JW Planning Pty Ltd

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ABN 45 102 698 242

Your ref: SSD 7198
Our Ref: 0820732

6 July 2020

Ms E Butcher
Planning Officer, Regional Assessments
Department of Planning, Industry and Environment
Level 29, 320 Pitt Street
Sydney 2000 NSW

Via email: Emma.Butcher@planning.nsw.gov.au

Dear Emma,

SSD 7198 – Moonee Beach Residential Subdivision
Interim Response to RFI issued 15 July 2019

I refer to your letter email of 19 December 2019 seeking a review of the proposal in the context of issues identified during the Department's consultation with Coffs Harbour City Council. The key issues relate to the integration with the proposed subdivision of the site to the south, potential sewer and stormwater impacts, site levels and biodiversity.

Although Moonee Parkland's Trust (MPT) consulted with the applicant upon receipt of the DPIE's letter, Coffs Harbour City Council did not determine the adjoining application (**0457/18 DA**) for subdivision until April 27th, 2020. This gave rise to significant delays in responding, not least because the approved subdivision on the adjoining land adopted a road alignment and levels inconsistent with those long proposed by MPT.

Nonetheless, MPT has worked to ensure the proposed subdivision under **SSD_7198** integrates with the subdivision design approved for the adjoining site by Council, including consultation with Council's engineer to ensure the design resolves the issues previously identified. In addition, a revised Biodiversity Offset Strategy is provided, along with confirmation that the proposed is consistent with Council's *Coastal Management Study 2013*.

Please find **hereunder** a response to the key issues listed in the DPIE's letter of 19 December 2019 (in *italics*):

1. Integration with the site to the south

The subdivision layout is to be reviewed and revised to better integrate with the site to the south (Lot 6, DP 252223). In order to achieve this, a connecting road is to be provided to the south, as shown in red here under. The Department notes that the Proponent for the adjoining subdivision (Lot 6 DP 252223) has nominated a reserve along the eastern boundary of its site that may, subject to final approval, be suitable for a future road connection. The Department also requires evidence of further consultation with the adjoining Applicant and Council, and is willing to facilitate a meeting should this be required.

Response:
The project subdivision engineers, Civiltech Pty Ltd, have considered the latest plans for the approved subdivision of Lot 6 by Resource, Design and Management Pty Ltd (RDM).

Plans of the proposed subdivision under (**SSD-7981**) have been adjusted to correlate with levels and alignments endorsed by Council in the approved RDM plans dated 19 December 2019 (Drawing No.17094 2) – see **Attachment A**.

The levels along the southern boundary are amended to suit the approved development to the south. The plan shows a temporary retaining wall, although Council has agreed to a notation on the plan that battering the fill is an acceptable alternative with the agreement of the adjoining landowner. Battering is proposed by the southern landowner, and for cost efficiency, earthworks are proposed to be carried out by both parties contemporaneously, negating the need for a retaining solution.

2. Sewer

The proposed low-pressure sewer (serving Lots D1 to D19) is to be reviewed and revised to comply with Council's Pressure Sewer System Policy and designed to include a gravity sewer system to a pump station. The Department also requires preliminary design details including levels.

Response: With the adjusted levels along the southern boundary the previously proposed low pressure sewer has been replaced with gravity sewer. Design surface and invert levels have been included on sheet 1277-DR5J to the SPS.

3. Stormwater

The stormwater plans show the southern boundary swale discharging through Council's reserve into Moonee Creek. As Council has advised it will not accept the public reserve as a discharge location, the plans will need to be amended to remove the open swale and demonstrate that discharge will be conveyed into a retention basin.

Response: The stormwater swale has been removed and inter-allotment drainage added to drain the southern lots to the proposed retention basin. The new link road (Road 7) has a high point at the southern boundary to ensure that the stormwater flows are directed to each internal basin. No concentrated stormwater flows discharge through the reserve to Moonee Creek. Levels on the critical lines are shown on the stormwater plan.

4. Site Levels Southern Boundary

The difference in levels between the southern boundary and the levels on the adjoining site do not appear to have been addressed. The Department requests the plans be amended, in consultation with the adjoining Applicant, to ensure fill levels are consistent between the two sites to address privacy concerns, management of stormwater impacts, minimise retaining walls on-site and allow for integrated sewer and road infrastructure.

Response: The fill levels along the southern boundary have been amended to integrate with the adjoining development.

5. Biodiversity

The Modification Report states that detailed investigations of the site determined that a buffer with an average width of 72m (excluding APZs and any infrastructure) should apply to Moonee Creek. The Department requests amended plans showing a buffer with an average width of 72m excluding APZs and stormwater infrastructure. Please note the location of any development infrastructure within the 50m buffer is not supported (excluding the existing legal access to Lot 2 DP 1097743).

Response:
The subdivision plan has been updated to provide a creek buffer consistent with the previously submitted environmental report, and the development consent granted by Council for the adjoining development to the south.

A partial extent of the APZ is proposed to occur within the reserve, to the extent comprising the fill batter. This arrangement has been agreed with Council, subject to plantings of the batter being of a kind that do not require management for APZ purposes, and on the basis that the applicant seek to reduce the APZ based on the PFBP 2019 prior to Construction Certificate. A notation is on the proposed plan of subdivision to this effect.

The Biodiversity Offset Strategy has been revised in accordance with the amended design (**Attachment B**).

6. Inundation

The Coffs Harbour Coastal Management Study (2013) mapping identifies the site as being at potential risk from inundation. The Department requires an assessment of the impact of coastal processes and hazards on or from the development, and how such risks would be managed or mitigated.

Response: Martens & Associates confirm that the proposed development will be consistent with the CHCMS 2013 if carried out in accordance with the recommendations of their Flood Assessment (2015). The Q100 flood levels along Moonee Creek are RL2.9. Minor filling for the road 7 fill batter is required below the Q100 flood level. This area is flood storage and no flood flow path. The impacts on the flood flow and levels are a result of the additional fill are negligible.

7. Miscellaneous

Further evidence is required demonstrating that the road reserves are capable of complying with Council's requirements, including infrastructure and street trees being accommodated.

Response:

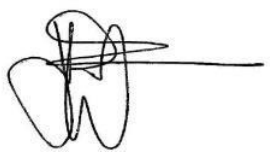
The revised plans have been resolved in consultation with the adjoining landowner and Coffs Harbour City Council, given the roads, drainage, and reserve area will ultimately be dedicated to Council.

The CHCC Development Design – Geometric road layout sets road geometry requirements for a range of road types. Roads 2, 6 & 7 are classified as Local streets with vehicle movements up to 2,000 vpd. They are required to be 8m wide with minimum 4m verges. Roads 4 & 5 are classified as access streets and require to have a width of 5.5-7.0m. The proposed roads 4 & 5 are 6.5m wide in a 14m verge. Additional details of service allocations have been added to the plans.

Revisions to the plans are of a kind that are unlikely to warrant further rounds of consultation with other agencies or further public exhibition. Consequently it is hoped that the above and attached information will enable the Department to promptly finalise their assessment of the proposal.

Please don't hesitate to contact the undersigned if you have any further questions.

Yours faithfully
JW PLANNING PTY LTD



Jason Wasiak
DIRECTOR – PRINCIPAL URBAN PLANNER
Bach. Urban & Regional Planning (U.N.E)
Assoc. Dip. Eng (LESD) (H.I.T)

Attachment A
Revised Subdivision Plans – Civiltech

LOT 1 DP 1097743 - Land Budget

Description	No	Area (ha)	% Total Area
Drainage Reserve D105		1.99	15.4%
Access D106		0.11	0.8%
Road Reserves		3.54	27.4%
Residential Lots	103	7.29	52.6%
	Totals	**12.93**	**100.0%**

N

20 10 0 25 50 75 100

SCALE 1:1000 AT A1

SUBDIVISION NOTES

1) EXACT LOT LAYOUT, AREAS AND DIMENSIONS TO BE CONFIRMED WITH FINAL DESIGN, SURVEY AND APPROVALS.
2) EASEMENT LOCATION AND WIDTHS TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
3) PROVIDE RIGHT OF WAY FOR ACCESS TO EXISTING LOT 2 RESIDENCE.
4) EASEMENTS TO BE PROVIDED FOR SERVICES TO THE SATISFACTION OF THE RELEVENT AUTHORITIES.

LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED EASEMENT
- **PROPOSED APZ** REDUCTION OF APZ WIDTH UNDER THE PROVISIONS OF RFS PBP 2019 TO BE SOUGHT AS PART OF C.C.
- CURRENT 7A ZONE
- APPROVED E2 ZONE
- (A) EXTENT OF HABITAT THAT REQUIRES A BUFFER
- (B) EXTENT OF HABITAT THAT REPRESENTS FLOOD AREA IN CONJUNCTION WITH A SPRING TIDE
- (C) EXTENT OF SPRING TIDE WITHOUT FLOOD CONDITIONS
- 20m CREEK HABITAT BUFFER

FUTURE "THE GLADES" DEVELOPMENT

Lot 1
DP 237928

E2 ZONE

EXISTING WATERMAIN TO BE REMOVED AND EASEMENT EXTINGUISHED.

PACIFIC HIGHWAY

CORRIDOR FOR EXISTING SERVICES

APPROVED COLLECTOR ROAD

BUS STOP

ROAD 1

ROAD 2

ROAD 4

ROAD 5

ROAD 6

ROAD 7

EXISTING SERVICES TO BE LOCATED IN PROPOSED ROAD RESERVE FOR COLLECTOR ROAD WITH CURRENT EASEMENTS TO BE EXTINGUISHED AS REQUIRED.

SW BASIN (SEE MARTENS SWMP)
RIPARIAN BESIDE BASIN TO BE PLANTED OUT WITH LOMANDRAS

part D104
1.99 ha
DRAINAGE & SERVICES

PROPOSED SEWER PS

EXISTING SUB-STN

PROPOSED ACCESS TRACK

12.5m BUS

12.5m BUS SWEEP PATH

PROPOSED COASTAL WALK

7A ZONE

COASTAL WALK

D105
1060m²

Lot 2
DP 1097743
EXISTING RESIDENCE

Lot 3
DP 1097743
PUBLIC RESERVE

part D104
1.99 ha

E2 ZONE

7A ZONE

(A)
(B)
(C)

20m BUFFER

MOONEE CREEK

Lot 6
DP 252223

FUTURE "MOONEE BEACH ESTATE" DEVELOPMENT

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Iss	Description	Des	Drw	Date	Appd
J	LINK TO SOUTHERN ESTATE	WF	WF	19.06.20	JP
H	AMENDED COLLECTOR ROAD	WF	WF	28.09.19	JP
G	AMENDED BUFFER	WF	WF	14.10.16	JP

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION LOT LAYOUT

Scale: 1:1000 at A1 CAD file: 1277-DR1J.dwg
Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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Dwg. No. **1277-DR1** Issue **J**

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SCALE 1:1000 AT A1

SUBDIVISION NOTES

1) EXACT CONSTRUCTION AND SALES STAGING BOUNDARIES TO BE CONFIRMED WITH FINAL DESIGN, SURVEY AND APPROVALS.

LEGEND

- CONSTRUCTION BOUNDARY
- SALES STAGE BOUNDARY

LOT 1 DP 1097743
NUMBER OF LOTS

1A	11	2B	8
1B	10	3A	10
1C	10	3B	10
1D	7	4A	13
2A	11	4B	13

BULK EARTHWORKS & BASIN TO BE COMPLETED AS PART OF STAGE 1 CONSTRUCTION

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H	AMENDED COLLECTOR ROAD	WF	WF	28.08.19	JP
F	FOR RE-SUBMISSION	WF	WF	24.08.15	JP

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED STAGING PLAN

Scale: 1:1000 at A1 CAD file: 1277-DR2J.dwg
Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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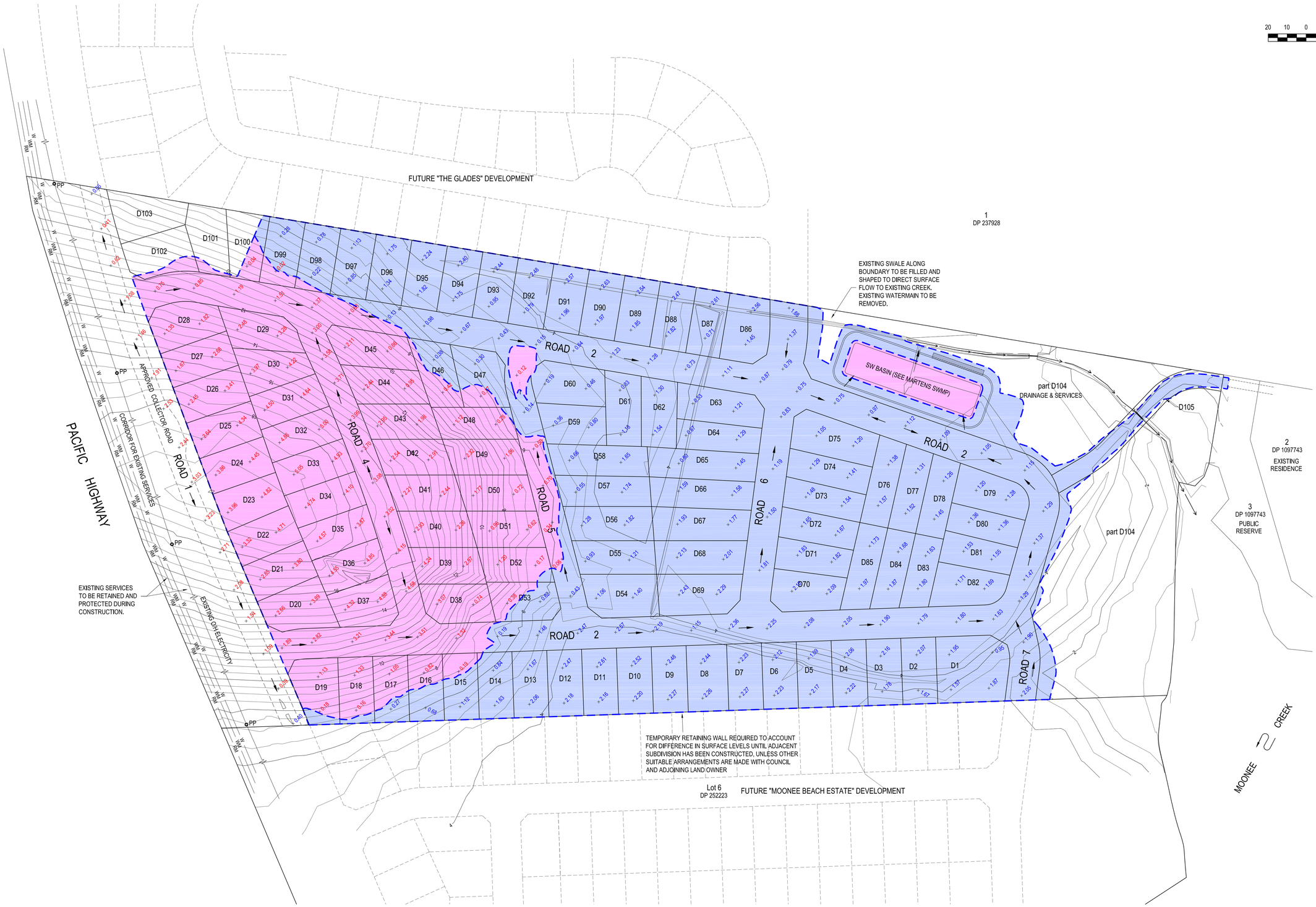
Dwg. No. **1277-DR2** Issue **J**



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SCALE 1:1000 AT A1

BULK EARTHWORK NOTES

1) BULK EARTHWORKS DESIGN SUBJECT TO DETAILED ENGINEERING DESIGN OF SERVICES, STORMWATER AND SEWER.
2) PAVEMENT DESIGN SUBJECT TO SUBGRADE CBR TESTS.

LEGEND

- PROPOSED LOT POLYGON (lot layout to be confirmed)
- TYPICAL DRAINAGE FLOW DIRECTION
- ×0.70 CUT DEPTH
- ×0.25 FILL DEPTH
- BULK FILL AREA (INDICATIVE ONLY)
- BULK CUT AREA (INDICATIVE ONLY)

COLLECTOR ROAD EARTHWORKS TO BE DONE SEPARATELY

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H	AMEND COLLECTOR ROAD	WF	WF	28.08.19	JP
F	FOR RE-SUBMISSION	WF	WF	26.08.15	JP

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION BULK EARTHWORKS AND CUT/FILL CONCEPT PLAN

0.5m EXISTING CONTOURS

Scale: 1:1000 at A1 CAD file: 1277-DR3J.dwg

Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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Dwg. No. **1277-DR3** Issue **J**

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20 10 0 25 50 75 100

SCALE 1:1000 AT A1

ROADWORKS NOTES

1) ROADWORKS DESIGN AND LOCATION AND FILL LEVELS SUBJECT TO FINAL DESIGN AND APPROVAL.
2) PAVEMENT DESIGN SUBJECT TO SUBGRADE CBR TESTS.
3) Q100 FLOOD FREE ACCESS TO SEWER PUMP STATION TO BE PROVIDED.

LEGEND

- PROPOSED LOT POLYGON (lot layout to be confirmed)
- EDGE OF BATTER
- FINISHED SURFACE LEVEL
- SURFACE RUNOFF DIRECTION

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION ROADWORKS AND LEVELS CONCEPT PLAN

0.5m FINISHED CONTOURS

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Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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Dwg. No. **1277-DR4** Issue **J**

SERVICES NOTES

1) SEWER PUMP OUT AND RISING MAIN FROM EXISTING RESIDENCE ON LOT 2 TO SEWER PUMP STATION TO BE DESIGNED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
2) LEVELS AND SIZE OF SEWER NETWORK TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
3) EASEMENT LOCATION AND WIDTHS TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION
4) ELECTRICITY NETWORK TO BE DESIGNED BY ACCREDITED CONSULTANT AND APPROVED BY ESSENTIAL ENERGY AS PART OF CONSTRUCTION CERTIFICATE APPLICATION. LAYOUT SHOWN IS INDICATIVE ONLY FOR CONCEPT PLAN.
5) COMMUNICATIONS NETWORK TO BE DESIGNED BY ACCREDITED CONSULTANT AND APPROVED BY NBNco AS PART OF CONSTRUCTION CERTIFICATE APPLICATION. LAYOUT SHOWN IS INDICATIVE ONLY FOR CONCEPT PLAN.
6) WATER RETICULATION LOCATION AND SIZE TO BE MODELED AND DESIGNED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
7) SEWER PUMP STATION AND RISING MAIN TO DE DESIGNED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
8) EXISTING SUB STATION TO BE UPGRADED/RELOCATED AS PER DETAILED ELECTRICITY DESIGN. EXISTING UNDERGROUND ELECTRICITY ADJACENT TO SW BASIN TO BE REALIGNED AS REQUIRED, DETAILS TO BE CONFIRMED.
9) Q100 FLOOD FREE ACCESS TO SEWER PUMP STATION TO BE PROVIDED

N

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SCALE 1:1000 AT A1

LEGEND

- PROPOSED LOT POLYGON (lot layout to be confirmed)
- PROPOSED GRAVITY SEWER (maintenance hole & junction)
- SL6.10 IL5.10 SMH SURFACE & OUTLET INVERT (longest sewer line only)
- PROPOSED LOW PRESSURE SEWER
- PROPOSED STORMWATER (stormwater & inter-allotment drainage)
- PROPOSED WATER RETICULATION (100Ø typical with house connection)
- PROPOSED ELECTRICITY & COMMS (shared trench with house connection)
- PROPOSED SEWER RISING MAIN (size and location to be confirmed)
- PROPOSED EASEMENT (width and location to be confirmed)

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION SERVICES PLAN

0.5m FINISHED CONTOURS

Scale: 1:1000 at A1 CAD file: 1277-DR5J.dwg
Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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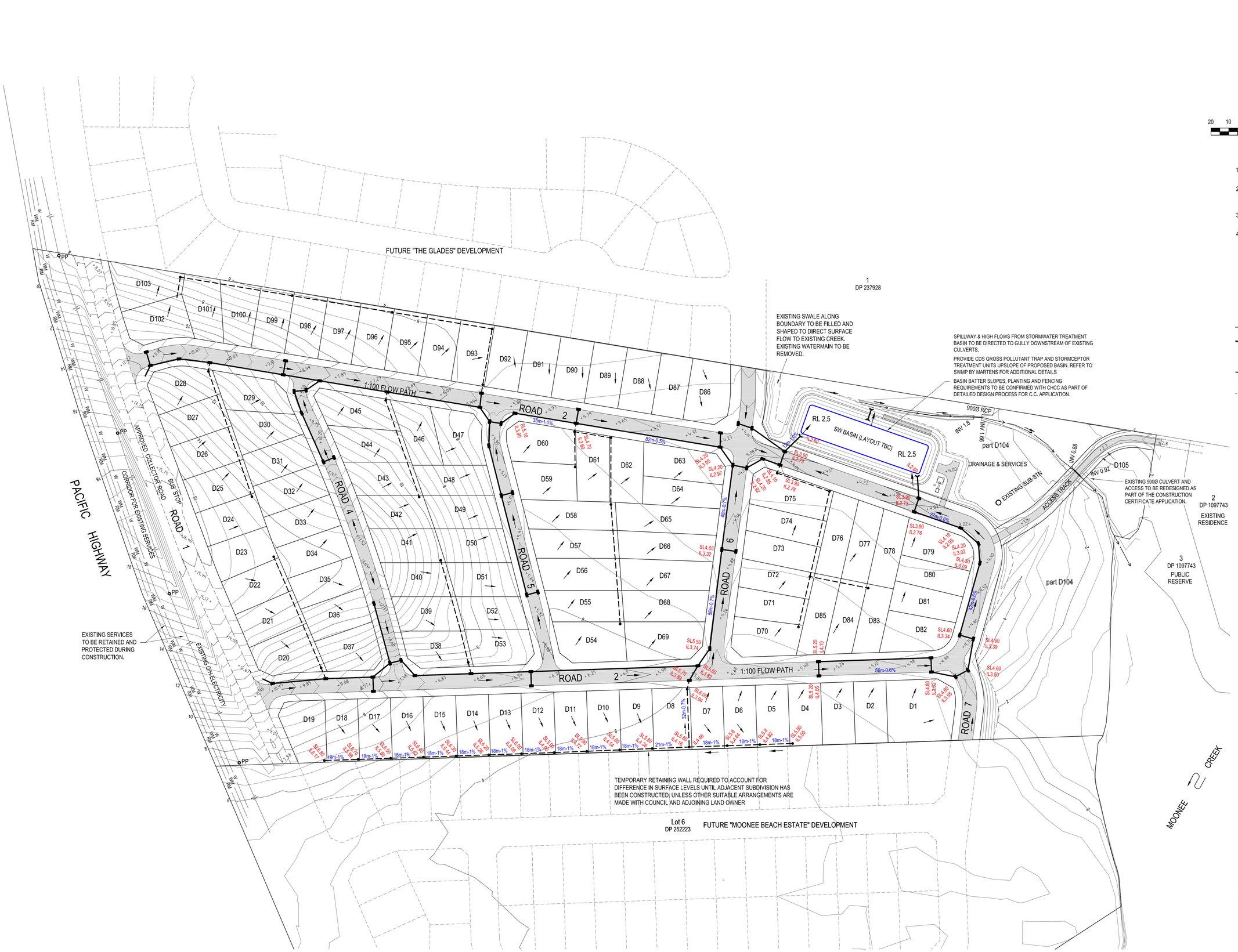
Dwg. No. **1277-DR5** Issue **J**



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SCALE 1:1000 AT A1

STORMWATER NOTES

1) DEPRESS SHOULDER AT SAG ADJACENT TO STORMWATER BASIN FOR Q100 FLOW PATH.
2) LEVELS AND SIZE OF STORMWATER AND IAD NETWORK TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
3) EASEMENT LOCATION AND WIDTHS TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION
4) STORMWATER BASIN DESIGN FOR DETENTION AND TREATMENT AS PER MODELING AND DETAILS BY MARTENS CONSULTING ENGINEERS.

LEGEND

- PROPOSED LOT POLYGON
- PROPOSED STORMWATER NETWORK
- SL6.10 IL5.10 — PIT SURFACE LEVEL & INVERT (critical lines)
- PROPOSED INTER ALLOTMENT DRAINAGE
- PROPOSED EASEMENT
- TYPICAL DRAINAGE FLOW DIRECTION
- STORMWATER CATCHMENT BOUNDARY
- BIO-RETENTION TREATMENT
- DESIGN SURFACE LEVEL

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION STORMWATER LAYOUT AND CATCHMENT PLAN

0.5m FINISHED CONTOURS

Scale: 1:1000 at A1 CAD file: 1277-DR6J.dwg

Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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Dwg. No. **1277-DR6** Issue **J**

LEGEND

TEMPORARY DRY SEDIMENT BASIN
SD6-3 TYPE 'C' SOILS
(WITH OVERFLOW WEIR FILTERED BY STRAW BALES SEE SD6-7)

SEDIMENT FENCE (SEE SD6-8)

STABILISED SITE ACCESS (SEE SD5-7)

STRAW BALE FILTER (SEE SD6-7)

SANDBAG BARRIER (PIT INLET FILTER) TO BE INSTALLED AT EACH INLET PIT (SEE SD6-11)

DIRTY WATER CATCH DRAIN (300 DEEP TYPICAL) (SEE SD5-5)

SEE SOIL AND CONSTRUCTION MANUAL FOR SD DETAILS

EROSION & SEDIMENT CONTROL NOTES

THIS EROSION AND SEDIMENT CONTROL PLAN IS INDICATIVE ONLY FOR THE PURPOSES OF THE CONCEPT PLAN. DETAILED EROSION AND SEDIMENT CONTROL PLANS WILL BE DESIGNED AND DETAILED FOR EACH SPECIFIC CONSTRUCTION PHASE. TEMPORARY BASIN SIZES ARE SUBJECT TO PARTICLE DISTRIBUTION SIZING.

WORKS ON THE SITE SHALL BE CARRIED OUT IN THE FOLLOWING SEQUENCE:

- INSTALL BARRIER AND SILT FENCES
- STRIP AND STOCKPILE TOPSOIL
- UNDERTAKE SITE DEVELOPMENT WORKS
- REHABILITATE SITE, CLEANUP & REMOVE RUBBISH DEBRIS
- REMOVE TEMPORARY SOIL AND WATER MANAGEMENT WORKS ONCE APPROVED TO DO SO BY COUNCIL.

1) THE PRINCIPAL STRATEGY IS:
TO PROVIDE "SILT" FENCES, STRAW BALE FENCES OR SOIL BERMS DOWNSLOPE OF ALL UNPROTECTED DISTURBED AREAS TO CAPTURE ANY SEDIMENT PASSING FROM THE SITE.

2) ALL WORKS TO BE IMPLEMENTED AND INSTALLED IN ACCORDANCE WITH LANDCOM & HOUSING NSW'S "BLUE BOOK", *MANAGING URBAN STORM WATER, SOILS AND CONSTRUCTION* AND ANY SPECIFIC DIRECTIONS OF COUNCIL.

3) VEHICULAR ACCESS POINTS ONTO CONSTRUCTION SITE MAY REQUIRE A GRAVEL PAD/STABILISED ACCESS.

4) SILT TRAPS MAY BE REQUIRED AT ENTRY TO KERB AND GUTTER INLET PITS. IF REQUESTED BY THE SUPERINTENDENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR CONSTRUCTION AND MAINTENANCE.

5) TURF STRIPS TO BE INSTALLED BEHIND THE BACK OF ALL KERB AND GUTTER.

6) SEDIMENT BASINS TO BE DECOMMISSIONED ONCE 80% GRASS COVER IS ACHIEVED AND STORMWATER TREATMENT BASINS CONSTRUCTED.

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Iss	Description	Des	Drw	Date	Appd
J	LINK TO SOUTHERN ESTATE	WF	WF	19.06.20	JP
H	AMEND COLLECTOR ROAD	WF	WF	28.08.19	JP
F	FOR RE-SUBMISSION	WF	WF	26.08.15	JP

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION EROSION AND SEDIMENT CONTROL PLAN

0.5m FINISHED CONTOURS

Scale: 1:1000 at A1 CAD file: 1277-DR7J.dwg

Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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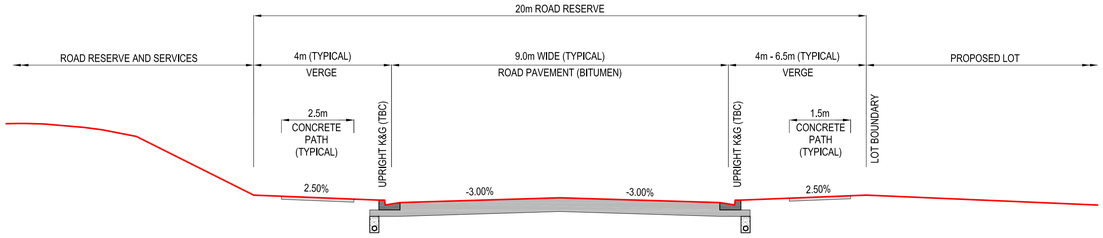
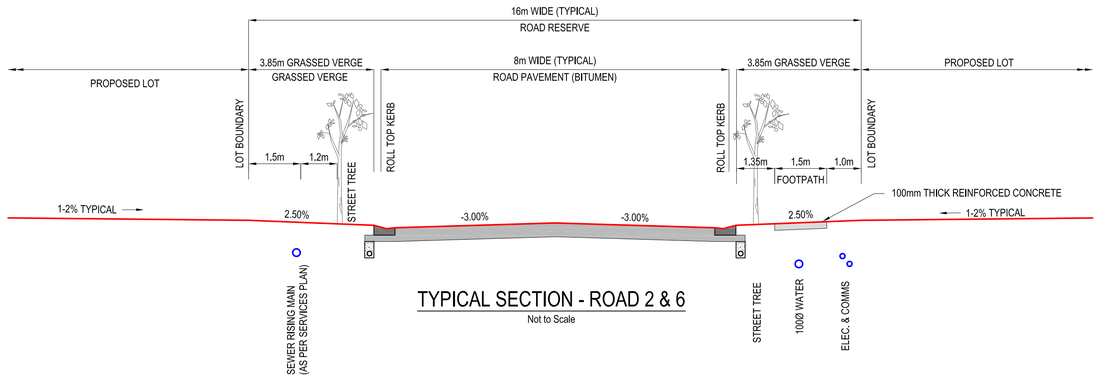
Dwg. No. **1277-DR7** Issue **J**



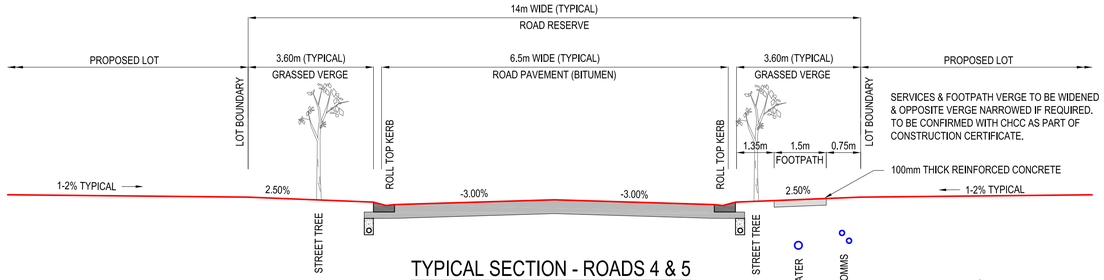
TYPICAL COLLECTOR ROAD (by others)

Not to Scale



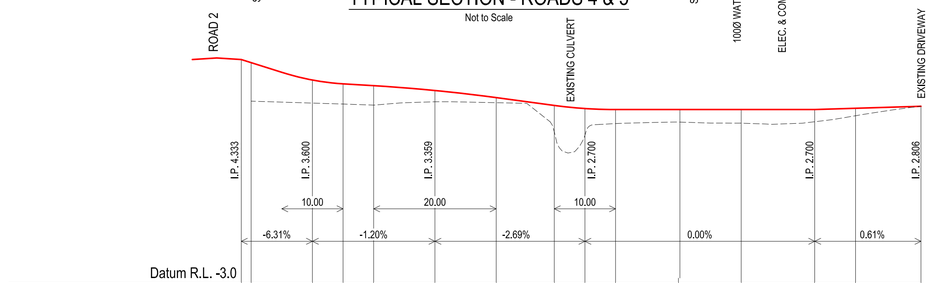
TYPICAL SECTION - ROAD 2 & 6

Not to Scale



TYPICAL SECTION - ROADS 4 & 5

Not to Scale

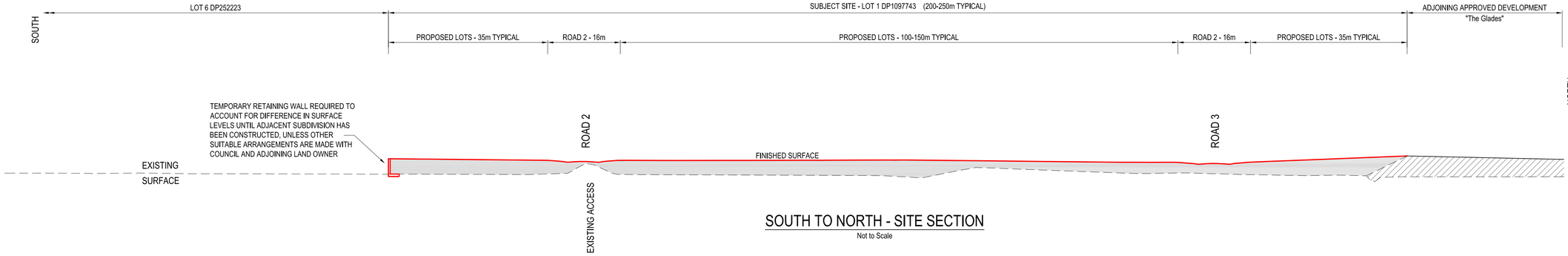


Datum R.L. -3.0

CUT/FILL		+1.26	+0.75	+0.66	+0.64	+0.37	+0.17		+0.53	+0.45	+0.41	+0.44		+0.24	-0.01
DESIGN SURFACE	4.33	4.23	3.66	3.54	3.48	3.32	3.09	2.83	2.73	2.70	2.70	2.70	2.70	2.74	2.81
NATURAL SURFACE		2.97	2.91	2.88	2.84	2.95	2.92		2.19	2.25	2.29	2.26		2.50	2.81
CHAINAGE	18.391	20.000	30.000	35.000	40.000	50.000	60.000	69.467	74.487	79.487	90.000	100.000	112.000	118.665	129.345

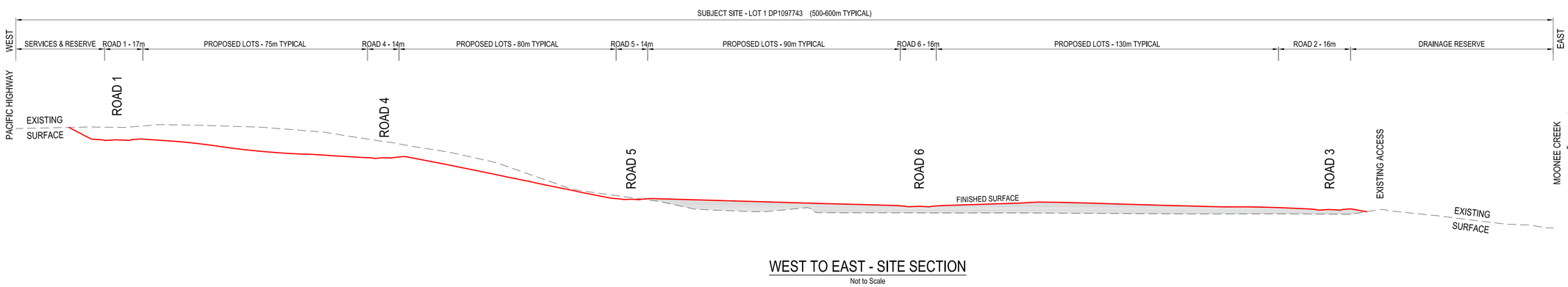
CONCEPT ACCESS TO EXISTING DWELLING (LOT 2 DP 1097743)

Scale Horizontal 1:500 Vertical 1:100



SOUTH TO NORTH - SITE SECTION

Not to Scale



WEST TO EAST - SITE SECTION

Not to Scale

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

TYPICAL SITE DETAILS AND ROAD SECTIONS

Scale: As Shown at A1 CAD file: 1277-DR8J.dwg
Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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Dwg. No. **1277-DR8** Issue **J**

N

20 10 0 25 50 75 100

SCALE 1:1000 AT A1

SUBDIVISION NOTES

1) EXACT LOT LAYOUT, AREAS AND DIMENSIONS TO BE CONFIRMED WITH FINAL DESIGN, SURVEY AND APPROVALS.
2) EASEMENT LOCATION AND WIDTHS TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.
3) PROVIDE RIGHT OF WAY FOR ACCESS TO EXISTING LOT 2 RESIDENCE.
4) EASEMENTS TO BE PROVIDED FOR SERVICES TO THE SATISFACTION OF THE RELEVENT AUTHORITIES.

FUTURE "THE GLADES" DEVELOPMENT

Lot 1
DP 237928

E2 ZONE

PACIFIC HIGHWAY

APPROVED COLLECTOR ROAD

ROAD 1

CORRIDOR FOR EXISTING SERVICES

EXISTING SERVICES TO BE LOCATED IN PROPOSED ROAD RESERVE FOR COLLECTOR ROAD WITH CURRENT EASEMENTS TO BE EXTINGUISHED AS REQUIRED.

ROAD 2

ROAD 4

ROAD 5

ROAD 6

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19

D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D30 D31 D32 D33 D34 D35 D36 D37

D38 D39 D40 D41 D42 D43 D44 D45 D46 D47 D48 D49 D50 D51 D52 D53

D54 D55 D56 D57 D58 D59 D60 D61 D62 D63 D64 D65 D66 D67 D68 D69

D70 D71 D72 D73 D74 D75 D76 D77 D78 D79 D80 D81 D82 D83 D84 D85 D86 D87 D88 D89 D90 D91 D92 D93 D94 D95 D96 D97 D98 D99 D100 D101 D102 D103

10m APZ

20.5

4.5

20m?

27m

16m

6.0

27m APZ

SW BASIN (SEE MARTENS SWMP)

part D104

DRAINAGE & SERVICES

PROPOSED SEWER PS

EXISTING SUB-STN

PROPOSED ACCESS TRACK

7A ZONE

COASTAL WALK

D105

Lot 2
DP 1097743
EXISTING RESIDENCE

Lot 3
DP 1097743
PUBLIC RESERVE

PART D104

E2 ZONE

7A ZONE

DRAINAGE RESERVE

Lot 6
DP 252223

FUTURE "MOONEE BEACH ESTATE" DEVELOPMENT

MOONEE CREEK

LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED EASEMENT
- PROPOSED APZ
- CURRENT 7A ZONE
- APPROVED E2 ZONE

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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

PROPOSED SUBDIVISION LOT LAYOUT WITH APZ

Scale: 1:1000 at A1 CAD file: 1277-DR9B.dwg
Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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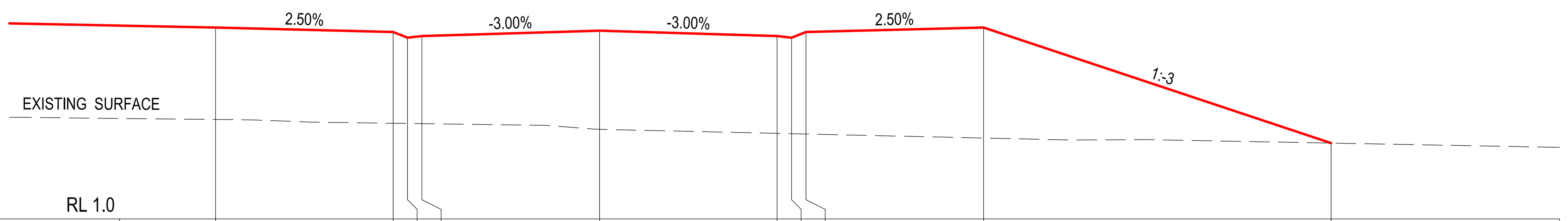
Dwg. No. **1277-DR9** Issue **B**



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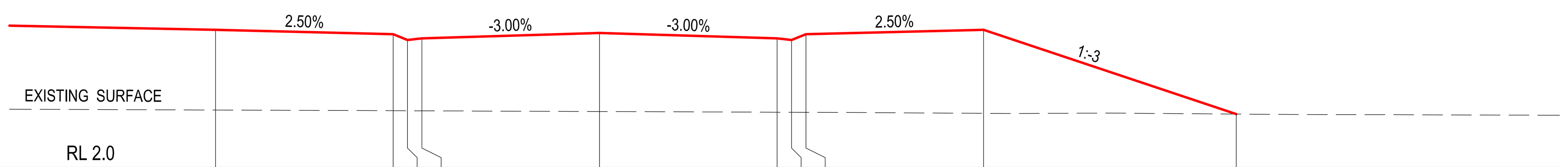
NATURAL	3.10	3.08	3.00	2.99	2.99	2.87	2.79	2.78	2.77	2.69	2.58	2.49
OFFSETS	10.00	8.00	4.30	4.00	3.70	0.00	3.70	4.00	4.30	8.00	15.24	20.00

50.000 (SITE BOUNDARY)



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DESIGN		4.86	4.77	4.65	4.68	4.79	4.68	4.65	4.77	4.86	3.11	
NATURAL	3.20	3.19	3.18	3.18	3.17	3.16	3.15	3.14	3.14	3.12	3.11	3.08
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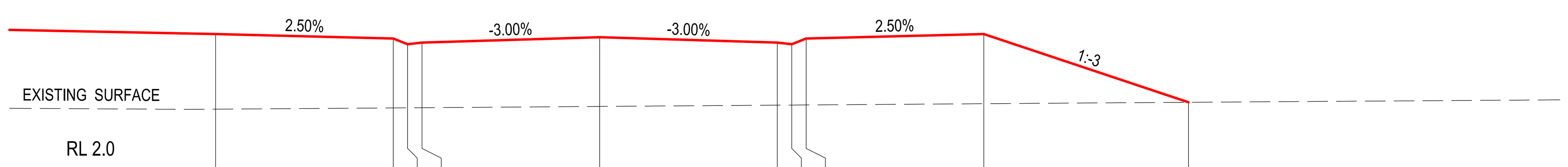
30.000 (by others)



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NATURAL	3.22	3.22	3.24	3.25	3.25	3.27	3.30	3.30	3.30	3.33	3.36	3.41
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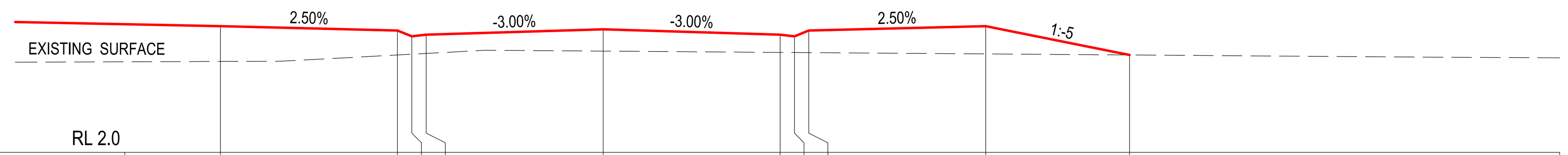
10.000 (by others)



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NATURAL	3.89	3.90	4.03	4.05	4.06	4.11	4.08	4.08	4.08	4.05	4.03	3.97
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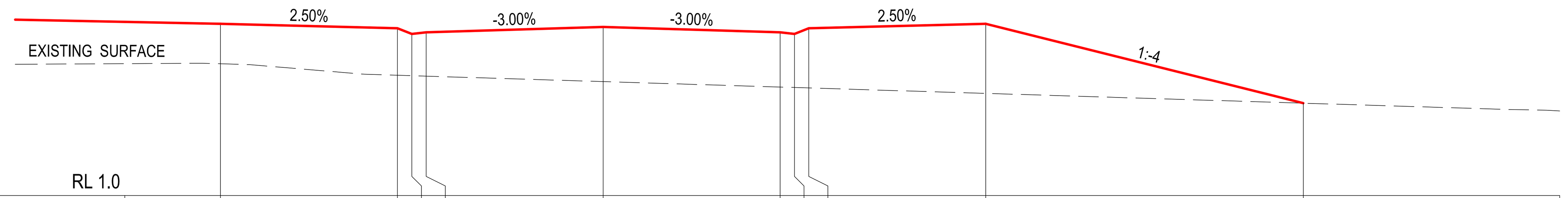
90.000



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NATURAL	3.76	3.76	3.52	3.51	3.50	3.38	3.27	3.26	3.25	3.14	2.93	2.77
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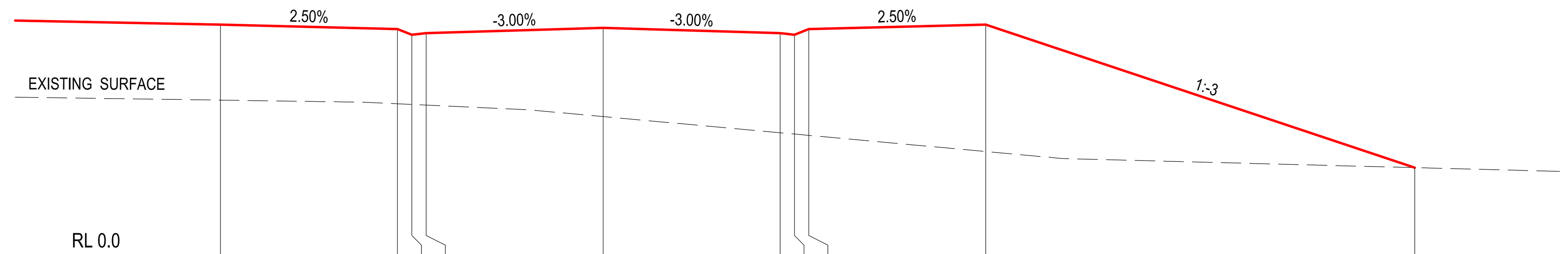
80.000



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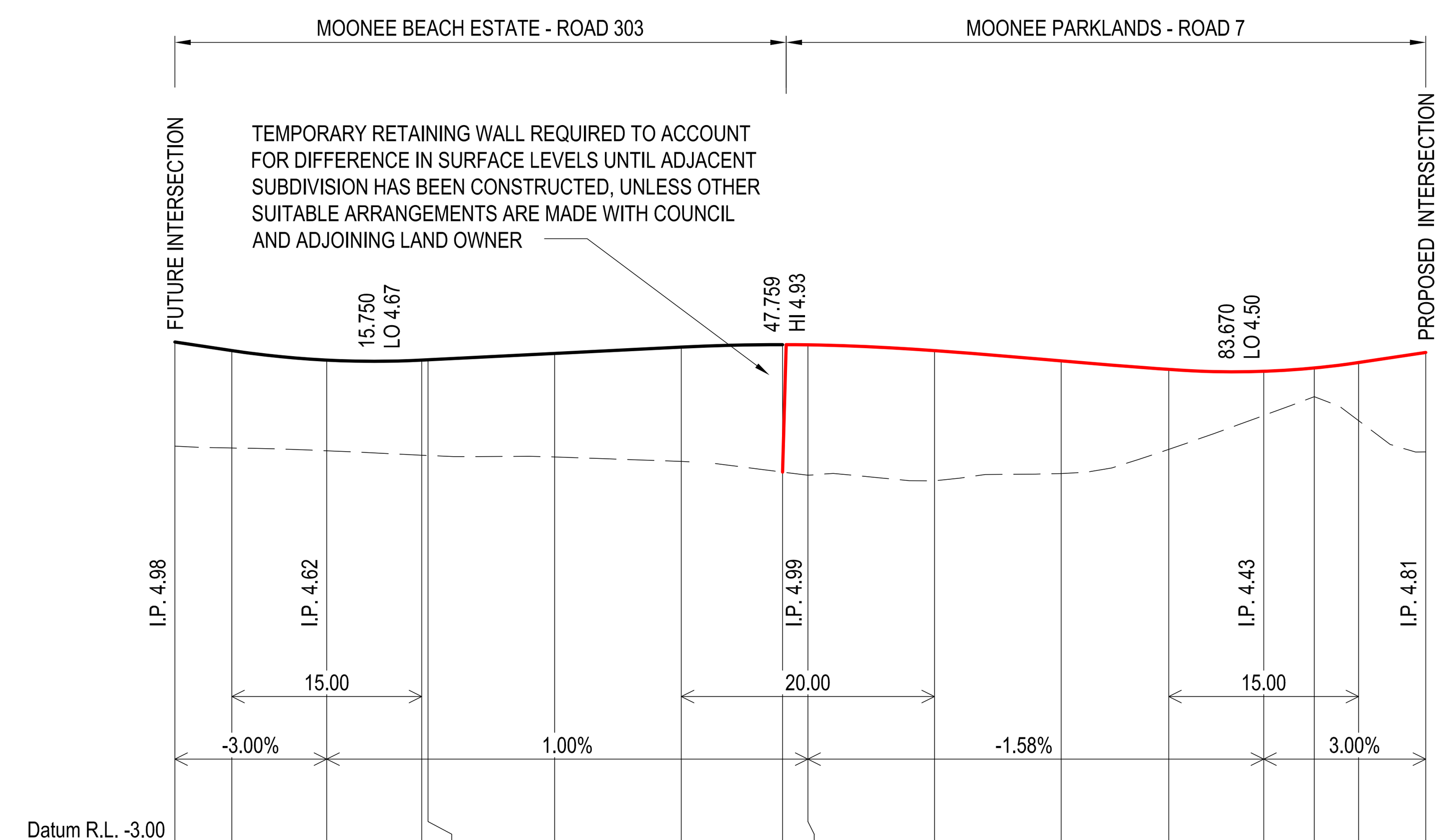
DESIGN		4.81	4.72	4.60	4.63	4.74	4.63	4.60	4.72	4.81	1.82	
NATURAL	3.26	3.23	3.15	3.14	3.13	2.89	2.55	2.52	2.49	2.16	1.82	1.74
OFFSETS	10.00	8.00	4.30	4.00	3.70	0.00	3.70	4.00	4.30	8.00	16.97	20.00

66.000 (GULLY)

ROAD 7 - CROSS SECTIONS

Scale Horizontal 1:100 Vertical 1:100



CUT/FILL	+1.64		+1.43		+1.51	+1.64	+1.81	+2.01	+2.06	+2.06	+1.78		+0.70	+0.45		+1.57
DESIGN SURFACE	4.98	4.84	4.69	4.69	4.70	4.79	4.90	4.93	4.93	4.84	4.68	4.55	4.51	4.57	4.65	4.81
NATURAL SURFACE	3.33		3.26		3.18	3.16	3.09	2.92	2.87	2.78	2.90		3.81	4.11		3.24
Chainage	0.000	4.500	12.000	19.500	20.000	30.000	40.000	48.000	50.000	60.000	70.000	78.500	86.000	90.000	93.500	98.799

Alignment Details: B=43°01'40" · R=14.00 L=4.37 · B=7°16'34" D=35.18 · B=7°16'34" D=17.98 · R=30.00 L=10.85 · R=30.00 L=10.85 · B=325°50'53" D=8.94

ROAD 7 - LONG SECTION

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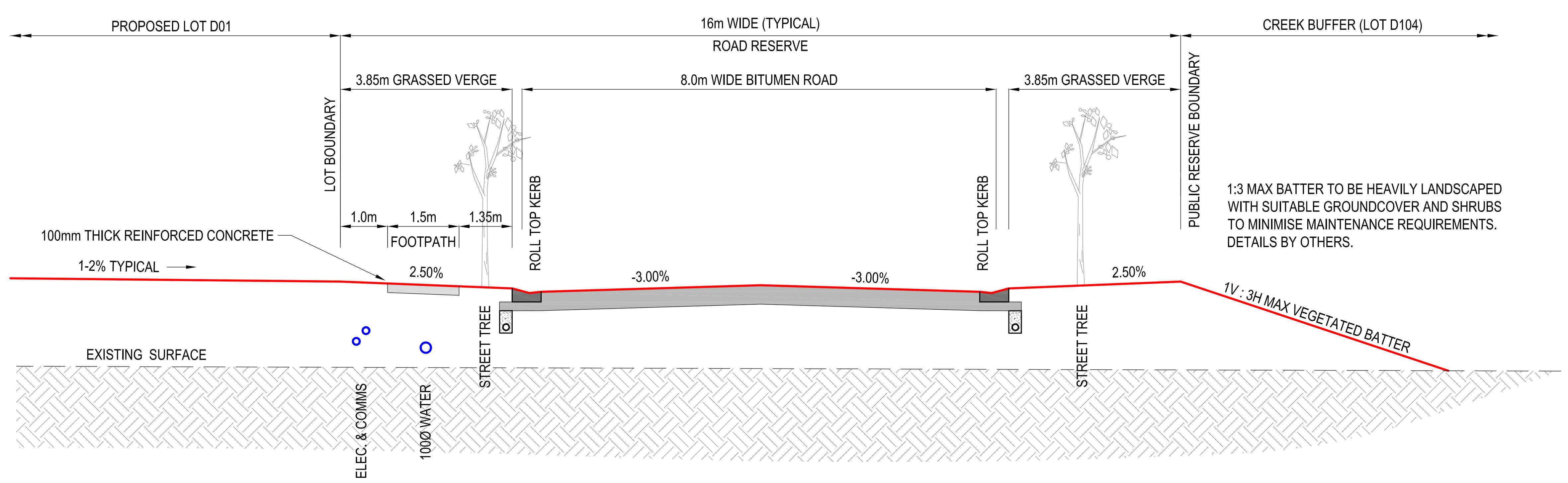

ROAD 7 - TYPICAL SECTION

Not to Scale

Iss	Description	Des	Drw	Date	Appd
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MOONEE PARKLANDS TRUST

MOONEE PARKLANDS
PROPOSED URBAN SUBDIVISION
MOONEE BEACH
LOT 1 DP 1097743

ROAD 7 LONG SECTION
CROSS SECTION & DETAILS

Scale: As Shown at A1 CAD file: 1277-DR10A.dwg
Datum: AHD CivilCAD file: 1277-ENG-V2.ccx

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Dwg. No. **1277-DR10** Issue **A**

Attachment B

Compliance with Coffs Harbour Coastal Management Strategy 2013 – Martens & Associates

martens
consulting engineers since 1989

Posted		
Faxed		
Emailed	X	jason@jwplanning.com.au
Courier		
By Hand		
Contact:		Jeff Fulton
Our Ref:		P1002663JC09V01
Pages:		1
cc.		

22 May, 2020

Moonee Parklands Trust Pty Ltd
C/ - JW Planning
Attn: Mr Jason Wasiak
By email

Dear Jason,

RE: MOONEE BEACH RESIDENTIAL SUBDIVISION (SSD 7198) - REALIGNMENT OF ROAD 303 AND COMMENTS ON COASTAL INUNDATION IMPACT

We have prepared this letter in response to the NSW DPIE request for information (RFI: reference SSD 7198, signed by Brendon Roberts, December 2019). The RFI notes that the Coffs Harbour Coastal Management Study (CHCMS 2013) considers the site as being at risk from coastal inundation hazard, and requires an assessment of that risk.

Martens and Associates previously prepared a flood assessment for the proposed development (ref: P1002663JR08V02, MA 2015). The model outcomes documented in MA 2015 assessed the combined effects of sea level rise and climate change (i.e. rainfall intensity) scenarios. The assessment of these scenarios was in accordance with the requirements of CHCMS 2013 for assessing the risk of coastal inundation on or from flood levels.

Provided the recommendations in MA 2015 are adhered to, the risk of coastal inundation on or from the development (including Road 303) is negligible and no further assessment is required.

If you have any queries with regards to the above matter, please contact the undersigned.

For and on behalf of

MARTENS & ASSOCIATES PTY LTD

JEFF FULTON
BSc, MEngSc
Senior Engineer

Head Office
Suite 201, 20 George St
Hornsby NSW 2077, Australia
Ph 02 9476 9999 **Fax** 02 9476 8767

> mail@martens.com.au
www.martens.com.au
MARTENS & ASSOCIATES P/L
ABN 85 070 240 890 ACN 070 240 890

Attachment C
Revised Biodiversity Offset Strategy

The trustee for Moonee Parklands Trust T/As Moonee Developments Pty Ltd

Moonee Parklands Residential Development
Biodiversity Offsets Strategy

June 2020

Table of contents

Table index

Figure index

Appendices

1. Biodiversity offsets strategy

1.1 Introduction

The trustee for Moonee Parklands Trust (the client) is seeking approval for the proposed Moonee Parklands residential subdivision MP 09_0067 (the Project). The site is shown in Figure 1.

This report presents the Biodiversity Offset Strategy (BOS) which outlines how the proponent will be required to offset the impacts of the Project. The strategy has been prepared giving consideration to the NSW Biodiversity Offsets Policy for Major Projects (2014). This policy is supported by the Framework for Biodiversity Assessment (2014) (FBA). The FBA sets out the assessment methodology that has been adopted by the Major Projects Policy to quantify the biodiversity impacts and determine the offset requirement of a Major Project. Major projects include State significant development (SSD) and State significant infrastructure (SSI) projects.

The proposed Moonee Parklands residential subdivision was lodged before the Major Projects Policy had been adopted by the NSW government. As such, the original application was submitted with a supporting Ecological Assessment prepared by PEA Consulting (2013). Since this time the NSW Department of Planning, Industry and Environment (DPIE) and the former NSW Office of Environment and Heritage (OEH) (now the Biodiversity Conservation Division (BCD) within DPIE)) have determined that the project is required to deliver biodiversity offsets to compensate for residual impacts to biodiversity. Consultation between the applicant and both the DPIE and BCD have agreed that the biodiversity offsets are to be provided in accordance with the Major Projects Policy and the FBA.

It should be noted however that both DPIE and BCD have agreed that the project is not required to complete a Biodiversity Assessment Report (BAR) in accordance with the requirements of the FBA as it has been acknowledged the PEA Report (2013) has adequately considered the site's biodiversity values. The agreement with DPIE and BCD is to prepare a BOS, giving consideration to the requirements and application of the FBA in relation to biodiversity offsets, only.

The BioBanking Assessment Methodology (BBAM) was used to determine the number and type of biodiversity credits required to offset impacts of the Project. A copy of the biodiversity credit report is included inAppendix A. The BOS also sets out the requirements and trading rules that the project will need to apply to secure the necessary biodiversity credits before a Construction Certificate (CC) can be issued for the project.

This report was prepared with consideration of the following legislation, reports and policies:

- NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014c)
- Framework for Biodiversity Assessment (OEH, 2014b)
- Ecological Assessment (PEA Consulting, 2013)
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Biodiversity Conservation Act 2016*

2. Methods

2.1 Approach

Biodiversity credits were calculated at the Project according to the methodology presented in the *BioBanking Assessment Methodology* (OEH 2014a) and the *Operational Manual for using the BioBanking Credit Calculator v4.1* (OEH 2016a). The credit calculator is the software version of the methodology. Data was entered into the credit calculator (version 4.1) based on information collected in the desktop assessment, site surveys and from using GIS mapping software.

The methodology establishes two classes of biodiversity credits that may be created:

- Ecosystem credits – these are created or required for all impacts on biodiversity values, including threatened species that can be reliably predicted by habitat surrogates.
- Species credits – these are created or required for impacts on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Threatened species that require species credits are identified in the Threatened Species Profile Database (OEH, 2015a).

This BOS has been prepared to support an application for the Moonee Parklands residential subdivision. The following methods were utilised in the approach:

- A literature and database review to describe the existing environment of the Project site and to obtain the necessary data to perform BioBanking credit calculations.
- Geographic information system (GIS) assessment to map the Project site and calculate the landscape value.
- Field survey of the Project site, including the BioBanking plot/transect methodology to calculate the site value.
- Credit calculations using the credit calculator v 4.1 to determine the ecosystems credits that will be required to offset the Projects biodiversity impacts.

The credit calculator produces a number of reports, including the threatened species predicted to occur, survey effort required at the site and the biodiversity credit profile, which are appended to this BOS.

The purpose of this BOS assessment is to assess the number of credits that are required by the Project and to outline the requirements and the trading rules for securing the credits.

2.2 Desktop assessment

2.2.1 Literature and database review

The following resources were reviewed to assist in describing the existing environment of the Project site and to obtain some of the necessary data to perform Offset credit calculations:

- Coffs Harbour City Council (2012) Fine Scale Vegetation Mapping for the Coffs Harbour LGA
- OEH (2014d) Vegetation Types Database
- OEH (2016d) Vegetation Information System: Classification
- OEH (2016c) NSW BioNet Search
- PEA Consulting (2013), Ecological Assessment Lot 1 DP 1097743 and Lot 6

- DECCW (2010) NSW Interim Vegetation Extent remote sensing imagery
- Aerial photographs and satellite imagery of the site

2.2.2 Geographical Information System (GIS) analysis

GIS analysis is an integral part of the BBAM. GIS was used to plot the Project site on a high resolution aerial photo base and to map vegetation types and biodiversity values across the site. GIS analysis was used to calculate the extent of native vegetation to be managed within the Project site, which was entered into the credit calculator.

GIS analysis was used to accurately determine the relevant Catchment Management Authority (CMA) CMA Sub-region and Mitchell Landscape for the site.

Additional GIS analysis was used to plot the assessment circles surrounding the site in which landscape scores are calculated. Native vegetation cover, extent and connectivity were assessed using aerial photography and NSW Interim Vegetation Extent remote sensing imagery (DECCW 2010). Air photo interpretation was used to identify and record distinct vegetation patches, determine the broad condition state of vegetation types and the location and extent of vegetated habitat corridors. The assessment circles and GIS area calculations were used to enter information about landscape value and to determine the change in Landscape Value score by assessing the impact of the Project on native vegetation cover and connectivity as well as the size of adjacent remnant area.

2.3 Site survey

2.3.1 Survey effort

Staged field surveys of the Project site were conducted with reference to the BBAM. Surveys involved broad vegetation surveys and vegetation mapping followed by BioBanking plot-transect surveys and additional opportunistic fauna and threatened flora surveys.

Survey effort that has contributed to this report is summarised in and described below.

Table 2-1 Survey effort

Stage	Date	Survey technique
Biobanking Surveys	29 – 30 September 2016	Vegetation composition of the site was ground truthed and any incidental fauna or threatened fauna sightings recorded. Nine 20 m x 50 m BioBanking plots / transects and nine 20 m x 20 m floristic plant species richness plots conducted.
Ecological Assessment conducted by Pacific Environmental Associates Pty Ltd (PEA) Consulting	March 2013	As per Ecological Assessment Report (EAR).

2.3.2 Vegetation mapping

Vegetation mapping as gathered from Coffs Harbour LGA Detailed Vegetation Mapping (2012) was ground-truthed in the field by GHD via walking the boundary of vegetation types. Field ecologists checked mapped vegetation polygons with a hand-held Trimble GPS unit loaded with aerial photography and the Coffs Harbour LGA vegetation mapping. Necessary adjustments were made by hand on aerial photographs of the site and by capturing waypoints at vegetation type boundaries. The site was divided into relatively homogenous or discrete zones for assessment. Each zone represented a distinct vegetation type according to the Vegetation Information System (VIS) (OEH 2016d) and broad condition state. Five vegetation zones were identified in the site, three in the development area and two in the conservation area as shown on Figure 2.

2.3.3 Plots /Transects

Plot and transect surveys were conducted on site in accordance with the BioBanking Assessment Methodology (BBAM) to obtain data for the calculation of biodiversity credits. The site value was determined by assessing 10 site condition attributes against benchmark values. Benchmarks are quantitative measures of the range of variability in condition in vegetation with relatively little evidence of alteration, disturbance or modification by humans since European settlement (DECC, 2009). Species were identified according to the nomenclature of the Royal Botanic Gardens and Domain Trust (2016). Cover abundance data was also collected for each species within the 20 metre x 20 metre portion of each plot/transect.

Plots were distributed between vegetation zones (i.e. NSW vegetation types and condition classes identified in the preliminary survey) according to the minimum number of plots required by the BBAM. A total of 9 plots were sampled within the site as shown on Figure 2.

The overall condition of vegetation was assessed through general observation and comparison against the BioBanking condition benchmark data as well as using parameters such as species diversity, history of disturbance, weed invasion and canopy health. Vegetation types all fell within the ‘Moderate/good’ condition class according to the BBAM.

Moderate/good condition vegetation was further split into three sub-classes with reference to BioBanking benchmark data (OEH, 2015d) as follows:

- Condition category ‘high’:
  - Vegetation still retains the species complement and structural characteristics of the pre-European equivalent. Such vegetation has usually changed very little over time and displays resilience to weed invasion due to intact groundcover, shrub and canopy layers. Native species diversity is relatively high. Weeds may exist in this vegetation type but are not dominant in any vegetation layer (native groundcover is greater than 50%).
- Condition category ‘medium’:
  - Vegetation has retained a native canopy (greater than or equal to 25% of the Lower benchmark value) but with a moderate to severe weed infestation in the midstorey and understorey. The understorey is still predominantly native. Native shrubs and were generally sparse and all stratum had Low species richness.

- Condition category ‘poor’:
  - Vegetation has a native canopy with predominantly exotic midstorey and understorey (native groundcover and shrub layer is less than 50%), or
  - Vegetation has lost most of the native canopy cover and is significantly modified structurally but has a predominantly native understorey and/or midstorey. All stratum have a very low diversity and abundance of native species.

Opportunistic and incidental observations of fauna species were recorded at all times during field surveys. Casual fauna observations were made in suitable areas of habitat throughout the course of the flora survey and while incidentally traversing the site. This included visual inspection of nests, creek lines, overhangs and woody debris, active searches for small fauna and opportunistic observation of scats, tracks, burrows or other traces.

Opportunistic observations of fauna and threatened plants were recorded throughout the survey. The locations of any threatened species identified within the site were captured with a handheld GPS.

Targeted flora surveys

No targeted flora surveys were conducted at the site. Previous surveys completed for the PEA Assessment (2013) were considered adequate by the BCD.

Targeted fauna surveys

No targeted fauna surveys were conducted at the site. Previous surveys completed for the PEA Assessment (2013) were considered adequate by the BCD.

Opportunistic and incidental observations of fauna species were recorded by GHD during this field survey. Casual fauna observations were made in suitable areas of habitat throughout the course of the flora survey and while incidentally traversing the site. This included visual inspection of fallen logs, overhangs and woody debris, and opportunistic observation of scats, tracks, burrows or other traces.

2.4 BioBanking assessment

The BioBanking credit calculations were completed by Dan Williams (accredited assessor 0082) using credit calculator Version 4.1. Field survey results, GIS calculations and this assessment report have been peer reviewed by Shaun Lawer (see Table 2-2). The credit calculations will be submitted to BCD and the biodiversity credit report is included as Appendix A.

2.5 Staff qualifications

This report, including all BioBanking credit calculations, was prepared by Dan Williams based on field surveys conducted by GHD ecologists Jessica Sharp and Ben Harrington. The assessment was peer reviewed by Shaun Lawer. Staff qualifications are presented in Table 2-2.

Table 2-2 Staff qualifications

Name	Position / Project role	Qualifications	Relevant experience
Daniel Williams	Principal Environmental Consultant / Reporting, management actions, TFD, consultation and planning	B. App. Sc. BioBanking Assessor Accreditation 1	15+ years
Jessica Sharp	Graduate ecologist / site surveys, reporting	BEnvSci	2 years
Ben Harrington	Principal Ecologist / site surveys, reporting	BSc MSc (Physical Geography) BioBanking Assessor Accreditation 1	10+ years
Shaun Lawer	Peer review	B. Urban and Regional Planning, M. Business Administration	25 years
1 Refer to OEH (2016b) list of accredited assessors.			

3. Existing environment

3.1 Site context

3.1.1 Location and land uses

The proposed site is located 30 km north of Coffs Harbour within the Coffs Harbour Local Government Area (LGA) as shown on Figure 1. It falls within the Coffs Harbour and Escarpment subregion of Northern Rivers Catchment Management Authority (CMA), and within the North Coast Bioregion.

The Project is contained within Lot 1 DP 1097743, off the Pacific Highway, Moonee Beach NSW. The site borders rural properties to the north and south and is bounded by Moonee Creek in the east and the Pacific Highway to the west.

The entire site is currently identified as DM (Deferred Matter) under the Coffs Harbour Local Environmental Plan (LEP) 2013. The site is zoned partly 2A Low Density Residential and Environmental Protection 7A Habitat and Catchment under Coffs Harbour LEP 2000.

A portion of the site in the east is excluded from the development footprint and proposed as conservation land. This includes vegetation directly adjacent to Moonee Creek.

3.1.2 Climate

The site has a subtropical, maritime climate. Based on data from the Coffs Harbour MO weather station, the site has a mean annual rainfall of 1,481 mm, mean daily maximum temperature of 24.3 degrees Celsius and mean daily minimum temperature of 11.9 degrees Celsius (BOM 2017).

3.1.3 Hydrology

Moonee Creek and an associated small tributary borders the eastern boundary of the site. The site itself does not include any drainage lines however, the site generally drains from west to east

LEGEND

- Study area
- Development site
- Conservation area
- Proposed subdivision
- Cadastre
- Contour

Paper Size A4

0 30 60 120

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Moonee Parklands Development
BioBanking Assessment

Job Number 22-18610
Revision 0
Date 26 Jun 2020

Study area

Figure 1

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\\ghdnet\ghd\AU\Newcastle\Projects\22\18610\GIS\Maps\Deliverables\BiobankingAssessment\2218610_BA001_StudyArea_0.mxd

Data source: LPI: DCDB/DTDB, 2012/2015 Created by: kpsroba

3.2 Vegetation and habitat resources

3.2.1 Overview

Field surveys confirmed the presence of four NSW vegetation types within the site. Of these, two are located within the development footprint and two are located within the proposed conservation lands in the east of the site.

All of these vegetation types are in moderate/good condition (according to the BBAM), with one (NR161) occurring in moderate/good - medium condition and moderate/good – poor condition. The list of vegetation types in the development area includes:

- NR117: Blackbutt - Pink Bloodwood shrubby open forest dry grassy open forest of the central parts North Coast
- NR161: Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast

The list of vegetation types in the proposed conservation area includes:

- NR220: Pink Bloodwood open forest of the coastal lowlands
- NR217: Paperbark swamp forest

The vegetation zones are shown on Figure 2 and summarised in Table 3-1.

The credit calculator indicates one vegetation type, Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast (NR161), is listed as part of the endangered ecological community (EEC) Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion under the TSC Act.

The distribution of vegetation zones in the site is closely tied to elevation, soil type, fire regime, underlying geology and geomorphic position. The site has also been previously cleared in parts and this disturbance has influenced the condition of vegetation communities within the site. Areas of higher elevation in the west contain Blackbutt - Pink Bloodwood shrubby open forest dry grassy open forest of the central parts North Coast (NR117). To the east, in areas of lower elevation, lies Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast (NR161).

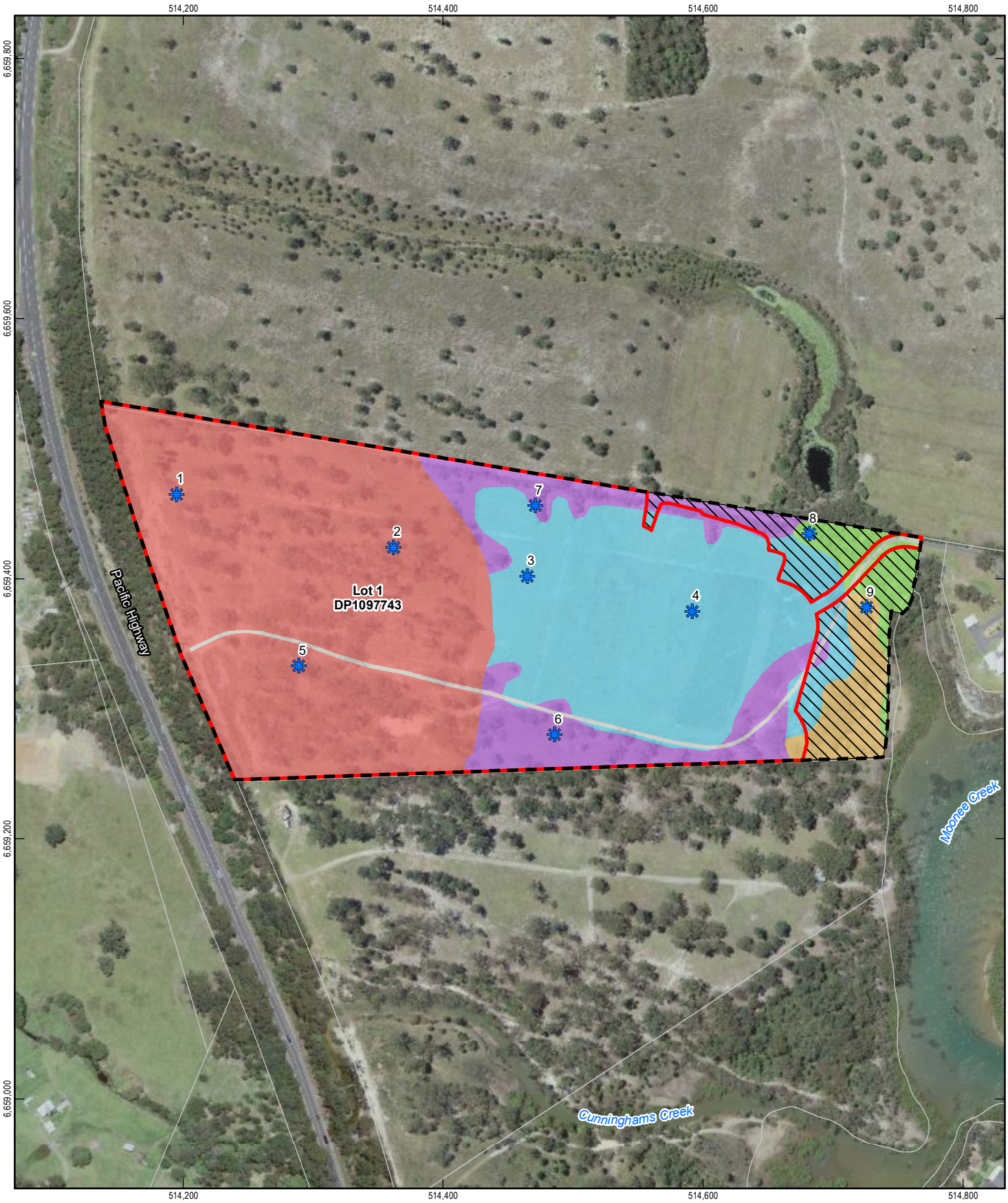
The majority of vegetation within the western portion of the site is in good condition with few weeds however, scattered individuals including Lantana (*Lantana camara*) were identified as described by PEA (2013). Vegetation within the central and eastern portions of the site includes significant areas of largely cleared lands and includes introduced pastures.

Table 3-1 Vegetation zones within the development area

Vegetation type (OEH, 2016d)	Veg Type ID	Condition	Area (ha)	Conservation significance
Blackbutt - Pink Bloodwood shrubby open forest dry grassy open forest of the central parts North Coast	(NR117)	Moderate/good – high	6.20	Not listed as an EEC
Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast	(NR161)	Moderate/good – medium	1.47	Listed as part of the EEC Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion

Vegetation type (OEH, 2016d)	Veg Type ID	Condition	Area (ha)	Conservation significance
Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast	(NR161)	Moderate/good – poor	3.7	Listed as part of the EEC Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion
		Total area	**11.37**	

Note: NR161 moderate/good – poor area calcs include two very small impact areas to other vegetation types, these being; 0.05 ha impact to NR217 and 0.03 ha impact to NR220. As these impact areas were smaller than the minimum polygon size of 0.25 ha the assessor used judgement to add these to the neighbouring vegetation zone for the purpose of calculating the ecosystem credit impact.



LEGEND

- Plot/transect
- Cadastre
- Study area
- Development site
- Conservation area
- Blackbutt - Pink Bloodwood shrubby open forest (NR117, Moderate/good - medium)
- Pink Bloodwood open forest of the coastal lowlands (NR220, Moderate/good)
- Forest Red Gum - Swamp Box forest (NR161, Moderate/good - medium)
- Forest Red Gum - Swamp Box forest (NR161, Moderate/good-poor)
- Paperbark swamp forest (NR217, Moderate/good)
- Access track

Paper Size A4

0 30 60 90 120

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Vegetation Zones

Figure 2

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\\ghdnet\ghd\AU\Newcastle\Projects\22\18610\GIS\Maps\Deliverables\BiobankingAssessment\2218610_BA002_VegetationZones_0.mxd

Data source: LPI: DCDB/DTDB/Aerial, 2012/2015 Created by: kpsroba, fmackay

3.3 Conservation significance

3.3.1 Threatened flora species

No threatened flora species were identified during the biobank plot transect surveys completed by GHD. Threatened flora surveys were previously completed by PEA Consulting, the results of which are shown in the 2013 assessment.

3.3.2 Threatened fauna species

There is the potential for a number of threatened fauna species to occur within the site, given the presence of suitable habitat and previous records within the locality. GHD to date have not included targeted surveys for threatened fauna as part of this assessment.

The PEA (2013) assessment included targeted surveys for threatened fauna, the results of which are detailed in this report.

3.3.3 Threatened ecological communities

The credit calculator indicates one vegetation type, Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast (NR161), is listed as part of the EEC Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion under the TSC Act.

4. BioBanking credit calculations

4.1 Approach

The BioBanking credit calculations were performed by Dan Williams (accredited assessor) using credit calculator Version 4.1. The credit calculations have been submitted to BCD for review and the biodiversity credit report is included as Appendix A.

The data and assumptions used to perform the BioBanking credit calculations are summarised below.

4.2 Project location

The site is located in the 'Northern Rivers CMA region; the 'Coffs Harbour and Escarpment' sub-region; and 'Manning – Macleay Coastal Alluvial Plain' is the most appropriate Mitchell Landscape for the assessment (DECC, 2008a; 2008b).

4.3 Project landscape value

4.3.1 Landscape assessment

The landscape assessment for the biobank is shown on Figure 3 and summarised in Table 4-1. The approach to the landscape assessment is described below.

The BBAM uses 100 hectare and 1,000 hectare assessment circles to estimate the extent and connectivity of native vegetation and habitat surrounding the site. Vegetation cover and connectivity was estimated based on the current situation and after the management of the site using GIS measurement of foliage projective cover within the assessment circles. The assessment circles were placed so as to capture the greatest change in vegetation cover as a result of the management of the Project. The percentage change in native vegetation cover was estimated by adding the area of cleared land and exotic vegetation within the Project site (i.e. the area that would regenerate into native vegetation cover) to the total area of native vegetation within the assessment circles. There is approximately 49 hectares of vegetation within the 100 hectare circle and 687 hectares of vegetation within the 1000 hectare circle. This would be reduced by approximately 7.67 hectares after the establishment of the Project (see Table 5-1).

According to the criteria for assessing patch size in Appendix 4 of the BBAM 2014, the Project falls within 'extra large' patch size class (greater than 200 hectares).

The BBAM 2014 also requires an assessment of whether the Project is within or partly within a 'strategic location' such as the riparian corridor of a third order or higher stream or a recognised biodiversity corridor. A strategic location as defined by the BBAM 2014 includes:

a. An area of land identified by the assessor as being part of a state significant biodiversity link and in a plan approved by the Chief Executive BCD, or

b. An area of land identified by the assessor as being part of a regionally significant biodiversity link and in a plan approved by the Chief Executive BCD, or

c. The riparian buffer area of a 3rd order stream or higher, an important wetland or an estuarine area.

The site is not located within a strategic location as defined by the BBAM.

Table 4-1 Landscape assessment values summary

Landscape Attribute	Before Project	After Project
% Native vegetation cover in 1000 ha assessment circle	56-60% (687 ha)	56-60% (679 ha)
% Native vegetation cover in 100 ha assessment circle	81-85% (49 ha)	81-85% (41.3 ha)
Strategic location	N/A	N/A
Patch size score	Extra large (>200 ha)	Extra large (>200 ha)

LEGEND

- Development site
- Cadastre
- 100 ha landscape assessment circle
- 1000 ha landscape assessment circle
- Native vegetation

Paper Size A4

0 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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BioBanking Assessment

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Landscape assessment circles

Figure 3

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\\ghdnet\ghd\AU\Newcastle\Projects\22\18610\GIS\Maps\Deliverables\BiobankingAssessment\2218610_BA003_LandscapeAssessment_0.mxd

Data source: JW Planning: Development Footprint, 2020; LPI: DCDB/DTDB/Aerial, 2012/2015 Created by: kpsroba, fmackay, tmorton

4.4 Project site value

One vegetation zone was created for each native vegetation type and broad condition state at the site. The area of each zone was calculated using GIS. Vegetation zones within the development area are summarised below in Table 4-2.

Site value data was collected using the BioBanking plot/transect methodology and was entered for each plot/transect field in each vegetation zone.

Table 4-2 Vegetation zones

Zone ID	Vegetation type	Veg Type ID	Condition	Patch size	Area	Plot / transects required	Plot / transects completed
1	Blackbutt - Pink Bloodwood shrubby open forest	(NR117)	Moderate/good	201 ha	6.20	3	3
2	Forest Red Gum - Swamp Box forest	(NR161)	Moderate/good - medium	201 ha	1.47	1	2
3	Forest Red Gum - Swamp Box forest	(NR161)	Moderate/good - low	201 ha	3.70	2	2
				Total	**11.37**		

Note: The eastern section of the site has been excluded from the development area to be reserved as a conservation area, therefore it has not been included in the area calculations associated with vegetation and management zones.

4.5 Threatened species assessment

4.5.1 Predicted ecosystem species

The BioBanking credit calculator reports the suite of threatened fauna species that are predicted to be associated with ecosystem credits required for the Project. The suite of threatened species associated with ecosystem credits for the Project is shown in Table 4-3.

Table 4-3 Predicted threatened species (ecosystem species)

Common name	Scientific name	Ts offset multiplier	On site
Barking Owl	*Ninox connivens*	3.0	Yes
Barred Cuckoo-shrike	*Coracina lineata*	1.5	Yes
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus subsp. victoriae*	2.0	Yes
Bush Stone-curlew	*Burhinus grallarius*	2.6	Yes
Diamond Firetail	*Stagonopleura guttata*	1.3	Yes
Eastern Freetail-bat	*Mormopterus norfolkensis*	2.2	Yes
Flame Robin	*Petroica phoenicea*	1.3	Yes
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	1.8	Yes
Golden-tipped Bat	*Kerivoula papuensis*	1.3	Yes
Greater Broad-nosed Bat	*Scoteanax rueppellii*	2.2	Yes
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis subsp. temporalis*	1.3	Yes
Hoary Wattled Bat	*Chalinolobus nigrogriseus*	2.1	Yes
Little Eagle	*Hieraaetus morphnoides*	1.4	Yes
Little Lorikeet	*Glossopsitta pusilla*	1.8	Yes
Long-nosed Potoroo	*Potorous tridactylus*	1.3	Yes
Masked Owl	*Tyto novaehollandiae*	3.0	Yes
New Holland Mouse	*Pseudomys novaehollandiae*	2.6	Yes
Powerful Owl	*Ninox strenua*	3.0	Yes
Red-legged Pademelon	*Thylogale stigmatica*	2.6	Yes
Scarlet Robin	*Petroica boodang*	1.3	Yes
Sooty Owl	*Tyto tenebricosa*	3.0	Yes
Spotted-tailed Quoll	*Dasyurus maculatus*	2.6	Yes
Square-tailed Kite	*Lophoictinia isura*	1.4	Yes
Swift Parrot	*Lathamus discolor*	1.3	Yes
Varied Sittella	*Daphoenositta chrysoptera*	1.3	Yes
Wompoo Fruit-dove	*Ptilinopus magnificus*	1.3	Yes
Yellow-bellied Glider	*Petaurus australis*	2.3	Yes
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	2.2	Yes

Notes:

- The TS offset multiplier is an index of the likely response of a threatened species to improvement in habitat condition at a biobank site.
- The site contains habitat resources for the threatened species and the species may occur at the site from time to time or in the future.

4.5.2 Species credits

Overview

The BBAM references geographic, vegetation and habitat data for the Project site to generate a list of the species credit-type threatened species predicted to occur at the site and requiring targeted survey.

No targeted, seasonal surveys for threatened species were conducted. Species credits may be generated at the site at a later date after completion of further targeted surveys. The appropriate time for targeted surveys for each threatened species is listed below. It has been agreed with BCD that surveys completed by PEA (2013) were adequate regarding targeted surveys for species credit matters. GHD used the results of the PEA (2013) to complete the species credit calculations for the Project.

Table 4-4 Species credit species

Common name	Scientific name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Brush-tailed Phascogale	*Phascogale tapoatafa*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Common Planigale	*Planigale maculata*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dwarf Heath Casuarina	*Allocasuarina defungens*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eastern Chestnut Mouse	*Pseudomys gracilicaudatus*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eastern Pygmy-possum	*Cercartetus nanus*												
Emu population, NSW North Coast Bioregion and Port Stephens Local Government Area	*Dromaius novaehollandiae* - endangered population	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Giant Barred Frog	*Mixophyes iteratus*	Yes	Yes	Yes	Yes						Yes	Yes	Yes
Green-thighed Frog	*Litoria brevipalmata*	Yes	Yes	Yes							Yes	Yes	Yes
Koala	*Phascolarctos cinereus*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lady Tankervilles Swamp Orchid	*Phaius tancarvilleae*									Yes	Yes		
Milky Silkpod	*Parsonsia dorrigoensis*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Moonee Quassia	*Quassia* sp. Mooney Creek	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Native Milkwort	*Polygala linariifolia*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Needle-leaf Fern	*Belvisia mucronata*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Newry Golden Wattle	*Acacia chrysotricha*								Yes	Yes	Yes	Yes	
Pale-vented Bush-hen	*Amaurornis moluccana*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parma Wallaby	*Macropus parma*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rainforest Cassia	*Senna acclinis*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Red Boppel Nut	*Hicksbeachia pinnatifolia*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Red Goshawk	*Erythrotriorchis radiatus*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Common name	Scientific name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regent Honeyeater	*Anthochaera phrygia*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rufous Bettong	*Aepyprymnus rufescens*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rusty Plum, Plum Boxwood	*Niemeyera whitei*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scant Pomaderris	*Pomaderris queenslandica*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Slender Marsdenia	*Marsdenia longiloba*	Yes	Yes										Yes
Slender Screw Fern	*Lindsaea incisa*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Southern Swamp Orchid	*Phaius australis*									Yes	Yes		
Spider orchid	*Dendrobium melaleucaphilum*							Yes	Yes	Yes	Yes		
Squirrel Glider	*Petaurus norfolcensis*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stephens' Banded Snake	*Hoplocephalus stephensii*												
Trailing Woodruff	*Asperula asthenes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
White-crowned Snake	*Cacophis harriettae*	Yes	Yes	Yes						Yes	Yes	Yes	Yes
White-eared Monarch	*Carterornis leucotis*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yellow-flowered King of the Fairies	*Oberonia complanata*	Yes	Yes							Yes	Yes	Yes	Yes

5. Biodiversity credits

This Section of the report summarises the results of credit calculations completed for the Project. They are based on the final development footprint as provided by the client on 12 June 2020.

The data from the field survey, GIS mapping and BioBanking assessment were entered into the credit calculator Version 4.1 to determine the number and type of biodiversity credits that would be required for the Project. The BioBanking Credit Report is included in Appendix A and summarised below.

5.1 Ecosystem credits

A total of 460 ecosystem credits would be required for the Project. A summary of the number and type of ecosystem credits required as outlined in the credit profile is provided in Table 5-1.

Table 5-1 Ecosystem credits required for the development area

Veg Code	Vegetation Type	Area	Ecosystem credits required
(NR117)	Blackbutt - Pink Bloodwood shrubby open forest	6.20	289
(NR161)	Forest Red Gum - Swamp Box forest	5.17	171
		11.37	**460**

5.2 Species credits

Species credits are required for one fauna species, the Squirrel glider, as this species was detected during the PEA (2013) Assessment. The number of credits required to offset the project is provided in Table 5-2.

Table 5-2 Species credits required for the Project

Species	Species credits required
Squirrel Glider (*Petaurus norfolcensis*)	169

The credits listed in Table 5-1 and Table 5-2 would need to be secured and retired before a Construction Certificate is issued for the Project.

6. Biodiversity offsets approach

The BOS outlines the credit requirements for the Project as well as the obligations associated with securing the credits. This BOS has been developed giving consideration to the Major Projects Policy and the FBA requirement to offset

This BOS documents the process for identifying and evaluating offset options that will be required for the Project. It sets out the pathways forward and trading rules associated with securing the biodiversity credits. These credits would need to be secured and retired before a Construction Certificate can be issued for the Project. The credit requirement for the project is summarised below.

Table 6-1 Offset requirements for the Project

Plant Community Type (PCT)	Veg Type Code	Number of credits required
Ecosystem credits		
Blackbutt - Pink Bloodwood shrubby open forest	(NR117)	289
Forest Red Gum - Swamp Box forest	(NR161)	171
Species credits		
Squirrel Glider (Petaurus norfolcensis)		169

6.1 Offset options

Under the Major Projects policy for SSD projects, ecosystem and species credit requirements identified for the Project can be offset in a number of ways, including:

- Purchasing and retiring credits from existing biobank site/s (now referred to as stewardship site/s).
- Purchasing a suitable site and establishing it as a stewardship site. Suitable credits would then be generated at the site and retired according to the number and type of credits required by the project.
- Supplementary measures (the use of supplementary measures is not proposed as part of the offsets for the Project).

6.1.1 Securing credits

Section 10.5 of the FBA sets out the detailed trading rules associated with securing suitable credits to offset a project's impacts. This rule set will apply whether the project seeks to purchase credits from an existing stewardship site and/or purchases land and establishes it as a stewardship site. A summary of the rule set is outlined below:

Ecosystem credits

- The vegetation type must match the vegetation type being impacted or be included in the list of vegetation types included as offset options as detailed in the credit report (Appendix A).
- The ecosystem credits must be located within the Coffs Coast and Escarpment IBRA subregion and/or any adjoining IBRA subregions.

Species credits

- The species credit must be a direct match for the species being impacted
- The species credits can be sourced from any stewardship site in NSW that has matching species credits

6.1.2 Variations to the trading rules

Where possible, the Project will aim to match ecosystem and species credits on a 'like for like' basis according to the trading rules listed above through the retirement of biodiversity credits and in accordance with the credit profiles provided in the Project credit report (refer to Appendix A). Where this is not possible, the credit trading rules associated with major projects can be used to source suitable credits as outlined in Section 10.5.4.2 and 10.5.7.2 of the FBA. Any variations to the trading rules requires approval from the consent authority.

Before the consent authority can approve a variation to the trading rules the Project is required to show that all reasonable steps have been taken to source matching credits. The following information summarises the list of reasonable steps.

- Check the BioBanking public register and place an expression of interest for credits wanted on it for at least six months
- Liaise with an BCD office and relevant local councils to obtain a list of potential sites that meet the requirements for offsetting
- Consider properties for sale in the required area
- Provide evidence of why offset sites are not feasible; suitable evidence may include: the unwillingness of a landowner to sell or establish a stewardship site

If insufficient credits are found after completing all 'reasonable steps', the Project may be able to apply to the consent authority to use the following variation rules in accordance with the FBA:

a. *A variation of the offset rules for matching ecosystem credits by allowing ecosystem credits created for a PCT for the same vegetation formation as the PCT to which the required ecosystem credit relates to be proposed as an offset, or*

b. *A variation of the offset rules for matching specie credits by allowing a different species to that impacted by the proposed development to be used to meet the offset requirement*

6.2 Summary of the stewardship site covenant and management actions

6.2.1 Approach

Entering into a BioBanking agreement (now referred to as a Stewardship agreement) places a conservation covenant over the land, regardless of zoning. This covenant is the strongest conservation covenant available on private lands and extinguishes all land uses other than conservation. The following describes the actions that would be required for ongoing management of an offset site. A Site Management Plan (SMP) detailing rehabilitation activities and an associated management program, would be prepared and included in the final Stewardship agreement. The SMP forms the basis of the funds required to be placed in the Biodiversity Conservation Fund (BCF) when purchasing the credits. The Biodiversity Conservation Trust (BCT) then funds the stewardship site owner to implement the SMP.

Biobank sites may have two types of management actions applied:

- Standard Management Actions
- Site Specific Management Actions

Standard management actions are those actions required on an offset site to improve vegetation condition when entering into a stewardship agreement. The standard management actions for all stewardship sites includes:

- Management of grazing for conservation
- Weed control
- Management of fire for conservation
- Management of human disturbance
- Retention of regrowth and remnant native vegetation
- Replanting or supplementary planting where natural regeneration would not be sufficient (note: it is anticipated that natural regeneration would be sufficient for the proposed biobank sites and hence supplementary plantings are not required)
- Retention of dead timber
- Erosion control
- Retention of rocks

Based on the habitat resources within the site and the suite of threatened species which are predicted to occur, the credit calculator nominates management actions that would be required to alleviate site-specific threats. Undertaking these actions is over and above the minimal requirements for a biobank site. Additional management actions that are likely to be required at the preferred biobank sites are summarised below:

- Feral animal control (pigs, horses)
- Exclude miscellaneous feral species
- Control of feral and/or overabundant native herbivores (e.g. rabbit, goats, deer etc.)
- Maintain or reintroduce flow regimes (aquatic flora)

The SMP will identify site specific vegetation rehabilitation and management actions appropriate for the proposed offset site which would be completed during the preparation of the BioBanking agreement.

6.2.2 Monitoring of the offset site

The purchase of credits includes two components:

- Part A being the cost of rehabilitation and management
- Part B being the ‘profit’ to the relevant landowner

The Part A funds are the equivalent of all costs associated with the rehabilitation, management and monitoring of the biobank site/s in perpetuity.

The Biodiversity Assessment Methodology (BAM) includes preparation of a SMP for each stewardship site. The methodology also includes a credit pricing tool which places a commercial value for completing each of the actions listed in the SMP. These funds are held by the BCFand managed by BCT. The funds are provided to the land owner on an annual basis for the amount equivalent to works required in that year. The stewardship site owner is then required to submit standard reports, outlining the works completed, their success and monitoring results. BCT then review the reports and, if works have been completed satisfactorily, provide the next payment for the following years work. The BCT also include site visits as part of their auditing process.

7. Conclusion

The proposed Moonee Parklands residential development is a SSD project requiring approval from the DPIE as the consent authority. The DPIE has been in consultation with BCD and it has been determined that the project is required to provide biodiversity offsets to mitigate residual impacts to biodiversity associated with the project. Consultation between the DPIE and BCD indicated the NSW Biodiversity Offsets for Major Projects and the FBA was the preferred approach to assessing the projects biodiversity impacts and determining suitable offsets. These policies require the applicant to quantify a projects biodiversity impacts using the BBAM to determine the biodiversity credits required to offset the project. The number and type of credits required include:

- 289 ecosystem credits of Blackbutt - Pink Bloodwood shrubby open forest (NR117)
- 171 ecosystem credits of Forest Red Gum - Swamp Box forest (NR161)
- 169 species credits for the Squirrel Glider (*Petaurus norfolcensis*)

These credits would need to be secured and retired in accordance with the approach described in section 6.2 of this report before a Construction Certificate can be issued for the project.

8. References

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9. Disclaimer

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Appendices

Appendix A – Credit report

Biodiversity credit report

This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 24/06/2020 Time: 4:55:44PM Calculator version: v4.0

Major Project details

Proposal ID:	082/2016/3989MP
Proposal name:	Moonee Parklands
Proposal address:	Pacific Highway Moonee Beach NSW 2450
Proponent name:	Moonee Parklands Trust
Proponent address:	PO Box 479 Coffs Harbour NSW 2450
Proponent phone:	02 6652 1202
Assessor name:	Daniel Williams
Assessor address:	Level 1, 62 Clarence Street Port Macquarie NSW 2444
Assessor phone:	6586 8714
Assessor accreditation:	082

Summary of ecosystem credits required

Plant Community type	Area (ha)	Credits created
Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion	6.20	289.00
Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the NSW North Coast Bioregion	5.17	171.39
Total	11.37	460

Credit profiles

1. Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion, (NR117)

Number of ecosystem credits created	289
IBRA sub-region	Coffs Coast & Escarpment

Offset options - Plant Community types	Offset options - IBRA sub-regions
Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion, (NR117) Flooded Gum - Brush Box moist forest of the coastal ranges of the North Coast, (NR159) Flooded Gum - Tallowwood - Brush Box moist open forest of the coastal ranges of the North Coast, (NR160) Pink Bloodwood - Tallowwood moist open forest of the far northern ranges of the NSW North Coast Bioregion, (NR219) Spotted Gum - Brush Box moist forest of ranges of the southern Clarence Valley of the NSW North Coast Bioregion, (NR243) Spotted Gum - Grey Ironbark shrubby open forest of the Richmond Range of the NSW North Coast, (NR248) Sydney Blue Gum open forest on coastal foothills and escarpment of the North Coast, (NR258) Tallowwood - Brush Box moist open forest of the coastal ranges of the central NSW North Coast, (NR260) Tallowwood - Narrow-leaved White Mahogany - Spotted Gum moist open forest in the Washpool area of the NSW North Coast, (NR261) Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion, (NR274)	Coffs Coast & Escarpment and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

2. Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the NSW North Coast Bioregion, (NR161)

Number of ecosystem credits created	171
IBRA sub-region	Coffs Coast & Escarpment

Offset options - Plant Community types	Offset options - IBRA sub-regions
Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the NSW North Coast Bioregion, (NR161) Cabbage Gum - Broad-leaved Apple open forest of the eastern escarpment, NSW North Coast Bioregion and South Eastern Queensland Bioregion, (NR145) Cabbage Gum open forest or woodland on flats of the North Coast, (NR286)	Coffs Coast & Escarpment and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Summary of species credits required

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Squirrel Glider	Petaurus norfolcensis	7.67	169

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Document Status

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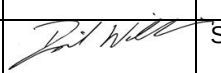
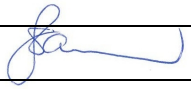
1	J Sharp	D Williams		S Lawer		26/06/20

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