.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	2818	3	107	2	4	0	1	0	0	0	0	0	2935
(%)	96.0	0.1	3.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	3090	10	119	6	4	1	0	0	0	0	0	0	3230
(%)	95.7	0.3	3.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	2203	9	91	3	3	0	0	0	0	0	0	0	2314
(%)	95.2	0.4	3.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	1904	11	83	3	3	0	1	0	0	0	0	0	2008
(%)	94.8	0.5	4.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	2953	6	112	4	3	0	0	0	0	0	0	0	3082
(%)	95.8	0.2	3.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-535**

**Site:** 13125.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD , BETWEEN ROSS ST & RD TO CAMP DREWE  
**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 17 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	2886	6	105	2	2	0	3	1	0	0	0	0	3005
(%)	96.0	0.2	3.5	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	2060	8	89	3	5	2	4	0	0	0	0	0	2171
(%)	94.9	0.4	4.1	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	1872	1	83	3	0	0	1	0	0	0	0	0	1960
(%)	95.5	0.1	4.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	1875	9	70	1	2	0	1	0	0	0	0	0	1958
(%)	95.8	0.5	3.6	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	1995	5	74	1	2	0	3	0	0	0	0	0	2080
(%)	95.9	0.2	3.6	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	2641	6	89	7	1	1	1	0	0	0	0	0	2746
(%)	96.2	0.2	3.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	2332	10	98	0	4	0	0	0	0	0	0	0	2444
(%)	95.4	0.4	4.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	2237	6	86	1	1	0	1	0	0	0	0	0	2337
(%)	95.7	0.3	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	2137	5	84	1	1	0	1	0	0	0	0	0	2234
(%)	95.7	0.2	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	2486	8	93	3	2	0	0	0	0	0	0	0	2595
(%)	95.8	0.3	3.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**

## Daily Classes

**DailyClass-535**

**Site:** 13125.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD ,BETWEEN ROSS ST & RD TO CAMP DREWE  
**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 24 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	1738	6	73	6	2	1	1	0	0	0	0	0	1827
(%)	95.1	0.3	4.0	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	2599	6	81	1	5	0	1	0	0	0	0	0	2693
(%)	96.5	0.2	3.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	1031	1	66	9	1	0	1	0	0	0	0	0	1109
(%)	93.0	0.1	6.0	0.8	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	1507	7	80	4	2	2	0	0	0	0	0	0	1602
(%)	94.1	0.4	5.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	1056	6	82	10	0	0	0	0	0	0	0	0	1154
(%)	91.5	0.5	7.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	1921	8	76	2	3	0	1	0	2	0	0	0	2013
(%)	95.4	0.4	3.8	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	
<b>Sun</b>	2303	8	92	2	0	1	2	0	0	0	0	0	2408
(%)	95.6	0.3	3.8	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	1736	5	77	4	1	0	0	0	0	0	0	0	1829
(%)	94.9	0.3	4.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	1586	4	76	6	2	0	0	0	0	0	0	0	1676
(%)	94.6	0.2	4.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	2111	8	83	1	1	0	1	0	1	0	0	0	2210
(%)	95.5	0.4	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-535**

**Site:** 13125.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD , BETWEEN ROSS ST & RD TO CAMP DREWE  
**Filter time:** 11:10 Wednesday, 22 March 2017 => 15:01 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 1 May 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	1540	7	70	4	2	0	1	0	0	0	0	0	1624
(%)	94.8	0.4	4.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	1584	4	89	3	3	0	1	0	0	0	0	0	1684
(%)	94.1	0.2	5.3	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	1180	3	52	7	1	1	3	0	0	0	0	0	1247
(%)	94.6	0.2	4.2	0.6	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	
<b>Thu*</b>	532	5	42	2	2	0	0	0	0	0	0	0	583
(%)	91.3	0.9	7.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	1434	4	69	4	1	0	1	0	0	0	0	0	1518
(%)	94.5	0.3	4.5	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	1434	4	69	4	1	0	1	0	0	0	0	0	1518
(%)	94.5	0.3	4.5	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	

**Weekend** No complete days.

**\* - Incomplete**

## **MetroCount Traffic Executive** **Daily Classes**

### **DailyClass-539 -- English (ENA)**

#### **Datasets:**

**Site:** [14835] PACIFIC PARADE,LENNOX HEAD.BETWEEN DOG EXERCISE AREA AND  
ENT.TO DEPT SPORT & REC – LOCATION 2  
**Attribute:** LENNOX HEAD  
**Direction:** 5 - South bound A>B, North bound B>A. **Lane:** 0  
**Survey Duration:** 9:19 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017,  
**Zone:**  
**File:** 14835 0 2017-05-04 1448.EC0 (Plus )  
**Identifier:** JH84XH90 MC56-L5 [MC55] (c)Microcom 19Oct04  
**Algorithm:** Factory default axle (v4.06)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017 (44.2695)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = North  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 11548 / 12948 (89.19%)



## Daily Classes

### DailyClass-539

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT.TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Monday, 20 March 2017

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue*</b>	139	0	0	5	0	0	0	0	0	0	0	0	144
(%)	96.5	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	140	0	14	9	1	0	0	0	0	0	0	0	164
(%)	85.4	0.0	8.5	5.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	212	0	12	12	3	0	0	0	0	0	0	0	239
(%)	88.7	0.0	5.0	5.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	155	0	15	7	0	0	0	0	0	0	0	0	177
(%)	87.6	0.0	8.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	84	0	4	16	0	0	0	0	0	0	0	0	104
(%)	80.8	0.0	3.8	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	165	0	4	12	0	0	0	0	0	0	0	0	181
(%)	91.2	0.0	2.2	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

### Average daily volume

<b>Entire week</b>	150	0	9	10	0	0	0	0	0	0	0	0	172
(%)	87.2	0.0	5.2	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Weekdays</b>	169	0	13	8	1	0	0	0	0	0	0	0	193
(%)	87.6	0.0	6.7	4.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Weekend</b>	124	0	3	14	0	0	0	0	0	0	0	0	142
(%)	87.3	0.0	2.1	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-539**

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT.TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 27 March 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	139	0	10	9	2	0	0	0	0	0	0	0	160
(%)	86.9	0.0	6.3	5.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	236	1	16	7	2	0	0	0	0	0	0	0	262
(%)	90.1	0.4	6.1	2.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	145	0	9	9	0	0	0	0	0	0	0	0	163
(%)	89.0	0.0	5.5	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	121	0	19	8	2	0	0	0	0	0	0	0	150
(%)	80.7	0.0	12.7	5.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	100	0	14	4	0	0	0	0	0	0	0	0	118
(%)	84.7	0.0	11.9	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	100	0	4	6	0	0	0	0	0	0	0	0	110
(%)	90.9	0.0	3.6	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	138	0	6	3	0	0	0	0	0	0	0	0	147
(%)	93.9	0.0	4.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	139	0	10	6	0	0	0	0	0	0	0	0	157
(%)	88.5	0.0	6.4	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	148	0	13	6	0	0	0	0	0	0	0	0	170
(%)	87.1	0.0	7.6	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	118	0	5	4	0	0	0	0	0	0	0	0	128
(%)	92.2	0.0	3.9	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

## Daily Classes

### DailyClass-539

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT. TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

#### Monday, 3 April 2017

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	130	0	19	13	0	0	0	0	0	0	0	0	162
(%)	80.2	0.0	11.7	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	185	0	27	10	2	0	0	0	0	0	0	0	224
(%)	82.6	0.0	12.1	4.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	225	3	35	12	0	0	0	1	0	0	0	0	276
(%)	81.5	1.1	12.7	4.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	
<b>Thu</b>	178	2	11	13	2	0	0	0	0	0	0	0	206
(%)	86.4	1.0	5.3	6.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	148	0	17	11	0	0	0	0	0	0	0	0	176
(%)	84.1	0.0	9.7	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	138	0	2	6	0	0	0	0	0	0	0	0	146
(%)	94.5	0.0	1.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	155	0	8	14	0	0	0	0	0	0	0	0	177
(%)	87.6	0.0	4.5	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

#### Average daily volume

##### Entire week

	164	0	17	10	0	0	0	0	0	0	0	0	194
(%)	84.5	0.0	8.8	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

##### Weekdays

	172	0	21	11	0	0	0	0	0	0	0	0	208
(%)	82.7	0.0	10.1	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

##### Weekend

	146	0	5	10	0	0	0	0	0	0	0	0	161
(%)	90.7	0.0	3.1	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-539**

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT. TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 10 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	147	1	17	3	2	0	0	0	0	0	0	0	170
(%)	86.5	0.6	10.0	1.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	247	1	17	6	2	0	0	0	0	0	0	0	273
(%)	90.5	0.4	6.2	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	168	0	18	7	0	0	0	0	0	0	0	0	193
(%)	87.0	0.0	9.3	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	275	0	28	11	2	0	0	0	0	0	0	0	316
(%)	87.0	0.0	8.9	3.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	173	0	14	9	0	0	0	0	0	0	0	0	196
(%)	88.3	0.0	7.1	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	178	1	9	21	1	0	0	0	0	0	0	0	210
(%)	84.8	0.5	4.3	10.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	201	0	9	20	1	0	0	0	0	0	0	0	231
(%)	87.0	0.0	3.9	8.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	198	0	15	10	0	0	0	0	0	0	0	0	226
(%)	87.6	0.0	6.6	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	201	0	18	6	0	0	0	0	0	0	0	0	229
(%)	87.8	0.0	7.9	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	189	0	9	20	1	0	0	0	0	0	0	0	220
(%)	85.9	0.0	4.1	9.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-539**

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT.TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 17 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	224	0	10	6	3	0	0	0	0	0	0	0	243
(%)	92.2	0.0	4.1	2.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	659	1	31	7	2	0	0	0	0	0	0	0	700
(%)	94.1	0.1	4.4	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	578	0	30	9	0	0	0	0	0	0	0	0	617
(%)	93.7	0.0	4.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	660	0	32	11	1	0	1	0	0	0	0	0	705
(%)	93.6	0.0	4.5	1.6	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	636	2	24	6	0	0	1	0	0	0	0	0	669
(%)	95.1	0.3	3.6	0.9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	631	2	27	10	0	1	0	0	0	0	0	0	671
(%)	94.0	0.3	4.0	1.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	195	0	14	8	0	0	0	0	0	0	0	0	217
(%)	89.9	0.0	6.5	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	511	0	23	8	0	0	0	0	0	0	0	0	546
(%)	93.6	0.0	4.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	550	0	24	7	0	0	0	0	0	0	0	0	586
(%)	93.9	0.0	4.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	413	1	20	9	0	0	0	0	0	0	0	0	444
(%)	93.0	0.2	4.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**

**Daily Classes****DailyClass-539**

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT.TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 24 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	167	0	15	8	2	0	0	0	0	0	0	0	192
(%)	87.0	0.0	7.8	4.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	249	0	14	5	2	0	0	0	0	0	0	0	270
(%)	92.2	0.0	5.2	1.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	157	0	25	10	0	0	0	0	0	0	0	0	192
(%)	81.8	0.0	13.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	290	2	18	8	2	0	0	0	0	0	0	0	320
(%)	90.6	0.6	5.6	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	213	0	27	12	0	0	0	0	0	0	0	0	252
(%)	84.5	0.0	10.7	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	237	0	9	5	1	0	0	0	0	0	0	0	252
(%)	94.0	0.0	3.6	2.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	283	0	12	15	1	0	0	0	0	0	0	0	311
(%)	91.0	0.0	3.9	4.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	227	0	17	8	0	0	0	0	0	0	0	0	255
(%)	89.0	0.0	6.7	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	214	0	19	8	0	0	0	0	0	0	0	0	245
(%)	87.3	0.0	7.8	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	259	0	10	9	1	0	0	0	0	0	0	0	281
(%)	92.2	0.0	3.6	3.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**



**Daily Classes****DailyClass-539**

**Site:** 14835.0.1SN  
**Description:** PACIFIC PARADE, LENNOX HEAD. BETWEEN DOG EXERCISE AREA AND ENT.TO  
**DEPT SPORT & REC**  
**Filter time:** 9:20 Tuesday, 21 March 2017 => 15:48 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 1 May 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	230	0	12	10	2	0	0	0	0	0	0	0	254
(%)	90.6	0.0	4.7	3.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	246	0	22	2	2	0	0	0	0	0	0	0	272
(%)	90.4	0.0	8.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	145	0	11	8	1	0	0	0	0	0	0	0	165
(%)	87.9	0.0	6.7	4.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu*</b>	134	0	29	6	2	0	0	0	0	0	0	0	171
(%)	78.4	0.0	17.0	3.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	206	0	14	6	1	0	0	0	0	0	0	0	230
(%)	89.6	0.0	6.1	2.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	206	0	14	6	1	0	0	0	0	0	0	0	230
(%)	89.6	0.0	6.1	2.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend** No complete days.

**\* - Incomplete**

## **MetroCount Traffic Executive** **Daily Classes**

### **DailyClass-540 -- English (ENA)**

#### **Datasets:**

**Site:** [14945] CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK –  
**LOCATION 3**  
**Attribute:** LENNOX HEAD  
**Direction:** 5 - South bound A>B, North bound B>A. **Lane:** 0  
**Survey Duration:** 10:08 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017,  
**Zone:**  
**File:** 14945 0 2017-05-04 1515.EC0 (Plus )  
**Identifier:** K087S0Q5 MC56-6 [MC55] (c)Microcom 02/03/01  
**Algorithm:** Factory default axle (v4.06)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017 (44.2526)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = North  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 9232 / 9260 (99.70%)

**Daily Classes****DailyClass-540**

**Site:** 14945.0.1SN  
**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK  
**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 20 March 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue*</b>	96	4	7	0	0	0	0	0	0	0	0	0	107
(%)	89.7	3.7	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	125	0	24	1	0	0	0	0	0	0	0	0	150
(%)	83.3	0.0	16.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	107	2	10	1	0	1	0	0	0	0	0	0	121
(%)	88.4	1.7	8.3	0.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	139	1	10	0	0	0	0	0	0	0	0	0	150
(%)	92.7	0.7	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	226	2	10	1	0	0	0	0	0	0	0	0	239
(%)	94.6	0.8	4.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	241	2	14	1	0	0	0	0	0	0	0	0	258
(%)	93.4	0.8	5.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	166	0	13	0	0	0	0	0	0	0	0	0	182
(%)	91.2	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	123	0	14	0	0	0	0	0	0	0	0	0	140
(%)	87.9	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	233	2	11	1	0	0	0	0	0	0	0	0	248
(%)	94.0	0.8	4.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

**Daily Classes****DailyClass-540****Site:** 14945.0.1SN**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017**Scheme:** Vehicle classification (AustRoads94)**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)**Monday, 27 March 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	163	3	26	2	0	1	0	0	0	0	0	0	195
(%)	83.6	1.5	13.3	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	200	2	11	0	0	1	0	0	0	0	0	0	214
(%)	93.5	0.9	5.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	174	4	15	0	0	0	0	0	0	0	0	0	193
(%)	90.2	2.1	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	47	1	5	1	1	0	0	0	0	0	0	0	55
(%)	85.5	1.8	9.1	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	57	0	0	0	0	0	0	0	0	0	0	0	57
(%)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	138	0	10	1	0	0	0	0	0	0	0	0	149
(%)	92.6	0.0	6.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	152	0	9	0	1	0	0	0	0	0	0	0	162
(%)	93.8	0.0	5.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	132	0	10	0	0	0	0	0	0	0	0	0	145
(%)	91.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	127	2	11	0	0	0	0	0	0	0	0	0	142
(%)	89.4	1.4	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	144	0	9	0	0	0	0	0	0	0	0	0	155
(%)	92.9	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**

**Daily Classes****DailyClass-540**

**Site:** 14945.0.1SN  
**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK  
**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 3 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	77	2	11	2	1	0	0	0	0	0	0	0	93
(%)	82.8	2.2	11.8	2.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	121	2	5	2	2	0	0	0	0	0	0	0	132
(%)	91.7	1.5	3.8	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	89	0	6	1	0	2	0	0	0	0	0	0	98
(%)	90.8	0.0	6.1	1.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	152	2	7	0	0	2	1	0	0	0	0	0	164
(%)	92.7	1.2	4.3	0.0	0.0	1.2	0.6	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	162	2	10	3	0	0	0	0	0	0	0	0	177
(%)	91.5	1.1	5.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	205	3	12	3	0	0	0	0	0	0	0	0	223
(%)	91.9	1.3	5.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	282	1	17	0	0	0	1	0	0	0	0	0	301
(%)	93.7	0.3	5.6	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	155	1	9	1	0	0	0	0	0	0	0	0	168
(%)	92.3	0.6	5.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	119	1	7	0	0	0	0	0	0	0	0	0	132
(%)	90.2	0.8	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	243	2	14	1	0	0	0	0	0	0	0	0	261
(%)	93.1	0.8	5.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**

**Daily Classes****DailyClass-540****Site:** 14945.0.1SN**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017**Scheme:** Vehicle classification (AustRoads94)**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)**Monday, 10 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	213	3	22	2	2	0	0	0	0	0	0	0	242
(%)	88.0	1.2	9.1	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	191	4	14	4	2	0	0	0	0	0	0	0	215
(%)	88.8	1.9	6.5	1.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	143	0	14	1	0	0	4	0	0	0	0	0	162
(%)	88.3	0.0	8.6	0.6	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	188	2	23	2	1	0	1	0	0	0	0	0	217
(%)	86.6	0.9	10.6	0.9	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	356	0	22	1	0	0	0	0	0	0	0	0	379
(%)	93.9	0.0	5.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	359	2	18	0	0	0	0	0	0	0	0	0	379
(%)	94.7	0.5	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	416	3	40	2	0	0	0	0	0	0	0	0	461
(%)	90.2	0.7	8.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	266	1	21	1	0	0	0	0	0	0	0	0	293
(%)	90.8	0.3	7.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	218	1	19	1	0	0	0	0	0	0	0	0	242
(%)	90.1	0.4	7.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	387	2	28	0	0	0	0	0	0	0	0	0	419
(%)	92.4	0.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**



## Daily Classes

### DailyClass-540

**Site:** 14945.0.1SN  
**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK  
**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Monday, 17 April 2017

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	264	6	28	0	2	0	1	0	0	0	0	0	301
(%)	87.7	2.0	9.3	0.0	0.7	0.0	0.3	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	147	0	20	0	2	0	0	0	0	0	0	0	169
(%)	87.0	0.0	11.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	107	2	11	0	0	0	0	0	0	0	0	0	120
(%)	89.2	1.7	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	147	0	18	0	1	0	0	0	0	0	0	0	166
(%)	88.6	0.0	10.8	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	272	1	16	0	0	0	0	0	0	0	0	0	289
(%)	94.1	0.3	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	416	0	30	0	0	0	0	0	0	0	0	0	446
(%)	93.3	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	323	4	19	0	0	0	0	0	0	0	0	0	346
(%)	93.4	1.2	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

### Average daily volume

#### Entire week

	238	1	19	0	0	0	0	0	0	0	0	0	261
(%)	91.2	0.4	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

#### Weekdays

	187	1	18	0	0	0	0	0	0	0	0	0	208
(%)	89.9	0.5	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

#### Weekend

	369	2	24	0	0	0	0	0	0	0	0	0	396
(%)	93.2	0.5	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\* - Incomplete

## Daily Classes

**DailyClass-540****Site:** 14945.0.1SN**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017**Scheme:** Vehicle classification (AustRoads94)**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)**Monday, 24 April 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	228	5	10	1	1	1	0	0	0	0	0	0	246
(%)	92.7	2.0	4.1	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	363	1	19	0	0	0	0	0	0	0	0	0	383
(%)	94.8	0.3	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	75	0	9	0	0	0	0	0	0	0	0	0	84
(%)	89.3	0.0	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu</b>	116	2	10	0	0	2	0	0	0	0	0	0	130
(%)	89.2	1.5	7.7	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri</b>	123	0	17	0	0	1	1	0	0	0	0	0	142
(%)	86.6	0.0	12.0	0.0	0.0	0.7	0.7	0.0	0.0	0.0	0.0	0.0	
<b>Sat</b>	253	0	13	0	0	0	2	0	0	0	0	0	268
(%)	94.4	0.0	4.9	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	
<b>Sun</b>	322	2	18	1	0	0	0	0	0	0	0	0	343
(%)	93.9	0.6	5.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	210	0	13	0	0	0	0	0	0	0	0	0	227
(%)	92.5	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	181	1	12	0	0	0	0	0	0	0	0	0	196
(%)	92.3	0.5	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend**

	287	0	15	0	0	0	0	0	0	0	0	0	305
(%)	94.1	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**\* - Incomplete**

**Daily Classes****DailyClass-540**

**Site:** 14945.0.1SN  
**Description:** CAMP DREWE ROAD,NORTHERN BOUNDARY OF CARAVAN PARK  
**Filter time:** 10:09 Tuesday, 21 March 2017 => 16:12 Thursday, 4 May 2017  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

**Monday, 1 May 2017**

	1	2	3	4	5	6	7	8	9	10	11	12	Total
<b>Mon</b>	188	0	12	0	2	0	0	0	0	0	0	0	202
(%)	93.1	0.0	5.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Tue</b>	119	0	10	1	2	1	0	0	0	0	0	0	133
(%)	89.5	0.0	7.5	0.8	1.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Wed</b>	116	2	7	0	0	0	0	0	0	0	0	0	125
(%)	92.8	1.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Thu*</b>	46	0	0	0	0	0	0	0	0	0	0	0	46
(%)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Fri*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sat*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Sun*</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Average daily volume****Entire week**

	141	0	9	0	0	0	0	0	0	0	0	0	153
(%)	92.2	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekdays**

	141	0	9	0	0	0	0	0	0	0	0	0	153
(%)	92.2	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Weekend** No complete days.


**\* - Incomplete**

# Appendix C

## MUSIC Model Parameters

## Rainfall Data

Catchment Name	Lake Ainsworth Carpark
Rainfall Station	58131 ALSTONVILLE
ET Station	User-defined monthly PET
Start Date	1/1/1996 12:00 AM
End Date	12/31/2006 11:54 PM
Modelling Time Step	6 Minutes

 Close

## Rainfall- Runoff Parameters for Sand

<b>Impervious Area Properties</b>	
Rainfall Threshold (mm/day)	1.50
<b>Pervious Area Properties</b>	
Soil Storage Capacity (mm)	170.00
Initial Storage (% of Capacity)	30
Field Capacity (mm)	70.00
Infiltration Capacity Coefficient - a	360.00
Infiltration Capacity Exponent - b	0.50
<b>Groundwater Properties</b>	
Initial Depth (mm)	10.00
Daily Recharge Rate (%)	100.00
Daily Baseflow Rate (%)	50.00
Daily Deep Seepage Rate (%)	0.00