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NorthLinkWA
Perth-Darwin National Highway

Infrastructure Plan

Perth–Darwin National Highway (Swan Valley Section)

FEBRUARY 2017

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Document *Control*

Revision	Date	Description	Prepared	Reviewed	Approved
A	28/10/2016	Draft (Coffey v1)	M. Holliday	E. Waterhouse	D. Morley
B	24/11/2016	Draft (Coffey v2)	M. Holliday	D. Morley	D. Morley
0	30/11/2016	Final for submission to OEPA (Coffey v3)	M. Holliday	D. Morley	D. Morley
1	21/12/2016	Addressed OEPA comments (Coffey v4)	T. Vu	D. Morley	D. Morley
2	30/01/2017	Addressed OEPA comments (Coffey v5)	M. Holliday	D. Morley	D. Morley
3	20/02/2017	Addressed OEPA comments (Coffey v6)	M. Holliday	D. Morley	D. Morley

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EP2016/073

1 SUMMARY

This pre-construction Infrastructure Plan (Terrestrial Fauna, Hydrological Processes, Inland Waters Environmental Quality, Amenity (Noise)) is submitted in accordance with Ministerial Statement No. 1036 conditions 6-1 to 6-4 for the Perth–Darwin Nation Highway (Swan Valley Section) by Main Roads Western Australia.

This document sets out the pre-construction location, design and construction of the key proposal elements.

Table 1 provides a summary of this plan.

Table 1 Infrastructure Plan summary

Item	Details
Title of proposal	Perth–Darwin National Highway (Swan Valley Section)
Proponent name	Commissioner for Main Roads Western Australia
Ministerial Statement No.	1036
Purpose of this plan	The Infrastructure Plan is submitted to fulfil the requirements of conditions 6-1 to 6-4 of the above Ministerial Statement.
Environmental objectives	• Minimise direct and indirect impacts to conservation significant terrestrial fauna. • Minimise impacts to hydrological regimes of surface water. • Minimise impacts to the quality of groundwater and surface water. • Minimise impacts to amenity as low as reasonable practicable.

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2 CONTEXT AND SCOPE

2.1 Description of the Proposal

Main Roads Western Australia (MRWA) proposes to construct a new 38 km long section of the Perth–Darwin National Highway (PDNH) between Malaga and Muchea, in Western Australia (the proposal) (Figure 1). The proposal is a dual carriageway highway and will connect the intersection of Tonkin Highway and Reid Highway in the south with Great Northern Highway and Brand Highway in the north.

2.2 Requirements of the Conditions

This plan is submitted in accordance with Ministerial Statement No. 1036, conditions 6-1 to 6-4 for the proposal.

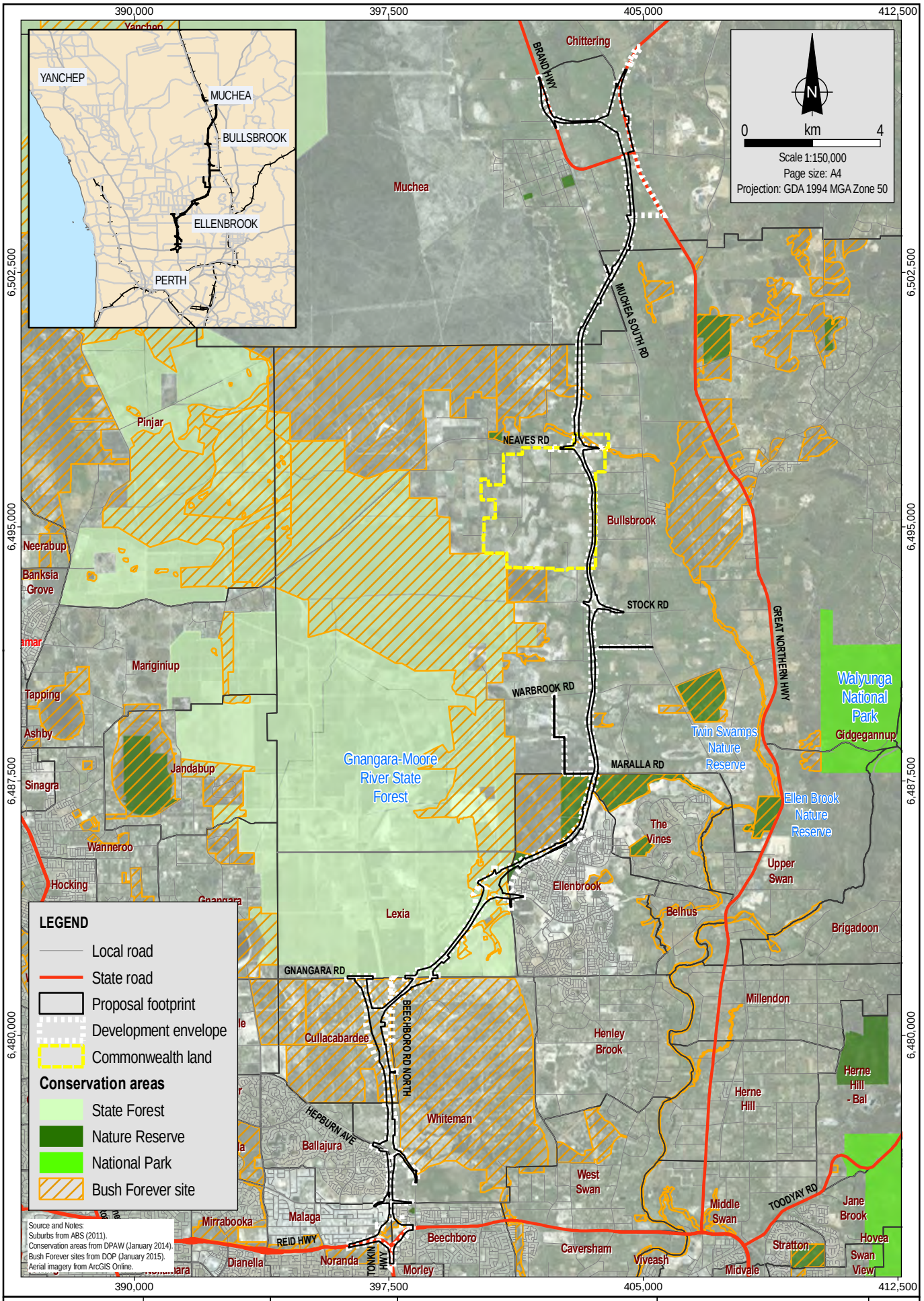
As required under condition 5-1, this plan will be made publicly available for the life of the proposal.

The requirement of these conditions and where they are addressed in this plan are described in Table 2.

Table 2 Summary of conditions

Condition No.	Condition	Section of this plan
5-1	Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal the proponent shall make publicly available, in a manner approved by the CEO, all environmental plans and reports required under this statement.	Section 2.2
6-1	The proponent shall demonstrate that the proposal is designed and constructed consistent with the authorised extent(s) as referred to in Table 2 in Schedule 1 in order to meet the following environmental objectives:	This plan; Sections 3.1 to 3.6
	1. Minimise direct and indirect impacts to conservation significant terrestrial fauna.	
	2. Minimise impacts to hydrological regimes of surface water.	
	3. Minimise impacts to the quality of groundwater and surface water.	
	4. Minimise impacts to amenity as low as reasonable practicable, through the implementation of conditions 6-2 to 6-5.	
6-2	The proponent shall prepare and submit a pre-construction Infrastructure Plan which is to be approved by the CEO prior to the commencement of ground disturbing activities. The pre-construction Infrastructure Plan shall include:	This plan
	1. The alignment, dimensions and locations of the key proposal elements as referred to in Columns 1 and 2 of Table 2 in Schedule 1.	Section 3
	2. The dimensions and locations of fauna underpasses and fauna fencing as referred to in Columns 1 and 2 of Table 2 in Schedule 1. Fauna underpass dimensions and locations should be consistent with the approved Fauna – Construction – Condition Environmental Management Plan as required by condition 12.	Section 3.3
	3. The design and locations of culverts and bridges as referred to in Columns 1 and 2 of Table 2 in Schedule 1.	Section 3.4

Condition No.	Condition	Section of this plan
	4. The design and location of bioretention swales and infiltration basins in the vicinity of Ellen Brook and within the GUWPCA, consistent with the approved Inland Waters Environmental Quality – Hydrological Processes – Condition Environmental Management Plan as required by condition 13.	Section 3.5
	5. The dimensions and locations of noise walls as referred to in Columns 1 and 2 of Table 2 in Schedule 1, consistent with the approved Amenity (Noise) – Condition Environmental Management Plan.	Section 3.6
	6. Spatial data for the proposal elements as detailed in 6-2(1), 6-2(2), 6-2(3), 6-2(4) and 6-2(5).	Figures 1 to 7
6-3	The proponent may review and revise the pre-construction Infrastructure Plan required by condition 6-2, or shall review and revise the pre-construction Infrastructure Plan required as and when directed by the CEO.	Section 4
6-4	The revised pre-construction Infrastructure Plan shall be the Infrastructure Plan used for implementing construction, following receipt in writing from the CEO that the revised pre-construction Infrastructure Plan satisfies the requirements set out in condition 6-2.	Section 4



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Perth–Darwin National Highway

Infrastructure Plan

Proposal overview

Figure No: **1**

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3 KEY PROPOSAL ELEMENTS

The location and authorised extent of the key proposal elements provided in Schedule 1 of Ministerial Statement No. 1036 are detailed in Table 3.

Table 3 Location and extent of physical and operational elements of the proposal

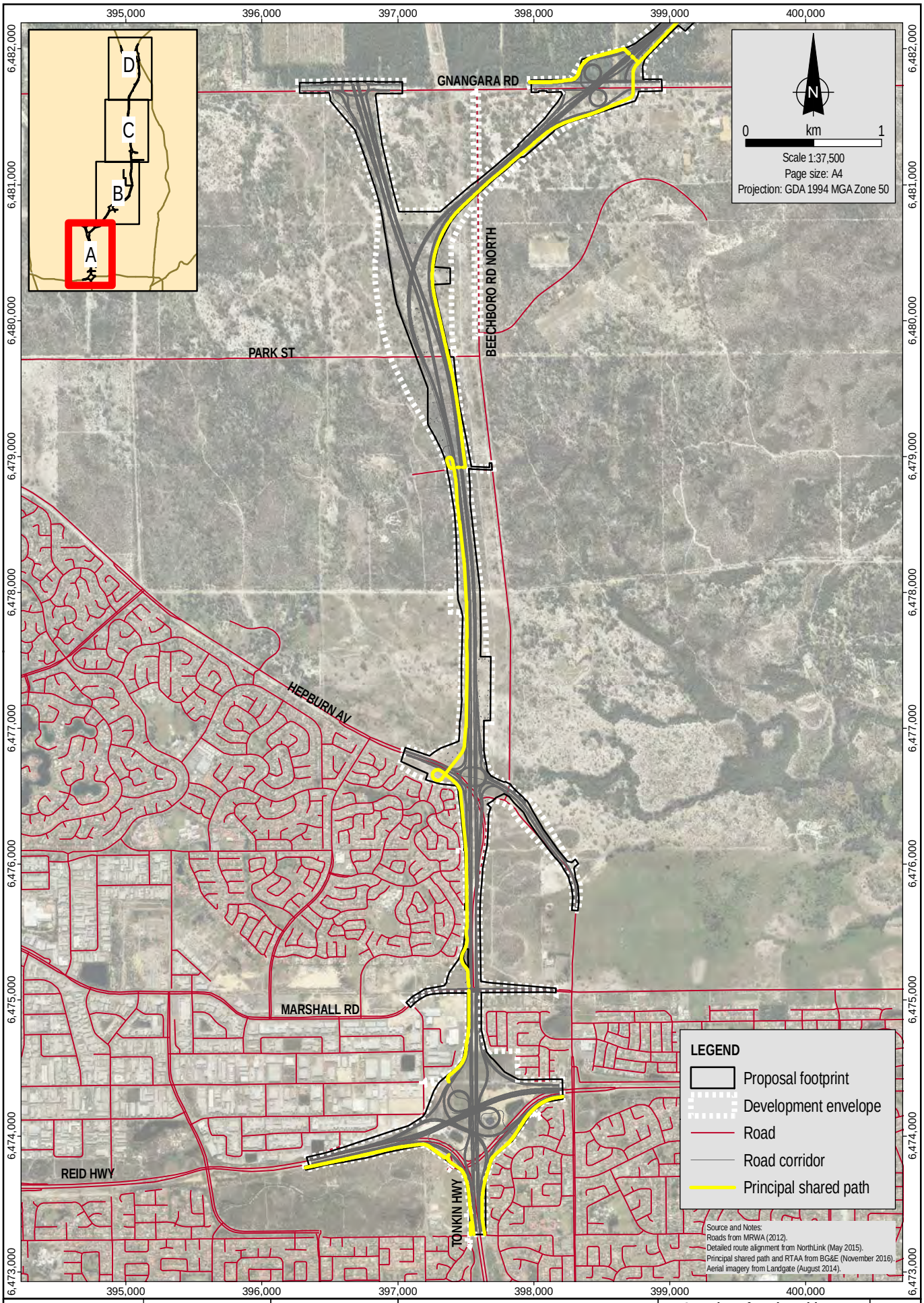
Column 1 – Element	Column 2 – Location	Column 3 – Authorised extent
Clearing and disturbance for road corridor, drainage structures including infiltration and bioretention basins and swales, laydowns, bridges and culverts, fauna fencing, fauna underpasses, noise walls, road train assembly area and principal shared path.	Located within the development envelope as shown in Figure 1 [of the Ministerial Statement].	Clearing and disturbance of no more than 746 ha consisting of up to 206 ha of native vegetation. This includes up to: • 129.9 ha of Bush Forever areas. • 0.4 ha of Class A Nature Reserve 46920. • 0.2 ha of Class A Nature Reserve 46919. • 32.6 ha of Gnangara–Moore River State Forest No. 65. • 4 ha Floristic Community Type SCP 20a Threatened Ecological Community. • 31.9 ha of *Caladenia huegelii* critical habitat. • 2 ha of *Grevillea curviloba* subsp. *incurva* critical habitat. • 16 ha of Conservation Category Wetlands, within a 985 ha development envelope.
Noise walls	Located within the development envelope as shown in Figure 1 [of the Ministerial Statement].	Height of noise walls to be no more than 5 m on residential boundaries between Reid Highway and south of Maralla Road.

Source: Ministerial Statement No. 1036.

3.1 Road Corridor, Principal Shared Path and Road Train Assembly Area

The road corridor, principal shared path (PSP) and road train assembly area are all within the proposal footprint. The road corridor, PSP and road train assembly area are depicted in Figure 2. These elements of the proposal will be constructed within the overall disturbance limit of 746 ha.

The remainder of this chapter details key proposal elements consistent with the environmental objectives stated in condition 6-1 of the Ministerial Statement.



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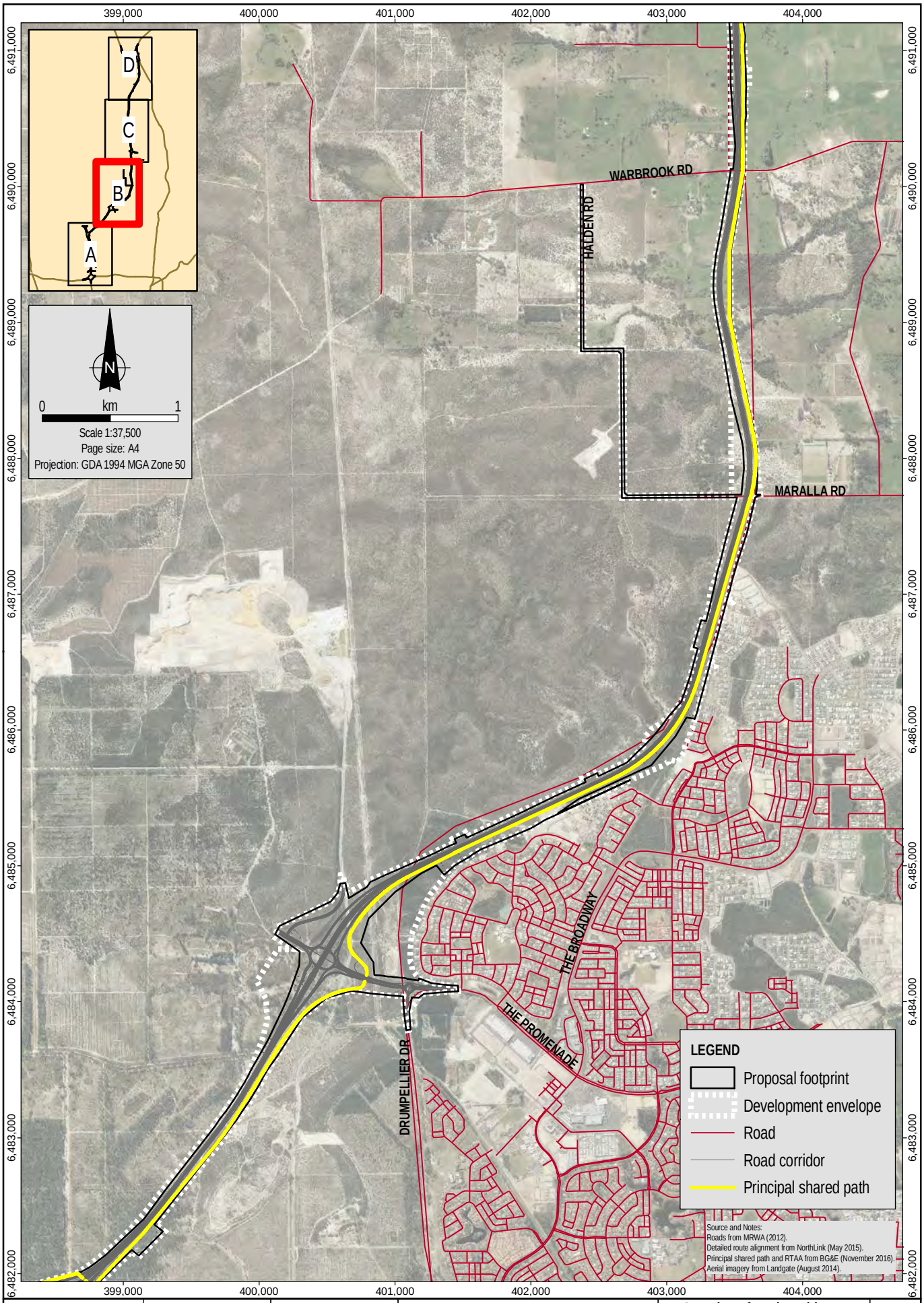
Infrastructure Plan

Location of road corridor, principal shared path and road train assembly area
Map 1 of 4

Figure No:
2A



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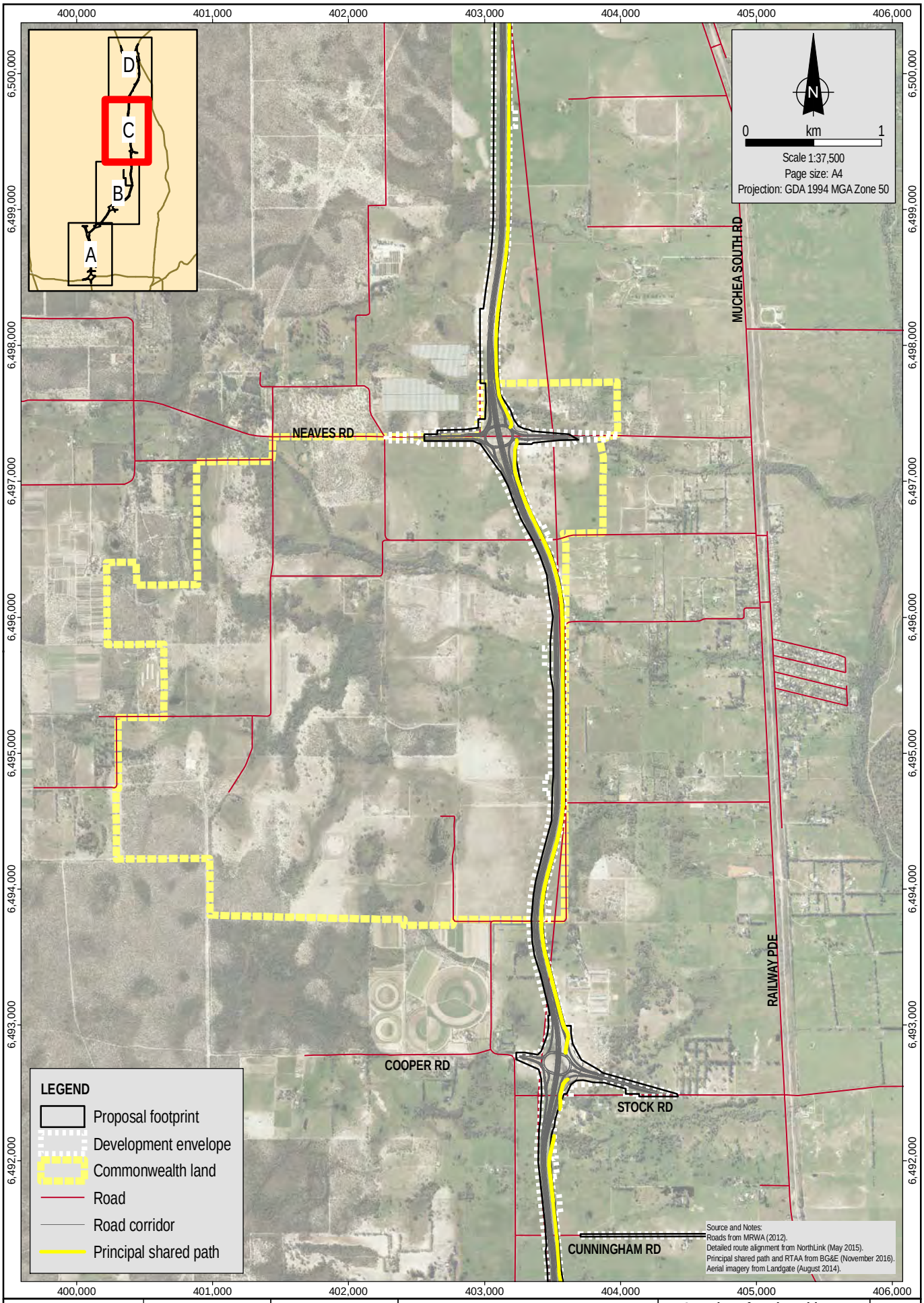
Infrastructure Plan

Location of road corridor, principal shared path and road train assembly area
Map 2 of 4

Figure No:
2B



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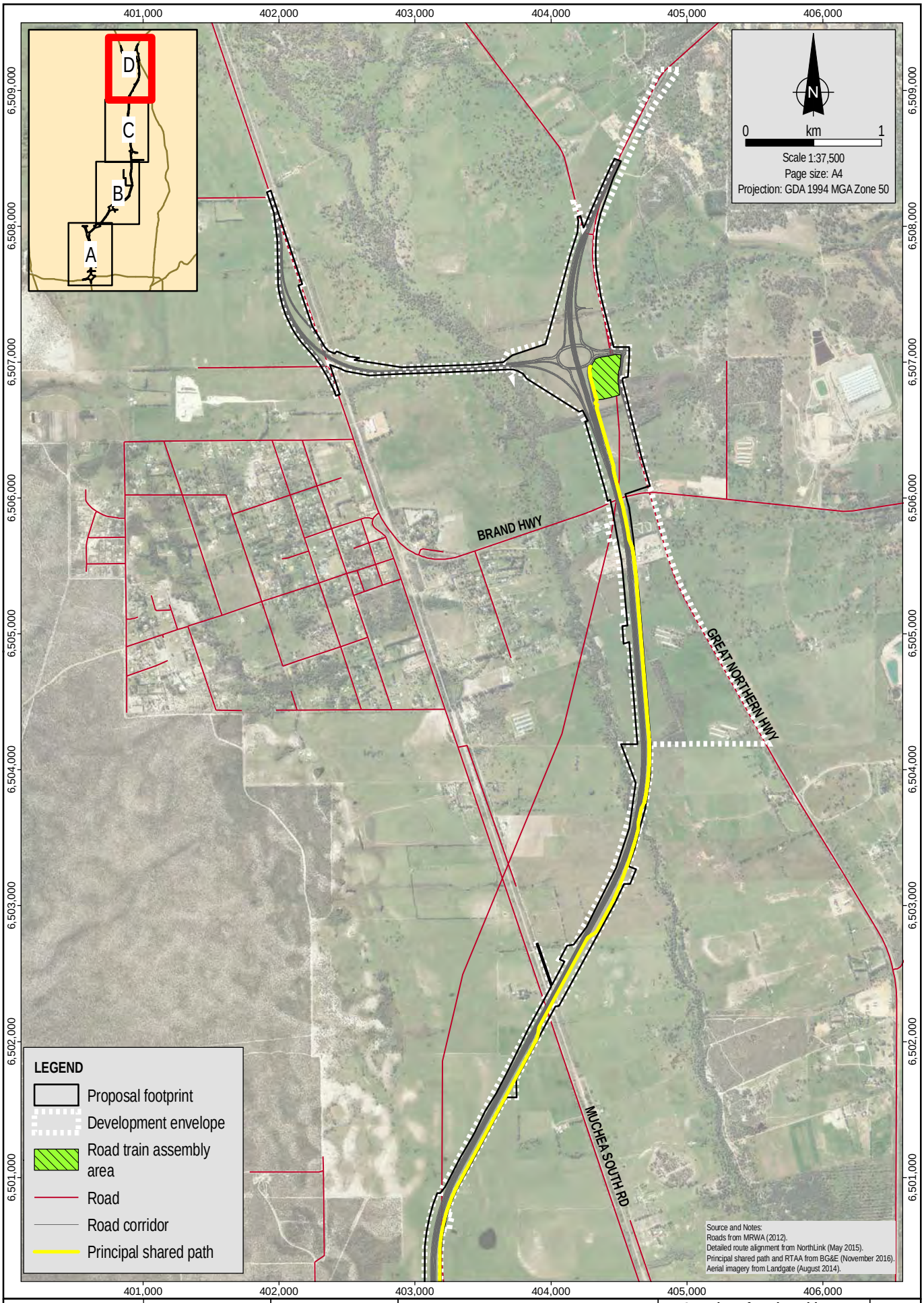

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3.2 Laydown Areas

There will be no clearing of native vegetation specifically for laydown areas. All laydown areas will be established in areas that are already cleared, or within the permanent footprint of the proposal. No laydown areas will be constructed within the wellhead protection zones in the Gnangara Underground Water Pollution Control Area (GUWPCA).

3.3 Fauna Underpasses, Bridges and Fencing

By providing connectivity between severed habitats, fauna underpasses and bridges installed along the alignment will minimise direct and indirect impacts from the proposal to conservation significant terrestrial fauna, such as those that arise from the fragmentation of habitat and fauna populations.

The underpass and bridge designs and locations are described in Table 4 and depicted in Figure 3. The designs and locations are consistent with the Fauna – Construction – Condition Environmental Management Plan as required by condition 12 of the Ministerial Statement. Most underpasses will be of a box culvert design (Appendix A) and some will provide for dual use; i.e., cross-highway drainage as well as the movement of fauna under the highway. Appendix B shows the concept design for the fauna bridge. Dimensions given in Table 4 refer to the internal space available to fauna within the fauna underpass or bridge structure.

The fauna fence locations are depicted in Figure 3. All fauna fencing will be 1,800 mm high and will be returned from the boundary over the fauna underpasses to ensure continuous fence line. The fauna fence will be constructed to guide fauna to the underpasses. All fauna fencing will be supplied and installed in accordance with Australian Standard AS1725. Dimensions for the fauna fences are provided in Appendix C.

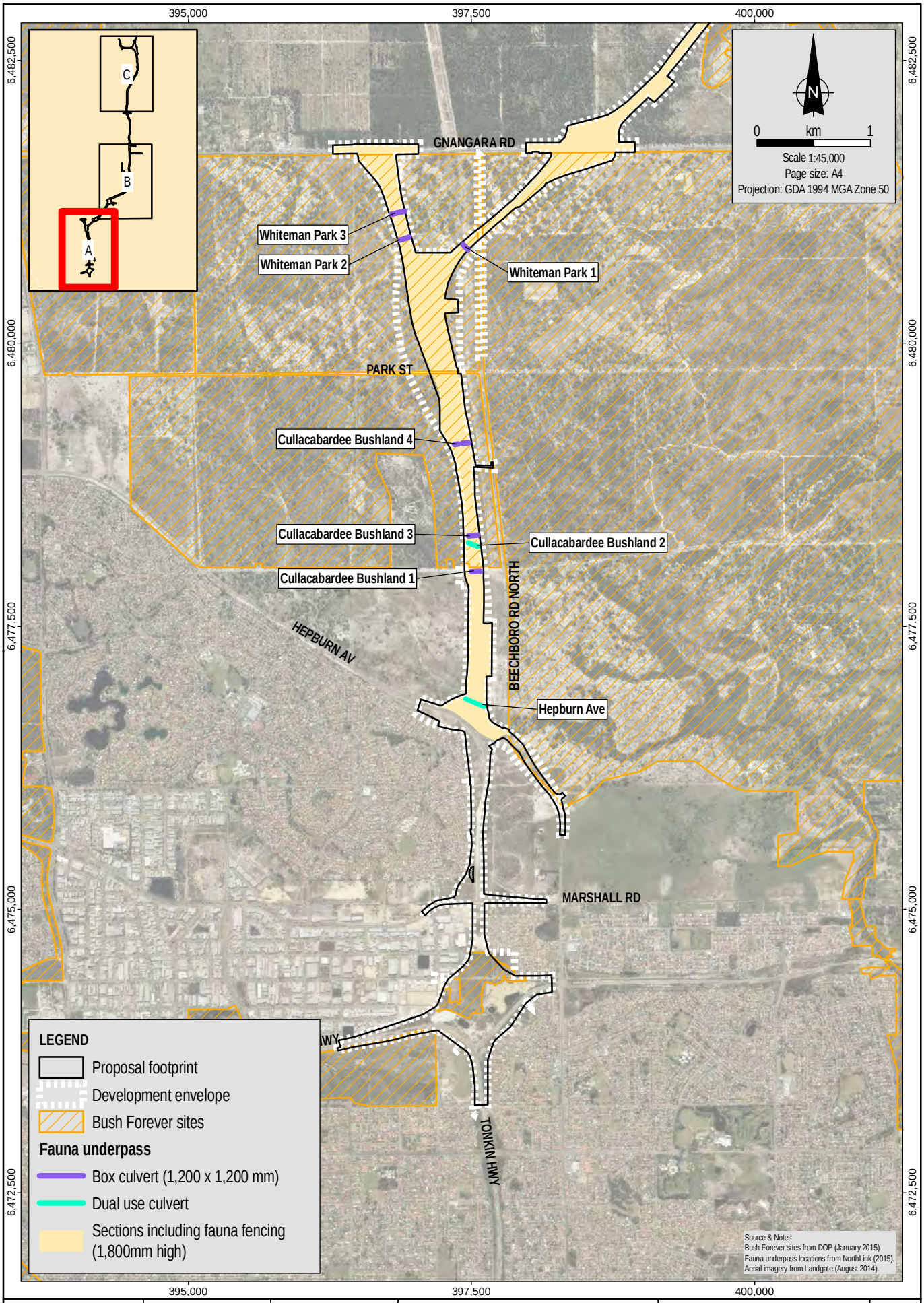
Table 4 Summary of fauna underpass and bridge design and locations

Location	Design	Internal dimensions[1] (height x width)	Length (opening to opening)	Comments
Hepburn Ave	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	Sections of 80 m, 20 m, 15 m	Under the proposal alignment
Cullacabardee Bushland 1	Box culvert	1,200 x 1,200 mm	82 m	Under the proposal alignment
Cullacabardee Bushland 2	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	90 m	Under the proposal alignment
Cullacabardee Bushland 3	Box culvert	1,200 x 1,200 mm	80 m	Under the proposal alignment
Cullacabardee Bushland 4	Box culvert	1,200 x 1,200 mm	Sections of 65 m, 50 m	Under the proposal alignment
Whiteman Park 1	Box culvert	1,200 x 1,200 mm	60 m	Under the proposal alignment
Whiteman Park 2	Box culvert	1,200 x 1,200 mm	Sections of 65 m, 15 m	Under the proposal alignment
Whiteman Park 3	Box culvert	1,200 x 1,200 mm	Sections of 65 m, 15 m	Under the proposal alignment

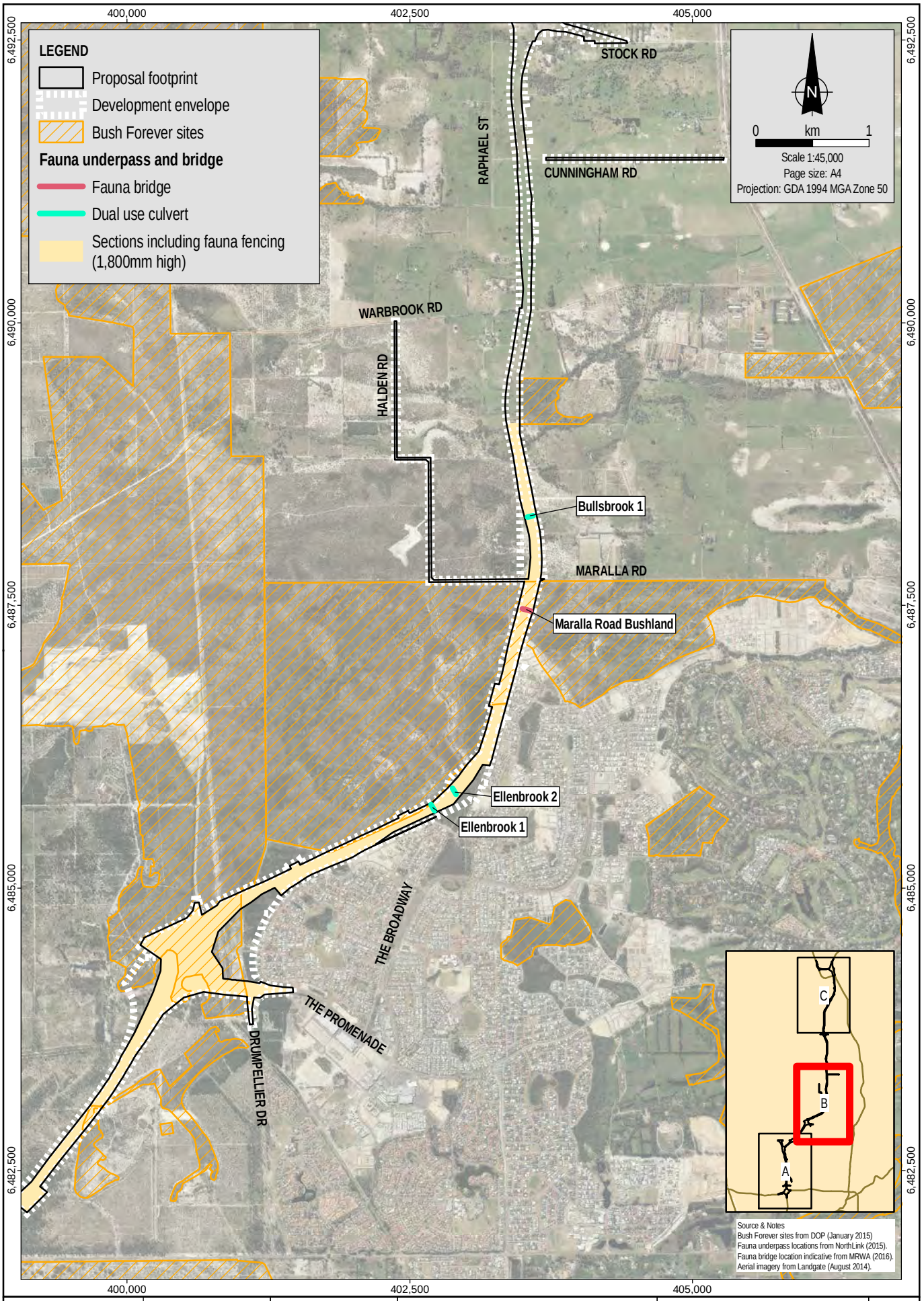
Location	Design	Internal dimensions[1] (height x width)	Length (opening to opening)	Comments
Ellenbrook 1	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	65 m	Under the proposal alignment
Ellenbrook2	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	65 m	Under the proposal alignment
Maralla Road Bushland	Fauna bridge	Minimum 12 m wide (10 m wide fauna access)	50 m	Bridge over proposal alignment, 10 m vegetated surface for fauna use only
Bullsbrook 1	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	Sections of 70 m, 44 m	Under the proposal alignment
Bullsbrook 2	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	Sections of 85 m, 50 m	Under the proposal alignment
Bullsbrook 3	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	76 m	Under the proposal alignment
Bullsbrook 4	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	Sections of 44 m, 12 m	Under the proposal alignment
Bullsbrook/ Muchea	Bridge	Unknown	Approx.78 m	Bridge over Ellen Brook, design allows fauna movement underneath during periods of low or no flow
Muchea 1	Dual use drainage/fauna culvert (box culvert)	300 x 300 mm	86 m	Under the proposal alignment
Muchea 2	Bridge	Unknown	Approx. 33 m	Bridge over Ellen Brook, design allows fauna movement underneath during periods of low or no flow

Notes:

1. Internal dimensions indicate headroom for enclosed spaces (e.g. fauna underpasses and dual use culverts) or available width for non-enclosed structures (e.g. bridges).



NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 29.11.2016 MXD: 4483AA_73_GIS002a_5 File Name: 4483AA_73_F003A_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of fauna underpasses, bridges and fencing Map 1 of 3	Figure No: 3A



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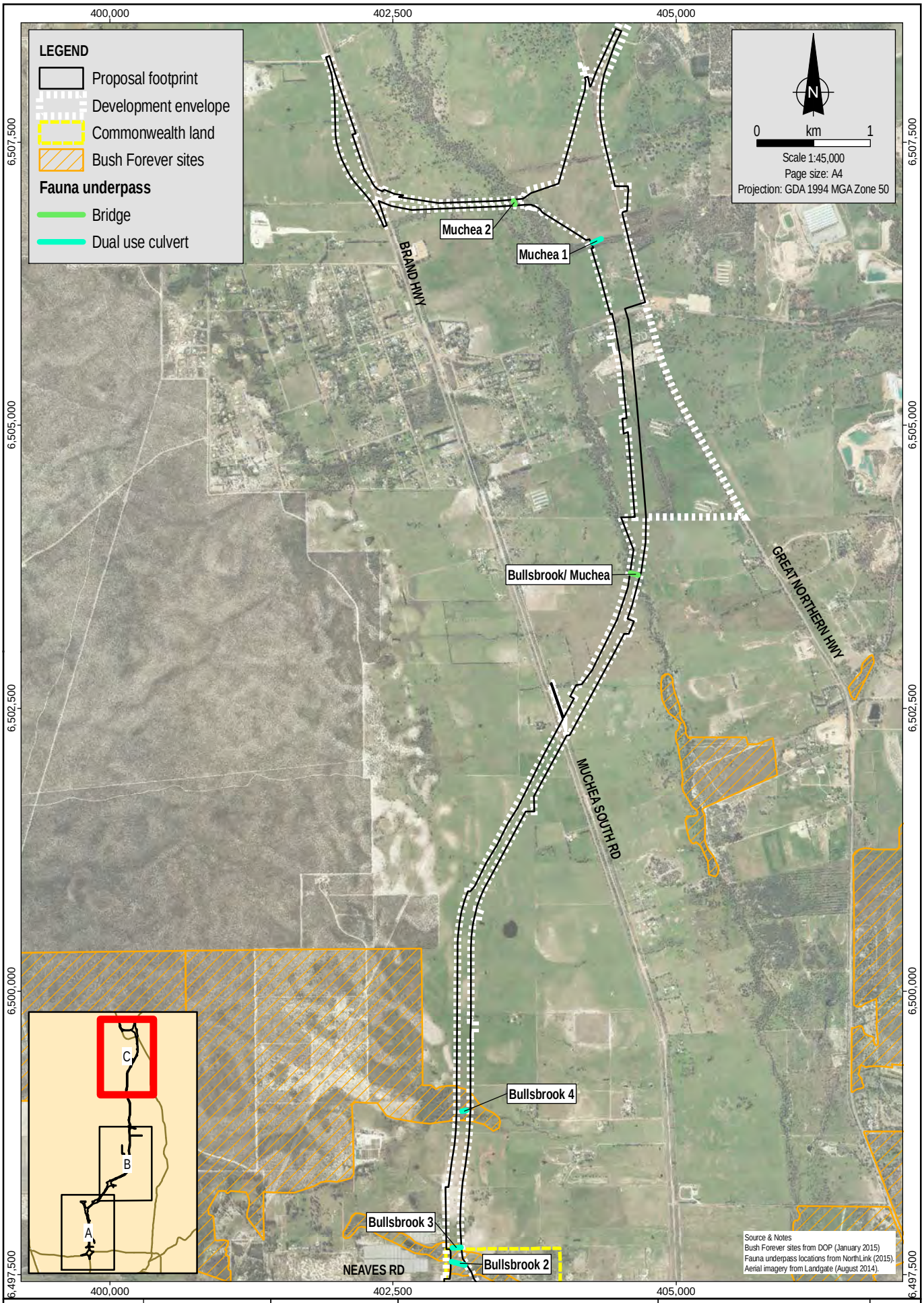

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3.4 Culverts and Bridges

Drainage design aims to maintain the existing hydrological regime throughout the proposal development envelope. Culverts and bridges installed along the alignment will minimise impacts to hydrological regimes of surface water from the proposal.

The culvert design and locations are summarised in Table 5 and depicted in Figure 4. Most culverts will be of a box culvert design (Appendix A) and some will provide for dual use; i.e., cross-highway drainage as well as the movement of fauna under the highway. The dimensions for the culverts will be confirmed during detailed design.

Table 5 Summary of culvert design and locations

Culvert No.	Location	Type	Approx. length (m)
1	Marshall Road	Culvert	14
2	Hepburn Avenue	Culvert	113
3	Hepburn Avenue	Dual use drainage/fauna culvert	Sections of 80, 20 and 15
4	Cullacabardee Bushland	Dual use drainage/fauna culvert	80
5	Cullacabardee Bushland	Culvert	16
6	Cullacabardee Bushland	Culvert	75
7	Cullacabardee Bushland	Culvert	28
8	Cullacabardee Bushland	Culvert	37
9	Cullacabardee Bushland	Culvert	37
10	Whiteman Park	Culvert	25
11	Whiteman Park	Culvert	54
12	Whiteman Park	Culvert	52
13	Lexia	Culvert	71
14	North of Maralla Road, Bullsbrook	Dual use drainage/fauna culvert	Sections of 44 and 70
15	North of Maralla Road, Bullsbrook	Culvert	46
16	North of Maralla Road, Bullsbrook	Culvert	62
17	North of Maralla Road, Bullsbrook	Culvert	51
18	South of Warbrook Road	Culvert	53
19	South of Warbrook Road	Culvert	55
20	North of Warbrook Road, Bullsbrook	Culvert	53
21	South of Cunningham Road, Bullsbrook	Culvert	61
22	South of Cunningham Road, Bullsbrook	Culvert	50
23	South of Cunningham Road, Bullsbrook	Culvert	46

Culvert No.	Location	Type	Approx. length (m)
24	South of Cunningham Road, Bullsbrook	Culvert	45
25	North of Cunningham Road, Bullsbrook	Culvert	50
26	South of Stock Road, Bullsbrook	Culvert	59
27	South of Stock Road, Bullsbrook	Culvert	105
28	Stock Road, Bullsbrook	Culvert	74
29	Stock Road, Bullsbrook	Culvert	73
30	North of Stock Road, Bullsbrook	Culvert	50
31	North of Stock Road, Bullsbrook	Culvert	51
32	North of Stock Road, Bullsbrook	Culvert	51
33	Bullsbrook	Culvert	62
34	Bullsbrook	Culvert	68
35	Bullsbrook	Culvert	67
36	Bullsbrook	Culvert	77
37	Bullsbrook	Culvert	80
38	Neaves Road, Bullsbrook	Culvert	49
39	Neaves Road, Bullsbrook	Culvert	23
40	Neaves Road, Bullsbrook	Culvert	48
41	North of Neaves Road, Bullsbrook	Dual use drainage/fauna culvert	135
42	North of Neaves Road, Bullsbrook	Dual use drainage/fauna culvert	76
43	West of Muchea South Road, Bullsbrook	Culvert	66
44	West of Muchea South Road, Bullsbrook	Dual use drainage/fauna culvert	56
45	West of Muchea South Road, Bullsbrook	Culvert	61
46	West of Muchea South Road, Bullsbrook	Culvert	65
47	West of Muchea South Road, Bullsbrook	Culvert	69
48	West of Muchea South Road, Bullsbrook	Culvert	62
49	West of Muchea South Road, Bullsbrook	Culvert	63
50	West of Muchea South Road, Bullsbrook	Culvert	69
51	West of Muchea South Road, Bullsbrook	Culvert	78
52	West of Muchea South Road, Bullsbrook	Culvert	63
53	West of Muchea South Road, Bullsbrook	Culvert	67
54	West of Muchea South Road, Bullsbrook	Culvert	107
55	East of Muchea South Road, Muchea	Culvert	103

Culvert No.	Location	Type	Approx. length (m)
56	East of Muchea South Road, Muchea	Culvert	57
57	East of Muchea South Road, Muchea	Culvert	72
58	East of Muchea South Road, Muchea	Culvert	82
59	East of Muchea South Road, Muchea	Culvert	67
60	East of Muchea South Road, Muchea	Culvert	70
61	East of Ellen Brook, Muchea	Culvert	63
62	East of Ellen Brook, Muchea	Culvert	44
63	East of Ellen Brook, Muchea	Culvert	59
64	East of Ellen Brook, Muchea	Culvert	58
65	East of Ellen Brook, Muchea	Culvert	54
66	East of Ellen Brook, Muchea	Culvert	55
67	East of Ellen Brook, Muchea	Culvert	58
68	East of Ellen Brook, Muchea	Culvert	59
69	East of Ellen Brook, Muchea	Culvert	51
70	East of Ellen Brook, Muchea	Culvert	81
71	Brand Highway, Muchea	Culvert	95
72	Brand Highway, Muchea	Culvert	110
73	Muchea	Dual use drainage/fauna culvert	43
74	Muchea	Dual use drainage/fauna culvert	43
75	Muchea	Culvert	49
76	Muchea	Culvert	45
77	Muchea	Culvert	18
78	Muchea	Culvert	27
79	Muchea	Culvert	32
80	Muchea	Culvert	29
81	Muchea	Culvert	20
82	Muchea	Culvert	63
83	Muchea	Culvert	37
84	Muchea	Culvert	30
85	Muchea	Culvert	82
86	Muchea	Culvert	28
87	Muchea	Culvert	53

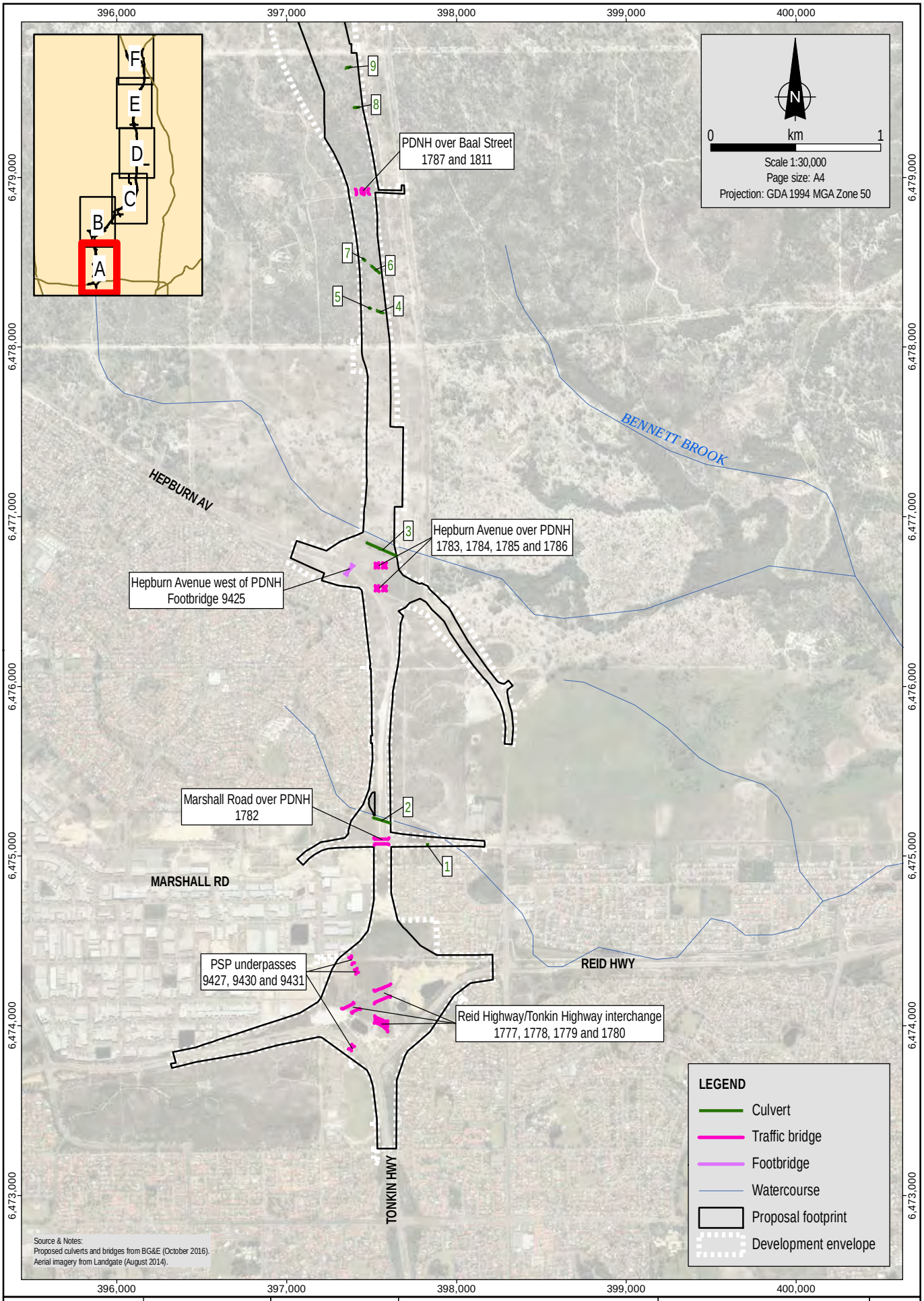
Culvert No.	Location	Type	Approx. length (m)
88	Muchea	Culvert	36
89	Muchea	Culvert	45
90	Muchea	Culvert	35
91	Muchea	Culvert	52
92	Muchea	Culvert	45
93	Muchea	Culvert	46
94	Muchea	Culvert	20
95	Muchea	Culvert	27
96	Muchea	Culvert	18
97	Muchea	Culvert	48
98	Muchea	Culvert	44
99	Muchea	Culvert	17
100	Muchea	Culvert	101

The bridge locations are summarised in Table 6 and depicted in Figure 4. The dimensions for the bridges will be confirmed during detailed design.

Table 6 Summary of bridge locations

Bridge No.	Location	Type	Approx. width	Approx. length
1777	Reid Highway/Tonkin Highway interchange	Traffic bridge	16 m	87 m
1778			11 m	79 m
1779			42 m	60 m
1780			61 m	97 m
9427	PSP underpasses	Traffic bridge	8 m	21 m
9430			8 m	17 m
9431			8 m	33 m
1782	Marshall Road over PDNH	Traffic bridge	28 m	96 m
1783	Hepburn Avenue over PDNH	Traffic bridge	14 m	33 m
1784			14 m	33 m
1785			14 m	33 m
1786			14 m	33 m
9425	Hepburn Avenue west of PDNH	Footbridge	5 m	77 m
1787	PDNH over Baal Street	Traffic bridge	28 m	38 m
1811			28 m	38 m

Bridge No.	Location	Type	Approx. width	Approx. length
1788	PDNH over Gnangara Road	Traffic bridge	46 m	128 m
9426	Gnangara Road east of PDNH	Footbridge	5 m	91 m
9443	PSP underpasses	Traffic bridge	11 m	15 m
9444			67 m	15 m
1789	The Promenade over PDNH	Traffic bridge	67 m	16 m
1790			64 m	17 m
9432	PSP underpass	Traffic bridge	33 m	46 m
(TBA)	Maralla Road Bushland	Fauna bridge	12 m	50 m
1801	PDNH over Stock Road	Traffic bridge	34 m	33 m
1802			34 m	32 m
1793	PDNH over Neaves Road	Traffic bridge	29 m	39 m
1794			29 m	39 m
1795	PDNH over Muchea South Road, railway and Almeria Parade	Traffic bridge	36 m	155 m
1796	PDNH over Ellen Brook	Traffic bridge	38 m	76 m
1797	PDNH over Brand Highway	Traffic bridge	38 m	53 m
1798	Brand Highway Deviation over Ellen Brook	Traffic bridge	27 m	57 m
1799	Brand Highway Deviation over Brand Highway and the Railway	Traffic bridge	15 m	160 m
1803	PDNH over Brand Highway Deviation	Traffic bridge	31 m	47 m
1804			29 m	39 m



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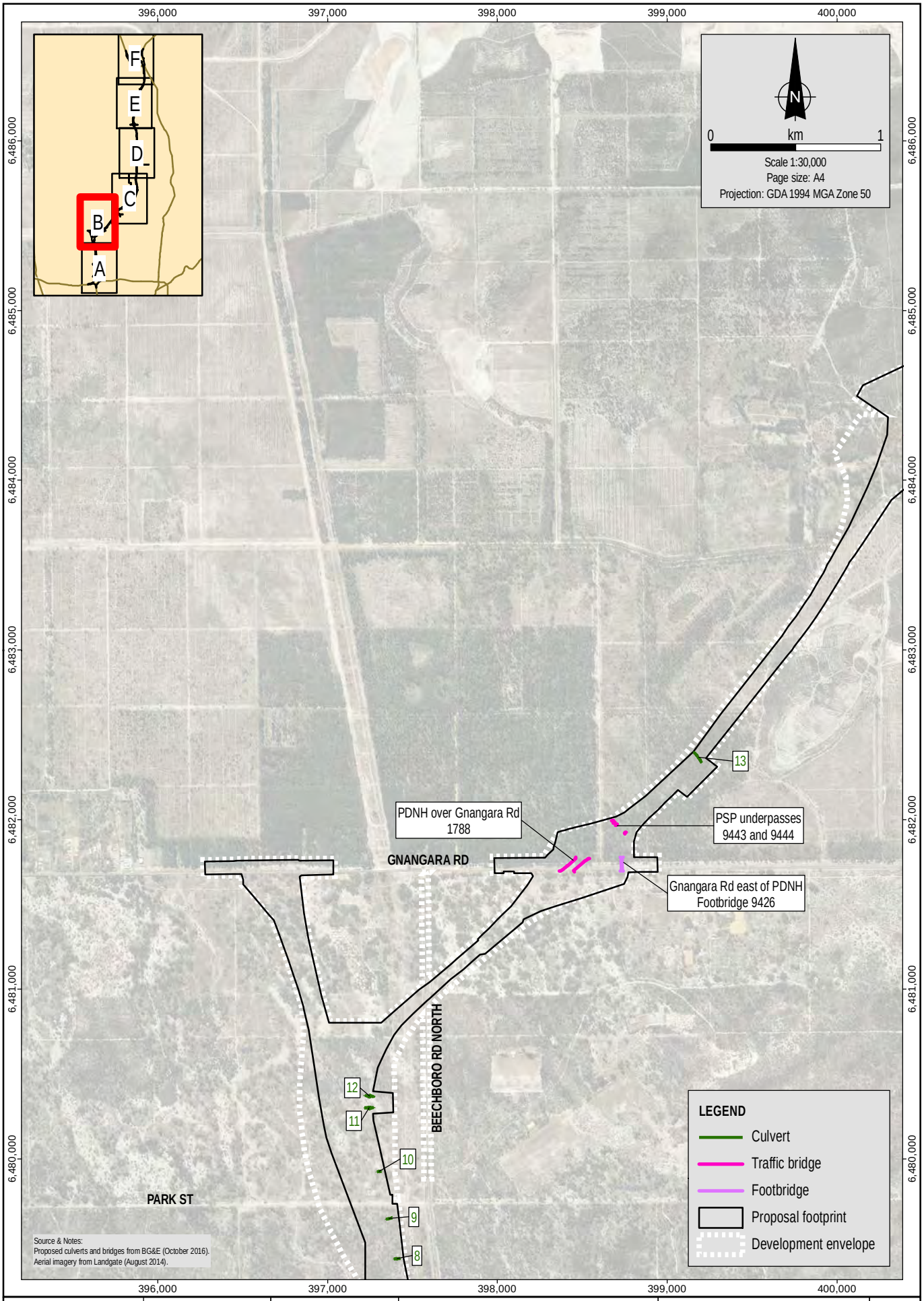

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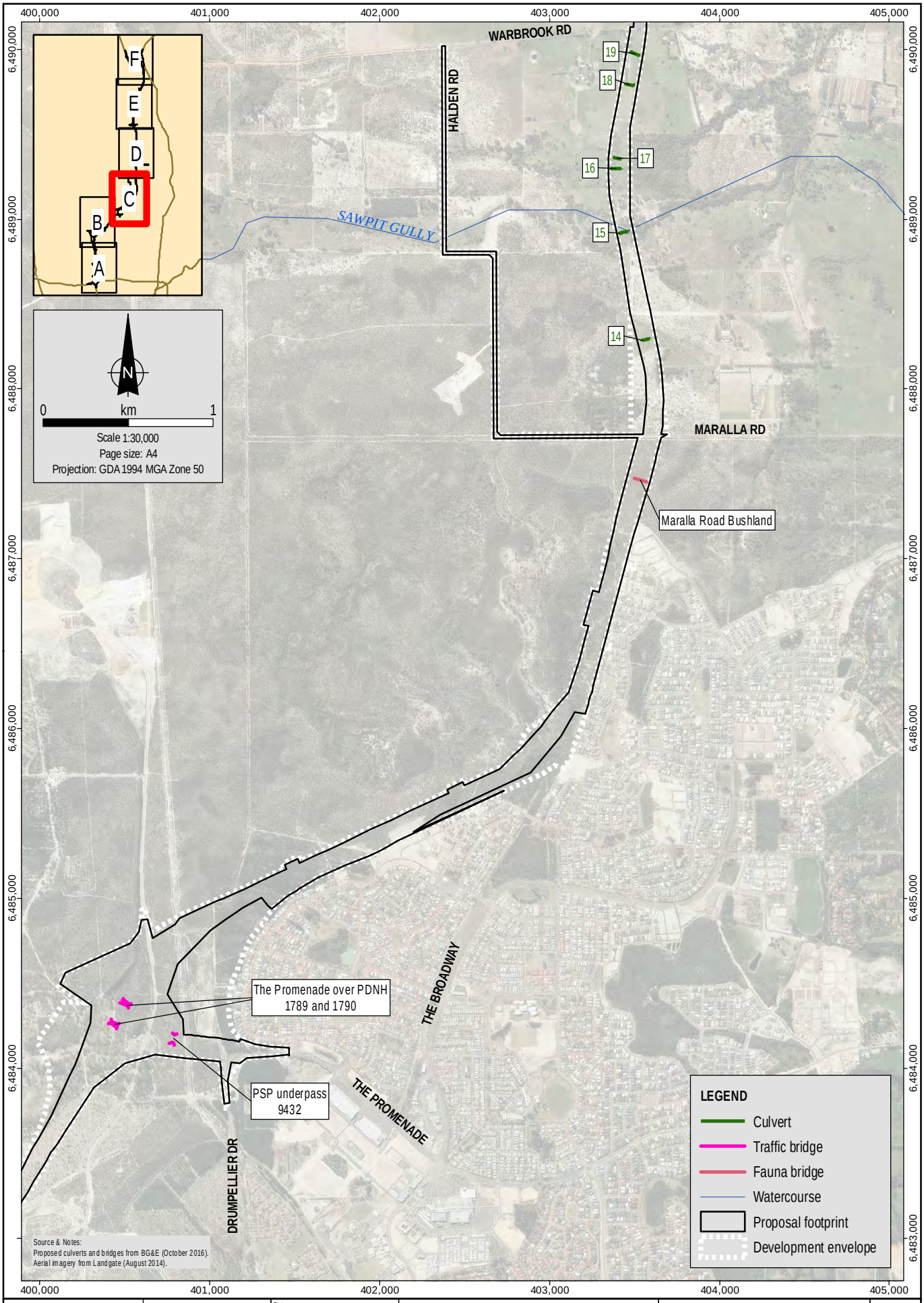
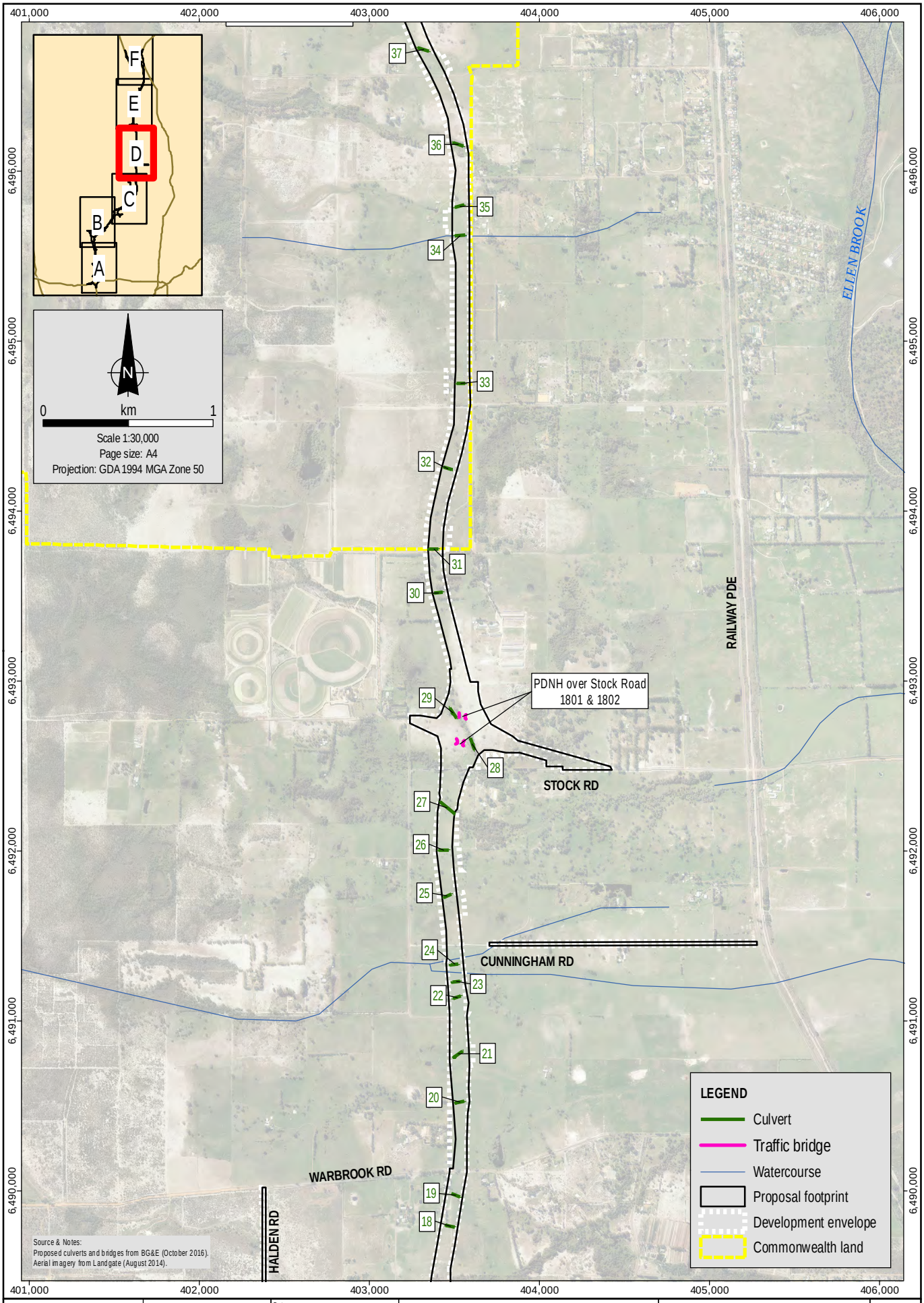
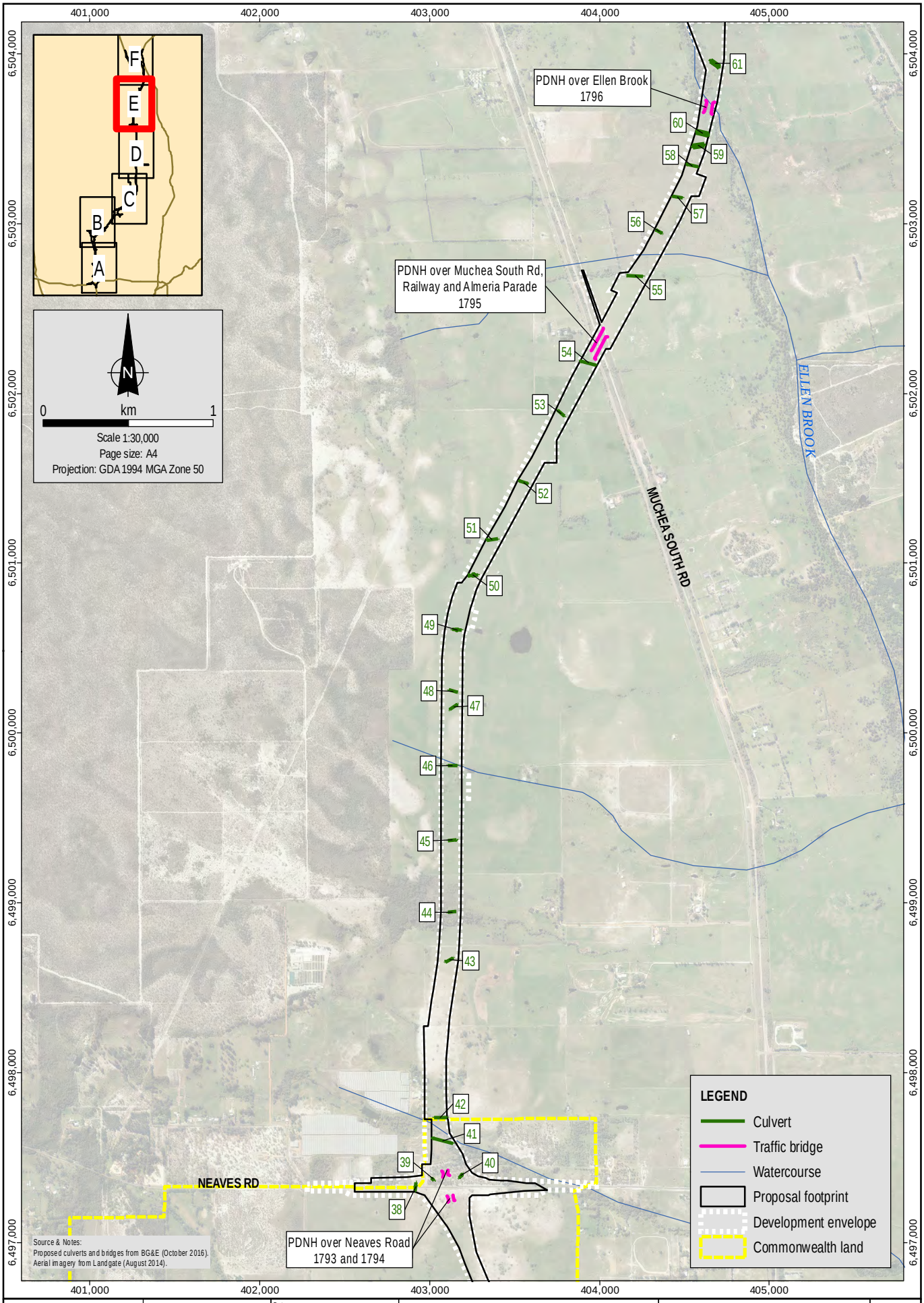


NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 30.11.2016 MXD: 4483AA_73_GIS003_6 File Name: 4483AA_73_F004C_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of culverts and bridges Map 3 of 6	Figure No: 4C



NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 30.11.2016 MXD: 4483AA_73_GIS003_5 File Name: 4483AA_73_F004D_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of culverts and bridges Map 4 of 6	Figure No: 4D



NorthLinkWA

coffey
A TETRA TECH COMPANY

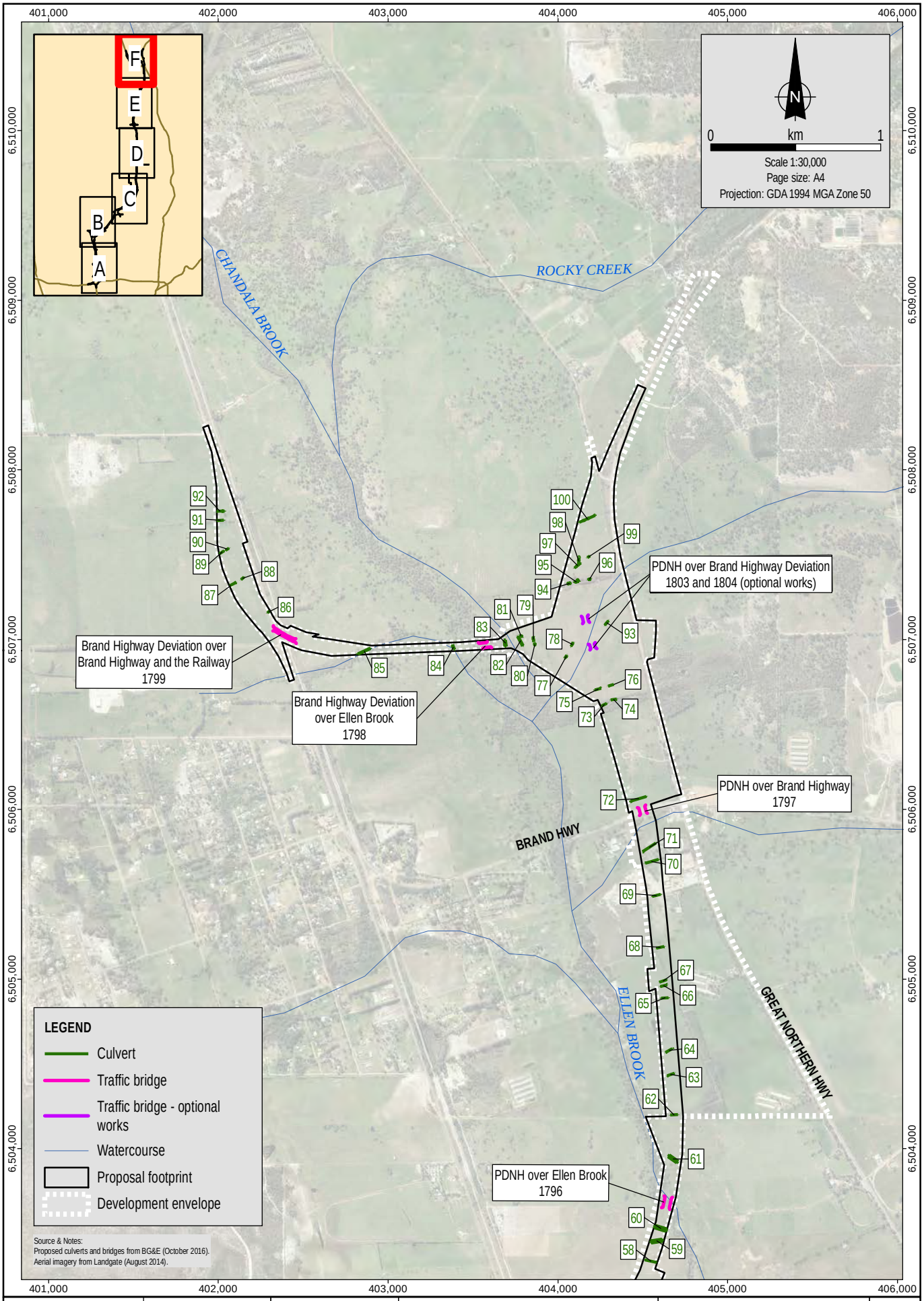
Date: 30.11.2016
MXD: 4483AA_73_GIS003_5
File Name: 4483AA_73_F004E_GIS

Perth-Darwin National Highway

Infrastructure Plan

Location of culverts and bridges
Map 5 of 6

Figure No:
4E



NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 20.12.2016 MXD: 4483AA_73_GIS003_6 File Name: 4483AA_73_F004F_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of culverts and bridges Map 6 of 6	Figure No: 4F

3.5 Bio-retention Swales and Infiltration Basins

Bio-retention swales and infiltration basins installed along the alignment will minimise impacts from the proposal to the quality of groundwater and surface water within the vicinity of Ellen Brook and within the GUWPCA.

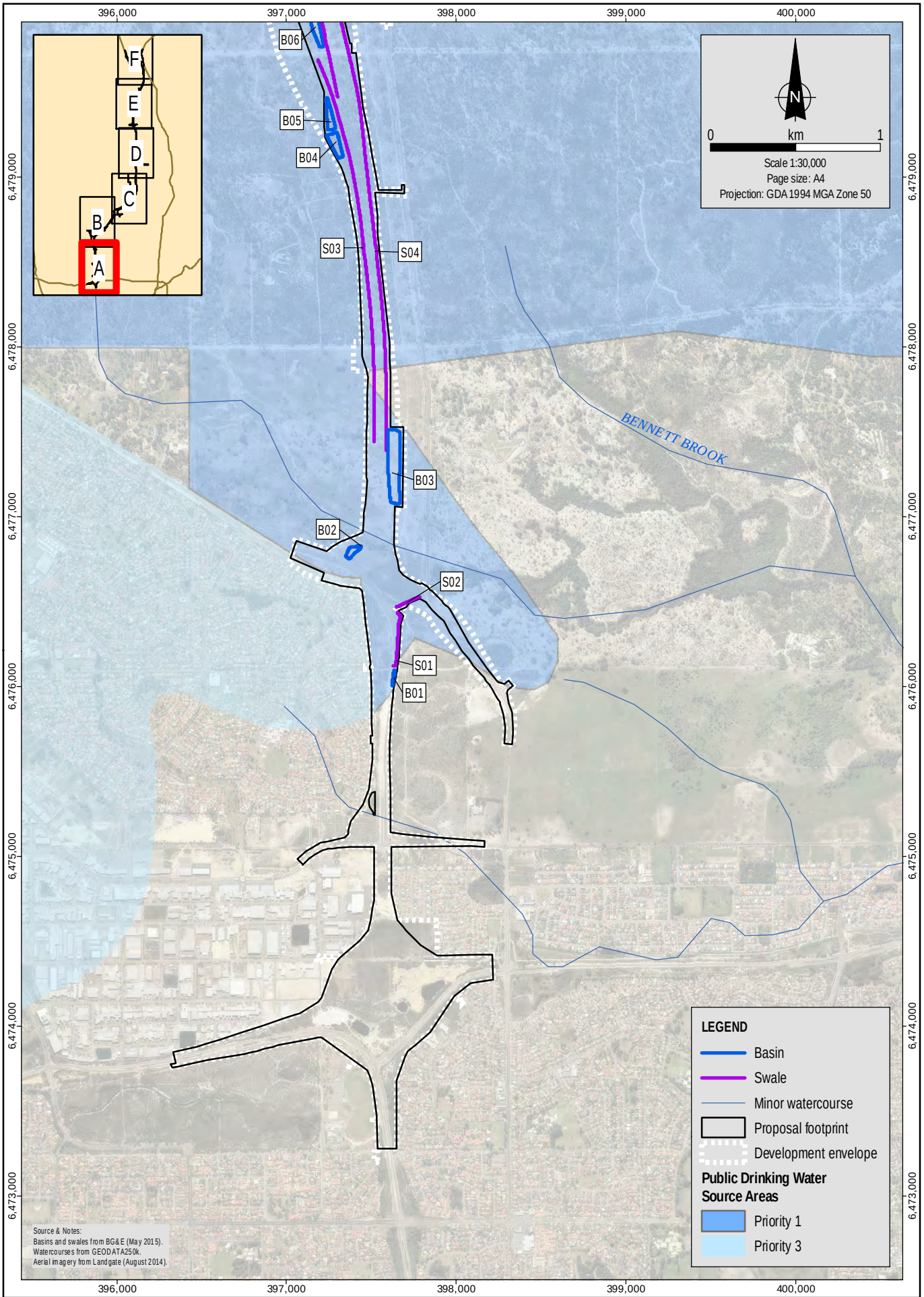
Table 7 and Figure 5 show the location of the bio-retention swales and infiltration basins in the vicinity of Ellen Brook and within the GUWPCA. The design of the bio-retention and infiltration systems are consistent with the approved Inland Waters Environmental Quality – Hydrological Processes – Condition Environmental Management Plan as required by condition 13 of the Ministerial Statement and will consist of an excavated basin or trench that is filled with porous media and planted with vegetation (BG&E, 2015). Figure 6 shows the design of a typical bio-retention swale and infiltration basin.

Table 7 Locations of infiltration basins and bio-retention swales

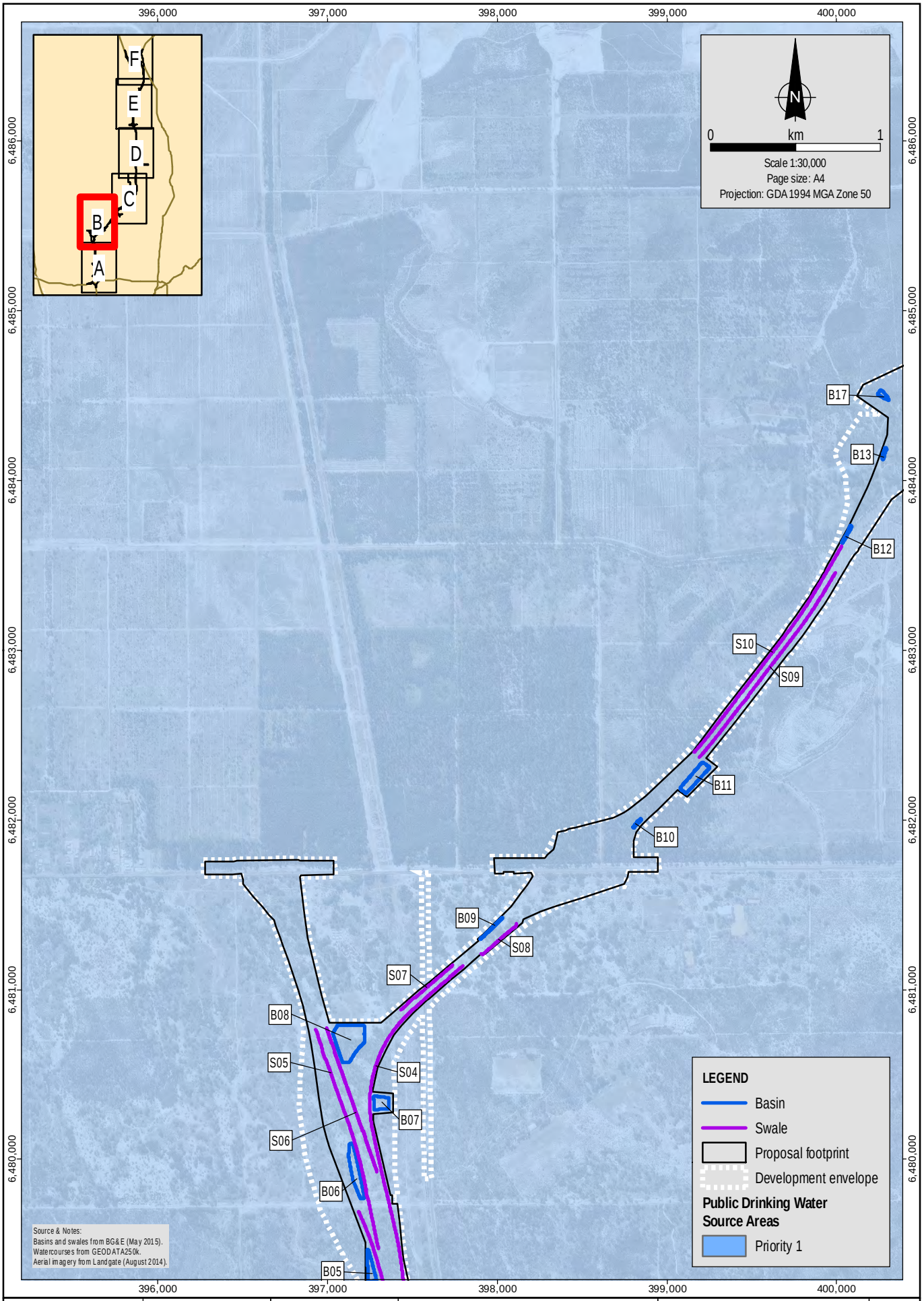
Basin/Swale No.	Location	Type
B01	Ballajura	Infiltration basin
S01	Ballajura	Bio-retention swale
B02	Hepburn Ave interchange	Infiltration basin
S02	Hepburn Ave interchange	Bio-retention swale
B03	Cullacabardee	Infiltration basin
S03	Cullacabardee	Bio-retention swale
S04	Cullacabardee/Whiteman	Bio-retention swale
B04	Cullacabardee	Infiltration basin
B05	Cullacabardee	Infiltration basin
B06	Whiteman	Infiltration basin
S05	Whiteman	Bio-retention swale
S06	Whiteman	Bio-retention swale
B07	Whiteman	Infiltration basin
B08	Whiteman	Infiltration basin
S07	Whiteman	Bio-retention swale
S08	Whiteman	Bio-retention swale
B09	Whiteman	Infiltration basin
B10	Lexia/Gnangara Rd interchange	Infiltration basin
B11	Lexia	Infiltration basin
S09	Lexia	Bio-retention swale
S10	Lexia	Bio-retention swale
B12	Lexia	Infiltration basin
B13	Lexia/The Promenade interchange	Infiltration basin
S11	Lexia/The Promenade interchange	Bio-retention swale

Basin/Swale No.	Location	Type
B14	Lexia/The Promenade interchange	Infiltration basin
B15	Lexia/The Promenade interchange	Infiltration basin
B16	Lexia/The Promenade interchange	Infiltration basin
B17	Lexia/The Promenade interchange	Infiltration basin
B18	Ellenbrook	Infiltration basin
B19	Ellenbrook	Infiltration basin
S12	Ellenbrook	Bio-retention swale
B20	Ellenbrook	Infiltration basin
B21	Ellenbrook	Infiltration basin
B22	Ellenbrook	Infiltration basin
S13	Ellenbrook	Bio-retention swale
S14	Bullsbrook	Bio-retention swale
S15	Bullsbrook	Bio-retention swale
S16	Bullsbrook	Bio-retention swale
S17	Bullsbrook	Bio-retention swale
S18	Bullsbrook	Bio-retention swale
S19	Bullsbrook	Bio-retention swale
S20	Bullsbrook	Bio-retention swale
S21	Bullsbrook	Bio-retention swale
S22	Bullsbrook	Bio-retention swale
S23	Bullsbrook	Bio-retention swale
S24	Bullsbrook	Bio-retention swale
S25	Bullsbrook	Bio-retention swale
S26	Bullsbrook	Bio-retention swale
S27	Bullsbrook	Bio-retention swale
S28	Bullsbrook	Bio-retention swale
S29	Bullsbrook	Bio-retention swale
S30	Bullsbrook	Bio-retention swale
S31	Bullsbrook	Bio-retention swale
S32	Bullsbrook	Bio-retention swale
S33	Bullsbrook	Bio-retention swale
S34	Bullsbrook	Bio-retention swale
S35	Bullsbrook	Bio-retention swale
S36	Bullsbrook	Bio-retention swale

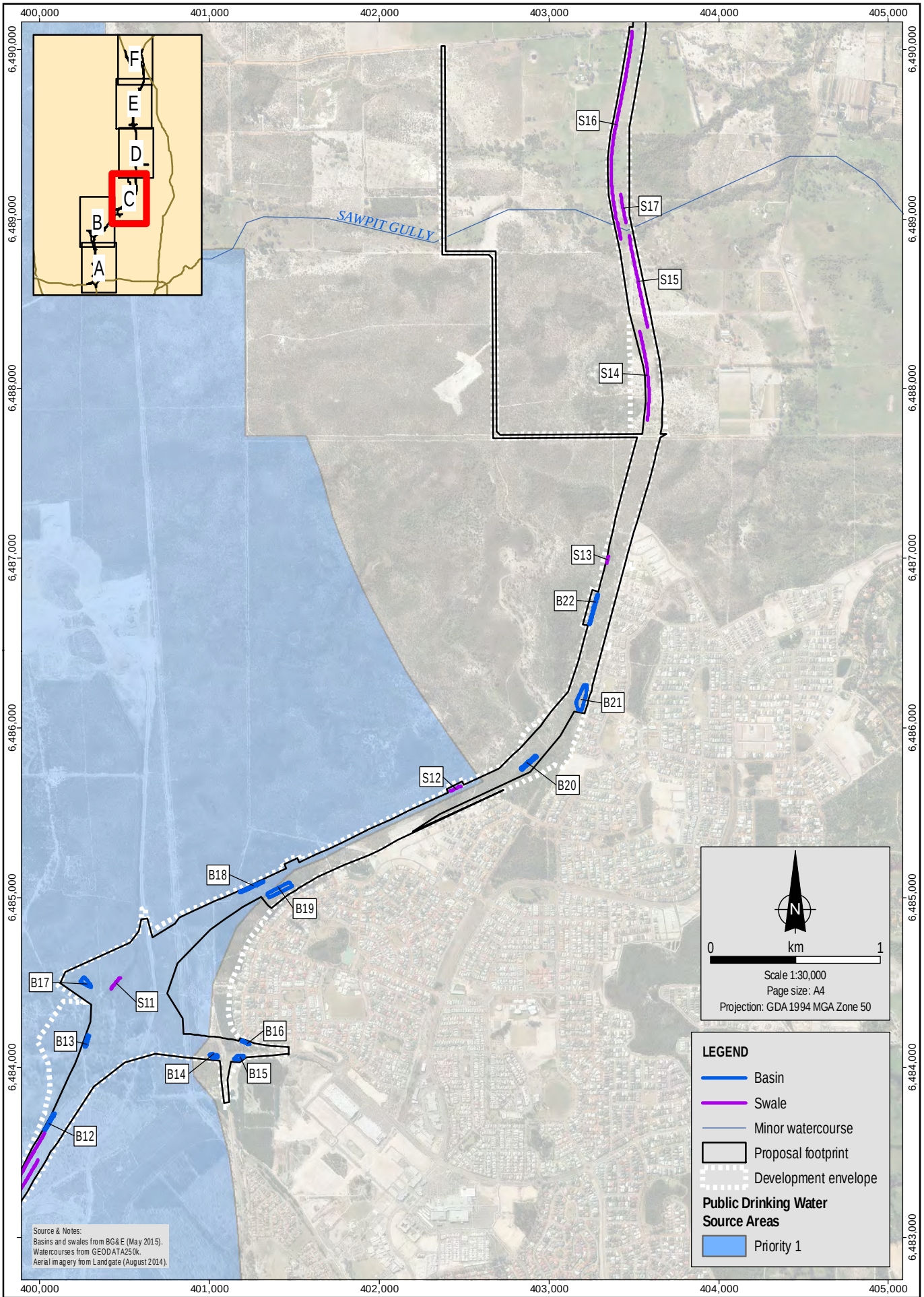
Basin/Swale No.	Location	Type
S37	Bullsbrook	Bio-retention swale
S38	Bullsbrook	Bio-retention swale
S39	Bullsbrook	Bio-retention swale
S40	Bullsbrook	Bio-retention swale
S41	Bullsbrook	Bio-retention swale
S42	Bullsbrook	Bio-retention swale
S43	Bullsbrook	Bio-retention swale
S44	Bullsbrook	Bio-retention swale
S45	Bullsbrook	Bio-retention swale
S46	Bullsbrook	Bio-retention swale
S47	Bullsbrook	Bio-retention swale
S48	Bullsbrook	Bio-retention swale
S49	Bullsbrook	Bio-retention swale
S50	Bullsbrook	Bio-retention swale
S51	Muchea	Bio-retention swale
S52	Muchea	Bio-retention swale
S53	Muchea	Bio-retention swale
S54	Muchea	Bio-retention swale
S55	Muchea	Bio-retention swale
S56	Muchea	Bio-retention swale
S57	Muchea	Bio-retention swale
S58	Muchea	Bio-retention swale
S59	Muchea	Bio-retention swale
S60	Muchea	Bio-retention swale
S61	Muchea	Bio-retention swale
S62	Muchea	Bio-retention swale
S63	Muchea	Bio-retention swale
S64	Muchea	Bio-retention swale
S65	Muchea	Bio-retention swale
S66	Muchea	Bio-retention swale
S67	Muchea	Bio-retention swale
S68	Muchea	Bio-retention swale



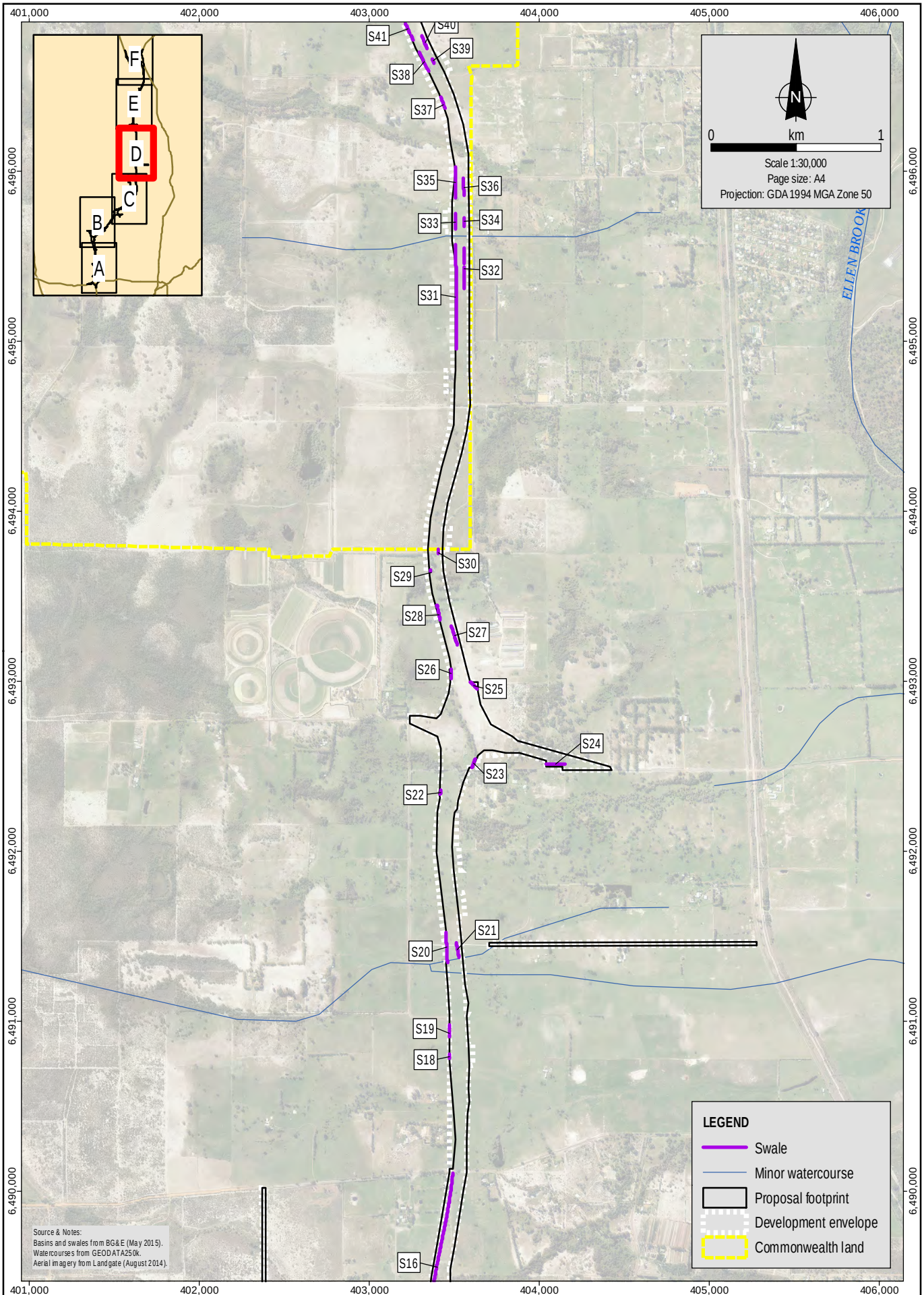
NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 22.11.2016 MXD: 4483AA_73_GIS004_4 File Name: 4483AA_73_F005A_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of bio-retention swales and infiltration basins in the GUWPCA and in the vicinity of Ellen Brook Map 1 of 6	Figure No: 5A



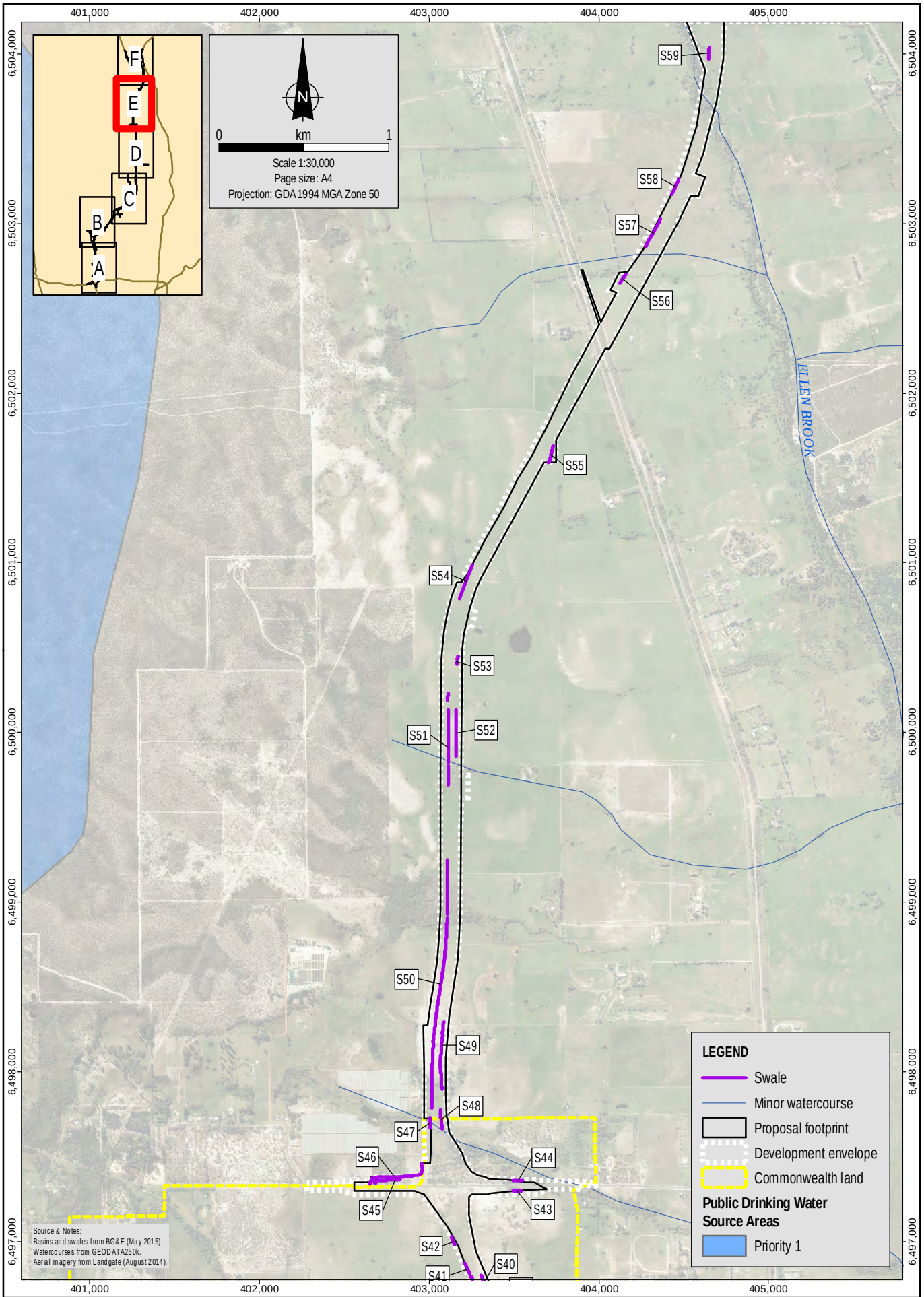
NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 22.11.2016 MXD: 4483AA_73_GIS004_4 File Name: 4483AA_73_F005B_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of bio-retention swales and infiltration basins in the GUWPCA and in the vicinity of Ellen Brook Map 2 of 6	Figure No: 5B



NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 22.11.2016 MXD: 4483AA_73_GIS004_4 File Name: 4483AA_73_F005C_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of bio-retention swales and infiltration basins in the GUWPCA and in the vicinity of Ellen Brook Map 3 of 6	Figure No: 5C



NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 22.11.2016 MXD: 4483AA_73_GIS004_4 File Name: 4483AA_73_F005D_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of bio-retention swales and infiltration basins in the GUWPCA and in the vicinity of Ellen Brook Map 4 of 6	Figure No: 5D



NorthLinkWA

coffey
A TETRA TECH COMPANY

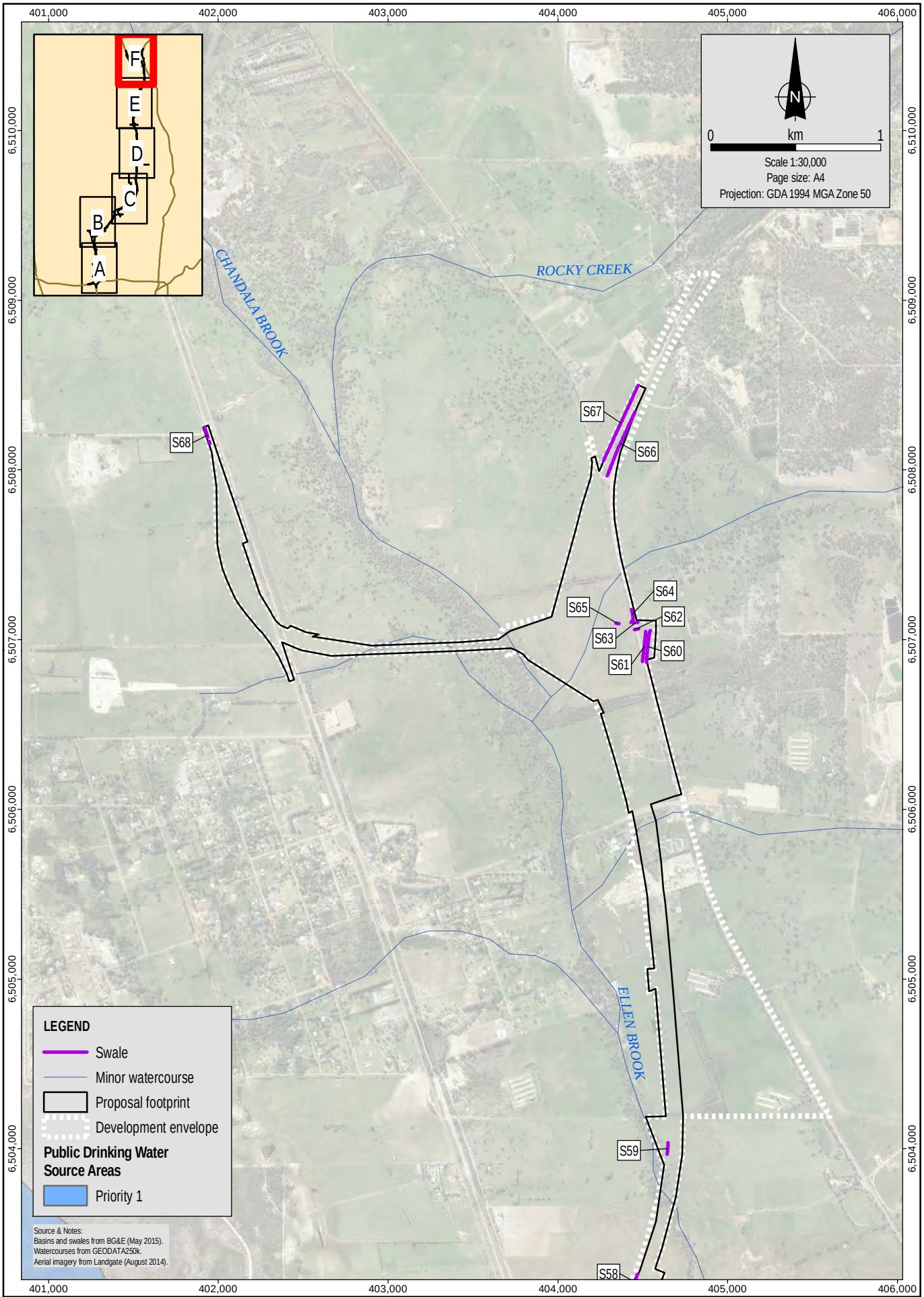
Date: 22.11.2016
MXD: 4483AA_73_GIS004_4
File Name: 4483AA_73_F005E_GIS

Perth-Darwin National Highway

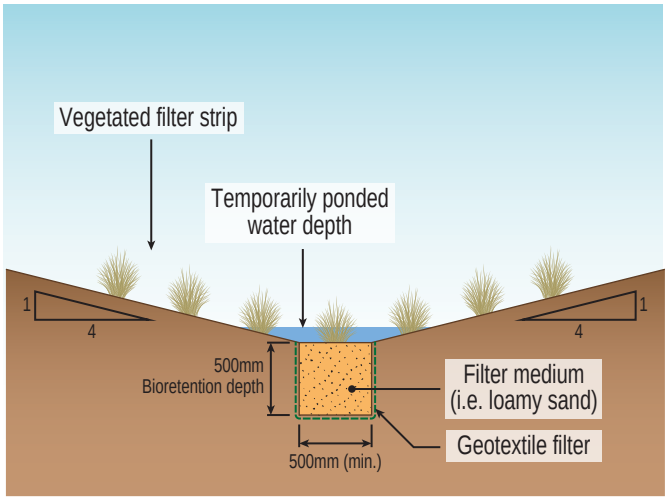
Infrastructure Plan

Location of bio-retention swales and infiltration basins in the GUWPCA and in the vicinity of Ellen Brook
Map 5 of 6

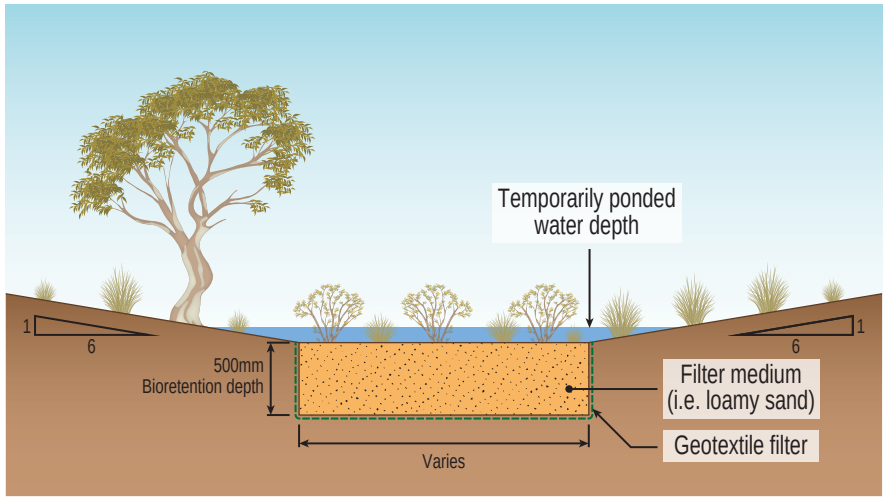
Figure No: 5E



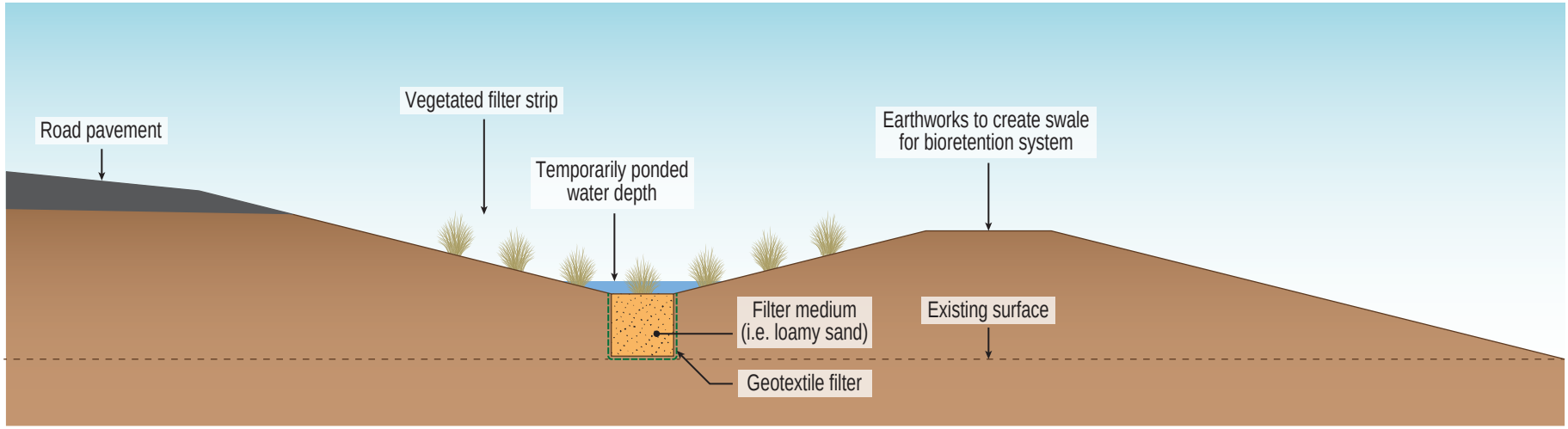
NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 29.11.2016 MXD: 4483AA_73_GIS004_5 File Name: 4483AA_73_F005F_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of bio-retention swales and infiltration basins in the GUWPCA and in the vicinity of Ellen Brook Map 6 of 6	Figure No: 5F



Typical bioretention swale



Typical bioretention basin



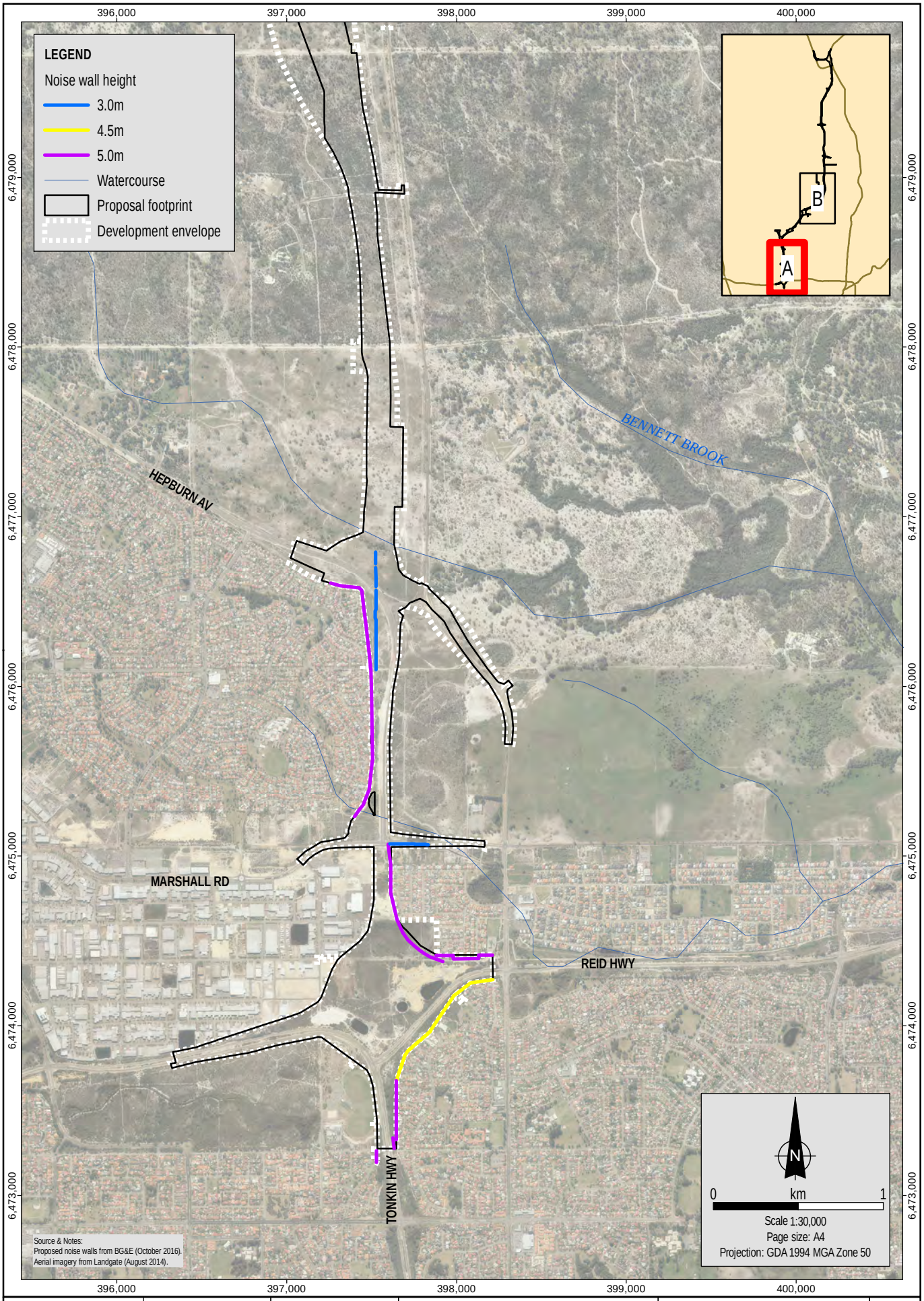
Typical bioretention swale in Palusplain Zone

Note: Drawing is not to scale and is for illustrative purposes only.	NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 22.11.2016	Perth–Darwin National Highway	Typical bioretention swale and basin	Figure No: 6
			File Name: 4483AA_73_F005_GRA	Infrastructure Plan		

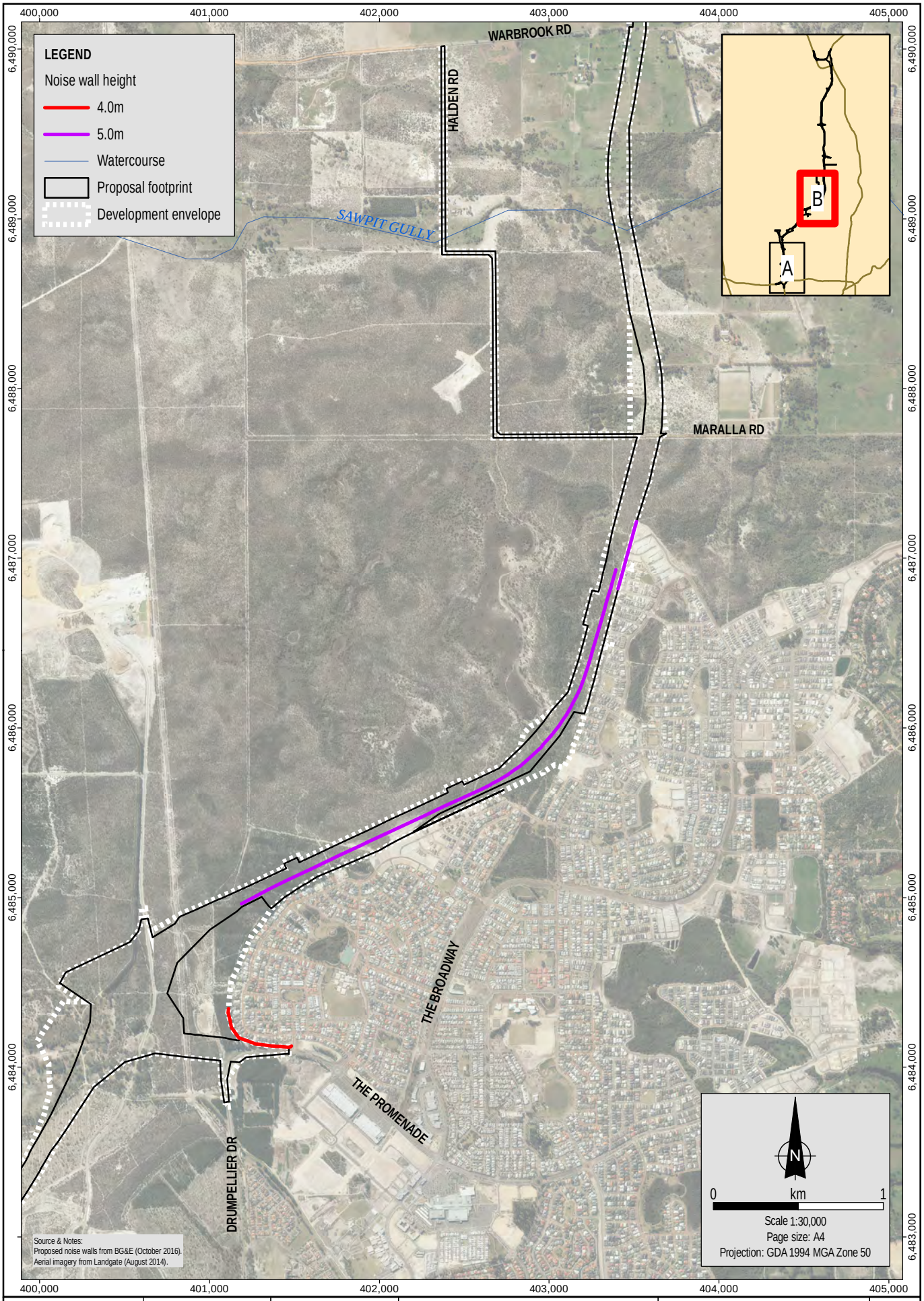
AI Reference: 4483AA_73_GRA001_v2ai

3.6 Noise Walls

Noise walls, installed to mitigate existing noise sensitive receptors south of Maralla Road, will minimise impacts to amenity as low as reasonable practicable. The locations, lengths and heights of the noise walls are shown in Figure 7. Noise walls will have a maximum height of 5 m and will be constructed using materials with a surface density exceeding 15 kg/m^2.



NorthLinkWA	coffey A TETRA TECH COMPANY	Date: 23.11.2016 MXD: 4483AA_73_GIS006_4 File Name: 4483AA_73_F007A_GIS	Perth-Darwin National Highway Infrastructure Plan	Location of noise walls Map 1 of 2	Figure No: 7A



NorthLinkWA

coffey
A TETRA TECH COMPANY

Date: 23.11.2016
MXD: 4483AA_73_GIS006_4
File Name: 4483AA_73_F007B_GIS

Perth-Darwin National Highway

Infrastructure Plan

Location of noise walls
Map 2 of 2

Figure No:
7B

4 REVIEW OF THE INFRASTRUCTURE PLAN

This pre-construction Infrastructure Plan will be reviewed and revised as required or when directed by the CEO in accordance with condition 6-3.

Upon receipt of written advice from the CEO that the revised pre-construction Infrastructure Plan satisfies the requirements set out in condition 6-2, the revised plan shall be the Infrastructure Plan used for implementing construction.

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5 REFERENCES

BG&E. 2015. Drainage Strategy. NorthLink WA Perth–Darwin National Highway. May. Report prepared for NorthLink WA by BG&E Pty Ltd.

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APPENDIX A

Box Culvert Design

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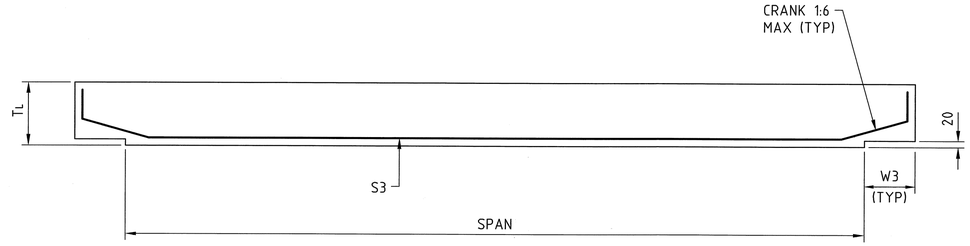
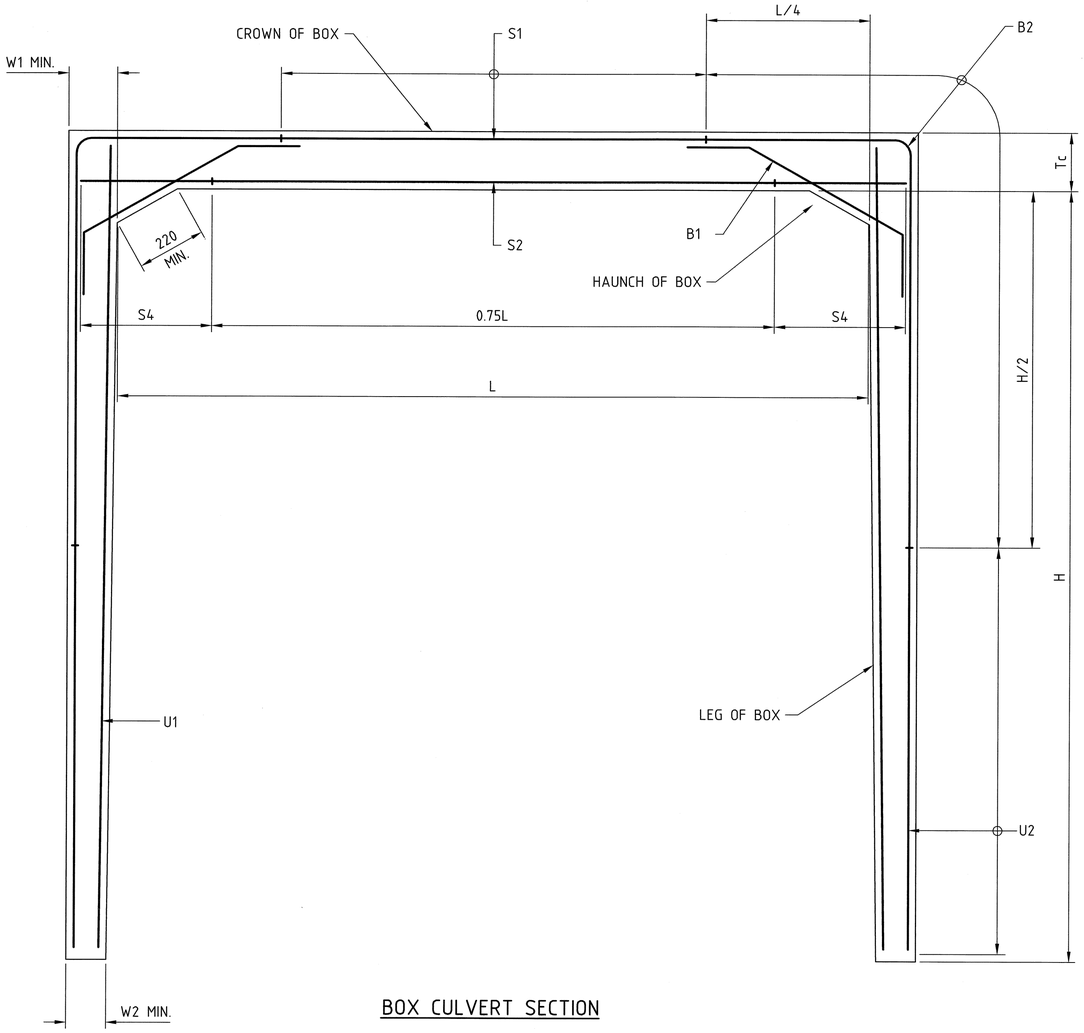


LINK SLAB SECTION



BOX CULVERT SECTION

PRECAST BOX SECTION NOM. (m)	CONCRETE DIMENSIONS					MINIMUM MAIN REINFORCEMENT						
	H (mm)	L (mm)	Tc MIN. (mm)	W1 MIN. (mm)	W2 MIN. (mm)	CROWN (mm)			HAUNCH (mm^2)		LEG (mm^2 /LEG)	
						S1	S2	S4	B1	B2	U1	U2
1.5 x 0.9 x 1.2	900	1500	180	145	130	700	1630	890	700	810	600	600
1.5 x 1.2 x 1.2	1200	1500	180	145	130	700	1700	930	700	900	600	600
1.5 x 1.5 x 1.2	1500	1500	180	145	130	700	1760	960	700	1040	600	600
1.8 x 0.9 x 1.2	900	1800	190	150	130	740	1750	950	740	1150	600	600
1.8 x 1.2 x 1.2	1200	1800	190	150	130	740	1820	1000	740	1240	600	600
1.8 x 1.5 x 1.2	1500	1800	190	150	130	740	1890	1030	740	1360	600	600
1.8 x 1.8 x 1.2	1800	1800	190	150	130	740	1970	1080	740	1530	700	700
2.1 x 1.2 x 1.2	1200	2100	205	155	130	800	1890	1030	800	1460	600	700
2.1 x 1.5 x 1.2	1500	2100	205	155	130	800	1990	1090	800	1550	600	700
2.1 x 1.8 x 1.2	1800	2100	205	155	130	800	2070	1130	800	1700	700	700
2.1 x 2.1 x 1.2	2100	2100	205	155	130	800	2150	1180	800	1880	800	800
2.4 x 1.2 x 1.2	1200	2400	210	165	130	880	2130	1170	880	1760	600	1060
2.4 x 1.5 x 1.2	1500	2400	210	165	130	880	2240	1230	880	1830	600	990
2.4 x 1.8 x 1.2	1800	2400	210	165	130	880	2340	1280	880	1940	700	920
2.4 x 2.1 x 1.2	2100	2400	210	170	130	880	2430	1330	880	1940	800	830
2.4 x 2.4 x 1.2	2400	2400	210	170	130	880	2490	1360	880	2140	960	920
2.7 x 1.5 x 1.2	1500	2700	230	170	130	1000	2490	1360	1000	2140	600	1260
2.7 x 1.8 x 1.2	1800	2700	230	170	130	1000	2600	1430	1000	2230	700	1180
2.7 x 2.1 x 1.2	2100	2700	230	180	130	1000	2700	1480	1000	2190	800	1060
2.7 x 2.4 x 1.2	2400	2700	230	180	130	1000	2700	1480	1000	2350	960	1000
2.7 x 2.7 x 1.2	2700	2700	230	190	130	1000	2770	1520	1000	2400	1150	920
3.0 x 1.8 x 1.2	1800	3000	245	190	140	1100	2860	1570	1100	2230	700	1290
3.0 x 2.1 x 1.2	2100	3000	245	190	140	1100	2960	1620	1100	2330	800	1210
3.0 x 2.4 x 1.2	2400	3000	245	190	140	1100	3050	1670	1100	2480	960	1140
3.0 x 2.7 x 1.2	2700	3000	245	200	140	1100	3050	1670	1100	2500	1100	1040
3.0 x 3.0 x 1.2	3000	3000	245	200	140	1100	3130	1720	1100	2730	1440	980
3.3 x 1.8 x 1.2	1800	3300	270	200	150	1200	3130	1720	1200	2480	700	1520
3.3 x 2.1 x 1.2	2100	3300	270	200	150	1200	3240	1780	1200	2570	800	1440
3.3 x 2.4 x 1.2	2400	3300	270	200	150	1200	3350	1840	1200	2690	960	1360
3.3 x 2.7 x 1.2	2700	3300	270	220	150	1200	3350	1840	1200	2690	1100	1240
3.3 x 3.0 x 1.2	3000	3300	270	220	150	1200	3430	1880	1200	2890	1440	1180
3.3 x 3.3 x 1.2	3300	3300	270	220	150	1200	3500	1920	1200	2970	1650	1080
3.6 x 1.8 x 1.2	1800	3600	305	220	160	1350	3370	1850	1350	2700	700	1740
3.6 x 2.1 x 1.2	2100	3600	305	220	160	1350	3490	1910	1350	2770	800	1640
3.6 x 2.4 x 1.2	2400	3600	305	220	160	1350	3600	1980	1350	2880	960	1550
3.6 x 2.7 x 1.2	2700	3600	305	230	160	1350	3700	2030	1350	2880	1100	1410
3.6 x 3.0 x 1.2	3000	3600	305	230	160	1350	3700	2030	1350	3040	1440	1340
3.6 x 3.3 x 1.2	3300	3600	305	240	160	1350	3780	2070	1350	3040	1650	1190
3.6 x 3.6 x 1.2	3600	3600	305	240	160	1350	3850	2110	1350	3280	1980	1140

BOX CULVERT SECTIONS

LINK SLAB NOM. (m)	SPAN (mm)	MIN. THICKNESS T_L (mm)	MIN. MAIN REINF. S3 (mm^2)	W3 MIN. (mm)
1.5 x 1.22	1500	175	2000	130
1.8 x 1.22	1800	185	2260	130
2.1 x 1.22	2100	200	2600	140
2.4 x 1.22	2400	220	2940	150
2.7 x 1.22	2700	240	3285	160
3.0 x 1.22	3000	260	3630	180
3.3 x 1.22	3300	280	3970	190
3.6 x 1.22	3600	300	4310	200

LINK SLABS

CONCRETE AND REINFORCEMENT DETAILS

NOTES

1. MINIMUM REQUIREMENTS HAVE BEEN BASED ON DESIGN TO SM1600 LOADING AS PER AS 5100.
2. MINIMUM DEPTH OF FILL OR PAVEMENT REQUIRED OVER BOX CULVERTS SHALL BE 350 mm.
3. FOR FILL OR PAVEMENT THICKNESS LESS THAN 350 mm, MINIMUM CROWN THICKNESS (Tc) AND REINFORCEMENT SHALL BE DESIGNED BY A PRACTICING STRUCTURAL ENGINEER.
4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE MRWA CULVERT SPECIFICATION.
5. CONCRETE SHALL BE CLASS S50. SEE MRWA SPECIFICATION FOR MIX DESIGN REQUIREMENTS.
6. MINIMUM COVER TO REINFORCEMENT SHALL BE 40.
7. THE TOLERANCE ON COVER SHALL BE -0mm TO +5mm.
8. IF LEGS OF CULVERT ARE PARALLEL THEN THE DIMENSION W2 SHALL BE THE SAME AS DIMENSION W1.
9. REINFORCEMENT SHALL BE HARD DRAWN STEEL WIRE OR GRADE 500 HOT ROLLED DEFORMED STEEL BARS CONFORMING TO AS/NZS 4671.
10. MINIMUM MAIN REINFORCEMENT GIVEN IN TABLE IS FOR 1220 LENGTH OF UNIT. REFER TO MRWA SPECIFICATION FOR DISTRIBUTION STEEL REQUIREMENTS.
11. SEE MRWA SPECIFICATION FOR BENDING AND FIXING TOLERANCES.
12. CONTRACTOR SHALL SUBMIT PROPOSED REINFORCEMENT DETAILS WITH THE TENDER DOCUMENT.

THIS DRAWING SUPERSEDES DRG N° 9630-0506

SCALE NOT TO SCALE

MICROFILM DATE

A 1

No.	DATE	DESCRIPTION	AUTHORISED

AMENDMENTS

TECHNOLOGY AND ENVIRONMENT DIRECTORATE
PAVEMENT AND STRUCTURES ENGINEERING
Telephone (08) 9323 4111 Fax (08) 9323 4136

FILE No.	04/7045	JOB No.	
DRAWN	W. GILES AUGUST 2005	DESIGNED	P. BRADBURY SEPTEMBER 2001
CHECKED	T. SLATTERY AUGUST 2005	VERIFIED	26/8/05
APPROVED			26/8/05

Government of Western Australia

MAIN ROADS Western Australia

STRUCTURES ENGINEERING

STANDARD DRAWING

MINIMUM DESIGN REQUIREMENTS FOR PRECAST BOX CULVERT UNITS

FOR SPANS 1500mm AND LARGER AND FOR FILL HEIGHTS UP TO 4.5m

LOCAL AUTHORITY ( )

DRAWING NUMBER AMEND.

0530-1470

ROCK CLASS (SECTION THICKNESS)	ROCK SIZE ✱ (m)	ROCK MASS (kg)	MINIMUM PERCENTAGE OF ROCK LARGER THAN
FACING (500mm)	0.40 0.30 0.15	100 35 2.5	0 50 90
LIGHT (750mm)	0.55 0.40 0.20	250 100 10	0 50 90
1/4 TONNE (1000mm)	0.75 0.55 0.30	500 250 35	0 50 90
1/2 TONNE (1250mm)	0.90 0.70 0.40	1000 450 100	0 50 90

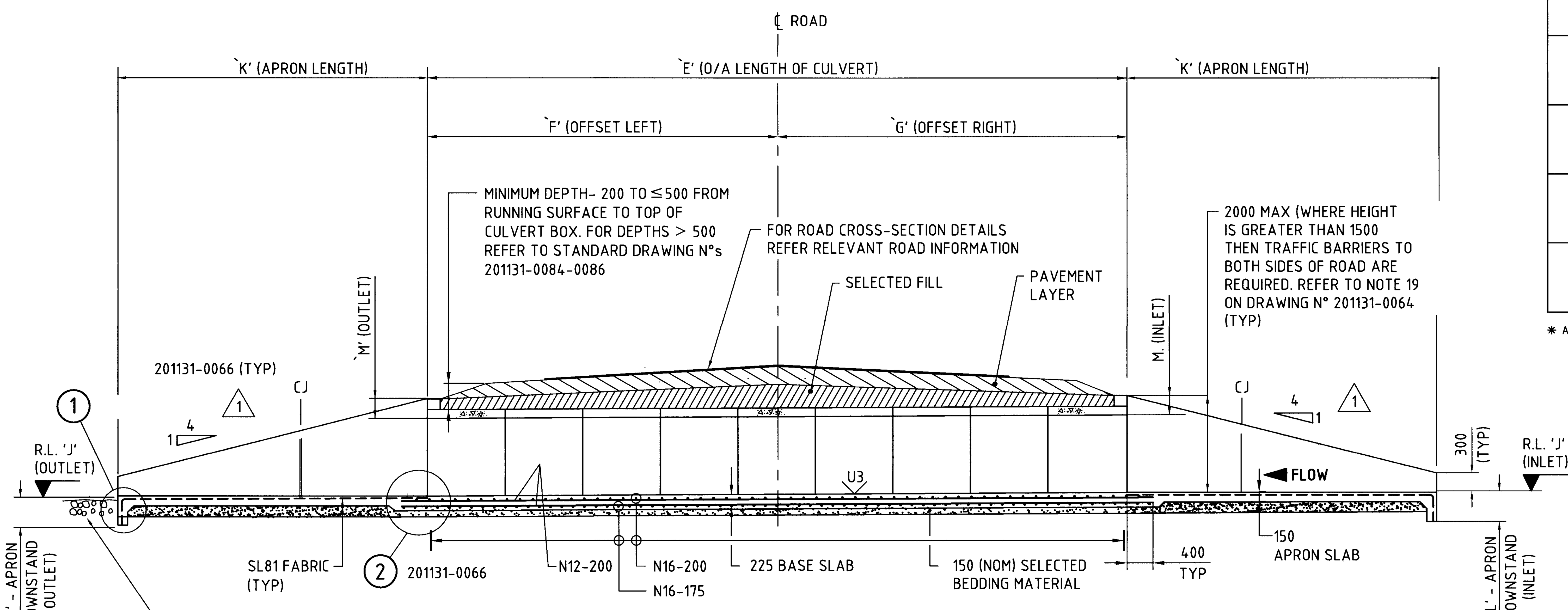
✱ ASSUMING A SPECIFIC GRAVITY OF 2.65 AND SPHERICAL SHAPE

ROCK PROTECTION TABLE

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE
1	WING WALL SLOPE CHANGED. NOTE 4 ADDED.	18.11.14

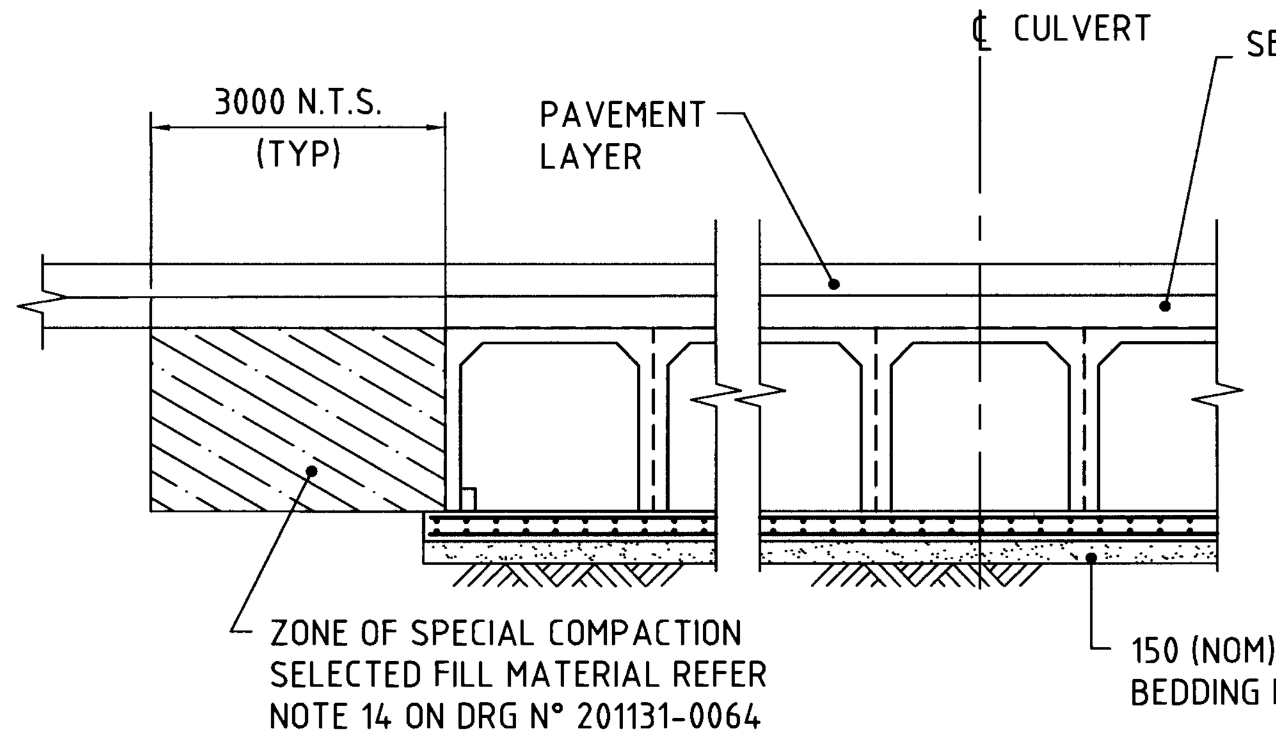
NOTES



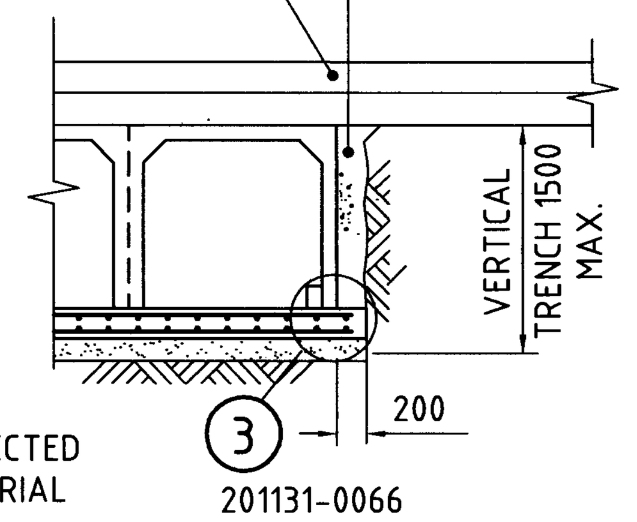
SECTIONAL ELEVATION (A) 201131-0064
(EMBANKMENT METHOD SHOWN)
1:50

1 WING WALL SLOPE CHANGED.

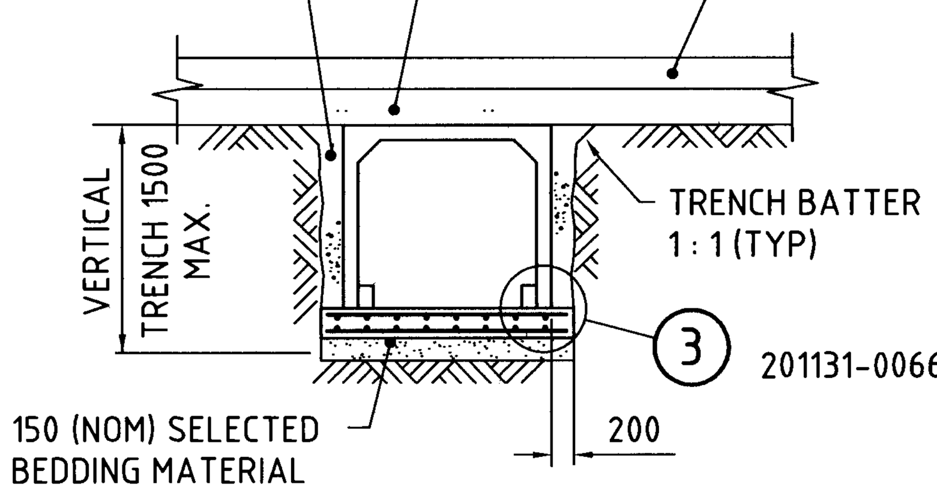
NOTE 4 ADDED.



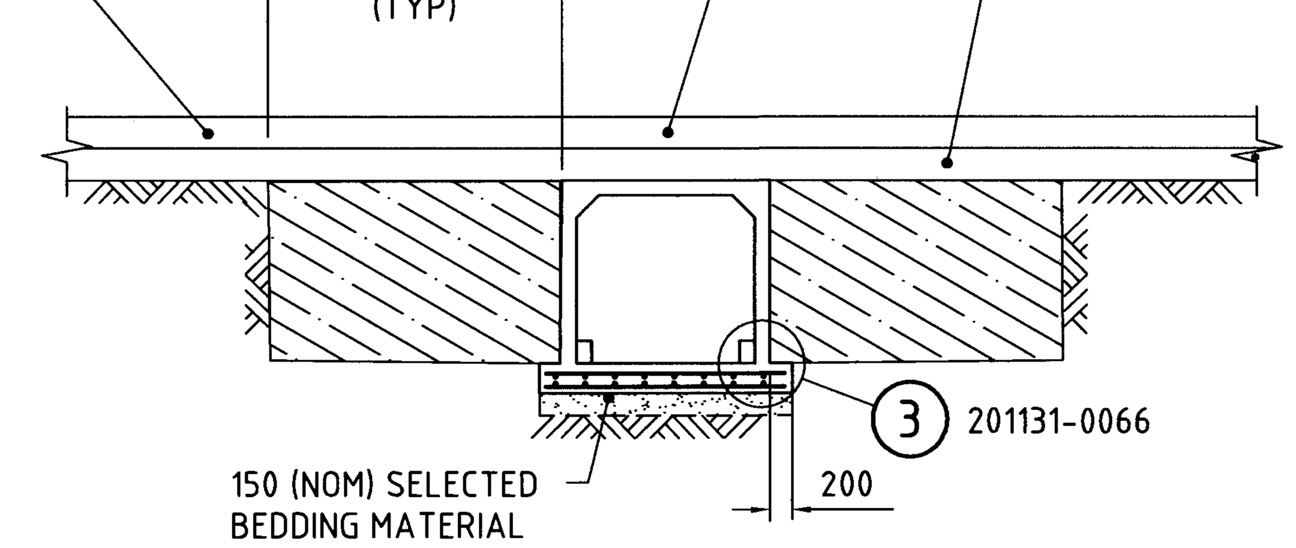
SECTION (B) 201131-0064
(EMBANKMENT METHOD - MULTI BARRELS)
1:50



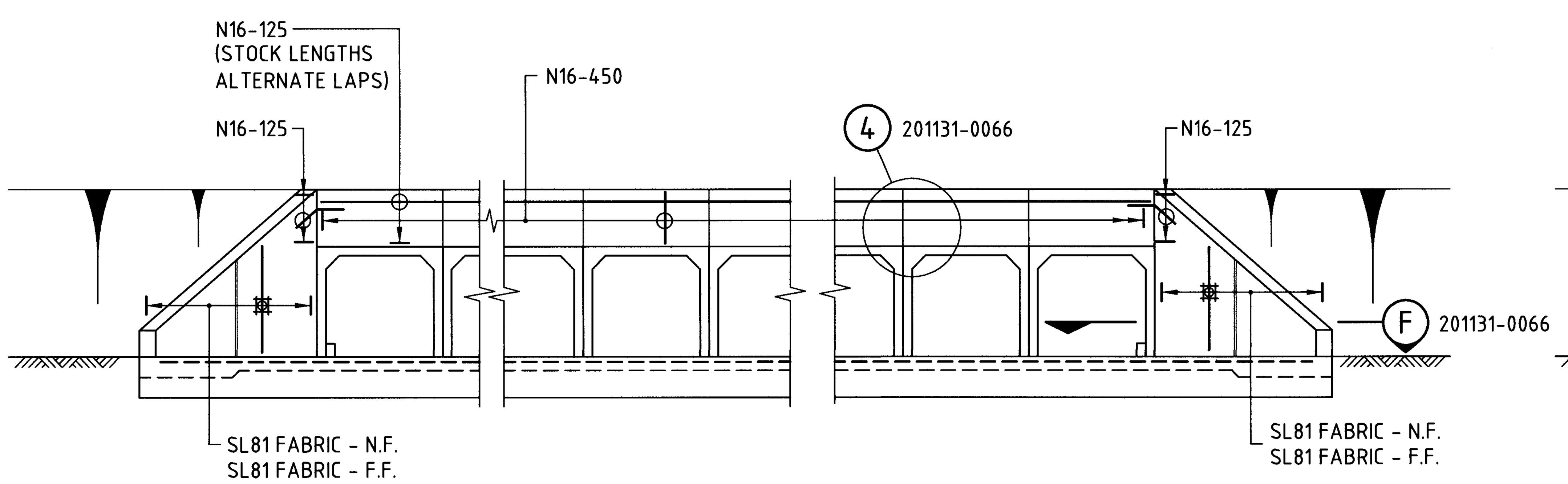
SECTION (B) 201131-0064
(TRENCH METHOD - MULTI BARRELS)
1:50



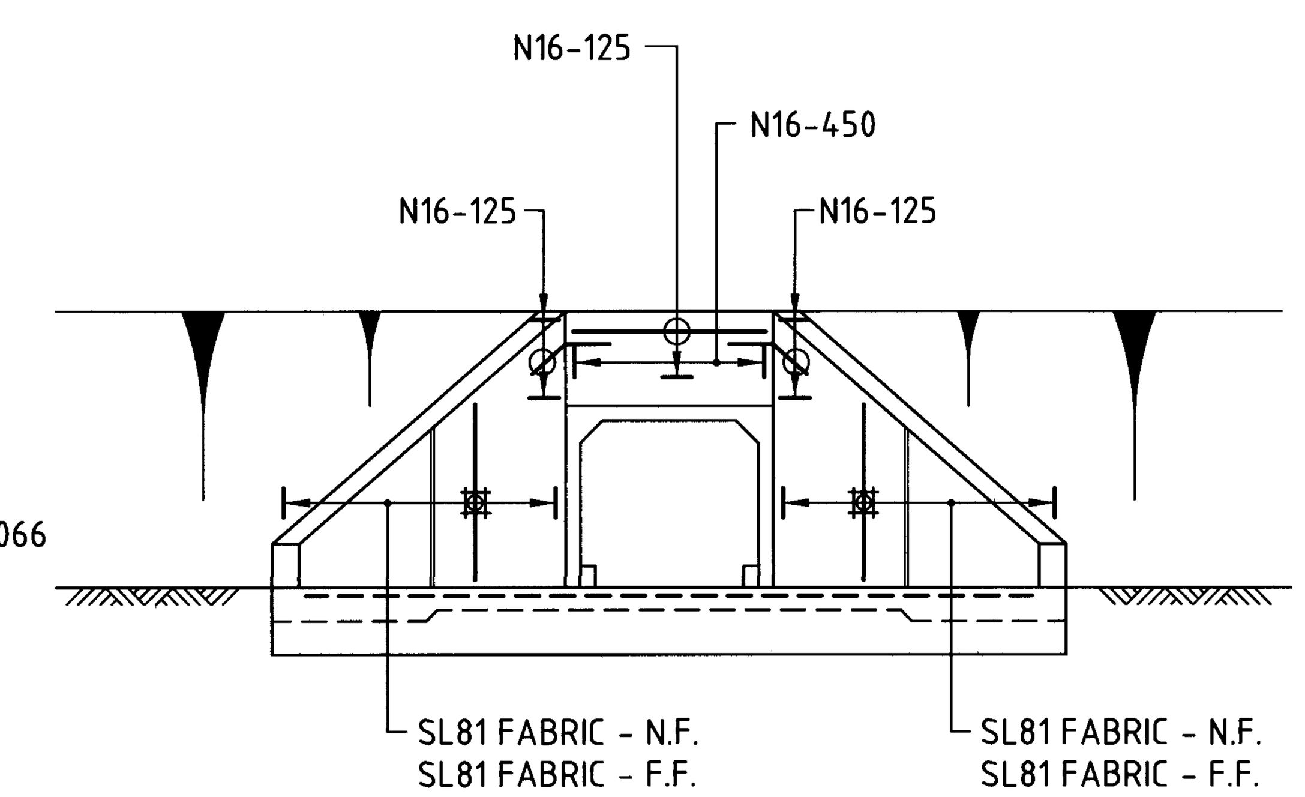
SECTION (B) 201131-0064
(TRENCH METHOD - SINGLE BARREL)
1:50



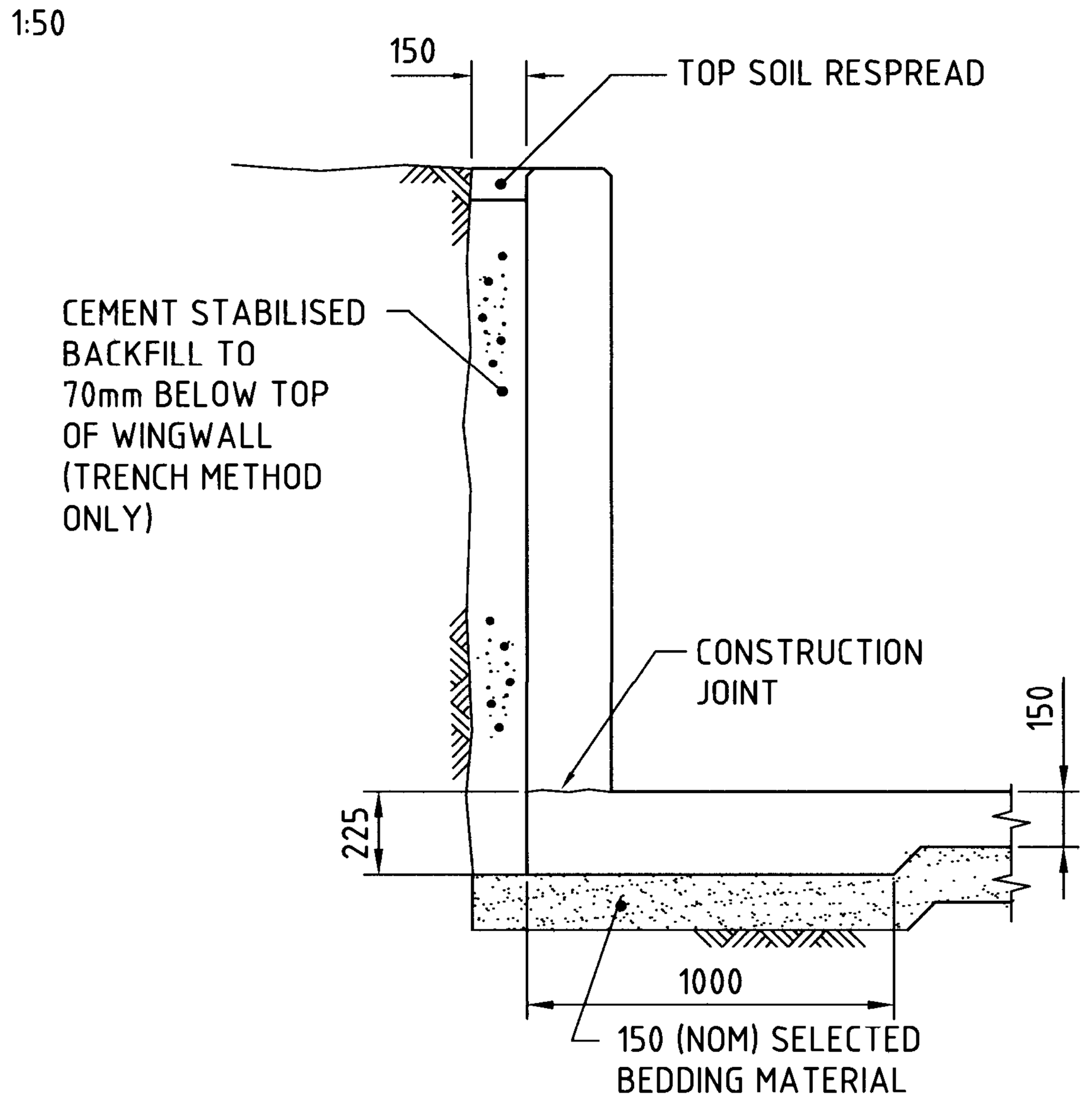
SECTION (B) 201131-0064
(EMBANKMENT METHOD - SINGLE BARREL)
1:50



VIEW (C) 201131-0064
MULTI BARRELS
1:50



VIEW (C) 201131-0064
(SINGLE BARREL)
1:50



SECTION (D) 201131-0064
(NOTE: REINF NOT SHOWN)
1:20

PRECAST DETAILS OF HEADWALLS, WINGWALLS & APRONS ARE TO BE SUBMITTED FOR REVIEW. REFER NOTE 18 ON DRAWING N° 201131-0064

NOTES:
1. FOR GENERAL NOTES REFER TO DRAWING N° 201131-0064
2. FOR LETTERED DIMENSIONS SHOWN AS THUS 'K', REFER TO CULVERT SCHEDULE DRAWING.
3. IF MINIMUM DEPTH (SEE SECTIONAL ELEVATION (A) IS ≤ 500 THEN REFER TO STANDARD DRAWING N°S 201131-0084-0086
4. FOR APRON LENGTH REFER TO STANDARD DRAWING No. 200131-064 (1)

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG. N°'s 201131-0064 & 201131-0066 AND THE GENERAL ARRANGEMENT OR CULVERT SCHEDULE DRAWINGS.

SCALES: 1:20, 1:50

Government of Western Australia
mainroads WESTERN AUSTRALIA
PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
WATERLOO CRESCENT EAST PERTH 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

FILE NUMBER	04/7045
DESIGNED / DRAWN	K.WONG/J.STANLEY/ K. KASIRI
VERIFIED	A. LIM 15/12/11
APPROVED	R. GROVE 16/12/11

A1

STANDARD DRAWING
SMALL BOX CULVERTS - MIN COVER 200mm
(MAX BOX SIZE 1200 x1200)
CONSTRUCTION DETAILS FOR BASE SLABS, APRON SLABS WINGWALLS, HEADWALLS - SHEET N° 2

LOCAL AUTHORITY

MRWA DRAWING NUMBER
201131-0065-1

APPENDIX B

Fauna Bridge Concept Design

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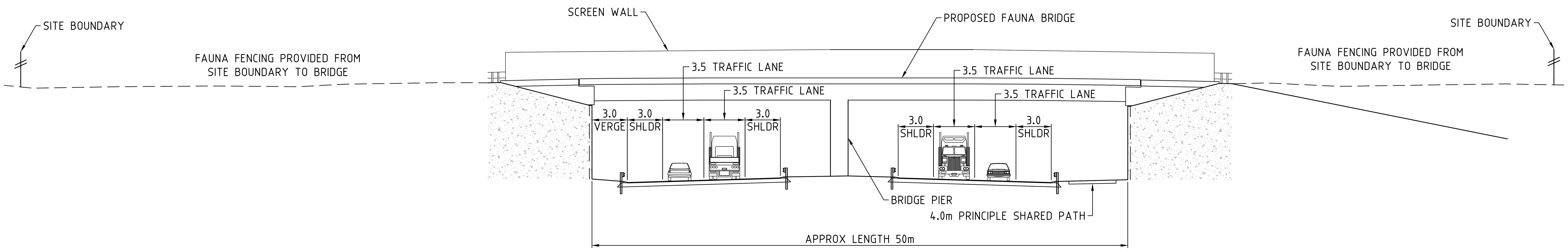
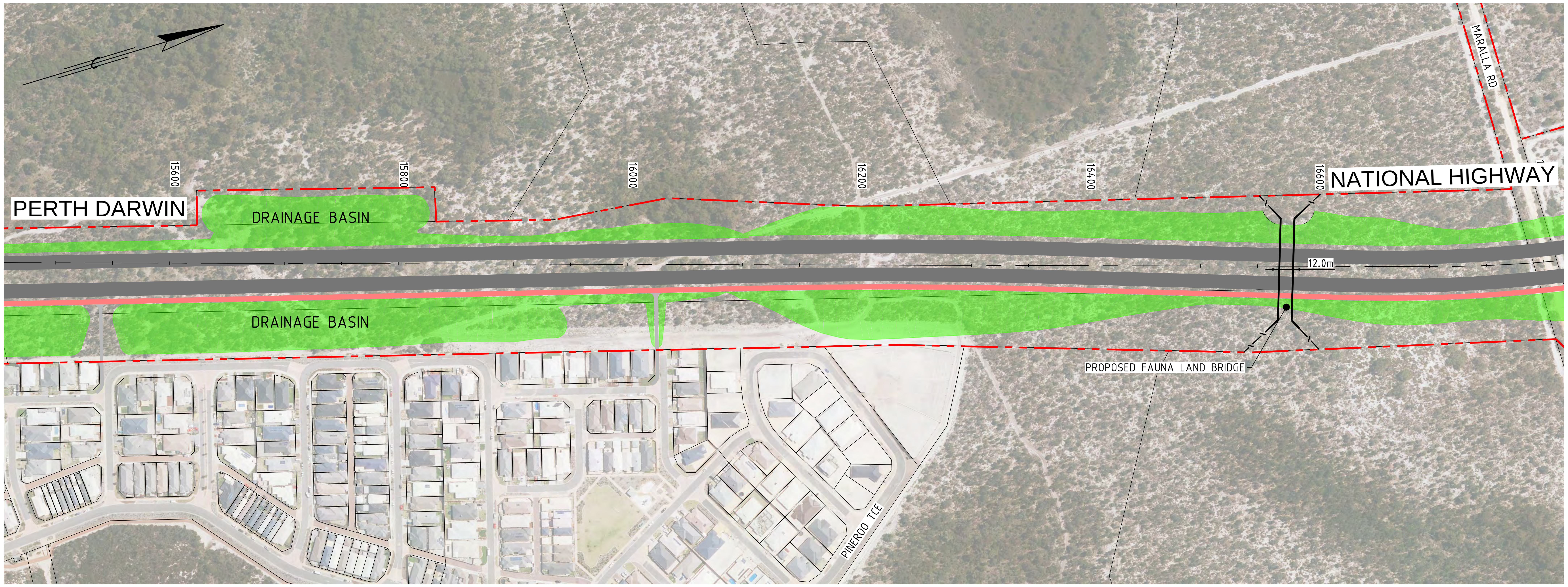
LEGEND:
- REFERENCE LINE
- PROJECT DEVELOPMENT ENVELOPE
- PROPOSED FAUNA FENCE
- PROPOSED ROAD
- PROPOSED PSP
- PROPOSED SHARED PATH
- PROPOSED EARTHWORKS



TYPICAL SECTION FAUNA LAND BRIDGE
SCALE 1:200



PLAN
SCALE 1:2000

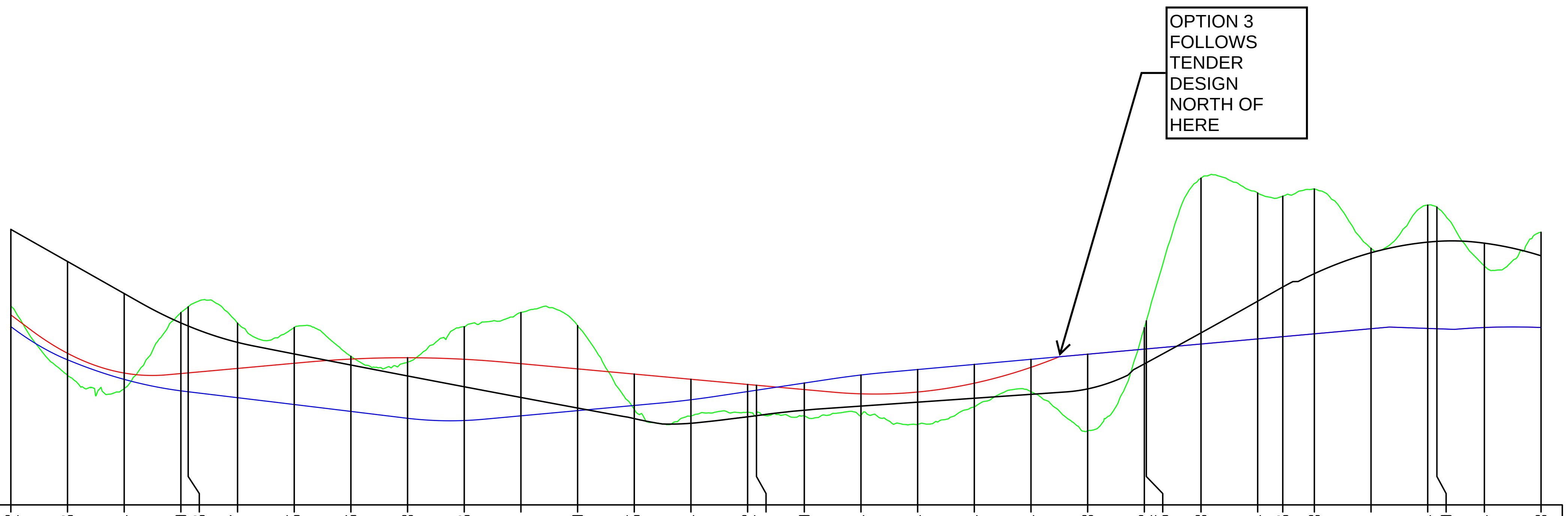
SKETCH ONLY

NorthLinkWA

BG&E

DATE	22/09/2016	PROJECT	NORTHLINK WA
SCALE	1:2000	TITLE	PERTH DARWIN NATIONAL HIGHWAY FAUNA LAND BRIDGE OPTION
GRID	PCG94		
PREPARED	EM		
SHEET	1 OF 1	PROJECT No. P13362	SKETCH No. NLWA-00-RD-SK-0331 REV B

FILENAME:N:\140 CADD\ACAD\SKETCH\RD\00\NLWA-00-RD-SK-0331.DWG PLOT DATE:22/09/2016 2:42:12 PM



Datum 41

Chainages	MRWA Concept	Tender Design	North Option 3	Existing Surface
14100.000	57.182	51.473	52.160	52.689
14200.000	55.298	49.524	49.905	48.611
14300.000	53.414	48.373	48.744	47.833
14400.000	51.689	47.698	48.715	52.296
14412.909	51.508	47.645	48.753	52.635
14500.000	50.547	47.297	49.016	51.676
14600.000	49.865	46.896	49.318	51.420
14700.000	49.216	46.491	49.565	49.726
14800.000	48.573	46.086	49.645	49.377
14900.000	47.938	45.956	49.553	51.463
15000.000	47.311	46.231	49.294	52.300
15100.000	46.690	46.536	48.989	51.532
15200.000	46.065	46.841	48.684	46.614
15300.000	45.794	47.176	48.379	46.212
15400.000	46.172	47.658	48.075	46.443
15415.650	46.241	47.736	48.028	46.321
15500.000	46.560	48.158	47.775	46.234
15600.000	46.804	48.629	47.523	46.251
15700.000	47.034	48.951	47.630	45.727
15800.000	47.264	49.251	48.148	46.754
15900.000	47.494	49.551	49.080	47.654
16000.000	47.813	49.851	49.851	45.343
16100.000	49.282	50.151	50.151	51.410
16103.522	49.345	50.161	50.161	51.809
16200.000	51.103	50.450	50.450	60.192
16300.000	52.964	50.749	50.749	59.321
16344.290	53.798	50.881	50.881	59.131
16400.000	54.583	51.048	51.048	59.557
16500.000	55.811	51.348	51.348	56.073
16600.000	56.434	51.365	51.365	58.610
16616.254	56.479	51.346	51.346	58.492
16700.000	56.374	51.419	51.419	55.032
16800.000	55.633	51.418	51.418	57.014

REV	AMENDMENTS	APP'D	DATE

GENERAL NOTES / REFERENCES

CO-ORDINATE SYSTEM: HEIGHT DATUM: 12d PROJECT: 160717 Raised Profile Promenade

LOCATION INFORMATION
START CHAINAGE: 14100.000
END CHAINAGE: 16800.000
CONTROL LINE:

Alliance Surveying
Alliance Surveying Pty Ltd
PO Box 1006, MORLEY WA 6943
E: info@alliancesurveying.com.au W: www.alliancesurveying.com.au

SURVEYED / DRAWN BY
CHECKED
VERIFIED
SCALE H 1:10000 V 1:333.333 Scales at A3size drawing

PLOT DATE: Tue Aug 09 19:27:54 2016
LOCATION :

BGC - Northlink Stage 2

Longsection CH 14100 tp 16800

DRAWING STATUS
DRAWING No. -ALS-BGC-PLOT-033--1
REV.

APPENDIX C

Fauna Fence Design

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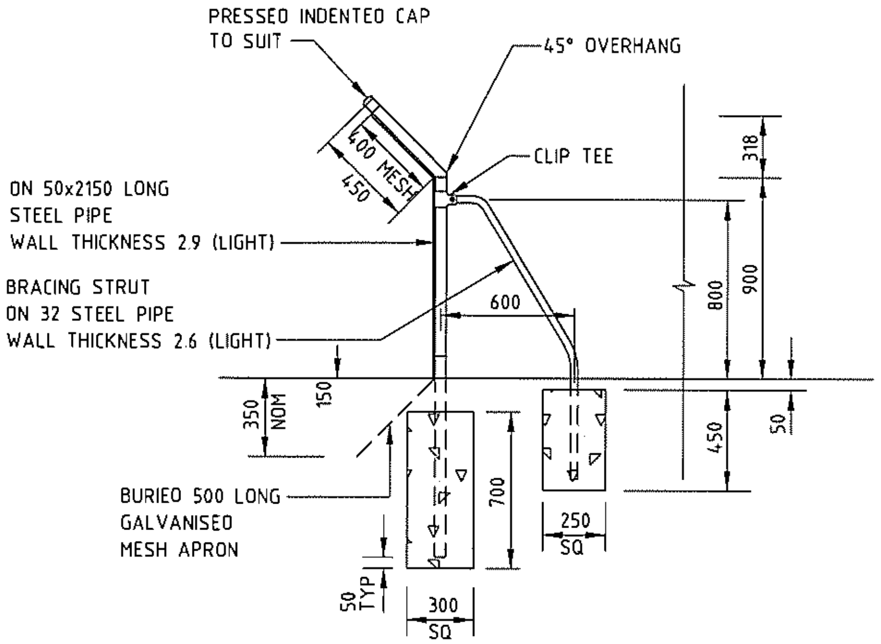
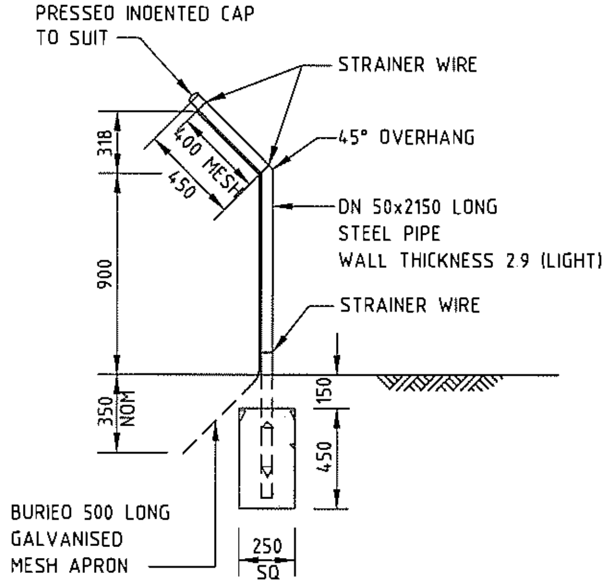
Note: Fence height to be 1800 mm for all fauna fencing on PDNH



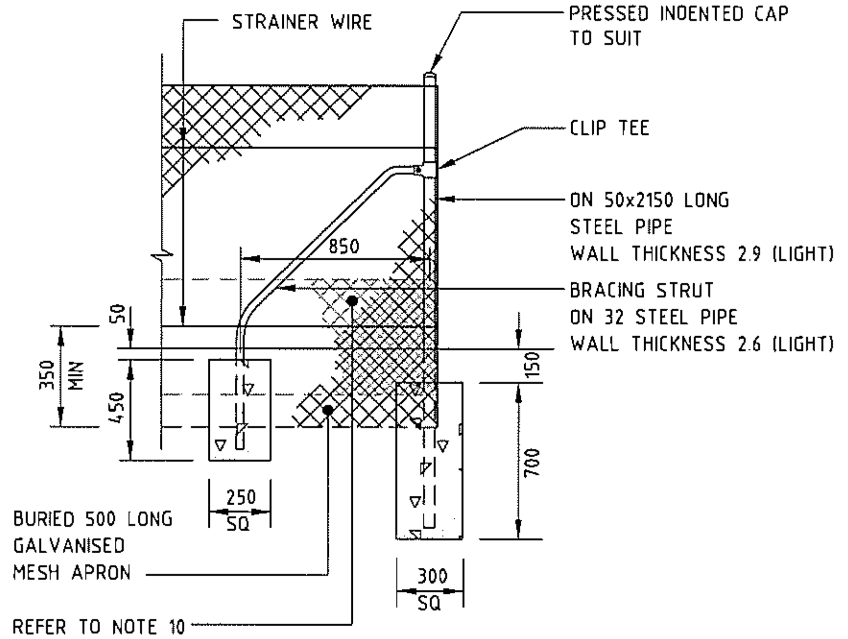
CORNER POST - SHALLOW ANGLES
(BACKSTAY BRACING STRUT)

ALTERNATIVE TO DIAGONAL BRACE ASSEMBLY (DOUBLE STRUT) FOR CHANGE IN FENCE DIRECTION UP TO 30°
REFER TO POST BRACING DETAILS



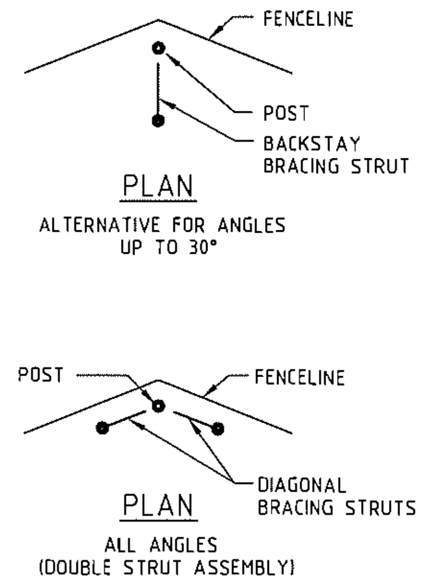
INTERMEDIATE POST

SHOWN IN PLANE OF FENCE

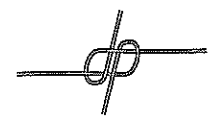


CORNER, GATE AND END POST
(DIAGONAL BRACING STRUT)

USE AT ENDS, GATES AND CORNERS (DOUBLE STRUT ASSEMBLY)
REFER TO POST BRACING DETAILS

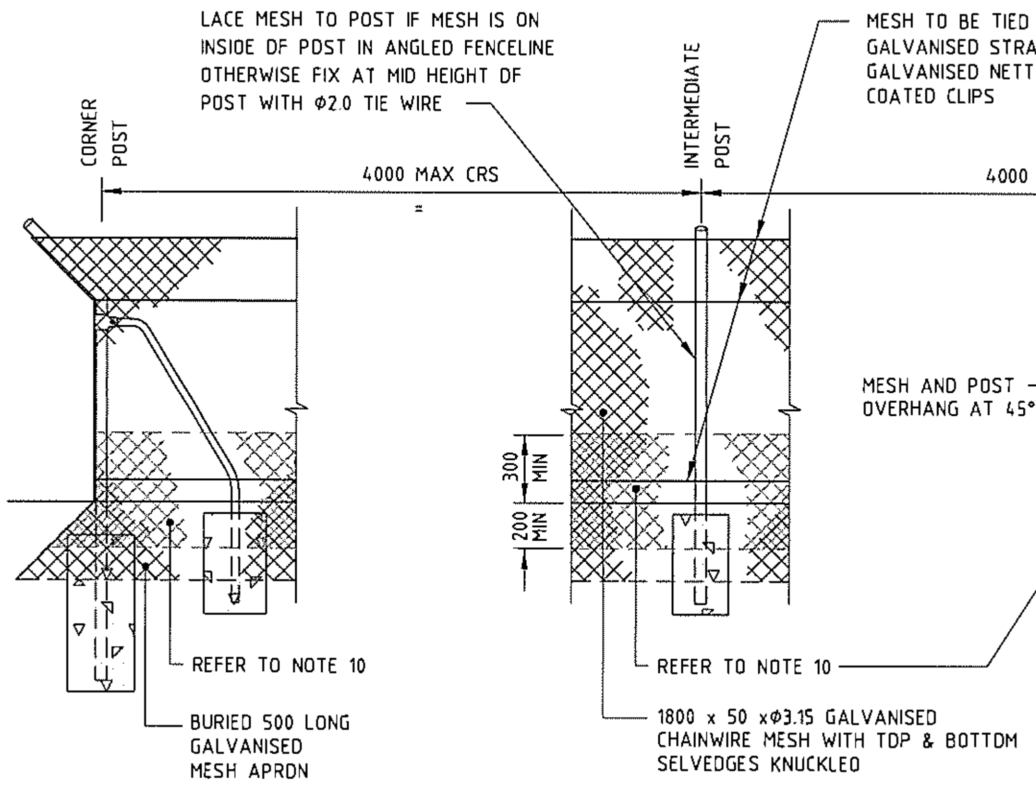


POST BRACING DETAILS

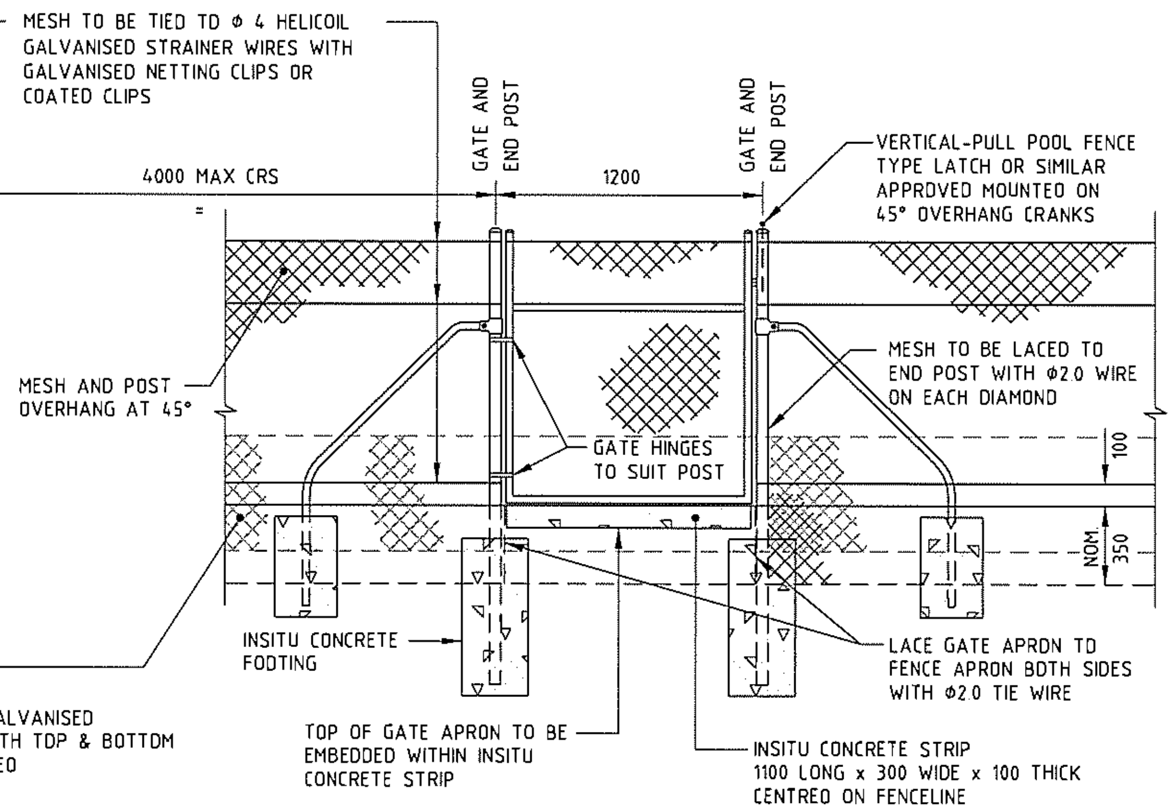


METHOD OF JOINING WIRES

(OR APPROVED ALTERNATIVE)



GENERAL ARRANGEMENT



GATE ASSEMBLY

NOTES

1. FENCING TO BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 1725 AND THE SPECIFICATION.
2. DIMENSIONS SHOWN ON THIS DRAWING ARE TYPICAL.
3. WIRE DIAMETER AND PIPE WALL THICKNESSES ARE WITHOUT GALVANISING.
4. POSTS TO BE VERTICAL WITH TOLERANCE 1:50.
5. CHAINWIRE MESH IS TO BE LOCATED ON THE SIDE OF POSTS AS INDICATED IN THE SPECIFICATION OR DRAWINGS.
6. STRAINER WIRE TO BE TENSIONED BETWEEN ANCHORAGE POINTS.
7. END POSTS TO BE PROPPED DURING TENSIONING IF USED AS ANCHORAGE POINTS.
8. STRAINER WIRE TO BE SINGLE Φ4.0 HELICOIL GALVANISED & Φ2.0 MESH TIE WIRE, STEEL PIPE, CLIP TEE & PRESSED CAP TO BE ALL GALVANISED.
9. ALL WIRES TO BE JOINED BY FIGURE OF 8 KNOT OR WIRE JOINERS AS PER INDUSTRY STANDARD.
10. (△2) TIE SECOND LAYER 40 x Φ3.15 GALVANISED CHAINWIRE MESH, OFFSET TO REDUCE OPENINGS TO LESS THAN 40mm WHERE REQUIRED FOR SMALL FAUNA.

SUPERSEDED DRAWINGS

THIS DRAWING SUPERSEDES DRAWING 9831-6416.

NOT TO SCALE

A3

ALL UNITS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

No.	DESCRIPTION	APPROVED & DATE
2	NOTE 10 AMENDED.	26-8-15
1	GALVANISED MESH AND NOTE 10 ADDED	R. GROVE 29.5.06

AMENDMENTS

Government of Western Australia — MAIN ROADS Western Australia
TECHNOLOGY AND ENVIRONMENT DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4449

STANDARD DRAWING

FAUNA FENCING DETAILS

DESIGNED: MILISAV VASEV	14.06.05	VERIFIED: J. KARPINSKI	15.6.05
DRAWN: ROAD AND TRAFFIC ENGINEERING		APPROVED: W. CANNELL	15.6.05
FILE NUMBER: 67-08-24			
DRAWING NUMBER: 200331-110-2		AMENDMENT	

BG&E NorthLinkWA
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Cloisters Square
Perth WA 6850

Australian Government

mainroads WESTERN AUSTRALIA

NorthLinkWA