Your Ref: 25405-210
Our Ref: AKH16.095

19 September 2022

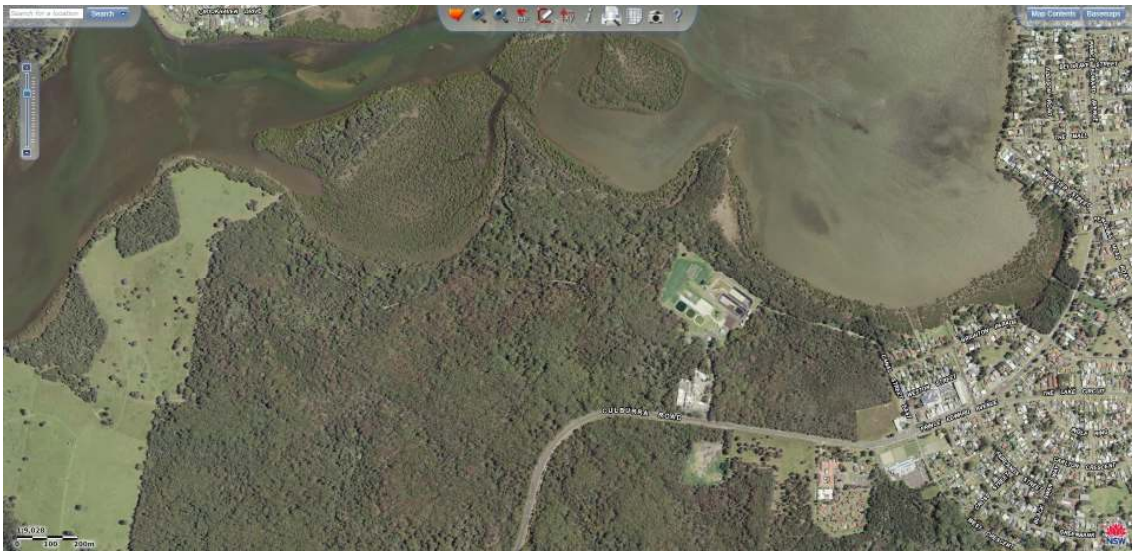
Sealark Pty Ltd
C\- Allen Price & Scarratts Pty Ltd
75 Plunkett Street
Nowra
NSW 2535

Brionai,

ELECTRICITY SUPPLY STRATEGIC REVIEW
WEST CULBURRA MIXED USE CONCEPT PLAN

On 1 December 2020, the NSW Land and Environment Court issued a Development Consent to the West Culburra Mixed Use Concept Plan. The West Culburra Mixed Use Concept Plan includes mixed use, residential, medium density, recreation and light industrial works on the site

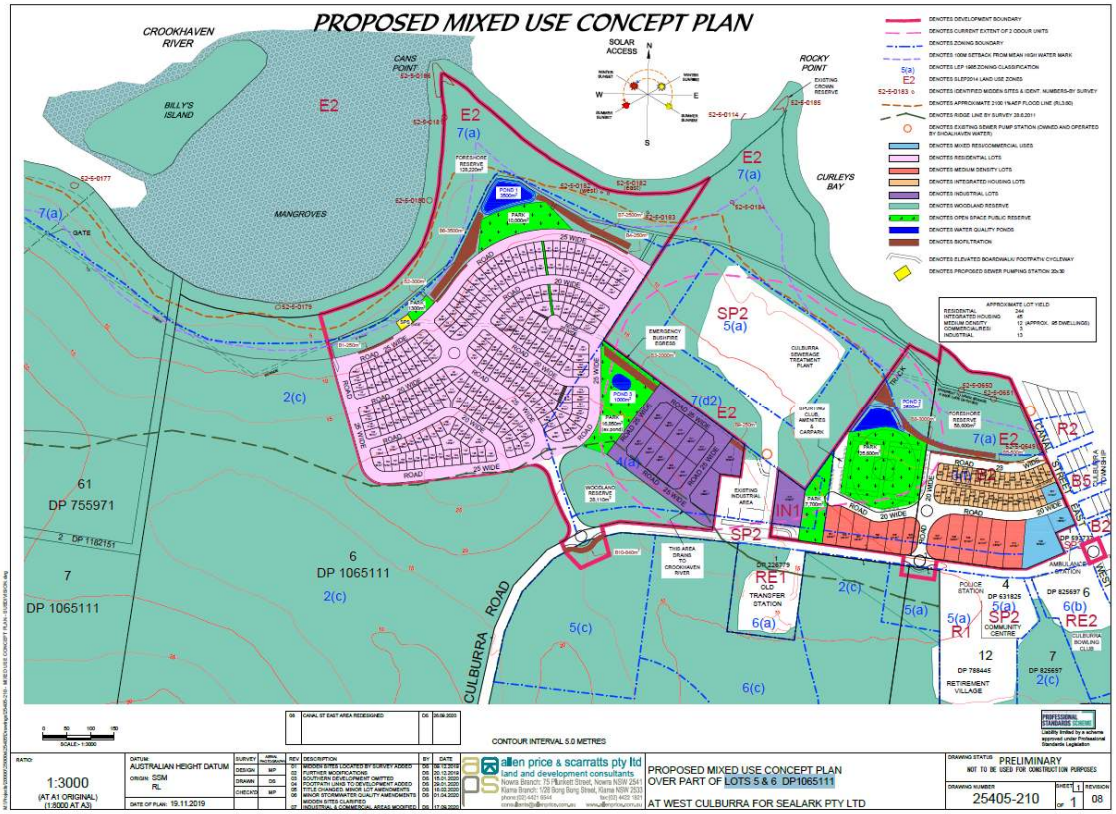
Condition A12 of the Development Consent requires Staging Plans to be prepared which includes conceptual designs for various services including electricity



Aerial View

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541



Proposed Mixed Use Concept Plan **(Annexure A)**

It is understood that the above plan from Allen Price & Scarratts is a concept only and is part of a consent issued by the NSW Land and Environment Court. A staging plan for the development has been provided **(Annexure B)**

A conceptual design for the likely required electrical services for the rezoning has been created based on Endeavour Energy's standard load requirements for Residential, Medium Density, Integrated Housing, Commercial and Industrial lots. It is noted that the road and lot layout are a concept and yet to be approved.

As part of the works to achieve the consent issued by the NSW Land and Environment Court it is understood that a technical enquiry was submitted to Endeavour Energy. It is noted that the layout has already changed to that which was submitted as part of the Techinial Enquiry ENL3632 (**Annexure C)**

I have had further correspondence with Gavin De Hossen Endeavour Energy's Network Planning Manager in relation to the proposed development with respect

- The likely loading requirements for development
- The likely staging of the development
- Future likely 33kV Feeder zone Substation funding and construction requirements by Endeavour Energy at an appropriate time in the staging of the development

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

An application for subdivision and proposed method of supply was sent to Endeavour Energy CAP No URS27231. A design brief was issued **(ANNEXURE D)** by Endeavour Energy on the 30/8/2022 agreeing with the preliminary design for the proposed method of supply for Stage 1 of the development. Endeavour energy agree there is sufficient capacity in the existing high voltage distribution network to supply the requirements of the initial stages of the development

The required Lots as per the Concept Design Area shows a mixed use development and consists of the following Lots

- 244 residential Lots
- 13 industrial Lots
- 12 medium density Lots (95 dwellings)
- 45 integrated housing Lots
- 3 commercial/residential Lots

The image below shows the existing overhead 11000V high voltage network surrounding the site. This includes the existing high voltage open wire overhead network that is located on the south and eastern side of the development.

Site and Endeavour Energy High Voltage Network

The technical enquiry ENL3632 response from Endeavour Energy indicated that it may be possible to provide approximately 1MVA of supply to the initial development from 11kV feeder CLC2. This will depend on actual commencement date of the development and load assessment at that time.

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

Endeavour Energy have standard requirements for load provision for varying types of development.

- Residential Lots > 350 sq m = 6.5kVA ADMD per lot
- Residential Lots < 350 sq m = 5kVA ADMD per lot
- Units 3.5kVA ADMD per unit
- Industrial Lots 40VA / sq m (Aligns with Table C3 of AS3000)
- Commercial Lots 100VA / sq m (Aligns with Table C3 of AS3000)

The above factors have been utilized to determine site loading for each of the subdivision areas thus determining a total load for the entire site.

Use	No	Applied Load	Area (m^2)	KVA
Residential	244	6.5kVA ADMD	N/A	1586
Industrial	13	40VA / sq m	32901	1316
Medium Density	12 (95 dwelling)	5kVA ADMD	N/A	475
Integrated Housing	45	3.5kVA ADMD	N/A	168
Commercial Residential	3	100VA / sq m	9743	879
			Total	4424kVA

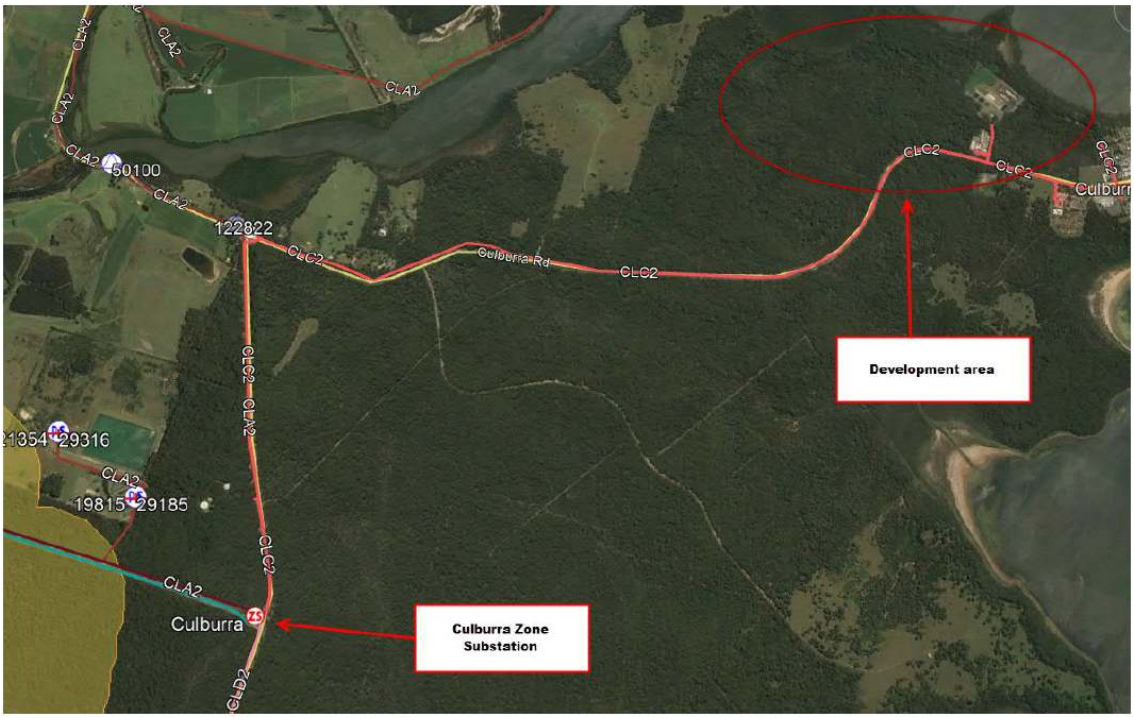
It is to be noted that the load figures for the required Commercial Residential may vary from the figures above dependent on the final percentage of the Residential to Commercial Area per lot as per final DA approvals etc.

The ENQ ENL3632 response from Endeavour states

- Exact determination of what Endeavour Energy can provide from feeder CLC2 will be determined upon submission of an Application for Subdivision. Endeavour Energy may be able to analyze closer as to whether we can accommodate more load from 11kV feeder CLC2.
- The masterplan indicates there will be future development. Based on the prospective loads being greater than the 1MVA available from 11kV feeder CLC2, A new 33kV/11kV zone substation will be required.
- Negotiations with Endeavour Energy Capacity Planning Manager Jason Lu (98535003) will be required to obtain a zone substation site approximately 40m wide and 60m deep. In addition to this, establishment of a 33kV overhead line will be required from Culburra Zone Substation to new 33kV/11kV zone substation.

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541



Showing Culburra Zone Substation with prospective 33kV feeder route to development area

It is noted that the ENQ sets out

All works on this project with relation to 11kV feeder CLC2 be contestable and will be customer funded and constructed

The 11kV works to extend the high voltage (11kV) network throughout the various subdivision areas including interconnection to the feeder and reticulation from pad substation to pad substation will be customer funded and constructed as per all similar subdivisions.

As the prospective load (4.43MVA) for the site is in excess of the available 1MVA of load in the existing 11kV feeder CLC2 a Zone substation site will be required to be provided and gifted to Endeavour Energy as per the requirements of the Technical Enquiry. Is envisaged that this would be likely to be Lot 302 of the Industrial Lots. It will be determined by Endeavour Energy capacity planning to determine the timeline for construction of the required 33kV feeder and Zone Substation.

As developers load is <10MVA the 33kV works including the extension from the Culburra Zone Substation and the required New Zone Substation Construction would be Endeavour Energy Funded and Constructed.

Endeavour Energy's current requirements for new subdivisions are the provision of underground power which includes high voltage, low voltage and street light infrastructure.

Underground reticulation within the site will require a connection or connection points to the existing high voltage 11000V network. Pad substations will then be required to be installed to supply the required low voltage reticulation though to the final development layout.

Endeavour Energy will require that these pad substations be installed as part of a ring main system

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

so that the pad substations and hence the subdivision are able to be suppled from two different points in times of maintenance of emergency. The final design layout combined with Endeavour Energy Planning requirements will determine the final connection points to the existing network.

The residential sections of the development will require emergency ties to be created between low voltage circuits of adjacent pad substation so that the load may be shifted to another pad substation in times of emergency/maintenance works.

Easements will need to be created and registered over Endeavour Energy assets that are not located within public road reserves within the development.

Endeavour Energy Distribution network feeder CLC2 exists on Culburrra Road which would be the connection point for the initial stages of the residential component. As per the technical enquiry response there is the potential for up to 1MVA to be able to be supplied. Based on the residential staging requirement and load per Lot, an existing spare capacity of 1MVA has the potential for approximately 130 Lots

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

The Design Brief for URS27231 **(Annexure D)** indicated that the AKH Design L3 ASP proposal was acceptable and that there is sufficient capacity in the 11kV feeder for CLC2 for the proposed stage 1 load

30 August 2022

Endeavour Energy Ref: URS27231
Customer Ref:

Design Brief

Method Of Supply Requirement:

The L3 ASP proposal is acceptable, there is sufficient capacity in nearby 11kV feeder CLC2 Culburra ZS to support the proposed stage 1 load.

Reference to be made to the PMOS Sketch.

1. Replace pole 1 terminate HV establish HUGOH.
2. Replace pole 5 terminate HV establish HUGOH .
3. A 1.2m road widening will be required along Culburra along the ug route to new road as there are existing Telstra assets in the standard EE alignment.
4. Install & remove poles as per the pole schedule in the PMOS.
5. Establish 500kVA pad sub 1 on residue lot 39 as shown
6. Pad sub 1 is to have RTR HV switchgear and FFIFF Cat 1 LV switchgear.
7. Establish 500kVA pad sub 2 on public reserve lot 38 as shown
8. Pad sub 2 is to have RTR HV switchgear and FFIFF Cat 1 LV switchgear.
9. Install HV LV and SL trenching as shown
10. Install road crossings and ducts as per the duct breakup table and MCI0006.
11. Lay 1 x 3c 240mm sq AL/XLPE/HDPE cable from HUGOH on pole 1 to new pad sub 1
12. Lay 1 x 3c 240mm sq AL/XLPE/HDPE cable from new pad sub 1 to new pad sub-2
13. Lay 1 x 3c 240mm sq AL/XLPE/HDPE cable from new pad sub 1 to new pad sub-2.
14. Removed overhead conductors and poles between pole 2 and pole 5.
15. Install pillars and link pillars as per the site plan and final LV circuit.
16. Lay 1 x 4c 240mm sq AL/XLPE/PVC cable from pad sub 1 &2 to the pillars as per the Final LV circuit.
17. Install earths on link pillars and any end of circuit LV mains pillars.
18. Any required service works to be undertaken by accredited level 2 service provider in accordance with AS3000 and the NSW service rules.
19. Install columns and lanterns as per the certified lighting design, street lighting table and final LV/SL circuit. Install 16a fuse cartridges in LV pillars as per drawing 280143D where PE cell-controlled SL terminates.
20. Create required easements and restriction zones as required.
21. Complete all restoration works and outline all Environmental and Community risks to be mitigated in the Endeavour Energy SER document.

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

An overall concept for the residential component shows 4 substations, where possible these have been placed in parkland to minimize impact on the already relatively small lot sizes

1. Standard Pad substation sizes for urban subdivision are 500kVA which can be loaded to 90% thus giving a 450kVA usable capacity.
2. New residential lots in urban subdivision are to be allowed at 6.5kVA ADMD
3. Lot yield per substation in ideal circuit design conditions = 69 Lots
4. It is understood that the sewer for the lots will be by way of low-pressure sewer system from each dwelling these loads are small and would be part of each individual lot load connected to the MSB and have not been considered as an additional load .
5. Based on the layout 244 lots are required to be serviced. Four 500kVA pad substations would be required to supply the total development. This will give sufficient spare capacity to supply any park areas if required
6. Emergency ties are required between low voltage circuits of adjacent pad substation so that the load may be switched to another pad substation in times of emergency/maintenance

The concept is indicative based on the provided layout and will require amendment to suit the final lot yield and layout

Concept Residential Area – 4 x 500-kVA Pad Substations for the residential component of the development **(Annexure E)**

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

An overall concept for the industrial component shows 2 substations, these have been placed on the larger lots

1. Standard Pad substation sizes for industrial subdivision are 1000kVA which can be loaded to 90% thus giving 900kVA usable capacity.
2. New industrial lots are allowed at 40VA/sq m
3. Based on the road layout 12 lots are required and the required load is 1316kVA. Two 1000kVA pad substations would be required to supply the industrial development.
4. It is envisaged that the future required Zone Substation would be established on Lot 302

The concept is indicative based on the provided layout and will require amendment to suit the final lot yield and layout. There is substantial scope to change the required pad substation location within the industrial area to suit the final design layout

Concept Industrial Area - 2 x 1000-kVA Pad Substations for the Industrial Area with Prospective Zone Substation Shown on lot 302 **(Annexure F)**

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

An overall concept for the Medium Density, Integrated Housing and Mixed Use Residential Commercial areas component shows 2 substations

1. Standard Pad substation sizes for mixed use subdivision are 1000kVA which can be loaded to 90% thus giving 900kVA usable capacity.
2. New Commercial Residential lots are allowed at 100VA / sq m
3. New Medium Density lots are allowed at 5kVA DMD per Lot
4. New Integrated Housing lots (units) are allowed at 3.5kVA DMD per Lot
5. Based on the road / lot layout the required load is 1522kVA. Two 1000kVA pad substations would be required to supply this section of the development. This would give sufficient spare capacity to supply the sporting field lighting and amenities.

The concept is indicative based on the provided layout and will require amendment to suit the final lot yield and layout. There is substantial scope to change the required pad substation location within the Medium Density, Integrated Housing and Mixed Use Residential Commercial areas to suit the final design layout

Concept 2 x 1000kVA pad substations for the Medium Density, Integrated Housing and Mixed Use Residential Commercial areas **(Annexure G)**

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

An overall concept for the high voltage reticulation is shown based on a new Zone Substation being established on new Lot 302 in the industrial area.

Endeavour Energy require pad substations to be installed on a ring to facilitate interconnection and allow the asset to be fed from either direction in the case of emergency or maintenance works on parts of the feeder.

Loading calculations and concept designs for the Residential, Medium Density, Mixed Use Commercial and Integrated Housing show 8 pad substations will be required to supply the development. It is likely this will be 4 x 1000kVA and 4 x 500kVA pad substations, a total of 6MVA with actual loading of closer to 4.4MVA . These will be split over multiple feeders created from the new zone substation arrangement.

The concept is indicative based on the provided layout and will require amendment to suit the final layout, zone substation location and tie into the existing overhead network. Dependent on staging and the establishment of the Zone Substation there are many interconnection options for the pad substations

Concept HV reticulation to proposed pad sub sites **(Annexure H)**

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

EARTHING

It is noted that the residential component which will be in the earlier stages of the construction is separated from the main body of Endeavour Energy MEN (Dense Interconnected Low Voltage Network) for the purpose of earthing the new high voltage pad substation assets required for the development.

It is likely that pad substation in the first stages will be required to be a high impedance insulated separate earth design to compensate for the lack of interconnection to the MEN of Culburra.

Generally this involves an insulated pad substation construction **(Annexure I)** and deep bored high voltage electrodes to be installed to mitigate the prospective fault levels around the pad substations

This will require a specialist earth design from Safearth to achieve the required dispensation compliance from Endeavour for these types of Installations. This is generally not an issue and a relatively standard process for these new isolated urban pockets.

Dependent on the staging, and prospective costs of the high impedance insulated separate earth design, it may be possible to interconnect to the existing low voltage network of Culburra in the early stages to establish common earthing at the site. This will be investigated in detailed staging design for the initial residential stages

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

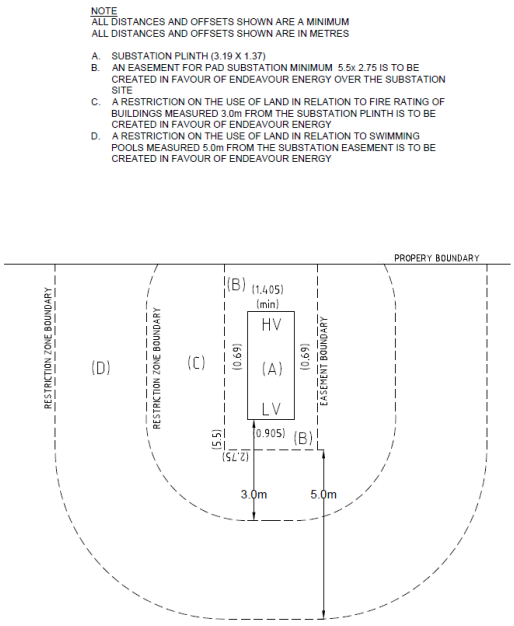
EASEMENTS & RESTICTIONS

Standard Easements and restriction zones will be required to be created over the pad substation sites within the development. These consist of

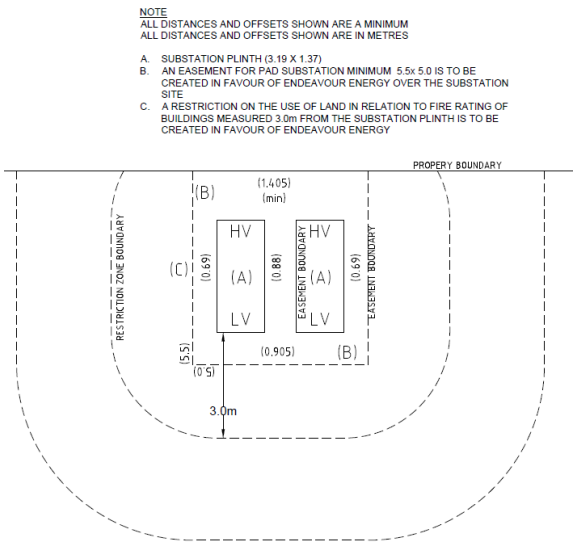
- An easement surrounding the pad substation (Size 2.75 x 5.5)
- A building restriction zone (fire rating) Measured 3m from the substation plinth
- A building restriction zone (swimming pools) Measured 5m from the substation easement

Endeavour Energy Detailed requirements are shown in

Annexure I Substation Easements
Annexure J MCI 0006 Substation Site Requirements



Single Pad Subs Easement Arrangement



Twin Pad Subs Easement Arrangement

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

AKH Design Services do not see any supply issues for this subdivision, other than the 1MVA initial limitation of Feeder CLC2 capacity set out in the Endeavour Energy Technical Enquiry Response.

The design brief for URS27231 stage 1 indicates that there is sufficient capacity int eh existing 11kV feeder CLC2 for the proposed stage 1 load

There will still be the ability to establish some additional lots above the stage 1 load (37 lots) probably up to 90 additional in the residential component before the required zone substation upgrade needs to be brought online. To make best use of these additional lots it may be prudent to look at the staging order once stage 1 is designed

There are connection points available to the existing 11000V overhead high voltage network feeder CLC2 and the initial connection would be made to that feeder.

Should you require any further information in regard to these matters please do not hesitate to call.

Yours Faithfully

Paul Hamilton

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

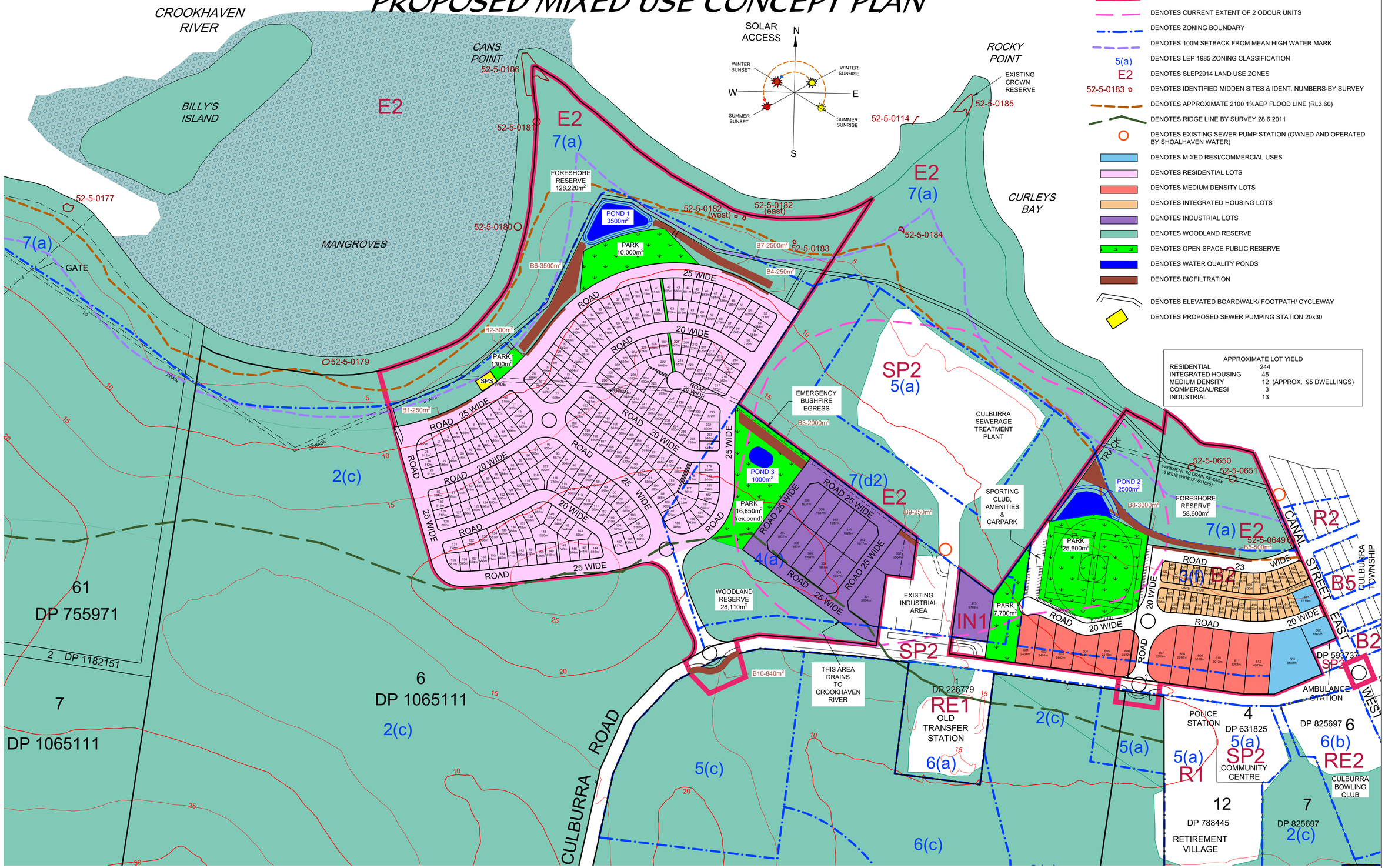
4 Barbata Grove
South Nowra, NSW 2541

ANNEXURE A

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

PROPOSED MIXED USE CONCEPT PLAN



DENOTES DEVELOPMENT BOUNDARY
DENOTES CURRENT EXTENT OF 2 ODOUR UNITS
DENOTES ZONING BOUNDARY
DENOTES 100M SETBACK FROM MEAN HIGH WATER MARK
5(a) DENOTES LEP 1985 ZONING CLASSIFICATION
E2 DENOTES SLEP2014 LAND USE ZONES
52-5-0183 DENOTES IDENTIFIED MIDDEN SITES & IDENT. NUMBERS-BY SURVEY
DENOTES APPROXIMATE 2100 1%AEP FLOOD LINE (RL3.60)
DENOTES RIDGE LINE BY SURVEY 28.6.2011
DENOTES EXISTING SEWER PUMP STATION (OWNED AND OPERATED BY SHOALHAVEN WATER)
DENOTES MIXED RESI/COMMERCIAL USES
DENOTES RESIDENTIAL LOTS
DENOTES MEDIUM DENSITY LOTS
DENOTES INTEGRATED HOUSING LOTS
DENOTES INDUSTRIAL LOTS
DENOTES WOODLAND RESERVE
DENOTES OPEN SPACE PUBLIC RESERVE
DENOTES WATER QUALITY PONDS
DENOTES BIOFILTRATION
DENOTES ELEVATED BOARDWALK/ FOOTPATH/ CYCLEWAY
DENOTES PROPOSED SEWER PUMPING STATION 20x30

APPROXIMATE LOT YIELD

RESIDENTIAL	244
INTEGRATED HOUSING	45
MEDIUM DENSITY	12 (APPROX. 95 DWELLINGS)
COMMERCIAL/RESI	3
INDUSTRIAL	13

0 50 100 150
SCALE:- 1:3000

CONTOUR INTERVAL 5.0 METRES

08	CANAL ST EAST AREA REDESIGNED	DS	28.09.2020

PROFESSIONAL STANDARDS SCHEME
Liability limited by a scheme approved under Professional Standards Legislation

RATIO: 1:3000 (AT A1 ORIGINAL) (1:8000 AT A3)

DATUM: AUSTRALIAN HEIGHT DATUM
ORIGIN: SSM RL
DATE OF PLAN: 19.11.2019

SURVEY	AERIAL PHOTOGRAPHY
DESIGN	MP
DRAWN	DS
CHECK'D	MP

REV	DESCRIPTION	BY	DATE
01	MIDDEN SITES LOCATED BY SURVEY ADDED	DS	09.12.2019
02	FURTHER MODIFICATIONS	DS	20.12.2019
03	SOUTHERN DEVELOPMENT OMITTED	DS	15.01.2020
04	FOOTPATH LINKS TO DEVELOPMENT ADDED	DS	29.01.2020
05	TITLE CHANGED. MINOR LOT AMENDMENTS	DS	18.02.2020
06	MINOR STORMWATER QUALITY AMENDMENTS MIDDEN SITES CLARIFIED	DS	01.04.2020
07	INDUSTRIAL & COMMERCIAL AREAS MODIFIED	DS	17.09.2020

allen price & scarratts pty ltd
land and development consultants
Nowra Branch: 75 Plunkett Street, Nowra NSW 2541
Kiama Branch: 1/28 Bong Bong Street, Kiama NSW 2533
phone:(02) 4421 6544 fax:(02) 4422 1821
consultants@allenprice.com.au www.allenprice.com.au

PROPOSED MIXED USE CONCEPT PLAN
OVER PART OF LOTS 5 & 6 DP1065111

AT WEST CULBURRA FOR SEALARK PTY LTD

DRAWING STATUS: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DRAWING NUMBER: 25405-210
SHEET 1 OF 1
REVISION 08

M:\Projects\200000\25000s\25405\Drawings\25405-210 - MIXED USE CONCEPT PLAN - SUBDIVISION.dwg

ANNEXURE B

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

ANNEXURE C

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

20 February 2020

Endeavour Energy Ref: ENL3632 – 2014/02306/001

Allen Price & Scarratts Pty Ltd
PO Box 73
NOWRA NSW 2541

Attention: Matt Philpott

TECHNICAL ENQUIRY REVIEW

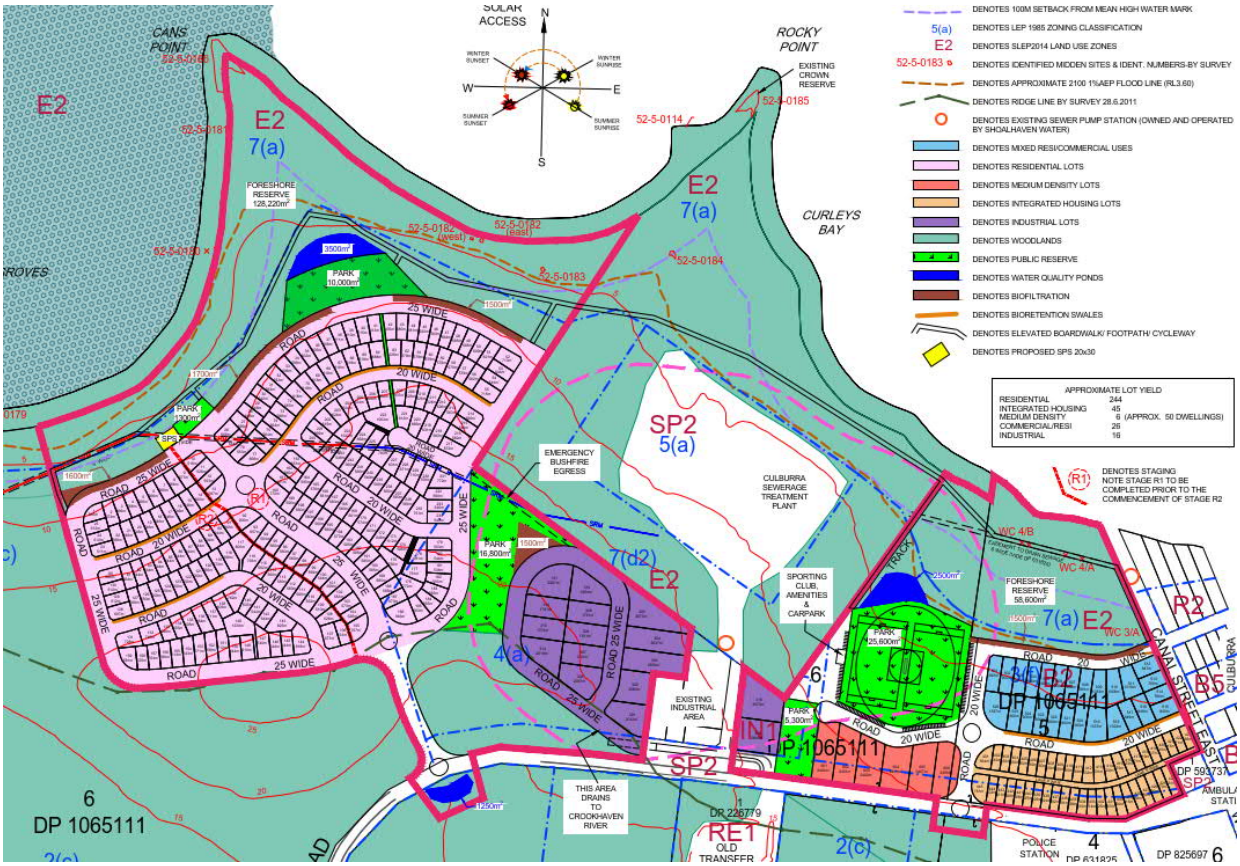
ENL3632 – LOT 5 & 6, DP 1065111, Off Culburra Road, WEST CULBURRA BEACH

Thank you for your enquiry application and the payment of fees to facilitate the enquiry request at the above location. Your application has been registered under ENL3632. Please quote this reference number on all future correspondence.

Your enquiry requires a load assessment for subdivision based on revised subdivision plan.

Proposed mixed-use subdivision consists of the following Lots with the following estimated maximum demands;

- 244 residential Lots (>350sqm @ 6.5kVA per Lot or 1.6MVA)
- 16 industrial Lots (<3500sqm Lot size @ 144kVA per Lot or 2.3MVA)
- 6 medium density Lots(50 multi-dwellings at 3.5kVA per unit or 175kVA)
- 45 integrated housing Lots (3.5kVA per Lot or 157.5kVA)
- 26 commercial/residential Lots (this load will be dependent on type of commercial development and has not been estimated at this stage)

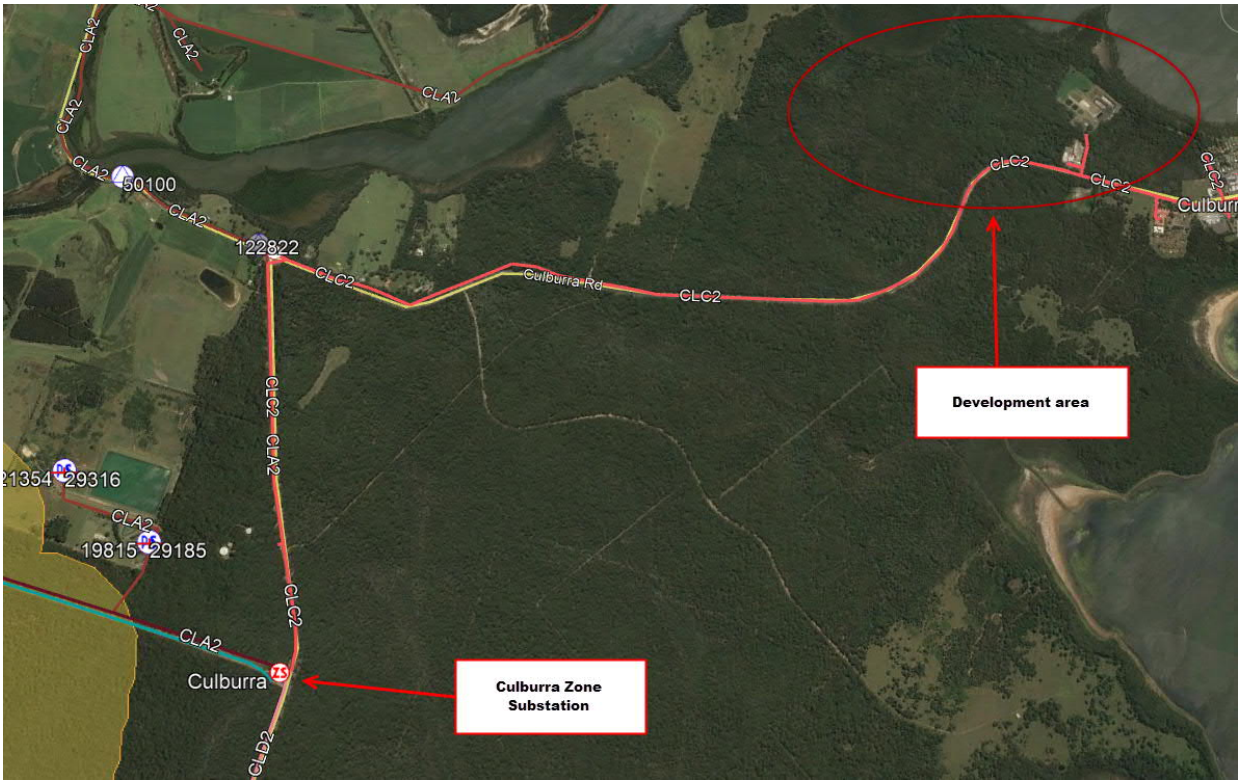


The development is situated in an existing 11kV network area. There is one nearby 11kV feeder in close proximity to the site;

- Existing 11kV feeder available is CULBURRA - Culburra - CLC2. It has a 2019 winter peak reading of 218A

Based on above 11kV feeder max values, it may be possible to provide approximately 1MVA supply to the initial development from 11kV feeder CLC2. This depends on actual commencement date of the development and load assessment. Exact determination of what Endeavour Energy can provide from feeder CLC2 will be determined upon submission of an Application for Subdivision. Endeavour Energy may be able to analyse closer as to whether we can accommodate more load from 11kV feeder CLC2. This development may look to consider non-network solutions to assist with load provision to the development.

Masterplan provided also suggests there will be future development. Ultimately, if supply cannot be provided from 11kV feeder CLC2, then a new 33kV/11kV zone substation will be required. Negotiations with Endeavour Energy Capacity Planning Manager Jason Lu(9853 5003) will be required to obtain a zone substation site approximately 40m wide and 60m deep. In addition to this, establishment of a 33kV overhead line will be required from Culburra Zone Substation to new 33kV/11kV zone substation.



All works on this project with relation to 11kV feeder CLC2 be contestable and will be customer funded and constructed.

If you wish to proceed with this project, the developer or their representative will need to submit an Application for Connection of Permanent Load to Endeavour Energy which is available on the Endeavour Energy website here.

Once the application is processed and a Supply Offer has been issued by Endeavour Energy, which will provide preliminary supply requirements, you will need to engage a level 3 Accredited Service Provider who will submit a formal Method of Supply.

A list of the Accredited Service Providers is available at the NSW Trade and Investment website here or can be obtained via phone 13 77 88.

Please note this enquiry is only a preliminary assessment and does not guarantee supply availability or provide final conditions of supply.

Should you have any enquiries regarding your application please contact me.

Yours faithfully,

M G rimwood

Regards,
Matt Grimwood
Contestable Works Project Manager
Network Connections
T : 98537916
E : matthew.grimwood@endeavourenergy.com.au

Endeavour Energy

ANNEXURE D

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

30 August 2022

Endeavour Energy Ref: URS27231 URS27231
Customer Ref:

AKH Design Services
4 Barbata Grove
SOUTH NOWRA NSW 2541

Attention: Paul Hamilton

Dear Sir/Madam

URS27231 – LOT 2, DP 1279350, Land Subdivision Application: Lot 2 Culburra Road, CULBURRA BEACH

Your Proposed Method of Supply has been assessed, and Endeavour Energy has determined the method of supply requirements as outlined in the enclosed Design Brief. Please use this Design Brief in preparation of the design package which you will submit for certification.

The design must comply with all the conditions specified in this document, the Terms and Conditions of Endeavour Energy's Model Standing Offer for a Standard Connection Service and all relevant Endeavour Energy standards and instructions.

This Design Brief is valid for three (3) months from the date of issue.

A final Determination of Funding and a Payment Advice for Ancillary Network Services Fees applicable to this phase of the project are attached.

Land Interests as specified in the Land Interest Guidelines ("LIG") are required for this project:

■ Registered Land Interest applicable – Subdivision – See LIG Section 5. Please provide a draft Plan of Subdivision prior to certification.

Should you have any enquiries regarding your application please contact the undersigned.

Yours faithfully,

Ravi Lal
Customer Network Engineer
Ph: 02 9853 5626
Email:CWTech@endeavourenergy.com.au

30 August 2022

Endeavour Energy Ref: URS27231
Customer Ref:

Design Brief

Method Of Supply Requirement:

The L3 ASP proposal is acceptable, there is sufficient capacity in nearby 11kV feeder CLC2 Culburra ZS to support the proposed stage 1 load.

Reference to be made to the PMOS Sketch.

1. Replace pole 1 terminate HV establish HUGOH.
2. Replace pole 5 terminate HV establish HUGOH .
3. A 1.2m road widening will be required along Culburra along the ug route to new road as there are existing Telstra assets in the standard EE alignment.
4. Install & remove poles as per the pole schedule in the PMOS.
5. Establish 500kVA pad sub 1 on residue lot 39 as shown
6. Pad sub 1 is to have RTR HV switchgear and FFIFF Cat 1 LV switchgear.
7. Establish 500kVA pad sub 2 on public reserve lot 38 as shown
8. Pad sub 2 is to have RTR HV switchgear and FFIFF Cat 1 LV switchgear.
9. Install HV LV and SL trenching as shown
10. Install road crossings and ducts as per the duct breakup table and MCI0006.
11. Lay 1 x 3c 240mm sq AL/XLPE/HDPE cable from HUGOH on pole 1 to new pad sub 1
12. Lay 1 x 3c 240mm sq AL/XLPE/HDPE cable from new pad sub 1 to new pad sub-2
13. Lay 1 x 3c 240mm sq AL/XLPE/HDPE cable from new pad sub 1 to new pad sub-2.
14. Removed overhead conductors and poles between pole 2 and pole 5.
15. Install pillars and link pillars as per the site plan and final LV circuit.
16. Lay 1 x 4c 240mm sq AL/XLPE/PVC cable from pad sub 1 &2 to the pillars as per the Final LV circuit.
17. Install earths on link pillars and any end of circuit LV mains pillars.
18. Any required service works to be undertaken by accredited level 2 service provider in accordance with AS3000 and the NSW service rules.
19. Install columns and lanterns as per the certified lighting design, street lighting table and final LV/SL circuit. Install 16a fuse cartridges in LV pillars as per drawing 280143D where PE cell-controlled SL terminates.
20. Create required easements and restriction zones as required.
21. Complete all restoration works and outline all Environmental and Community risks to be mitigated in the Endeavour Energy SER document.

Determination of Funding

Endeavour Energy Supplied Materials:

NIL

Endeavour Energy Funded and Constructed:

NIL

Endeavour Energy Funded and Customer (ASP L1) Constructed – Reimbursement Paid by Endeavour Energy:

Capital contribution:

- Spare HV duct as per Fact Sheet 11
- 2 x 500kVA PM Substation Transformer.

Reimbursements to be paid to Endeavour Energy by Customer:

- Duct usage charge as required

Customer Funded Non-Contestable Works:

Network switching, substation commissioning, contract inspection

Customer Funded Contestable Works:

All other works required.

PAYMENT ADVICE/PRO FORMA TAX INVOICE

ABN 11 247 365 823

ANCILLARY NETWORK SERVICES FEES

Applicant: Sealark Pty Ltd
Address: PO BOX 73
NOWRA NSW 2541

Project Address: LOT 2 Culburra Road
CULBURRA BEACH NSW

(Your Ref:)

Fees and Charges quoted in this letter are valid for 3 months Endeavour Energy reserves the right to amend the fees and charges at any time subject to any regulatory approval.

The required AER Monopoly fees and charges consist of:-

Standard Connection Offer Fee	29-06-2022	$271.61
Design Information Fee	29-06-2022	$1267.56
Design Certification Fee	29-06-2022	$905.41
Administration Fee	29-06-2022	$838.25
Total		$3282.83

Total Amount Due: $ 3282.83 GST inclusive

Please follow the payment instructions below to avoid unnecessary delay in processing your payment.

Endeavour Energy's preferred method of payment is EFT.
BSB: 012-003 Account Number: 8376 89858

Please quote our reference ***URS27231A2*** in the EFT transaction reference field
Please email a copy of the remittance to **remittances@endeavourenergy.com.au**

Payment by credit cards and cheques will not be accepted

Your Tax Invoice will be forwarded to you upon the receipt of your payment.

ANNEXURE E

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

POND 1
3500m2

PARK
10,000m2

B6-3500m2

B7-2500m2

52-5-0183

B4-250m2

B2-300m2

PARK
1300m2

Sub2

SPS

B1-250m2

6 WIDE

25 WIDE

20 WIDE

ROAD

564m²

EMERGENCY
BUSHFIRE
EGRESS

B3-2000m2

Sub3

POND 3
1000m2

PARK
16,850m2
(ex.pond)

Sub4

Sub1

5

10

15

Cadastre: © Land and Property Information 2016

AMENDMENTS		
5.0	ORIGINAL ISSUE	
A	DRAFT No. 01	

REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.	
				AM PROJ. No.	
		GENERAL		HV SWITCHING	
		OVERHEAD		UBD/PENGUIN REF	
		UNDERGROUND		GIS MAP No	
		SUBSTATIONS		HV OP DIAGRAM	
				LOCAL GOV AREA	

ORIGINAL SCALE

DRAWN

DATE

CH'D

DO NOT SCALE
DIMENSIONS IN METRES

DESIGN

West Culburra Concept Residential

Endeavour Energy

A1

A

SHEET No 1 OF 1 SHEETS

ANNEXURE F

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

Cadastre: © Land and Property Information 2016

AMENDMENTS
A ORIGINAL ISSUE DRAFT No. 01

5.0

REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.	
				AM PROJ. No.	
		GENERAL		HV SWITCHING	
		OVERHEAD		UBD/PENGUIN REF	
		UNDERGROUND		GIS MAP No	
		SUBSTATIONS		HV OP DIAGRAM	
				LOCAL GOV AREA	

ORIGINAL SCALE
DRAWN
DATE
CH'D
DESIGN

DO NOT SCALE
DIMENSIONS IN METRES

West Culburra Concept Industrial

Endeavour Energy

A1 A

SHEET No 1 OF 1 SHEETS

ANNEXURE G

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

POND 2
2500m2

B8-3000m2

FORESHORE
RESERVE
58,600m2

PARK
25,600m2

ROAD 23 WIDE

LANE 10 WIDE

LANE 10 WIDE

CANAL STREET EAST

20 WIDE

ROAD

20 WIDE

ROAD

20 WIDE

ROAD

422 350m² | 420 350m² | 418 350m² | 416 350m² | 414 350m² | 412 350m² | 410 382m² | 408 400m² | 406 396m² | 404 397m² | 402 350m² | 401 468m²
423 404m² | 421 350m² | 419 350m² | 417 350m² | 415 350m² | 413 350m² | 411 350m² | 409 400m² | 407 404m² | 405 400m² | 403 350m²

425 | 427 375m² | 429 | 431 | 433 | 435 350m² | 437 | 439 | 441 | 443 | 445 411m²
424 388m² 508m² | 426 382m² | 428 368m² | 430 361m² | 432 354m² | 434 350m² | 436 350m² | 438 385m² | 440 390m² | 442 393m² | 444 395m² | 446 398m² | 448 401m² | 402m² | 407m²

501
1319m²

502
1865m²

503
6559m²

601
2404m²

602
2401m²

603
2402m²

604
2401m²

605
2413m²

606
2422m²

607
3203m²

608
2978m²

609
3019m²

610
3012m²

611
3263m²

612
4073m²

1
DP 593737B2

Cadastre: © Land and Property Information 2016

AMENDMENTS		
5.0	ORIGINAL ISSUE	
A		DRAFT No. 01

REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.	
				AM PROJ. No.	
		GENERAL		HV SWITCHING	
		OVERHEAD		UBD/PENGUIN REF	
		UNDERGROUND		GIS MAP No	
		SUBSTATIONS		HV OP DIAGRAM	
				LOCAL GOV AREA	

ORIGINAL SCALE

DRAWN

DATE

CH'D

DESIGN

DO NOT SCALE
DIMENSIONS IN METRES

West Culburra Concept Medium Density

Endeavour Energy

A1

A

SHEET No 1 OF 1 SHEETS

ANNEXURE H

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

7(a)

FORESHORE RESERVE 128,220m2

POND 1 3500m2

CURLEYS BAY

52-5-0184

PARK 10,000m2

25 WIDE

ROAD

20 WIDE

ESTABLISH NEW PAD SUB ON NEW UG HV RING FEEDER

PARK 1300m2

Sub2

SPS

6 WIDE

25 WIDE

ROAD 20 WIDE

EMERGENCY BUSHFIRE EGRESS

CULBURRA SEWERAGE TREATMENT PLANT

TRACK

52-5-0650

52-5-0651

EASEMENT TO DRAIN SEWAGE 6 WIDE (VIDE DP 631825)

POND 2 2500m2

FORESHORE RESERVE 58,600m2

SPORTING CLUB, AMENITIES & CARPARK

B8-3000m2

B9-250m2

TIE NEW UG HV TO EXISTING OVERHEAD HV NETWORK

PARK 25,600m2

R2

7(a)E2

52-5-0649

B5-500m2

CANAL STREET EAST

LANE 10 WIDE

POND 3 1000m2

PARK 16,850m2 (ex.pond)

ROAD 25 WIDE

Sub3

Sub1

Sub4

WOODLAND RESERVE 28,110m2

EXISTING INDUSTRIAL AREA

PROSPECTIVE ZONE SUBSTATION SITE

PARK 7,700m2

ESTABLISH NEW UG FEEDER FROM NEW ZONE SUBSTATION

ESTABLISH UNDERGROUND TIE TO FEEDER CLC2

CULBURRA ROAD

1 DP 226779

OLD TRANSFER STATION

POLICE STATION

4 DP 631825

AMBULANCE STATION

DP 5937

DP 825697 6

6 DP 1065111

7(c)

AMENDMENTS		
A	ORIGINAL ISSUE	DRAFT No. 01

REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.	
		GENERAL		AM PROJ. No.	
		OVERHEAD		HV SWITCHING	
		UNDERGROUND		UBD/PENGUIN REF	
		SUBSTATIONS		GIS MAP No	
				HV OP DIAGRAM	
				LOCAL GOV AREA	

ORIGINAL SCALE

DRAWN

DATE

CH'D

DO NOT SCALE

DIMENSIONS IN METRES

DESIGN

West Culburra Concept Final HV

Endeavour Energy

A1

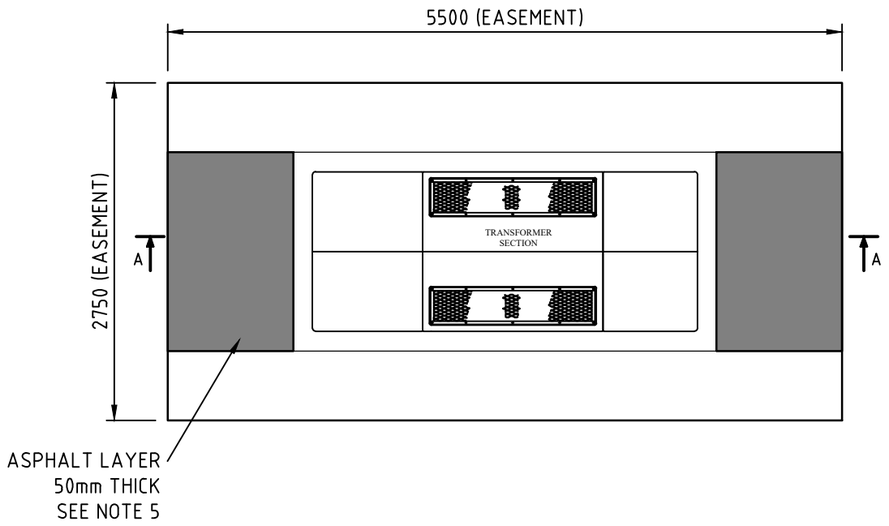
A

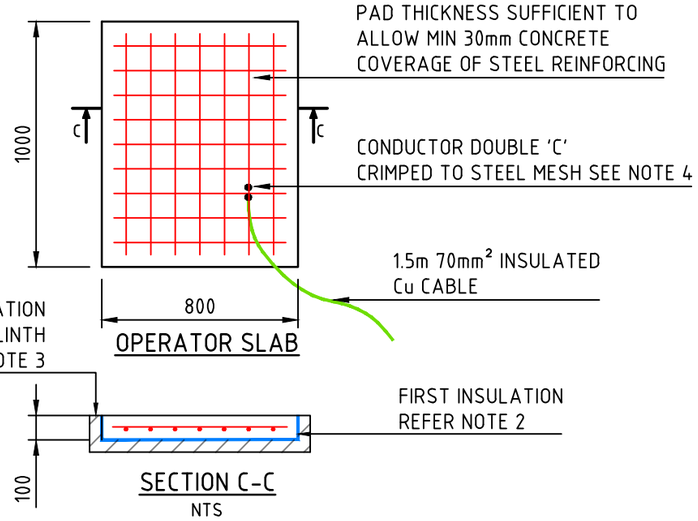
SHEET No 1 OF 1 SHEETS

ANNEXURE I

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

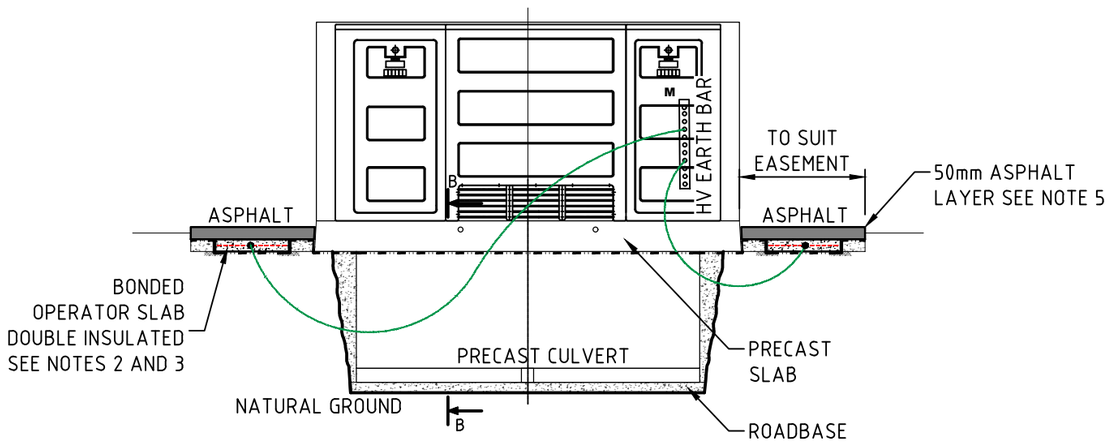




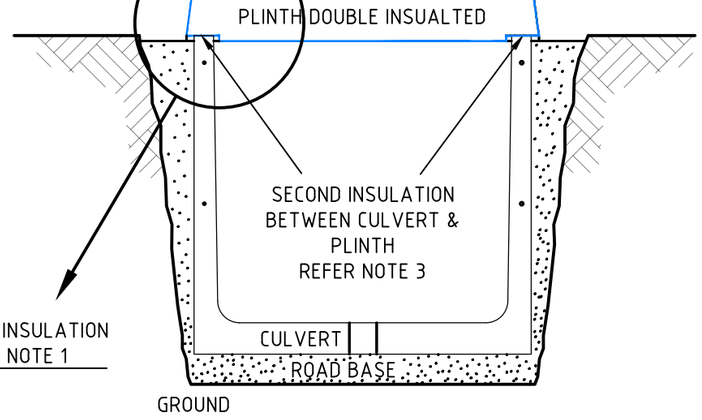
SECTION C-C
NTS

EARTHING NOTES

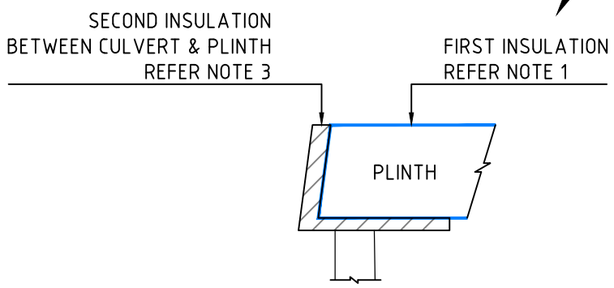
1. PADMOUNT PLINTH WILL BE SUPPLIED WITH FACTORY COATED MINIMUM 2mm THICK INSULATION LAYER FROM THE TRANSFORMER WORKSHOP. LOCKWELL P-515 POLYUREA IS THE APPROVED PRODUCT FOR THIS FIRST INSULATION LAYER.
2. ACREDITED SERVICE PROVIDER MUST ARRANGE FOR MINIMUM 2mm THICK INSULATION LAYER FOR SIDES AND BASE OF OPERATOR SLABS (TOP IS TO BE LEFT BARE) AS FIRST INSULATION LAYER. REFER TO APPROVED MATERIAL LIST (AML) FOR SERVICE PROVIDER.
3. 6mm THICK > 22KV INSULATING MAT IS REQUIRED AS SECOND LAYER OF INSULATION OF THE PLINTH AND OPERATOR SLABS, EQUIVALENT TO BALMORALENGINEERING.COM.AU (TELEPHONE +61294824000) ETHYLENE PROPYLENE DIENE MONOMER (EPDM) RUBBER 6mm THICK ROLL- CAT 1813, CLASS 3 (26.5kV).
4. DOUBLE CRIMP 70mm^2 COPPER INSULATED CABLE TO STEEL REINFORCEMENT BEFORE POURING CONCRETE.
5. HOT MIX ASPHALT LAYER TO MINIMUM THICKNESS 50MM. NO SURFACE CRACKS PERMITTED.
6. INSTALL EARTHING SIMILAR TO SEPARATE EARTH PADMOUNT SUBSTATION EXCEPT GRADING RING. REFER TO DRAWING 348262. INSTALL 70mm^2 COPPER INSULATED CABLE AND BOND TO HV EARTH BAR AT LV SWITCH AND EARTH BAR AT HV SWITCH.
7. DISPENSATION APPROVAL IS REQUIRED FOR INSULATED PADMOUNT EARTHING DESIGNS.



SECTION A-A
NTS



SECTION B-B
NTS



LEGEND

- STEEL REINFORCEMENT
- FIRST INSULATION LAYER
- SECOND INSULATION LAYER
- ASPHALT
- ROAD BASE

FOR CONSTRUCTION

Endeavour Energy

DRIVEN DRILLED EARTHING	348246
DRIVEN ROD EARTHING	348247
REFERENCE DRAWINGS	

DO NOT SCALE
DIMENSIONS IN MILLIMETRES

AUTHORISED/CERTIFIED
Peter West

SUBSTATION DESIGN MANAGER

ORIGINAL SCALE 1:50

APPROVED
M. Adair

DESIGNED	GA	DATE	17/03/22
DRAWN	KT	DATE	17/03/22
CHECKED	BC	DATE	17/03/22

INSULATED PADMOUNT SUBSTATION CONSTRUCTION

A3

524542

SHEET No 1 OF 1 SHEETS

AMENDMENTS

JOB No	DESIGN	DR'N	CH'D	DATE	APP'D
A	GA	BC	GA		

HISTORY

Civil version 5.1

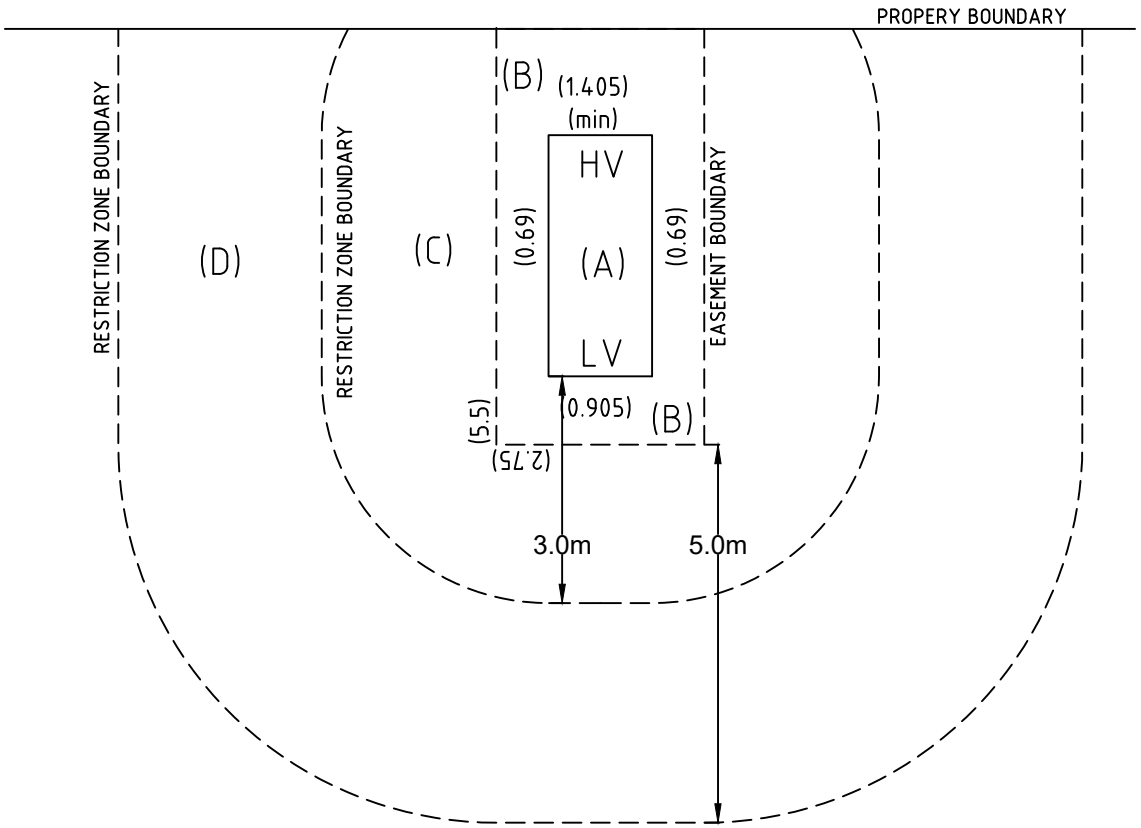
ANNEXURE J

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

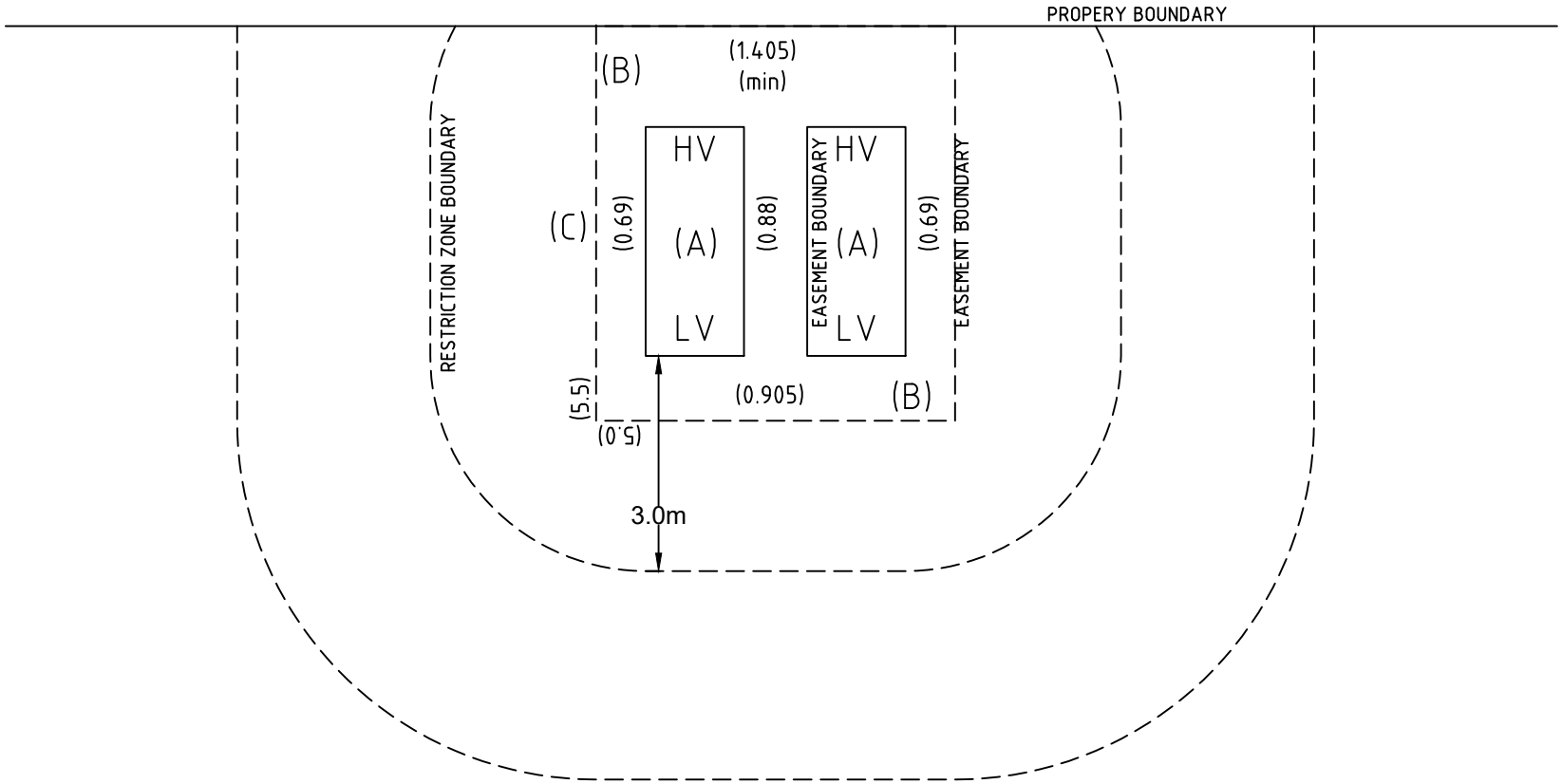
NOTE
ALL DISTANCES AND OFFSETS SHOWN ARE A MINIMUM
ALL DISTANCES AND OFFSETS SHOWN ARE IN METRES

A. SUBSTATION PLINTH (3.19 X 1.37)
B. AN EASEMENT FOR PAD SUBSTATION MINIMUM 5.5x 2.75 IS TO BE CREATED IN FAVOUR OF ENDEAVOUR ENERGY OVER THE SUBSTATION SITE
C. A RESTRICTION ON THE USE OF LAND IN RELATION TO FIRE RATING OF BUILDINGS MEASURED 3.0m FROM THE SUBSTATION PLINTH IS TO BE CREATED IN FAVOUR OF ENDEAVOUR ENERGY
D. A RESTRICTION ON THE USE OF LAND IN RELATION TO SWIMMING POOLS MEASURED 5.0m FROM THE SUBSTATION EASEMENT IS TO BE CREATED IN FAVOUR OF ENDEAVOUR ENERGY



NOTE
ALL DISTANCES AND OFFSETS SHOWN ARE A MINIMUM
ALL DISTANCES AND OFFSETS SHOWN ARE IN METRES

A. SUBSTATION PLINTH (3.19 X 1.37)
B. AN EASEMENT FOR PAD SUBSTATION MINIMUM 5.5x 5.0 IS TO BE CREATED IN FAVOUR OF ENDEAVOUR ENERGY OVER THE SUBSTATION SITE
C. A RESTRICTION ON THE USE OF LAND IN RELATION TO FIRE RATING OF BUILDINGS MEASURED 3.0m FROM THE SUBSTATION PLINTH IS TO BE CREATED IN FAVOUR OF ENDEAVOUR ENERGY



ANNEXURE K

T : 02 44228004
M: 0412423520
E : paul@akhdesign.com.au

4 Barbata Grove
South Nowra, NSW 2541

7.3 PADMOUNT SUBSTATIONS

7.3.1 SEGREGATION REQUIREMENTS FROM OTHER STRUCTURES

There are a number of restrictions to construction near substations. Figure 7.3.1A shows the overall view with the following sections detailing individual requirements.

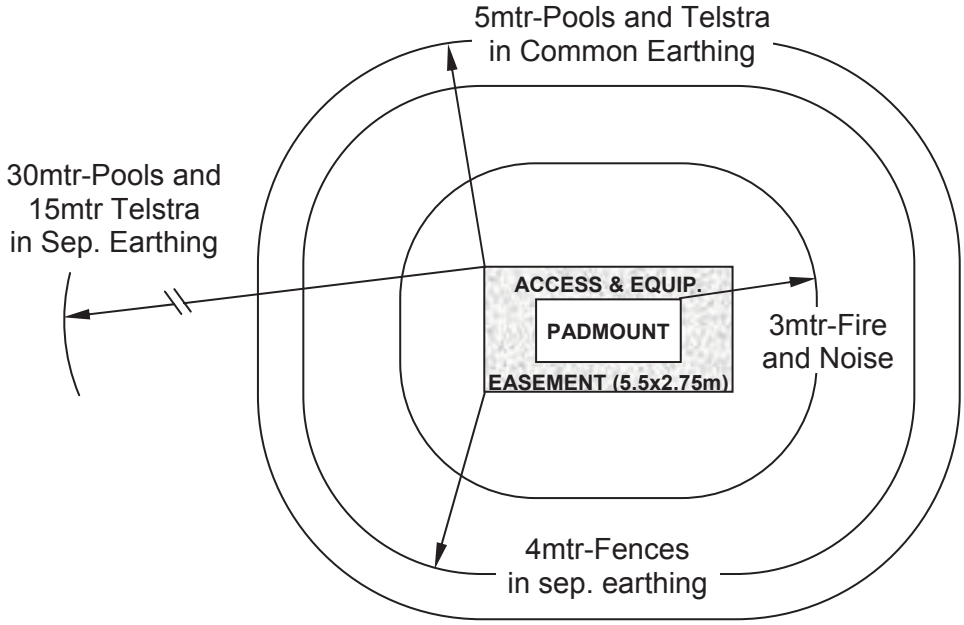


Figure 7.3.1A – All restrictions

7.3.1.1 Fire

Padmount substations require separation from neighbouring areas and buildings that are subject to fire risk. Separation may be by means of adequate clearances or building components having minimum fire resistance level (FRL) as set out in figure 7.3.1B.

Fire ratings shall be achieved by static means (ie. walls or distance) rather than active system (ie. deluge showers etc).

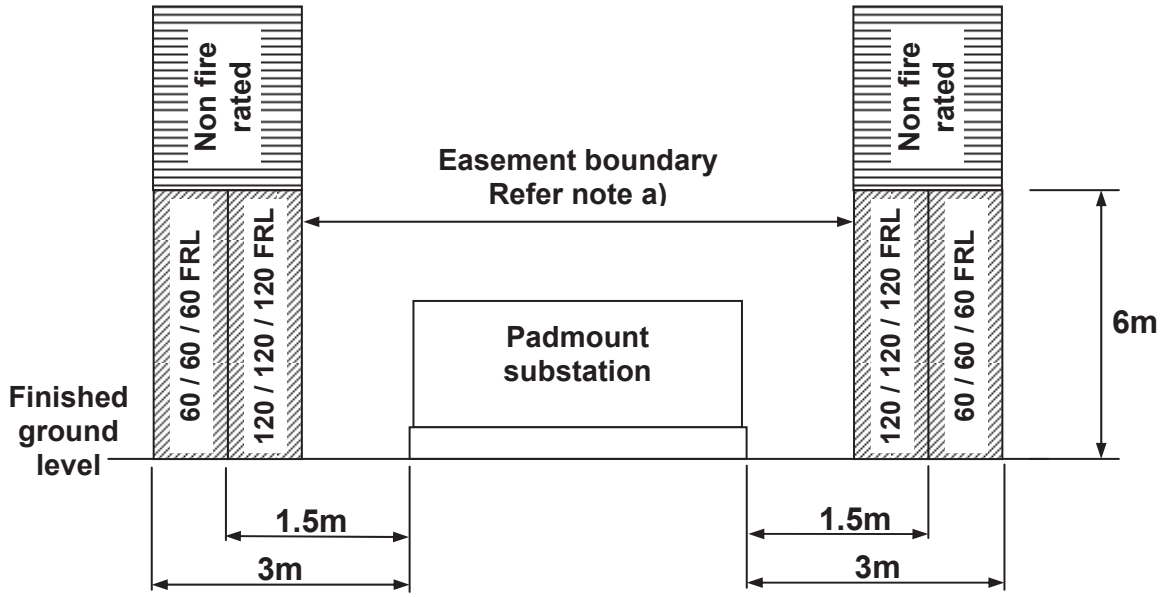


Figure 7.3.1B - Minimum FRL clearances for components

FRL means the grading period in minutes. The three figures represent structural adequacy/integrity/insulation.

Notes:

a) When a padmount substation is located under the overhang of a building, the substation may be considered to be within the building and the elements of the building above and adjacent to the substation must have an FRL of 120/120/120. In these circumstances, a ruling must be obtained from the relevant government body.

b) Personnel access doors and fire exit doors to a building are not permitted within three (3) metres of the padmount plinth.

Where minimum clearances cannot be achieved, non FRL openings, eg windows, may be permitted within the fire rated area of Figure 7.3.1B provided that suitable screening walls are installed to create sheltered areas. Such openings shall be within these sheltered areas as shown in Figure 7.3.1C. Screen walls shall have a 120/120/120 FRL.

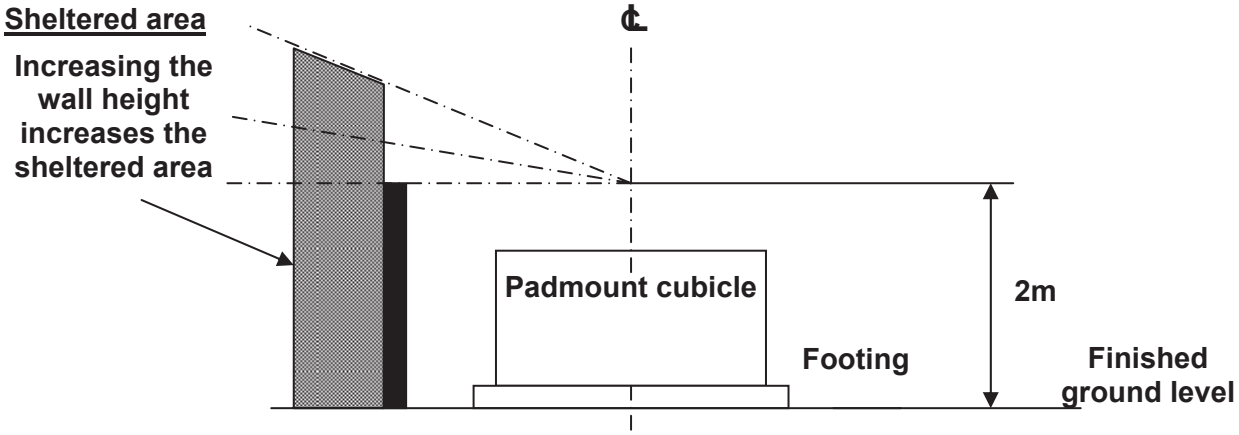


Figure 7.3.1C – Use of screen walls

Note: Screen walls shall be located outside the easement

7.3.1.2 Noise

Padmount substation sites shall comply with a nominal 3m noise separation between the substation and any building/living area. This 3m will usually satisfy acceptable noise levels in residential premises. Where a suitable fire/baffle wall is erected (by that customer without cost to Endeavour Energy) the noise restriction may be reduced accordingly if approved by Endeavour Energy.

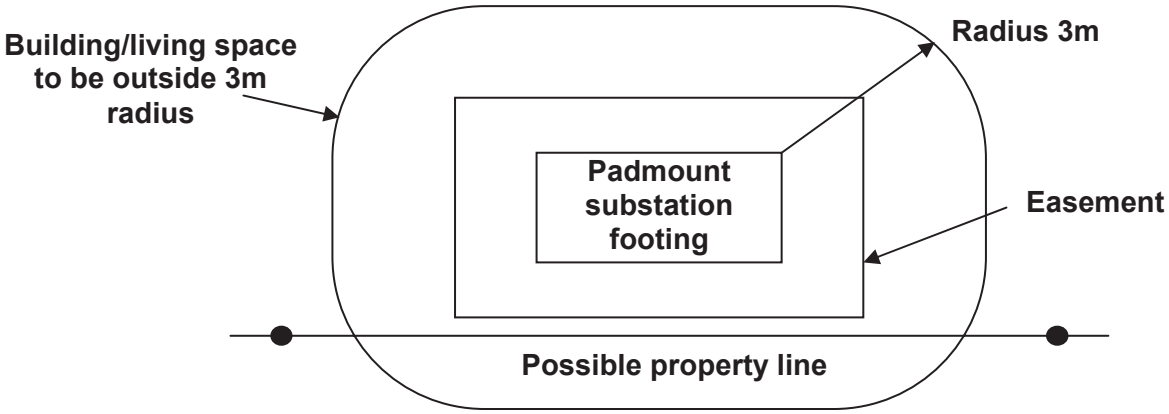


Figure 7.3.1D – Minimum clearance to building/living areas

7.3.1.3 Earthing

An accredited designer should complete the design of the earthing system. More specific details of earthing constructions can be found in the “Earthing” section of this manual.

7.3.1.3.1 Pools and spas

Pools and spas should not be located near substations, if possible. Typically, separations of 5m in common earthed areas and 30m in separately earthed areas are required.

7.3.1.3.2 Telecommunications equipment

Telecommunications equipment should not be located near substations, if possible. Typically, separations of 5m in common earthed areas and 15m in separately earthed areas are required.

7.3.1.3.3 Metallic objects including fencing and metal clad buildings

a) If the padmount substation has common earthing (as detailed in the earthing section), no restrictions beyond those required for easement and fire rating need be placed on its siting in respect of metal clad buildings and metallic fences.

b) Where a substation has separate earthing (as detailed in the earthing section), any metal clad building or metal fence shall not be located within 4 metres of the padmount footing and earth grid.

c) If a metal object, including pipes, buildings or fences, passes through the area, they shall be constructed in such a way that the objects/posts insulate the adjacent panels from each other and from the ground. Refer Figure 7.3.1E and Drawing no. 016665. A suggested method of isolating a metallic fence is shown on Drawing no. 061674.

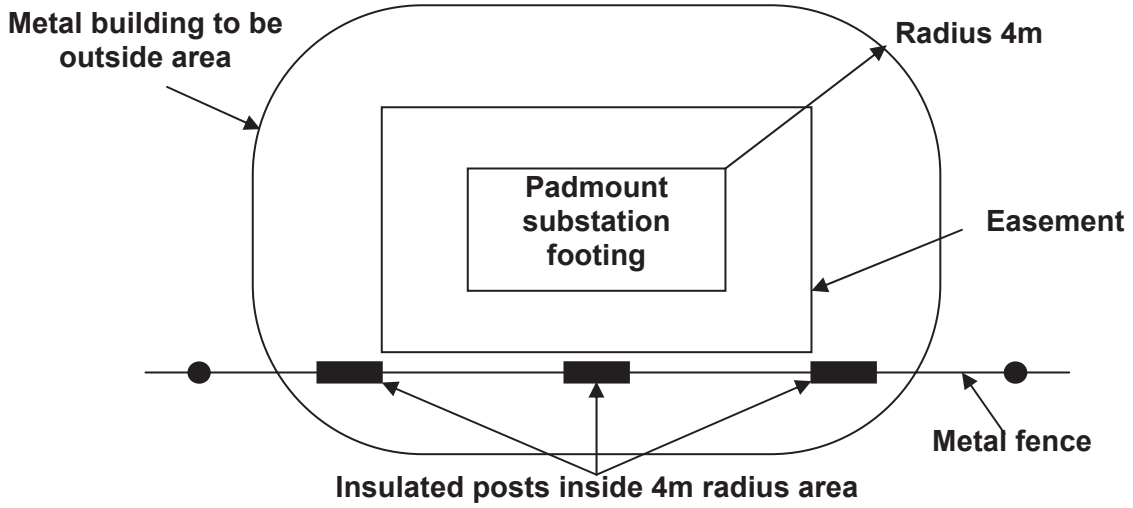


Figure 7.3.1E – Metal fence or metal clad building exclusion area

7.3.2 SUBSTATION SITE

7.3.2.1 Site contours and retaining walls

The easement represents the minimum working area required for normal operation of the substation and the following requirements must be adhered to:

a) Substation site shall be flat and level **over the entire easement area**.

b) Where it is necessary to carry out excavations to provide a level site, the batter adjacent to the site shall be no steeper than 1 in 3.

c) The maximum step to be allowed without a retaining wall is 300mm.

d) Retaining walls are to be used only when absolutely necessary. The retaining wall may be up to 700mm in height, constructed from concrete or brick, but not treated pine. Where required, they shall be constructed outside the standard easement and at the ASP's cost. It is the responsibility of the ASP to liaise with Endeavour Energy for the location of the easement. The retaining wall must comply with the relevant building codes and local government requirements.

e) Where necessary, the substation easement location and size shall be altered and increased as shown to ensure that the retaining wall (or vehicle impact protection device, such as bollards) is wholly within the one property boundary and the easement includes the retaining wall (or vehicle impact protection device). If this condition cannot be met, an alternative may be considered on application.

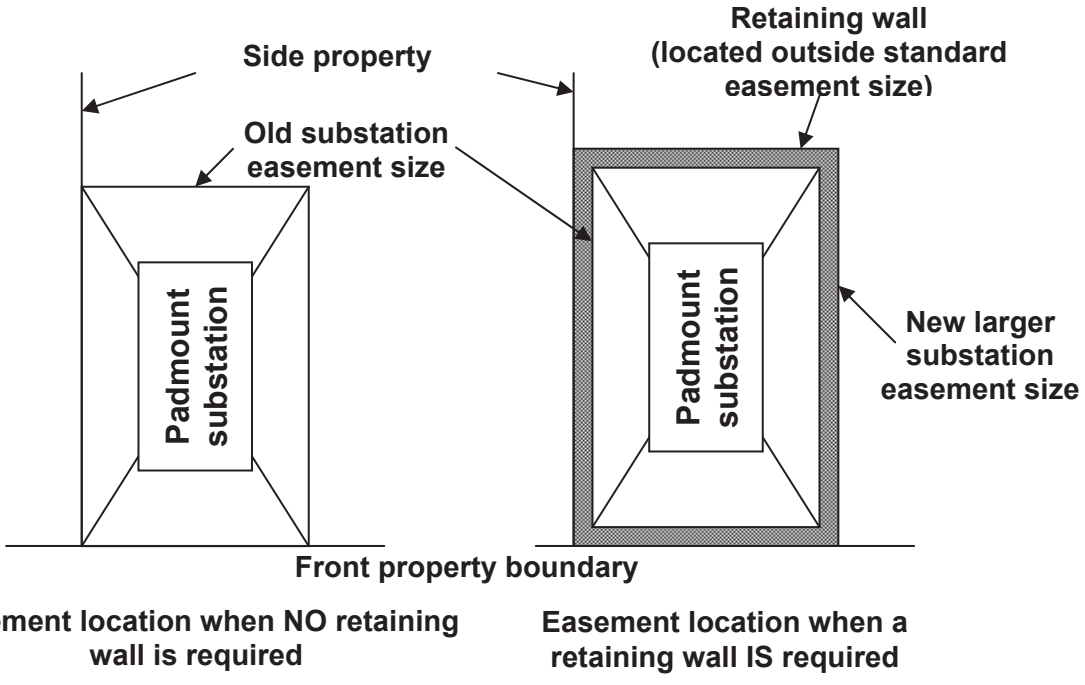


Figure 7.3.2A – Easement location details

7.3.2.2 Foundation requirements

The substation site is required to be stable and clear of any obstruction that could interfere with the installation of the earthing electrodes that may extend to a depth of 30 metres.

Drawing no. 076665 details the padmount substation culvert footing installation.

6.3.11 General requirements

Refer to Section 7 – Substation and switching stations in MCI 0006 for details, especially for but not limited to the following requirements:

- Easement and covenants.
- Segregation requirements from other structures.
- Minimum substation access requirements.
- Protection from vehicles.
- Flooding and drainage.
- Condensation mitigation.
- Numbering, warning and identification signs.
- Consumer mains.
- Earthing.
- Inspection and testing.

6.3.12 Cubicle

Fibreglass and stainless steel cubicles are suitable for use in the distribution network of Endeavour Energy. However,

- For switching stations and substations in a separately earthed electrical system, a fibreglass cubicle is essential.
- Stainless steel cubicles can be used in common earthed locations, but in Special areas (as defined in SDI 100) such as schools, pool and the like, prior approval shall be obtained from the Manager Primary Systems by providing a special earthing report setting out in detail the steps taken to overcome the touch and step potential hazards.

For full details of the cubicle requirements for padmount substations and switching stations, refer to ETS 0077

6.3.13 Plinth and culvert

All substation or switching station plinths shall be suitable for mounting on the standard culvert. The centre of gravity of the substation shall be suitable for this arrangement. The total weight of the substation including the plinth shall not exceed 8,000kg.

Only precast plinths and culverts shall be used for substations and switching stations. Where it is not possible to use a precast plinth and culvert, approval shall be obtained for an alternate method.

For full details of plinth and culvert requirements for padmount substations or switching stations, refer to ETS 0072 and Section 7- Substations and switching stations in MCI 0006.

6.3.14 Segregation requirements from other structures

MCI 0006 lists most details for the segregation of substations from other buildings and equipment for operations, maintenance, earthing, fire and noise and should be referred to when designing any substation.

FRL (fire resistance level) describes the time (in minutes) that structural adequacy/integrity/insulation is maintained, as defined in the Building Code of Australia.

Where the minimum clearances indicated in MCI 0006 for fire zones cannot be achieved, non- FRL rated openings, for example, windows, garage doors and the like may be permitted within the fire rated area provided that suitable screening walls are installed to create sheltered areas. Screen walls shall have a 120/120/120 FRL (refer Figure 6.3.14).

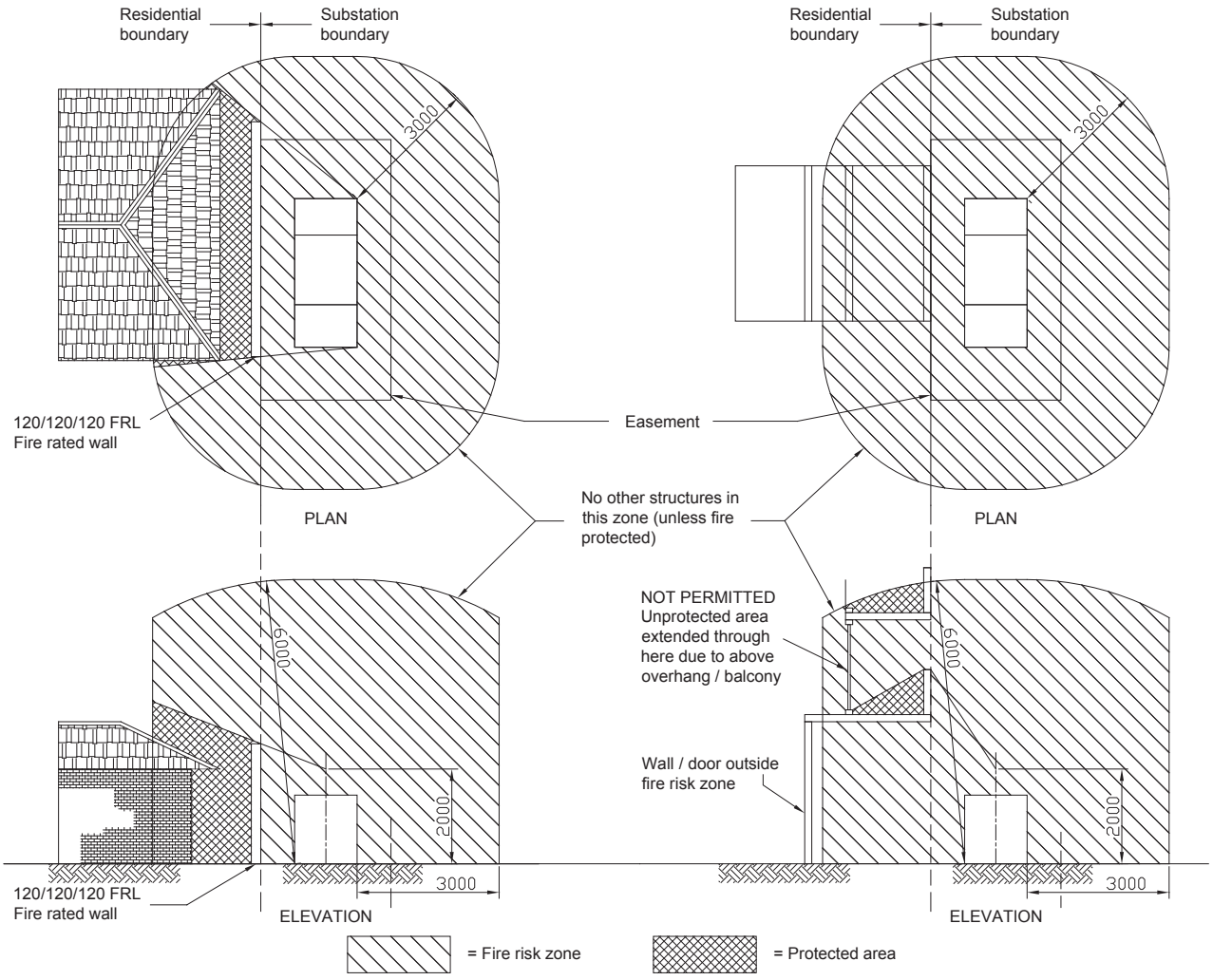


Figure 6.3.14 - Example use of screen walls in fire zones

Note: Screen walls shall be located outside the standard easement size as shown. Then the easement shall be altered and increased to accommodate the screen wall inside the easement. The easement and screen walls shall be wholly within the one property boundary.

No structure should overhang the easement. No structure should overhang a protected area which could trap smoke or fire and cause it to enter any openings in the structure.