



## Sections 1902 and 1905, Hundred of Ayers Development Application

### INTRODUCTION

Sections 1902 and 1905, Hundred of Ayers, located on the Middle Arm Peninsula, are owned by Land Development Corporation (LDC).

LDC is an NT Government business division that delivers developments that provide enterprises with strategically positioned land parcels on which they are able to develop their businesses.

In the Wickham locality, LDC has approximately 600 hectares of land within what is referred to as the Middle Arm Industrial Precinct (MAIP). Land within the MAIP is available for strategic, industrial development.

In 2018, LDC carried out a pre-feasibility analysis for the development of the first stage of the MAIP, known as Kittyhawk Estate. Kittyhawk Estate comprises Section 1900 and 1902 with an area in excess of 335 hectares. During the pre-feasibility analysis process and subsequent project control group meetings, LDC consulted with Litchfield Council, Power and Water Corporation, Department of Infrastructure, Planning and Logistics, Department of Environment and Natural Resources (DENR), Department of Health and a range of other agencies, authorities and service providers to progress the design.

The pre-feasibility analysis report considered the availability of services, land suitability, development opportunities and the servicing requirements to facilitate the identified development opportunities.

Development/subdivision options were considered in the pre-feasibility analysis report and as a result of those, and subsequent considerations, LDC has settled on a preferred option for the initial stage of Kittyhawk Estate. This initial stage comprises 3 proposed development parcels in the southern part of Section 1902.

Section 1902 is separated from Channel Island Road by Section 1905, also owned by LDC. Section 1905 is a products corridor that currently comprises high pressure gas, power transmission and watermain and is available for further products and services should the need arise.

LDC is currently finalising approvals for the construction of an access road that will provide access from Channel Island Road, across Section 1905 and into Kittyhawk Estate.

The number of accesses that will be permitted off Channel Island Road is limited due the nature of the traffic and road speeds on the road so the proposed access through Section 1905 will be a strategic access point for other parts of the MAIP and areas of Government controlled land that may be developed in the future.

As well as the 3 proposed lots, an additional products corridor allotment is proposed adjacent to the internal road that will be developed in the initial stage of the Kittyhawk development. This products corridor allotment will be addressed in more detail in this application.

This Development Application is seeking the approval of the consent authority for the development of Sections 1902 and 1905 to create 6 lots being:

- 3 development parcels.
- 1 parcel being the balance of Section 1902.
- 1 products corridor parcel
- 1 parcel being the balance of Section 1905 once the road reserves are excised and a small portion of Section 1902 is added (to be addressed in more detail).

**SITE DETAILS**

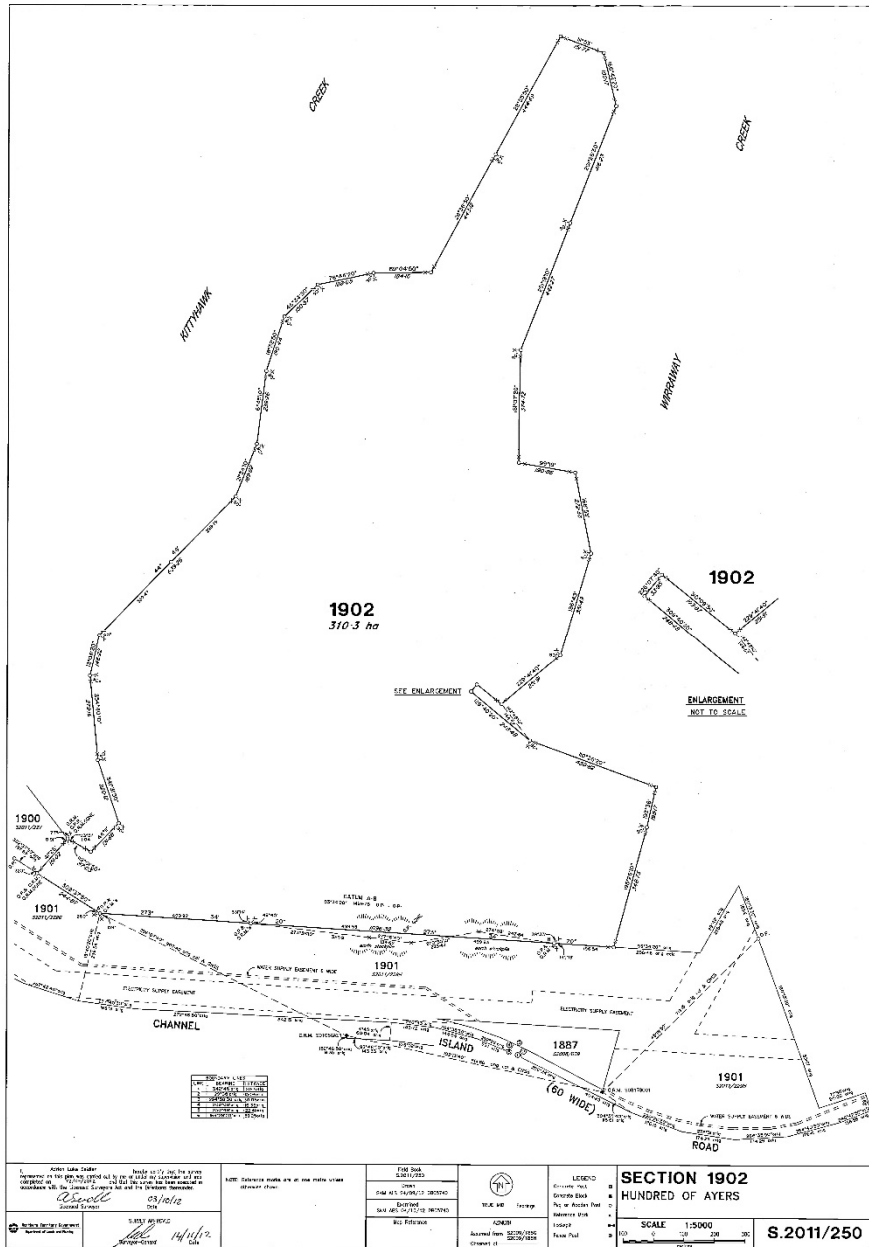
**Section 1902**

Title details – Volume 787 Folio 302

Site area – 310.3 hectares

Survey plan – S2011/250

Easements - nil



**Section 1905**

Title details – Volume 807 Folio 435

Site area – 471.8 hectares

Survey plan – S2012/176A-H (see Attachment A)

**Easements**

Electricity Supply Easement to Power and Water Corporation

Electricity Supply Easement to Power and Water Corporation

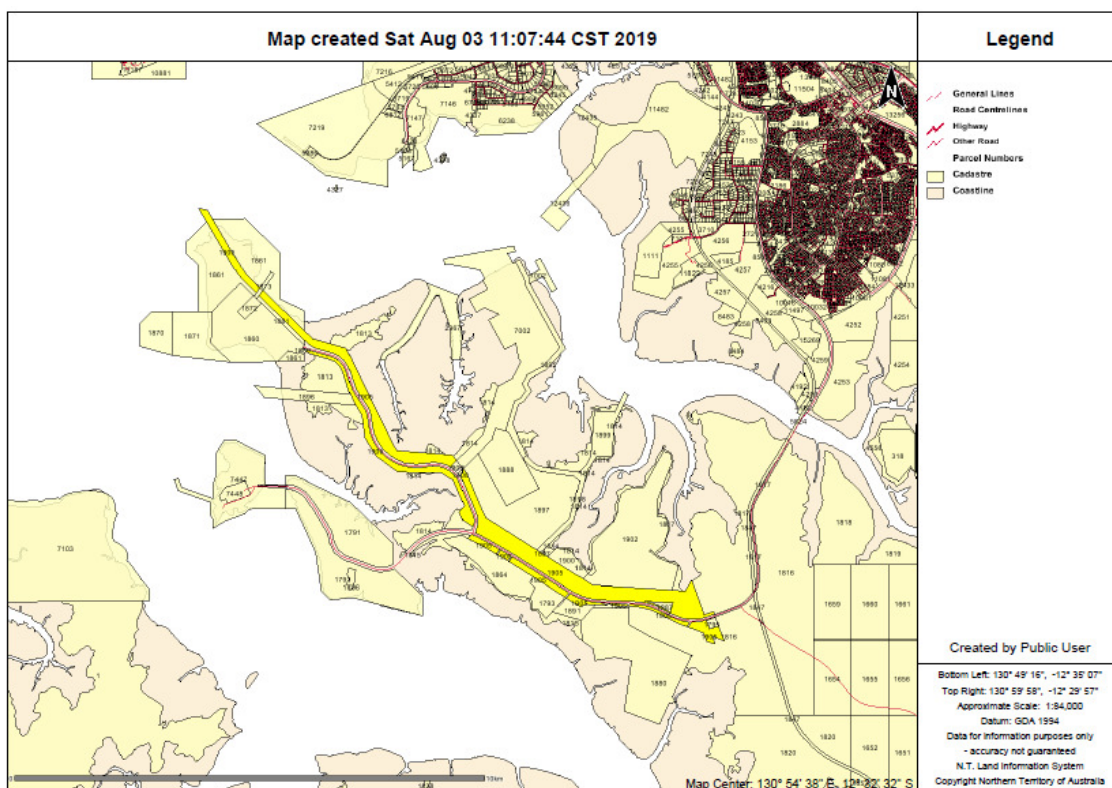
Electricity Supply Easement to Power and Water Corporation

Water Supply Easement to Power and Water Corporation

Energy Supply Easement to Northern Territory of Australia

Energy Supply Easement to EII Pipelines (WPP) Pty Limited (Dealing Number 861826)

Easement to Ichthys LNG Pty Ltd (Dealing Number 838950)



*Extent of Section 1905 – map produced from NTATLAS*

## THE PROPOSAL

The intention of this development application is to seek approval to develop a portion of Section 1902 to create 3 saleable industrial allotments. By way of creating these allotments Section 1905 is also affected.

The current proposal involves the creation of approximately 200 metres of spine road reserve and is referred to as Road 1 on the draft engineering plans. It is proposed that Road 1 will initially incorporate a temporary turnaround (cul-de-sac head) that will be constructed as part of the current subdivision proposal. This temporary turnaround will be within the balance of Section 1902 (proposed Lot 5).


Future development of Section 1902 will be serviced by extending Road 1 to create an internal spine road alignment that follows the ridge line to the northern part of Section 1902.

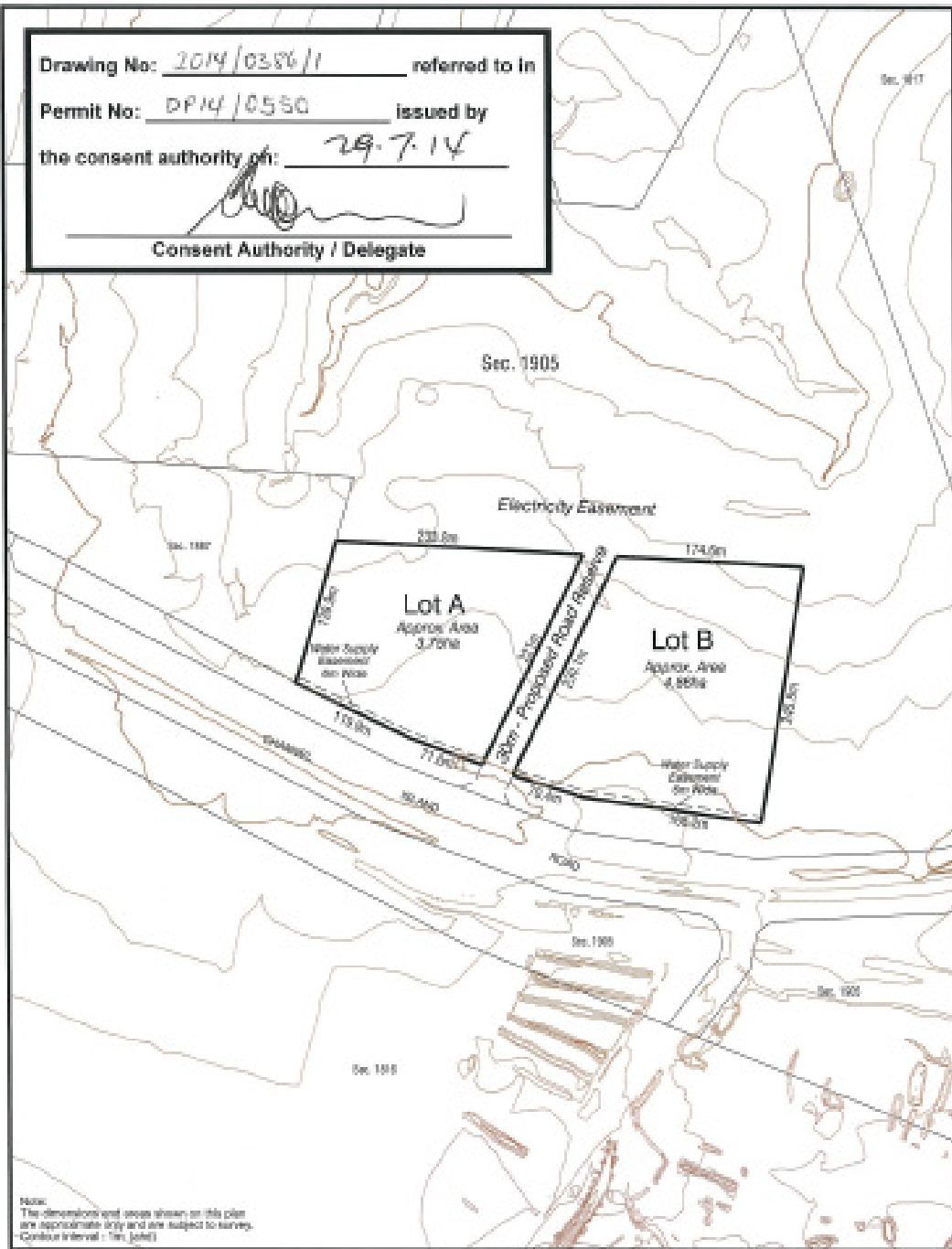
This proposal also involves the creation of a second road reserve (Road 2), traversing to the east, adjacent to the southern boundary of Section 1902. In the future, it is envisaged that this road will continue to the east providing access to other developable land currently owned by LDC and the NT Government.

LDC also has an existing approval to create two new parcels adjacent to the Weddell Power Station (approved concept plan on following page). This approval indicates that access to the proposed lots will be from a new access road that will be constructed from Channel Island Road. Construction of this access road may not be required as it is also possible to create an access from the rear of these lots via an extension to the proposed new Road 2

Section 1905 is the existing products corridor within Middle Arm and runs adjacent to Channel Island Road and Wickham Point Road. Section 1905 will be affected by this proposal as the 50 metre wide access road reserve from Channel Island Road to the southern boundary of Section 1902 will be excised, leaving a balance parcel. A further, small portion of the internal road reserve will affect Section 1905 and this will be explained in more detail.



Drawing No: 2014/0386/1 referred to in  
 Permit No: DP14/0550 issued by  
 the consent authority on: 29.7.14  
  
 \_\_\_\_\_  
 Consent Authority / Delegate



Note:  
 The dimensions and areas shown on this plan  
 are approximate only and are subject to survey.  
 Contour Interval: 1m (alt)

Proposed Subdivision of Section 1905  
 Hundred of Ayers  
 to create 3 Lots



Northern  
 Territory  
 Government

Department of Lands, Planning and the Environment

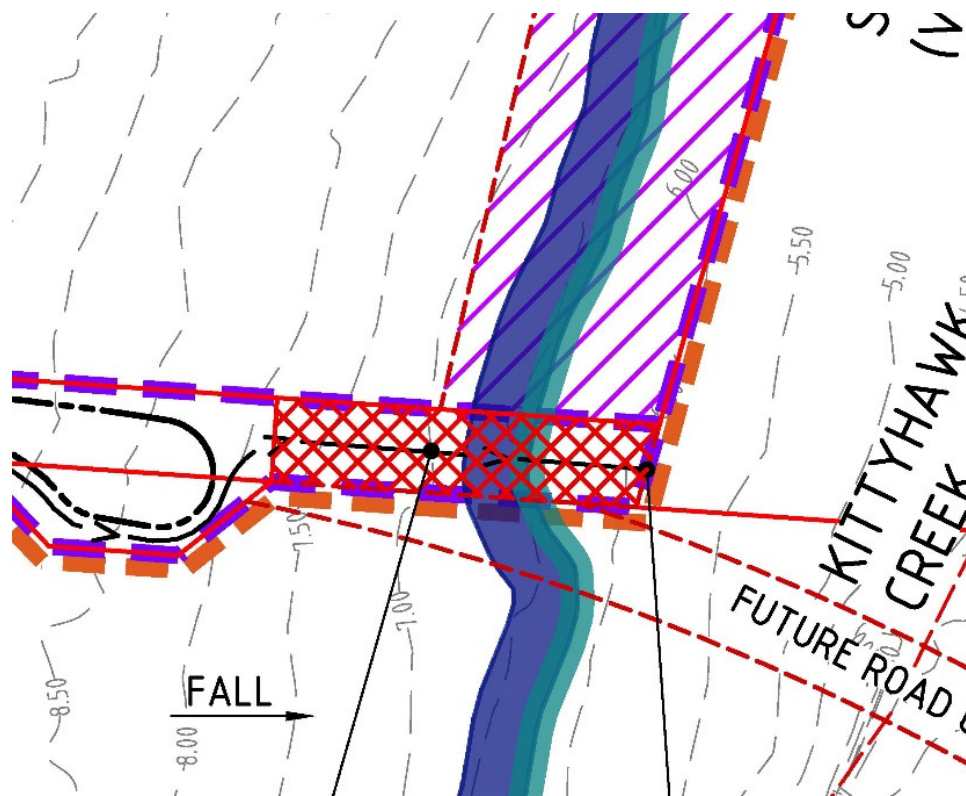


Date: 30/08/14  
 Drawing Name: Middle Arm Sub Div Industrial.dwg

The alignment of this future eastern connector road will need to deviate south into Section 1905 to avoid sensitive mangrove environments and the current proposal includes part of that deviation and will comprise a cul-de-sac head at the termination of the Road 2 construction works.

It was initially proposed to also include road reserve, past the termination point and within Section 1902, to accommodate the drainage outfall from Road 2. Rather than extend the road reserve, it is now proposed that a small portion of Section 1902 will now be included in the parcel created from Section 1905 following the excision of the road reserves. An easement, in favour of Litchfield Council, will be registered on title to cover the proposed drainage line.

The figure below (an extract from the stormwater management plan – Attachment B) indicates the small portion of land.



As previously mentioned, this application is proposing 3 development parcels – identified as Lots 2, 3 and 4 on plan 19/10999/5A.

Proposed Lot 1 is a 'products corridor' parcel that will have components on either side of the Road 1 road reserve. Each component will be 10 metres wide and they are being established to accommodate products and high pressure gas services (apart from power, streetlighting, water, communications and low pressure gas reticulation) that may be required to support industries that may be developed at some time in the future.

The purpose of the proposed products corridors is to accommodate high pressure gas reticulation and other gas-based fuel products (i.e. methanol, ethanol, condensate, butane and propane), processed water, chemicals or waste products from the future uses as required.

Establishing the product corridor allotment at this stage will make provision for these uses to be located in a corridor that will be retained by the LDC, and not within a Council owned road reserve.

It is expected that if and when the spine road is extended to the north as part of future development of section 1905, the product corridors will also be extended.

Following consideration of the current application, the intention is to seek an amendment to the NT Planning Scheme and zone proposed Lot 1 U (Utilities). The existing products corridor, Section 1905, is zoned U.

For the 3 development parcels being developed as part of the current application, access and servicing will initially be from Road 2. If it is determined that future access or servicing for proposed Lot 2, and other future lots abutting the spine road, easements will be established across the product corridor allotment to accommodate these accesses and service connections.

Proposed Lot 2 will have an area of approximately 15 hectares. Whilst Lot 2 will comprise areas that have been cleared in the past, no further clearing of native vegetation or site grading is proposed as part of the subdivision process. However; LDC has consulted heavily with the Department of Environment and Natural Resources, Flora and Fauna division, and it is recognised and agreed that all lots are expected to be fully cleared if not by LDC, then by the proponent. Therefore it is not expected that the proponents will be required to obtain clearing permits when they undertake their developments.

Lot 2 has been designed with a 30 metre wide 'corridor' that extends north east to the boundary of Section 1902. Any future development on Lot 2 will require a Development Application under the DV zone and the corridor will provide an avenue for drainage from that future development.

As part of the current subdivision proposal, a cut-off drain will be established along the eastern boundary of proposed Lot 2 in order to prevent cross boundary drainage flow into proposed Lots 3 and 4. This cut-off drain is indicated on the storm water management plan.

Proposed Lot 3, to be accessed from Road 2, will have an area of 1 hectare. This lot size has been developed for a specific proponent who has indicated that the location is desirable for their particular use.

Lot 3 will be cleared and graded with stormwater flow being directly to Road 2. The stormwater management plan also indicates that a cut-off drain will be constructed as part of the subdivision process to ensure that there is no cross-boundary flow into proposed Lot 4.

Proposed Lot 4 will have an area of approximately 27 hectares and as with Lot 2, no further clearing of native vegetation will take place as part of the proposed subdivision process. However as mentioned above, LDC has consulted heavily with the Department of Environment and Natural Resources (DENR) and it is recognised and agreed that all lots are expected to be fully cleared if not by LDC, then by the proponent. Therefore it is not expected that the proponents will be required to obtain clearing permits when they undertake their developments.

The stormwater management plan indicates an area adjacent to the eastern and northern boundaries that at this stage is identified as an 'interim no-clearing zone'. The area has been identified due to the vegetation within the area and the desire to maintain a corridor for native fauna including the Black-footed tree-rat. The limitations in this area are expected to be determined as part of ongoing discussions between LDC, EcOz and DENR.





**MATTERS TO BE ADDRESSED**

**46(3)(a) – Compliance with the NT Planning Scheme**

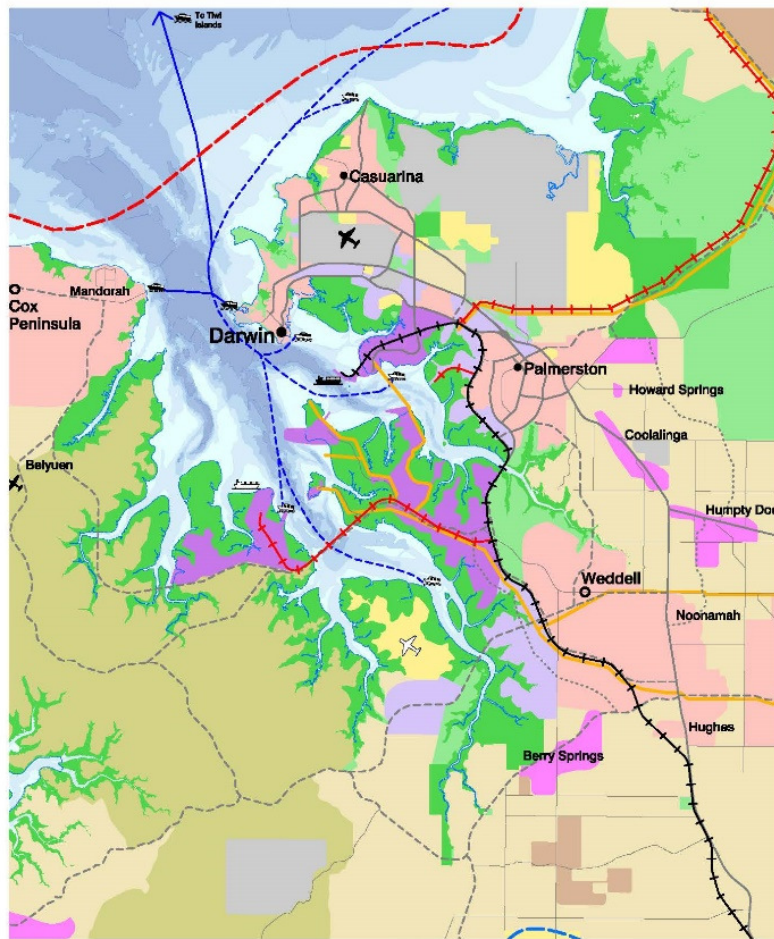
The Darwin Regional Land Use Plan 2015 (DRLUP) identifies the areas of Sections 1902 and 1905 as Strategic Industry.

The DRLUP lists as one of the key objectives.... *Ensure the detailed planning for future development in the region takes account of the limited opportunities to appropriately locate strategic industrial development to minimise the potential for future land use conflict and detrimental impacts on the environment.*

The DRLUP also notes that the future strategic industrial development will depend on the availability of sufficiently large and suitable land.

The subdivision being proposed by the current application is consistent with the DRLUP.

LAND USE STRUCTURE



**LEGEND**

Plan Area	Strategic Industry	Existing / Planned Railway
Urban / Peri-Urban	Commonwealth	Existing / Planned Ferry Route
Rural Lifestyle	Rural Activity Centre	Existing / Planned Arterial Road and Transport Corridor
Horticulture	Grazing / Agriculture	Existing / Planned Collector Road
Community / Government	Utility Corridor	Existing / Planned Airport
Open Space / Natural Area	Water Supply Catchment	Existing / Planned Sea Port
Mangrove / Conservation	Existing Waterbody	Existing / Planned Ferry Terminal
Industry	Potential Waterbody	Aerodrome
	Coastline	Existing / Planned Regional Centre

Land Use Structure



The NT Planning Scheme (NTPS) advises that Section 1902 has multiple zones however the Government zoning map suggests that the vast majority, if not all of the parcel, is zoned DV (Development).

The primary purpose of Zone DV is *to provide for the development of major strategic industries including gas based, road, rail or port related activities.*

Section 1902 is adjacent to major gas, power, communication, water and road services and the lots being proposed by the current application will facilitate the type of developments intended for the DV zone.

The title to Section 1905 advises that it comprises multiple zones however it appears to be primarily zoned U (Utilities).

**Clause 13.6** of the NTPS deals with Utilities and advises that the primary purpose of this clause is *to ensure that the use or development of land in zone U does not prejudice the future development of the utility.*

The proposal to construct a small section of road reserve through Section 1905 has been under consideration for a number of years as it will provide access to the land on the northern side of Channel Island Road and facilitate development. All of the work associated with the design of the subject section of road has been on the basis of minimising any impact on the existing utilities within Section 1905 or compromise the development of other utilities in the future.

**Clause 6.14** (*Land Subject to Flooding and Storm Surge*) is referenced in the description of the DV zone in the NTPS. The purpose of the clause is *to reduce risk to people, damage to property and costs to the general community caused by flooding and storm surge.*

The Department of Environment and Natural Resources (DENR) has advised that the primary storm surge (PSS) level for Section 1902 is 5.19 m AHD.

A surface water assessment was also undertaken by EnviroConsult in 2018 and it determined storm surge predictions for 2018 and 2100 using specific hydrological modelling. This assessment indicated a storm surge level greater than that predicted by DENR however minimal areas of Section 1902 are affected by the PSS and the only activity within these areas associated with the proposed subdivision will be the establishment of short sections of lot boundaries.

**Clause 11.1.1** deals with the minimum lot sizes required for the various zonings in the NTPS. The prescribed minimum lot size for zone DV is 1,225m<sup>2</sup> and the lots being proposed by the current application are well in excess of this prescribed minimum.

Given that a DV development will be similar in nature to an industrial subdivision, the proposal will be considered against the NTPS provisions relating to Industrial Subdivision.

Site characteristics in industrial subdivisions are addressed in **Clause 11.3.1** with the purpose of the clause being to ensure that the industrial lots respond to the physical characteristics of the land.

The LDC has commissioned extensive site investigations, firstly as part of the pre-feasibility analysis report and more recently by consultants in formulating the current Development Application.

Douglas Partners undertook geotechnical investigations and reporting, Byrne Consultants (Byrne) has considered all of the engineering factors associated with the subdivision and EcOz Environmental Consultants (EcOz) carried out the environmental assessment.

An assessment of the site characteristics was undertaken by EcOz as part of the pre-feasibility assessment in 2018 and further investigative work has taken place. This has included extensive flora and fauna investigation and liaison with DENR.

The investigations identified threatened species and this resulted in the extent of Stage 1 being scaled back considerably to what is now being proposed by the current application.



The EcOz report, 'Environmental Impact and Risk Assessment - Stage 1 Kittyhawk Estate' is included as Attachment C with a summary of the matters as follows:

#### *Vegetation*

The vegetation communities on Kittyhawk are common across the greater Darwin region.

Vegetation mapping carried out by EcOz has concluded that there are no sensitive vegetation communities within the proposed development area however the site is abutted by mangrove communities – a sensitive vegetation type.

The mangrove communities will not be affected by the works associated with the proposed subdivision.

#### *Weeds*

The Stage 1 area comprises existing weeds, mainly Gamba Grass and Mission Grass.

A weed and fire management plan is included as Appendix D of the Environmental Impact and Risk Assessment.

#### *Threatened Species*

Three threatened species-Darwin Cycad, Black-footed Tree-rat and the plant *Typhonium praetermissum* were detected on Kittyhawk Estate.

The extent of the Stage 1 development was developed in consultation with the Department of Environment and Natural Resources (DENR). This consultation led to a substantial reduction in the proposed area of Stage 1, reduced vegetation clearing (5.1 ha) and allowed for a wildlife corridor on the eastern boundary. Consequently, there will be no impact to the Black-footed Tree-rat from Stage 1. Some Darwin Cycad will be removed in Stage 1, approximately 0.5 ha of Lot 3 contains 45 to 65 cycads, the population is much denser in other parts of Kittyhawk. A total of 798 *T. praetermissum* plants were found across Kittyhawk. Of these, 37 are in Stage 1 boundary, 15 of which are located in vegetation to be cleared. This was discussed with DENR during project design, they thought a suitable offset would be developing a research program aimed at understanding the success of translocation of the species. LDC commits to translocating these plants prior to development. A Translocation Management Plan will be developed in collaboration with DENR with the plan to be approved by DENR prior to being implemented.

**Clause 11.3.1** suggests that industrial subdivision design should avoid land affected by the 1% AEP (primary) storm surge event.

The Department of Environment and Natural Resources (DENR) has advised that the primary storm surge (PSS) level for Section 1902 is 5.19 m AHD.

A surface water assessment was also undertaken by EnviroConsult in 2018 and it determined storm surge predictions for 2018 and 2100 using specific hydrological modelling. This assessment indicated a storm surge level greater than that predicted by DENR however minimal areas of Section 1902 are affected by the PSS and the only activity within these areas associated with the proposed subdivision will be the establishment of short sections of lot boundaries.

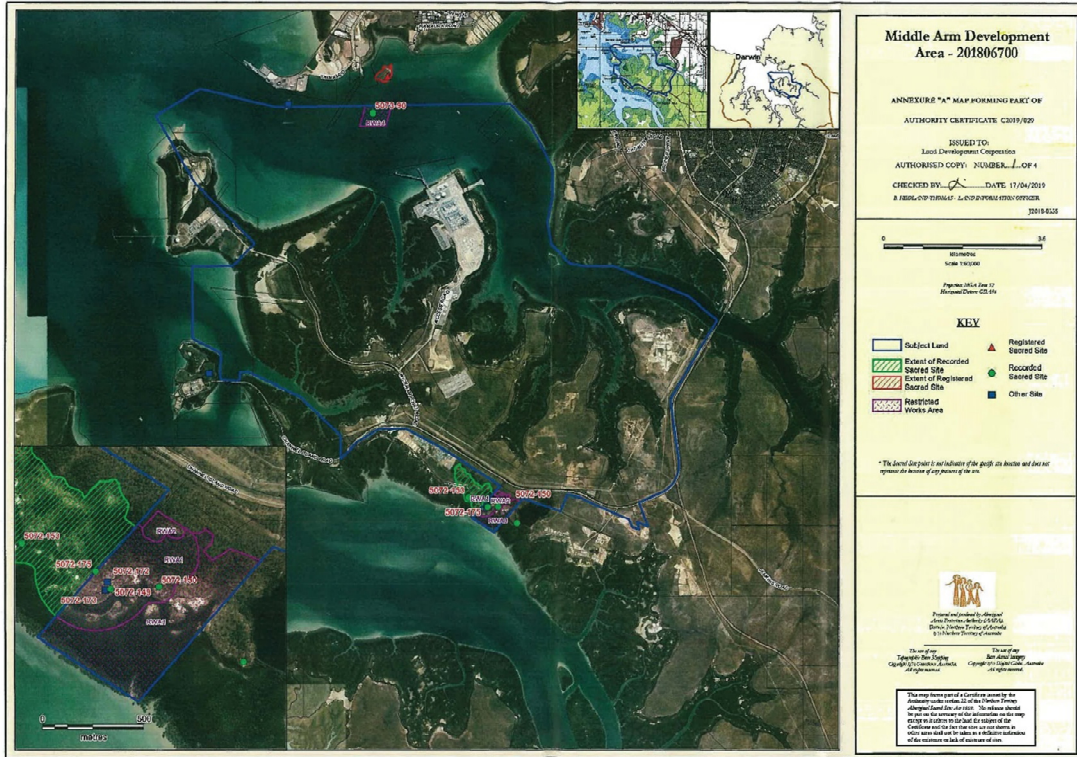
**Cause 11.3.1** also requires that industrial subdivision design should retain significant cultural features.

The Aboriginal Areas Protection Authority issued Authority Certificate C2019/029 with the subject land being Sections 1900, 1902, 1897, 1899, Part Sections 1905, 1891, 1904, 1905, 1908 and Corridor Sections 1895 and 1896, Hundred of Ayers plus adjacent areas of mangrove and Darwin Harbour waters – Wickham, Northern Territory.

The Certificate (Attachment E) covers *all works associated with commercial/industrial development and expansion*.

No sacred sites or restricted work areas are identified in the areas that are subject to the current Development Application.





**Clause 11.3.2** deals with infrastructure in industrial subdivisions.

**Road Infrastructure**

The subject area is within the Litchfield Municipality and consequently the design and construction of roads, drainage and lighting infrastructure shall be in accordance with service authority requirements, including:

- *Litchfield Council Development and Subdivision Standards 2017.*
- *Performance and Design Standards for Northern Territory Government Roads 2017*

Access into the Kittyhawk Estate will be from Channel Island Road through Section 1905. The current application considers subdivision of Section 1905 to formalise a road opening for the site access, with the balance lot demarcated as Lot 6.

The Channel Island Road intersection and site access road for Kittyhawk Estate was originally designed by GHD for LDC, with the design previously presented to the relevant authorities for comment. As part of the current application, Byrne Consultants is reviewing and amending these designs to establish a clean interface with the internal roads.

Two internal roads are proposed within Kittyhawk Estate, with the current application considering subdivision of Section 1902 to formalise these roads. The proposed layout plans and cross-sections for these roads are provided in Attachment D.

Road 1 is an extension of the proposed site access through Section 1905, extending north along the ridgeline of Section 1902 by approximately 450m to reach a total length of 790m under Stage 1. It is a typical urban cross-section, comprising a 22m road reserve, 11m kerbed carriageway, 5.5m verges, and an underground pit/pipe network. Within the estate, Road 1 is bounded by two 10m wide products



corridors (Lot 1) which exist as an extension of the road verges to direct stormwater into the road carriageway via sheet flow.

Road 2 intersects with Road 1 and runs along the southern boundary of Section 1902 to service proposed allotments, with option for extension to service future development to the east. It is approximately 750m in length and comprises a hybrid urban/rural cross-section with one-way cross fall and a table drain along the southern side. The proposed design comprises a 25m wide road reserve with an 11m wide kerbed carriageway, a 5.5m verge to the north, and 1.5m verge and 7m drainage corridor to the south. The proposed table drain collects all stormwater from the road reserve, as well as acting as a cut-off drain to receive stormwater from the adjacent products corridor (Section 1905 / Lot 6).

The design and construction of the roadworks will be carried out in consultation with Litchfield Council and the Department of Infrastructure, Planning and Logistics.

### ***Stormwater Drainage Infrastructure***

Byrne Consultants has prepared a stormwater management plan (Ref. 18096\_L002), provided in Attachment B. A summary of this report is provided as follows.

The subject area is within the Litchfield Municipality and consequently the design and construction of all roads, drainage and lighting infrastructure shall be in accordance with Council requirements, including *Litchfield Council Development and Subdivision Standards 2017*.

Road 1 is an urban cross-section with underground pit/pipe network. It receives stormwater via sheet flow from Lot 1, which comprises two 10m wide products corridors as an extension of the road verge. It does not receive stormwater from any other allotments. All infrastructure contained within the Road 1 reserve is designed to manage fully-developed flows.

Road 2 is a hybrid urban/rural cross-section with one-way cross fall and a table drain on one side. It receives stormwater from the Road 2 reserve, a portion of Lot 6 (existing Section 1905 Products Corridor), a 1 hectare sub-catchment of Lot 2, and the entirety of Lot 3 which is 1 hectare. The table drain acts as a cut-off drain to prevent Lot 6 from sheet flowing stormwater directly onto the road carriageway. The contributions from Lot 2 and 3 are addressed via provision of a lawful point of discharge and cross-road culverts, each designed for fully-developed flows.

Easements will be established, as required, to support lawful discharge of stormwater from these road reserves into adjoining lands. One easement is currently proposed over Lot 6 at the eastern end of Road 2. An additional easement may be required to accommodate discharge from Road 1, subject to detailed design outcomes.

Cut-off drains are proposed within the allotments to collect and convey post-subdivision/pre-development flows to a lawful point of discharge without inter-allotment flows. The only exception to this is in Lot 2, where the northern sub-catchment (approximately 9 hectares) is proposed to continue temporarily draining via natural sheet-flow into Lot 5; the balance lot of Section 1902 to be retained by LDC and developed as "future stages". LDC supports this approach and acknowledges appropriate covenants will need to be put in place to ensure the future owner of Lot 2 manages all stormwater from this sub-catchment within their site prior to Stage 2 land release and when the lot is developed. Each future lot owner will be required to install appropriate post-development stormwater management practices during development of their sites, subject to their own development permits and conditions.

A hydrological impact assessment has been completed to confirm any changes in peak flow rates entering Kittyhawk Creek and Wirraway Creek as a result of the subdivision. No stormwater detention is proposed for the Subdivision stage, noting that the hydrological impact is limited, and each allotment will require its own development approval prior to industrial development.

### ***Street Lighting***

Street lighting to Channel Island Road, site access road, Road 1 and Road 2 will be designed to the requirements of the relevant authorities.

Provision has been made for standard streetlighting service allocations in the road reserves.



### ***Water Reticulation***

Power and Water Corporation (PWC) was consulted for the development of a water masterplan, and during the pre-feasibility analysis to confirm the available water capacity and the likely requirements for the internal reticulation.

The extent of Stage 1 of Kittyhawk (the lots being proposed by the current application) has been determined by considering the available capacity in the existing water network.

The water main to service the Kittyhawk Estate will be extended off the existing DN375 main in the products corridor (Section 1905). PWC has previously approved the GHD designed DN375 extension.

Provision has been made for standard water service allocations in the road reserves.

The proposed lots are expected to be serviced from the new water main located in the Road 2 road reserve. Design and construction of the internal reticulation will be carried out in consultation with PWC.

### ***Power Reticulation***

Power and Water Corporation (PWC) was consulted for the development of an electrical masterplan, and during the pre-feasibility analysis to confirm the available capacity of the electrical network and the likely requirements for the internal reticulation.

The existing electrical infrastructure within the vicinity of the Kittyhawk Estate consists of 66 kV/132 kV transmission lines located within the products corridor, and 22 kV overhead powerlines located within the Channel Island Road Reserve. Adjacent to the Kittyhawk development area is the Weddell Zone Substation which consists of 3x66/22 kV transformers which supply three 22 kV overhead 'feeder' powerlines to the Middle Arm Area (via auto reclosers which provide 22 kV HV protection).

Overhead reticulation is proposed throughout the Stage 1 development area with underground connections being considered for proposed lots on the opposite side of the road.

Provision has been made for standard electrical service allocations in the road reserves.

Design and construction of electrical infrastructure will in accordance with PWC requirements.

### ***Waste Water***

Reticulated sewerage services are not available in this locality and therefore it proposed that future developments on the proposed lots will utilise on-site systems for the treatment and disposal of waste water.

Department of Health (DoH) was consulted as part of the 2018 pre-feasibility analysis and DoH advised primary treatment systems would not be acceptable due to the proximity of the site to Darwin Harbour.

DoH supports the use of secondary waste water treatment systems and a Caution Notice will be registered on the title for each of the proposed lots to alert owners of the requirements for waste water treatment and disposal.

### ***Communications***

Communication services including Vocus and Telstra wideband are available in the Channel Island Road reserve. Kittyhawk Estate pit and pipe requirements for communications will be designed to NBN *New Development Pit and Pipe Design Guidelines*, or the service provider's requirements.

Provision has been made for standard communication service allocations in the road reserves.



## **Gas**

High pressure gas is available in the area and there is potential for the Estate to be supplied with high and low pressure gas by agreement with the service provider/s.

Gas supply within Kittyhawk Estate will have to comply with the service provider's requirements and relevant standards and legislation.

A service space allocation for low pressure gas reticulation is proposed within the internal road reserves to support the future development of this service if required in the future.

Lot size and configuration in industrial subdivisions are addressed in **Clause 11.3.3** of the NTPS.

The purpose of the clause is *to ensure lots are of an appropriate size and configuration*.

The 3 development parcels proposed by the current application are the result of extensive consultation with prospective developers and the various stakeholders comprising Government agencies, Litchfield Council and service authorities.

They have been designed for uses that are suited to the DV zone and the location. These uses will require approval from the consent authority so the specific details will be assessment as part of future Development Applications.

### **46(3)(b) – Compliance with an Interim Development Control Order**

The Applicant is not aware of any Interim Development Control Orders applying to the subject land.

### **46(3)(c) – Public Environmental Report or Environment Impact Statement**

There is no requirement for a report or statement under the Environmental Assessment Act however there has been considerable environmental assessment as part of the pre-feasibility analysis report and the formulation of the current proposal.

### **46(3)(d) – Merits of the proposed development**

As mentioned in the Introduction, the Land Development Corporation is an NT Government business division that delivers developments that provide enterprises with strategically positioned land parcels on which they are able to develop their businesses.

The Middle Arm locality has been identified future, regional industrial development and has already seen the development of the LNG facilities at Wickham and Bladin Points.

The subdivision being proposed by the current application will create parcels that will facilitate the continuation of that development in accordance with the NT Government's objectives for the locality.

The number of accesses from Channel Island Road will be limited for safety reasons so the access proposed by the current application could provide access for not only the LDC landholdings but also land to the east.

### **46(3)(e) – The physical characteristics of the land**

The physical characteristics of the land have previously been discussed and the land will be developed in accordance with relevant controls to provide lots that are suitable for development.

### **46(3)(f) – Public facilities or open space**

The proposal does not create a demand for any additional public facilities or open space.

### **46(3)(g) – Public utilities and infrastructure**

This has previously been addressed in the section of this report that deals with Clause 11.3.2 of the NTPS.



**46(3)(h) – Potential impact on the existing and future amenity of the area**

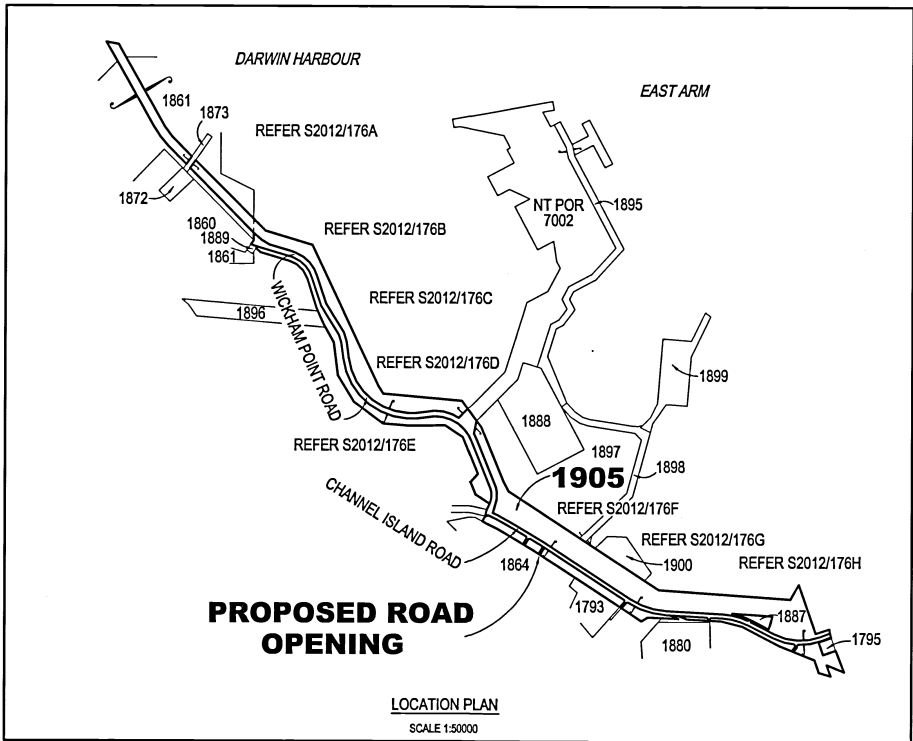
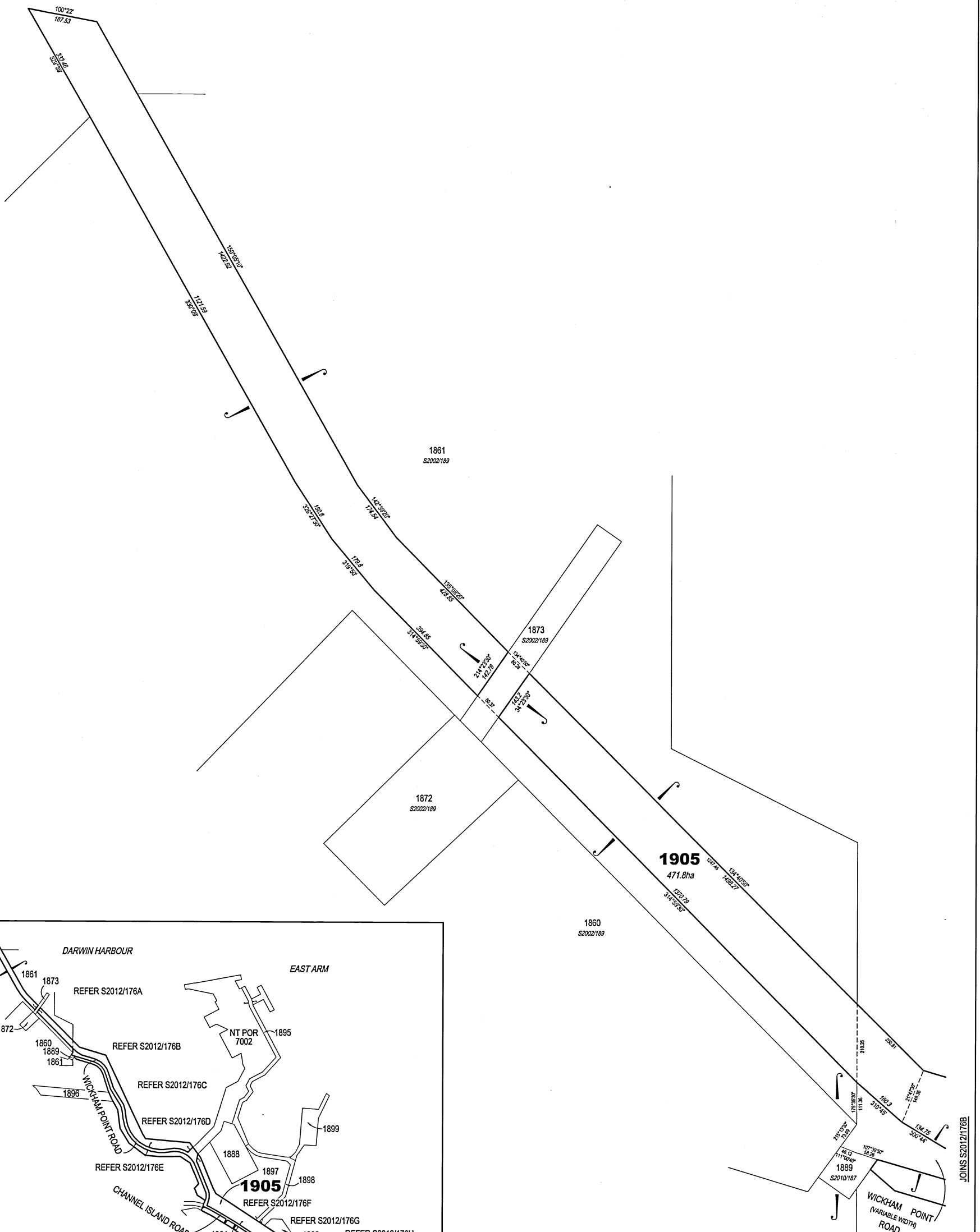
The subdivision being proposed by the current proposal will not have any negative impact on the existing or future amenity of the area.

Environmental impacts have been exhaustively considered and measures have been incorporated to ensure there will be minimal impact.

The location of the proposed access has been determined for some time to be in an appropriate position so as to minimise impact on traffic.



Supersedes S2011/229A



I, Keith Leslie Schulz, hereby certify that the survey represented on this plan was carried out by me or under my supervision and was completed on 12.05.12 and that this survey has been executed in accordance with the Licensed Surveyors Act and the Directions thereunder.

*KLS*  
Licensed Surveyor  
Date: 4/6/2012

**SURVEY APPROVED**  
*al*  
Surveyor-General  
Date: 11/03/13

Note: Dimensions are original

Field Book: S2012/176  
Drawn: Earl James & Associates (8371) 27.04.12  
Examined: Earl James & Associates 28.05.12  
Map Reference:

True Mid . . . . . Bearings

**AZIMUTH**  
Assumed from: S2009/185F  
Observed at: . . . . .

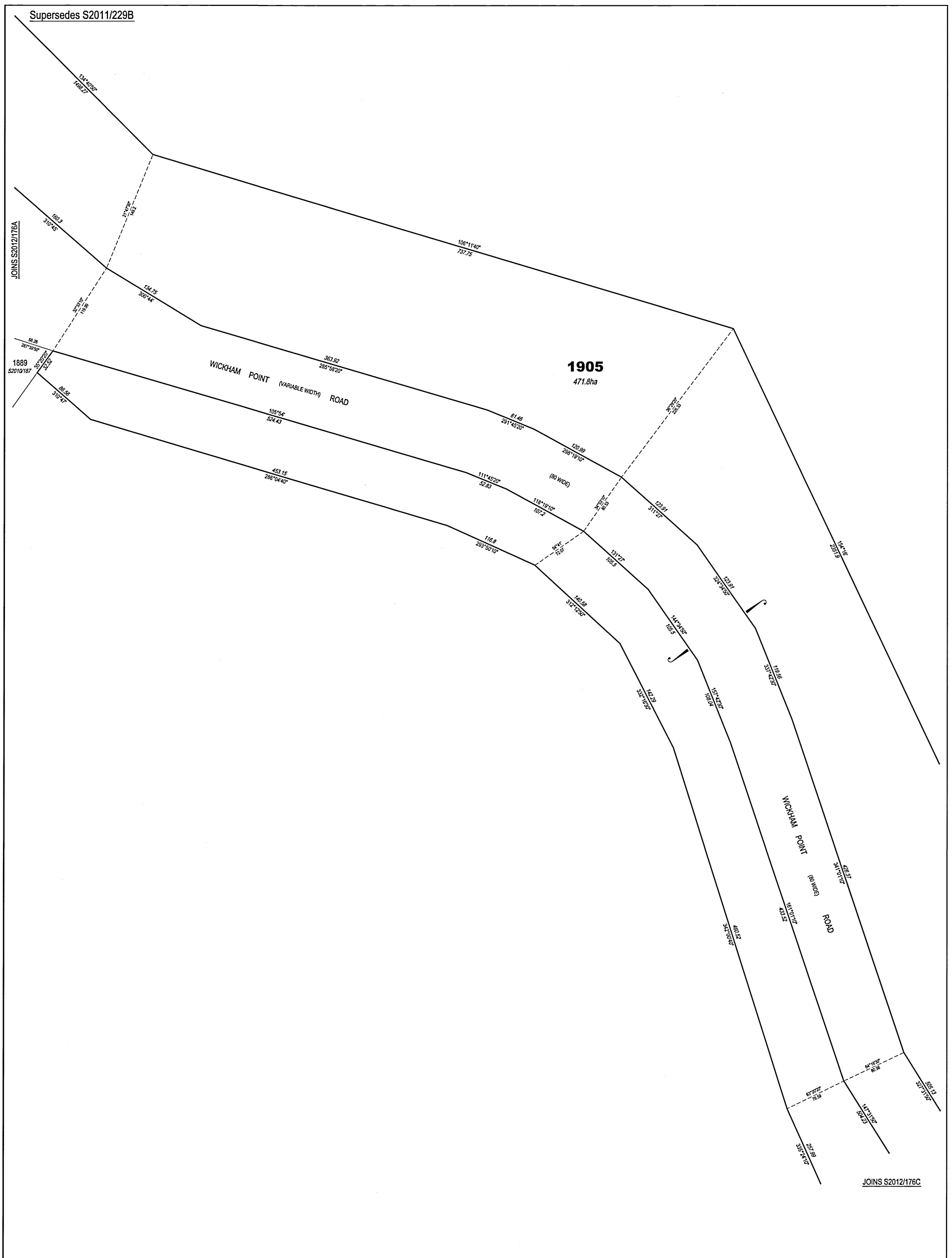
**LEGEND**  
Concrete Post . . . . . □  
Concrete Block . . . . . ■  
Peg or Wooden Post . . . . . ○  
Reference Mark . . . . . x  
Lockspit . . . . . ▶  
Fence Post . . . . . ⊗


**SECTION 1905**  
**HUNDRED OF AYERS**

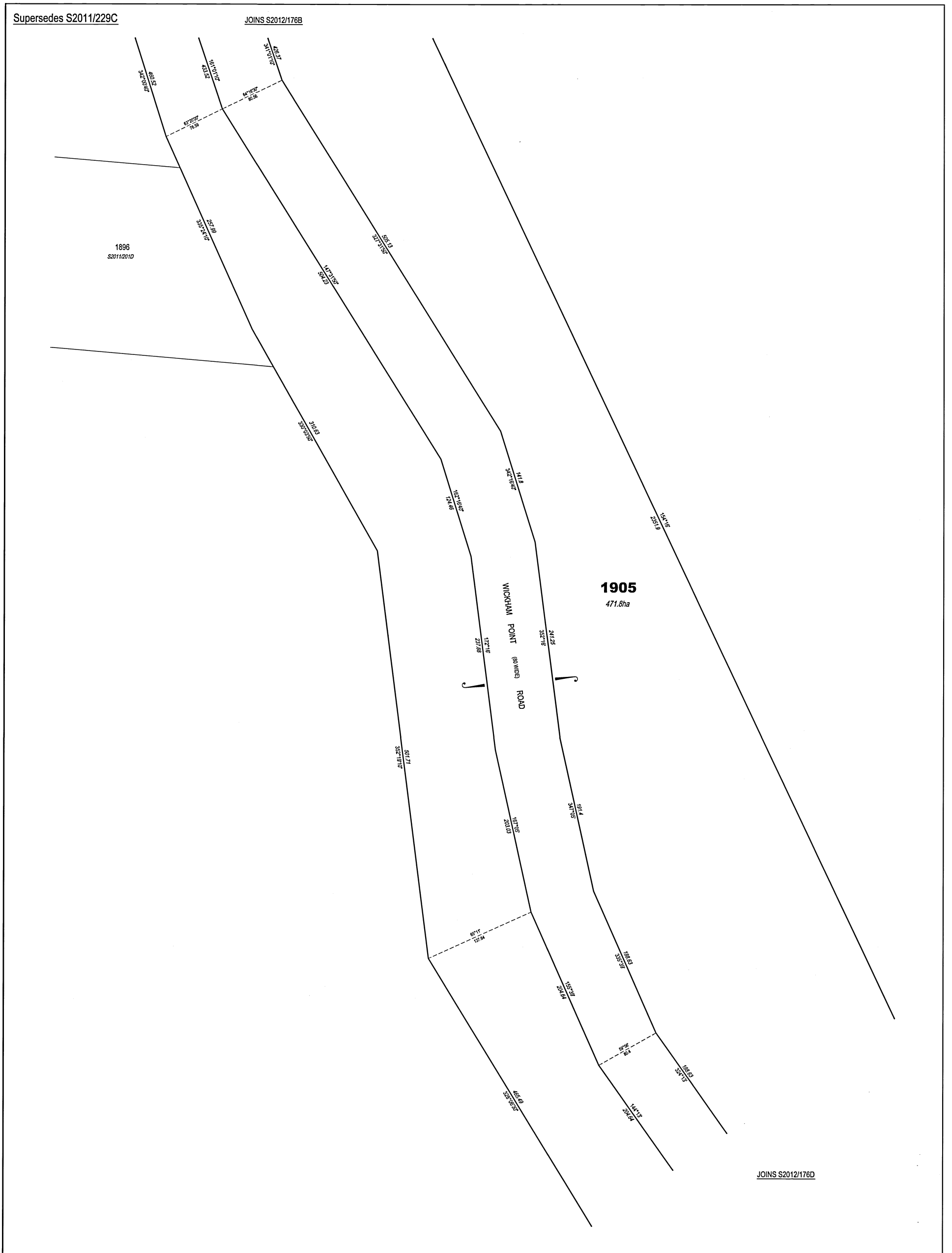
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**S2012/176A**  
SHEET 1 OF 8

WARNING - Damaged or creased plan will be rejected.



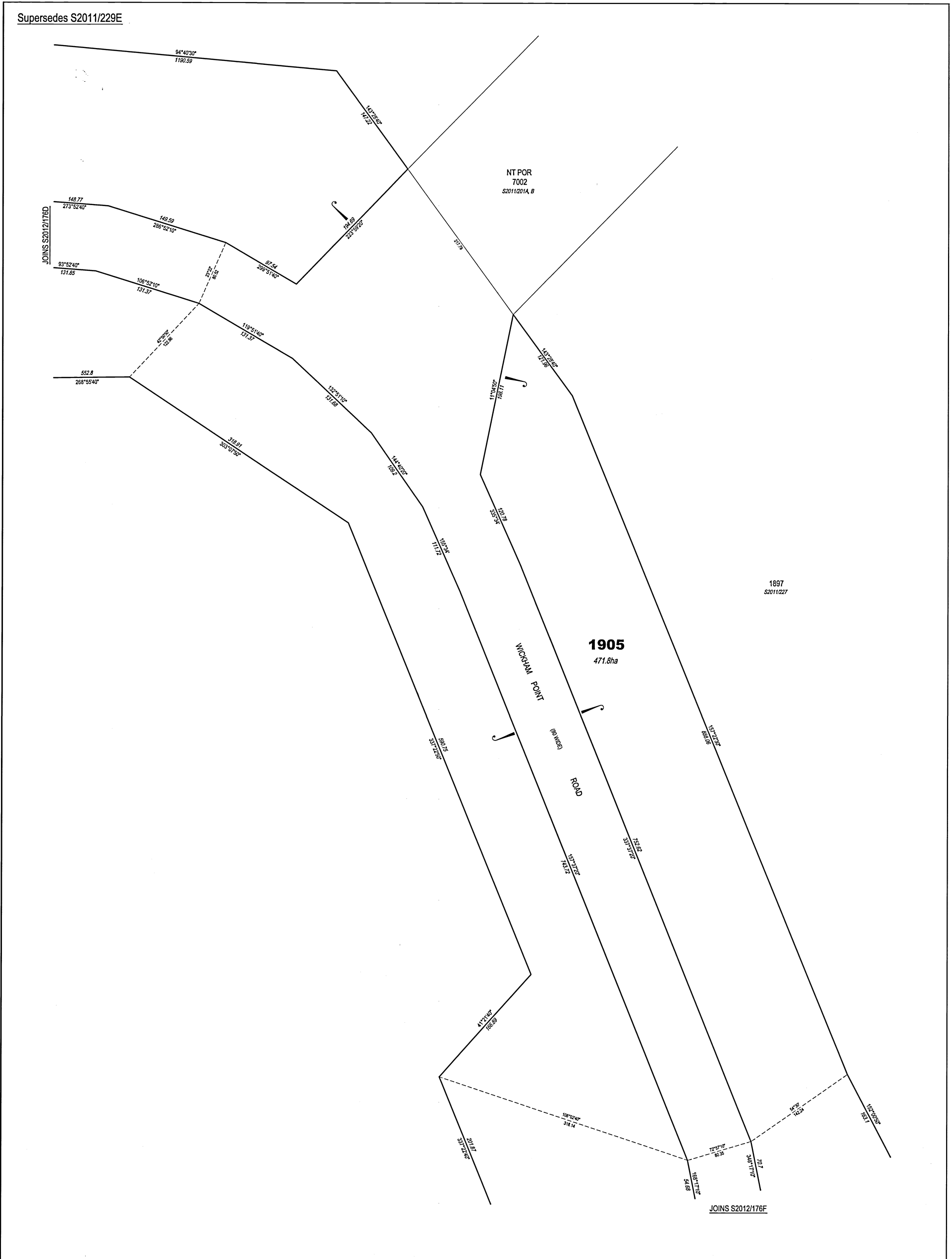
Keith Leslie Schulz I hereby certify that the survey represented on this plan was carried out by me or under my supervision and was completed on 12.05.12, and that this survey has been executed in accordance with the Licensed Surveyors Act and the Directions thereunder. <i>KLS</i> Licensed Surveyor	Note Dimensions are original	Field Book S2012/176	 True Mid . . . . . Bearings	<b>LEGEND</b> Concrete Post . . . . . □ Concrete Block . . . . . ■ Peg or Wooden Post . . . . . ○ Reference Mark . . . . . x Locksplit . . . . . ⊕ Fence Post . . . . . ⊗	<b>PART BOUNDARIES SECTION 1905                  HUNDRED OF AYERS</b>	
		Drawn Earl James & Associates (8371) 27.04.12 Examined Earl James & Associates 26.05.12 Map Reference				<b>AZIMUTH</b> Assumed from S2009/185F . . . . . Observed at . . . . .
Northern Territory Government Department of Lands and Planning	SURVEY APPROVED <i>[Signature]</i> Surveyor-General	Date 4/6/2012	Date 11/03/13	WARNING - Damaged or creased plan will be rejected.		




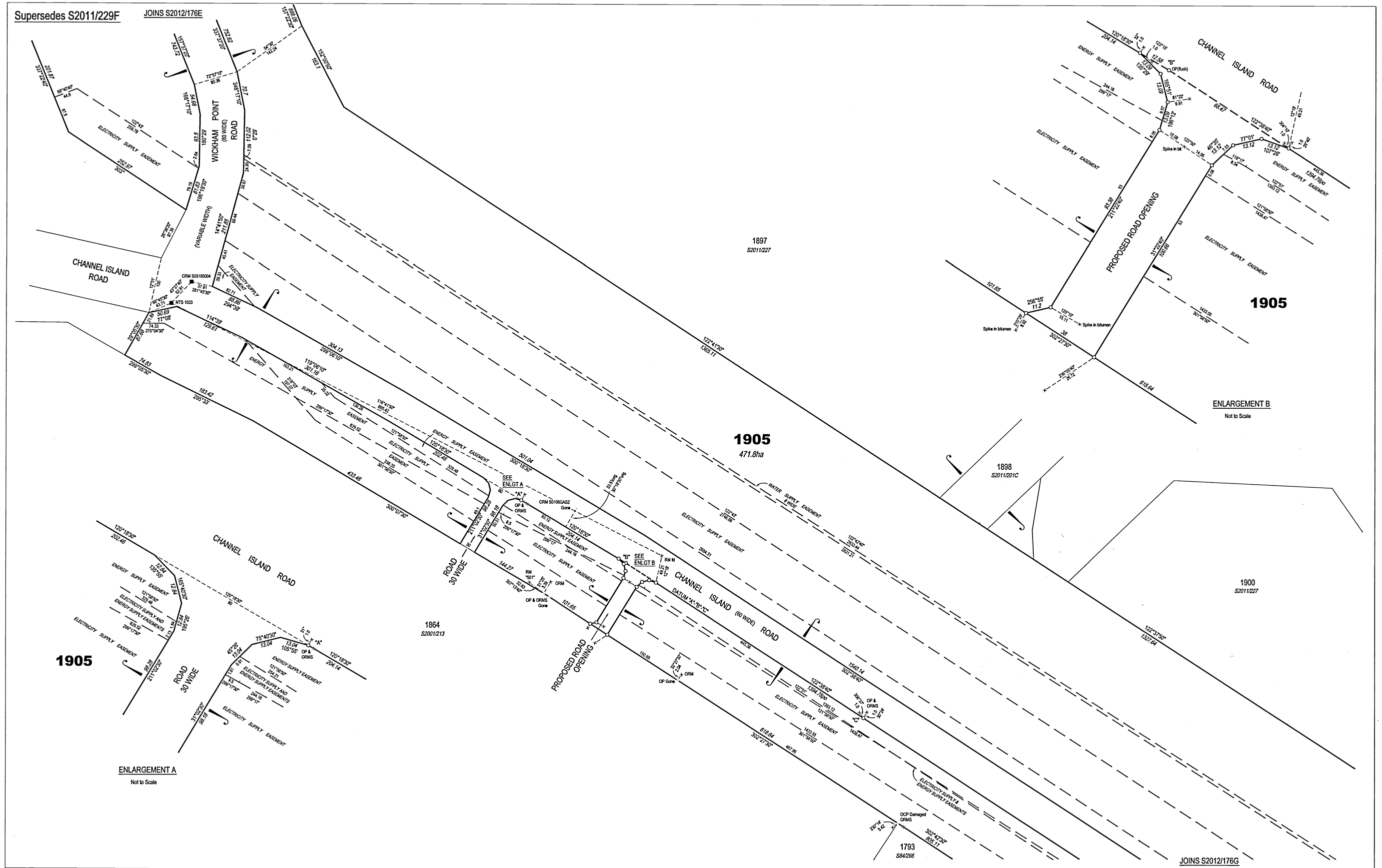
Keith Leslie Schultz Licensed Surveyor Date: 4/6/2012	Note Dimensions are original	Field Book S2012/176	True Mid ..... Bearings	<b>LEGEND</b> Concrete Post ..... □ Concrete Block ..... ■ Peg or Wooden Post ..... ○ Reference Mark ..... x Locksplit ..... ▶ Fence Post ..... ⊙	<b>PART BOUNDARIES SECTION 1905                  HUNDRED OF AYERS</b>
		Drawn Earl James & Associates (8371) 27.04.12 Examined Earl James & Associates 26.05.12 Map Reference			
Northern Territory Government Department of Lands and Planning <b>SURVEY APPROVED</b> Date: 11/03/13				SCALE 1:2000 40 0 40 80 120 metres	<b>S2012/176C</b> SHEET 3 OF 8

WARNING - Damaged or creased plan will be rejected.





<p>Keith Leslie Schulz I, Keith Leslie Schulz, hereby certify that the survey represented on this plan was carried out by me or under my supervision and was completed on 12.03.12, and that the survey has been executed in accordance with the Licensed Surveyors Act and the Directions thereunder.</p> <p><i>KLS</i> Licensed Surveyor</p> <p>4/6/2012 Date</p>	<p>Note Dimensions are original</p>	<p>Field Book S2012/176</p> <p>Drawn Earl James &amp; Associates (8371) 27.04.12</p> <p>Examined Earl James &amp; Associates 26.05.12</p> <p>Map Reference</p>	 True Mid ..... Bearings	<p><b>LEGEND</b></p> <p>Concrete Post ..... ■</p> <p>Concrete Block ..... □</p> <p>Peg or Wooden Post ..... ○</p> <p>Reference Mark ..... x</p> <p>Locksplit ..... ▶</p> <p>Fence Post ..... ⊗</p>	<p><b>PART BOUNDARIES SECTION 1905 HUNDRED OF AYERS</b></p> <p>SCALE 1:2000</p> <p>40 0 40 80 120 metres</p>	<p><b>S2012/176E</b></p> <p>SHEET 5 OF 8</p>
<p><b>SURVEY APPROVED</b></p> <p><i>MLC</i> Surveyor-General</p> <p>11/03/13 Date</p>		<p><b>AZIMUTH</b></p> <p>Assumed from S2009/185F</p> <p>Observed at .....</p>		<p>WARNING - Damaged or creased plan will be rejected.</p>		



Keith Leslie Schulz  
 I hereby certify that the survey represented on this plan was carried out by me or under my supervision and was completed on 12.03.12 and that this survey has been executed in accordance with the Licensed Surveyors Act and the Directions thereunder.  
 Licensee's Signature: *KL Schulz* Date: 4/6/2012  
 Licensee's Name: Keith Leslie Schulz

**SURVEY APPROVED**  
 Northern Territory Government  
 Department of Lands and Planning  
 Surveyor-General: *[Signature]* Date: 11/03/13

Reference	AMENDMENTS Details	Approved	Date

**Note**  
 Electricity Supply and Water Supply Easements are in favour of the Power and Water Corporation  
 Energy Supply Easement is in favour of the Northern Territory of Australia  
 Dimensions of unmarked boundaries are original  
 Easements are not shown to scale  
 Area of road to be opened ex Section 1901 (now Section 1905) is 4140m<sup>2</sup>  
 Reference marks are at one metre unless otherwise shown

Field Book S2012/176  
 Drawn: Earl James & Associates (8371) 27.04.12  
 Examined: Earl James & Associates 26.05.12  
 Map Reference

**LEGEND**  
 Concrete Post □  
 Concrete Block ■  
 Peg or Wooden Post ○  
 Reference Mark ×  
 Lockspit ⚡  
 Fence Post ⊗

**True Mid** (with arrow symbol)  
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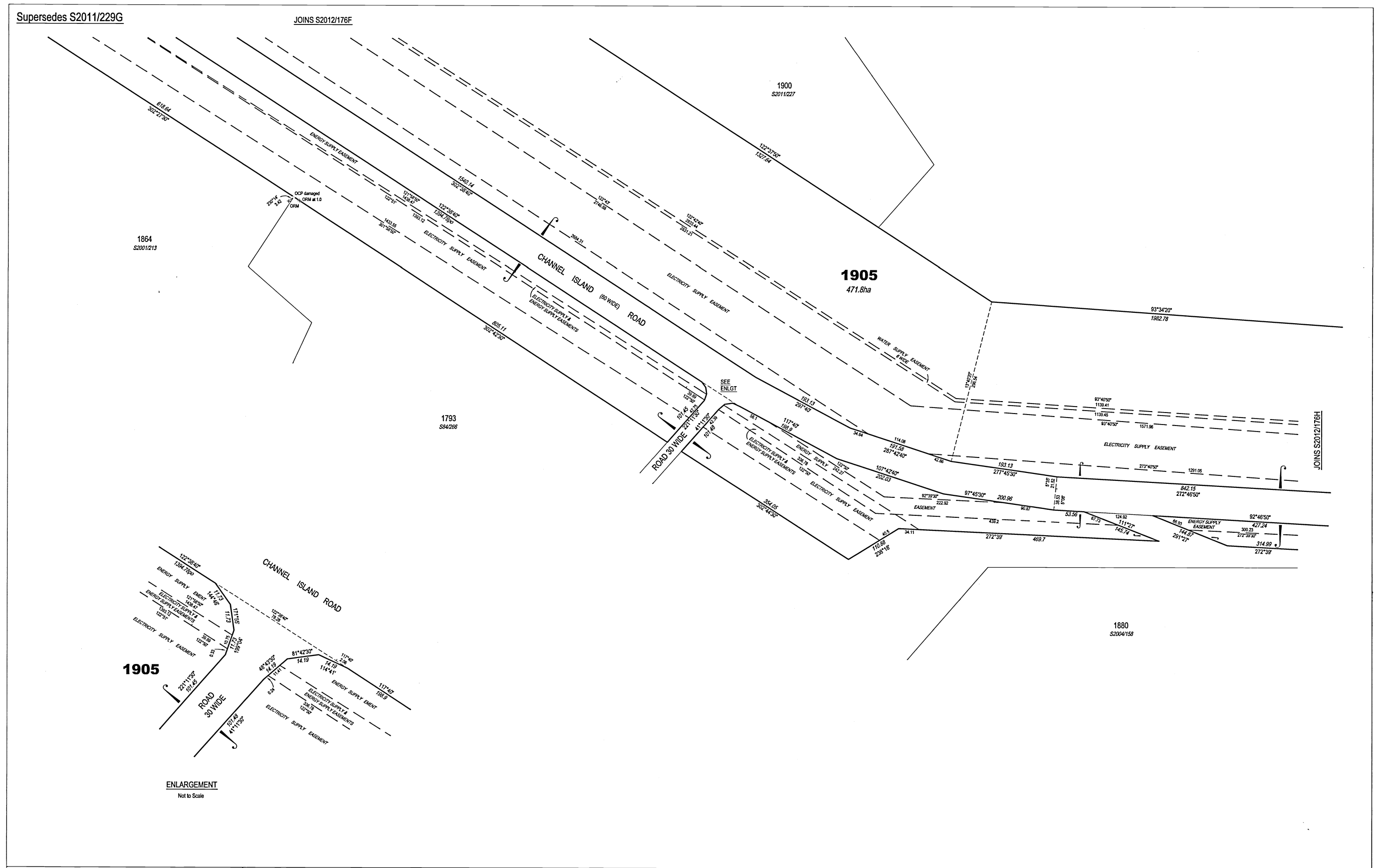
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 Assumed from S2009185F  
 Observed at

**PART BOUNDARIES SECTION 1905  
 HUNDRED OF AYERS**

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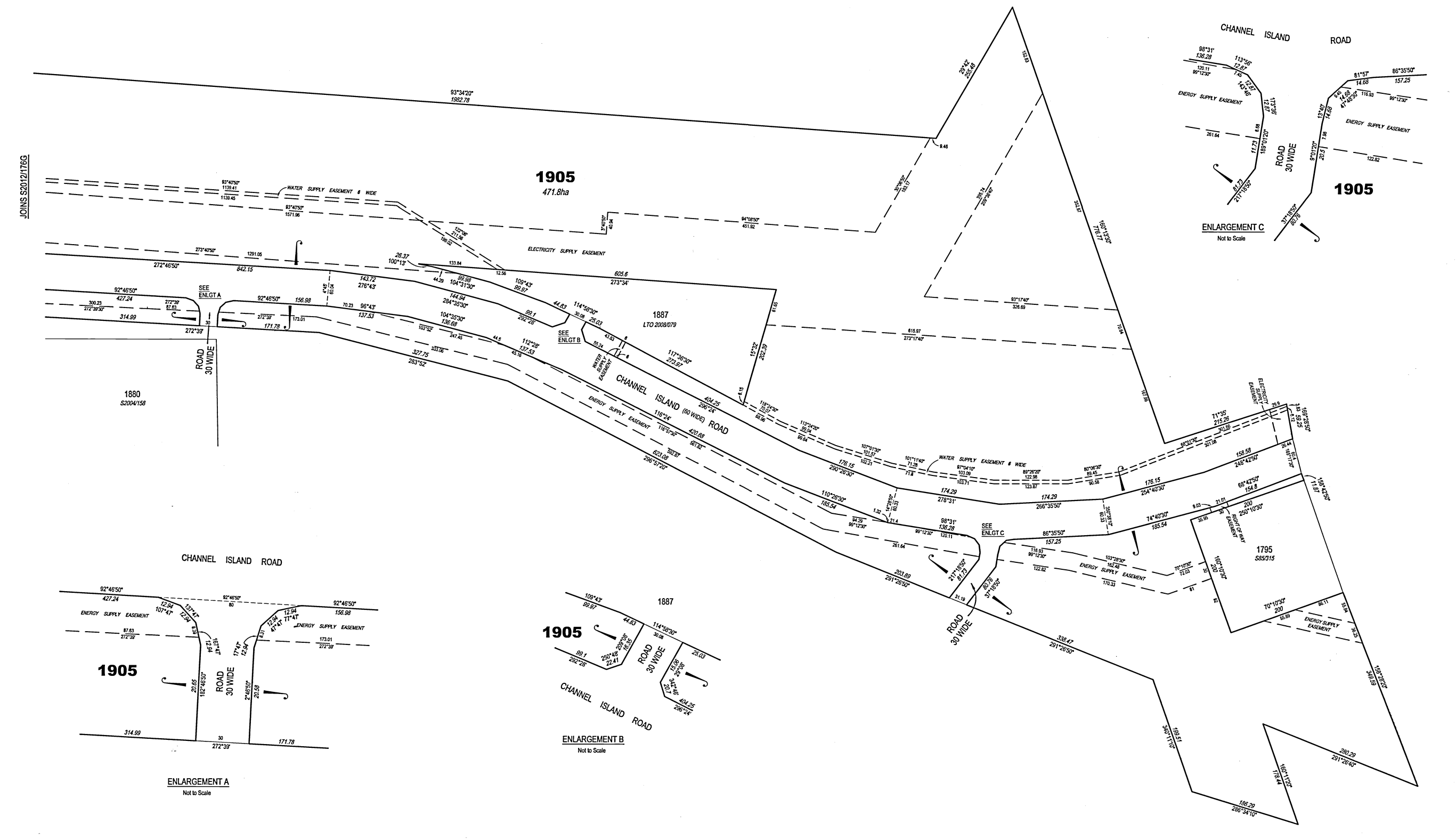
**S2012/176F**  
 SHEET 6 OF 8

WARNING - Damaged or crossed plan will be rejected.



<p>Keith Leslie Schulz I, the undersigned, hereby certify that the survey represented on this plan was carried out by me or under my supervision and was completed on 12.03.12 and that this survey has been executed in accordance with the Licensed Surveyors Act and the Directions thereunder.</p> <p><i>[Signature]</i> Licensed Surveyor Date: 4/6/2012</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">AMENDMENTS</th> </tr> <tr> <th>Reference</th> <th>Details</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	AMENDMENTS				Reference	Details	Approved	Date					<p>Note Electricity Supply and Water Supply Easements are in favour of the Power and Water Corporation Energy Supply Easement is in favour of the Northern Territory of Australia Dimensions of unmarked boundaries are original</p>	<p>Field Book S2012/176</p> <p>Drawn Earl James &amp; Associates (8371) 27.04.12</p> <p>Examined Earl James &amp; Associates 26.05.12</p> <p>Map Reference</p>	<p style="text-align: center;">↑ True Mid</p> <p style="text-align: center;">Bearings</p>	<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li>Concrete Post</li> <li>Concrete Block</li> <li>Peg or Wooden Post</li> <li>Reference Mark</li> <li>Lockspit</li> <li>Fence Post</li> </ul>	<p><b>PART BOUNDARIES SECTION 1905</b> <b>HUNDRED OF AYERS</b></p> <p>SCALE 1:3000</p> <p>60 0 60 120 180 metres</p> <p><b>S2012/176G</b> SHEET 7 OF 8</p>
AMENDMENTS																		
Reference	Details	Approved	Date															
<p>Northern Territory Government Department of Lands and Planning</p> <p><b>SURVEY APPROVED</b></p> <p><i>[Signature]</i> Surveyor-General Date: 11/03/13</p>	<p>WARNING - Damaged or crossed plan will be rejected.</p>																	

Supersedes S2011/229H



I, Keith Leslie Schulz, Licensed Surveyor, hereby certify that the survey represented on this plan was carried out by me or under my supervision and was completed on 12.03.12 and that this survey has been executed in accordance with the Licensed Surveyors Act and the Directions thereunder.

*KLS*  
Licensed Surveyor

4/6/2012  
Date

**SURVEY APPROVED**  
Northern Territory Government  
Department of Lands and Planning  
*lcl*  
Surveyor-General  
11/03/13  
Date

AMENDMENTS			
Reference	Details	Approved	Date

**Note**  
Electricity Supply and Water Supply Easements are in favour of the Power and Water Corporation  
Energy Supply Easement is in favour of the Northern Territory of Australia  
Right of Way Easement is in favour of Section 1795  
Dimensions are original

Field Book  
S2012/176

Drawn  
Earl James & Associates  
(8371) 27.04.12

Examined  
Earl James & Associates  
26.05.12

Map Reference

**LEGEND**  
Concrete Post  
Concrete Block  
Peg or Wooden Post  
Reference Mark  
Locksplit  
Fence Post

**True Mid**  
Bearings

**AZIMUTH**  
Assumed from S2009/185F  
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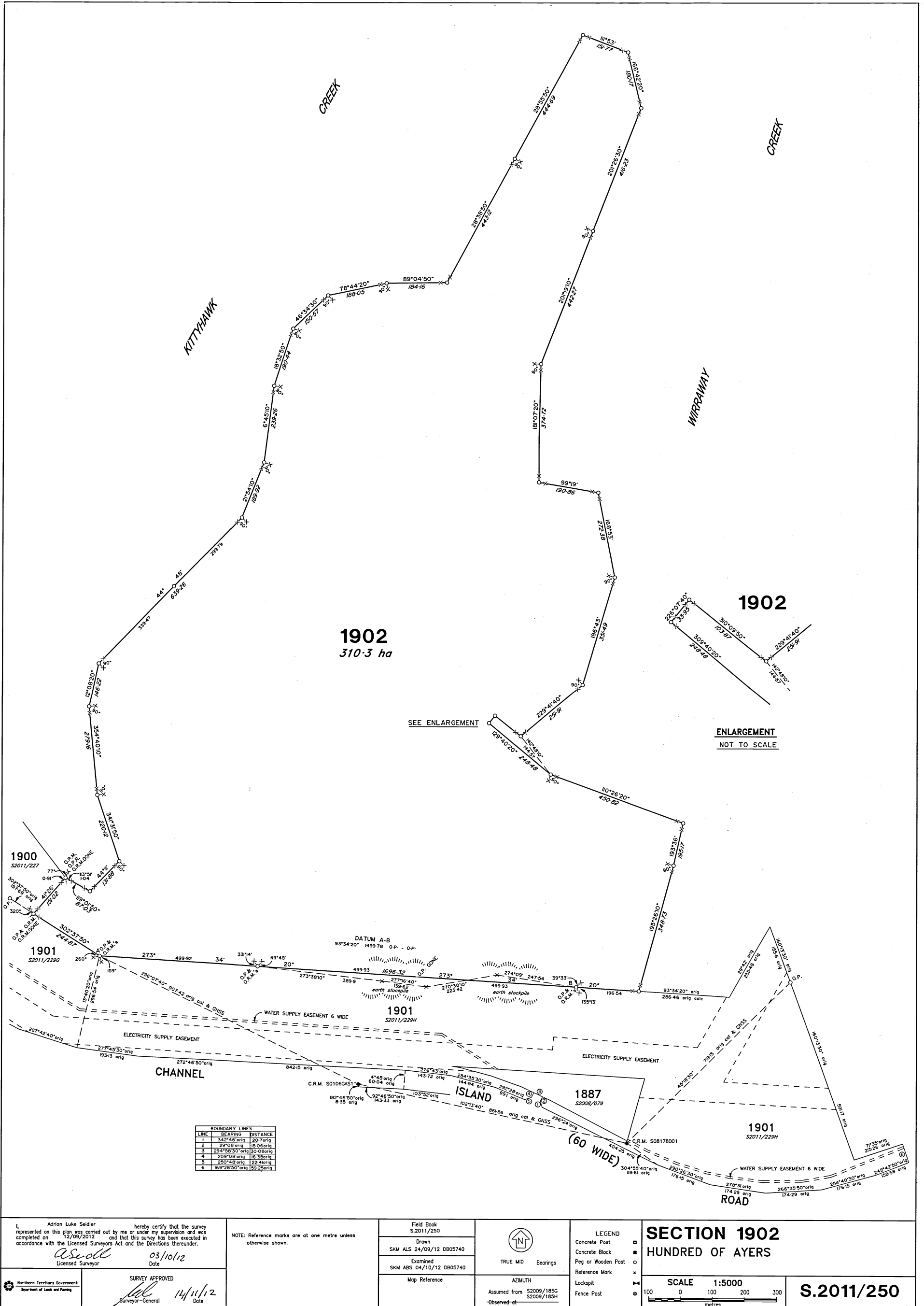
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HUNDRED OF AYERS**

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metres

**S2012/176H**  
SHEET 8 OF 8

WARNING - Damaged or crossed plan will be rejected.





19 August 2019

Our Ref: 18096\_L002 Rev A

Wendy Smith  
Planning and Development Manager  
Litchfield Council  
PO Box 446 Humpty Doo, NT, 0836

Dear Ms. Smith,

**RE: SECTIONS 1902 & 1905 HUNDRED OF AYERS, KITTYHAWK ESTATE, WICKHAM, NT  
STORMWATER MANAGEMENT PLAN**

## **1. INTRODUCTION**

Byrne Consultants (Byrne) has been commissioned by Land Development Corporation (LDC) to undertake detailed design and documentation for Stage 1 of the Kittyhawk Estate industrial subdivision (the Project), which forms part of the greater Middle Arm Industrial Precinct. LDC are preparing to submit a Development Application and has requested Byrne to prepare a Stormwater Management Plan to address the requirements of relevant authorities. LDC and Byrne have undertaken preliminary consultation with Litchfield Council (LC), Crown Land and the Department of Environment and Natural Resources (DENR) to understand their requirements, which has informed both the subdivision layout and stormwater management practices adopted within the proposed plan.

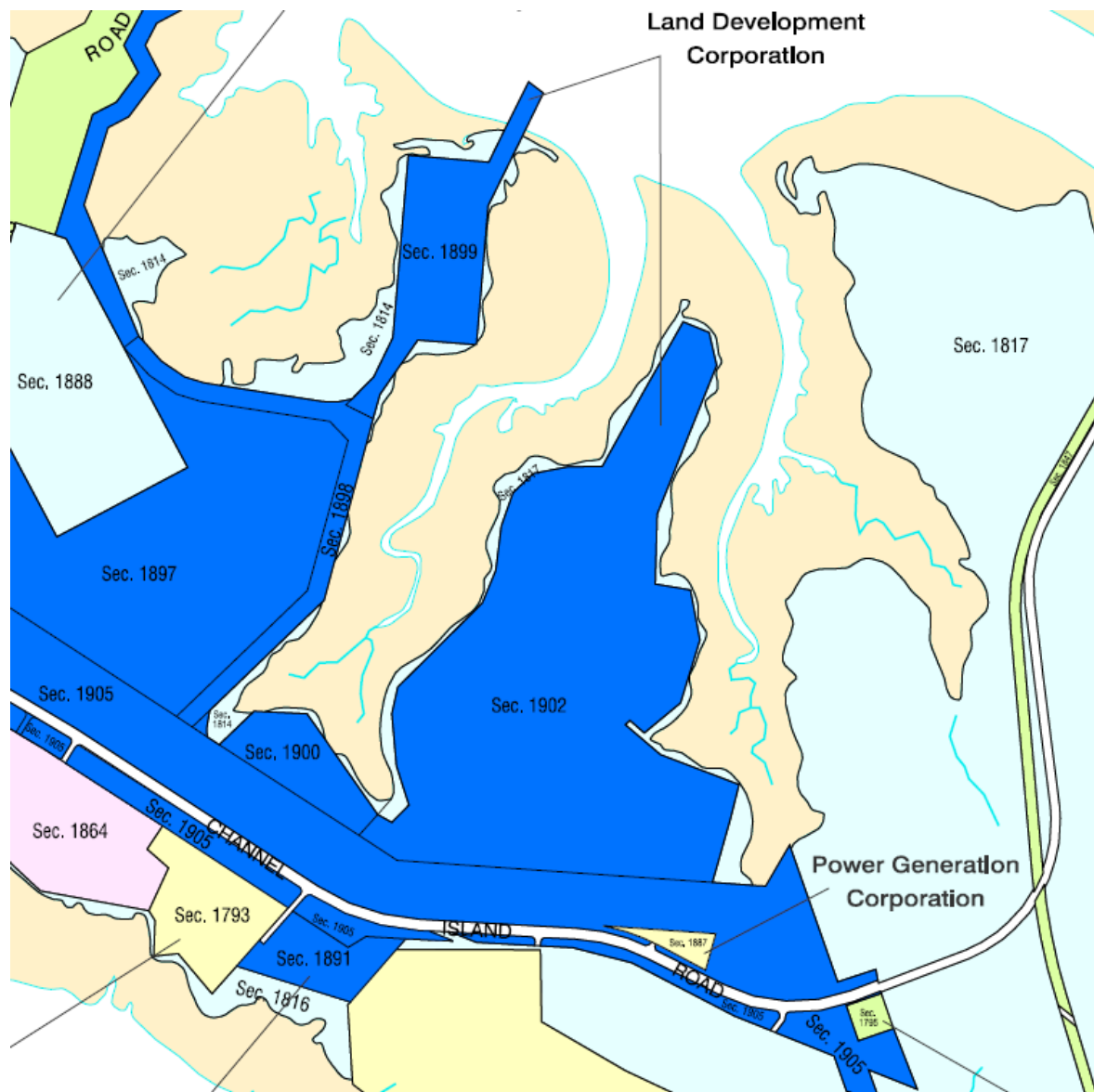
The Stormwater Management Plan is shown in 18096-SK100 (Attachment A). This letter is to be read in conjunction with the plan, providing supporting commentary of the proposed stormwater management outcomes.

## **2. ABOUT KITTYHAWK ESTATE**

Kittyhawk Estate is comprised of Sections 1900 and 1902, Hundred of Ayers, Channel Island Road in the suburb of Wickham, Northern Territory (NT) as shown in Figure 1. The estate is bounded by Darwin Harbour to the north, west and east, and Section 1905 to the south. The estate is 335 ha, zoned as DV (Development), and forms part of the Middle Arm Industrial Precinct (MAIP) which is planned to accommodate large strategic industries for downstream gas processing and gas related developments.

The estate is currently largely undeveloped natural bushland, with some areas of cleared ground within which extractive works have been undertaken. The estate comprises rolling terrain, with natural grades generally varying between 1% to 5% and overland drainage flowing generally to the west and east from a central ridgeline to Darwin Harbour.

The proposed subdivisions involves Sections 1902 and 1905, herein referred to as the 'Site' and described further below.



**Figure 1 – Site Locality Plan (Source: Middle Arm Tenure Map 2018)**

### 3. ABOUT THE SUBDIVISION

The Subdivision Plan for Sec 1902 and 1905 (the ‘Site’) is provided as Figure 2.

The proposed development involves:

- Subdivision of Sec 1902 to establish two new road reserves (Road 1 and Road 2).
- Subdivision of Sec 1902 to form a new Products Corridor (Lot 1), bordering the Road 1 Reserve.
- Subdivision of Sec 1902 to consolidate a small portion (0.30ha) with Sec 1905 and facilitate a drainage easement to allow discharge of stormwater from Road 2 into Sec 1817 (Vacant Crown Land).
- Subdivision of Sec 1902 to form three new industrial allotments and one balance lot for future stages.
- Subdivision of Sec 1905 to form a new road opening for the site access road.

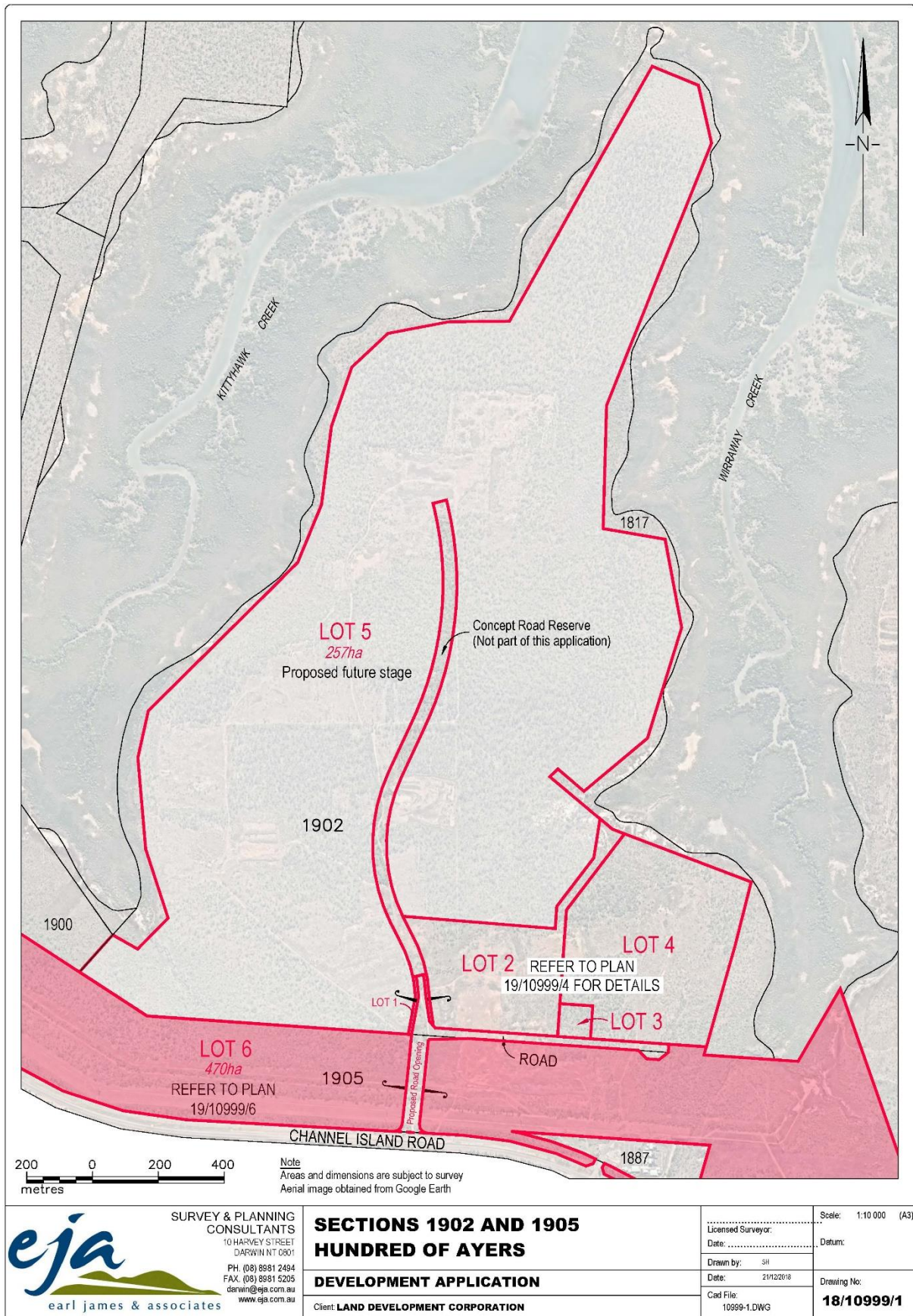


Figure 2 – Subdivision Plan

For the purpose of subdivision, the 'new' industrial allotments will generally be retained in their natural state, with the exception of Lot 3 (1 ha) which will be cleared and graded. Lot 2 (15 ha) and Lot 4 (27.1 ha) will both remain uncleared, other than that which is required to construct short-term drainage controls on Lot 2. Lot 5 (future stages) will remain uncleared, other than that which is required to construct a temporary cul-de-sac at the end of Road 1.

Under the current land use zone, DV (Development), each purchaser of the subdivided allotments will need to seek Development Approval prior to commencing works within their allotment. Therefore, this stormwater management plan only considers the subdivision works including limits of clearing on proposed allotments as described above.

Note: Lot 4 includes an "interim no-clearing zone", which is described further in the Environmental Report: *Environmental Impact and Risk Assessment, Stage 1 Kittyhawk Estate* (Ecoz, 2019).

## 4. STORMWATER MANAGEMENT

A concept Stormwater Management Plan (SWMP) has been prepared for the Subdivision, presented in Attachment A.

### 4.1. Design Basis

All stormwater management infrastructure is designed in accordance with Litchfield Council 'Development and Subdivision Standards' (2017).

Design Storm Events are as follows:

- Minor Storm Event:
  - Road surface drainage and underground pit/pipe network – ARI 5 years
  - Table drains and driveway culverts – ARI 5 years
  - Cross-road culverts – ARI 20 years
- Major Storm Event: ARI 100 years

No inter-allotment flows will be permitted up to and including the major design storm event, with the exception of Lot 2 draining into future stages as described further below.

### 4.2. Road 1

Road 1 comprises a typical urban cross-section with an underground pit/pipe network to manage stormwater drainage (Refer Attachment B). This network will outlet via a level spreader within the road reserve, converting concentrated flow to sheet flow prior to release into Lot 6 (Land Development Corporation products corridor). An easement may be required over the outfall into Lot 6, subject to detailed design and negotiations with Litchfield Council.

### 4.3. Road 2

Road 2 comprises a hybrid urban/rural cross-section, with one-way cross-fall draining stormwater into a table drain along its southern edge (Refer Attachment B). Some sections of this table drain will require protection to limit erosion. This table drain will discharge via a level spreader into Lot 6, which will have a drainage easement over it in favour of Litchfield Council to lawfully allow stormwater to sheet flow into Sec 1817 (Vacant Crown Land).

### 4.4. Lot 1

Lot 1 comprises two 10m wide products corridors bounding the Road 1 road reserve, which will be privately owned by Land Development Corporation. These will be formed as an extension of the Road 1 verges, with stormwater discharging into the Road 1 carriageway via sheet flow.

#### **4.5. Lot 2**

Lot 2 will remain uncleared other than that which is required to establish short-term drainage controls.

Approx. 1 ha of the allotment in the south-west corner falls towards Road 2, where a lawful point of discharge will be provided via a cross-road culvert, designed for Q20 post-development flows. For the subdivision stage, local cut-off drains will be provided to contain stormwater onsite and direct it to the discharge location, designed for Q5 post-subdivision/pre-development flows. The purchaser of Lot 2 will be required to manage post-development flows, installing permanent drainage controls to prevent sheet flow into the road reserves during the minor storm event.

Approximately 4 ha falls to the east, where cut-off drains are proposed to contain water onsite and convey it north east to a controlled discharge point within the allotment, prior to release into Sec 1817 (Vacant Crown Land). For the subdivision stage, this drain will be designed for the Q100 post-subdivision/pre-development flows. The purchaser of Lot 2 will be required to manage post-development flows, installing permanent drainage controls to prevent cross-boundary flows during the major storm event.

Approximately 9 ha falls to the north (Lot 5) where it is proposed to retain natural sheet flow for the subdivision stage, allowing for cross-boundary flow into the balance lot of Sec 1902 ('future stages'). The purchaser of Lot 2 will be required to manage post-development flows, installing permanent drainage controls to prevent cross-boundary flows during the major storm event, completed prior to Stage 2 land release. LDC will retain ownership of Lot 5 until Stage 2 is subdivided, and support this approach for Stage 1.

#### **4.6. Lot 3**

Lot 3 will be cleared, graded and stabilised during the subdivision stage. A cut-off drain will be installed along the eastern boundary to prevent cross-boundary flows during the major storm event, designed for Q100 post-development flows. A lawful point of discharge will be provided via a cross-road culvert under Road 2, designed for Q20 post-development flows. Q100 flows will overflow into the Road 2 reserve and be conveyed in a controlled manner via the proposed table drain.

#### **4.7. Lot 4**

Lot 4 will remain uncleared, with existing sheet flow maintained to the north/east away from Road 2. No infrastructure is proposed during the subdivision stage. The purchaser of Lot 4 will be required to manage all post-development flows and discharge into Kittyhawk Creek via the north/east, without any connection to the Road 2 drainage network.

#### **4.8. Lot 5**

Lot 5 is to serve as the balance lot of Sec 1902 for future stages of development. It will remain uncleared, with existing sheet flow maintained and no infrastructure provided, other than that area required for formation of a temporary cul-de-sac to be owned by LDC. Stormwater collected on this cul-de-sac is expected to be discharged within Lot 5 via a level spreader, subject to detailed design.

It is proposed that this allotment will receive approximately 9 ha of the stormwater discharged from Lot 2 via natural sheet flow, until such time that Lot 2 is developed by the purchaser and permanent drainage controls are established.

#### **4.9. Lot 6**

Lot 6 is to serve as the balance lot of Sec 1905, intended only to facilitate the road opening of the site access road. All proposed work forming part of the subdivision is expected to be contained within the new road reserve, with nil works undertaken within the balance lot. An easement may be required over the drainage outfall from Road 1, subject to detailed design and negotiations with Litchfield Council.

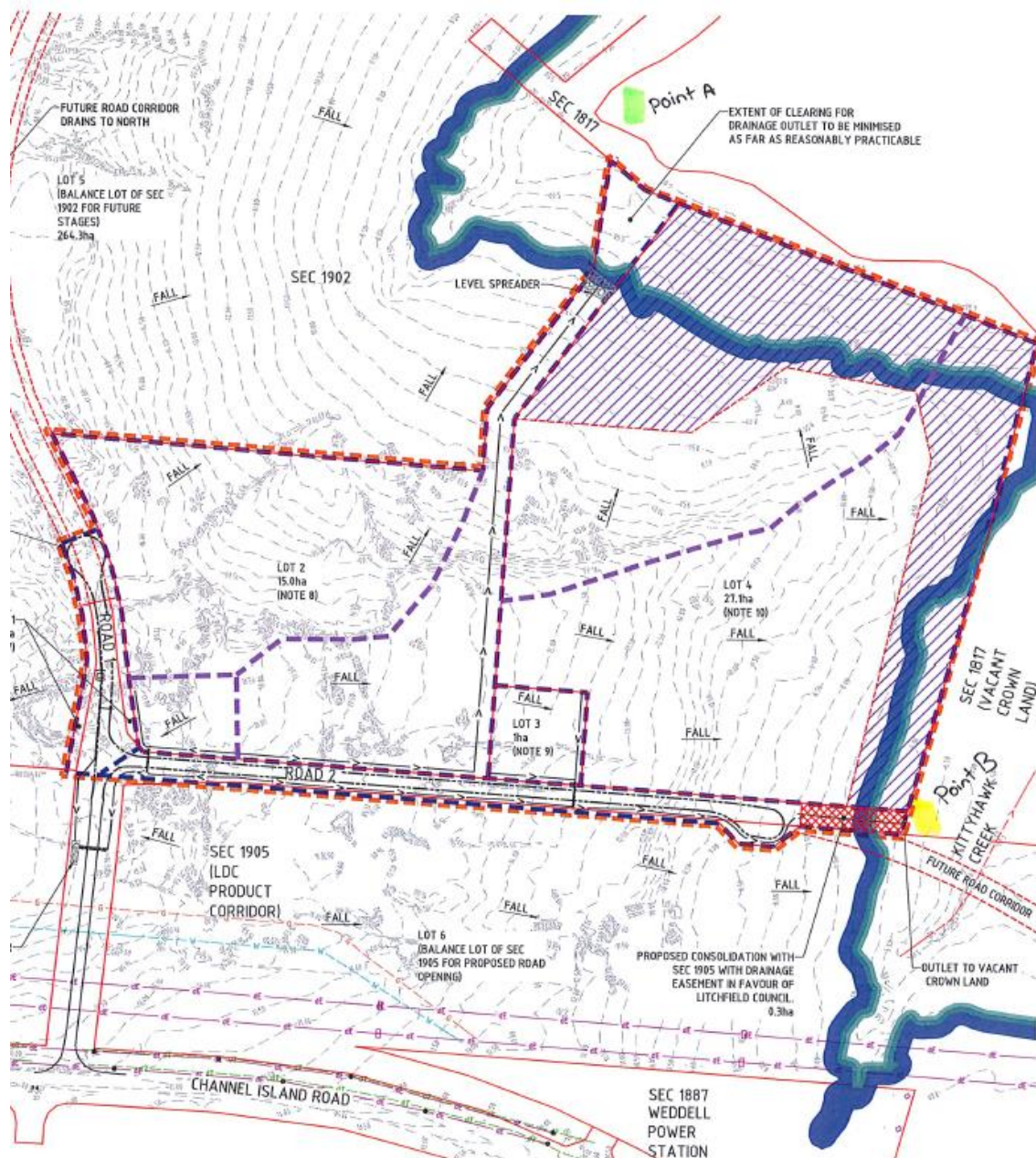
#### 4.10. Driveway Access

Driveway access for each allotment will be designed as urban concrete cross-overs, generally in accordance with Litchfield Council guidelines and standard drawings, and accommodating A-Triple Road Train access. The details of this, including responsibilities and timing for installation, will be developed further during the detailed design phase.

### 5. HYDROLOGICAL IMPACT ASSESSMENT

The impact of the proposed subdivision on stormwater flows exiting the Site has been assessed. As discussed earlier, this assessment is focused on the post-subdivision/pre-development flows only. It is expected that the development of each industrial allotment will attract its own development permit and associated conditions/checks.

Two locations for hydrological impact assessment were chosen, adopting natural creek lines within Kittyhawk Creek, as depicted in Figure 3 below.

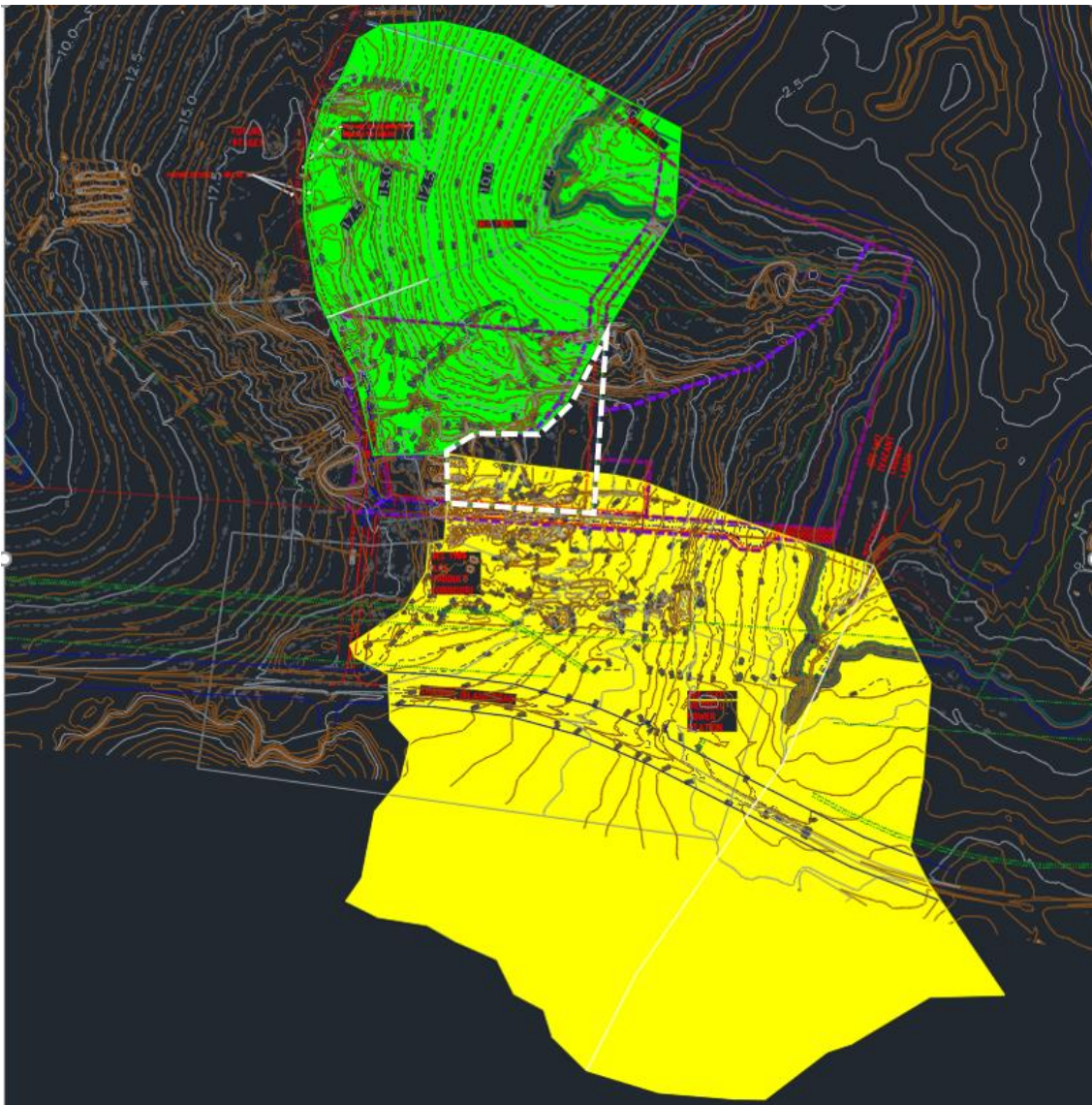


**Figure 3 - Points of discharge considered for pre-development and post-development flows**

The following parameters were used in the generation of flow rates for the Site:

- Approach: Rational Method
- Fraction Impervious (Fi) and Coefficient of Runoff – As per LC Standards
  - Road 1, Road 2, Lot 1 (Road Reserve):  $Fi = 0.85$
  - Cleared Allotment, Lot 3 (Industrial):  $Fi = 0.90$
  - Uncleared Allotments, Lots 2, 4, 5 and 6 (Parkland, Public Reserve):  $Fi = 0.1$
- Time of Concentration
  - Overland flow via Friend's equation, up to maximum length of 200m
  - Remainder via the modified stream velocity method (as defined in QUDM 2017, section 4.6.11 (c))
- Rainfall Intensities: Sourced via Bureau of Meteorology 2016 IFD Data

Catchment areas were developed using available topographic data as illustrated in Figure 4. The green polygon represents the catchment currently discharging to Point A, whilst the yellow polygon represents the catchment currently discharging to Point B. The white-dash outlined polygon illustrates the area diverted to Point A post-subdivision, resulting in an increase in total catchment contributing to Point A and a reduction at Point B.



**Figure 4 – Catchment Plan**



Catchment areas, weighted average runoff coefficients, and calculated peak flows for the Major Storm Event (Q100) are provided in the table below for pre and post-subdivision stages:

**Table 1 – Summary of Pre and Post-Subdivision Peak Flows (Q100)**

Discharge Location	Development Stage	Catchment Area (ha)	Weighted Average Runoff Coefficient, $C_{100}$	Time of Concentration (min)	Rainfall Intensity, $I_{100}$ (mm/hr)	Peak Flow Rate, $Q_{100}$ ( $m^3/s$ )
Point A	Pre-Subdivision	40.80	0.52	39	126.66	7.468
	Post-Subdivision	44.20	0.52	39	126.66	8.092
	Difference	+3.40	N/A	0	0	+0.624
Point B	Pre-Subdivision	97.10	0.552	54	104.17	15.517
	Post-Subdivision	94.90	0.565	54	104.17	15.524
	Difference	-2.20	+0.013	0	0	+0.007

Discharge Point A sees an increase of  $0.624m^3/s$  (or 8.36%) due to an increase in catchment area from Lot 2.

Discharge Point B sees an increase of  $0.007m^3/s$  (or 0.05%) due to an increase in runoff coefficient from construction of proposed road reserves and clearing of Lot 3, noting this impact is offset in part by a reduction in catchment area from Lot 2.

In both cases, the time of concentration and corresponding rainfall intensities are the same for pre and post-subdivision stages. This is due to the minimal amount of clearing and development works which is being undertaken during the subdivision stage. As the developed areas of Kittyhawk Estate form part of much larger, predominantly uncleared catchments, the peak flow occurs when the full catchment is contributing (i.e. no partial area effects).

No stormwater detention is proposed for the Subdivision stage, noting that the hydrological impact is limited, and each allotment will require its own development approval prior to industrial development.

## 6. DETAILED DESIGN CONSIDERATIONS

The following stormwater management works will be undertaken during the detailed design stage:

- Detailed hydrologic and hydraulic calculations;
- Design and documentation of stormwater infrastructure features, including:
  - Table Drains
  - Drop Structures
  - Culverts
  - Pits and Pipes
- Confirmation of required easements that are dependent on detailed design outcomes.
- Confirmation of lawful points of discharge.

## 7. DISCUSSION

The proposed subdivision of 'Kittyhawk Estate' is intended to support heavy industry in the Northern Territory through the provision of large industrial allotments. With the exception of Lot 3 (1 ha), clearing of allotments will generally be deferred until future owners initiate their own developments. As the Site is zoned DV, each developer will be required to submit a Development Application for their individual site and be subject to additional development conditions relating to appropriate onsite stormwater management practices. This stormwater management plan addresses the 'subdivision' stage only.

The stormwater management approach complies with *Litchfield Council Development and Subdivision Standards (2017)*.

Road 1 is an urban cross-section with underground pit/pipe network. It receives stormwater via sheet flow from Lot 1, which comprises 2 x 10m wide products corridors as an extension of the road verge. It does not receive stormwater from any other allotments. All infrastructure contained within the Road 1 reserve is designed to manage fully-developed flows.

Road 2 is a hybrid urban/rural cross-section with one-way cross fall and a table drain on one side. It receives stormwater from the Road 2 reserve, a portion of Lot 6 (existing Sec 1905 Products Corridor), a 1ha sub-catchment of Lot 2, and the entirety of Lot 3 which is 1ha. The table drain acts as a cut-off drain to prevent Lot 6 from sheet flowing stormwater directly onto the road carriageway. The contributions from Lot 2 and 3 are addressed via provision of a lawful point of discharge and cross-road culverts, each designed for fully-developed flows.

Easements will be established, as required, to support lawful discharge of stormwater from these road reserves into adjoining lands. One easement is currently proposed over Lot 6 at the eastern end of Road 2. An additional easement may be required to accommodate discharge from Road 1, subject to detailed design outcomes.

Cut-off drains are proposed within the allotments to collect and convey post-subdivision/pre-development flows to a lawful point of discharge without inter-allotment flows. The only exception to this is in Lot 2, where the northern sub-catchment (approx. 9ha) is proposed to continue temporarily draining via natural sheet-flow into Lot 5; the balance lot of Sec 1902 to be retained by LDC and developed as "future stages". LDC supports this approach and acknowledges appropriate covenants will need to be put in place to ensure the future owner of Lot 2 manages all stormwater from this sub-catchment within their site prior to Stage 2 land release. Each future lot owner will be required to install appropriate post-development stormwater management practices during development of their sites, subject to their own development permits and conditions.

A hydrological impact assessment has been completed to confirm any changes in peak flow rates entering Kittyhawk Creek as a result of the subdivision. Discharge Point A sees an increase of 0.624m<sup>3</sup>/s (or 8.36%) due to an increase in catchment area from Lot 2. Discharge Point B sees an increase of 0.007m<sup>3</sup>/s (or 0.05%) due to an increase in runoff coefficient from construction of proposed road reserves and clearing of Lot 3, noting this impact is slightly offset by a reduction in catchment area from Lot 2. No stormwater detention is proposed for the Subdivision stage, noting that the hydrological impact is limited, and each allotment will require its own development approval prior to industrial development.

## 8. CLOSING

Please contact me should you wish to discuss this Technical Memorandum further.

Yours sincerely,

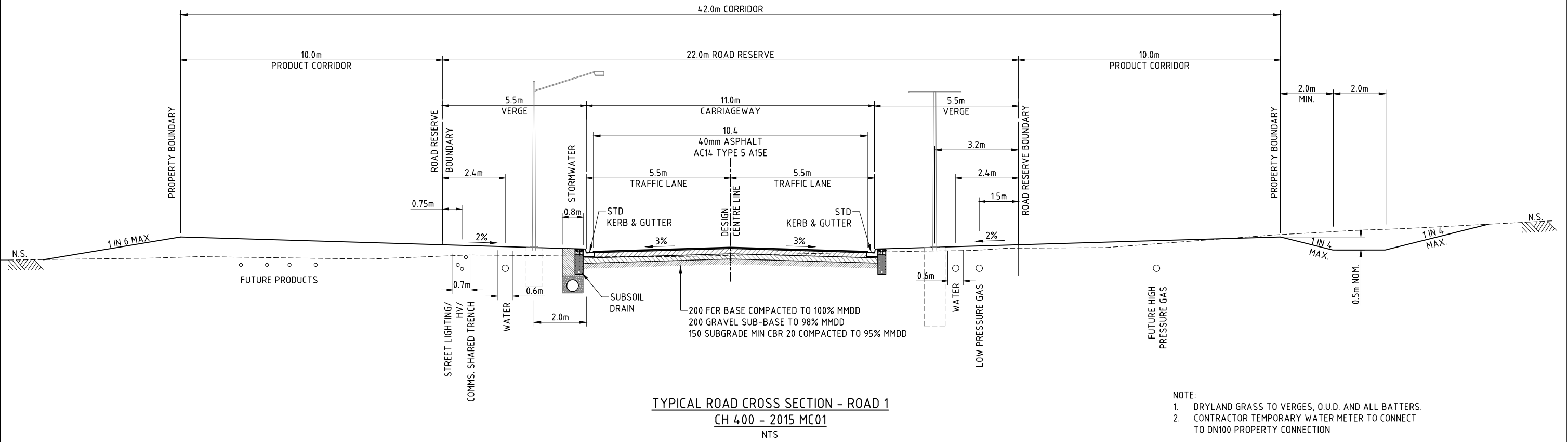


Paul Brandis  
Senior Civil Engineer

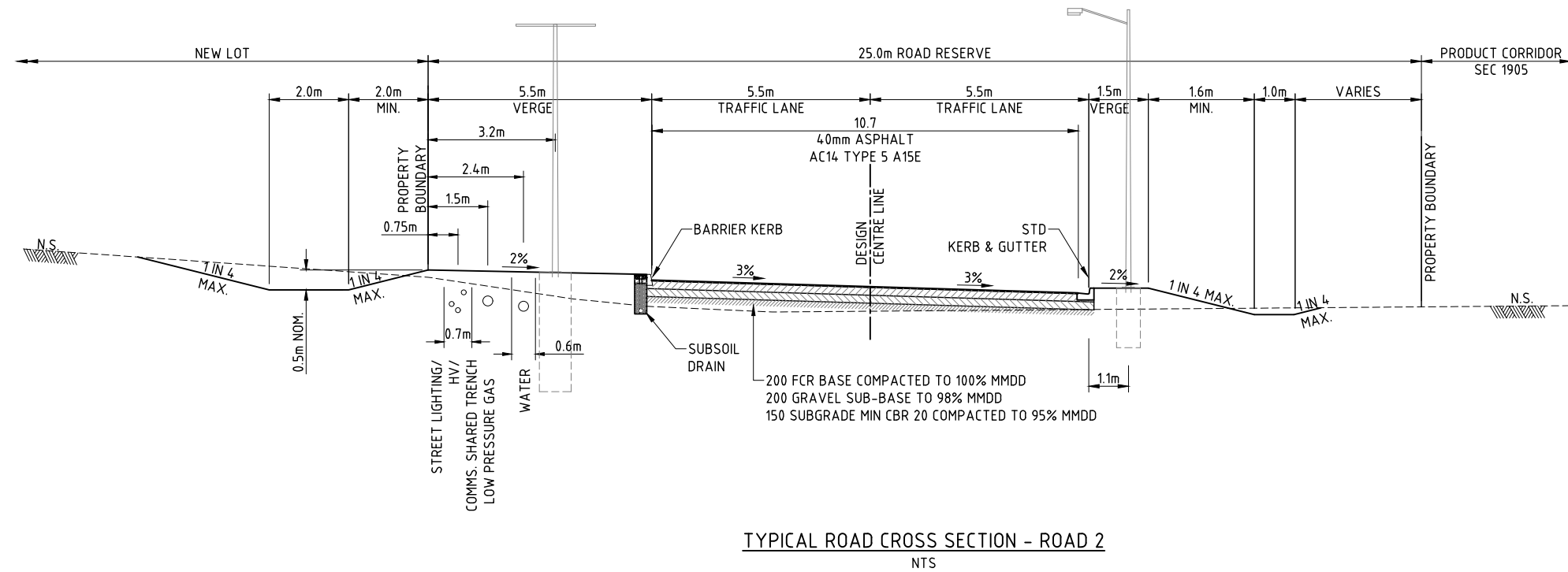
MIEAust, CPEng, NER, RPEQ, DipPM

## ATTACHMENTS:

- A. Stormwater Management Plan – 18096-SK1000 Rev D
- B. Typical Road Cross Sections – 18096-C503 Rev B



- NOTE:
1. DRYLAND GRASS TO VERGES, O.U.D. AND ALL BATTERS.
  2. CONTRACTOR TEMPORARY WATER METER TO CONNECT TO DN100 PROPERTY CONNECTION



No	DATE	INITIAL	AMENDMENT
B	11/06/19	GB	ISSUE FOR 60% REVIEW
A	17/05/19	GB	ISSUE FOR 50% REVIEW

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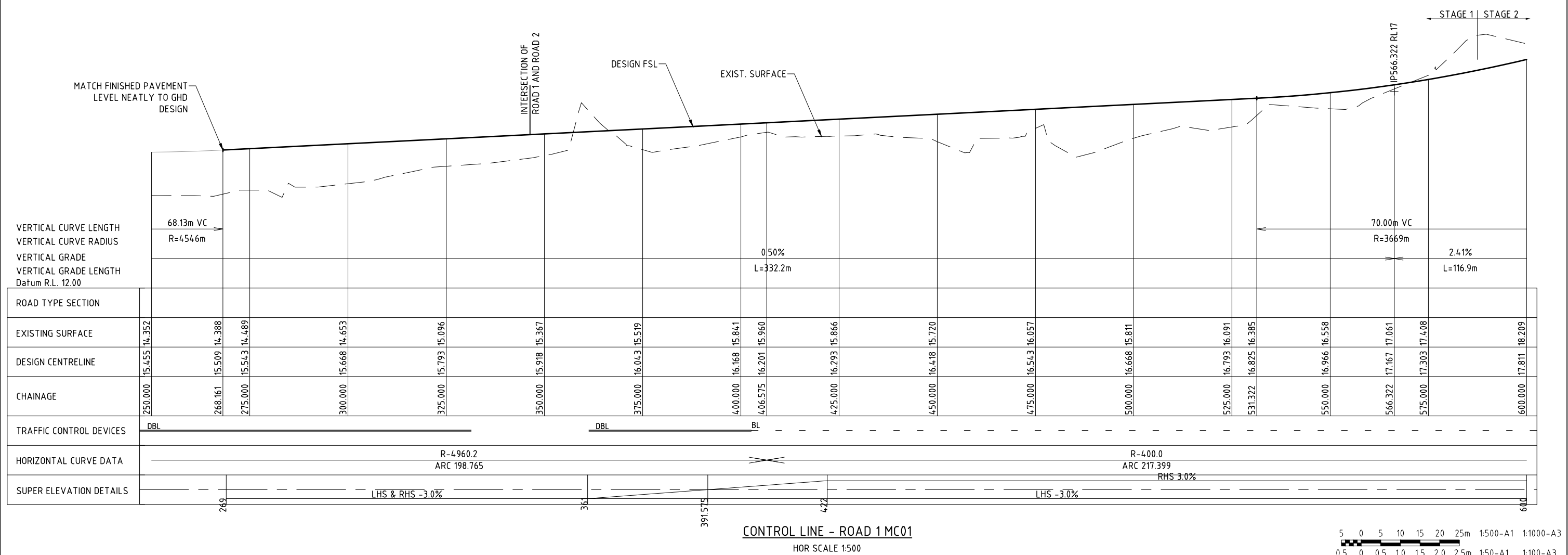
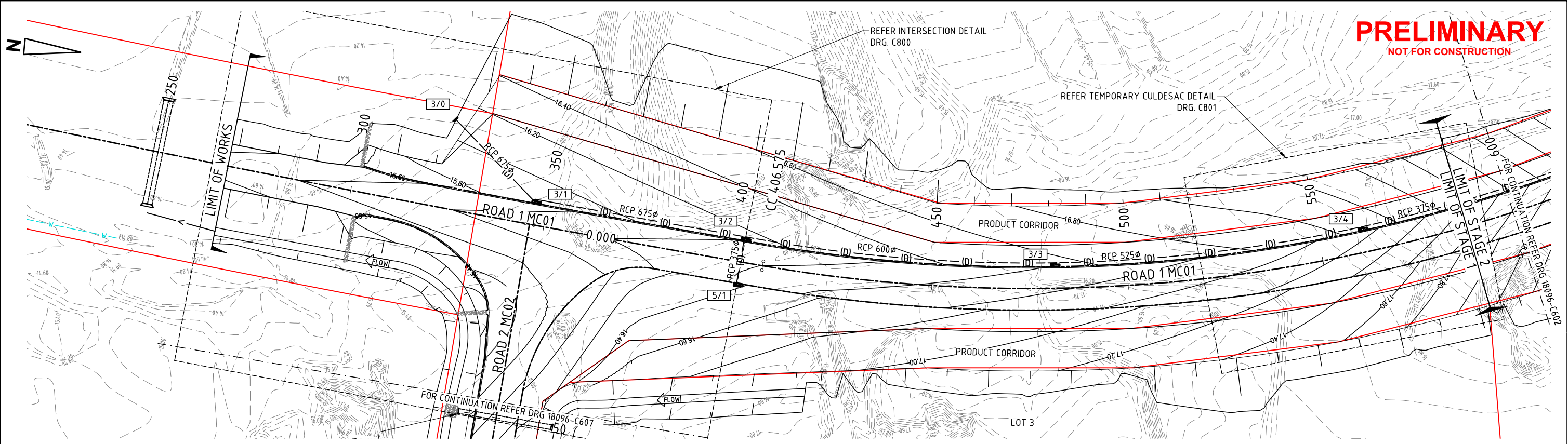
CLIENT

ABN 78 124 388 192  
P.O.Box 43420 Casuarina NT 0811  
Ph. 08 894 724 76 Fax: 08 894 750 98

APPROVED	
DRAWN	CHECKED
AC	-
DESIGNED	CHECKED
AC	-

TITLE			
MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/A YERS			
TYPICAL CROSS SECTIONS			
SCALE	PROJECT No	DRAWING No	AMDT
N.T.S.	18096	18096-C503	B

**PRELIMINARY**  
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A	17/05/19	GB	ISSUE FOR 50% REVIEW

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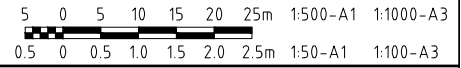
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**LAND DEVELOPMENT CORPORATION**

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P.O.Box 43420 Casuarina NT 0811  
Ph. 08 89472476 Fax: 08 89475098

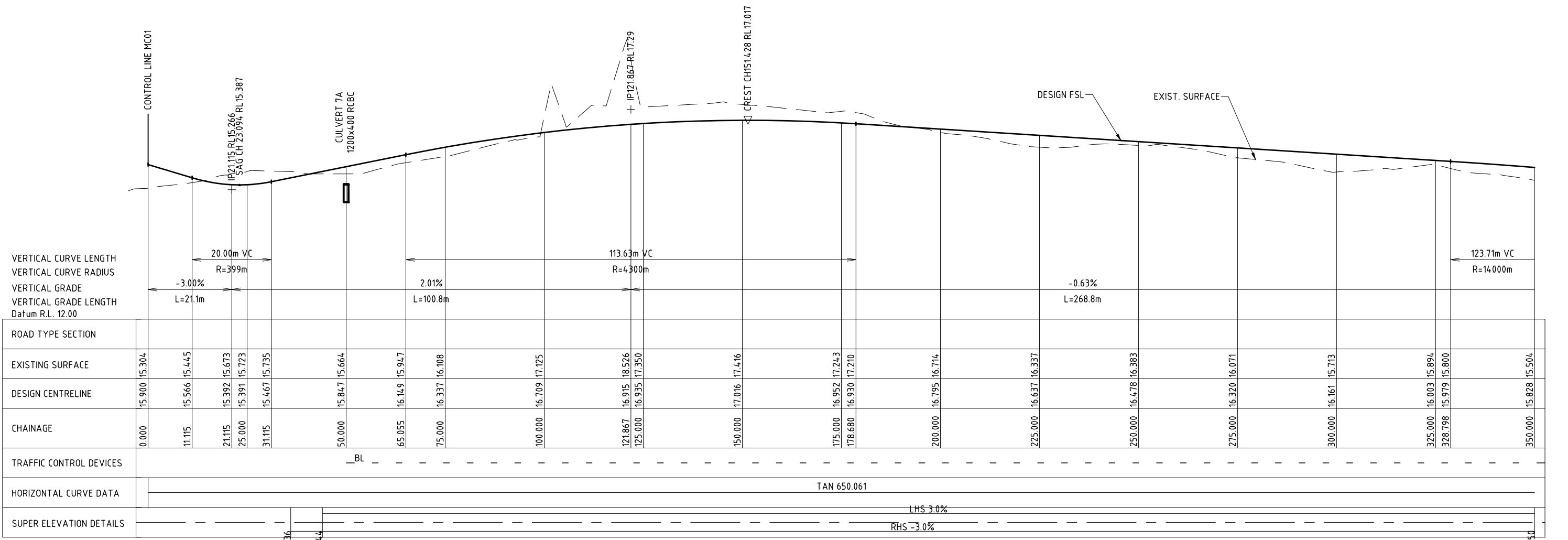
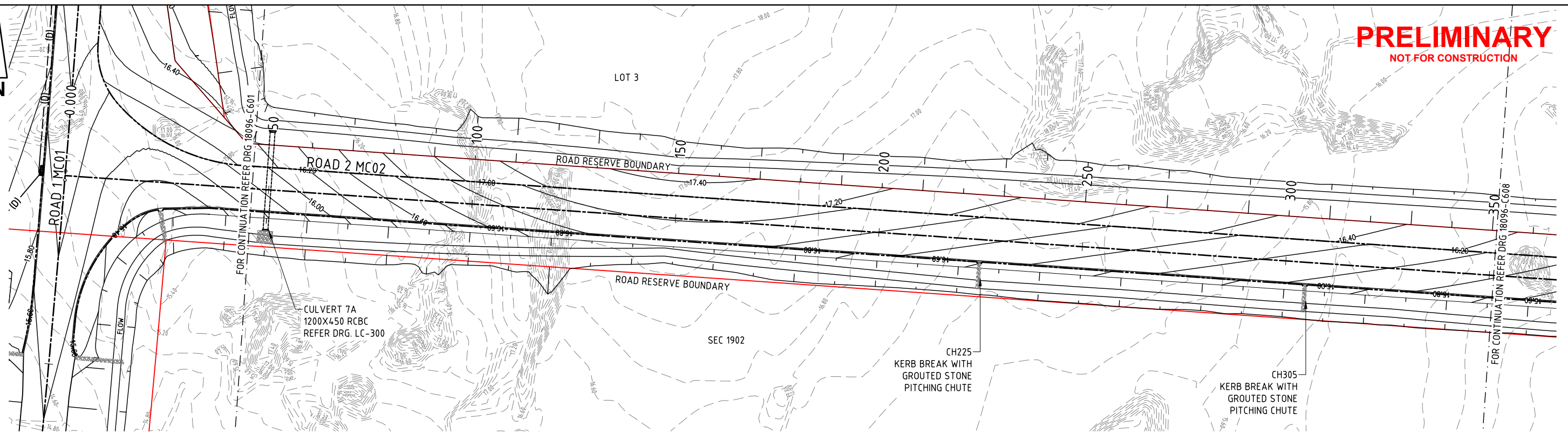
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DRAWN	CHECKED
AC	-
DESIGNED	CHECKED
AC	-

TITLE **MIDDLE ARM INDUSTRIAL PRECINCT  
KITTYHAWK ESTATE - SECTION 1902 H/AYERS  
ROAD 1 - STAGE 1  
PLAN & LONGITUDINAL SECTION - SHEET 1**

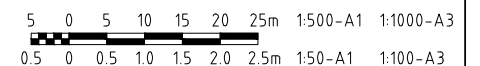
SCALE AS SHOWN PROJECT No **18096** DRAWING No **18096-C601** AMDT **B**



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CONTROL LINE - ROAD 2 MC02  
HOR SCALE 1:500



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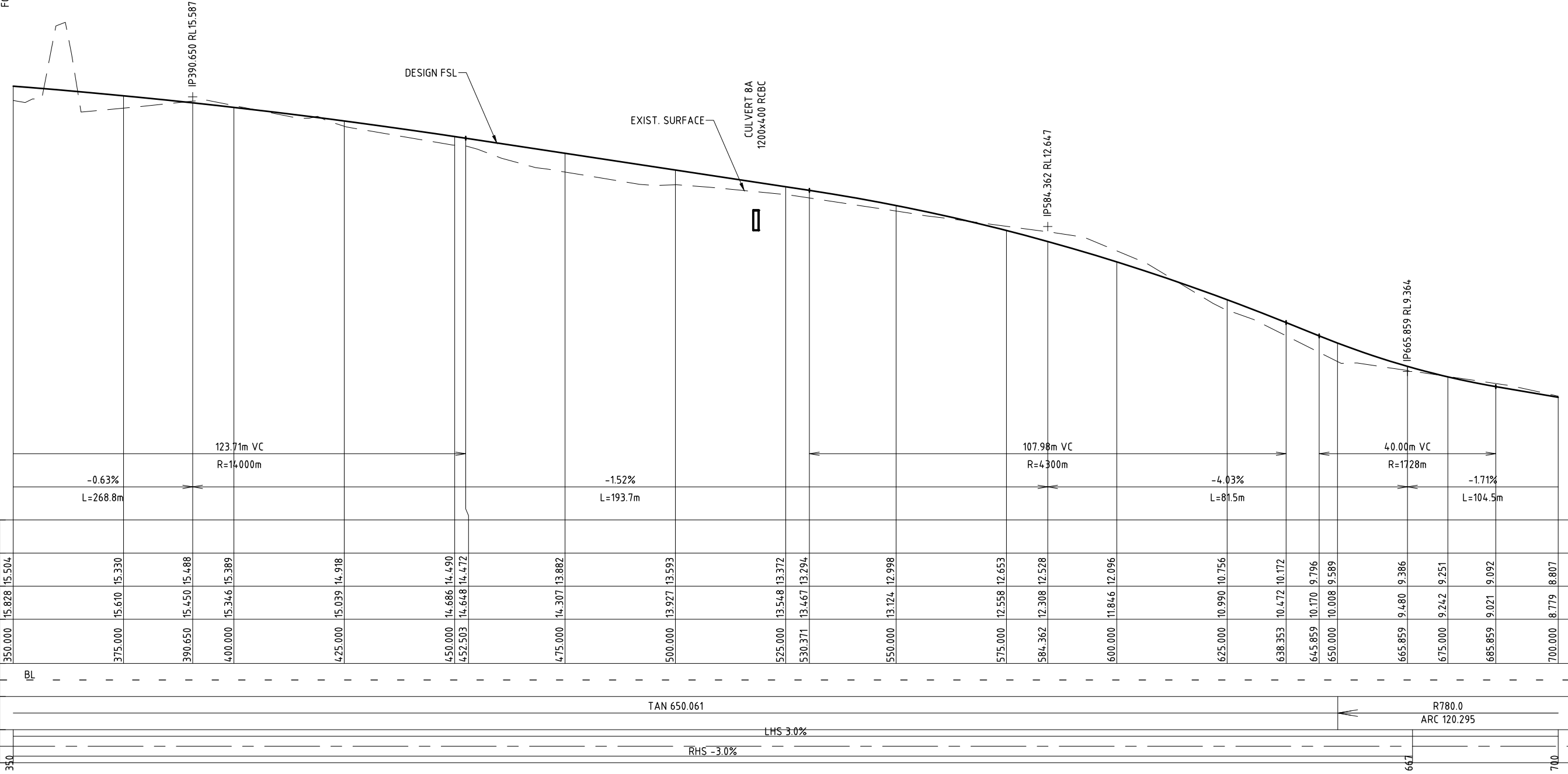
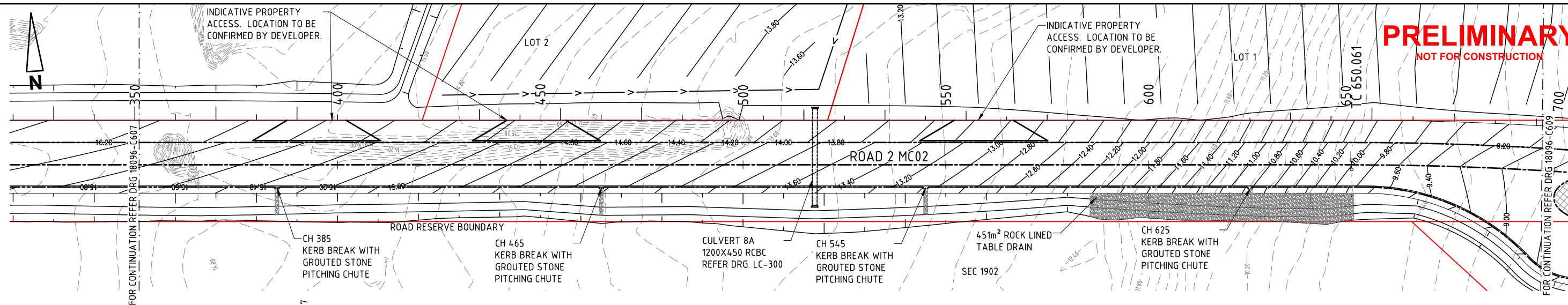
ABN 78 124 388 192  
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Ph. 08 89472476 Fax: 08 89475098

APPROVED	CHECKED
-	-
DRAWN	CHECKED
AC	-
DESIGNED	CHECKED
AC	-

TITLE **MIDDLE ARM INDUSTRIAL PRECINCT**  
**KITTYHAWK ESTATE - SECTION 1902 H/AYERS**  
**ROAD 2**  
**PLAN & LONGITUDINAL SECTION - SHEET 1**

SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	<b>18096</b>	<b>18096-C607</b>	<b>B</b>

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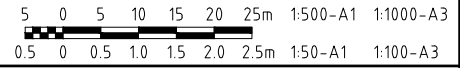


VERTICAL CURVE LENGTH  
VERTICAL CURVE RADIUS  
VERTICAL GRADE  
VERTICAL GRADE LENGTH  
Datum R.L. 6.00

VERTICAL CURVE LENGTH	123.71m VC	107.98m VC	40.00m VC
VERTICAL CURVE RADIUS	R=14000m	R=4300m	R=1728m
VERTICAL GRADE	-0.63%	-1.52%	-4.03%
VERTICAL GRADE LENGTH	L=268.8m	L=193.7m	L=81.5m
			-1.71%
			L=104.5m

ROAD TYPE SECTION	BL																						
EXISTING SURFACE	15.504	15.330	15.488	15.389	14.918	14.490	14.472	13.882	13.593	13.372	13.294	12.998	12.653	12.528	12.096	10.756	10.172	9.796	9.589	9.386	9.251	9.092	8.807
DESIGN CENTRELINE	15.828	15.610	15.450	15.346	15.039	14.686	14.472	14.307	13.927	13.548	13.467	13.124	12.558	12.308	11.846	10.990	10.472	10.170	10.008	9.480	9.242	9.021	8.779
CHAINAGE	350.000	375.000	390.650	400.000	425.000	450.000	452.503	475.000	500.000	525.000	530.371	550.000	575.000	584.362	600.000	625.000	638.353	645.859	650.000	665.859	675.000	685.859	700.000
TRAFFIC CONTROL DEVICES	BL																						
HORIZONTAL CURVE DATA	TAN 650.061																				R780.0 ARC 120.295		
SUPER ELEVATION DETAILS	LHS 3.0%											RHS -3.0%											

**CONTROL LINE - ROAD 2 MC02**  
HOR SCALE 1:500



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A	17/05/19	GB	ISSUE FOR 50% REVIEW
No	DATE	INITIAL	AMENDMENT

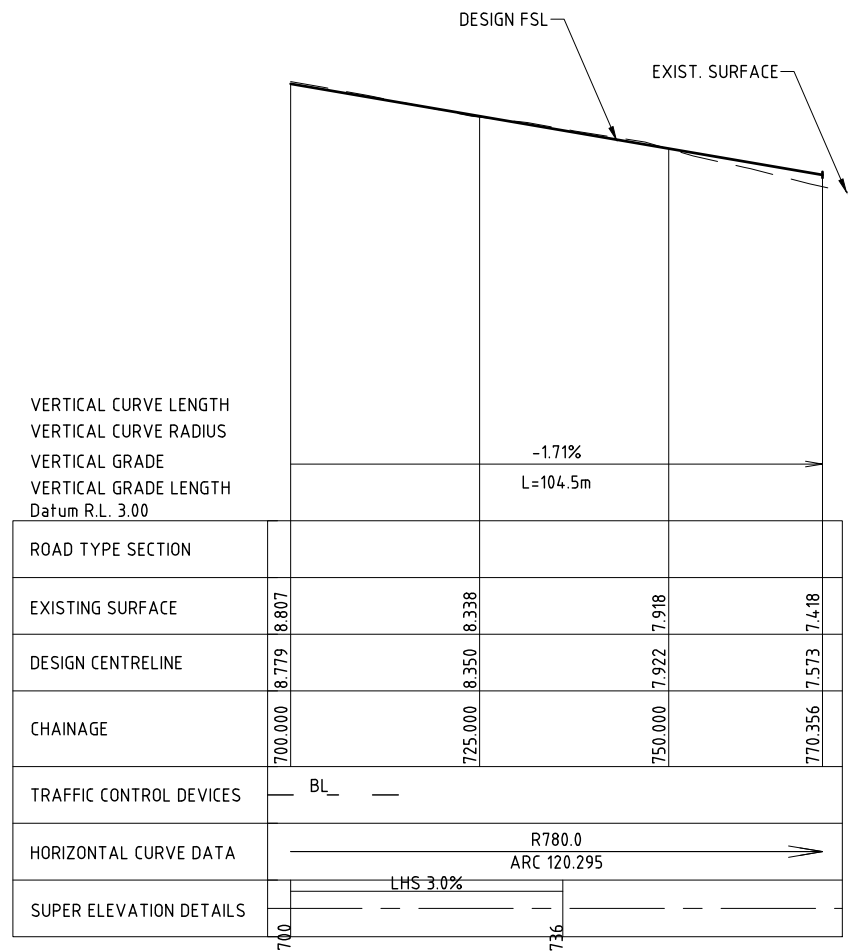
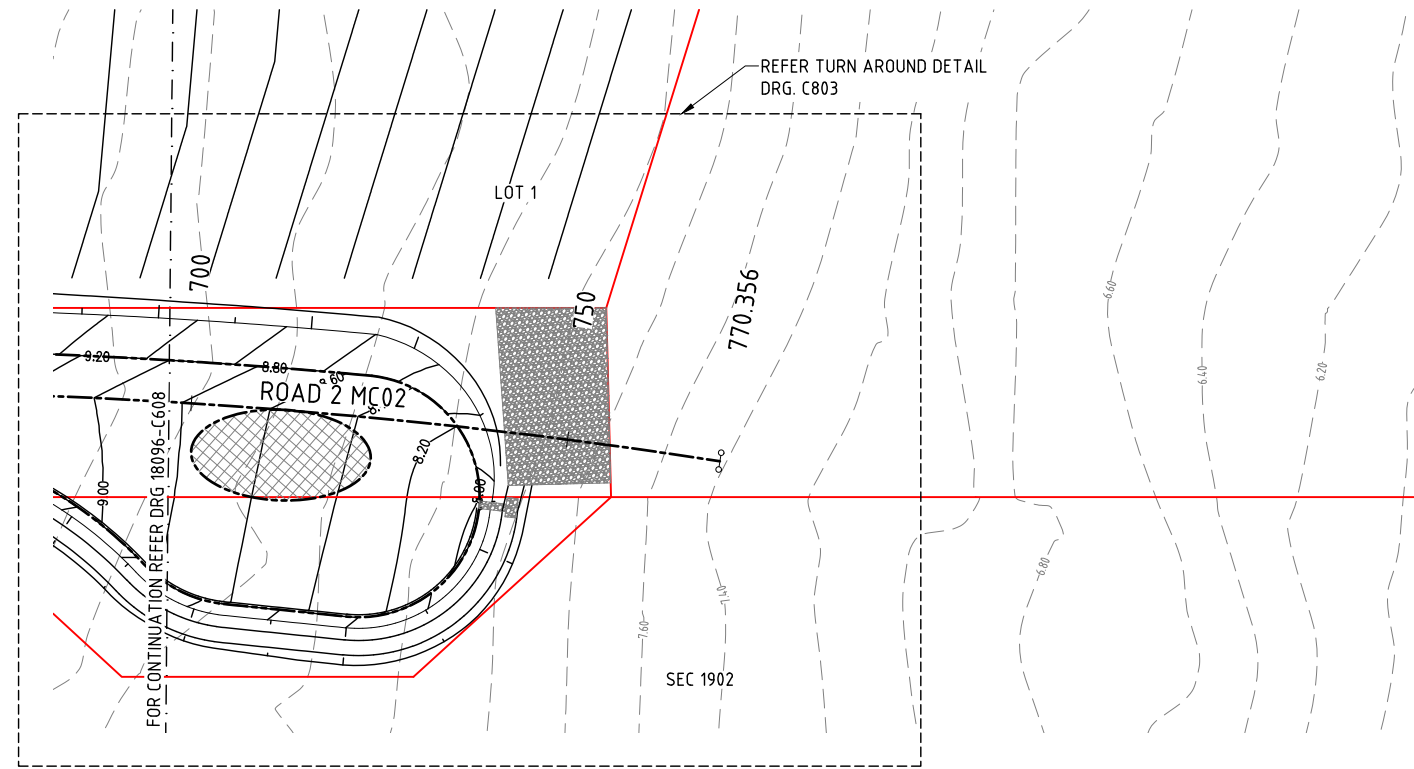
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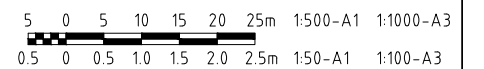
**byrne CONSULTANTS**  
ABN 78 124 388 192  
P.O.Box 43420 Casuarina NT 0811  
Ph. 08 89472476 Fax: 08 89475098

APPROVED	-
DRAWN	CHECKED
DESIGNED	CHECKED
AC	-
AC	-

<b>TITLE</b> MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/AYERS ROAD 2 PLAN & LONGITUDINAL SECTION - SHEET 2			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	18096	18096-C608	B



**CONTROL LINE - ROAD 2 MC02**  
HOR SCALE 1:500



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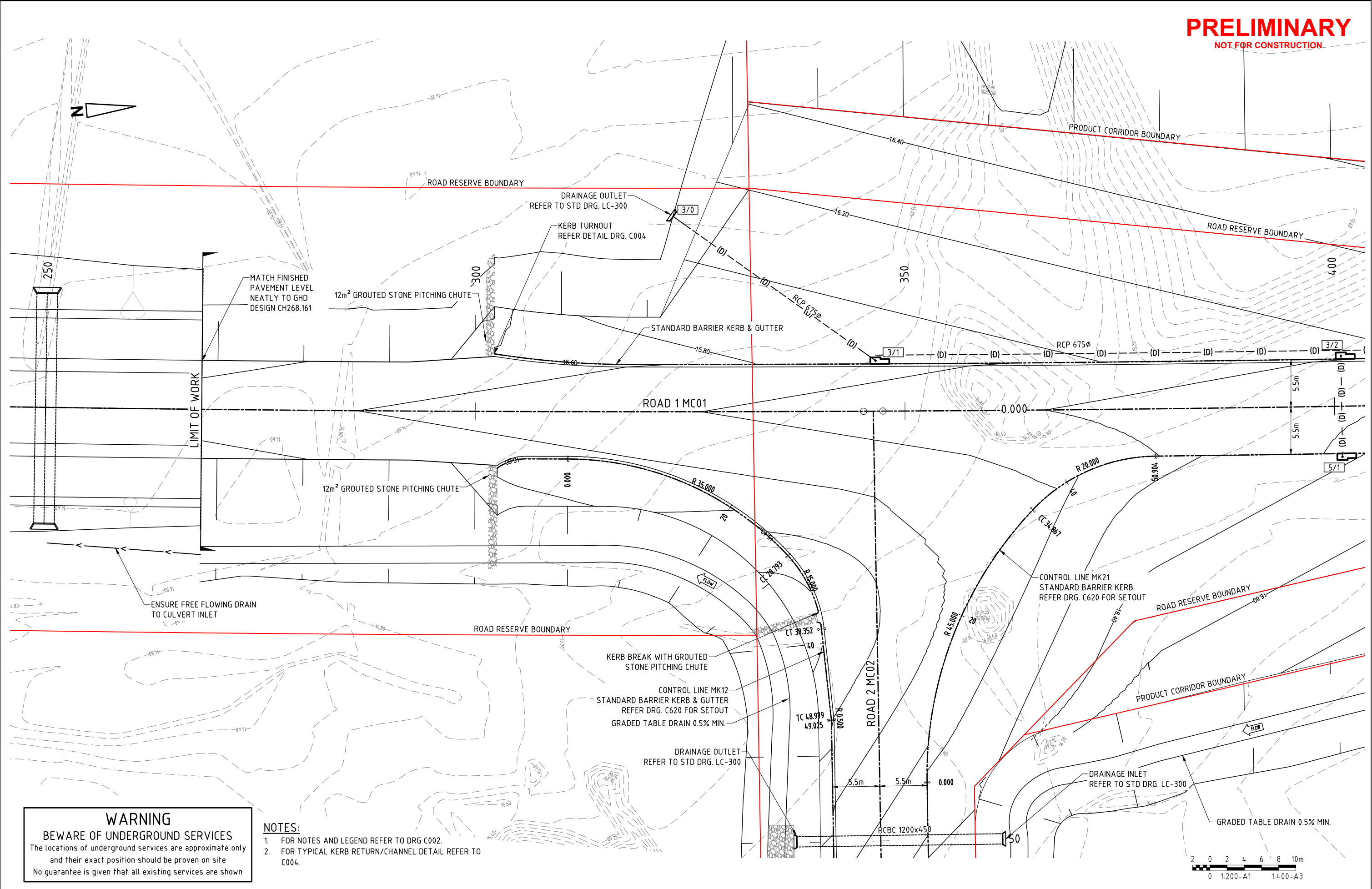


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 P.O.Box 43420 Casuarina NT 0811  
 Ph. 08 894 724 76 Fax: 08 894 750 98

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DRAWN	CHECKED
DESIGNED	CHECKED
AC	-
AC	-

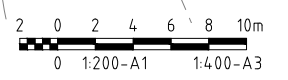
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MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/AYERS ROAD 2 PLAN & LONGITUDINAL SECTION - SHEET 3			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	<b>18096</b>	<b>18096-C609</b>	<b>B</b>

**PRELIMINARY**  
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**WARNING**  
BEWARE OF UNDERGROUND SERVICES  
The locations of underground services are approximate only and their exact position should be proven on site  
No guarantee is given that all existing services are shown

- NOTES:**
- FOR NOTES AND LEGEND REFER TO DRG C002.
  - FOR TYPICAL KERB RETURN/CHANNEL DETAIL REFER TO C004.



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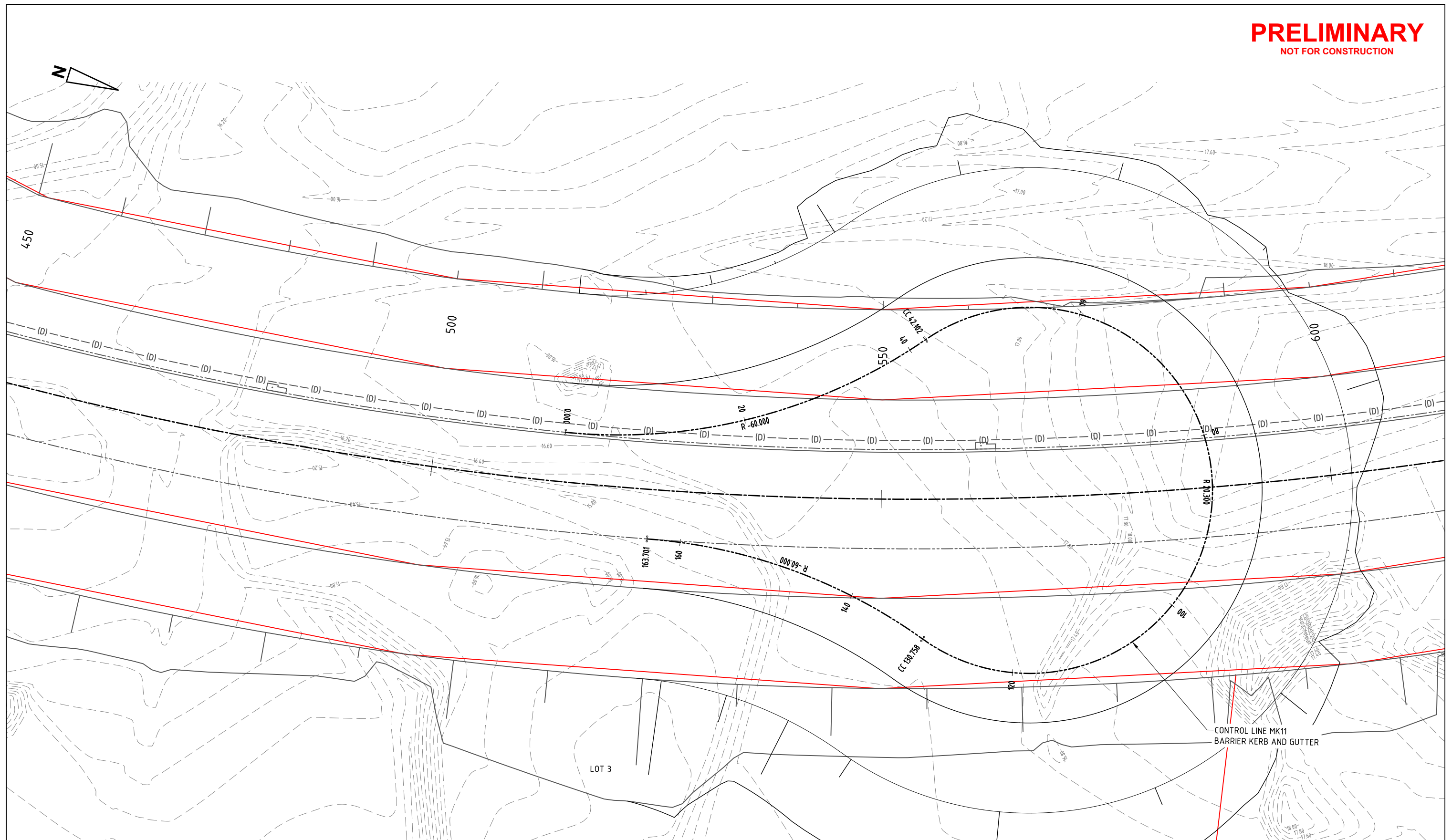


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AC	-
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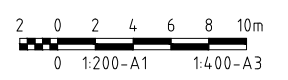
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MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/AYERS ROAD 1 / ROAD 2 INTERSECTION INTERSECTION DETAIL			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	18096	18096-C800	B





**WARNING**  
**BEWARE OF UNDERGROUND SERVICES**  
The locations of underground services are approximate only and their exact position should be proven on site  
No guarantee is given that all existing services are shown

- NOTES:**
- FOR NOTES AND LEGEND REFER TO DRG C002.
  - READ IN CONJUNCTION WITH STANDARD LINEMARKING DRGS CS-3400 AND CS-3401.



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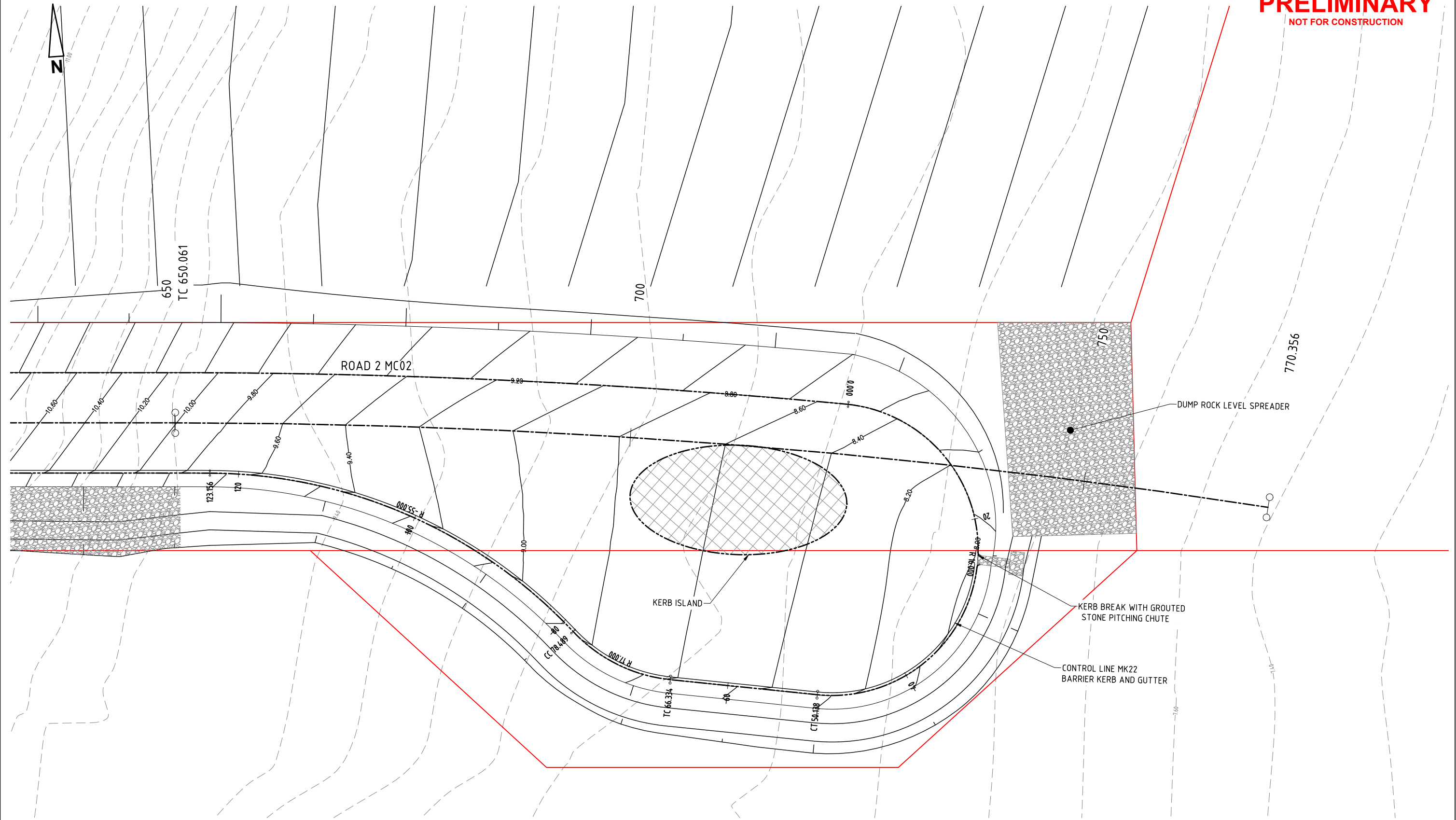


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P.O.Box 43420 Casuarina NT 0811  
Ph. 08 89472476 Fax: 08 89475098

APPROVED	CHECKED
DRAWN AC	-
DESIGNED AC	CHECKED -

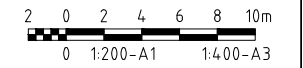
TITLE			
MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/AYERS ROAD 1 - STAGE 1 TEMPORARY CULDESAC DETAIL			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	18096	18096-C801	B

**PRELIMINARY**  
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**WARNING**  
**BEWARE OF UNDERGROUND SERVICES**  
The locations of underground services are approximate only and their exact position should be proven on site  
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- NOTES:**
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  - READ IN CONJUNCTION WITH STANDARD LINEMARKING DRGS CS-3400 AND CS-3401.



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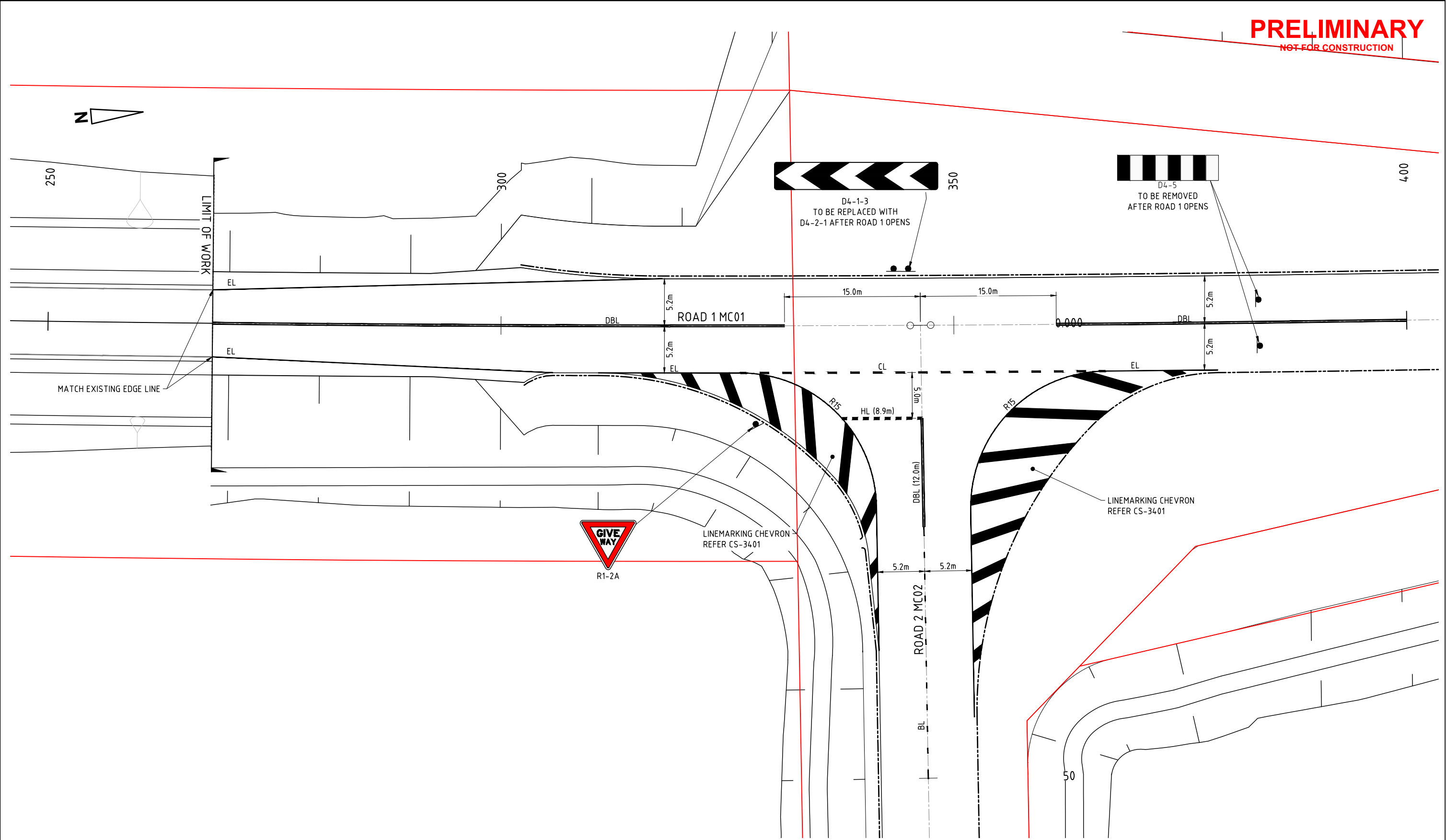
**LAND DEVELOPMENT CORPORATION**

**byrne CONSULTANTS**  
ABN 78 124 388 192  
P.O.Box 43420 Casuarina NT 0811  
Ph. 08 894 724 76 Fax: 08 894 750 98

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DESIGNED	-

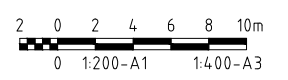
TITLE			
<b>MIDDLE ARM INDUSTRIAL PRECINCT</b>			
KITTYHAWK ESTATE - SECTION 1902 H/AYERS			
ROAD 2			
TURN AROUND DETAIL			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	<b>18096</b>	<b>18096-C803</b>	<b>B</b>

**PRELIMINARY**  
NOT FOR CONSTRUCTION



- NOTES:**
- FOR NOTES AND LEGEND REFER TO DRG C002.
  - READ IN CONJUNCTION WITH STANDARD LINEMARKING DRGS CS-3400 AND CS-3401.

**WARNING**  
**BEWARE OF UNDERGROUND SERVICES**  
The locations of underground services are approximate only and their exact position should be proven on site  
No guarantee is given that all existing services are shown



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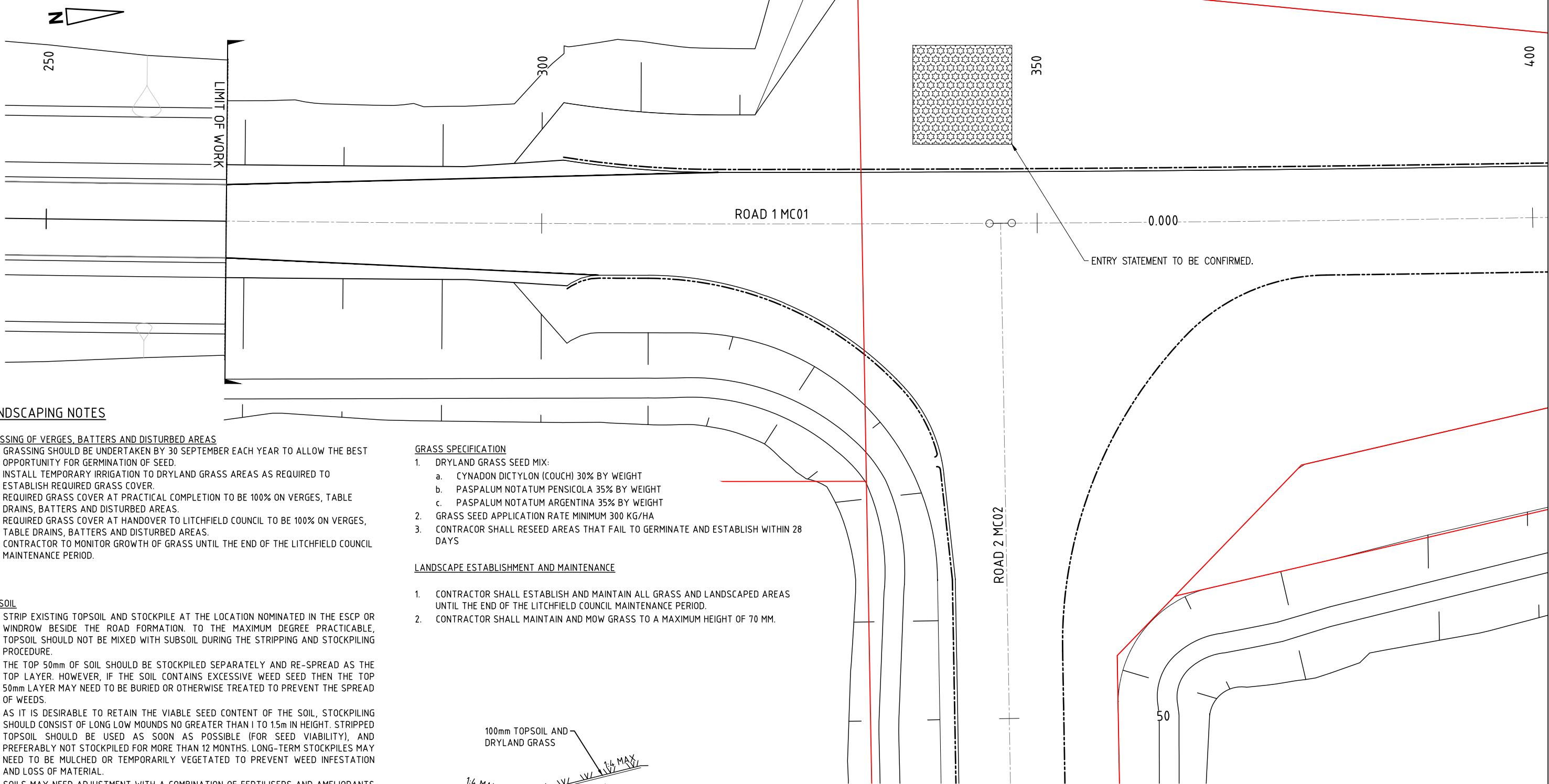
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TITLE			
MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/AYERS ROAD 1 / ROAD 2 INTERSECTION TRAFFIC CONTROL DEVICES			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	18096	18096-C900	B



**LANDSCAPING NOTES**

**GRASSING OF VERGES, BATTERS AND DISTURBED AREAS**

- GRASSING SHOULD BE UNDERTAKEN BY 30 SEPTEMBER EACH YEAR TO ALLOW THE BEST OPPORTUNITY FOR GERMINATION OF SEED.
- INSTALL TEMPORARY IRRIGATION TO DRYLAND GRASS AREAS AS REQUIRED TO ESTABLISH REQUIRED GRASS COVER.
- REQUIRED GRASS COVER AT PRACTICAL COMPLETION TO BE 100% ON VERGES, TABLE DRAINS, BATTERS AND DISTURBED AREAS.
- REQUIRED GRASS COVER AT HANDOVER TO LITCHFIELD COUNCIL TO BE 100% ON VERGES, TABLE DRAINS, BATTERS AND DISTURBED AREAS.
- CONTRACTOR TO MONITOR GROWTH OF GRASS UNTIL THE END OF THE LITCHFIELD COUNCIL MAINTENANCE PERIOD.

**TOPSOIL**

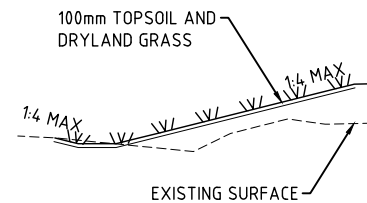
- STRIP EXISTING TOPSOIL AND STOCKPILE AT THE LOCATION NOMINATED IN THE ESCP OR WINDROW BESIDE THE ROAD FORMATION. TO THE MAXIMUM DEGREE PRACTICABLE, TOPSOIL SHOULD NOT BE MIXED WITH SUBSOIL DURING THE STRIPPING AND STOCKPILING PROCEDURE.
- THE TOP 50mm OF SOIL SHOULD BE STOCKPILED SEPARATELY AND RE-SPREAD AS THE TOP LAYER. HOWEVER, IF THE SOIL CONTAINS EXCESSIVE WEED SEED THEN THE TOP 50mm LAYER MAY NEED TO BE BURIED OR OTHERWISE TREATED TO PREVENT THE SPREAD OF WEEDS.
- AS IT IS DESIRABLE TO RETAIN THE VIABLE SEED CONTENT OF THE SOIL, STOCKPILING SHOULD CONSIST OF LONG LOW MOUNDS NO GREATER THAN 1 TO 1.5m IN HEIGHT. STRIPPED TOPSOIL SHOULD BE USED AS SOON AS POSSIBLE (FOR SEED VIABILITY), AND PREFERABLY NOT STOCKPILED FOR MORE THAN 12 MONTHS. LONG-TERM STOCKPILES MAY NEED TO BE MULCHED OR TEMPORARILY VEGETATED TO PREVENT WEED INFESTATION AND LOSS OF MATERIAL.
- SOILS MAY NEED ADJUSTMENT WITH A COMBINATION OF FERTILISERS AND AMELIORANTS TO IMPROVE BOTH THE SHORT AND LONG TERM SUCCESS OF VEGETATION ESTABLISHMENT. FERTILISERS MUST BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES, OR SITE-SPECIFIC SPECIALIST ADVICE.
- PRIOR TO THE APPLICATION OF THE TOPSOIL, LIGHTLY RIP THE FINISHED EARTHWORKS TO A DEPTH OF 50-100mm ENSURING RIPPING OPERATIONS OCCUR ALONG THE CONTOUR.
- SPREAD TOPSOIL TO A LIGHTLY COMPACTED (I. E. FIRM) DEPTH OF ABOUT 40 TO 60mm WHERE THE SLOPE EXCEEDS 6:1(H:V) AND 75 mm ELSEWHERE. WHERE IT IS DESIRABLE TO RE-ESTABLISH THE ENTRAPPED SEED CONTENT OF THE SOIL, THE TOPSOIL SHOULD BE RE-SPREAD IN THE REVERSE SEQUENCE TO ITS REMOVAL SO THAT THE ORIGINAL UPPER 50mm SOIL LAYER IS RETURNED TO THE SURFACE.
- IF EXISTING STRIPPED TOPSOIL LIMITED, IMPORT CLEAN, WEED FREE TOPSOIL AS REQUIRED.
- UTILISING A PAD FOOT ROLLER (NOT VIBRATING) COMPLETE ONE PASS OVER THE TOPSOIL AREA TO INTRODUCE SURFACE ROUGHNESS.

**GRASS SPECIFICATION**

- DRYLAND GRASS SEED MIX:
  - CYNADON DICTYLON (COUCH) 30% BY WEIGHT
  - PASPALUM NOTATUM PENSICOLA 35% BY WEIGHT
  - PASPALUM NOTATUM ARGENTINA 35% BY WEIGHT
- GRASS SEED APPLICATION RATE MINIMUM 300 KG/HA
- CONTRACTOR SHALL RESEED AREAS THAT FAIL TO GERMINATE AND ESTABLISH WITHIN 28 DAYS

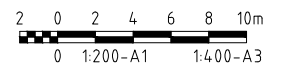
**LANDSCAPE ESTABLISHMENT AND MAINTENANCE**

- CONTRACTOR SHALL ESTABLISH AND MAINTAIN ALL GRASS AND LANDSCAPED AREAS UNTIL THE END OF THE LITCHFIELD COUNCIL MAINTENANCE PERIOD.
- CONTRACTOR SHALL MAINTAIN AND MOW GRASS TO A MAXIMUM HEIGHT OF 70 MM.



**LANDSCAPING DETAIL**

**WARNING**  
BEWARE OF UNDERGROUND SERVICES  
The locations of underground services are approximate only and their exact position should be proven on site  
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Ph. 08 89472476 Fax: 08 89475098

APPROVED	
DRAWN	CHECKED
AC	-
DESIGNED	CHECKED
AC	-

<b>TITLE</b> MIDDLE ARM INDUSTRIAL PRECINCT KITTYHAWK ESTATE - SECTION 1902 H/AYERS ROAD 1 / ROAD 2 INTERSECTION LANDSCAPING PLAN			
SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	18096	18096-C950	A



**Aboriginal Areas  
Protection Authority**

protecting sacred sites across the territory

**Our File: RA2018/59**

**In reply please quote: 201806700**

Land Development Corporation  
GPO BOX 353  
DARWIN NT 0801

**ATTENTION: KASSI PICKEN**

**RE: ISSUE OF AUTHORITY CERTIFICATE FOR MIDDLE ARM DEVELOPMENT  
AREA - 201806700**

I refer to your application for Authority Certificate received on the 7th August 2018 for the above location. Accordingly, under the powers delegated to me under Section 19 of the *Northern Territory Aboriginal Sacred Sites Act 1989* I am pleased to issue the attached Authority Certificate.

Please read carefully the conditions outlined in the Certificate. In particular, you should note that it has been issued for an indefinite period of time, providing that the works covered by the Certificate start within the period stipulated in condition 3.

Please note that during consultations Aboriginal custodians raised concerns about continued access to sites 5072-175, 5072-149 and 5072-150 upon completion of the proposed works. They respectfully request that access to these sites via existing tracks be maintained.

Custodians have also requested that the applicant minimises vegetation disturbance and ground disturbance wherever possible within Restricted Works Areas (RWA) 2 and 3 at Conditions 6 and 7 respectively of the Authority Certificate herein.

Please be advised that archaeological places or objects may exist within the subject land for the attached Certificate. All such materials are protected under the *Northern Territory Heritage Act*. For further information please contact the Director Heritage Branch, Department of Tourism and Culture on (08) 8999 5039 (Darwin office) or (08) 8951 9247 (Alice Springs office) or email [heritage@nt.gov.au](mailto:heritage@nt.gov.au).

You should also note that the Authority has issued you with two identical copies of digitised maps attached. One copy should be retained with your original Certificate. The second is supplied for use by contractors to avoid unnecessary photocopying of a colour coded document.

Please note that the cost of this Authority Certificate will be \$26,579 inclusive of GST and an invoice will be issued to you by the Department of Corporate and Information Services. An application fee of 57 revenue units (\$67) will also apply. The terms and conditions of the invoice will require you to make payment within 30 days of receipt.

**Darwin**  
P: +61 (08) 8999 5511  
F: +61 (08) 8999 4334  
[www.aapant.org.au](http://www.aapant.org.au)  
[enquiries.aapa@nt.gov.au](mailto:enquiries.aapa@nt.gov.au)  
4th Floor, R.C.G Centre,  
47 Mitchell Street DARWIN NT  
GPO Box 1890, Darwin NT 0801

**Alice Springs**  
P: +61 (08) 8999 5511  
F: +61 (08) 8952 2824  
[www.aapant.org.au](http://www.aapant.org.au)  
[enquiries.aapa@nt.gov.au](mailto:enquiries.aapa@nt.gov.au)  
Ground Floor, Belvedere House  
Cnr Bath & Parsons Streets Alice Springs NT  
All mail to Darwin GPO

If you have any further queries regarding this Authority Certificate please email [enquiries.aapa@nt.gov.au](mailto:enquiries.aapa@nt.gov.au) or contact Virginie Branchut on (08) 89994343.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Ben Scambary', written in a cursive style.

DR. BEN SCAMBARY  
Chief Executive Officer

18 April 2019

# ABORIGINAL AREAS PROTECTION AUTHORITY

## AUTHORITY CERTIFICATE

Issued in accordance with Section 22 of the *Northern Territory Aboriginal Sacred Sites Act 1989*.

**REFERENCE:** RA2018/59 (Doc: 201806700) C2019/029

**APPLICANT:** Land Development Corporation  
GPO BOX 353  
DARWIN NT 0801

**SUBJECT LAND:** Sections 1900, 1902, 1897, 1899, Part Section 1905, 1891, 1904, 1905, 1908 and Corridor Sections 1895 & 1896 Hundred of Ayers plus adjacent areas of mangrove and Darwin Harbour waters - Wickham, Northern Territory.  
, as shown on the map which is Annexure 'A' hereto.

**PROPOSED WORK OR USE:** All works associated with commercial/industrial development including development and expansion, including: residential area; community use area; service commercial area; open space area; utility purposes area; earthworks and site works; construction of new buildings, demolition, refurbishment or upgrade of existing buildings; construction of all related infrastructure, power stations, sewerage ponds, bore fields, rubbish dumps, gravel pits, barge landing, aerodrome; reticulation of engineering and telecommunication services; roads, pathways, cycle ways and associated drainage, lighting and signage; all works and uses ancillary to the above works including temporary roads and access, set down areas, workforce accommodation and services; vegetation management including land clearing, tree trimming, planting, streetscapes and landscaping; tree removal; dams /watercourse upgrades, water use and access, drains, reserves; and all works ancillary to the above mentioned works including routine and ongoing maintenance of any infrastructure and or services.

### CONDITIONS:

1. The applicant shall ensure that the conditions of this Certificate are included in any subsequent contract or tender documents for the works or use described herein.
2. The applicant shall ensure any agent, contractor or employee is aware of the conditions of this Certificate and the obligations of all persons (who enter on, or carry out works or use land on which there is a sacred site) under Part IV of the *Northern Territory Aboriginal Sacred Sites Act 1989*.
3. This Certificate shall lapse and be null and void if the works in question or the proposed use is not commenced within 24 months of this Certificate.
4. The applicant shall ensure any agent, contractor or employee is aware of the content of section 40(1) of the *Northern Territory Aboriginal Sacred Sites Act 1989* which provides that this Certificate does not negate the need for consent, approval or permission for the subject works or use of the land which may be required under another statute.

5. Within the area marked Restricted Works Area 1 (RWA1) on Annexure 'A', associated with sacred sites 5072-175, 5072-149 and 5072-150, no person shall enter or no work shall take place or no damage shall occur.

The features of sacred site 5072-175 include: ceremony ground, sandstone outcrops, hill range, springs.

The features of sacred site 5072-149 include: petroglyphs and sandstone outcrops.

The features of sacred site 5072-150 include: petroglyphs and sandstone outcrops.

6. Within the area marked Restricted Works Area 2 (RWA2) on Annexure 'A', associated with sacred sites 5072-175, the only works permitted are works associated with the construction, installation and ongoing maintenance of a water tank storage structure and communications tower. And further, the conduct of such works shall occur in a manner which minimises ground and vegetation disturbance as much as possible.

The features of sacred site 5072-175 include: hill range.

7. Within the area marked Restricted Works Area 3 (RWA3) on Annexure 'A', associated with sacred sites 5072-175, 5072-149 and 5072-150, the only works permitted are works associated with the construction, installation and ongoing maintenance of water overflow pipes and underground valve pit connected to the aforementioned water tank, and of a drain associated with excess local surface water. And further, the conduct of such works shall occur in a manner which minimises ground and vegetation disturbance as much as possible.

The features of sacred site 5072-175 include: ceremony ground, sandstone outcrops, hill range, springs.

The features of sacred site 5072-149 include: petroglyphs and sandstone outcrops.

The features of sacred site 5072-150 include: petroglyphs and sandstone outcrops.

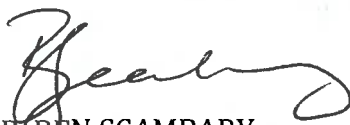
8. Within the area marked Restricted Works Area 4 (RWA4) on Annexure 'A', associated with sacred site 5073-90, no work shall take place or no damage shall occur.

The features of sacred site 5073-90 include: a surface level rock

The COMMON SEAL of the  
ABORIGINAL AREAS PROTECTION AUTHORITY

was hereto affixed on the 18 day

of April 2019

  
DR. BEN SCAMBARY  
Chief Executive Officer







# Middle Arm Development Area - 201806700

ANNEXURE "A" MAP FORMING PART OF

AUTHORITY CERTIFICATE C2019/029

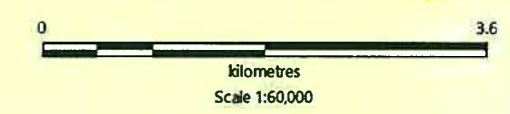
ISSUED TO:  
Land Development Corporation

AUTHORISED COPY: NUMBER... OF 4

CHECKED BY:..... DATE 17/04/2019

B. HEDLAND-THOMAS - LAND INFORMATION OFFICER

J2018-0355



Projection: MGA Zone 52  
Horizontal Datum: GDA94

### KEY

- |                                  |                        |
|----------------------------------|------------------------|
| Subject Land                     | Registered Sacred Site |
| Extent of Recorded Sacred Site   | Recorded Sacred Site   |
| Extent of Registered Sacred Site | Other Site             |
| Restricted Works Area            |                        |

\* The Sacred Site point is not indicative of the specific site location and does not represent the location of any features of the site.



Prepared and produced by Aboriginal Areas Protection Authority (AAPA), Darwin, Northern Territory of Australia 1/2 Northern Territory of Australia

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This map forms part of a Certificate issued by the Authority under section 22 of the Northern Territory Aboriginal Sacred Sites Act 1989. No reliance should be put on the accuracy of the information on the map except as it relates to the land the subject of the Certificate and the fact that sites are not shown in other areas shall not be taken as a definitive indication of the existence or lack of existence of sites.

# Middle Arm Development Area - 201806700

ANNEXURE "A" MAP FORMING PART OF  
AUTHORITY CERTIFICATE C2019/029

ISSUED TO:  
Land Development Corporation  
AUTHORISED COPY: NUMBER 2 OF 4

CHECKED BY: *[Signature]* DATE 17/04/2019  
B. HEDLAND-THOMAS - LAND INFORMATION OFFICER

J2018-0355



Projection: MGA Zone 52  
Horizontal Datum: GD494

## KEY

- |  |                                  |  |                        |
|--|----------------------------------|--|------------------------|
|  | Subject Land                     |  | Registered Sacred Site |
|  | Extent of Recorded Sacred Site   |  | Recorded Sacred Site   |
|  | Extent of Registered Sacred Site |  | Other Site             |
|  | Restricted Works Area            |  |                        |

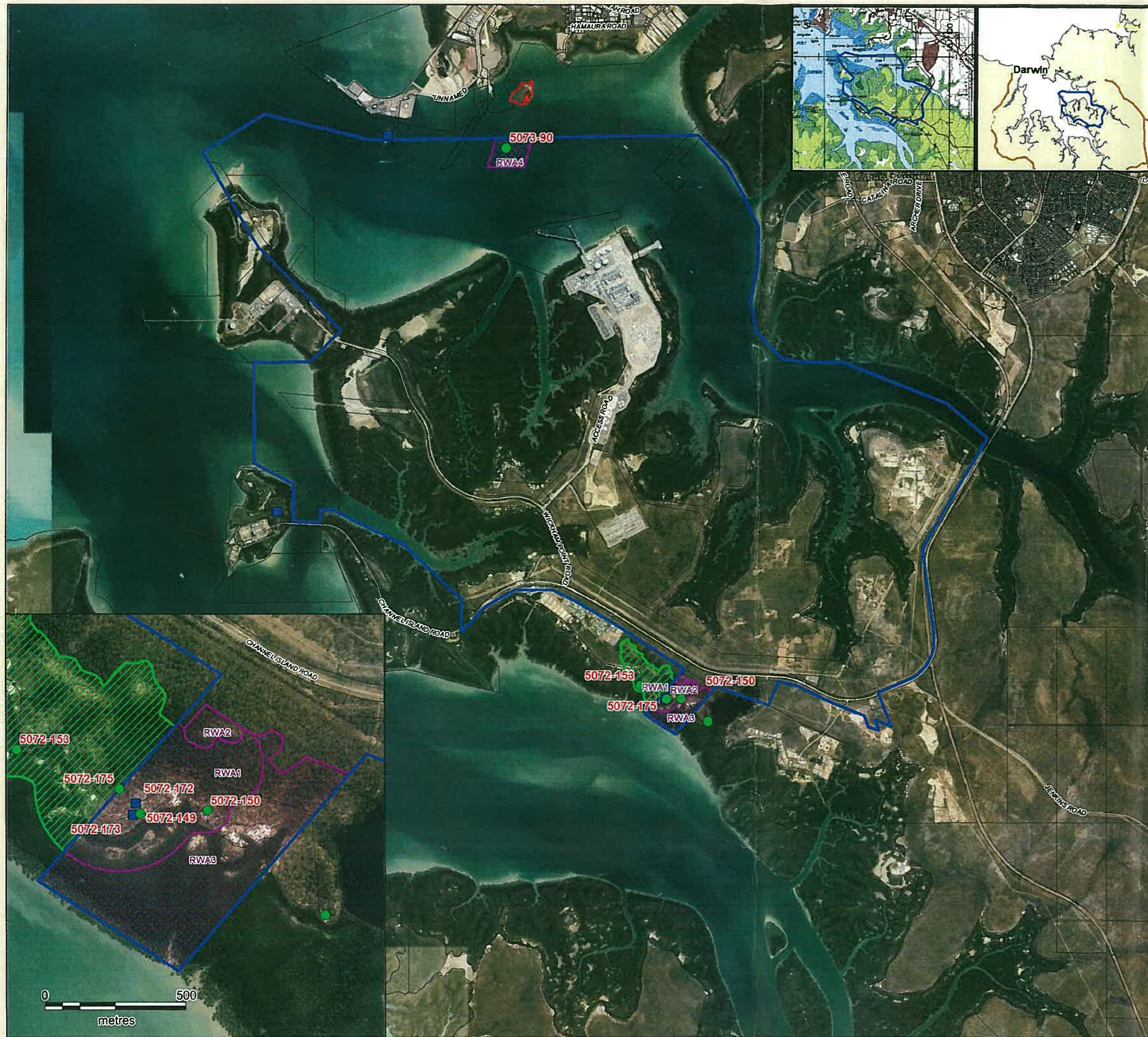
\* The Sacred Site point is not indicative of the specific site location and does not represent the location of any features of the site.



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GPO Box 353  
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**File Ref:** H:\LDC\PRECINCTS\MIDDLE  
ARM\Section 1902 Kittyhawk\Section  
1902\_3\_Stage 1 Detailed  
Design\Deliverables\Outdocs\20190822 [EJA]  
DA LDC comments

Kevin Dodd  
Consultant Planner  
Earl James & Associates  
GPO Box 884  
Darwin NT 0801

Dear Sir,

**Re: Authorisation to Lodge a Development Application**

The Land Development Corporation is the owner of Sec. 1902 and 1905 Hundred of Ayers.

Approval is granted to Earl James & Associates to lodge a development application for the proposed subdivision over Sec. 1902 and 1905 Hundred of Ayers, in accordance with the requirements of the Planning Act.

In providing this authorisation, the Land Development Corporation in no way accepts responsibility for the contents of the application but merely provides authorisation for the application to be lodged and considered by the relevant Consent Authority.

Should you wish to discuss the above matter in further detail please do not hesitate to contact the Project Director Kassi Picken on telephone 8944 0901 or email: [Kassi.Picken@landdevcorp.com.au](mailto:Kassi.Picken@landdevcorp.com.au)

Yours sincerely



**Tony Stubbin**

Chief Executive Officer

22/08/2019