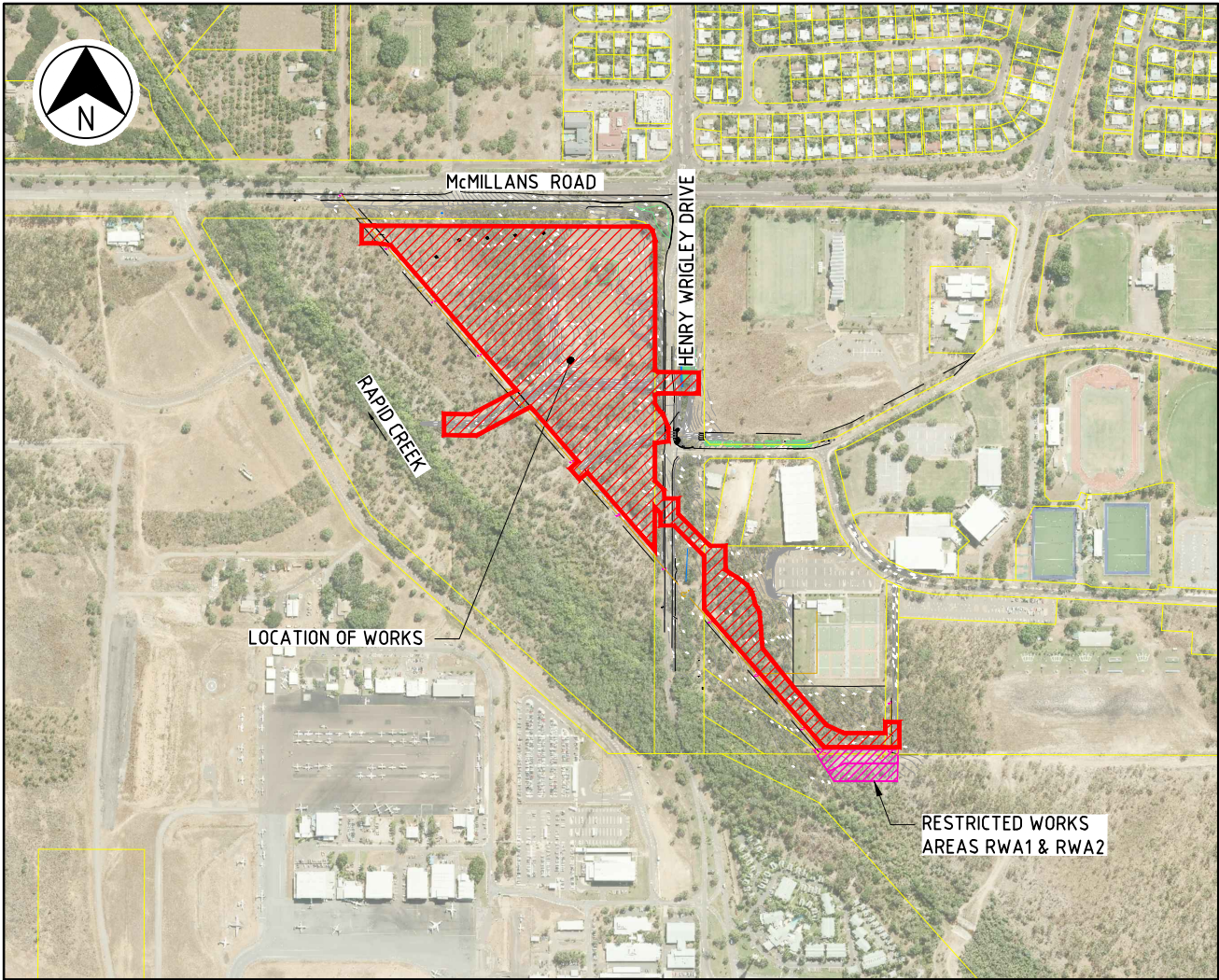


RAPID CREEK FLOOD MITIGATION

SCHEDULE OF DRAWINGS



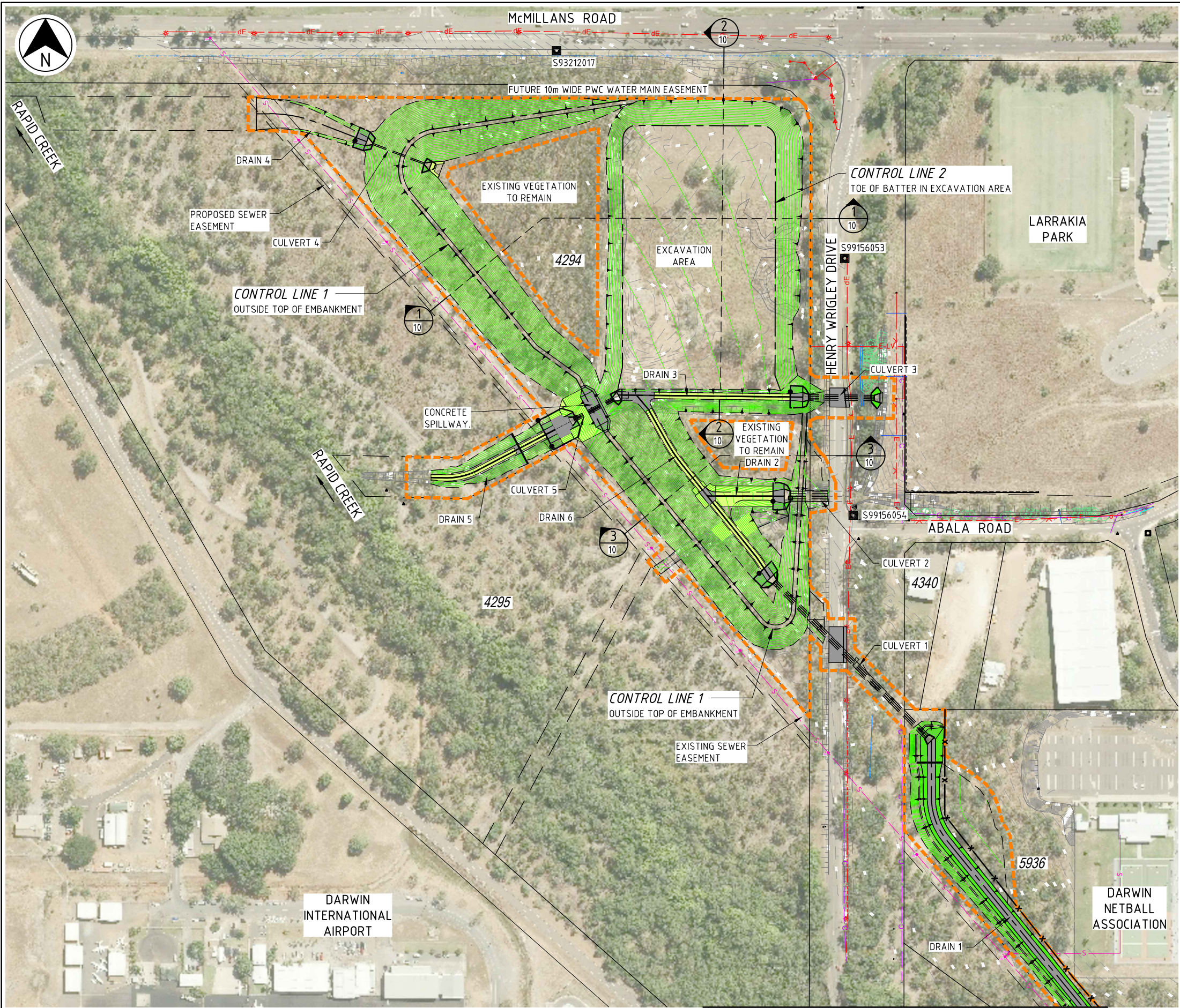
LOCALITY PLAN
N.T.S

STANDARD DRAWINGS

DRAWING No.	DRAWING TITLE
CS3451 0	NTG BRANDING SIGNAGE NTG FUNDED - ROAD AND BUILDINGS
CS3100 0	GENERAL DRAINAGE NOTES AND APRON DETAILS
CS3109 0	RCBC AND LINK SLABS - ARRANGEMENT AND INSTALLATION OF PRECAST UNITS
CS3110 0	RCBC AND LINK SLAB - REINFORCED WING & HEADWALLS
CS3112 0	RCBC & LINK SLABS - CONSTRUCTION OF BASES WITH RECESSES & APRONS
CS3300 0	STANDARD KERB PROFILES
CS3307 0	PEDESTRIAN FENCE
CS3310 0	STOCK FENCE DESIGN AND DETAILS
CS3401 2	PAVEMENT MARKINGS - CHEVRONS AND RRPM'S - SHEET 1
CS3402 2	PAVEMENT MARKINGS - CHEVRONS AND RRPM'S - SHEET 2

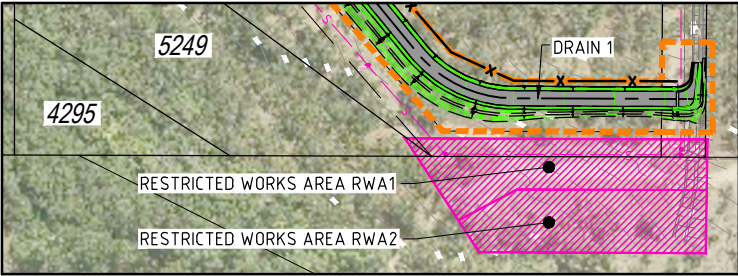
DRAWING No.	DRAWING TITLE
R16-4547	LOCALITY PLAN AND DRAWING SCHEDULE
R16-4548	NOTES
R16-4549	GENERAL ARRANGEMENT SITE PLAN
R16-4550	DETENTION BASIN PLAN SHEET 1 OF 3
R16-4551	DETENTION BASIN PLAN SHEET 2 OF 3
R16-4552	DETENTION BASIN PLAN SHEET 3 OF 3
R16-4553	DETENTION BASIN LONGITUDINAL SECTIONS CONTROL LINES 1 & 2
R16-4554	DRAIN LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS SHEET 1 OF 2
R16-4555	DRAIN LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS SHEET 2 OF 2
R16-4556	DETENTION BASIN TYPICAL SECTIONS
R16-4557	CULVERT SECTIONS SHEET 1 OF 2
R16-4558	CULVERT SECTIONS SHEET 2 OF 2
R16-4559	DETENTION BASIN DETAILS
R16-4560	DETAILS SHEET 1 OF 4
R16-4561	DETAILS SHEET 2 OF 4
R16-4562	DETAILS SHEET 3 OF 4
R16-4563	DETAILS SHEET 4 OF 4
R16-4564	CULVERT INLET/OUTLET DETAILS SHEET 1 OF 2
R16-4565	CULVERT INLET/OUTLET DETAILS SHEET 2 OF 2
R16-4566	LANDSCAPING PLAN
R16-4567	EARTHWORKS
R16-4568	CULVERT 1 & 3 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 1 OF 2
R16-4569	CULVERT 1 & 3 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2
R16-4570	CULVERT 2 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 1 OF 2
R16-4571	CULVERT 2 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2
R16-4572	CULVERT 4 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 1 OF 2
R16-4573	CULVERT 4 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2
R16-4574	CULVERT 5 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 1 OF 2
R16-4575	CULVERT 5 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2
R16-4576	CULVERT 1 & 3 - INLET SCREEN PLAN AND DETAILS
R16-4577	CULVERT 4 - INLET SCREEN PLAN AND DETAILS
R16-4578	CULVERT 5 - INLET SCREEN PLAN AND DETAILS
R16-4579	CULVERT 1 - INSPECTION PIT STRUCTURAL DETAILS
R16-4580	SIGN TYPE 1 AND TYPE 2 CONSTRUCTION DETAILS

										 Northern Territory Government		DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA LOCALITY PLAN AND DRAWING SCHEDULE			
3	CONTRACT DRAWING	06.02.18	RK	JACOBS	A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA	Project No: IW110800 Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	DRAWN JP	CHECKED PME		NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 1 OF 34	NTG DRAWING No. R16-4547	AMENDMENT 3	SHEET SIZE A1
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS			DATE 15.02.17	DATE 15.02.17							
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS			DESIGNED PME	CHECKED PAS							
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS			DATE 15.02.17	DATE 15.02.17							
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY			DESIGN PROJECT LEADER RK	NTG PROJECT MANAGER J NOBLE							
AMENDMENTS							DATE 15.02.17	DATE 15.02.17							



- LEGEND**
- CONTROL LINE
 - BATTER
 - WORKS BOUNDARY
 - DESIGN SURFACE CONTOURS (0.2m INTERVAL)
 - EXISTING SURFACE CONTOURS (0.2m INTERVAL)
 - CADASTRAL BOUNDARY
 - EASEMENT BOUNDARY
 - FENCING/SAFETY BARRIER. REFER NOTES ON DRG R16-4548
 - ACCESS GATE. REFER NOTES ON DRG R16-4548
 - SIGN REFER DRG R16-4552 AND R16-4564
 - SURVEY MONUMENT
 - STEEL PINS
 - RENO MATTRESS
 - PROTECTION WORKS
 - GROUTED
 - STONE PITCHING
 - TURF MAT PROPEX LANDLOK 450 OR EQUIVALENT
 - PERMANENT SURVEY MARKER
 - EXISTING ROAD SIGN
 - BOLLARD
 - SEWER MANHOLE
 - POWER POLE
 - LIGHT POLE
 - ELECTRICAL CABLE MARKER
 - FLOOD LIGHT
 - ELECTRICAL PILLAR/PIT
 - STOP VALVE
 - IRRIGATION POINT
 - BORE WELL
 - HYDRANT
 - COMMUNICATION PIT
 - SURVEY INSTRUMENT STATION
 - WATER
 - ELECTRICAL UNDERGROUND
 - SEWER
 - COMMUNICATIONS
 - ELECTRICAL OVERHEAD CABLE
 - IRRIGATION

CRM				
NUMBER	EASTING	NORTHING	ELEVATION	DESCRIPTION
S93221017	703971.688	8628987.395	14.178	BRASS PLAQUE IN CONCRETE
S99156053	704185.059	8628833.424	15.371	BRASS PLAQUE IN CONCRETE
S99156054	704191.310	8628643.310	13.909	BRASS PLAQUE IN CONCRETE



INSET A SCALE 1:1500

SCALE 1:1500 (A1) 0 30 60 90 120 150m

REFER TO INSET A FOR CONTINUATION

No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

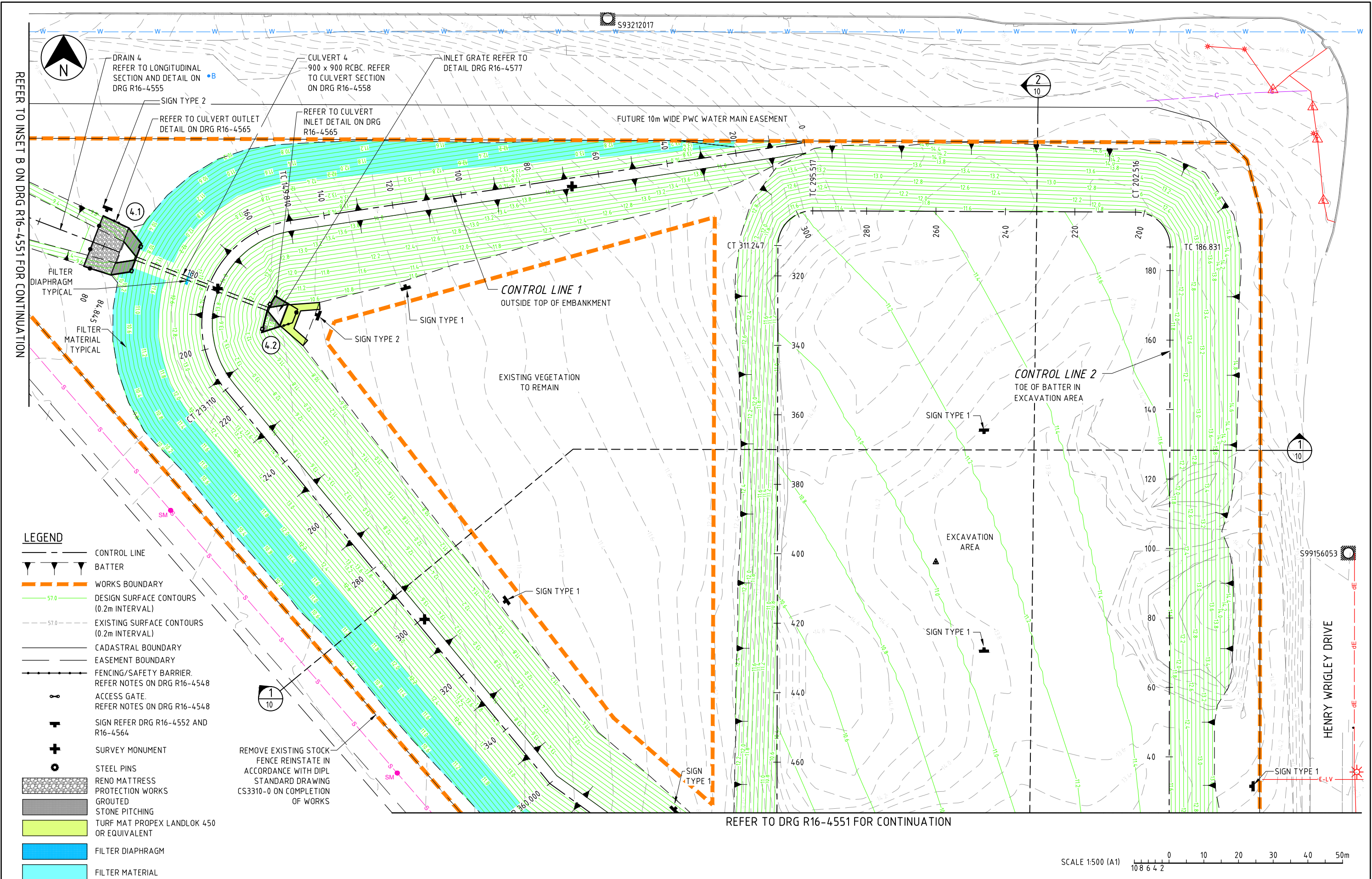
Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	JP	CHECKED	PME
DATE	15.02.17	DATE	15.02.17
DESIGNED	PME	CHECKED	PAS
DATE	15.02.17	DATE	15.02.17
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17	DATE	15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
GENERAL ARRANGEMENT SITE PLAN

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07940	-	3 OF 34	R16-4549	3	A1



3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

DRAWN	JP	CHECKED	PME
DATE	15.02.17	DATE	15.02.17
DESIGNED	PME	CHECKED	PAS
DATE	15.02.17	DATE	15.02.17
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17	DATE	15.02.17

Northern Territory Government		DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA DETENTION BASIN PLAN SHEET 1 OF 3	
NTG PROJECT No.	LPD07940	NTG ASSET No.	-
SHEET No.	4 OF 34	NTG DRAWING No.	R16-4550
AMENDMENT	3	SHEET SIZE	A1

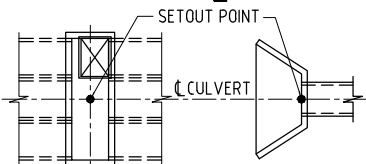


DRAINAGE STRUCTURE SETOUT

STRUCTURE	COORDINATES		STRUCTURE TYPE
	EASTING	NORTHING	
1.1	704132.972	8628594.008	HEADWALL
1.2	704166.346	8628560.068	INSPECTION PIT
1.3	704219.351	8628506.162	INSPECTION PIT
1.4	704245.881	8628479.181	HEADWALL
2.1	704144.381	8628657.442	HEADWALL
3.1	704158.151	8628730.732	HEADWALL
3.2	704206.948	8628730.164	HEADWALL
4.1	703835.400	8628918.370	HEADWALL
4.2	703874.139	8628903.541	HEADWALL
5.1	703985.777	8628714.655	HEADWALL
5.2	704013.913	8628729.302	HEADWALL

NOTE: DO NOT DRIVE HEAVY MACHINERY OVER LINE OF SEWER CROSSING DRAIN 5

RAPID CREEK

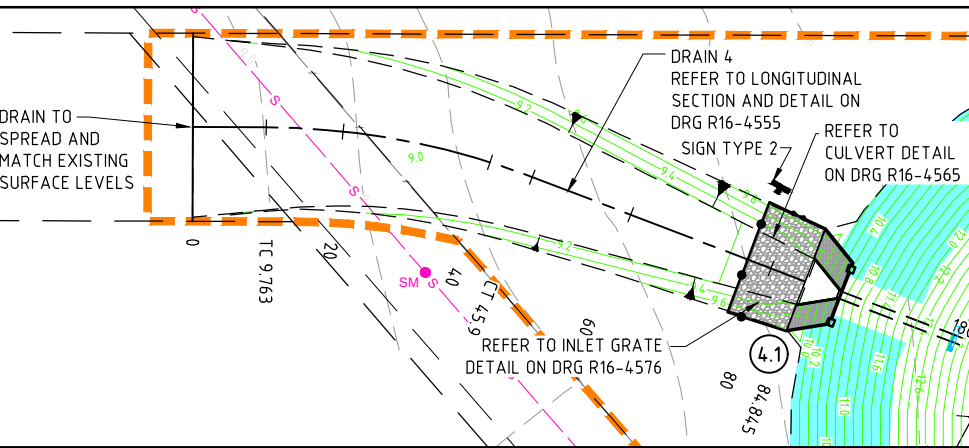


STRUCTURE SETOUT POINTS

N.T.S.

LEGEND

- CONTROL LINE
- BATTER
- WORKS BOUNDARY
- DESIGN SURFACE CONTOURS (0.2m INTERVAL)
- EXISTING SURFACE CONTOURS (0.2m INTERVAL)
- CADASTRAL BOUNDARY
- EASEMENT BOUNDARY
- FENCING/SAFETY BARRIER. REFER NOTES ON DRG R16-4548
- ACCESS GATE. REFER NOTES ON DRG R16-4548
- SIGN REFER DRG R16-4552 AND R16-4564
- SURVEY MONUMENT
- STEEL PINS
- RENO MATTRESS
- PROTECTION WORKS
- GROUTED
- STONE PITCHING
- TURF MAT PROPEX LANDLOK 450 OR EQUIVALENT
- FILTER DIAPHRAGM
- FILTER MATERIAL



INSET B
SCALE 1:500

CONTROL LINE 2 - TOE OF BATTER IN EXCAVATION AREA SETOUT

CHAINAGE	COORDINATES		BEARING DEG MIN SEC	RADIUS OF CURVATURE	TANGENT LENGTH	ARC LENGTH
	EASTING	NORTHING				
0.000	704137.566	8628735.472	34° 0' 0"	STRAIGHT		
12.097	704133.429	8628746.839	360° 5' 51"	STRAIGHT		
186.831	704133.726	8628921.573	360° 5' 51"	STRAIGHT		
IP 194.674	704133.743	8628931.551	-	-10.000	9.977	15.685
202.516	704123.766	8628931.590	270° 13' 39"	STRAIGHT		
295.517	704030.767	8628931.960	270° 13' 39"	-10.000		
IP 303.382	704020.744	8628931.999	-	-10.000	10.023	15.731
311.247	704020.727	8628921.977	180° 5' 51"	STRAIGHT		
480.526	704020.438	8628752.698	192° 7' 25"	STRAIGHT		
496.852	704017.010	8628736.736	192° 7' 25"	STRAIGHT		

CONTROL LINE 1 - OUTSIDE TOP OF EMBANKMENT SETOUT

CHAINAGE	COORDINATES		BEARING DEG MIN SEC	RADIUS OF CURVATURE	TANGENT LENGTH	ARC LENGTH
	EASTING	NORTHING				
0.000	704028.355	8628951.569	261° 23' 39"	STRAIGHT		
149.810	703880.231	8628929.153	261° 23' 39"	-30.000		
IP 165.635	703862.951	8628926.537	-	-30.000	17.477	31.650
181.460	703856.703	8628910.216	200° 56' 50"	-30.000		
IP 197.285	703850.455	8628893.894	-	-30.000	17.477	31.650
213.110	703861.571	8628880.408	140° 30' 0"	STRAIGHT		
360.000	703955.005	8628767.064	125° 53' 23"	STRAIGHT		
398.700	703986.357	8628744.378	152° 30' 0"	STRAIGHT		
445.651	704008.037	8628702.731	140° 30' 0"	STRAIGHT		
624.901	704122.054	8628564.418	140° 30' 0"	-15.000		
IP 633.878	704128.560	8628556.525	-	-15.000	10.229	17.955
642.856	704138.284	8628559.700	71° 55' 0"	-15.000		
IP 651.833	704148.008	8628562.875	-	-15.000	10.229	17.955
660.811	704148.603	8628573.087	3° 20' 0"	STRAIGHT		
806.878	704157.096	8628718.907	3° 20' 0"	STRAIGHT		

REFER TO DRG R16-4550 FOR CONTINUATION

REFER TO DRG R16-4552 FOR CONTINUATION

SCALE 1:500 (A1) 10 8 6 4 2 0 10 20 30 40 50m

JACOBS

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Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

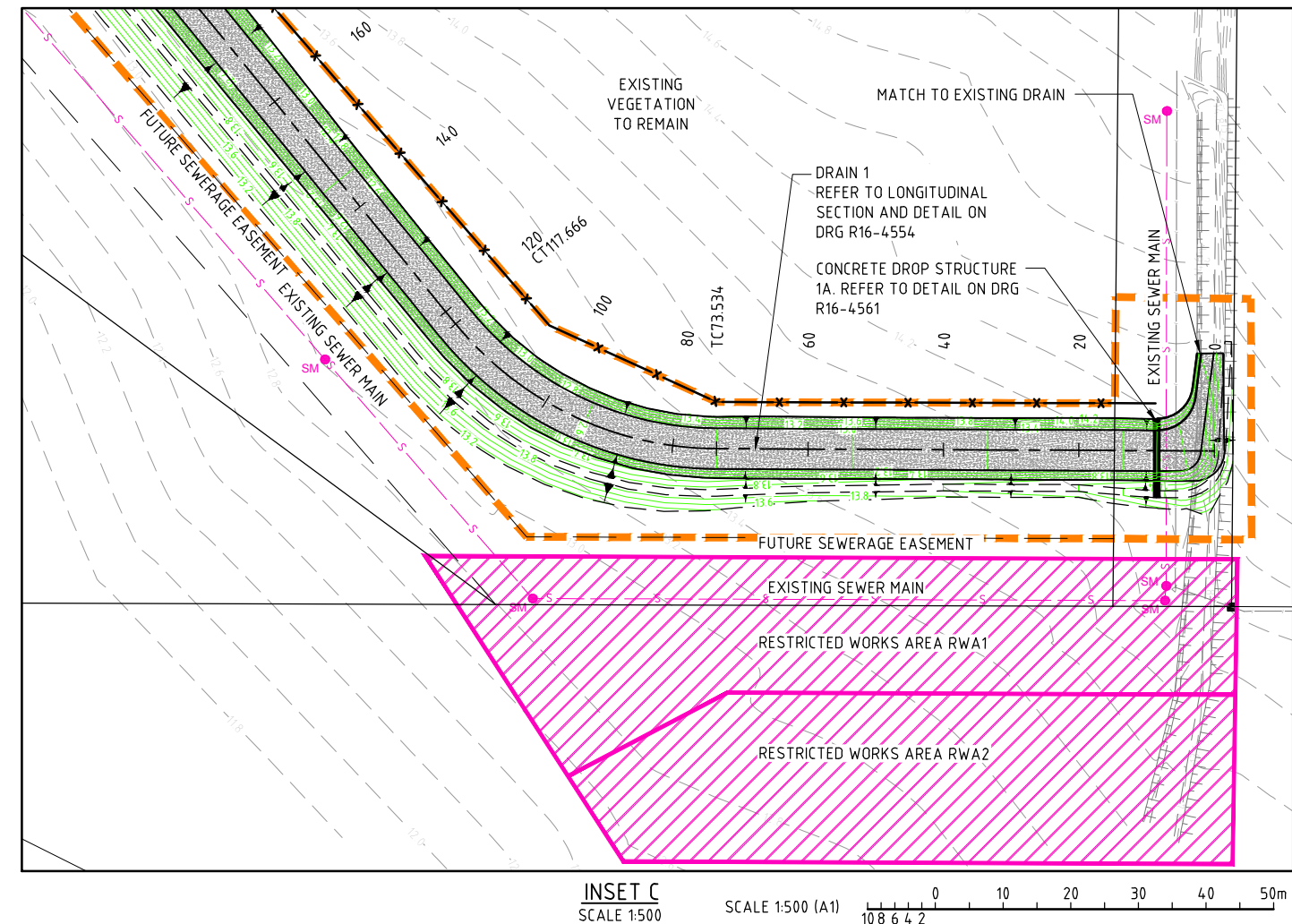
Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN JP DATE 15.02.17	CHECKED PME DATE 15.02.17
DESIGNED PME DATE 15.02.17	CHECKED PAS DATE 15.02.17
DESIGN PROJECT LEADER RK DATE 15.02.17	NTG PROJECT MANAGER J NOBLE DATE 15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
DETENTION BASIN PLAN
SHEET 2 OF 3

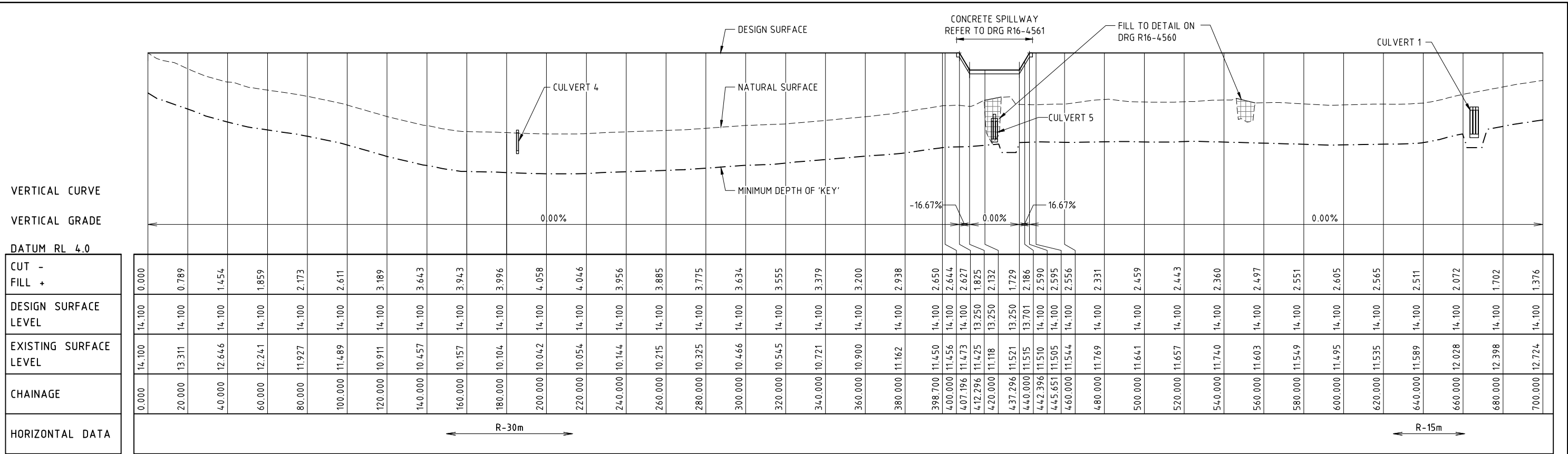
NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 5 OF 34	NTG DRAWING No. R16-4551	AMENDMENT 3	SHEET SIZE A1
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CONTROL LINE DRAIN 4 SETOUT						
CHAINAGE	C O O R D I N A T E S		BEARING DEG MIN SEC	RADIUS OF CURVATURE	TANGENT LENGTH	ARC LENGTH
	EASTING	NORTHING				
0.000	707374.9581	862894.0575	90° 11' 58"	STRAIGHT	18.306	36.211
9.763	703759.345	862894.0541	90° 11' 58"	100.000		
IP 27.869	703777.651	862894.0477	-	100.000		
45.975	703794.747	8628933.933	110° 56' 50"	STRAIGHT		
84.845	703831.048	8628920.036	110° 56' 50"	STRAIGHT		

CONTROL LINE DRAIN 5 SETOUT						
CHAINAGE	C O O R D I N A T E S		BEARING DEG MIN SEC	RADIUS OF CURVATURE	TANGENT LENGTH	ARC LENGTH
	EASTING	NORTHING				
0.000	703878.754	8628671.243	91° 16' 58"	STRAIGHT	12.936	25.317
10.466	703889.218	8628671.009	91° 16' 58"	-50.000		
IP 23.125	703902.151	8628670.719	-	-50.000		
35.783	703913.601	8628676.738	62° 16' 17"	STRAIGHT		
112.653	703981.643	8628712.504	62° 16' 17"	STRAIGHT		

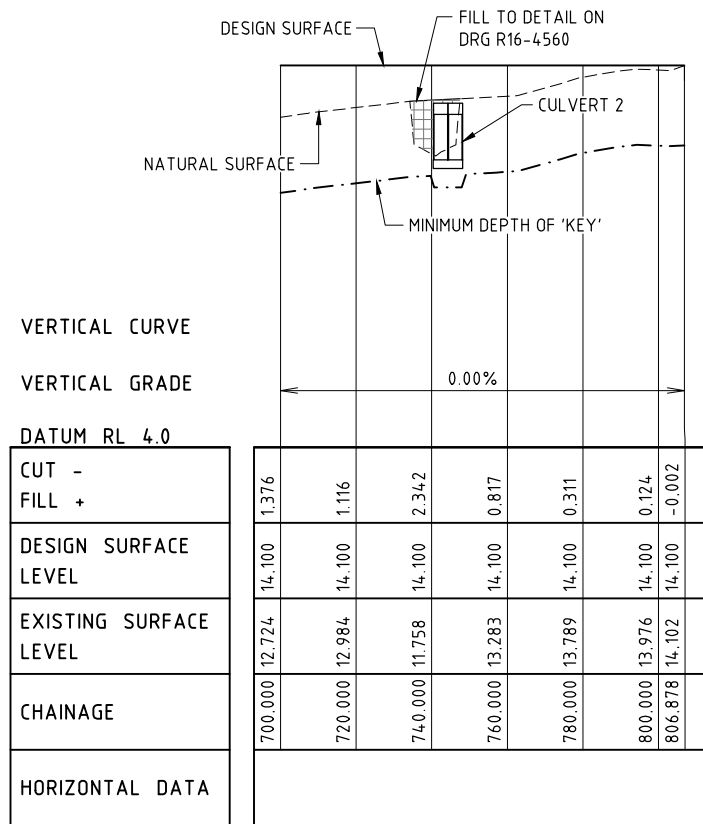
CONTROL LINE DRAIN 6 SETOUT						
CHAINAGE	C O O R D I N A T E S		BEARING DEG MIN SEC	RADIUS OF CURVATURE	TANGENT LENGTH	ARC LENGTH
	EASTING	NORTHING				
0.000	704030.832	8628732.214	140° 0' 0"	STRAIGHT		
14.037	704039.855	8628721.461	150° 39' 60"	STRAIGHT		
43.336	704054.208	8628695.918	150° 39' 60"	-100.000		
IP 51.612	704058.272	8628688.687	-	-100.000	8.295	16.552
59.888	704063.471	8628682.224	141° 11' 0"	STRAIGHT		
150.000	704119.956	8628612.013	146° 10' 26"	STRAIGHT		
168.016	704129.985	8628597.046	146° 10' 26"	STRAIGHT		



LONGITUDINAL SECTION - CONTROL LINE 1

(OUTSIDE TOP OF EMBANKMENT)

SCALE 1:1000(H), 1:100(V)



LONGITUDINAL SECTION - CONTROL LINE 1

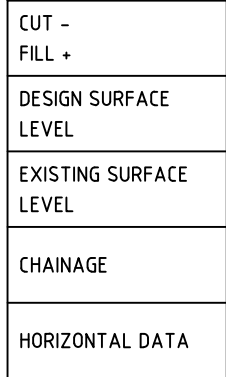
(OUTSIDE TOP OF EMBANKMENT)

SCALE 1:1000(H), 1:100(V)

VERTICAL CURVE

VERTICAL GRADE

DATUM RL 5.0



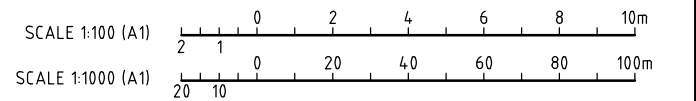
LONGITUDINAL SECTION - CONTROL LINE 2

(TOE OF BATTER IN EXCAVATION AREA)

SCALE 1:1000(H), 1:100(V)

R-10m

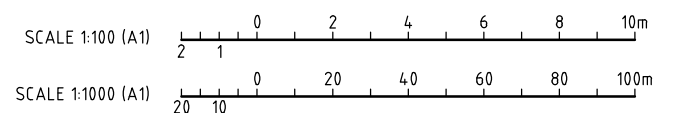
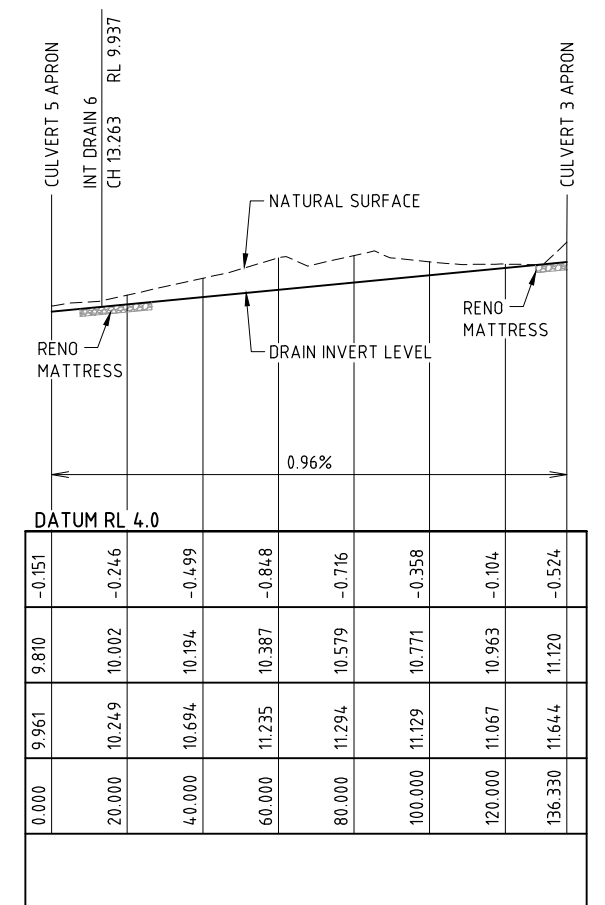
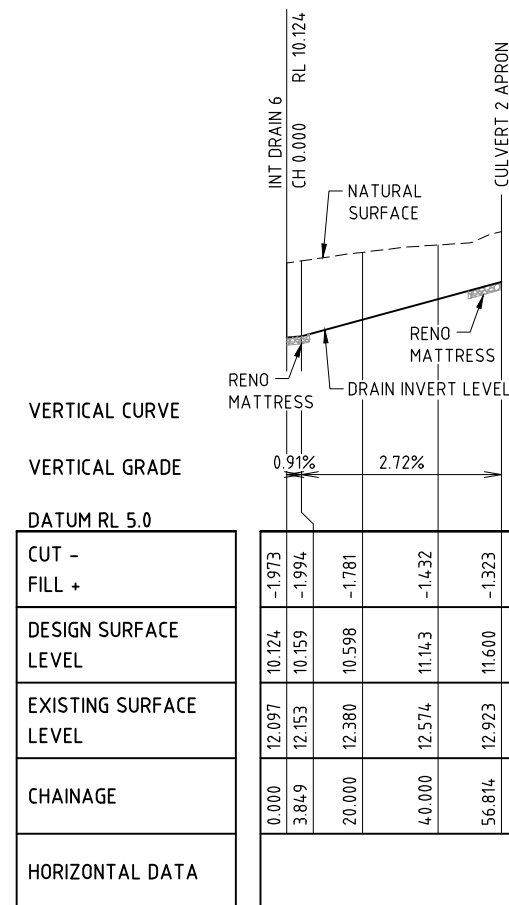
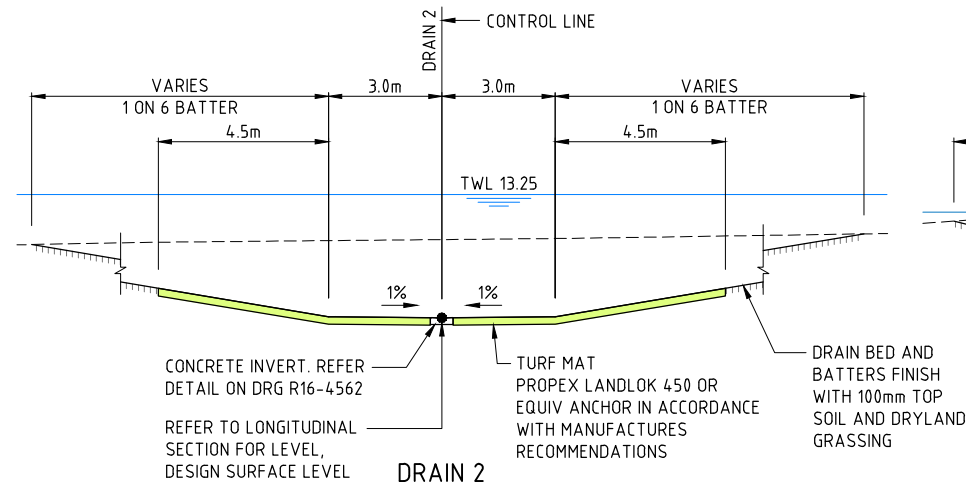
R-10m



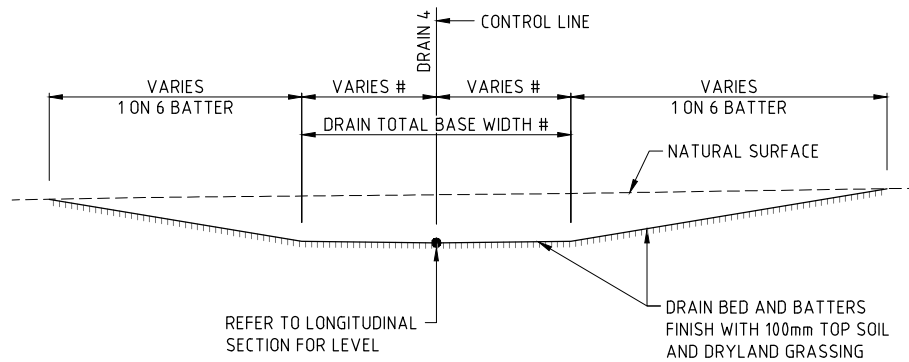
3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS		Project No: IW110800 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA	
A.C.N 001 024 095 Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com		DRAWN JP DATE 15.02.17 DESIGNED PME DATE 15.02.17 DESIGN PROJECT LEADER RK DATE 15.02.17	
		CHECKED PME DATE 15.02.17 PAS DATE 15.02.17 NTG PROJECT MANAGER J NOBLE DATE 15.02.17	

DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA DETENTION BASIN LONGITUDINAL SECTIONS CONTROL LINES 1 & 2			
NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 7 OF 34	NTG DRAWING No. R16-4553
		AMENDMENT 3	SHEET SIZE A1

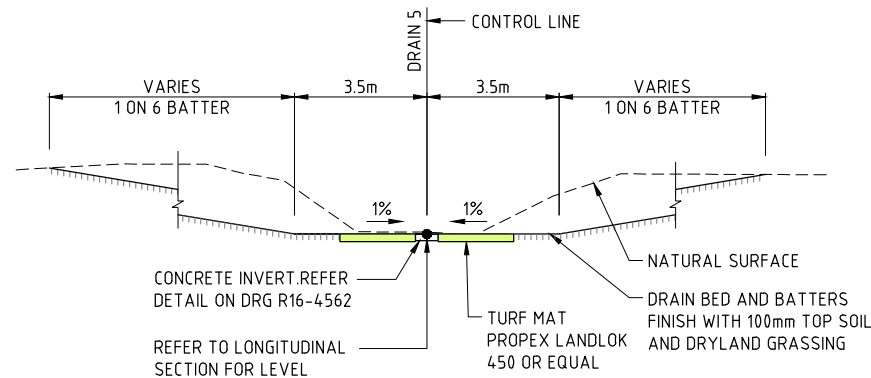


3	CONTRACT DRAWING	16.02.18	RK	JACOBS	 A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Project No: IW110800 Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	DRAWN JP DATE 15.02.17	CHECKED PME DATE 15.02.17	 Northern Territory Government	DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA DRAIN LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS SHEET 1 OF 2					
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS		DESIGNED PME DATE 15.02.17	CHECKED PAS DATE 15.02.17		NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 8 OF 34	NTG DRAWING No. R16-4554	AMENDMENT 3	SHEET SIZE A1
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS		DESIGN PROJECT LEADER RK	NTG PROJECT MANAGER J NOBLE							
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS		DATE 15.02.17	DATE 15.02.17							
No.		DESCRIPTION	DATE	INIT.	DEPT/COMPANY									
AMENDMENTS														

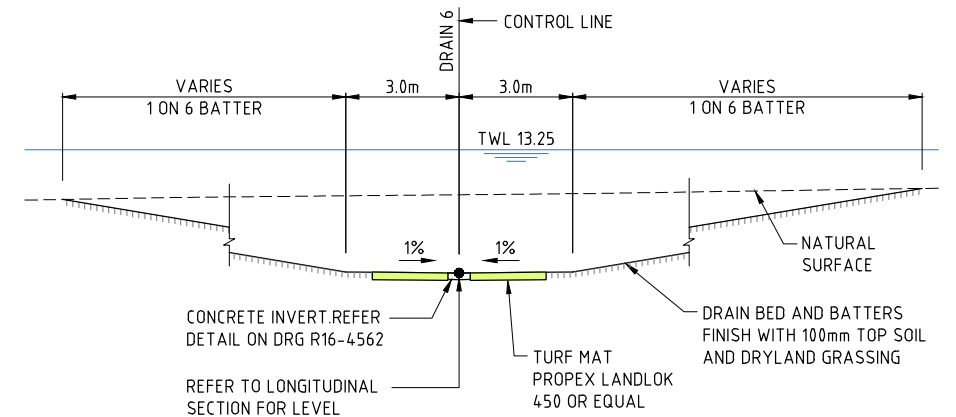


DRAIN TOTAL BASE WIDTH VARIES FROM 24m WIDE AT CH0.0 TO 6.5m WIDE AT CH85.028 (CULVERT 4 APRON).

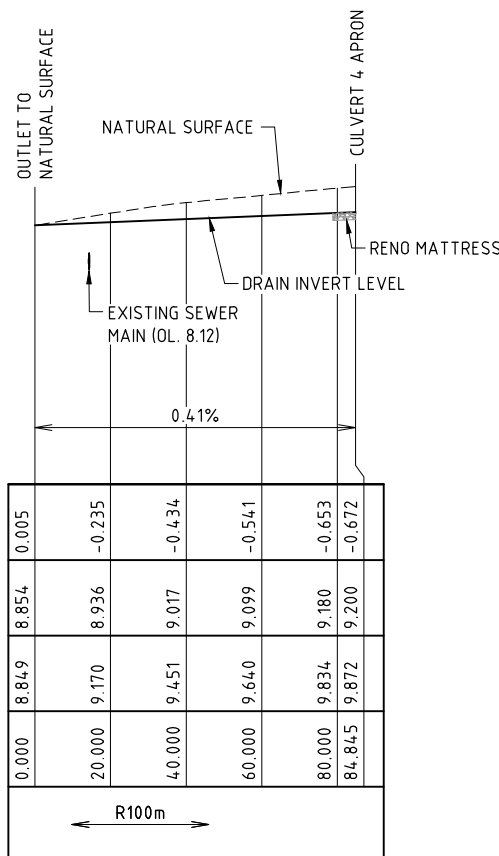
DRAIN 4
TYPICAL CROSS SECTION
SCALE 1:100



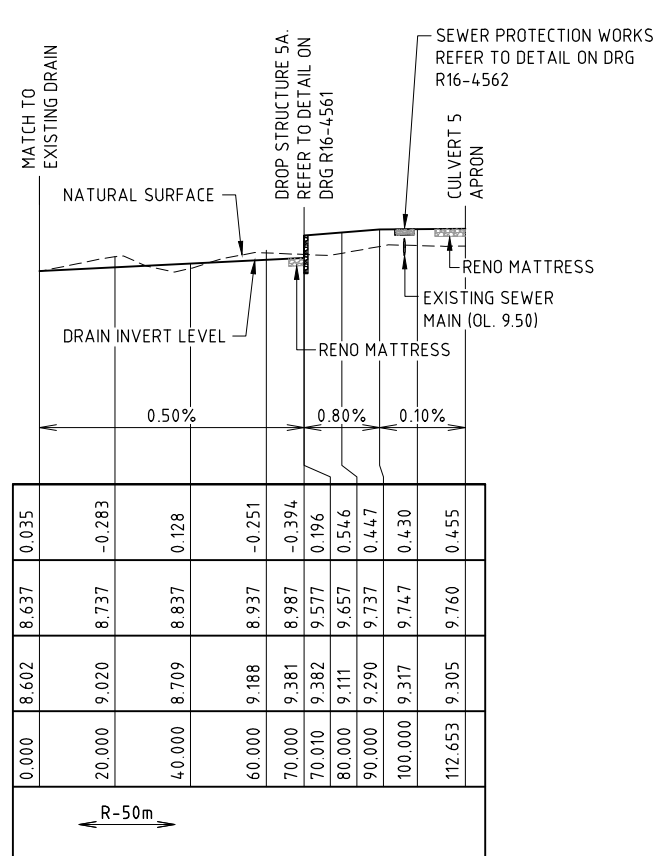
DRAIN 5
TYPICAL CROSS SECTION
SCALE 1:100



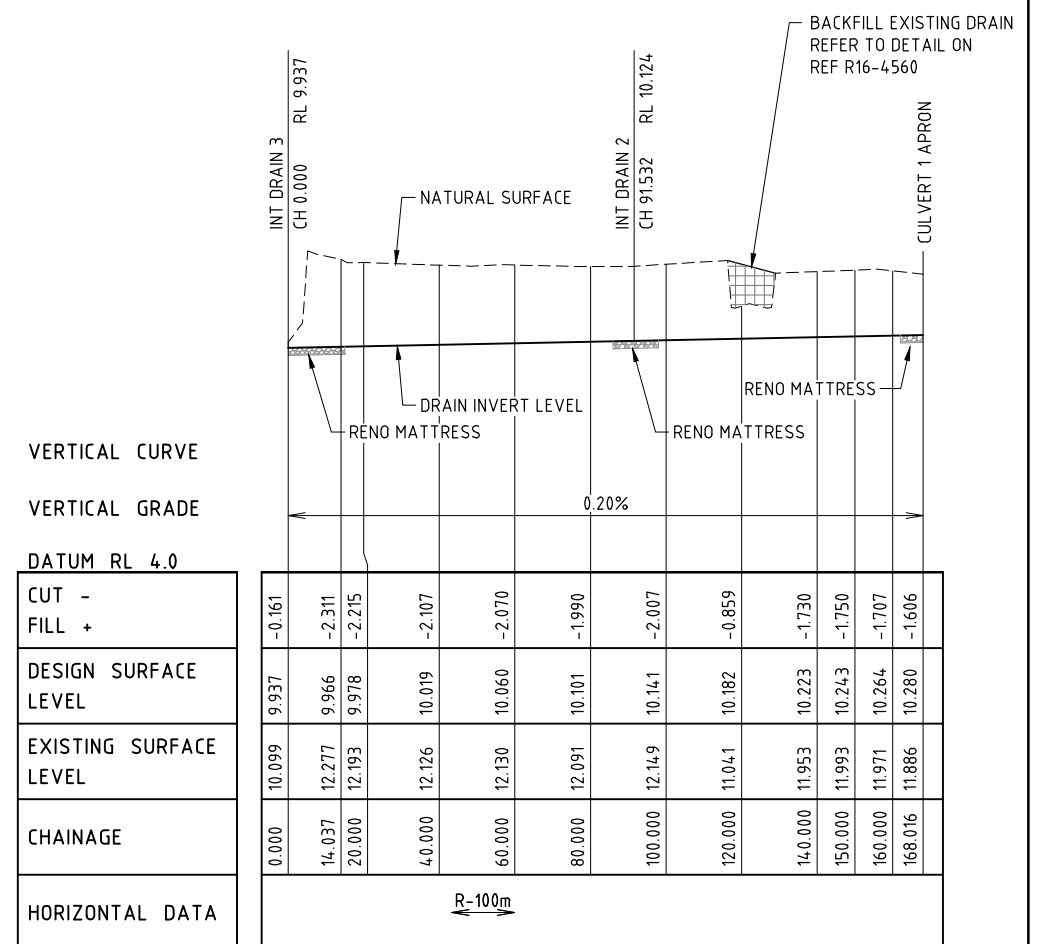
DRAIN 6
TYPICAL CROSS SECTION
SCALE 1:100



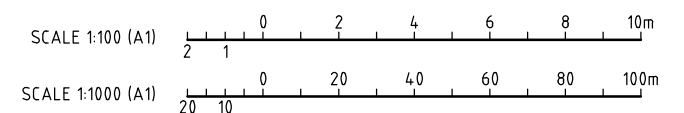
LONGITUDINAL SECTION - DRAIN 4
SCALE 1:1000(H), 1:100(V)



LONGITUDINAL SECTION - DRAIN 5
SCALE 1:1000(H), 1:100(V)



LONGITUDINAL SECTION - DRAIN 6
SCALE 1:1000(H), 1:100(V)



3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS

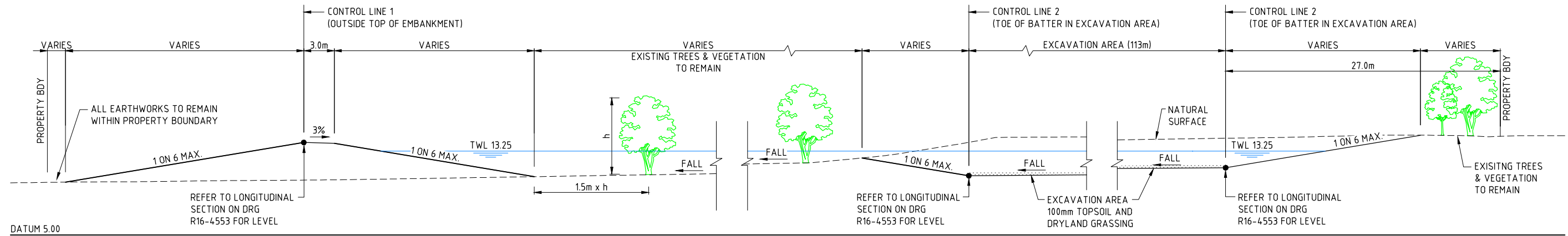
A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

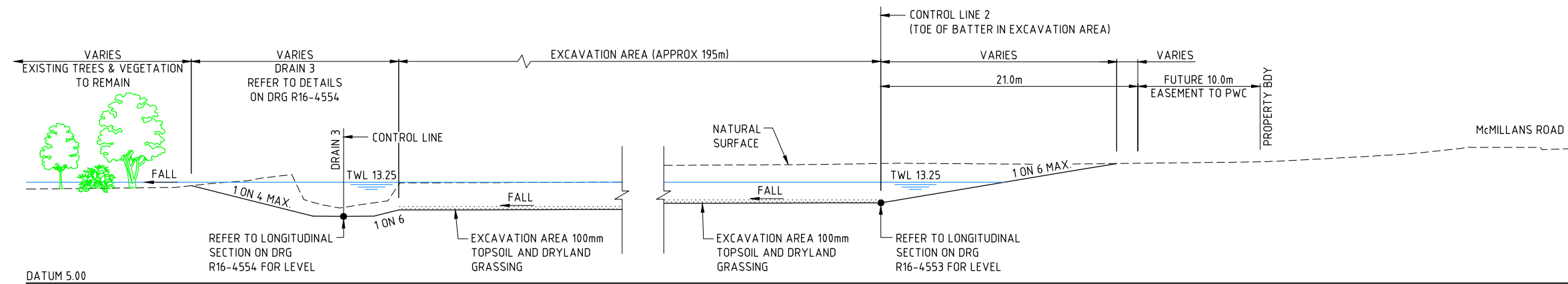
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DATE	15.02.17	DATE	15.02.17
DESIGNED	PME	CHECKED	PAS
DATE	15.02.17	DATE	15.02.17
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17	DATE	15.02.17



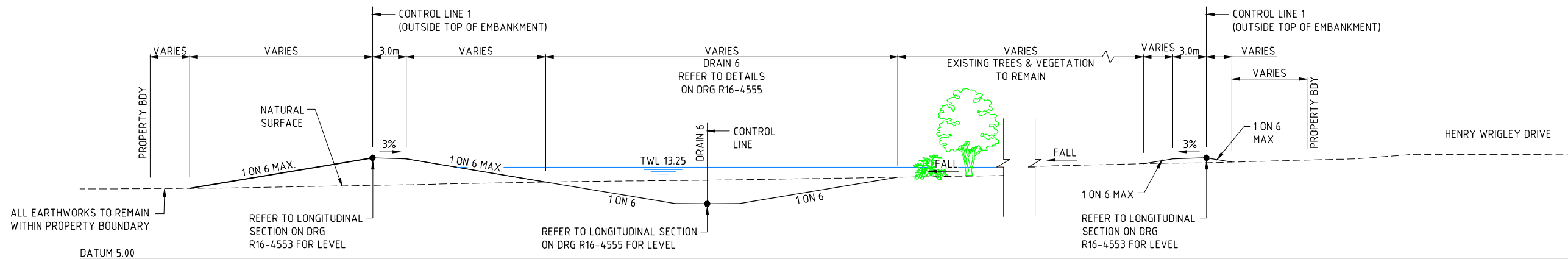
DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA DRAIN LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS SHEET 2 OF 2			
NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 9 OF 34	NTG DRAWING No. R16-4555
AMENDMENT 3		SHEET SIZE A1	



SECTION 1
SCALE 1:200



SECTION 2
SCALE 1:200



SECTION 3
SCALE 1:200

SCALE 1:200 (A1)

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS

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DRAWN
JP
DATE 15.02.17
DESIGNED
PME
DATE 15.02.17
DESIGN PROJECT LEADER
RK
DATE 15.02.17

CHECKED
PME
DATE 15.02.17
CHECKED
PAS
DATE 15.02.17
NTG PROJECT MANAGER
J NOBLE
DATE 15.02.17

Northern Territory Government

DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
DETENTION BASIN
TYPICAL SECTIONS

NTG PROJECT No.
LPD07940

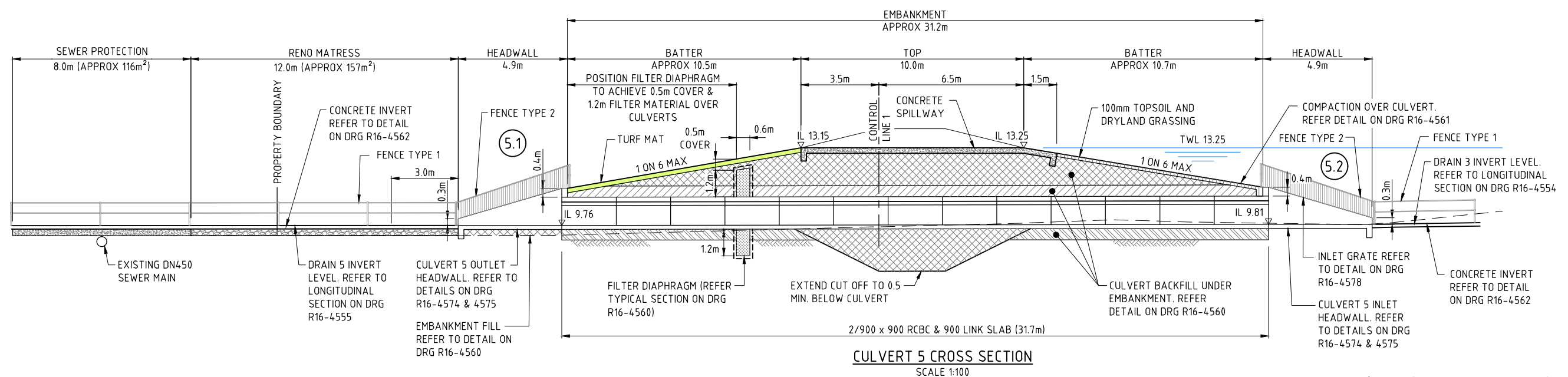
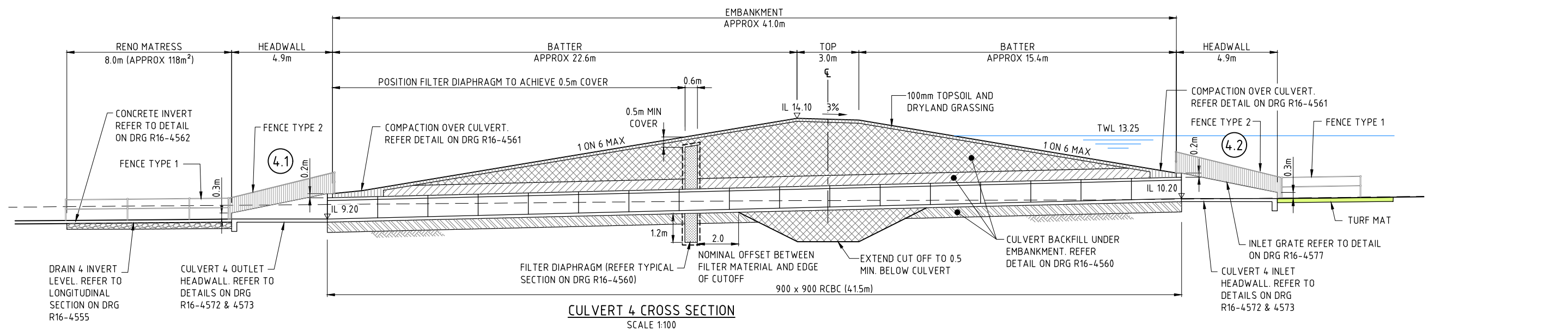
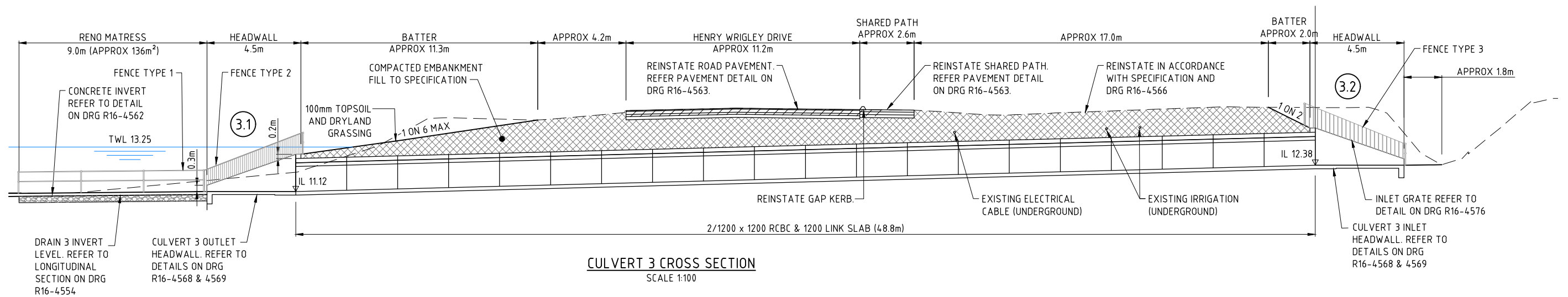
NTG ASSET No.
-

SHEET No.
10 OF 34

NTG DRAWING No.
R16-4556

AMENDMENT
3

SHEET SIZE
A1



SCALE 1:100 (A1)

0 2 4 6 8 10m

2 1

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				



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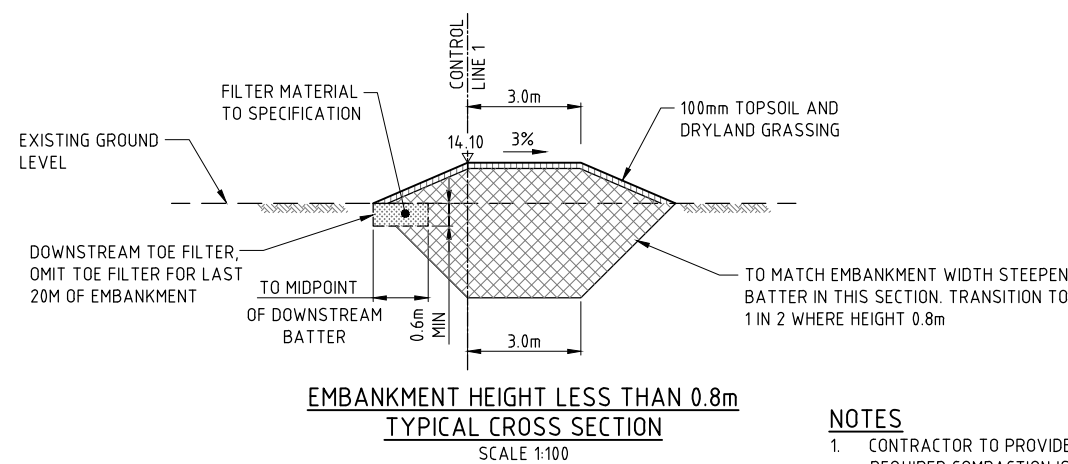
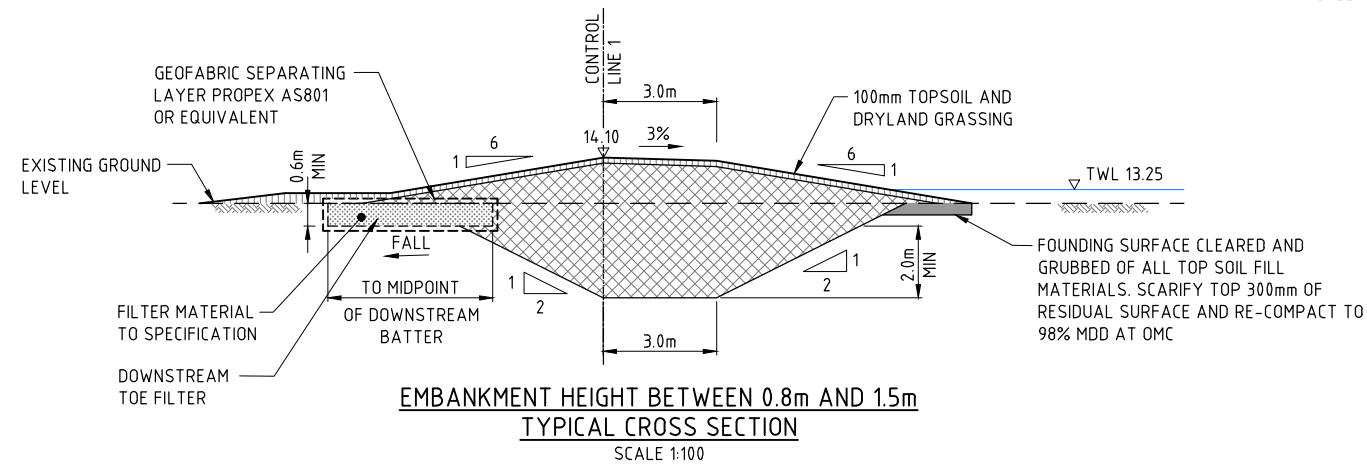
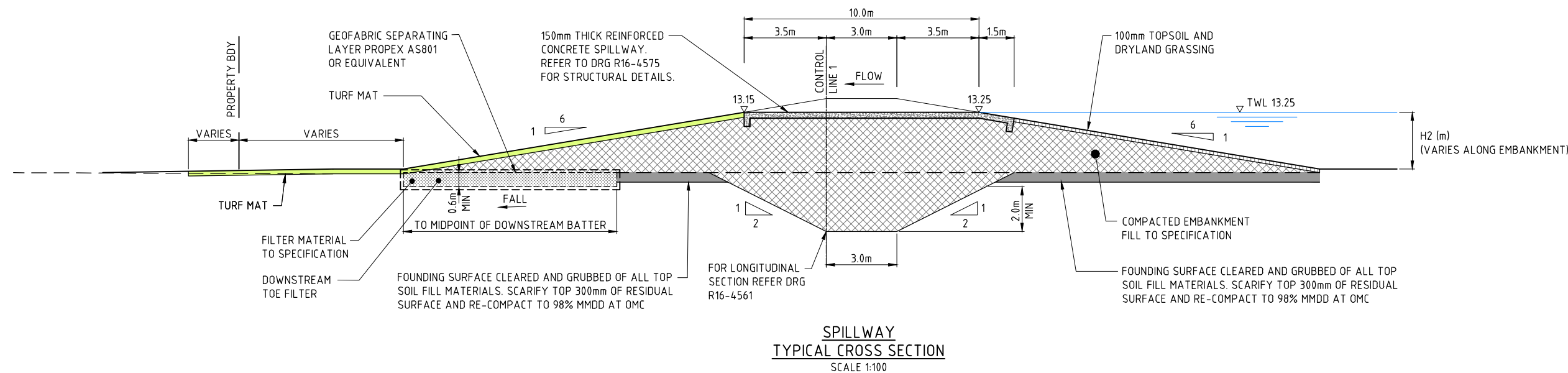
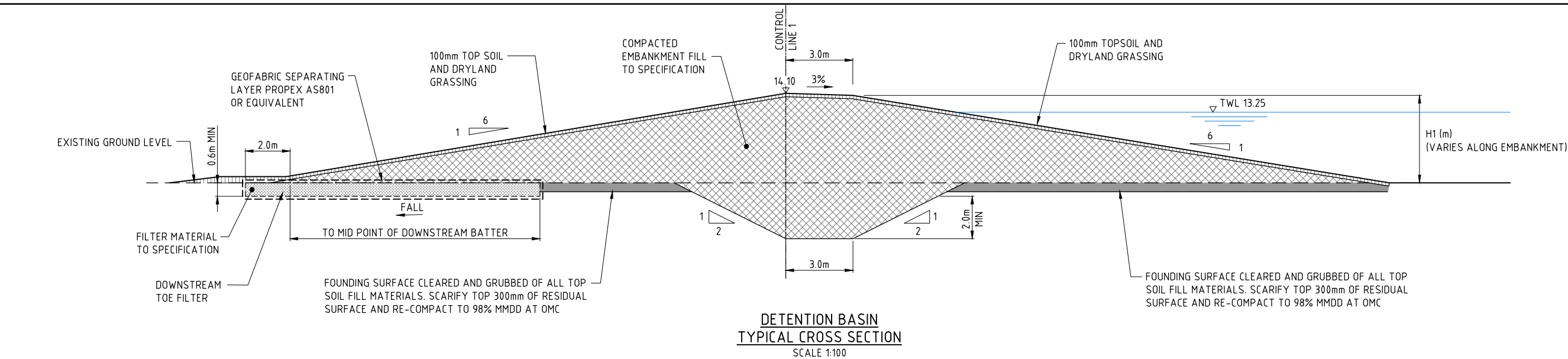
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DATE	15.02.17	DATE	15.02.17
DESIGNED		CHECKED	
	PME		PAS
DATE	15.02.17	DATE	15.02.17
DESIGN PROJECT LEADER		NTG PROJECT MANAGER	
	RK		J NOBLE
DATE	15.02.17	DATE	15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA

CULVERT SECTIONS
SHEET 2 OF 2

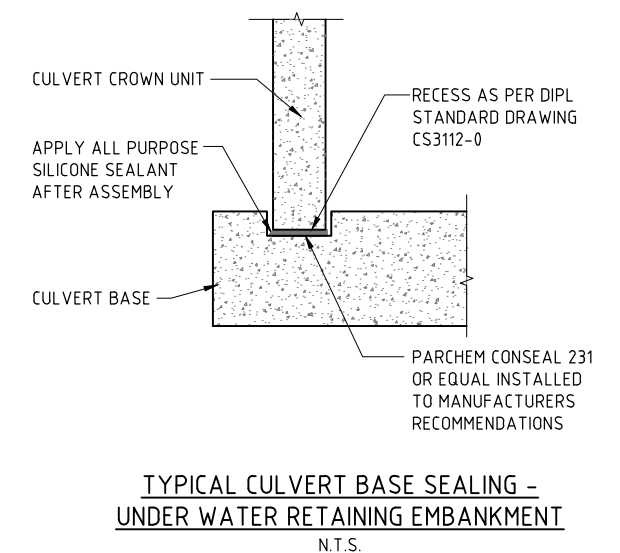
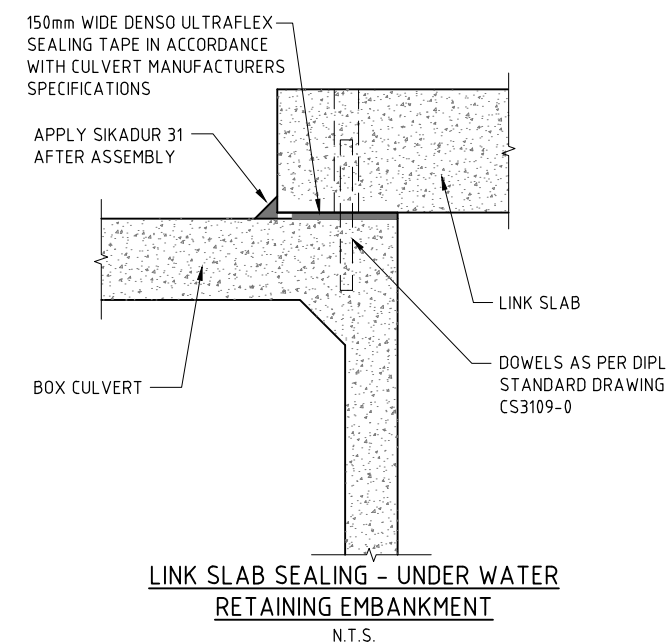
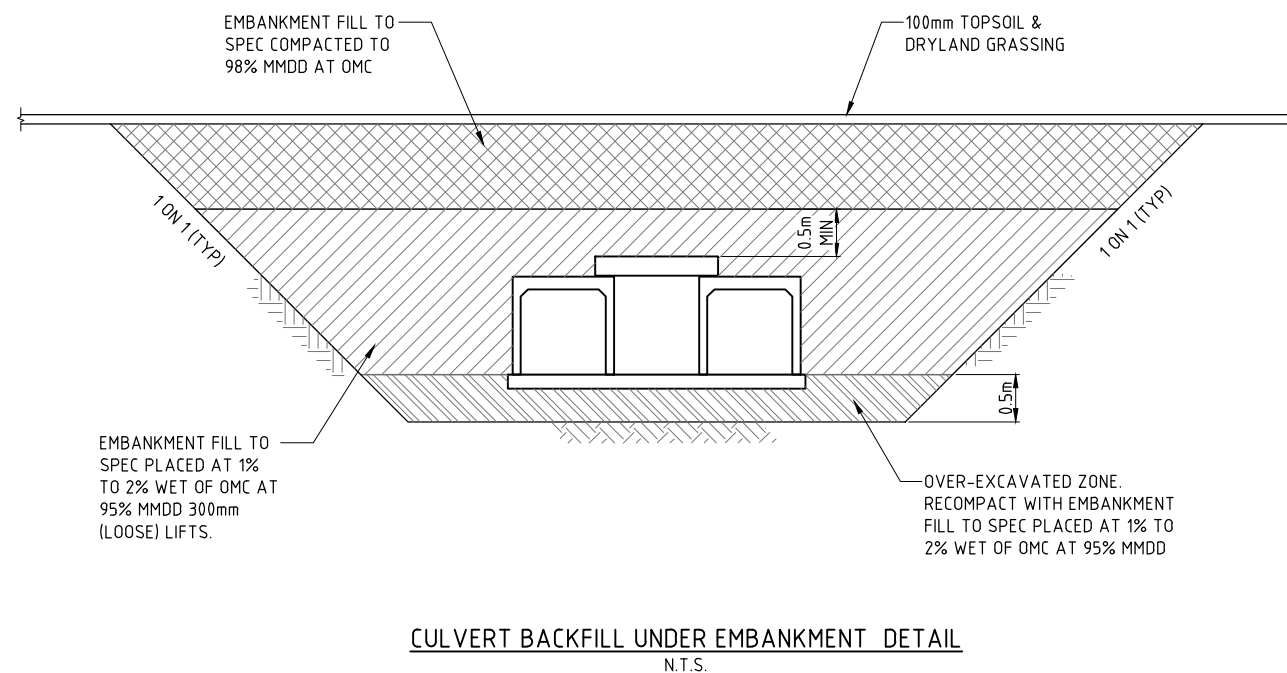
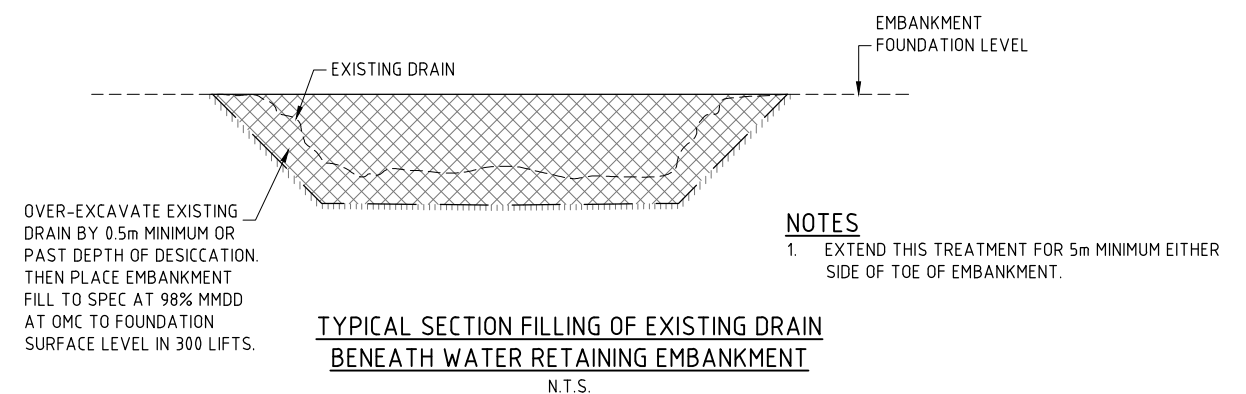
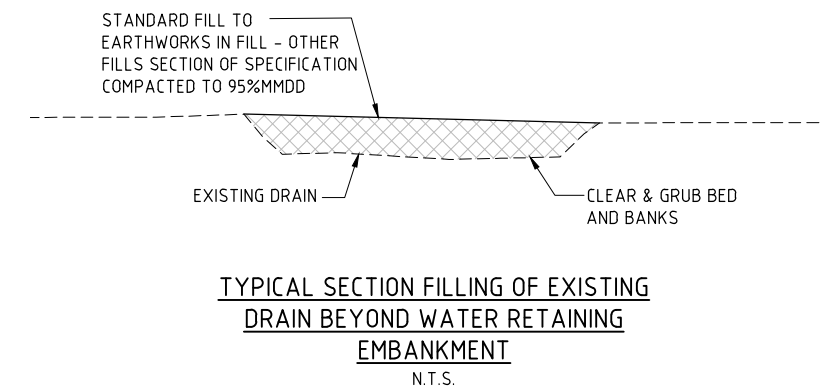
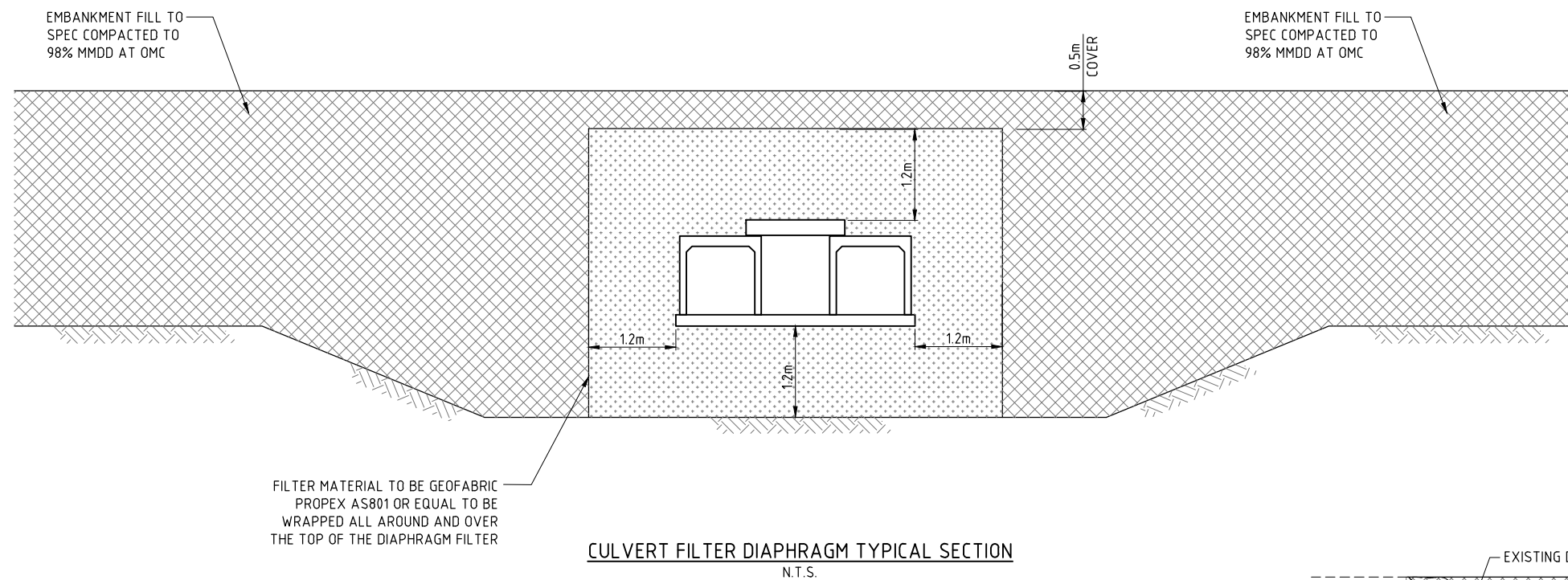
NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 12 OF 34	NTG DRAWING No. R16-4558	AMENDMENT 3	SHEET SIZE A1
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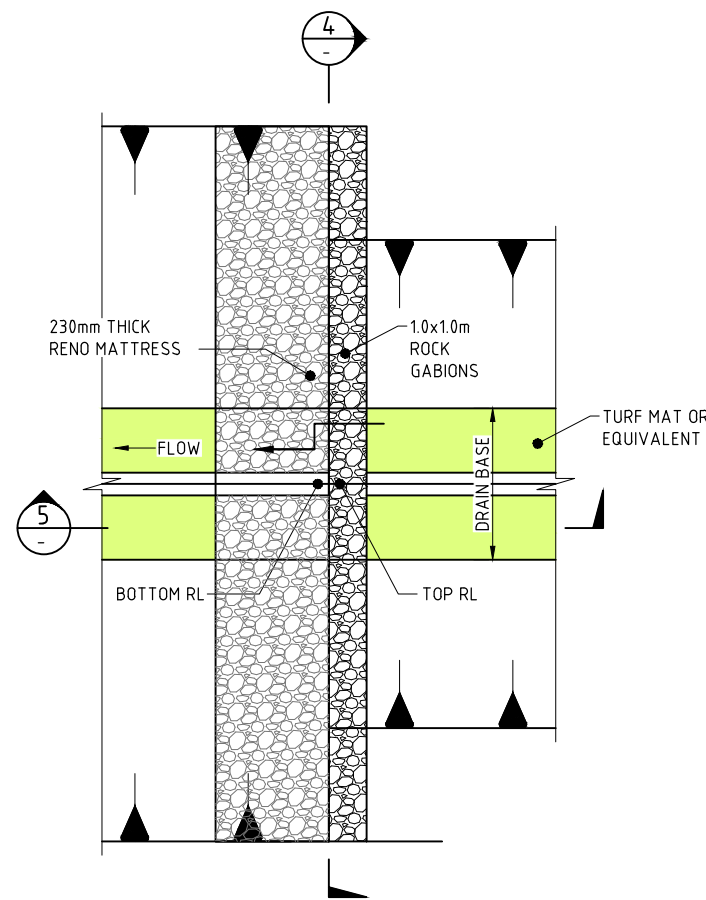


- NOTES**
1. CONTRACTOR TO PROVIDE CONSTRUCTION PROCEDURE TO ENSURE REQUIRED COMPACTION IS ACHIEVED - REFER SPECIFICATION.
 2. TRANSITION TOE FILTER WIDTH FROM MID DOWNSTREAM EMBANKMENT AT SPILLWAY HEIGHT TO MID DOWNSTREAM EMBANKMENT AT FULL EMBANKMENT HEIGHT OVER THE 1 IN 6 RISE AT ENDS OF SPILLWAY.

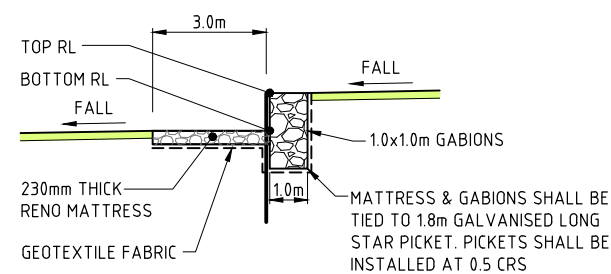
SCALE 1:100 (A1) 0 2 4 6 8 10m
2 1

3 CONTRACT DRAWING 2 ISSUED FOR CONSTRUCTION 1 REVISED TENDER ISSUE 0 ISSUED FOR TENDER	16.02.18 RK JACOBS 03.05.17 PS JACOBS 31.03.17 PS JACOBS 03.03.17 PS JACOBS	JACOBS A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Project No: IW110800 Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	DRAWN JP DATE 15.02.17 DESIGNED PME DATE 15.02.17 DESIGN PROJECT LEADER RK DATE 15.02.17 CHECKED PME DATE 15.02.17 CHECKED PAS DATE 15.02.17 NTG PROJECT MANAGER J NOBLE DATE 15.02.17 Northern Territory Government
No. DESCRIPTION AMENDMENTS	DATE INIT. DEPT/COMPANY	DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA DETENTION BASIN DETAILS	NTG PROJECT No. LPD07940 NTG ASSET No. - SHEET No. 13 OF 34 NTG DRAWING No. R16-4559 AMENDMENT 3 SHEET SIZE A1

[illegible]

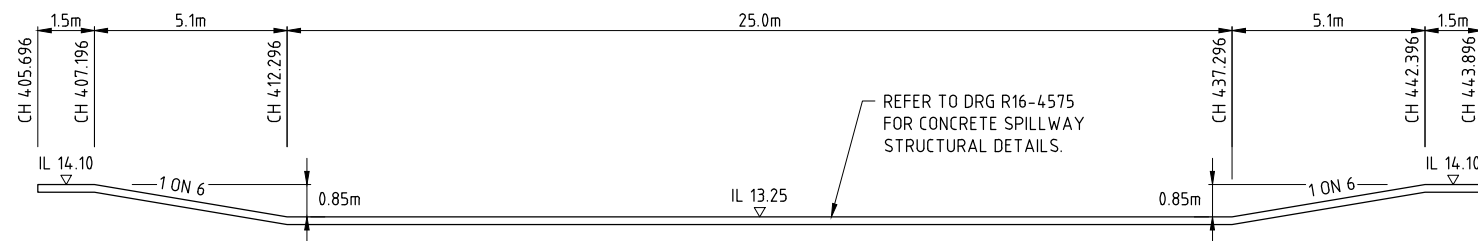


TYPICAL GABION DROP STRUCTURE
SCALE 1:100

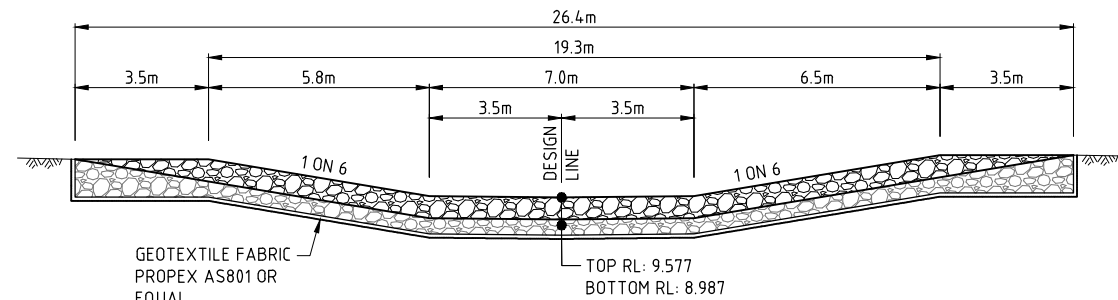


DRAIN DROP STRUCTURE

SECTION 5
SCALE 1:100

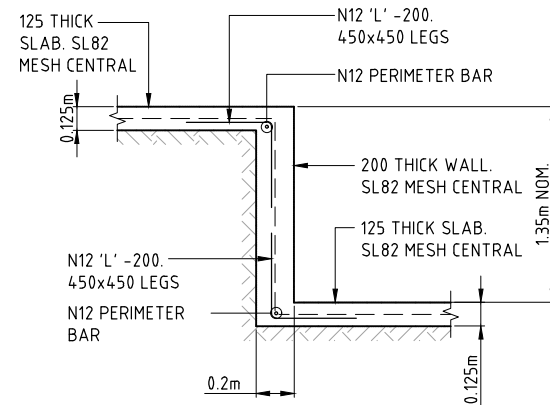


SPILLWAY LONGITUDINAL SECTION
SCALE 1:100

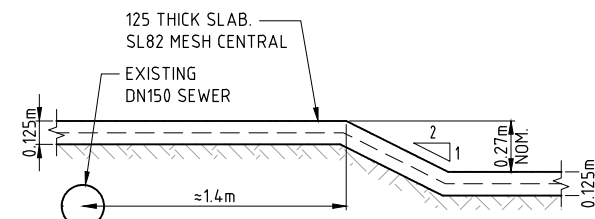


DROP STRUCTURE 5A (DRAIN 5 - CH 70.000)

SECTION 4
SCALE 1:100



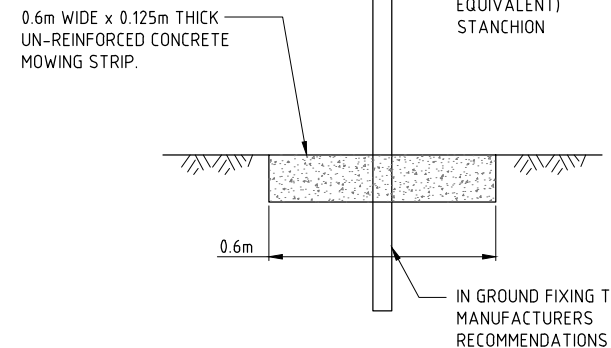
DROP STRUCTURE 1B DETAIL
SCALE 1:20



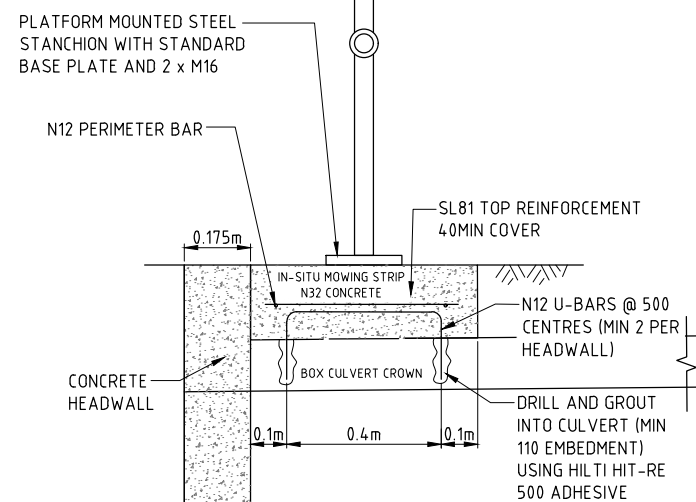
DROP STRUCTURE 1A DETAIL
SCALE 1:20

NOTES:

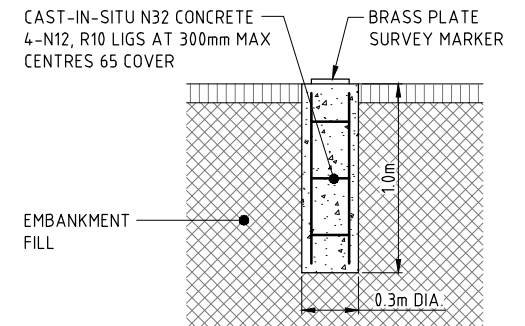
1. USE N32 CONCRETE AND 45 COVER UNLESS NOTED OTHERWISE.
2. COMPLY WITH A.S.3600, A.S.3610 AND A.S.1379.
3. REINFORCEMENT TO BE D500N BARS AND D500L MESH TO AS4671.



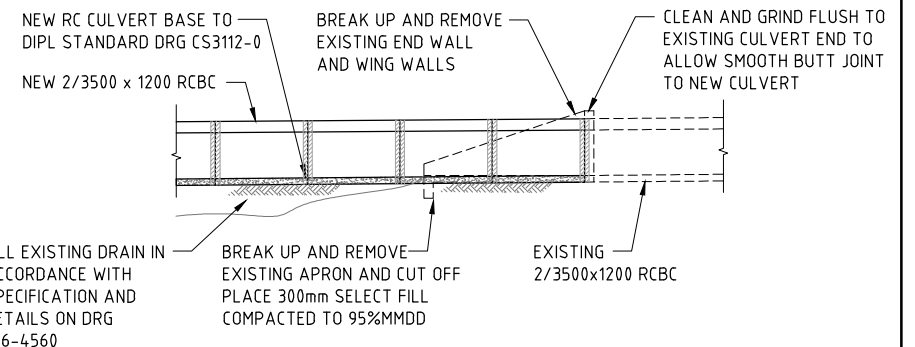
FENCE MOWING STRIP DETAIL
SCALE 1:10



FENCE MOWING STRIP OVER CULVERT DETAIL
SCALE 1:10



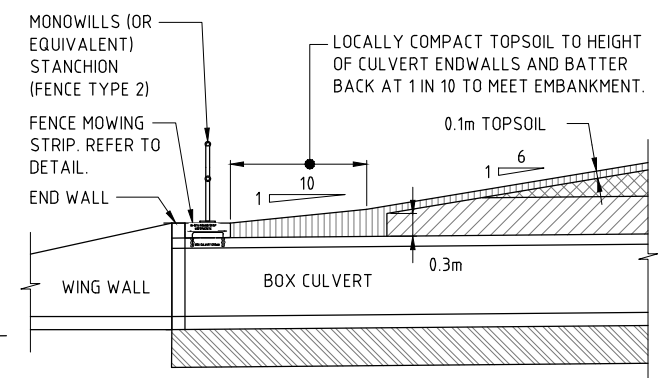
SURVEY MONUMENT DETAIL
SCALE 1:20



DETAIL OF CONNECTION NEW CULVERT 2 TO EXISTING
SCALE N.T.S

FENCE MOWING NOTES:

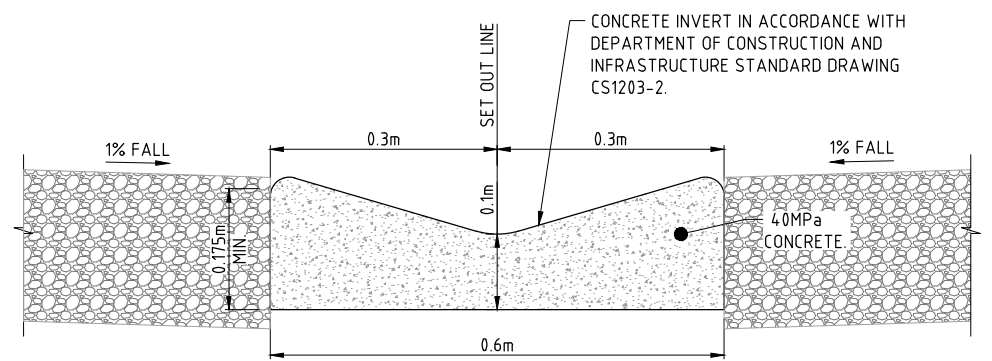
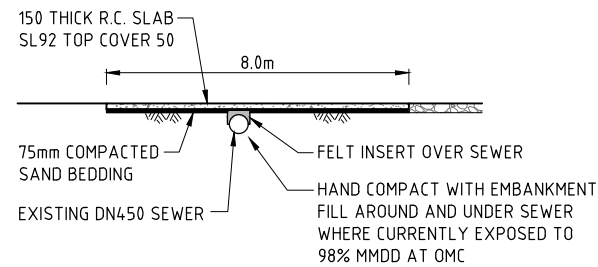
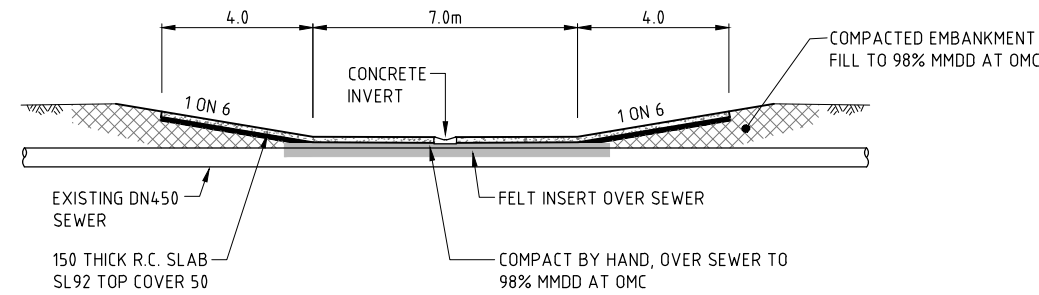
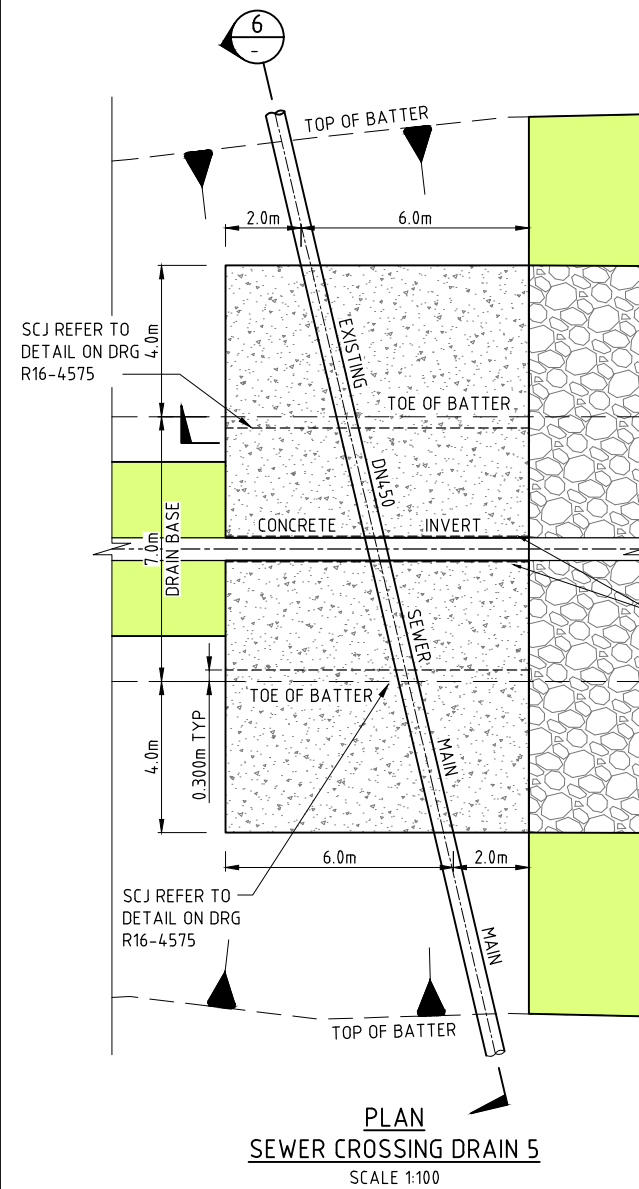
1. DETAIL SHOWS MOWING STRIP AND FENCE FIXING OVER BOX CULVERT CROWNS CULVERTS 2 AND 4.
2. FOR FENCE FIXING OVER BOX CULVERT LINK SLAB CULVERTS 1, 3 AND 5 ADOPT SAME DETAIL.
3. FOR FENCE FIXING OVER BOX CULVERT CROWNS EITHER SIDE OF LINK SLAB CULVERTS 1, 3 AND 5 ADOPT SAME DETAIL EXCEPT MOWING STRIP GOES FULL DEPTH TO TOP OF CULVERT CROWN AND REINFORCEMENT IS SL81 TOP AND BOTTOM 40 COVER.
4. BEYOND CULVERTS MOWING STRIP IS 0.6m WIDE x 0.125m THICK UNREINFORCED AND FENCE STANCHION PENETRATES MOWING STRIP FOR IN GROUND FIXING TO MANUFACTURERS RECOMMENDATIONS.



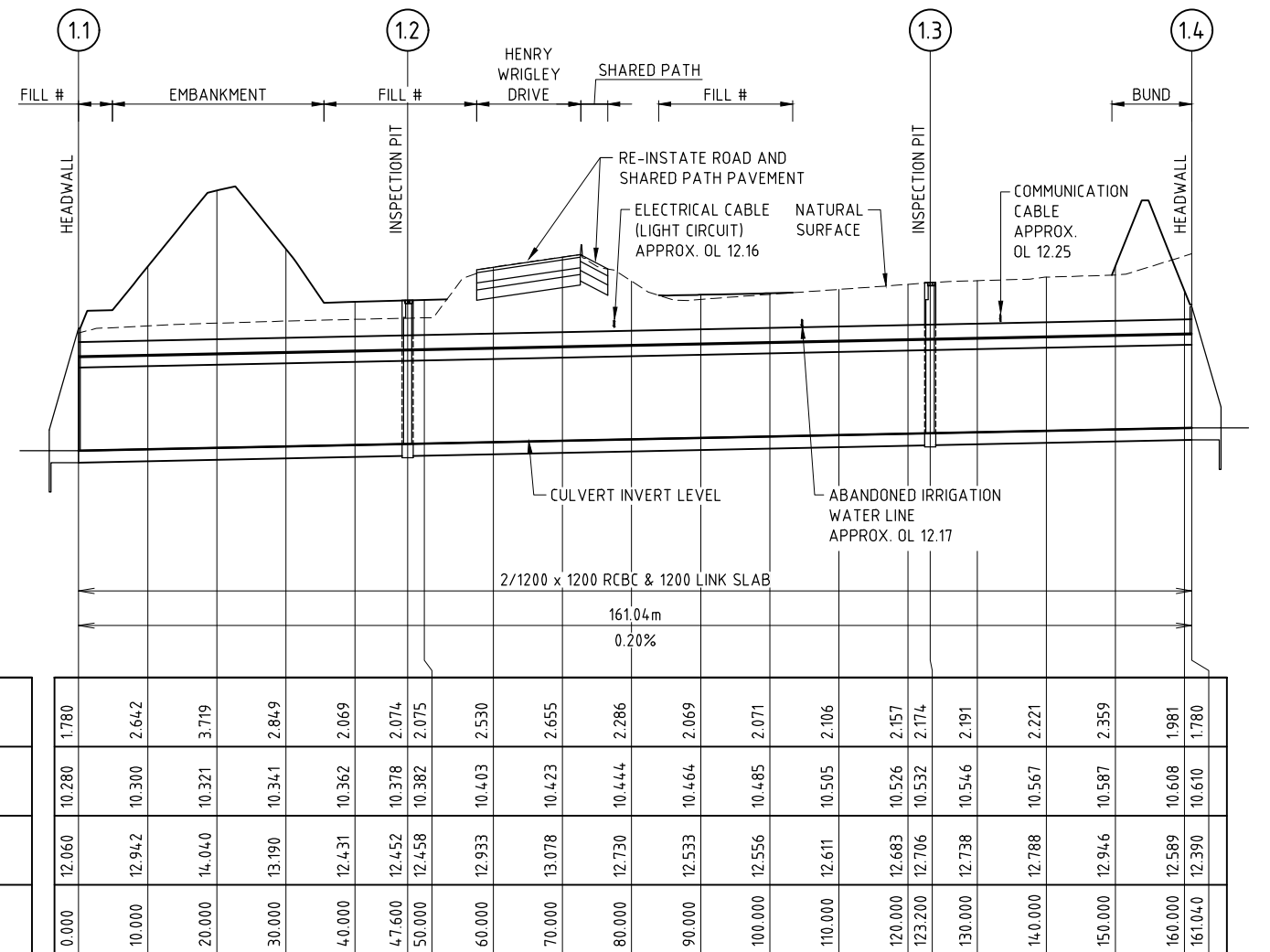
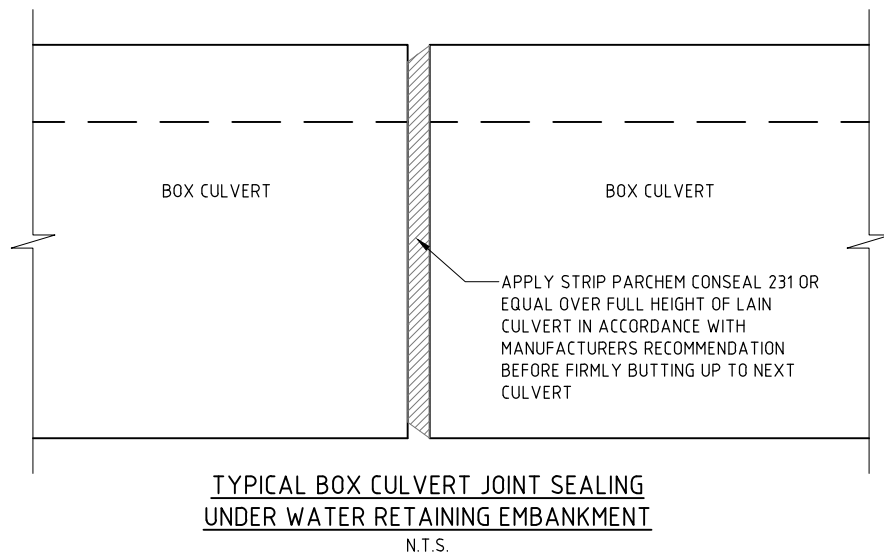
COMPACTION OVER CULVERT DETAIL
SCALE 1:50

SCALE 1:100 (A1) 0 2 4 6 8 10m

3 CONTRACT DRAWING 16.02.18 RK JACOBS 2 ISSUED FOR CONSTRUCTION 03.05.17 PS JACOBS 1 REVISED TENDER ISSUE 31.03.17 PS JACOBS 0 ISSUED FOR TENDER 03.03.17 PS JACOBS					JACOBS A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Project No: IW110800 Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com		DRAWN JP CHECKED PME DATE 15.02.17 DATE 15.02.17 DESIGNED PME CHECKED PAS DATE 15.02.17 DATE 15.02.17 DESIGN PROJECT LEADER RK NTG PROJECT MANAGER J NOBLE DATE 15.02.17 DATE 15.02.17		 Northern Territory Government		DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA DETAILS SHEET 2 OF 4						
No. DESCRIPTION DATE INIT. DEPT/COMPANY						NTG PROJECT No. LPD07940		NTG ASSET No. -		SHEET No. 15 OF 34		NTG DRAWING No. R16-4561		AMENDMENT 3		SHEET SIZE A1	



CONCRETE INVERT
SCALE 1:5
NOTE: ADJOINING RENO MATTRESSES SHOWN SIMILAR WHERE ADJOINING TURF MAT



LONGITUDINAL SECTION - CULVERT 1
SCALE 1:500(H), 1:50(V)

FILL #
AREA TO BE FILLED TO ACHIEVE MINIMUM 450mm COVER OVER CULVERT. EXTEND FILL TO NORTH AT 0.5% FALL TO MATCH EXISTING SURFACE TO ENSURE FREE DRAINAGE TO SOUTH.

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

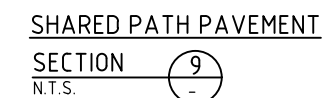
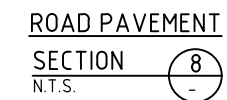
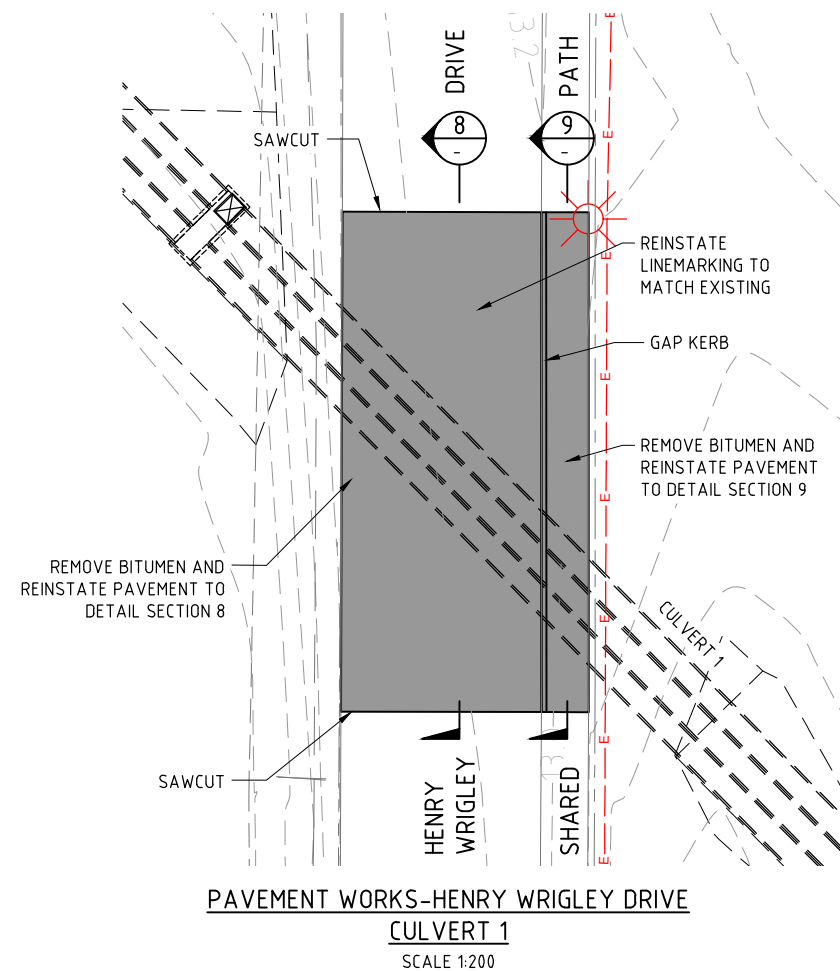
Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	JP	CHECKED	PME
DATE	15.02.17	DATE	15.02.17
DESIGNED	PME	CHECKED	PAS
DATE	15.02.17	DATE	15.02.17
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17	DATE	15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
DETAILS
SHEET 3 OF 4

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07940	-	16 OF 34	R16-4562	3	A1



3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
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No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				



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Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

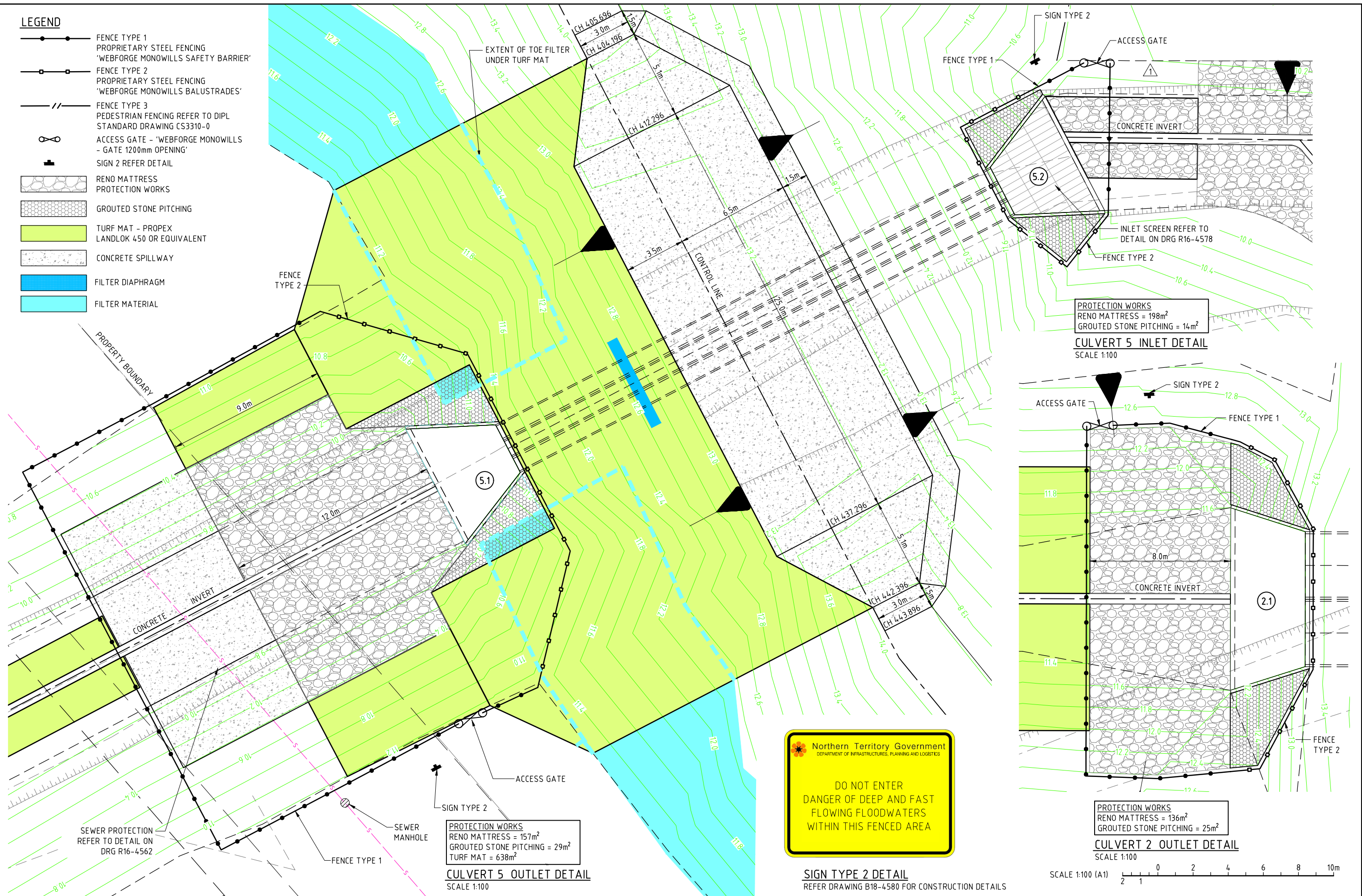
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JP	PME
DATE 15.02.17	DATE 15.02.17
DESIGNED	CHECKED
PME	PAS
DATE 15.02.17	DATE 15.02.17
DESIGN PROJECT LEADER	NTG PROJECT MANAGER
RK	J NOBLE
DATE 15.02.17	DATE 15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
DETAILS
SHEET 4 OF 4

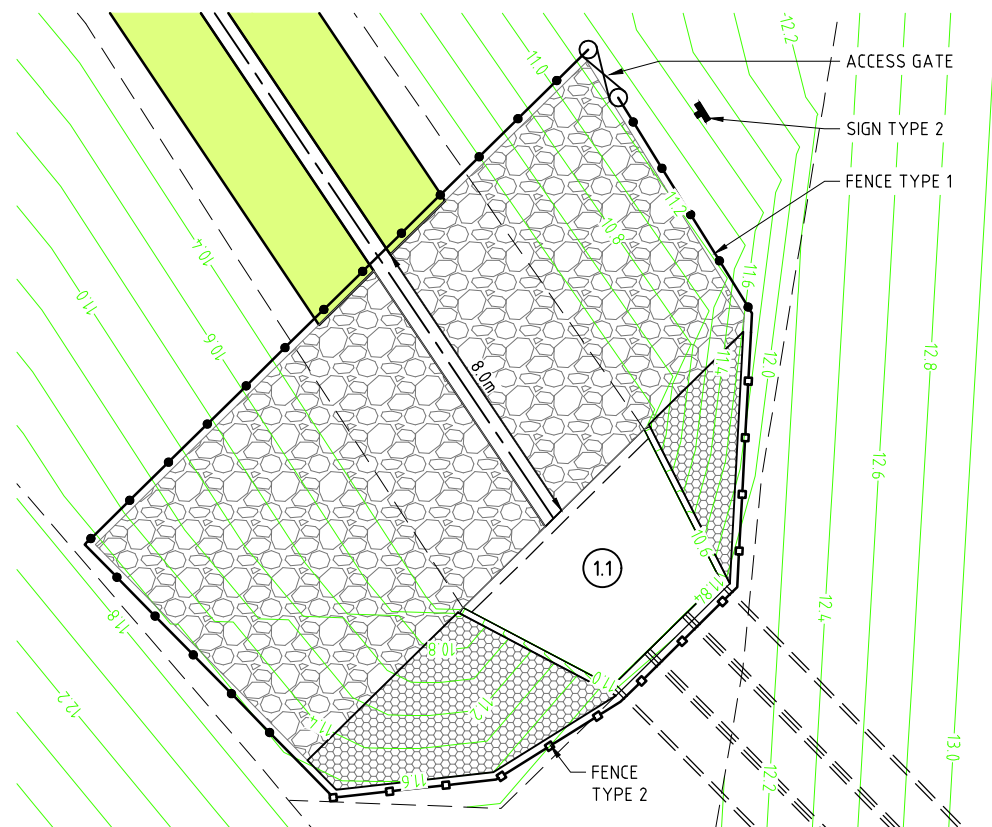
NTG PROJECT No. LPD07940	NTG ASSET No. -	SHEET No. 17 OF 34	NTG DRAWING No. R16-4563	AMENDMENT 3	SHEET SIZE A1
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- LEGEND**
- FENCE TYPE 1
PROPRIETARY STEEL FENCING
'WEBFORGE MONOWILLS SAFETY BARRIER'
 - FENCE TYPE 2
PROPRIETARY STEEL FENCING
'WEBFORGE MONOWILLS BALUSTRADES'
 - FENCE TYPE 3
PEDESTRIAN FENCING REFER TO DIPL
STANDARD DRAWING CS3310-0
 - ACCESS GATE - 'WEBFORGE MONOWILLS
- GATE 1200mm OPENING'
 - SIGN 2 REFER DETAIL
 - RENO MATTRESS
PROTECTION WORKS
 - GROUTED STONE PITCHING
 - TURF MAT - PROPEX
LANDLOK 450 OR EQUIVALENT
 - CONCRETE SPILLWAY
 - FILTER DIAPHRAGM
 - FILTER MATERIAL



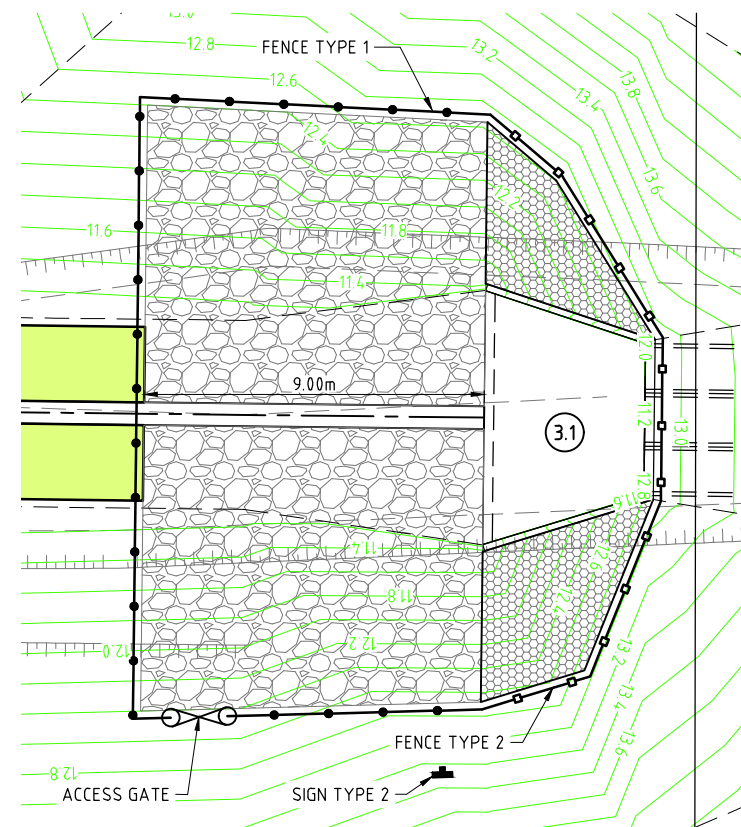
3 CONTRACT DRAWING		16.02.18	RK	JACOBS
2 ISSUED FOR CONSTRUCTION		03.05.17	PS	JACOBS
1 REVISED TENDER ISSUE		31.03.17	PS	JACOBS
0 ISSUED FOR TENDER		03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS		A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA		Project No: IW110800 Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	
DRAWN	JP	CHECKED	PME	Northern Territory Government	
DATE	15.02.17	DATE	15.02.17		
DESIGNED	PME	CHECKED	PAS		
DATE	15.02.17	DATE	15.02.17		
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE	DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA CULVERT INLET/OUTLET DETAILS SHEET 1 OF 2	
DATE	15.02.17	DATE	15.02.17		
NTG PROJECT No.	LPD07940	NTG ASSET No.	-	SHEET No.	18 OF 34
NTG DRAWING No.		R16-4564		AMENDMENT	3
				SHEET SIZE	A1



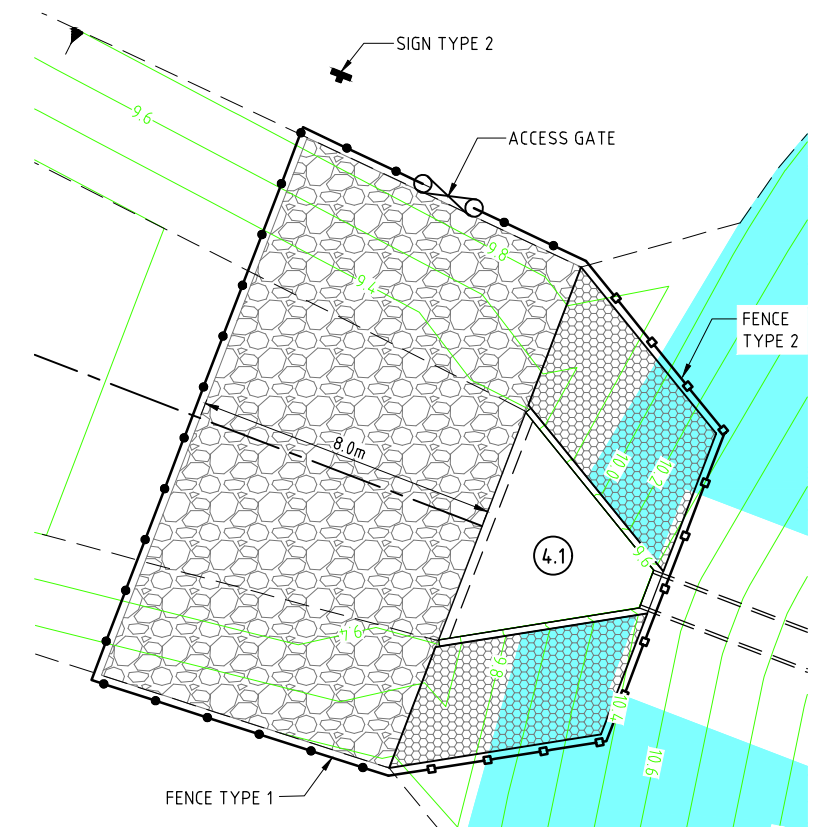
CULVERT 1 OUTLET DETAIL
SCALE 1:100

PROTECTION WORKS
RENO MATTRESS = 133m²
GROUTED STONE PITCHING = 28m²



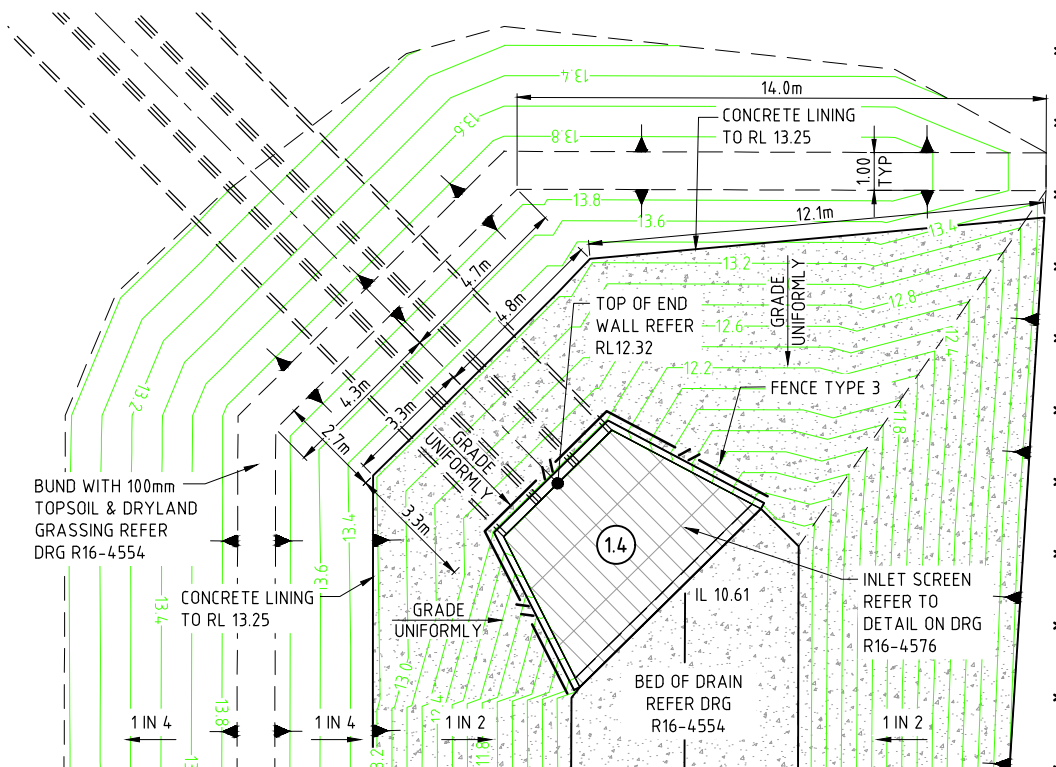
CULVERT 3 OUTLET DETAIL
SCALE 1:100

PROTECTION WORKS
RENO MATTRESS = 136m²
GROUTED STONE PITCHING = 25m²



CULVERT 4 OUTLET DETAIL
SCALE 1:100

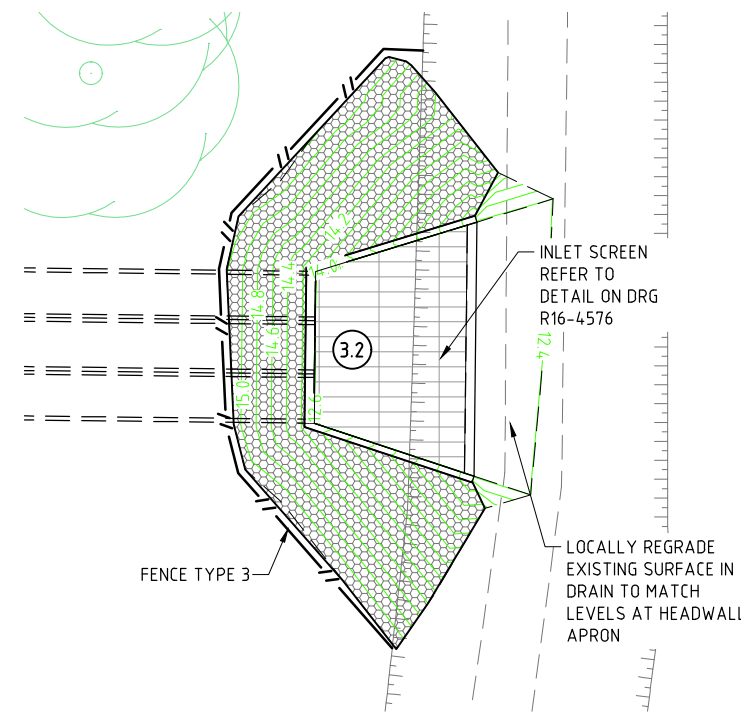
PROTECTION WORKS
RENO MATTRESS = 118m²
GROUTED STONE PITCHING = 36m²



CULVERT 1 INLET DETAIL
SCALE 1:100

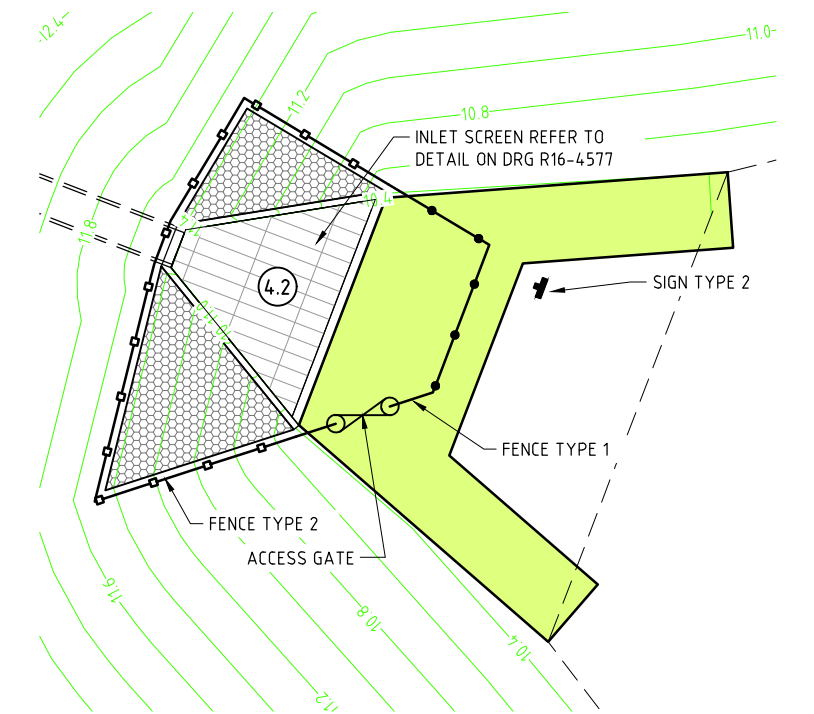
NOTES

1. REFER TO DRG R16-4564 FOR LEGEND AND NOTES.



CULVERT 3 INLET DETAIL
SCALE 1:100

PROTECTION WORKS
GROUTED STONE PITCHING = 50m²



CULVERT 4 INLET DETAIL
SCALE 1:100

PROTECTION WORKS
GROUTED STONE PITCHING = 22m²

SCALE 1:100 (A1)
2 1 0 2 4 6 8 10m

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

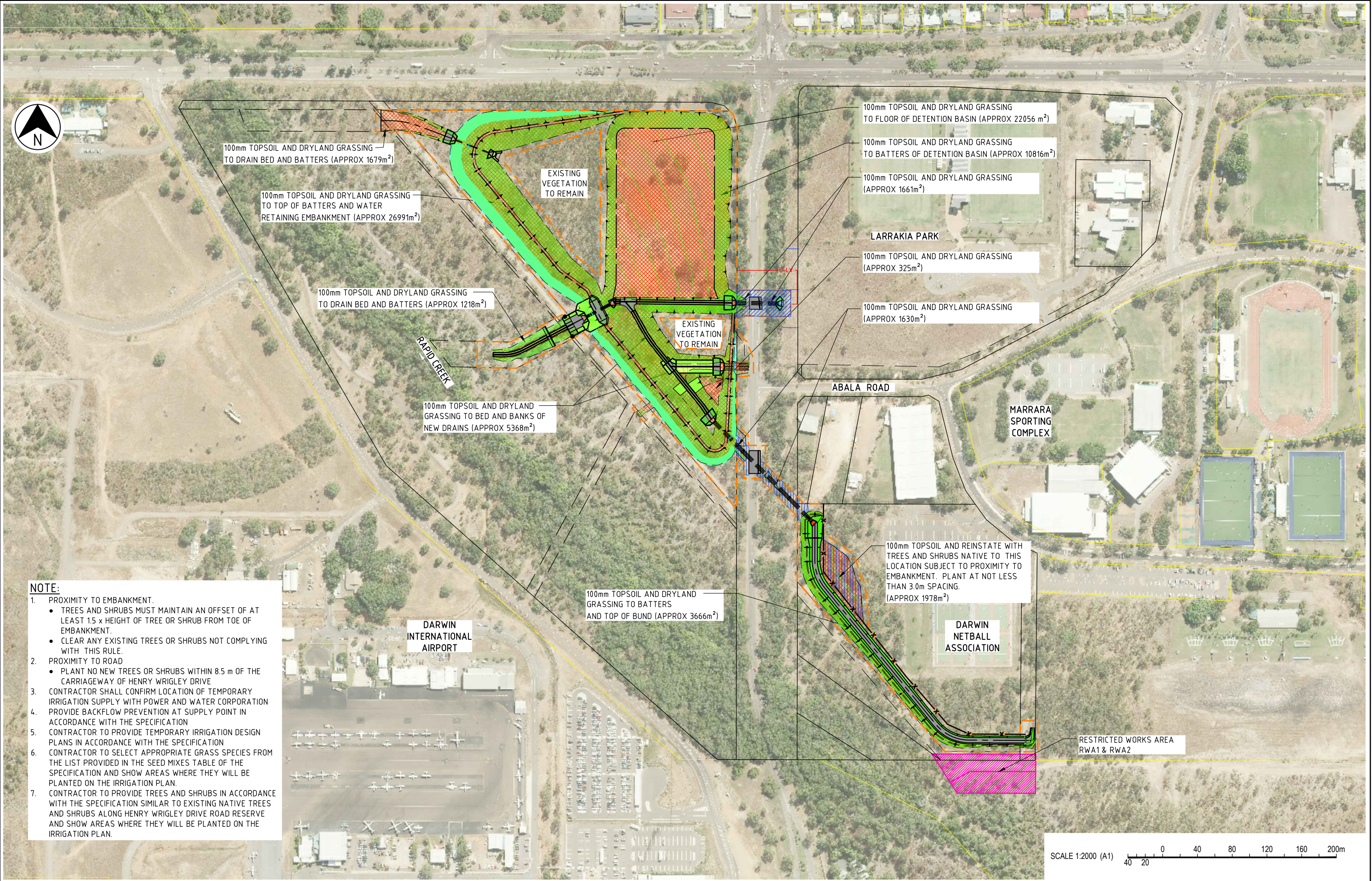
Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	JP	CHECKED	PME
DATE	15.02.17	DATE	15.02.17
DESIGNED	PME	CHECKED	PAS
DATE	15.02.17	DATE	15.02.17
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17	DATE	15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
CULVERT INLET/OUTLET DETAILS
SHEET 2 OF 2

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07940	-	19 OF 34	R16-4565	3	A1



- NOTE:**
- PROXIMITY TO EMBANKMENT.
 - TREES AND SHRUBS MUST MAINTAIN AN OFFSET OF AT LEAST 1.5 x HEIGHT OF TREE OR SHRUB FROM TOE OF EMBANKMENT.
 - CLEAR ANY EXISTING TREES OR SHRUBS NOT COMPLYING WITH THIS RULE.
 - PROXIMITY TO ROAD
 - PLANT NO NEW TREES OR SHRUBS WITHIN 8.5 m OF THE CARRIAGEWAY OF HENRY WRIGLEY DRIVE
 - CONTRACTOR SHALL CONFIRM LOCATION OF TEMPORARY IRRIGATION SUPPLY WITH POWER AND WATER CORPORATION
 - PROVIDE BACKFLOW PREVENTION AT SUPPLY POINT IN ACCORDANCE WITH THE SPECIFICATION
 - CONTRACTOR TO PROVIDE TEMPORARY IRRIGATION DESIGN PLANS IN ACCORDANCE WITH THE SPECIFICATION
 - CONTRACTOR TO SELECT APPROPRIATE GRASS SPECIES FROM THE LIST PROVIDED IN THE SEED MIXES TABLE OF THE SPECIFICATION AND SHOW AREAS WHERE THEY WILL BE PLANTED ON THE IRRIGATION PLAN.
 - CONTRACTOR TO PROVIDE TREES AND SHRUBS IN ACCORDANCE WITH THE SPECIFICATION SIMILAR TO EXISTING NATIVE TREES AND SHRUBS ALONG HENRY WRIGLEY DRIVE ROAD RESERVE AND SHOW AREAS WHERE THEY WILL BE PLANTED ON THE IRRIGATION PLAN.

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS

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Parap, Darwin
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Project No: IW110800
Tel: +61 8 8982 4800
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Web: www.jacobs.com

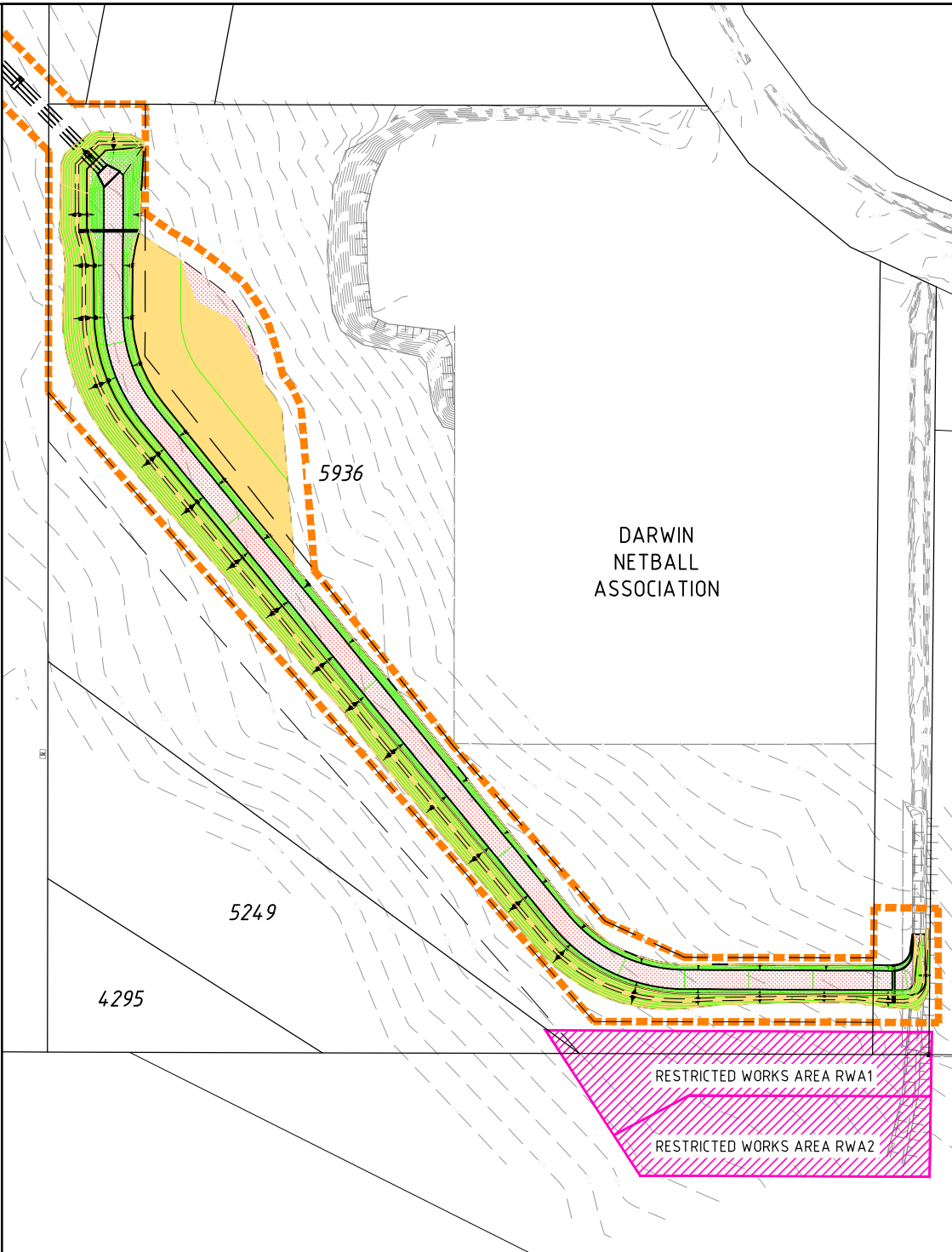
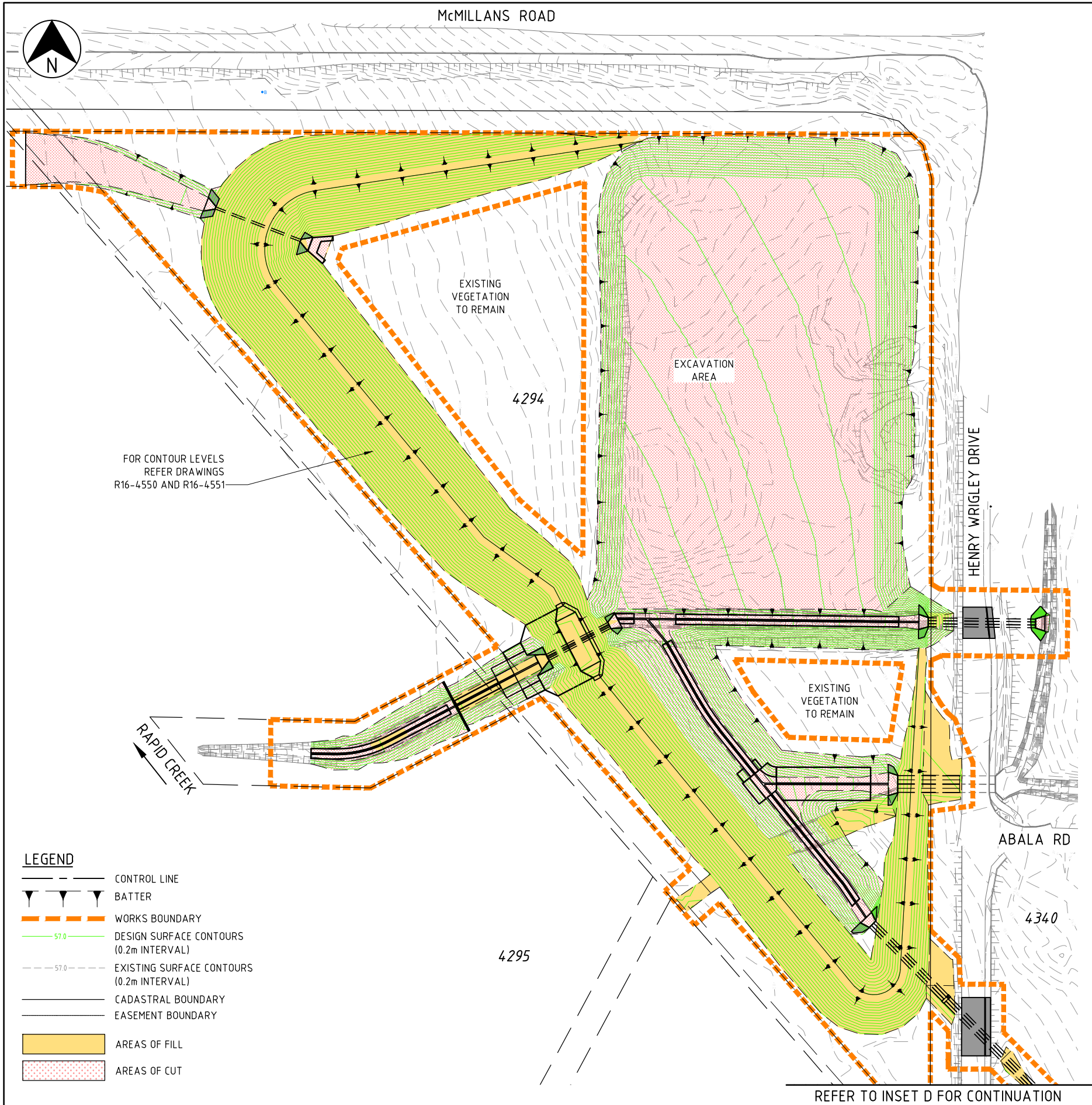
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DATE	15.02.17
DESIGNED	PME
DATE	15.02.17
DESIGN PROJECT LEADER	RK
DATE	15.02.17

CHECKED	PME
DATE	15.02.17
CHECKED	PAS
DATE	15.02.17
NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
LANDSCAPING PLAN

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07940	-	20 OF 34	R16-4566	3	A1



INSET D
SCALE 1:1000

SCALE 1:1000 (A1) 20 10 0 20 40 60 80 100m

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	PS	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

Project No: IW110800
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	JP
DATE	15.02.17
DESIGNED	PME
DATE	15.02.17
DESIGN PROJECT LEADER	RK
DATE	15.02.17

CHECKED	PME
DATE	15.02.17
CHECKED	PAS
DATE	15.02.17
NTG PROJECT MANAGER	J NOBLE
DATE	15.02.17



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
EARTHWORKS

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07940	-	21 OF 34	R16-4567	3	A1



1. REFER TO DRAWING R16-4568 FOR NOTES.

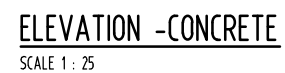
3	CONTRACT DRAWING ISSUED FOR CONSTRUCTION	16.02.18	RK	JACOBS	 A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	DRAWN SHW DATE NOVEMBER 2016	CHECKED MT DATE NOVEMBER 2016	 Northern Territory Government	DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA CULVERT 1 AND 3 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2				
1	REVISED TENDER ISSUE	03.05.17	RK	JACOBS		DESIGNED MT DATE NOVEMBER 2016	CHECKED KD DATE NOVEMBER 2016		NTG PROJECT No. LPD07941	NTG ASSET No. -	SHEET No. 23 OF 34	AMENDMENT R16-4569 3	SHEET SIZE A1
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS		DESIGN PROJECT LEADER RK DATE NOVEMBER 2016	NTG PROJECT MANAGER J NOBLE DATE NOVEMBER 2016						
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY:									
AMENDMENTS													



NOTES:-
1. REFER TO DRAWING R16-4570 FOR NOTES.

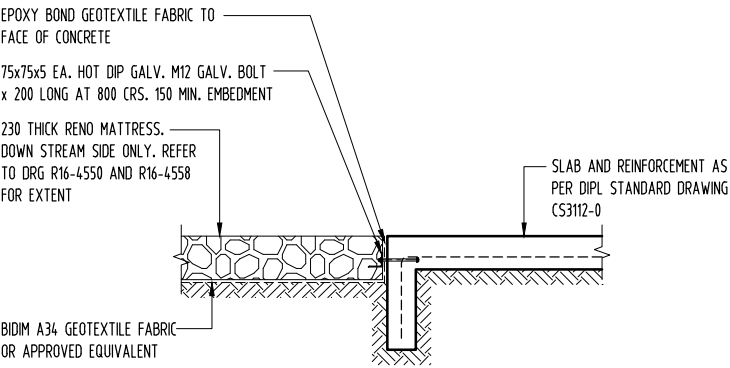
								DRAWN SHW DATE NOVEMBER 2016 DESIGNED MT DATE NOVEMBER 2016 DESIGN PROJECT LEADER RK DATE NOVEMBER 2016 CHECKED MT DATE NOVEMBER 2016 CHECKED KD DATE NOVEMBER 2016 NTG PROJECT MANAGER J NOBLE DATE NOVEMBER 2016				DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA CULVERT 2 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2				
3	CONTRACT DRAWING	16.02.18	RK	JACOBS												
2	ISSUED FOR CONSTRUCTION	03.05.17	RK	JACOBS												
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS												
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS												
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY.	A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA		Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com									
AMENDMENTS																

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07941	-	25 OF 34	R16-4571	3	A1



1. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
2. DIMENSIONS SHOWN THUS '**' ARE BASED ON ROCLA STANDARD PRECAST BOX CULVERT.

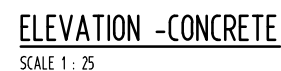
						 A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com		DRAWN SHW DATE NOVEMBER 2016 DESIGNED MT DATE NOVEMBER 2016 DESIGN PROJECT LEADER RK DATE NOVEMBER 2016 CHECKED MT DATE NOVEMBER 2016 CHECKED KD DATE NOVEMBER 2016 NTG PROJECT MANAGER J NOBLE DATE NOVEMBER 2016		 Northern Territory Government		DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA CULVERT 4 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 1 OF 2									
3 2 1 0		CONTRACT DRAWING ISSUED FOR CONSTRUCTION REVISED TENDER ISSUE ISSUED FOR TENDER		16.02.18 03.05.17 31.03.17 03.03.17		RK RK PS PS		JACOBS JACOBS JACOBS JACOBS													
No.		DESCRIPTION		DATE		INIT.		DEPT/COMPANY.													
		AMENDMENTS																			
										NTG PROJECT No. LPD07941		NTG ASSET No. -		SHEET No. 26 OF 34		NTG DRAWING No. R16-4572		AMENDMENT 3		SHEET SIZE A1	



TYPICAL RENO MATTRESS TO TOE WALL CONNECTION DETAIL
SCALE 1 : 20

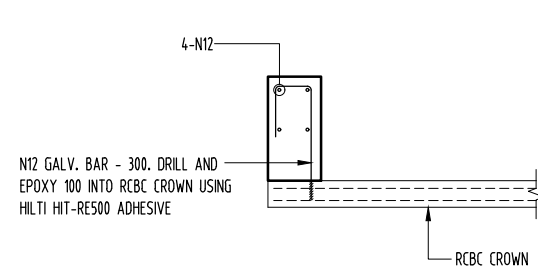
NOTES:-
1. REFER TO DRAWING R16-4572 FOR NOTES.

3 2 1 0	CONTRACT DRAWING ISSUED FOR CONSTRUCTION REVISED TENDER ISSUE ISSUED FOR TENDER	16.02.18 03.05.17 31.03.17 03.03.17	RK RK PS PS	JACOBS JACOBS JACOBS JACOBS	 A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	DRAWN SHW DATE NOVEMBER 2016	CHECKED MT DATE NOVEMBER 2016	 Northern Territory Government	DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA CULVERT 4 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 2 OF 2								
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY.													
AMENDMENTS																	

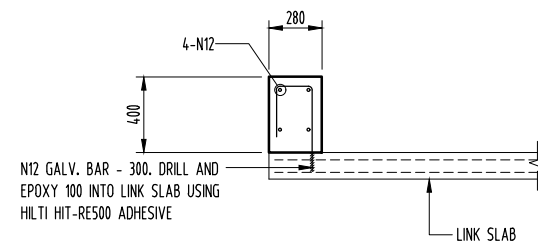


1. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
2. DIMENSIONS SHOWN THUS '**' ARE BASED ON ROCLA STANDARD PRECAST BOX CULVERT.

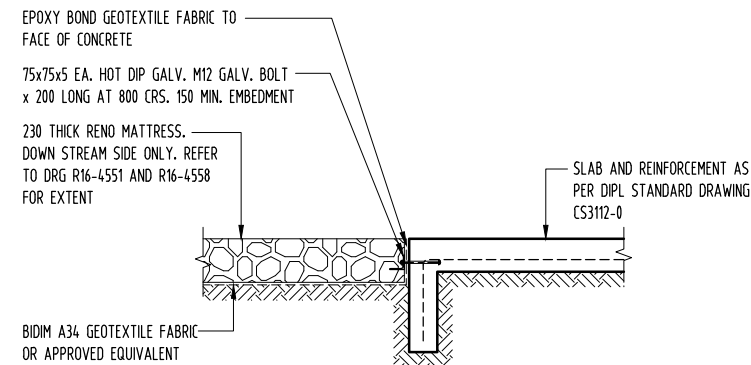
										DARWIN REGION RAPID CREEK FLOOD MITIGATION MARRARA CULVERT 5 - APRON SLAB, HEAD WALL AND WING WALL STRUCTURAL DETAILS - SHEET 1 OF 2					
3	CONTRACT DRAWING ISSUED FOR CONSTRUCTION REVISED TENDER ISSUE ISSUED FOR TENDER	16.02.18	RK	JACOBS	A.C.N 001 024 095 Jacobs Group (Australia) Pty. Ltd. Level 2, 23-25 Parap Road Parap, Darwin NT 0820 AUSTRALIA Tel: +61 8 8982 4800 Fax: +61 8 8982 4840 Web: www.jacobs.com	DRAWN SHW DATE NOVEMBER 2016	CHECKED MT DATE NOVEMBER 2016								
2		03.05.17	RK	JACOBS										DESIGNED MT DATE NOVEMBER 2016	CHECKED KD DATE NOVEMBER 2016
1		31.03.17	PS	JACOBS										DESIGN PROJECT LEADER RK DATE NOVEMBER 2016	NTG PROJECT MANAGER J NOBLE DATE NOVEMBER 2016
0		03.03.17	PS	JACOBS											
No.		DESCRIPTION	DATE	INIT.	DEPT/COMPANY.										
		AMENDMENTS													



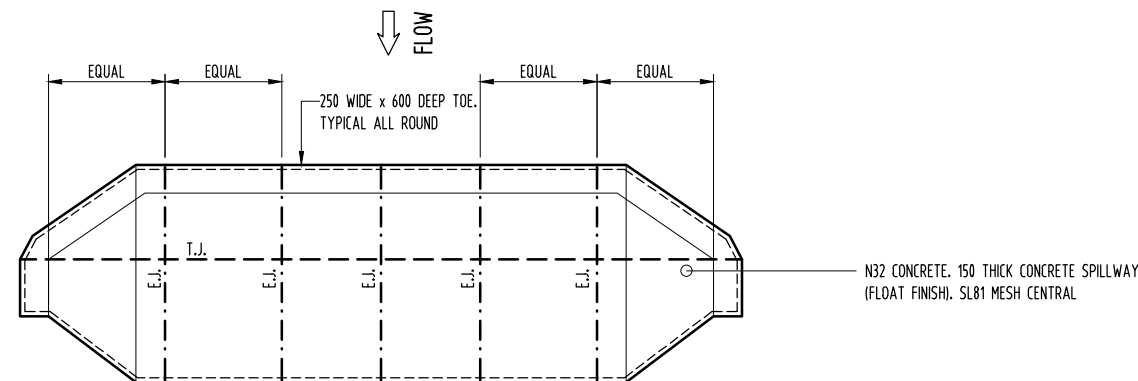
TYPICAL HEAD WALL TO RCBC CROWN REINFORCEMENT
SCALE 1 : 20



TYPICAL HEAD WALL TO LINK SLAB REINFORCEMENT
SCALE 1 : 20

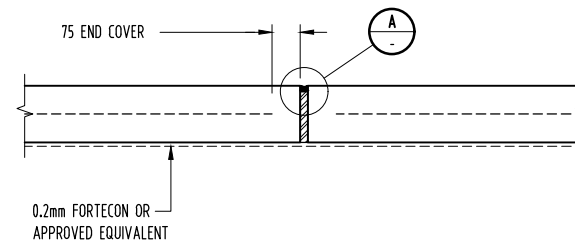


TYPICAL RENO MATTRESS TO TOE WALL CONNECTION DETAIL
SCALE 1 : 20

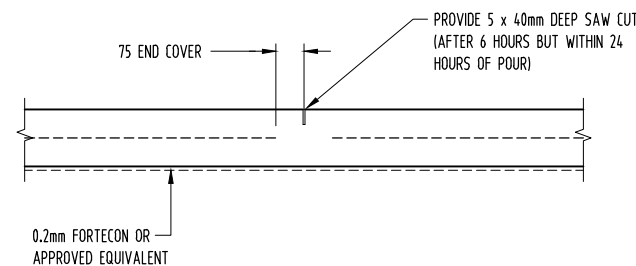


CONCRETE SPILLWAY - PLAN
SCALE 1 : 200

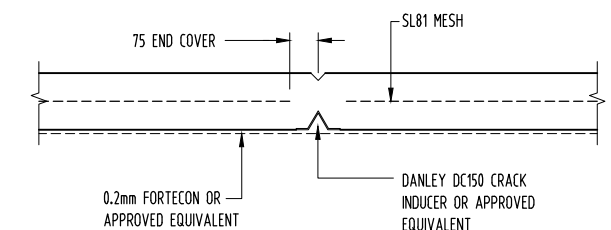
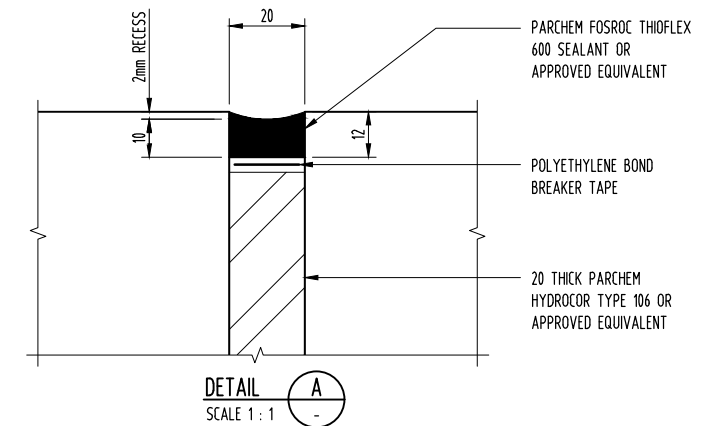
PLAN SHOWN IS INDICATIVE ONLY. REFER TO R16-4564 FOR EXACT SIZE AND LOCATION



TYPICAL EXPANSION JOINT (E.J.)
SCALE 1:10



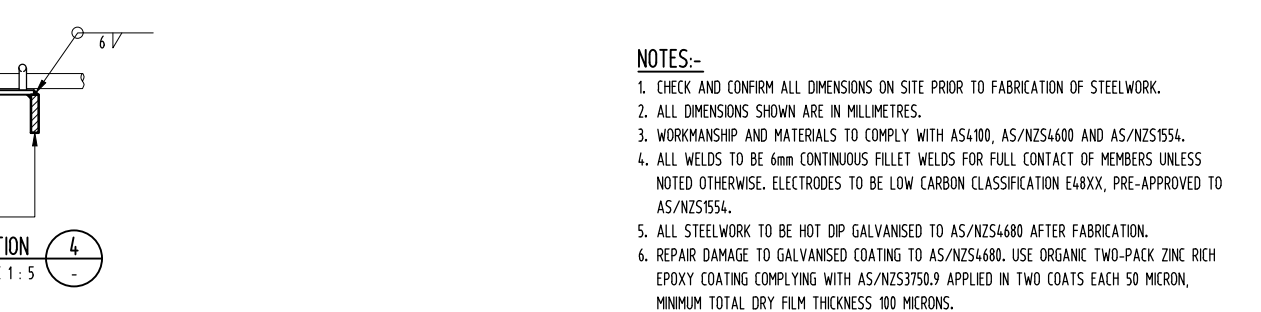
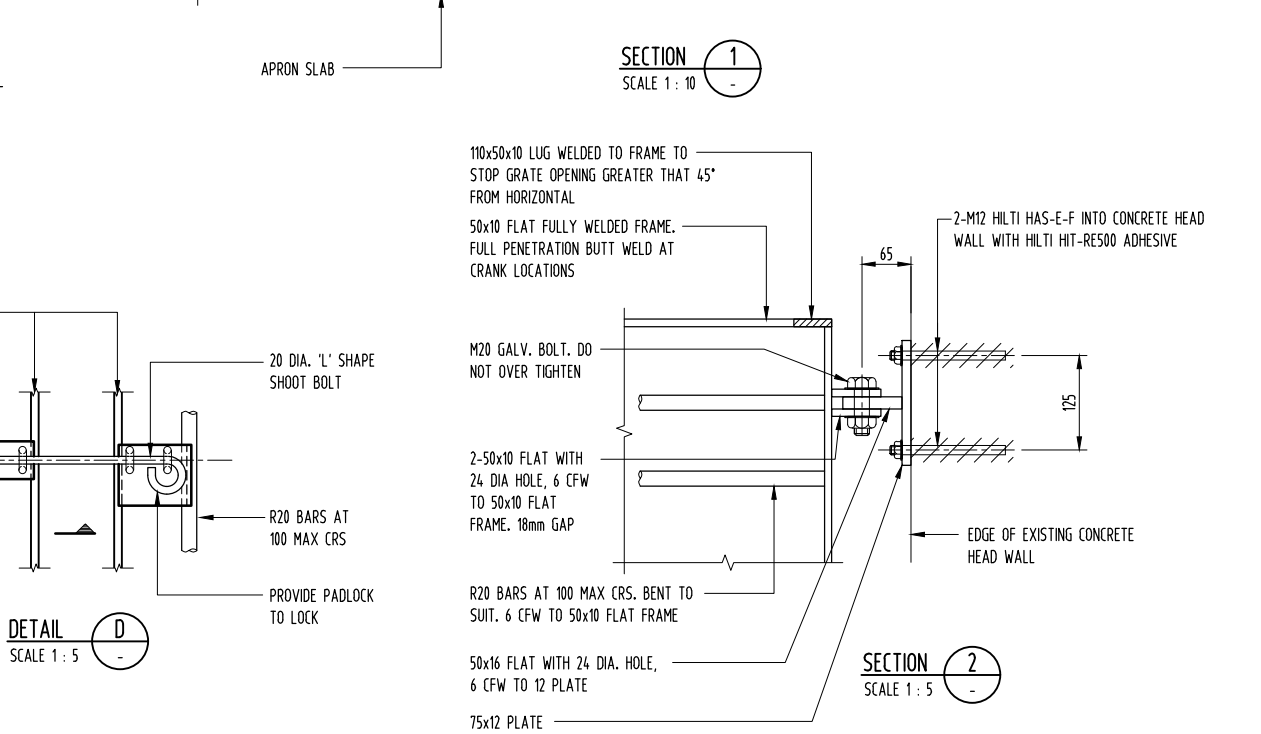
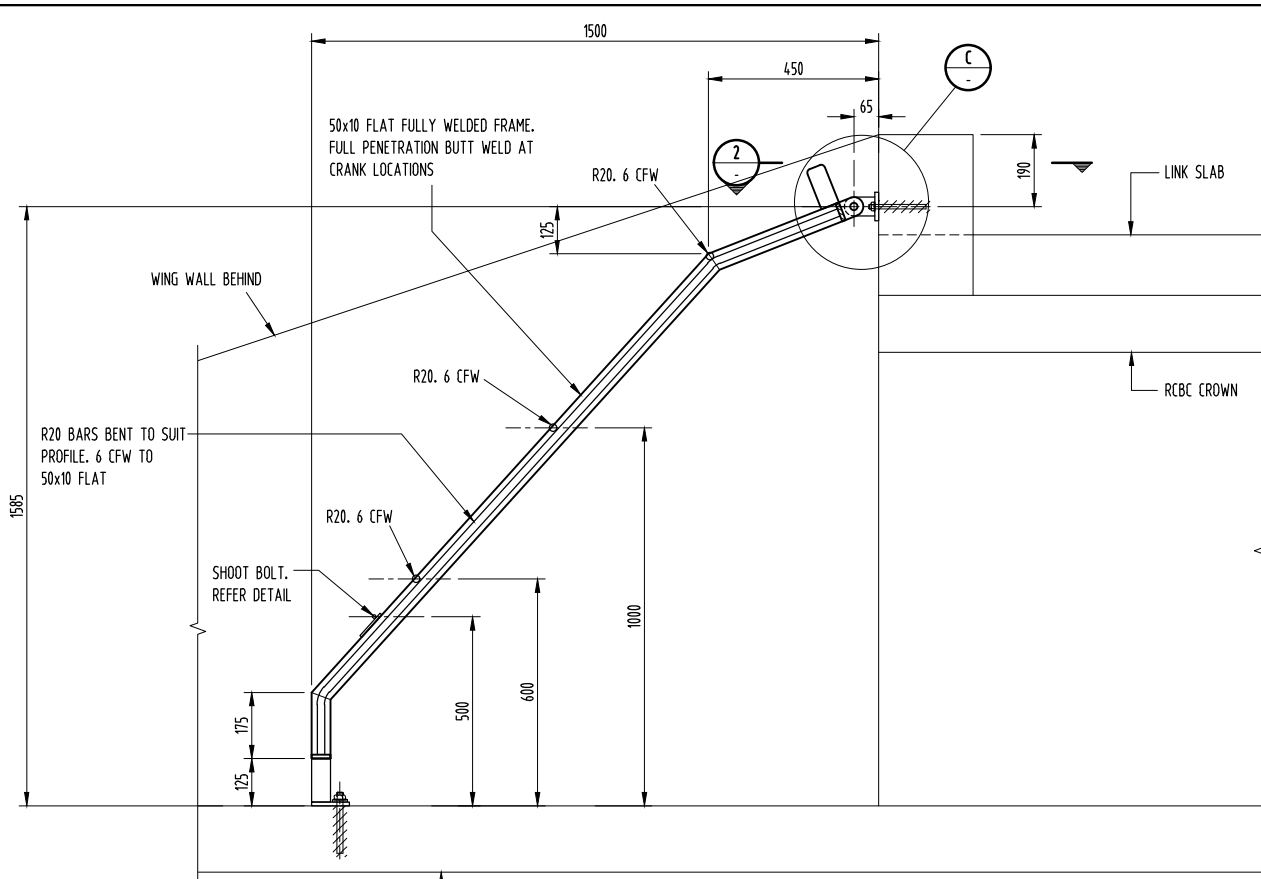
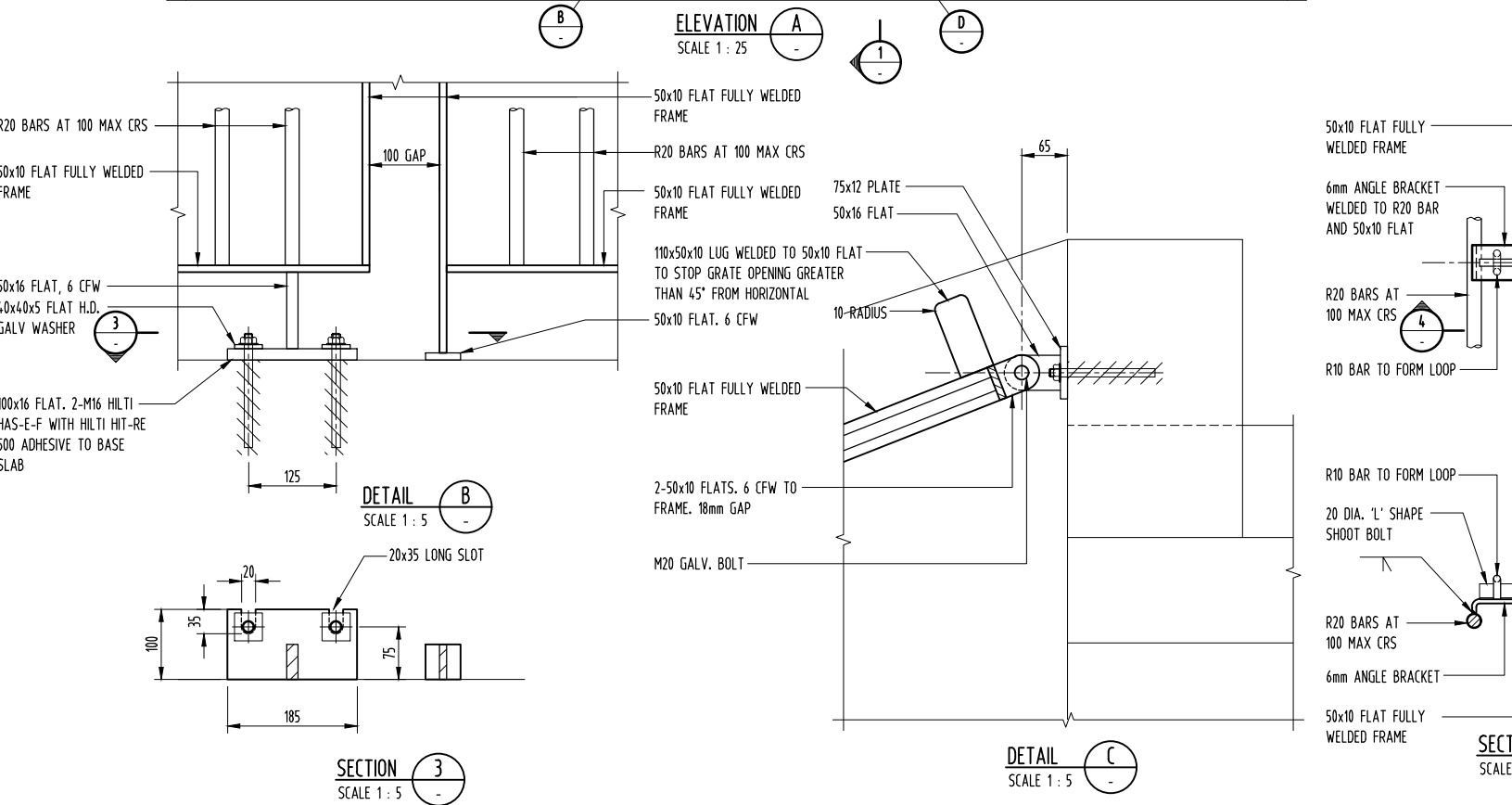
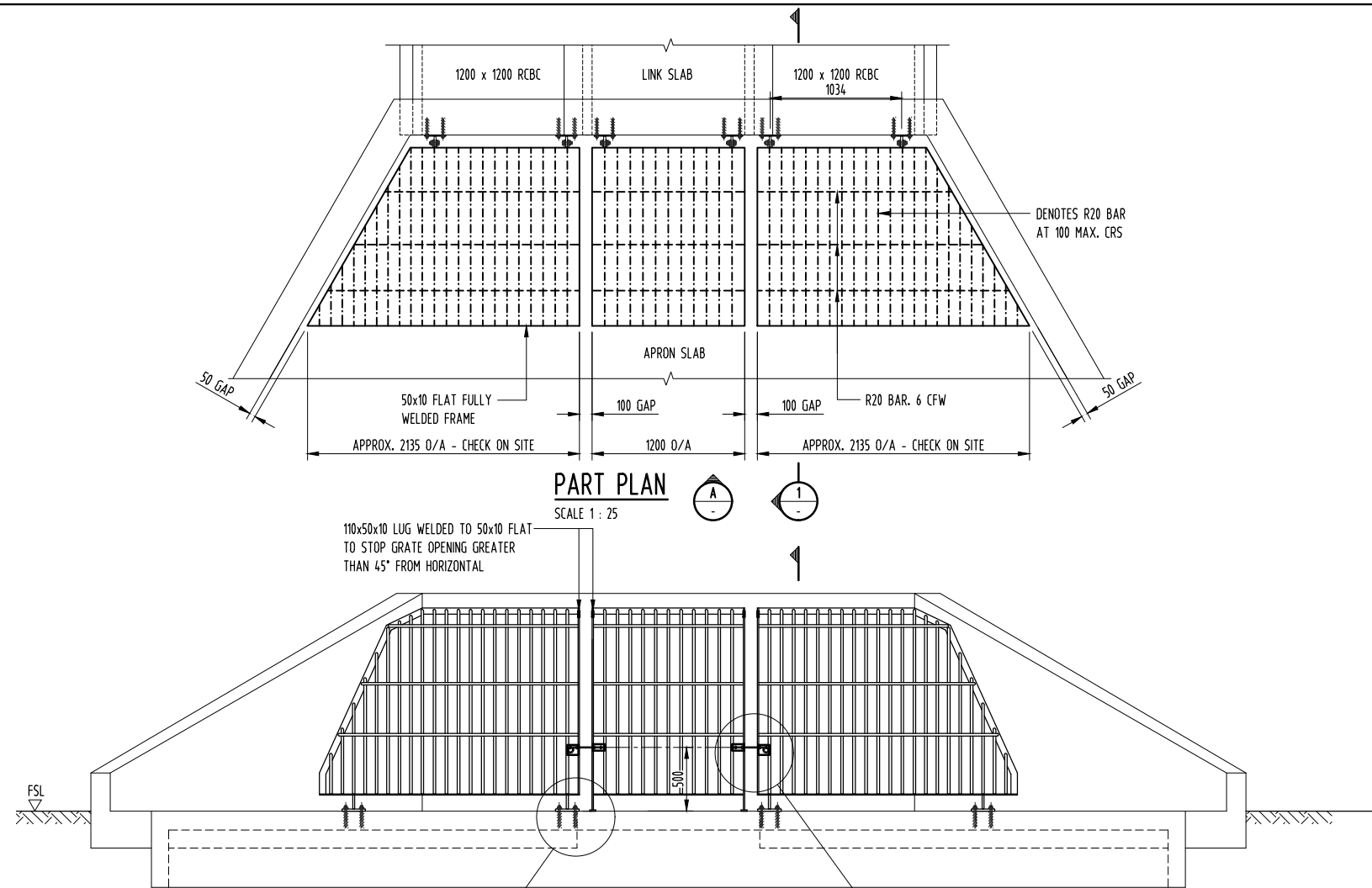
TYPICAL SAW CUT JOINT (S.C.J.)
SCALE 1:10



TYPICAL TOOLED JOINT (T.J.)
SCALE 1:10

NOTES:-
1. REFER TO DRAWING R16-4574 FOR NOTES.

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NOTES:-

1. CHECK AND CONFIRM ALL DIMENSIONS ON SITE PRIOR TO FABRICATION OF STEELWORK.
2. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
3. WORKMANSHIP AND MATERIALS TO COMPLY WITH AS4100, AS/NZS4600 AND AS/NZS1554.
4. ALL WELDS TO BE 6mm CONTINUOUS FILLET WELDS FOR FULL CONTACT OF MEMBERS UNLESS NOTED OTHERWISE. ELECTRODES TO BE LOW CARBON CLASSIFICATION E48XX, PRE-APPROVED TO AS/NZS1554.
5. ALL STEELWORK TO BE HOT DIP GALVANISED TO AS/NZS4680 AFTER FABRICATION.
6. REPAIR DAMAGE TO GALVANISED COATING TO AS/NZS4680. USE ORGANIC TWO-PACK ZINC RICH EPOXY COATING COMPLYING WITH AS/NZS3750.9 APPLIED IN TWO COATS EACH 50 MICRON, MINIMUM TOTAL DRY FILM THICKNESS 100 MICRONS.

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	RK	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

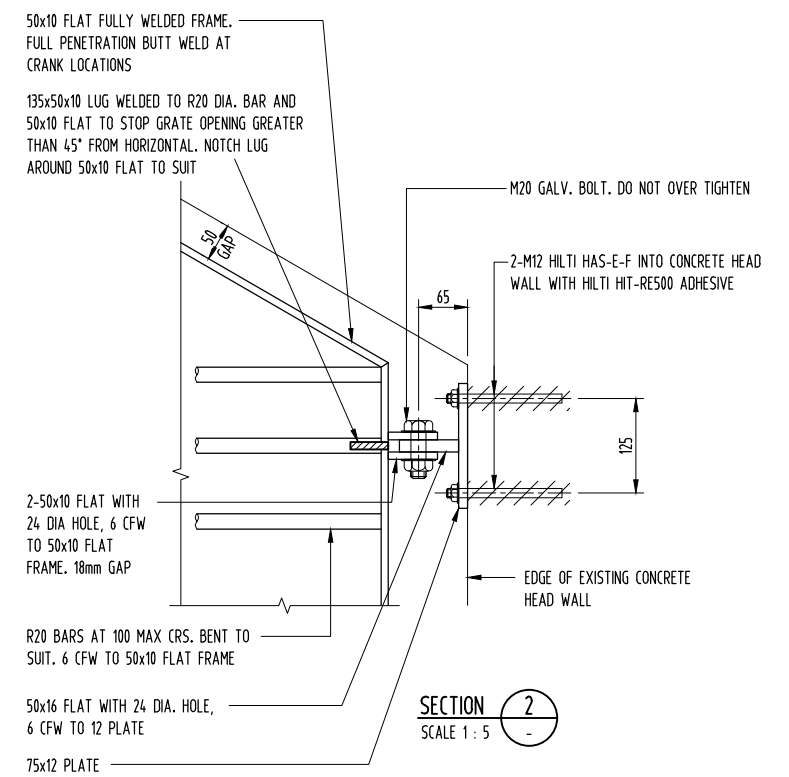
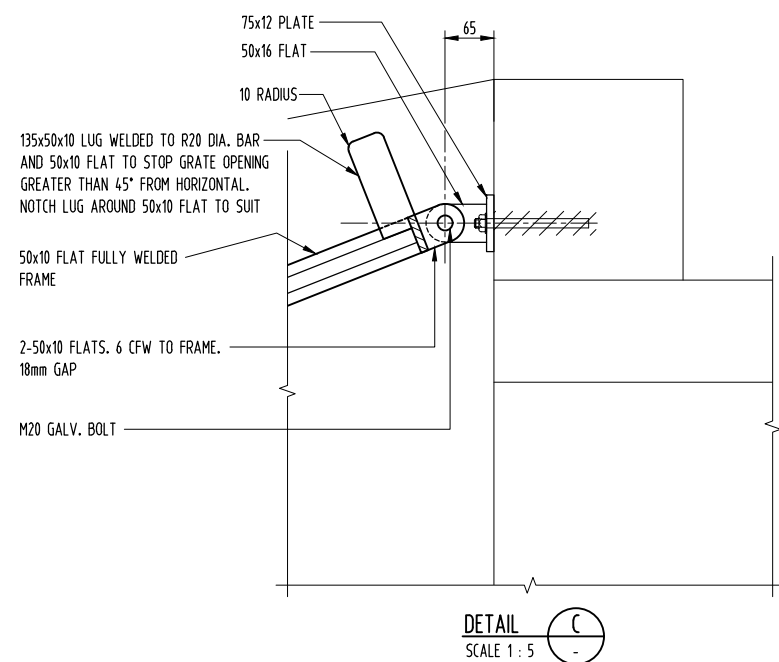
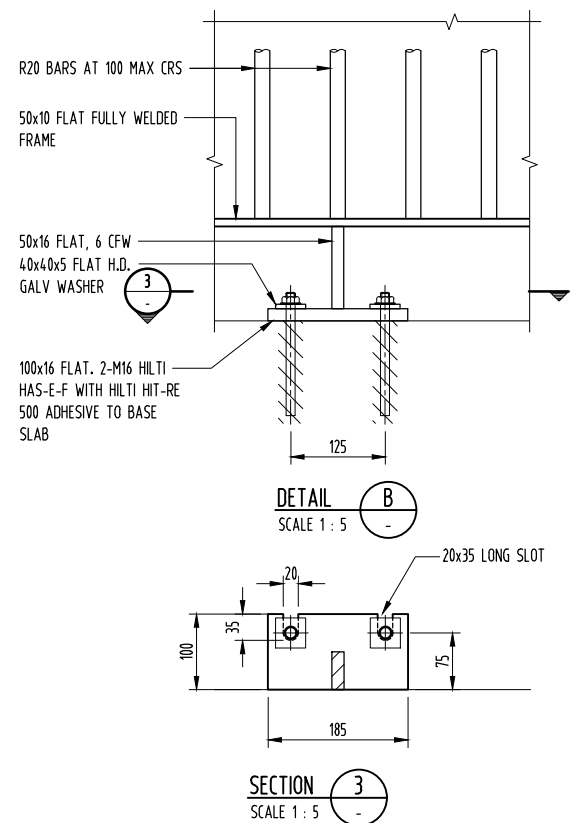
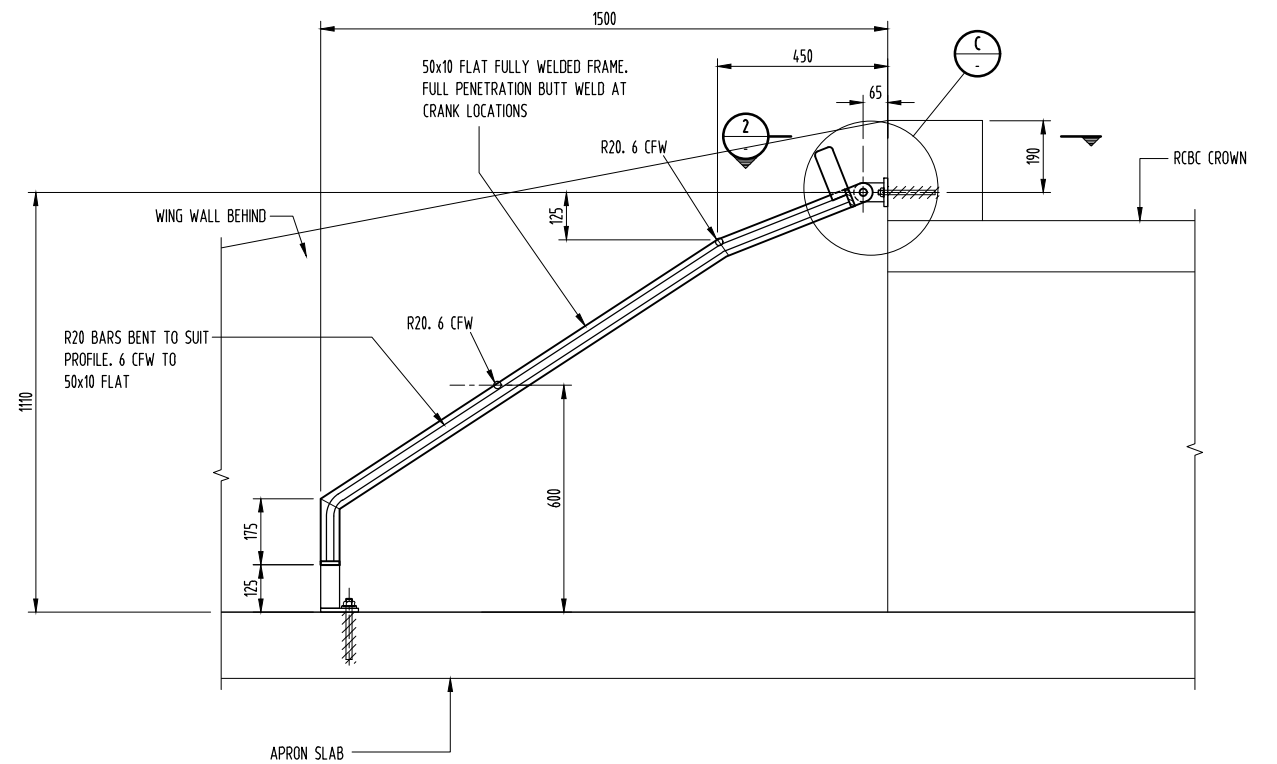
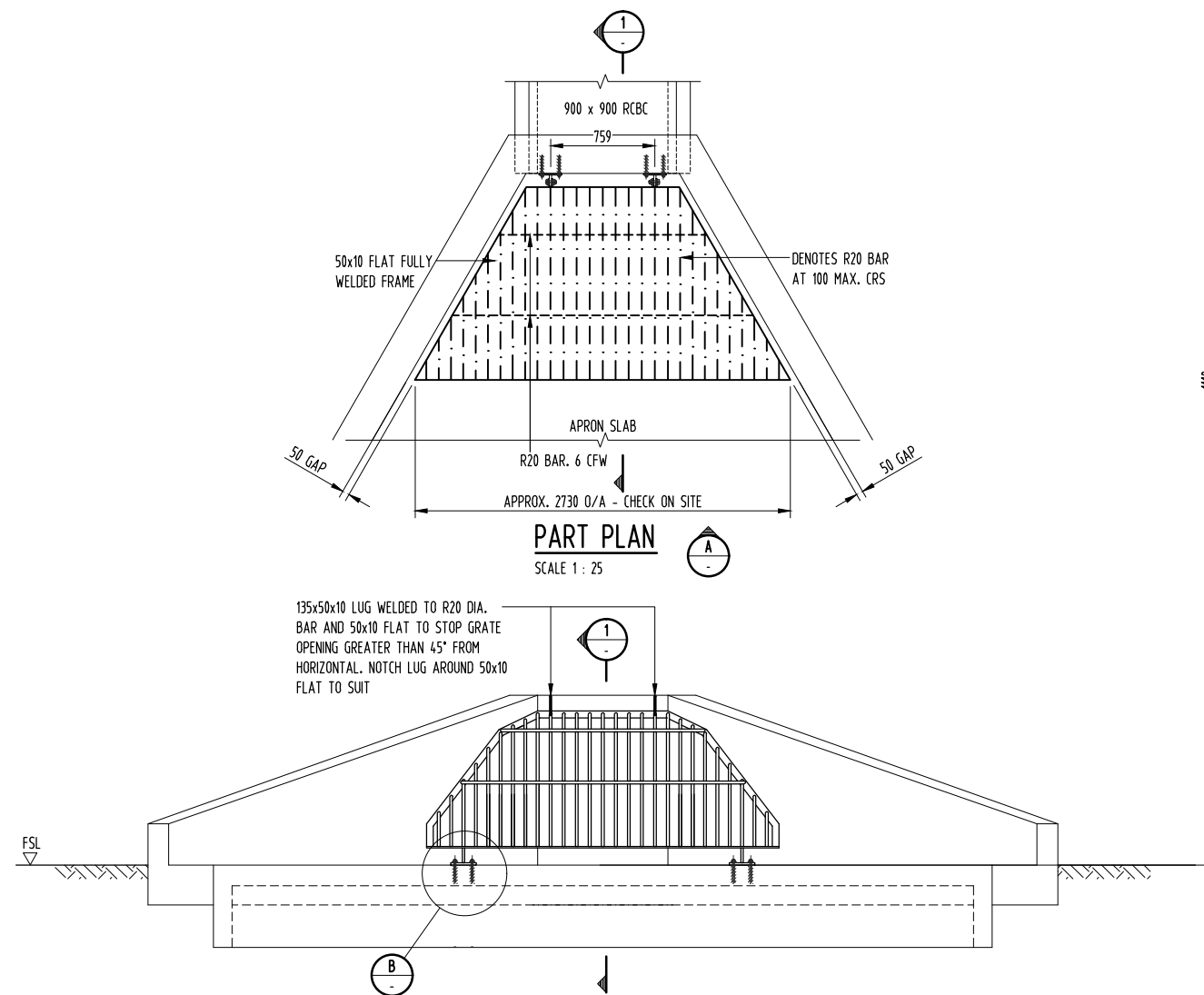
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN SHW	CHECKED KD
DATE DECEMBER 2016	DATE DECEMBER 2016
DESIGNED KD	CHECKED CS
DATE DECEMBER 2016	DATE DECEMBER 2016
DESIGN PROJECT LEADER RK	NTG PROJECT MANAGER J NOBLE
DATE DECEMBER 2016	DATE DECEMBER 2016



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
CULVERT 1 AND 3 - INLET SCREEN
PLAN AND DETAILS

NTG PROJECT No. LPD07941	NTG ASSET No. -	SHEET No. 30 OF 34	NTG DRAWING No. R16-4576	AMENDMENT 3	SHEET SIZE A1
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- NOTES:-**
- CHECK AND CONFIRM ALL DIMENSIONS ON SITE PRIOR TO FABRICATION OF STEELWORK.
 - ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
 - WORKMANSHIP AND MATERIALS TO COMPLY WITH AS4100, AS/NZS4600 AND AS/NZS1554.
 - ALL WELDS TO BE 6mm CONTINUOUS FILLET WELDS FOR FULL CONTACT OF MEMBERS UNLESS NOTED OTHERWISE. ELECTRODES TO BE LOW CARBON CLASSIFICATION E48XX, PRE-APPROVED TO AS/NZS1554.
 - ALL STEELWORK TO BE HOT DIP GALVANISED TO AS/NZS4680 AFTER FABRICATION.
 - REPAIR DAMAGE TO GALVANISED COATING TO AS/NZS4680. USE ORGANIC TWO-PACK ZINC RICH EPOXY COATING COMPLYING WITH AS/NZS3750.9 APPLIED IN TWO COATS EACH 50 MICRON, MINIMUM TOTAL DRY FILM THICKNESS 100 MICRONS.

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	RK	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

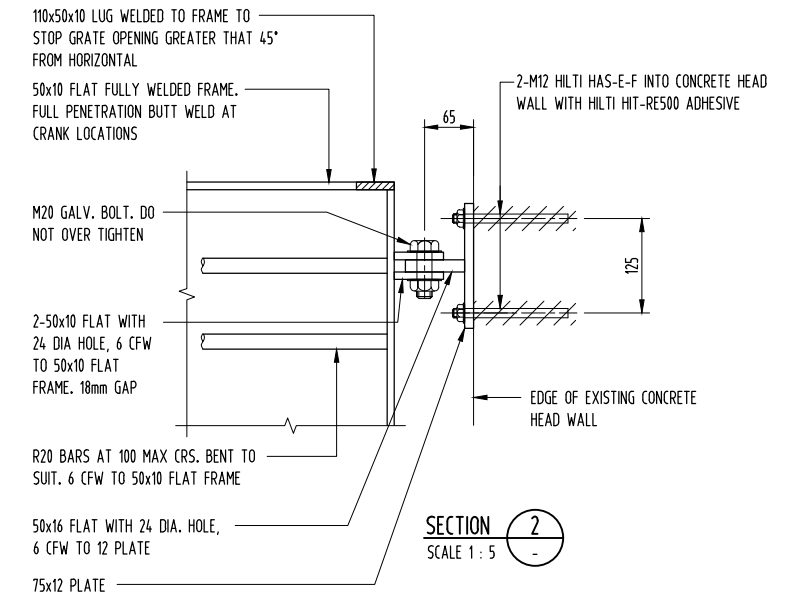
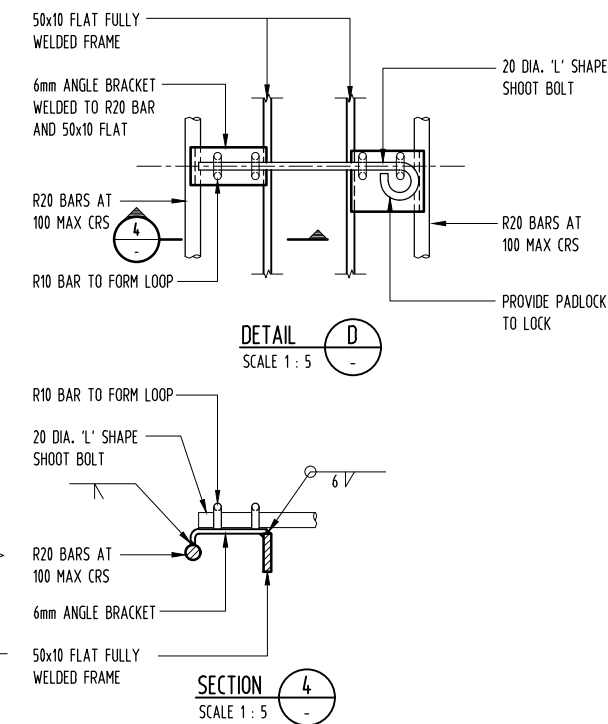
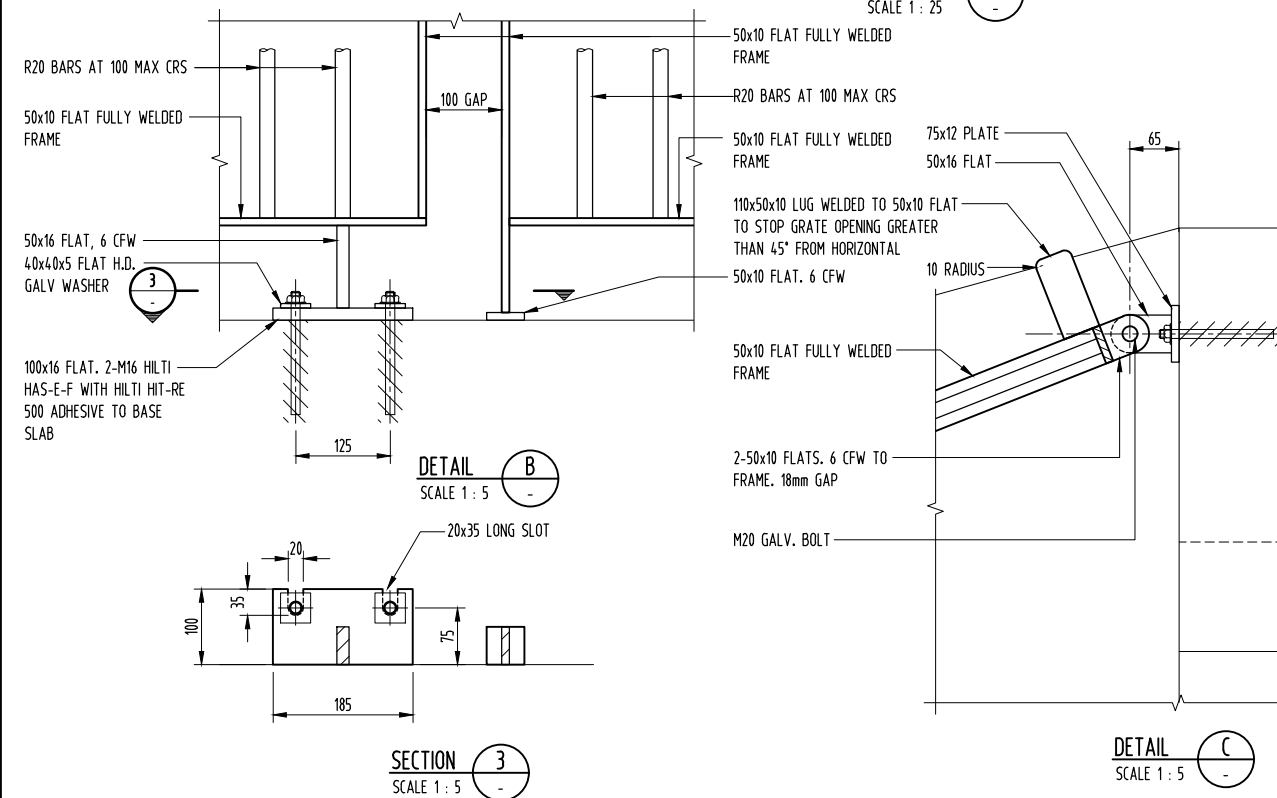
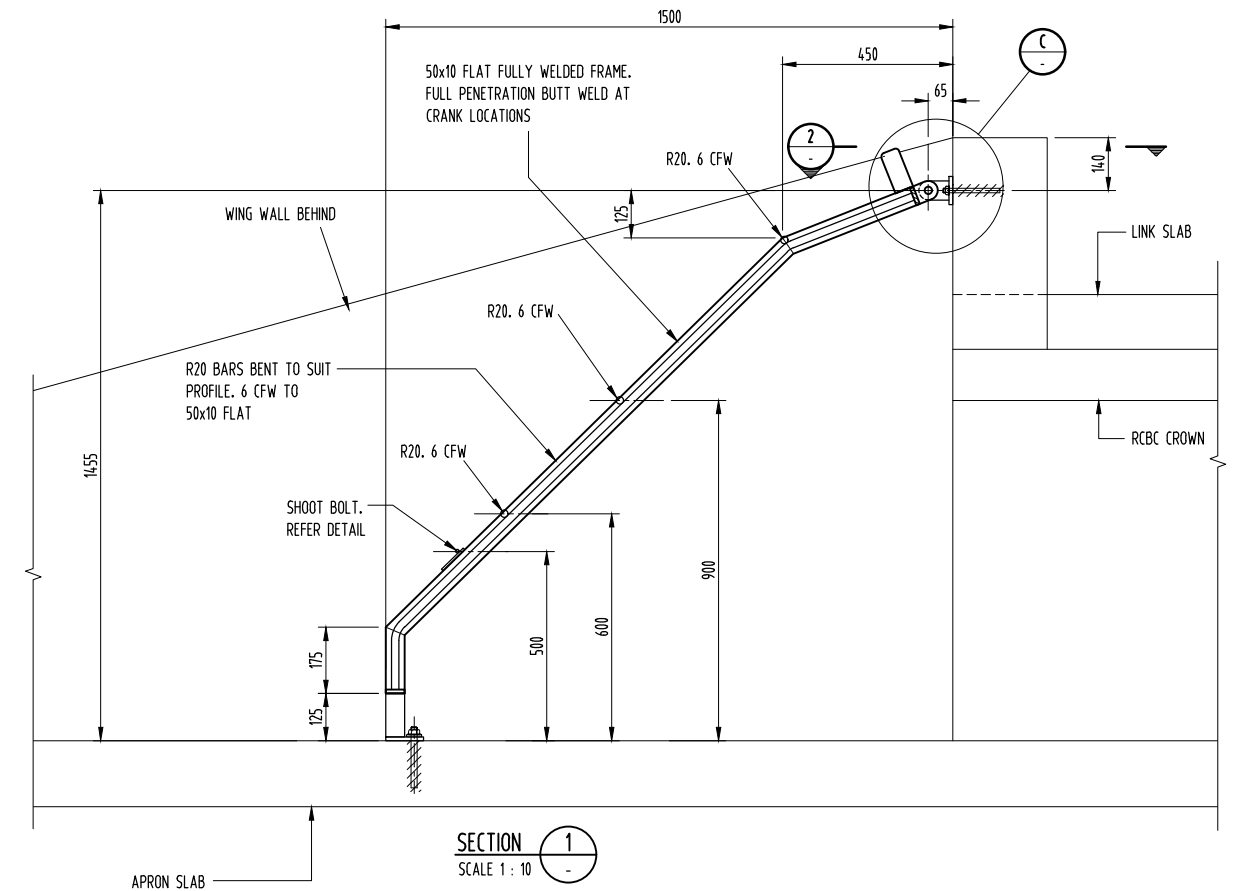
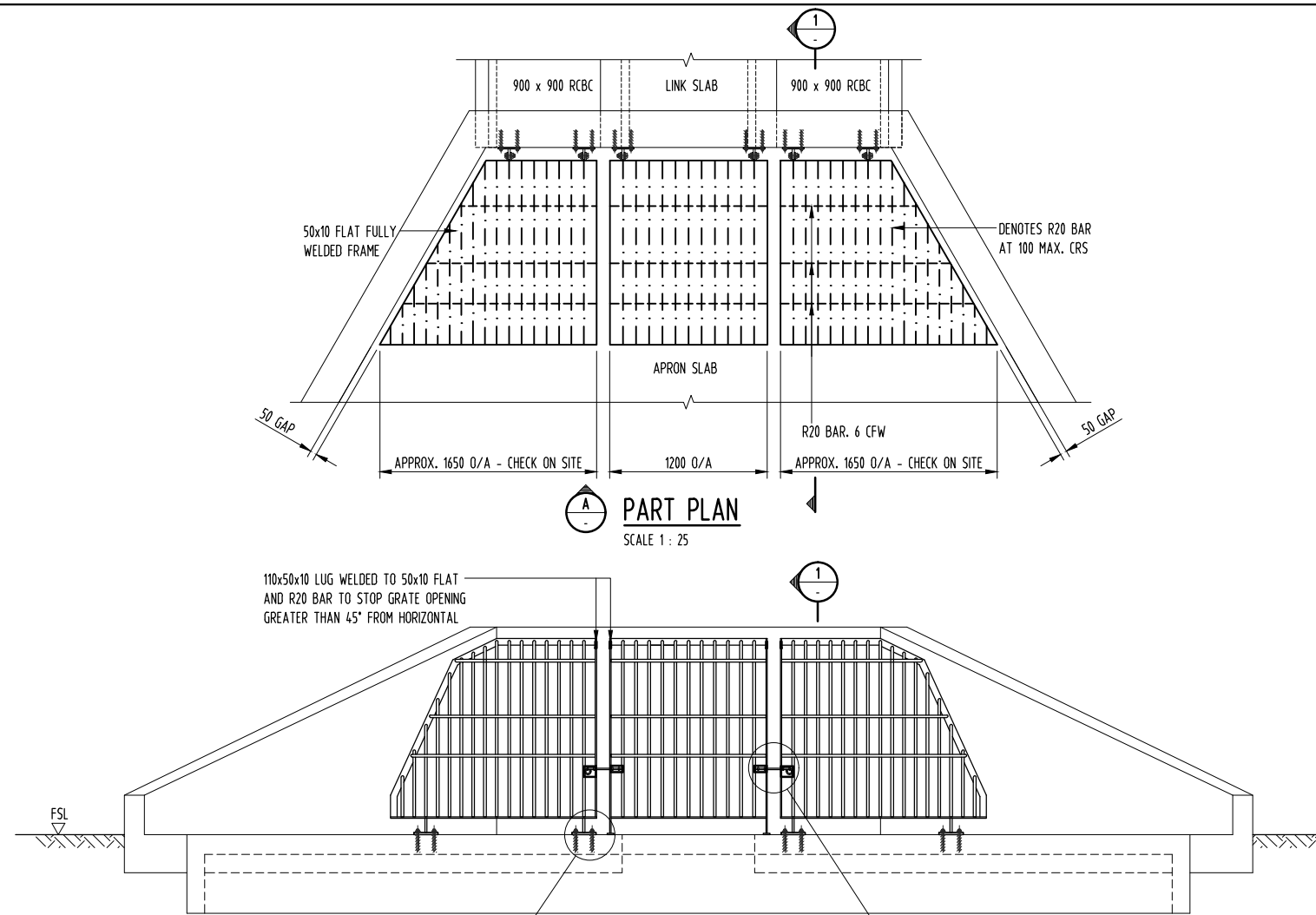
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	SHW	CHECKED	KD
DATE	DECEMBER 2016	DATE	DECEMBER 2016
DESIGNED	KD	CHECKED	CS
DATE	DECEMBER 2016	DATE	DECEMBER 2016
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	DECEMBER 2016	DATE	DECEMBER 2016



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
**CULVERT 4 - INLET SCREEN
PLAN AND DETAILS**

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07941	-	31 OF 34	R16-4577	3	A1



- NOTES:-**
1. CHECK AND CONFIRM ALL DIMENSIONS ON SITE PRIOR TO FABRICATION OF STEELWORK.
 2. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
 3. WORKMANSHIP AND MATERIALS TO COMPLY WITH AS4100, AS/NZS4600 AND AS/NZS1554.
 4. ALL WELDS TO BE 6mm CONTINUOUS FILLET WELDS FOR FULL CONTACT OF MEMBERS UNLESS NOTED OTHERWISE. ELECTRODES TO BE LOW CARBON CLASSIFICATION E48XX, PRE-APPROVED TO AS/NZS1554.
 5. ALL STEELWORK TO BE HOT DIP GALVANISED TO AS/NZS4680 AFTER FABRICATION.
 6. REPAIR DAMAGE TO GALVANISED COATING TO AS/NZS4680. USE ORGANIC TWO-PACK ZINC RICH EPOXY COATING COMPLYING WITH AS/NZS3750.9 APPLIED IN TWO COATS EACH 50 MICRON, MINIMUM TOTAL DRY FILM THICKNESS 100 MICRONS.

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	RK	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
AMENDMENTS				

JACOBS

A.C.N 001 024 095
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Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

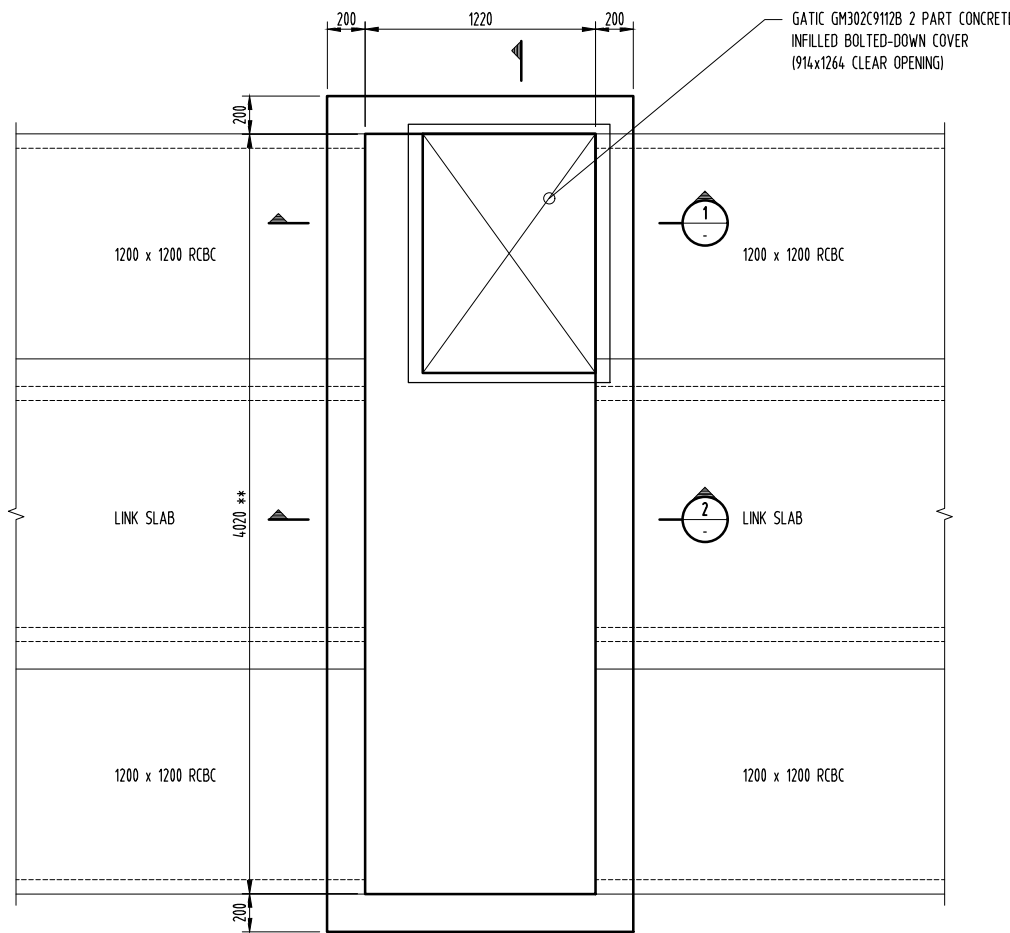
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	SHW	CHECKED	KD
DATE	DECEMBER 2016	DATE	DECEMBER 2016
DESIGNED	KD	CHECKED	CS
DATE	DECEMBER 2016	DATE	DECEMBER 2016
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	DECEMBER 2016	DATE	DECEMBER 2016



DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
**CULVERT 5 - INLET SCREEN
PLAN AND DETAILS**

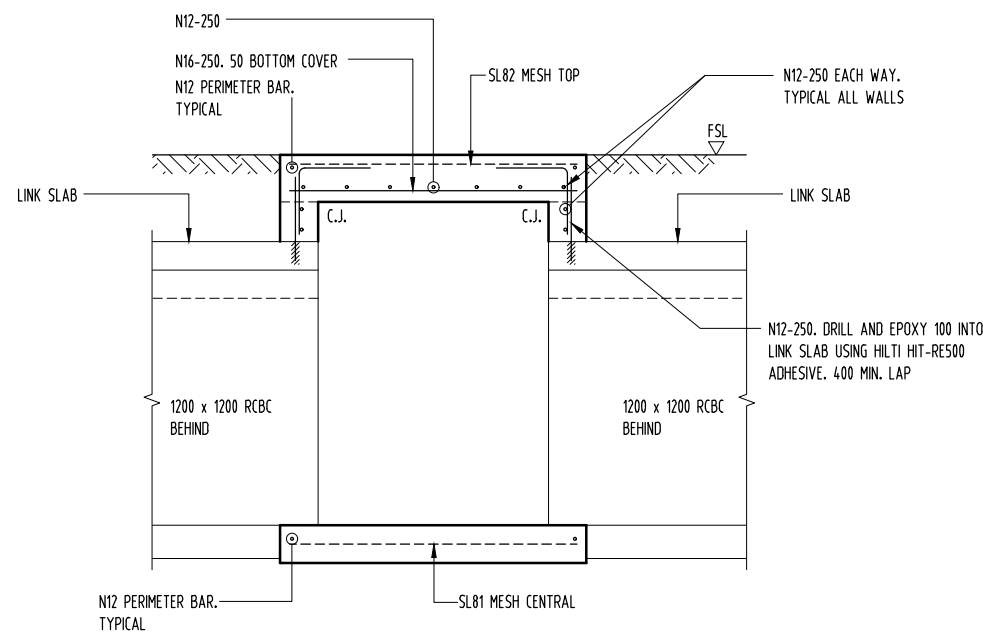
NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07941	-	32 OF 34	R16-4578	3	A1



REFER TO DRAWING R16-4557 FOR LOCATIONS

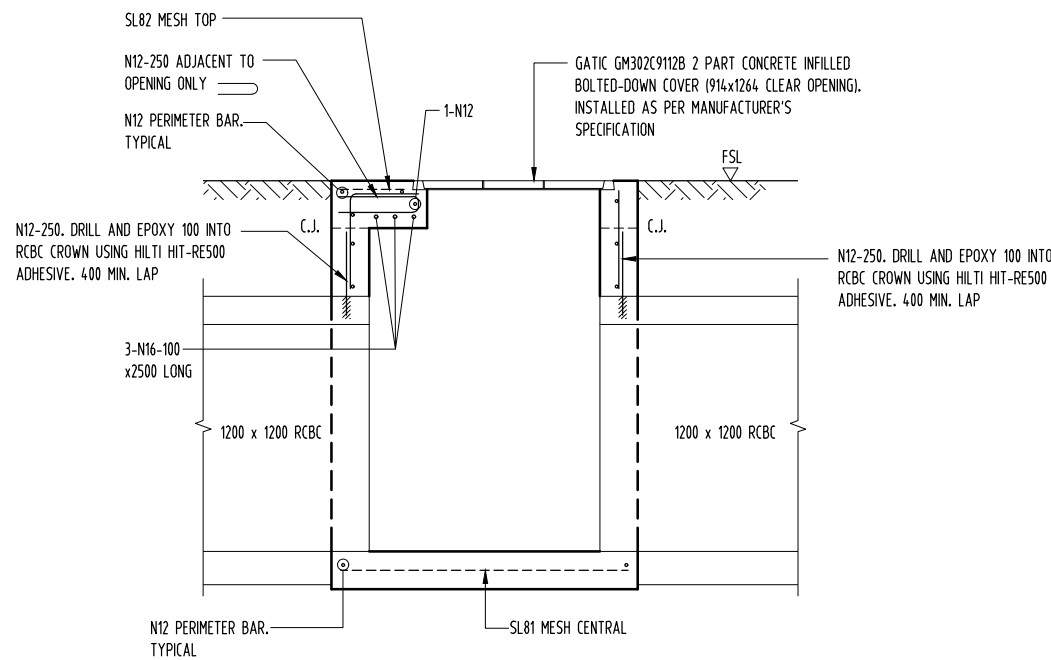
PLAN - CONCRETE

SCALE 1 : 20



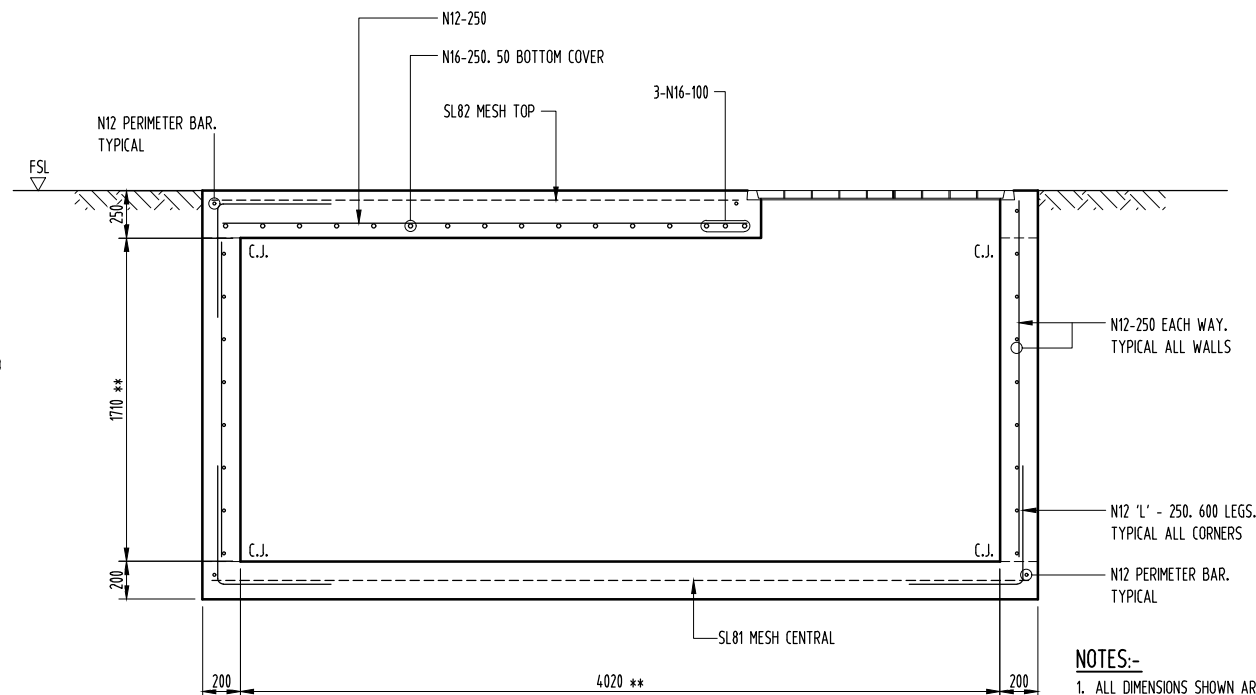
SECTION 2

SCALE 1 : 20



SECTION 1

SCALE 1 : 20



SECTION 3

SCALE 1 : 20

- NOTES:-**
1. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
 2. USE N40 CONCRETE AND 45 COVER UNLESS NOTED OTHERWISE.
 3. COMPLY WITH A.S.3600, A.S.3610 AND A.S.1379.
 4. REINFORCEMENT TO BE D500N BARS AND D500L MESH TO AS4671.
 5. DIMENSIONS SHOW THUS '**' ARE BASED ON ROCLA STANDARD PRECAST BOX CULVERTS.

3	CONTRACT DRAWING	16.02.18	RK	JACOBS
2	ISSUED FOR CONSTRUCTION	03.05.17	RK	JACOBS
1	REVISED TENDER ISSUE	31.03.17	PS	JACOBS
0	ISSUED FOR TENDER	03.03.17	PS	JACOBS
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
AMENDMENTS				

JACOBS

A.C.N 001 024 095
Jacobs Group (Australia) Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

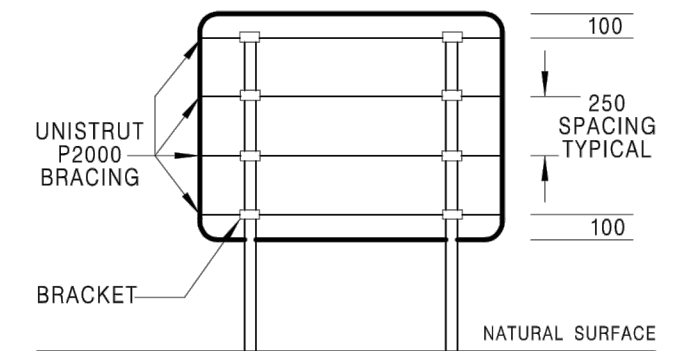
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.jacobs.com

DRAWN	SHW	CHECKED	KD
DATE	FEBRUARY 2017	DATE	FEBRUARY 2017
DESIGNED	KD	CHECKED	RJM
DATE	FEBRUARY 2017	DATE	FEBRUARY 2017
DESIGN PROJECT LEADER	RK	NTG PROJECT MANAGER	J NOBLE
DATE	FEBRUARY 2017	DATE	FEBRUARY 2017

Northern Territory Government

DARWIN REGION
RAPID CREEK FLOOD MITIGATION
MARRARA
**CULVERT 1 INSPECTION PIT
STRUCTURAL DETAILS**

NTG PROJECT No.	NTG ASSET No.	SHEET No.	NTG DRAWING No.	AMENDMENT	SHEET SIZE
LPD07941	-	33 OF 34	R16-4579	3	A1



NTG PROJECT No. LPD07941	NTG ASSET No. -	SHEET No. 34 OF 34	NTG DRAWING No. R16-4580	AMENDMENT 0	SHEET SIZE A1
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FENCE NOTES:

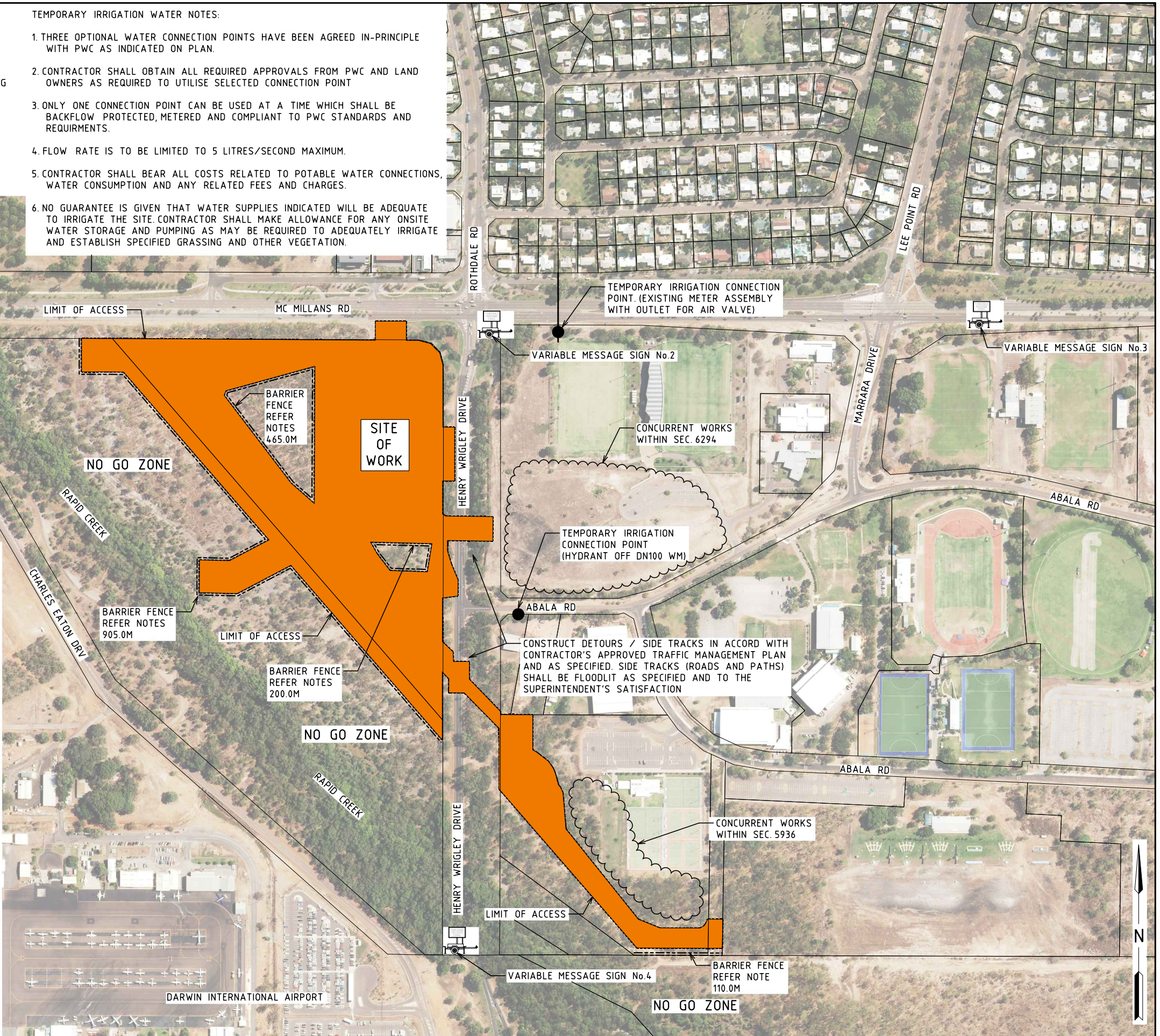
1. PRIOR TO COMMENCEMENT OF WORKS, CONTRACTOR SHALL ERECT TEMPORARY BARRIER FENCING IN LOCATIONS INDICATED NO BROADER THAN 'LIMIT OF ACCESS' PERIMETER.
2. FENCE ALIGNMENT IS TO BE SURVEYED AND PEGGED FOR APPROVAL BY SUPERINTENDENT PRIOR TO BEING ERECTED. TO PERMIT FENCE ERECTION MINIMAL CLEARING IS PERMITTED WITHIN 'LIMIT OF ACCESS' ONLY.
3. TEMPORARY BARRIER FENCE TO BE ALIGNED TO MINIMISE CLEARING OF EXISTING VEGETATION AND MAINTAINED FOR DURATION OF WORKS.
4. TEMP BARRIER FENCE (TOTAL LENGTH 1680M IN FOUR LOCATIONS) COMPRISES:
 - STAR PICKETS AND STRAINER POSTS AS REQUIRED
 - 3 STRANDS OF TENSIONED FENCING WIRE (GALV)
 - 1.0M HIGH UV STABILISED SHADE CLOTH (ORANGE)

TEMPORARY IRRIGATION WATER NOTES:

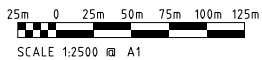
1. THREE OPTIONAL WATER CONNECTION POINTS HAVE BEEN AGREED IN-PRINCIPLE WITH PWC AS INDICATED ON PLAN.
2. CONTRACTOR SHALL OBTAIN ALL REQUIRED APPROVALS FROM PWC AND LAND OWNERS AS REQUIRED TO UTILISE SELECTED CONNECTION POINT
3. ONLY ONE CONNECTION POINT CAN BE USED AT A TIME WHICH SHALL BE BACKFLOW PROTECTED, METERED AND COMPLIANT TO PWC STANDARDS AND REQUIRMENTS.
4. FLOW RATE IS TO BE LIMITED TO 5 LITRES/SECOND MAXIMUM.
5. CONTRACTOR SHALL BEAR ALL COSTS RELATED TO POTABLE WATER CONNECTIONS, WATER CONSUMPTION AND ANY RELATED FEES AND CHARGES.
6. NO GUARANTEE IS GIVEN THAT WATER SUPPLIES INDICATED WILL BE ADEQUATE TO IRRIGATE THE SITE. CONTRACTOR SHALL MAKE ALLOWANCE FOR ANY ONSITE WATER STORAGE AND PUMPING AS MAY BE REQUIRED TO ADEQUATELY IRRIGATE AND ESTABLISH SPECIFIED GRASSING AND OTHER VEGETATION.

CONSTRUCTION ACCESS NOTES:

1. CONSTRUCTION ACCESSES, EGRESSSES AND HAULAGE ROUTES HAVE BEEN APPROVED IN-PRINCIPLE BY THE RELEVANT ROAD AUTHORITIES.
2. VEHICLE SIZES ARE RESTRICTED - REFER SPECIFICATION 'PROVISION FOR TRAFFIC'. ROUTES NOMINATED ARE LIMITED TO VEHICLES NO LARGER THAN 19.0m.
3. MASS HAULAGE VEHICLES, IRRESPECTIVE OF VEHICLE SIZE, SHALL BE LIMITED TO WORKING OUTSIDE OF PEAK TRAFFIC HOURS ON PUBLIC ROADS I.E 7:30AM TO 8:30AM AND 4:30PM TO 5:30PM.
4. PRIOR TO COMMENCEMENT OF WORKS CONTRACTOR TO OBTAIN ALL PERMITS AND APPROVALS FOR WORKS WITHIN ROAD RESERVES AND OBTAIN APPROVAL FROM THE RELEVANT ROAD AUTHORITY FOR ALL REQUIRED TRAFFIC MANAGEMENT PLANS.
5. VARIABLE MESSAGE SIGNS (VMS) LOCATIONS ARE INDICATIVE ONLY. ADDITIONAL VMSs MAY BE REQUIRED DEPENDING ON APPROVED TRAFFIC MANAGEMENT PLANS.
5. CONTRACTOR SHALL FOR THE DURATION OF WORKS MAINTAIN TWO WAY TRAFFIC AND PEDESTRIAN FLOW ON HENRY WRIGLEY DRIVE AT ALL TIMES FOR ALL VEHICLES AND USERS OF SHARED PATH
6. PRIOR TO COMMENCEMENT OF WORKS, CONTRACTOR SHALL ARRANGE JOINT INSPECTION WITH THE APPROPRIATE ROAD AUTHORITY AND SUPERINTENDENT AND PREPARE AN ASSET CONDITION (DILAPIDATION) REPORT DETAILING THE CURRENT CONDITION OF ROADS AND OTHER ASSETS THAT WILL OR MAY BE IMPACTED BY WORKS
7. PRIOR TO COMMENCEMENT OF WORKS, CONTRACTOR TO OBTAIN OCCUPATIONAL LICENCE FOR ALL WORKS WITHIN CROWN LAND AND APPROPRIATE PERMITS FROM CITY OF DARWIN (COD) FOR WORKS WITHIN COD LAND.
8. UPON COMPLETION OF WORKS, CONTRACTOR SHALL REINSTATE ALL DISTURBED AREAS OUTSIDE OF THE PERMANENT WORKS FOOTPRINT TO ORIGINAL CONDITION, AS SPECIFIED AND TO THE SATISFACTION OF THE SUPERINTENDENT.
9. CONTRACTOR SHALL AT ALL TIMES ENSURE UNRESTRICTED PUBLIC ACCESS TO THE DARWIN INTERNATIONAL AIRPORT, MARRARA SPORTING COMPLEX, DARWIN NETBALL ASSOCIATION AND ALL OTHER LOCAL BUSINESSES OR CLUBS.
10. CONTRACTOR SHALL LIAISE WITH AND COORDINATE WITH CONCURRENT CONSTRUCTION PROJECTS WITHIN ADJACENT PROPERTIES (BELOW) ENSURING ACCESS TO PROJECT SITES IS UNIMPEDED.
 - SECTION 6294, 23 ABALA ROAD, MARRARA AND;
 - SECTION 5936, 235 ABALA ROAD, MARRARA



2	CONTRACT DRAWING	21/02/18	G.T.	DIPL - LSE
1	ISSUED FOR CONSTRUCTION	17/05/17	G.T.	DIPL - MP
0	ISSUED FOR TENDER	17/02/17	G.T.	DIPL - MP
No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
AMENDMENTS				

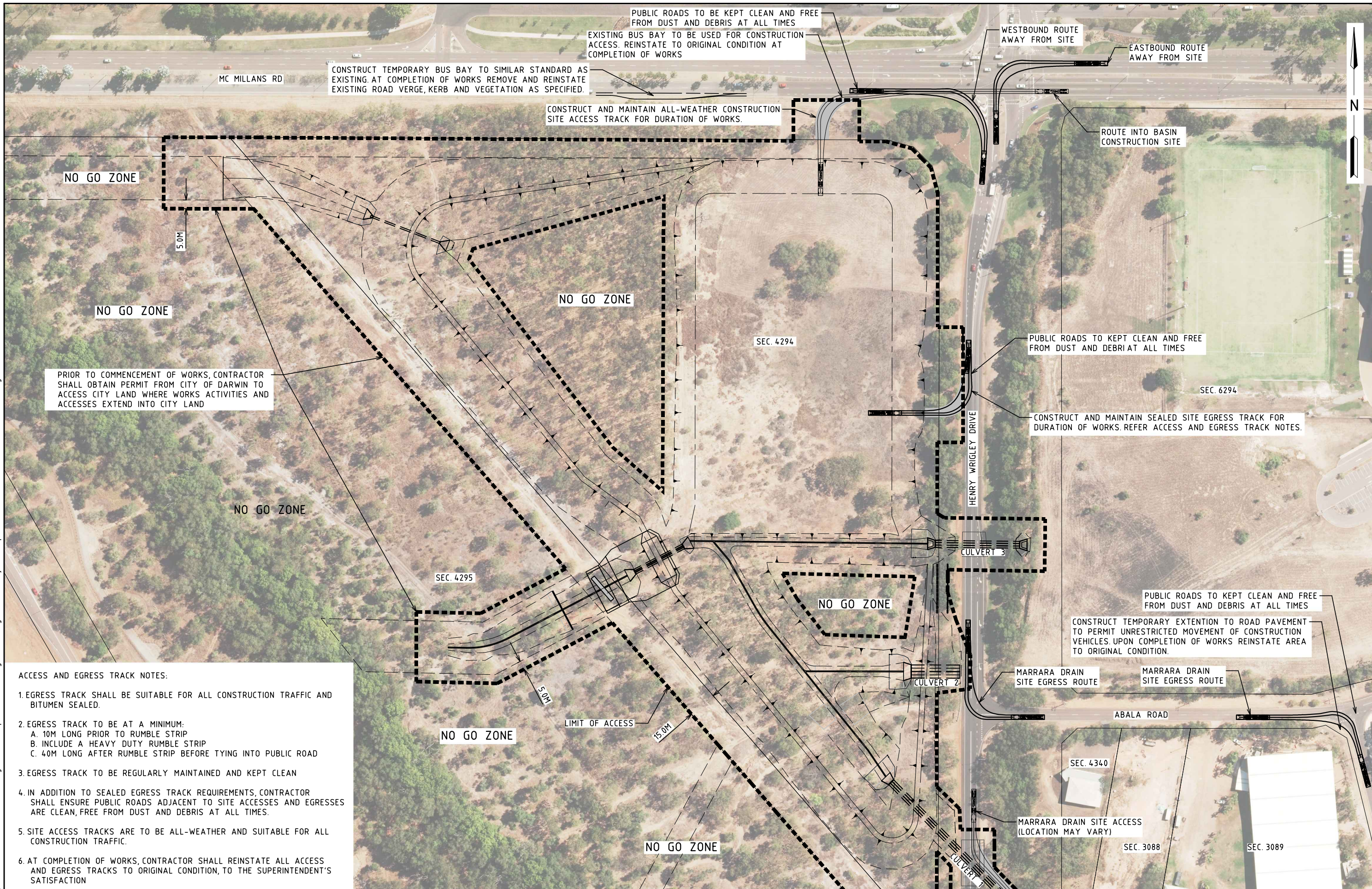


DRAWN	G.T.	CHECKED	J.N.
DATE	FEB 2017	DATE	FEB 2017
DESIGNED	G.T.	CHECKED	J.N.
DATE	FEB 2017	DATE	FEB 2017
DESIGN PROJECT LEADER		PROJECT MANAGER	
DATE		DATE	



DARWIN REGION - MARRARA RAPID CREEK FLOOD MITIGATION				
CONSTRUCTION ACCESS REQUIREMENTS - SHEET 1 MARRARA DRAIN AND RAPID CREEK DETENTION BASIN				
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND
LPD07941		1 OF 3	R17-1402	2
				SHEET SIZE
				A1

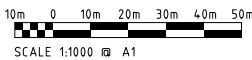
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ACCESS AND EGRESS TRACK NOTES:

- EGRESS TRACK SHALL BE SUITABLE FOR ALL CONSTRUCTION TRAFFIC AND BITUMEN SEALED.
- EGRESS TRACK TO BE AT A MINIMUM:
A. 10M LONG PRIOR TO RUMBLE STRIP
B. INCLUDE A HEAVY DUTY RUMBLE STRIP
C. 40M LONG AFTER RUMBLE STRIP BEFORE TYING INTO PUBLIC ROAD
- EGRESS TRACK TO BE REGULARLY MAINTAINED AND KEPT CLEAN
- IN ADDITION TO SEALED EGRESS TRACK REQUIREMENTS, CONTRACTOR SHALL ENSURE PUBLIC ROADS ADJACENT TO SITE ACCESSSES AND EGRESSSES ARE CLEAN, FREE FROM DUST AND DEBRIS AT ALL TIMES.
- SITE ACCESS TRACKS ARE TO BE ALL-WEATHER AND SUITABLE FOR ALL CONSTRUCTION TRAFFIC.
- AT COMPLETION OF WORKS, CONTRACTOR SHALL REINSTATE ALL ACCESS AND EGRESS TRACKS TO ORIGINAL CONDITION, TO THE SUPERINTENDENT'S SATISFACTION

2	CONTRACT DRAWING	21/02/18	G.T.	DIPL - LSE
1	ISSUED FOR CONSTRUCTION	20/05/17	G.T.	DIPL - MP
0	ISSUED FOR TENDER	20/02/17	G.T.	DIPL - MP
No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
AMENDMENTS				

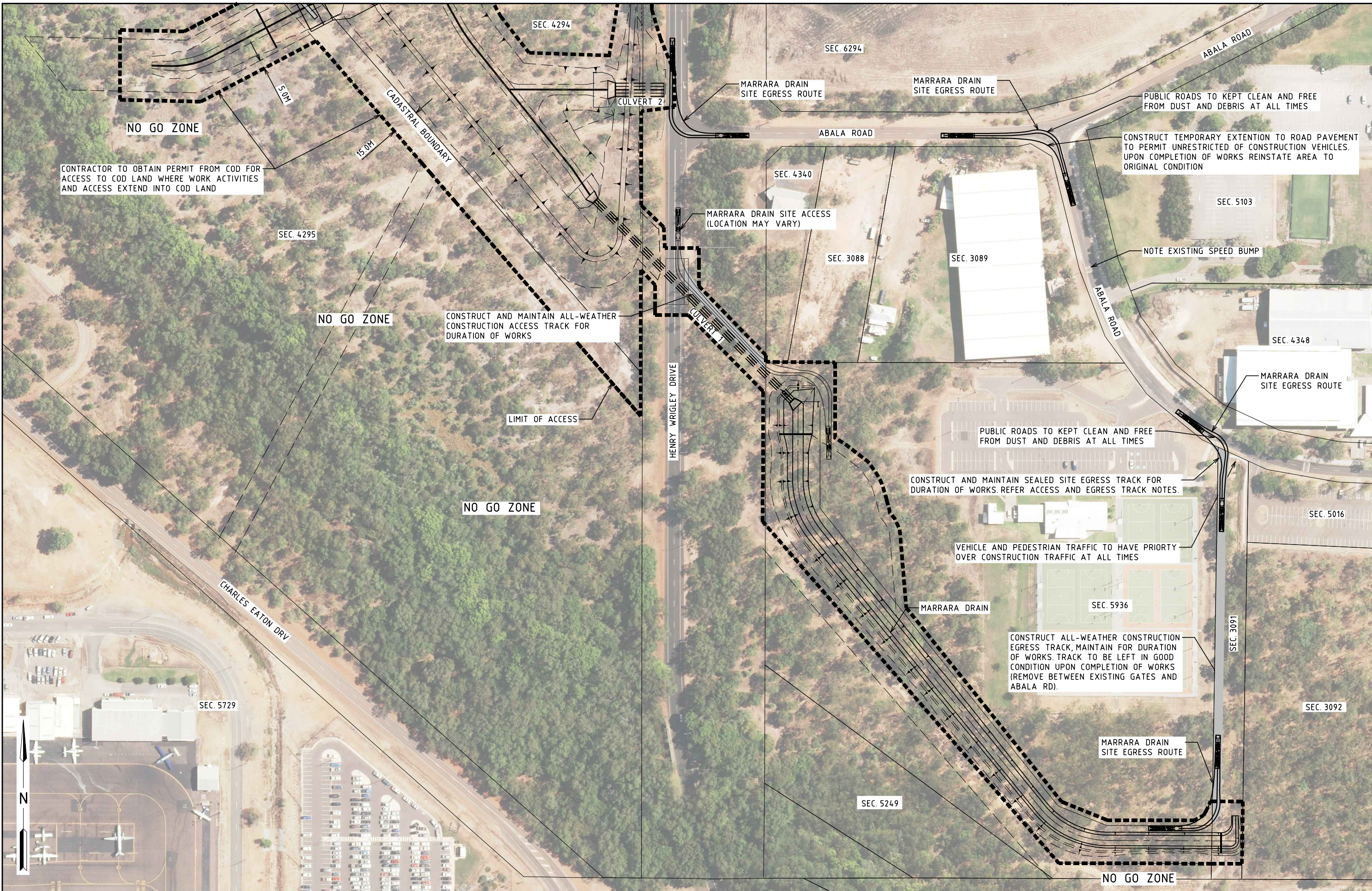


DRAWN G.T.	CHECKED J.N.
DATE FEB 2017	DATE FEB 2017
DESIGNED	CHECKED
G.T.	J.N.
DATE FEB 2017	DATE FEB 2017
DESIGN PROJECT LEADER	PROJECT MANAGER
DATE	DATE

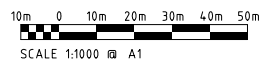


DARWIN REGION - MARRARA RAPID CREEK FLOOD MITIGATION				
CONSTRUCTION ACCESS REQUIREMENTS - SHEET 2 MARRARA DRAIN AND RAPID CREEK DETENTION BASIN				
FILE No. LPD07941	ASSET No.	SHEET No. 2 OF 3	DRAWING No. R17-1403	AMEND 2
				SHEET SIZE A1

21/02/2018 8:18:46 AM F:\Project Files\L P D\LPD07940 - Flood Mitigation\07941 Rapid Creek Flood Mitigation\02 Design Phase\06 Project Development\03 TM Site Access - Haul routes\R17-1404_2.dgn



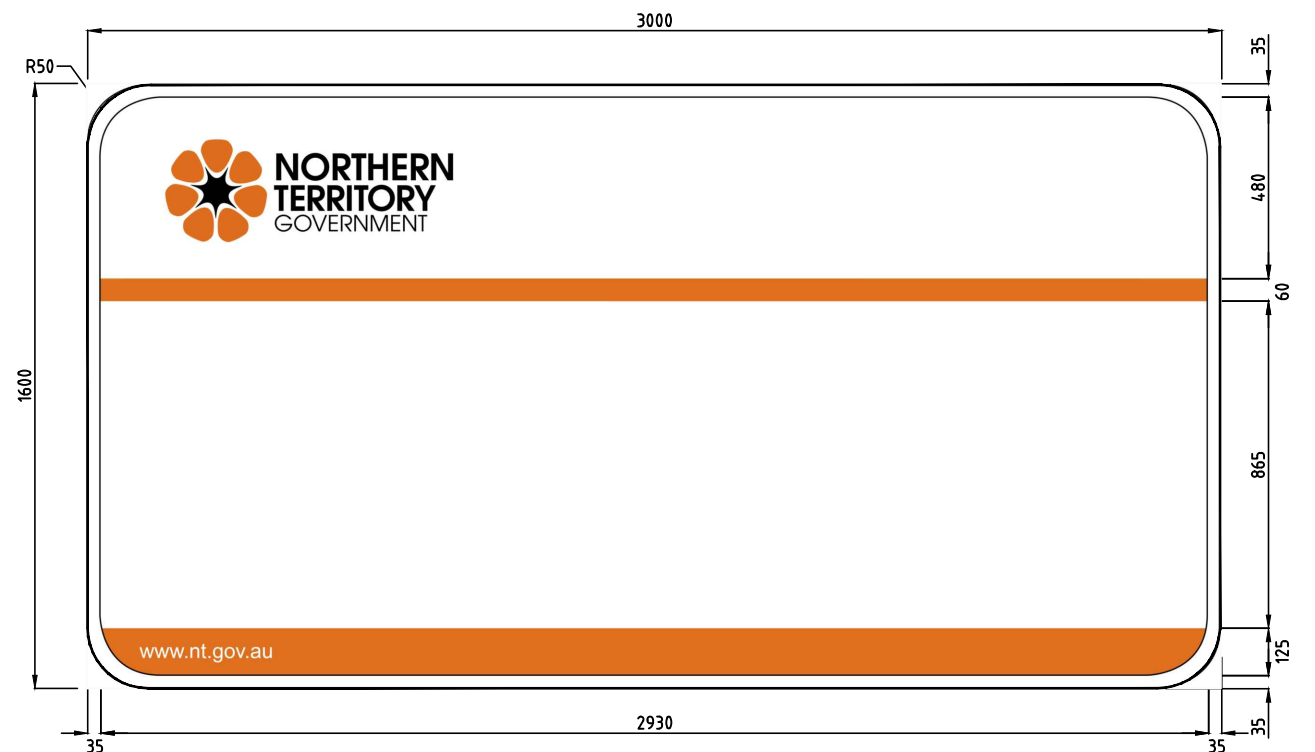
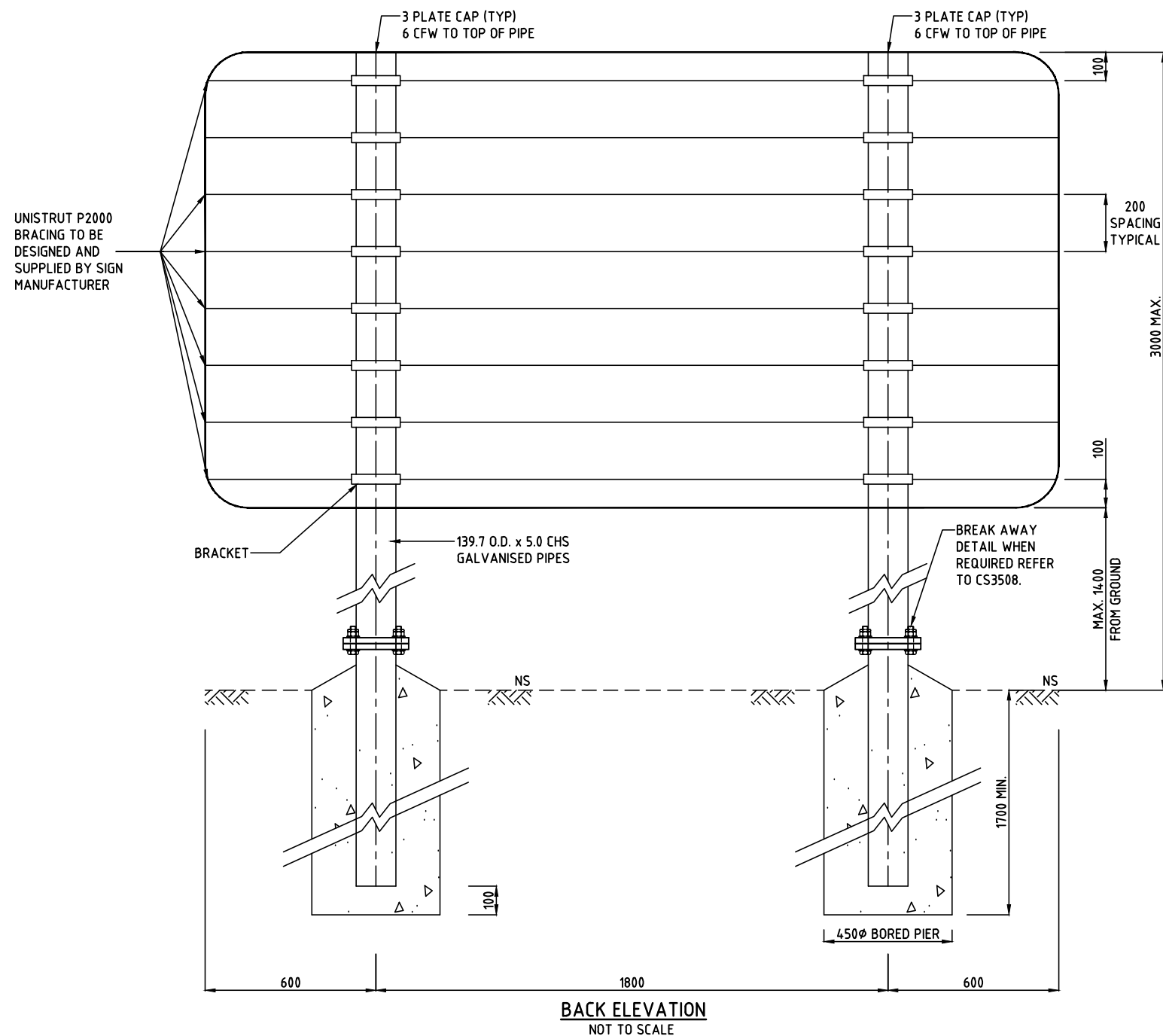
2	CONTRACT DRAWING	21/02/18	G.T.	DIPL - LSE
1	ISSUED FOR CONSTRUCTION	17/05/17	G.T.	DIPL - MP
0	ISSUED FOR TENDER	20/02/17	G.T.	DIPL - MP
No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
AMENDMENTS				



DRAWN G.T. DATE FEB 2017	CHECKED J.N. DATE FEB 2017
DESIGNED G.T. DATE FEB 2017	CHECKED J.N. DATE FEB 2017
DESIGN PROJECT LEADER	PROJECT MANAGER
DATE	DATE

 Northern Territory Government

DARWIN REGION - MARRARA RAPID CREEK FLOOD MITIGATION				
CONSTRUCTION ACCESS REQUIREMENTS - SHEET 3 MARRARA DRAIN AND RAPID CREEK DETENTION BASIN				
FILE No. LPD07941	ASSET No.	SHEET No. 3 OF 3	DRAWING No. R17-1404	AMEND 2
				SHEET SIZE A1



FRONT ELEVATION
NOT TO SCALE

PROGRAMME: INVESTMENT

EXCLUDES: ROAD TO RECOVERY, BLACK SPOTS PROGRAMME, BRIDGED RENEWAL PROGRAMME AND HEAVY VEHICLE SAFETY AND PRODUCTIVITY PROGRAMME.

SIGN:
NTG FUNDED

FONT:
ARIAL BLACK, ARIAL BOLD

COLOUR SPECIFICATIONS

PMS 159
C1 M72 Y100 K7
R203 G96 B21
Hex #CB6015

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

STRUCTURE:

- SIGN IS TO BE BRACED WITH 38mm x 38mm STEEL TUBING OR SIMILAR MATERIAL. FIXING OF SHEET TO BRACING TO BE DETERMINED BY THE MANUFACTURER.
- POSTS:
 - SIGN TO BE SUPPORTED BY 2/139.7 O.D. x 5 CHS. (MINIMUM) GALVANISED PIPES.
 - POST CENTRES TO BE 0.6m FROM THE EDGE OF THE SIGN ON BOTH SIDES.
- BOARD TO POST ATTACHMENTS:
 - POST SHOULD BE IN CONTACT WITH SIGN SHEETING BRACING OVER THE FULL HEIGHT OF THE SIGN.
 - SPOT WELDING OR BOLTING TO BRACING OR ATTACHMENTS TO BE APPROVED BY THE SUPERINTENDENT.
- FOOTING DETAIL:
 - POST HOLES TO BE 450mm DIA. AND 1700mm DEEP (BASED ON 100KPa SOIL BEARING PRESSURE CAPACITY. ENGINEER IS TO BE ADVISED IF SOIL IS LESS THAN 100KPa. THIS MAY BE MODIFIED IN ROCK AS DETERMINED BY THE SUPERINTENDENT.
 - POST TO BE SET IN 20mpa. CONCRETE.
- HORIZONTAL MEMBERS UNISTRUT P2000 BRACING AT 200mm CENTRES, 100mm IN FROM TOP AND BOTTOM EDGES.

- SIGN BOARD TO BE IN CONTACT WITH AND FIRMLY ATTACHED TO BRACING FOR FULL WIDTH AND FULL HEIGHT OF SIGN BOARD.
- ATTACHMENT SYSTEM TO BE APPROVED BY SUPERINTENDENT.
- BOTTOM EDGE OF SIGN BOARD TO BE MINIMUM 1000mm AND MAXIMUM 1500mm ABOVE NATURAL GROUND LEVEL (AVERAGE CROSS SLOPING SITES).

SIGN CONTENT (TEXT AND IMAGES):

- TEXT AND IMAGES TO BE PROVIDED BY THE SUPERINTENDENT BEFORE SIGN IS MANUFACTURED.
- CONTRACTOR WILL BE PROVIDED A PRINT-READY ELECTRONIC FILE SUITABLE FOR SIGN-WRITER PRODUCTION.

SIGN BOARD:

- SIGN BOARD TO BE SINGLE SHEET OF MARINE GRADE ALUMINIUM ALLOY DESIGNATION 5052-H38, 1600x3000, ALL CORNERS TO BE RADIUS AT 50mm.
- REFLECTIVE CLASS 2 ON ALUMINIUM BACKING PLATE.

APPROVALS:

- FOOTINGS TO BE INSPECTED BY STRUCTURAL ENGINEER PRIOR TO FILL WITH CONCRETE.

WARNING

BEWARE OF UNDERGROUND SERVICES.
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL
AMENDMENTS				

DRAWN J.LEESON	CHECKED S.HATZI
DATE JULY 2017	DATE JULY 2017
DESIGNED	CHECKED
DATE	DATE
DESIGN LEADER S.HATZI	DESIGN DIRECTOR S.JACKSON
DATE 1/09/2017	DATE 1/09/2017



STANDARD DRAWINGS PROJECT SIGNS					
NTG BRANDING SIGNAGE NTG FUNDED - ROAD AND BUILDINGS					
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3451	0	A1

GENERAL NOTES – CULVERT AND PIPE LAYING

DESIGN NOTES:

1. EXPOSURE CLASSIFICATION B1. DIMENSIONS INDICATING SLAB THICKNESS, STEEL COVER AND CONCRETE CLASS ARE SHOWN IN BRACKETS FOR ALT-RICH ARID AREAS AND TIDAL OR SPLASH ZONES (B2 & ABOVE). SPECIAL DESIGN ADVICE IS REQUIRED FOR AGGRESSIVE SOILS.
2. DESIGN LOADS HLP320, MS1600, A160, W80.
3. MAXIMUM FILL OF 2 METRES. SEEK DESIGN ADVICE FOR FILL HEIGHTS GREATER THAN 2 METRES.
4. ALLOWABLE BEARING PRESSURE FOR CULVERT BASES 150kPa.

GENERAL

5. ALL CONCRETE SHALL BE CLASS S32 (S40) UNLESS NOTED OTHERWISE.
6. CONCRETE COVER SHALL BE MIN. 55mm (75mm) UNLESS SHOWN OTHERWISE.
7. REINFORCING STEEL TO BE IN ACCORDANCE WITH AS/NZS 4671-2001.
DEFORMED BARS – GRADE D500N
ROUND BARS – R250N
DEFORMED WIRE – GRADE D500L
ALL REINFORCING STEEL TO BE ACRS CERTIFIED.
8. DOWELS, RESTRAINING PLATES HOT DIP GALVANISED TO AS 4680-2006.
9. LAPS SHALL BE MADE SO THAT THE TWO OUTERMOST WIRES OF ONE FABRIC OVERLAP WITH THE TWO OUTERMOST WIRES OF THE SHEET BEING LAPPED.



10. COMPLY WITH AS 3600-2009, AS 3610-1995 AND AS 1379-2007.
11. REINFORCING SHALL BE BE AS PER MINIMUM REINFORCING REQUIREMENTS TABLES.
12. MESH DENOTED 'SLXX' SHALL BE 'DL500SLXX' MESH TO AS 4671-2001 TYP.
13. MESH DENOTED 'RLXXX' SHALL BE 'D500RLXXX' MESH TO AS 4671-2001 TYP.
14. BARS NOTED 'N10' SHALL BE 'DN500N10' TO AS 4671-2001.

BACKFILL

- 15.
- 15.a. ALL BACKFILL TO BE IN ACCORDANCE WITH SECTION 12 OF THE STANDARD SPECIFICATION FOR ROADWORKS
- 15.b. BEDDING MATERIAL IN ACCORDANCE WITH SECTION 12 OF THE DEPARTMENTS STANDARD SPECIFICATION FOR ROADWORKS.
- 15.c. BACKFILL AROUND THE CULVERT FOR THE FULL WIDTH OF THE TRENCH AND FOR A MINIMUM 300mm ABOVE THE TOP OF THE CULVERT, OR TO SUBGRADE SURFACE IF LESS, WITH SELECT FILL.
16. BACKFILL THE REMAINDER OF THE TRENCH WITH STANDARD FILL.
17. STABILISE ALL FILL WITH 2% CEMENT BY MASS AND COMPACT TO 95% MMDD WHERE THE TRENCH OR EMBANKMENT LIES BENEATH A ROAD PAVEMENT.

WALLS FOR BOX CULVERTS

18. STRUCTURE REINFORCED THROUGHOUT WITH REINFORCEMENT AS PER MINIMUM REINFORCEMENT REQUIREMENTS. REINFORCEMENT SHALL BE CENTRALLY PLACED BOTH WAYS.
19. WHERE SPECIFIED, DOWNSTREAM END TO BE PROTECTED BY ROCK MATTRESS. REFER TYPICAL ROCK PROTECTION DETAILS, DRAWING CS3120
20. FOR MULTIPLE BOX CULVERTS, APRON AND INVERT SLAB TO BE CONTINUOUS.
21. HEADWALL ONLY TO BE PROVIDED FOR BOX CULVERTS UP TO AND INCLUDING 600 x 450 (REFER STD. DRAWING CS3102 FOR SIMILAR).
22. WEEPHOLES SHALL BE PROVIDED HORIZONTALLY AS FOLLOWS:
- WINGWALLS AND ABUTMENT WALLS, AT 1200 CRS,
 - HEADWALLS , A MINIMUM OF 2 WEEPHOLES FOR EACH CULVERT OR LINK SLAB,
 - LOCATION OF WEEPHOLES SHALL BE DETERMINED SUCH THAT REINFORCEMENT COVER REQUIREMENTS ARE MET,
 - A 300 x 300 x 150 NO FINES CONCRETE BLOCK OR APPROVED EQUIVALENT SHALL BE PROVIDED AT EACH WEEPHOLE AS A DRAINAGE FILTER
23. APRONS – A CONTINUOUS REINFORCED CONCRETE APRON IS TO BE PROVIDED BETWEEN THE WALLS WHEN Hw > 3000. WHERE THE WIDTH BETWEEN THE WALLS MAKES A CONTINUOUS APRON UNECONOMIC, THE WALL DESIGN SHOULD BE REFERRED TO A STRUCTURAL ENGINEER. WHERE REINFORCED WINGWALLS ARE USED, REFER STANDARD DRAWING CS3105 FOR APRON DETAILS. PROTECTION WORKS AT OUTLETS AND INLETS ARE TYPICAL AND MAY BE VARIED AS SHOWN IN DOCUMENTS. IF APRONS ARE SPECIFIED, APRON LENGTHS SHALL BE NOMINALLY BETWEEN ENDS OF THE WINGS AS DRAWN. ANY EXTENDED OR REDUCED LENGTH WILL BE SHOWN ON THE DRAWINGS.
24. MESH TYPE D1 & D2 BARS MAY BE VARIED FOR THE APPROXIMATE VALUE OF 'hw' USED IN THE LOWER PARTS OF THE WING. 'T' IS A CONSTANT THICKNESS BASED ON THE MAXIMUM HEIGHT 'Hw'.
25. EXCESS BAR LENGTH PROTRUDING OUTSIDE THE DIMENSIONS OF THE WALL OR FOOTING SHALL BE CUT TO PROVIDE THE MINIMUM COVER.
26. INFILL BETWEEN LEGS OF MULTIPLE CULVERTS IS ACHIEVED BY PLACING N32/20 (N40/20) CONCRETE PLUGS OF 250 MINIMUM LENGTH AT BOTH ENDS OF THE STRUCTURE AND INFILL THE REMAINING GAP WITH 1:10 LEAN MIX HAVING MAXIMUM AGGREGATE SIZE OF 10mm PACKED DRY. DO NOT USE FLUID GROUT AS HYDROSTATIC HEAD WILL DAMAGE CULVERT LEGS. (WHERE HEADWALLS ARE REQUIRED FOR MULTIPLE CULVERT WITHOUT WINGWALLS, REFER TO THE HEADWALL ANCHORING PROVISIONS DETAIL.)

27. HOLDING DOWN ANCHORS ARE TO BE INSTALLED WHERE THE LEG(S) OF THE CROWN UNIT EXTEND MORE THAN 300 BEYOND THE OUTSIDE FACE OF THE HEADWALL. NIBS ARE NOT REQUIRED FOR THESE CROWN UNITS. WHERE NIBS ARE REQUIRED, THEY ARE TO EXTEND FOR THE FULL LENGTH OF ALL OTHER UNITS.
28. LEAN MIX CONCRETE IS ONLY TO BE PLACED BETWEEN SPANNING SLABS ON CROWN UNIT CELLS. LEAN MIX CONCRETE INFILL IS NOT REQUIRED ON THE OUTERMOST CROWN UNITS.
29. CROWN UNIT RESTRAINING PLATES ARE REQUIRED ON THE OUTER 3 OF ALL INTERNAL CELLS WHEN SLAB LINK BOX CULVERT > 5 CELLS WHEN CROWN UNITS ≥ 1800 HIGH, AND 1200 LONG, ARE USED.

WALLS FOR R.C. PIPES

30. STRUCTURE REINFORCED THROUGHOUT WITH REINFORCEMENT AS PER MINIMUM REINFORCEMENT REQUIREMENTS. REINFORCEMENT SHALL BE CENTRALLY PLACED BOTH WAYS.
31. WHERE SPECIFIED, DOWNSTREAM END TO BE PROTECTED BY ROCK MATTRESS. REFER TYPICAL ROCK PROTECTION DETAILS, DRAWING CS3120.
32. FOR MULTIPLE PIPES, APRON AND INVERT SLAB TO BE CONTINUOUS.
33. WEEPHOLES SHALL BE PROVIDED HORIZONTALLY AS FOLLOWS:
- WINGWALLS AND ABUTMENT WALLS, AT 1200 CRS,
 - HEADWALLS , A MINIMUM OF 2 WEEPHOLES FOR EACH CULVERT OR LINK SLAB, LOCATION OF WEEPHOLES SHALL BE DETERMINED SUCH THAT REINFORCEMENT COVER REQUIREMENTS ARE MET,
 - A 300 x 300 x 150 NO FINES CONCRETE BLOCK OR APPROVED EQUIVALENT SHALL BE PROVIDED AT EACH WEEPHOLE AS A DRAINAGE FILTER

INSTALLATION

34. "D" DENOTES EXTERNAL DIAMETRE OF CULVERT.
35. FOUNDATION BEDDING:
- C R.C. PIPES
100 IF ID < 1350
150 IF ID ≥ 1350
 - H PRECAST BOX CULVERTS
75 MIN. IN FIRM MATERIAL OTHER THAN ROCK
150 MIN. IN ROCK
36. SPACING BETWEEN MULTIPLE CULVERTS
- S* R.C. PIPES
300 WHEN NOMINAL ID ≤ 600
600 WHEN NOMINAL ID > 600 AND ≤ 1800
900 WHEN NOMINAL ID > 1800
37. WINGWALLS FILL/BACKFILL MATERIAL SHALL BE PLACED 300mm THICK BEHIND WINGWALLS FOR THE LENGTH AND HEIGHT OF THE WINGS.
38. TRENCH WALL COMPACTION OF NATURAL GROUND OR EMBANKMENT MINIMUM 90% STANDARD FOR MINIMUM 2.5D EACH SIDE OF TRENCH WALL AND TO A MINIMUM DEPTH OF 0.7D.
39. WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLES AS PER AS 3725-2007. ALLOWANCE FOR CONSTRUCTION LOADS SHALL COMPLY WITH STANDARD SPECIFICATION.
40. MINIMUM DEPTH OF OVERLAY ZONE ABOVE PIPES/CULVERTS AS SHOWN MAY INCLUDE PAVEMENT. PAVEMENT WITHIN THIS AREA TO BE COMPACTED BY HAND OR ALTERNATIVELY A LEAN MIX CONCRETE PAVEMENT LAYER MAY BE USED.

HOLDING DOWN ANCHORS

41. HEXAGONAL BOLTS AND SCREWS M20 GRADE 4.6 TO AS 1111-2015 WITH M20 NUTS AND WASHERS GRADE 5 TO AS 1112-2015 AND AS 1237.1-2002, HOT DIPPED GALVANISED TO AS 1214-20016.
42. STEEL BRACKETS SHALL BE GRADE 250 TO AS 3679.1-2016. BRACKETS TO BE HOT DIPPED AFTER FABRICATION TO AS 4534-2006, AS 4680-2006 AND AS 4792-2006.
43. APPROVED MILD STEEL FERRULE WITH CROSS BAR FOR USE IN PRECAST BASE SLABS:
- (a) LENGTH 65, THREAD DEPTH 32, FOR P.C. BASE SLABS 80 THICK OR GREATER.
 - (b) TO TAKE HEXAGONAL SCREW M20 x 45 TO AS 1111-2015.
 - (c) CROSS HOLED TO TAKE 12 x 250 M.S. BAR.
 - (d) FERRULE AND CROSS BAR TO BE HOT DIPPED GALVANISED TO AS 1214-2016.
 - (e) FERRULE LOCATED 300 FROM ENDS TO MATCH CORED HOLES IN CROWN UNITS. (IF PRECAST BASE UNITS ARE LESS THAN 80mm THICK, THE FERRULES LENGTH, THREAD DEPTH AND SCREW LENGTH ARE TO BE REDUCED IN ORDER TO MAINTAIN CLEAR COVER OF 15).
44. HOLDING DOWN BOLTS TO BE PLACED IN DRILLED 30 DIA. HOLES AND GROUTED WITH 1:2 CEMENT SAND GROUT AFTER PLACING CROWNS.

PIPES

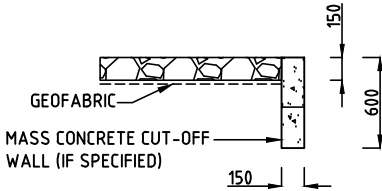
44. FOR PIPE CLASS, REFER TO MANUFACTURERS SPECIFICATION. DESIGNER TO NOMINATE PIPE CLASS.
45. MANUFACTURER TO PROVIDE CERTIFICATION OF PIPE CLASS OF CULVERTS DELIVERED TO SITE.

DEFINITIONS

- 46.
- (A) RCBC – REINFORCED CONCRETE BOX CULVERT
 - (B) SLBC – SLAB LINK BOX CULVERT

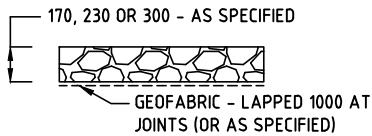
CULVERT WINGWALL LENGTH CALCULATIONS (W1 AND W2)

DESCRIPTION	SYMBOL
INTERNAL DIAMETRE OF A PIPE CULVERT OR INTERNAL HEIGHT OF A BOX CULVERT	D
THICKNESS OF PIPE OR BOX CULVERT	T
EXTERNAL DIAMETRE OF PIPE CULVERT OR EXTERNAL HEIGHT OF BOX CULVERT	D2
SKREW ANGLE	φ
WINGWALL ANGLE 1	α
WINGWALL ANGLE 2	β
BATTER SLOPE	1 IN 'S' (1 VERTICAL METRE TO 'S' HORIZONTAL METRE)
HEADWALL THICKNESS	300mm (UNLESS NOTED OTHERWISE)



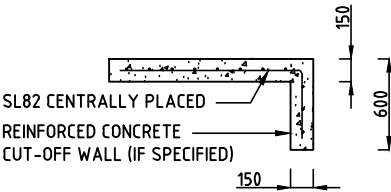
TYPE 1 APRON

GROUTED ROCK PITCHING (FOR CULVERT OUTLET PROTECTION)



TYPE 2 APRON

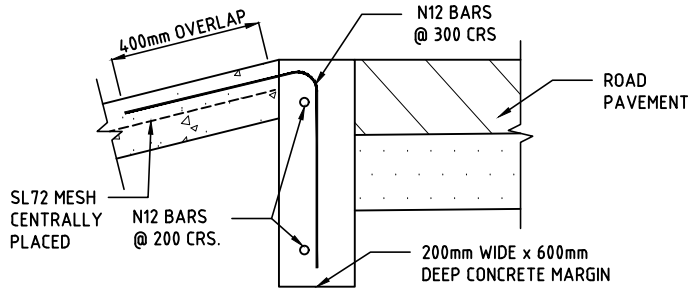
ROCK FILLED WIRE MATTRESSES (FOR CULVERT OUTLET PROTECTION AND FLOODWAY PROTECTION)



TYPE 3 APRON

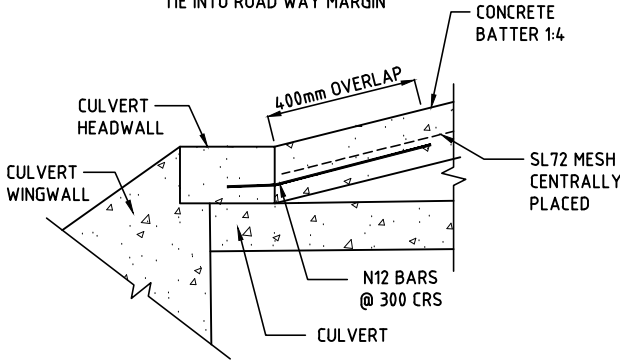
REINFORCED CONCRETE (FOR CULVERT OUTLET PROTECTION AND FLOODWAY PROTECTION)

APRON TYPES



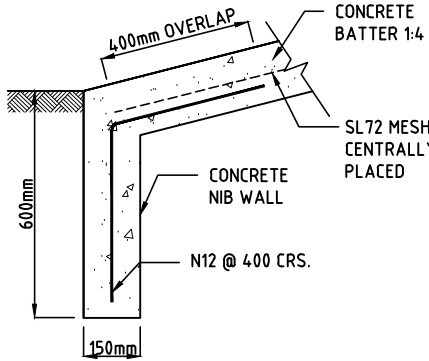
DETAIL 1

CONCRETE APRON/BATTER PROTECTION TIE INTO ROAD WAY MARGIN



DETAIL 2

CONCRETE BATTER PROTECTION TIE INTO CULVERT HEADWALL



DETAIL3

CONCRETE APRON/BATTER PROTECTION TOE DETAIL

CONCRETE BATTER DETAILS

THIS DRAWING IS DERIVED FROM QLD MAIN ROADS STANDARD DRAWING FOR CULVERT NOTES AND ADOPTED FOR THE NT CONDITIONS.

0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL
No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
AMENDMENTS				

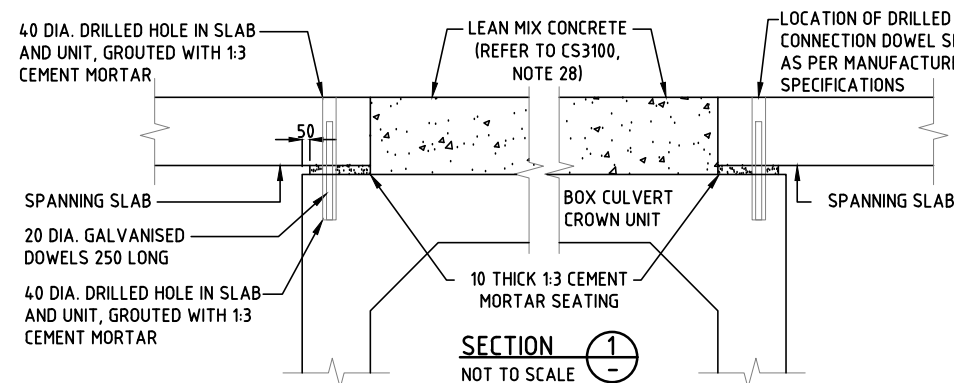
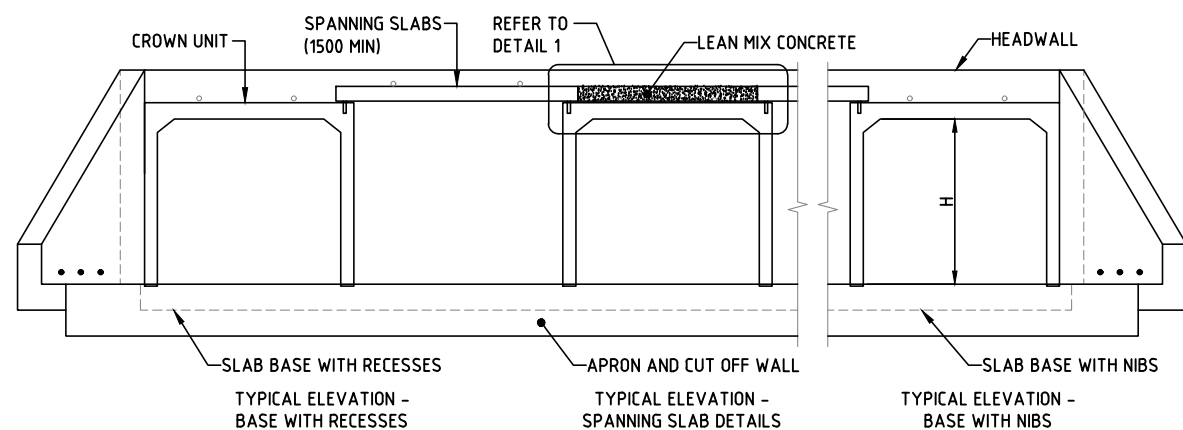
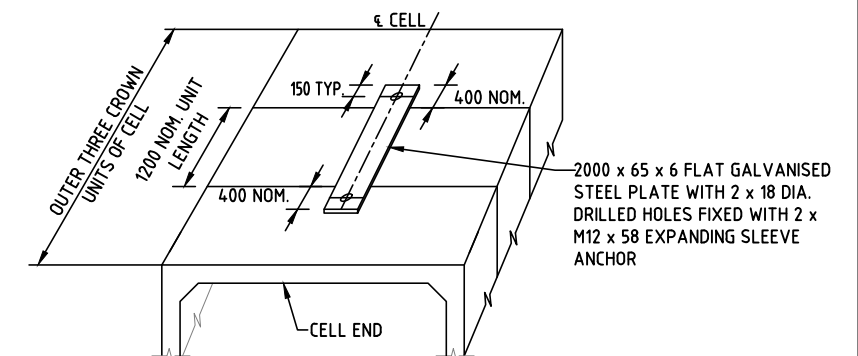
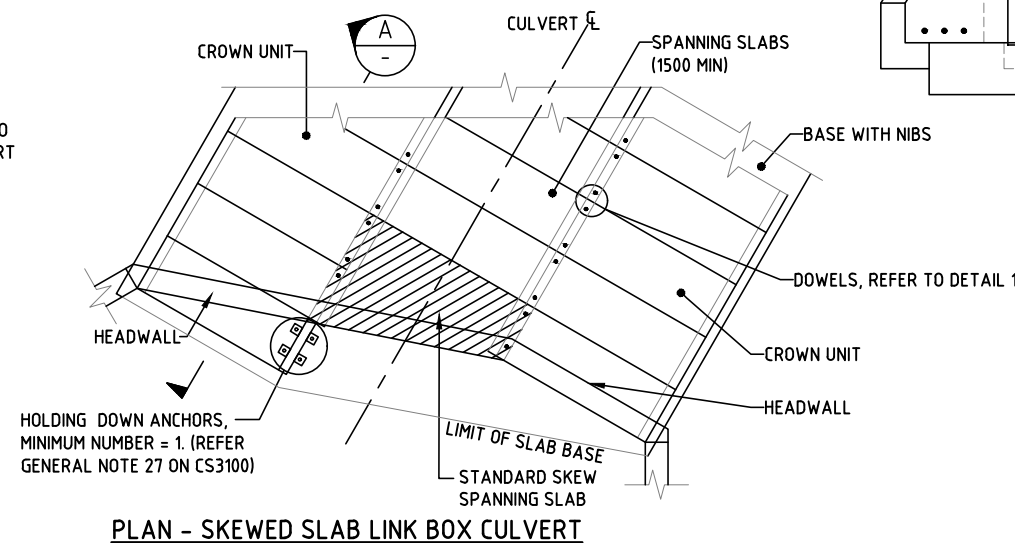
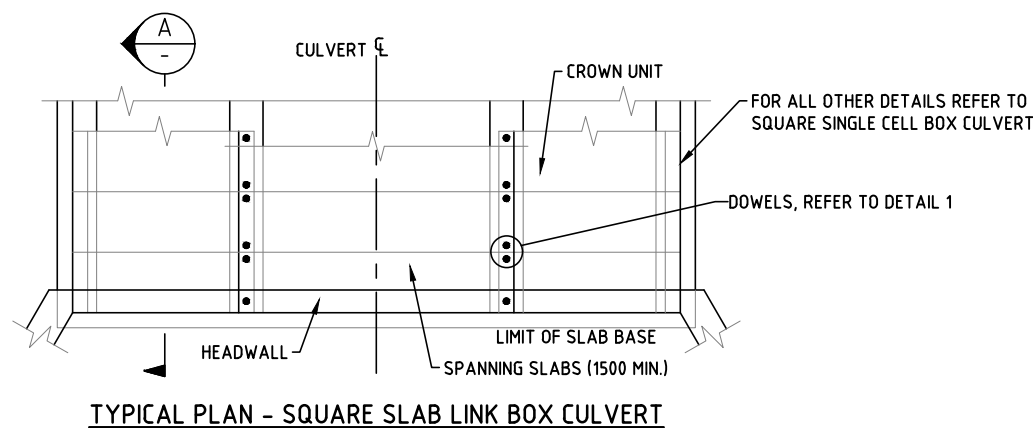
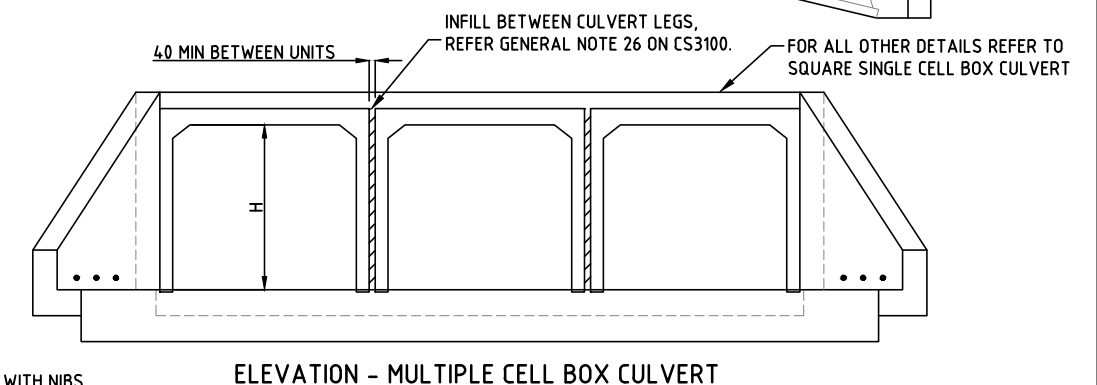
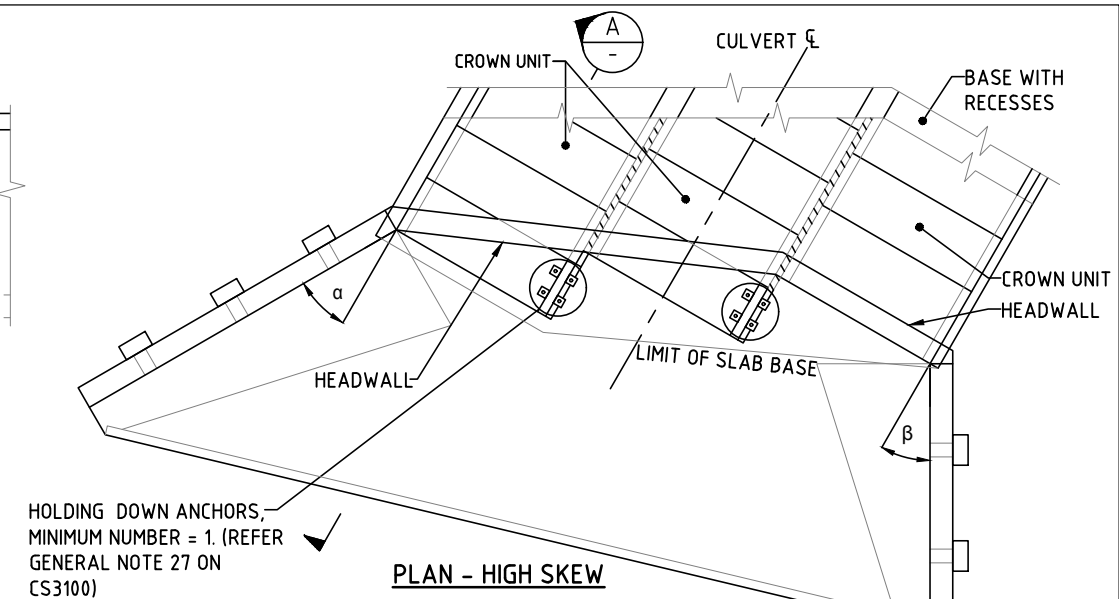
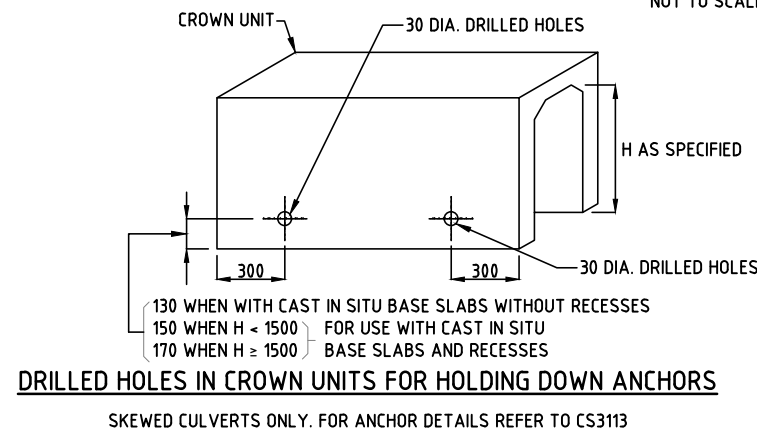
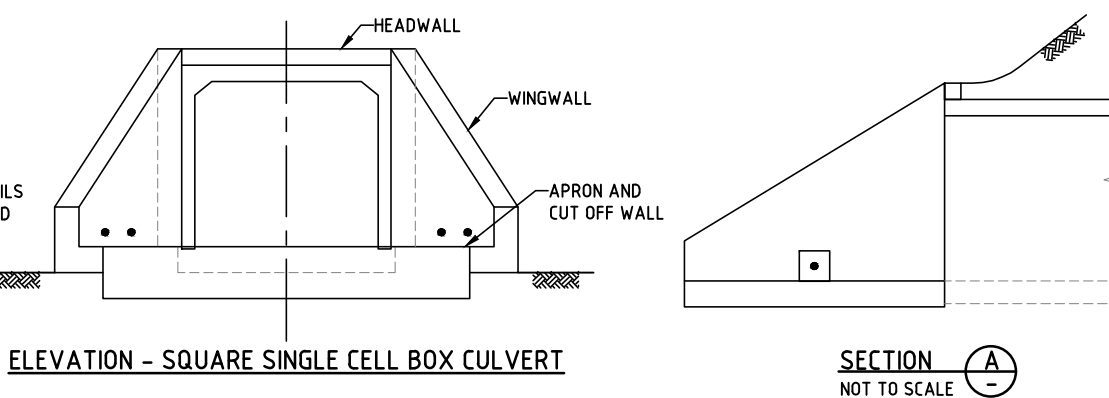
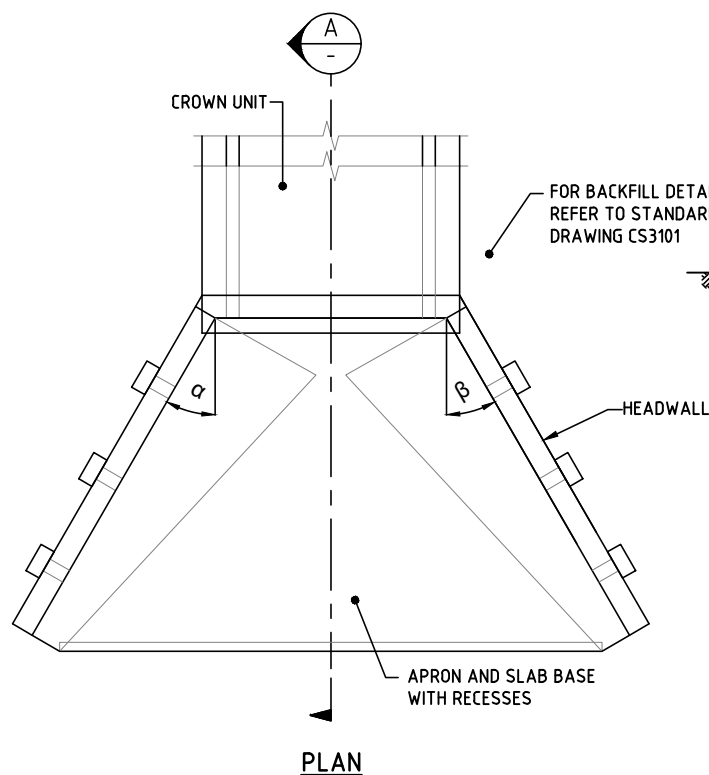
WARNING

BEWARE OF UNDERGROUND SERVICES.
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DRAWN	A.R	CHECKED	L.Mc
DATE	DEC 2012	DATE	DEC 2012
DESIGNED	QLD	CHECKED	QLD
DATE		DATE	
DESIGN LEADER	S.HATZI	DESIGN DIRECTOR	S.JACKSON
DATE	1/09/2017	DATE	1/09/2017



STANDARD DRAWINGS DRAINAGE					
GENERAL DRAINAGE NOTES AND APRON DETAILS					
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3100	0	A1



- NOTES:**
1. REFER TO STANDARD DRAWING CS3100 FOR GENERAL NOTES.
 2. FOR HEADWALL AND WINGWALL REFER TO CS3107 AND CS3108.
 3. FOR CULVERT BASES AND APRONS REFER TO CS3111 AND CS3112.
 4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 5. REFER TO CS3110, CS3111, CS3112 AND CS3113 FOR SHEET 2 TO SHEET 5.

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING 1316 AND ADOPTED FOR THE NT CONDITIONS.

WARNING

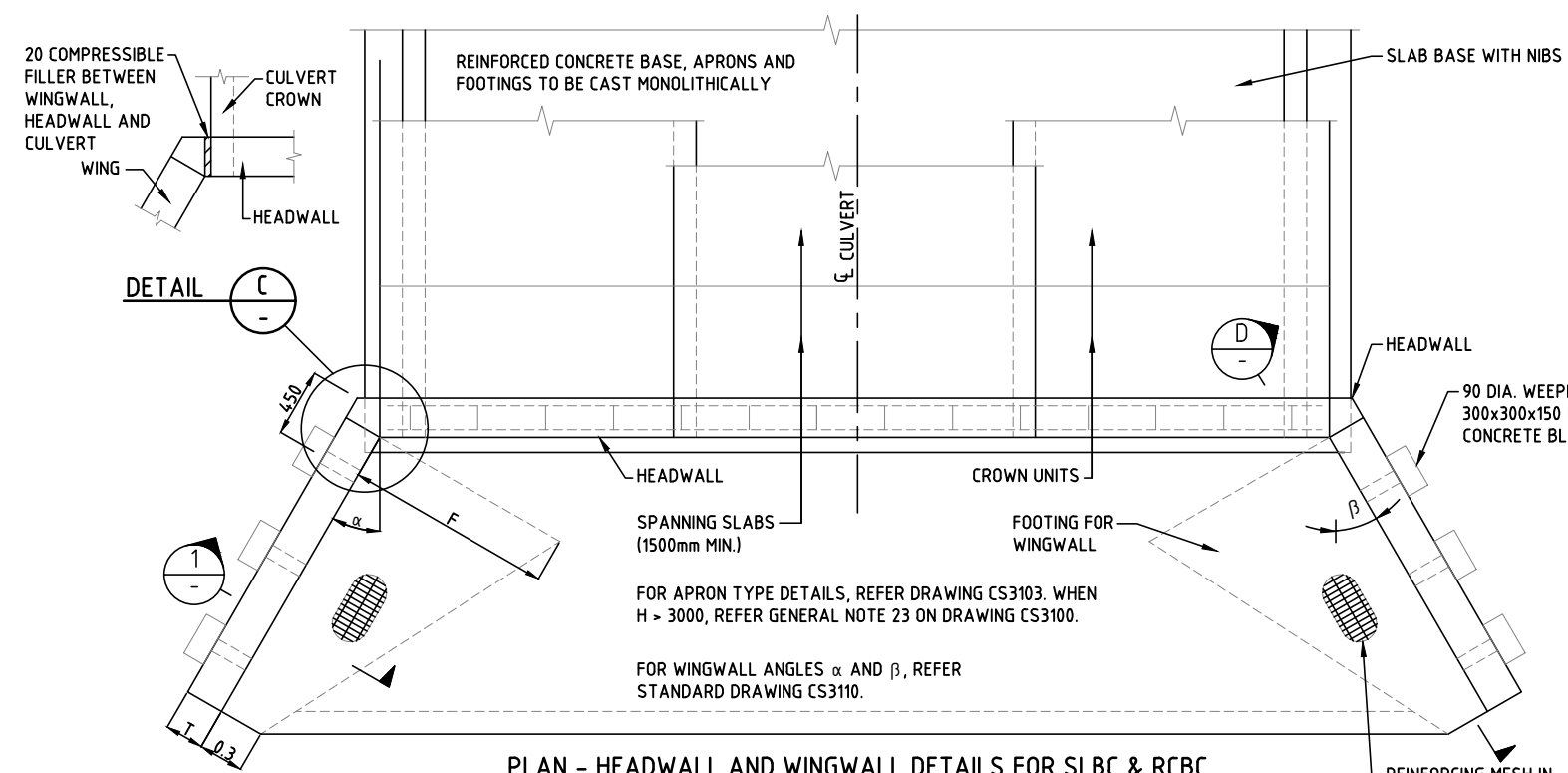
BEWARE OF UNDERGROUND SERVICES. THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DRAWN	A.R.	CHECKED	L.Mc
DATE	DEC 2012	DATE	DEC 2012
DESIGNED	QLD	CHECKED	QLD
DATE		DATE	
DESIGN LEADER	S.HATZI	DESIGN DIRECTOR	S.JACKSON
DATE	1/09/2017	DATE	1/09/2017

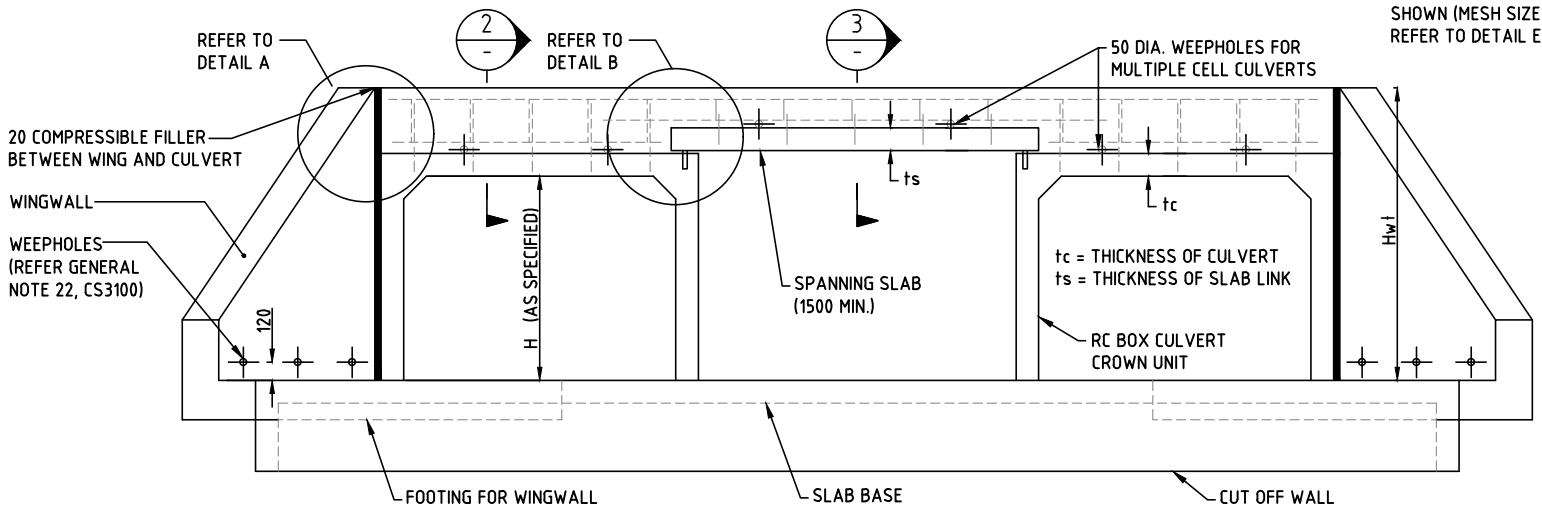


STANDARD DRAWINGS DRAINAGE					
RCBC AND LINK SLABS ARRANGEMENT AND INSTALLATION OF PRECAST UNITS					
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 5	CS3109	0	A1

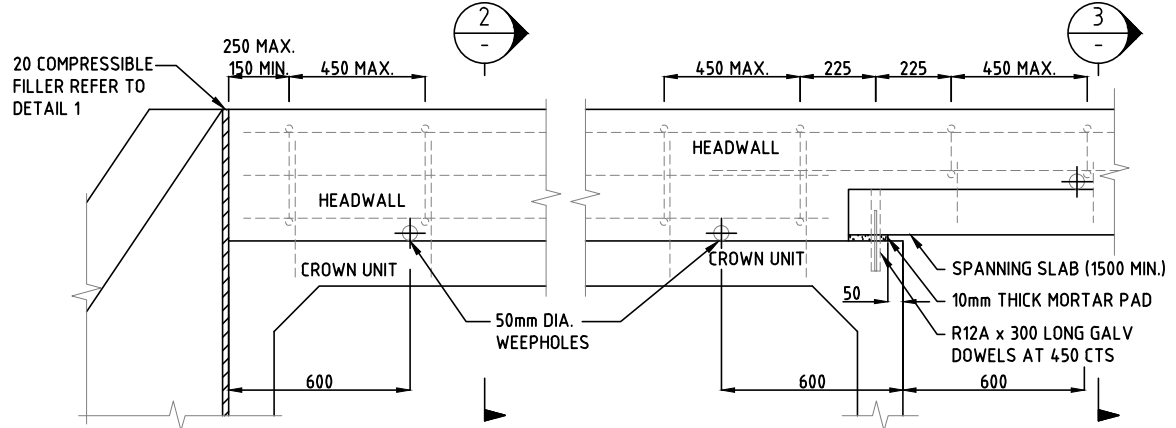
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL
No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
AMENDMENTS				



PLAN - HEADWALL AND WINGWALL DETAILS FOR SLBC & RCBC

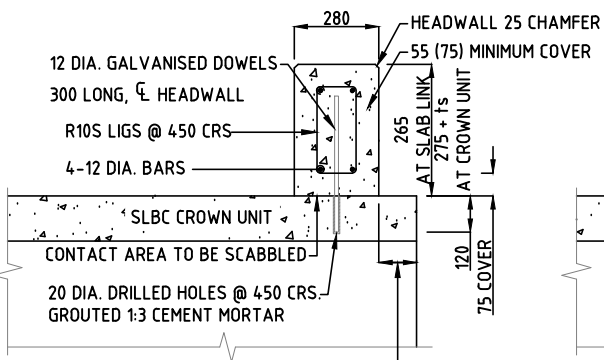


ELEVATION - HEADWALL & WINGWALL DETAILS FOR SLBC & RCBC (BASE WITH NIBS)

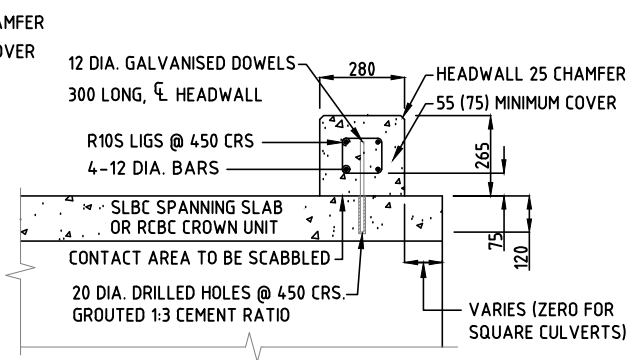


DETAIL A NOT TO SCALE

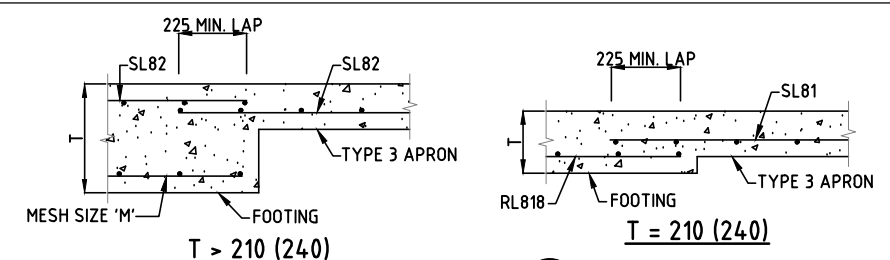
DETAIL B NOT TO SCALE



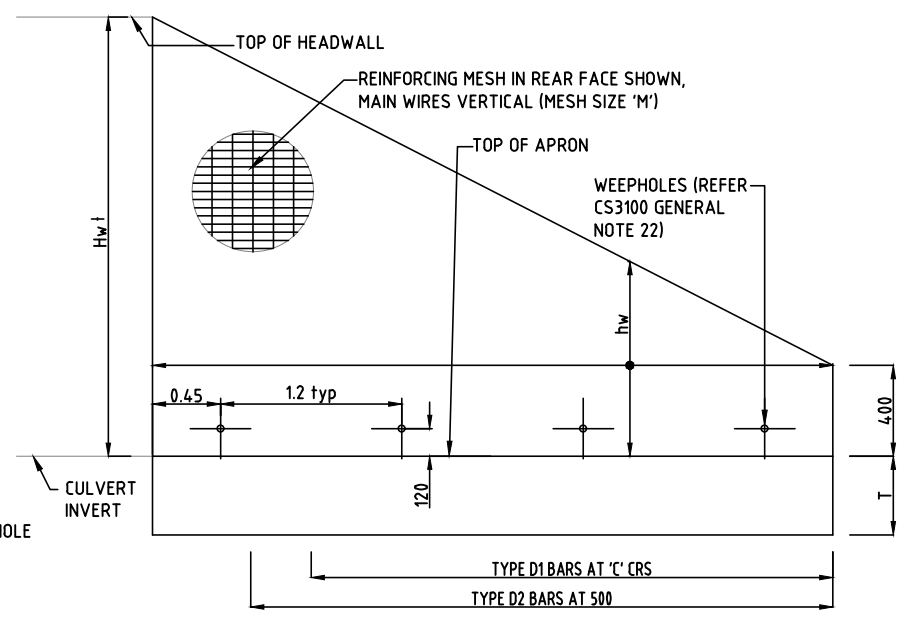
SECTION 2 HEADWALL NOT TO SCALE



SECTION 3 HEADWALL NOT TO SCALE



ELEVATION E NOT TO SCALE
WING WALL FOOTING - TYPE 3 APRON REINFORCEMENT
DETAILS REFER TO CS3100 FOR APRON TYPES 1,2 AND 3



ELEVATION D NOT TO SCALE

WING DIMENSIONS

UP TO Hw	F	T	
		WINGWALL THICKNESS	WINGWALL FOOTING THICKNESS
1000	0.75 Hw	250	(240)
1500		250	(240)
2000		250	(290)
2500		310	(340)
3000		310	(340)

WHERE Hw = H + tc + ts + 250 HEIGHT OF OPENING, H, THICKNESS OF CULVERT, tc, THICKNESS OF SLAB, ts

MINIMUM REINFORCEMENT REQUIREMENTS

hw	M	TYPE D1 BARS			12 DIA. TYPE D2 BARS
		DIA.	A	B	C
400 - 1000	RL 818	12	550	400	200
1001 - 1500	RL 818	12	550	400	200
1501 - 2000	RL 1018	12	600	400	100
2001 - 2500	RL 1018	12	650	400	100
2501 - 3000	RL 1218	20	750	400	100

hw = HEIGHT OF WINGWALL HERE hw VARIES FROM Hw AT HEADWALL TO 400 AT WINGWALL END

NOTES:

- REFER TO STANDARD DRAWING CS3100 FOR GENERAL NOTES.
- FOR HEADWALL AND WINGWALL REFER TO CS3107 AND CS3108.
- FOR CULVERT BASES AND APRONS REFER TO CS3111 AND CS3112.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- REFER TO CS3109 FOR SHEET 1, CS3111, CS3112 AND CS3113 FOR SHEET 3 TO SHEET 5

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING 1303 AND ADOPTED FOR THE NT CONDITIONS.

WARNING

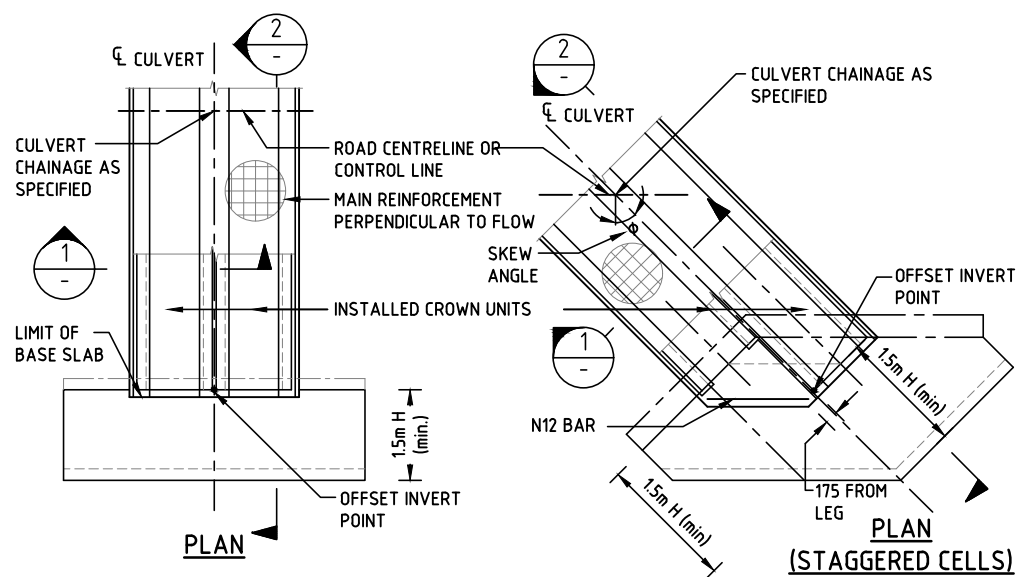
BEWARE OF UNDERGROUND SERVICES. THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DRAWN A.R.	CHECKED L.Mc
DATE DEC 2012	DATE DEC 2012
DESIGNED QLD	CHECKED QLD
DATE	DATE
DESIGN LEADER S.HATZI	DESIGN DIRECTOR S.JACKSON
DATE 1/09/2017	DATE 1/09/2017



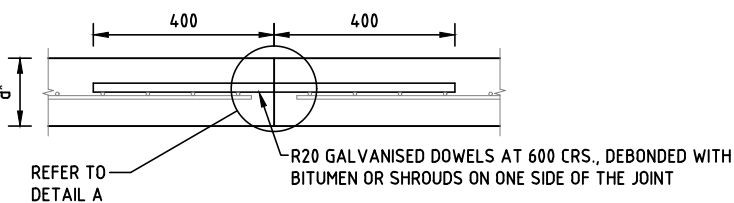
STANDARD DRAWINGS DRAINAGE				
RCBC AND LINK SLAB REINFORCED WING & HEADWALLS				
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.
-	-	2 OF 5	CS3110	0
				SHEET SIZE A1

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AMENDMENTS				



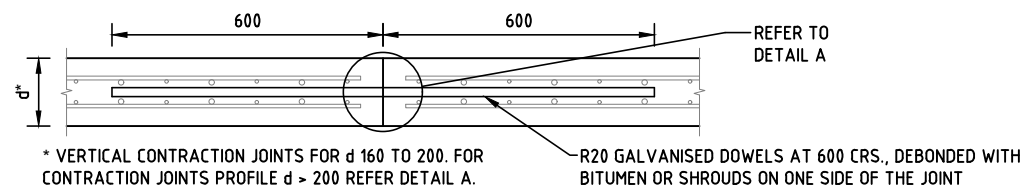
SLAB & APRON DETAILS FOR CULVERTS WITHOUT WINGWALLS

FOR HEADWALL & WINGWALL DETAILS REFER STANDARD DRAWINGS CS3107 AND CS3108



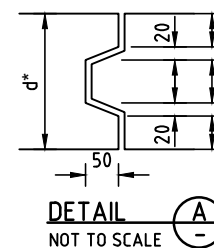
CONTRACTION JOINT

(SINGLE REINFORCEMENT LAYER) REFER NOTE 1 THIS PAGE FOR SPANS OF 600 TO 1800 FOR ALL APRONS



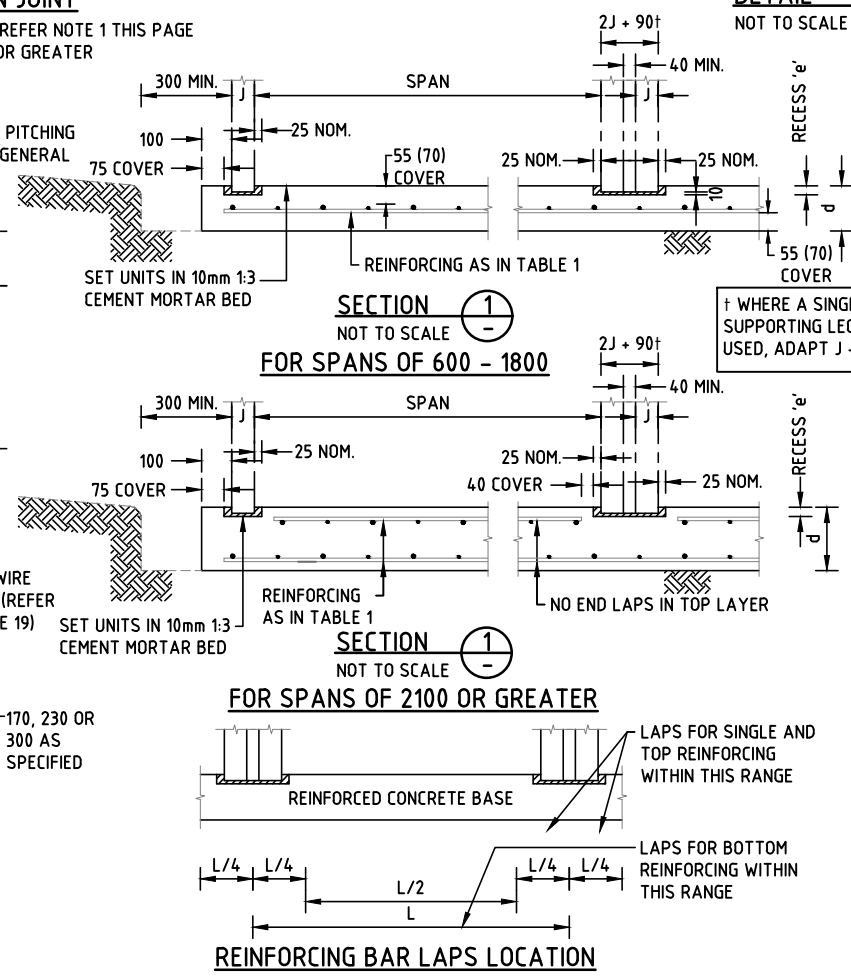
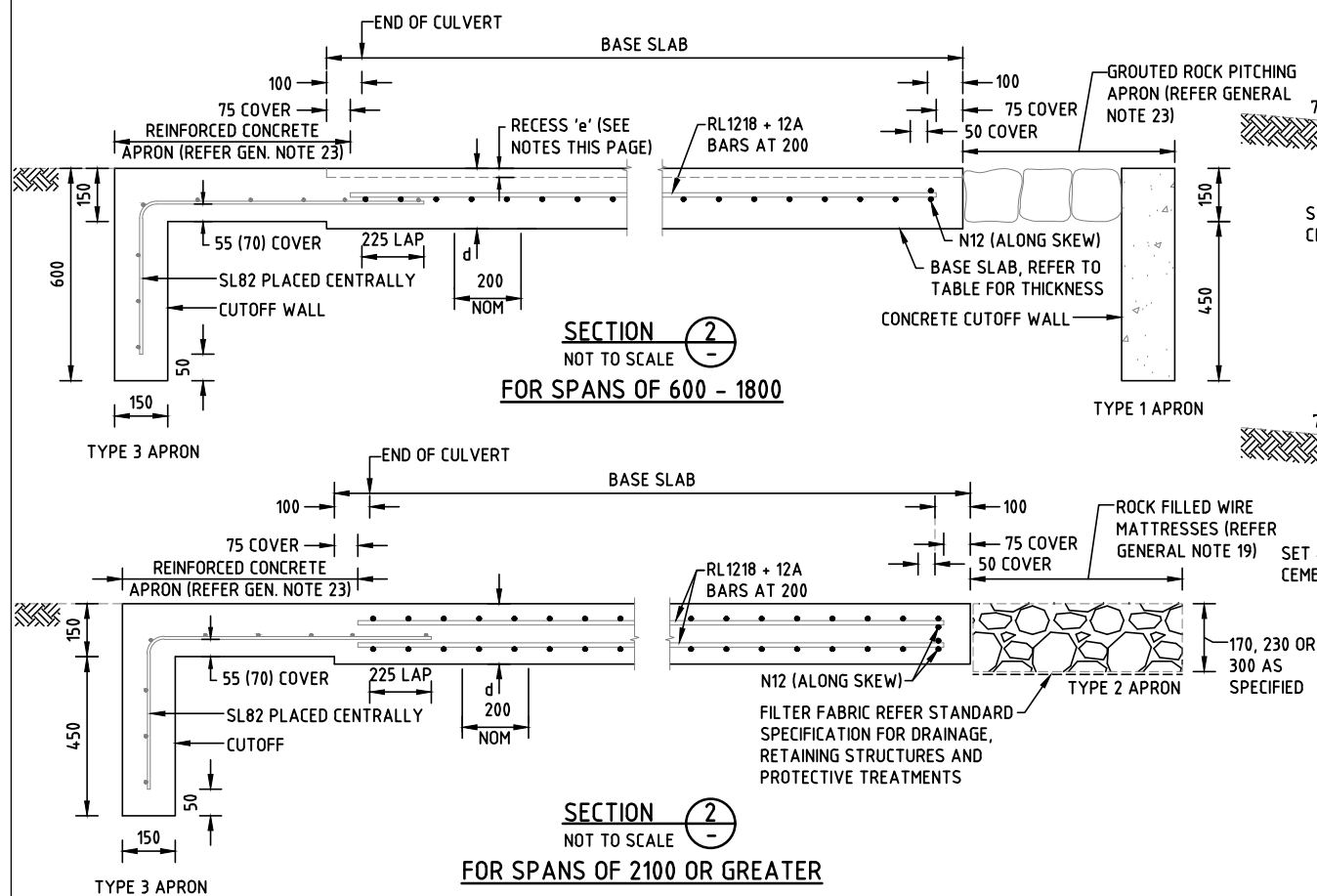
CONTRACTION JOINT

(DOUBLE REINFORCEMENT LAYER) REFER NOTE 1 THIS PAGE FOR SPANS OF 2100 OR GREATER



DETAIL A

NOT TO SCALE



NOTES:

- CONTRACTION JOINTS ARE TO BE PROVIDED WHERE (a) THE LENGTH OF THE BASE SLAB AND/OR (b) THE WIDTH OF THE BASE SLAB EXCEED 20 METRES. WHEN CONTRACTION JOINTS ARE REQUIRED ACROSS THE WIDTH OF THE BASE SLAB, THEY ARE TO BE LOCATED AT 1/4 SPAN POINTS OF CROWN UNITS. CONTRACTION JOINTS ACROSS THE WIDTH OF THE BASE SLAB ARE TO BE CONTINUED ACROSS THE APRONS. FOR APRON CONTRACTION JOINTS REFER TO THE DETAIL FOR SINGLE REINFORCEMENT LAYER. 24 HOURS MINIMUM IS TO BE ALLOWED BETWEEN POURS.
- FOR CULVERTS WITH A BASE > 10 METRES ALONG ROAD CENTRELINE, THIS DESIGN SHOULD NOT BE USED IN:
 - HIGHLY REACTIVE OR EXPANSIVE CLAY SOILS (LINEAR SHRINKAGE >8%)
 - WHERE LARGE DIFFERENTIAL SETTLEMENTS ARE EXPECTED TO OCCUR.SPECIAL DESIGN ADVICE SHOULD BE OBTAINED IN THESE CIRCUMSTANCES.
- REFER TO STANDARD DRAWING CS3100 FOR GENERAL NOTES, W1 & W2 CALCULATIONS AND WINGWALLS ANGLES α AND β .
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- REFER TO CS3109, CS3110 AND CS3111 FOR SHEET 1 TO SHEET 3, CS3113 FOR SHEET 5
- RECESS DETAILS ARE AS FOLLOWS:

FOR H =	- 'e' =
600	0, NO RECESSES
600 to 750	20mm
750 to 1200	30mm
1200	40mm

SPAN	THICKNESS OF SLAB, d	MAIN REINFORCEMENT	SECONDARY REINFORCEMENT	POSITION	LENGTH OF NIB BARS
600	180 (210)	RL1218	12 AT 200	SINGLE MAT ON CENTRE LINE	N/A
750	180 (210)	RL1218	12 AT 200		630
900	180 (210)	RL1218	12 AT 200		630
1200	180 (210)	RL1218	12 AT 200		630
1500	190 (210)	RL1218	12 AT 200		650
1800	190 (210)	RL1218	12 AT 200		650
2100	210 (240)	RL1218	12 AT 200	TOP MAT 55 (70) & BOTTOM MAT 75 (90) COVER	690
2400	220 (240)	RL1218	12 AT 200		710
2700	240 (280)	RL1218	12 AT 200		750
3000	240 (280)	RL1218	12 AT 200		750
3300	250 (290)	RL1218	12 AT 200		770
3600	260 (300)	RL1218	12 AT 200		790

TABLE 1 - SLAB DETAILS

REFER TO STANDARD DRAWING CS3100 FOR GENERAL NOTES 1, 2, 3 & 4

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING 1318 AND ADOPTED FOR THE NT CONDITIONS.

WARNING

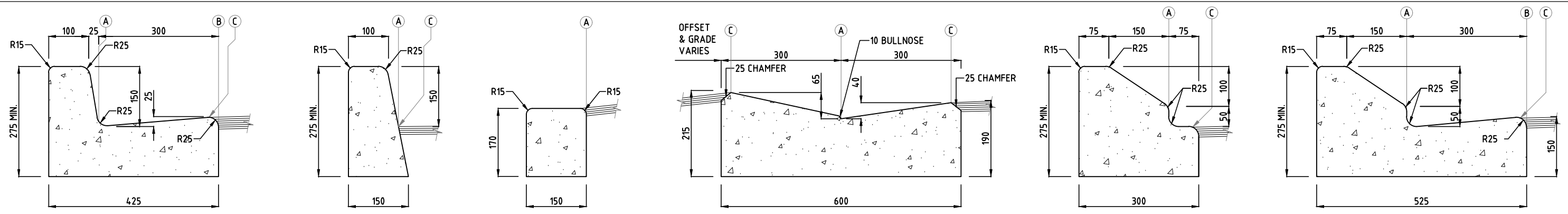
BEWARE OF UNDERGROUND SERVICES. THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DRAWN	A.R	CHECKED	L.Mc
DATE	DEC 2012	DATE	DEC 2012
DESIGNED	QLD	CHECKED	QLD
DATE		DATE	
DESIGN LEADER	S.HATZI	DESIGN DIRECTOR	S.JACKSON
DATE	1/09/2017	DATE	1/09/2017



STANDARD DRAWINGS DRAINAGE					
RCBC & LINK SLABS CONSTRUCTION OF BASES WITH RECESSES & APRONS					
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	4 OF 5	CS3112	0	A1

ISSUED AS A STANDARD DRAWING			
No.	DESCRIPTION	DATE	DEPT/COMPANY
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON EES/DIPL
AMENDMENTS			



KERB & GUTTER

KERB ONLY

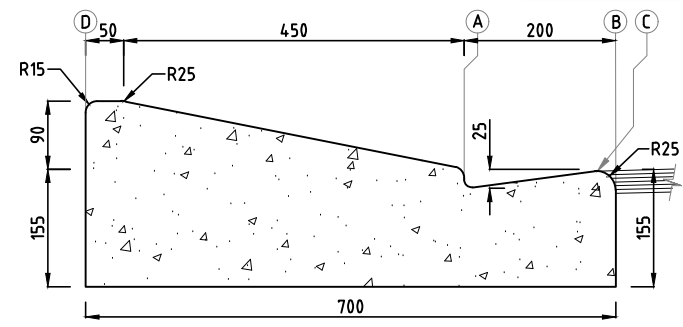
FLUSH KERB
(MAY BE INDEPENDENT)

MOUNTABLE SPECIAL KERB
(USED AT INTERSECTION LET TURN SLIP WITH ROAD TRAIN MOVEMENTS)

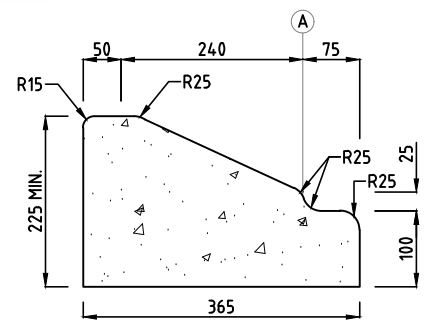
MOUNTABLE KERB

MOUNTABLE KERB & GUTTER

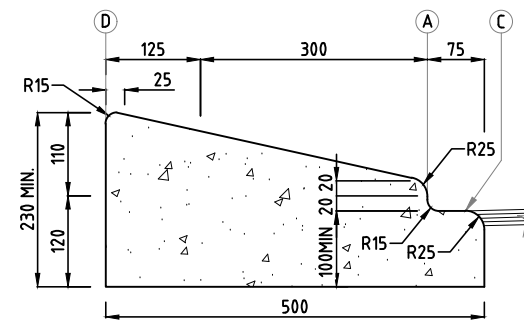
BARRIER KERB



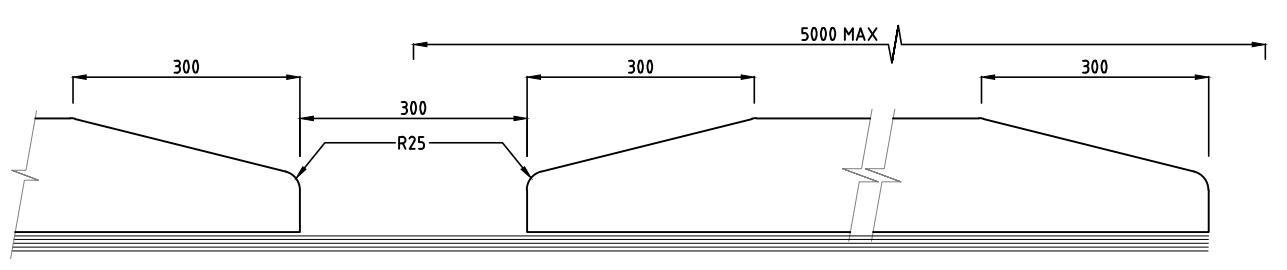
LAYBACK KERB TYPE 1



LAYBACK KERB TYPE 2

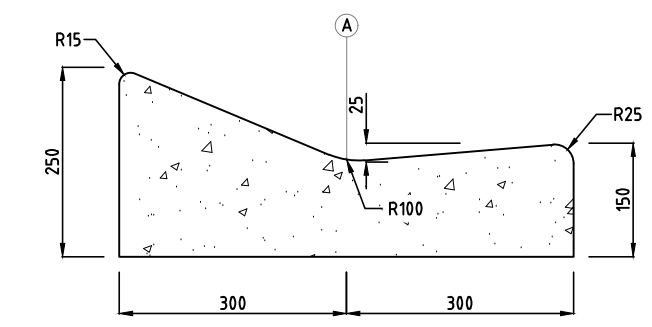


LAYBACK KERB TYPE 3

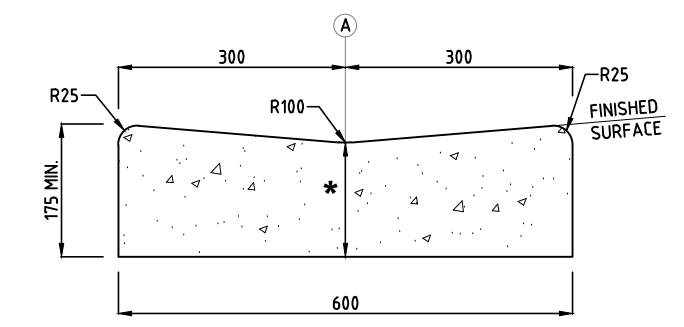


MOUNTABLE GAP KERB - ELEVATION
MOUNTABLE KERB

LAYBACK KERB

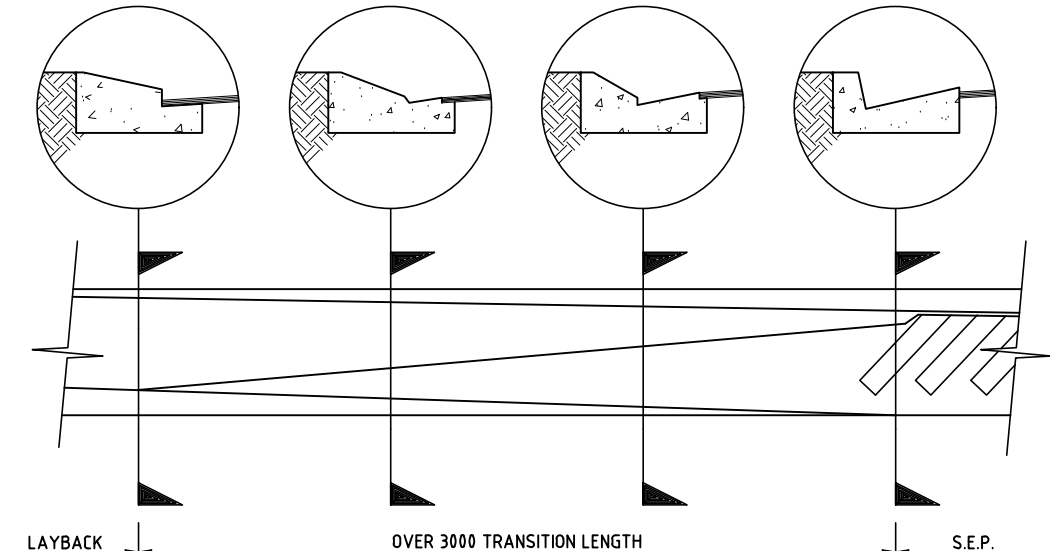


LOW PROFILE KERB

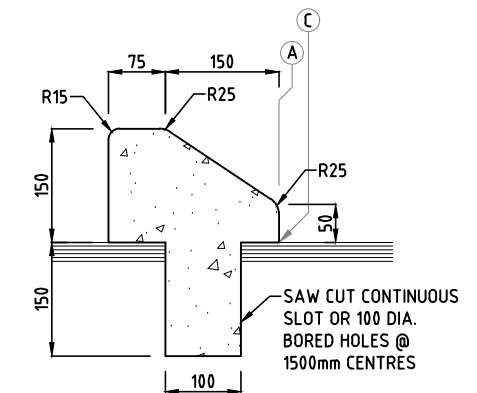


CONCRETE INVERT

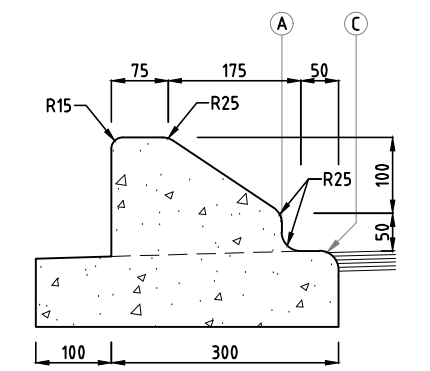
* 150mm IN ROAD PAVEMENT
100mm ELSEWHERE



LAYBACK KERB TRANSITION TO STANDARD KERB/S.E.P. APRON



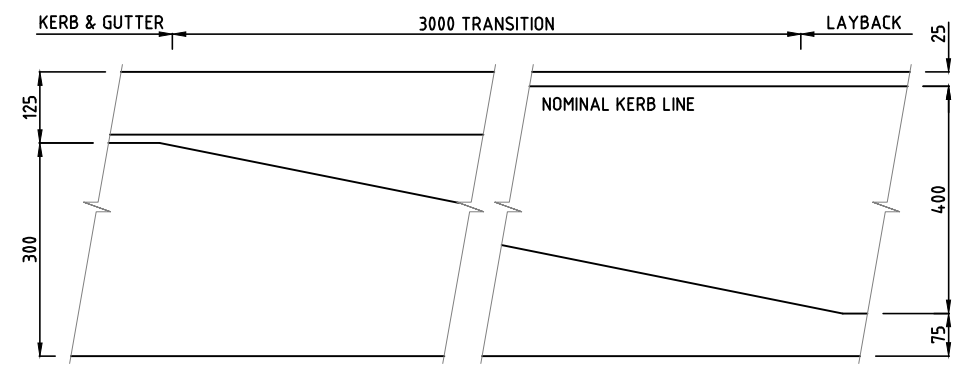
KEY KERB



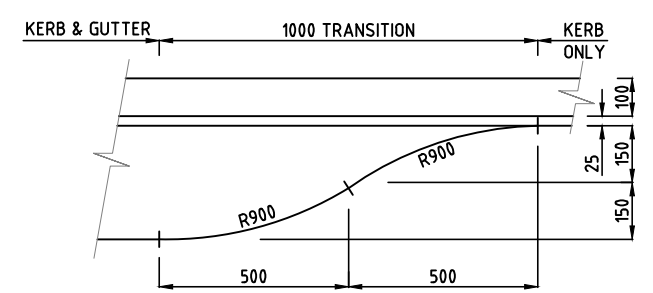
GAP KERB
(ALTERNATIVE SEE KEY KERB)

NOTE:

1. BASE OF KERB TO BE CONTINUOUS ACROSS GAP
2. FOR GAP DETAILS REFER TO MOUNTABLE KERB ABOVE



TRANSITION KERB & GUTTER TO LAYBACK KERB



TRANSITION KERB & GUTTER TO KERB

NOTES:

1. ALL CONCRETE TO BE GRADE N32 UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

AUSTRALIAN STANDARDS REFERENCED:
AS 2876-2000 CONCRETE KERBS AND CHANNELS (GUTTERS) - MANUALLY OR MACHINE PLACED

REFERENCE POSITIONS

- (A) INVERT LEVEL SETOUT POINT
- (B) TOE OF KERB
- (C) END OF SEAL
- (D) BACK OF KERB

No.	DESCRIPTION	DATE	NAME	DEPT./COMPANY
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL
AMENDMENTS				

WARNING

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DRAWN A.R	CHECKED L.Mc
DATE DEC 2012	DATE DEC 2012
DESIGNED	CHECKED
DATE	DATE
DESIGN LEADER S.HATZI	DESIGN DIRECTOR S.JACKSON
DATE 1/09/2017	DATE 1/09/2017

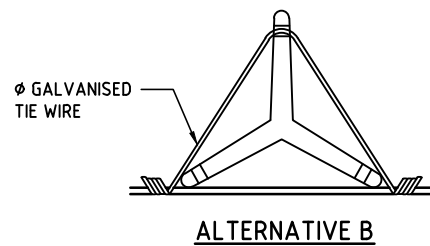
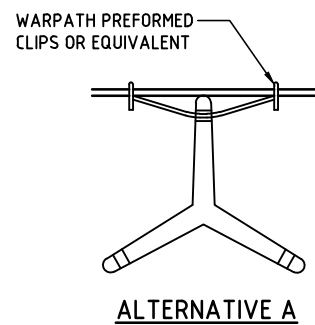
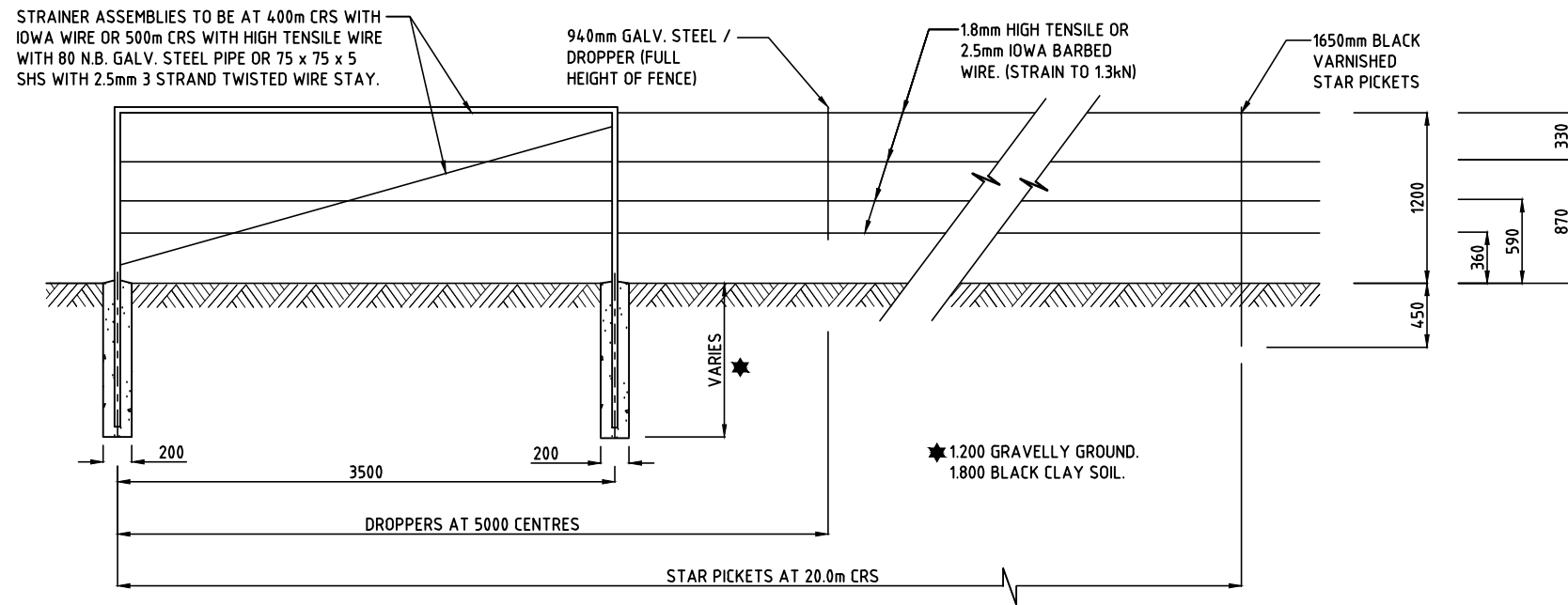
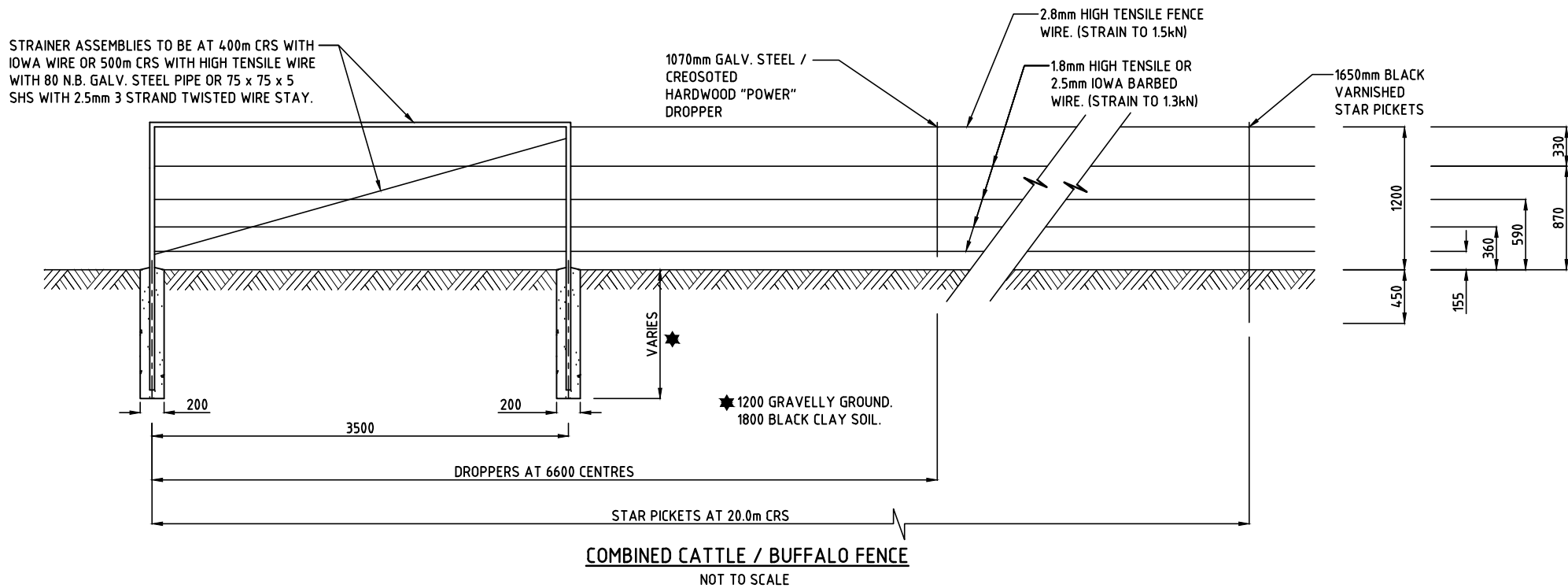


STANDARD DRAWINGS
KERBING, FENCING & LANDSCAPING

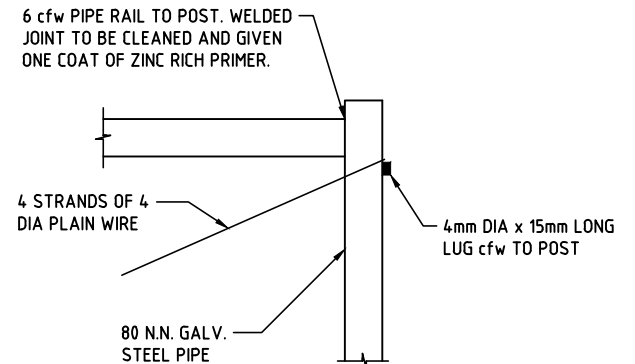
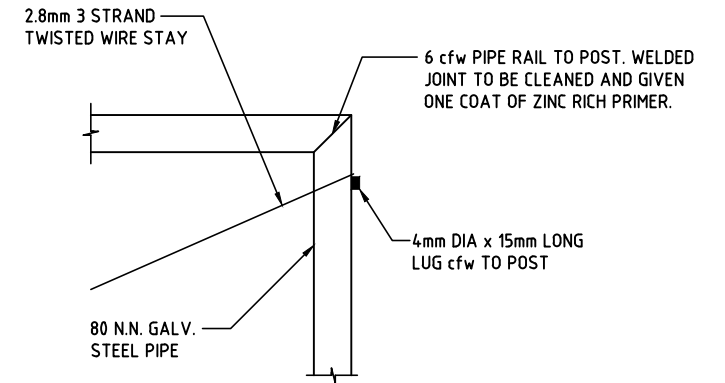
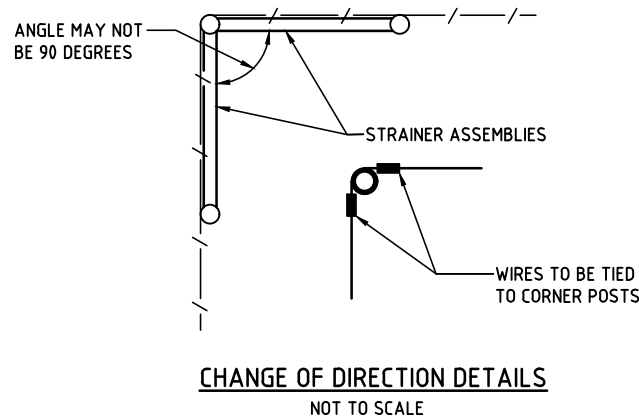
STANDARD KERB PROFILES

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3300	0	A1

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STAR PICKET FIXING
NOT TO SCALE



STRAINER CONNECTION
NOT TO SCALE

NOTES:

- GALVANISING: -ALL METAL PARTS USED IN FENCE TO BE HOT DIP GALVANISED TO AS 4680-2006 AND AS 2423-2002 UNLESS OTHERWISE STATED.
- STRAINING: STRAIN OF ALTERNATIVE WIRE TYPES IN ACCORDANCE WITH THE MANUFACTURES DIRECTIONS: E.G. 2.5mm FLEXIBLE - STRAIN TO 1.4kN. 2.5mm TIEASY - STRAIN TO 2.0kN. 1.57mm BARBED - STRAIN TO 1.1kN.
- STRAINER ASSEMBLY TO BE INSTALLED AT CHANGES OF DIRECTION AND GRADE, AND AT 400m MAXIMUM CENTRES WITH IOWA WIRE 500m CENTRES WITH HIGH TENSILE WIRE.
- CONCRETE FOOTINGS TO BE N25 CONCRETE.
- ALTERNATIVE FOOTING CONSTRUCTION (E.G. CONSTRUCTION BY WATER JETTING, AND HYDRAULIC RAMMING.) - CONTRACTOR TO SUBMIT ALTERNATIVES FOR APPROVAL. THE COMPLETED. STRAINER ASSEMBLY IS REQUIRED TO BE ABLE TO WITHSTAND A TEST LOAD OF 8.5kN APPLIED TO THE TOP CORNER OF THE ASSEMBLY FOR A PERIOD OF 15 MINUTES. IMMEDIATELY PRIOR TO THE TEST BEING CARRIED OUT, THE GROUND IS TO BE PRE-SATURATED. DURING THE TEST THERE SHALL BE NO OTHER FENCE WIRES ATTACHED TO THE STRAINER. STRAINER ARRANGEMENT PASSING THE LOAD TEST WITHOUT FAILURE ARE DEEMED SATISFIED FOR THE PURPOSE.
- GATES:
 - INSTALL GATES IN ROAD RESERVE BOUNDARIES AT APPROVED LOCATIONS ONLY.
 - GATE TYPE AND LOCKING DEVICE, IF ANY, SHALL BE APPROVED BY THE SUPERINTENDENT PRIOR TO INSTALLATION.
 - INSTALL PROPRIETY BRAND GATES IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.
 - INSTALL STRAINER ASSEMBLY EACH SIDE OF GATE OPENING IN ACCORDANCE WITH APPROVED ACCESS WIDTH. IF TEMPORARY, GATES SHALL BE REMOVED AND FENCE REINSTATED BETWEEN STRAINER ASSEMBLIES.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

WARNING

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DRAWN J.LEESON	CHECKED S.HATZI
DATE MAY 2017	DATE MAY 2017
DESIGNED W.H.A.M.	CHECKED
DATE AUG 2001	DATE
DESIGN LEADER S.HATZI	DESIGN DIRECTOR S.JACKSON
DATE 1/09/2017	DATE 1/09/2017



STANDARD DRAWINGS
KERBING, FENCING & LANDSCAPING

STOCK FENCE DESIGN AND DETAILS

0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL
No.	DESCRIPTION	DATE	NAME	DEPT./COMPANY
AMENDMENTS				

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3310	0	A1

SYMBOLS FOR RAISED PAVEMENT MARKERS

MARKER OR TERM	COLOUR	SYMBOL
RETROREFLECTIVE RAISED PAVEMENT MARKER:	-	
UNIDIRECTIONAL	WHITE	◻
	YELLOW	◊
	RED	◄
BIDIRECTIONAL	WHITE	◻◻
	YELLOW	◊◊

TABLE 1
NORMAL SPACING (N) BETWEEN RRPMs

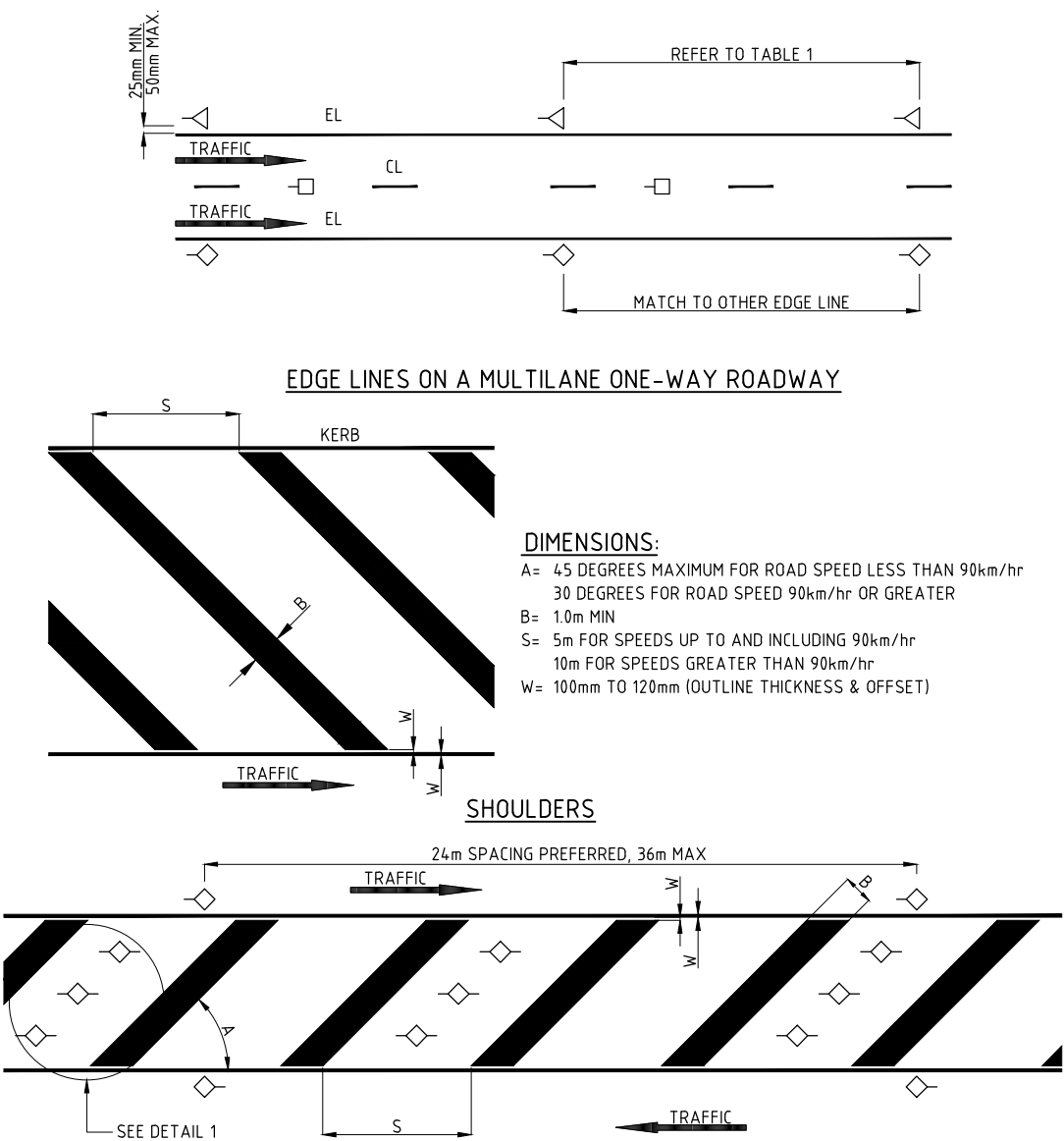
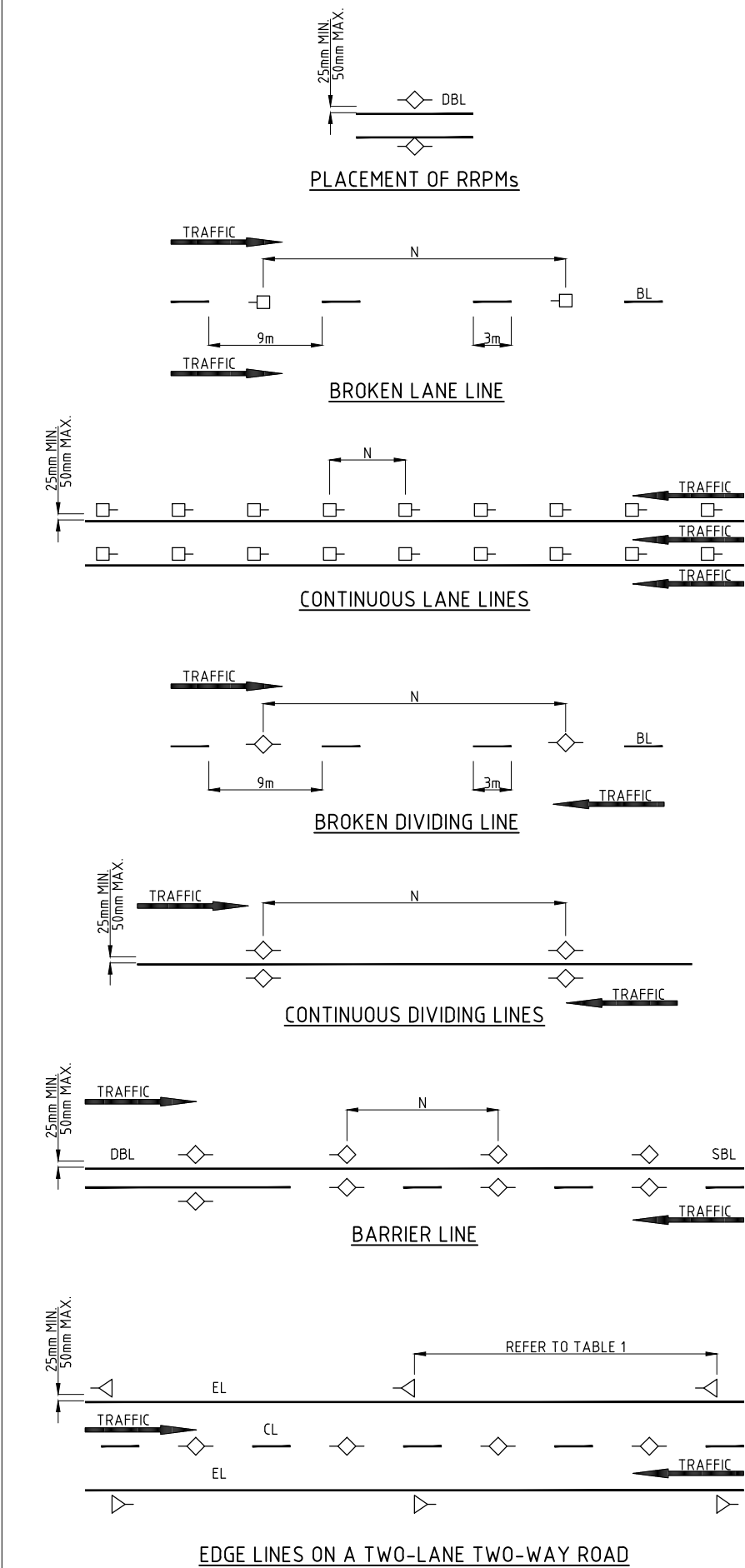
SITUATION	DIMENSION N, m
UNLIT ROADS GENERALLY, LANE LINES AND DIVIDING LINES	24
SUBSTANDARD CURVES OR CURVES 400m RADIUS OR LESS	12
DIVIDING (BARRIER) LINE ON APPROACHES TO MEDIAN ENDS	
ROADS WITH STREET LIGHTING MEETING AS/NZS 1158.1.1-2005 (EXCEPT THAT 24m SPACING FOR LANE LINES MAY BE SUFFICIENT IN MANY CASES)	
SHORT LENGTH OF SPECIAL PURPOSE DIVIDING OR LANE LINE, EXIT LINES AT ROUNDABOUTS.	
DIVIDING LINES ON ALL MULTILANE UNDIVIDED ROADS	4 MIN, 12 MAX (REFER NOTE 1)
LINES OUTLINING TRAFFIC ISLANDS, MEDIAN AND SEPARATOR ENDS, AND OTHER DEVICES	
MARKERS ON EDGE LINES INCLUDING OF PAINTED MEDIAN STRIPS AND SEPARATORS	24 PREFERRED, 36 MAX
DIVIDING AND LANE LINES ON INTERSECTION APPROACHES (MINIMUM - ONE AND MARKER AT EACH END OF THE LINE)	12

1. REFER TO DETAILS 1,2,3,4 AND 5 ON CS34.02. THE PREFERRED DIMENSION IS 6m.

COLOUR OF RETROREFLECTIVE RAISED PAVEMENT MARKERS TO AUGMENT PAINTED LINES

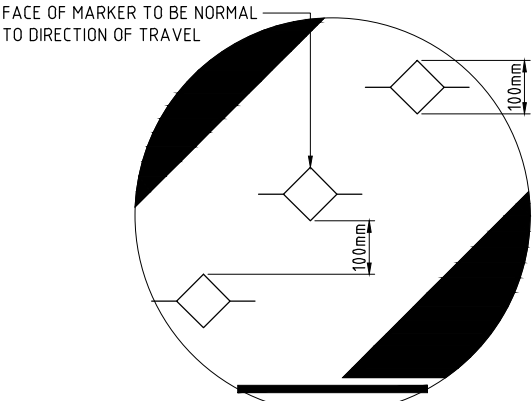
APPLICATION	RRPM COLOUR
DIVIDING LINES	YELLOW
LANE LINES (EXCL. TRAM LANE LINES)	WHITE
RIGHT HAND EDGE LINE, DIVIDED ROAD	YELLOW
LEFT HAND EDGE LINE, DIVIDED ROAD	RED
LEFT HAND EDGE LINE, 2-WAY ROAD	RED
SMALL (REFER NOTE 2) CHANNELISING ISLAND OUTLINE, PAINTED OR RAISED - ALL SIDES	WHITE
MEDIAN ISLAND OUTLINE, PAINTED OR RAISED - ALL SIDES	YELLOW
ROADWAY DIVERGE OUTLINE, INCLUDING EXPRESSWAY EXIT NOSE, AND APPROACH END OF LARGE ISLAND	
LEFT (REFER NOTE 3) SIDE	YELLOW
RIGHT (REFER NOTE 3) SIDE	RED

2. A SMALL ISLAND SHOULD GENERALLY BE REGARDED AS ONE WITH NO SIDE, INCLUDING APPROACH AND DEPARTURE MARKINGS, LONGER THAN 12 METRES.
3. LEFT OR RIGHT WHEN VIEWED IN THE DIRECTION OF TRAVEL.
4. ROAD SPEED REFERENCE ON THIS DRAWING REFERS TO DESIGN ROAD SPEED.



DIMENSIONS:
A= 45 DEGREES MAXIMUM FOR ROAD SPEED LESS THAN 90km/hr
30 DEGREES FOR ROAD SPEED 90km/hr OR GREATER
B= 1.0m MIN
S= 5m FOR SPEEDS UP TO AND INCLUDING 90km/hr
10m FOR SPEEDS GREATER THAN 90km/hr
W= 100mm TO 120mm (OUTLINE THICKNESS & OFFSET)

PAINTED MEDIAN STRIPS



DETAIL 1
NOT TO SCALE

WARNING

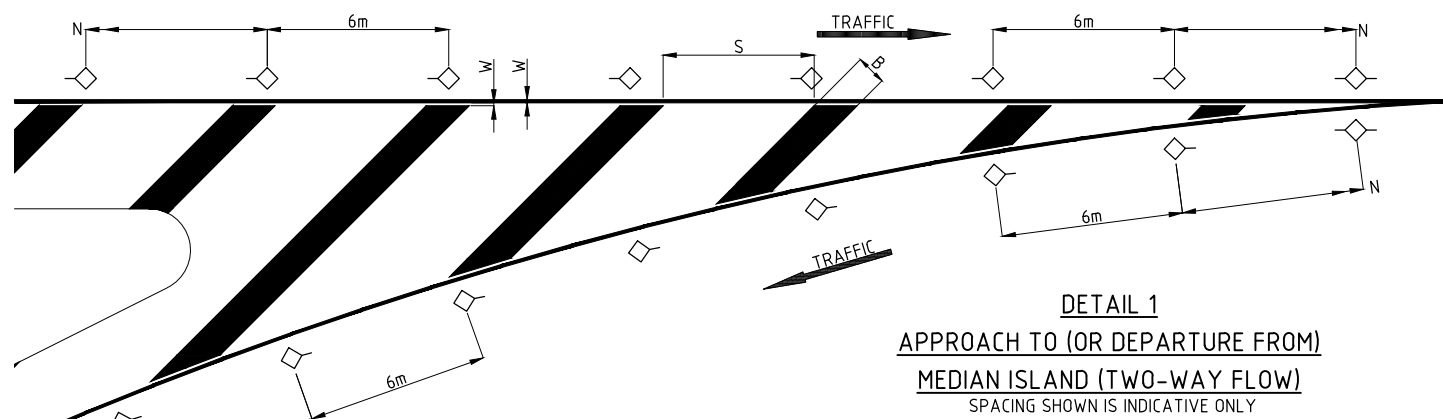
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DRAWN J.LEESON	CHECKED S.HATZI
DATE MAY 2017	DATE MAY 2017
DESIGNED	CHECKED
DATE	DATE
DESIGN LEADER S.HATZI	DESIGN DIRECTOR S.JACKSON
DATE 6/09/2017	DATE 6/09/2017

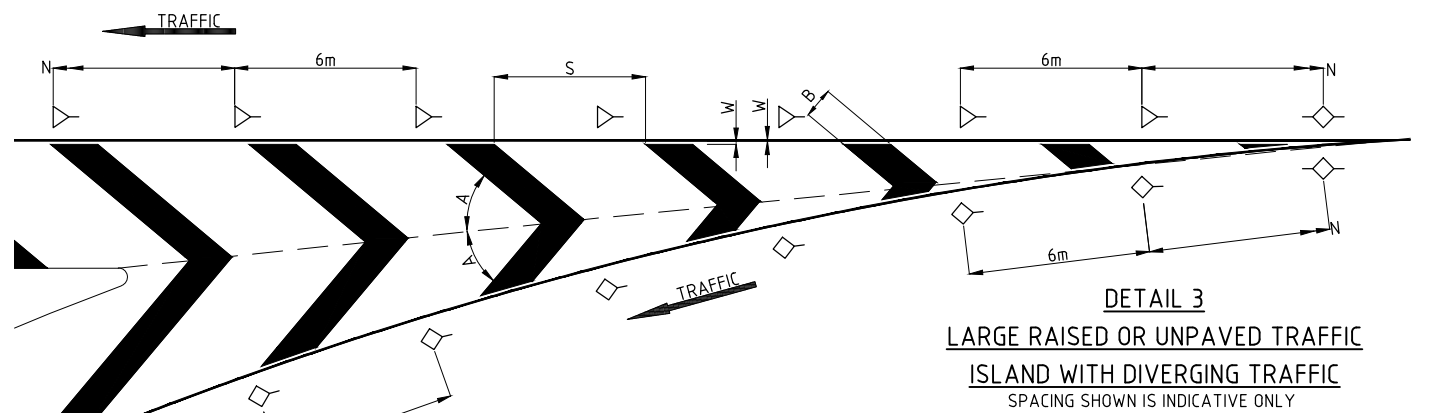
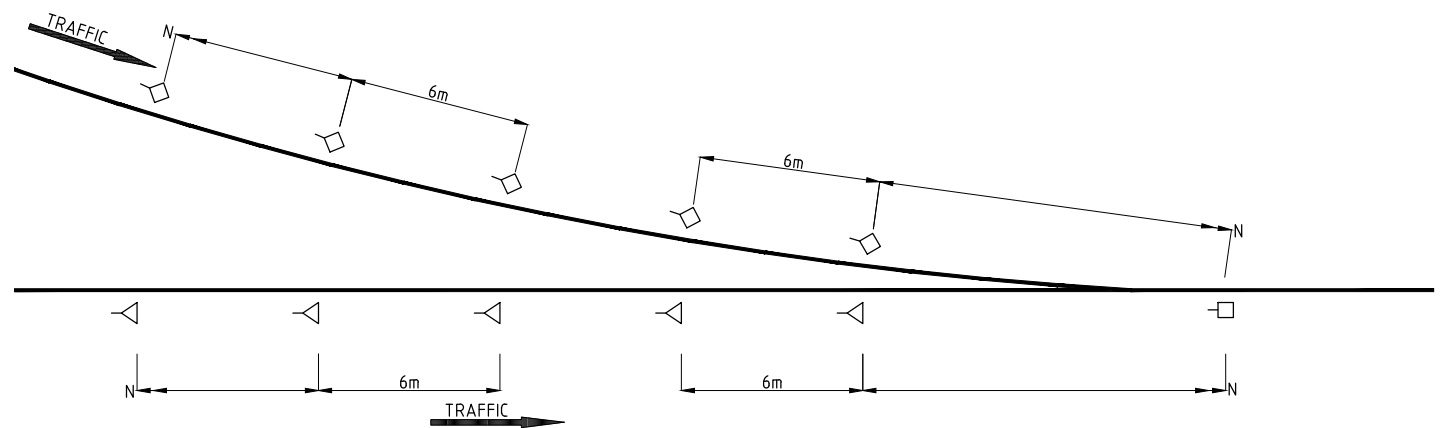


STANDARD DRAWINGS TRAFFIC CONTROL DEVICES					
PAVEMENT MARKINGS - CHEVRONS AND RRPM'S SHEET 1					
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 2	CS3401	2	A1

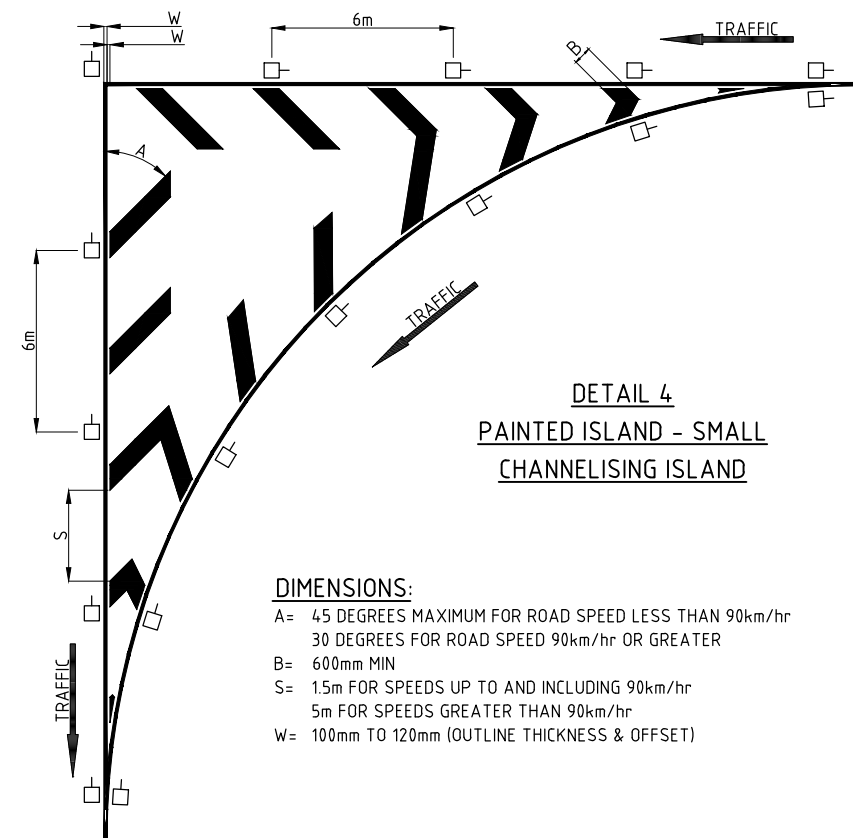
No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
2	"W" REDEFINED	DEC 2017	S.SHI	EES/DIPL
1	"S" REDEFINED	NOV 2017	J.LEESON	EES/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL
AMENDMENTS				



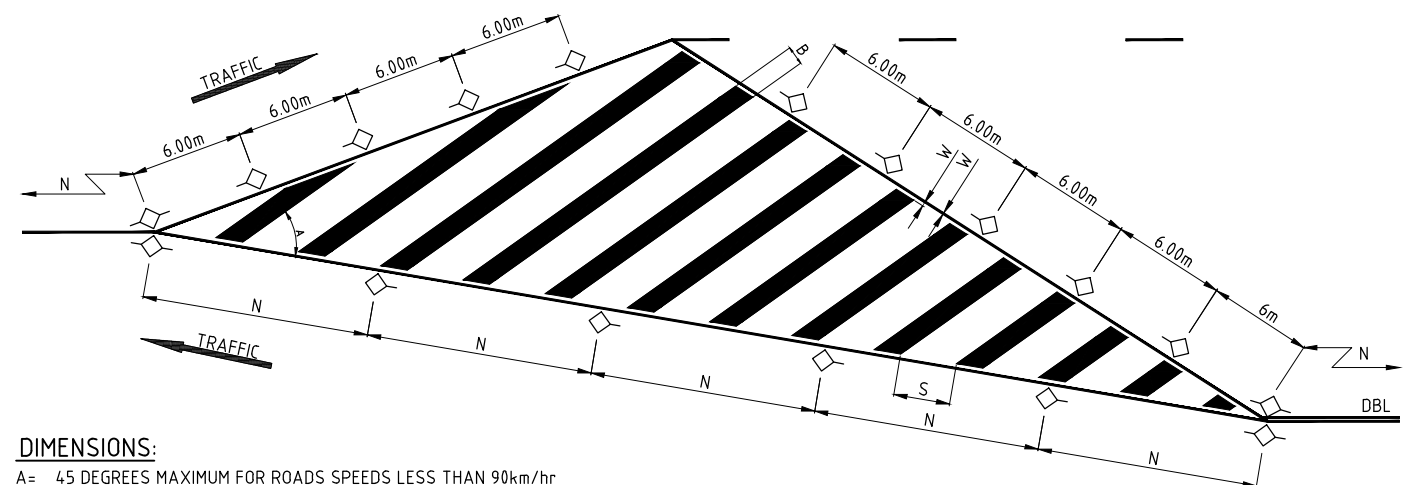
DIMENSIONS:
 A= 45 DEGREES MAXIMUM FOR ROAD SPEED LESS THAN 90km/hr
 30 DEGREES FOR ROAD SPEED 90km/hr OR GREATER
 B= 1.0m MIN
 S= 3m FOR SPEEDS UP TO AND INCLUDING 90km/hr
 5m FOR SPEEDS GREATER THAN 90km/hr
 W= 100mm TO 120mm (OUTLINE THICKNESS & OFFSET)



DIMENSIONS:
 A= 45 DEGREES MAXIMUM FOR ROAD SPEED LESS THAN 90km/hr
 30 DEGREES FOR ROAD SPEED 90km/hr OR GREATER
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 5m FOR SPEEDS GREATER THAN 90km/hr
 W= 100mm TO 120mm (OUTLINE THICKNESS & OFFSET)



DIMENSIONS:
 A= 45 DEGREES MAXIMUM FOR ROAD SPEED LESS THAN 90km/hr
 30 DEGREES FOR ROAD SPEED 90km/hr OR GREATER
 B= 600mm MIN
 S= 1.5m FOR SPEEDS UP TO AND INCLUDING 90km/hr
 5m FOR SPEEDS GREATER THAN 90km/hr
 W= 100mm TO 120mm (OUTLINE THICKNESS & OFFSET)



DIMENSIONS:
 A= 45 DEGREES MAXIMUM FOR ROADS SPEEDS LESS THAN 90km/hr
 30 DEGREES FOR ROADS SPEEDS 90km/hr OR GREATER
 B= 1.0mm MIN
 S= 3m FOR SPEEDS UP TO AND INCLUDING 90km/hr
 5m FOR SPEEDS GREATER THAN 90km/hr
 W= 100mm TO 120mm (OUTLINE THICKNESS & OFFSET)

- NOTE:**
- ROAD SPEED REFERENCE ON THIS DRAWING REFERS TO DESIGN ROAD SPEEDS.
 - ON SMALL ISLANDS SPACING "S" MAYBE ADJUSTED BY SUPERINTENDENT.
 - ON SMALL PAINTED ISLANDS, A MINIMUM OF TWO RRPMS SHOULD BE VISIBLE ON ANYONE EDGE. ADJUST SPACING OF RRPMS TO ALLOW EVEN GAPS BETWEEN RRPMS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
2	"W" REDEFINED	DEC 2017	S.SHI	EES/DIPL
1	"S" REDEFINED AND NOTES ADDED	NOV 2017	J.LEESON	EES/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

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DRAWN J.LEESON	CHECKED S.HATZI
DATE MAY 2017	DATE MAY 2017
DESIGNED	CHECKED
DATE	DATE
DESIGN LEADER S.HATZI	DESIGN DIRECTOR S.JACKSON
DATE 6/09/2017	DATE 6/09/2017



STANDARD DRAWINGS
 TRAFFIC CONTROL DEVICES

PAVEMENT MARKINGS - CHEVRONS AND RRPMS
 SHEET 2

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	2 OF 2	CS3402	2	A1