VINCENTIA COASTAL VILLAGE & DISTRICT CENTRE UTILITY SERVICES & INFRASTRUCTURE REPORT

FOR

STOCKLAND DEVELOPMENT

JANUARY 2006

Forbes Rigby Ref 104016-04 Report 001 Rev 6

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LIST OF ABBREVIATIONS

Acronym	Meaning
ADSL	Assymmetric Digital Subscriber Line
ASP	Approved Service Provider (by Integral Energy)
BBLC	Bay and Basin Leisure Centre
CDMA	Code Division Multiple Access
CMUX	Customer Access Multiplexer Unit
DIPNR	Department of Planning and Natural Resources
DCP	Development Control Plan
DSP	Development Servicing Plan
EIS	Environmental Impact Statement
EP	Equivalent Population
ET	Equivalent Tenement
GSM	Global System for Mobile Communications
JREP	Jervis Bay Regional Environmental Plan
Kbps	Kilobytes per second
kV	Kilovolt
LGA	Local Government Area
IE	Integral Energy
ISDN	Integrated Service Digital Network
Mbps	Megabytes per second
MDF	Main Distribution Frame
ML	Mega Litre
MSCL	Mild Steel Concrete Lined
PFM	Planning Focus Meeting
PRV	Pressure Reducing Valve
REF	Review of Environmental Factors
REMS	Reclaimed Water Management Scheme
SCC	Shoalhaven City Council
SCAD	Small Capacity Distribution System
SEE	Statement of Environmental Effects
SLEP	Shoalhaven Local Environment Plan
SPS	Sewer Pumping Station
STP	Sewage Treatment Plant
SW	Shoalhaven Water
TS	Transmission Substation
ZS	Zone Substation
WCC	Wollongong City Council
WwTP	Waste water Treatment Plant

EXECUTIVE SUMMARY

Stockland owns the site of the proposed Jervis Bay District Centre and residential development identified in the Jervis Bay Settlement Strategy and other planning documents. The site is located on the corner of Naval College (Jervis Bay) Road and The Wool Road Vincentia. The proposed subdivision shall be known as the Vincentia Coastal Village & District Centre and presents a unique opportunity to create a masterplanned commercial, civic, leisure and residential community that complements the Bay and Basin area. The development comprises:

- *A staged commercial centre with a total retail floor space of approximately 32,000m^2 including supermarkets, a discount department store, restaurants, specialty shops, and bulky good stores;*
- *A residential subdivision of 604 lots;*
- *Adaptable housing of approximately 136 dwelling units.*

Stockland has engaged Forbes Rigby to investigate the availability of utility services within this locality, establish the limitations of these services, identify the requirements to upgrade these services and propose a viable and logical staging sequence for the proposed development. This investigation was undertaken in consultation with the various utility servicing authorities.

The majority of the site in its natural condition is characterised by native bushlands, sandy soils and minor streams. The north eastern end of the site has been modified by the recent development of the Bay and Basin Leisure Centre, which will be an integral part of the final subdivision development.

Most of the site is not serviced by sewer, water, electricity or telecommunications. This provides an opportunity to implement recent advances in infrastructure, including "trenchless" construction methods, common trenching of services and ADSL data exchange. These recent advances will provide a modern, integrated commercial and residential development which maximises sustainability initiatives.

Sewage from the site will be drained to the Vincentia Wastewater Treatment Plant for tertiary treatment and transfer to Shoalhaven Water's successful Reclaimed Water Management Scheme without adversely affecting sensitive wetlands and the Jervis Bay Marine Park. Town water will be sourced from the Vincentia Reservoir outlet trunk main without impacting on the water supply or pressure to existing customers. Optical fibre at the Naval College Road / Wool Road intersection will be extended to provide the latest technology in telecommunications including broadband internet access. Mobile phone coverage and satellite television reception are available at the site. Natural gas, while not commercially feasible at this time, will continue to be monitored by the gas distributors. In the meantime bottled gas is available in the area and will be available to the proposed subdivision. Electricity from the nearby Huskisson Zone Substation will be provided underground within the site to maximise streetscape aesthetics. The existing high voltage overhead cables are proposed to be relocated on concrete poles or underground to minimise power outages and bushfire risk and provide an opportunity to rehabilitate the powerline route. Shoalhaven Council's waste/recycling collection services for commercial and domestic customers will be extended into the development.

The commercial and residential components of the site can be staged in a logical sequence to meet progressive servicing requirements.

The Vincentia Coastal Village & District Centre represents an opportunity for people to work and live on the New South Wales South Coast. This report has identified that essential services will be available to the site and that there will be no significant impact on the level of service to the existing residents in the Bay and Basin area.

This report forms part of the concept and project approval being sought from Department of Planning under Part 3A of the Environmental Planning & Assessment Act 1979.

1. INTRODUCTION

1.1. GENERAL

Stockland owns the proposed Vincentia Coastal Village and District Centre site located on the corner of Naval College (Jervis Bay) Road & The Wool Road Vincentia. Stockland has commissioned Forbes Rigby to prepare a report regarding the utility services and infrastructure needs of the future development.

This report provides preliminary discussion of the servicing requirements for the proposal by Stockland to develop the subject site for residential subdivision of 604 lots and a staged district village centre comprising approximately 32,000m^2 of commercial/retail floor space, and approximately 136 adaptable housing dwellings. This study examines the proposal prepared by Stockland and Annand Alcock together with data from other project consultants including:

- BN Architects;
- Clouston Associates Landscape Architects;
- Bushfire and Environmental Services, Bushfire Consultants;
- Environmental Resources Management Ecologists;
- GHD Ecologists;
- Mary Dallas and Associates, Heritage Consultants;
- Network Geotechnics, Geotechnical Engineers;
- Cundall, Sustainability Consultants;
- Elton Consulting, Consultation & Facilitation Experts;
- Masson Wilson Twiney, Traffic Engineers;
- Richard Heggie Associates, Acoustic Consultants;
- Forbes Rigby, Water Sensitive Urban Design Consultants;
- Environmental Resources Management Statutory Planners;
- Don Fox Planning Section 94 Planners;
- Environmental Resources Management, Hydrological Consultants; and
- Allen Price & Associates, Surveyors;
- Economic Planning Advocacy, Section 64 DSP Consultants.

The study also looks beyond the boundaries of the subject site to identify critical servicing relationships with adjoining development.

In keeping with the Stockland vision for the subject site, the underlying principles of this study are to:

- Establish the servicing constraints and opportunities facing development within the subject site;
- Establish the servicing needs of the future development on a staged basis and provide an indicative servicing plan with necessary infrastructure to meet this demand; and
- Consider the needs of surrounding residents and minimise impacts on existing levels of service.

1.2. SCOPE

Stockland has engaged Forbes Rigby Pty Ltd to investigate the availability of services within this locality, with the intent to:

- Establish the location of existing services within the area;
- Identify the limitations of existing services within the area;
- Estimate expected servicing and infrastructure demands;
- Establish the need for relocation and integration of existing services within the site;
- Identify where developable areas are affected by service easements;
- Make any proposed residential development as free as possible from easement restrictions;
- Establish the requirements to upgrade services to meet the expected demands;
- Liaise with service authorities for servicing requirements and amplifications external to the site;
- Provide future residents with access to the latest communication and lifestyle services;
- Prepare a services infrastructure master plan indicating how utility services (water, sewer, electricity, telecommunications and waste removal etc) will be made available for the future development of the site;
- Devise an appropriate staging plan for development of the site in consultation with service providers and Stockland; and
- Prepare a report on the provision of utility services for the application to Department of Planning for concept approval and project approval under Part 3A of the Environmental Planning and Assessment Act 1979 (as amended).

1.3. SITE IN CONTEXT

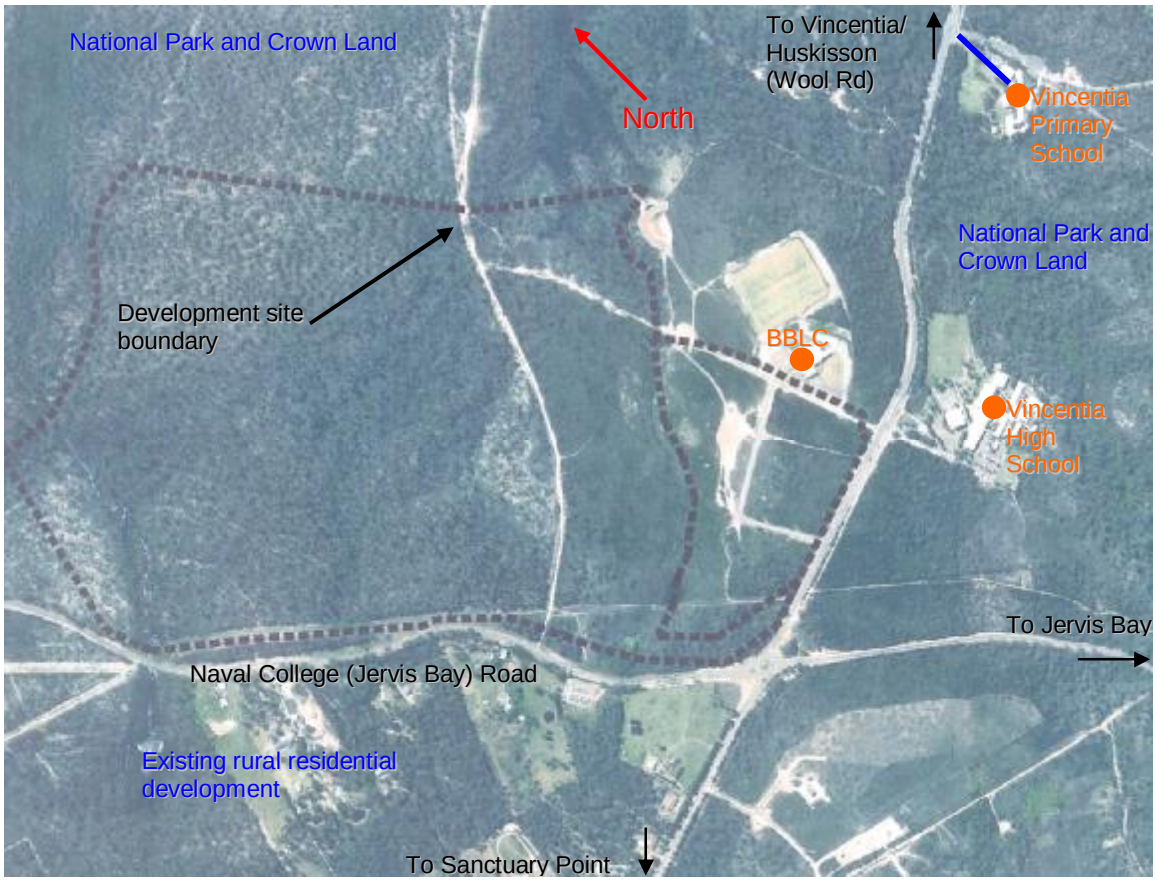
The subject site is located on the northern corner of the intersection of Naval College (Jervis Bay) Road and the Wool Road at Vincentia. The site, as shown in **Figure 1**, is bounded to the:

- South-east by the Wool Road and park/woodland;
- South-west by Naval College (Jervis Bay) Road and existing rural residential development;
- North-west by National Park and Crown land;
- North-east by National Park and the existing Council-operated Bay and Basin Leisure Centre (BBLC).

The topography of the site is dominated by two north east trending ridge lines dissected by three ephemeral natural watercourses flowing north to north-east to adjacent wetlands within the National Park. Vegetation over the site varies from heath land and closed shrub land to woodland and open forest. Grades over the site vary from 1% to approximately 20% from a reduced level of 1m AHD in the east to 24m AHD along Naval College (Jervis Bay) Road.

Copies of the deposited plan/s for the area are included as **Appendix A** of this report.

Figure 1 – The Development Site in Context of Surrounds



1.4. METHODOLOGY

Prior the commencing the Study, a 6 stage methodology was developed:

- **Stage 1** - Identify all infrastructure and servicing needs based on the proposed development.
- **Stage 2** - Liaise with relevant service providers to ascertain the following:
    - Location of existing services and those within the immediate vicinity of the subject site.
    - Identification of any planned upgrades to existing services or facilities, including any new capital outlays.
    - Investigate existing capacity of services.
    - Understand servicing relationships between the subject site and adjoining development.
    - Investigate potential for relocation of services on the site.
- **Stage 3** – Prepare concept designs of utility services required for the development.
- **Stage 4** – Prepare a staging plan on the basis of servicing, infrastructure and commercial requirements.
- **Stage 5** – Consider statutory approval processes and document the approval steps required from service authorities.
- **Stage 6** – Consider sustainability initiatives and targets and optimise sustainability outcomes from a servicing perspective.

1.5. LIMITATIONS

a) This assessment is based on the gathering of information from service providers (i.e. readily available) and preliminary concept designs. Assumptions, preliminary sizing and infrastructure locations will need to be confirmed during the detailed design process.

b) In terms of this report, utility services and infrastructure are defined as:

- *Utilities services*: water, sewer, electricity, gas, telecommunications and Council refuse services; and
- *Infrastructure:* the physical structures associated with utility services.

2. BACKGROUND TO DEVELOPMENT

The planning history of the site has been documented in detail in other consultant reports as part of the application. Particular issues relating to servicing and infrastructure are identified below.

Council commenced the process of rezoning the subject site in the late 1980's. A Draft Local Environmental Plan (DLEP) for residential and commercial development was deferred by the State Government until completion of the Jervis Bay Regional Environmental Plan (JREP) No.1. The DLEP was finally gazetted in 1999 which enacted the current zones.

In 2001 Council placed the draft Jervis Bay Settlement Strategy on exhibition. The Minister for Infrastructure, Planning and Natural Resources released a final version of the Settlement Strategy in October 2003. The implications of the draft Settlement Strategy for the subject site include:

- Up to 850 new dwellings within the residential portion of the subject site;
- Identifying the need for a district centre on the subject site;
- Identifying the subject site for urban expansion within an expanse of Crown Land and National Park;
- Identifying that further urban expansion in Vincentia (other than the subject site) is constrained by the National Park;
- Identifying key environmental heads of consideration to be addressed in detailed studies of the subject site, including:

    - Threatened species (Eastern Bristlebird and Jervis Bay Leek Orchid); and
    - Natural hazards including flooding and acid sulfate soils.

- Recommending the integration of residential development within the commercial zone.

The Settlement Strategy also makes the following comments and predictions concerning service provision:

- Council has a general principle of not allowing residential expansion without the provision of reticulated sewerage. In this regard there is sufficient capacity in the Shoalhaven Water Reclaimed Water Management Scheme (REMS) to accommodate reasonable population growth into the future in the areas identified for growth under the Strategy Principles Plan (which includes the subject site as proposed urban expansion); and

- As the population of the region expands, strategies will be developed to ensure that water needs of residents are met. Council will continue to make the community aware of the need to conserve water, and to improve water management strategies.

3. CONSULTATION

Consultation has occurred through 3 separate mechanisms, being:

- The Planning Focus Meeting process – through the Department of Infrastructure, Planning and Natural Resources (DIPNR);
- Community Information and Feedback Sessions; and
- Forbes Rigby investigations with service authorities.

3.1. PLANNING FOCUS MEETING

Stockland has undertaken significant consultation with the community and public authorities during the application process for the subject site. A planning focus meeting (PFM No.1) regarding the proposal was conducted by the Department of Infrastructure, Planning and Natural Resources (DIPNR), together with other relevant authorities and servicing agencies.

In terms of servicing, the following comments were made by Integral Energy at PFM No.1.

- Integral Energy is the electrical supply authority for the Shoalhaven City Council Region and Integral Energy considers that the impact of these proposed urban residential and commercial developments is significant.

- The additional power requirements associated with the project will need to be assessed prior to application lodgement to ensure that sufficient capacity is available to accommodate this new load.

- A clear understanding of the total electrical load and the timing of any staged developments is essential to any planning for the energy requirements and identifying possible infrastructure works that may need to be included in future works programs.

- The Huskisson Zone Substation is situated adjacent to this development site. The annually increasing electrical load demand from this Zone Substation needs to be considered in terms of meeting the overall supply requirements for the present and future as the area population grows and energy use patterns change.

- Integral Energy will need to prepare an assessment of the capacity of existing systems and the need for any upgrade or supplement of existing systems.

A second Planning Focus Meeting was held to discuss the preferred development layout. A draft of this Utility Services and Infrastructure report was provided to the service authorities and government stakeholders as part of the PFM assessment process. Comments were received from Shoalhaven Water and have been addressed in this final report. Agility Gas Networks responded to the Planning Focus Meeting by advising that reticulated natural gas supplied from the Eastern Gas Pipeline was not commercially viable at this time. Other utility service authorities declined to respond, suggesting that the consultation throughout the preparation of the report had been successful in addressing the servicing issues.

3.2. COMMUNITY INFORMATION & FEEDBACK SESSIONS

Stockland has undertaken 3 Community Information & Feedback Sessions through consultation facilitators Elton Consulting. Community issues have been documented and reported as part of the consultation process. The issues raised by the community have been considered in the preparation of this report.

3.3. FORBES RIGBY INVESTIGATIONS

Forbes Rigby has consulted service authorities during the preparation of this report. Each of the service authorities listed below have been very helpful in providing relevant information on infrastructure for the proposed development.

- **Shoalhaven City Council:** Provided information on the waste and recycling service arrangements for the area, through council's telephone information services.

- **Shoalhaven Water:** (Mr John Gould, Mr Bill Tomkinson, Mr Ljupco Lazarevski, Mr Matt Philpott) Through written correspondence, telephone calls and meetings, Shoalhaven Water provided information on the existing sewer and water services of the area and statutory Section 64 DSP charges. Furthermore, Shoalhaven Water gave a preliminary indication of how the proposed development will be expected to connect into these existing services.

- **Telstra:** (Mr Barry Lewis) Met with Forbes Rigby and established the preliminary telecommunications requirement for the proposed development.

- **Agility:** (Ms Eliana Peters and Mr Graham Fox): Met with Forbes Rigby and advised of their requirements to service the site with natural gas. Agility provided information regarding minium gas usage requirements to make a secondary connection into the eastern gas pipeline, including the possibility of usage by existing developments within the area.

- **Integral Energy:** (Mr Paul Hardman): Liaised with Forbes Rigby to establish the overall site requirements. Integral Energy provided an indication of their network requirements to support the proposed subdivision.

Forbes Rigby would like to thank each of the services authorities for their input to the preparation of this report.

4. PROPOSED DEVELOPMENT

The proposed Vincentia Coastal Village & District Centre shall comprise approximately:

- 604 lots in the residential portion of the subject site, with a mix of lot sizes and frontages
- 136 medium density lots and apartments
- 32,000m^2 commercial, retail and civic floor space (excluding existing Bay and Basin Leisure Centre)
- 60 hectares of parks, open space and environmental zones.

A master plan for development of the subject site is attached as **Appendix D**.

It is proposed that the Vincentia Coastal Village & District Centre be provided with all essential residential development services. These services will be provided through links to existing service infrastructure and will not impact on supply to existing residential developments within the area.

We note that while absolute lot numbers have been identified above, the servicing strategy described in this report is sufficiently robust to accommodate changes to the gross floor areas, lot yields and lot densities. We suggest that the servicing strategy be reviewed if the floor areas or total lot yields increase by greater than 10% over the figures adopted for this study.

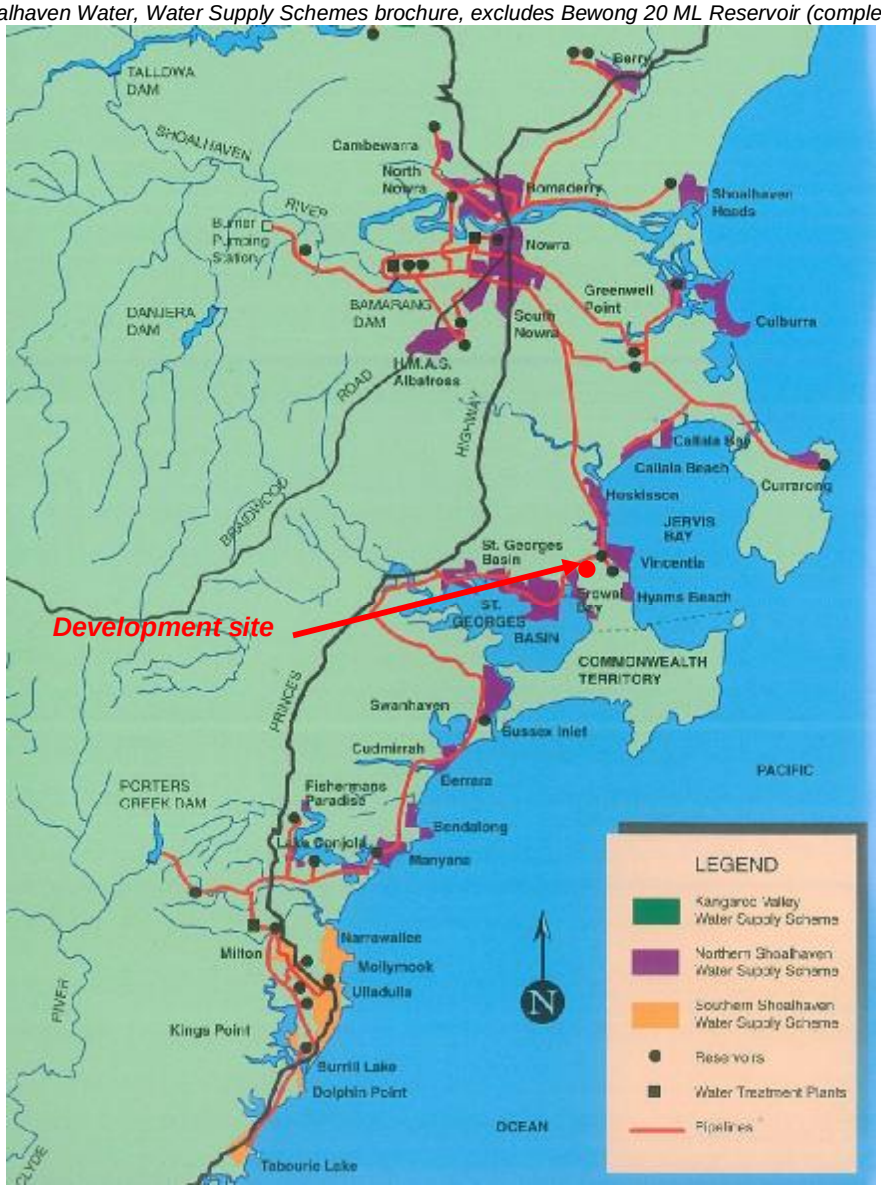
5. EXISTING SERVICES

Each utility service on and around the subject site is discussed in the following sections. A diagram of all existing services is presented in **Appendix E**. However, where it is considered relevant, figures illustrating specific services are presented within the following sections.

5.1. WATER

Water infrastructure is managed by Shoalhaven Water, as shown in **Figure 2**. The Vincentia water supply network forms part of the Northern Shoalhaven Water Supply System. Potable water for the Northern Shoalhaven Water Supply System is sourced from the Shoalhaven River & pumped to the Burrier Reservoir. Water is treated at the Bamerang Water Treatment Plant before being gravity fed to the Vincentia reservoir on high ground near the golf course at Vincentia. The trunk main from the Vincentia reservoir serves the village of St Georges Basin before reaching the Sussex Inlet Reservoir.

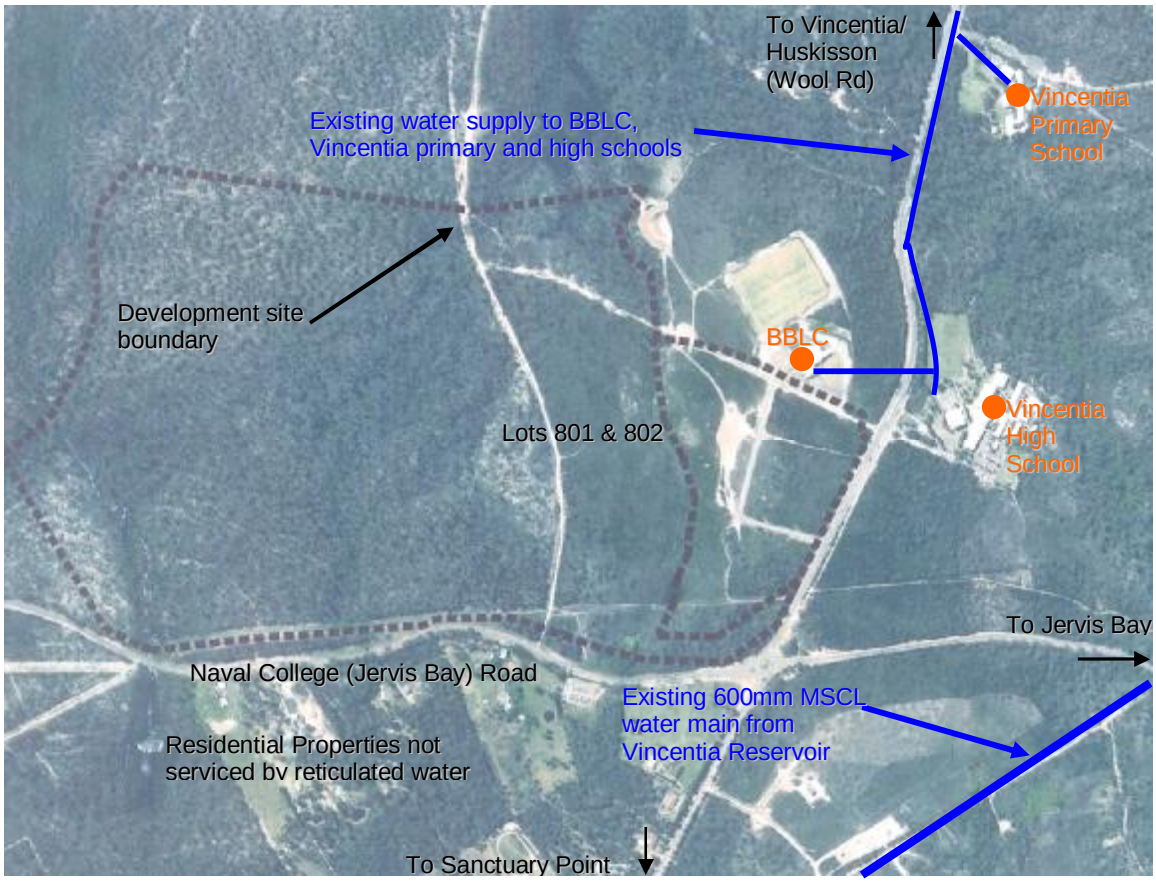
Figure 2 – Shoalhaven water supply details,
from Shoalhaven Water, Water Supply Schemes brochure, excludes Bewong 20 ML Reservoir (completed 2003)



As shown in **Figure 3**, an existing water reticulation main is located within The Wool Road reserve to serve the Vincentia High School (opposite the subject site) and the existing Bay and Basin Leisure Centre. Shoalhaven Water has advised that there is insufficient surplus capacity in this main to serve any of the proposed development on Lot 801 and 802. The existing rural residential properties on the opposite side of Naval College (Jervis Bay) Road are not serviced by town water and rely on rainwater tanks.

Shoalhaven Water customers in the Vincentia area have previously complained of insufficient mains pressure, particularly during peak demand holiday times. A local resident reaffirmed this issue at the first Community Consultation & Information Feedback Session held on Saturday 20 September 2003 at the Vincentia High School. Shoalhaven Water has advised that this problem was recently rectified through the construction of the 20 megalitre (ML) Bewong Reservoir in 2003.

Figure 3 – Existing Water Services Near the Development Site

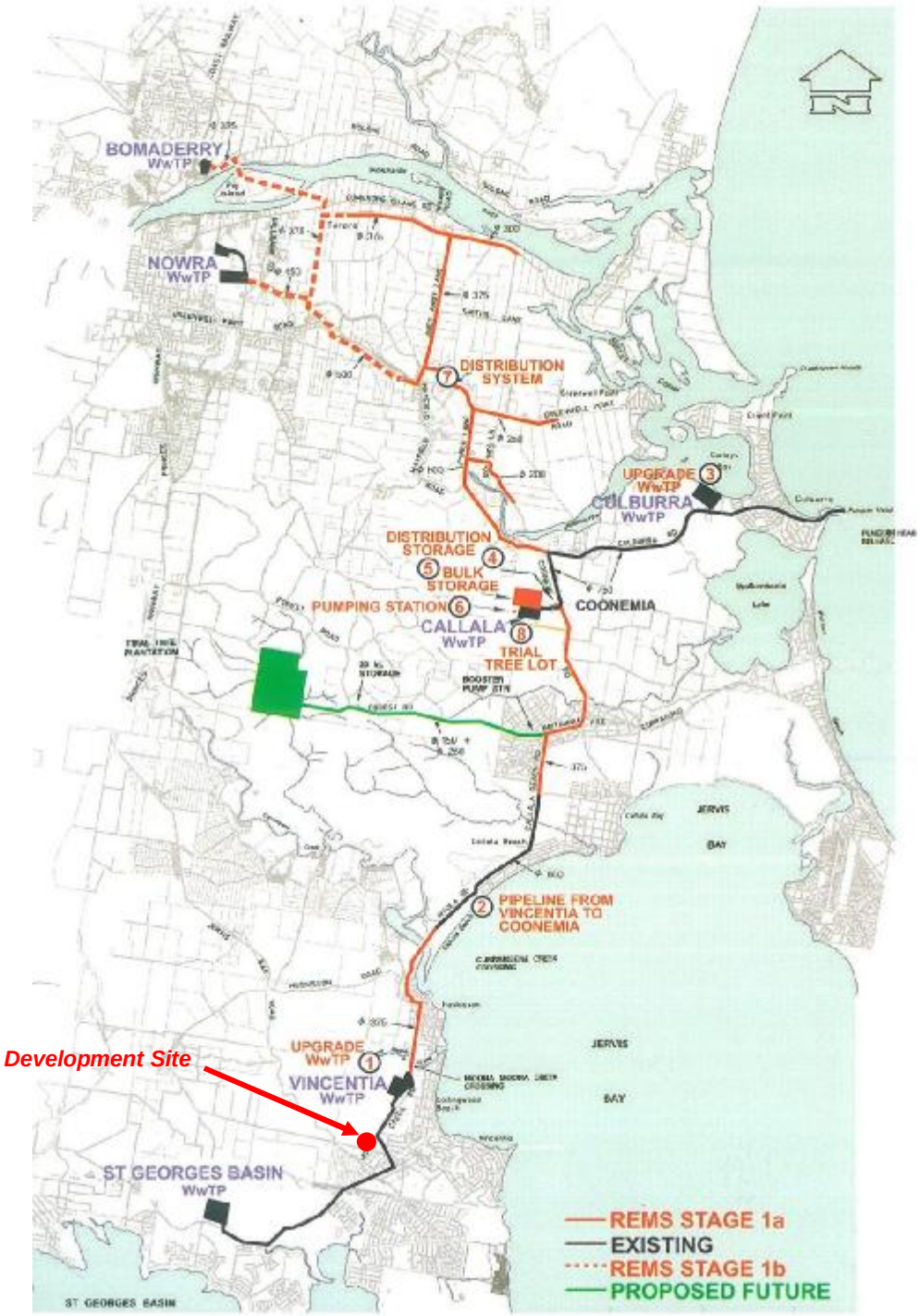


5.2. SEWER

The sewerage system in the Vincentia area forms part of the Northern Shoalhaven Reclaimed Water Management Scheme (REMS). This scheme involves the collection and transportation of treated sewage from six waste water treatment plants for spray irrigation over 750 hectares of dairy farms, golf courses and recreation fields. Shoalhaven Water describes the scheme as “one of the largest and most complex water-recycling schemes undertaken by an Australian water authority”.

The Vincentia Wastewater Treatment Plant (WwTP) is located approximately 2km northeast of the site along the Moona Creek Road (track). This WwTP filters & chlorinates effluent from the Vincentia area to a tertiary treatment level. **Figure 4** Illustrates the overall Shoalhaven Water Reclaimed Water Management Scheme.

Figure 4 – Shoalhaven Reclaimed Water Management Scheme,
from Shoalhaven Water, REMS publication



REMS Stage 1a comprises the following components:

1. An upgrade of Vincentia WwTP to provide tertiary filtration, chlorination & a pumping station for both Vincentia & St, Georges Basin reclaimed water.
2. A 15 km, 375mm & pipeline from Vincentia to the bulk storage at Coonemia.
3. An upgrade of Culburra WwTP to include filters, chlorination & a reclaimed water pumping station.
4. A 4 ML concrete distribution storage at Coonemia.
5. A 600 ML earth fill bulk storage at Coonemia.
6. A pumping station & chlorinator at the bulk storage with provision for future treatment facilities (if necessary) to deliver water to the distribution storage at Coonemia.
7. A distribution system comprising 19km of pipelines varying from 600mm & to 200mm & from Coonemia to properties on the Nowra flood plain.
8. Trial tree lot of 2 hectares to be established at Coonemia.

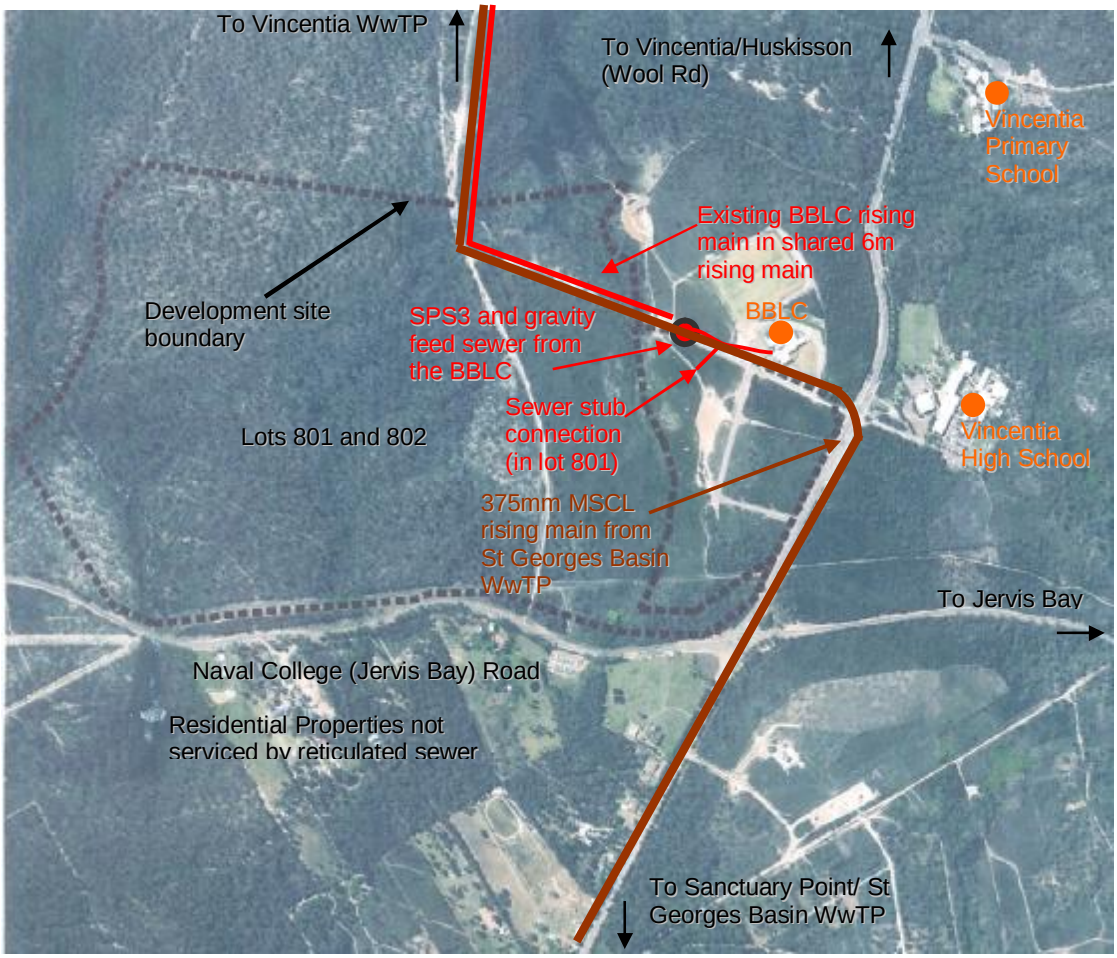
An existing pump station SPS 3 (also known as PS 17) is located in the northern corner of the Bay and Basin Leisure Centre (BBLC) site. SPS 3 is gravity fed from the BBLC and was designed by Shoalhaven Water to accommodate future development within the catchment of lot 801 (i.e. within Vincentia Coastal Village and District Centre site). A stub connection point has been constructed from the gravity main towards lot 801 for this future connection.

A 125/225mm diameter rising main passes from SPS3, through the National Park to the Vincentia WwTP. A Special Section 64 Contribution Report was created to recoup construction costs for the pump station and rising main from future benefiting developments. The Special Section 64 report has been superseded by the new Development Servicing Plan adopted by Shoalhaven Council on 2 November 2005 (refer section 7.3).

The rural residential properties opposite the site on Naval College (Jervis Bay) Road are not connected to the reticulated sewerage system and rely on on-site effluent management.

A 375mm diameter sewage transfer main from the St Georges Basin WwTP passes along the northern boundary of the site feeding through to the Vincentia WwTP. This 375mm transfer main shares a 6m wide easement with the rising main from SPS 3. **Figure 5** illustrates the existing sewer services near the development site.

Figure 5 – Existing Sewer Services Near the Development Site



5.3. WASTE REMOVAL/RECYCLING

Shoalhaven City Council contracts regular waste and recycling services to the Vincentia area through SITA Environmental Services, located in South Nowra.

Residential Waste

Residential waste is collected on a weekly basis in a variety of kerb side 'red lid' bins. Recyclable material is also collected in kerbside 'yellow lid' bins on a fortnightly basis. Both waste and recyclable material are transported to one of ten waste and recycling depots within the Shoalhaven area. The nearest depot to the development site is located to the north in Huskisson Road.

Recyclable material such as paper, plastics, glass, steel and aluminium cans are transported from each of the 10 depots to the Material Recovery Facility (MRF) in Bomaderry. These materials are then separated and forwarded to reprocessing facilities within Australia.

Shoalhaven City Council also provides two larger waste services to cater for items that will not fit in the kerb side bins. These services are:

- *Green waste collection* – available on request for a fee of $5.00 and includes the disposal of general garden materials such as grass clippings, prunings and weeds
- *Bulky waste collection* – available on request for a fee of $10.00 and includes items such as white goods and furniture.

Commercial Waste

The existing residential waste services (as described above) are available for commercial premises within the Shoalhaven area. However, commercial premises are permitted to use other contracted waste and recycling services to accommodate their individual needs.

5.4. GAS SERVICES

Natural Gas

The Eastern Gas Pipeline along the NSW coast is approximately 20km west of Vincentia and operates at approximately 15MPa. Natural gas services have not yet been extended from this pipeline to Vincentia. There were no firm proposals to construct a lead in gas main from the Eastern Gas Pipeline before this site was discussed with gas distributors.

Reticulated gas supply infrastructure has not been constructed in the Huskisson/Vincentia area. The nearest natural gas reticulation service is in Nowra, approximately 30km north of the development site, and operates at maximum pressure 210kPa. Nowra is provided with natural gas through a local reticulation network branched from the Eastern Gas Pipeline. Agility maintains the natural gas network in Nowra and has noted that only some 25% of the township is connected to this service. However, as new subdivisions are constructed in and around Nowra, most houses are built with natural gas services connected (ie. up to 95% of new homes). This is slowly raising the overall percentage of people utilising the natural gas service in Nowra.

Bottled LPG Services

Bottled LPG services are provided to Vincentia from a number of private companies operating from Nowra. **Table 5.1** lists these companies and their respective services to Vincentia.

Table 5.1 – Existing bottled gas services supplied to Vincentia

Local Supplier	Parent Distributor	Service Provided	Interval
Kleenheat Gas	Kleenheat Gas	Residential 45 kg cylinders & Commercial [a]	3 times a week during winter, 2 times a week during summer
Shoalhaven Gas	Origin Energy	Residential 45 kg cylinders only	2 times a week
Elgas	Elgas and BOC	Residential 45 kg cylinders & Commercial [a]	Once a week
Linde Gas	Linde Gas	Residential 45 kg cylinders only	As needed basis

[a] Commercial gas services are either the delivery of 45kg bottles or delivery of gas to on site gas storage facilities from a tanker

5.5. ELECTRICITY

Power Distribution within NSW

Power generated within NSW is distributed in high voltage powerlines between 132kV and 500kV. One controlling body, Transgrid, operates this power distribution network and distributes power to lower voltage network operators within NSW. Four separate groups transmit and reticulate power at 132kV or lower throughout NSW, these groups being:

- Integral Energy Australia (Integral Energy);
- Country Wide Energy;
- Energy Australia; and
- Australian Inland Energy.

The NSW South Coast area (including the Vincentia area) is under the control of Integral Energy.

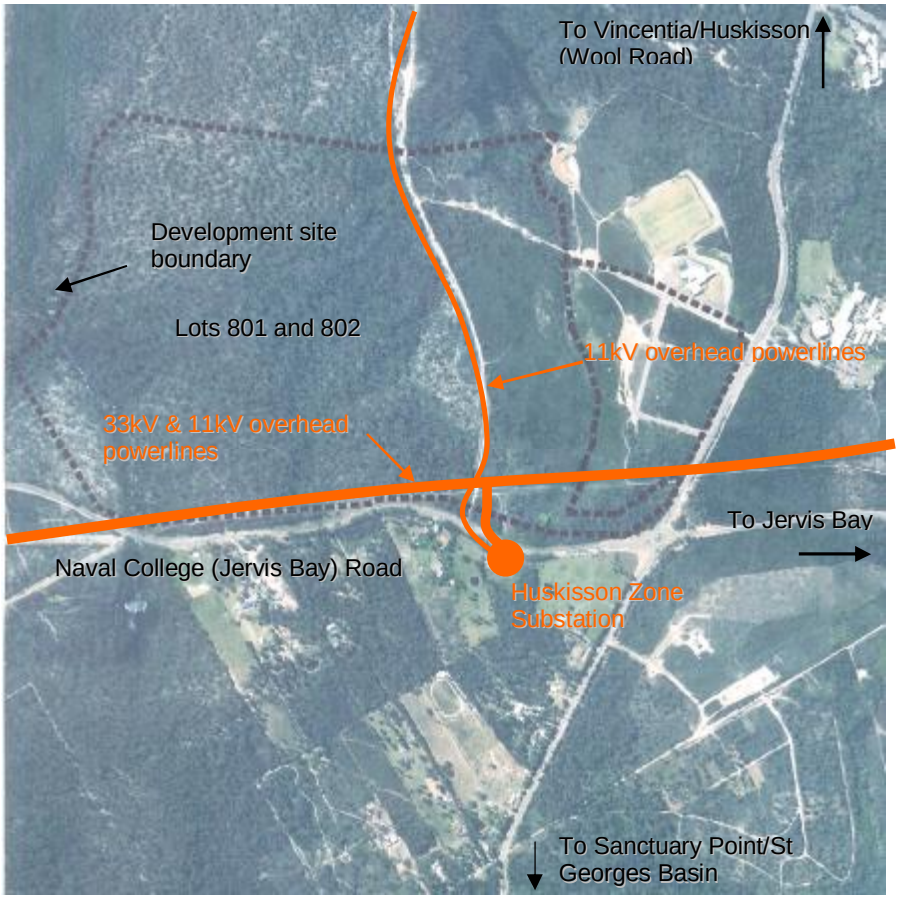
Power Reticulation within the Vincentia area

The Huskisson zone substation is located on the southern side of Naval College (Jervis Bay) Road opposite Lot 802. This substation is supplied with electrical power from the Shoalhaven transmission substation and distributes power to Huskisson and the surrounding areas (including Vincentia).

A number of 33kV & 11kV high voltage electricity power lines traverse the development site parallel to Naval College (Jervis Bay) Road & along Moona Creek Road. The power lines parallel to Naval College (Jervis Bay) Road are 33kV & 11kV. The power lines along Moona Creek Road (11kV) appear to be located in public road reserve and will need to be accommodated in the Moona Creek Road realignment or relocated as part of the development. Integral Energy will likely require that easements be created as part of any development of Lots 801 and 802. Integral Energy has advised that the likely easement width is 9.0 metres either side of the overhead cables.

An illustration of these overhead powerlines on the development site is shown in **Figure 6**.

Figure 6 – Existing overhead powerlines



5.6. TELECOMMUNICATIONS

An existing telecommunication network is provided within public roads around the subject site for neighbouring developments including the nearby Vincentia High School and Bay and Basin Leisure Centre.

The existing optical fibre network characteristics are as follows:

From Sanctuary Point

36 fibre optic cables extend from the Sanctuary Point telephone exchange along Wool Road to a junction at the intersection of Naval College and Wool Roads. This is the major network supply line to the area. At this intersection the network is distributed as follows:

- 12 fibre optic cables are routed through to the Vincentia High School; and
- 36 fibre optic cables continue along Naval College (Jervis Bay) Road to the Jervis Bay telephone exchange.

From Huskisson

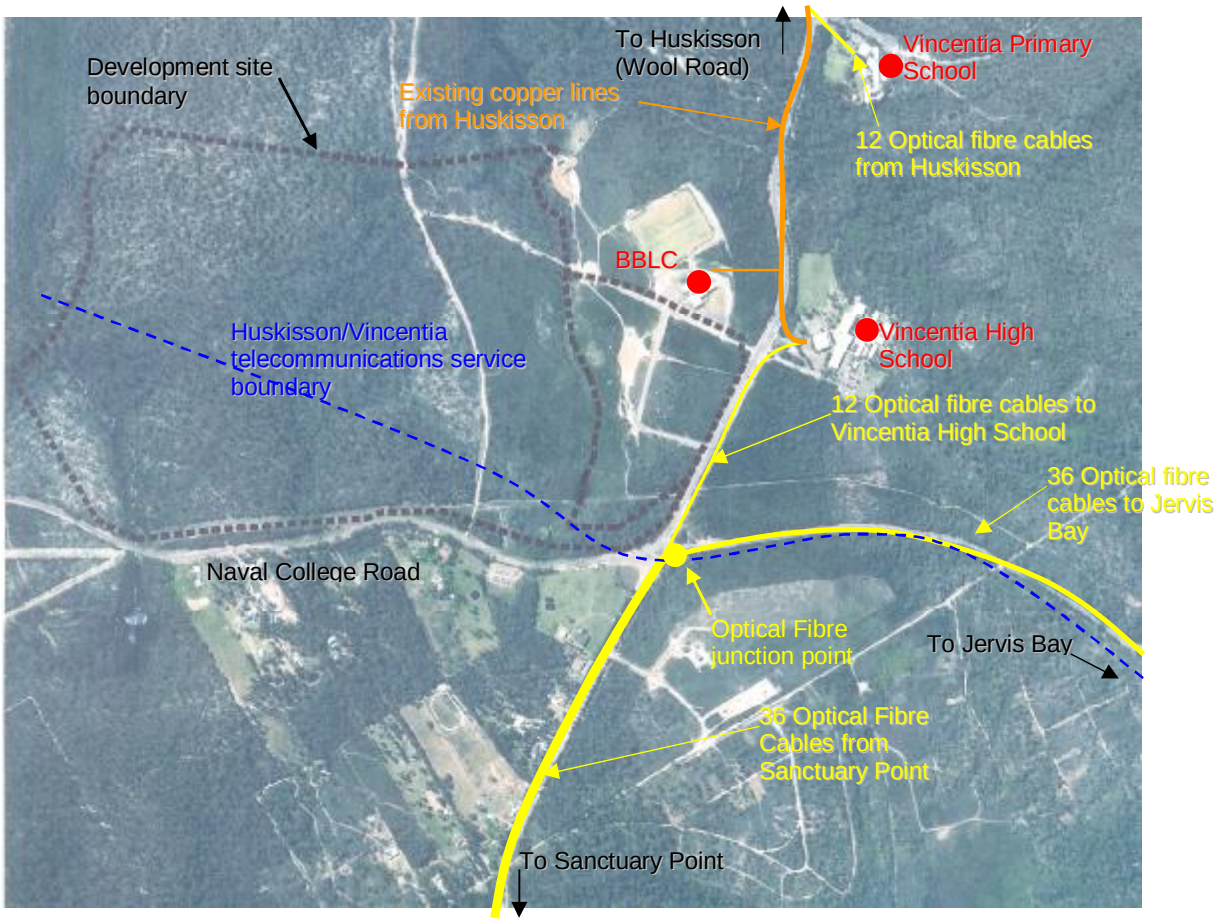
Limited services extend from the nearby Huskisson telephone exchange to the development site. Services from this exchange terminate in the following locations:

- At the Vincentia High School (in copper phone line pairs);
- At the Bay and Basin Leisure Centre (in copper phone line pairs); and
- At the Vincentia Primary School (12 optical fibre cables).

The service boundary between Huskisson and Vincentia telephone exchanges also runs through this area and directly through the development site (though we note that there are no physical services associated with the service boundary that affect the site).

Figure 7 indicates the termination points of telecommunications services within the vicinity of the site and **Appendix E** illustrates optical fibre lines within the vicinity of the development site in the context of other existing services of the area.

Figure 7 – Existing Telstra services within the area



5.7. MOBILE PHONE NETWORK

Telstra and Optus currently provide mobile GSM and CDMA network coverage in the Vincentia area. A colour network coverage map for each provider is attached as **Appendix C.**

5.8. CABLE/SATELLITE TV

Austar currently provides satellite television services to the Vincentia area. Cable television is not currently available in this area.

6. EXISTING SERVICES - POTENTIAL FOR RELOCATION

The relocation of several services would benefit the proposed development. Each of these services are discussed below and illustrated in the Proposed External Services Layout and Relocations Plan (**Appendix F**).

6.1. OVERHEAD POWERLINES

As discussed in **Section 5.5** several 33kV and 11kV overhead powerlines traverse the site. Re-routing these cables to a more appropriate location on concrete poles or underground would generate the following benefits for the area:

- Reduction in potential for bushfire ignition during storm events;
- Reduction in potential for electrical outage during storms or bushfire;
- Improved aesthetics of the residential and commercial development;
- Allow construction of the commercial development over land currently affected by the cables; and
- A reduction in required electrical easement width or removal of requirement for an easement (if relocated to a public road).

Relocation of these electricity assets underground is considered to be “contestable works” by Integral Energy and can therefore be done by the developer with the approval from Integral through an Integral accredited organisation. Integral Energy has advised that both relocation options (on concrete poles or underground) are acceptable technical solutions.

Stockland has considered the merits of relocating the existing high voltage overhead power lines parallel to Naval College (Jervis Bay) Road. Stockland requested that Integral Energy contribute to the funding of the relocation (together with the relocation of cables on Moona Creek Road) in the letter from Forbes Rigby to Integral’s Mr Ty Christopher dated 16 December 2005. Funding would be on the basis of benefit to Integral derived from the relocation. Stockland intends to proceed with this relocation, subject to confirmation of preliminary design and a suitable funding arrangement. Stockland has also considered the merits of relocating the 11kV overhead power lines underground along Moona Creek Road and intends to further consider the aesthetic, funding and marketing impact of the powerlines as part of the detailed design phase of the project. The relocation and potential relocation of these powerlines forms part of this application for development.

6.2. SEWER PRESSURE MAINS

The existing 125mm diameter sewer rising main from SPS 3 to the Vincentia WwTP and the 375mm diameter effluent transfer main pass through proposed housing lots within the residential subdivision. The relocation of these sewer pressure mains will provide the following benefits:

- Allows residential dwelling construction without affectation by easements;
- Allows permanent maintenance access to the mains; and

Stockland has considered the merit of relocating these pressure mains into proposed roadway reserves and intends to relocate the pressure mains subject to Shoalhaven Water design approval. Shoalhaven Water has indicated a preference for the relocated main to be laid in the footpath reserve on the opposite side of the road to the proposed lots. Shoalhaven

Water has further advised that their Operations Section will need to be involved during the design stage.

The existing treated sewer effluent main through Village East will need to be accommodated in the future road design to ensure adequate cover is maintained. Works as executed plans of the main have not been available from Shoalhaven Water and sewer main potholing may be required during the investigation for the detailed design.

7. PROPOSED SERVICES

7.1. WATER

Lead in water main

The development will require a water main extension from an existing 600mm diameter mild steel cement lined trunk main running in an east-west direction, south of the site. The 300mm diameter lead in water main extension (as shown in **Appendix F**) will connect to the existing 600mm diameter main where it crosses Naval College Road. The lead in main has been preliminarily sized as 300mm diameter based on historical concept designs by Shoalhaven Water and indicative sizing criteria reducing to a 250mm diameter main northwest of The Wool Road roundabout. A second lead-in main will be required along the Wool Road to serve the Village East Precinct and has been preliminarily sized as a 200mm diameter main. The capacity and size of the mains will need to be investigated during the detailed design phase and may be affected by a new pressure reducing valve (PRV) located immediately upstream of the proposed connection point.

The 300 and 250mm diameter lead in mains will be funded by Shoalhaven Water under the new Development Servicing Plan adopted by Shoalhaven Council on 2 November 2005. The 200mm diameter lead in water main was not included in the Development Servicing Plan, and would therefore be funded by Stockland. We believe this to be inequitable and suggest that the 200mm diameter lead in main along The Wool Road to Village East be included in the DSP and funded by Shoalhaven Water. We propose to further discuss this issue with Shoalhaven Water during the project approval phase for Village East.

We understand that Shoalhaven Water wishes to modify our proposed water strategy by adding a link main between Village East and Stage 4 and by adding an interconnection main with stop valve between the proposed 150mm diameter watermain for Village East development and the existing 150mm diameter PVC watermain located on the southern side of The Wool Road. We believe these additional mains are in excess of the reticulation mains required for the development and therefore should not be funded by the developer. If these additional mains are required by Shoalhaven Water to provide redundancy in the water system, we propose that the mains be funded by Shoalhaven Water.

Shoalhaven Water advised that it will not be compulsory for rural properties on the south western side of Naval College (Jervis Bay) Road to connect to the proposed watermain. These properties will continue to operate under the Shoalhaven Council's Rural Water Supply Policy.

Internal water distribution network

The masterplanned residential and commercial layout lends itself to an efficient internal water distribution network with good connectivity and relatively minor hydraulic losses. Water mains are to be located in the footpath verge of the road reserve at a standard distance from the property line to allow easy identification of the main by Shoalhaven Water maintenance personnel (as shown in **Appendix J**). The water main alignment can be varied in circumstances where obstructions such as mature trees are to be preserved. It is anticipated that water main easements over private property will not be required.

Water main design and hydrant spacing will need to comply with the requirements for residential and commercial development in a bushfire prone area.

Design and construction of the internal water distribution network (as shown in **Appendix H**) will be funded by the developer and Shoalhaven Water depending on whether the relevant section of main is included in the Development Servicing Plan.

7.2. SEWER

A conventional gravity and rising main sewer system is proposed for the development. This sewer system will collect residential and commercial/retail area sewage through a series of gravity reticulation mains. The entire catchment will feed into a pumping station SPS1 for conveyance to the Vincentia WwTP. Shoalhaven Water advises that the Vincentia WwTP and REMS will accommodate the additional load generated by the proposed development.

Gravity sewers for Shoalhaven Water are typically located within private property and require an easement under Section 88b of the Conveyancing Act. Sewer mains are located 1.25m from the property boundary in an easement 2.4m wide (where sewer is less than 2.5m deep) or 4.0m (where sewer is greater than 2.5m deep).

The masterplanned layout, with residential streets orientated perpendicular to the contour, is generally conducive to sewer mains at the front boundary and will therefore minimise the need for vegetation removal at the rear boundary. Some lots that have slight fall to the rear boundary can be *"reserve drained"* by constructing relatively deep sewers (approx 2.5m) at the front boundary to allow full drainage of the lot and promote tree retention at the rear. However, some construction works for sewer mains and interallotment drainage will be required along some rear and side boundaries.

Prior to the development of the existing Bay and Basin Leisure Centre, Shoalhaven City Council prepared a Special Section 64 Contribution report which outlined a series of sewage catchments and pumping stations (as shown in **Table 7.1**) that would be required for future development of the area. At that time it was envisaged that the area would be developed as a residential/commercial centre comprising:

- A commercial centre,
- A leisure centre (now the Bay and Basin Leisure Centre); and
- 800 residential lots.

Table 7.1 – Provision of sewer services as proposed in the Section 64 Contribution Report (Shoalhaven Water)

Catchment [1]	Pumping Station	Proposed capacity	Comment
1 (centre section of the development site)	SPS1	864 ET	To pump sewage from catchments 1, 2 & 3 to Vincentia WwTP.
2 (western catchment)	SPS2	297 ET	Serves only residential areas in the western end of the site.
3 (eastern catchment, including commercial area)	SPS3, also known as PS17	148 ET	Existing SPS constructed to accommodate 148 ET

[1] Catchment numbers shown in plans in **Appendix B** and **Appendix G**.

The proposed sewer system for the subdivision is shown in **Appendix G** and further described in terms of the three catchment areas originally proposed by the Section 64 Report. The proposed development intends to provide and make use of sewer systems in a manner consistent with the original intentions of Shoalhaven Water.

Catchment 1 (SPS No.1)

Catchment 1 will contribute gravity-drained sewage to SPS1 from:

- Village Central and part Village West (428 ET), plus
- Commercial premises in the district centre (65 ET).

SPS1 will be located in the northeastern portion of Catchment 1 and will have a pumping capacity for approximately 829 ET comprising

- 493 ET (gravity) from Catchment 1,
- 176 ET (pumped) from Catchment 2 and
- 160 ET (pumped) from Catchment 3 (Village East plus existing Bay and Basin Leisure Centre)

The proposed gravity main from Catchments 1 and 2 will need to cross a riparian corridor to SPS 1. The gravity main design and final route will be subject to detailed design analysis to avoid significant trees and cross the invert of the watercourse at the bridge crossing.

The existing 225mm diameter rising main in the 6m wide easement will be intercepted and connected to SPS 1 such that SPS 3 drains to SPS 1 which in turn drains to the Vincentia WwTP. The capacity of the existing 225mm diameter rising main will be subject to investigation and confirmation during the detailed design of the sewerage system.

We note that a future 300m gravity main is proposed by Shoalhaven Water through the central gully of Catchment 1 to serve the future Heritage Estates (and possibly the existing rural residential properties and proposed schools on Naval College Road). There is a possibility that this future discharge could be accommodated in the Vincentia Coastal Village sewer scheme if an appropriate contribution from Shoalhaven Water can be negotiated. We propose to further discuss this issue with Shoalhaven Water during the design phase for Stage 1.

Catchment 2 (SPS No.2)

Catchment 2 will contribute gravity-drained sewage to SPS2 from 176 ET within the western portion of Village West. SPS 2 will be located at a low point between residential stages 13 and 14 and pump sewage along a road reserve into the gravity feed system for Catchment 1.

Catchment 3 (SPS No.3)

Catchment 3 will contribute gravity-drained sewage to SPS 3 from:

- The existing Bay and Basin Leisure Centre (approx 24 ET),
- Village East (approx 136 ET),
- Potential future flows from an extension to the Bay and Basin Leisure Centre (notionally 10 ET), and
- Future community facilities in Council's Leisure Centre site (notionally 14 ET).

SPS 3 has been designed for 148ET and the requirement for upgrade will need to be considered during the detailed design phase. We would envisage that the nature of development in Village East would dictate that one dwelling unit would be less than one ET, and therefore the current pump station would be sufficient to accommodate the development indicated in this application.

It was originally proposed that the commercial area would discharge to a gravity system through the environment zone to SPS 3. This gravity sewer system would have been designed and constructed to accommodate the sensitive environment zone by installing the pipe as part of the raised boardwalk through the area. This would have left the main accessible for inspection and maintenance and would minimise construction disturbance

within the area. It was considered that this above ground gravity scheme would minimise environmental risk by removing reliance on electrical power to operate the system. However, during the negotiations with DEC regarding development footprint areas and environmental management measures it was established that DEC's preferred sewer option for the commercial area was a gravity main located along Moona Creek Road. This option has been adopted for this report. The gravity main will require a relatively deep trench (approx 5m deep) at Moona Creek Road. Thorough analysis of this scheme will be undertaken during the detailed design phase.

Catchment 3 (SPS 3) - Transition from existing arrangement

The Shoalhaven City Council Section 64 Report indicated that the initial rising main from SPS 3 to Vincentia WwTP be 100mm diameter. This rising main was to be augmented with a 225mm diameter rising main upon construction of the estimated 800 residential lots. However the rising main constructed between SPS 3 and the Vincentia WwTP was 125mm diameter (125 HDPE PE100 PN12.5 ID 105mm) increasing to 225mm diameter (225 HDPE PE100 PN12.5 ID 189mm). It is proposed as part of this development that the existing 225mm rising main serve the entire development (i.e. SPS 1, 2 and 3) by intercepting and redirecting the rising main from SPS 3 to SPS 1 such that SPS 1 pumps to the Vincentia WwTP. The existing rising main capacity will need to be investigated and confirmed during the detailed design phase.

7.3. WATER & SEWER CONTRIBUTIONS

Section 64 Development Servicing Plan charges have changed significantly since Stockland purchased the site in 2003. Standard Section 64 charges were approximately $4,200 per ET for combined water & sewer, with a Special Section 64 Charge of some $2,400 per ET for the limited development in Catchment 3. The Shoalhaven Water Strategic Operations and Review Committee resolved to exhibit new Development Servicing Plans for water and sewer in March 2005. The exhibited Plans proposed an increase in Section 64 charges from $4,200 per ET to some $15,000 per ET to be phased in over 3 years. The development industry including Stockland attended a workshop and made numerous submissions to Shoalhaven Water during and after the exhibition period to highlight apparent inconsistencies and inequities in the proposed Plans. Mr Peter Price of Economic Planning Advocacy has been engaged by Stockland and other organisations to analyse and challenge the DSP's where appropriate.

Council resolved on 2 November 2005 to adopt the Development Servicing Plans with a phased Section 64 Charge increase as follows:

Year	Effective Date	Water Charge	Sewer Charge
Base 05/06	1/7/05 (Current)	$2,441	$2,010
1	1/01/06	$3,000	$3,000
2	1/07/06	$4,000	$4,000
3	1/07/07	$5,000	$5,000
4	1/07/08	$5,347	$6,000
5	1/07/09	$5,347	$6,780

Council further resolved that "*in the event of substantial industry concern regarding the information or calculations in the DSP, Council undertake a review (subject to approval by DEUS) by June 2006*". The development industry including Stockland remains of the view that the Development Servicing Plan adopted by Shoalhaven Council contains inconsistencies and inequities that result in a artificially high Section 64 Charges. The industry, primarily through consultant Economic Planning Advocacy, will continue to liaise

with Shoalhaven Water to resolve the DSP issue. A copy of Council's resolution of 2 November 2005 is included as Appendix B.

7.4. WASTE REMOVAL/RECYCLING

Shoalhaven City Council has confirmed that further residential development in Vincentia will be supported with the extension of the contracted waste removal/recycling services. The cost of this service will be at the expense of residents within the development under the normal Council rates system.

Waste & recycling will be in accordance with normal Shoalhaven Council practices as discussed in **Section 5.3**. Waste reduction and recycling strategies will be employed as identified in the sustainability report prepared by Cundall Johnston & Partners, which forms part of the application for concept and project approval.

Commercial premises not intending to use the Shoalhaven City Council service will be required to arrange alternative waste collection arrangements.

7.5. NATURAL GAS

Agility had expressed interest in extending a natural gas reticulation service to Vincentia from the eastern gas pipeline and has conducted a scoping feasibility study of the area. Several important factors influenced the feasibility of a natural gas service in the area and included:

- The possibility of the developer installing a cogeneration plant on the commercial site to supply power, heating and cooling services.

- Other potential users of natural gas in the Bay and Basin area include existing residential estates, shopping centres, and the Albatross Naval Base.

Definitive proposals for providing reticulated gas into the site are dependent on the economic feasibilities being carried out by the gas distributor. Agility advised in August 2004 that provision of reticulated natural gas is not currently commercially feasible based on estimates of future gas consumption and the considerable distance of lead-in main.

7.6. ELECTRICITY

Electricity will be provided to the proposed development from the existing Huskisson Zone Substation (ZS). Integral Energy advises that the proposed development will generate an approximate load of 8MVA on their electrical network. This load will be supplied through 2 x 11kV underground feeders leading out of the Huskisson ZS. Each of these feeders will be located within a 5 m wide easement where they cross private land.

The Huskisson ZS will require augmentation of transformer capacity and switchgear availability in order to accommodate the additional electrical load. Stockland is required to engage an Integral Energy Level 3 approved service provider (ASP) for the design upgrade of the Huskisson Zone Substation and reticulation of electricity throughout the proposed development.

Internal reticulation within the proposed development will generally be underground in a common services trench within the road reserve as shown on the common trench plan (**Appendix I**). Padmount substations will be located strategically in parks and other discreet locations within public land to convert HV to LV.

Electricity assets in private lands will be subject to the normal easement provisions of Integral Energy. These easements for underground cables are typically between 1 and 3 metres wide.

7.7. TELECOMMUNICATIONS

Telecommunication services for the development will be linked into an existing fibre optic junction point on the intersection of Naval College (Jervis Bay) and Wool Roads. From this point, 12 fibre optic cables are to be routed to a central distribution point within the development site and terminated in either several Customer Access Multiplexers (CMUX) or a Main Distribution Frame (MDF).

Telstra would prefer to terminate the 12 fibre optic cables in an on site MDF. An on site MDF will have greater versatility than a CMUX in that it will be able to accommodate future technological advances in telecommunication equipment. However in order to use an MDF, the developer will be required to contribute by providing either a freestanding building and lot within the residential development or a room annexed off a commercial building. At this stage the preferred option would be to annex the MDF room off the edge of a commercial building as shown in **Appendix I**.

The staging of the development will require a temporary CMUX to be installed in the residential area as a temporary distribution point. Once the MDF is placed within the commercial area, all telecommunications will switch from the temporary CMUX to this MDF. This arrangement is considered acceptable by Telstra.

Beyond the central distribution point/s, telecommunication services will be distributed throughout the site using copper paired cable to each household and commercial development. Telecommunication services at the site will include normal phone services and Asymmetric Distribution Subscriber Line (ADSL) Internet connection for high speed broadband data transfer.

Telecommunication cables are to be common trenched with electricity cables throughout the subdivision, as shown in **Appendix I**.

7.8. MOBILE PHONE NETWORK

Full CDMA and GSM network coverage is available in the area. Upgrading of these existing services may be required to accommodate the increase in demand. Such upgrading would be funded by the network supplier.

7.9. CABLE/SATELLITE TV

Satellite television is available to the development site.

Cable television will not be available to the proposed development at this stage.

7.10. INTERALLOTMENT DRAINAGE

The masterplanned residential lot layout with public roads orientated perpendicular to the contours generally enables many lots to drain to the public street drainage system. Some lots will require interallotment drainage and will therefore require construction works along the rear boundary. **Appendix I** illustrates the concept interallotment drainage layout.

8. PLANNING APPROVALS PROCESS FOR ELECTRICITY, TELECOMMUNICATIONS, WATER AND SEWER

Stockland is seeking project approval for the residential development and associated works in Village West and Village Central, and concept approval for the district centre and adaptable housing and associated works in Village East. Approvals for servicing and infrastructure are required from the following authorities:

- Integral Energy;
- Telstra; and
- Shoalhaven Water (water and sewer).

The approvals process for these authorities is discussed in the below **Table 8.1.** Separate Council consent for these utility services is not required.

Approval from Shoalhaven City Council for interallotment drainage has been excluded from this section of the report. Project approval for Village West and Village Central interallotment drainage is sought as part of this application under Part 3A of the EPA Act. Further approval for interallotment drainage will be obtained from Shoalhaven City Council as part of a future Construction Certificate application.

Table 8.1 Servicing Authorities Staged Approval Process

Staged Approval Process	Telstra	Integral Energy	Shoalhaven Water
Stage 1	Consultation with Telstra prior to submitting application to Dept Planning (DoP)	Consultation with Integral as part of the Planning focus meeting and broader consultation process.	Consultation with Shoalhaven Water (SW) prior to submitting. Concept or project approval application to (DoP)
Stage 2	Application to Telstra for Reticulation in property developments and new estates (E11 Form).	Provide Letter of Intent – for electrical reticulation. The letter of intent must indicate whether a Notification of Arrangement or early notification of arrangement is required (for determination with Client)	DoP refer concept/project approval application to SW for comment.
Stage 3	Telstra to design reticulation system.	Engage accredited designer to provide design brief and nominate necessary easements for lines and padmount substations.	SW provide DoP with notification of required project/concept approval conditions.
Stage 4	Pre-commencement Notification to Telstra prior to earthworks (E10 Form)	Incorporate easements into the draft subdivision plan.	Obtain operations consent from SW by addressing specific conditions of the approval. Operations consent is required prior to Construction Certificate Stage
Stage 5	Compliance Certificate from Telstra confirming the provision of services in accordance with Telstra's Policy for External Cabling of Estates and Property Developments.	Lodge application with Integral (using standard form FPJ 4003) for Provision of an Electricity System in a Subdivision.	Obtain Construction Certificate.
Stage 6	Issue compliance certificate to Consent Authority for issuing of subdivision	Designer to prepare Environmental Assessment necessary to Satisfy the requirements of the	Construct sewer and water infrastructure in accordance with the Stage 1 plan,

Staged Approval Process	Telstra	Integral Energy	Shoalhaven Water
	certificate.	Environmental Planning and Assessment Act (EP&A Act), 1979.	updated under Stage 4.
Stage 7	Telecommunication conduits installed with electricity cables. Telstra contractor to draw cable through pits and conduits prior to connection of dwellings to communication network.	Obtain design certification (fee payable). Undergrounding power must accord with Schedule 6 of the General Terms and Conditions for Underground Electricity Systems in New Urban Residential Subdivisions	Obtain Compliance Certificate for constructed works
Stage 8		Level 1 Integral accredited service provider (ASP) constructs 'contestable works'. Works are tested and energised by Integral Energy	
Stage 9		Obtain approval (if necessary) to interrupt local power connection. Notify adjoining customers of the interruption to electricity supply.	
Stage 10		Obtain Acceptance Notification (transfer of works to Integral)	
Stage 11		Obtain Notification of Arrangement Certification. Required by the consent authority prior to issuing of a Subdivision Certificate.	

Specific legislation relating to electricity infrastructure has been sought from Integral Energy who advise that:

- Zone sub-stations (substantial buildings and outdoor transformers) require consent through Council under Part 4 of the EP&A Act. However, as Integral Energy is a Crown Body, it has specified privileges under Part 5 of the EP&A Act which work to prevent Council rejecting an application or placing specific conditions on these developments; and

- All other works are exempt development under SEPP 4 Development Without Consent and Miscellaneous Exempt and Complying Development and the Environmental Planning and Assessment Regulations – Model Provisions, 1980.

Integral Energy also advises that other State Legislation and policies may apply to the proposal and would expect that the full range of planning matters are addressed by the designer as part of a Review of Environmental Factors (REF).

Telstra has advised that a Main Distribution Frame (MDF) would be best located in a building on an individual lot within the estate or as part of a commercial building within the district centre. If the MDF is a building within the residential estate, a development application will need to be lodged with Council under Part 4 of the EP & A Act. Telstra would enjoy the same privileges as Integral Energy under Part 5 of the Act. A Statement of Environmental Effects would be required to accompany the application.

Sewer and water servicing will be addressed in the Statement of Environmental Effects (SEE) accompanying the applications for residential and commercial landuses within the subject site.

9. DEVELOPMENT STAGING

9.1. DEVELOPMENT STAGING

An indicative staging plan for development of both residential and commercial components of the development has been included as **Appendix K.**

Sequencing of the development stages depends on many variables including:

- Development layouts;
- Availability & direction of servicing;
- Environmental issues;
- Marketing advice;
- Financial and funding issues;
- Construction timeframes; and
- Authority approvals.

The staging sequence in terms of lot yields and floor space is expressed in **Table 9.1**. The staging program is indicative and actual program dates will rely on the factors identified above.

Table 9.1 Development Staging

	STAGE	LANDUSE [1]	No. LOTS	FLOOR SPACE (m^2)
District Centre	1	DDS, Supermarket, Restaurant, Medical Centre, Nursery, Speciality Retail		19,500
	2	Supermarket, Commercial Child Care, Bulky Goods, Speciality Retail		12,100
Residential	1	Marketing suite, Seed housing, Low density residential	63	
	2	Low density residential	43	
	3	Low density residential	33	
	4	Low density residential	27	
	5	Low & medium density residential	20	
	6	Low density residential	46	
	7	Medium density residential	34	
	8	Low density residential	13	
	9	Low density residential	44	
	10	Low density residential	55	
	11	Low density residential	14	
	12	Low density residential	36	
	13	Low density residential	44	
	14	Low density residential	34	
	15	Low density residential	31	
	16	Low density residential	33	
	17	Low density residential	34	
			604	
	Village East	Medium density residential	47 [2]	

[1] Landuse for district centre is preliminary only and subject to market demand and separate project approval application

[2] Total 136 dwelling units including apartments

The servicing strategies identified in this report are consistent with the staging concepts identified above and in **Appendix K**. Utility infrastructure can be provided in a logical, structured manner so that each stage of the development is provided with the full suite of servicing. It will be important to continue to engage the utility service providers throughout the development phase to ensure that sufficient lead time is provided for the design and product delivery of infrastructure.

10. SUSTAINABILITY

10.1. BASIX PRINCIPLES

Stockland is committed to providing an environmentally sustainable subdivision in conjunction with the Building Sustainability Index (BASIX) criteria. The BASIX criteria, developed by Dept Planning (then named DIPNR) in conjunction with local government, legislates target reductions in potable water use (by 40%) and greenhouse emissions (by 25%). BASIX provides a range options to reduce water use and energy use. These include water tanks and passive solar design.

BASIX will initially only apply to residential development, including:

- Dwelling houses (attached or detached)
- Dual Occupancies
- Guest house, boarding house, lodging house or hostel where these are less than 300m^2.

Development achieving the BASIX requirements will be issued with a BASIX certificate. A BASIX certificate is required for residential development in Metropolitan Sydney from the 1 July 2004 and the remainder of NSW (including the Shoalhaven) from 1 July 2005. BASIX targets are discussed by Cundall in the Sustainability Report included in this application for project and concept approval of the Vincentia Central Village and District Centre.

10.2. SERVICE-RELATED SUSTAINABILITY PRINCIPLES

The following sustainability principles will be applied to the proposed development during design, construction and for the long - term environmental benefit of the area.

Design phase

- Utility service locations will be designed to optimise pipe routes and thereby minimise materials consumption (including polyvinyl chloride), construction effort and environmental disturbance.
- The implementation of BASIX principles will be discussed with the service authorities to establish whether infrastructure can be further optimised to reflect reduced consumption.
- Utility services will be designed within the public road reserve where possible to allow retention of vegetation within front yards of residential properties.
- Sewer will be designed to take advantage of the existing effluent re-use scheme operating successfully in the Shoalhaven.
- Sewer pipes will be constructed along proposed fire trails and emergency vehicle tracks to minimise environmental disturbance through riparian zones.
- Pump station designs will investigate design options to allow use of the existing 225mm diameter rising main through the National Park thereby eliminating the need for further construction works in this area.
- Overhead high voltage powerlines will be investigated for relocation out of bushland areas to minimise bushfire ignition and power outages.
- Telecommunication networks will be designed to provide for the latest data exchange technology promoting work-home opportunities.
- Telecommunications MDF will be provided integrally within the commercial centre reducing materials useage and ongoing air conditioning energy consumption.
- Water supply infrastructure will be designed to provide for fire fighting to protect buildings and environmental zones.

- Lots will be designed to drain to the street wherever possible to minimise the need for interallotment drainage and associated construction works.

Construction phase

- Trenchless excavation technology will be employed at key locations so pipework is bored beneath the ground to limit disturbance of sensitive flora and fauna in the area.
- Construction works will be staged to provide manageable worksites with opportunity for migration of fauna species.
- Best practice soil and water management will be used during services construction to minimise sediment-laden runoff during storm events.

11. CONCLUSIONS

This report documents the results of the investigation into the utility servicing and staging of the proposed Vincentia Coastal Village and District Centre. Existing utility services have been identified and researched. Opportunities for relocating existing services to provide environmental, social or economic benefits have been explored. Future servicing needs have been considered and concept designs prepared to show the feasibility of providing such services and the likely environmental impacts of such services. Service authorities have been consulted throughout the process and their input has been incorporated into the concept designs wherever possible. Finally, a staging strategy has been prepared to provide for the ordered progression of construction toward an integrated district level commercial centre and residential community.

The conclusions of the utility servicing and staging investigation are listed below.

- The proposed development represents a viable and sustainable development from a servicing and infrastructure perspective.
- Existing utility services infrastructure can be augmented to adequately serve the development proposed. Final supply and demand calculations based on the proposed development layout can now be carried out by the utility service authorities.
- The utility servicing of the development can be constructed to minimise environmental impacts and meet environmental targets.
- The development will not have a significant adverse impact on the utility servicing of existing surrounding properties.
- Relocation of existing utility services can provide environmental and operating benefits to the service authorities.
- The construction of the residential, leisure and commercial development can be staged to so servicing infrastructure can be provided to meet demand.

Prepared by
For and on behalf of
FORBES RIGBY PTY LTD

Ben Braddock

Amended 2006 by

Jamie Quilliam

Reviewed by: .....
Martin Wells (Director)

APPENDIX A

DEPOSITED PLANS

PLAN FORM 2

Plan Drawing only to appear in this space

M

SIGNATURE AND SEALS ONLY.

GIVEN UNDER THE COMMON SEAL OF WOLLONG PTY LIMITED AT SYDNEY THIS 28th DAY OF December 2000

L Kenny — SECRETARY

DIRECTOR

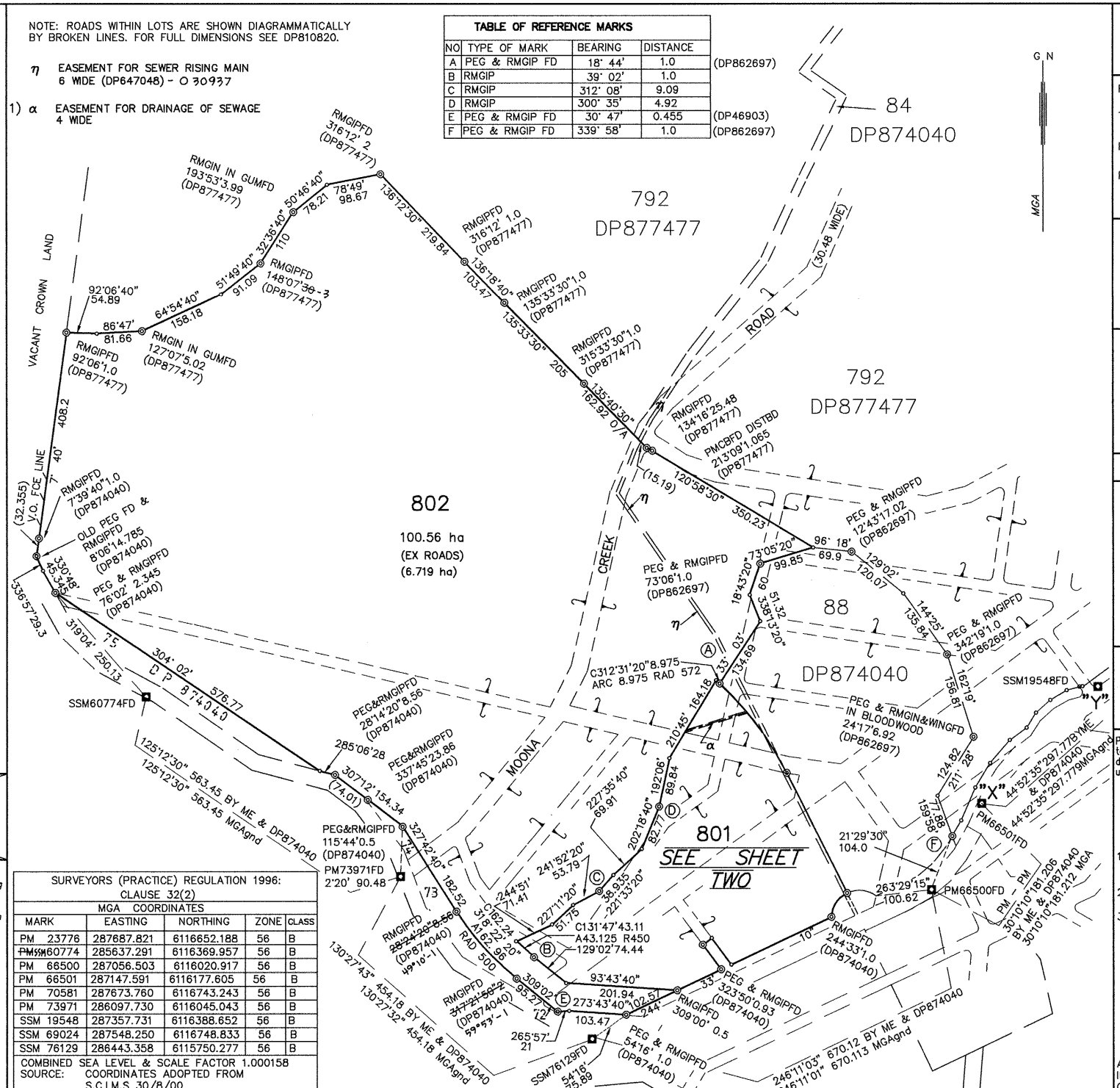
WOLLONG PTY LIMITED A.C.N. 070 614 494 Common Seal

NOTE: ROADS WITHIN LOTS ARE SHOWN DIAGRAMMATICALLY BY BROKEN LINES. FOR FULL DIMENSIONS SEE DP810820.

η EASEMENT FOR SEWER RISING MAIN 6 WIDE (DP647048) - O 30937

1) α EASEMENT FOR DRAINAGE OF SEWAGE 4 WIDE

TABLE OF REFERENCE MARKS				
NO	TYPE OF MARK	BEARING	DISTANCE	
A	PEG & RMGIP FD	18° 44'	1.0	(DP862697)
B	RMGIP	39° 02'	1.0	
C	RMGIP	312° 08'	9.09	
D	RMGIP	300° 35'	4.92	
E	PEG & RMGIP FD	30° 47'	0.455	(DP46903)
F	PEG & RMGIP FD	339° 58'	1.0	(DP862697)



SURVEYORS (PRACTICE) REGULATION 1996: CLAUSE 32(2) MGA COORDINATES				
MARK	EASTING	NORTHING	ZONE	CLASS
PM 23776	287687.821	6116652.188	56	B
~~PM~~SSM60774	285637.291	6116369.957	56	B
PM 66500	287056.503	6116020.917	56	B
PM 66501	287147.591	6116177.605	56	B
PM 70581	287673.760	6116743.243	56	B
PM 73971	286097.730	6116045.043	56	B
SSM 19548	287357.731	6116388.652	56	B
SSM 69024	287548.250	6116748.833	56	B
SSM 76129	286443.358	6115750.277	56	B

COMBINED SEA LEVEL & SCALE FACTOR 1.000158
SOURCE: COORDINATES ADOPTED FROM S.C.I.M.S 30/8/00

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No. .....

Field Book ..... pages .....

Subdivison Certificate

hereby certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed

SUBDIVISION ..... set out herein

* (Insert 'subdivision' or 'new road')

* Authorised Person/General Manager/Accredited Certifier

Consent Authority: .....

Date of endorsement : 21/12/00

Accreditation no : .....

Subdivision Certificate no : 10131

File no. S/F 8856

Note: When the plan is to be lodged electronically in the land Titles Office it should include a signature in an electronic or digital format approved by the Registar-General.

* Delete whichever is inapplicable

DP1022286

Registered 8.2.2001 *

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: PARISH

Last Plan: DP 874040 #

PLAN

OF SUBDIVISION OF LOT 791 DP877477

Lengths are in metres. Reduction Ratio 1: 5000

L G A SHOALHAVEN CITY

Locality: VINCENTIA

Parish: BHERWERRE

County: ST VINCENT

This is sheet 1 of my plan in TWO sheets. (Delete if inapplicable)

Surveyors (Practice) Regulation 1996

I, ROSS J. DOUGLAS

of ALLEN PRICE & ASSOCIATES 75 PLUNKETT ST NOWRA 2541

a surveyor registered under the Surveyors Act, 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveyors (Practice) Regulation 1996 and was completed on 13 NOV 2000

The survey relates to LOTS 801, 802 & 804 (here specify the land actually surveyed, or specify any land shown in the plan that is not the subject of the survey)

Datum Line: "X" - "Y"

Zone: Suburban/Country

(Signature) ..... Surveyor registered under the surveyors Act 1929

Plans used in preparation of survey/compilation.

DP647048 DP874040
DP46903 DP877477
DP810820
DP862697

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919, IT IS INTENDED TO CREATE:-

1) EASEMENT FOR DRAINAGE OF SEWAGE 4 WIDE

2) RESTRICTION ON THE USE OF LAND

3) RESTRICTION ON THE USE OF LAND

AS SET OUT IN THE ACCOMPANYING INSTRUMENT APPROVED BY THE COUNCIL OF THE CITY OF SHOALHAVEN

*OFFICE USE ONLY

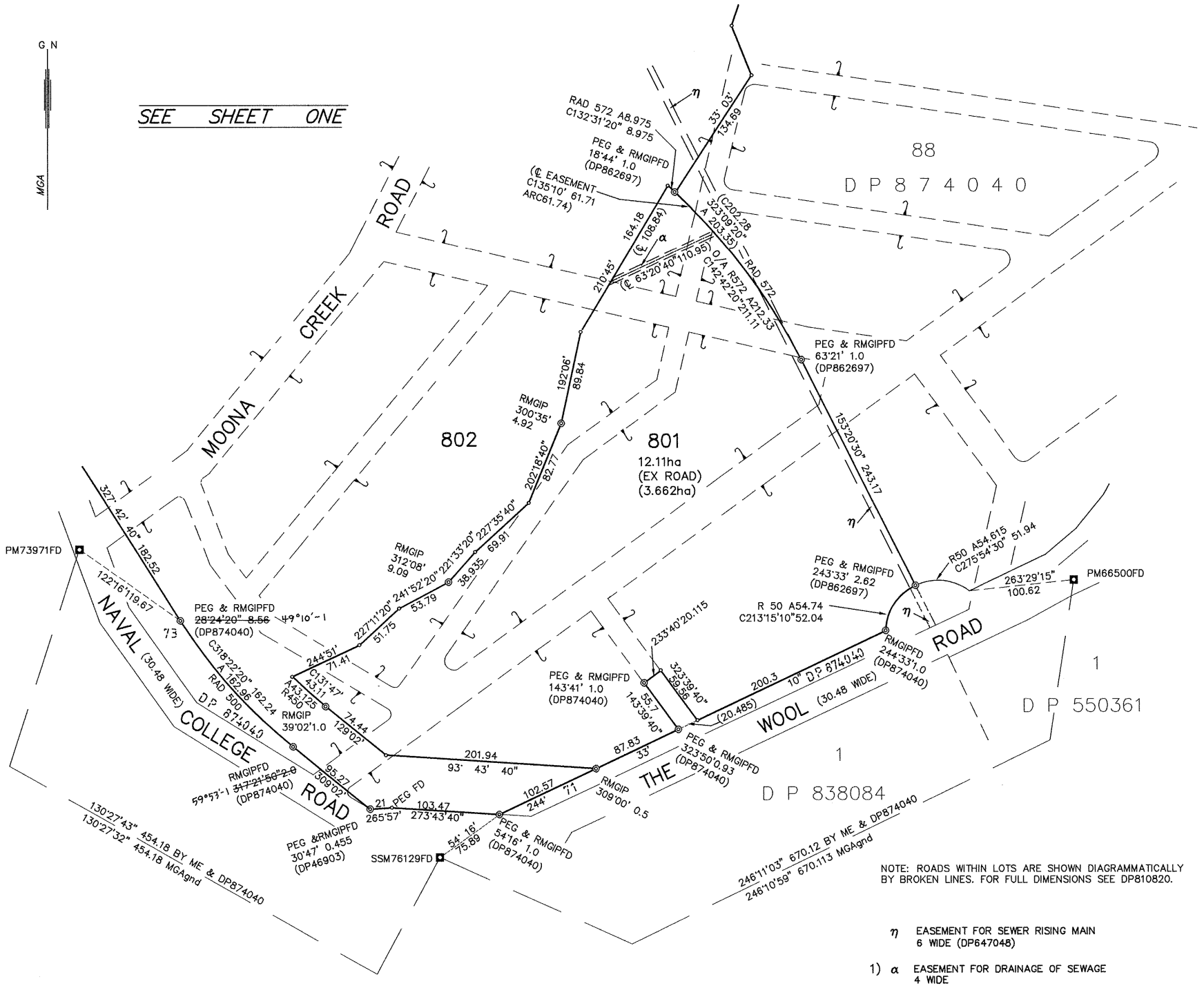
PLAN AMENDED IN LPINSW AT SURVEYOR'S REQUEST.

SURVEYOR'S REFERENCE: 23358 PHONE: (02)44216544 FAX: (02)221821 CHECKLIST MPR : 2005

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

PLAN FORM 3 To be used in conjunction with Plan Form 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION



NOTE: ROADS WITHIN LOTS ARE SHOWN DIAGRAMMATICALLY BY BROKEN LINES. FOR FULL DIMENSIONS SEE DP810820.

η EASEMENT FOR SEWER RISING MAIN 6 WIDE (DP647048)

1) α EASEMENT FOR DRAINAGE OF SEWAGE 4 WIDE

DP1022286

Registered 8-2-2001 *

This is sheet 2 of my plan in 2 sheets dated 13/11/00

Surveyor registered under Surveyors Act 1929

This is sheet 2 of the plan of 2 sheets covered by Subdivision Certificate No. 8856 of

SC10137 SF 8856 21112100

Authorised Person/~~General Manager~~/~~Accredited Certifier~~

For use where space is insufficient in any panel on Plan Form 2.

*OFFICE USE ONLY

Reduction Ratio 1: 2500

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 23358

Req:RB295148 /Doc:DP 1022286 B /Rev:13-Feb-2001 /Sts:SC.OK /Prt:15-Jun-2004 11:45 /Pgs:3
Ref:2004061500087702 104016-04 /Src:z

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTIONS ON THE USE OF LAND INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919.

Measurements are in metres

DP1022286

Subdivision of Lot 791 DP 877477 covered by Subdivision Certificate No.8856.

Full name and address of owners of the land.

Wollong Pty Limited
of GPO Box 2678
Sydney NSW 2000

PART 1

1. Identity of Easement to be created and firstly referred to in abovementioned plan

Easement for Drainage of Sewage (4 Wide)

Schedule of Lots etc. Affected

Lot Burdened	Name of Authority Benefited
Lot 801	Shoalhaven City Council

2. Identity of Restriction to be created and secondly referred to in abovementioned plan

Restriction on the Use of Land

Schedule of Lots etc. Affected

Lot Burdened	Authority Benefited
Lot 801	Shoalhaven City Council

3. Identity of Restriction to be created and thirdly referred to in abovementioned plan

Restriction on the Use of Land

Schedule of Lots etc. Affected

Lot Burdened	Lot Benefited
Every Lot	Every other lot

Approved by the Council of the City of Shoalhaven

.....dated 21/12/00

SF 8856

PC 28 C: \ wpdocs\88b\23358

LK

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTIONS ON THE USE OF LAND INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919.

Measurements are in metres

DP1022286

Subdivision of Lot 791 DP 877477 covered by Subdivision Certificate No.8856.

PART 2

Terms of Restriction secondly referred to in abovementioned plan

a) No development shall be undertaken on Lot 801, unless it makes provision for an access road to Lot 802, generally in accordance with the adopted DCP 90.

b) No removal or disturbance to vegetation shall be permitted in the areas identified as Open Scrub and Heath, without the prior written consent of the Development and Environment Services manager of Shoalhaven City Council and without additional investigations of flora and fauna issues that concentrate on the Eastern Bristle Bird and *Prasophyllum affine*.

c) No removal or disturbance to vegetation shall be permitted within 20 metres of The Wool Road, except for the provision of access to the property along the formed access road.

Terms of Restriction thirdly referred to in abovementioned plan

During the ownership of any adjoining land by Wollong Pty Limited, its successors or assigns other than Purchasers on sale, no fence or wall shall be erected on the Lot to divide it from any adjoining land without consent of Wollong Pty. Limited, its successors or assigns other than Purchasers on sale, but such consent shall not be withheld if such fence or wall is erected without expense to Wollong Pty. Limited, its successors or assigns other than Purchasers on sale, and in favour of any person dealing with the registered proprietor of the Lot from time to time, such consent shall be deemed to have been given in respect of any such fence for the time being erected.

Name of Authority empowered to release, vary or modify Easement firstly and Restriction secondly referred to in abovementioned plan

Shoalhaven City Council

Name of Persons empowered to release, vary or modify Restriction thirdly referred to in abovementioned plan

Wollong Pty Limited

Approved by the Council of the City of Shoalhaven

.....dated 21/12/00.....

SF 8856

PC 28 C: \ wpdocs\88b\23358

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTIONS ON THE USE OF LAND INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919.

Measurements are in metres

Subdivision of Lot 791 DP 877477 covered by Subdivision Certificate No.8856.

DP1022286

PART 2 cont.

The Common Seal of
WOLLONG PTY LIMITED
was hereunto affixed by
resolution of the Board
of Directors in the presence of
this 28th December 2000

WOLLONG PTY LIMITED A.C.N. 079 814 494 Common Seal

Director

L Kenny

Secretary

REGISTERED 8.2.2001

Approved by the Council of the City of Shoalhaven

.....dated 21/12/00.....

SF 8856

PC 28 C: \ wpdocs\88b\23358

APPENDIX B

SHOALHAVEN COUNCIL RESOLUTION OF 2/11/05 FOR DSP'S

MINUTES OF THE ORDINARY MEETING OF THE COUNCIL OF THE CITY OF SHOALHAVEN HELD IN THE COUNCIL CHAMBERS, CITY ADMINISTRATIVE CENTRE, BRIDGE ROAD, NOWRA ON WEDNESDAY 2ND NOVEMBER 2005 COMMENCING AT 4.08 PM

The following members were present;

Clr G Watson – Chairman
Clr J Finkernagel
Clr R Rudd
Clr P Murphy
Clr P Green
Clr J McCrudden
Clr J Kerr
Clr G Ward – arrived 4.24 pm
Clr G Kearney
Clr J Anderson
Clr J Willmott
Clr J Young – arrived 4.46 pm
Clr R Bates

The meeting was opened in Prayer by Father Patrick Faherty – St Michaels Catholic Church.

1391. Moments Silence **File**

The Mayor introduced a moments silence in recognition of the recent passing of Ross Kalenderidis, Les Bryce and Joy Pratt.

MAYORAL MINUTE

1392. Submission for Proposed Correctional Facility - South Coast **File 32511**

Note: Clr Ward arrived, the time being 4.24 pm.

RESOLVED on a MOTION of Clr Watson seconded Clr Kerr that Council

a) Proceed to develop a submission to the NSW Department of Correctional Services to have a Correctional Facility established in the Shoalhaven.

b) Clr Anderson be nominated as a member of the Submission Team in addition to the Mayor.

THE RECORD OF VOTING ON THIS MATTER WAS AS FOLLOWS:

The following Councillors voted "Aye";

Clrs Finkernagel, Murphy, Green, McCrudden, Kerr, Ward, Kearney, Anderson, Willmott, Watson

1513. (Item 4, Page 36) Section 64 Developer Charges **File 4267**

This item was withdrawn and dealt with separately

RECOMMENDED that:

a) Council invite submissions from the public on the proposed Section 64 Developer charges up until Friday 28th October, 2005.

b) A Councillor Briefing on the proposed Section 64 Developer Charges and submissions received be held prior to the Ordinary meeting of 2nd November 2005.

c) The General Manager and Mayor make urgent representations to the Minister for a thirty (30) day extension on the adoption of a Section 64 Developer Charges Plan due to significant issues raised by the development industry whilst indicating that a Plan will be adopted prior to the end of November.

A MOTION was moved by Clr Rudd, seconded Clr Bates that

a) Council adopt the Development Servicing Plans for Water Supply and Sewerage Services dated October 2005;

b) The Developer Charge be phased in accordance with the Development Servicing Plans and Table 3 below:

Year	Effective Date	Water Charge	Sewer Charge
Base 05/06	1/7/05 (Current)	$2441	$2010
1	1/01/06	$3000	$3000
2	1/07/06	$4000	$4000
3	1/07/07	$5000	$5000
4	1/07/08	$5347	$6000
5	1/07/09	$5347	$6780

Annual CPI adjustments will be made from year 2 onwards.

c) The Development Serving Plan to be registered with the Department of Energy, Utilities and Sustainability

d) Advertise the adoption of the DSP in local papers and on Council's website.

An AMENDMENT was moved by Clr Willmott, seconded Clr Finkernagel that

a) Council adopt the Development Servicing Plans for Water Supply and Sewerage Services dated October 2005;

b) The Developer Charge be phased in accordance with the Development Servicing Plans and Table 3 below:

Year	Effective Date	Water Charge	Sewer Charge
Base	1/7/05 (Current)	$2441	$2010

APPENDIX C

GSM & CDMA COVERAGE PLAN

Australia's largest owned and operated GSM Network

This coverage map shows the extent of the Telstra GSM/GPRS network generally at the time of publication. It also shows the planned coverage expansion of the Telstra GSM/GPRS network based on the targeted rollout schedule at the time of publication. As it may be necessary to change or modify the rollout schedule, Telstra reserves the right to do this without notice.

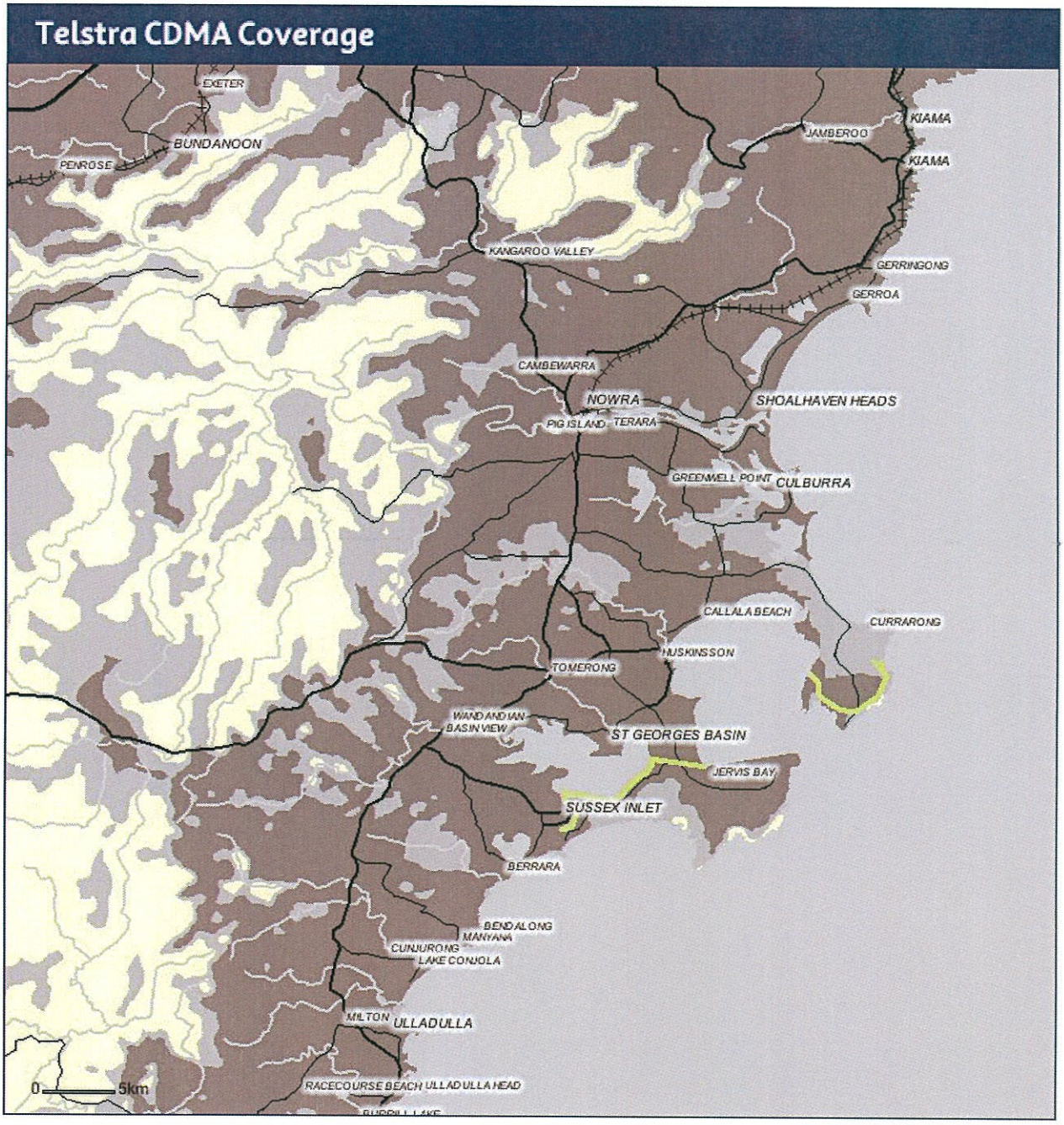
As with any cellular system there are places inside the marked coverage areas where a mobile phone may not work due to a variety of factors. For example, reception can be degraded or non-existent in certain places, particularly basements, lifts, underground carparks and large concrete buildings. However Telstra is endeavouring to provide the best depth of radio reception practicable into such areas. Reception can also be affected by mountains, tunnels and road cuttings.

Wireless Data Services may vary in speed from that stated. This could be for several reasons including, the customer equipment and its configuration, external network performance (eg the Internet), or radio network availability and signal strength. The Network may also be unavailable as a result of the Application or the customer equipment utilised.

For more information about Telstra coverage, visit www.telstra.com.au/mobile or call Customer Service on 125 111*

*Call charges apply

Date Produced: 12-Jun-04 14:10



Australia's largest owned and operated digital cellular network

This coverage map shows the extent of the Telstra CDMA network generally at the time of publication. It also shows the planned coverage expansion of the Telstra CDMA network based on the targeted rollout schedule at the time of publication. As it may be necessary to change or modify the rollout schedule, Telstra reserves the right to do this without notice.

As with any cellular system there are places inside the marked coverage areas where a mobile phone may not work due to a variety of factors. For example, reception can be degraded or non-existent in certain places, particularly basements, lifts, underground carparks and large concrete buildings. However Telstra is endeavouring to provide the best depth of radio reception practicable into such areas. Reception can also be affected by mountains, tunnels and road cuttings.

Wireless Data Services may vary in speed from that stated. This could be for several reasons including, the customer equipment and its configuration, external network performance (eg the Internet), or radio network availability and signal strength. The Network may also be unavailable as a result of the Application or the customer equipment utilised.

For more information about Telstra coverage, visit www.telstra.com.au/mobile or call Customer Service on 125 111*

*Call charges apply

Date Produced: 12-Jun-04 14:10

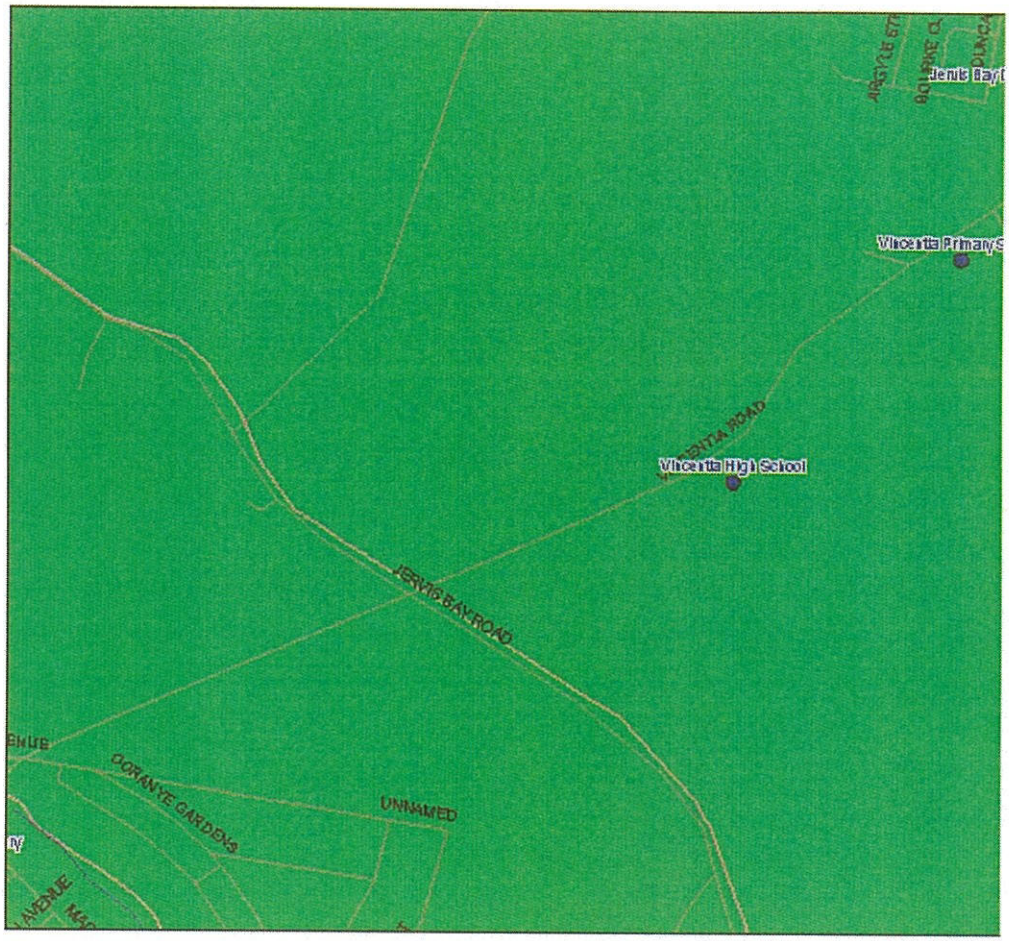
Optus Mobile coverage results

Address : **VINCENTIA 2540**

Date/time of search : **4/05/04 8:22:57**

LEGEND

- Car Kit Coverage
- Hand Held Coverage
- Future Coverage
- Optus store location



DISCLAIMER

This map shows the general extent of the Optus Mobile Network as at December, 2003.

Our coverage maps show planned coverage to April, 2004 and as these predictions as based on rollout schedules available at the time of publication, they may be subject to change without notice should circumstances require.

Optus prepares mobile coverage maps using the latest available data, tools and techniques to map Optus Mobile Network as accurately as possible. However as with any network based on radio technology, handset quality or local conditions mahy prevent or interfere with mobile reception within coverage areas - e.g., inside concrete buildings, lift wells, basements, tunnels and road cuttings.

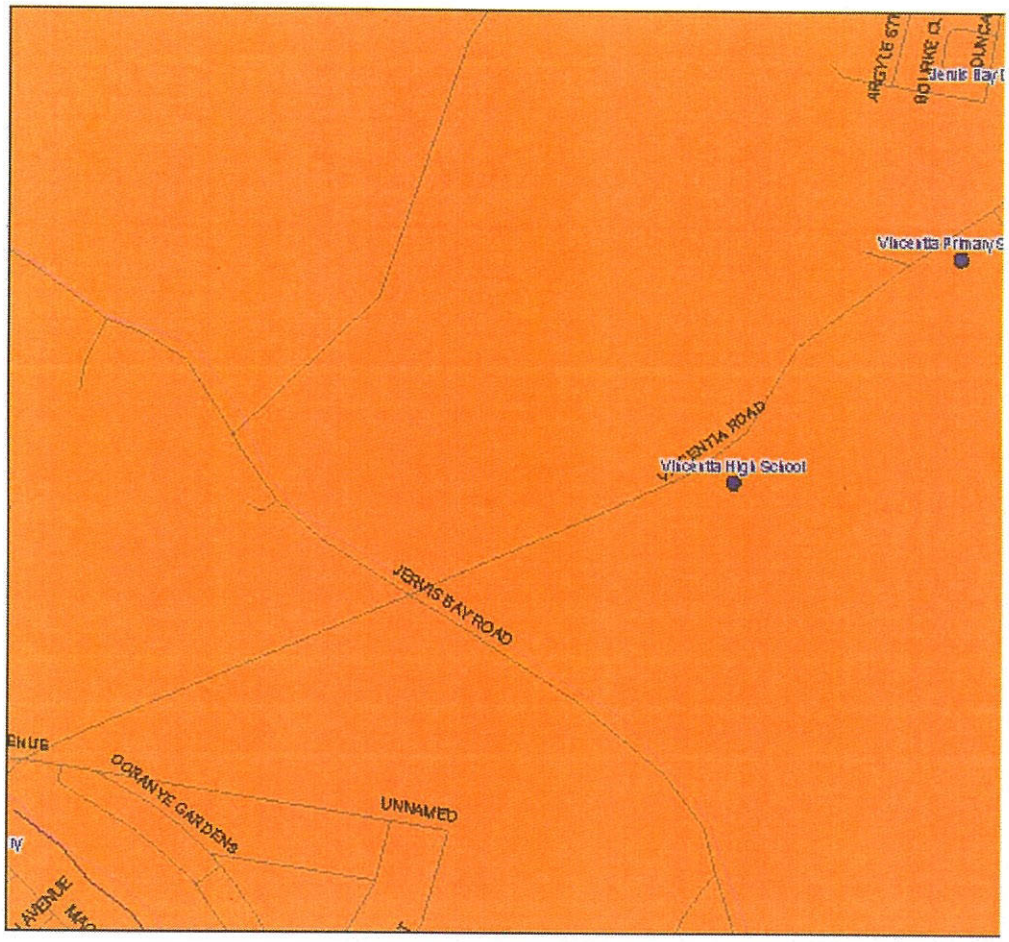
Optus Mobile coverage results

Address : **VINCENTIA 2540**

Date/time of search : **4/05/04 8:29:17**

LEGEND

- Car Kit Coverage
- Hand Held Coverage
- Future Coverage
- Optus store location



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APPENDIX D

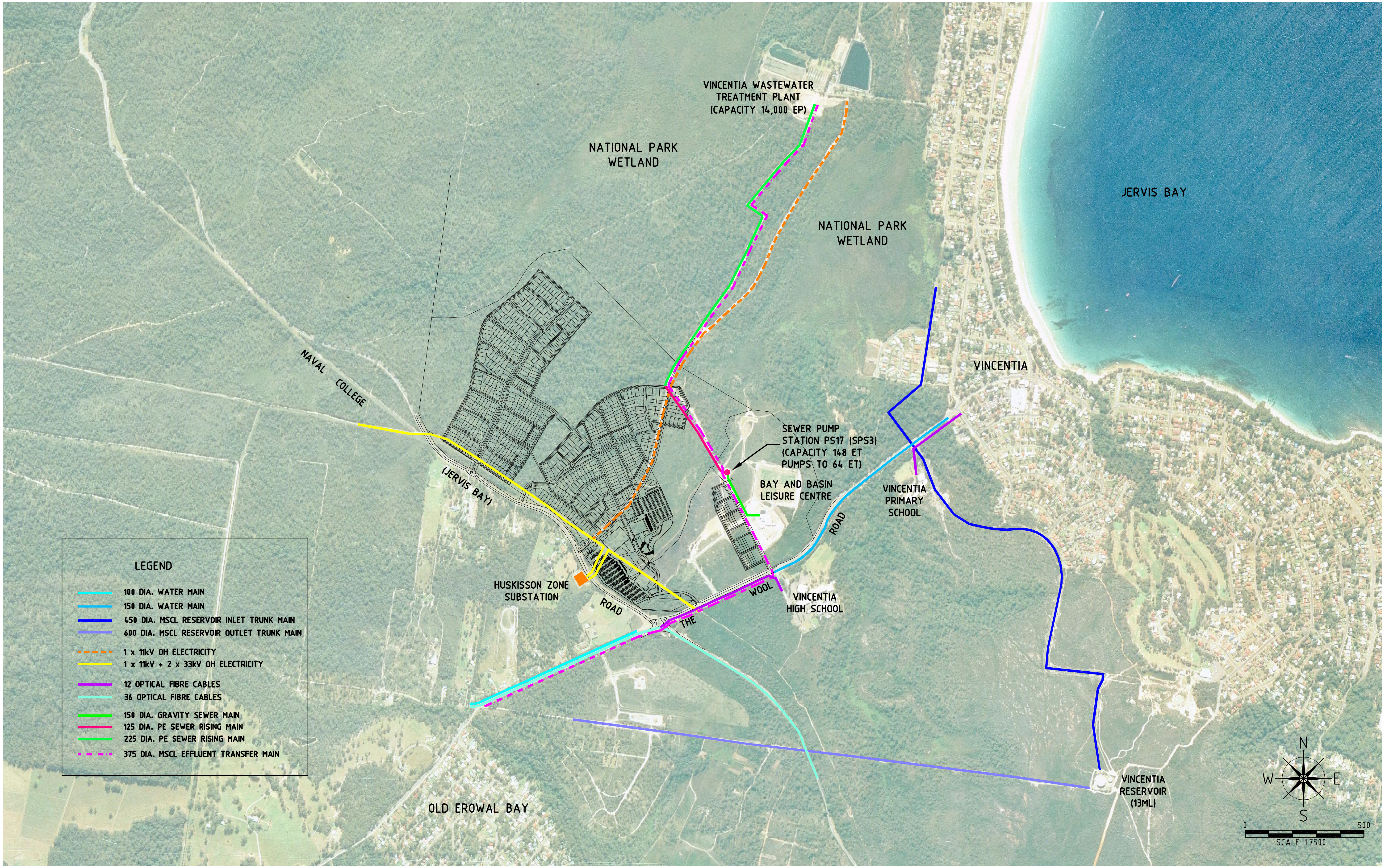
DEVELOPMENT LAYOUT PLAN


DISTRICT CENTRE
Naval College Road
The Wool Road

APPENDIX E

EXISTING EXTERNAL SERVICES LOCATION PLAN

DO NOT SCALE IF IN DOUBT ASK



REV	DATE	BY	APP.	DETAILS
1	17/12/04	ROH	MCW	AMENDED COMMERCIAL & VILLAGE EAST FOOTPRINT
2	21/12/05	CJG	MCW	LOT LAYOUT UPDATED

DRAWING STATUS		
DESIGN BY	B.J.B.	10/06/04
DRAWN BY	S.B./ROH	10/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/12/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

SCALE: (on A1 Original) 1:7500

HEIGHT DATUM AHD

FORBES RIGBY PTY LTD
Engineers Planners & Scientists
Quality Endorsed Company, ISO 9001 LIC QEC 10508, Standards Australia
Quality Systems
278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE

VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE for STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE

EXISTING EXTERNAL SERVICES LAYOUT PLAN

Project No.	Com No.	Drawing No.	REV
104016	4	4101	2

A1

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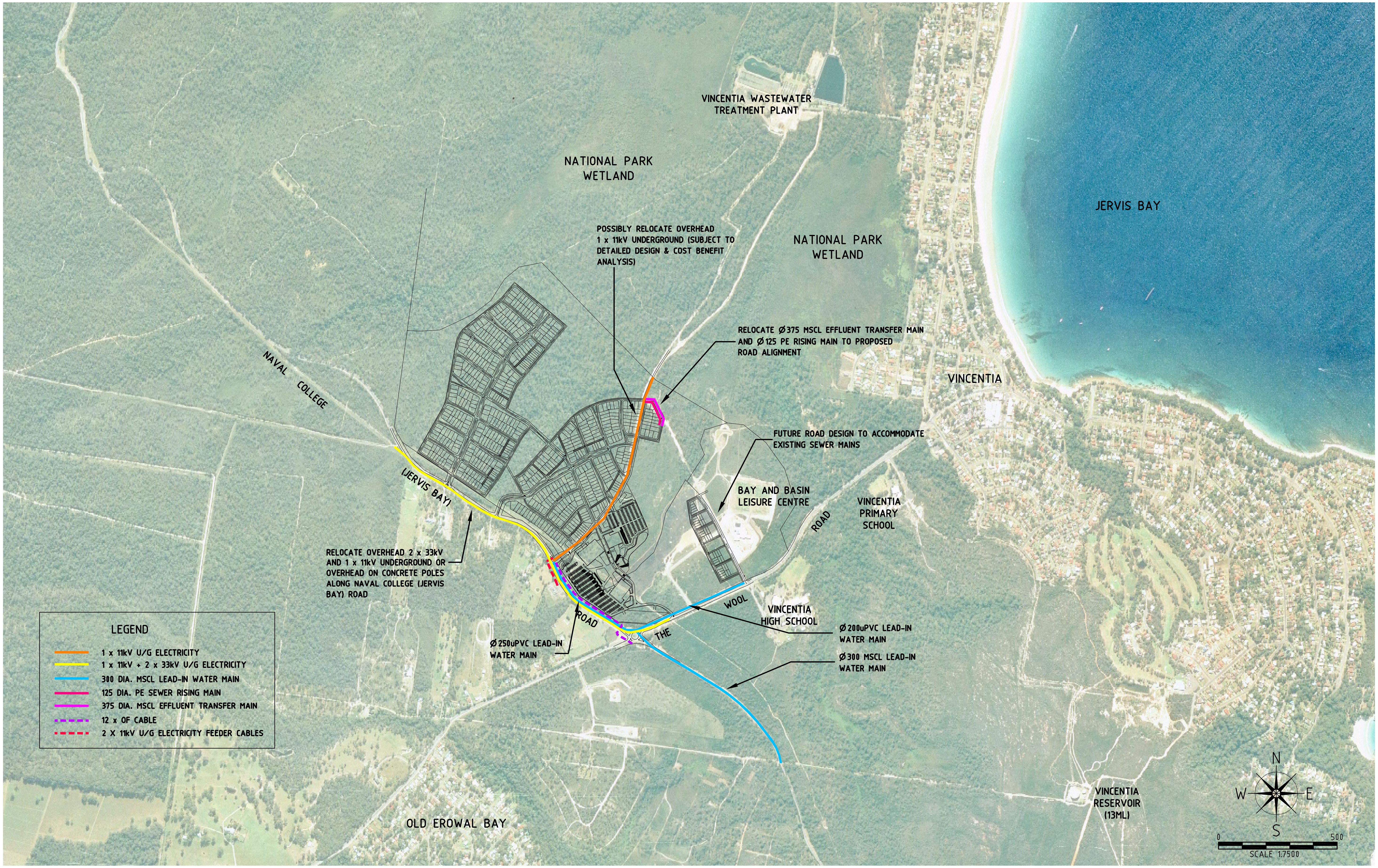
January 09, 2006 3:34:48 p.m.
Xrefs: x104016-04_External Services_text.DWG x-Vincentia Image_09-08-04.DWG x-104016-04_External Services.DWG x104016-04_base_3.DWG x-104016-04_External Services.DWG

APPENDIX F

PROPOSED EXTERNAL SERVICES LAYOUT AND RELOCATIONS PLAN

DO NOT SCALE IF IN DOUBT ASK



REV	DATE	BY	APP.	DETAILS
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2	21/12/05	CJG	MCW	LOT LAYOUT UPDATED

DRAWING STATUS		
DESIGN BY	B.J.B.	10/06/04
DRAWN BY	S.B./ROH	10/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/12/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

SCALE: (on A1 Original) 1:7500

HEIGHT DATUM AHD

FORBES RIGBY PTY LTD
Engineers Planners & Scientists
Quality Endorsed Company, ISO 9001 LIC QEC 10508, Standards Australia
278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE

VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE for STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE

PROPOSED EXTERNAL SERVICES LAYOUT AND RELOCATIONS PLAN

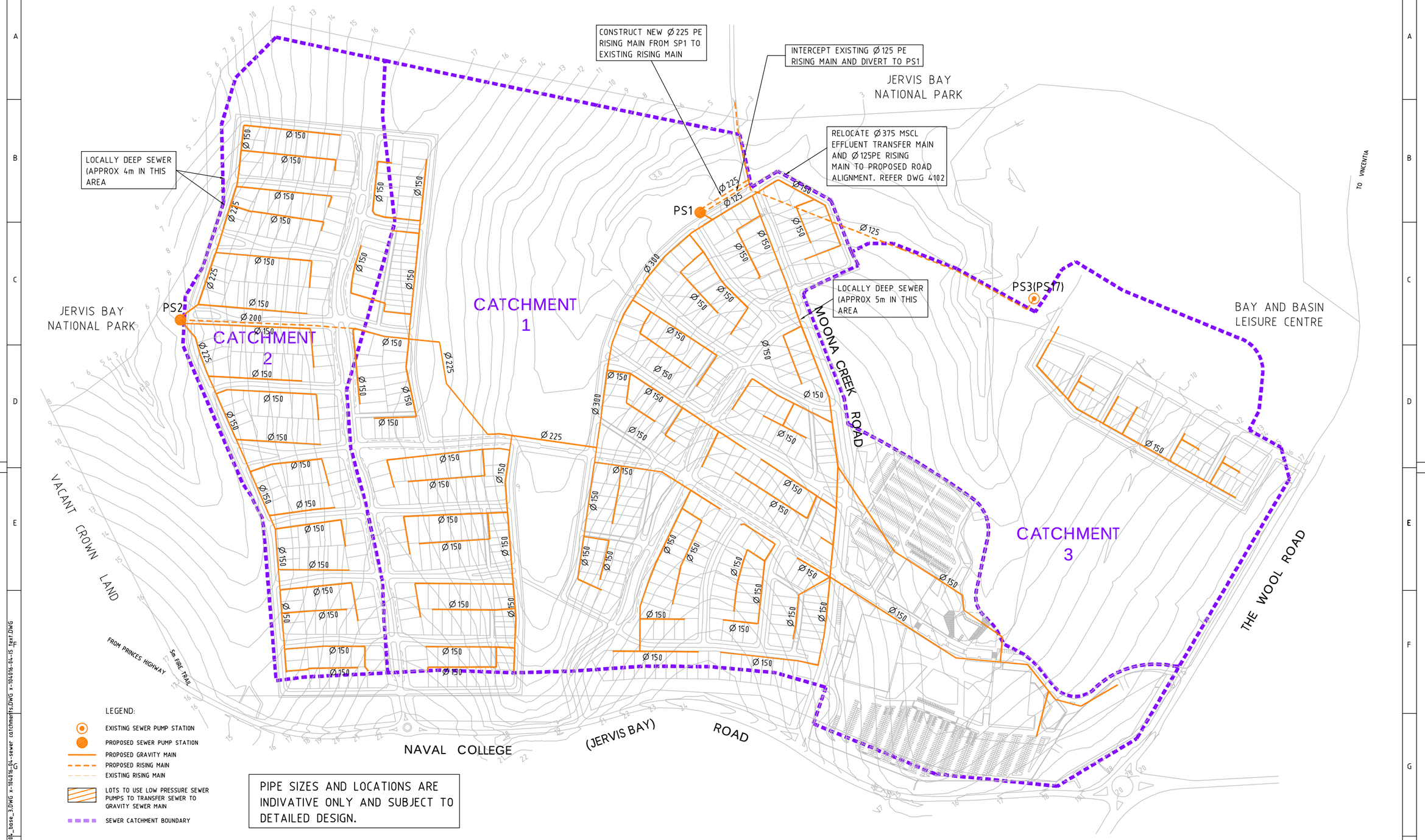
Project No.	Com No.	Drawing No.	REV
104016	4	4102	2

A1

APPENDIX G

PROPOSED RETICULATION SERVICES - SEWER

DO NOT SCALE IF IN DOUBT ASK



REV	DATE	BY	APP.	DETAILS
1	17/12/04	ROH	MCW	AMENDED COMMERCIAL & VILLAGE EAST FOOTPRINT
2	22/12/05	ROH		UPDATED LOT LAYOUT

DRAWING STATUS		
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DRAWN BY	ROH	11/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/12/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

SCALE: (on A1 Original) 1:2500

HEIGHT DATUM AHD

FORBES RIGBY PTY LTD
Engineers Planners & Scientists
Quality Endorsed Company, ISO 9001 LIC QEC 10508, Standards Australia
278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE
VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE
for
STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE
SEWER RETICULATION CONCEPT PLAN

Project No.	Com No.	Drawing No.	REV
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A1

APPENDIX H

PROPOSED RETICULATION SERVICES - WATER

DO NOT SCALE IF IN DOUBT ASK

PIPE SIZES AND LOCATIONS ARE INDIVATIVE ONLY AND SUBJECT TO DETAILED DESIGN.

REV	DATE	BY	APP.	DETAILS
1	17/12/04	ROH	MCW	AMENDED COMMERCIAL & VILLAGE EAST FOOTPRINT
2	20/12/05	ROH		LOT LAYOUT UPDATED

DRAWING STATUS		
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DRAWN BY	ROH	10/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/012/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

SCALE: (on A1 Original) 1:2500

HEIGHT DATUM AHD

FORBES RIGBY PTY LTD
Engineers Planners & Scientists
Quality Endorsed Company, ISO 9001 LIC QEC 10508, Standards Australia
278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE
VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE
for
STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE
WATER RETICULATION CONCEPT PLAN

Project No.	Com No.	Drawing No.	REV
104016	4	4104	2

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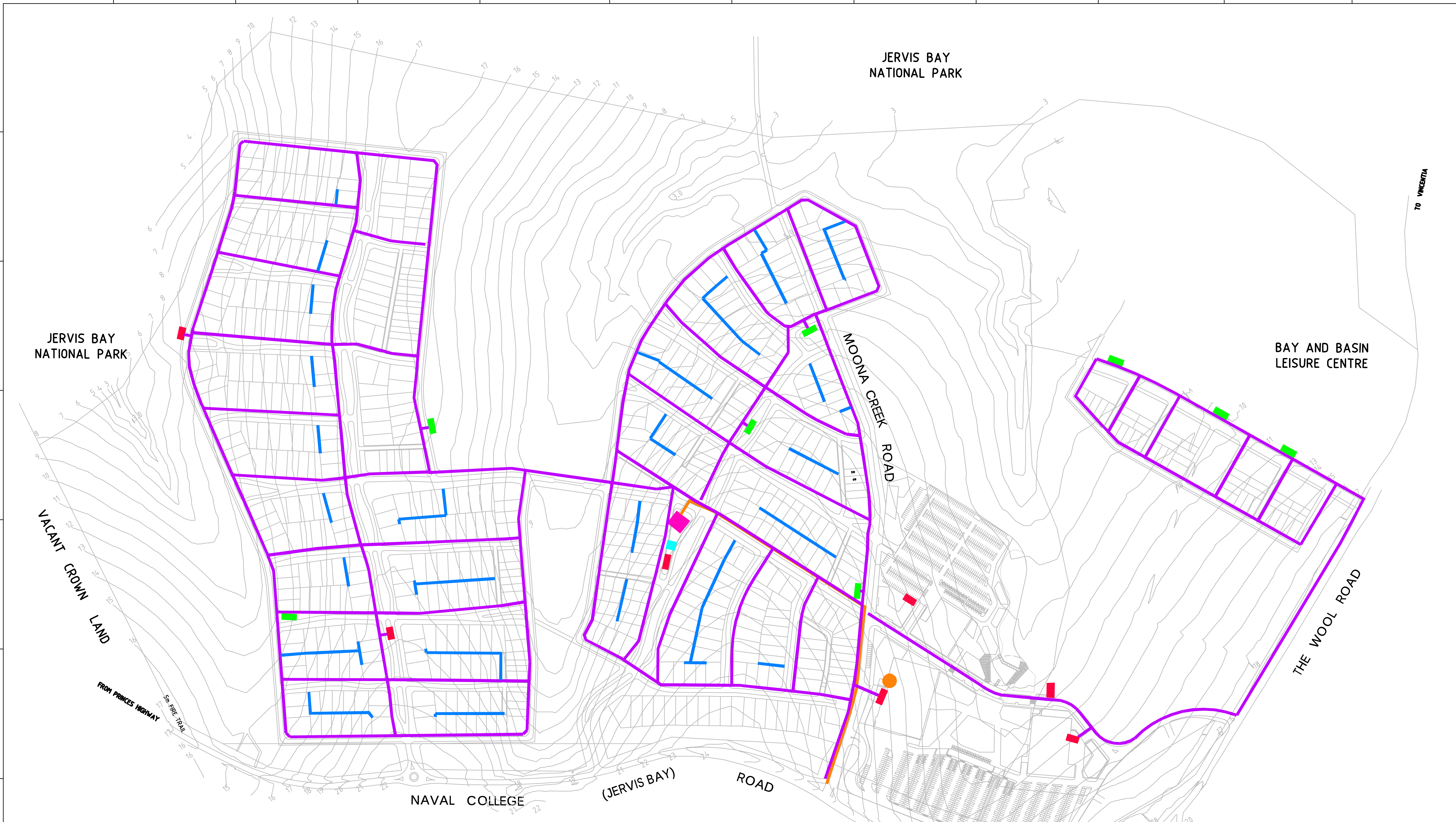
A1

APPENDIX I

PROPOSED RETICULATION SERVICES – ELECT, TELECOM, INTERALLOTMENT DRAINAGE

DO NOT SCALE IF IN DOUBT ASK



LEGEND

- COMBINED SERVICES
- INTERALLOTMENT DRAINAGE
- 2 x 11kV UNDERGROUND FEEDERS FROM HUSKISSON ZONE SUBSTATION
- 11kV SWITCHING STATION
- 500kVA PAD MOUNT SUBSTATION
- 300kVA PAD MOUNT SUBSTATION
- TEMPORARY TELECOMMUNICATIONS CMUX FOR RESIDENTIAL STAGE 1
- TELECOMMUNICATIONS MDF

NOTES
1.PAD MOUNT SUBSTATIONS TO BE LOCATED IN PUBLIC AREAS WITH APPROPRIATE LANDSCAPING.
2.UTILITY SERVICE LOCATIONS SUBJECT TO DETAILED DESIGN.

REV	DATE	BY	APP.	DETAILS
1	17/12/04	MCW		AMENDED COMMERCIAL & VILLAGE EAST FOOTPRINT
2	20/12/05	ROH		LOT LAYOUT UPDATED

DRAWING STATUS		
DESIGN BY	B.J.B.	09/06/04
DRAWN BY	S.B./ROH	10/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/12/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

SCALE: (on A1 Original) 1:2500

HEIGHT DATUM AHD

FORBES RIGBY PTY LTD
Engineers Planners & Scientists
Quality Endorsed Company, ISO 9001 LIC QEC 10508, Standards Australia
278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE
VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE
for
STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE
ELECTRICITY,TELECOMMUNICATIONS AND INTERALLOTMENT DRAINAGE CONCEPT PLAN

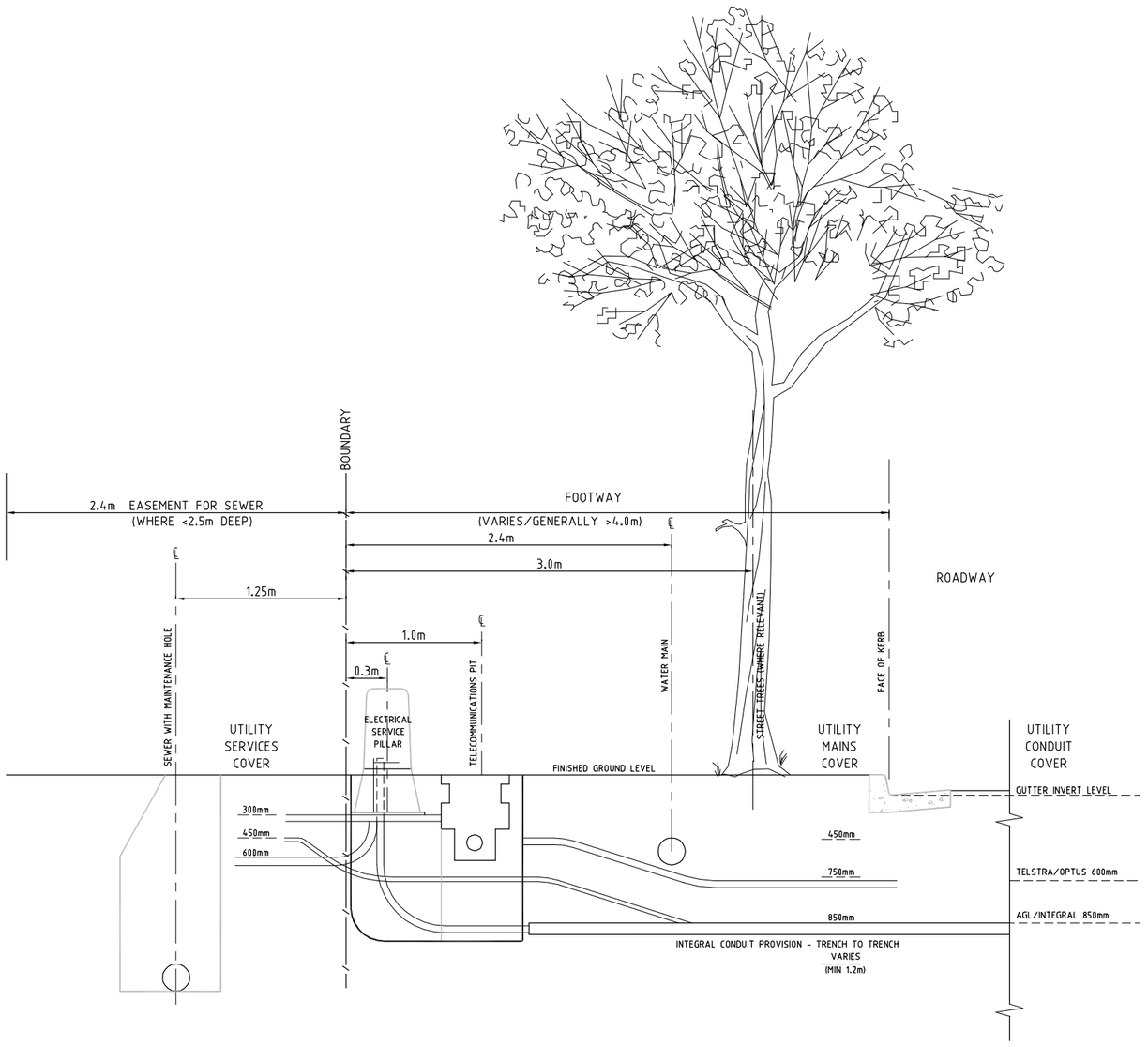
Project No.	Com No.	Drawing No.	REV
104016	4	4105	2

A1

APPENDIX J

PROPOSED SERVICES – FOOTWAY ALLOCATIONS

DO NOT SCALE IF IN DOUBT ASK



NOTES::

1. UNDERBORING AND TRENCHLESS TECHNOLOGY TO BE USED TO PRESERVE EXISTING TREES WHERE REQUIRED.
2. TREE ROOTS TO BE PROTECTED AND PRESERVED WHERE ENCOUNTERED IN SERVICE TRENCHES.
3. WHERE ELECTRICAL CABLES ARE DIRECT BURIED, A MECHANICAL PROTECTION BARRIER IS TO BE INSTALLED 75mm ABOVE H.V. & L.V. ELECTRICAL CABLES, WITH OVERLAP OF 40mm EITHER SIDE.
4. ALL BEDDING/BACKFILL IS TO SUIT RELEVANT AUTHORITY/UTILITY SPECIFICATIONS.
5. AT TELSTRA PIT LOCATIONS ARRANGEMENTS ARE MADE SO AS NOT TO HAVE GAS MAIN DIRECTLY BENEATH PIT.
6. ROAD CROSSING COVERS ARE AS PER RELEVANT UTILITY REQUIREMENTS. REFER DETAILS 3 & 4 ON IER.4-2.
7. TRENCH WIDTH MAY BE REDUCED TO 450mm IF THERE IS ONLY ONE TELECOMMUNICATION PROVIDER AND NO H.V. CABLES.

MANDATORY SEPARATIONS:

MANDATORY SEPARATION BETWEEN ALL SERVICES IS TO BE OBSERVED AS PER RELEVANT DETAILS.

MANDATORY SEPARATIONS BETWEEN GAS AND TELECOMMUNICATIONS ARE TO BE OBSERVED AT ALL TIMES. MINIMUM SEPARATIONS ARE AS FOLLOWS:
GAS MAINS 75mm DIA OR LESS - 150mm
GAS MAINS 110mm DIA OR GREATER - 300mm

MANDATORY SEPARATIONS OF 100mm BETWEEN TELECOMMUNICATIONS AND PROTECTED L.V. CABLES AND 300mm BETWEEN TELECOMMUNICATIONS AND PROTECTED H.V. CABLES IS TO BE MAINTAINED AT ALL TIMES.

MANDATORY SEPARATIONS OF 150mm BETWEEN GAS ANS L.V. CABLES AND 300mm BETWEEN GAS AND H.V. CABLES IS TO BE MAINTAINED AT ALL TIMES.

REV	DATE	BY	APP.	DETAILS
1	13/01/06	JL	MCW	AMMEND EASEMENT WIDTH TO 2.4m

DRAWING STATUS		
DESIGN BY	BJB	11/06/04
DRAWN BY	ROH	12/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/12/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

REFERENCE:
"UNDERGROUND SERVICES IN A SHARED TRENCH"-AGL GAS NETWORKS LIMITED, 1998

SCALE: (on A1 Original) 1:20

HEIGHT DATUM AHD

FORBES RIGBY PTY LTD
Engineers Planners & Scientists
Quality Endorsed Company, ISO 9001 LIC QEC 10508, Standards Australia
278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE
VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE
for
STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE
PROPOSED FOOTWAY ALLOCATIONS

Project No.	Com No.	Drawing No.	REV
104016	4	4106	1

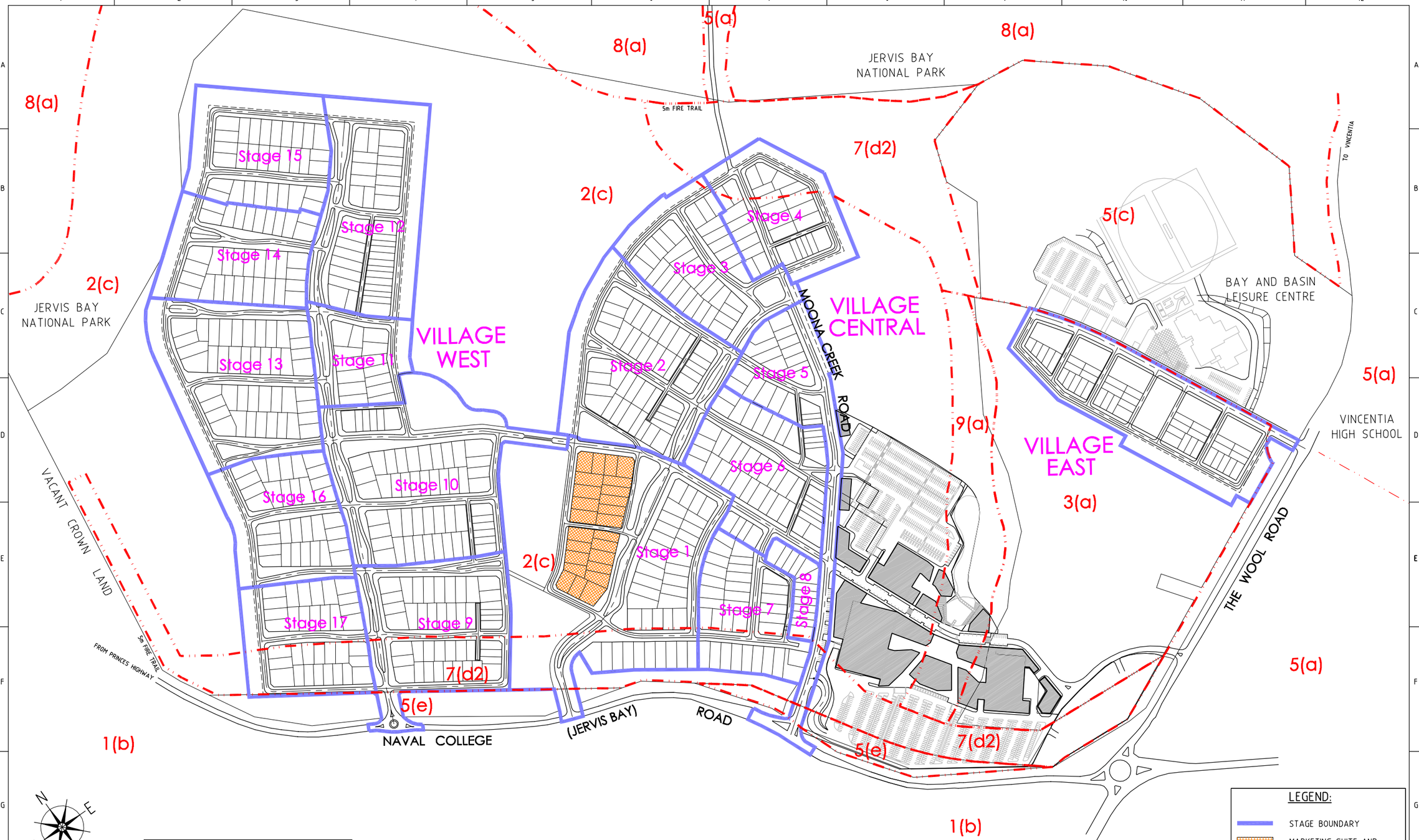
File Plotted: U:\2984\104-016-04 - VINCENTIA DISTRICT CENTRE - CIVIL ENG'G & INFRASTRUCTURE\DRAWING\BUILD\4106-FOOTWAY ALLOCATIONS.DWG
January 13, 2006 11:25:54 a.m.

A1

APPENDIX K

STAGING PLAN

DO NOT SCALE IF IN DOUBT ASK



N E S W

0 125
SCALE 1:2500

STAGING BOUNDARIES MAY CHANGE SUBJECT TO DETAILED DESIGN AND MARKENTING DEMAND.

LEGEND:
- STAGE BOUNDARY
- MARKETING SUITE AND DISPLAY VILLAGE
- EXISTING ZONING BOUNDARY

REV	DATE	BY	APP.	DETAILS
1	20/12/04	CJG	MCW	AMENDED COMMERCIAL & VILLAGE EAST FOOTPRINT
2	21/01/05	CJG	MCW	LOT LATOUT UPDATED
3	27/01/06	CJG	MCW	FOOT PRINT, TITLE, LENGEND AND LOT LAYOUT UPDATED
4	01/02/06	CJG	MCW	STAGING BOUNDARYS UPDATED
5	02/02/06	CJG	MCW	FOOT PRINT HATCH ADDED

DRAWING STATUS		
DESIGN BY	BJB	09/06/04
DRAWN BY	ROH	10/06/04
DRAFTING CHECK	PJS	10/12/04
DESIGN CHECK	MCW	10/12/04
FINAL APPROVAL	MCW	10/12/04

FOR APPROVAL

SCALE: (on A1 Original) 1:2500

HEIGHT DATUM AHD

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PROJECT TITLE
VINCENTIA COASTAL VILLAGE AND DISTRICT CENTRE
for
STOCKLAND DEVELOPMENTS PTY LTD

DRAWING TITLE
PROPOSED STAGING PLAN

Project No.	Com No.	Drawing No.	REV
104016	4	4107	5

File Plotted: U:\2004\104-016-04 - VINCENTIA DISTRICT CENTRE - CIVIL ENG'G & INFRASTRUCTURE\DRAWING\BUILD\4107 - PROPOSED STAGING PLAN.DWG
February 14, 2006 11:43:10 a.m.
Xrefs: x104016-04_base_3.DWG

A1