GENERAL:

1. IN ACCORDANCE WITH AUSTRALIA STANDARD AS5100.5-2017, THE MINIMUM REQUIRED CONCRETE COVER UNDER DIFFERENT EXPOSURE CLASSIFICATIONS ARE AS SHOWN BELOW.

EXPOSURE CLASS / CONCRETE STRENGTH	MINIMUM COVER (mm)		CONCRETE CLASS
	40MPa	50MPa	
B1	50	-	N
B2	55	50	SB
C	–	70	SC
U	CONFIRM THE VALUE WITH A CERTIFIED STRUCTURAL ENGINEER		SU

CONDUCT TESTING OF SITE ENVIRONMENT TO IDENTIFY THE EXPOSURE CLASS AS PER AS5100.5-2017 AND INCORPORATE RELEVANT INFORMATION FROM TABLE ABOVE INTO PROJECT DESIGN.
CONCRETE CLASS ARE SPECIFIED AS PER AS1379-2007. WHEN SPECIAL CLASS 'S' CONCRETE IS REQUIRED, THE AGGREGATES ARE TO BE TESTED AS PER AS2758.1-2014 AND SEEK SUPERINTENDENT'S APPROVAL FOR TYPE OF CEMENT.

2. APPLIED DESIGN LOADS HLP320, MS1600, A160 AND W80 IN ACCORDANCE WITH AS5100.2-2017.
3. WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLE AS PER AS3725-2007. ALLOWANCE FOR CONSTRUCTION LOADS SHALL COMPLY WITH DEPARTMENT'S STANDARD SPECIFICATION FOR ROADWORK.
4. MAXIMUM FILL OF 2 METRES. SEEK DESIGN ADVICES FOR FILL HEIGHTS GREATER THAN 2 METRES.
5. ALLOWABLE BEARING PRESSURE FOR CULVERT BASES IS 150kPa.
6. REFER TO NOTE 1 FOR SUITABLE CONCRETE CLASS USE IN DIFFERENT EXPOSURE CLASS.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

REINFORCEMENT:

8. REINFORCING STEEL TO BE IN ACCORDANCE WITH AS/NZS 4671-2019.
   DEFORMED BARS - GRADE D500N
   ROUND BARS - R250N
   DEFORMED WIRE - GRADE D500L
   ALL REINFORCING STEEL TO BE ACRS CERTIFIED.
9. DOWELS, RESTRAINING PLATES HOT DIP GALVANISED TO AS 4680-2006.
10. LAPS SHALL BE MADE SO THAT THE TWO OUTERMOST WIRES OF ONE MESH OVERLAP WITH THE TWO OUTERMOST WIRES OF THE SHEET BEING LAPPED.

11. COMPLY WITH AS 3600-2018, AS 3610.1-2018 AND AS 1379-2007.
12. REINFORCEMENT SHALL BE AS PER MINIMUM REINFORCING SHOWN ON THE DRAWINGS.
13. MESH DENOTED 'SLXX' SHALL BE 'DL500SLXX' MESH TO AS 4671-2019 TYP.
14. MESH DENOTED 'RLXXX' SHALL BE 'D500RLXXX' MESH TO AS 4671-2019 TYP.
15. BARS NOTED 'N10' SHALL BE 'DN500N10' TO AS 4671-2019.
16. EXCESS BAR LENGTH PROTRUDING OUTSIDE THE DIMENSIONS OF THE WALL OR FOOTING SHALL BE CURED TO PROVIDE THE MINIMUM COVER
17. STRUCTURE REINFORCED THROUGH OUT WITH REINFORCEMENT AS PER MINIMUM REINFORCEMENT REQUIREMENTS. REINFORCEMENT SHALL BE CENTRALLY PLACED BOTH WAYS.

OVERLAY & FILL & BACKFILL:

18. MINIMUM DEPTH OF OVERLAY ZONE ABOVE PIPE/BOX 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.
19. WINGWALL FILL/BACKFILL MATERIAL SHALL BE PLACED 300mm THICK BEHIND WINGWALLS FOR THE LENGTH AND HEIGHT OF THE WINGS.
20.
    20.a. ALL BACKFILL TO BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR ROADWORKS
    20.b. BEDDING MATERIAL IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR ROADWORKS.
    20.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.
    20.d. BACKFILL THE REMAINDER OF THE TRENCH WITH STANDARD FILL.
21. STABILISE ALL FILL WITH 2% CEMENT BY MASS AND COMPACT TO 95% MMDD WHERE THE TRENCH OR EMBANKMENT LIES BENEATH A ROAD PAVEMENT.

REINFORCED CONCRETE BOX CULVERT (RCBC):

22. FOR MULTIPLE BOX CULVERTS, APRON AND INVERT SLAB TO BE CONTINUOUS.
23. HEADWALL ONLY TO BE PROVIDED FOR BOX CULVERTS UP TO AND INCLUDING 600 x 450 (REFER STD. DRAWING CS3102 FOR SIMILAR).
24. IN MULTI-CELLS BOX CULVERTS INSTALLATION, CELLS MAY BE PLACED EITHER TOUCHING OR WITH A GAP NO MORE THAN 25mm. THE GAP SHOULD BE GROUTED WITH 1 TO 3 SAND&CEMENT MORTAR OR EQUIVALENT FOR A MINIMUM DEPTH OF AT LEAST THE CROWN THICKNESS AS DETAILS IN AS1597.1-2010 AND AS1597.2-2013.
25. 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.
26. 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. 5% CEMENT STABILISED SAND IS ACCEPTABLE ALTERNATIVE FOR LEAN MIX CONCRETE INFILL.
27. CROWN UNIT RESTRAINING PLATES ARE REQUIRED ON THE OUTER 3 OF ALL INTERNAL CELLS WHEN SLAB LINK BOX CULVERT > 5 CELLS, WHEN CROW UNITS ≥ 1800 HIGH, AND 1200 LONG, ARE USED.

REINFORCED CONCRETE PIPES:

28. FOR MULTIPLE PIPES, APRON AND INVERT SLAB TO BE CONTINUOUS.
29. FOR NOMINATED PIPE CLASS, REFER TO PROJECT DRAWINGS AND MANUFACTURERS SPECIFICATION.
30. MANUFACTURER TO PROVIDE CERTIFICATION OF PIPE CLASS OF PIPES DELIVERED TO SITE.

WEEPHOLES:

31. 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,
    - PROVIDE 300 x 300 x 150 DRAINAGE FILTER MATERIAL WRAPPED IN STRENGTH CLASS 'B' GEOTEXTILE BEHIND EACH WEEPHOLE. ALTERNATIVELY, PROVIDE A CONTINUOUS 300 HIGH × 150 WIDE DRAINAGE LAYER WRAPPED IN STRENGTH CLASS 'B' GEOTEXTILE ACROSS THE TOE OF THE WINGWALL.

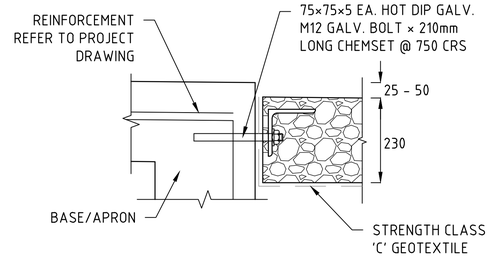
APRON:

32. WHERE REINFORCED WINGWALLS ARE USED REFER TO APRON DETAILS ON THIS STANDARD DRAWINGS. PROTECTION WORKS AT OUTLETS AND INLETS ARE TYPICAL AND MAY BE VARIED AS SHOWN IN PROJECT DRAWINGS.

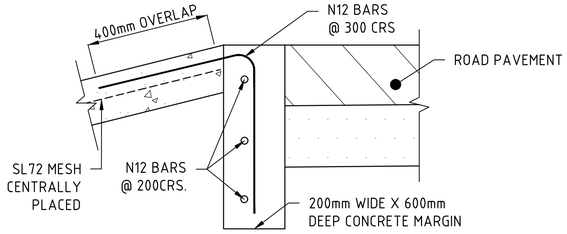
PROTECTION:

33. WHERE SPECIFIED, DOWNSTREAM END TO BE PROTECTED BY RENO MATTRESS. REFER TO CULVERT OUTLET PROTECTION DETAILS FOR BOLT CONNECTION DETAILS OF RENO MATTRESS AND CONCRETE.
34. WHERE REQUIRED, THE CULVERT WINGWALLS MAY BE MODIFIED AND HAVE A TRAVERSABLE GRATE INSTALLED. FOR GRATE DETAILS & MODIFIED WINGWALL SETOUT, REFER CS3133 - CS3140

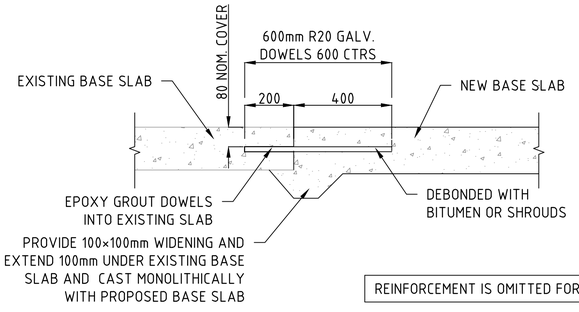
TERMINOLOGY / ABBREVIATIONS / REFERENCES	
DESCRIPTION	SYMBOL
REINFORCED CONCRETE PIPE	RCP
REINFORCED CONCRETE BOX CULVERT	RCBC
SLAB LINK BOX CULVERT	SLBC
THICKNESS OF LINK SLAB	ts
INTERNAL DIAMETER OF A PIPE CULVERT OR INTERNAL HEIGHT OF A BOX CULVERT	D
OVERALL HEADWALL HEIGHT	H
WINGWALL END HEIGHT	d
THICKNESS OF WINGWALL / HEADWALL	T
EXTERNAL DIAMETER OF PIPE CULVERT OR EXTERNAL DEPTH OF BOX CULVERT	ED
SKEW ANGLE	φ
WINGWALL ANGLE 1	α
WINGWALL ANGLE 2	β
WIDTH DUE TO WINGWALL ANGLE 1	B
WIDTH DUE TO WINGWALL ANGLE 2	E
CULVERT APRON LENGTH	A
BASE SLAB THICKNESS	Bt
WINGWALL FOOTING WIDTH	Fw
HEADWALL EXTENSION WIDTH FOR HEADWALL ONLY	F
APRON END WIDTH/GRATE MAX SPAN	C



CULVERT OUTLET PROTECTION
CONNECTION BETWEEN CONCRETE BASE/APRON AND RENO MATTRESS
NOT TO SCALE

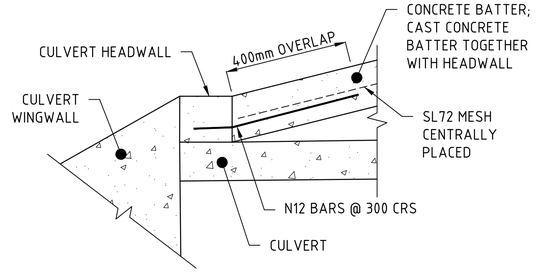


DETAIL 1
CONCRETE APRON/ BATTER PROTECTION TIE INTO ROAD WAY MARGIN
N.T.S.

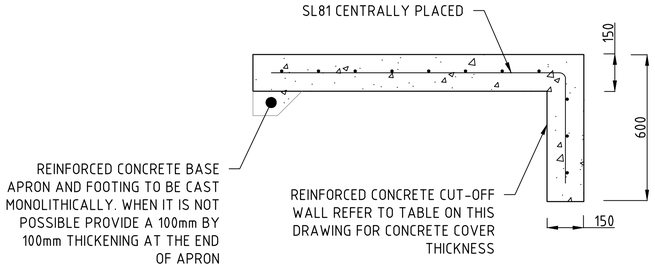


REINFORCEMENT IS OMITTED FOR CLARITY

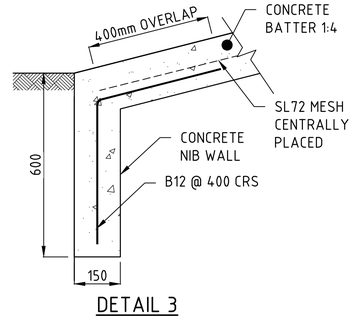
BASE SLAB EXTENSION DETAILS
NOT TO SCALE



DETAIL 2
CONCRETE BATTER PROTECTION TIE INTO CULVERT HEADWALL
N.T.S.



REINFORCED CONCRETE APRON
NO TO SCALE



DETAIL 3
CONCRETE APRON/BATTER PROTECTION TOE DETAIL
N.T.S.

CONCRETE BATTER DETAILS

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
1	NOTES & DESIGN DETAILS AMENDED	APR 2023	J. COOK	TCS / DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

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

Northern Territory Government

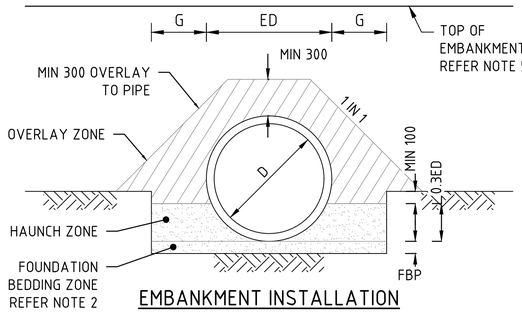
STANDARD DRAWINGS
DRAINAGE

GENERAL DRAINAGE NOTES
AND BASE SLAB EXTENSION & APRON DETAILS

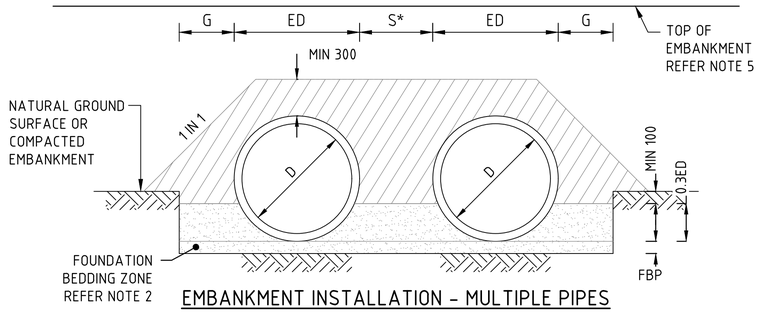
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3100	1	A1

CS3100_AMED_1 RELEASED 12/07/2023

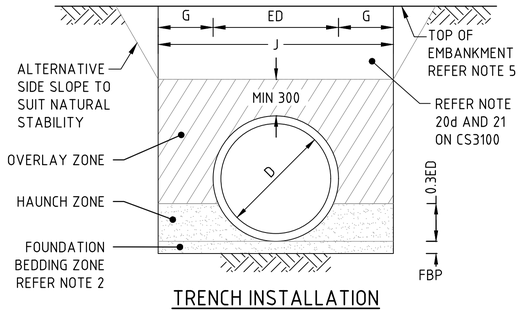
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



EMBANKMENT INSTALLATION



EMBANKMENT INSTALLATION - MULTIPLE PIPES



TRENCH INSTALLATION

TYPE H2 SUPPORT FOR CONCRETE PIPES

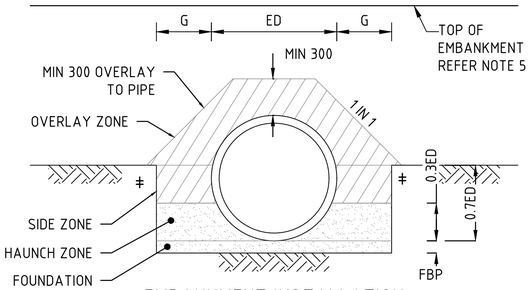
NOTES:

1. REFER CS3100 FOR GENERAL NOTES AND REFERENCES
2. FBP - FOUNDATION BEDDING FOR REINFORCED CONCRETE PIPES, IN ACCORDANCE WITH SPECIFICATIONS.
   - 2.1. D < 1350 - 100mm
   - 2.2. D ≥ 1350 - 150mm
3. FBC - FOUNDATION BEDDING FOR REINFORCED CONCRETE BOX CULVERT, IN ACCORDANCE WITH SPECIFICATIONS.
   - 3.1. FIRM MATERIAL 50mm - 150mm
4. TRENCH WALL COMPACTION OF NATURAL GROUND OR EMBANKMENT MINIMUM 90% STANDARD FOR MINIMUM 'ED' EACH SIDE OF TRENCH WALL AND TO A MINIMUM DEPTH OF 0.7'ED'.
5. WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLE AS PER AS3725-2007. ALLOWANCE FOR CONSTRUCTION LOADS SHALL COMPLY WITH DEPARTMENT'S STANDARD SPECIFICATION FOR ROADWORK.
6. PIPE SUPPORT TYPES IN ACCORDANCE WITH AS 3725-2007.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

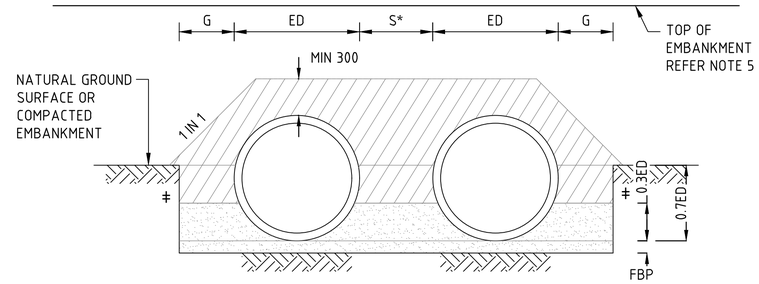
LEGEND:

BACKFILL MATERIAL (REFER NOTES 20, ON CS3100)

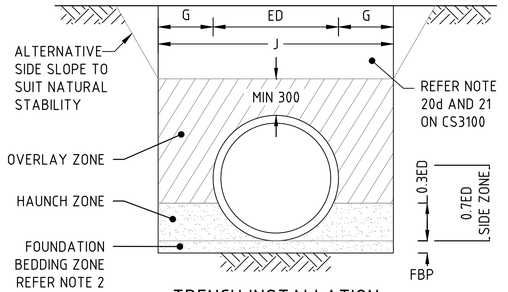
FOUNDATION/BEDDING/HAUNCH MATERIAL



EMBANKMENT INSTALLATION



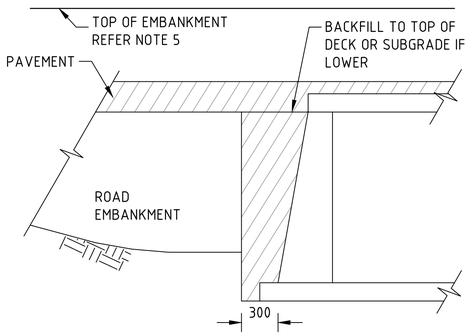
EMBANKMENT INSTALLATION - MULTIPLE PIPES



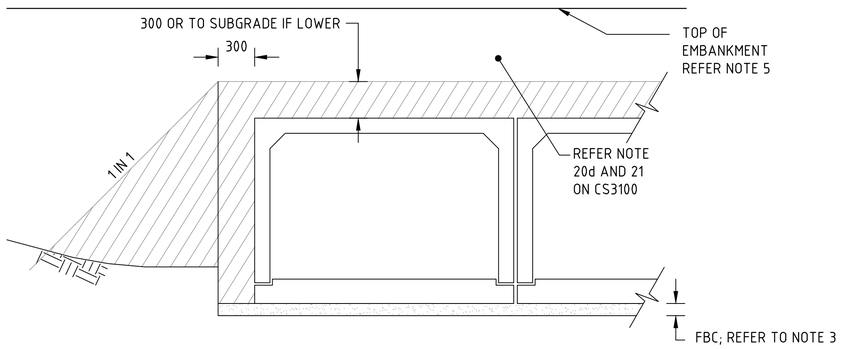
TRENCH INSTALLATION

TYPE HS3 SUPPORT FOR CONCRETE PIPES

‡ - TRENCH WALL COMPACTION. REFER NOTE 4



R.C. SLAB DECK CULVERT



NOTES:

1. THE SAME BACKFILL DETAILS APPLY FOR R.C.B.C. CROWN UNITS ON A CAST IN SITU BASE SLAB. HOWEVER, BEDDING MATERIALS MAY NOT BE REQUIRED, REFER RELEVANT CULVERT DETAILS SHOWN ELSEWHERE IN THIS STANDARD DRAWING SERIES.
2. WHERE SAND IS USED FOR THE "FBC" PROVIDE "DAMP PROOF MEMBRANE" TO ASSIST IN SEATING REINFORCEMENT CHAIRS & REINFORCEMENT.

PRECAST R.C. BOX CULVERT

TABLE 1: EMBANKMENT & TRENCH DIMENSIONS - RCP

NOMINAL INTERNAL DIAMETER [D] (mm)	NOMINAL EXTERNAL DIAMETER [ED] [1] (mm)	MINIMUM WIDTH [G] (mm)	HAUNCH DEPTH (0.3 × ED mm)	MAXIMUM ALLOWABLE WIDTH [J] (m) TRENCH INSTALLATION	SPACING BETWEEN MULTIPLE PIPES [S*] (mm)
300	362	300	110	1.1	300
375	445	300	135	1.2	300
450	534	300	165	1.3	300
525	616	300	185	1.5	300
600	698	300	210	1.6	300
750	864	450	260	1.8	600
900	1029	450	310	1.9	600
1050	1194	450	360	2.1	600
1200	1359	450	410	2.2	600
1350	1524	450	460	2.4	600
1500	1676	500	505	2.7	600
1650	1842	500	555	2.9	600
1800	2006	500	605	3.1	600
1950	2198	500	660	3.3	900

1. NOMINAL EXTERNAL DIAMETER IS PROVIDED FOR INFORMATION ONLY AND TO ASSIST SETOUT OF DIMENSIONS MENTIONED IN THIS STANDARD DRAWING. IT IS THE RESPONSIBILITY OF THE PROJECT MANAGER / CONTRACTOR TO CONFIRM THE EXTERNAL DIAMETER WITH THE MANUFACTURERS.

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING 1359 AND ADOPTED FOR NT CONDITIONS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
1	NOTES & ABBREVIATIONS AMENDED	APR 2023	J. COOK	TCS / DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

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DESIGNED	DATE	CHECKED	DATE
DESIGN LEADER S.HATZI	DATE 1/09/2017	DESIGN DIRECTOR S.JACKSON	DATE 1/09/2017

Northern Territory Government

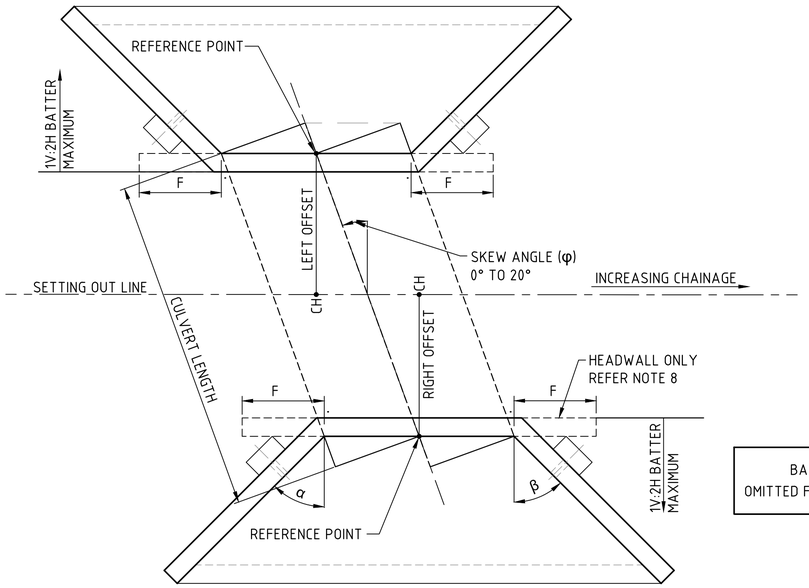
STANDARD DRAWINGS
DRAINAGE

INSTALLATION, BEDDING AND FILLING/BACKFILLING AGAINST/OVER CULVERTS

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3101	1	A1

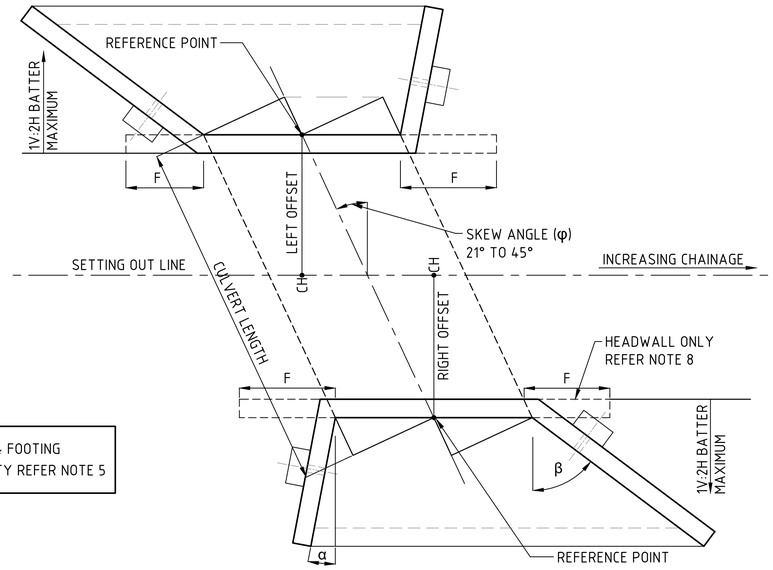
CS3101_AMED_1 RELEASED 12/07/2023

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



RCBC WITH SKEW ANGLE (φ) LESS THAN 20°
NOT TO SCALE

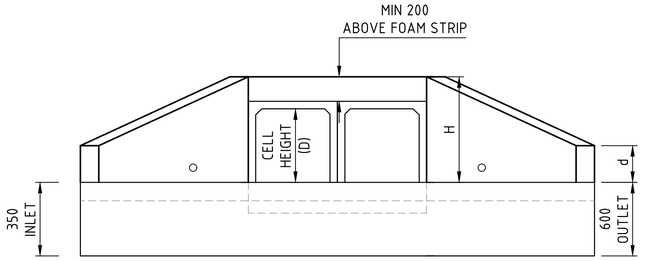
BASE SLAB & FOOTING
OMITTED FOR CLARITY REFER NOTE 5



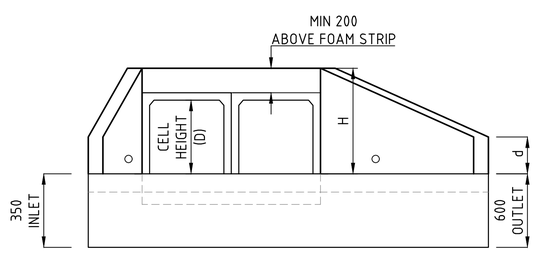
RCBC WITH SKEW ANGLE (φ) BETWEEN 20° AND 45°
NOT TO SCALE

EXAMPLE SET OUT PLAN FOR RCBC

(REFER TO NOTE 4 FOR REFERENCE POINT)

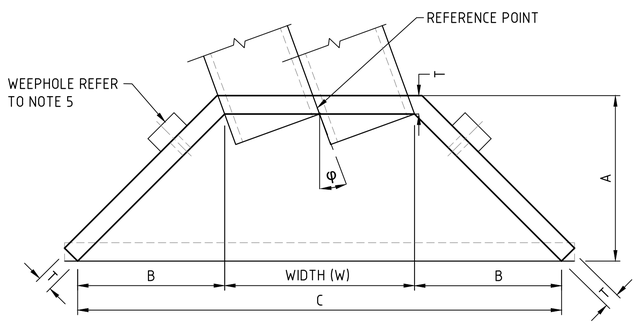


RCBC WITH SKEW ANGLE (φ) LESS THAN 20°
NOT TO SCALE

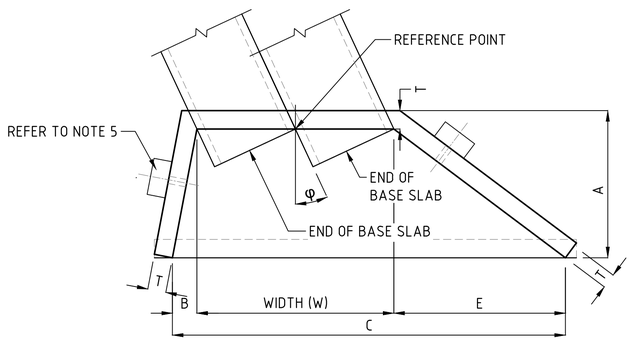


RCBC WITH SKEW ANGLE (φ) BETWEEN 20° AND 45°
NOT TO SCALE

ELEVATION



RCBC WITH SKEW ANGLE (φ) LESS THAN 20°
NOT TO SCALE



RCBC WITH SKEW ANGLE (φ) BETWEEN 20° AND 45°
NOT TO SCALE

HEADWALL & WINGWALL SET OUT DETAILS

NOTE

1. DESIGN LOADS ARE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE AS5100-2017.
2. HEADWALLS ARE NOT DESIGNED FOR GUARDRAIL IMPACT FORCES.
3. THE SETTING OUT DIMENSIONS IN THIS DRAWINGS ARE BASED ON A SET ROAD BATTER & CULVERT BATTER BEHIND THE WINGWALLS. THIS SHALL BE A MAXIMUM OF 1V:2H.
4. INLET AND OUTLET REFERENCE POINT FOR CULVERT SET-OUT LOCATED AT THE CENTER OF THE CULVERT CELL OR CELL GROUPS.
5. STANDARD DRAWING REFERENCES:
   - 5.1. CS3100 - NOTE 31 AND 32 FOR WEEPHOLES AND APRON DETAILS, NOTE 25 FOR MAXIMUM SPACING & GROUTING METHODS
   - 5.3. CS3108 - FOR LINK SLAB DETAILS.
   - 5.4. CS3109 AND CS3110 - FOR HEADWALL & WINGWALL REINFORCING DETAILS FOR CULVERT WITH D ≤ 900mm AND D > 900mm CORRESPONDINGLY.
   - 5.5. CS3111 - BASE SLAB & CONNECTION DETAILS WITH NIBS
   - 5.6. CS3112 - BASE SLAB & CONNECTION DETAILS WITH RECESSES
   - 5.7. CS3129 - CS3132 - WINGWALL SETOUT DIMENSIONS & QUANTITIES [A], [B], [C], [E], [H]
6. ALL EXPOSED EDGES TO BE PROVIDED WITH 20mm CHAMFERS.
7. LAY 50mm COMPACTED SAND AS FOUNDATION PREPARATION.
8. FOR BOX CULVERTS UP TO 600mm INTERNAL HEIGHT, WINGWALLS MAY BE OMITTED IN FAVOUR OF AN EXTENDED HEADWALL ARRANGEMENT. TYPICAL VALUES OF [F] ARE PROVIDED.
9. DEPTH OF HEADWALL MAY VARY, BASED ON THE BATTER SLOPE. LOCALLY INCREASE HEADWALL HEIGHT SO THAT BATTER HINGE MEETS FLUSH WITH TOP OF HEADWALL.
10. DESIRED HEADWALLS/WINGWALLS THICKNESS (T) ARE PROVIDED. ANY OTHER PROJECT SPECIFIC THICKNESS SHALL DESIGN TO OBTAIN AN ADEQUATE CONCRETE COVER AS PER STANDARD DRAWING CS3100 NOTE 1.
13. CROWN UNITS MAY BE PLACED EITHER TOUCHING OR WITH A GAP.
14. DO NOT USE THIS DRAWING SET FOR WINGWALL SETOUT IF A TRAVERSABLE WINGWALL GRATE IS TO BE INSTALLED. REFER CS3133 FOR USE OF THE WINGWALL GRATE
15. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

SETOUT REFERENCES & ABBREVIATIONS

DESCRIPTION	REFERENCE
REINFORCED CONCRETE BOX CULVERT	RCBC
SLAB LINK BOX CULVERT	SLBC
SKEW ANGLE	φ
HEADWALL HEIGHT FROM TOP OF APRON TO TOP OF HEADWALL	H
CULVERT CELL HEIGHT	D
CULVERT WINGWALL END HEIGHT	d = 200mm
DESIRABLE WINGWALL / HEADWALL THICKNESS	D ≤ 900mm, T = 150mm D > 900mm, T = 250mm
CULVERT APRON LENGTH	A
WINGWALL ANGLE 1	α
WINGWALL ANGLE 2	β
WIDTH DUE TO WINGWALL ANGLE 1	B
WIDTH DUE TO WINGWALL ANGLE 2	E
CULVERT WIDTH	W
HEADWALL EXTENSION (HEADWALL ONLY)	D = 450mm, F = 700mm D = 600mm, F = 950mm D > 600mm, F = N/A
APRON END WIDTH/GRATE MAX SPAN	C

THIS DRAWING IS DERIVED FROM TRANSPORT SOUTH AUSTRALIA STANDARD DRAWING S-4002, SHEET 19 & 20 AND ADOPTED FOR NT CONDITIONS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
4	DESIGN DETAILS AMENDED & SETOUT UPDATED	APR 2023	J. COOK	TCS / DIPL
3	MINOR AMENDMENT	OCT 2022	N.V	TCS / DIPL
2	HEAD WALL ANGLE MODIFIED FOR RCBC	JUNE 2018	S.JALIL	EES/DIPL
1	HEADWALL DETAILS ADDED	DEC 2017	J.STANW	EES/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

WARNING

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

Northern Territory Government

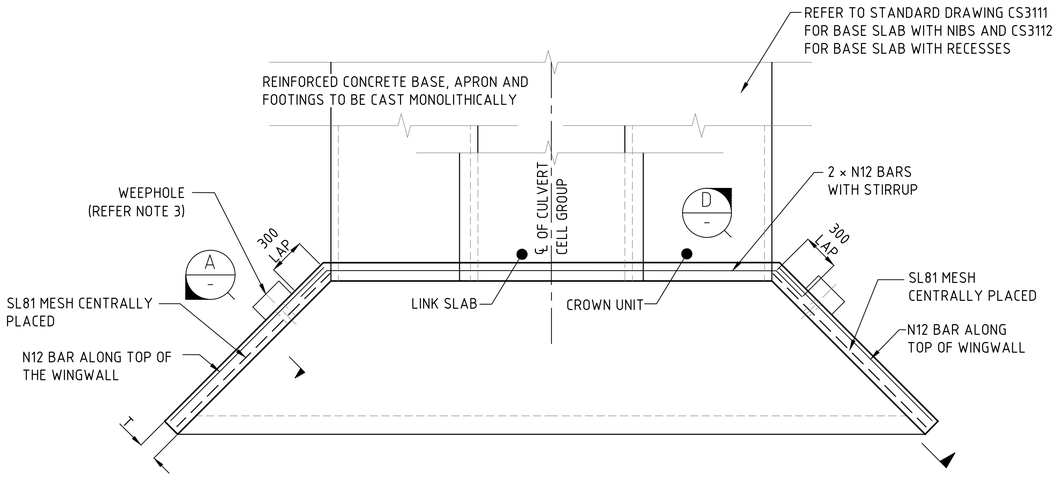
STANDARD DRAWINGS
DRAINAGE

REINFORCED CONCRETE BOX CULVERT (RCBC)
SET OUT DETAILS

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 7	CS3107	4	A1

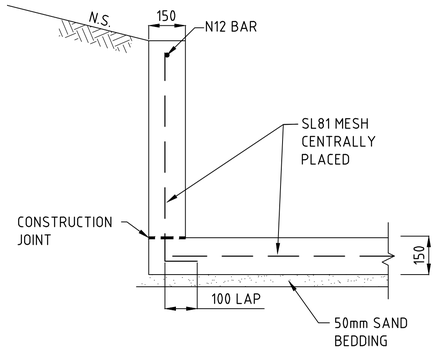
CS3107_AMED_4 RELEASED 12/07/2023

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



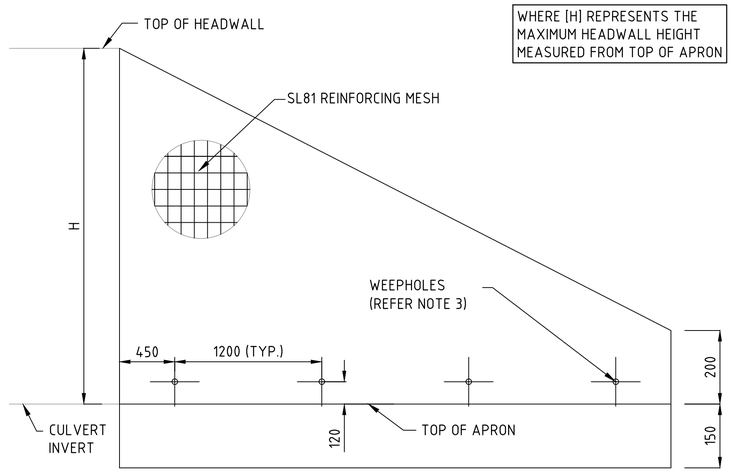
PLAN - HEADWALL AND WINGWALL DETAILS FOR RCBC + LINK SLAB

NOT TO SCALE



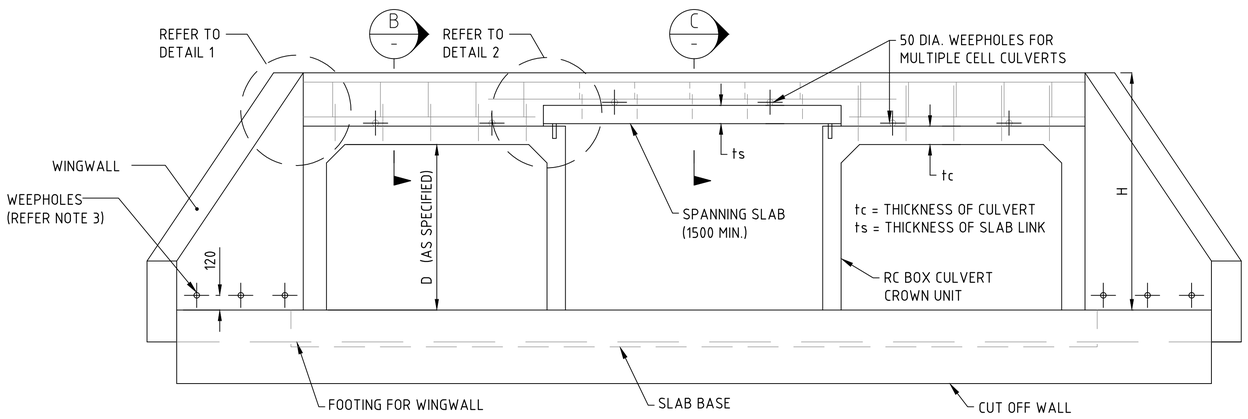
SECTION A

NOT TO SCALE



SECTION D

NOT TO SCALE

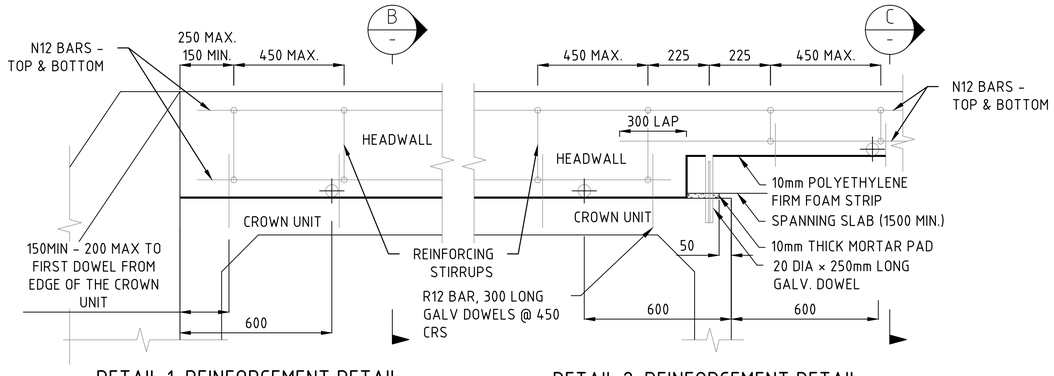


ELEVATION - HEADWALL & WINGWALL DETAILS FOR SLBC & RCBC (BASE WITH NIBS)

NOTES:

1. DESIGN LOADS ARE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE AS5100-2017.
2. HEADWALLS ARE NOT DESIGNED FOR GUARDRAIL IMPACT FORCES.
3. STANDARD DRAWING REFERENCES:
   - 3.1. CS3100 - RECOMMENDED REINFORCEMENT COVER THICKNESS AND STRENGTH OF CONCRETE UNDER DIFFERENT EXPOSURE CLASS, WEEPHOLE NOTES, APRON DETAILS AND FOR MAXIMUM SPACING AND GROUTING METHODS.
   - 3.2. CS3107 - RCBC SET OUT DETAILS & HEADWALL WINGWALL DETAIL FOR RCBC WITH D > 900mm.
   - 3.3. CS3108 - ARRANGEMENT AND INSTALLATION DETAILS OF RCBC AND LINK SLAB
   - 3.4. CS3110 - HEADWALL AND WINGWALL REINFORCING DETAILS FOR RCBC WITH D > 900mm
   - 3.5. CS3111 AND CS3112 - BASE SLAB DETAILS.
   - 3.6. CS3107 - CS3113 - SHEET 1 TO SHEET 7 OF THIS SET
   - 3.7. CS3129 - CS3132 - CULVERT SETOUT DIMENSIONS & QUANTITIES FOR RCBC / SLBC
4. REINFORCING BAR SHALL BE D500N AND MESH SHALL BE D500L IN ACCORDANCE WITH AS/NZS4671-2019.
5. MINIMUM LAP SHALL BE 300mm FOR REINFORCING BARS AND 100mm FOR MESH.
6. ALL EXPOSED EDGES TO BE PROVIDED WITH 20mm CHAMFERS.
7. LAY 50mm COMPACTED SAND AS FOUNDATION PREPARATION.
8. DEPTH OF HEAD WALL MAY VARY, BASED ON THE BATTER SLOPE & THICKNESS OF LINK SLAB. LOCALLY INCREASE HEADWALL HEIGHT SO THAT THE BATTER HINGE MEETS FLUSH WITH THE TOP OF HEADWALL.
9. DESIRED HEADWALLS/WINGWALLS THICKNESS [T] IS 150mm. ANY OTHER PROJECT SPECIFIC THICKNESS SHALL DESIGN TO OBTAIN AN ADEQUATE CONCRETE COVER AS PER STANDARD DRAWING CS3100 NOTE 1.
10. DOWELS ARE REQUIRED WHEN WIDTH OF THE CULVERT SYSTEM 'W' > 2.4m TO ENSURE SUFFICIENT RESISTANCE AGAINST SLIDING FAILURE.
11. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING SET 1250 AND ADOPTED FOR NT CONDITIONS.

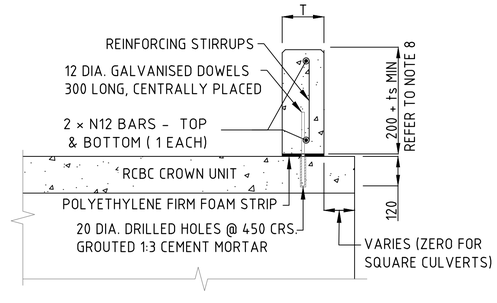


DETAIL 1: REINFORCEMENT DETAIL AT END OF HEADWALL

NOT TO SCALE

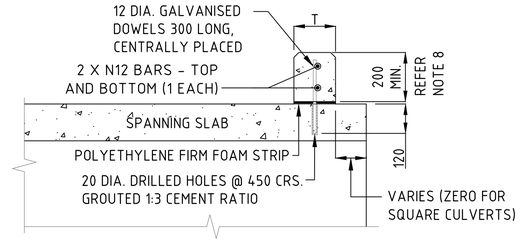
DETAIL 2: REINFORCEMENT DETAIL AROUND LINK SLAB

NOT TO SCALE



SECTION B

NOT TO SCALE



SECTION C

NOT TO SCALE

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
2	DESIGN DETAILS AMENDED	APR 2023	J. COOK	TCS / DIPL
1	MINOR AMENDMENT	OCT 2022	N.V	EES
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

WARNING

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

Northern Territory Government

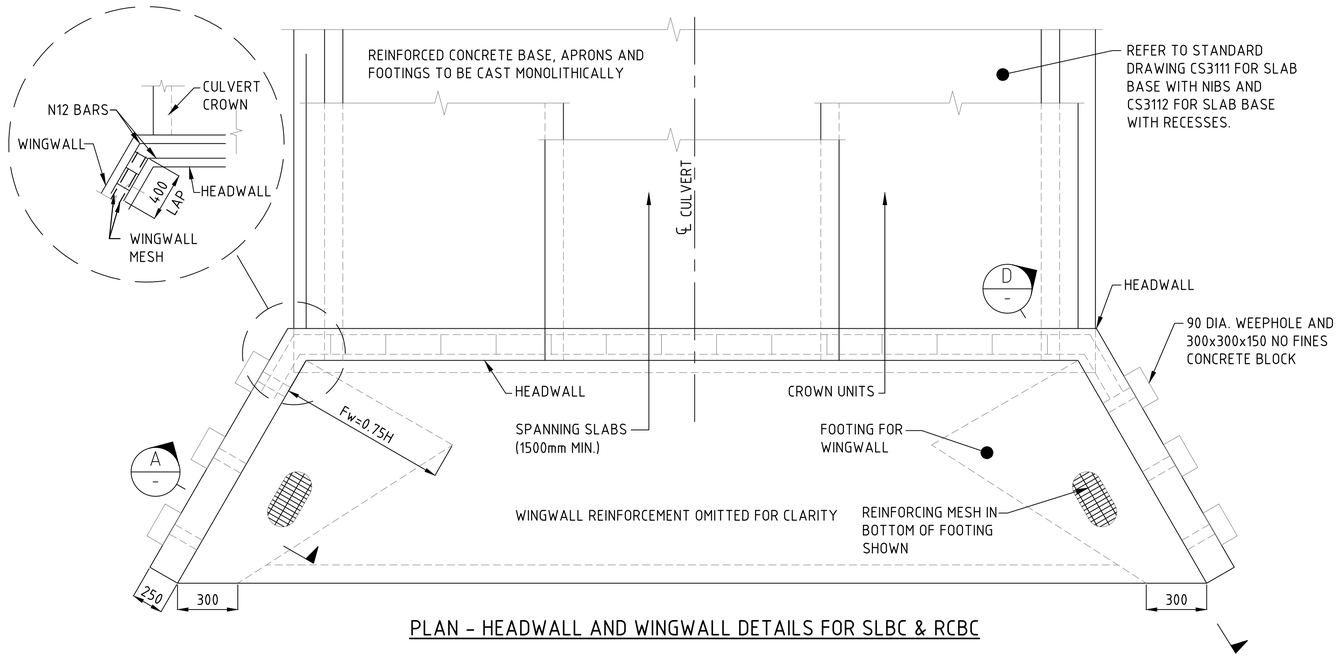
STANDARD DRAWINGS
DRAINAGE

REINFORCED CONCRETE BOX CULVERT (RCBC) WINGWALL AND HEADWALL DETAIL FOR D ≤ 900mm

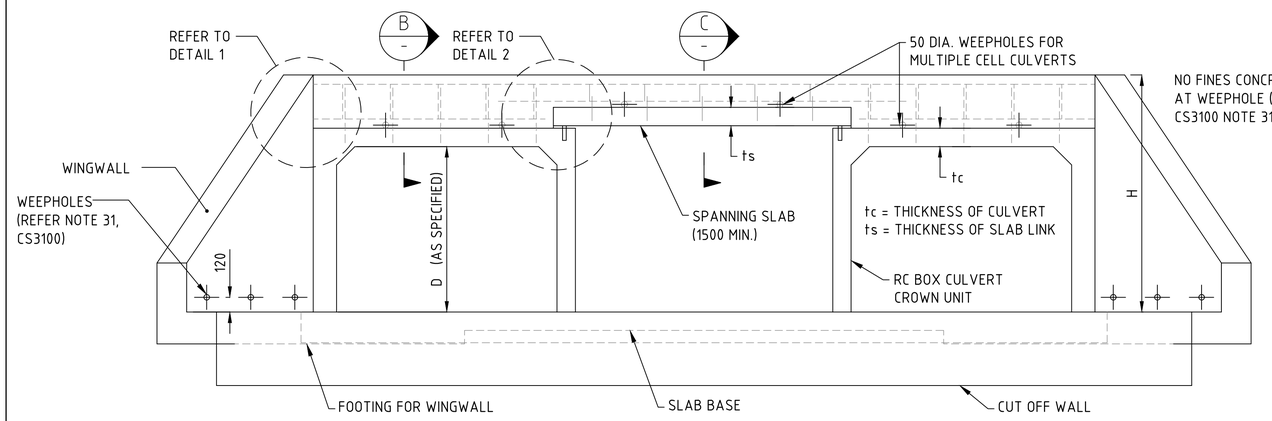
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	3 OF 7	CS3109	2	A1

CS3109_AMED_2 RELEASED 12/07/2023

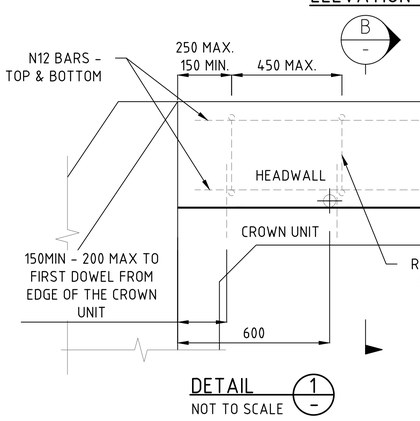
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



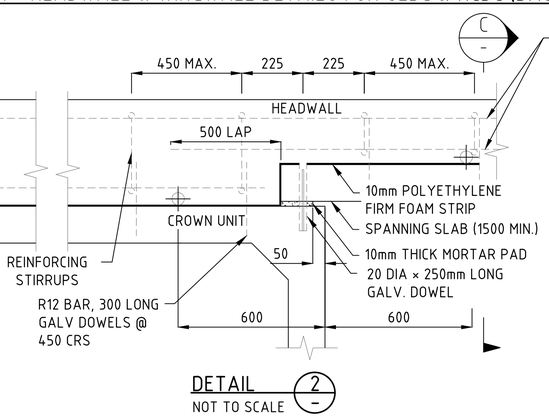
PLAN – HEADWALL AND WINGWALL DETAILS FOR SLBC & RCBC



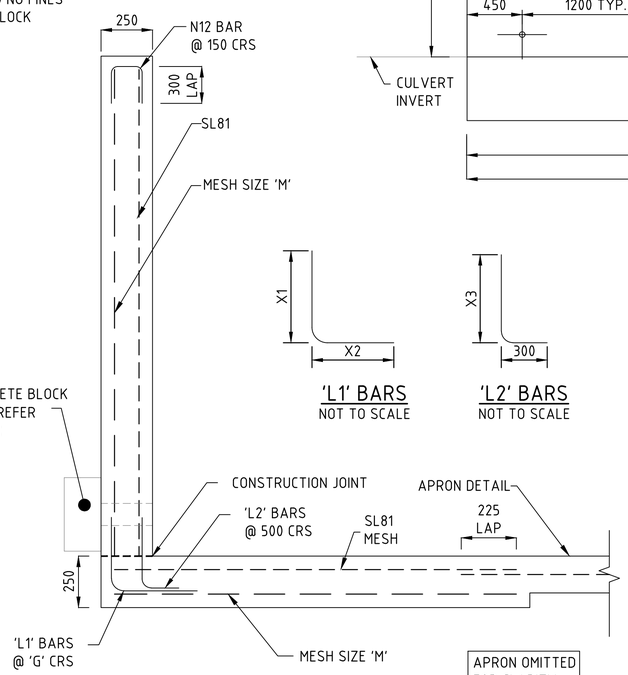
ELEVATION – HEADWALL & WINGWALL DETAILS FOR SLBC & RCBC (BASE WITH NIBS)



DETAIL 1 NOT TO SCALE

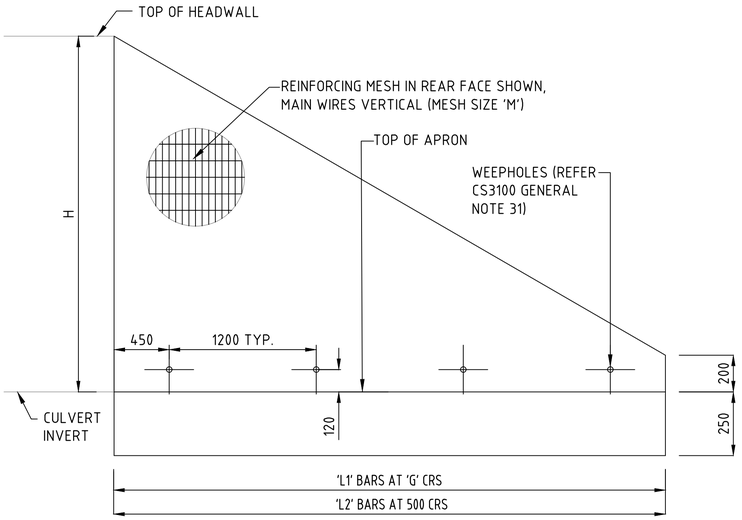


DETAIL 2 NOT TO SCALE



APRON OMITTED FOR CLARITY

SECTION A WINGWALL NOT TO SCALE



ELEVATION D NOT TO SCALE

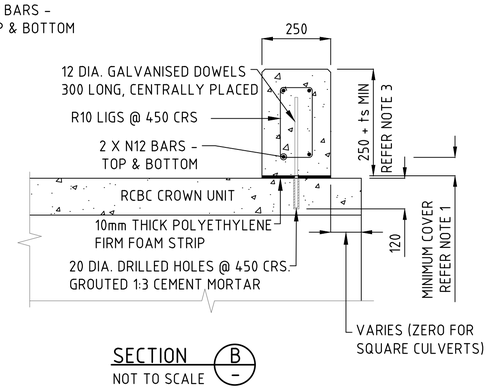
'L1' BARS NOT TO SCALE

'L2' BARS NOT TO SCALE

TABLE 1: MINIMUM REINFORCEMENT REQUIREMENTS

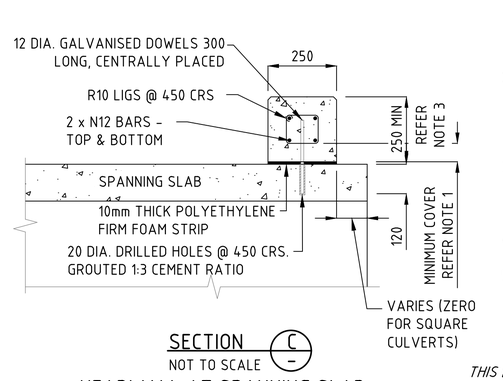
H	MESH SIZE [M]	L1 BARS				L2 BARS [N12]
		ϕ	X1	X2	G	X3
0 – 1500	SL81	12	550	400	200	550
1501 – 2000	RL1018	12	550		200	600
2001 – 2500	RL1018	12	600		100	650
2501 – 3000	RL1218	20	750		100	650
>3000	PROJECT SPECIFIC DESIGN REQUIRED					

H = MAXIMUM HEIGHT OF WINGWALL, MEASURED FROM APRON TO TOP OF WINGWALL WHERE IT MEETS THE HEADWALL



SECTION B NOT TO SCALE

HEADWALL AT CROWN UNIT



SECTION C NOT TO SCALE

HEADWALL AT SPANNING SLAB

NOTES:

1. STANDARD DRAWING REFERENCES
   - 1.1. CS3100 – THE REQUIRED CONCRETE COVER THICKNESS AND MINIMUM CONCRETE STRENGTH FOR DIFFERENT EXPOSURE CLASS AND OTHER NOTES.
   - 1.2. CS3107 AND CS3109 – SET OUT PLAN & HEADWALL AND WINGWALL REINFORCING DETAILS FOR RCBC WITH D ≤ 900mm.
   - 1.3. CS3111 AND CS3112 – CULVERT BASES AND APRONS CONNECTION DETAILS
   - 1.4. CS3107 – CS3113 – SHEET 1 TO 7 OF THIS SET
   - 1.5. CS3127 – CS3132 – CULVERT SETOUT DIMENSIONS & QUANTITIES FOR RCBC & SLBC
2. DESIRED THICKNESS FOR HEADWALL & WINGWALL [T] FOR BOX CULVERT WITH D>900mm IS 250mm. ANY OTHER PROJECT SPECIFIC THICKNESS SHALL BE DESIGNED TO OBTAIN AN ADEQUATE COVER AS PER STANDARD DRAWING CS3100 NOTE 1.
3. DEPTH OF HEADWALL MAY VARY, BASED ON THE BATTER SLOPE. LOCALLY INCREASE HEADWALL HEIGHT TO ENSURE TOP OF HEADWALL MEETS BATTER HINGE FLUSH
4. ALL EXPOSED EDGES TO BE PROVIDED WITH 20mm CHAMFERS.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING SET 1250 AND ADOPTED FOR NT CONDITIONS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
2	DESIGN DETAILS AMENDED	APR 2023	J. COOK	TCS / DIPL
1	MINOR AMENDMENT	OCT 2022	N.V	TCS/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

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

Northern Territory Government

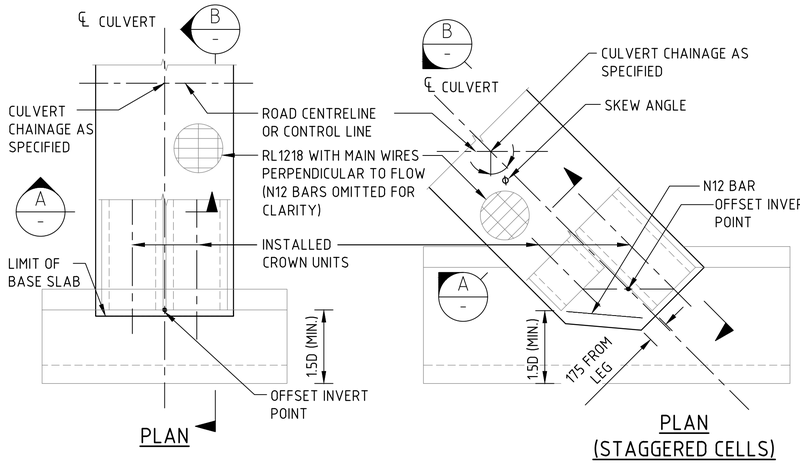
STANDARD DRAWINGS
DRAINAGE

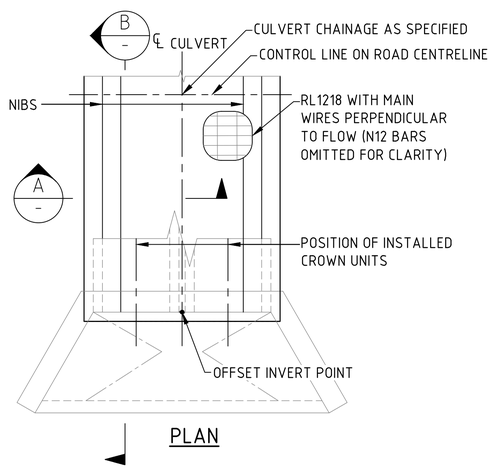
REINFORCED CONCRETE BOX CULVERT (RCBC) WINGWALL AND HEADWALL DETAILS FOR D > 900mm

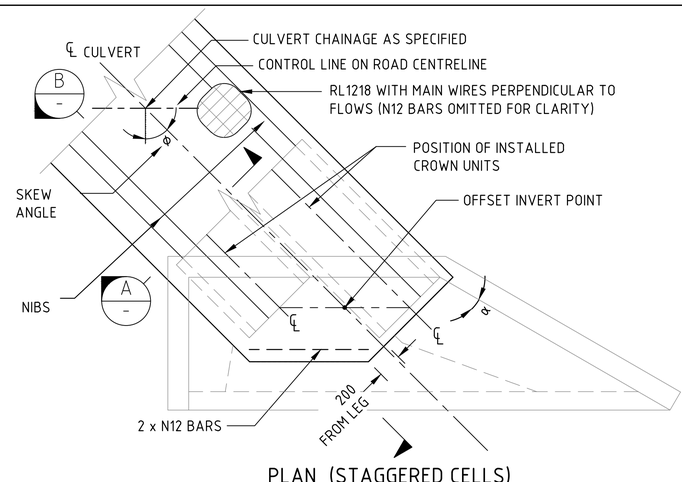
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	4 OF 7	CS3110	2	A1

CS3110_AMED_2 RELEASED 12/07/2023

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

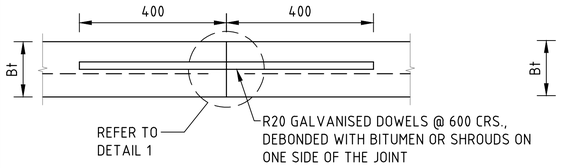






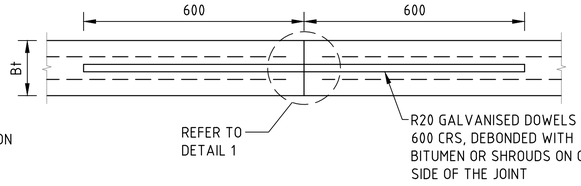
SLAB & APRON DETAILS FOR CULVERTS WITHOUT WINGWALLS

FOR HEADWALL DETAILS REFER STANDARD DRAWINGS CS3107



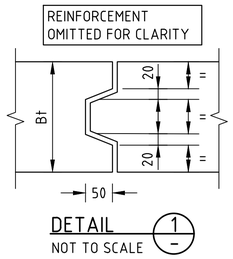
CONTRACTION JOINT - SPAN UP TO 1800mm

(SINGLE REINFORCEMENT LAYER) - REFER NOTE 1



CONTRACTION JOINT - SPAN GREATER THAN 1800mm

(DOUBLE REINFORCEMENT LAYER) - REFER NOTE 1



DETAIL 1 - NOT TO SCALE

SLAB & APRON DETAILS FOR CULVERTS WITH WINGWALLS

FOR HEADWALL & WINGWALL DETAILS REFER STANDARD DRAWINGS CS3107, CS3109 & CS3110

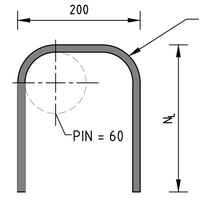
TABLE 1 - BASE SLAB DETAILS

SPAN OF CROWN UNIT	BASE SLAB THICKNESS (Bt)	PRIMARY REINFORCEMENT	SECONDARY REINFORCEMENT
600 - 1800	200	RL1218 CENTRALLY PLACED	N12 BARS @ 200 CRS
>1800	250	RL1218 TOP & BOTTOM	N12 BARS @ 200 CRS

TABLE 2 - NIB ARRANGEMENT & INSTALLATION

CULVERT TYPE	ARRANGEMENT	
RCBC D < 600	NO NIBS	
RCBC D > 600	NIBS SUPPORTING EXTERNAL LEGS OF EXTERNAL CELLS	
SLBC 600 < D < 900	NIBS SUPPORTING EXTERNAL LEGS OF EXTERNAL CELLS	
SLBC D > 600	NIBS SUPPORTNG BOTH LEGS OF EXTERNAL CELLS	

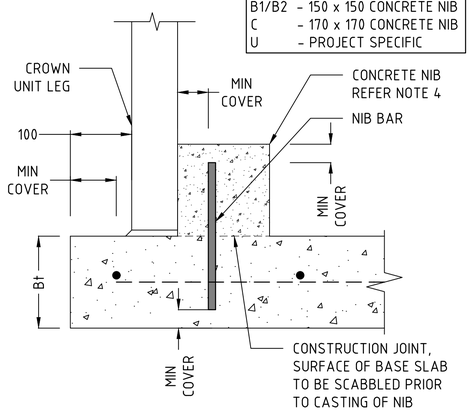
INSTALLATION:
H < 1500, NIBS CAST BEFORE PLACEMENT OF UNITS
H > 1500, NIBS CAST AFTER PLACEMENT OF UNITS



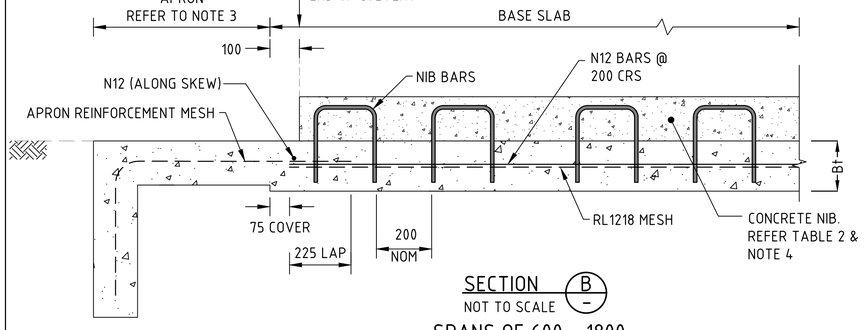
NIB BAR DIMENSIONS:
B1/B2 - N_L = Bt + 50
C - N_L = Bt + 30
U - N_L = PROJECT SPECIFIC

NIB BAR DETAIL

CONCRETE NIB DIMENSIONS:
B1/B2 - 150 x 150 CONCRETE NIB
C - 170 x 170 CONCRETE NIB
U - PROJECT SPECIFIC

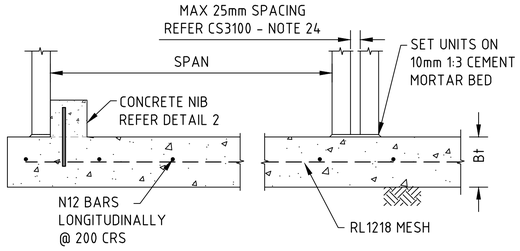


CONCRETE NIB - DETAIL 2 - NOT TO SCALE



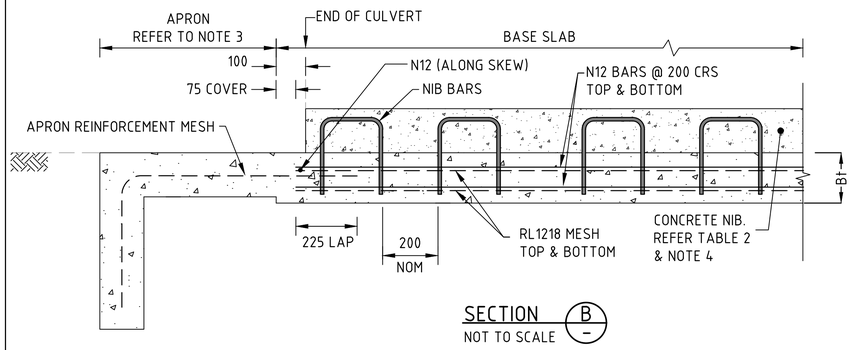
SECTION B - NOT TO SCALE

SPANS OF 600 - 1800



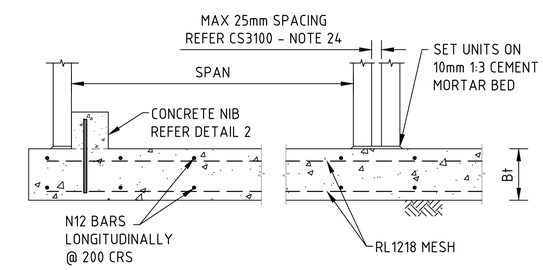
SECTION A - NOT TO SCALE

SPAN OF 600 - 1800



SECTION B - NOT TO SCALE

SPAN GREATER THAN 1800



SECTION A - NOT TO SCALE

SPAN GREATER THAN 1800

NOTES:

1. CONTRACTION JOINTS ARE TO BE PROVIDED WHERE:
   - 1.1. THE LENGTH OF THE BASE SLAB EXCEEDS 20 METRES
   - 1.2. THE WIDTH OF THE BASE SLAB EXCEED 20 METRES.
   - 1.3. 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.
   - 1.4. FOR APRON CONTRACTION JOINTS REFER TO THE DETAIL FOR SINGLE REINFORCEMENT LAYER. 24 HOURS MINIMUM IS TO BE ALLOWED BETWEEN POURS.
2. FOR CULVERTS WITH A BASE > 10 METRES ALONG ROAD CENTRELINE, THIS DESIGN SHOULD NOT BE USED IN:
   - 2.1. HIGHLY REACTIVE OR EXPANSIVE CLAY SOILS (LINEAR SHRINKAGE >8%)
   - 2.2. WHERE LARGE DIFFERENTIAL SETTLEMENTS ARE EXPECTED TO OCCUR.
   - 2.3. WHERE THE ABOVE HAS BEEN IDENTIFIED, SPECIAL DESIGN ADVICE IS REQUIRED
3. STANDARD DRAWING REFERENCES:
   - 3.1. CS3100 - GENERAL NOTES, APRON DETAILS, DEFINITION OF SYMBOLS, & BASE SLAB EXTENSION DETAILS
   - 3.2. CS3107 - CS3113 - SHEET 1 TO SHEET 7 OF THIS SET
4. NIB BAR LENGTHS ARE DEPENDENT ON THE THICKNESS OF BASE SLAB & MINIMUM COVER REQUIREMENTS. REFER CS3100 - NOTE 1 FOR MINIMUM COVER AND CONCRETE EXPOSURE CLASSIFICATIONS
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING SET 1250 AND ADOPTED FOR THE NT CONDITIONS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
2	DESIGN DETAILS AMENDED	APR 2023	J. COOK	TCS / DIPL
1	MINOR AMENDMENT	OCT 2022	N.V	TCS/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

WARNING

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

Northern Territory Government

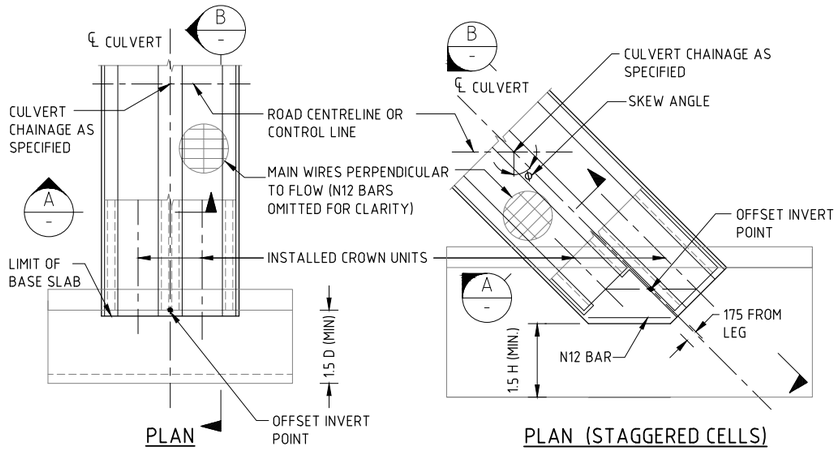
STANDARD DRAWINGS
DRAINAGE

REINFORCED CONCRETE BOX CULVERT (RCBC) CONSTRUCTION OF BASES WITH NIBS AND APRONS

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	5 OF 7	CS3111	2	A1

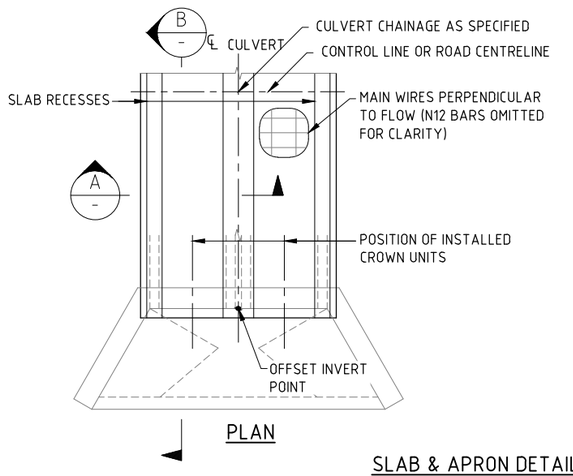
CS3111_AMED_2 RELEASED 12/07/2023

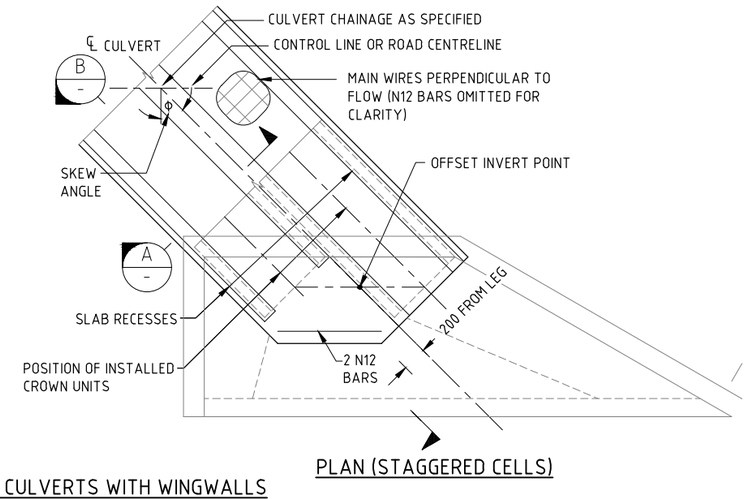
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



SLAB & APRON DETAILS FOR CULVERTS WITHOUT WINGWALLS

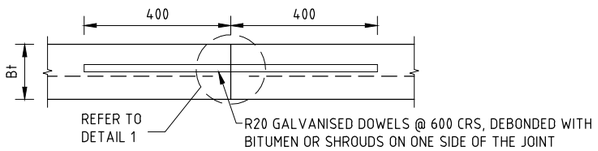
FOR HEADWALL DETAILS REFER STANDARD DRAWINGS CS3107





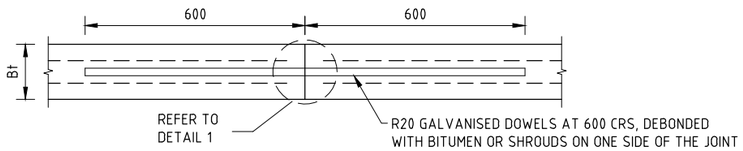
SLAB & APRON DETAILS FOR CULVERTS WITH WINGWALLS

FOR HEADWALL & WINGWALL DETAILS REFER STANDARD DRAWINGS CS3107, CS3109 & CS3110



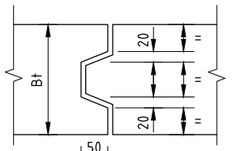
CONTRACTION JOINT - SPAN UP TO 1800

(SINGLE REINFORCEMENT LAYER) - REFER NOTE 1



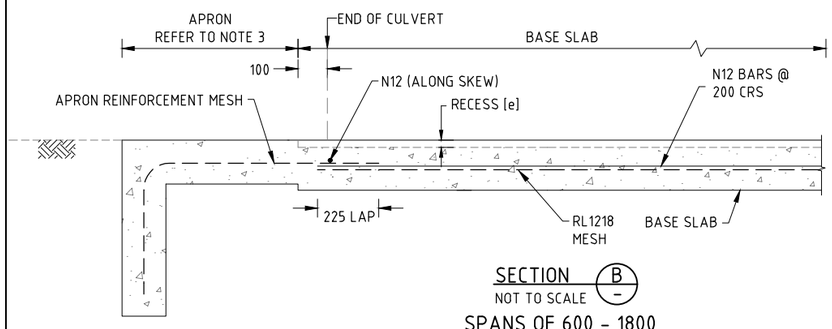
CONTRACTION JOINT - SPAN GREATER THAN 1800

(DOUBLE REINFORCEMENT LAYER) - REFER NOTE 1



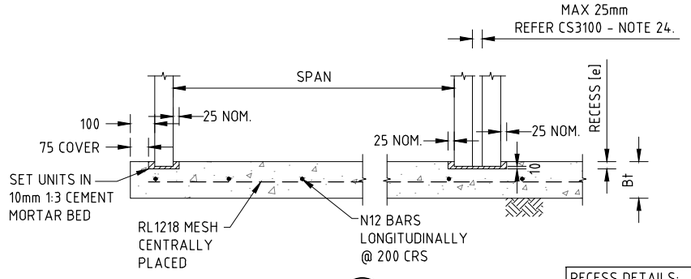
DETAIL 1 - NOT TO SCALE

REINFORCEMENT OMITTED FOR CLARITY



SECTION B - NOT TO SCALE

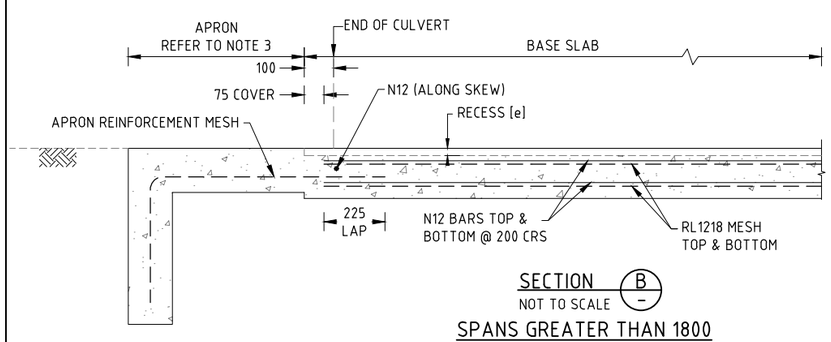
SPANS OF 600 - 1800



SECTION A - NOT TO SCALE

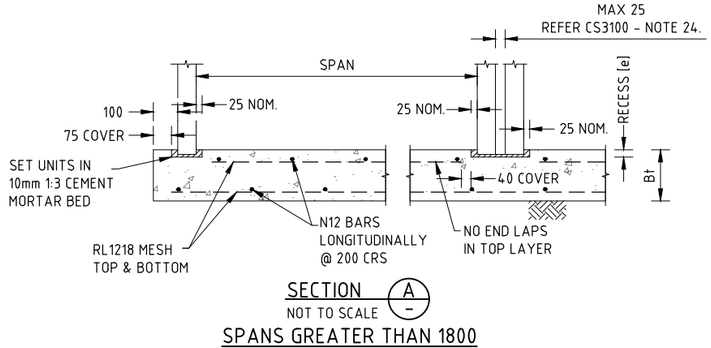
SPANS OF 600 - 1800

RECESS DETAILS:	
D ≤ 600	- [e] = 0, NO RECESSES
600 < D < 750	- [e] = 20mm
750 < D < 1200	- [e] = 30mm
D > 1200	- [e] = 40mm



SECTION B - NOT TO SCALE

SPANS GREATER THAN 1800



SECTION A - NOT TO SCALE

SPANS GREATER THAN 1800

NOTES:

1. CONTRACTION JOINTS ARE TO BE PROVIDED WHERE
   - 1.1. THE LENGTH OF THE BASE SLAB AND/OR
   - 1.2. THE WIDTH OF THE BASE SLAB EXCEED 20 METRES.
   - 1.3. 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.
   - 1.4. FOR APRON CONTRACTION JOINTS REFER TO THE DETAIL FOR SINGLE REINFORCEMENT LAYER. 24 HOURS MINIMUM IS TO BE ALLOWED BETWEEN POURS.
2. FOR CULVERTS WITH A BASE > 10 METRES ALONG ROAD CENTRELINE, THIS DESIGN SHOULD NOT BE USED IN:
   - 2.1. HIGHLY REACTIVE OR EXPANSIVE CLAY SOILS (LINEAR SHRINKAGE >8%
   - 2.2. WHERE LARGE DIFFERENTIAL SETTLEMENTS ARE EXPECTED TO OCCUR.
   - 2.3. SPECIAL DESIGN ADVICE SHOULD BE OBTAINED IN THESE CIRCUMSTANCES.
3. STANDARD DRAWING REFERENCES:
   - 3.1. CS3100 - GENERAL NOTES, APRON DETAILS, DEFINITION OF SYMBOLS, CONCRETE STRENGTH, MINIMUM CONCRETE COVER THICKNESS & BASE SLAB EXTENSION DETAILS
   - 3.2. CS3107 - CS3113 - SHEET 1 TO SHEET 7 OF THIS SET
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

TABLE 1 - BASE SLAB DETAILS

SPAN OF CROWN UNIT	THICKNESS OF BASE SLAB (Bt)	PRIMARY REINFORCEMENT	SECONDARY REINFORCEMENT
600 - 1800	200	RL1218 MESH CENTRALLY PLACED MAIN WIRES PERPENDICULAR TO FLOW	N12 BARS @ 200 CRS
>1800	250	RL1218 MESH TOP & BOTTOM MAIN WIRES PERPENDICULAR TO FLOW	N12 BARS @ 200 CRS TOP & BOTTOM

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING 1250 AND ADOPTED FOR THE NT CONDITIONS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
2	DESIGN DETAILS AMENDED	APR 2023	J. COOK	TCS / DIPL
1	MINOR AMENDMENT	OCT 2022	N.V	TCS/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

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DESIGNED QLD	DATE	CHECKED QLD	DATE
DESIGN LEADER S.HATZI	DATE 1/09/2017	DESIGN DIRECTOR S.JACKSON	DATE 1/09/2017

Northern Territory Government

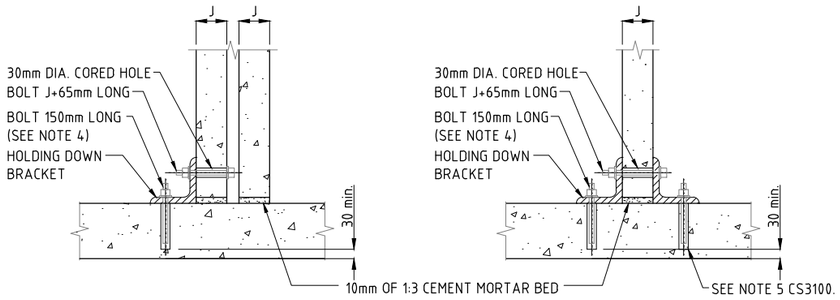
STANDARD DRAWINGS
DRAINAGE

REINFORCED CONCRETE BOX CULVERT (RCBC) CONSTRUCTION OF BASES WITH RECESSES & APRONS

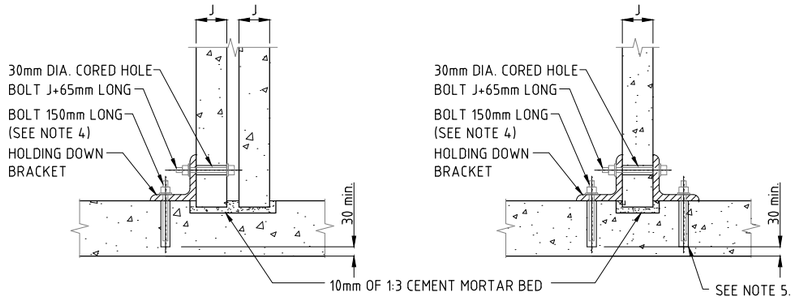
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	6 OF 7	CS3112	2	A1

CS3112_AMED_2 RELEASED 12/07/2023

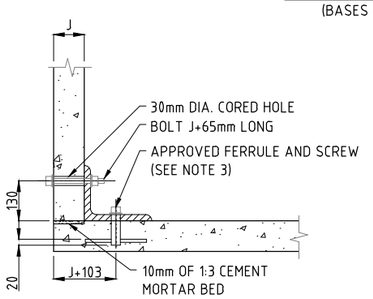
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



HOLDING DOWN ANCHORS
(BASES WITHOUT RECESSES)

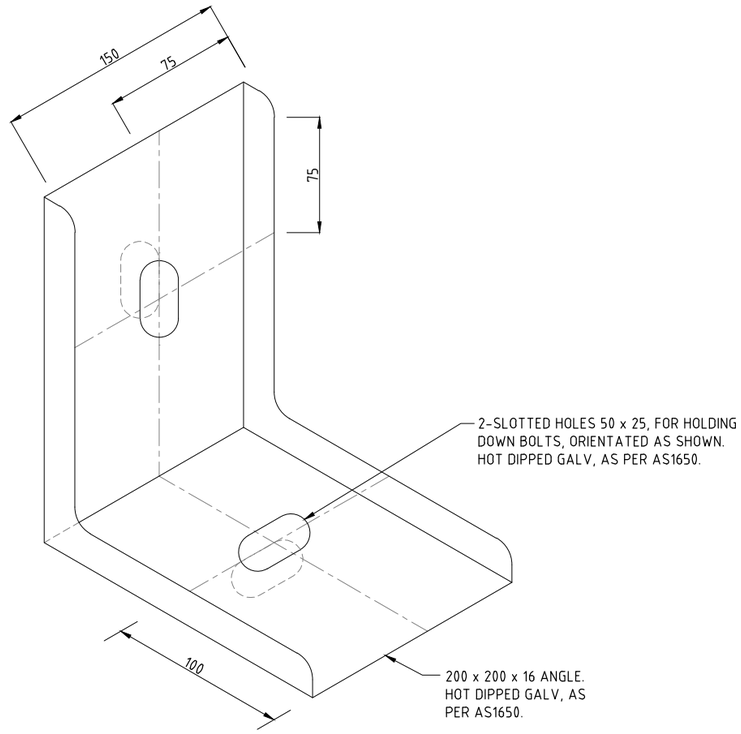


HOLDING DOWN ANCHORS
(BASES WITH RECESSES)



PRECAST BASE UNIT

"J"= WIDTH OF CELL LEG



HOLDING DOWN BRACKET
NOT TO SCALE

NOTE:

1. 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 1214-2016.
2. 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.
3. APPROVED MILD STEEL FERRULE WITH CROSS BAR FOR USE IN PRECAST BASE SLABS:
   - 3.1. LENGTH 65, THREAD DEPTH 32, FOR P.C. BASE SLABS 80 THICK OR GREATER.
   - 3.2. TO TAKE HEXAGONAL SCREW M20 X 45 TO AS 1111-2015.
   - 3.3. CROSS HOLED TO TAKE 12 X 250 M.S. BAR.
   - 3.4. FERRULE AND CROSS BAR TO BE HOT DIPPED GALVANISED TO AS 1214-2016.
   - 3.5. FERRULE LOCATED 300 FROM ENDS TO MATCH CORED HOLES IN CROWN UNITS.
   - 3.6. 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.
4. HOLDING DOWN BOLTS TO BE PLACED IN DRILLED 30 DIA. HOLES AND GROUTED WITH 1:2 CEMENT SAND GROUT AFTER PLACING CROWNS. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
5. STANDARD DRAWING REFERENCES:
   - 5.1. CS3100 - CULVERT GENERAL NOTES AND USE OF THE HOLDING DOWN ANCHORS
   - 5.2. CS3107 - RCBC SETOUT DETAILS
   - 5.3. CS3108 - CROWN UNIT AND LINK SLAB INSTALLATION DETAILS, AND USE OF HOLDING DOWN ANCHORS
   - 5.4. CS3109 & CS3110 - WINGWALL AND HEADWALL DETAIL FOR RCBC / SLBC
   - 5.5. CS3111 - RCBC BASE SLABS WITH NIBS AND APRONS
   - 5.5. CS3112 - RCBC BASE SLABS WITH RECESSES AND APRONS
6. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

THIS DRAWING IS DERIVED FROM QUEENSLAND MAIN ROADS STANDARD DRAWING SET 1250 AND ADOPTED FOR THE NT CONDITIONS.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
1	DESIGN NOTES ADDED	APR 2023	J. COOK	TCS / DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

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DESIGNED QLD	DATE	CHECKED QLD	DATE
DESIGN LEADER S.HATZI	DATE 1/09/2017	DESIGN DIRECTOR S.JACKSON	DATE 1/09/2017

Northern Territory Government

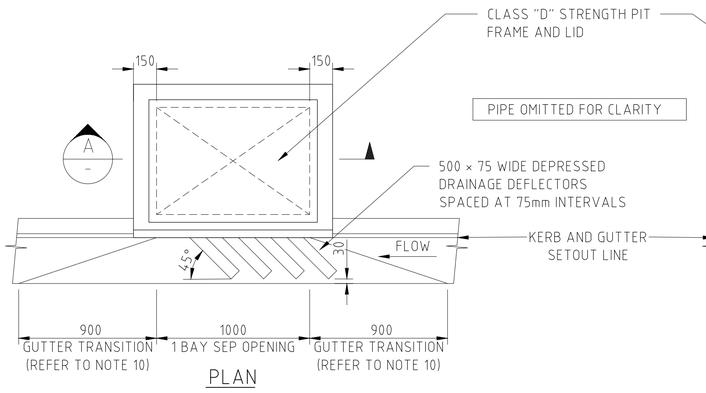
STANDARD DRAWINGS
DRAINAGE

REINFORCED CONCRETE BOX CULVERT (RCBC) CROWN UNIT HOLDING DOWN ANCHORS

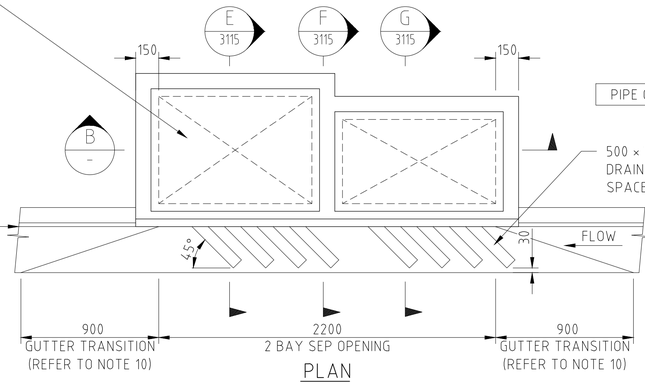
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	7 OF 7	CS3113	1	A1

CS3113_AMED_1 RELEASED 12/07/2023

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



PLAN



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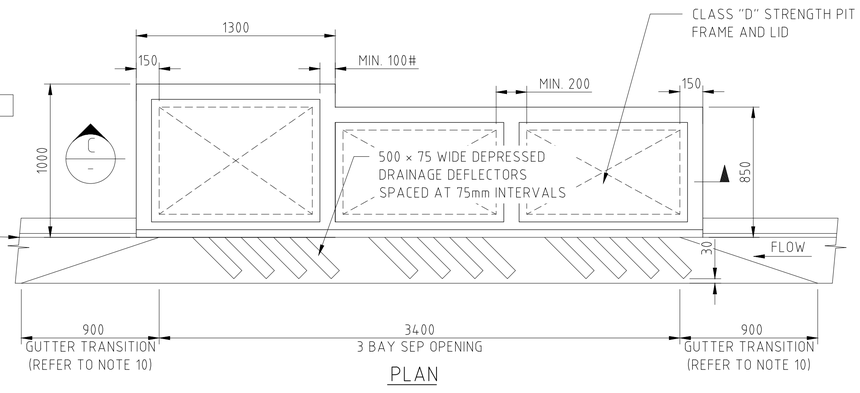
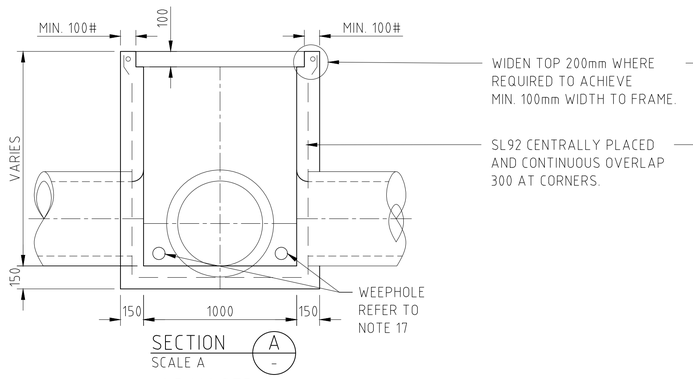
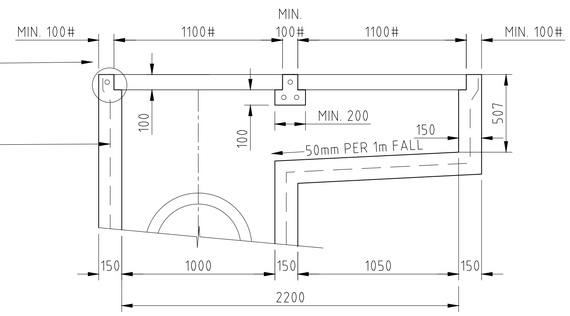


PLAN



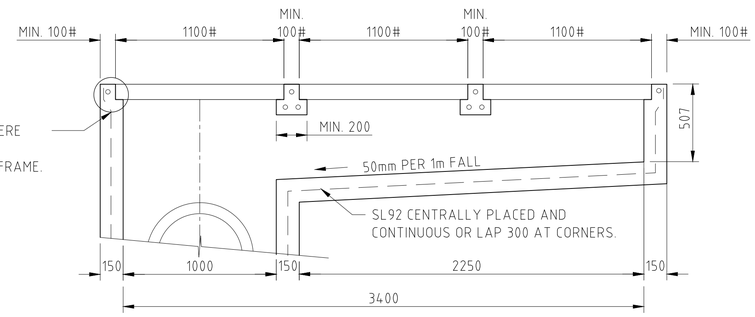
SECTION A
SCALE A

1 BAY SEP

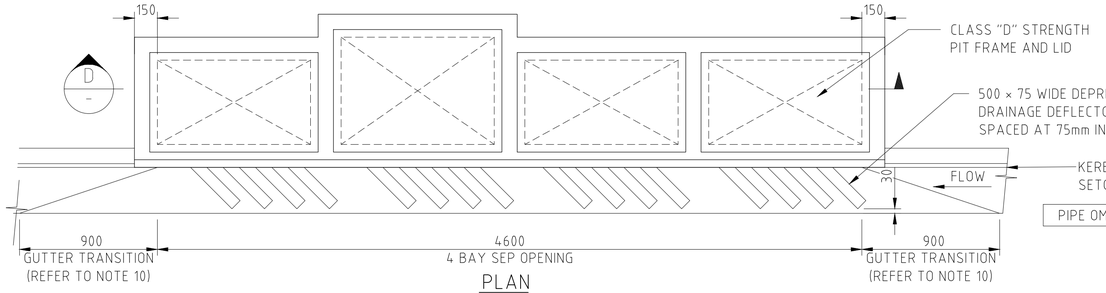


SECTION B
SCALE A

2 BAY SEP

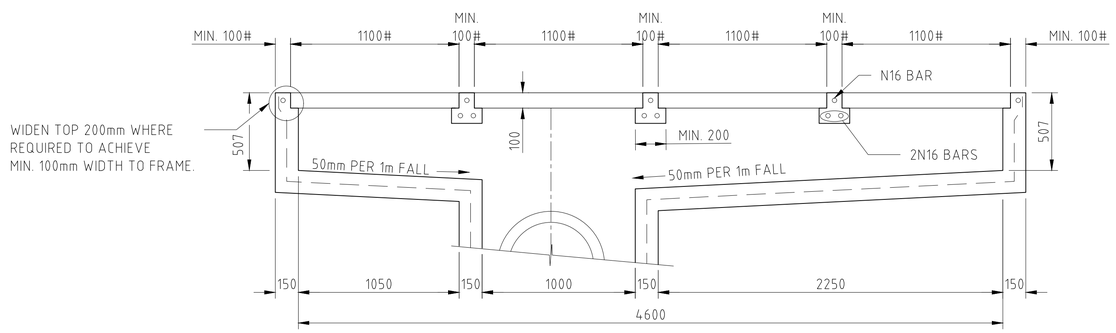


SECTION C
SCALE A



PIPE OMITTED FOR CLARITY

PLAN



SECTION D
SCALE A

4 BAY SEP

SCALE A 0.20 0 0.20 0.40 0.60 0.80 1.00 IN METERS

\# WIDTH MAY VARY DEPENDANT ON THE TYPE OF LID

NOTES:

1. CONCRETE SHALL COMPLY WITH AS 3600-2009 AND AS 1379-2007.
2. USE N32 CONCRETE UNLESS OTHERWISE AGREED.
3. DESIGNED FOR CLASS D LOADING TO AS 3996-2006. ULTIMATE LIMIT STATE DESIGN LOAD 210 KN.
4. USE PIT LIDS AND FRAMES DESIGNED AND TESTED FOR CLASS D LOADS TO AS 3996-2006, UNLESS OTHERWISE DIRECTED.
5. ADJUST THE BLOCKOUT DIMENSIONS TO SUIT THE ACTUAL SIZE OF LID FRAME.
6. REFER TO THE PROJECT DRAWINGS FOR PIPE AND PIT LOCATIONS, DEPTHS AND ARRANGEMENTS.
7. THE SURFACE UNDER THE PIT AND KERB IS CONSIDERED AS SUBGRADE AND SHALL BE COMPACTED TO 95% MMDD.
8. A BLOCKOUT IS SHOWN FOR THE INSERTION OF ACCESS COVER FRAME. THE COVER SHALL BE CAST INTO THE CONCRETE SURROUND.
9. DO NOT INSTALL STEP IRONS IN PIT UNLESS OTHERWISE DIRECTED.
10. TRANSITION THE GUTTER FROM THE PIT TO THE STANDARD GUTTER OVER 900mm EACH SIDE OF PIT, OR 3000 FOR LAY BACK KERBS. REFER CS-3300.
11. IT IS NOT ESSENTIAL TO FORM THE EXTERNAL SURFACES OF THE PIT BELOW THE LEVEL OF THE C.J. IT IS EXPECTED THAT IN MANY SITUATIONS THE BOTTOM PORTION OF THE PIT WILL BE CAST AGAINST GROUND OR SANDBAGS.
12. LIDS SHALL BE MARKED IN ACCORDANCE WITH AS 3996-2006. LOAD CLASS AND THE MASS OF THE LID, AND ALIGNMENT MARKS MUST BE CLEARLY AND PERMANENTLY VISIBLE ON THE UPPER SURFACE OF THE LID.
13. PROVIDE LIDS WITH STANDARD LIFTING KEY HOLES MEETING THE REQUIREMENTS OF AS 3996-2006 AND WHICH ARE COMPATIBLE WITH COMMONLY AVAILABLE LIFTING TOOLS.
14. 'C.J' DENOTES CONSTRUCTION JOINT. THIS SURFACE MUST BE CLEAN AND MOIST PRIOR TO CASTING THE UPPER PORTION OF THE PIT, AND BE SOUND ROUGHENED CONCRETE SURFACE, FREE FROM DELETERIOUS MATERIAL AND CONCRETE LAITANCE. AGREE THE JOINT PREPARATION WITH THE SUPERINTENDENT.
15. REFER TO STANDARD DRAWING CS-3115 FOR SHEET 2 AND CS-3116 FOR SHEET 3
16. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
17. WEEPHOLES SHALL BE PROVIDED ON UPSTREAM SIDE IN ALL PITS. CONNECT 1000 LONG x 100 DIA. SEWER STRENGTH SLOTTED P.V.C. PIPES WITH END CAPS AT EACH WEEPHOLE AND WRAP IN GEOTEXTILE MATERIAL AND BED AS SHOWN. CONNECT TO SIDE DRAIN WHERE APPROPRIATE.
18. PIT SIZES:
    a. MAX LONGITUDINAL PIPE SIZE FOR THIS PIT SIZE IS DN 525.
    b. MAX TRANSVERSE PIPE SIZE FOR THIS PIT SIZE IS DN 825.
    c. MAX DEPTH OF PIT TO BE 3.6m.
    d. REFER TO CS-3116 FOR THE PIT SIZE OF LARGER PIPES.
19. UNLESS NOTED OTHERWISE, REINFORCEMENT LAPS AS FOLLOW
    a. N16 BAR - 500mm LAP MIN.
    b. MESH - 300mm LAP MIN.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
3	DEFLECTOR DETAILS ADDED	AUG 2020	S.SHI	EES
2	SECTION REFERENCE CHANGED	JUNE 2018	S.JALIL	EES/DIPL
1	PIT DETAILS ADDED	MAR 2018	S.JALIL	EES/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

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DRAWN S.JALIL	DATE MAR 2018	CHECKED S.HATZI	DATE MAR 2018
DESIGNED	DATE	CHECKED J.MU	DATE NOV 2017
DESIGN LEADER S.HATZI	DATE 1/09/2017	DESIGN DIRECTOR S.JACKSON	DATE 1/09/2017

Northern Territory Government

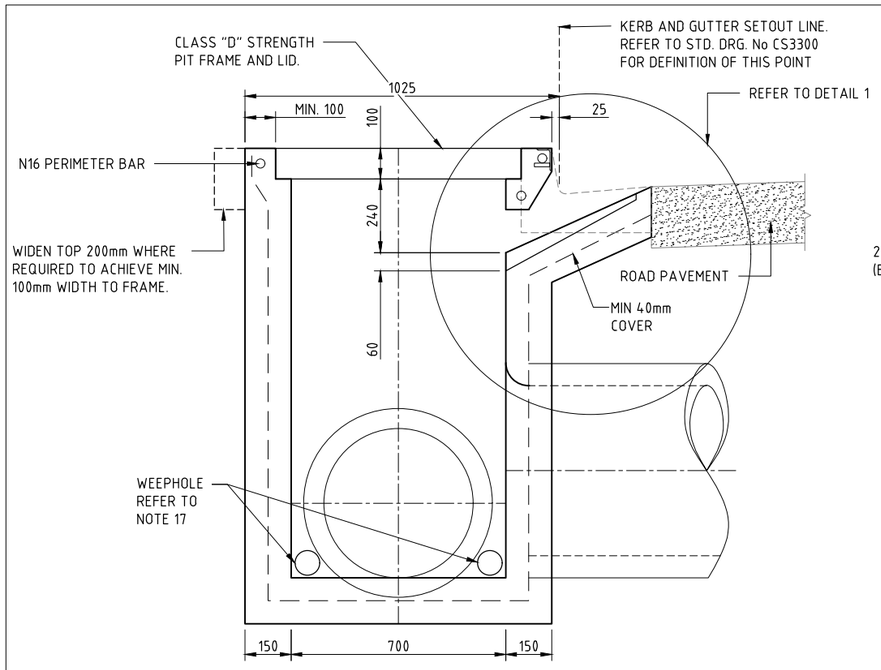
STANDARD DRAWINGS
DRAINAGE

SIDE ENTRY PIT - LOAD CLASS D CONCRETE DETAILS - SHEET 1

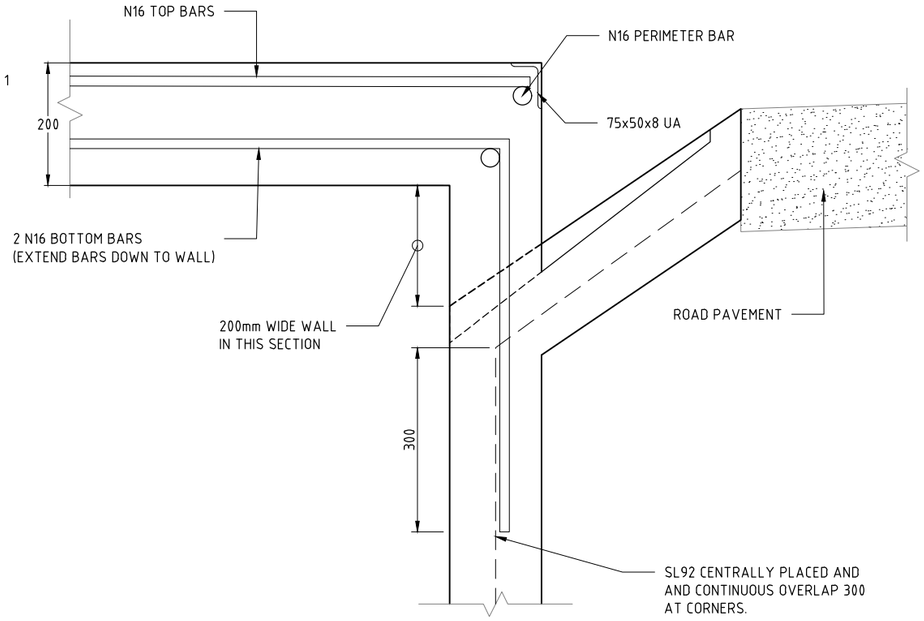
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 3	CS3114	3	A1

CS3114_AMED_3 RELEASED 12/08/2020

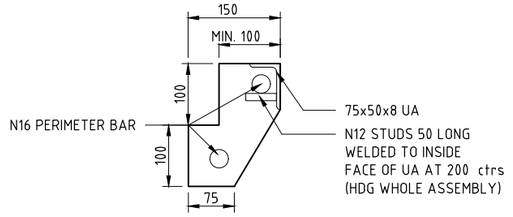
APRODOCS T23-13577 - 137 CONTRACT DRAWINGS



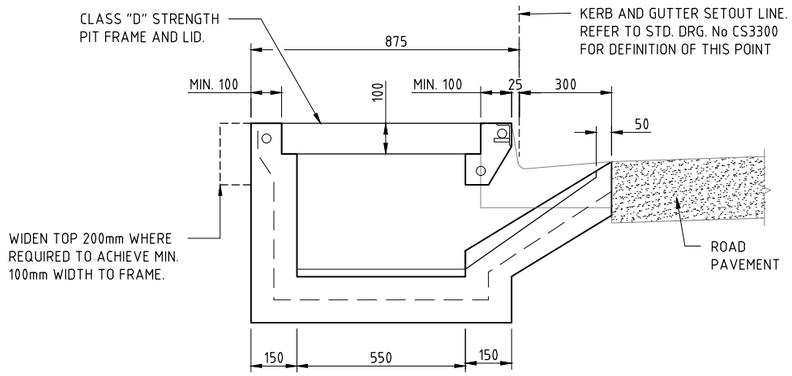
SECTION E
SCALE A 3114



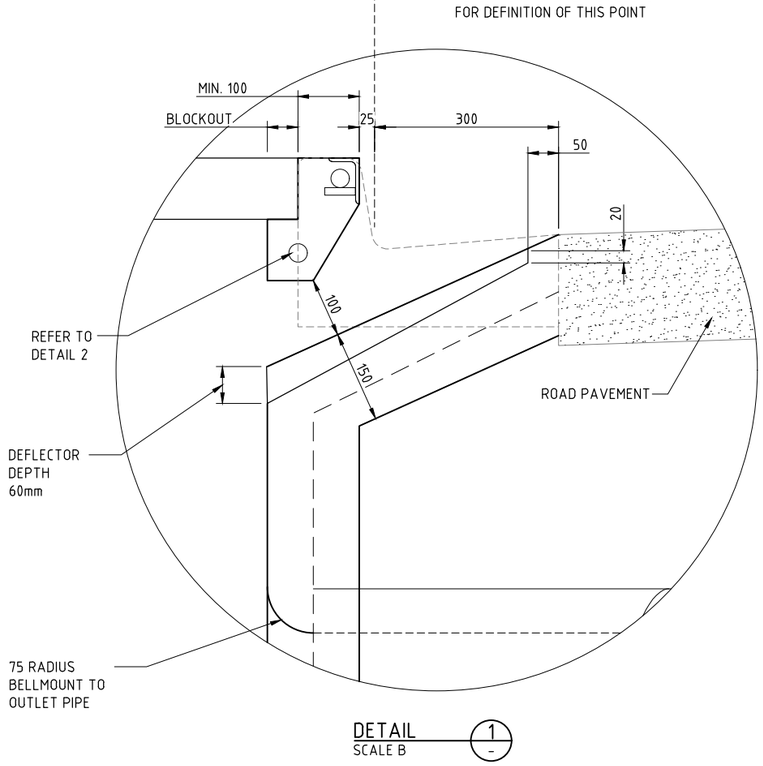
SECTION F
SCALE B 3114



DETAIL 2
SCALE B –



SECTION G
SCALE A 3114



DETAIL 1
SCALE B –

SCALE A 0.10 0 0.10 0.20 0.30 .040 0.50
SCALE B 0.05 0 0.05 0.10 0.15 0.20 0.25
IN METERS

NOTES:

1. CONCRETE SHALL COMPLY WITH AS 3600-2009 AND AS 1379-2007.
2. USE N32 CONCRETE UNLESS OTHERWISE AGREED.
3. DESIGNED FOR CLASS D LOADING TO AS 3996-2006. ULTIMATE LIMIT STATE DESIGN LOAD 210 KN.
4. USE PIT LIDS AND FRAMES DESIGNED AND TESTED FOR CLASS D LOADS TO AS 3996-2006, UNLESS OTHERWISE DIRECTED.
5. ADJUST THE BLOCKOUT DIMENSIONS TO SUIT THE ACTUAL SIZE OF LID FRAME.
6. REFER TO THE PROJECT DRAWINGS FOR PIPE AND PIT LOCATIONS, DEPTHS AND ARRANGEMENTS.
7. THE SURFACE UNDER THE PIT AND KERB IS CONSIDERED AS SUBGRADE AND SHALL BE COMPACTED TO 95% MMDD.
8. A BLOCKOUT IS SHOWN FOR THE INSERTION OF ACCESS COVER FRAME. THE COVER SHALL BE CAST INTO THE CONCRETE SURROUND.
9. DO NOT INSTALL STEP IRONS IN PIT UNLESS OTHERWISE DIRECTED.
10. TRANSITION THE GUTTER FROM THE PIT TO THE STANDARD GUTTER OVER 900mm EACH SIDE OF PIT, OR 3000 FOR LAY BACK KERBS. REFER CS3300.
11. IT IS NOT ESSENTIAL TO FORM THE EXTERNAL SURFACES OF THE PIT BELOW THE LEVEL OF THE C.J. IT IS EXPECTED THAT IN MANY SITUATIONS THE BOTTOM PORTION OF THE PIT WILL BE CAST AGAINST GROUND OR SANDBAGS.
12. LIDS SHALL BE MARKED IN ACCORDANCE WITH AS 3996-2006. LOAD CLASS AND THE MASS OF THE LID, AND ALIGNMENT MARKS MUST BE CLEARLY AND PERMANENTLY VISIBLE ON THE UPPER SURFACE OF THE LID.
13. PROVIDE LIDS WITH STANDARD LIFTING KEY HOLES MEETING THE REQUIREMENTS OF AS 3996-2006 AND WHICH ARE COMPATIBLE WITH COMMONLY AVAILABLE LIFTING TOOLS.
14. 'C.J' DENOTES CONSTRUCTION JOINT. THIS SURFACE MUST BE CLEAN AND MOIST PRIOR TO CASTING THE UPPER PORTION OF THE PIT, AND BE SOUND ROUGHENED CONCRETE SURFACE, FREE FROM DELETERIOUS MATERIAL AND CONCRETE LAITANCE. AGREE THE JOINT PREPARATION WITH THE SUPERINTENDENT.
15. REFER TO STANDARD DRAWING CS3114 FOR SHEET 1 AND CS3116 FOR SHEET 3.
16. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
17. WEEPHOLES SHALL BE PROVIDED ON UPSTREAM SIDE IN ALL PITS. CONNECT 1000 LONG x 100 DIA. SEWER STRENGTH SLOTTED P.V.C. PIPES WITH END CAPS AT EACH WEEPHOLE AND WRAP IN GEOTEXTILE MATERIAL AND BED AS SHOWN. CONNECT TO SIDE DRAIN WHERE APPROPRIATE.
18. USE GRADE D500N REINFORCEMENT TO AS 4671-2001.
19. USE GRADE 300 ROLLED STEEL SECTION.
20. PROVIDE 45 MIN COVER TO ALL SURFACES. COMPLY WITH AS 3600-2009 COVER REQUIREMENTS FOR PITS WITHIN THE TIDAL ZONE OR IN AGGRESSIVE SOILS.
21. ALL EXPOSED FABRICATED STEELWORK SHALL BE HOT DIP GALVANIZED TO AS 4680-2006.
22. USE GP WELDS TO AS 1554.1-2014. ALL WELDS TO BE 100% VISUALLY INSPECTED.
23. USE STANDARD COGS TO BARS UNLESS NOTED OTHERWISE. REFER CS3204
24. PIT SIZES:

a. MAX LONGITUDINAL PIPE SIZE FOR THIS PIT SIZE IS DN 525.
b. MAX TRANSVERSE PIPE SIZE FOR THIS PIT SIZE IS DN 825.
c. MAX DEPTH OF PIT TO BE 3.6m
d. REFER TO CS3116 FOR THE PIT SIZE OF LARGER PIPES

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
1	PIT DETAILS ADDED	MAR 2018	S.JALIL	EES/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

WARNING

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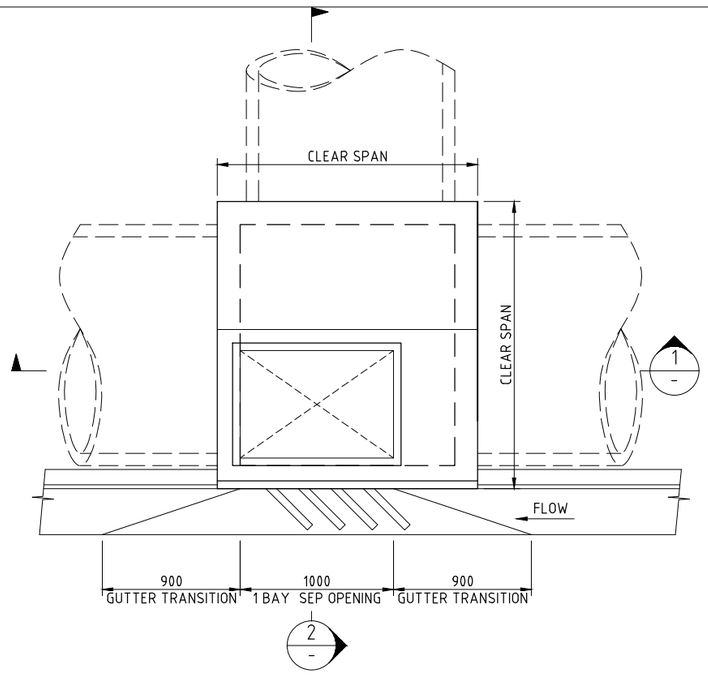
DRAWN S.JALIL DATE MAR 2018	CHECKED S.HATZI DATE MAR 2018	Northern Territory Government	STANDARD DRAWINGS DRAINAGE
DESIGNED DATE	CHECKED J.MU DATE NOV 2017		SIDE ENTRY PIT - LOAD CLASS D REINFORCEMENT DETAILS - SHEET 2
DESIGN LEADER S.HATZI DATE 1/09/2017	DESIGN DIRECTOR S.JACKSON DATE 1/09/2017		

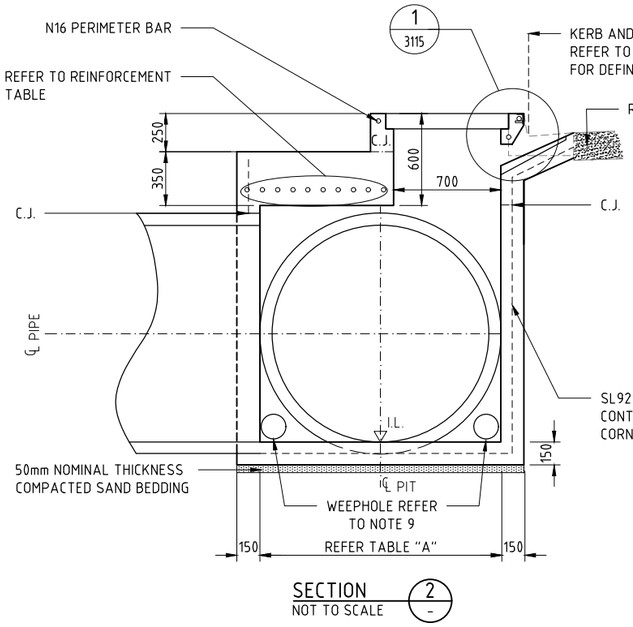
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	2 OF 3	CS3115	1	A1

CS3115_AMED_1 RELEASED 06/03/2018

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



PLAN
NOT TO SCALE



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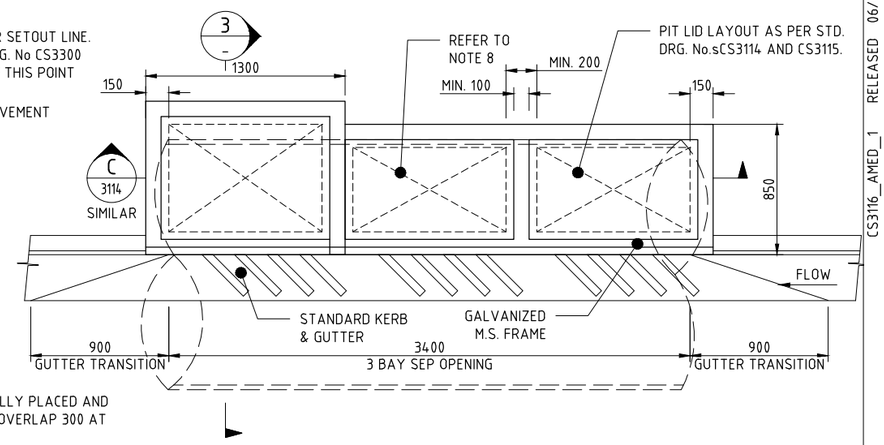
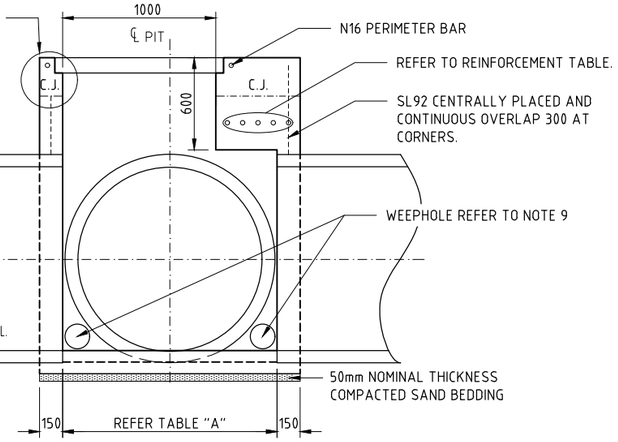
NOT TO SCALE



ALTERNATIVE PLAN-SADDLE PIT
NOT TO SCALE

OPTION 1: PIT WIDENING IN VERGE



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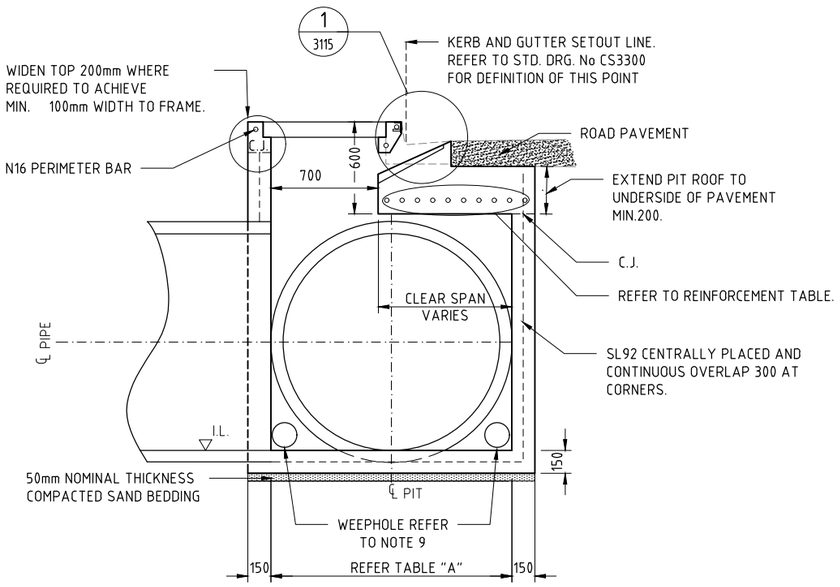

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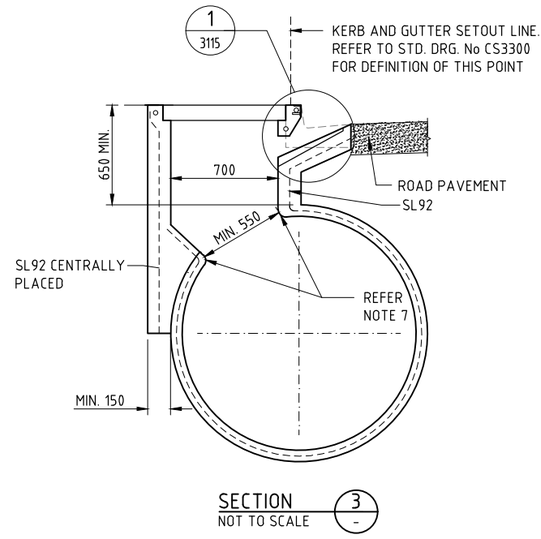

SECTION
NOT TO SCALE

PIPE SIZE	PIT WIDTH/ LENGTH	PIPE SIZE	PIT WIDTH/ LENGTH	PIPE SIZE	PIT WIDTH/ LENGTH
DN375	REFER CS3114	DN900	1100	DN1950	2250
DN450	REFER CS3114	DN1050	1250	DN2100	2400
DN525	REFER CS3114	DN1200	1550	DN2250	2600
DN600	750	DN1350	1550	DN2400	2800
DN675	800	DN1500	1750	DN2700	3050
DN750	900	DN1650	1900	DN3000	3450
DN825	1000	DN1800	2050	DN3300	3950
				DN3600	4150

TABLE A

REINFORCEMENT TABLE	
CLEAR SPAN OF ROOF (MM) IN DIRECTION OF REINFORCEMENT	REINFORCEMENT
≥1000	N20-100
≤3000	N20-100

NOTES:

1. USE DETAILS SIMILAR TO THESE WHEN LARGE PIPES ARE USED. AGREE SETOUT, ADDITIONAL REINFORCEMENT AND FINAL DETAILS WITH THE SUPERINTENDENT.
2. VARY SIDE ENTRY PIT CONFIGURATION AS REQUIRED.
3. REFER TO STANDARD DRAWING CS3114 FOR SHEET 1 AND CS3115 FOR SHEET 2.
4. INTERNAL FACES SHALL BE FORMED. ALL OTHER EXTERNAL VERTICAL SURFACES MAY BE CAST AGAINST GROUND IF APPROVED PROVIDED THE GROUND IS COMPACTED.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
6. ALTERNATIVE TO BE USED ONLY BY APPROVAL.
7. BEND PIPE REINFORCEMENT BACK INTO PIT WALL REMOVE CONCRETE OVER PIPE REINFORCEMENT TO ACHIEVE THIS.
8. REINFORCEMENT IN PRECAST CONCRETE COVER TO BE RL1018.
9. WEEPHOLES SHALL BE PROVIDED ON UPSTREAM SIDE IN ALL PITS. CONNECT 1000 LONG X 100 DIA. SEWER STRENGTH SLOTTED P.V.C. PIPES WITH END CAPS AT EACH WEEPHOLE AND WRAP IN GEOTEXTILE MATERIAL AND BED AS SHOWN. CONNECT TO SIDE DRAIN WHERE APPROPRIATE.
10. WHERE ADDITIONAL SEP BAYS ARE REQUIRED, REFER TO DETAILS ON CS3114.

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
1	PIT DETAILS ADDED	MAR 2018	S.JALIL	EES/DIPL
0	ISSUED AS A STANDARD DRAWING	SEPT 2017	J.LEESON	EES/DIPL

AMENDMENTS

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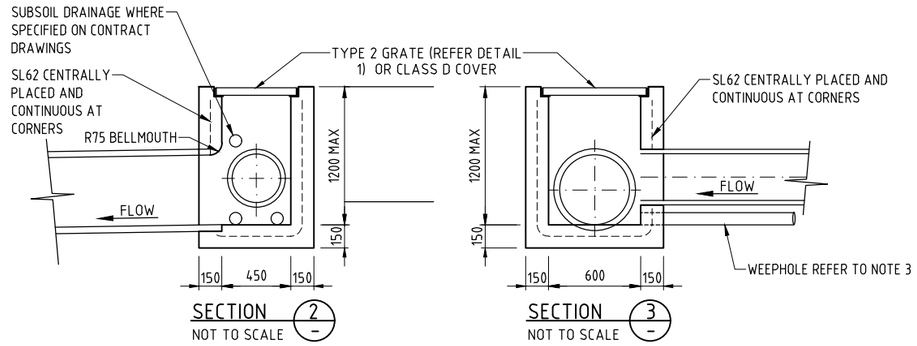
DRAWN S.JALIL DATE MAR 2018	CHECKED S.HATZI DATE MAR 2018	Northern Territory Government	STANDARD DRAWINGS DRAINAGE SIDE ENTRY PIT - LOAD CLASS D LARGER PIPE SETOUT - SHEET 3
DESIGNED GC DATE NOV 12	CHECKED GC DATE FEB 13		
DESIGN LEADER S.HATZI DATE 1/09/2017	DESIGN DIRECTOR S.JACKSON DATE 1/09/2017		

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	3 OF 3	CS3116	1	A1

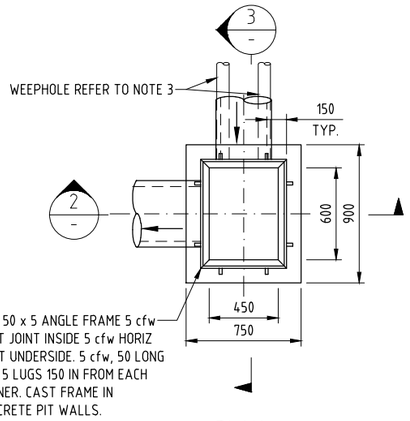
CS3116_AMED_1 RELEASED 06/03/2018

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



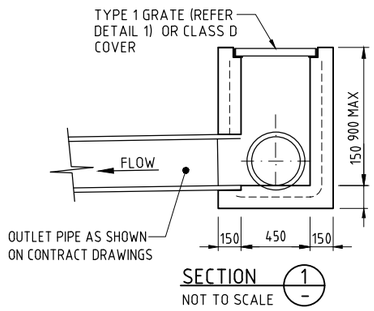
SECTION 2 NOT TO SCALE

SECTION 3 NOT TO SCALE



PLAN

600 x 450 MANHOLE OR GRATED INLET PIT



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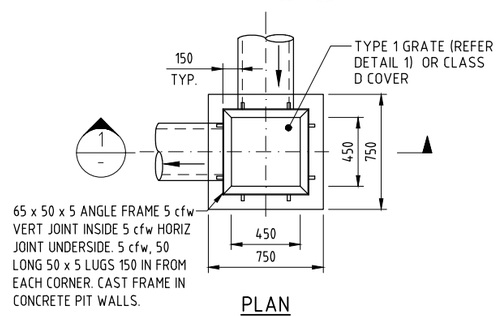
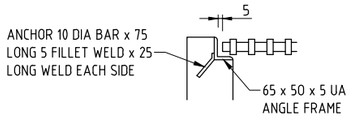


PLAN

450 x 450 MANHOLE OR GRATED INLET PIT

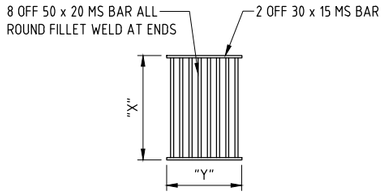


DETAIL 2 NOT TO SCALE

SEATING & WELD

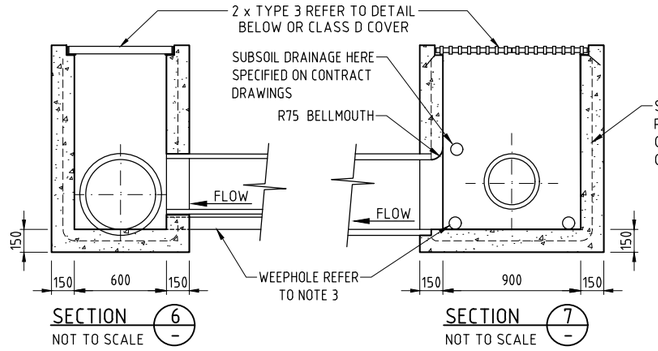
GRATE TABLE

GRATE	"X"	"Y"
TYPE 1	530	530
TYPE 2	680	530
TYPE 3	680	490



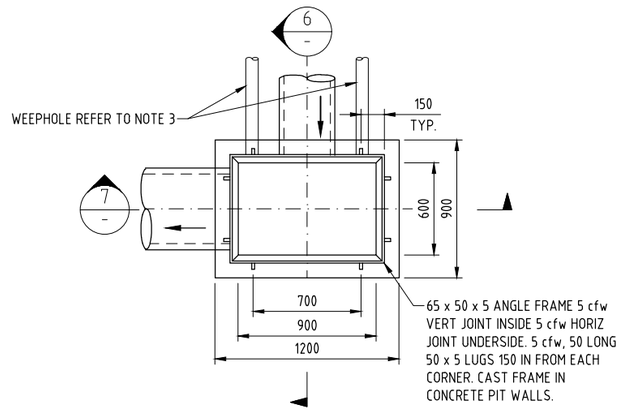
DETAIL 1 NOT TO SCALE

STEEL GRATE



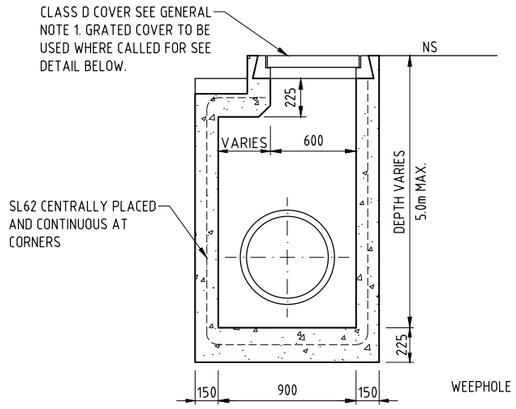
SECTION 6 NOT TO SCALE

SECTION 7 NOT TO SCALE



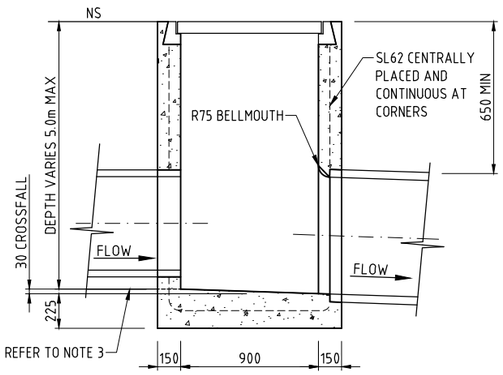
PLAN

900 x 600 MANHOLE OR GRATED INLET PIT



REFER NOTES BELOW FOR MANHOLE INTERNAL WIDTH

SECTION 4 NOT TO SCALE

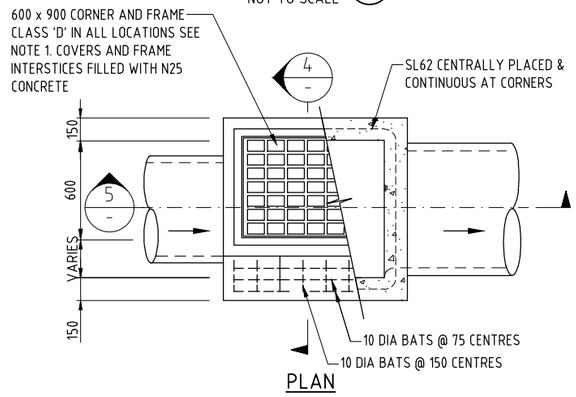


SECTION 5 NOT TO SCALE

MANHOLE WIDTH:

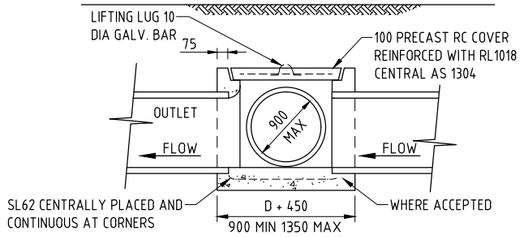
FOR SINGLE PIPE:-
INTERNAL WIDTH EQUALS EXTERNAL DIA OF LARGEST PIPE + 75mm WITH A MIN OF 900mm

FOR DOUBLE PIPES INTERNAL WIDTH EQUALS THE SUM OF EXTERNAL DIA + 325mm (MAX)

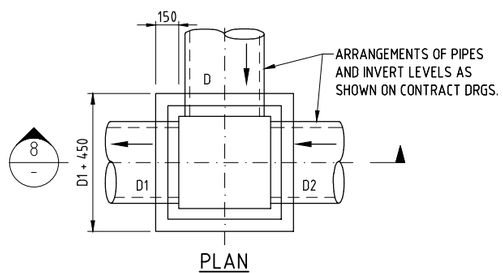


PLAN

STORMWATER MANHOLE (WIDTH >900)



SECTION 8 NOT TO SCALE



PLAN

UNDERGROUND PIT

NOTES:

1. GATIC TYPE COVERS OR APPROVED SIMILAR SHALL BE USED. FOR ALL LOCATIONS USE HEAVY DUTY 'CLASS D' 600 x 990 COVER OR EQUIVALENT. COVERS TO BE SET FLUSH AND AT GRADE WITH FINISHED SURFACE.
2. ARRANGEMENTS OF INLET AND OUTLET STORMWATER PIPES SHOWN IN THIS DRAWING ARE INDICATIVE.
3. WEEPHOLES SHALL BE PROVIDED ON UPSTREAM SIDE IN ALL PIT. CONNECT 1000 LONG x 100 DIA. SEWER STRENGTH SLOTTED P.V.C. PIPES WITH END CAPS AT EACH WEEPHOLE AND WRAP IN GEOTEXTILE MATERIAL AND BED AS SHOWN. CONNECT TO SIDE DRAIN WHERE APPROPRIATE.
4. CONCRETE FOR PITS TO BE CLASS N25 WITH SL62 MESH PLACED CENTRALLY.
5. FOR FIXING OF PRECAST COMPONENTS AND ANY PATCHING OF PITS USE MORTAR MIXED WITH 'BONDCRETE' OR SIMILAR APPROVED.
6. ALL EXPOSED STEELWORK SHALL BE CLEANED AFTER FABRICATION AND HOTDIPPED GALVANISED.
7. COMMERCIALLY PRODUCED GRATES MAY BE USED BUT MUST BE CYCLE SAFE WHEN ON CARRIAGEWAYS OR SIMILAR CYCLE ACCESSIBLE AREAS.
8. ACCESS TO DRAINAGE STRUCTURES SHALL COMPLY WITH WORKPLACE HEALTH AND SAFETY REQUIREMENTS.
9. REFER TO CS3121 AND CS3122 FOR SUBSOIL DRAINAGE AROUND PITS.
10. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

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

AMENDMENTS

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DRAWN	BYRNE	CHECKED	S.HATZI
DATE	APRIL 2017	DATE	APRIL 2017
DESIGNED	BYRNE	CHECKED	S.HATZI
DATE	APRIL 2017	DATE	APRIL 2017
DESIGN LEADER	S.HATZI	DESIGN DIRECTOR	S.JACKSON
DATE	1/09/2017	DATE	1/09/2017

Northern Territory Government

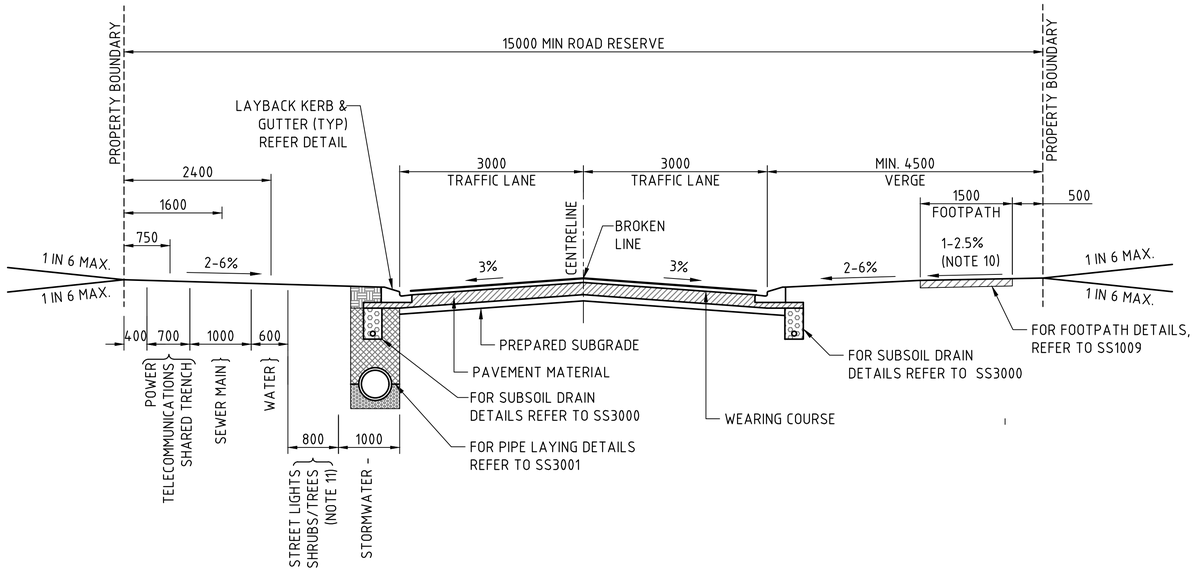
STANDARD DRAWINGS
DRAINAGE

MANHOLES AND INLET PITS

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	1 OF 1	CS3119	1	A1

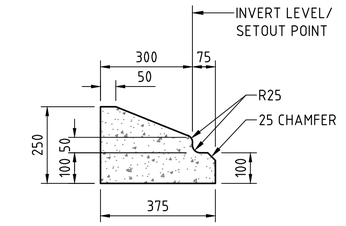
CS3119_AMED_1 RELEASED 06/03/2018

APRODOCS TZ3-1357 - 137 CONTRACT DRAWINGS



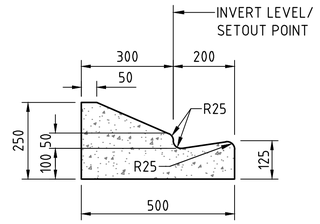
MINOR STREET / CUL-DE-SAC

NOT TO SCALE



LAYBACK KERB DETAIL (LBK)

NOT TO SCALE

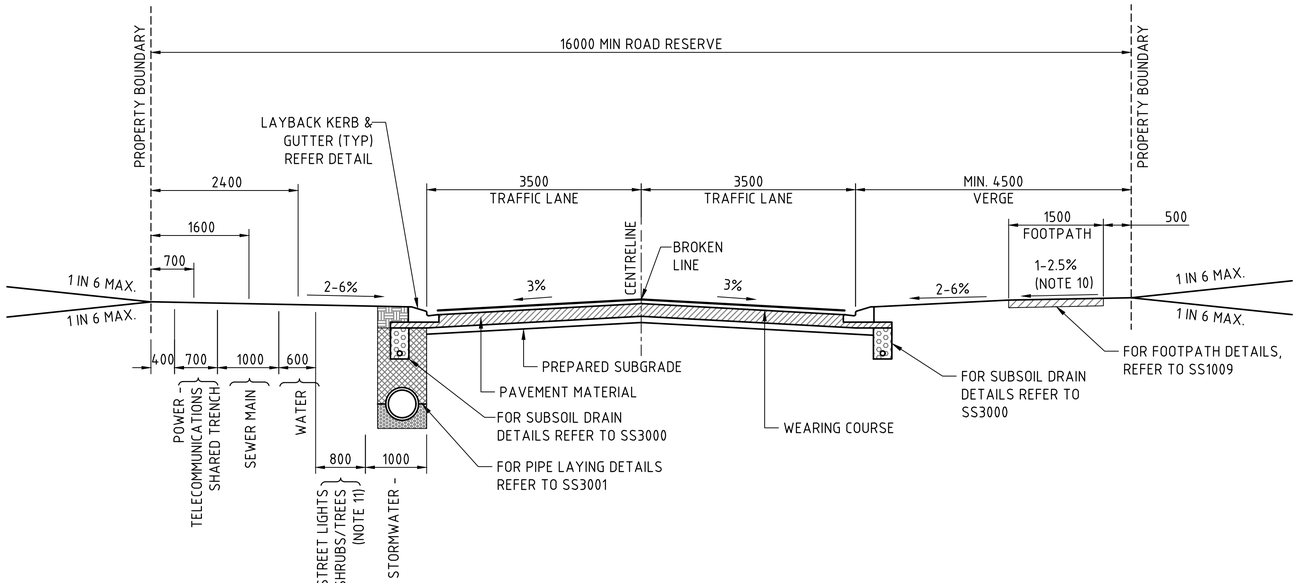


LAYBACK KERB & GUTTER DETAIL (LBK&G)

NOT TO SCALE

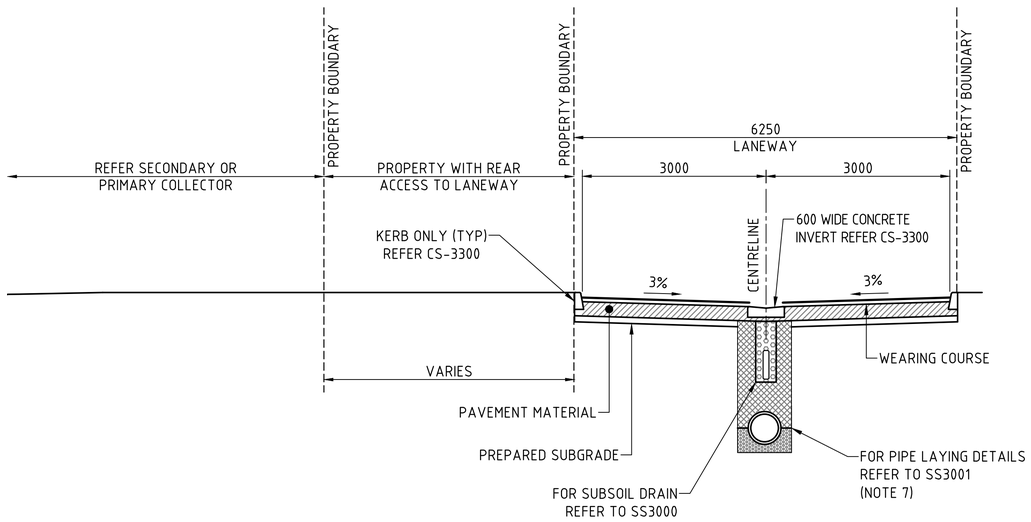
NOTES:

1. ALL WORK MUST BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. ALL LINEMARKINGS AND SIGNAGE MUST COMPLY WITH AS1742 AND DIPL STANDARD DRAWINGS. RRPMs AND GUIDEPOSTS MAY ALSO BE REQUIRED IN PROJECT SPECIFIC CIRCUMSTANCES.
4. EXTEND PAVEMENT MATERIAL UNDER KERB 75mm MINIMUM THICKNESS AND MIN 300mm BEHIND BACK OF KERB.
5. SERVICE CORRIDORS ARE SHOWN ON ONE SIDE OF STREET RESERVE FOR ILLUSTRATION PURPOSES; HOWEVER, THE NOMINATED SERVICE CORRIDORS EXIST ON BOTH SIDES OF THE STREET RESERVE AND ACTUAL SERVICES MAY BE LOCATED ON ONE OR BOTH SIDES OF THE ROAD, AS APPLICABLE.
6. PROVIDE 100mm TOPSOIL AND GRASS TO ALL VERGES AND MEDIANS, OR ALTERNATIVE LANDSCAPING TREATMENT.
7. STORMWATER PIPES MAY NOT BE REQUIRED IN LANEWAYS, DEPENDING ON LENGTH OF LANEWAY AND SIZE OF CONTRIBUTING STORMWATER CATCHMENTS.
8. REFER PROJECT DRAWINGS FOR EARTHWORKS, SUBGRADE PREPARATION, PAVEMENT MATERIALS AND WEARING SURFACE SPECIFICATIONS.
9. FOR STREET NETWORK PLANNING, HIERARCHY SELECTION CRITERIA AND DESIGN BASIS REQUIREMENTS, REFER TO PART 1 SUBDIVISION DEVELOPMENT GUIDELINES.
10. AS CONSTRUCTED CROSSFALL ON FOOTPATHS MUST NOT EXCEED 2.5% (1:40) INCLUDING LEVEL TOLERANCES IN PART 4 STANDARD SPECIFICATION FOR SUBDIVISIONS.
11. LANDSCAPING CORRIDORS IN VERGES SHOULD BE WIDENED WHERE PRACTICABLE TO A DESIRABLE WIDTH OF 1500, SUBJECT TO AUTHORITY APPROVALS. WHERE FOOTPATHS ARE NOMINATED ON ONE SIDE OF THE STREET ONLY, WATER SHOULD IDEALLY BE NOMINATED ON THE OTHER SIDE OF THE STREET TO MAXIMISE LANDSCAPING CORRIDOR.



ACCESS STREET

NOT TO SCALE



LANEWAY - BACK OF BLOCK

NOT TO SCALE

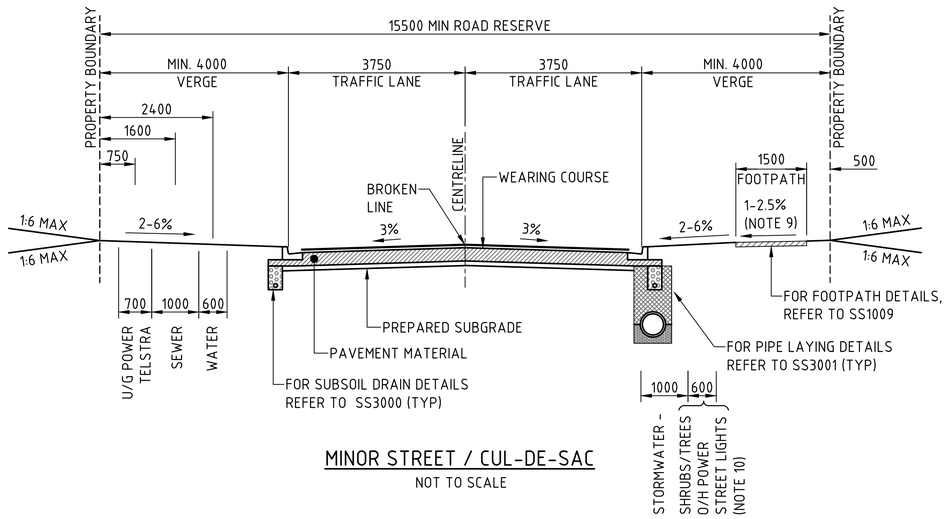
No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
2	RE-ISSUED AS A STANDARD DRAWING	JUNE 24	JCM	BYRNE
1	RE-ISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020	Northern Territory Government	SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS STREETS AND PATHWAYS
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020		STREET HIERARCHY - CATEGORY A RESIDENTIAL AND MIXED USE - SET TYPE 1
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020		

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	1 OF 4	SS1000	2	A1

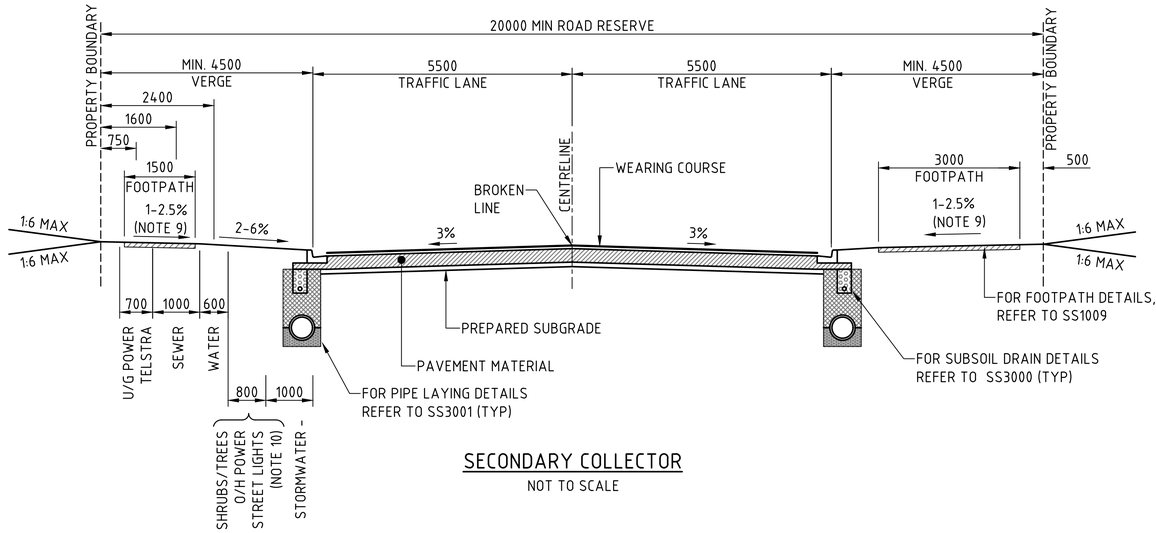
Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



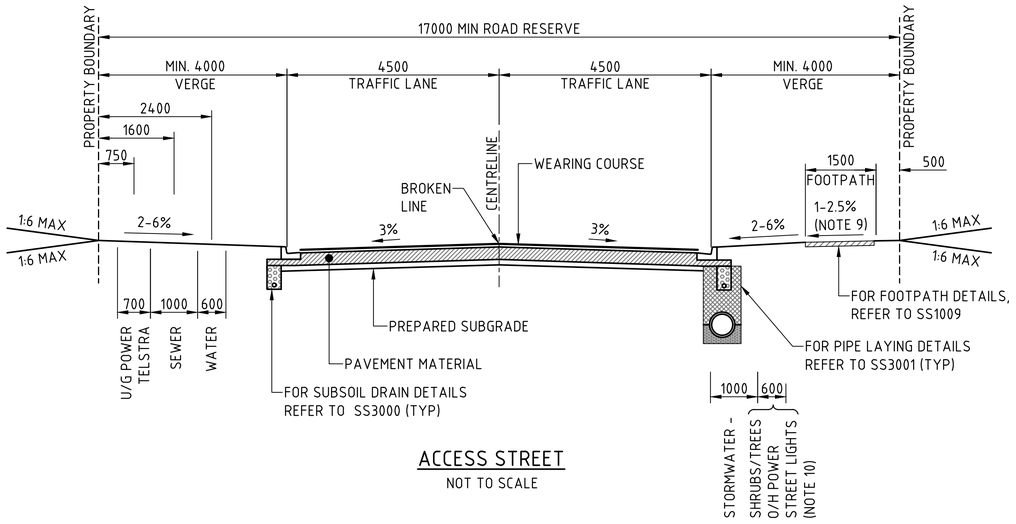
MINOR STREET / CUL-DE-SAC

NOT TO SCALE



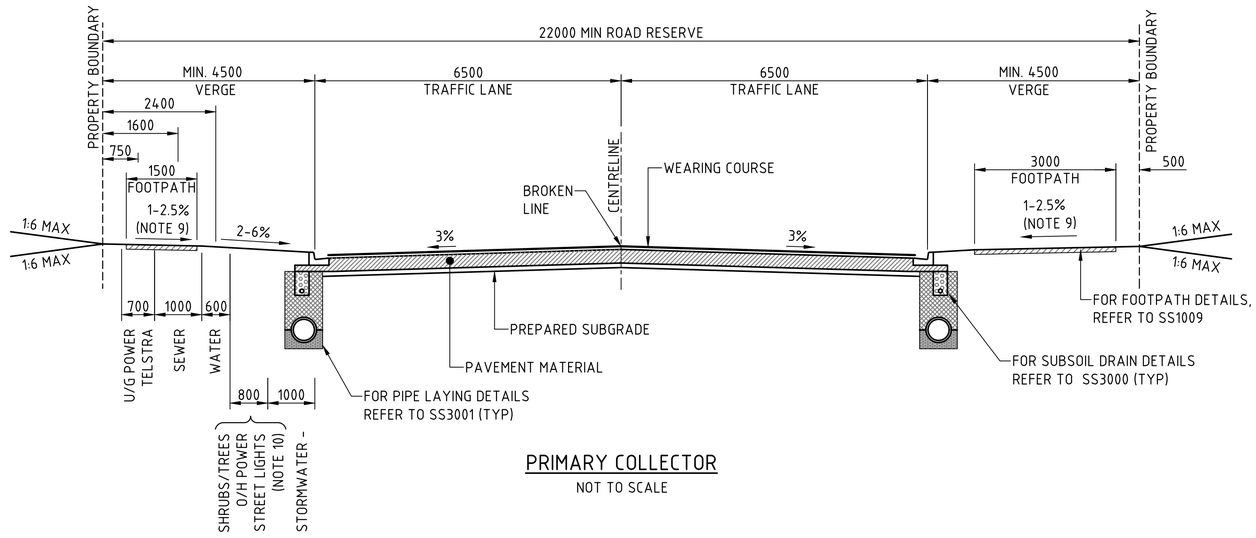
SECONDARY COLLECTOR

NOT TO SCALE



ACCESS STREET

NOT TO SCALE



PRIMARY COLLECTOR

NOT TO SCALE

NOTES:

1. ALL WORK MUST BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. ALL LINEMARKINGS AND SIGNAGE MUST COMPLY WITH AS1742 AND DIPL STANDARD DRAWINGS. RRPMs AND GUIDEPOSTS MAY ALSO BE REQUIRED IN PROJECT SPECIFIC CIRCUMSTANCES.
4. EXTEND PAVEMENT MATERIAL UNDER KERB MINIMUM 75mm THICKNESS AND MINIMUM 300mm BEHIND BACK OF KERB.
5. SERVICE CORRIDORS ARE SHOWN ON ONE SIDE OF STREET RESERVE FOR ILLUSTRATION PURPOSES; HOWEVER, THE NOMINATED SERVICE CORRIDORS EXIST ON BOTH SIDES OF THE STREET RESERVE AND ACTUAL SERVICES MAY BE LOCATED ON ONE OR BOTH SIDES OF THE ROAD, AS APPLICABLE.
6. PROVIDE 100mm TOPSOIL AND GRASS TO ALL VERGES AND MEDIANS, OR ALTERNATIVE LANDSCAPING TREATMENT.
7. REFER PROJECT DRAWINGS FOR EARTHWORKS, SUBGRADE PREPARATION, PAVEMENT MATERIALS AND WEARING SURFACE SPECIFICATIONS.
8. FOR STREET NETWORK PLANNING, HIERARCHY SELECTION CRITERIA AND DESIGN BASIS REQUIREMENTS, REFER TO PART 1 SUBDIVISION DEVELOPMENT GUIDELINES.
9. AS CONSTRUCTED CROSSFALL ON FOOTPATHS MUST NOT EXCEED 2.5% (1:40) INCLUDING LEVEL TOLERANCES IN PART 4 STANDARD SPECIFICATION FOR SUBDIVISIONS.
10. LANDSCAPING CORRIDORS IN VERGES SHOULD BE WIDENED WHERE PRACTICABLE TO A DESIRABLE WIDTH OF 1500, SUBJECT TO AUTHORITY APPROVALS. WHERE FOOTPATHS ARE NOMINATED ON ONE SIDE OF THE STREET ONLY, WATER SHOULD IDEALLY BE NOMINATED ON THE OTHER SIDE OF THE STREET TO MAXIMISE LANDSCAPING CORRIDOR.

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
2	RE-ISSUED AS A STANDARD DRAWING	JUNE 24	JCM	BYRNE
1	RE-ISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020

Northern Territory Government

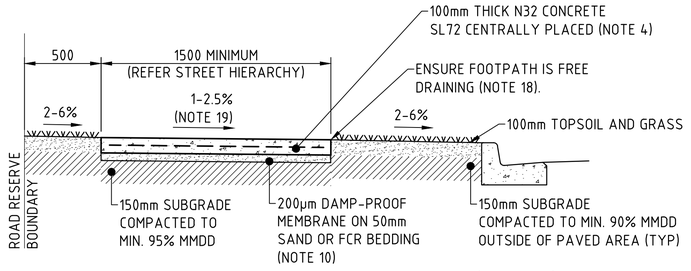
SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS
STREETS AND PATHWAYS

STREET HIERARCHY - CATEGORY A RESIDENTIAL AND MIXED USE - SET TYPE 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	3 OF 4	SS1002	2	A1

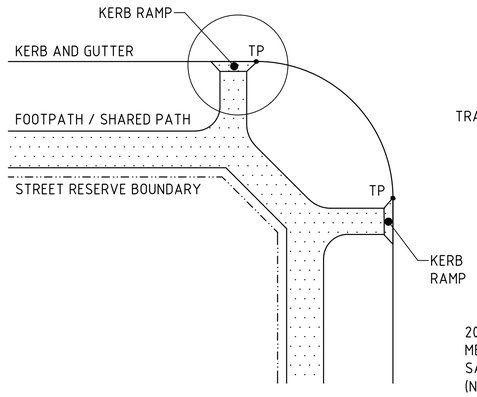
Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



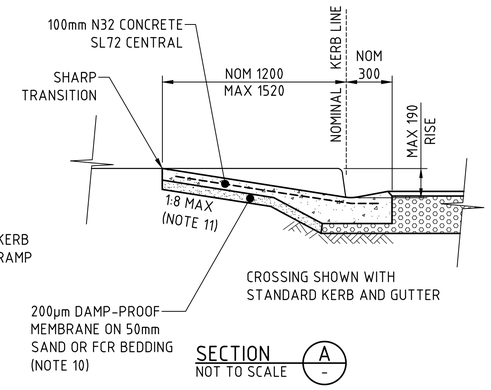
TYPICAL FOOTPATH SECTION - BEHIND KERB (NOTE 11)

NOT TO SCALE

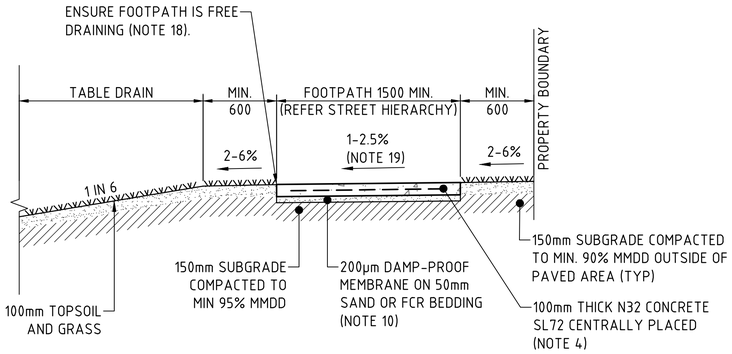


KERB RAMP PREFERABLE LOCATIONS

NOT TO SCALE

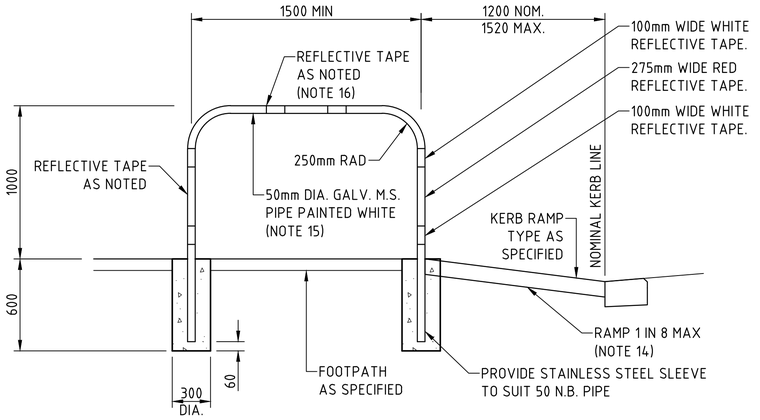


SECTION A
NOT TO SCALE



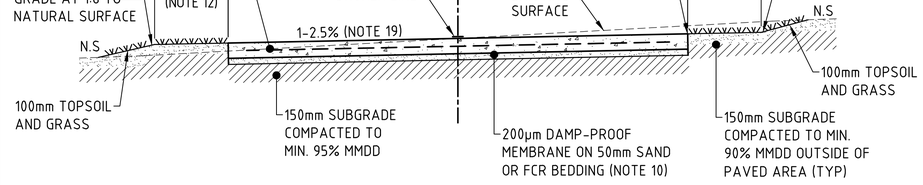
TYPICAL FOOTPATH SECTION - BEHIND TABLE DRAIN (NOTE 11)

NOT TO SCALE



GRAB RAIL DETAIL

NOT TO SCALE



TYPICAL SHARED PATH SECTION

NOT TO SCALE

GENERAL NOTES:

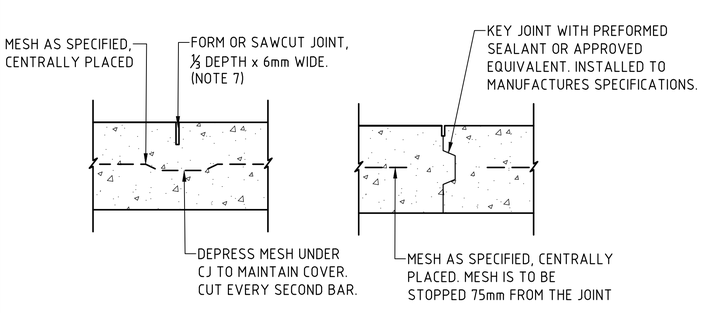
1. ALL WORK MUST COMPLY WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. CONCRETE WORKS MUST COMPLY WITH AS3600 AND AS1379.
4. CONCRETE TO BE MINIMUM N32/20/80 UNO. CONCRETE DESIGN IS TYPICALLY BASED ON B1 EXPOSURE CLASSIFICATION, WITH MINIMUM REQUIRED COVER TO REINFORCEMENT OF 40mm IN ACCORDANCE WITH AS3600.

   FOR OTHER EXPOSURE CLASSIFICATIONS, COMPLY WITH AS3600 AND THE FOLLOWING MINIMUM STRENGTH AND COVER REQUIREMENTS:

EXPOSURE CLASSIFICATION	CHARACTERISTIC STRENGTH (MPa)	REQUIRED COVER (mm)
A1, A2	N25/20/80	30mm
B1	N32/20/80	40mm
B2	N40/20/80	45mm
C1	N50/20/80	50mm
C2	N50/20/80	65mm

   TABLE NOTE: EXPOSURE CLASSIFICATIONS B2, C1 AND C2 MAY TRIGGER INCREASED CONCRETE THICKNESSES TO ACHIEVE MINIMUM COVER REQUIREMENTS.

5. CONCRETE TO BE MOIST CURED FOR AT LEAST 48 HOURS AFTER CONCRETE POUR.
6. NO LONGITUDINAL JOINTS IN PATHS. TRANSVERSE JOINTS MUST BE PROVIDED AS FOLLOWS:
   6.1. CONTRACTION JOINTS (CJ) AT MAX 2m CENTERS, AND ALL CHANGES IN SHAPE AND DIRECTION.
   6.2. EXPANSION JOINTS (KEJ, OR DEJ) AT MAX 6m CENTERS. CONCRETE THICKNESS MAY NEED TO BE INCREASED WHEN USING DEJs DUE TO RISK OF SPALLING IN THIN SLABS.
7. SAWCUT JOINTS SHOULD BE UNDERTAKEN BETWEEN 4 HOURS TO 12 HOURS AFTER LAYING CONCRETE, DEPENDING ON CONDITIONS. JOINT SEALANT IS REQUIRED IN SANDY AREAS.
8. CONSTRUCTION JOINTS ARE REQUIRED FOR PLANNED INTERRUPTIONS. ROUGHEN AND CLEAN FACE OF HARDENED CONCRETE, REMOVE LOOSE AND FOREIGN MATERIAL.
9. THE CONCRETE PATH MUST BE STEEL TROWELLED FOLLOWED BY A MOIST HAIR BROOM. THE FINAL SURFACE MUST BE NON-SLIP WITH A MINIMUM TEXTURED SURFACE OF 2mm.
10. SAND OR FCR BEDDING MAY BE OMITTED FOR CATEGORY B AND C INFRASTRUCTURE LOCALITIES.
11. CROSSFALL IN VERGE ADJACENT TO FOOTPATH TO COMPLY WITH AS1428.1, WHERE APPLICABLE.
12. INCREASED CLEARANCE TO BATTERS MAY BE REQUIRED FOR SHARED PATHS PER AUSTROADS GUIDELINES.
13. TYPE A KERB RAMP TO BE USED WHEREVER PAVED SURFACES (PEDESTRIAN CORRIDORS) EXTEND TO BACK OF KERB. TYPE B MAY BE USED WHEREVER PAVED SURFACES (PEDESTRIAN CORRIDORS) EXTEND NO FURTHER THAN TOP OF KERB RAMP LOCATION.
14. IF HEIGHT DIFFERENCE BETWEEN KERB INVERT AND LEVEL OF PATH EXCEEDS 150mm, OR LENGTH OF CROSSOVER EXCEEDS 1200mm, THEN GRADE OF CROSSOVER TO BE 1 IN 14. (REFER TO AS1428.1)
15. GRAB RAILS TO BE FROM 50mm N.B GALVANISED STEEL PIPE WITH WALL THICKNESS NOT LESS THAN 3mm. ALL JOINTS SHALL BE WELDED &SHARP EDGES GROUND SMOOTH. ALL WELDING SLAG TO BE SHIPPED AWAY AND AREAS OF DAMAGED GALVANISING SHALL BE MADE GOOD WITH AN APPROVED WHITE ZINC RICH PAINT.
16. REFLECTIVE TAPE TO BE CLASS 1 TO AS1906.1
17. WHERE FOOTPATH IS PROVIDED WITH BLOCK-OUTS FOR SERVICE PIT LIDS (OR SIMILAR), PROVIDE ISOLATION JOINTS (IJ) AROUND SERVICE PIT LID AND N12 TRIMMER BARS AT ALL SERVICE PIT LID CORNERS.
18. ALL PATHS MUST BE FREE DRAINING AND NOT CONCENTRATE FLOWS ON OR ALONG THE EDGE OF PATH. FINISH PATHS 0 - 20mm LOWER THAN ADJACENT GROUND ON UPSLOPE SIDE AND 0 - 20mm HIGHER THAN ADJACENT GROUND ON DOWNSLOPE SIDE.
19. AS CONSTRUCTED CROSSFALL ON FOOTPATHS MUST NOT EXCEED 2.5% (1:40) INCLUDING LEVEL TOLERANCES IN PART 4 STANDARD SPECIFICATION FOR SUBDIVISIONS.

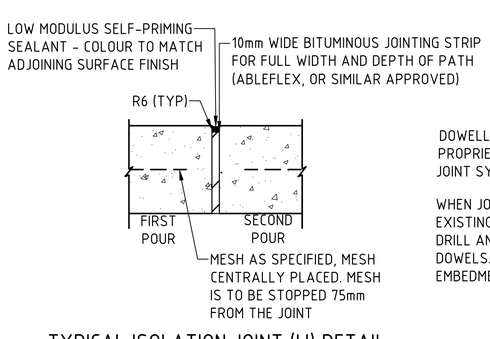


CONTRACTION JOINT (CJ)

NOT TO SCALE

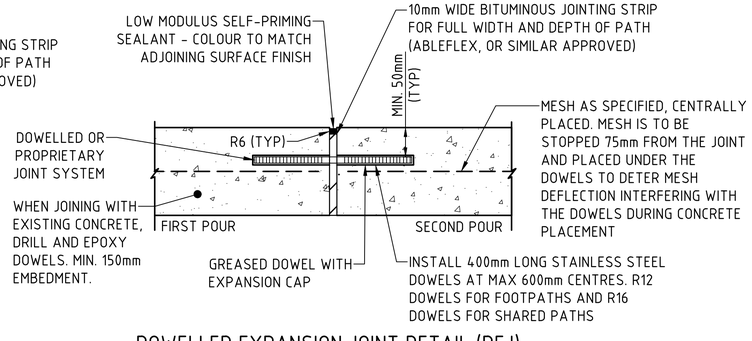
KEYED EXPANSION JOINT (KEJ)

NOT TO SCALE



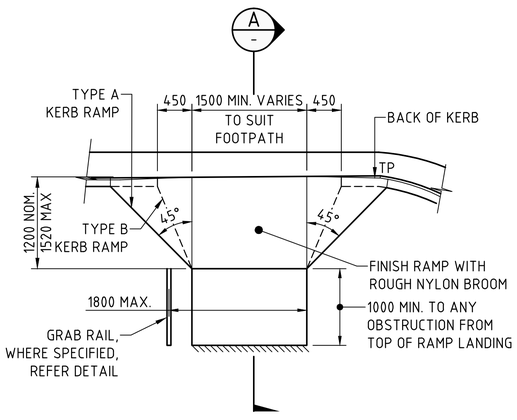
TYPICAL ISOLATION JOINT (IJ) DETAIL

NOT TO SCALE



DOWELLED EXPANSION JOINT DETAIL (DEJ)

NOT TO SCALE



PLAN OF KERB RAMP (NOTE 13)

NOT TO SCALE

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
2	RE-ISSUED AS A STANDARD DRAWING	JUNE 24	JCM	BYRNE
1	RE-ISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020		
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020		
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020		

Northern Territory Government

SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS
STREETS AND PATHWAYS

FOOTPATHS, SHARED PATHS AND KERB RAMPS TYPICAL DETAILS

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	1 OF 1	SS1009	2	A1

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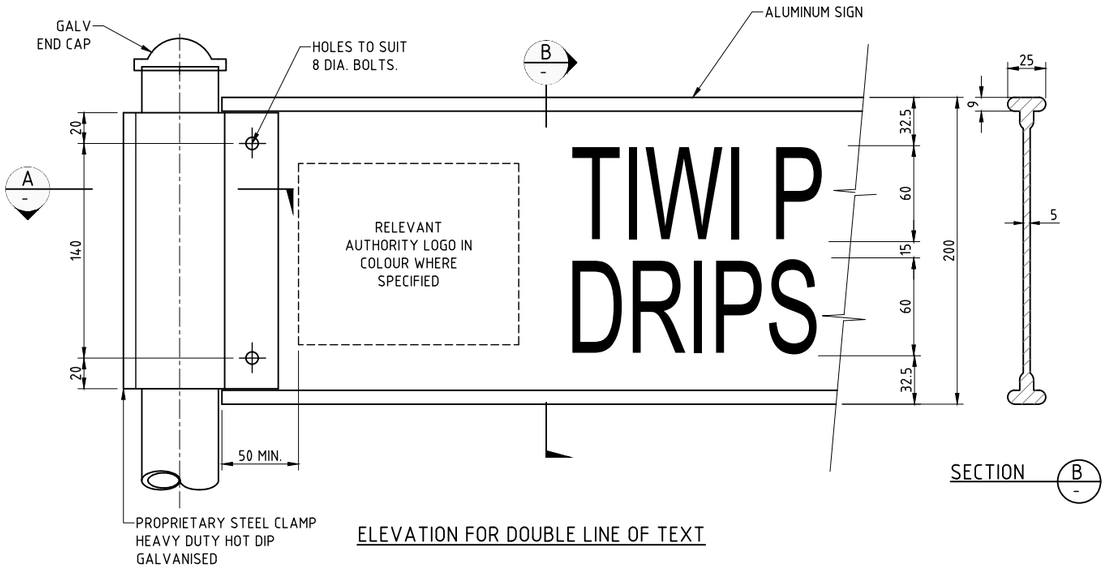
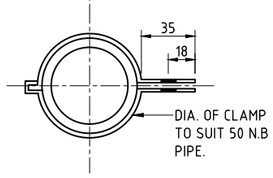
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ELEVATION FOR DOUBLE LINE OF TEXT

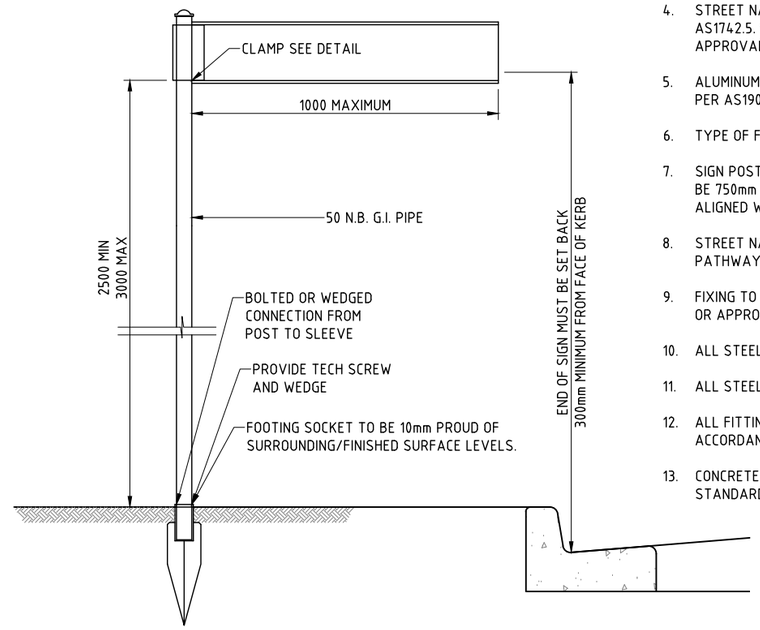


SECTION A

COLOUR OF SIGNS

STREET SIGNS:
BLACK LETTERS ON REFLECTORISED WHITE BACKGROUND.

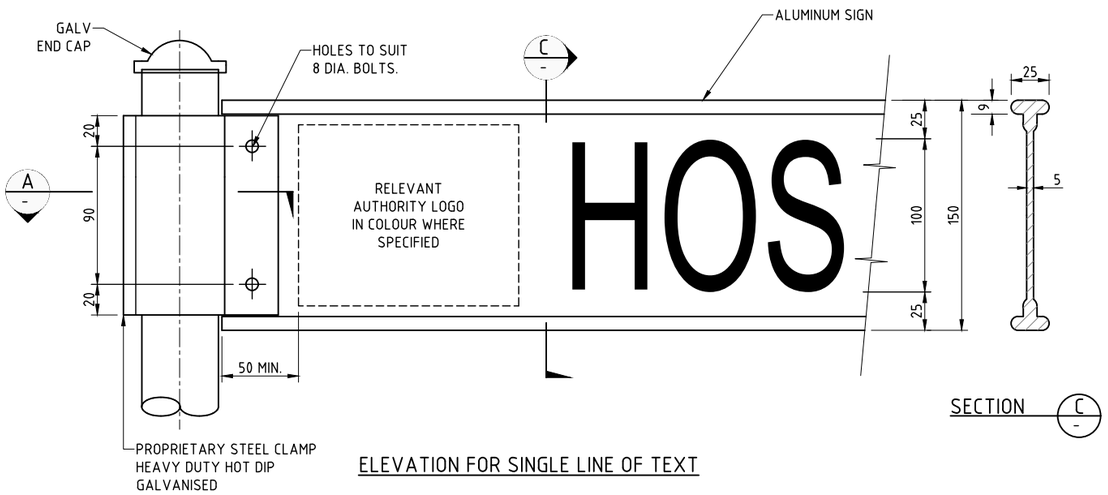
INFORMATION SIGNS:
REFLECTORISED WHITE LETTERS ON BLUE BACKGROUND.



TYPICAL INSTALLATION DETAIL
"OZSOCKETS" FOOTING (OR APPROVED SIMILAR)
NOT TO SCALE

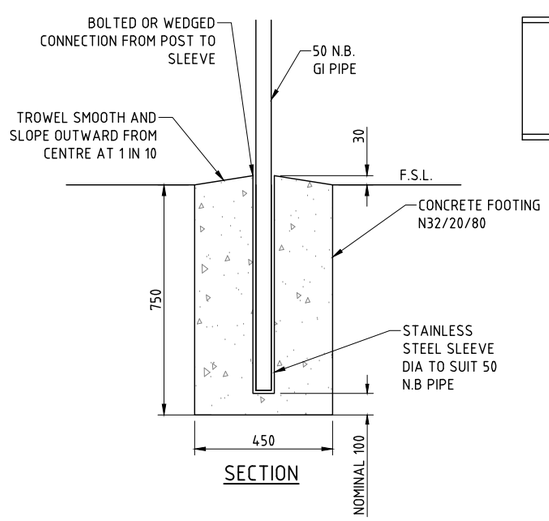
GENERAL NOTES

1. ALL WORK MUST BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
2. STREET Nos. ARE ONLY REQUIRED WHERE NOMINATED ON PROJECT DRAWINGS OR REQUIRED BY RELEVANT AUTHORITY.
3. ALL STREET NAME SIGN POSTS MUST BE REMOVABLE.
4. STREET NAME SIGN COLORS, LETTER SIZE, LETTER TYPES TO CONFORM TO AS1742.5. SPECIAL DECORATIVE, HERITAGE, OTHER SIGN STYLES SUBJECT TO APPROVAL OF RELEVANT AUTHORITY.
5. ALUMINUM STREET NAME SIGN TO CONSIST OF RETRO-REFLECTIVE MATERIALS AS PER AS1906.1.
6. TYPE OF FOOTING TO BE AGREED WITH RELEVANT AUTHORITY.
7. SIGN POST HEIGHT MUST BE TO AS1742. SETOUT OF STREET NAME SIGN POST TO BE 750mm BEHIND KERB SET OUT LINE OR 2000-4000mm FROM EDGE OF SEAL, ALIGNED WITH PROPERTY BOUNDARY PROJECTION OF MINOR ROAD.
8. STREET NAME SIGN POSTS MUST HAVE MIN 0.5m CLEARANCE FROM ALL PATHWAYS.
9. FIXING TO UTILITY POLES: USE 13mm WIDE 'BAND-IT' STAINLESS STEEL STRAPPING OR APPROVED EQUIVALENT. SUBJECT TO APPROVAL BY SERVICE AUTHORITY.
10. ALL STEEL PIPES MUST BE CLASS 1 TO AS1074.
11. ALL STEEL PLATES MUST BE AS3678.
12. ALL FITTINGS AND POSTS MUST BE HEAVY HOT DIPPED GALVANISED IN ACCORDANCE WITH AS4680.
13. CONCRETE SUPPLY AND PLACEMENT MUST COMPLY WITH AS1379, AS3600 AND STANDARD SPECIFICATION FOR SUBDIVISIONS.



ELEVATION FOR SINGLE LINE OF TEXT

STANDARD STREET OR INFORMATION SIGN
NOT TO SCALE



TYPICAL INSTALLATION DETAIL
FOR CONCRETE FOOTING
NOT TO SCALE

STREET SIGNS WITH LOGO

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
1	REISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020		
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020		
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020		

Northern Territory Government

SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS
STREETS AND PATHWAYS

STREET NAME SIGNS
TYPICAL DETAILS

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	1 OF 1	SS1010	1	A1

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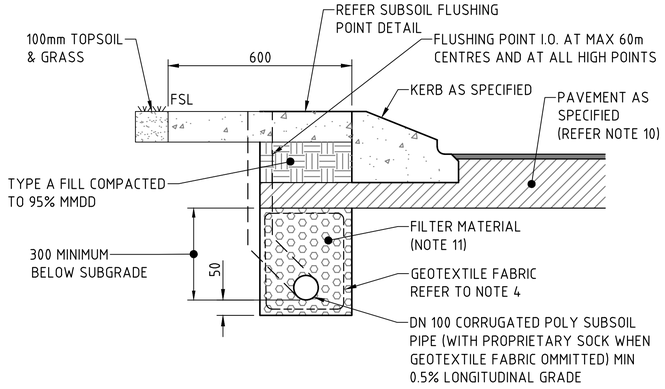
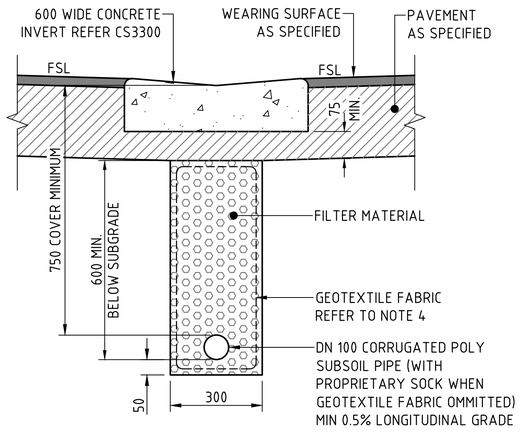
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



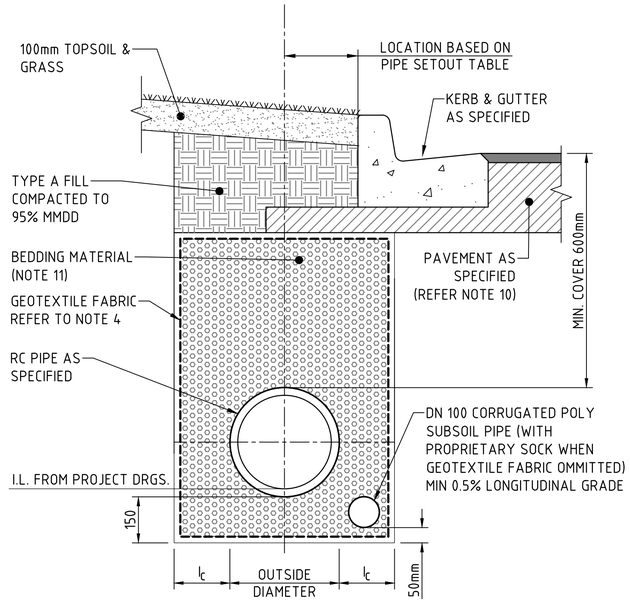
SUBSOIL DRAIN TYPE 1 - BEHIND KERB

NOT TO SCALE



SUBSOIL DRAIN TYPE 3 - BENEATH CONCRETE INVERT

NOT TO SCALE

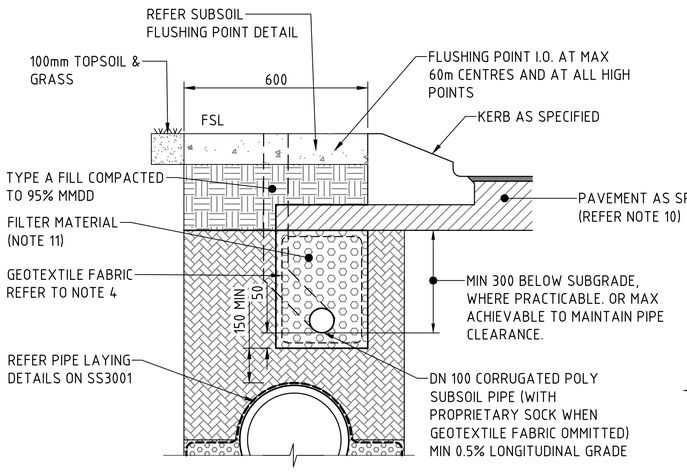


SUBSOIL DRAIN TYPE 2B - BEHIND KERB IN COMMON TRENCH (ALT)

NOT TO SCALE

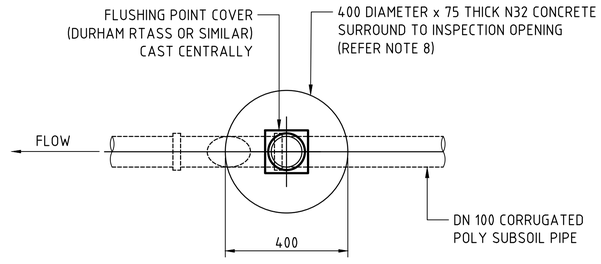
NOTES:

1. ALL WORK MUST BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
2. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
3. PROVIDE MINIMUM COVER TO ALL PIPES IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
4. GEOTEXTILE FABRIC TO COMPLY WITH STANDARD SPECIFICATION FOR SUBDIVISIONS. LAY GEOTEXTILE FABRIC CONTINUOUSLY. PROVIDE MINIMUM LAP LENGTHS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. GEOTEXTILE FABRIC MAY BE OMITTED IN ROCK, WHERE APPROVED BY CERTIFYING ENGINEER.
5. PROVIDE WEEPHOLE CONNECTIONS TO DEWATER DRAINAGE TRENCH. INSTALL TO UPSTREAM SIDES OF ALL PITS AND HEADWALLS.
6. ALL PVC PIPE JOINTS TO BE SPIGOT AND SOCKET TYPE WITH RUBBER RING JOINT OR SOLVENT WELDED JOINT.
7. LOCATE FLUSHING POINTS AT TOP OF LINE AND MAX. 60m SPACINGS. LOCATE TO AVOID CONFLICT WITH OTHER SERVICES AND LOT ACCESSES.
8. CONCRETE SURROUND MAY BE OMITTED WHERE FLUSHING POINT LOCATED IN CONCRETE PAVEMENT.
9. OUTLET ALL SUBSOILS TO DRAINAGE STRUCTURES GENERALLY BY CASTING DN100 uPVC SUBSOIL OUTLET WITH FROG FLAP SCREW CAP INTO STRUCTURE WALLS. FOR SUBSOIL DRAIN OUTLET TO BATTERS/TABLE DRAINS, REFER DETAIL.
10. EXTEND PAVEMENT BENEATH KERB, 75 MIN. THICKNESS AND 300 BEYOND THE BACK OF KERB.
11. EXTEND FILTER/BEDDING MATERIAL TO UNDERSIDE OF TOPSOIL WHERE SUBSOIL IS LOCATED ON HIGH SIDE OF ROAD (e.g. CENTRAL MEDIANS)

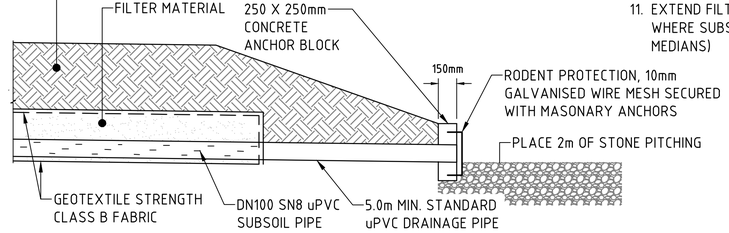


SUBSOIL DRAIN TYPE 2A - BEHIND KERB IN COMMON TRENCH

NOT TO SCALE

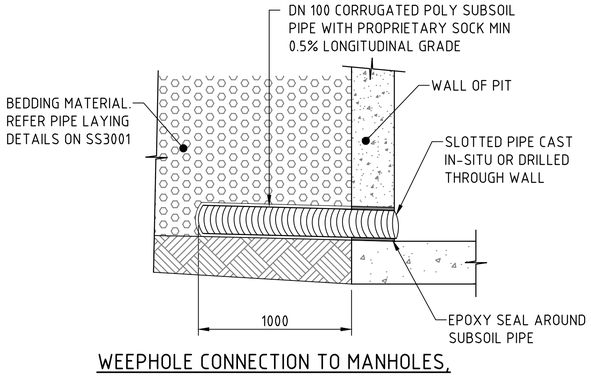


PLAN



SUBSOIL DRAIN OUTLET TO BATTERS/TABLE DRAINS

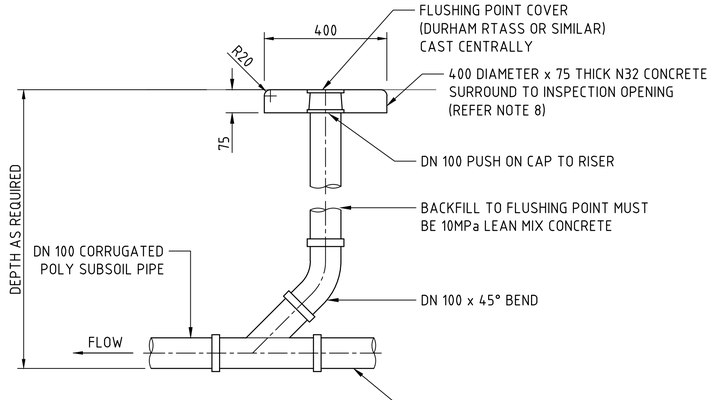
NOT TO SCALE



WEEPHOLE CONNECTION TO MANHOLES, SIDE ENTRY PITS AND HEADWALLS

NOT TO SCALE

(REFER NOTE 5)

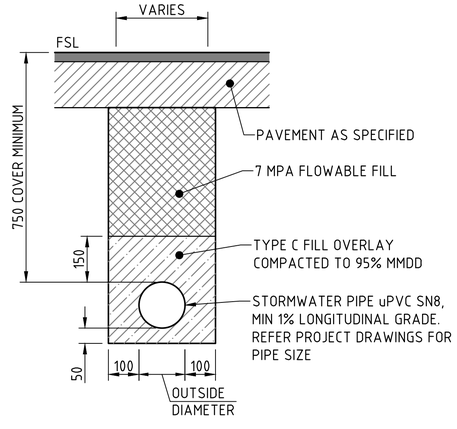


ELEVATION

SUBSOIL FLUSHING POINT DETAIL

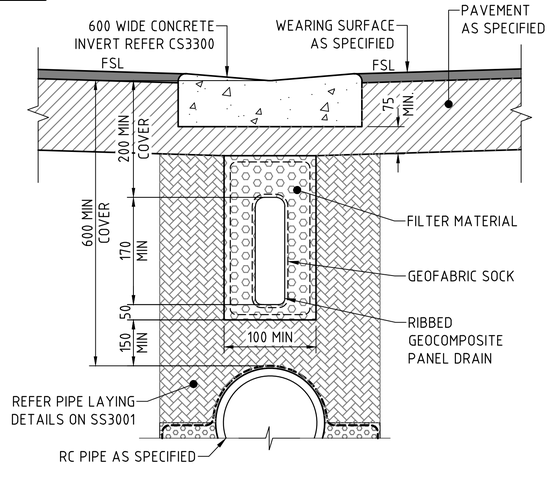
NOT TO SCALE

(REFER NOTES 6 & 7)



SUBSOIL DRAIN - TYPICAL ROAD CROSSING

NOT TO SCALE



SUBSOIL DRAIN TYPE 4 - BENEATH CONCRETE INVERT IN COMMON TRENCH

NOT TO SCALE

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
2	RE-ISSUED AS A STANDARD DRAWING	JUNE 24	JCM	BYRNE
1	RE-ISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020		
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020		
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020		

Northern Territory Government

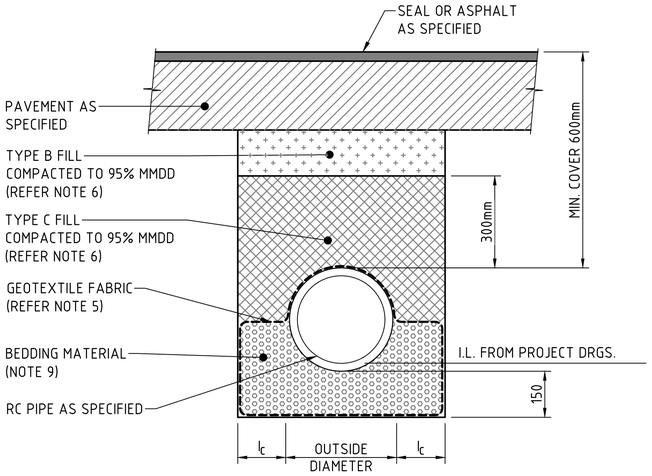
SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS
STORMWATER DRAINAGE

SUBSOIL DRAINAGE TYPICAL DETAILS

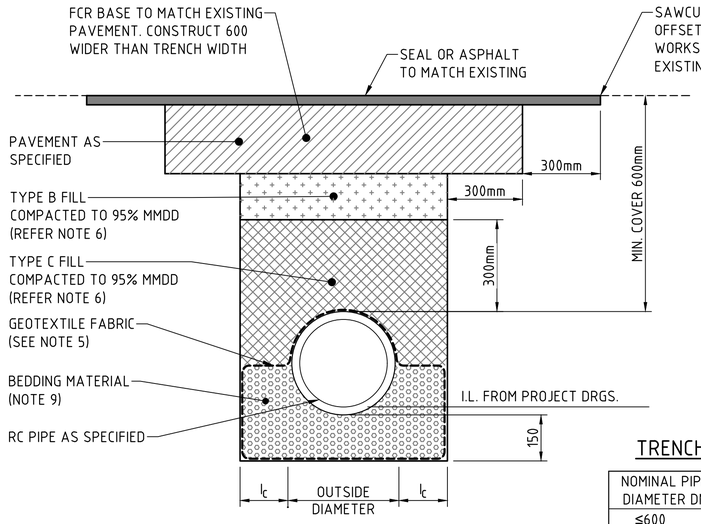
NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	1 OF 1	SS3000	2	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



NEW ROAD CROSSING
NOT TO SCALE



EXISTING ROAD CROSSING
NOT TO SCALE
(REFER NOTE 8)

PIPE SETOUT TABLE

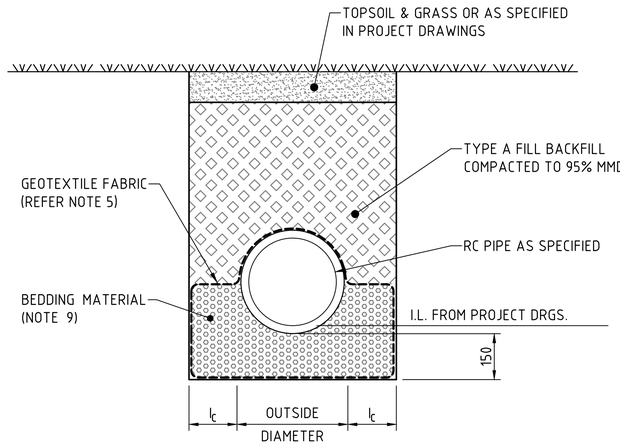
CORRESPONDING PIPE SIZES	
RANGE OF PIPE SIZES	BACK OF KERB OFFSET TO PIPE C.L.
375 AND 450	240 BEHIND
525 TO 750	110 BEHIND
825 TO 1200	150 IN FRONT
1350 TO 1650	375 IN FRONT
1800 TO 2100	675 IN FRONT

TRENCH WIDTH PARAMETERS TABLE

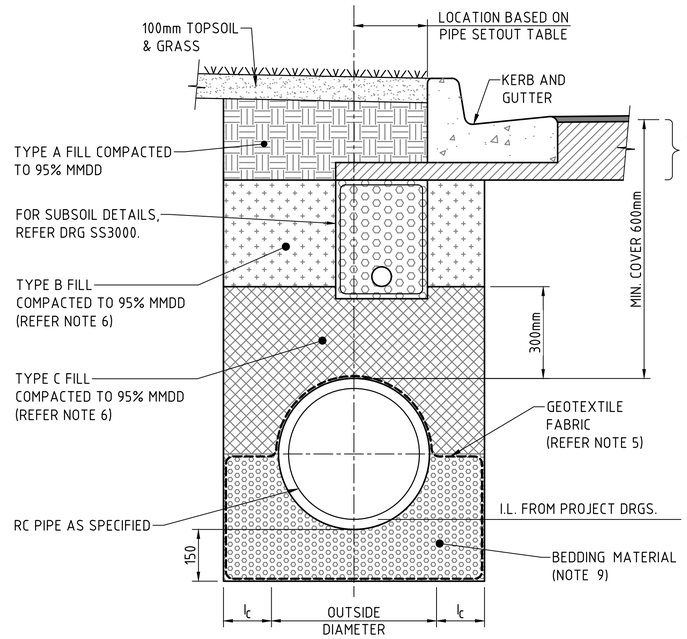
NOMINAL PIPE DIAMETER DN	MINIMUM l_c (mm)	SPACING BETWEEN MULTIPLE CULVERTS (mm)
≤600	150	300
600-1200	200	600
1200-1800	D/6	600
>1800	D/6	900

TABLE NOTES:
1. THE MINIMUM VALUES SHOULD ONLY BE USED WHEN NECESSARY COMPACTION BETWEEN THE PIPES CAN BE ASSURED.
2. MINIMUM VALUES MAY NEED TO BE INCREASED FOR RUBBER RING JOINT PIPES TO ENSURE MIN. 50mm SEPARATION BETWEEN SOCKETS.

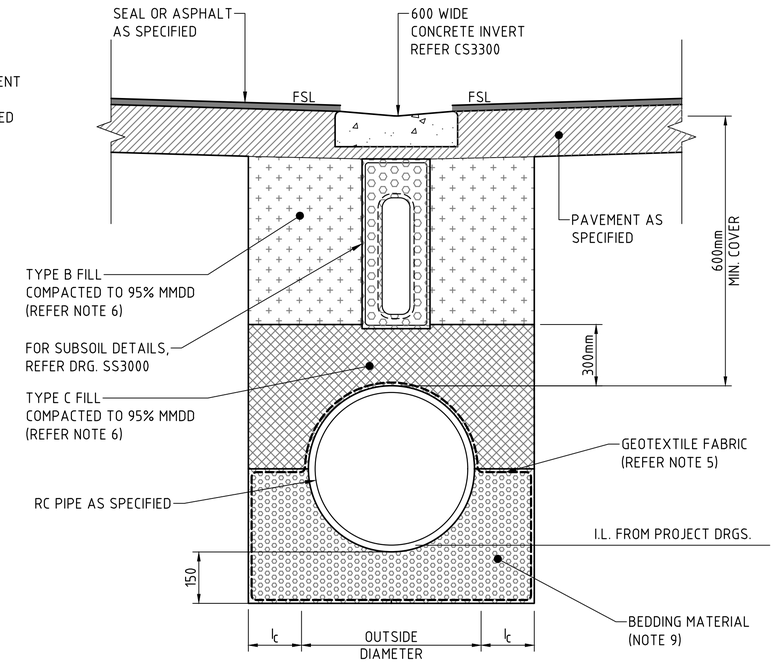
NOTES:
1. ALL WORK MUST BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
2. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
3. DETAILS REFLECT STORMWATER PIPES ONLY. FOR ALL OTHER SERVICES, REFER TO RELEVANT AUTHORITY TECHNICAL REQUIREMENTS.
4. PROVIDE MINIMUM COVER TO PIPES IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS.
5. GEOTEXTILE FABRIC TO COMPLY WITH STANDARD SPECIFICATION FOR SUBDIVISIONS. LAY GEOTEXTILE FABRIC CONTINUOUSLY. PROVIDE MINIMUM LAP LENGTHS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. GEOTEXTILE FABRIC MAY BE OMMITTED IN ROCK, WHERE APPROVED BY CERTIFYING ENGINEER.
6. WHERE THE TRENCH OR EMBANKMENT IS LOCATED, OR WILL BE LOCATED, BENEATH A PAVEMENT:
   a. BACKFILL AROUND THE PIPE FOR THE FULL WIDTH OF THE TRENCH AND FOR A MINIMUM 300mm ABOVE THE TOP OF THE PIPE, OR TO SUBGRADE SURFACE IF LESS WITH TYPE C FILL.
   b. BACKFILL REMAINDER OF THE TRENCH TO SUBGRADE SURFACE WITH TYPE B FILL. ENSURE MINIMUM LAYER THICKNESS OF 100mm.
   c. STABILISE ALL BACK FILL WITH 2% CEMENT BY MASS AND COMPACT TO 95% RELATIVE COMPACTION.
7. FLOWABLE FILL MAY BE USED AS AN ALTERNATIVE BACKFILL, WHERE APPROVED BY THE RELEVANT AUTHORITY.
8. TRENCHING MUST ONLY BE USED FOR EXISTING ROAD CROSSINGS WHERE APPROVAL IS OBTAINED FROM THE RELEVANT AUTHORITY.
9. GEOTEXTILE WRAPPED BEDDING MATERIAL MAY BE EXTENDED TO SUBGRADE SURFACE WHERE DESIRABLE (e.g. HIGH GROUND WATER AREAS).



NON TRAFFICABLE AREAS
NOT TO SCALE



ROADSIDE
NOT TO SCALE



PIPE BENEATH INVERT
NOT TO SCALE

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
2	RE-ISSUED AS A STANDARD DRAWING	JUNE 24	JCM	BYRNE
1	RE-ISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020		
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020		
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020		

Northern Territory Government

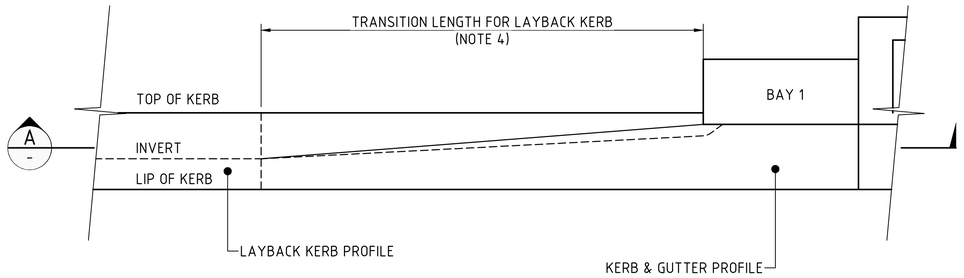
SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS
STORMWATER DRAINAGE

STORMWATER PIPES
TYPICAL TRENCH DETAILS

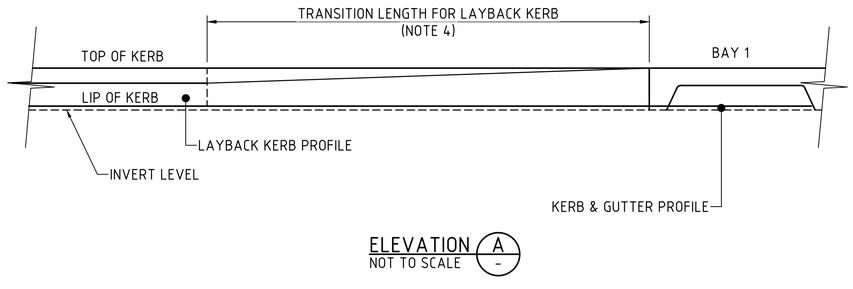
NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	1 OF 1	SS3001	2	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



TRANSITION - PLAN
NOT TO SCALE



ELEVATION A
NOT TO SCALE

NOTES:

1. CONSTRUCT SIDE ENTRY PITS AS PER DIPL STANDARD DRAWINGS CS-3114 TO CS-3116, UNLESS OTHERWISE ON PROJECT DRAWINGS OR THIS DRAWING.
2. ALL WORK MUST COMPLY WITH THE STANDARD SPECIFICATION FOR SUBDIVISIONS ALONG WITH PROJECT SPECIFIC AMENDMENTS.
3. SAG PITS DO NOT REQUIRE DEFLECTORS.
4. TRANSITION LENGTHS TO LAYBACK KERB:
   - SAG PITS: 1.0m (UPSTREAM AND DOWNSTREAM)
   - PITS ON GRADE: 3.0m BOTH SIDES ON STRAIGHTS
     1.5m ON CURVES LESS THAN R20.0m
5. WEEPHOLES MUST BE PROVIDED. REFER SS3000 FOR DETAILS.
6. LOCATE KERB RAMPS CLEAR OF TRANSITION SECTIONS ON PITS.
7. LIMIT VERTICAL OPENING TO 100mm. INSTALL N12 HOT DIPPED GALVANIZED SAFETY BAR AS REQUIRED.
8. PROVIDE 7 MPA FLOWABLE FILL BACKFILL TO ALL DRAINAGE STRUCTURES.
9. DESIGN AND INSTALLATION OF PRECAST PITS, WHERE APPROVED, SHALL ENSURE THAT PENETRATIONS DO NOT COMPROMISE THE OVERALL STRENGTH CAPACITY OF THE PIT.

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
2	RE-ISSUED AS A STANDARD DRAWING	JUNE 24	JCM	BYRNE
1	RE-ISSUED AS A STANDARD DRAWING	APR 23	KS	BYRNE
0	ISSUED AS A STANDARD DRAWING	AUG 20	KS	BYRNE

Drawn: KS, Date: AUGUST 2020	Checked: PB, Date: AUGUST 2020
Designed: PB, Date: AUGUST 2020	Checked: SPB, Date: AUGUST 2020
Design Project Leader: SPB, Date: AUGUST 2020	NTG Project Manager: N/A, Date: AUGUST 2020

Northern Territory Government

SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS
STORMWATER DRAINAGE

SIDE ENTRY PIT NOTES

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
-	-	1 OF 2	SS3003	2	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

PRINT IN COLOUR

KULALUK - STORMWATER DRAINAGE AND PAVEMENT UPGRADES

DRAWING SCHEDULE

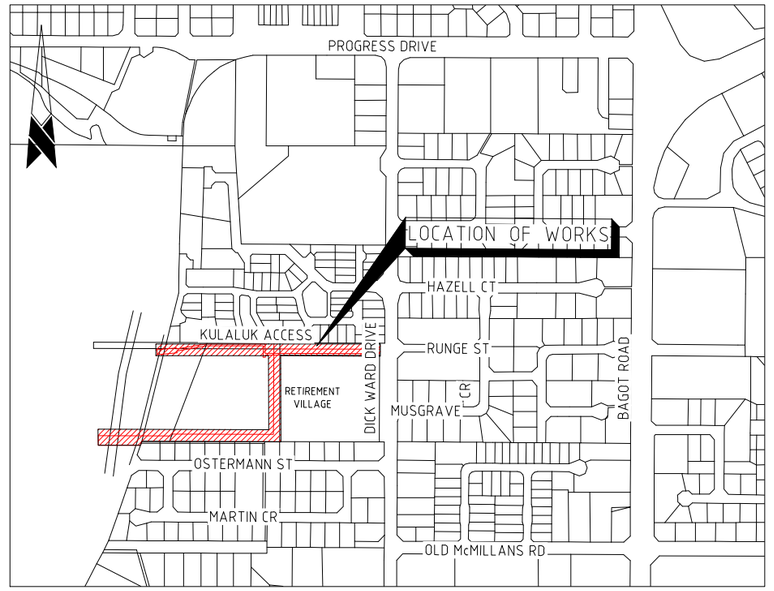
CIVIL

DRAWING No	DRAWING TITLE
R24-2269	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
R24-2270	GENERAL NOTES, LEGEND AND ABBREVIATIONS
R24-2271	ALIGNMENT PLAN AND CONTROL LINE SETOUT
R24-2272	SURVEY & DEMOLITION PLAN SHEET 1 OF 2
R24-2273	SURVEY & DEMOLITION PLAN SHEET 2 OF 2
R24-2274	TYPICAL SECTIONS AND DETAILS SHEET 1 OF 4
R24-2275	TYPICAL SECTIONS AND DETAILS SHEET 2 OF 4
R24-2276	TYPICAL SECTIONS AND DETAILS SHEET 3 OF 4
R24-2277	TYPICAL SECTIONS AND DETAILS SHEET 4 OF 4
R24-2278	BULK EARTHWORKS PLAN SHEET 1 OF 2
R24-2279	BULK EARTHWORKS PLAN SHEET 2 OF 2
R24-2280	GENERAL ARRANGEMENT PLAN SHEET 1 OF 2
R24-2281	GENERAL ARRANGEMENT PLAN SHEET 2 OF 2
R24-2282	ROAD LONGITUDINAL SECTIONS SHEET 1 OF 2
R24-2283	ROAD LONGITUDINAL SECTIONS SHEET 2 OF 2
R24-2284	DRAIN LONGITUDINAL SECTIONS SHEET 1 OF 2
R24-2285	DRAIN LONGITUDINAL SECTIONS SHEET 2 OF 2
R24-2286	ROADS AND DRAINAGE PLANS SHEET 1 OF 5
R24-2287	ROADS AND DRAINAGE PLANS SHEET 2 OF 5
R24-2288	ROADS AND DRAINAGE PLANS SHEET 3 OF 5
R24-2289	ROADS AND DRAINAGE PLANS SHEET 4 OF 5
R24-2290	ROADS AND DRAINAGE PLANS SHEET 5 OF 5
R24-2291	DRAINAGE LONGITUDINAL SECTIONS SHEET 1 OF 5
R24-2292	DRAINAGE LONGITUDINAL SECTIONS SHEET 2 OF 5
R24-2293	DRAINAGE LONGITUDINAL SECTIONS SHEET 3 OF 5
R24-2294	DRAINAGE LONGITUDINAL SECTIONS SHEET 4 OF 5
R24-2295	DRAINAGE LONGITUDINAL SECTIONS SHEET 5 OF 5
R24-2296	DRAINAGE STRUCTURE CONFIGURATIONS SHEET 1 OF 3
R24-2297	DRAINAGE STRUCTURE CONFIGURATIONS SHEET 2 OF 3
R24-2298	DRAINAGE STRUCTURE CONFIGURATIONS SHEET 3 OF 3
R24-2299	DRAINAGE PIT STUCTURAL NOTES SHEET 1 OF 2
R24-2300	DRAINAGE PIT STUCTURAL NOTES SHEET 2 OF 2
R24-2301	DRAINAGE PIT STUCTURAL DETAILS SHEET 1 OF 6
R24-2302	DRAINAGE PIT STUCTURAL DETAILS SHEET 2 OF 6
R24-2303	DRAINAGE PIT STUCTURAL DETAILS SHEET 3 OF 6
R24-2304	DRAINAGE PIT STUCTURAL DETAILS SHEET 4 OF 6
R24-2305	DRAINAGE PIT STUCTURAL DETAILS SHEET 5 OF 6
R24-2306	DRAINAGE PIT STUCTURAL DETAILS SHEET 6 OF 6
R24-2307	LINEMARKING AND SIGNAGE PLAN SHEET 1 OF 3
R24-2308	LINEMARKING AND SIGNAGE PLAN SHEET 2 OF 3
R24-2309	LINEMARKING AND SIGNAGE PLAN SHEET 3 OF 3
R24-2310	DN100 WATER MAIN PLAN AND LONGITUDINAL SECTION

DRAWING SCHEDULE

CIVIL

DRAWING No	DRAWING TITLE
R24-2311	MASTER SERVICES PLAN SHEET 1 OF 2
R24-2312	MASTER SERVICES PLAN SHEET 2 OF 2
R24-2313	CROSS SECTIONS - KULALUK ACCESS SHEET 1 OF 9
R24-2314	CROSS SECTIONS - KULALUK ACCESS SHEET 2 OF 9
R24-2315	CROSS SECTIONS - KULALUK ACCESS SHEET 3 OF 9
R24-2316	CROSS SECTIONS - KULALUK ACCESS SHEET 4 OF 9
R24-2317	CROSS SECTIONS - KULALUK ACCESS SHEET 5 OF 9
R24-2318	CROSS SECTIONS - KULALUK ACCESS SHEET 6 OF 9
R24-2319	CROSS SECTIONS - KULALUK ACCESS SHEET 7 OF 9
R24-2320	CROSS SECTIONS - KULALUK ACCESS SHEET 8 OF 9
R24-2321	CROSS SECTIONS - KULALUK ACCESS SHEET 9 OF 9
R24-2322	CROSS SECTIONS - DRAIN 1 SHEET 1 OF 3
R24-2323	CROSS SECTIONS - DRAIN 1 SHEET 2 OF 3
R24-2324	CROSS SECTIONS - DRAIN 1 SHEET 3 OF 3
R24-2325	CROSS SECTIONS - DRAIN 2 SHEET 1 OF 5
R24-2326	CROSS SECTIONS - DRAIN 2 SHEET 2 OF 5
R24-2327	CROSS SECTIONS - DRAIN 2 SHEET 3 OF 5
R24-2328	CROSS SECTIONS - DRAIN 2 SHEET 4 OF 5
R24-2329	CROSS SECTIONS - DRAIN 2 SHEET 5 OF 5



LOCALITY PLAN
N.T.S.

DIPL STANDARD DRAWINGS

DRAWING NO.	AMEND NO.	DRAWING TITLE
CS3100	1	GENERA; DRAINAGE NOTES AND BASE SLAB EXTENSION & APRON DETAILS
CS3101	1	INSTALLATION, BEDDING AND FILLING/ BACKFILLING AGAINST/ OVER CULVERTS
CS3107	4	REINFORCED CONCRETE BOX CULVERT (RCBC) SET OUT DETAILS
CS3109	2	REINFORCED CONCRETE BOX CULVERT (RCBC) WINGWALL AND HEADWALL DETAIL FOR D ≤ 900mm
CS3110	2	REINFORCED CONCRETE BOX CULVERT (RCBC) WINGWALL AND HEADWALL DETAILS FOR D > 900mm
CS3111	2	REINFORCED CONCRETE BOX CULVERT (RCBC) CONSTRUCTION OF BASES WITH NIBS AND APRONS
CS3112	2	REINFORCED CONCRETE BOX CULVERT (RCBC) CONSTRUCTION OF BASES WITH RECESSES & APRONS
CS3113	1	REINFORCED CONCRETE BOX CULVERT (RCBC) CROWN UNIT HOLDING DOWN ANCHORS
CS3114	3	SIDE ENTRY PIT – LOAD CLASS D CONCRETE DETAILS – SHEET 1
CS3115	1	SIDE ENTRY PIT – LOAD CLASS D REINFORCEMENT DETAILS – SHEET 2
CS3116	1	SIDE ENTRY PIT-LOAD CLASS D LARGER PIPE SETOUT SHEET 3
CS3119	1	MANHOLES AND INLET PITS

SUBDIVISION DEVELOPMENT GUIDELINES STANDARD DRAWINGS

DRAWING NO.	AMEND NO.	DRAWING TITLE
SS1000	2	STREET HEIRARCHY – CATEGORY A – RESIDENTIAL AND MIXED USE – SET TYPE 1
SS1002	2	STREET HEIRARCHY – CATEGORY A – RESIDENTIAL AND MIXED USE – SET TYPE 2
SS1009	2	FOOTPATHS, SHARED PATHS AND KERB RAMPS – TYPICAL DETAILS
SS1010	1	STREET NAME SIGNS – TYPICAL DETAILS
SS3000	2	SUBSOIL DRAINAGE – TYPICAL DETAILS
SS3001	2	STORMWATER PIPES – TYPICAL TRENCH DETAILS
SS3003	2	SIDE ENTRY PIT NOTES

PWC STANDARD DRAWINGS

DRAWING NO.	AMEND NO.	DRAWING TITLE
W1-2-05A	3	MAINLAYING THURST AND ANCHOR BLOCK DETAILS FOR DN100 TO DN300 PRESSURE MAIN
W1-2-21A	2	MAINLAYING DN150 – D450 TRENCHING DETAILS 1, 2, 3, 4, 5

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
0	CONTRACT DRAWING	21.10.24	RK	JACOBS

Jacobs
ABN 37 001 024 095 and ACN 001 024 095
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WARNING
BEWARE OF SERVICES
THE LOCATIONS OF ALL EXISTING SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

Drawn	T.BOUNDY	Date: -	Checked A.NAWAZ Date: -
Designed	T.BOUNDY	Date: -	Checked A.NAWAZ Date: -
Design Project Leader	R.KRAKE	Date: -	NTG Project Manager ALI ASHRAF Date: -

Northern Territory Government

DARWIN REGION
KULALUK
KULALUK ACCESS

COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C01 OF 61	R24-2269	0	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS
PLOTTED ON: 21/Oct/2024 11:47 AM
USER: NAWAZ, ASHAAR
FILE LOCATION: C:\projectwise\jacobs_anz_ie\d0652661\W284400-0000-CI-DRG-0001.dwg

PRINT IN COLOUR

NOTES

GENERAL

G1. ALL LEVELS GIVEN ARE TO A.H.D. UNLESS NOTED OTHERWISE.

G2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

G3. GIVE A MINIMUM 48 HOURS NOTICE TO THE DIPL OF INTENDED COMMENCEMENT DATE AND PROGRAMME OF WORKS. ALL NOTIFICATIONS SHALL BE IN WRITING.

G4. ALL WORKS SHALL BE IN ACCORDANCE WITH THE TECHNCINAL SPECIFICATION.

G5. REMOVAL OR PROTECTION OF ANY EXISTING TREES AND ENVIRONS WITHIN THE WORKS AREA SHALL BE AS PER CONTRACT DRAWINGS OR AS DIRECTED BY THE SUPERINTENDENT.

G6. THE CATCH POINTS OF FILL BATTERS AND TOP OF CUT BATTERS SHALL BE NEAT AND REGULAR ALIGNMENT IRRESPECTIVE OF THE DIMENSIONS SHOWN, THOUGH NO LESS THAN THE MINIMUM DIMENSIONS GIVEN.

G7. IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK. CHECK LEVELS OF SERVICES IN CRITICAL AREAS. IT IS NOT GUARANTEED THAT ALL SERVICES HAVE BEEN SHOWN ON THE DRAWINGS.

G8. OBTAIN PERMIT(S) FROM THE RELEVANT AUTHORITY AS AND WHEN REQUIRED. BE AWARE OF AAPA CERTIFICATE REQUIREMENTS FOR LIMITED AND RESTRICTED WORK AREAS.

G9. REINSTATE ALL SURFACES UPON COMPLETION OF THE WORKS AS DIRECTED BY AND TO THE SATISFACTION OF THE SUPERINTENDENT.

G10. IN THE EVENT THAT EXCAVATION OR OTHER SITEWORKS UNCOVER MANMADE STRUCTURES NOT PREVIOUSLY VISIBLE OR DOCUMENTED, WORKS SHOULD CEASE IN THAT VICINITY AND DIRECTION OBTAINED FROM THE SUPERINTENDENT BEFORE PROCEEDING.

G11. THE SITE IS TO BE LEFT CLEAN AND FREE OF RUBBISH/ DEBRIS UPON COMPLETION OF WORKS.

G12. 'AS CONSTRUCTED' DRAWINGS ARE TO BE PREPARED TO THE REQUIREMENTS OF THE SPECIFICATION.

G13. ALL EXCESS EARTHWORKS MATERIAL SHALL REMAIN ON SITE IN THE APPROVED STOCK PILE SITE.

G14. SITE OF WORKS TO BE SECURE. SITE LOCKED AND SECURED AT THE END OF EACH DAY. THE CONTRACTOR IS RESPONSIBLE FOR THE SECURITY OF THEIR OWN EQUIPMENT.

ROADS & DRAINAGE

R1. ALL LEVELS SHOWN ARE TO AUSTRALIAN HEIGHT DATUM (AHD) AND ALL SETTING OUT CO-ORDINATES ARE TO PLAN MGA ZONE 52.

R2. SETTING OUT AND LEVELLING REFERENCE POINTS FOR KERBING IS SHOWN ON THE DRAWINGS.

R3. GRADE FINISHED SURFACE EVENLY BETWEEN LEVELS SUPPLIED.

R4. WHERE NEW PAVEMENT JOINS EXISTING PAVEMENT, SAW CUT BACK 200mm MIN. INTO SOUND UNCONTAMINATED PAVEMENT MATERIAL AND MAKE GOOD.

R5. LINEMARKING & SIGNPOSTING SHALL BE IN ACCORDANCE WITH AS 1742. LINEMARKING SHALL BE 100mm WIDE AND WHITE IN COLOUR UNLESS NOTED OTHERWISE.

R6. TOP OF DRAINAGE STRUCTURES SHALL BE FINISHED SUCH THAT COVERS AND SURROUNDS MATCH THE ADJACENT FINISHED SURFACE U.N.O.

R7. DRAINAGE PIPES SHALL BE RCP CLASS '3' WITH RUBBER RING JOINTS UNLESS SHOWN OTHERWISE.

R8. DRAINAGE STRUCTURES SETTING OUT REFER TO:-

a) SEP's - CENTRE OF MAIN CHAMBER AT INVERT LINE

b) MANHOLE - CENTRE OF PIT

c) HEADWALL - CENTRE OF HEADWALL.

R9. THE CONTRACTOR SHALL MAINTAIN SITE DRAINAGE OF ALL AREAS THROUGHOUT THE CONSTRUCTION PERIOD AND SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN A SAFE AND STABLE CONDITION AT ALL TIMES.

R10. ALL STORMWATER DRAINAGE PIPES SHALL BE CLEANED BY THE CONTRACTOR AND FREE OF ALL SILTATION, DEBRIS AND/OR OTHER CONTAMINATION PRIOR TO THE PRACTICAL COMPLETION INSPECTION.

R11. ALL CONSTRUCTION SHALL MAKE SMOOTH CONNECTION TO EXISTING WORK. PERMANENT CUTS IN ALL MATERIAL SHOULD BE FORMED WITH A BATTER SLOPE OF MAX 3H:1V AND LINED WITH DRYLAND GRASS.

R12. ALL TEMPORARY, DRY, UN-SHORED OR UN-RETAINED EXCAVATIONS SHOULD BE BATTERS NO STEEPER THAN 1.5H:1V FOR EXCAVATIONS UP TO 3m DEEP. IF SOFT CLAY OR LOOSE SAND IS ENCOUNTERED, THEN TEMPORARY BATTERS AT 2H:1V NEED TO BE IMPLEMENTED.

SETOUT

ST1. TO ENABLE THE PLAN SETOUT FOR THIS PROJECT A DIGITAL COPY OF THESE ENGINEERING DRAWINGS WILL BE MADE AVAILABLE FOR USE BY THE PROJECT SURVEYOR. ALL DRAWING NOTATION TAKES PRECEDENCE OVER ALL DIGITAL INFORMATION PROVIDED.

ST2. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL CHECK THE EXISTING LEVELS AND CROSS FALLS AT ALL TIE IN POINTS TO CONFIRM DESIGN LEVELS AND TRANSITIONS TO EXISTING. THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT OF ANY DISCREPANCIES FOR RESOLUTION PRIOR TO CONSTRUCTION.

ST3. 3D DIGITAL FILES ARE ISSUED ONLY TO ASSIST THE CONTRACTOR WITH EARTHWORKS AND ARE CONSIDERED A GUIDE ONLY. NO GUARANTEE IS GIVEN HAS BEEN GIVEN THAT THE DESIGN HAS BEEN FULLY MODELLED. ALL DRAWING NOTATION TAKES PRECEDENCE OVER ANY 3D DIGITAL INFORMATION PROVIDED.

ST4. ALL SETOUT AND LEVELLING MUST COMPLY WITH CONTRACT DRAWINGS AND THE LEVEL TOLERANCES NOTED IN THE SPECIFICATION.

TEMPORARY FOUNDATION SUPPORT

TF1. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF THE TEMPORARY FOUNDATION SUPPORT TO PROTECT ADJACENT PROPERTIES AND ALLOW EXCAVATION OF THE PROPOSED DRAINAGE INFRASTRUCTURE EXTENTS.

TF2. THE CONTRACTOR IS RESPONSIBLE FOR THE DETAILED DESIGN, CO-ORDINATION, DOCUMENTATION AND CONSTRUCTION OF THE TEMPORARY FOUNDATION SUPPORT. THE CONTRACTOR IS TO ENGAGE AN ADEQUATELY QUALIFIED GEOTECHNICAL ENGINEER AS REQUIRED TO PROVIDE ADVICE ON SOIL RETAINING AND GROUNDWATER CONDITIONS. THE DESIGN AT A MINIMUM WILL NEED TO ACCOUNT FOR:

- SURCHARGE LOADS FROM ADJACENT BUILDINGS/ STRUCTURES
- FOUNDATION SUPPORT/ RETAINING WALL MOVEMENT INDUCED BY EXCAVATIONS
- GROUND MOVEMENT INDUCED BY EXCAVATIONS
- PRESSURES EXERTED BY THE GROUNDWATER

TF3. ENSURE FOUNDATION SUPPORT/ RETAINING METHOD DOES NOT SURCHARGE OR UNDERMINE ADJACENT STRUCTURES UNLESS NOTED OTHERWISE. CONTRACTOR TO ALLOW FOR SURCHARGE LOADING OF ADJACENT PROPERTIES, STRUCTURES, ROADS, ETC. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TAKE SUITABLE MEASURES TO ENSURE NO STRUCTURAL IMPACT ON ADJACENT PROPERTIES THROUGHOUT WORKS.

TF4. PROPOSED DESIGN DRAWINGS AND METHODOLOGY TO BE CERTIFIED BY GEOTECHNICAL ENGINEER AND SUBMITTED TO SUPERINTENDENT PRIOR TO COMMENCING WORKS.

TRAFFIC CONTROL DEVICES

TC1. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH AS1742.

TC2. ALL ROAD SIGNS SHALL BE SIZE "B" UNLESS SHOWN OTHERWISE.

TC3. LINEMARKING SHALL BE IN ACCORDANCE WITH DIPL STD DRAWING CS3400.

SURVEY

S1. ALL CO-ORDINATES AND LEVELS SHOWN ON THIS DRAWING SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT BEFORE PROCEEDING.

S2. SITE CONTROLS TO BE PROVIDED BY THE CONTRACTOR'S SURVEYOR.

S3. ALL CO-ORDINATES ARE TO THE MGA94 ZONE 52 COORDINATE SYSTEM.

S4. ALL BENCHMARKS ARE TO BE PROTECTED AND PRESERVED DURING WORKS.

DEMOLITION

D1. ALL DEMOLITION DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION AND OTHER RELEVANT DRAWINGS.

D2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND PAY REQUIRED FEES PRIOR TO COMMENCING DEMOLITION.

D3. SHOULD ANY HAZARDOUS OR ASBESTOS CONTAINING MATERIAL BE ENCOUNTERED ON SITE, REPORT TO SUPERINTENDENT IMMEDIATELY.

D4. CONTRACTOR TO ENSURE SITE SAFETY AND SECURITY IS MAINTAINED AT ALL TIMES.

D5. ALL BUILDING MUST BE SUPPORTED AND KEPT STABLE DURING DEMOLITION.

D5. THE CONTRACTOR IS RESPONSIBLE FOR ANY APPLICATIONS REQUIRED TO RELEVANT AUTHORITIES FOR THE DISCONNECTION AND REMOVAL OF EXISTING SERVICES.

D6. ALL DEMOLISHED MATERIAL SHALL BE DISPOSED OFFSITE AT AN APPROVED DISPOSAL FACILITY AT THE CONTRACTOR'S EXPENSE. ALL EXCESS EARTHWORKS MATERIAL SHALL REMAIN ON SITE IN THE APPROVED STOCK PILE SITE.

ABBREVIATIONS

DIPL	DEPARTMENT OF INFRASTRUCTURE PLANNING AND LOGISTICS	O/H	OVERHEAD
		OUD	OPEN UNLINED DRAIN
DN	NOMINAL DIAMETER	PL	PAVEMENT LEVEL
DRG	DRAWING	RCBC	REINFORCED CONCRETE BOX CULVERT
D/S	DOWNSTREAM	RCP	REINFORCED CONCRETE PIPE
FSL	FINISHED SURFACE LEVEL	RL	REDUCED LEVEL
GSP	GROUTED STONE PITCHING	RRPM	RAISED REFLECTIVE PAVEMENT MARKERS
GP	GUIDE POST	STD	STANDARD
HV	HIGH VOLTAGE	STN	SURVEY STATION
HW	HEADWALL	UNO	UNLESS NOTED OTHERWISE
IL	INVERT LEVEL	U/G	UNDERGROUND
NTS	NOT TO SCALE	U/S	UPSTREAM

LEGEND

PROPOSED

- DRAINAGE PIPE, PIT AND HEADWALL
- SUBSOIL DRAINAGE
- W — DN100 WATER MAIN
- E-HV — ELECTRICAL HV
- E-LV — ELECTRICAL LV
- E — ELECTRICAL AND LIGHT POLE
- C — COMMUNICATIONS

EXISTING

- D — DRAINAGE PIPE / CULVERT
- W — WATER
- S — SEWER
- SRM — SEWER RISING MAIN
- E — ELECTRICAL (U/G)
- E — ELECTRICAL (O/H)
- C — COMMUNICATIONS
- OF — OPTIC FIBRE
- G — GAS
- TOP OF BATTER
- TOE OF BATTER
- EDGE OF SEAL
- 250.0 — SURFACE CONTOURS

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GENERAL NOTES, LEGEND AND ABBREVIATIONS

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C02 OF 61	R24-2270	0	A1

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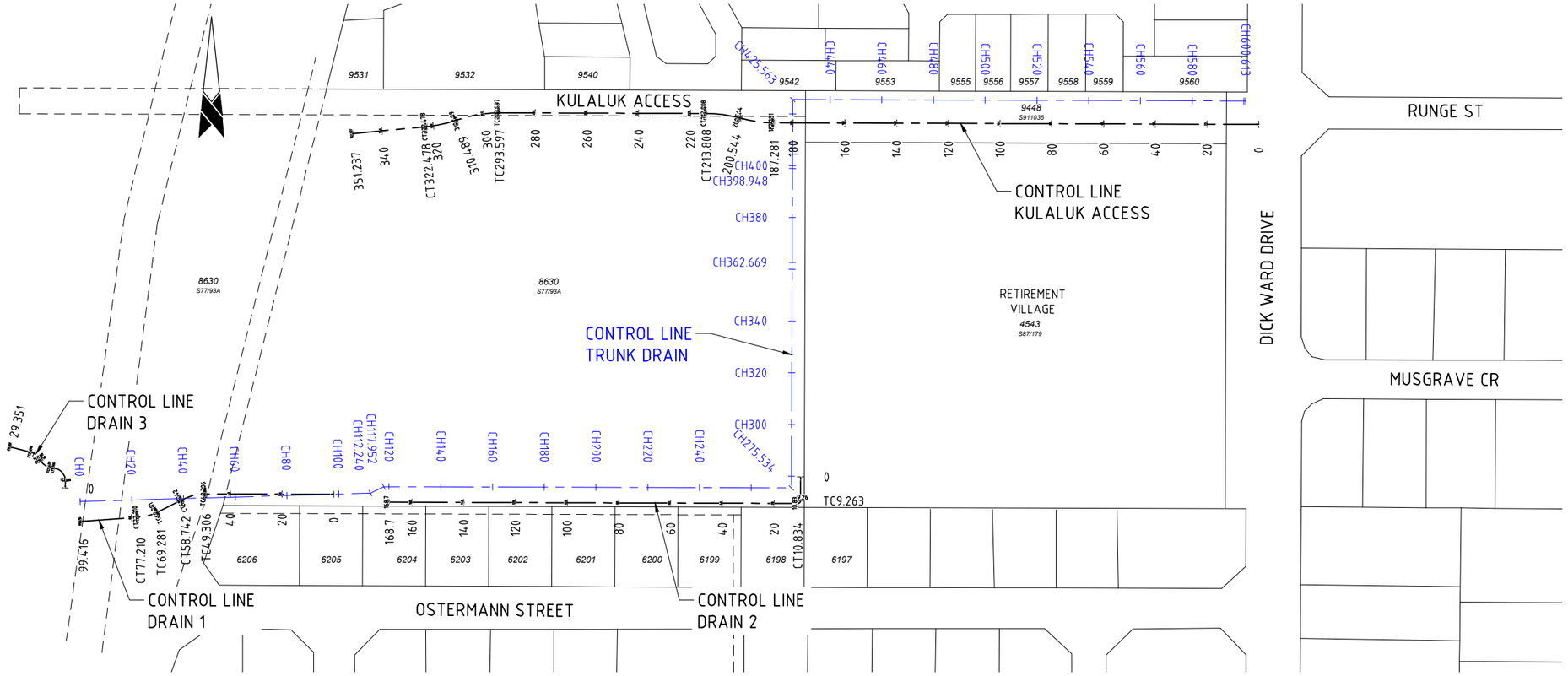

ALIGNMENT PLAN
SCALE A

CONTROL LINE KULALUK ACCESS SETOUT

CHAINAGE	COORDINATES		BEARING	RADIUS OF	TANGENT	ARC
	EASTING	NORTHING	DEG MIN SEC	CURVATURE	LENGTH	LENGTH
0.000	701368.287	8629352.435	270° 11' 24"	STRAIGHT		
187.281	701181.007	8629353.056	270° 11' 24"	49.998		
IP 193.913	701174.337	8629353.078	-	49.998	6.671	13.263
200.544	701167.905	8629354.849	285° 23' 19"	-50.000		
IP 207.176	701161.473	8629356.619	-	-50.000	6.671	13.264
213.808	701154.802	8629356.641	270° 11' 20"	STRAIGHT		
293.597	701075.014	8629356.904	270° 11' 20"	-50.000		
IP 302.043	701066.486	8629356.932	-	-50.000	8.527	16.892
310.489	701058.432	8629354.132	250° 49' 55"	50.000		
IP 316.483	701052.743	8629352.155	-	50.000	6.023	11.989
322.478	701046.746	8629351.585	264° 34' 12"	STRAIGHT		
351.237	701018.116	8629348.863	264° 34' 12"	STRAIGHT		

CONTROL LINE TRUNK DRAIN SETOUT

CHAINAGE	COORDINATES		BEARING	RADIUS OF	TANGENT	ARC
	EASTING	NORTHING	DEG MIN SEC	CURVATURE	LENGTH	LENGTH
0.000	700912.721	8629206.731	88° 20' 36"	STRAIGHT		
112.240	701024.914	8629209.976	64° 3' 2"	STRAIGHT		
117.952	701030.050	8629212.475	90° 10' 19"	STRAIGHT		
275.534	701187.632	8629212.002	360° 10' 59"	STRAIGHT		
362.669	701187.910	8629299.137	360° 11' 2"	STRAIGHT		
398.948	701188.026	8629335.416	360° 11' 0"	STRAIGHT		
425.563	701188.112	8629362.031	90° 11' 20"	STRAIGHT		
600.613	701363.160	8629361.454	90° 11' 20"	STRAIGHT		

CONTROL LINE DRAIN 1 SETOUT

CHAINAGE	COORDINATES		BEARING	RADIUS OF	TANGENT	ARC
	EASTING	NORTHING	DEG MIN SEC	CURVATURE	LENGTH	LENGTH
0.000	701010.733	8629209.533	270° 10' 19"	STRAIGHT		
49.306	700961.427	8629209.681	270° 10' 19"	-20.000		
IP 54.024	700956.620	8629209.696	-	-20.000	4.807	9.436
58.742	700952.331	8629207.524	243° 8' 28"	STRAIGHT		
69.281	700942.929	8629202.762	243° 8' 28"	20.000		
IP 73.245	700939.345	8629200.947	-	20.000	4.017	7.928
77.210	700935.339	8629200.657	265° 51' 14"	STRAIGHT		
99.416	700913.191	8629199.051	265° 51' 14"	STRAIGHT		

CONTROL LINE DRAIN 2 SETOUT

CHAINAGE	COORDINATES		BEARING	RADIUS OF	TANGENT	ARC
	EASTING	NORTHING	DEG MIN SEC	CURVATURE	LENGTH	LENGTH
0.000	701191.145	8629216.255	180° 10' 60"	STRAIGHT		
9.263	701191.116	8629206.992	180° 10' 60"	1.000		
IP 10.048	701191.112	8629205.992	-	1.000	1.000	1.571
10.834	701190.113	8629205.995	270° 10' 19"	STRAIGHT		
168.700	701032.247	8629206.469	270° 10' 19"	STRAIGHT		

CONTROL LINE DRAIN 3 SETOUT

CHAINAGE	COORDINATES		BEARING	RADIUS OF	TANGENT	ARC
	EASTING	NORTHING	DEG MIN SEC	CURVATURE	LENGTH	LENGTH
0.000	700906.896	8629211.989	2° 3' 32"	STRAIGHT		
2.533	700906.987	8629214.520	2° 3' 32"	-5.000		
IP 6.149	700907.145	8629218.932	-	-5.000	4.414	7.232
9.766	700902.788	8629219.636	279° 10' 51"	STRAIGHT		
11.429	700901.145	8629219.901	279° 10' 51"	5.000		
IP 13.604	700898.852	8629220.272	-	5.000	2.323	4.349
15.778	700897.657	8629222.263	329° 0' 41"	STRAIGHT		
17.187	700896.931	8629223.471	329° 0' 41"	-5.000		
IP 19.143	700895.869	8629225.239	-	-5.000	2.062	3.911
21.098	700893.871	8629225.744	284° 11' 38"	STRAIGHT		
29.351	700885.870	8629227.768	284° 11' 38"	STRAIGHT		

SCALE A 20 0 20 40 60m

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Design Project Leader: R.KRAKE, Date: -	NTG Project Manager: ALI ASHRAF, Date: -		

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ALIGNMENT PLAN AND CONTROL LINE SETOUT

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C03 OF 61	R24-2271	0	A1

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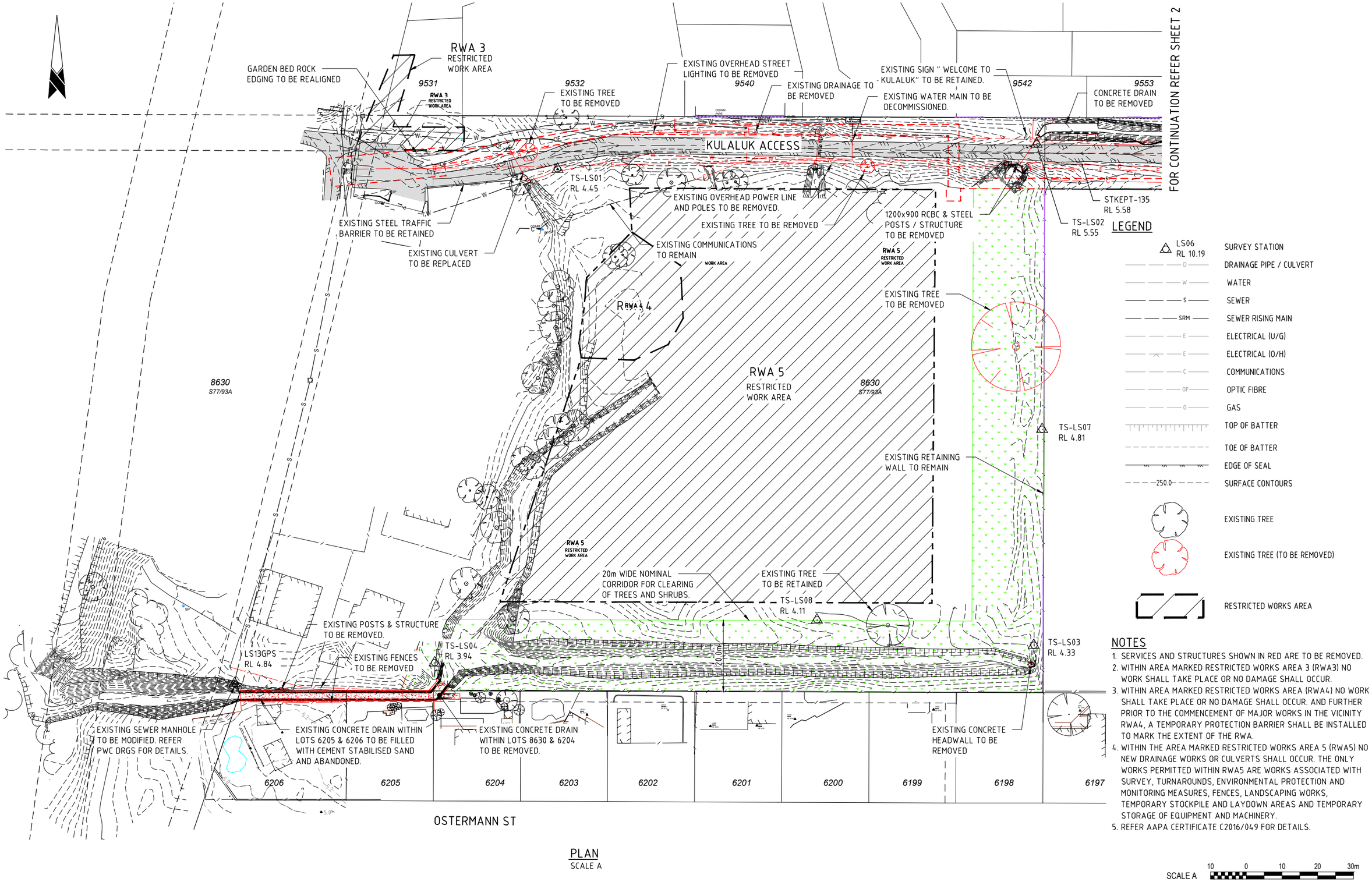

PLAN
SCALE A

LEGEND

- LS06 RL 10.19 — SURVEY STATION
- D — DRAINAGE PIPE / CULVERT
- W — WATER
- S — SEWER
- SRM — SEWER RISING MAIN
- E — ELECTRICAL (U/G)
- E — ELECTRICAL (O/H)
- C — COMMUNICATIONS
- OF — OPTIC FIBRE
- G — GAS
- TOP OF BATTER
- TOE OF BATTER
- EDGE OF SEAL
- 250.0 — SURFACE CONTOURS
- EXISTING TREE
- EXISTING TREE (TO BE REMOVED)
- RESTRICTED WORKS AREA

NOTES

1. SERVICES AND STRUCTURES SHOWN IN RED ARE TO BE REMOVED.
2. WITHIN AREA MARKED RESTRICTED WORKS AREA 3 (RWA3) NO WORK SHALL TAKE PLACE OR NO DAMAGE SHALL OCCUR.
3. WITHIN AREA MARKED RESTRICTED WORKS AREA (RWA4) NO WORK SHALL TAKE PLACE OR NO DAMAGE SHALL OCCUR. AND FURTHER PRIOR TO THE COMMENCEMENT OF MAJOR WORKS IN THE VICINITY RWA4, A TEMPORARY PROTECTION BARRIER SHALL BE INSTALLED TO MARK THE EXTENT OF THE RWA.
4. WITHIN THE AREA MARKED RESTRICTED WORKS AREA 5 (RWA5) NO NEW DRAINAGE WORKS OR CULVERTS SHALL OCCUR. THE ONLY WORKS PERMITTED WITHIN RWA5 ARE WORKS ASSOCIATED WITH SURVEY, TURNAROUNDS, ENVIRONMENTAL PROTECTION AND MONITORING MEASURES, FENCES, LANDSCAPING WORKS, TEMPORARY STOCKPILE AND LAYDOWN AREAS AND TEMPORARY STORAGE OF EQUIPMENT AND MACHINERY.
5. REFER AAPA CERTIFICATE C2016/049 FOR DETAILS.

SCALE A 10 0 10 20 30m

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SURVEY & DEMOLITION PLAN SHEET 1 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C04 OF 61	R24-2272	0	A1

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EXISTING SIGN " WELCOME TO KULALUK" TO BE RETAINED.

EXISTING WATER MAIN TO BE DECOMMISSIONED.

9542

9553
CONCRETE DRAIN TO BE REMOVED

9555 9556
EXISTING FENCE TO BE REMOVED

9557 9558 9559
EXISTING OVERHEAD STREET LIGHTING TO BE REMOVED

CONCRETE HEADWALL AND STONE PITCHING WALL TO BE REMOVED.

STKEPT-141
RL 7.63

DN800 RCP
DN1100 RCP

DN400 RCP
DN1000 RCP

RUNGE ST

EXISTING ACCESS CROSSOVER TO BE REMOVED.

KULALUK ACCESS

STKEPT-135
RL 5.58

TS-LS02
RL 5.55

EXISTING OVERHEAD POWER LINE AND POLES TO BE REMOVED.

EXISTING COMMUNICATIONS TO BE RELOCATED

TS-LS06
RL 7.23

STKEPT-141
RL 7.63

CRM S93268004
RL 7.33

1200x900 RCBC & STEEL POSTS / STRUCTURE TO BE REMOVED

RWA 5
RESTRICTED WORK AREA

EXISTING TREE TO BE REMOVED

TS-LS07
RL 4.81

EXISTING RETAINING WALL TO REMAIN

4543
S87/179
RETIREMENT VILLAGE

DICK WARD DRIVE

CRM S93268005
RL 6.94

MUSGRAVE CR

TS-LS03
RL 4.33

FOR CONTINUATION REFER SHEET 1

EXISTING CONCRETE HEADWALL TO BE REMOVED

6199 6198 6197 6196 6195 6194 6193 6192

CRM S93268046
RL 5.81

CRM S93268006
RL 6.54

OSTERMANN ST

PLAN
SCALE A

SCALE A 10 0 10 20 30m

NOTES
1. REFER SHEET C04 FOR NOTES AND LEGEND.

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SURVEY & DEMOLITION PLAN
SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C05 OF 61	R24-2273	0	A1

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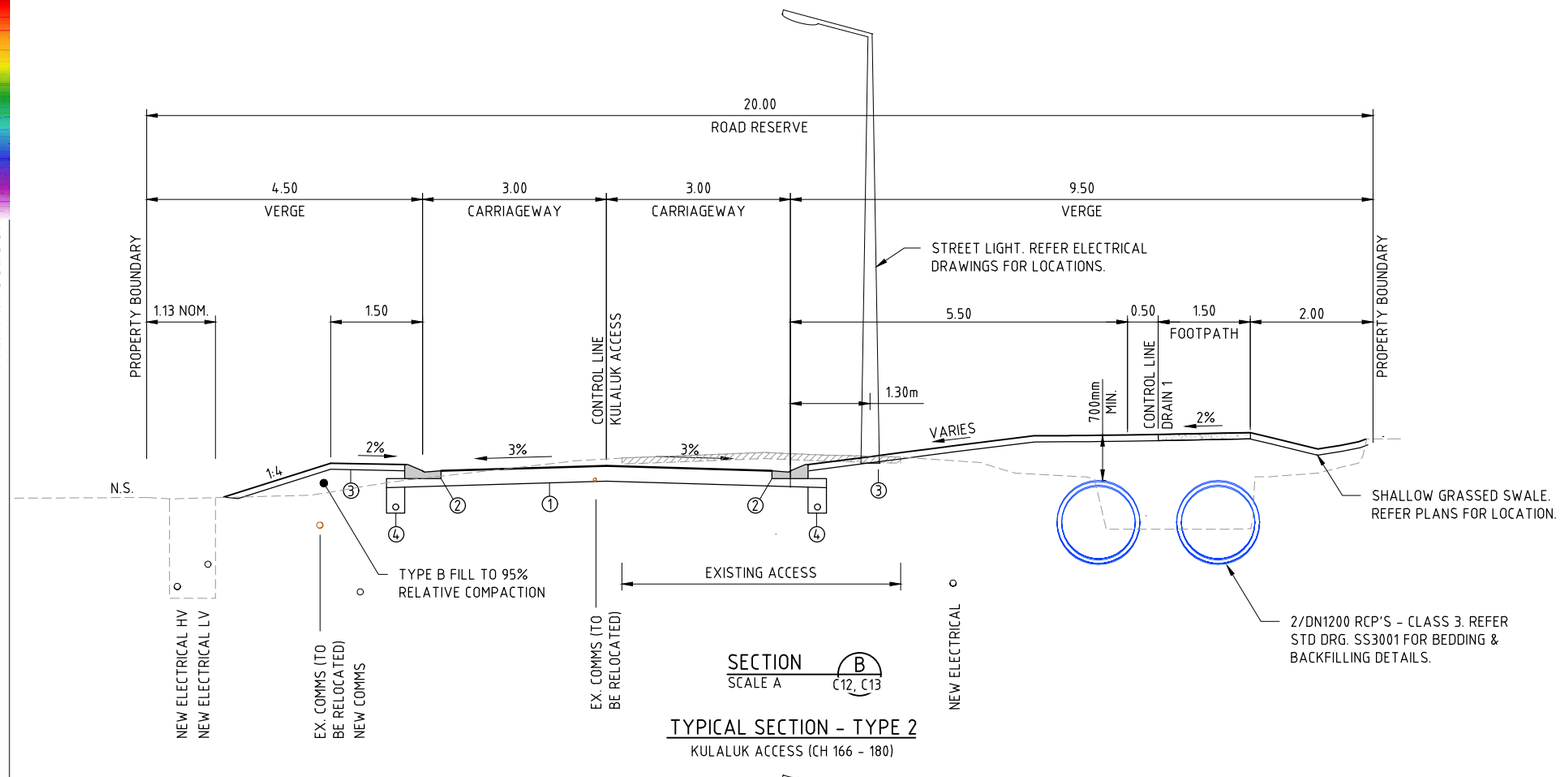
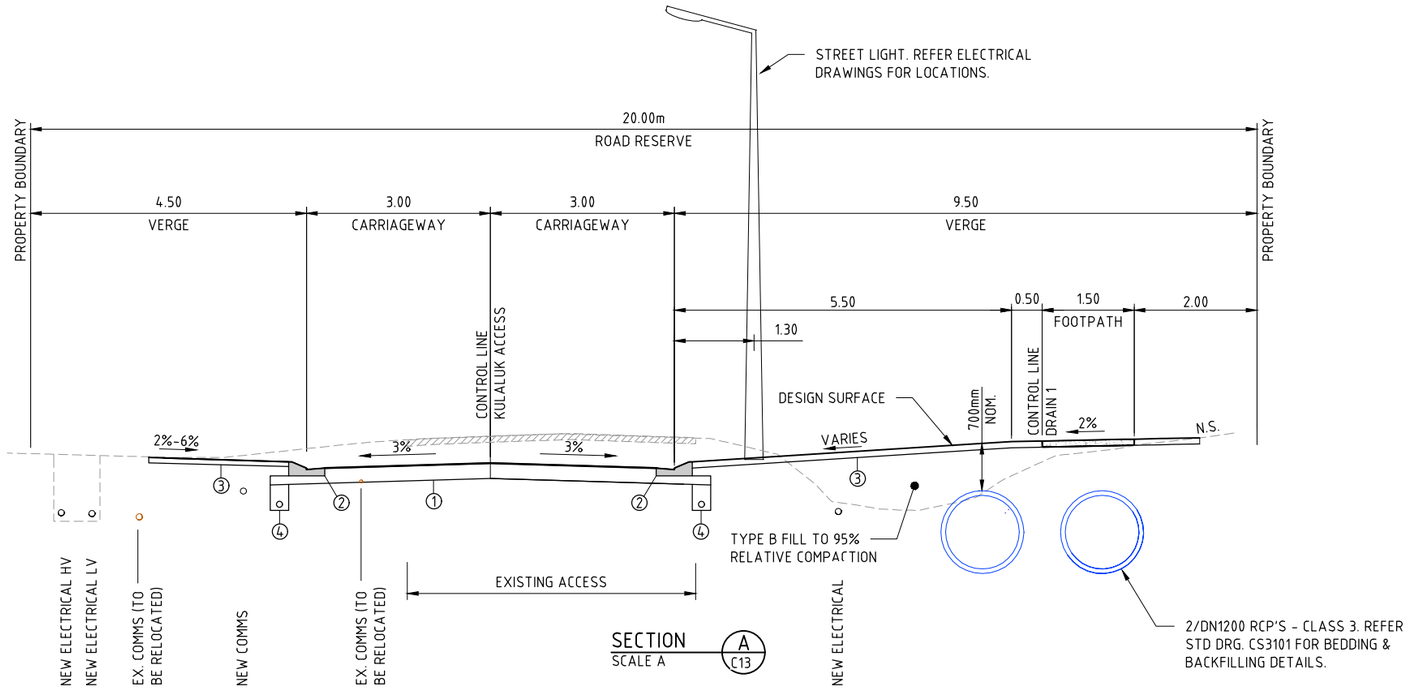


SECTION B C12, C13
SCALE A

TYPICAL SECTION - TYPE 2

KULALUK ACCESS (CH 166 - 180)



SECTION A C13
SCALE A

TYPICAL SECTION - TYPE 1

KULALUK ACCESS (CH 0 TO 166)

LEGEND

① PRIME AND 40mm ASPHALT AC14- MIX TYPE 5 (A15E)
200mm COMPACTED THICKNESS FCR BASE COMPACTED TO 100% MMDD.
150mm COMPACTED THICKNESS SUBGRADE MIN CBR 10. COMPACTED TO 95% MMDD (MIN). REFER NOTE 2.

② LAYBACK KERB AND GUTTER (LKG). REFER SDG STD DRG SS1000.

③ FINISH COMPACTED EARTHWORKS MIN. 100mm BELOW FINISHED SURFACE LEVEL. PROVIDE TOPSOIL AND LIGHTLY SCARIFY TO ESTABLISH DRY-LAND GRASS (SLOPE 2% U.N.O). FOR PATH LOCATION & WIDTHS REFER GENERAL ARRANGEMENT PLAN AND INTERSECTION DETAILS.

④ TYPE 1 OR TYPE 2 SUBSOIL DRAIN AT BACK OF KERB. MIN. GRADE EQUAL TO ADJACENT ROAD GRADE ALLOW FOR CROSSINGS. REFER SS3000 FOR DETAILS.

⑤ CONCRETE FOOTPATH. REFER SS1009 FOR DETAILS.

⑥ FLUSH KERB AND GUTTER (FK). REFER DIPL STD DRG CS3300.

⑦ MOUNTABLE GAP KERB AND GUTTER (MGKG) WITH GAPS AT CHAINAGE 335, 340 & 345. REFER DIPL STD DRG CS3300.

NOTES

1. DIMENSIONS ARE IN METERS U.N.O.
2. CONDUCT IN-SITU TESTING TO DETERMINE SUBGRADE CBR VALUES. WHERE CBR IS LESS THAN 10% REFER TO SUPERINTENDENT FOR DIRECTION.

SCALE A 1 0 1 2 3m

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TYPICAL SECTIONS AND DETAILS SHEET 1 OF 4

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C06 OF 61	R24-2274	0	A1

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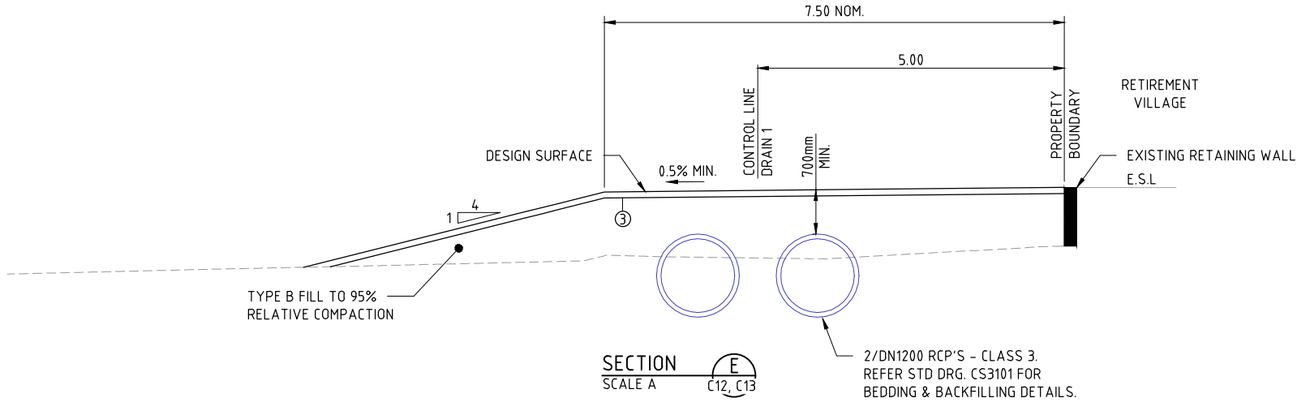
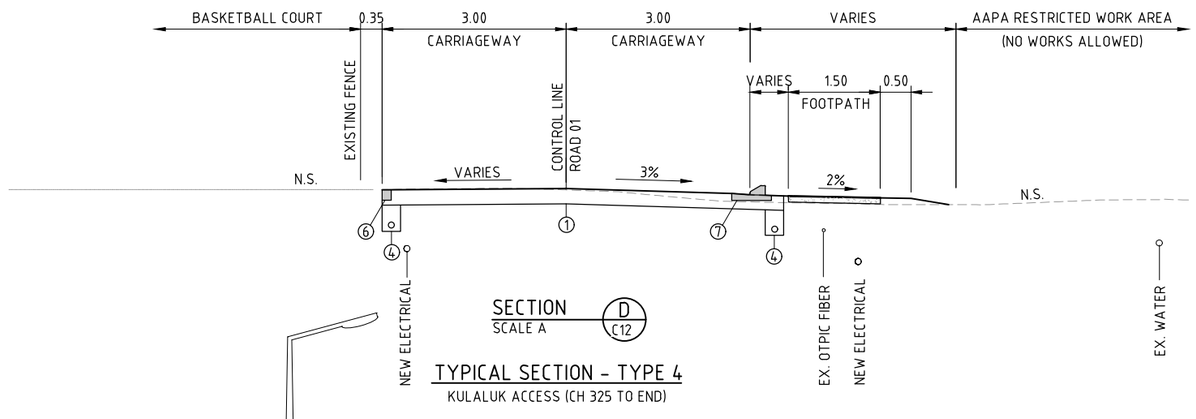
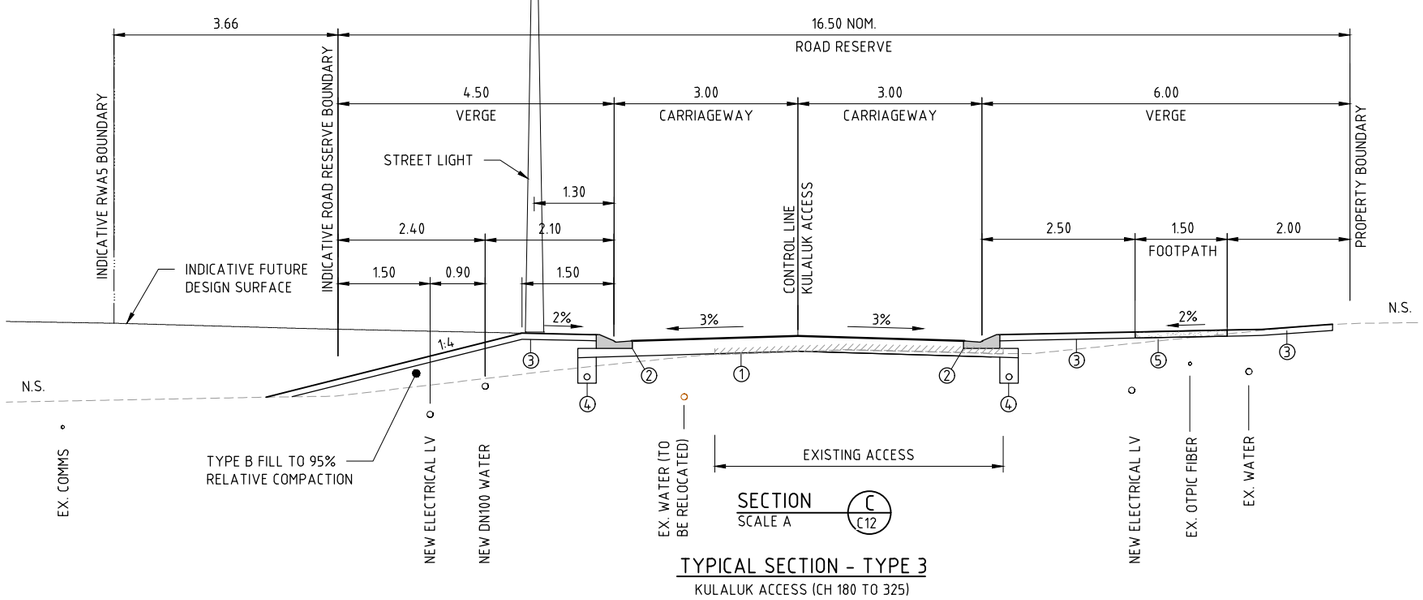


TYPICAL SECTION - TYPE 5



TYPICAL SECTION - TYPE 4

KULALUK ACCESS (CH 325 TO END)



TYPICAL SECTION - TYPE 3

KULALUK ACCESS (CH 180 TO 325)

NOTES

1. REFER C06 FOR NOTES AND LEGEND.

SCALE A 1 0 1 2 3m

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Designed: T.BOUNDY Date: -	Checked: A.NAWAZ Date: -		
Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -		

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TYPICAL SECTIONS AND DETAILS SHEET 2 OF 4

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C07 OF 61	R24-2275	0	A1

Version: March 2021

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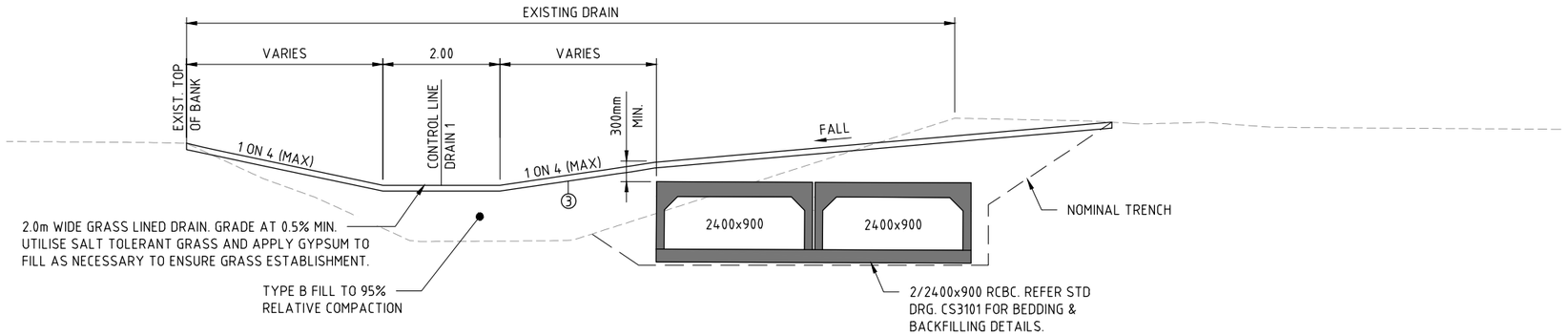
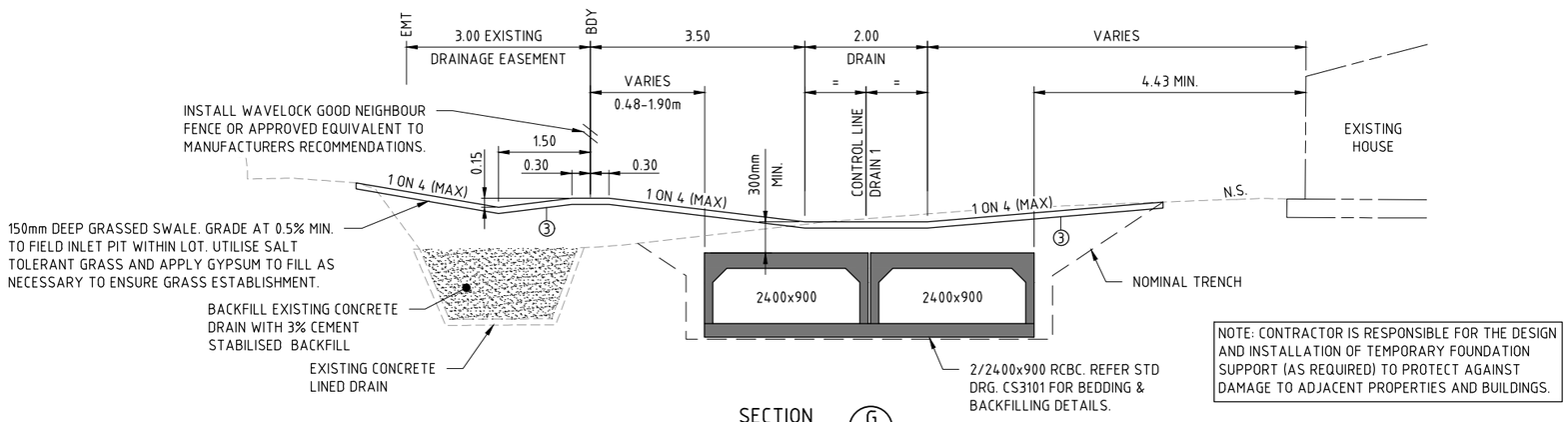


SECTION H C12
SCALE A

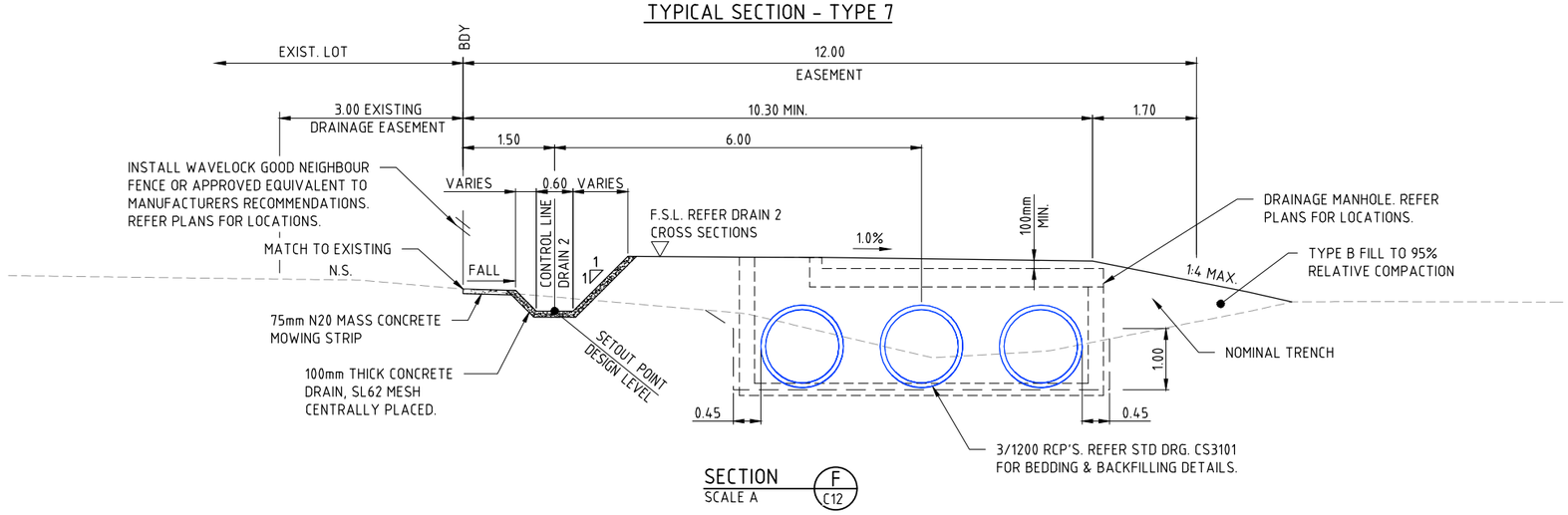
TYPICAL SECTION - TYPE 8



NOTE: CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF TEMPORARY FOUNDATION SUPPORT (AS REQUIRED) TO PROTECT AGAINST DAMAGE TO ADJACENT PROPERTIES AND BUILDINGS.

SECTION G C12
SCALE A

TYPICAL SECTION - TYPE 7



SECTION F C12
SCALE A

TYPICAL SECTION - TYPE 6

NOTES

1. REFER SHEET 1 FOR NOTES AND LEGEND.

SCALE A 1 0 1 2 3m

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TYPICAL SECTIONS AND DETAILS SHEET 3 OF 4

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C08 OF 61	R24-2276	0	A1

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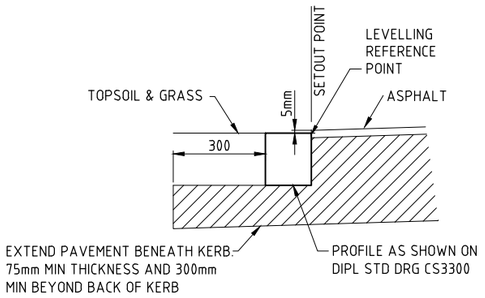
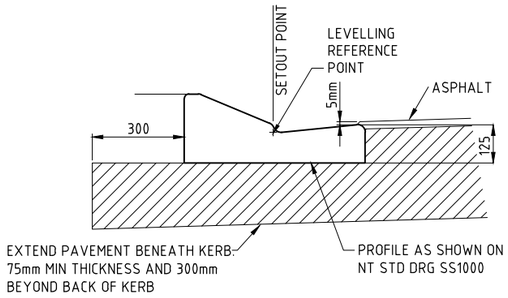
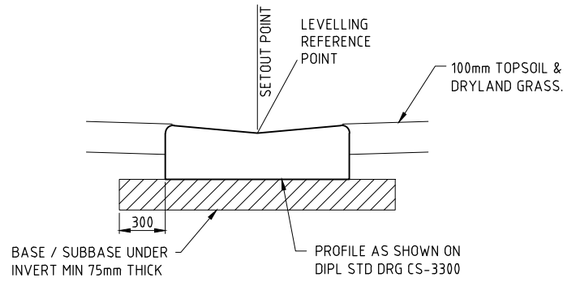
NOTES:
1. INSTALL 12mm EXPANSION JOINTS IN KERB AND GUTTER AT THE TURNING POINT OF KERB RETURNS. FILL JOINTS WITH APPROPRIATE FLEXIBLE JOINTING COMPOUND.



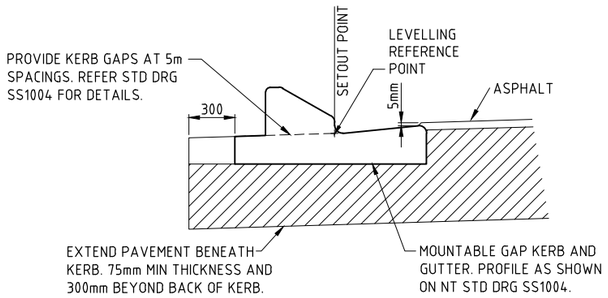
FLUSH KERB DETAIL (FK)
N.T.S.



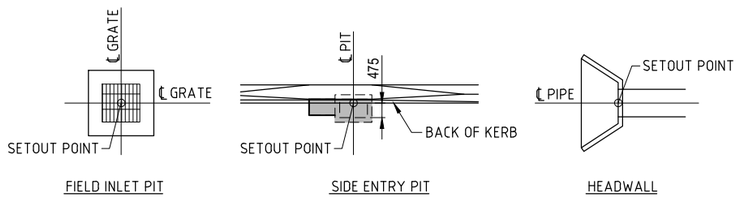
LAYBACK KERB & GUTTER DETAIL (LKG)
N.T.S.



CONCRETE INVERT DETAIL (600mm WIDE) (INV)
N.T.S.

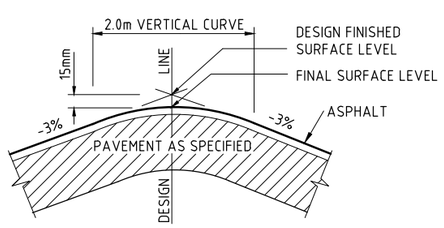


MOUNTABLE GAP KERB & GUTTER DETAIL (MGKG)
N.T.S.

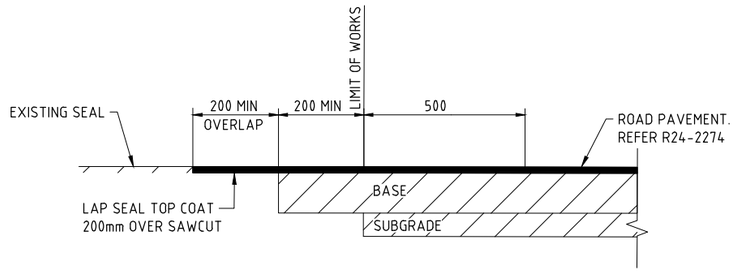


NOTE: REFER DRAINAGE LONG SECTIONS FOR SETOUT POINT CO-ORDINATES

STRUCTURE SETOUT POINTS
N.T.S.



TYPICAL CROWN DETAIL
N.T.S.



TYPICAL JOIN TO EXISTING ROAD
N.T.S.

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TYPICAL SECTIONS AND DETAILS
SHEET 4 OF 4

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C09 OF 61	R24-2277	0	A1

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RWA 3
RESTRICTED
WORK AREA

PROPERTY BOUNDARY

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FOR CONTINUATION REFER SHEET 2

EXTENT OF
EARTHWORKS

1 IN 2 BATTER
ADJACENT SUB
STATION PAD

1 IN 4 BATTER

RWA 4

RWA 5
RESTRICTED
WORK AREA

LOT 8630

EXTENT OF
EARTHWORKS

1 IN 4 BATTER

PROPERTY BOUNDARY

EXISTING CONCRETE DRAIN
TO BE FILLED WITH CEMENT
STABILISED SAND

PROPERTY BOUNDARY

NEW CONCRETE
CONCRETE LINED DRAIN
AND FIELD INLET PITS

OSTERMANN ST

PLAN
SCALE A

EARTHWORKS QUANTITIES					
	TOPSOIL			EARTHWORKS	
LOT	STRIPPING (m^2)	PLACEMENT (m^3)	STOCKPILE (m^3)	EXCAVATION (m^3)	FILL (m^3)
8630	8166	754	63	2997	4653
9448	2523	202	50	2145	837
Total	10,689	956	113	5142	5490

EARTHWORKS NOTES
1. EXCAVATION VOLUMES INCLUDE TRENCHING FOR DRAINAGE.
2. 100mm NOM. DEPTH FOR TOPSOIL STRIPPING AND PLACEMENT.

LEGEND

- AREAS OF FILL
- EXTENT OF EARTHWORKS
- 18.70 FINISHED SURFACE LEVEL
- 18.68 NATURAL SURFACE LEVEL
- 20.2 DESIGN SURFACE CONTOURS (0.2m INTERVAL)
- 17.0 EXISTING SURFACE CONTOURS (0.2m INTERVAL)

NOTES

1. FOR ADDITIONAL NOTES AND LEGEND REFER SHEET C02.
2. ALL EXISTING SERVICES WITHIN WORKS ARE TO BE PROTECTED AT ALL TIMES.
3. FOR FINISHED SURFACE LEVELS REFER CROSS SECTIONS ON SHEETS C52 TO C60.

SCALE A 10 0 10 20 30m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
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BULK EARTHWORKS PLAN SHEET 1 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C10 OF 61	R24-2278	0	A1

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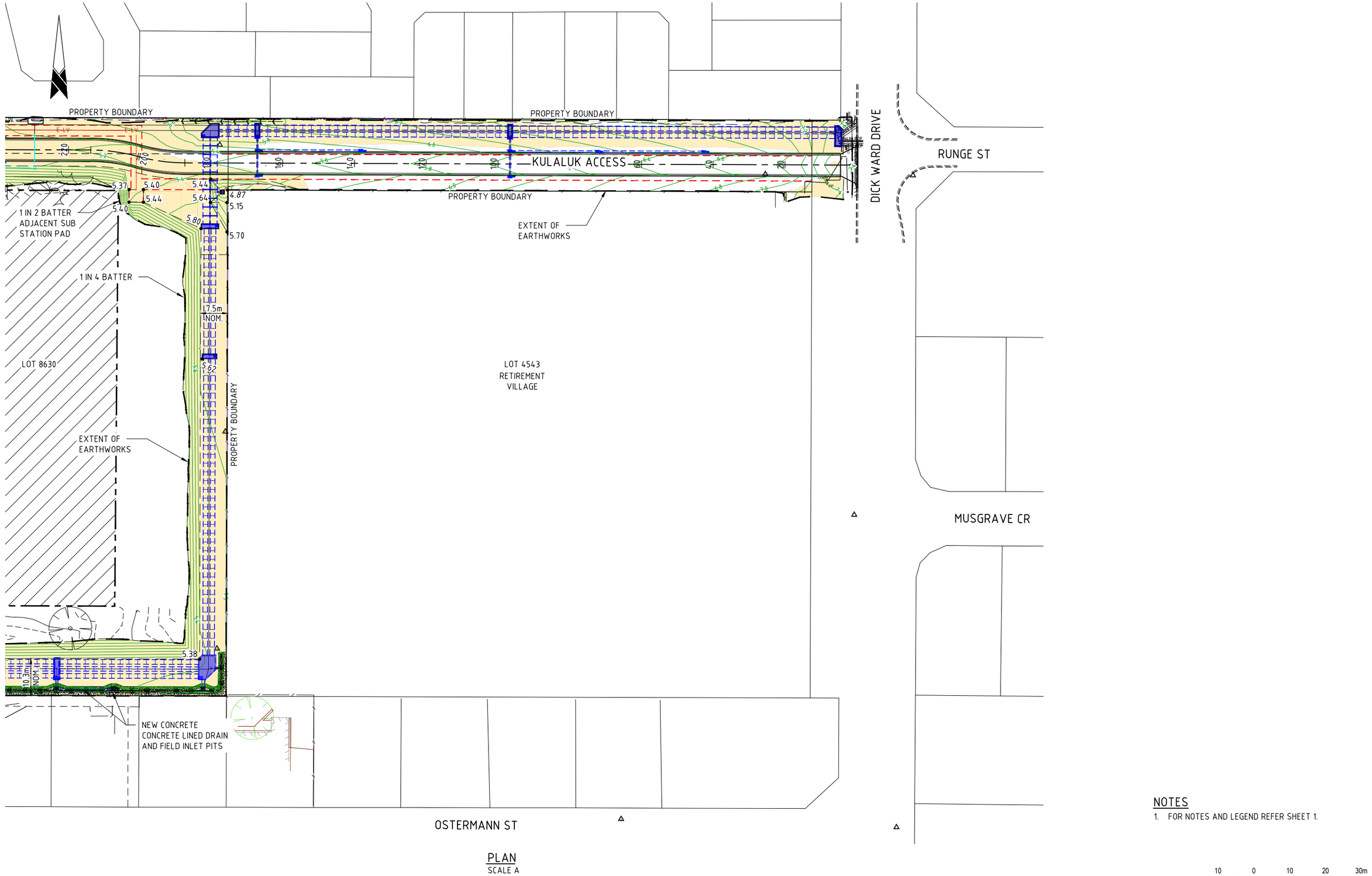

PLAN
SCALE A

NOTES
1. FOR NOTES AND LEGEND REFER SHEET 1.

SCALE A 10 0 10 20 30m

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Design Project Leader	R.KRAKE	NTG Project Manager	ALI ASHRAF
Date:	-	Date:	-

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BULK EARTHWORKS PLAN SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C11 OF 61	R24-2279	0	A1

Version: March 2021

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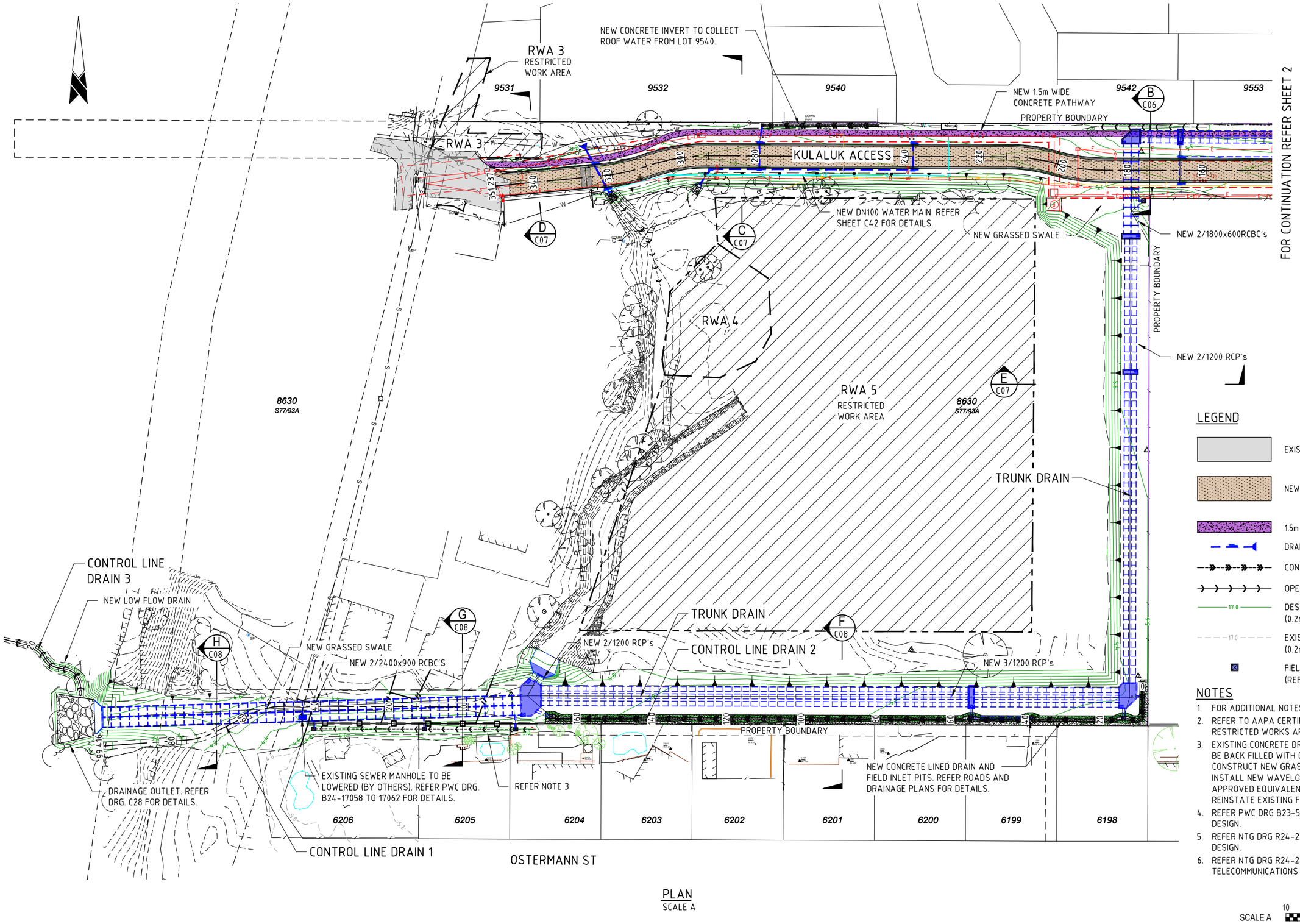

PLAN
SCALE A

LEGEND

- EXISTING PAVEMENT
- NEW SEALED PAVEMENT
- 1.5m WIDE PEDESTRIAN PATH
- DRAINAGE PIPE, PIT AND HEADWALL
- CONCRETE LINED DRAIN
- OPEN UNLINED DRAIN
- 17.0 DESIGN SURFACE CONTOURS (0.2m INTERVAL)
- 17.0 EXISTING SURFACE CONTOURS (0.2m INTERVAL)
- FIELD INLET PIT (REFER CS3119)

NOTES

1. FOR ADDITIONAL NOTES AND LEGEND REFER SHEET C02.
2. REFER TO AAPA CERTIFICATE C2016/049 FOR DETAILS ON RESTRICTED WORKS AREAS AND SACRED SITES.
3. EXISTING CONCRETE DRAIN AT REAR OF LOTS 6204 - 6206 TO BE BACK FILLED WITH CEMENT STABILISED MATERIAL. CONSTRUCT NEW GRASSED SWALE AND FIELD INLET PITS. INSTALL NEW WAVELOCK GOOD NEIGHBOUR FENCE (OR APPROVED EQUIVALENT) ALONG REAR LOT BOUNDARY & REINSTATE EXISTING FENCE ON SIDE LOT BOUNDARIES.
4. REFER PWC DRG B23-5711 TO 5717 FOR POWER SUPPLY DESIGN.
5. REFER NTG DRG R24-2334 TO 2336 FOR STREET LIGHTING DESIGN.
6. REFER NTG DRG R24-2337 TO 2338 FOR TELECOMMUNICATIONS DESIGN.

SCALE A 10 0 10 20 30m

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GENERAL ARRANGEMENT PLAN
SHEET 1 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C12 OF 61	R24-2280	0	A1

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NEW 1.5m WIDE CONCRETE PATHWAY

PROPERTY BOUNDARY

9542

B C06

9553

9555

9556

9557

9558

9559

9560

TRUNK DRAIN

PROPERTY BOUNDARY

NEW 2/1200 RCP's

NEW ACCESS CROSSOVER

9448 S911035

RUNGE ST

KULALUK ACCESS

AIN. REFER ILS.

NEW GRASSED SWALE

NEW 2/1800x600RCBC's

PROPERTY BOUNDARY

RECONSTRUCT EXISTING ACCESS

A C06

PROPERTY BOUNDARY

NEW 2/1200 RCP's

E C07

8630 S77/93A

RETIREMENT VILLAGE

4543 S87/179

DICK WARD DRIVE

TRUNK DRAIN

MUSGRAVE CR

NEW 3/1200 RCP's

EXTEND EXISTING 525 RCP

CONTROL LINE DRAIN 2

FOR CONTINUATION REFER SHEET 1

6200 6199 6198 6197 6196 6195 6194 6193 6192

OSTERMANN ST

PLAN
SCALE A

NOTES

1. FOR NOTES AND LEGEND REFER SHEET C02.

SCALE A 10 0 10 20 30m

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GENERAL ARRANGEMENT PLAN SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C13 OF 61	R24-2281	0	A1

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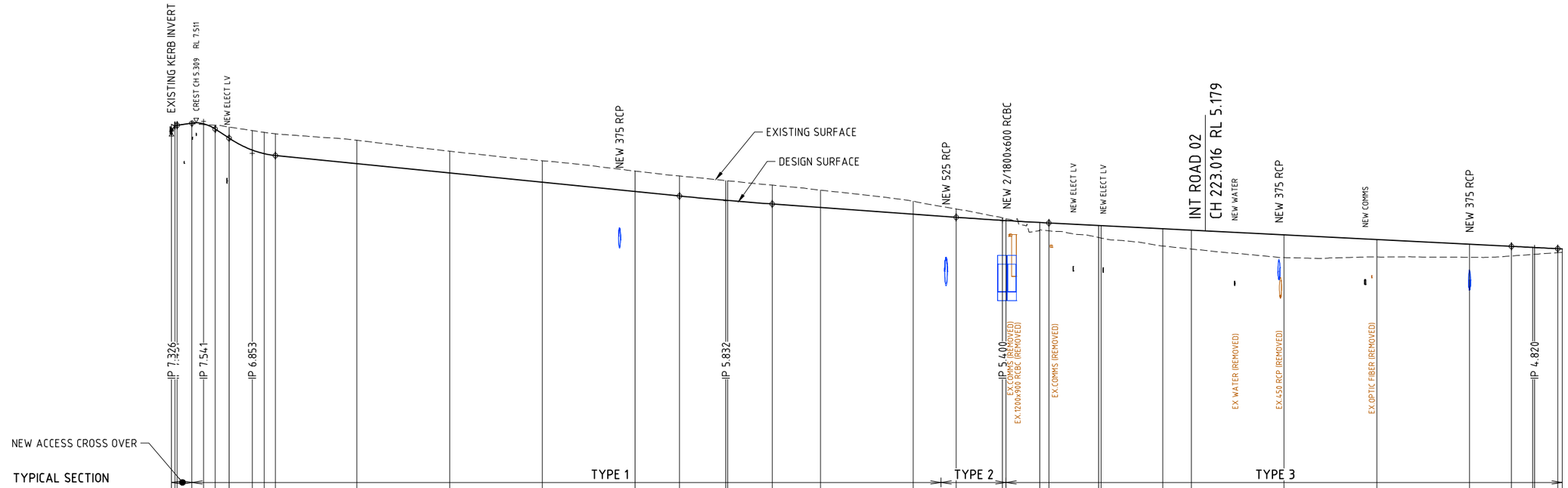

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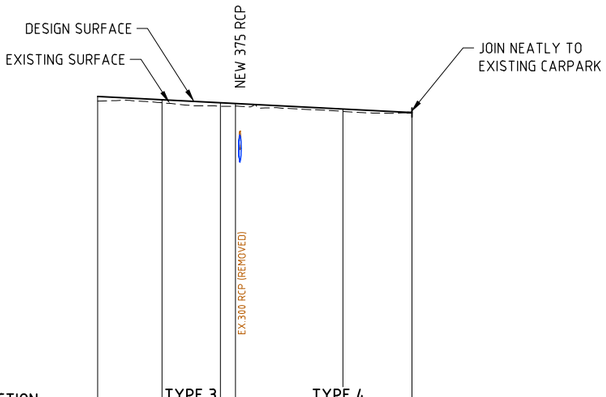

TYPICAL SECTION						
VERTICAL CURVE						
VERTICAL GRADE			-0.51%			
DATUM RL -3.0						
CUT - FILL +	0.049	0.055	0.042	0.039	0.000	
DESIGN SURFACE LEVEL	4.736	4.687	4.674	4.585	4.527	
EXISTING SURFACE LEVEL	4.687	4.632	4.633	4.546	4.527	
CHAINAGE	310.489	320.000	322.478	340.000	351.247	
HORIZONTAL DATA		R-50m	R50m			

LONGITUDINAL SECTION ROAD 01

SCALE 1:500H
1:50V

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 10 0 10 20 30m

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ROAD LONGITUDINAL SECTIONS
SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C15 OF 61	R24-2283	0	A1

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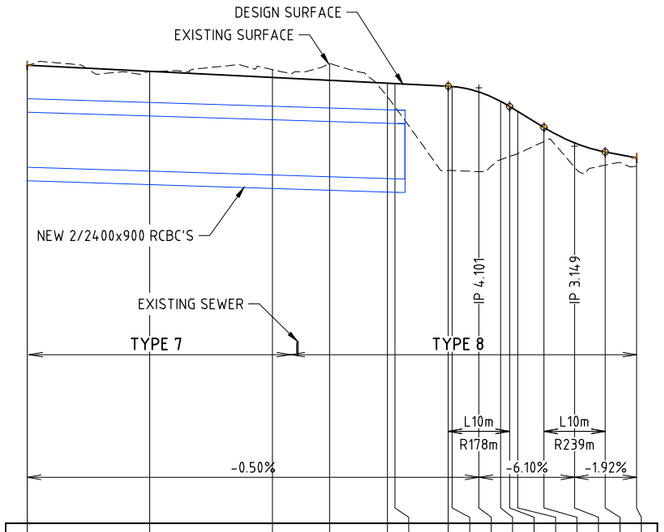

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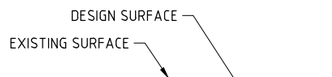

CUT – FILL +	-0.480	-0.481	-0.601	-0.562	-0.424	-0.392	-0.301	-0.260	-0.049		
DESIGN SURFACE LEVEL	2.432	2.419	2.383	2.374	2.353	2.346	2.332	2.326	2.285		
EXISTING SURFACE LEVEL	2.911	2.900	2.983	2.936	2.777	2.737	2.632	2.586	2.333		
CHAINAGE	0.000	2.533	9.766	11.429	15.778	17.187	20.000	21.098	29.351		
HORIZONTAL DATA	R-5m		R5m		R-5m						

LONGITUDINAL SECTION DRAIN 03

SCALE 1:500H
1:50V

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 10 0 10 20 30m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
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Design Project Leader R.KRAKE Date: -	NTG Project Manager ALI ASHRAF Date: -		

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DRAIN LONGITUDINAL SECTIONS SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C17 OF 61	R24-2285	0	A1

Version: March 2021

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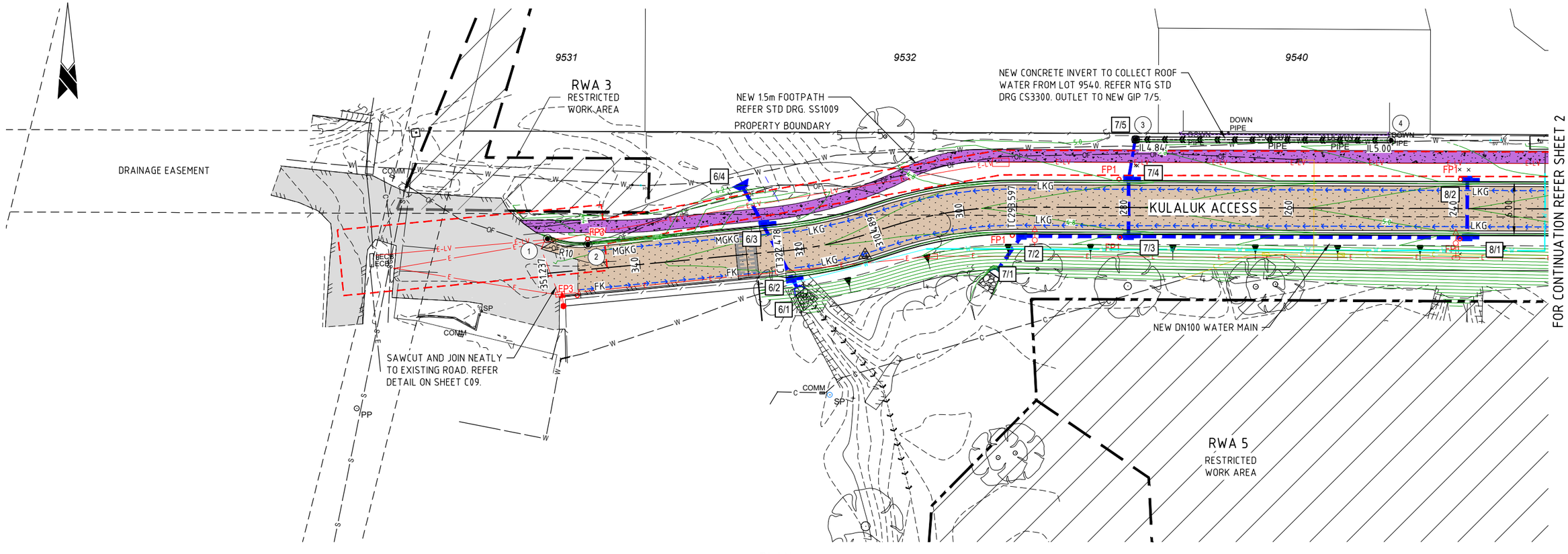

PLAN
SCALE A

LEGEND

- EXISTING PAVEMENT
- NEW SEALED PAVEMENT
- 1.5m WIDE PEDESTRIAN PATH
- 2/1 — DRAINAGE LINE NUMBER / STRUCTURE No.
- DRAINAGE PIPE, PIT AND HEADWALL
- SUBSOIL DRAINAGE
- CONCRETE LINED DRAIN
- OPEN UNLINED DRAIN
- 21 — SETOUT POINT
- TANGENT POINT

44.956	FINISHED SURFACE LEVEL
IL45.286	INVERT LEVEL
PL46.436	PAVEMENT LEVEL
FK	FLUSH KERB
LKG	LAYBACK KERB AND GUTTER
MGKG	MOUNTABLE GAP KERB AND GUTTER

FLUSHING POINT LEGEND

FP1	FLUSHING POINT IN PIT
FP2	FLUSHING POINT IN LINE
FP3	FLUSHING POINT HEAD

NOTES

1. FOR ADDITIONAL NOTES AND LEGEND REFER SHEET C02.
2. ALL ROAD WORKS TO COMPLY WITH DIPL STANDARD DRAWINGS AND SPECIFICATIONS.
3. FOR PAVEMENT DETAILS REFER SHEET C06.
4. FOR TYPICAL DRAINAGE SETOUT DETAILS REFER SHEET C09.
5. FOR DRAINAGE LONG SECTIONS REFER SHEETS C23TO C27.
6. SUBSOIL DRAINS ARE SHOWN IN ROAD CARRIAGEWAY FOR CLARITY. REFER STD DRG. SS3000 FOR LOCATIONS RELATIVE TO KERB.

SCALE A 5 0 5 10 15m

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Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -	

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ROADS AND DRAINAGE PLANS
SHEET 1 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C18 OF 61	R24-2286	0	A1

Version: March 2021

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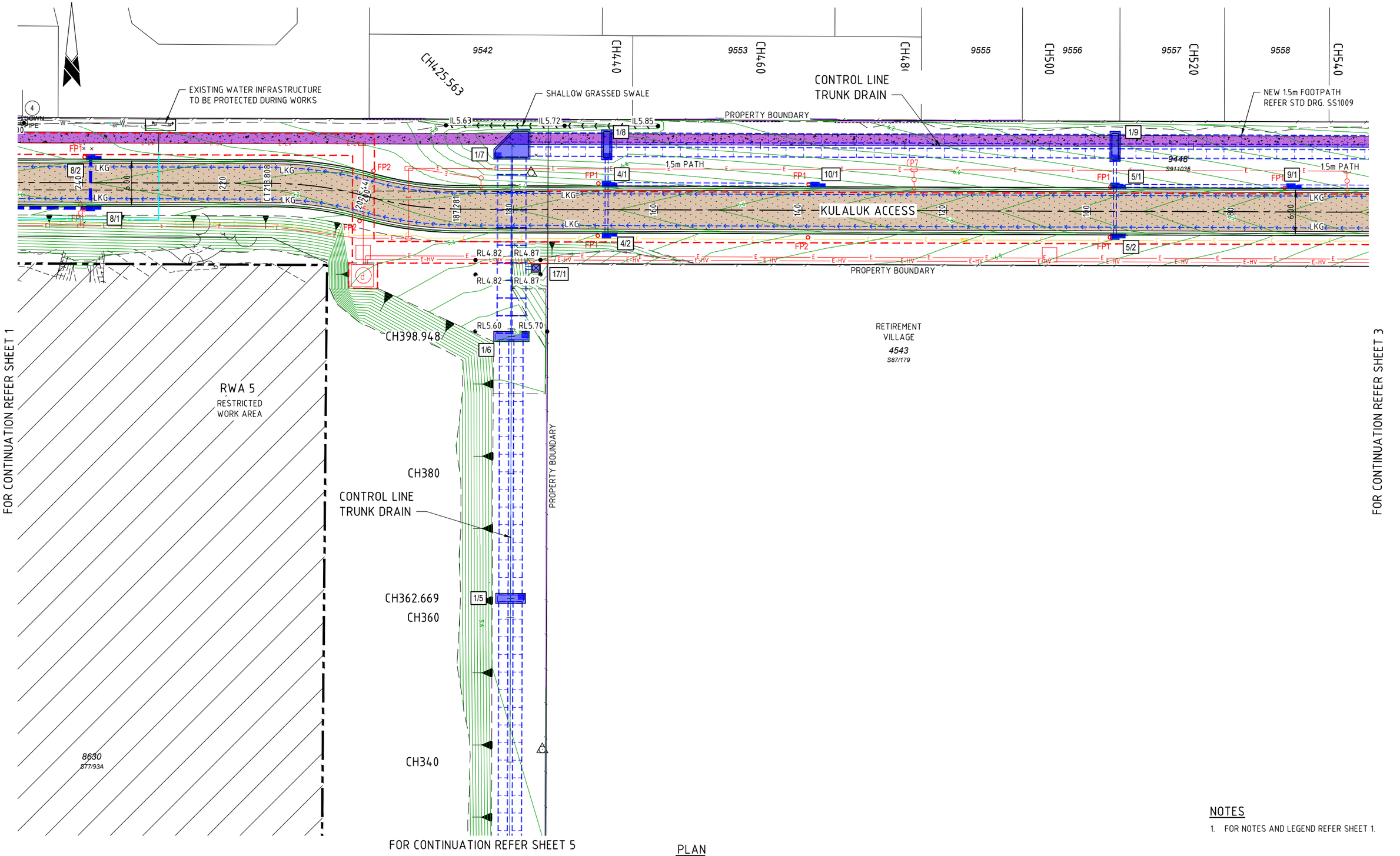

PLAN
SCALE A

NOTES

1. FOR NOTES AND LEGEND REFER SHEET 1.

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ROADS AND DRAINAGE PLANS SHEET 2 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C19 OF 61	R24-2287	0	A1

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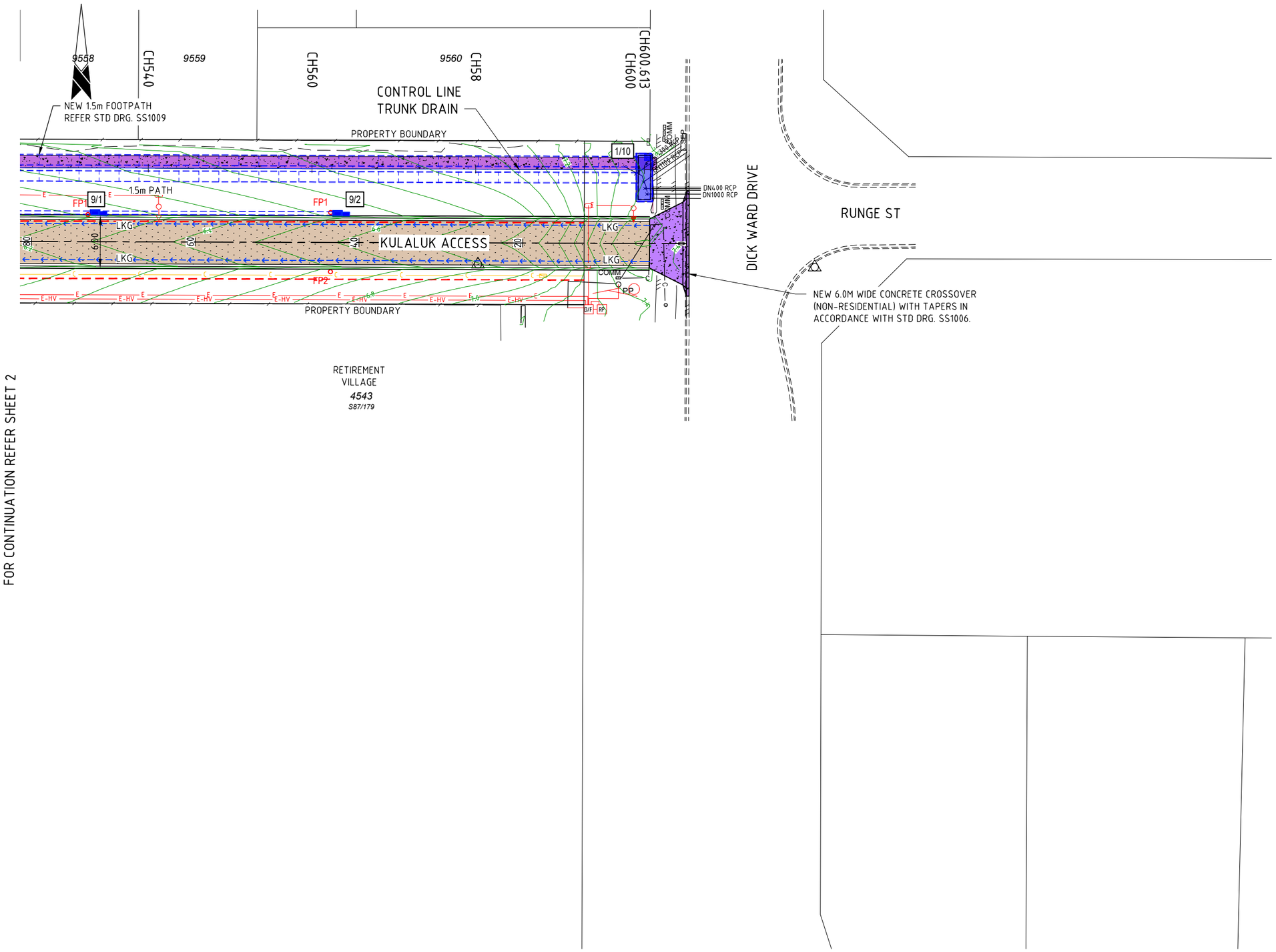

PLAN
SCALE A

NOTES

1. FOR NOTES AND LEGEND REFER SHEET 1.

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ROADS AND DRAINAGE PLANS
SHEET 3 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C20 OF 61	R24-2288	0	A1

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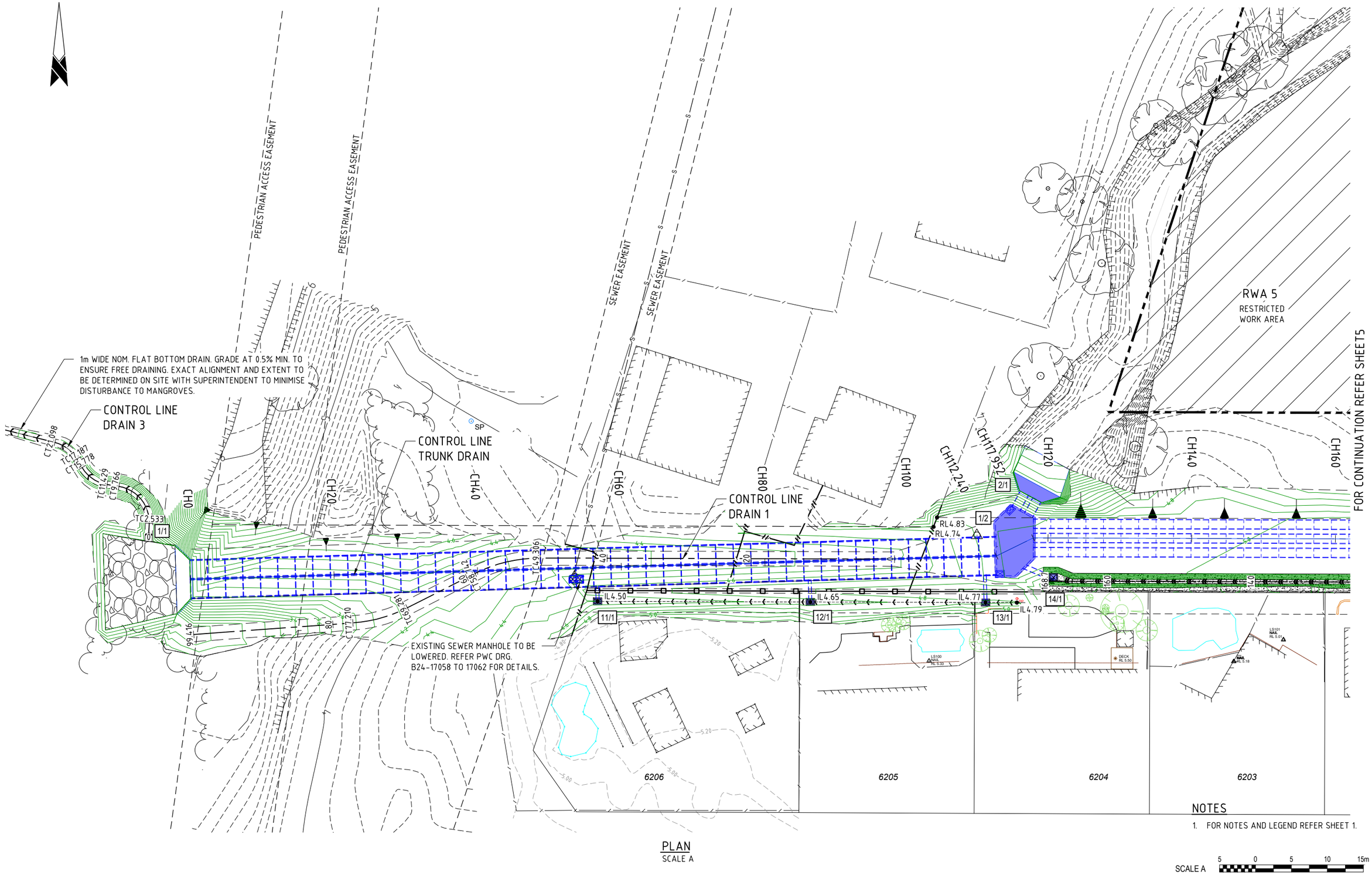

PLAN
SCALE A

NOTES

1. FOR NOTES AND LEGEND REFER SHEET 1.

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ROADS AND DRAINAGE PLANS SHEET 4 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C21 OF 61	R24-2289	0	A1

Version: March 2021

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FOR CONTINUATION REFER SHEET 4

FOR CONTINUATION REFER SHEET 2

RWA 5
RESTRICTED
WORK AREA

8630
S77/93A

4543
S87/179

CONTROL LINE
TRUNK DRAIN

CONTROL LINE
DRAIN 2

PROPERTY BOUNDARY

PROPERTY BOUNDARY

REMOVE EXISTING HEADWALL
AND EXTEND EXISTING 525 RCP.

CH112.240
CH117.952
CH120
CH140
CH160
CH180
CH200
CH220
CH240
CH260
CH275.534
CH300
CH320
CH340

RL4.83
RL4.74
IL4.77
IL4.79
RL5.35
10.834
9.263

1/2
2/1
1/3
1/4
3/1
13/1
14/1
15/1
15/2
16/1

6204
6203
6202
6201
6200
6199
6198
6197

NOTES

1. FOR NOTES AND LEGEND REFER SHEET 1.

PLAN
SCALE A

SCALE A 5 0 5 10 15m

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ROADS AND DRAINAGE PLANS SHEET 5 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C22 OF 61	R24-2290	0	A1

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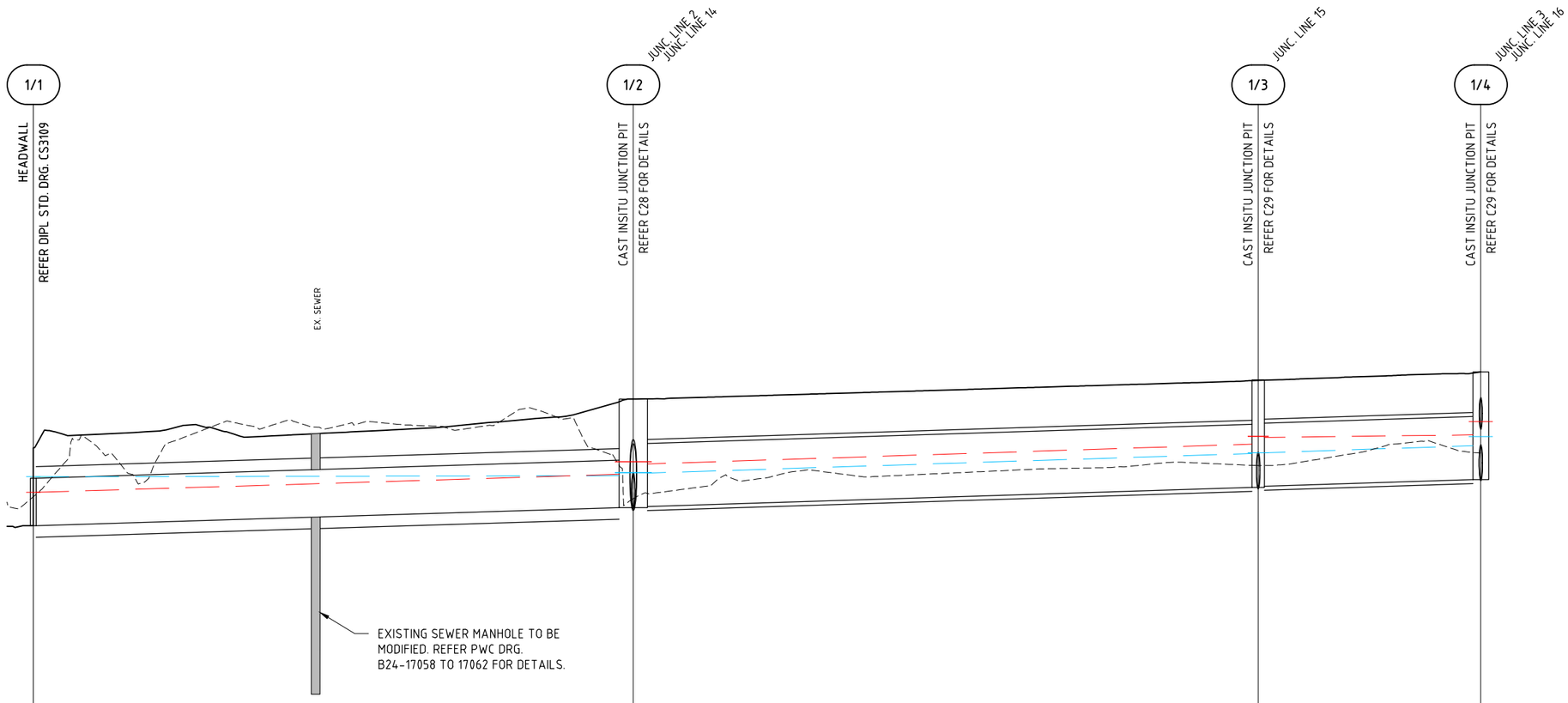

LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- H.A.T. & 50% AEP HGL
- 1% AEP HGL

SETOUT POINT

	1/1	1/2	1/3	1/4
E	700912.721	701026.581	701145.330	701187.632
N	8629206.731	8629212.486	8629212.129	8629212.002
PIPE SIZE (mm)		(2x)2400x900	(3x)1200	(3x)1200
PIPE TYPE/CLASS		RCBC (MARINE)	RCP CL 3	RCP CL 3
PIPE LENGTH		114.0m	118.7m	42.3m
PIPE GRADE (%)		0.30%	0.31%	0.30%
DATUM RL	-6.0			
DEPTH TO INVERT	0.900	0.900 / 2.063	2.043 / 2.040	2.020 / 2.047
PIPE INVERT LEVEL	2.500	2.500 / 2.843	2.863 / 3.228	3.248 / 3.375
FINISHED SURFACE LEVEL	3.400	4.906	5.268	5.422
CHAINAGE	0.000	114.483	233.232	275.534

LINE 1

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 10 0 10 20 30m

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DRAINAGE LONGITUDINAL SECTIONS SHEET 1 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C23 OF 61	R24-2291	0	A1

Version: March 2021

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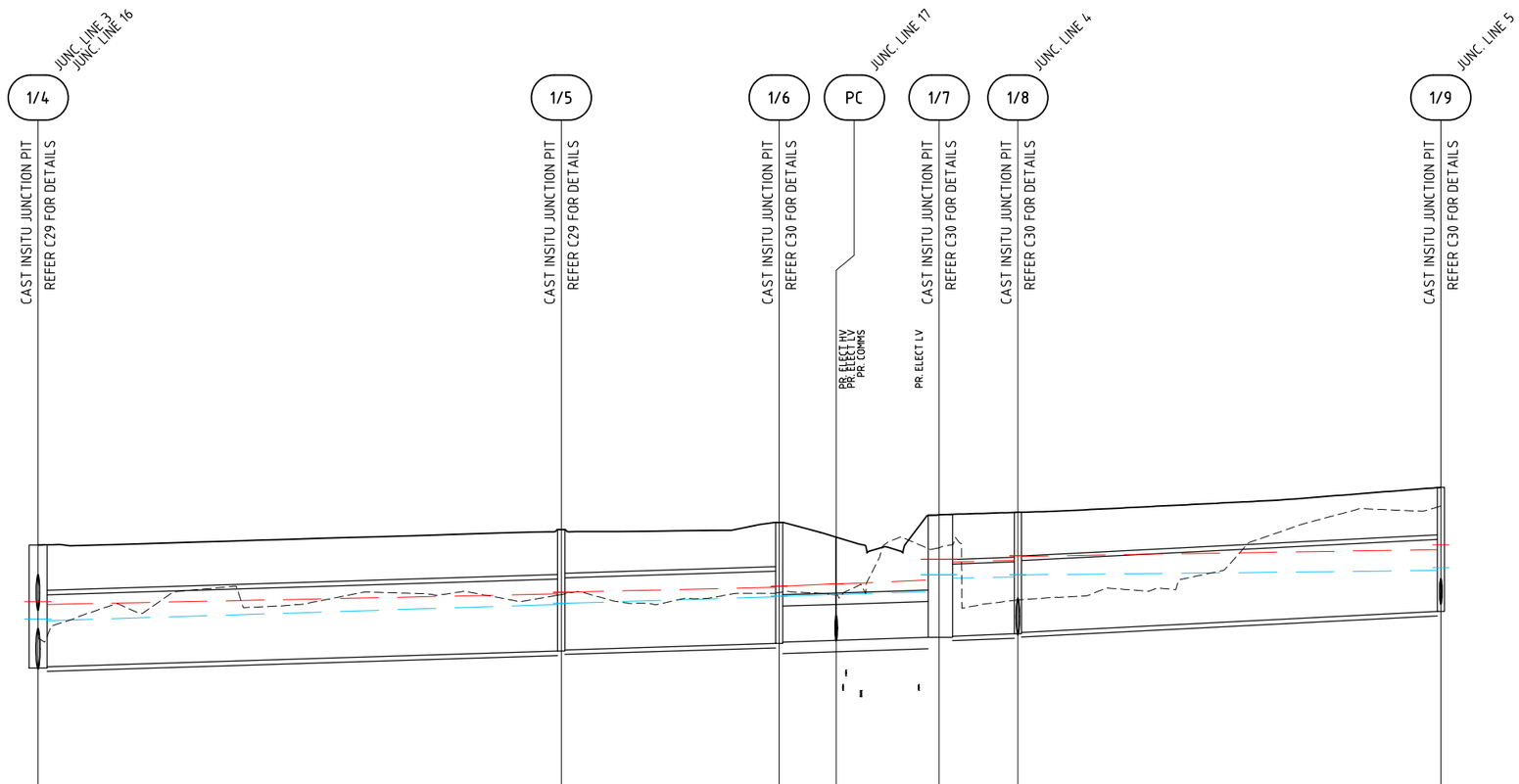


LEGEND

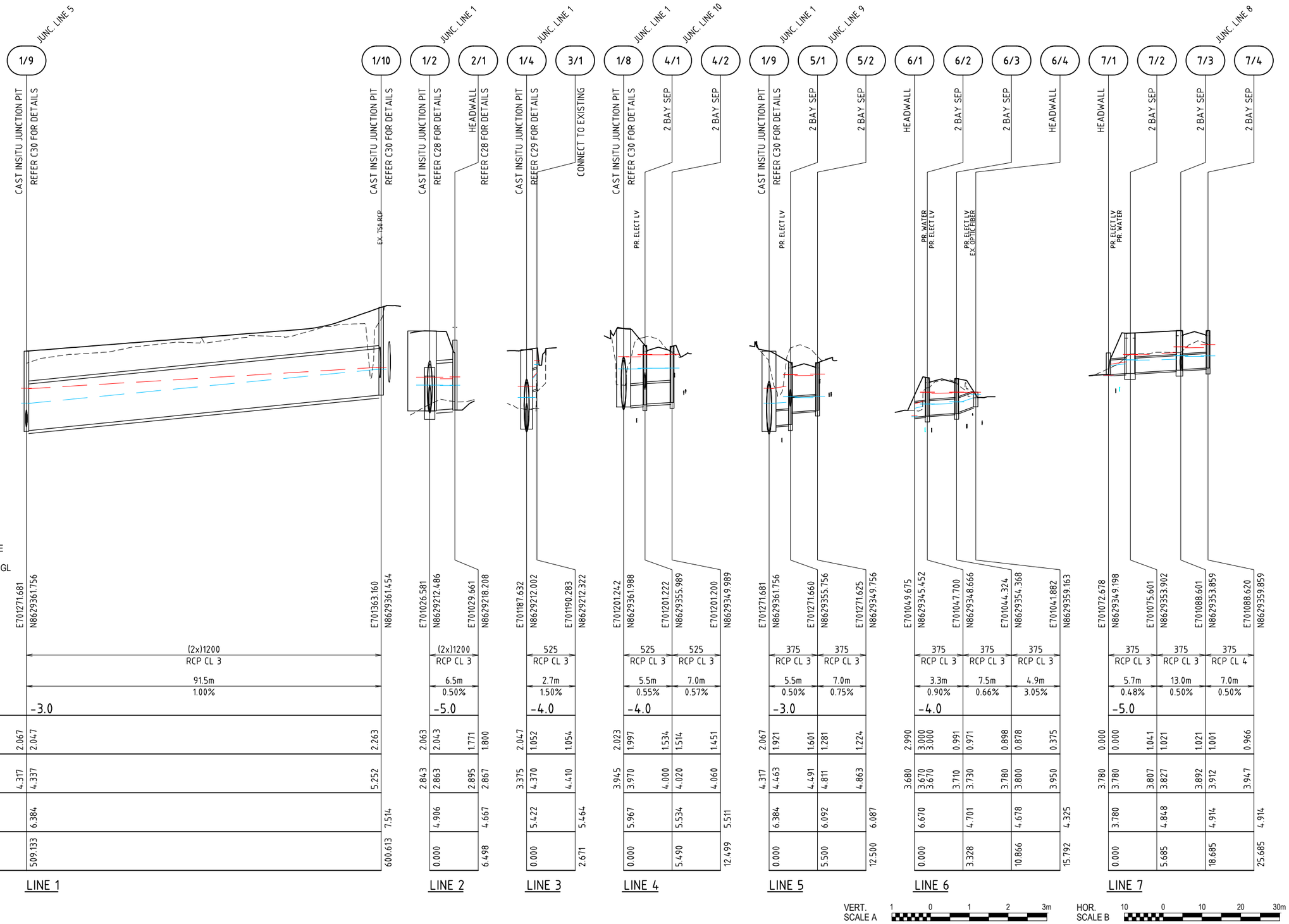
- DESIGN SURFACE
- EXISTING SURFACE
- H.A.T. & 50% AEP HGL
- 1% AEP HGL

SETOUT POINT

| | | |

PRINT IN COLOUR

PIT TYPE



LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- H.A.T. & 50% AEP HGL
- 1% AEP HGL

SETOUT POINT

	E701271.681	N8629361.756																											E701363.160	N8629361.454
PIPE SIZE (mm)			(2x)1200																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			91.5m																											
PIPE GRADE (%)			1.00%																											
DATUM RL		-3.0																												
DEPTH TO INVERT	2.067	2.047																											2.263	
PIPE INVERT LEVEL	4.317	4.337																											5.252	
FINISHED SURFACE LEVEL		6.384																											7.514	
CHAINAGE		509.133																											600.613	

LINE 1

	E701026.581	N8629212.486																											E701029.661	N8629218.208
PIPE SIZE (mm)			(2x)1200																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			6.5m																											
PIPE GRADE (%)			0.50%																											
DATUM RL		-5.0																												
DEPTH TO INVERT	2.063	2.043																											1.771	1.800
PIPE INVERT LEVEL	2.843	2.863																											2.895	2.867
FINISHED SURFACE LEVEL		4.906																											4.667	
CHAINAGE		0.000																											6.498	

LINE 2

	E701187.632	N8629212.002																											E701190.283	N8629212.322
PIPE SIZE (mm)			525																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			2.7m																											
PIPE GRADE (%)			1.50%																											
DATUM RL		-4.0																												
DEPTH TO INVERT	2.047	1.052																											1.054	
PIPE INVERT LEVEL	3.375	4.370																											4.410	
FINISHED SURFACE LEVEL		5.422																											5.464	
CHAINAGE		0.000																											2.671	

LINE 3

	E701201.242	N8629361.988																											E701201.222	N8629355.989
PIPE SIZE (mm)			525																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			5.5m																											
PIPE GRADE (%)			0.55%																											
DATUM RL		-4.0																												
DEPTH TO INVERT	2.023	1.997																											1.534	
PIPE INVERT LEVEL	3.945	3.970																											4.000	
FINISHED SURFACE LEVEL		5.967																											5.534	
CHAINAGE		0.000																											5.490	

LINE 4

	E701201.200	N8629349.989																											E701271.681	N8629361.756
PIPE SIZE (mm)			525																										375	
PIPE TYPE/CLASS			RCP CL 3																										RCP CL 3	
PIPE LENGTH			7.0m																										5.5m	
PIPE GRADE (%)			0.57%																										0.50%	
DATUM RL		-4.0																											-3.0	
DEPTH TO INVERT	2.047	1.451																											1.601	
PIPE INVERT LEVEL	3.375	4.060																											4.491	
FINISHED SURFACE LEVEL		5.511																											6.092	
CHAINAGE		12.499																											0.000	

LINE 5

	E701271.660	N8629355.756																											E701271.625	N8629349.756
PIPE SIZE (mm)			375																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			7.0m																											
PIPE GRADE (%)			0.75%																											
DATUM RL		-3.0																												
DEPTH TO INVERT	1.281	1.224																												
PIPE INVERT LEVEL	4.811	4.863																												
FINISHED SURFACE LEVEL		6.087																												
CHAINAGE		12.500																												

LINE 5

	E701049.675	N8629345.452																											E701047.700	N8629348.666
PIPE SIZE (mm)			375																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			3.3m																											
PIPE GRADE (%)			0.90%																											
DATUM RL		-4.0																												
DEPTH TO INVERT	2.990	3.000																											0.991	
PIPE INVERT LEVEL	3.680	3.670																											3.710	
FINISHED SURFACE LEVEL		6.670																											4.701	
CHAINAGE		0.000																											3.328	

LINE 6

	E701044.324	N8629354.368																											E701041.882	N8629359.163
PIPE SIZE (mm)			375																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			4.9m																											
PIPE GRADE (%)			3.05%																											
DATUM RL																														
DEPTH TO INVERT	0.898	0.878																											0.375	
PIPE INVERT LEVEL	3.780	3.800																											3.950	
FINISHED SURFACE LEVEL		4.678																											4.325	
CHAINAGE		10.866																											15.792	

LINE 6

	E701072.678	N8629349.198																											E701075.601	N8629353.902
PIPE SIZE (mm)			375																											
PIPE TYPE/CLASS			RCP CL 3																											
PIPE LENGTH			5.7m																											
PIPE GRADE (%)			0.48%																											
DATUM RL		-5.0																												
DEPTH TO INVERT	0.000	0.000																											1.041	
PIPE INVERT LEVEL	3.780	3.780																											3.807	
FINISHED SURFACE LEVEL		3.780																											4.848	
CHAINAGE		0.000																											5.685	

LINE 7

	E701088.601	N8629353.859																											E701088.620	N8629359.859
PIPE SIZE (mm)			375																											
PIPE TYPE/CLASS			RCP CL 4																											
PIPE LENGTH			13.0m																											
PIPE GRADE (%)			0.50%																											
DATUM RL																														
DEPTH TO INVERT	1.021	1.001																											0.966	
PIPE INVERT LEVEL	3.827	3.892																											3.947	
FINISHED SURFACE LEVEL		4.914																											4.914	
CHAINAGE		18.685																											25.685	

LINE 7

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 10 0 10 20 30m

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DRAINAGE LONGITUDINAL SECTIONS SHEET 3 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C25 OF 61	R24-2293	0	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS
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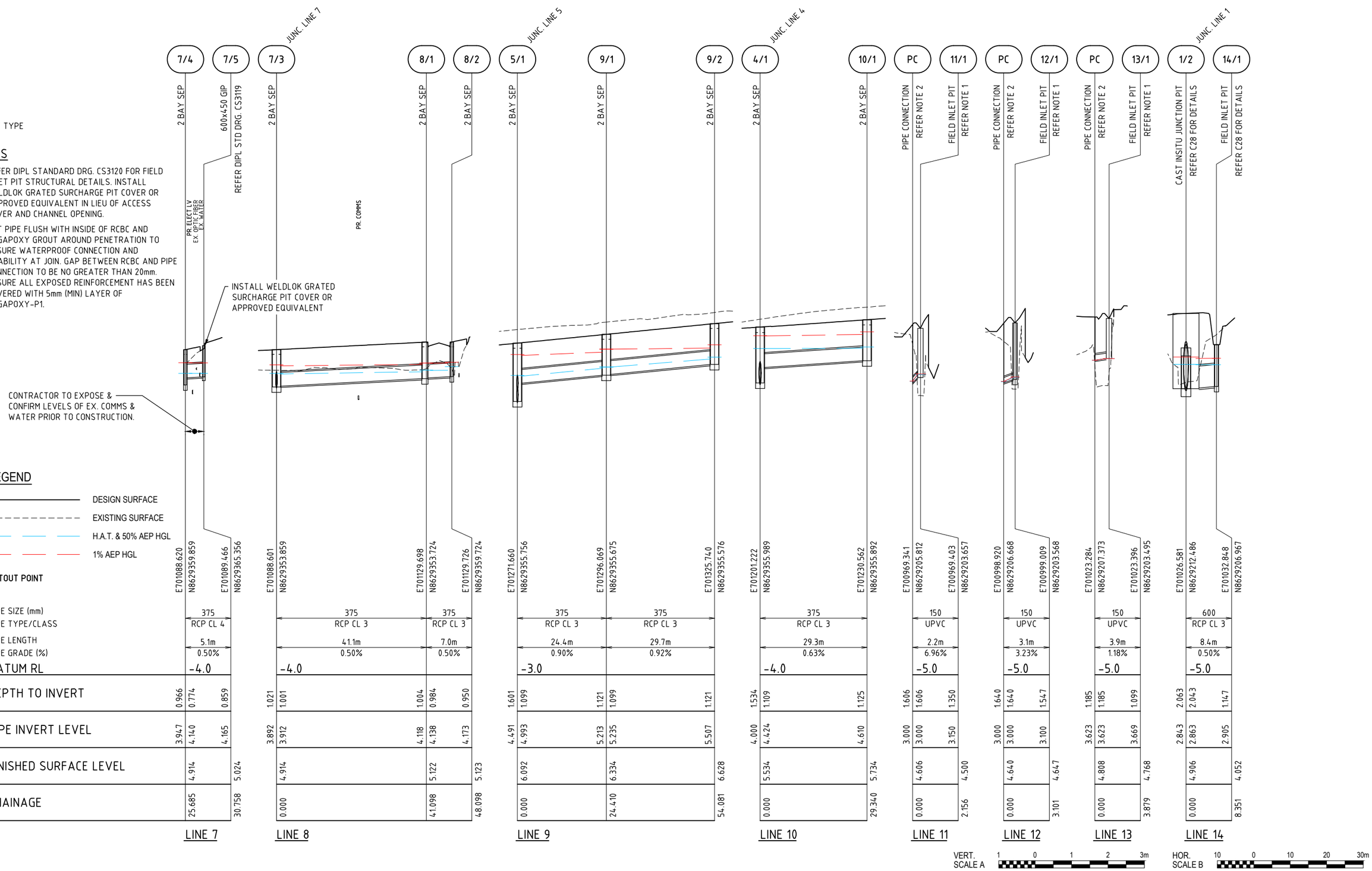
PIT TYPE

NOTES

1. REFER DIPL STANDARD DRG. CS3120 FOR FIELD INLET PIT STRUCTURAL DETAILS. INSTALL WELDLOK GRATED SURCHARGE PIT COVER OR APPROVED EQUIVALENT IN LIEU OF ACCESS COVER AND CHANNEL OPENING.
2. CUT PIPE FLUSH WITH INSIDE OF RCBC AND MEGAPOXY GROUT AROUND PENETRATION TO ENSURE WATERPROOF CONNECTION AND STABILITY AT JOIN. GAP BETWEEN RCBC AND PIPE CONNECTION TO BE NO GREATER THAN 20mm. ENSURE ALL EXPOSED REINFORCEMENT HAS BEEN COVERED WITH 5mm (MIN) LAYER OF MEGAPOXY-P1.



LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- H.A.T. & 50% AEP HGL
- 1% AEP HGL

SETOUT POINT

E			E701088.620			E701089.466			E701088.601			E701129.698			E701129.726			E701271.660			E701296.069			E701325.740			E701201.222			E701230.562	
N			N862959.859			N862965.356			N862953.859			N862953.724			N862959.724			N862955.756			N862955.675			N862955.576			N862955.989			N862955.892	
PIPE SIZE (mm)			375						375			375						375			375						375					
PIPE TYPE/CLASS			RCP CL 4						RCP CL 3			RCP CL 3						RCP CL 3			RCP CL 3						RCP CL 3				
PIPE LENGTH			5.1m						41.1m			7.0m						24.4m			29.7m						29.3m					
PIPE GRADE (%)			0.50%						0.50%			0.50%						0.90%			0.92%						0.63%					
DATUM RL			-4.0						-4.0									-3.0									-4.0					
DEPTH TO INVERT	0.966		0.774		0.859		1.021	1.001			1.004	0.984		0.950		1.601	1.099			1.121	1.099			1.121	1.534	1.109			1.125			
PIPE INVERT LEVEL	3.947	4.140		4.165			3.892	3.912			4.118	4.138		4.173		4.491	4.993			5.213	5.235			5.507	4.000	4.424			4.610			
FINISHED SURFACE LEVEL		4.914			5.024			4.914				5.122			5.123		6.092				6.334			6.628		5.534			5.734		
CHAINAGE		25.685			30.758			0.000				4.098			4.808		0.000				24.410			54.081		0.000			29.340		

LINE 7 LINE 8 LINE 9 LINE 10

E			E700969.341			E700969.403			E700998.920			E700999.009			E701023.284			E701023.396			E701026.581			E701032.848							
N			N862955.812			N862955.657			N862955.668			N862955.568			N862955.373			N862955.495			N862955.486			N862955.967							
PIPE SIZE (mm)			150						150						150						600										
PIPE TYPE/CLASS			UPVC						UPVC						UPVC						RCP CL 3										
PIPE LENGTH			2.2m						3.1m						3.9m						8.4m										
PIPE GRADE (%)			6.96%						3.23%						1.18%						0.50%										
DATUM RL			-5.0						-5.0						-5.0						-5.0										
DEPTH TO INVERT	1.606	1.606		1.350			1.640	1.640			1.547				1.185	1.185		1.099			2.063	2.043		1.147							
PIPE INVERT LEVEL	3.000	3.000		3.150			3.000	3.000			3.100				3.623	3.623		3.669			2.843	2.863		2.905							
FINISHED SURFACE LEVEL		4.606			4.500			4.640				4.647				4.808			4.768			4.906			4.052					
CHAINAGE		0.000			2.156			0.000				3.101				0.000			3.879			0.000			8.351					

LINE 11 LINE 12 LINE 13 LINE 14

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 10 0 10 20 30m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
0	CONTRACT DRAWING	02.10.24	AN	JACOBS

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

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

Drawn	T.BOUNDY	Date: -	Checked A.NAWAZ Date: -
Designed	T.BOUNDY	Date: -	Checked A.NAWAZ Date: -
Design Project Leader	R.KRAKE	Date: -	NTG Project Manager ALI ASHRAF Date: -

Northern Territory Government

DARWIN REGION
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KULALUK ACCESS

DRAINAGE LONGITUDINAL SECTIONS SHEET 4 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C26 OF 61	R24-2294	0	A1

Version: March 2021

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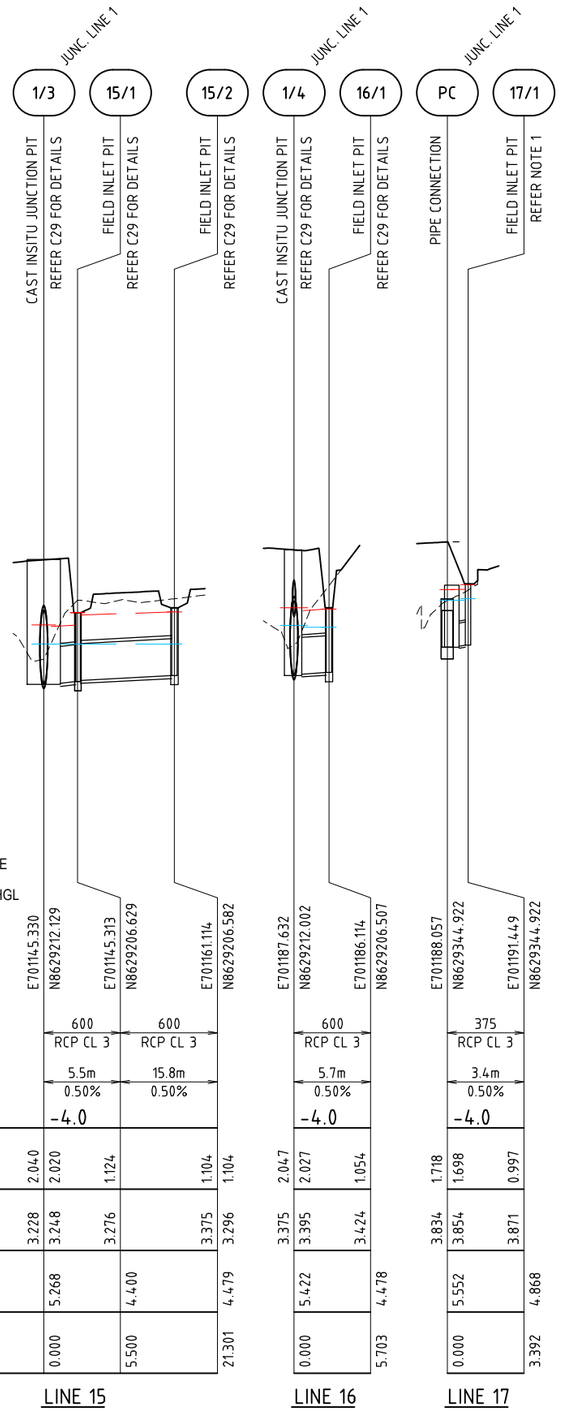
PRINT IN COLOUR

NOTES

1. REFER DIPL STANDARD DRG. CS3120 FOR FIELD INLET PIT STRUCTURAL DETAILS. INSTALL WELDLOK GRATED SURCHARGE PIT COVER OR APPROVED EQUIVALENT IN LIEU OF ACCESS COVER AND CHANNEL OPENING.



LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- H.A.T. & 50% AEP HGL
- 1% AEP HGL

SETOUT POINT

PIT TYPE

		JUNC. LINE 1						JUNC. LINE 1						JUNC. LINE 1					
		1/3		15/1		15/2		1/4		16/1		PC		17/1					
		CAST INSITU JUNCTION PIT REFER C29 FOR DETAILS		FIELD INLET PIT REFER C29 FOR DETAILS		FIELD INLET PIT REFER C29 FOR DETAILS		CAST INSITU JUNCTION PIT REFER C29 FOR DETAILS		FIELD INLET PIT REFER C29 FOR DETAILS		PIPE CONNECTION		FIELD INLET PIT REFER NOTE 1					
		E701145.330	N8629212.129	E701145.313	N8629206.629	E701161.114	N8629206.582	E701187.632	N8629212.002	E701186.114	N8629206.507	E701188.057	N8629344.922	E701191.449	N8629344.922				
PIPE SIZE (mm)			600		600				600				375						
PIPE TYPE/CLASS			RCP CL 3		RCP CL 3				RCP CL 3				RCP CL 3						
PIPE LENGTH			5.5m		15.8m				5.7m				3.4m						
PIPE GRADE (%)			0.50%		0.50%				0.50%				0.50%						
DATUM RL			-4.0						-4.0				-4.0						
DEPTH TO INVERT	2.040	2.020		1.124		1.104	1.104	2.047	2.027		1.054	1.718	1.698		0.997				
PIPE INVERT LEVEL	3.228	3.248		3.276		3.375	3.296	3.375	3.395		3.424	3.834	3.854		3.871				
FINISHED SURFACE LEVEL		5.268		4.400			4.479		5.422		4.478		5.552		4.868				
CHAINAGE		0.000		5.500			21.301		0.000		5.703		0.000		3.392				
		LINE 15						LINE 16				LINE 17							

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 10 0 10 20 30m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
0	CONTRACT DRAWING	02.10.24	AN	JACOBS

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Design Project Leader R.KRAKE Date: -	NTG Project Manager ALI ASHRAF Date: -	

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DRAINAGE LONGITUDINAL SECTIONS SHEET 5 OF 5

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C27 OF 61	R24-2295	0	A1

Version: March 2021

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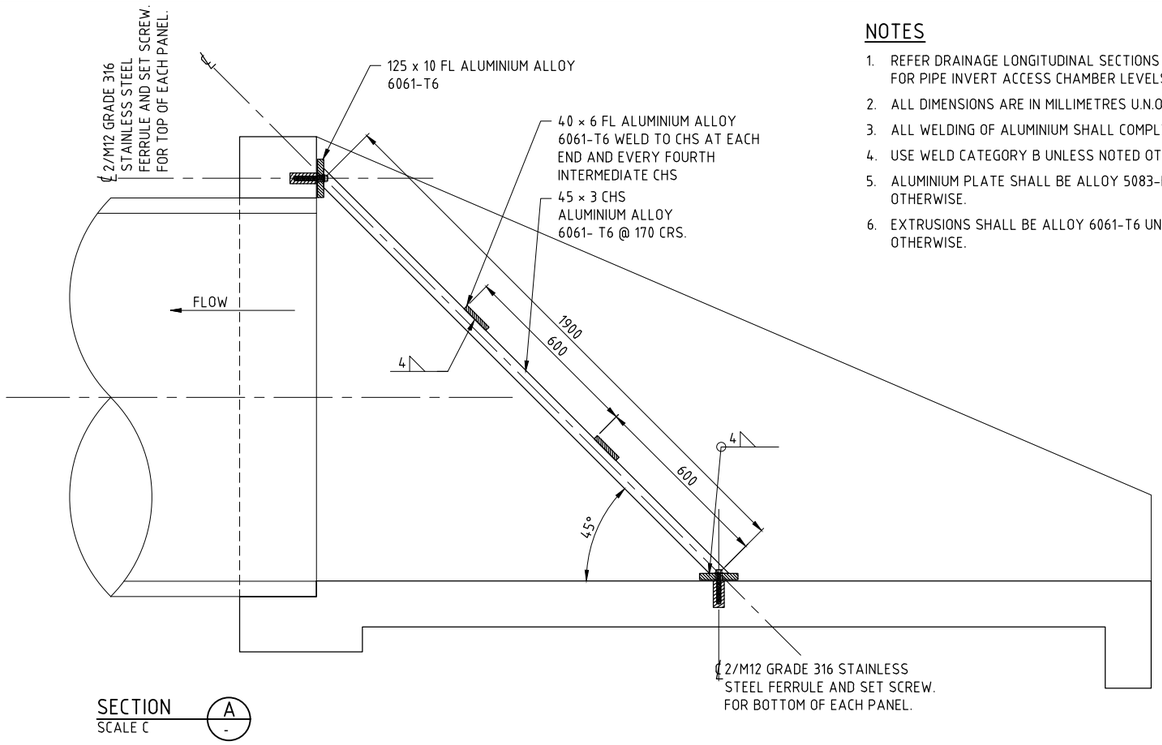
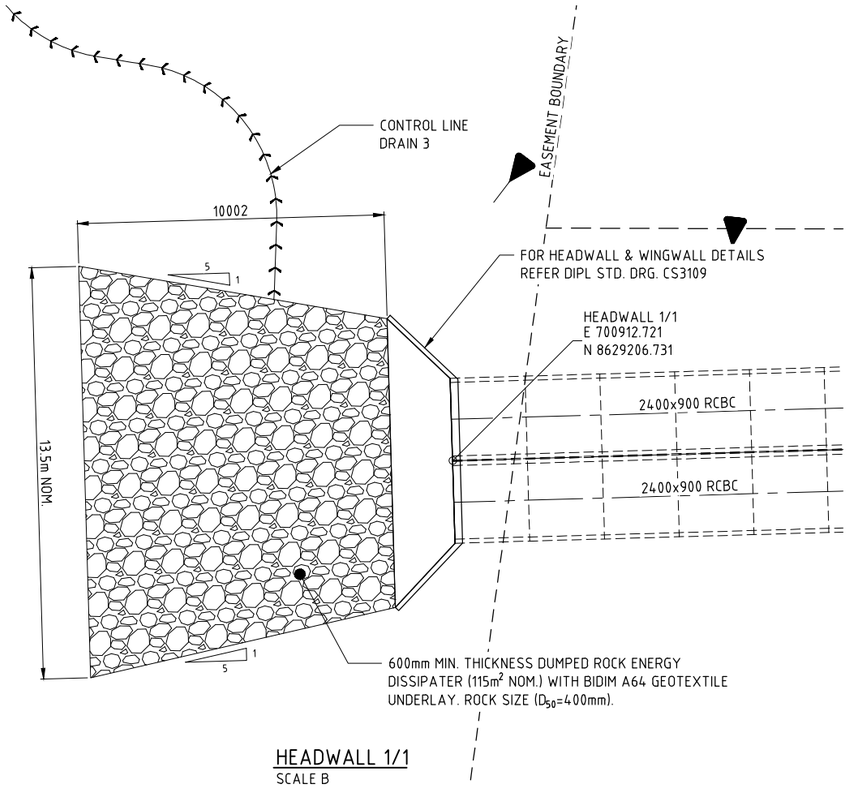
NOTES

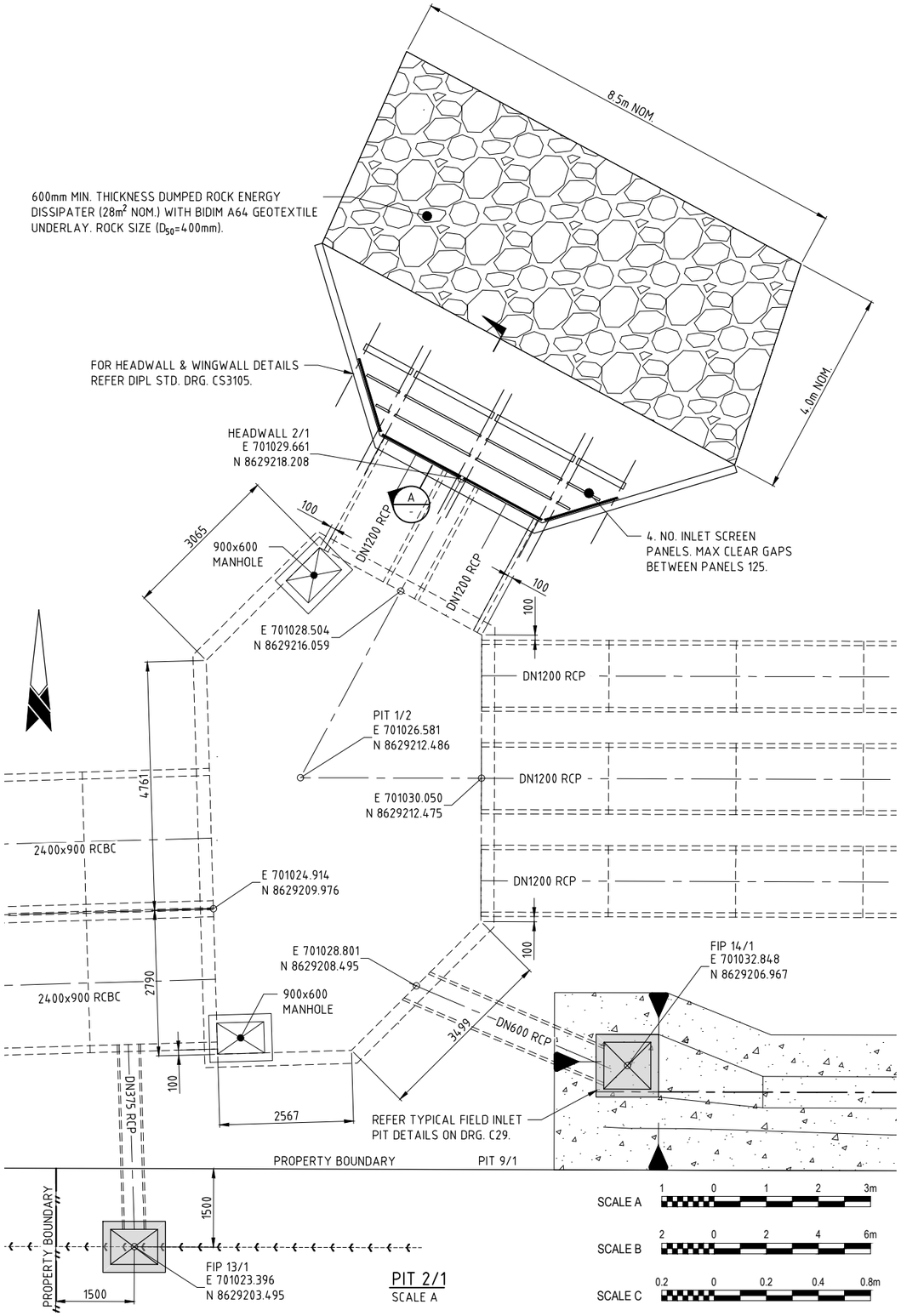
1. REFER DRAINAGE LONGITUDINAL SECTIONS ON DRGS. C23 TO C27 FOR PIPE INVERT ACCESS CHAMBER LEVELS.
2. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
3. ALL WELDING OF ALUMINIUM SHALL COMPLY WITH AS1665.
4. USE WELD CATEGORY B UNLESS NOTED OTHERWISE.
5. ALUMINIUM PLATE SHALL BE ALLOY 5083-H321 UNLESS NOTED OTHERWISE.
6. EXTRUSIONS SHALL BE ALLOY 6061-T6 UNLESS NOTED OTHERWISE.



SECTION A
SCALE C



HEADWALL 1/1
SCALE B



PIT 2/1
SCALE A

SCALE A 1 0 1 2 3m
SCALE B 2 0 2 4 6m
SCALE C 0.2 0 0.2 0.4 0.8m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
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Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -		

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DRAINAGE STRUCTURE CONFIGURATIONS SHEET 1 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C28 OF 61	R24-2296	0	A1

Version: March 2021

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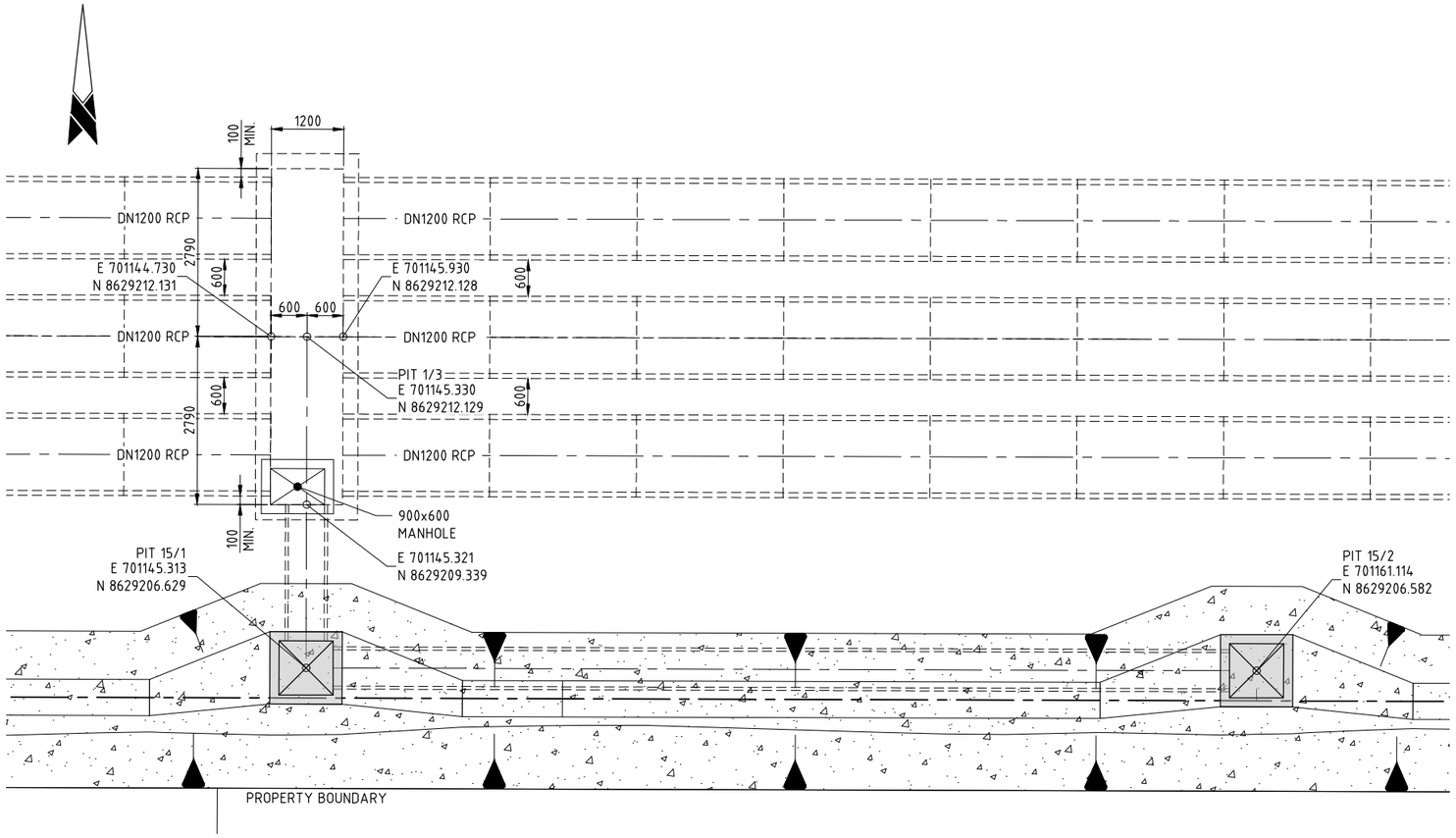
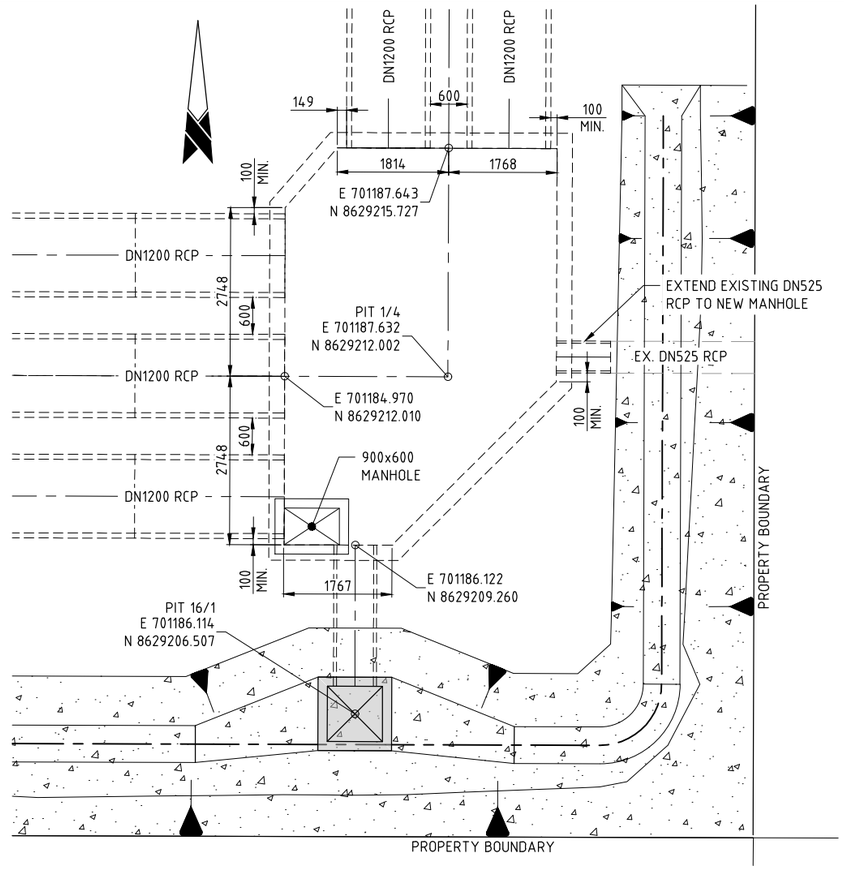
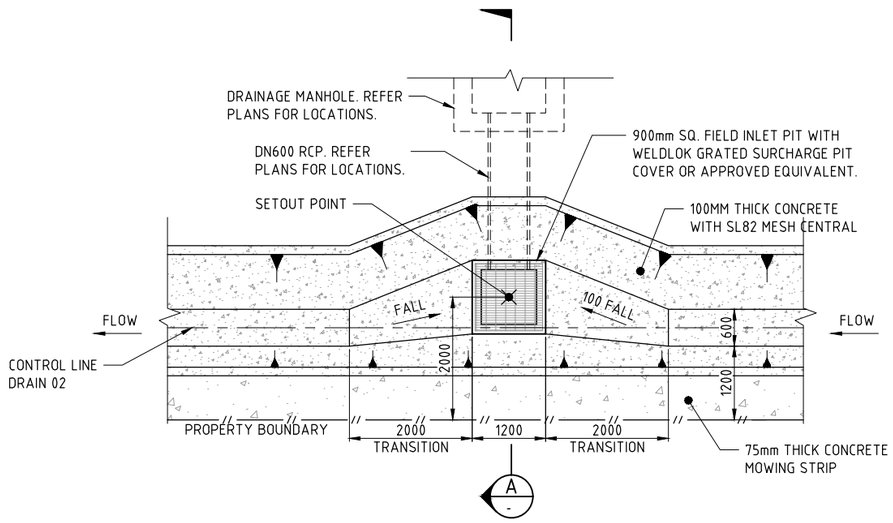


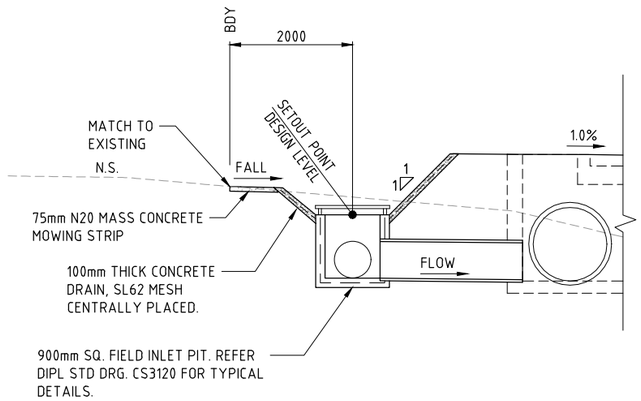
PITS 1/3, 15/1 AND 15/2
SCALE A



PIT 1/4 AND 16/1
SCALE A



TYPICAL FIELD INLET PIT DETAIL FOR PITS 15/1, 15/2, 16/1



SECTION A
SCALE A

SCALE A 1 0 1 2 3m

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Design Project Leader R.KRAKE Date: -	NTG Project Manager ALI ASHRAF Date: -	

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DRAINAGE STRUCTURE CONFIGURATIONS SHEET 2 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C29 OF 61	R24-2297	0	A1

Version: March 2021

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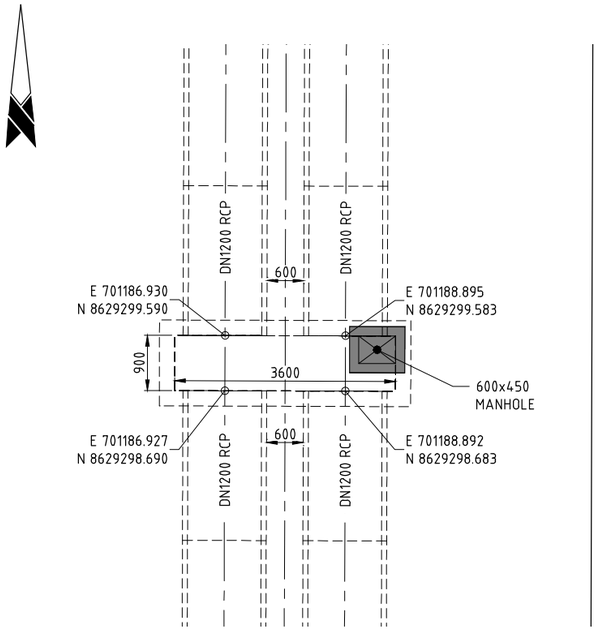
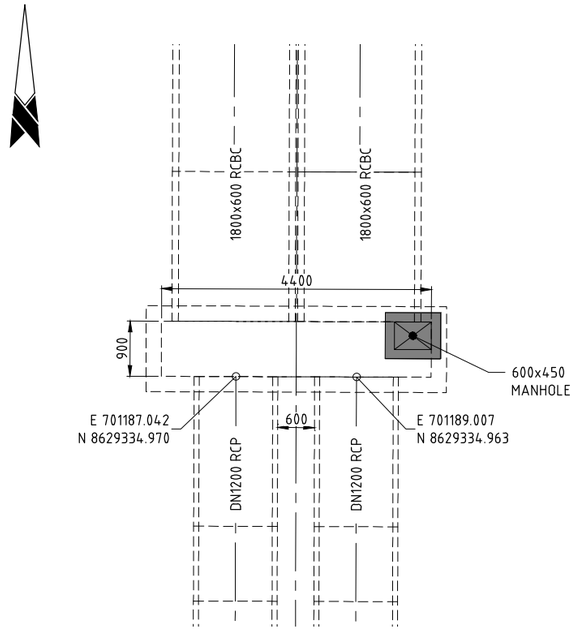
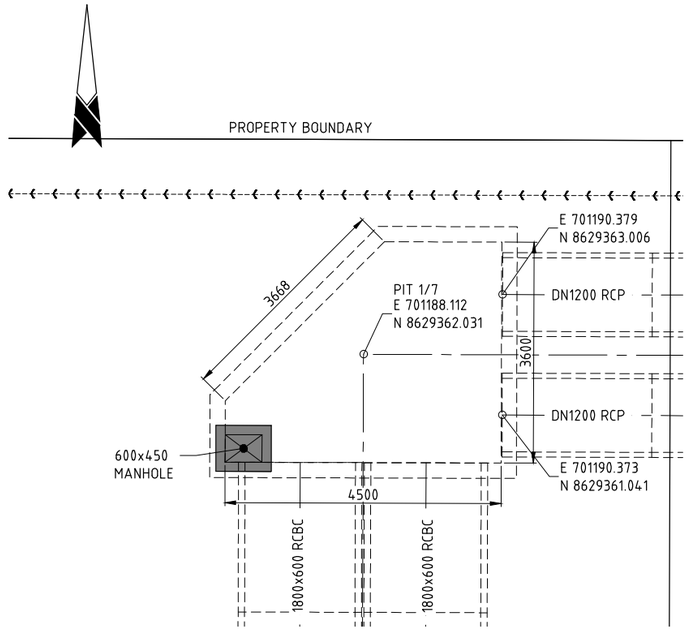


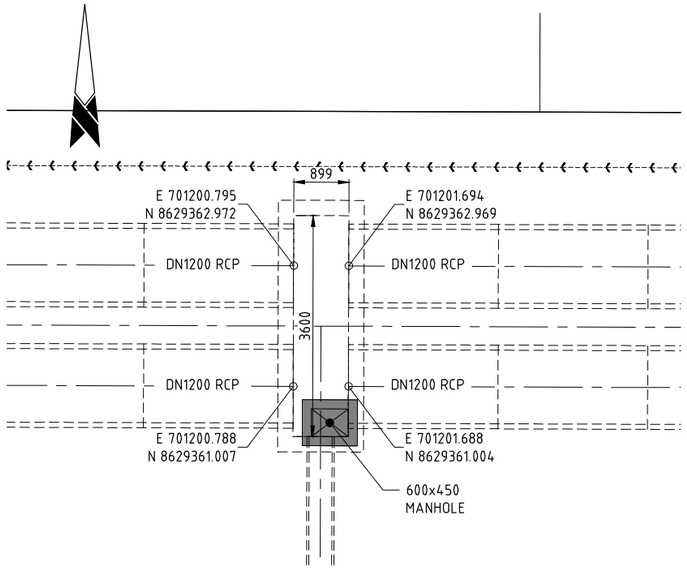
PIT 1/5
SCALE A



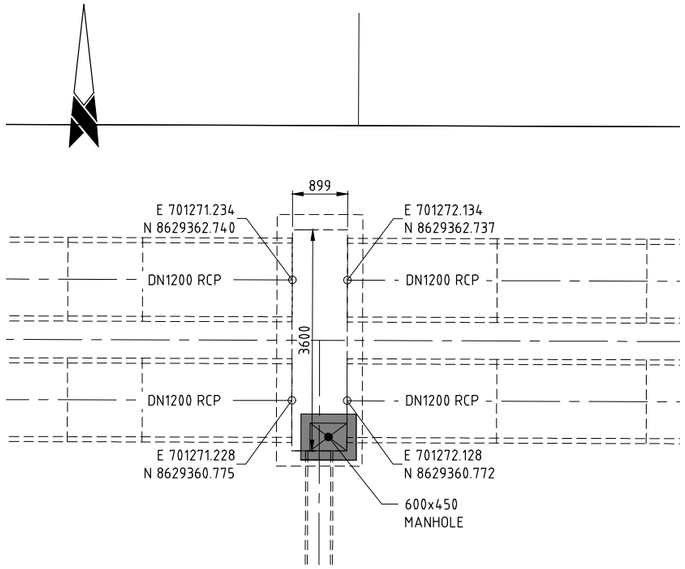
PIT 1/6
SCALE A



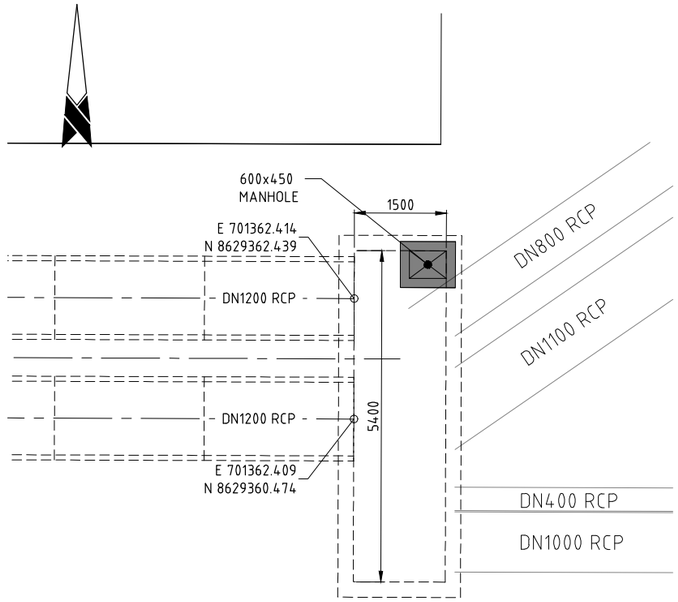
PIT 1/7
SCALE A



PIT 1/8
SCALE A



PIT 1/9
SCALE A



PIT 1/10
SCALE A

SCALE A 1 0 1 2 3m

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Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -

Northern Territory Government

DARWIN REGION
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DRAINAGE STRUCTURE CONFIGURATIONS SHEET 3 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C30 OF 61	R24-2298	0	A1

Version: March 2021

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GENERAL NOTES - DRAINAGE STRUCTURES

G1. DO NOT SCALE FROM DRAWINGS.

G2. ALL DIMENSIONS IN (mm) AND ALL LEVELS IN (m) AHD UNLESS NOTED OTHERWISE.

G3. THE LOCATION OF ALL EXISTING SERVICES IDENTIFIED ON THE DRAWINGS ARE INDICATIVE ONLY. ALL EXISTING SERVICES LOCATIONS SHALL BE VERIFIED ON SITE BY THE CONSTRUCTOR BEFORE COMMENCING WORK AND CONFIRM THAT THE LOCATION OF ALL SERVICES THAT MAY BE AFFECTED BY THE WORKS HAS BEEN CORRECTLY IDENTIFIED.

G4. PROPRIETARY PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

G5. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, AUSTRALIAN STANDARDS (INCLUDING ALL AMENDMENTS), AUSTRALIAN STANDARDS CODES OF PRACTICE AND THE REQUIREMENTS OF ANY OTHER RELEVANT STATUTORY AUTHORITIES.

G6. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART IS OVER STRESSED. THE CONSTRUCTOR SHALL INSTALL TEMPORARY BRACING, FALSEWORK AND FORMWORK AND ALL RELEVANT TEMPORARY WORKS AS REQUIRED. GROUNDWATER PUMPING SHALL BE CONTINUED UNTIL THE PRECAST TOPSLABS ARE INSTALLED TO ENSURE THE DRAINAGE STRUCTURES ARE STABLE IN THE TEMPORARY CONDITION.

G7. THE REQUIRED BEARING CAPACITY UNDER THE MANHOLE SHALL BE MINIMUM 150kPa.

G8. REFER TO THE DRAINAGE LAYOUT PLANS FOR SETOUT DETAILS AND SITE ORIENTATION.

G9. DRAINAGE STRUCTURES HAVE BEEN DESIGNED FOR THE FOLLOWING SUPERIMPOSED LIVE LOADS:
- PIT LIDS: 80kN WHEEL LOAD IN ACCORDANCE WITH AS5100.5.
- PIT WALLS: 20kPa SURCHARGE PRESSURE IN ACCORDANCE WITH AS5100.5.

G10. THE DRAINAGE STRUCTURES HAVE BEEN DESIGNED FOR A 100 YEAR DESIGN LIFE.

CONCRETE NOTES

C1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF AS5100.5 INCLUDING AMENDMENTS AND ANY OTHER RELEVANT SPECIFICATIONS.

C2. CONCRETE SHALL BE FROM AN APPROVED SOURCE AND SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING STANDARDS, UNLESS NOTED OTHERWISE :-

AS5100.5:	BRIDGE DESIGN PART 5: CONCRETE
AS/NZS4671:	STEEL FOR REINFORCEMENT OF CONCRETE
AS3972:	GENERAL PURPOSE AND BLENDED CEMENTS
AS 1379:	SPECIFICATION AND SUPPLY OF CONCRETE
AS2758.1:	AGGREGATES AND ROCK FOR ENGINEERING PURPOSES - CONCRETE AGGREGATES

C3. ALL CONCRETE SHALL BE S50/20. SPECIAL CLASS CONCRETE IN ACCORDANCE WITH AS1379.

C4. ALL CONCRETE COVER TO REINFORCEMENT SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

C4.1. CAST IN-SITU CONCRETE WITH STANDARD FORMWORK AND COMPACTION IN ACCORDANCE WITH AS5100.5 IN:
- B2 ENVIRONMENTS (ALL PITS UNO) - 50mm.
- C2 ENVIRONMENTS (PIT 1/2) - 80mm.

C4.2. PRECAST CONCRETE WITH RIGID FORMS AND INTENSE VIBRATION IN ACCORDANCE WITH AS5100.5 IN:
- B2 ENVIRONMENTS (ALL PITS UNO) - 40mm.
- C2 ENVIRONMENTS (PIT 1/2) - 75mm.

C4.3. DRAINAGE STRUCTURES ARE NOT TO BE CAST AGAINST GROUND (IE. THE CONTRACTOR SHALL USE BLINDING LAYER FOR BASE SLAB AS PER NOTE C11 AND FORMWORK FOR WALLS).

C6. THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE OR AIR POCKETS.

C7. ALL CONCRETE INTERFACES ARE TO BE ROUGHENED TO ENSURE SATISFACTORY BOND BETWEEN INSITU CONCRETE AND EXISTING CONCRETE OR BETWEEN DIFFERENT POURS OF INSITU CONCRETE INCLUDING WALL BLOCKOUT INFILL CONCRETE POUR FOR PIPE PENETRATIONS. METHOD TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL. ALL CONCRETE INTERFACES TO BE FREE OF LAITANCE.

C8. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND CONCRETE SURFACES AGAINST WHICH NEW CONCRETE IS TO BE PLACED SHALL BE CLEAN, FREE OF ALL LAITANCE, AND BE DAMPENED DOWN PRIOR TO COMMENCEMENT OF POURING THE NEW CONCRETE.

C9. C.J- INDICATES A CONSTRUCTION JOINT. FULLY PREPARE SURFACE TO 5mm ROUGHNESS EXCEPT WHERE WATER STOP IS PLACED AS PER MANUFACTURER'S RECOMMENDATIONS. DAMPEN EXISTING CONCRETE BEFORE PLACING FRESH CONCRETE.

C10. CONSTRUCTION JOINTS SHALL BE USED ONLY WHERE SHOWN ON THE DRAWINGS OR WHERE SPECIFICALLY APPROVED BY THE SUPERINTENDENT.

C11. ALL CONCRETE BASE SLABS SHALL BE PLACED ON POLYTHENE MEMBRANE (0.2mm MIN THICKNESS) ON 50mm NOMINAL CONCRETE BLINDING LAYER. THE MEMBRANE SHALL BE LAPPED NOT LESS THAN 200mm AND BE CONTINUOUSLY SEALED/TAPED. POLYTHENE MEMBRANE SHALL BE PROVIDED TO ALL CAST-IN-SITU CONCRETE SURFACES (IE. BASE SLAB AND PIT WALLS)

C12. NO PENETRATIONS, RECESSES, HOLES, CHASES OR EMBEDMENT OF TEMPORARY FIXTURES, PIPES AND CONDUITS OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE MADE IN THE CONCRETE MEMBERS WITHOUT APPROVAL OF THE SUPERINTENDENT.

C13. CURING OF CONCRETE SHALL COMMENCE IMMEDIATELY AFTER FINISHING OPERATIONS HAVE BEEN COMPLETED. THE CONCRETE SHALL BE CURED IN ACCORDANCE WITH AS5100.5 AND RELEVANT SPECIFICATIONS.

C14. UNLESS NOTED OTHERWISE, ALL GROUT SHALL BE CONBEXTRA GP FREE-FLOW NON SHRINK CEMENTITIOUS GROUT OR EQUIVALENT. GROUT STRENGTH SHALL BE A MINIMUM 50MPa.

C17. UNLESS NOTED OTHERWISE, ALL EXPOSED CONCRETE EDGES WITH A CONTAINED ANGLE LESS THAN 120 DEGREES SHALL BE PROVIDED WITH 20mm FILLETS OR CHAMFERS. THE EDGES OF BEARING PEDESTALS SHALL HAVE 10x10mm CHAMFERS.

C18. MAXIMUM ALLOWED FREE DROP OF CONCRETE DURING PLACING IS 2000mm.

C19. MAXIMUM SLUMP OF CONCRETE TO BE 80mm UNLESS NOTED OTHERWISE. CONCRETE MIX DESIGN, INCLUDING PROPORTIONS OF ADDITIVES AND CEMENTITIOUS REPLACEMENT MATERIALS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO THE PLACEMENT OF ANT CONCRETE. CALCIUM CHLORIDE SHALL NOT BE USED IN ANY MIX.

C20. CONCRETE BENCHING INFILL WITHIN MANHOLES, PITS AND CHAMBERS SHALL BE N20/20 MASS CONCRETE U.N.O.

FORMWORK AND FALSEWORK

FF1. THE CONSTRUCTOR IS RESPONSIBLE FOR THE DESIGN, PROOF ENGINEER CERTIFICATION (AS REQUIRED), CONSTRUCTION, INSPECTION AND PERFORMANCE OF THE FORMWORK AND FALSE WORK.

FF2. ALL TEMPORARY WORKS INCLUDING FORMWORK AND FALSEWORK SHALL NOT BE RELIANT ON RESTRAINT OR SUPPORT FROM THE PERMANENT WORKS AND SHALL BE DESIGNED AS TO NOT IMPOSE LOADS ONTO ANY PART OF THE PERMANENT WORKS WITHOUT PRIOR APPROVAL FROM THE SUPERINTENDENT.

FF3. FORMWORK AND STRIPPING TIMES SHALL COMPLY WITH AS3610

FF4. CONSTRUCTION SUPPORT PROPPING SHALL BE LEFT IN PLACE TO AVOID OVERSTRESSING THE STRUCTURE DUE TO CONSTRUCTION LOADING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT STRIPPING AND BACKPROPPING COMPLIES WITH THE REQUIREMENTS OF AS.3610 - FORMWORK FOR CONCRETE.

PRECAST CONCRETE

PC1. ALL PRECAST CONCRETE IS TO COMPLY WITH THE CONCRETE NOTES ON THESE DRAWINGS.

PC2. MANUFACTURE, SUPPLY AND ERECTION OF PRECAST CONCRETE ELEMENTS SHALL BE IN ACCORDANCE WITH AS3850 AND OTHER RELEVANT STANDARDS AND SPECIFICATIONS.

PC3. PRECAST ELEMENTS SHALL BE CAST HORIZONTALLY.

PC4. PRECAST CONCRETE SHALL BE CAST IN RIGID FORMWORK AND SUBJECTED TO INTENSE VIBRATION, UTILISING EXTERNAL VIBRATION IN ACCORDANCE WITH AS5100.5.

PC5. THE CONTRACTOR SHALL REFER TO ALL RELEVANT DRAWINGS TO ENSURE THAT ALL OPENINGS, RECESSES, FIXINGS AND FITTINGS SPECIFIED ON THE DRAWINGS ARE INCORPORATED INTO THE PRECAST ELEMENTS.

PC6. GROUT USED SHALL BE NON SHRINK AND SHALL HAVE A 28 DAY CHARACTERISTIC STRENGTH OF 40MPa UNLESS NOTED OTHERWISE. GROUT SHALL ACHIEVE A MINIMUM 80% OF THE 28 DAY STRENGTH PRIOR TO LOADING.

PC7. PRECAST CONCRETE LID HAS BEEN DESIGNED FOR THE PERMANENT CONDITION ONLY. CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF TEMPORARY WORKS CONDITIONS INCLUDING LIFTING AND TRANSPORTATION.

PC8. THE CONTRACTOR SHALL SUPPLY ADDITIONAL REINFORCING IF NECESSARY TO RESIST STRESSES DUE TO LIFTING, TRANSPORT AND ERECTION. CONCRETE STRENGTH AT TIME OF LIFT TO BE TO CONTRACTOR'S REQUIREMENTS AND AS 3850 (MINIMUM 20 MPa).

PC9. ALL CAST IN FIXINGS AND LIFTING DEVICES SHALL BE HOT DIP GALVANISED.

PC10. PROPPING TO BE DESIGNED TO AS3850 BY THE CONTRACTOR. ALL PANELS SHALL REMAIN PROPPED UNTIL ALL CONNECTIONS HAVE BEEN SECURED IN PLACE.

PC11. CAST FACE OF PANELS IS TO BE THE EXPOSED EXTERNAL FACE.

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Designed: J. LUCK Date: -	Checked: P.HOMKESORN Date: -
Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -

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DRAINAGE PIT STUCTURAL NOTES SHEET 1 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C31 OF 61	R24-2299	0	A1

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REINFORCEMENT NOTES

R1. REINFORCEMENT SHOWN ON THE DRAWINGS IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION.

R2. STEEL REINFORCEMENT SHALL BE FROM AN APPROVED SOURCE AND SHALL COMPLY WITH THE REQUIREMENTS OF AS/NZS 4671. THE SUPPLIER SHALL PROVIDE CERTIFICATION (AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEELS) OR COMPLIANCE WITH AS/NZS 4671.

R3. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE SUPERINTENDENT. WHERE THE LAP LENGTH IS NOT SHOWN IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT. BAR LAPS IN MILLIMETRES ARE TO BE AS BELOW UNLESS SHOWN OTHERWISE:

N12	600
N16	750
N20	950
N24	1100
N28	1400
N32	1700

R4. REINFORCEMENT SYMBOLS:

R:	DENOTES R250N – PLAIN 250 GRADE BARS TO AS/NZ 4671 NORMAL DUCTILITY CLASS
N:	DENOTES 500N – DEFORMED 500 GRADE BARS TO AS/NZ4671 NORMAL DUCTILITY CLASS
SL OR RL:	DENOTES R500SL, R500RL, D500SL, 1500SL, 1500RL, WELDED MESH – PLAIN, DEFORMED AND INDENTED TO AS/NZ 4671 – SQUARE OR RECTANGULAR MESH – LOW DUCTILITY CLASS.

R5. REINFORCEMENT ABBREVIATIONS:

EF	EACH FACE
NF	NEAR FACE
FF	FAR FACE
EW	EACH WAY
T	TOP
B OR BTM	BOTTOM
C	CENTRAL
LV	LENGTH VARIES
SL	STAGGER LAP
LAR	LAP AT RANDOM

R6. COGS AND HOOKS TO BE STANDARD IN ACCORDANCE WITH AS 5100.5. UNLESS NOTED OTHERWISE.

R7. WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE SUPERINTENDENT.

R8. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1 METRE CENTRES BOTH WAYS. ALL REINFORCEMENT SHALL BE SECURELY TIED WITH WIRE TIES AND ALL TIE ENDS SHALL BE TURNED INTO THE MEMBER CLEAR OF THE COVER ZONE. MESH SHALL BE SUPPORTED ON PLASTIC OR CONCRETE CHAIRS AT 800 MAXIMUM CENTRES.

R9. REINFORCEMENT DEVELOPMENT LENGTHS SHALL EQUAL LAP LENGTHS. REFER NOTE R3.

R10. PROVIDE N16 DIAGONAL TRIMMER BARS FOR EACH FACE, AT ALL WALL AND SLAB RE-ENTRANT CORNERS AND PIPE PENETRATIONS. COG TRIMMER BARS TO MAINTAIN COVER WHERE REQUIRED. REFER TO TYPICAL DETAILS.

R11. REINFORCEMENT SHALL NOT BE CUT, BENT OR REBENT ON SITE WITHOUT THE PRIOR APPROVAL OF THE SUPERINTENDENT (UNLESS SHOWN ON DRAWINGS).

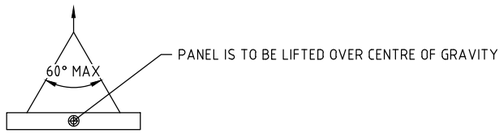
R12. AT SLAB EDGES INCLUDING CONSTRUCTION AND OTHER JOINTS, AT LEAST ONE REINFORCING BAR OR FABRIC WIRE SHALL BE RELOCATED PARALLEL TO AND WITHIN 75mm OF THE SLAB EDGE.

ROOF SLAB LIFTING ANCHOR NOTES

RS1. LIFTING INSERT PRODUCTS PROCURED MUST COMPLY WITH AS 3850 TESTING PROCEDURES.

RS2. DURING MANUFACTURE, SIDE MOULD FORMS MUST BE REMOVED PRIOR TO DEMOULDING OF PRECAST ELEMENTS. THE MOULD SURFACE MUST BE OILED ROUGH STEEL OR VARNISHED TIMBER.

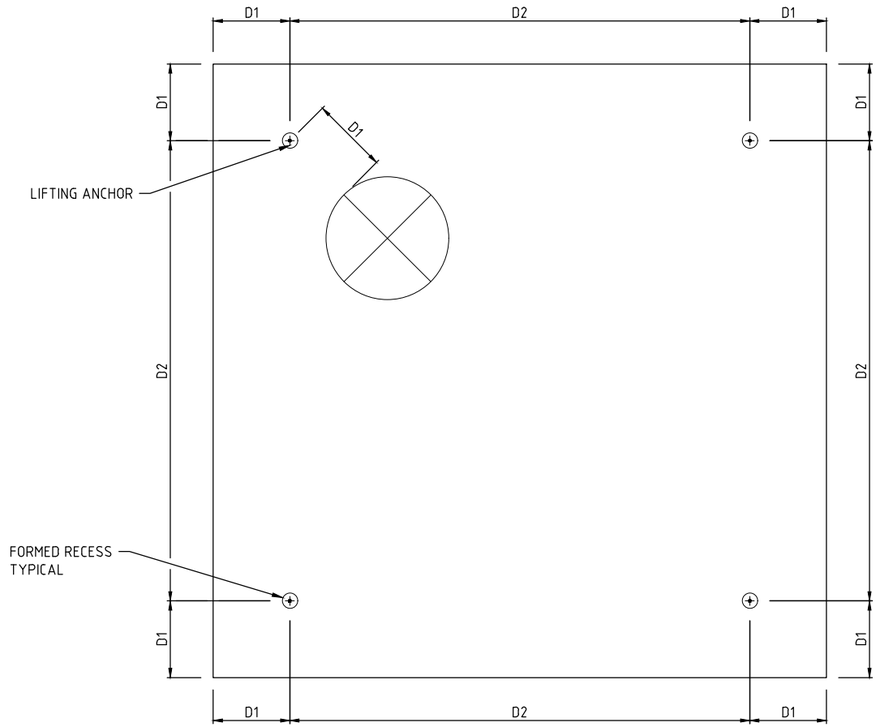
RS3. SAFE LIFT PRACTICES MUST BE USED WHEN TRANSPORTING PRECAST ELEMENTS. MAINTAINING OVERALL LIFT STABILITY IS THE CONTRACTOR'S RESPONSIBILITY. LOAD EQUALISING OVER ALL LIFT ANCHORS MUST BE ACHIEVED USING A SUITABLE LIFTING METHODOLOGY, UTILISING DIFFERENTIAL SPREADER BEAMS WHERE SUITABLE. FIXED CHAINS MUST NOT BE USED DURING LIFTING. THE INTERNAL ANGLE OF SLINGS MUST NOT EXCEED 60 DEGREES AS SHOWN BELOW.



RS4. THE MINIMUM CONCRETE STRENGTH AT LIFT MUST BE EQUAL TO 20MPa. THE PANEL ERECTOR MUST PROVIDE WRITTEN DOCUMENTATION TO VERIFY THE CONCRETE HAS REACHED THE MINIMUM ACCEPTABLE STRENGTH. THERE SHOULD BE A SAMPLING AND CONCRETE TESTING PROCEDURE IN PLACE TO VERIFY CONCRETE MEETS ITS DESIGN SPECIFICATION.

RS5. ALL ANCHORS ARE TO BE RECESSED. ONLY APPROVED RECESS FORMERS AND LIFTING CLUTCHES ARE TO BE USED FOR THE SPECIFIED ANCHOR PRODUCT AND MANUFACTURER. ALL RECESSED POCKETS SHALL BE GROUT FILLED WITH EP120 PARCHEM EPOXY GROUT OR APPROVED EQUIVALENT.

RS6. DESIGN OF LIFTING ANCHORS IS THE CONTRACTORS RESPONSIBILITY. THE TYPICAL LIFTING ARRANGEMENT IS SHOWN INDICATIVELY ONLY AND SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO FABRICATION. REINFORCEMENT AUGMENTATION MAY BE REQUIRED (E.G. ADDITIONAL MAIN REINFORCEMENT OR ADDITIONAL SHEAR LIGS) DEPENDING ON FINAL LIFTING DESIGN, DETAILS AND METHODOLOGY.



D1 – MINIMUM DISTANCE FROM ANY EDGE TO CENTRE OF ANCHOR = 300mm U.N.O.
D2 – MINIMUM SPACING BETWEEN ANCHORS = 900mm U.N.O.

TYPICAL PRECAST CONCRETE ROOF SLAB
LIFTING ANCHOR ARRANGEMENT
N.T.S.

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DRAINAGE PIT STUCTURAL NOTES
SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C32 OF 61	R24-2300	0	A1

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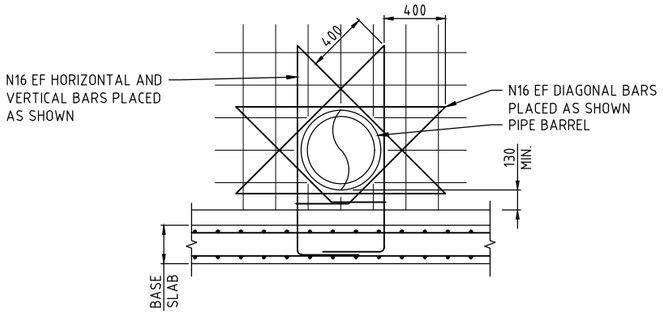

PIPE PENETRATION DETAIL AT SLAB LEVEL

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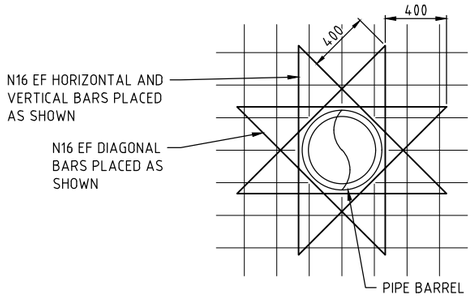

PIPE PENETRATION DETAIL

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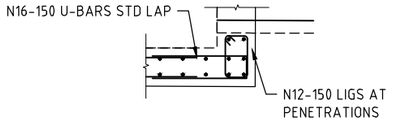

TYPICAL WALL CORNER @ PENETRATIONS =90 DEG

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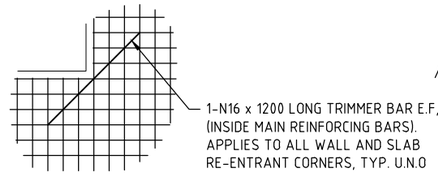

PLAN / ELEVATION TYPICAL RE-ENTRANCE CORNER DETAIL

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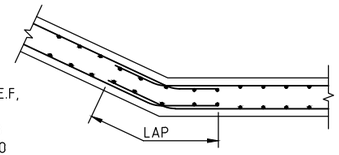

TYPICAL WALL REINFORCEMENT 151-170° CORNER DETAIL

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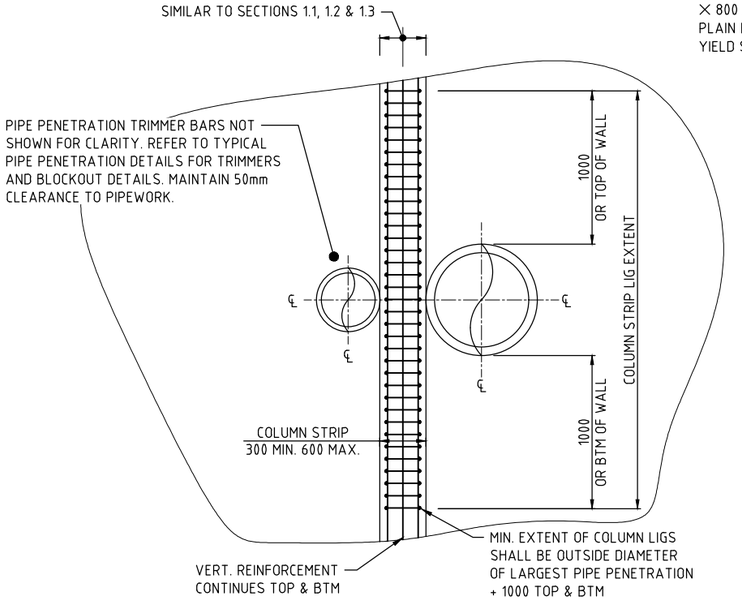
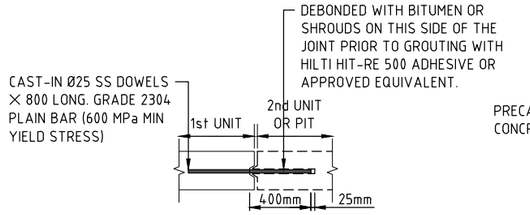


TYPICAL COLUMN STRIP ELEVATION

SCALE B



TYPICAL DOWELLED EXPANSION JOINT (DEJ)

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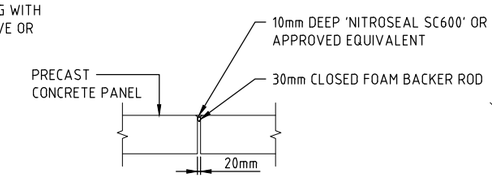

TYPICAL PANEL TO PANEL DETAIL

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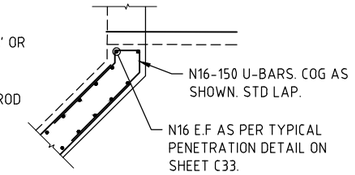
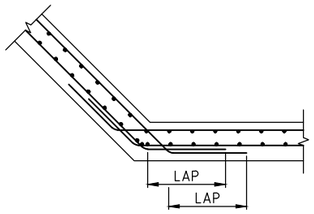


TYPICAL WALL CORNER @ PENETRATIONS >90 DEG

N.T.S.



TYPICAL WALL REINFORCEMENT 90-150° CORNER DETAIL

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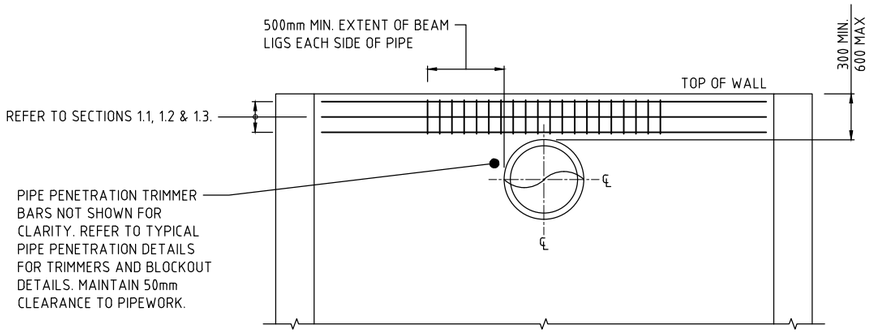

TYPICAL BEAM STRIP ELEVATION

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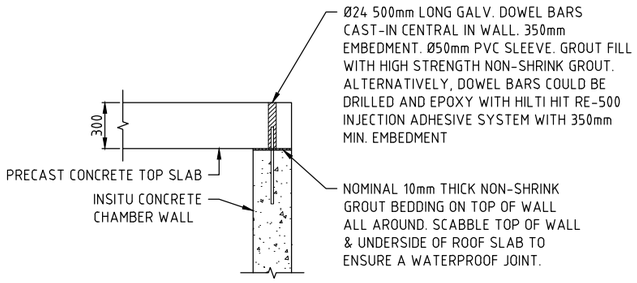
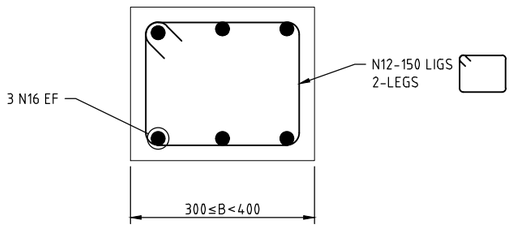


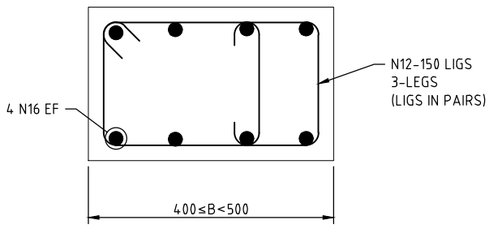
TYPICAL PRECAST TOP SLAB TO IN SITU WALL DETAIL

SCALE B



SECTION 1.1

SCALE A



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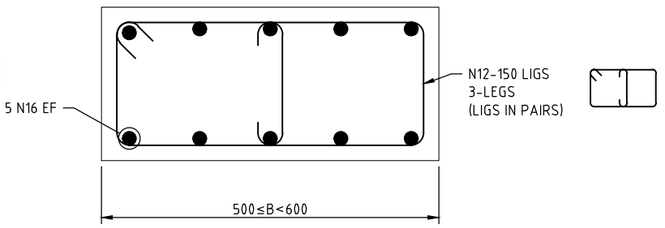

SECTION 1.3

SCALE A

TYPICAL BEAM STRIP REINFORCEMENT DETAILS

SCALE A 1:10 0.2 0 0.2 0.4 0.6m

SCALE B 1:20 0.4 0 0.4 0.8 1.2m

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SHEET 1 OF 6

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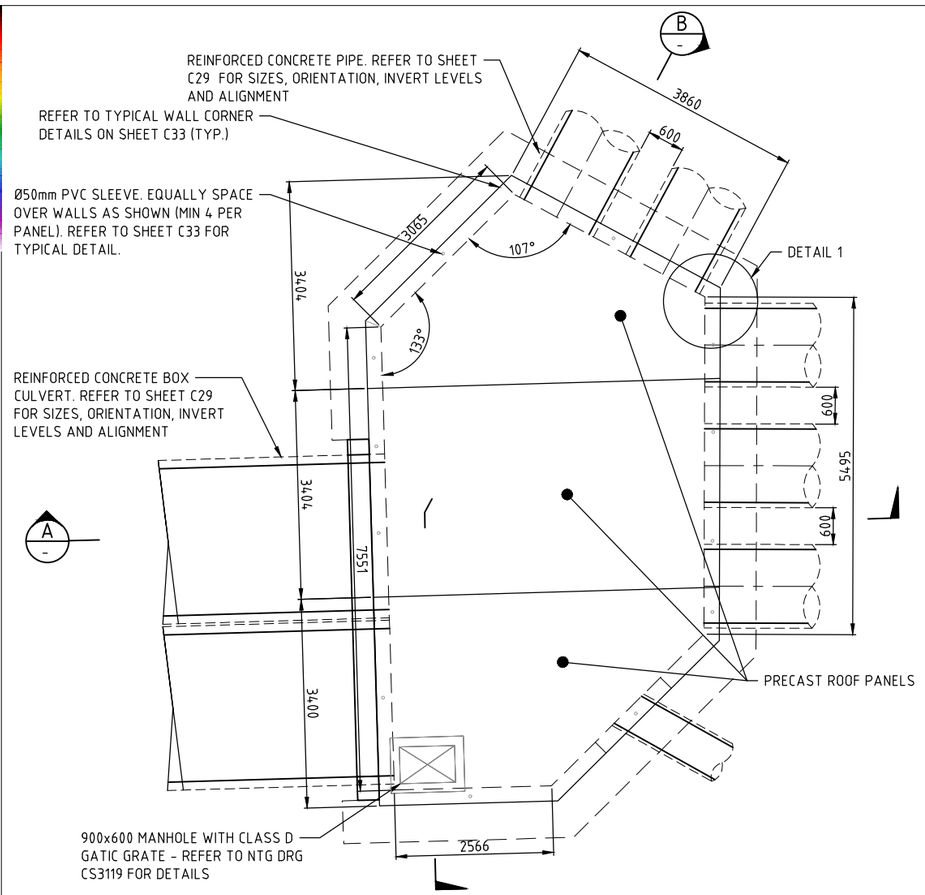
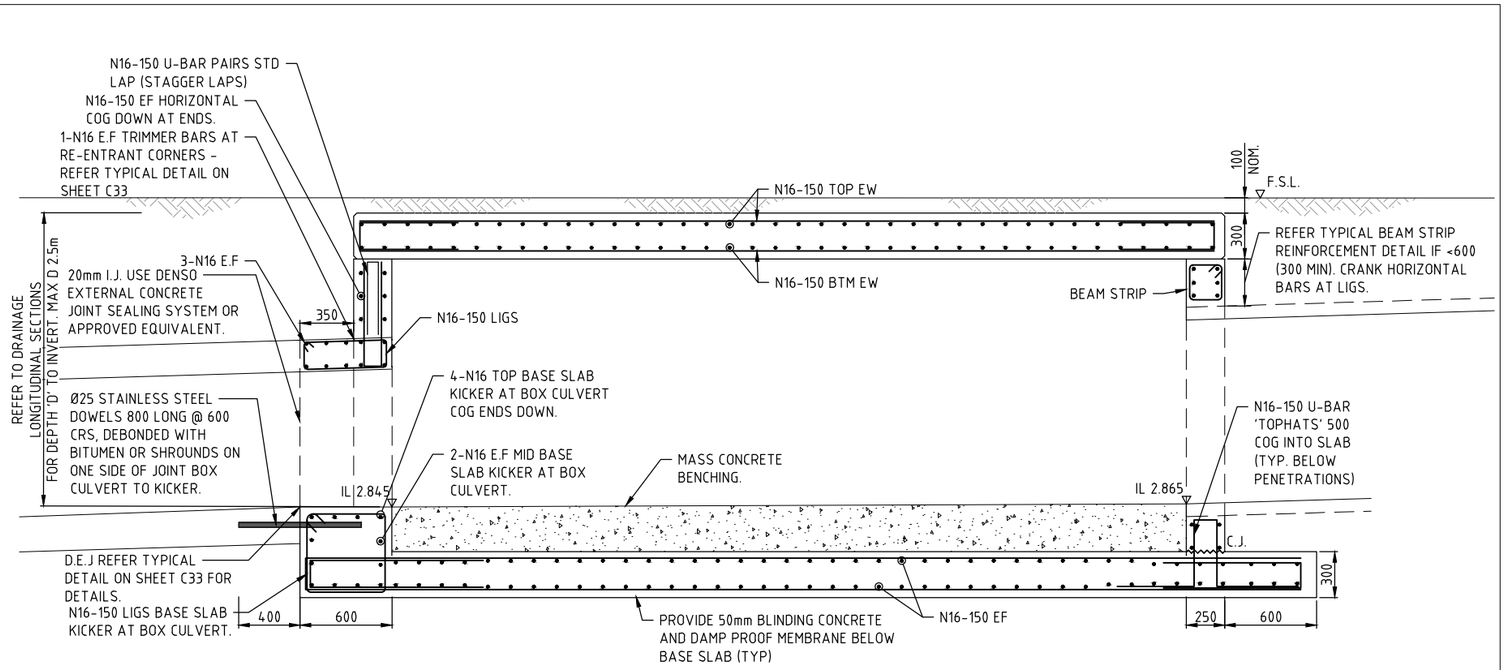
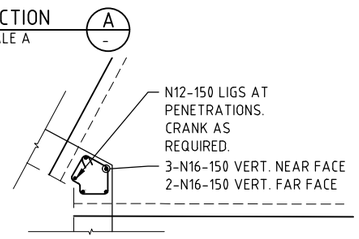


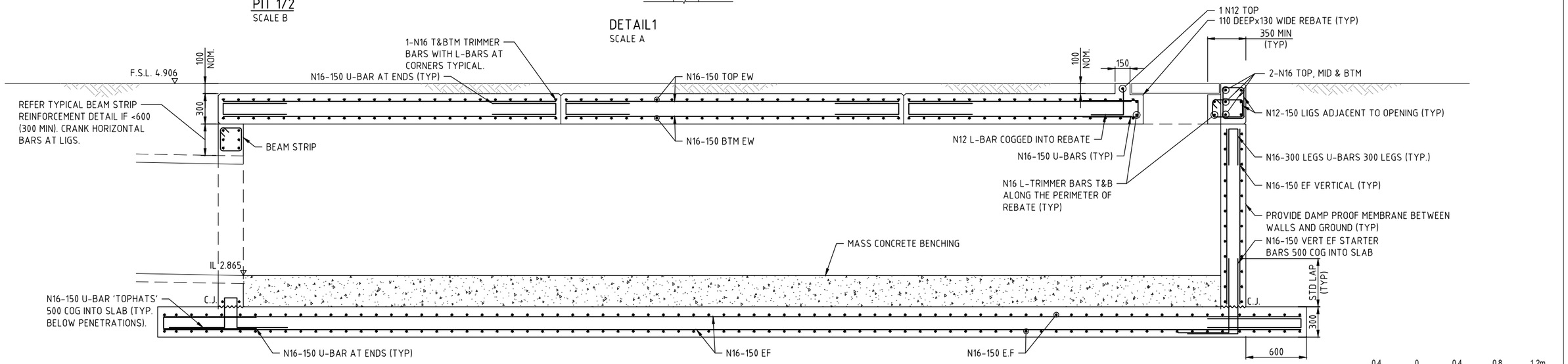
PIT 1/2
SCALE B



SECTION A
SCALE A



DETAIL1
SCALE A



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Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -

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DRAINAGE PIT STUCTURAL DETAILS SHEET 2 OF 6

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C34 OF 61	R24-2302	0	A1

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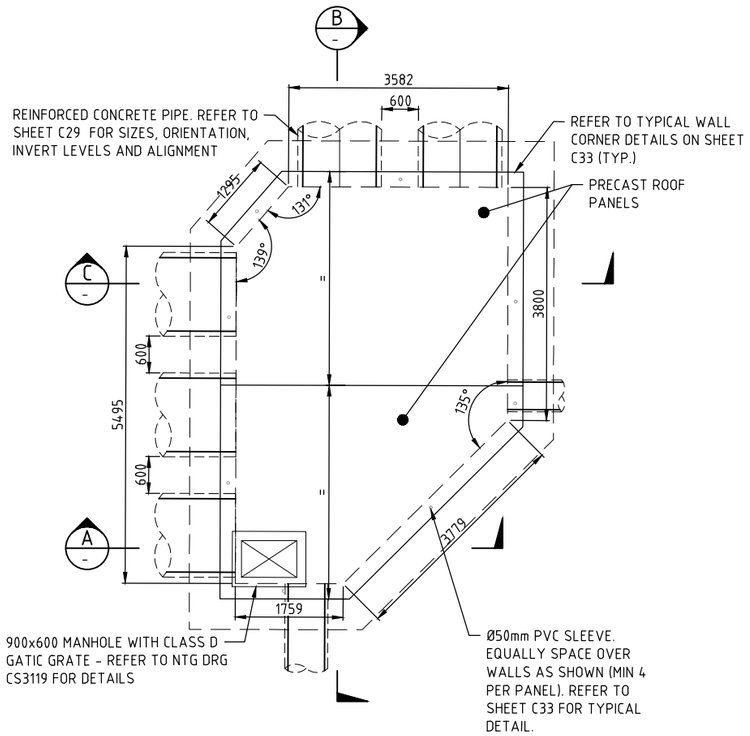

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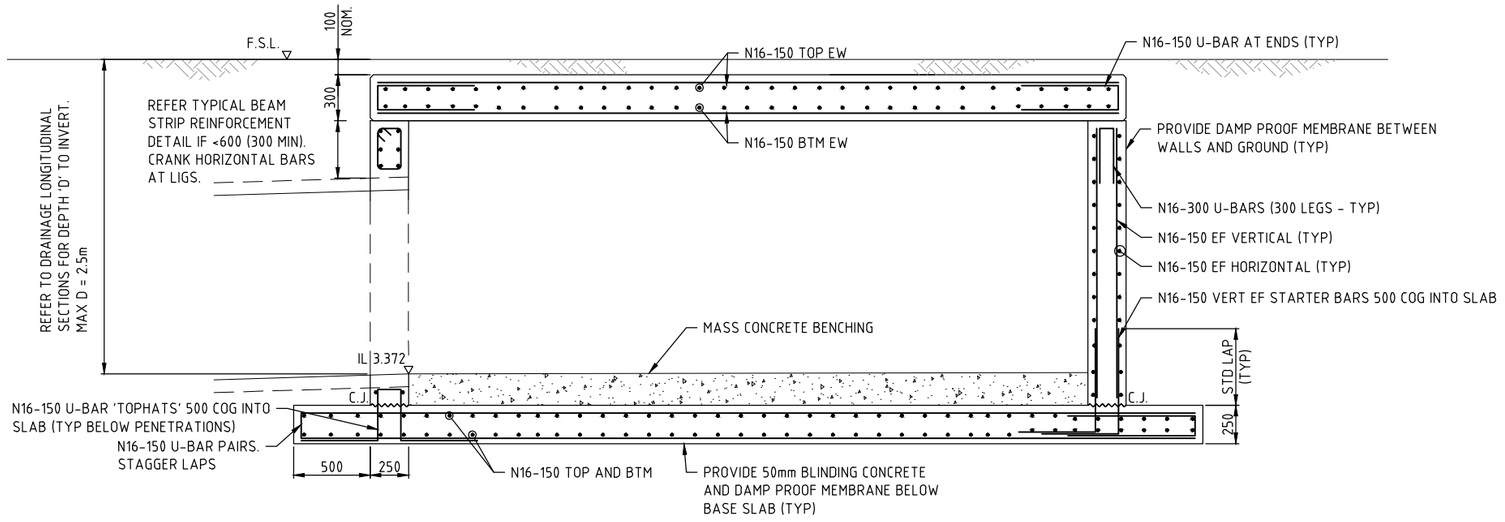

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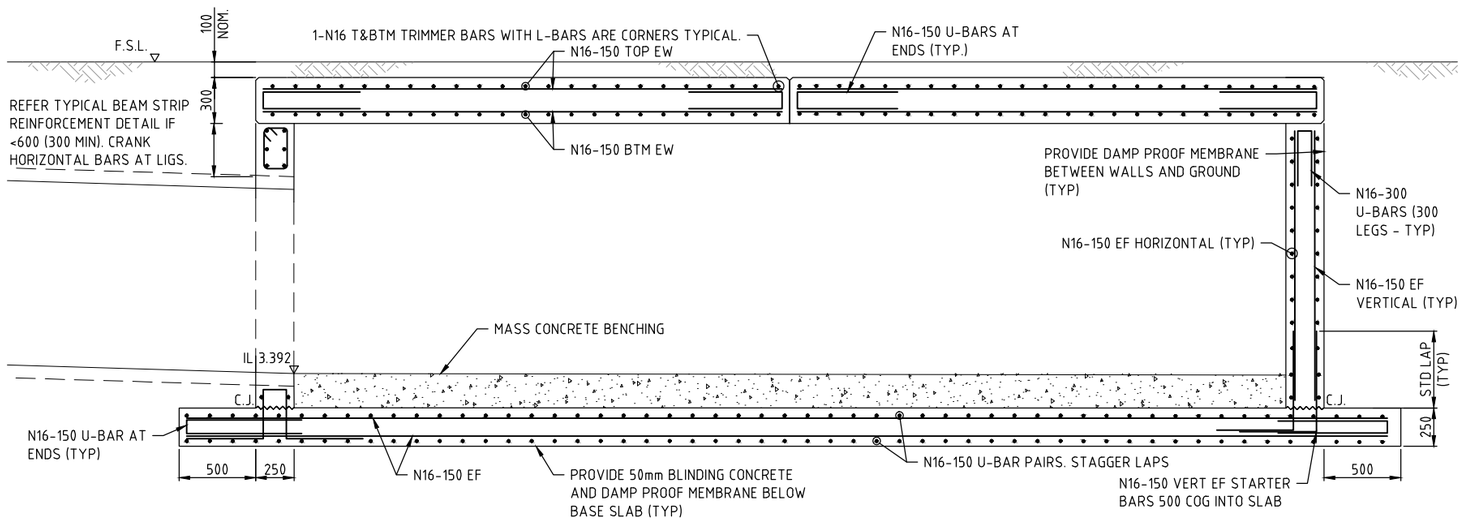

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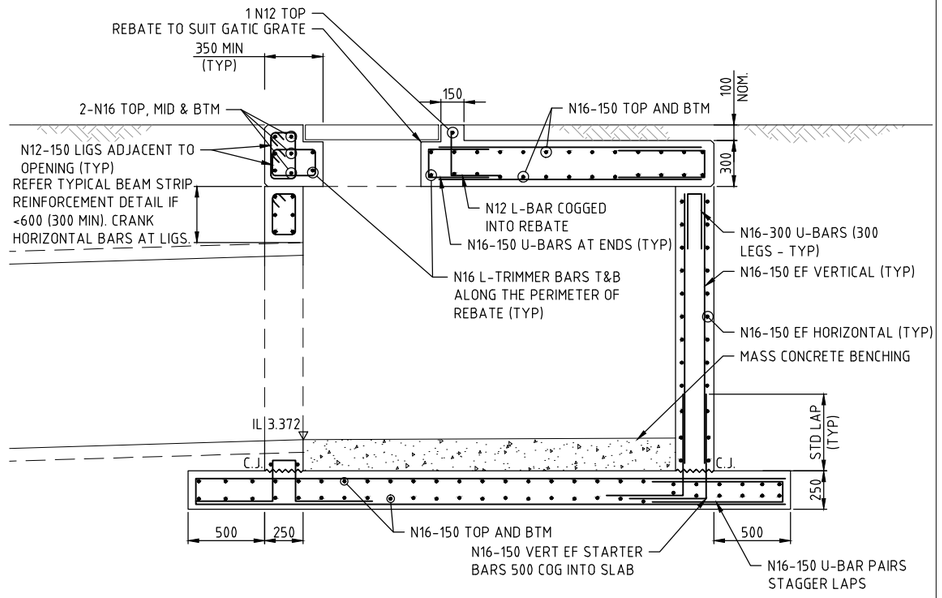

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DRAINAGE PIT STUCTURAL DETAILS SHEET 3 OF 6

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C35 OF 61	R24-2303	0	A1

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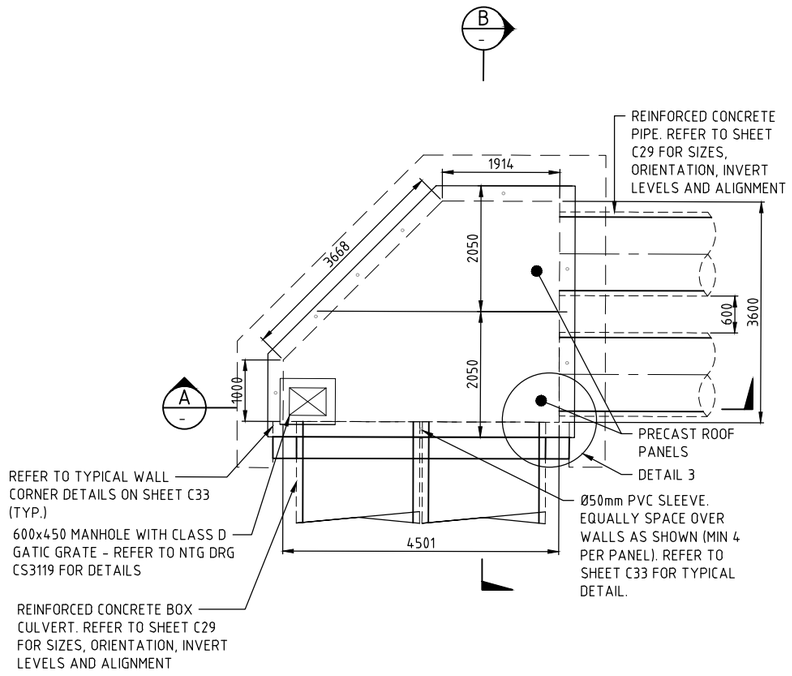

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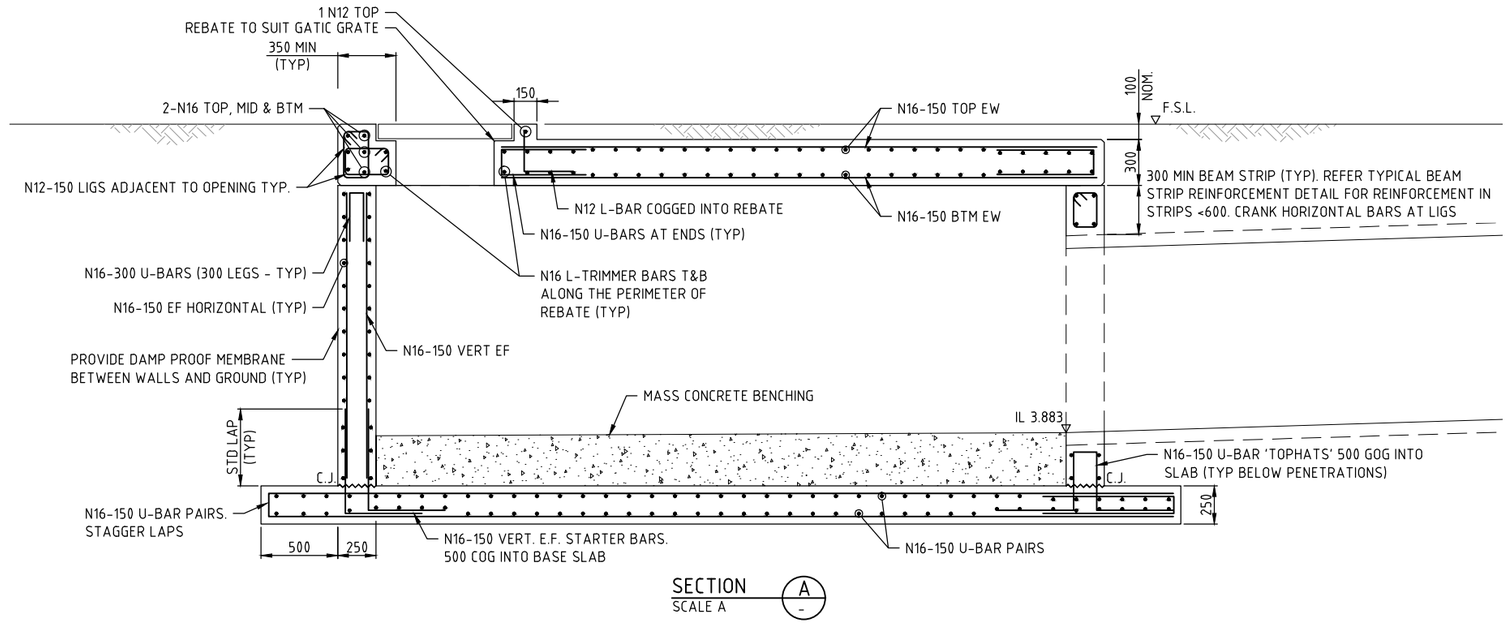

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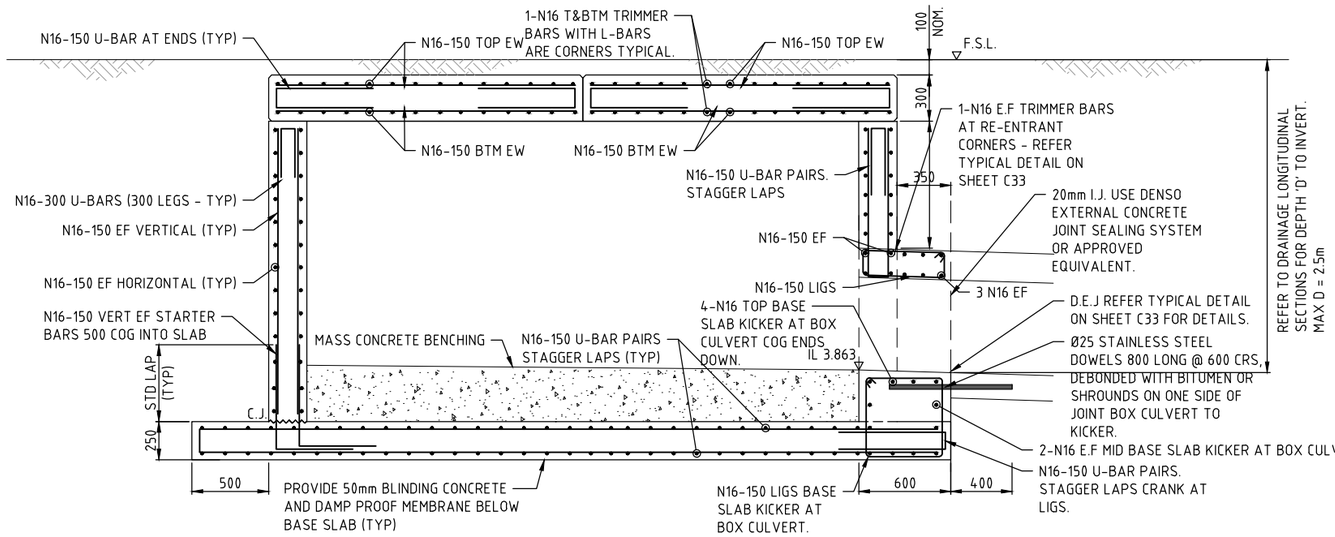

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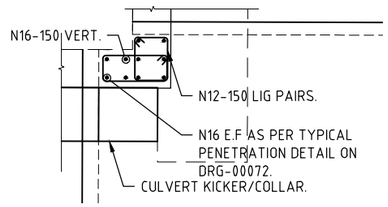

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DRAINAGE PIT STUCTURAL DETAILS SHEET 4 OF 6

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C36 OF 61	R24-2304	0	A1

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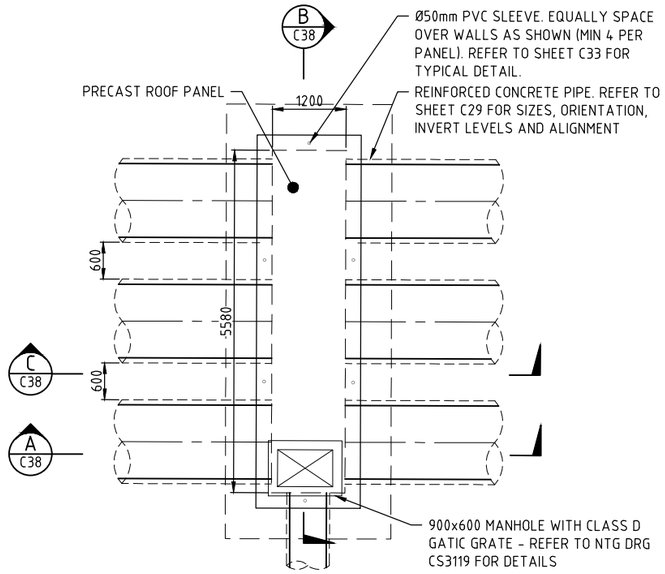

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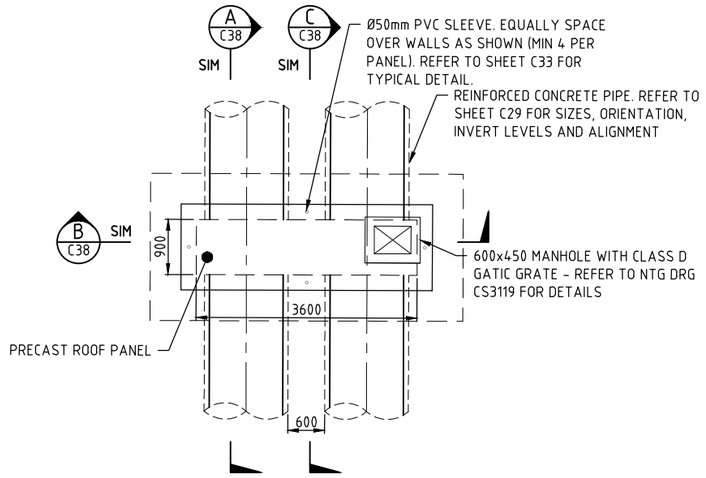

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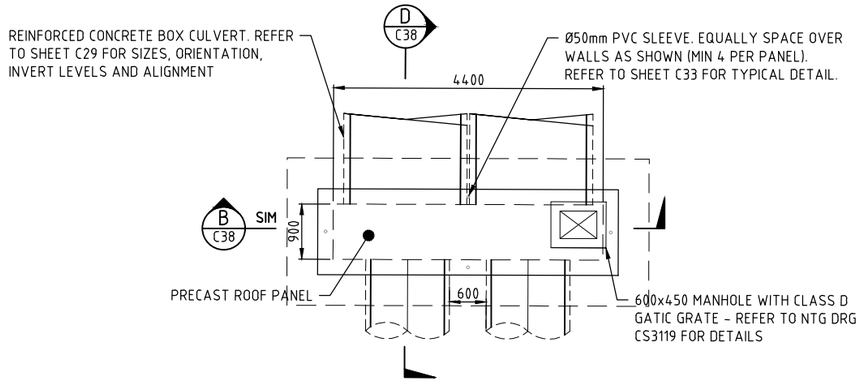

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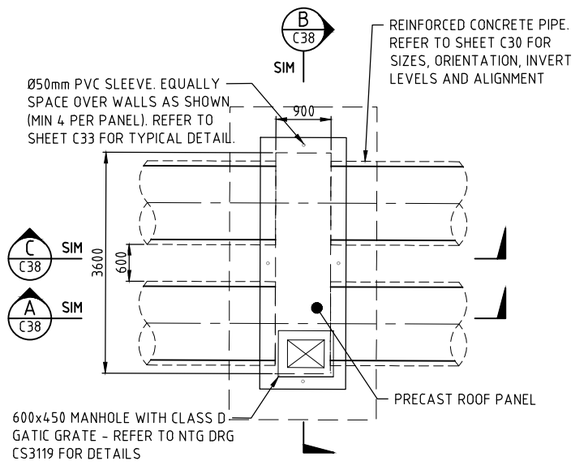

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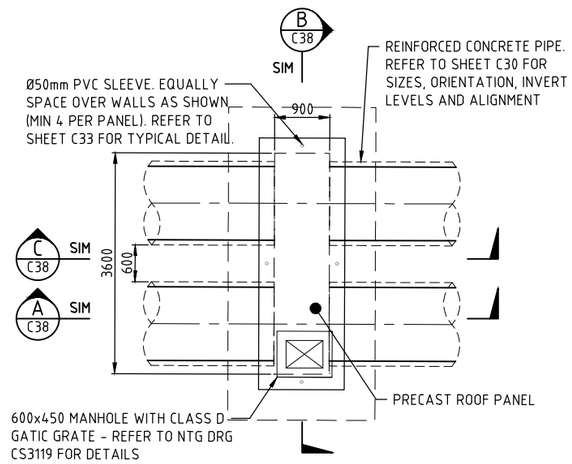

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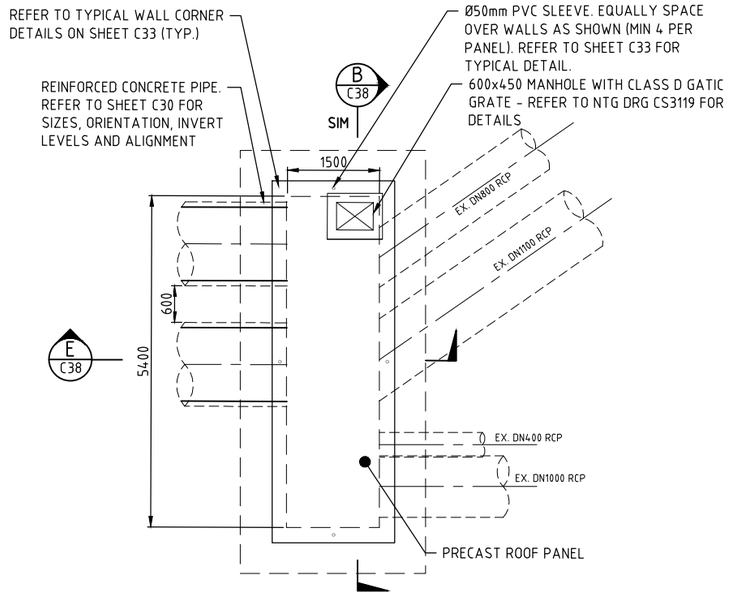

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DRAINAGE PIT STUCTURAL DETAILS SHEET 5 OF 6

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C37 OF 61	R24-2305	0	A1

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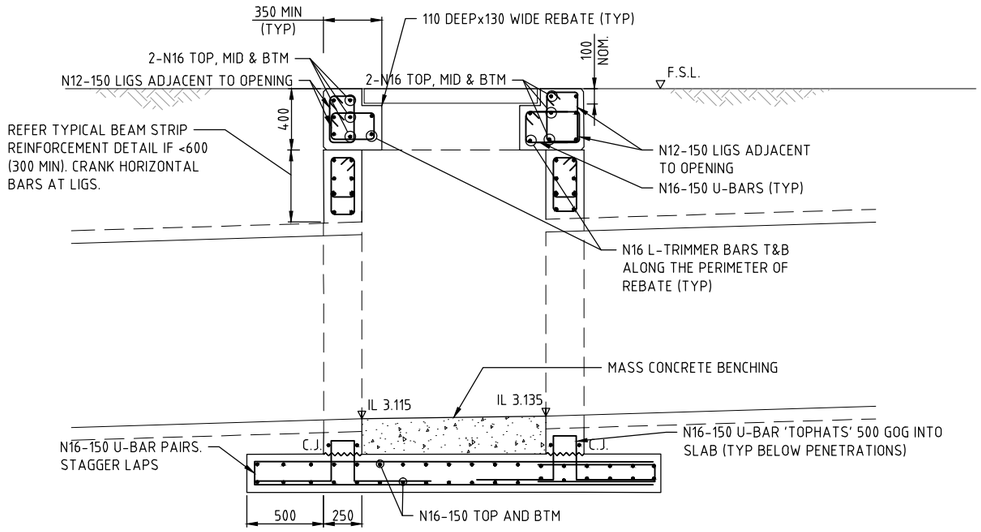

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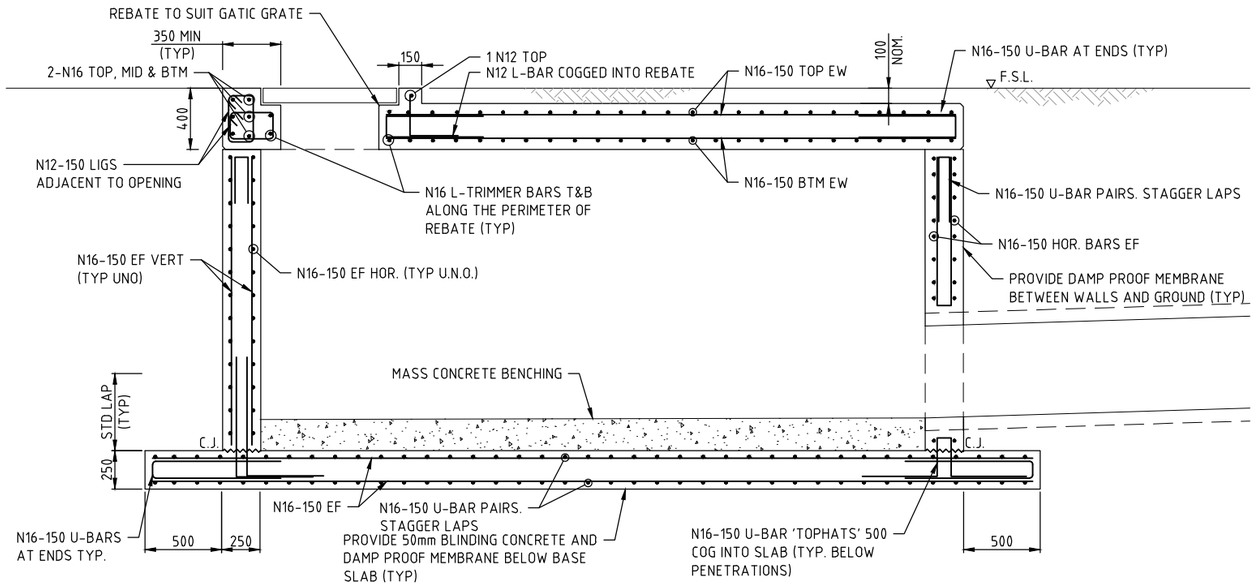

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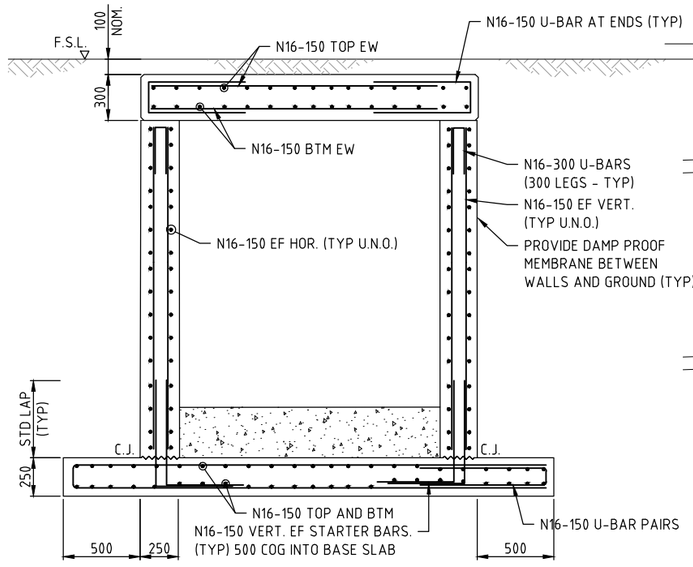

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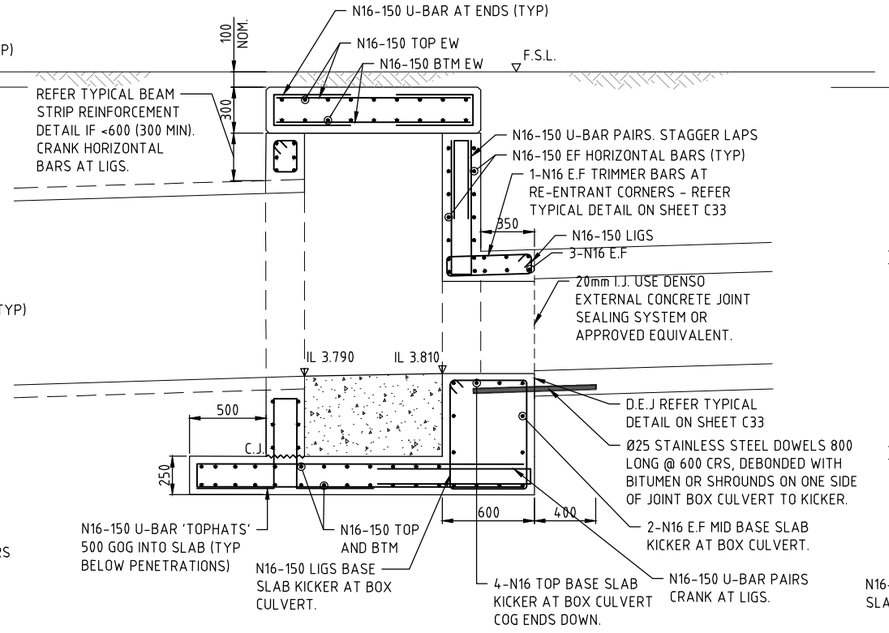

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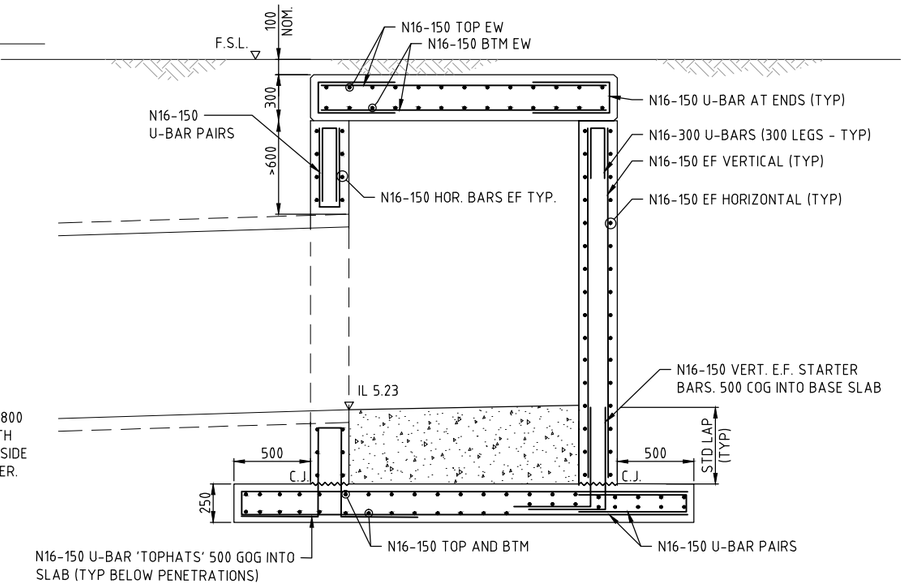

SECTION E
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NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C38 OF 61	R24-2306	0	A1

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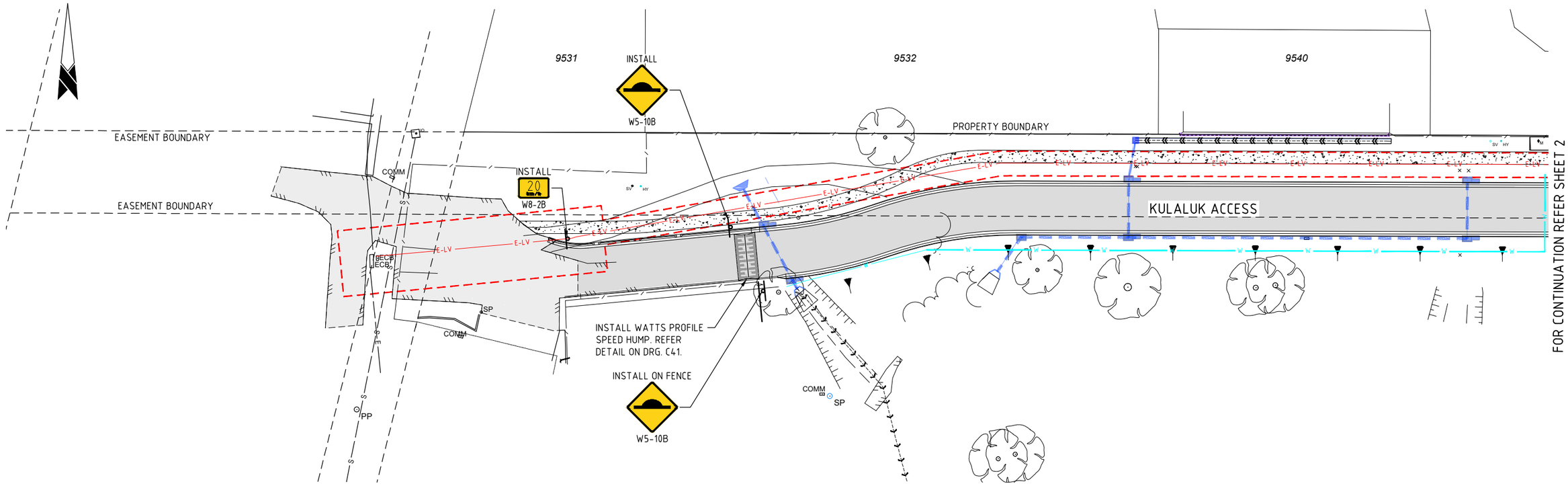

PLAN
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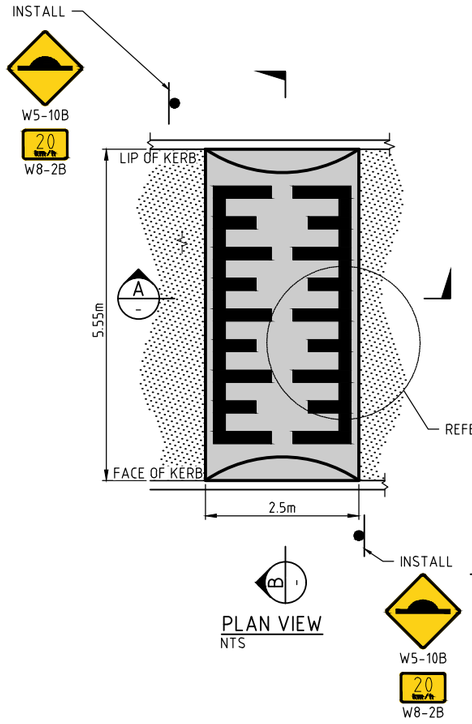
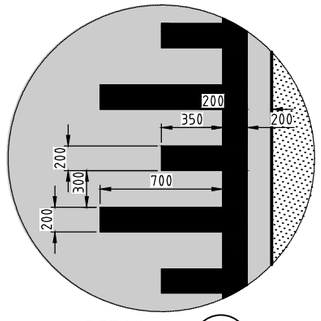
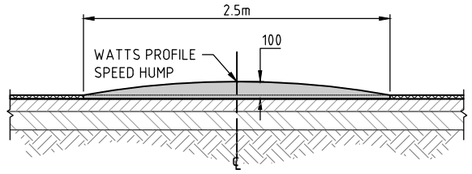


PLAN VIEW
NTS



DETAIL 1
N.T.S.

PIANO MARKING SETOUT DETAIL



SECTION A
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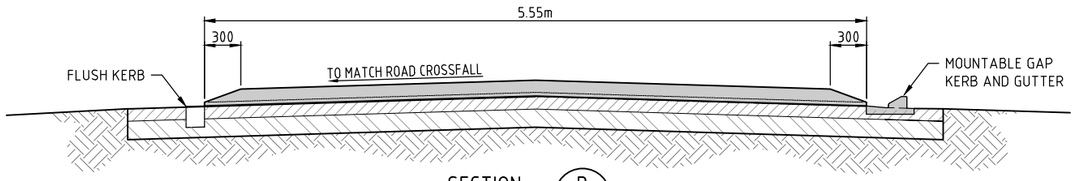

SECTION B
N.T.S.

TYPICAL SPEED HUMP DETAIL – 'WATTS' PROFILE

WATT'S PROFILE SPEED HUMP NOTES

1. THE PIANO PAVEMENT MARKING SHALL BE INSTALLED IN ACCORDANCE WITH AS1742.13
2. IF A CONTRASTING PAVEMENT MATERIAL IS USED SUCH THAT THE HUMP IS CLEARLY VISIBLE UNDER ALL CONDITIONS, THE PIANO PAVEMENT MARKING MAY BE OMITTED.

NOTES

1. FOR ADDITIONAL NOTES AND LEGEND REFER SHEET C02.
2. ALL LINE MARKING, SIGNPOSTING, AND RETRO REFLECTIVE PAVEMENT MARKERS (RRPMS) SHALL BE INSTALLED IN ACCORDANCE WITH A.S.1742 AND DIPL STD DRG. CS3400 UNO.
3. ALL SIGNS SHALL BE SIZE 'A' UNO.
4. G5-1 SIGN AS PER STD DRG. SS1010.
5. ALL TEMPORARY TRAFFIC CONTROL DEVICES FOR THE DURATION OF THE WORKS SHALL BE IN ACCORDANCE WITH AS 1742 AND AUSTROADS GUIDE TO TEMPORARY TRAFFIC MANAGEMENT: PARTS 1 TO 10.

SCALE A 5 0 5 10 15m

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LINEMARKING AND SIGNAGE PLAN SHEET 1 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C39 OF 61	R24-2307	0	A1

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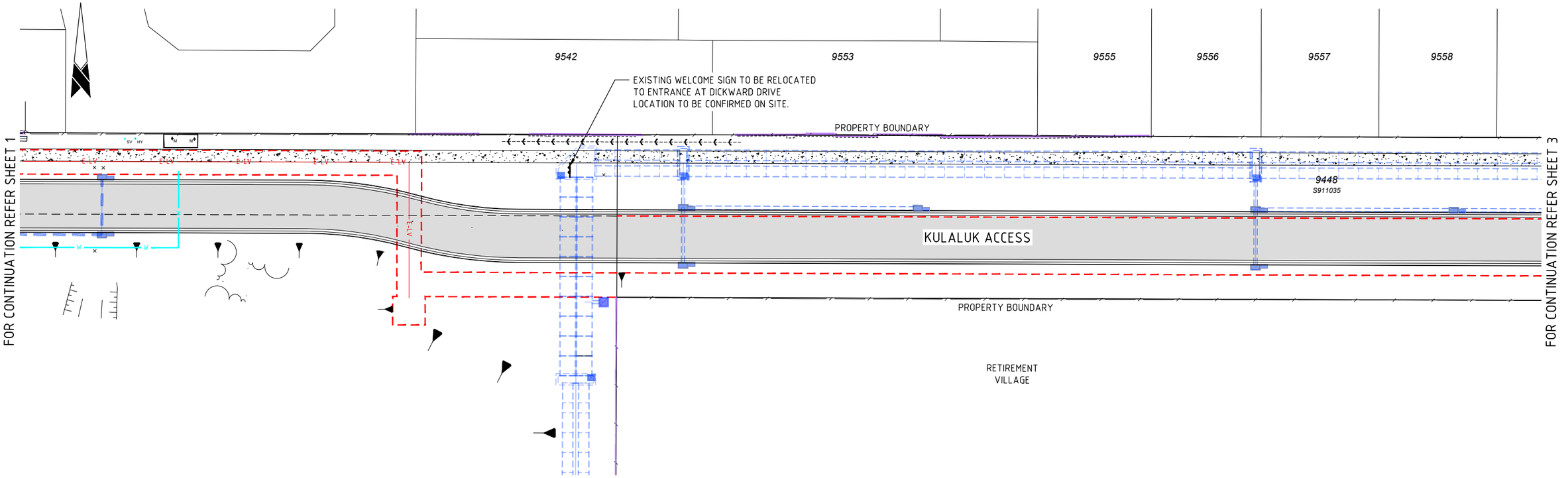

PLAN
SCALE A

NOTES

1. FOR NOTES AND LEGEND REFER SHEET 1.

SCALE A 5 0 5 10 15m

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LINEMARKING AND SIGNAGE PLAN SHEET 2 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C40 OF 61	R24-2308	0	A1

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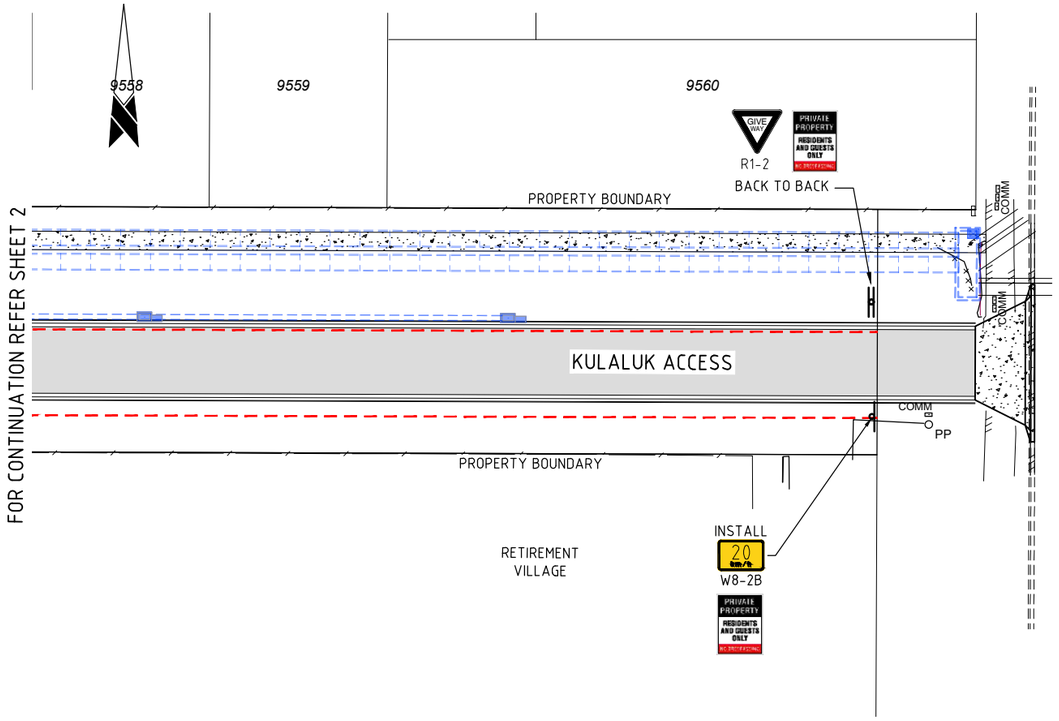

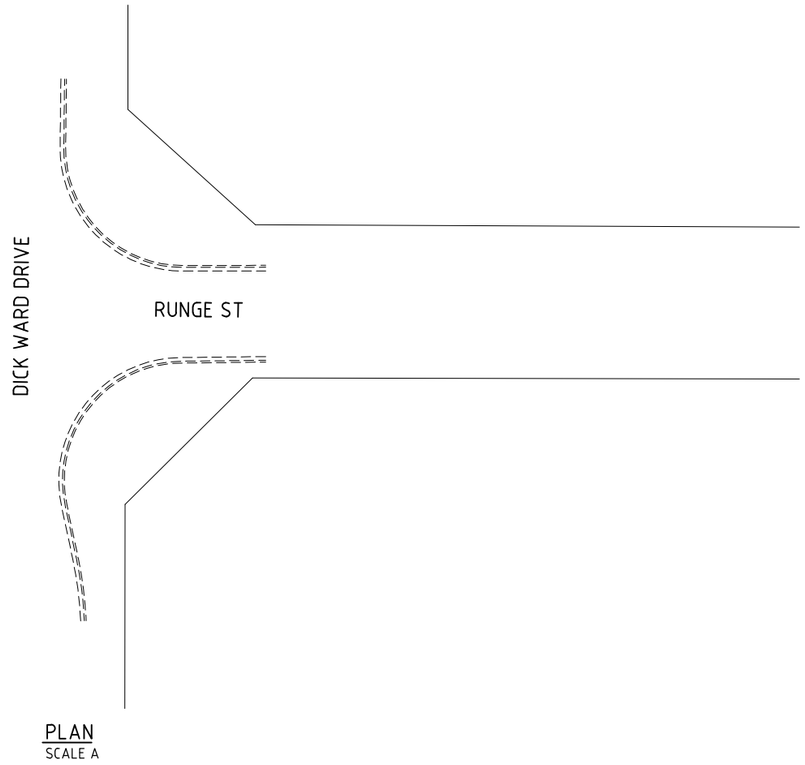

PLAN
SCALE A

NOTES

1. FOR NOTES AND LEGEND REFER SHEET 1.

SCALE A 5 0 5 10 15m

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Designed T.BOUNDY Date: -	Checked A.NAWAZ Date: -	
Design Project Leader R.KRAKE Date: -	NTG Project Manager ALI ASHRAF Date: -	

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LINEMARKING AND SIGNAGE PLAN SHEET 3 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C41 OF 61	R24-2309	0	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS
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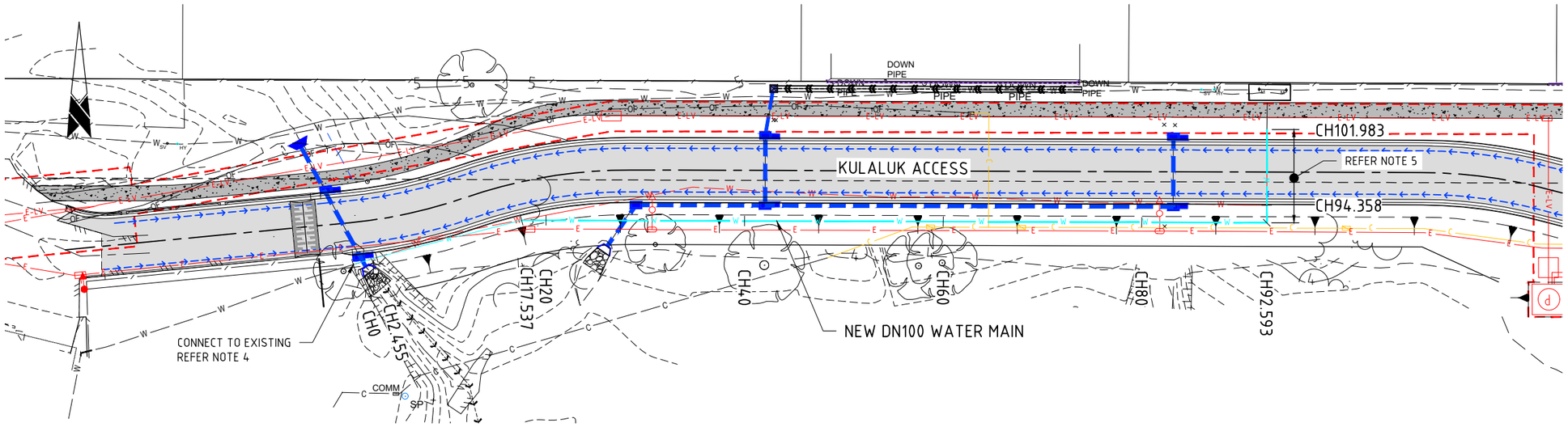


LEGEND

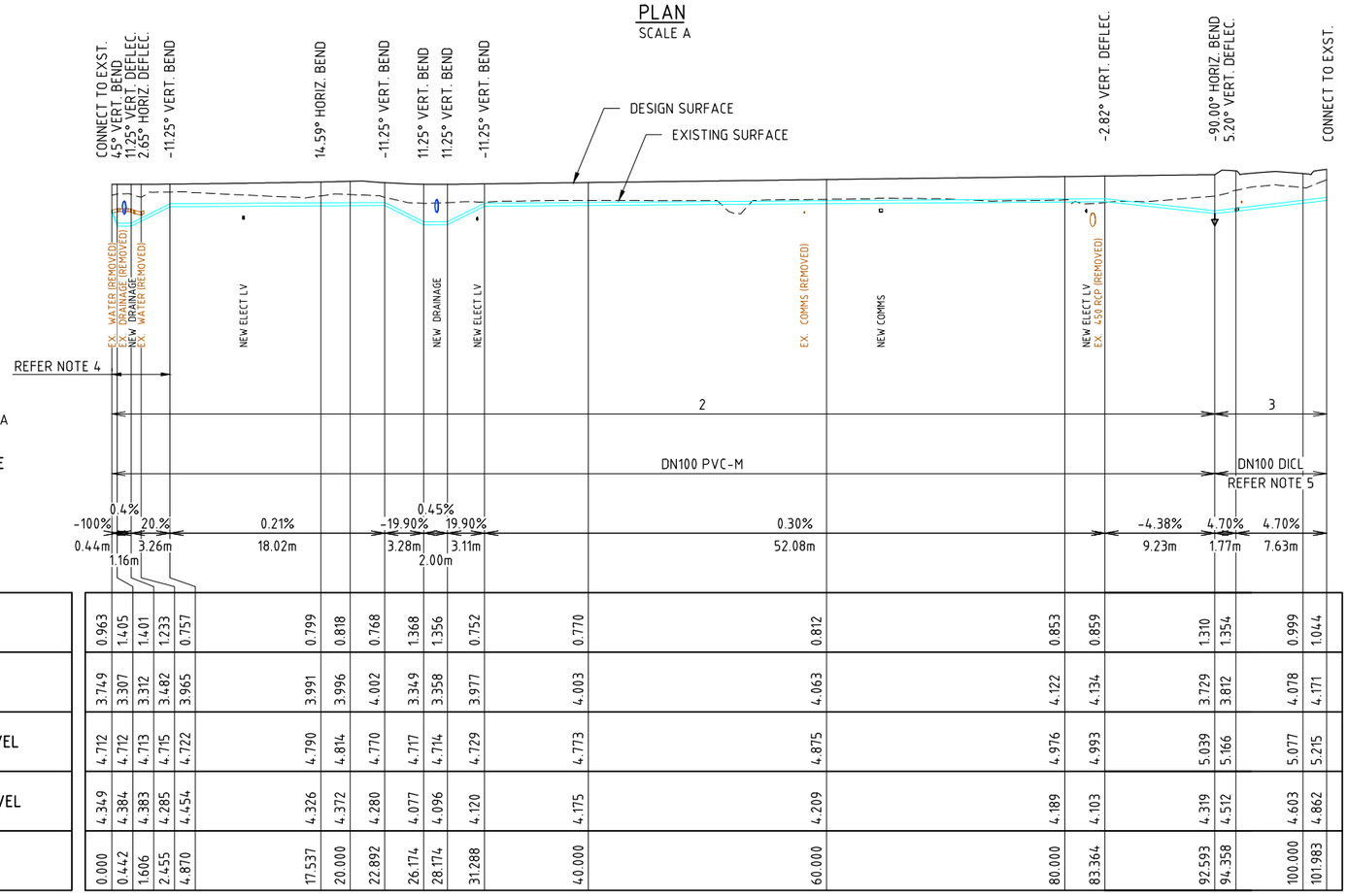
PROPOSED

- DRAINAGE PIPE, PIT AND HEADWALL
- SUBSOIL DRAINAGE
- W — DN100 WATER MAIN
- E-HV — ELECTRICAL HV
- E-LV — ELECTRICAL LV
- E — ELECTRICAL AND LIGHT POLE
- C — COMMUNICATIONS

EXISTING

- D — DRAINAGE PIPE / CULVERT
- W — WATER
- S — SEWER
- SRM — SEWER RISING MAIN
- E — ELECTRICAL (U/G)
- E — ELECTRICAL (O/H)
- C — COMMUNICATIONS
- OF — OPTIC FIBRE
- G — GAS
- TOP OF BATTER
- TOE OF BATTER
- EDGE OF SEAL
- —250.0— SURFACE CONTOURS

PLAN
SCALE A



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PRINT IN COLOUR

RWA 3
RESTRICTED
WORK AREA

DRAINAGE
RESERVE

KULALUK ACCESS

NEW DN100 WATER
WATER MAIN.

RWA 4

RWA 5
RESTRICTED
WORK AREA

RESTRICTED WORKS
AREA BOUNDARY

FOR CONTINUATION REFER SHEET 2

9531 9532 9540 9542 9553

8630
S77/93A

8630
S77/93A

6206 6205 6204 6203 6202 6201 6200 6199 6198 6197

OSTERMANN ST

PLAN
SCALE A

LEGEND

PROPOSED

- DRAINAGE PIPE, PIT AND HEADWALL
- SUBSOIL DRAINAGE
- W — DN100 WATER MAIN
- E-HV — ELECTRICAL HV
- E-LV — ELECTRICAL LV
- E — ELECTRICAL AND LIGHT POLE
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- C — COMMUNICATIONS
- OF — OPTIC FIBRE
- G — GAS
- TOP OF BATTER
- TOE OF BATTER
- EDGE OF SEAL
- 250.0 — SURFACE CONTOURS

NOTES

1. FOR ADDITIONAL NOTES AND LEGEND REFER SHEET C02.
2. ALL EXISTING SERVICES WITHIN WORKS FOOTPRINT SHALL BE EXPOSED, LOCATED AND ELEVATION IDENTIFIED PRIOR TO COMMENCING WORKS. THE CONTRACTOR SHALL LIAISE WITH THE SUPERINTENDENT IF ANY CLASHES BECOME APPARENT.

SCALE A 10 0 10 20 30m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
0	CONTRACT DRAWING	02.10.24	RK	JACOBS

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MASTER SERVICES PLAN
SHEET 1 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C43 OF 61	R24-2311	0	A1

Version: March 2021

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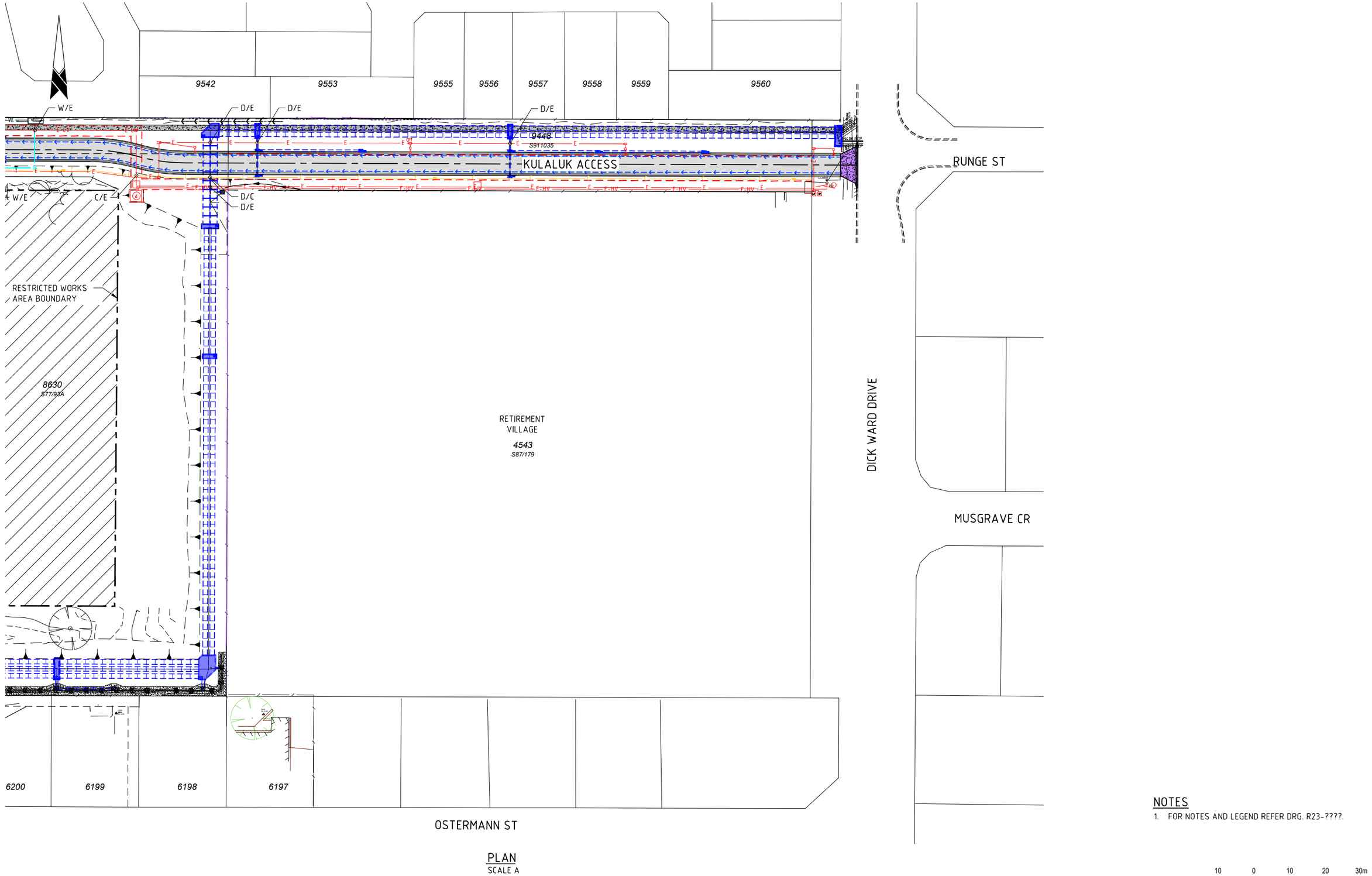

PLAN
SCALE A

NOTES
1. FOR NOTES AND LEGEND REFER DRG. R23-????.

SCALE A 10 0 10 20 30m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
0	CONTRACT DRAWING	02.10.24	RK	JACOBS

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MASTER SERVICES PLAN SHEET 2 OF 2

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C44 OF 61	R24-2312	0	A1

Version: March 2021

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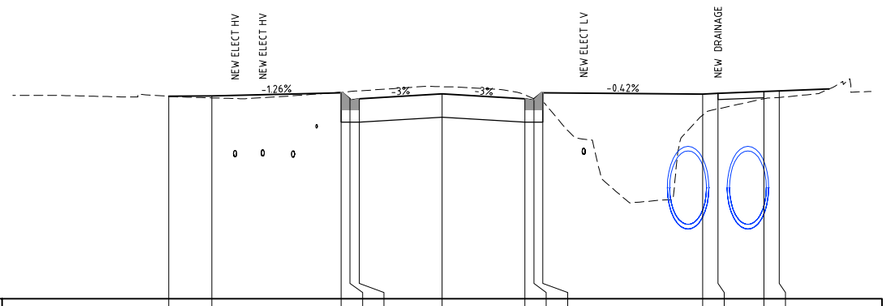

DATUM RL 4.0

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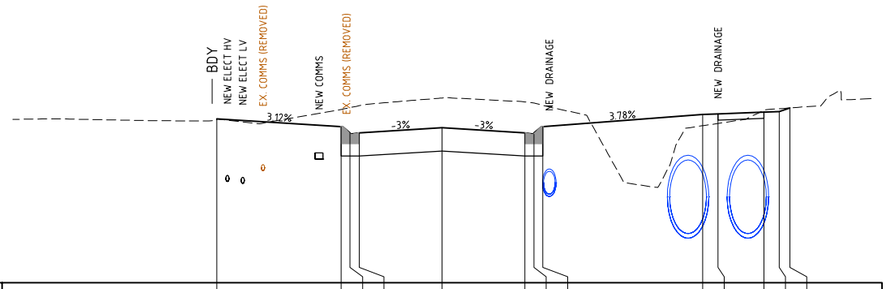

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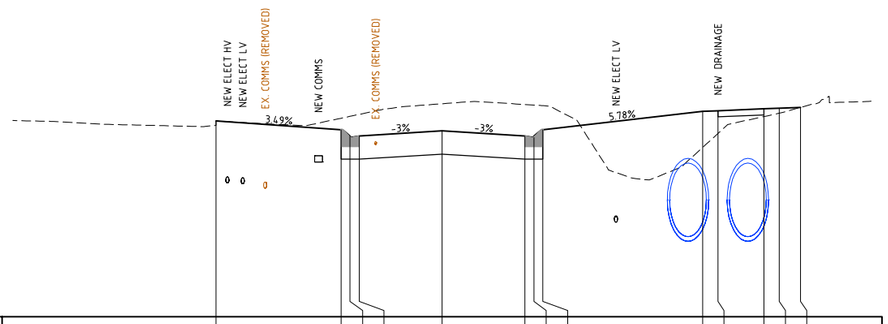

DATUM RL 3.0

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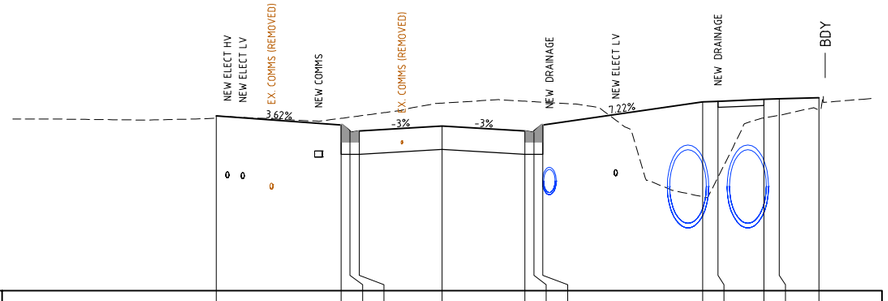

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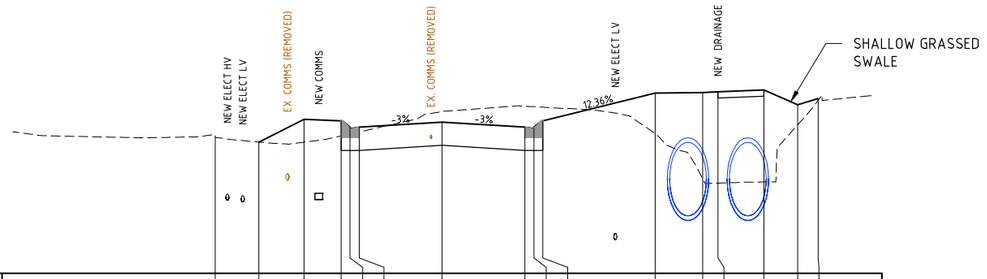
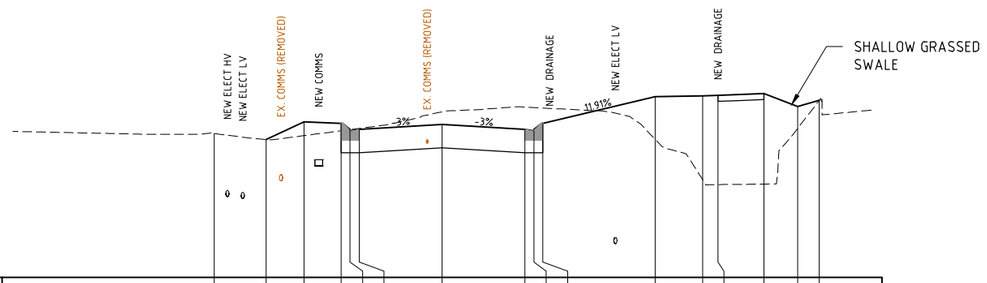


DATUM RL 3.0

DESIGN SURFACE LEVEL		5.217		5.141		5.510		5.486		5.361		5.386		5.467		5.386		5.361		5.486		5.939		5.949	
EXISTING SURFACE LEVEL		5.265		5.141		5.140		5.241		5.273		5.307		5.640		5.726		5.718		5.710		5.283		4.545	
OFFSET		-7.395		-5.976		-4.500		-3.291		-3.000		-2.700		0.000		2.700		3.000		3.291		6.957		8.499	

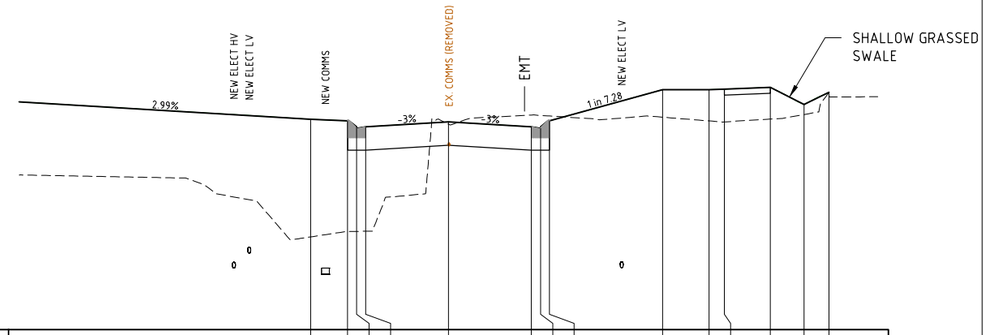
CH 170.000



DATUM RL 3.0

DESIGN SURFACE LEVEL		5.346		5.247		5.535		5.511		5.386		5.411		5.492		5.411		5.386		5.511		5.947		5.959	
EXISTING SURFACE LEVEL		5.359		5.247		5.311		5.390		5.409		5.429		5.699		5.777		5.769		5.761		5.252		4.598	
OFFSET		-7.431		-5.741		-4.500		-3.291		-3.000		-2.700		0.000		2.700		3.000		3.291		6.949		8.499	

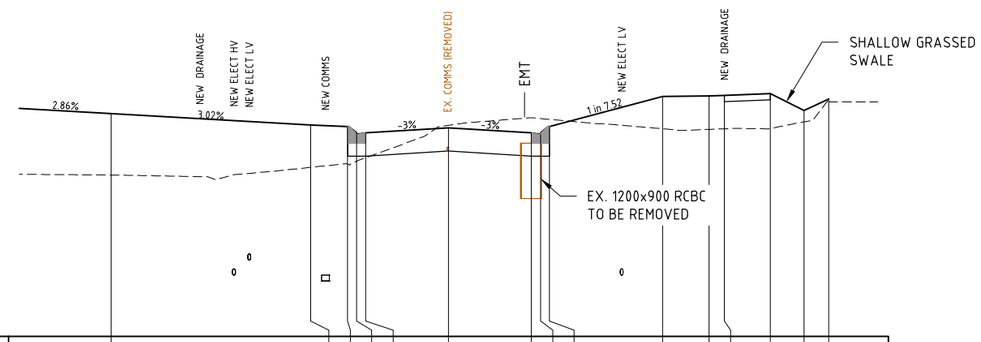
CH 166.500



DATUM RL 2.0

DESIGN SURFACE LEVEL		5.428		5.404		5.279		5.304		5.385		5.304		5.279		5.404		5.911		5.910		5.920		5.950	
EXISTING SURFACE LEVEL		3.510		3.598		3.600		3.602		5.348		5.496		5.491		5.482		5.461		5.400		5.385		5.431	
OFFSET		-4.500		-3.291		-3.000		-2.700		0.000		2.700		3.000		3.291		6.982		8.498		8.997		10.497	

CH 182.700



DATUM RL 2.0

DESIGN SURFACE LEVEL		5.631		5.615		5.423		5.444		5.420		5.295		5.320		5.401		5.320		5.295		5.420		5.911	
EXISTING SURFACE LEVEL		4.631		4.630		4.750		4.755		4.810		4.856		4.914		5.441		5.565		5.551		5.538		5.385	
OFFSET		-11.011		-10.932		-4.605		-4.500		-3.291		-3.000		-2.700		0.000		2.700		3.000		3.291		6.983	

CH 180.000

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 2 0 2 4 6m

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CROSS SECTIONS - KULALUK ACCESS SHEET 5 OF 9

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C49 OF 61	R24-2317	0	A1

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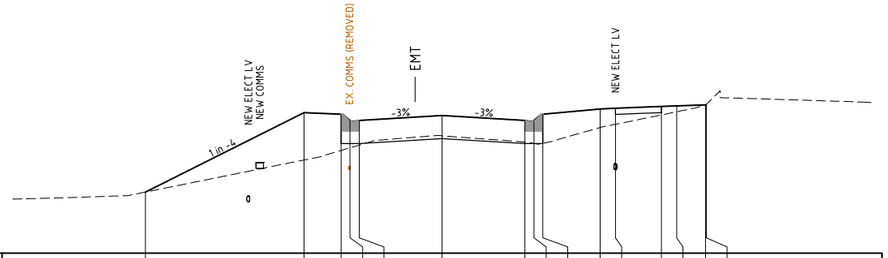

DATUM RL 3.0

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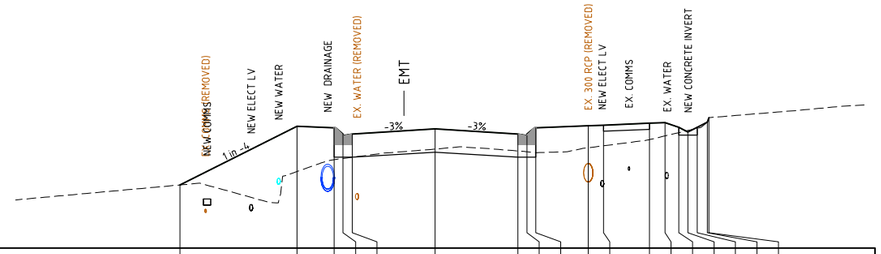

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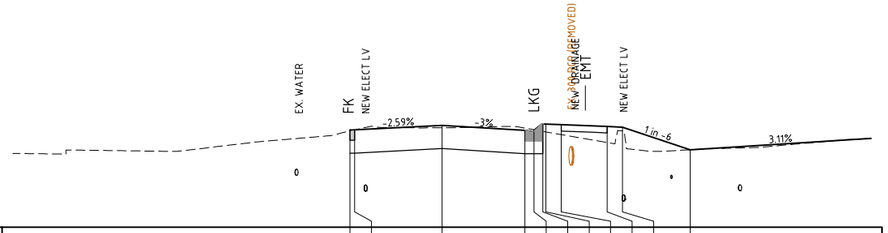

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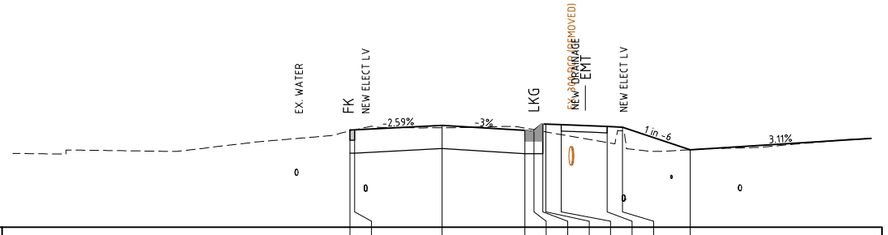

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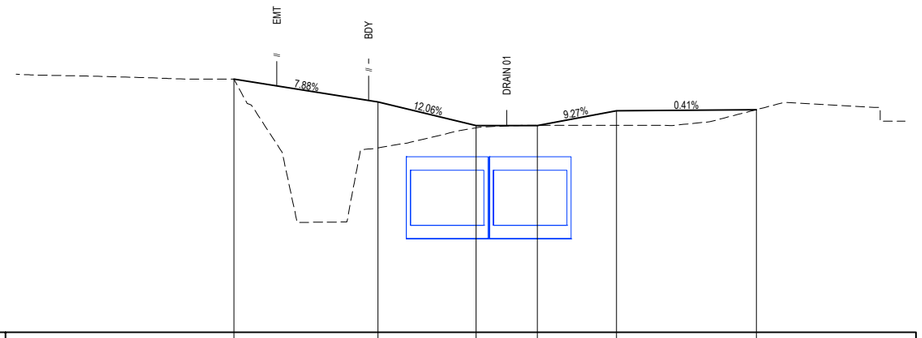
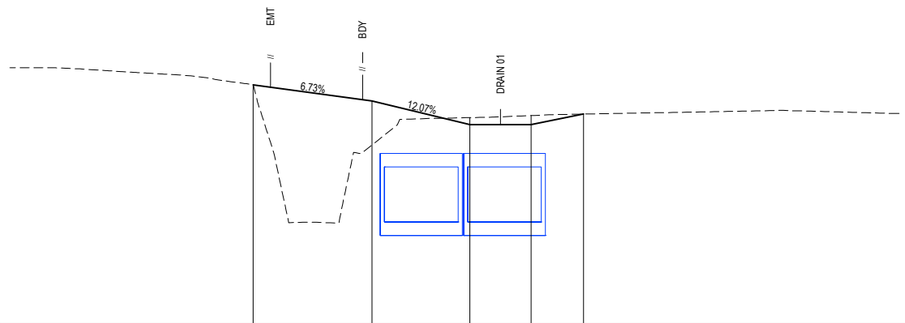


DATUM RL 1.0

DESIGN SURFACE LEVEL	5.125	4.755	4.369	4.369	4.609	4.628	
EXISTING SURFACE LEVEL	5.124	4.006	4.331	4.372	4.371	4.628	
OFFSET	-8.895	-4.195	-1.000	1.000	3.586	8.145	

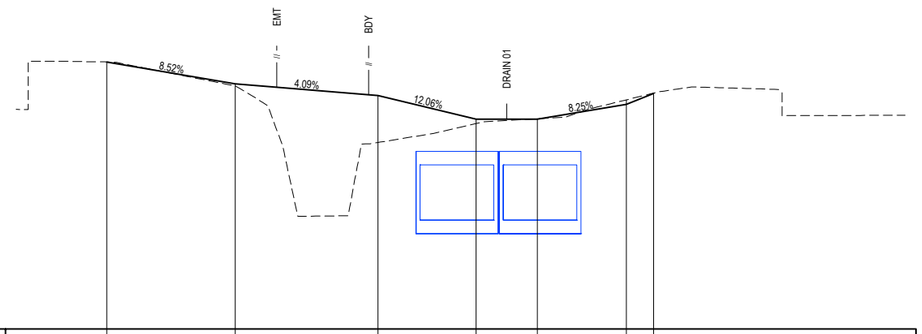
CH 20.000



DATUM RL 1.0

DESIGN SURFACE LEVEL	4.916	4.655	4.269	4.269	4.440	
EXISTING SURFACE LEVEL	4.922	3.935	4.382	4.416	4.440	
OFFSET	-8.071	-4.193	-1.000	1.000	2.708	

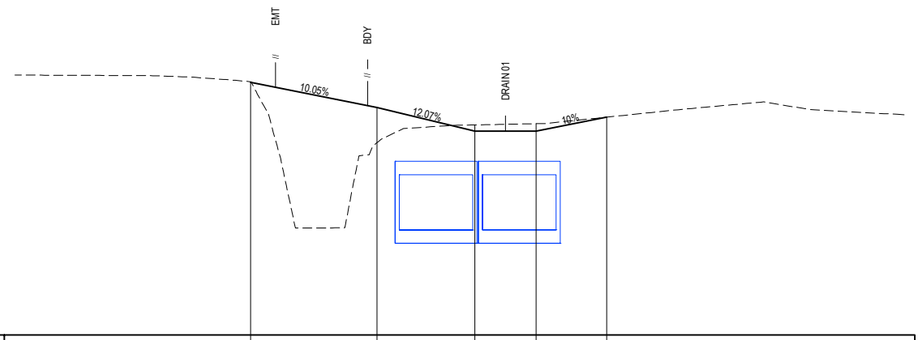
CH 40.000



DATUM RL 1.0

DESIGN SURFACE LEVEL	5.352	4.995	4.805	4.419	4.419	4.659	4.837	
EXISTING SURFACE LEVEL	5.352	4.961	4.039	4.346	4.427	4.734	4.843	
OFFSET	-13.041	-8.856	-4.196	-1.000	1.000	3.905	4.791	

CH 10.000



DATUM RL 1.0

DESIGN SURFACE LEVEL	5.119	4.705	4.319	4.319	4.549	
EXISTING SURFACE LEVEL	5.126	4.133	4.423	4.442	4.549	
OFFSET	-8.316	-4.194	-1.000	1.000	3.300	

CH 30.000

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 2 0 2 4 6m

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CROSS SECTIONS - DRAIN 1
SHEET 1 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C54 OF 61	R24-2322	0	A1

Version: March 2021

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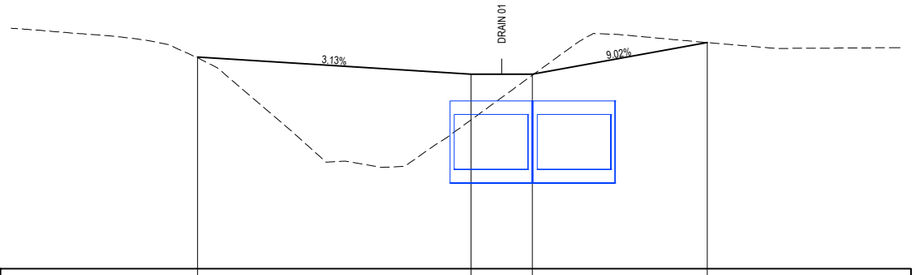
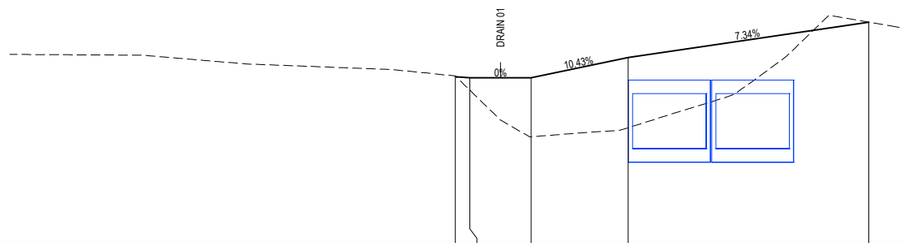


DATUM RL 1.0

DESIGN SURFACE LEVEL	4.449		4.169		4.169		4.685		
EXISTING SURFACE LEVEL	4.439		3.425		4.152		4.684		
OFFSET	-9.924		-1.000		1.000		6.709		

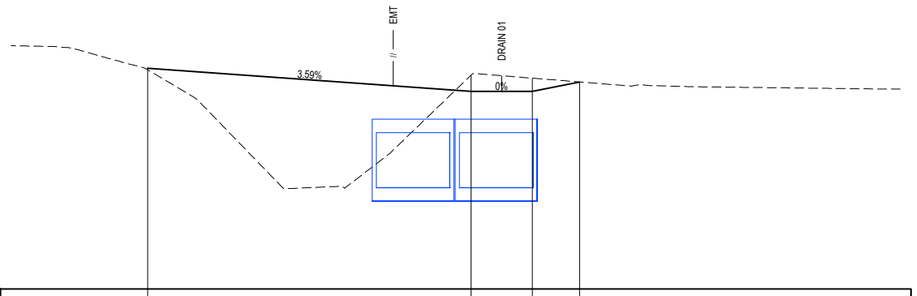
CH 60.000



DATUM RL 1.0

DESIGN SURFACE LEVEL	3.730	3.715	3.715		4.045		4.622		
EXISTING SURFACE LEVEL	3.746	3.514	2.752		2.900		4.622		
OFFSET	-1.475	-1.000	1.000		4.161		12.013		

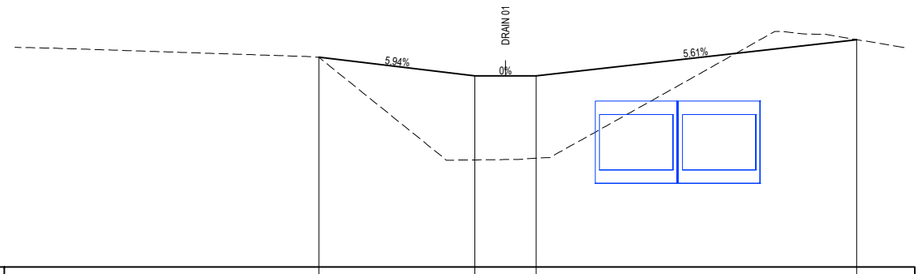
CH 80.000



DATUM RL 1.0

DESIGN SURFACE LEVEL	4.598		4.219		4.219	4.373			
EXISTING SURFACE LEVEL	4.570		4.483		4.435	4.373			
OFFSET	-11.544		-1.000		1.000	2.537			

CH 50.000



DATUM RL 1.0

DESIGN SURFACE LEVEL	4.417		4.115		4.115		4.701		
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OFFSET	-6.089		-1.000		1.000		11.449		

CH 70.000

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 2 0 2 4 6m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
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Drawn: T.BOUNDY Date: -	Checked: A.NAWAZ Date: -
Designed: T.BOUNDY Date: -	Checked: A.NAWAZ Date: -
Design Project Leader: R.KRAKE Date: -	NTG Project Manager: ALI ASHRAF Date: -

Northern Territory Government

DARWIN REGION
KULALUK
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CROSS SECTIONS - DRAIN 1
SHEET 2 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C55 OF 61	R24-2323	0	A1

Version: March 2021

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS
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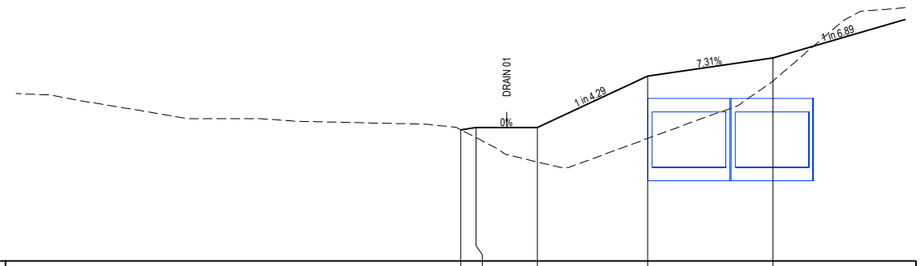

DATUM RL 1.0

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EXISTING SURFACE LEVEL	3.138	3.009	2.613	2.995	3.932		
OFFSET	-1.498	-1.000	1.000	4.595	8.683		

CH 90.000

VERT. SCALE A 1 0 1 2 3m

HOR. SCALE B 2 0 2 4 6m

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY.
0	CONTRACT DRAWING	02.10.24	AN	JACOBS

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Designed T.BOUNDY Date: -	Checked A.NAWAZ Date: -	
Design Project Leader R.KRAKE Date: -	NTG Project Manager ALI ASHRAF Date: -	

Northern Territory Government

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CROSS SECTIONS - DRAIN 1
SHEET 3 OF 3

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment	
LPD08300		C56 OF 61	R24-2324	0	A1

Version: March 2021

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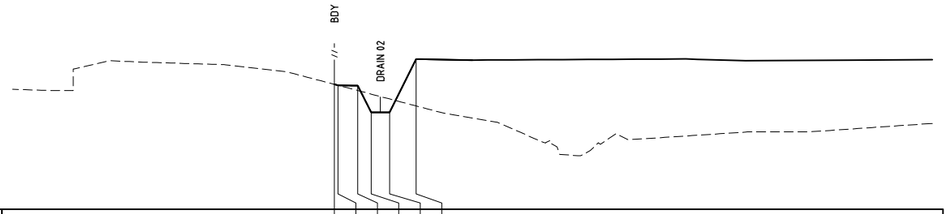

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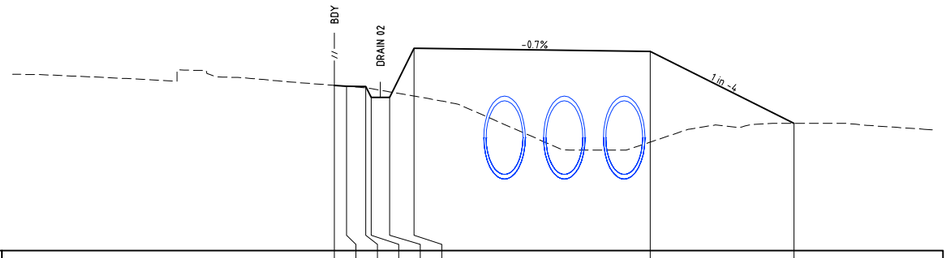

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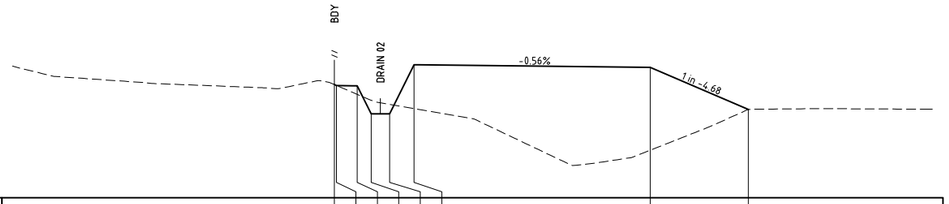

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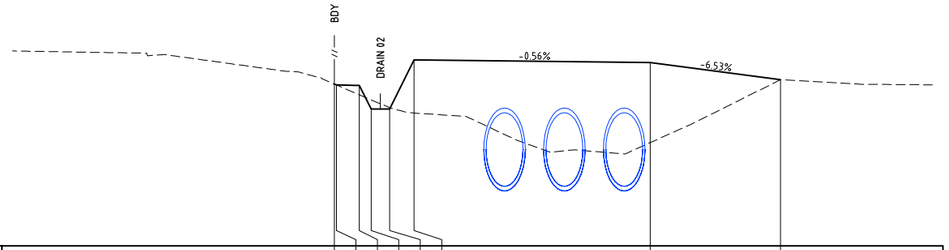

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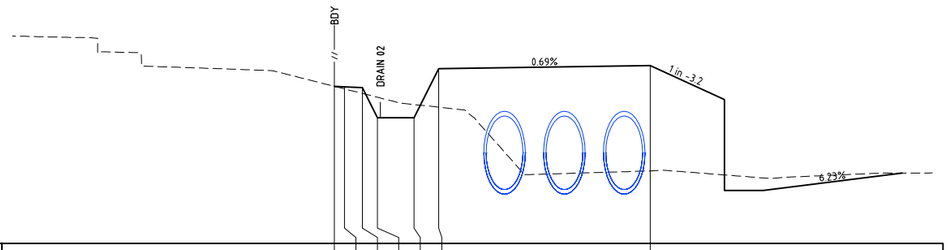

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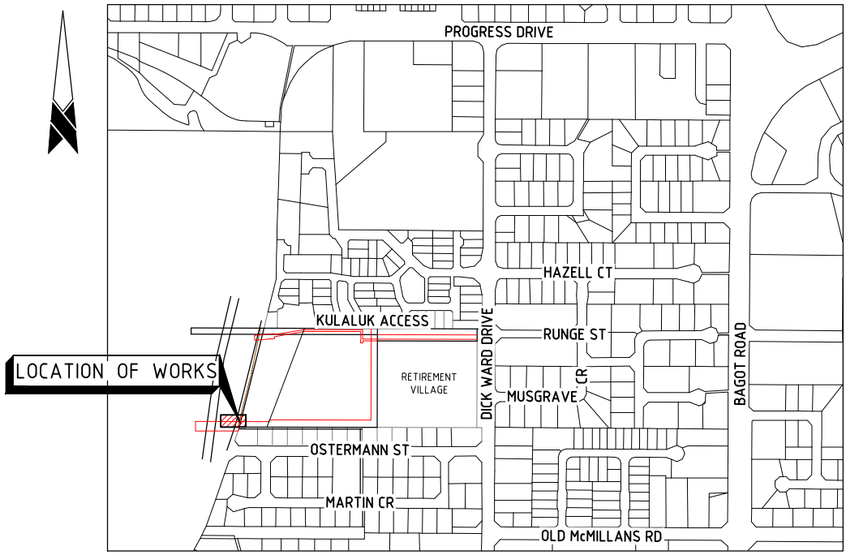
KULALUK - STORMWATER DRAINAGE AND PAVEMENT UPGRADES



LOCALITY PLAN
N.T.S.

SCHEDULE OF DRAWINGS

DRAWING NO.	DRAWING TITLE
B24-17058	SEWER MODIFICATIONS COVER SHEET
B24-17059	SEWER MODIFICATIONS PLAN AND DETAILS
B24-17060	SEWER MODIFICATIONS SECTION SHEET 1
B24-17061	SEWER MODIFICATIONS SECTION SHEET 2
B24-17062	SEWER MODIFICATIONS CULVERT BASE SLAB

MINIMUM REQUIRED INSPECTIONS BY HYDRAULIC CERTIFIER - SEWER

PRE-START MEETING
THE CERTIFYING ENGINEER TO ARRANGE PRE-START MEETING WITH POWER WATER REPRESENTATIVE AND PLUMBING CONTRACTOR.
INSPECTION 1
INSPECT EXCAVATED TRENCH AND VERIFY EMBEDMENT TYPE REQUIRED FOR THE SUBSOIL CONDITION. OTHER EMBEDMENT TYPES MUST BE ENDORSED WITH SUPPORTING GEOTECHNICAL REPORT AND APPROVED BY POWER AND WATER.
INSPECTION 2
VERIFY ALL CONNECTIONS ARE COMPLETED AND ISOLATED FROM EXISTING.
INSPECTION 3
VERIFY ALL PIPE WORK AND CONCRETE STRUCTURES ARE CONSTRUCTED TO DRAWINGS AND SPECIFICATIONS.
INSPECTION 4
WITNESS PRESSURE TEST, DISINFECTION, FLUSHING AND WATER SAMPLING. VERIFY PRESSURE, DISINFECTION AND BACTERIOLOGICAL TESTS HAVE PASSED.
INSPECTION 5
VERIFY ALL AS CONSTRUCTED INFORMATION. CONDUCT HANDOVER WITH POWER AND WATER.
INSPECTION 6
VERIFY ALL OUTSTANDING DEFECTS ARE COMPLETED.

POWER AND WATER STANDARD NOTES

1. GENERAL

WS.1. CONSTRUCTION OF THE WATER AND SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST AMENDMENT OF THE APPROVED PROJECT DRAWINGS AND SPECIFICATION AND THE POWER AND WATER CONNECTION CODE.

WS.2. DRAWINGS MUST BE SIGNED AS 'APPROVED FOR CONSTRUCTION' BY POWER AND WATER PRIOR TO COMMENCING WORKS.

WS.3. THE DEVELOPER MUST SUBMIT THE "DEVELOPMENT WORK PERMIT" WITH ALL RELEVANT DOCUMENTATION AT LEAST SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF WORKS. THE DEVELOPER MUST CONFIRM WITH POWER AND WATER IF A MEETING IS REQUIRED PRIOR TO COMMENCEMENT OF SITE WORKS.

WS.4. PRIOR TO COMMENCEMENT OF WORKS, THE CONSTRUCTOR MUST CHECK THE LOCATION OF ALL UNDERGROUND SERVICES, CONFIRM FINISHED SURFACE LEVELS, CHECK THE MATERIAL, DIAMETER ALIGNMENT, LEVEL AND LOCATION OF EXISTING PIPEWORK AT THE CONNECTION POINTS. IT IS NOT GUARANTEED THAT ALL SERVICES HAVE BEEN SHOWN ON THE DRAWINGS.

WS.5. CHANGES REQUESTED BY ANY PARTY TO THE DESIGN OF THE WORKS DURING ANY STAGE OF THE DEVELOPMENT MUST BE ENDORSED BY THE DESIGNER/CERTIFIER WITH AMENDED DRAWINGS SUBMITTED TO POWER AND WATER FOR APPROVAL PRIOR TO THE CHANGE BEING CARRIED OUT.

WS.6. ALL EXISTING PROPERTY SERVICES ARE TO REMAIN IN SERVICE UNTIL THE CONSTRUCTION OF THE NEW SERVICE IS COMPLETED TO THE SATISFACTION OF POWER AND WATER.

WS.7. ALL LEVELS GIVEN ARE TO AUSTRALIAN HEIGHT DATUM (AHD) IN METRES TO THREE DECIMAL PLACES. PROJECTION SHALL BE BASED ON MGA94 MAP GRID OF AUSTRALIA ZONE 52 OR 53 COORDINATE SYSTEM.

WS.8. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL CHAINAGES AND LEVELS IN METRES UNLESS SHOWN OTHERWISE.

2. EXCAVATION AND BACKFILLING

WS.9. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITY PRIOR TO ANY EXCAVATION. WHERE APPLICABLE, THE CONTRACTOR MUST SEEK A WRITTEN APPROVAL FROM THE LAND OWNER TO ACCESS AND CONSTRUCT WITHIN THEIR PROPERTY. ALL APPROVALS AND PERMITS MUST BE SUBMITTED TO POWER AND WATER AT LEAST SEVEN (7) DAYS PRIOR TO EXCAVATION WORKS.

WS.10. MINIMUM COVER TO PIPE IS 750MM IN TRAFFICABLE AREAS, 600MM IN OTHER AREAS. 1500mm COVER REQUIRED FOR THRUST BORING UNDER ROAD.

WS.11. EMBEDMENT TYPE FOR ALL PIPES MUST BE TYPE 2A OR 2B WRAPPED IN GEOTEXTILE UNLESS NOTED OTHERWISE. ALL OTHER EMBEDMENT TYPES MUST BE ENDORSED BY THE CERTIFIER WITH SUPPORTING GEOTECHNICAL INVESTIGATION, AND APPROVED BY POWER AND WATER.

WS.12. WHEN EMBEDMENT TYPE CHANGES, A VERTICAL GEOTEXTILE BARRIER SHALL BE INSERTED BETWEEN THE EMBEDMENT TYPES.

WS.13. UNLESS NOTED OTHERWISE IN THE DRAWINGS:

A. USE GENERAL OR SELECTED BACKFILL FOR ROAD RESERVES AND GENERAL AREAS

B. USE 3% CEMENT STABILISED SAND FOR ROADWAYS, DRIVEWAYS AND TRAFFICABLE AREAS

C. USE 5% CEMENT STABILISED GRAVEL FOR OPEN UNLINED DRAIN CROSSINGS.

WS.14. REINSTATE ALL SURFACES UPON COMPLETION OF THE WORKS AS SPECIFIED OR TO MATCH EXISTING TO SATISFACTION OF THE RELEVANT AUTHORITY OR PERSONNEL.

3. LIVE CONNECTIONS

WS.15. ONLY AUTHORISED POWER AND WATER PERSONNEL ARE PERMITTED TO UNDERTAKE ANY WORKS, OPERATE AND PHYSICALLY ACCESS LIVE ASSETS. AT NO STAGE SHALL ANY OTHER PERSONS CARRY OUT WORK ON POWER AND WATER INFRASTRUCTURE.

WS.16. THE DEVELOPER IS RESPONSIBLE FOR ALL CONNECTION FEES AND CHARGES. THE DEVELOPER MUST SUBMIT THE "REQUEST FOR CONNECTIONS" FORM AND ALLOW FOR A MINIMUM OF TWENTY-ONE (21) DAYS FOR SCHEDULING CONNECTIONS. POWER AND WATER HAVE NO OBLIGATIONS IN AVAILABILITY FOR REQUESTED CONNECTION DATE AND THE DEVELOPER IS TO NEGOTIATE ALTERNATIVE DATES WITH POWER AND WATER.

4. HANDOVER AND COMMISSIONING

WS.17. THE CERTIFIER MUST SUBMIT THE "HANDOVER REQUEST FORM" WITH ALL RELEVANT DOCUMENTATION AT LEAST SEVEN (7) DAYS PRIOR TO REQUESTED INITIAL HANDOVER INSPECTION DATE.

WS.18. ALL IDENTIFIED DEFECTS MUST BE RECTIFIED BY THE DEVELOPER WITHIN FOURTEEN DAYS (14) OF INITIAL HANDOVER DATE. A FINAL HANDOVER INSPECTION WITH POWER AND WATER MUST BE ARRANGED TO CONFIRM RECTIFICATION OF OUTSTANDING DEFECTS.

WS.19. COMMISSIONING OF GIFTED ASSET WORKS IS UNDERTAKEN BY POWER AND WATER AFTER SUCCESSFUL HANDOVER OF ASSET, RECTIFICATION OF ALL OUTSTANDING DEFECTS AND COMPLETION OF ALL LIVE CONNECTIONS TO EXISTING MAINS.

5. CLEARANCE NOTICES AND LIABILITY PERIOD

WS.20. THE DEVELOPER MUST SUBMIT THE "CLEARANCE REQUEST FORM" WITH ALL RELEVANT DOCUMENTATION AND ALLOW A MINIMUM OF FOURTEEN (14) DAYS TO OBTAIN DEVELOPMENT PERMIT CLEARANCE. ALLOW FOR AN ADDITIONAL FOURTEEN (14) DAYS TO RECTIFY ALL OUTSTANDING DEFECTS AND ISSUES.

WS.21. THE DEFECTS AND LIABILITY PERIOD OF THE ASSET WILL COMMENCE ON THE DATE WHEN DEVELOPMENT CLEARANCE WAS ISSUED BY POWER AND WATER OR DATE OF FINAL ACCEPTANCE OF ASSET.

WS.22. ALL EXTENSIONS AND SUBDIVISIONS ARE SUBJECT TO TWENTY FOUR (24) MONTH DEFECT AND LIABILITY PERIOD. ALL BUILDING DEVELOPMENTS ARE SUBJECT TO TWELVE (12) MONTH DEFECT AND LIABILITY PERIOD.

WS.23. THE DEVELOPER IS FULLY RESPONSIBLE FOR ALL COSTS TO RECTIFY DEFECTS, REPAIR AND EMERGENCY WORKS WITHIN THIS PERIOD. SUCH WORKS WILL RESULT IN AN EXTENDED DEFECTS AND LIABILITY PERIOD OF FIVE (5) YEARS.

WS.24. THE DEVELOPER MUST SCHEDULE AN OFF-MAINTENANCE INSPECTION AT LEAST SEVEN (7) DAYS PRIOR TO REQUESTED INSPECTION DATE. POWER AND WATER WILL TAKE FULL RESPONSIBILITY OF ASSET AFTER ALL DEFECTS HAVE BEEN RECTIFIED AND ALL ASSOCIATED PAYMENT TO REPAIR AND EMERGENCY WORKS HAVE BEEN PAID BY THE DEVELOPER.

6. SEWER (IN CONJUNCTION WITH POWER AND WATER STANDARD DRAWINGS)

S.1. ALL GRAVITY SEWER PIPES SHALL BE UPVC DWV CLASS SN8 WITH STYRENE-BUTADIENE RUBBER RING JOINTS (SBR), UNLESS NOTED OTHERWISE.

S.2. SEWER SHALL BE OFFSET FROM PROPERTY BOUNDARIES A DISTANCE OF 1.6m IN ROAD RESERVES AND 1.5m IN PRIVATE PROPERTY, EXCEPT WHERE SHOWN OTHERWISE ON THE DRAWINGS.

S.3. ALL GRAVITY SEWER ARE TO BE A MINIMUM OF DN150, UNLESS NOTED OTHERWISE.

S.4. THE CONTRACTOR SHALL EITHER INSCRIBE OR ATTACH A PLATE TO THE MAINTENANCE HOLES OR MAINTENANCE SHAFT WITH THE IDENTIFYING NUMBER AS SHOWN ON THE DRAWINGS.

S.5. FLEXIBLE JOINTS WITH CONCRETE SURROUND MUST BE CONSTRUCTED ON BOTH UPSTREAM AND DOWNSTREAM SIDES OF THE MAINTENANCE HOLES. CONCRETE SURROUND MUST BE MINIMUM N32, 300mm THICK WITH 4 x N12 BAR AT EACH CORNER. EACH N12 BAR TO BE COGGED AND EPOXIED MIN 50mm INTO MAINTENANCE HOLE WALL WITH A MIN 50mm COVER.

S.6. DEPTH TO INVERT AT MAINTENANCE HOLES/SHAFT ARE MEASURED FROM THE TOP OF MAINTENANCE HOLES/SHAFT.

S.7. UNLESS NOTED OTHERWISE IN THE DRAWINGS, THE MINIMUM CONCRETE STRENGTH FOR ALL SEWERAGE STRUCTURES INCLUDING MAINTENANCE HOLES MUST BE N50. REFER TO POWER AND WATER STANDARD DRAWING W2-2-01D FOR ADDITIONAL NOTES FOR SEWERAGE STRUCTURES.

S.8. ALIGN MAINTENANCE HOLE COVER SUCH THAT THE LONG SIDE OF THE LID IS PARALLEL WITH THE SEWER MAIN.

S.9. ALL SEWER RISING MAINS MUST BE PVC-O CLASS 16 RRJ, UNLESS NOTED OTHERWISE. NO DEFLECTIONS AT PVC JOINT ARE PERMITTED. 5D-5D DI CONNECTORS (MAXIMUM OF TWO (2) DEGREES) OR DI BENDS MUST BE USED TO ACHIEVE DEFLECTIONS ON PVC PIPES.

S.10. MARKING TAPE COLOURED ORANGE AND MARKED 'SEWER MAIN' MUST BE LAID CONTINUOUSLY AND LOCATED 300mm ABOVE THE SEWER PIPEWORK.

S.11. THE MINIMUM HORIZONTAL CLEARANCE BETWEEN EXISTING SERVICES MUST BE 600mm FOR NEW MAINS UP TO AND EQUAL TO DN200 AND 1000mm FOR NEW MAINS LARGER THAN DN200.

S.12. THE MINIMUM VERTICAL CLEARANCE BETWEEN EXISTING SERVICES MUST BE 300mm FOR NEW MAINS UP TO AND EQUAL TO DN200 AND 500mm FOR NEW MAINS LARGER THAN DN200.

S.13. THE TESTING OF SEWER MAINS AND STRUCTURES MUST BE ACCORDING TO POWER AND WATER'S TEST PROCEDURES GUIDELINE.

HYDRAULIC DESIGN	
CERTIFIER:	RYAN KRAKE
ACCREDITATION NO:	255625EH
SIGNATURE:	R.KRAKE

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APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
0	CONTRACT DRAWING	VX	13.09.2024	AN	RK

AMENDMENTS

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PowerWater
NORTHERN TERRITORY

DES	GC
DRN	VX
CHK	AN
APPD	RK
SCALE	N.T.S.
ISSUED	13.09.2024
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

DARWIN REGION - KULALUK
ROADS AND DRAINAGE UPGRADES
SEWER MODIFICATIONS COVER SHEET

A1 | DRAWING NUMBER B24-17058 | 0 AMDT

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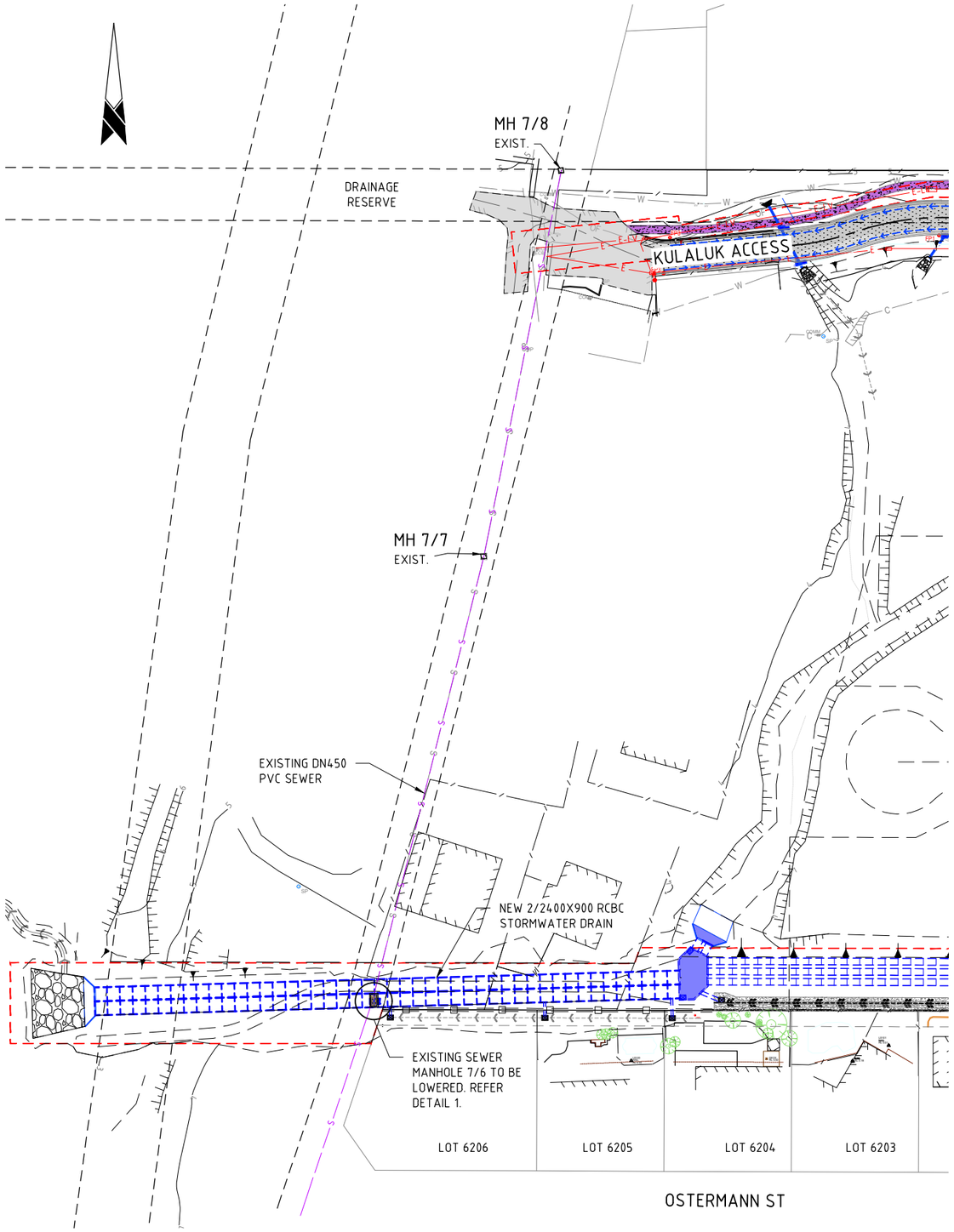
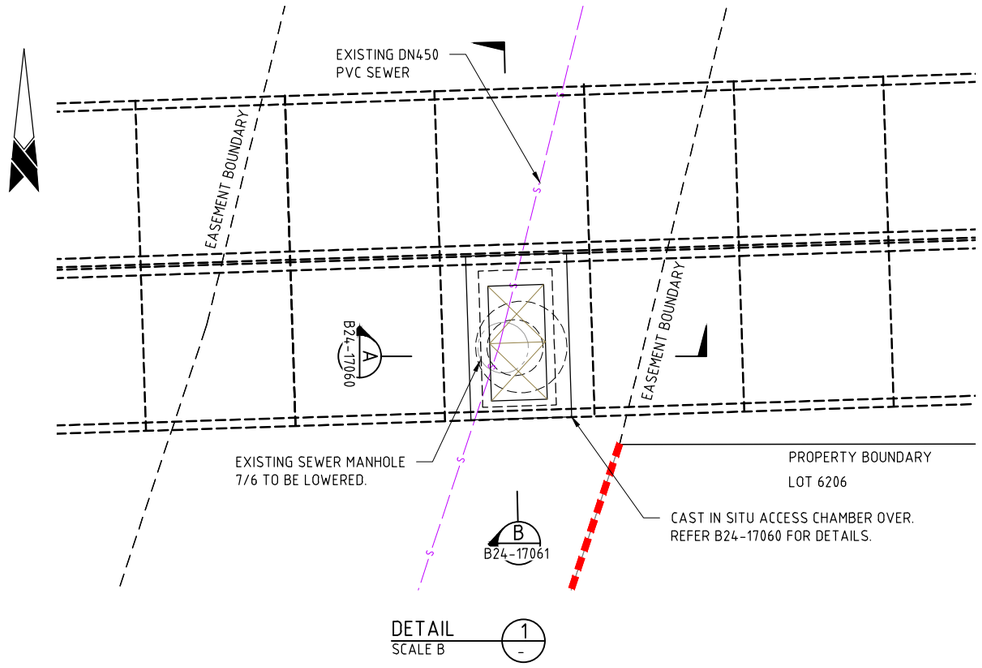


PLAN
SCALE A



DETAIL 1
SCALE B

NOTES

1. REFER TO DRAWINGS R24-2269 TO R24-2329 FOR DOCUMENTATION OF CIVIL AND DRAINAGE WORKS.
2. THE EXISTING SEWER IS TO REMAIN IN SERVICE AT ALL TIMES.
3. COMPLY WITH POWERWATER REQUIREMENTS WHEN WORKING IN OR NEAR SEWER MAINS.
4. MODIFICATIONS AND WORK ON OR IN THE IMMEDIATE VICINITY OF THE SEWER CHAMBER SHALL NOT BE UNDERTAKEN BY ANY PERSONNEL OR SUBCONTRACTORS THAT ARE NOT POWERWATER ACCREDITED FOR SUCH WORK.
5. NON-ACCREDITED PERSONS ARE PERMITTED TO WORK ABOVE, OR IN THE VICINITY OF THE SEWER CHAMBER ONCE THE CHAMBER MODIFICATION IS COMPLETE, IT IS BACKFILLED TO THE UNDERSIDE OF THE CULVERT SLAB, THE CHAMBER IS CLOSED, AND THE MANHOLE COVER IS IN PLACE AND SECURED.
6. DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
7. ALL WORKS SHALL BE DELIVERED BY DIPL CONTRACTOR, BY PROCURING A PWC ACCREDITED CONTRACTOR.

HYDRAULIC DESIGN	
CERTIFIER:	RYAN KRAKE
ACCREDITATION NO:	255625EH
SIGNATURE:	R.KRAKE

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SCALE A 10 0 10 20 30m

SCALE B 1 0 1 2 3m

NO	DESCRIPTION	DRN	DATE	CKD	APPD
0	CONTRACT DRAWING	VX	13.09.2024	AN	RK

AMENDMENTS

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DES	GC
DRN	VX
CHK	AN
APPD	RK
SCALE	N.T.S.
ISSUED	13.09.2024
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

DARWIN REGION - KULALUK
ROADS AND DRAINAGE UPGRADES
SEWER MODIFICATIONS PLAN AND DETAILS

A1 | DRAWING NUMBER B24-17059 | 0 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

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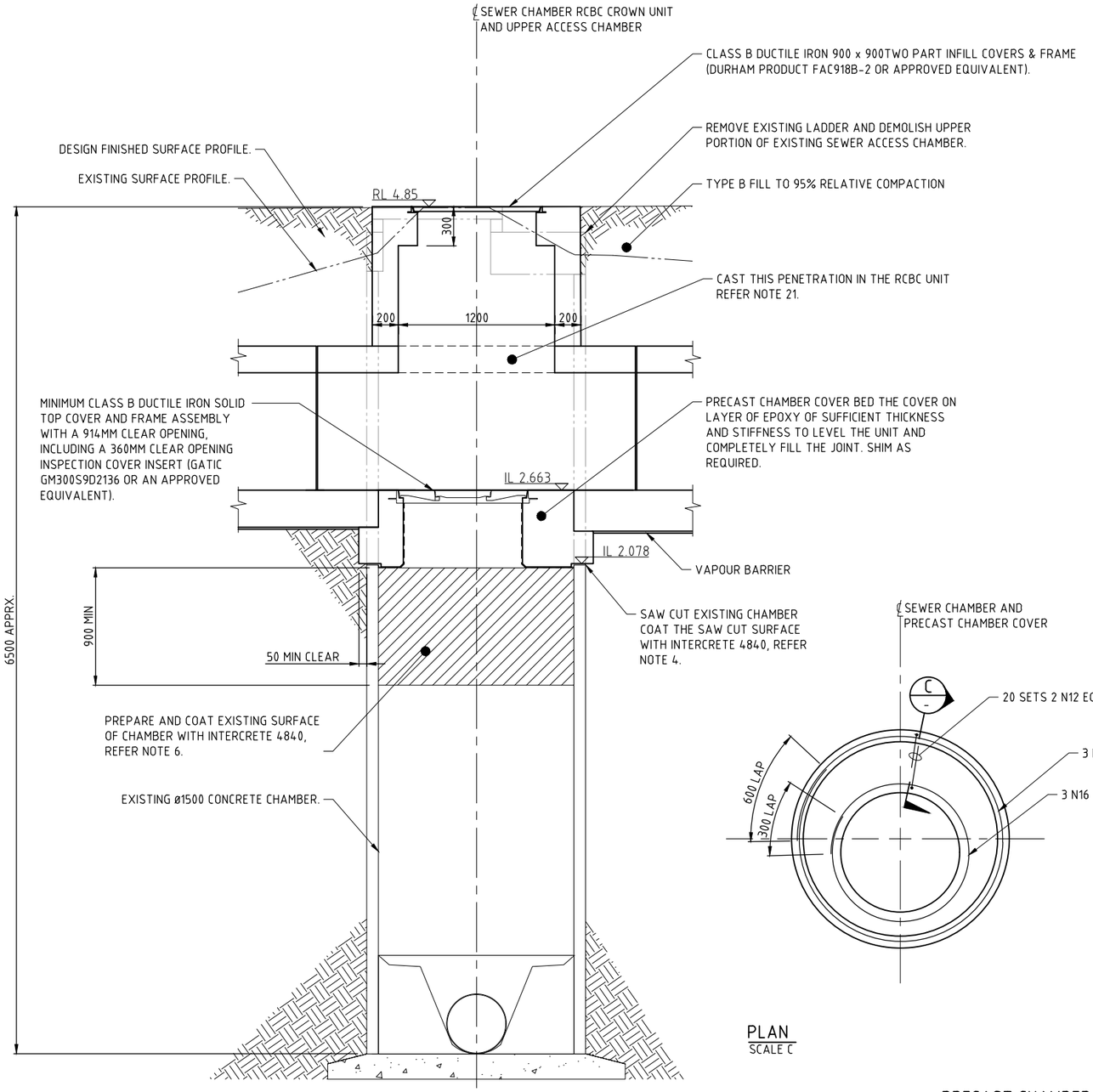

SECTION A
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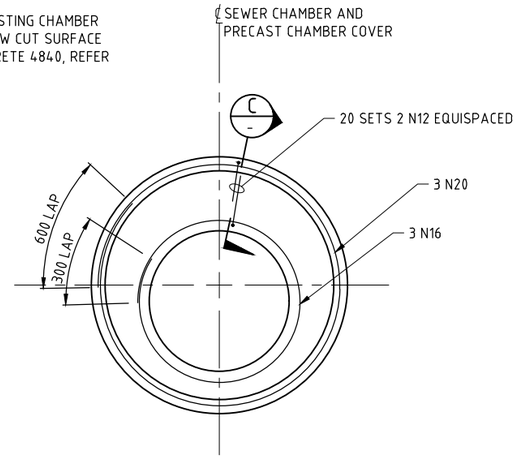
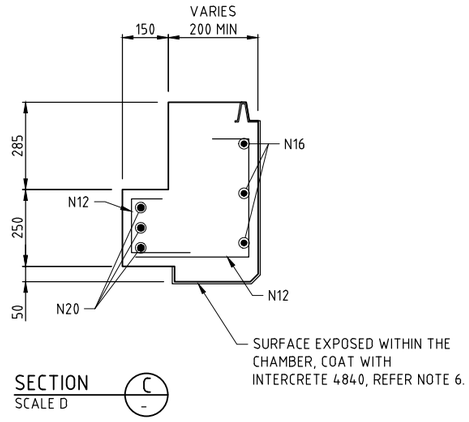
B24-17059



PLAN
SCALE C



SECTION C
SCALE D

NOTES

1. DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

SEWER CHAMBER WORKS

2. SUBMIT THE INTENDED METHOD OF DEMOLITION OF THE CHAMBER AND FOR PREVENTION OF DEBRIS ENTERING THE SEWER TO THE SUPERINTENDENT FOR APPROVAL AT LEAST SEVEN DAYS PRIOR TO INTENDED COMMENCEMENT OF WORK. DO NOT COMMENCE WORK WITHOUT APPROVAL.
3. PREVENT DEBRIS, TOOLS, ET CETERA, FROM FALLING INTO THE SEWER.
4. UNLESS OTHERWISE AGREED, SAW CUT THE PERIMETER OF THE EXISTING CONCRETE CHAMBER AT THE LOWER EXTREMITY OF THE CHAMBER DEMOLITION.
5. VERIFY DIMENSIONS OF EXISTING CHAMBER BY MEASUREMENT ON SITE.
6. SURFACE SEAL THE UPPER PORTION OF THE SEWER CHAMBER, THE SAW CUT SURFACE, AND THE INTERNAL SURFACES OF THE PRECAST CHAMBER COVER WITH A 2000 MICRON THICKNESS COAT OF INTERNATIONAL INTERCRETE 4840 EPOXY AND POLYMER MODIFIED CEMENTITIOUS COATING OR APPROVED EQUIVALENT. PREPARE THE SUBSTRATES AND MIX, HANDLE, APPLY, AND CURE THE COATING STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.
7. EPOXY PROPOSED FOR BEDDING BENEATH THE PRECAST CHAMBER LID SHALL BE APPROVED BY THE SUPERINTENDENT. MIX, HANDLE, APPLY, AND CURE IT STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.

RCBC (REINFORCED CONCRETE BOX CULVERT) BASE SLAB AND PRECAST UNITS

8. UNLESS NOTED OTHERWISE, COMPLY WITH STANDARD DRAWINGS CS3100, CS3101, CS3107, CS3108, SPACE CS31, AND CS3112.
9. SUPPLY OF CONCRETE SHALL COMPLY WITH AS1379.
10. HANDLING AND PLACEMENT AND CONSTRUCTION OF CONCRETE STRUCTURES SHALL COMPLY WITH AS5100 UNLESS OTHERWISE AGREED.
11. COMPLY WITH THE REQUIREMENTS OF AS3850 FOR THE FABRICATION, HANDLING, AND PLACEMENT OF PRECAST CONCRETE ALL ELEMENTS UNLESS NOTED OTHERWISE.
12. DESIGN AND MANUFACTURE REINFORCED CONCRETE BOX CULVERT COMPONENTS IN ACCORDANCE WITH AS1597.2. PROVIDE 2400 X 900/A-2 UNITS.
13. INTERNAL SURFACES OF THE DRAIN ARE CONSIDERED TO BE AS5100 EXPOSURE CATEGORY C2 (TIDAL/SPLASH ZONE) AND BURIED SURFACES AND THOSE CAST AGAINST GROUND ARE CONSIDERED TO BE EXPOSURE CATEGORY B2 (SOMEWHAT AGGRESSIVE).
14. UNLESS OTHERWISE AGREED, CONCRETE EMPLOYED IN THE CAST IN SITU AND PRECAST COMPONENTS SHALL BE S50 (SPECIAL CLASS CONCRETE) HAVING A MINIMUM CHARACTERISTIC STRENGTH OF 50 MPA, MINIMUM CEMENTITIOUS CONTENT OF 470 KG/M^3, A MAXIMUM WATER/CEMENT RATIO OF 0.36 AND IT MUST BE CONTINUOUSLY CURED FOR NOT LESS THAN 14 DAYS.
15. IN ADDITION, A PROPORTION OF ANOTHER CEMENTITIOUS MATERIAL SHALL BE BLENDED WITH ORDINARY PORTLAND CEMENT IN THE PROPORTION CHOSEN FROM TABLE 4.4.1(B) OF AS5100.5 FOR EXPOSURE CLASSIFICATION C2.
16. OTHER METHODS OF PROVIDING THE NECESSARY DURABILITY OF THE CONCRETE MAY BE CONSIDERED AND APPROVED, SUBJECT TO SUBMISSION OF A SUITABLY DETAILED TECHNICAL PROPOSAL.
17. PRECAST COMPONENTS MUST NOT BE SUBJECT TO ANY DEGREE OF TIDAL SUBMERGENCE WITHIN 30 DAYS AFTER CASTING.
18. PROVIDE AT LEAST 50MM MINIMUM CONCRETE COVER TO REINFORCEMENT IN PRECAST COMPONENTS.
19. PROVIDE AT LEAST 75MM MINIMUM CONCRETE COVER TO REINFORCEMENT IN CAST-IN-SITU MEMBERS WHEN CAST AGAINST FORMWORK, 85MM WHEN CAST AGAINST GROUND ON DAMP-PROOF MEMBRANE, AND 105MM WHEN CAST AGAINST GROUND WITHOUT A DAMP-PROOF MEMBRANE.
20. COVER REQUIREMENTS ARE BASED ON THE PROVISION OF CONTINUOUS MOIST CURING. IF CURING MEMBRANES ARE USED, INCREASE COVER BY 10MM AND CORRESPONDINGLY INCREASE MEMBER THICKNESS OR AMOUNT OF REINFORCEMENT IN PROPORTION TO ANY CHANGE IN EFFECTIVE STRUCTURAL DEPTH.
21. IN PRECAST CROWN UNITS THAT WILL HAVE PIPE PENETRATIONS OR PENETRATIONS FOR CAST-IN-SITU ACCESS CHAMBERS, RELOCATE/MOVE THE PRIMARY REINFORCEMENT THAT IS OTHERWISE INTERSECTED BY THE PENETRATION INSTEAD OF CUTTING THE REINFORCEMENT. ADJUST THE SPACING OF THE REINFORCEMENT TO SUIT.

PRECAST CHAMBER COVER DETAILS

HYDRAULIC DESIGN	
CERTIFIER:	RYAN KRAKE
ACCREDITATION NO:	255625EH
SIGNATURE:	R.KRAKE

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SCALE C 0.4 0 0.4 0.8 1.2m

SCALE D 0.2 0 0.2 0.4 0.6m

NO	DESCRIPTION	DRN	DATE	CKD	APPD
0	CONTRACT DRAWING	VX	13.09.2024	AN	RK

AMENDMENTS

JACOBS
ABN 37 001 024 095 and ACN 001 024 095
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PowerWater
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DARWIN REGION - KULALUK
ROADS AND DRAINAGE UPGRADES
SEWER MODIFICATIONS SECTION SHEET 1

A1 | DRAWING NUMBER B24-17060 | 0 AMDT

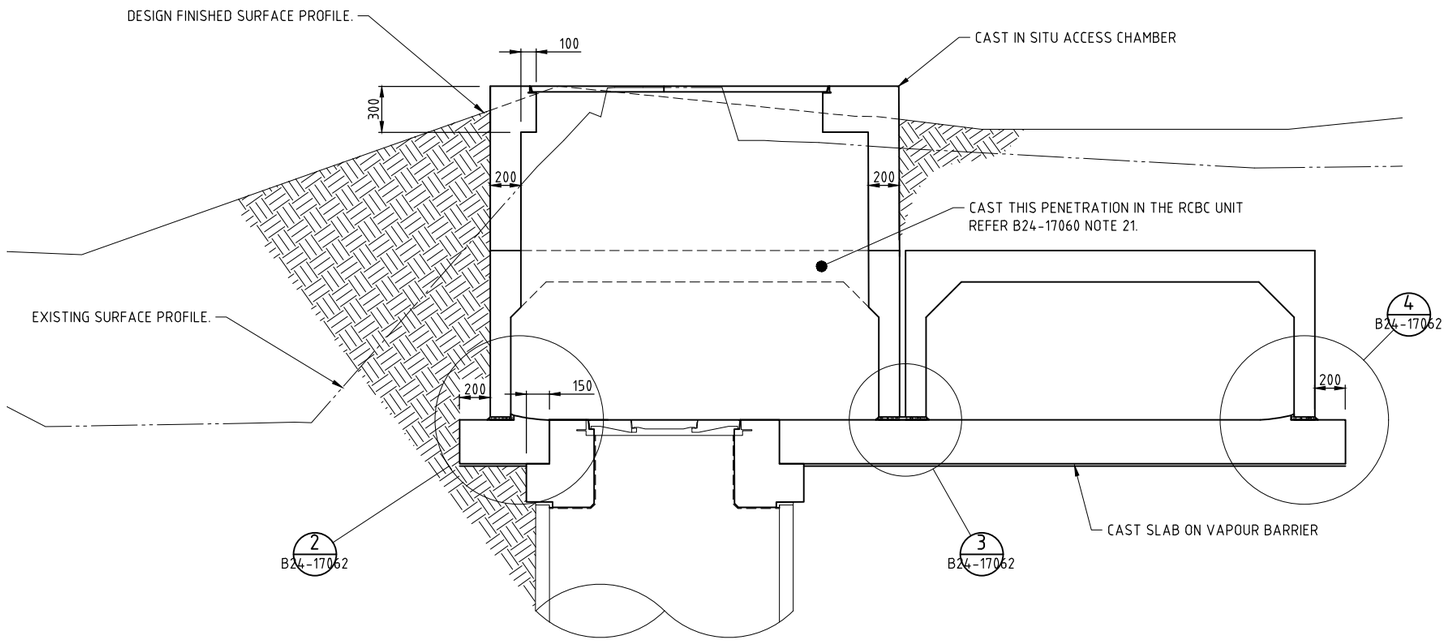
CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

LOCATION: C:\projectwise\jacobs_anz_ie\d0694-37\i\iw284400-0000-CI-DRG-1010.dwg

NOTES

1. DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. REFER TO B24-17060 FOR CONCRETE NOTES.



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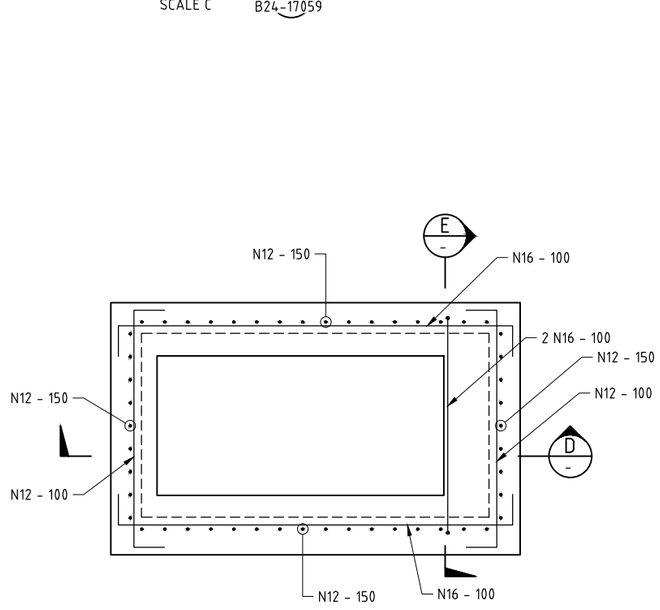

CAST IN SITU ACCESS CHAMBER PLAN
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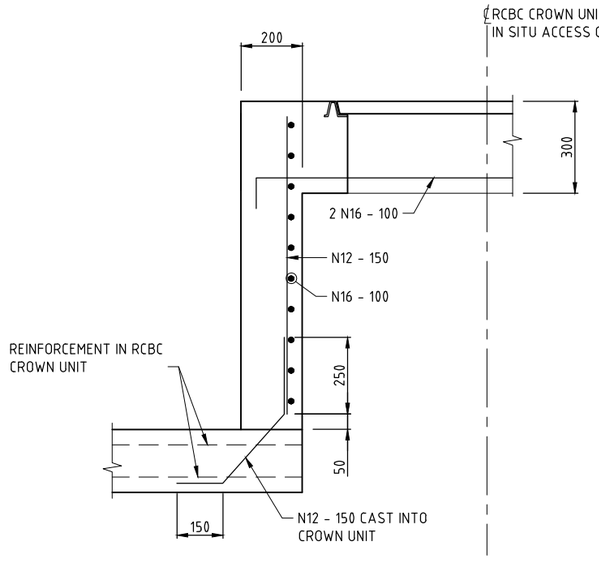

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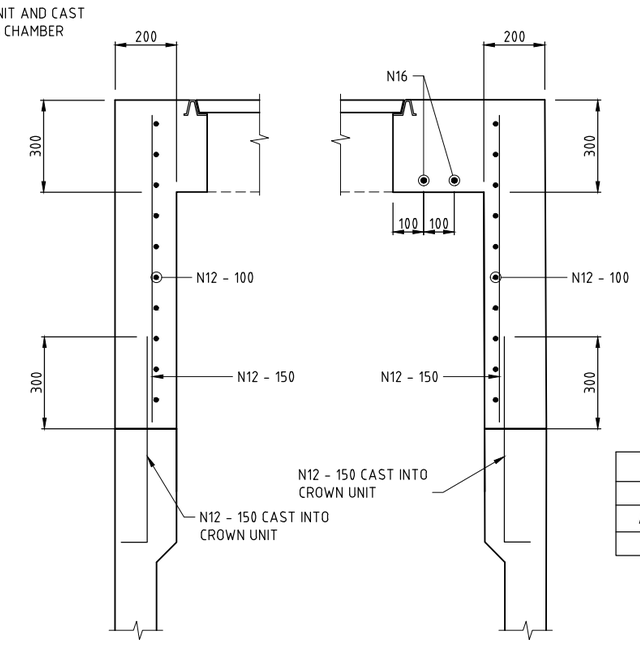

SECTION D
SCALE D

HYDRAULIC DESIGN	
CERTIFIER:	RYAN KRAKE
ACCREDITATION NO:	255625EH
SIGNATURE:	R.KRAKE

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DARWIN REGION - KULALUK
ROADS AND DRAINAGE UPGRADES
SEWER MODIFICATIONS SECTION SHEET 2

A1 | DRAWING NUMBER B24-17061 | 0 AMDT

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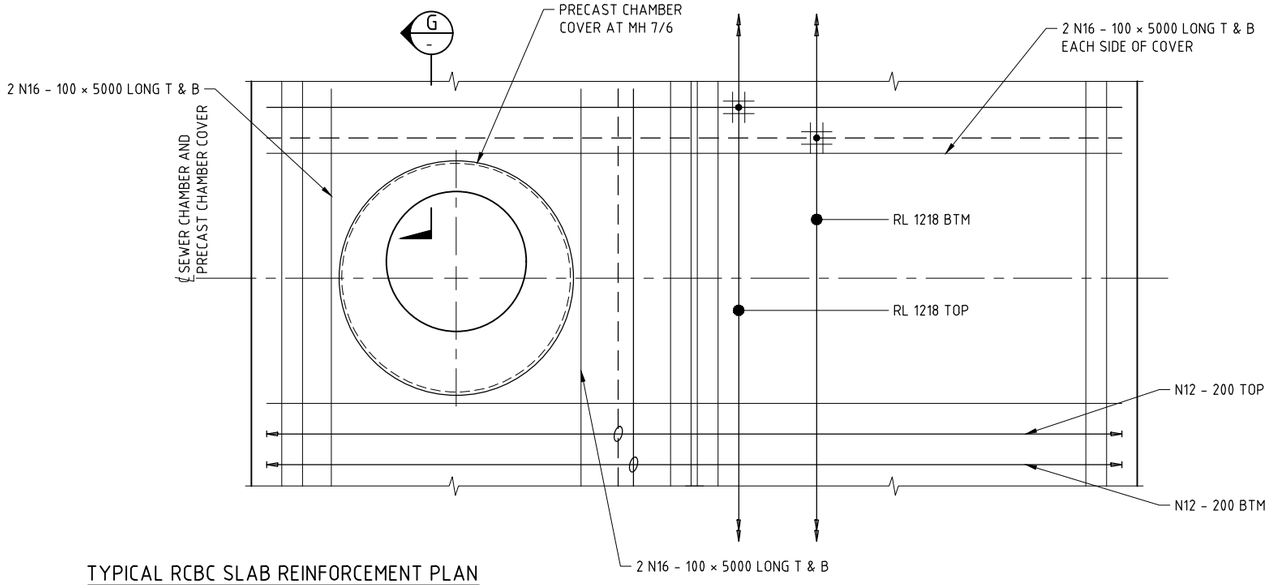

TYPICAL RCBC SLAB REINFORCEMENT PLAN
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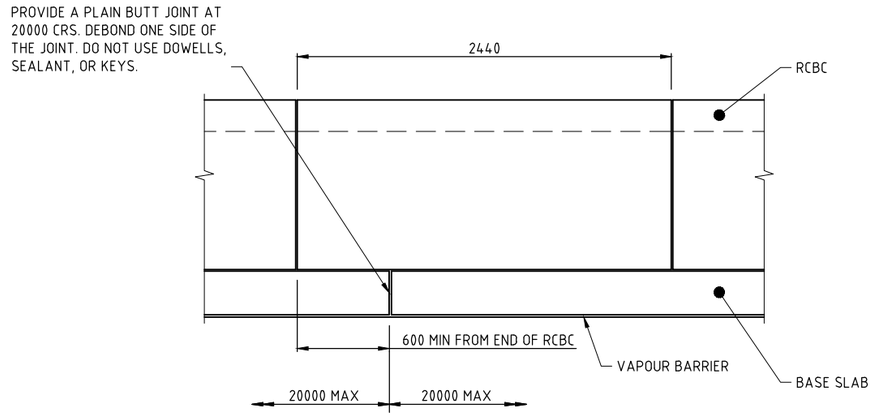

TYPICAL SLAB CONTRACTION JOINT
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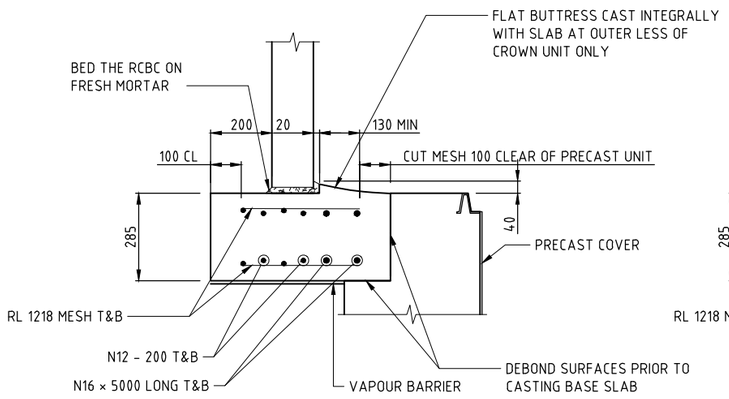

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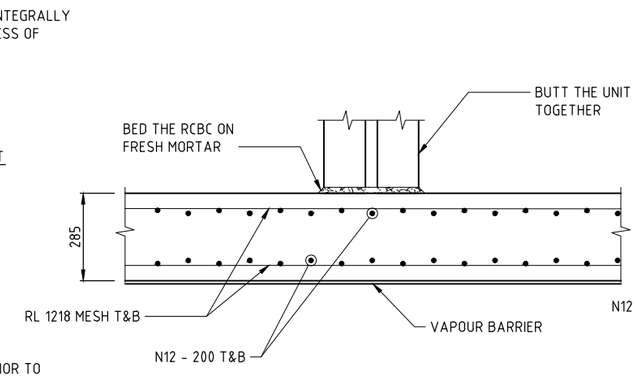

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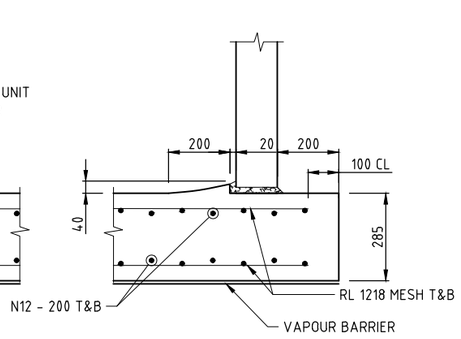

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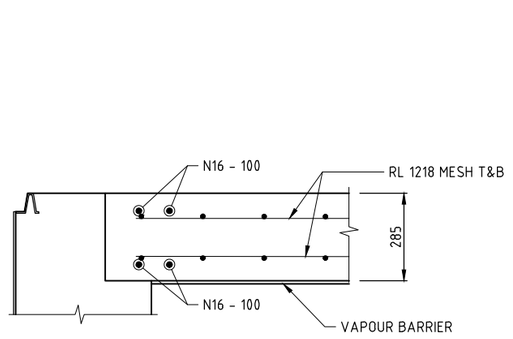

SECTION G
SCALE D -

HYDRAULIC DESIGN	
CERTIFIER:	RYAN KRAKE
ACCREDITATION NO:	255625EH
SIGNATURE:	R.KRAKE

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SCALE D 0.2 0 0.2 0.4 0.6m

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

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DARWIN REGION - KULALUK
ROADS AND DRAINAGE UPGRADES
SEWER MODIFICATIONS SECTION CULVERT BASE SLAB

A1

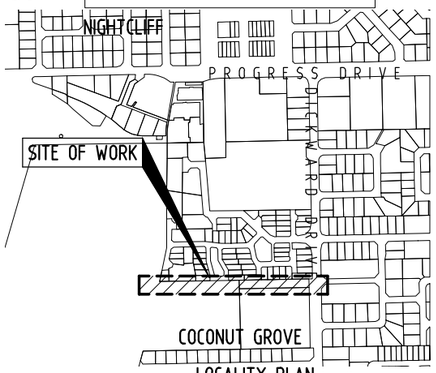
DRAWING NUMBER B24-17062

CAD PRODUCT - DO NOT AMEND MANUALLY

0 AMDT

NORTH

WARNING
BEWARE OF EXISTING UNDERGROUND SERVICES.
CONTRACTOR SHALL CONFIRM LOCATIONS OF SERVICES PRIOR TO EXCAVATION. COORDINATE WITH ALL RELEVANT AUTHORITIES.



LOCALITY PLAN (N.T.S.)

NOTES - GENERAL

1 - ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH CURRENT POWER AND WATER CONSTRUCTION METHODS, REQUIREMENTS & STANDARDS AS DETAILED IN POWER AND WATER DESIGN AND CONSTRUCTION GUIDELINES, UNDERGROUND/OVERHEAD LINE MANUALS & ACCESS TO APPARATUS RULES.

2 - DEVELOPER SHALL ENSURE THAT ONLY POWER AND WATER ACCREDITED ELECTRICAL CONTRACTOR IS EMPLOYED TO CARRY OUT WORK ON THIS ELECTRICAL SYSTEM (CONTACT MANAGER NETWORK ENGINEERING, TELEPHONE No. 8924 5191 - DARWIN).

3 - ELECTRICITY EASEMENTS SHALL BE IN ACCORDANCE WITH POWER AND WATER STANDARD DWG S02-02-06-17.
- SUBSTATION : 4mx3.5m
- UNDERGROUND HV/LV DIST. CABLES : 3m WIDE.
- OVERHEAD LV POWERLINE : 8m WIDE.

DEVELOPER SHALL SURVEY & REGISTER ELECTRICITY EASEMENTS REQUIRED IN FAVOUR OF POWER AND WATER (AT NO COST TO POWER AND WATER).

4 - DEVELOPER SHALL PROVIDE "AS CONSTRUCTED" DRAWINGS AS DETAILED NOTES - WORKS BY CONTRACTOR, NOTE 13.
- COPY OF THE RECEIPT OF PAYMENT.
- COPY OF THE HANDOVER BY DEVELOPER FORM.
- CONTRACTORS CERTIFICATE OF COMPLETION & HANDOVER OF POWER AND WATER NETWORK ASSETS FORM.
- CONSTRUCTION WORKS HAVE PASSED POWER AND WATER FINAL INSPECTION/APPROVAL.

5 - ON PAYMENT OF THE POWER AND WATER INVOICE (AT DEVELOPERS COST) POWER AND WATER WILL INCLUDE THESE WORKS INTO POWER AND WATER SERVICE DELIVERY PROGRAM FOR COMPLETION WITHIN 16 WEEKS OF PAYMENT.

6 - ALL PURCHASED MATERIALS/EQUIPMENT TO CONSTRUCT ELECTRICAL RETICULATION SHALL BE IN ACCORDANCE WITH POWER AND WATER'S RELEVANT STANDARDS/TECHNICAL REQUIREMENTS AND FROM A POWER AND WATER AUTHORISED MANUFACTURER, SPECIFICALLY FOR HIGH VOLTAGE AND LOW VOLTAGE DISTRIBUTION NETWORKS. ANY NON-STANDARD MATERIALS/EQUIPMENT USED WITHOUT OBTAINING PRIOR APPROVAL IN WRITING FROM POWER NETWORKS, ASSET MANAGEMENT QUALITY GROUP CAN BE REJECTED AND REPLACED BY THE APPROVED STANDARD ITEM (AT DEVELOPER'S CONTRACTOR COST) BEFORE POWER AND WATER ACCEPTS THE HANDED-OVER OF ELECTRICAL ASSETS AND ISSUING POWER CLEARANCE FOR THE CONSTRUCTION/DEVELOPMENT. IF UNSURE, CONTACT POWER AND WATER POWER NETWORK ASSET MANAGEMENT QUALITY GROUP ON standardsengineers@powerwater.com.au.

7 - IN COMPLIANCE TO SAFETY REQUIREMENTS REGARDING ACCESS TO APPARATUS RULES, ALL OPENINGS OR TRENCHES IN FRONT OF APPLICABLE POWER ASSETS WHICH ARE CURRENTLY IN SERVICE MUST BE BACKFILLED OR HAVE A SUBSTANTIAL COVER (SUITABLE STEEL PLATE OR 19mm FORM PLY SECURED TO A 150mmx100mm TIMBER CROSS MEMBERS) OVER THE OPENINGS INCLUDING SECURED FENCING WHEN WORKS HAVE BEEN COMPLETED FOR THE DAY IN ORDER TO ALLOW POWER AND WATER'S PERSONNEL SAFE ACCESS TO APPARATUS, AND TO PERFORM ANY SWITCHING IF REQUIRED, IN ADDITION TO CURRENT FENCING ARRANGEMENT.

LEGEND

- NEW PACKAGE SUBSTATION (RATING AS SHOWN).
- NEW DIST. DOUBLE LINK PILLAR (FUSED TYPE).
- NEW ROAD OWNER DIST. PILLAR.
- NEW STREET LIGHTING METERING PANEL.
- EXISTING POLE MOUNTED SUBSTATION TO BE REMOVED.
- EXISTING HV POLE TO BE REMOVED.
- EXISTING HV/LV POLE.
- EXISTING HV/LV POLE WITH EDO's TO BE REMOVED.
- NEW HV/LV POLE.
- EXISTING LV POLE.
- NEW LV POLE.
- EXISTING HV OPEN AERIAL CONDUCTORS.
- EXISTING HV/LV OPEN AERIAL CONDUCTORS TO BE REMOVED.
- EXISTING LV OPEN AERIAL CONDUCTORS.
- EXISTING LV ABC AERIAL CONDUCTOR.
- NEW LV ABC AERIAL CONDUCTOR.
- EXISTING STREET LIGHTING TWISTED AERIAL CONDUCTOR TO BE REMOVED.
- NEW HV TERMINATION.
- EXISTING LV TERMINATION TO BE REMOVED.
- NEW LV TERMINATION.
- EXISTING STREET LIGHT POLE/LUMINAIRE TO BE REMOVED.
- EXISTING STREET LIGHT MOUNTED ON POWER POLE.
- NEW UNDERGROUND HV CABLING - 6.35/11kV 3x1C 240 Sq mm Al, (WATER BLOCKED) XLPE/WBT/SCN/HDPE/NJ/PVC IN 150mm HD uPVC CONDUIT & 1x1C 70 Sq mm Cu, BARE EARTH DIRECT BURIED.
- NEW UNDERGROUND LV DIST. CABLING - 0.6/1kV 4x1C 240 Sq mm Al, XLPE/NJ/MDPE IN 100mm HD uPVC CONDUIT & 1x1C 70 Sq mm Cu, BARE EARTH DIRECT BURIED.
- NEW UNDERGROUND LV SERVICE CABLE (SUPPLY TO ROAD OWNER DIST. PILLAR/STREET LIGHTING METERING PANEL) - 2x1C 25 Sq mm Cu, XLPE/NJ/MDPE IN 50 Sq mm HD uPVC CONDUIT.
- EXISTING UNDERGROUND LV CONSUMER MAINS CABLING. 'ER' INDICATES RELOCATED EXISTING.
- EXISTING UNDERGROUND LV CONSUMER MAINS CABLING TO BE REMOVED.
- NEW CABLE PIT - TYPE 'A' IN ACCORDANCE WITH POWER AND WATER STD DWG S02-02-06-10 (1.97mx1.95m CLEAR OPENING). FIT WITH 'DURHAM' HEAVY DUTY GATIC LIDS.
- NEW CABLE PIT - TYPE 'C' IN ACCORDANCE WITH POWER AND WATER STD DWG S02-02-06-10. FIT WITH 'DURHAM' HEAVY DUTY GATIC LIDS.
- NEW CABLE PIT - 'ACO' TYPE 52 WITH RISER/DUCTILE IRON RHINOCAST CLASS D LID/IRON FRAME.
- NEW CABLE PIT - TYPE IN ACCORDANCE WITH POWER AND WATER STD DWG S03-01-06-01 WITH CONCRETE SURROUND.
- NEW SAND PIT - 2000x2000x600D (EXCEPT SP1/SP5 1000x1000x600D) WITH A MINIMUM COVER OF 0.9m TO TOP OF CONDUITS.
- NEW HD uPVC CAT 'A' CONDUIT (NUMBER/SIZE AS SHOWN).

NOTES - WORKS BY POWER AND WATER (AT DEVELOPERS COST)

1 - CONTRACTOR SHALL ARRANGE FOR POWER AND WATER TO CARRY OUT THE FOLLOWING WORKS (AT DEVELOPERS COST):
a) INSTALL TOP SECTION OF NEW POLE 13 (SUPPLIED/DELIVERED TO SITE BY CONTRACTOR) & SUPPLY/INSTALL NEW HV X-ARM/LV SERVICE X-ARM & ALL POLE HARDWARE/NEW 400A LV FUSED LINKS. PULL THROUGH NEW HV/LV CABLING FROM NEW SUB 3600 HV SW21799/DIST. PILLAR P014CG (LEFT COILED AT BASE OF POLE 13 BY CONTRACTOR) & CONNECT/TERMINATE TO NEW HV LINKS 21798 INCLUDING DRESSING POLE FOR HV TERMINATION & PROVIDE MECHANICAL PROTECTION BARRIER, PULL THROUGH NEW LV DIST. CABLING (FROM NEW DIST. PILLAR P014CG) & CONNECT/TERMINATE TO NEW 400A LV FUSED LINKS WITH 250A FUSES INCLUDING DRESSING POLE FOR LV TERMINATION & PROVIDE MECHANICAL PROTECTION BARRIER.
b) INSTALL TOP SECTION OF NEW POLE 12 (SUPPLIED/DELIVERED TO SITE BY CONTRACTOR) & SUPPLY/INSTALL NEW LV X-ARM PULL THROUGH NEW LV DIST. CABLING (FROM NEW SUB 3600 LV SECTION 1 OFF 630A STRIPPLE FUSE UNIT) & NEW LV SERVICE CABLING (FROM NEW SLMP) LEFT COILED AT BASE OF POLE 12 BY CONTRACTOR & CONNECT/TERMINATE TO NEW 630A LV SOLID LINKS/NEW 1x100A FUSE BASE RESPECTIVELY INCLUDING DRESSING POLE FOR 2 OFF LV TERMINATIONS & SUPPLY/INSTALL 2 OFF NEW MECHANICAL PROTECTION. SUPPLY/INSTALL NEW LV ABC AERIAL CONDUCTOR BETWEEN EXISTING POLE 6/NEW POLE 12 & CONNECT/TERMINATE EACH END.
c) SUPPLY SUBSTATION/HV SWITCHES NUMBER PLATES (LABELS) FOR CONTRACTOR TO INSTALL.
d) CARRY OUT EARTH TESTS.
e) TEST & COMMISSION NEW OVERHEAD/UNDERGROUND RETICULATION & NEW POWER AND WATER SUBSTATION 3600.
f) PROVIDE 200kVA BACKUP GENERATOR FOR LOT 4543 (141) DICKWARD DRIVE.
g) DISCONNECT EXISTING HV AERIALS/LV ABC AERIAL CONDUCTORS FROM EXISTING POLE 1 PULL BACK TO NEW POLE 13, CUT & CONNECT/TERMINATE. CUT TOP SECTION OF EXISTING POLE 1 (TO ENABLE CONTRACTOR TO REMOVE INCLUDING COMPLETE FOOTING/FOUNDATION).
h) DISCONNECT EXISTING LOT 4543 CONSUMER MAINS UNDERGROUND CABLES (4x1C 120 Sq mm Cu XLPE) FROM EXISTING POLE 1 (CONTRACTOR TO PULL BACK TO NEW DIST. PILLAR P014CG AND CONNECT/TERMINATE TO 630A STRIPPLE FUSE BASE).
i) DISCONNECT/REMOVE EXISTING LV AERIAL CONDUCTORS BETWEEN EXISTING POLES 5/6. DISCONNECT EXISTING STREET LIGHTING TWISTED AERIAL CONDUCTOR FROM EXISTING POLE 5 (TO ENABLE CONTRACTOR TO REMOVE BETWEEN EXISTING POLE 5/EXISTING STREET LIGHTS S1780/S1802 TO S1805.
j) CARRY OUT PHASE ROTATION/POLARITY TESTING ON NEW LV SERVICE.
k) DISCONNECT/REMOVE EXISTING HV AERIAL CONDUCTORS BETWEEN EXISTING POLES 1/5 (CONTRACTOR TO REMOVE COMPLETE POLES & FOOTINGS/FOUNDATIONS). BRACE EXISTING POLE 1 DURING CONTRACTOR ELECTRICAL WORKS IN THE VICINITY OF EXISTING POLE 1.
l) DISCONNECT/REMOVE EXISTING SUB 1092 TRANSFORMER FROM EXISTING POLE 5. CUT TOP SECTION OF EXISTING POLE 5 (TO ENABLE CONTRACTOR TO REMOVE INCLUDING COMPLETE FOOTING/FOUNDATION).

2 - DEVELOPER SHALL PAY ALL ASSOCIATED COSTS FOR POWER AND WATER TO CARRY OUT ABOVE WORKS.
POWER AND WATER's FINAL CONNECTION QUOTE FOR PAYMENT SHALL ONLY BE PROVIDED TO DEVELOPERS SUCCESSFUL ELECTRICAL CONTRACTOR WITH A WRITTEN ADVICE BY THE DEVELOPER.

NOTES - WORKS BY DEVELOPERS CONTRACTOR (AT DEVELOPER'S COST)

GIFTED ASSETS

1 - CONTRACTOR SHALL CARRY OUT ALL WORKS AS DETAILED INCLUDING THE FOLLOWING:
- REMOVE EXISTING POLES 1 TO 5 INCLUDING COMPLETE FOOTINGS/FOUNDATIONS & BACKFILL/COMPACT HOLES (POWER AND WATER TO DISCONNECT/REMOVE EXISTING HV AERIAL CONDUCTORS).
- DISCONNECT/REMOVE EXISTING OVERHEAD STREET LIGHTING AERIAL CONDUCTOR BETWEEN EXISTING POLE 5 (TO BE DISCONNECTED FROM POLE 5 BY POWER AND WATER) AND STREET LIGHT S1805. REMOVE ALL REDUNDANT STREET LIGHT POLES INCLUDING COMPLETE FOOTINGS/FOUNDATIONS & BACKFILL/COMPACT HOLES.
- SUPPLY/INSTALL NEW OVERHEAD/UNDERGROUND HV/LV RETICULATION (INCLUDING TREE/VEGETATION CLEARING).

2 - PRIOR TO COMMENCING WORK ON SITE, CONTRACTOR SHALL OBTAIN RELEVANT PERMITS & (AND PAY ANY ASSOCIATED COSTS) LIAISE WITH ALL RELEVANT AUTHORITIES TO ENSURE ALL EXISTING UNDERGROUND SERVICES ARE LOCATED (PRIOR TO TRENCH EXCAVATION). CONTACTS ARE 1800 245 091 (POWER AND WATER), BRADLEY BOOTS - 0427 301647 (TELSTRA) & "DIAL BEFORE YOU DIG" - 1100. CONTRACTOR SHALL BE RESPONSIBLE/LIABLE FOR COST OF REPAIRS TO ANY EXISTING SERVICES DAMAGED. CONTRACTOR SHALL REMOVE SURPLUS MATERIAL & CLEAN SITE AT COMPLETION OF WORKS. CONTRACTOR SHALL PROVIDE SUFFICIENT WARNING SIGNS & BARRIERS TO COMPLY WITH RELEVANT CURRENT WORK HEALTH ACT DURING CONSTRUCTION WORKS.

3 - CONTRACTOR SHALL LIAISE WITH POWER AND WATER TO COORDINATE CONNECTION OF THE WORK INTO EXISTING OVERHEAD RETICULATION INCLUSIVE OF ANY REWORKING.

4 - CONTRACTOR SHALL CONTACT & SUBMIT AN OVERHEAD/UNDERGROUND INSTALLATION PROGRAM TO POWER AND WATER DEMAND AND DEVELOPMENT SERVICES (DDS) VIA EMAIL (connection.development@powerwater.com.au) 30 DAYS PRIOR TO ANY CONSTRUCTION WORKS BEING CARRIED OUT. INSTALLATION PROGRAM SHALL BE AGREED BY DDS" 7 DAYS PRIOR TO WORKS COMMENCING. **ANTICIPATED CONSTRUCTION COMMENCEMENT DATE IS NOVEMBER 2024.**

5 - POLE FOUNDATION ARRANGEMENT SHALL BE TROWEL FINISHED AND CONCRETE RESIDUE TO BE REMOVED FROM POLE - REFER DWG No. B23-5716, DETAIL A. POLE EARTHING SHALL BE IN ACCORDANCE WITH POWER AND WATER STANDARD DWG S01-02-03-19 OF OVERHEAD LINE MANUAL. POLE SHALL BE BOLTED CONNECTION TYPE IN ACCORDANCE WITH POWER AND WATER STANDARD DWG S01-01-01-08.

6 - SUBSTATION SHALL BE SUPPLIED BY CONTRACTOR AND SHALL BE MK3 (11kV/433V) TYPE IN ACCORDANCE WITH POWER AND WATER STANDARD DWG's S02-01-07-18_1, S02-01-07-18_2, S02-01-07-18_3 & S02-01-07-18_4. SUBSTATION SHALL BE INSTALLED BY CONTRACTOR IN ACCORDANCE WITH POWER AND WATER STANDARD DWG's S02-02-05-10, S02-02-06-33, S02-02-06-37_1, S02-02-06-37_2, S02-02-06-37_3, S02-02-06-37_4, S02-02-06-40_1, S02-02-06-40_2 & S02-01-05-12. "ARMCO" SAFETY BARRIERS ARE NOT REQUIRED. CONTRACTOR SHALL DELIVER/PICK UP TO/FROM POWER AND WATER BEN HAMMOND WORKSHOP AND ARRANGE FOR POWER AND WATER TO TEST NEW SUBSTATION/HV SWITCHGEAR & SUPPLY/INSTALL NEW SIM CARD FOR TARIFF METER FOR NEW SUBSTATION. CONTACT "TEST & PROTECTION", TELEPHONE No. 8985 7186. SUBSTATION SHALL BE POWDER COATED TO AS 3715 COLOR - 'HERITAGE GREEN'.

7 - FUSED DISTRIBUTION PILLAR SHALL BE SUPPLIED AND INSTALLED BY CONTRACTOR AND LABELLED IN ACCORDANCE WITH POWER AND WATER REQUIREMENTS. LABEL SHALL BE PROVIDED BY CONTRACTOR. PILLAR SHALL BE TYPE IN ACCORDANCE WITH POWER AND WATER STANDARD DWG S02-02-03-08 & INSTALLATION IN ACCORDANCE WITH POWER AND WATER STD DWG's S02-02-03-12 & S02-02-03-13.

8 - CONTRACTOR SHALL COORDINATE SITE INSPECTION BY POWER AND WATER PROJECT OFFICER AT FOLLOWING STAGES:
- POLE LOCATIONS BEFORE BORING OF HOLES.
- CONCRETING OF POLES.
- CONDUIT INSTALLATION.
- PULLING OF UNDERGROUND HV/LV DIST. CABLING.
- INSTALLATION OF EARTHING REQUIREMENTS.
- VEGETATION CLEARING.
- COMPLETION OF CONSTRUCTION.

9 - HV CABLING SHALL BE TYPE IN ACCORDANCE WITH POWER AND WATER STD DWG S02-01-01-25. LV CABLING SHALL BE TYPE IN ACCORDANCE WITH POWER AND WATER STD DWG's S02-01-01-19 & S02-01-01-20. CONTRACTOR SHALL SUPPLY/INSTALL 1x1C 70 Sq mm Cu, BARE EARTH CABLE WITH NEW UNDERGROUND HV CABLE. ALSO REFER DWG No. B23-5716, DETAILS B TO G.

10 - CONTRACTOR SHALL PROVIDE EARTHING FOR NEW POWER AND WATER HV TERMINATION GENERALLY IN ACCORDANCE WITH DWG No. B23-5716, "EARTHING INSTALLATION ADVICE". CONTRACTOR SHALL CARRY OUT SOIL RESISTIVITY TESTS TO PROPOSED POWER AND WATER HV TERMINATION SITE & CONFIRM EARTHING REQUIRED TO BE INSTALLED TO ACHIEVE TEST RESULTS OF LESS THAN 30 OHMS FOR HV TERMINATION & 1 OHM WITH M.E.N. CONNECTED.

11 - CONTRACTOR SHALL SUPPLY/INSTALL ALL MATERIALS FOR PROJECT EXCLUDING ALL MATERIALS ASSOCIATED WITH WORKS BY POWER AND WATER. CONTRACTOR SHALL INSTALL ALL NUMBER PLATES (LABELS) REQUIRED BY POWER AND WATER IE SUBSTATION & PILLARS, NOTE - SUBSTATION NUMBER PLATES & HV SWITCHES NUMBER PLATES WILL BE PROVIDED BY POWER AND WATER TO CONTRACTOR. CONTRACTOR SHALL LABEL ALL CABLE DESTINATIONS IN ACCORDANCE WITH POWER AND WATER STANDARD DRAWING S02-01-08-25.

12 - CONTRACTOR SHALL SUBMIT TO POWER AND WATER ON COMPLETION OF WORK, SIGNED COPY OF "CONTRACTOR CERTIFICATE OF COMPLETION & HANDOVER OF POWER NETWORK ASSETS".

13 - CONTRACTOR SHALL PROVIDE "AS CONSTRUCTED" DETAILS AS REQUIRED IN POWER AND WATER'S "POWER NETWORKS DESIGN AND CONSTRUCTION GUIDELINES". THE "AS CONSTRUCTED" DRAWINGS SHALL INCLUDE:
- 1xA1/1xA3 PAPER PRINT INDICATING "AS CONSTRUCTED" (OF ALL DRAWINGS).
- 1 DIGITAL (USB) COPY OF ALL DRAWINGS ('MICROSTATION' .DGN FILES).

DEVELOPER TO THEN PROVIDE ABOVE "AS CONSTRUCTED" DRAWINGS/SURVEY PLAN TO POWER AND WATER.

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

DEVELOPER:
DEPARTMENT OF INFRASTRUCTURE, PLANNING & LOGISTICS
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CONTACT: ALI ASHRAF

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ELECTRICAL & MECHANICAL
ACN 070 242 296

GPO BOX 3897
DARWIN NT 0801

MOBILE : 0411 262714
EMAIL: aleks@agaeng.com.au

NO	DESCRIPTION	DRN	DATE	APPD
0	CONTRACT DRAWING	K.T.	3-9-23	AG

AMENDMENTS

DRG NO	TITLE
B23-5717	HV SCHEMATICS & SINGLE LINE DIAGRAM
B23-5716	NOTES & DETAILS
B23-5715	SCHEDULES
B23-5714	CONDUIT/DUCT LAYOUT
B23-5713	HV/LV ELECTRICAL RETICULATION
B23-5712	HV/LV ELECTRICAL & STREET LIGHTING RETICULATION

ASSOCIATED DRAWINGS

DRAWING STATUS		APPD	DATE
P	PRELIMINARY/PROPOSED		
T	TENDERING PURPOSES ONLY		
AC	APP. FOR CONSTRUCTION		
AI	AS INSTALLED		
C	CANCELLED/SUPERSEDED		
	AGA477-1A		

PowerWater
NORTHERN TERRITORY

DES	A.GANGUR
DRN	K.TAVENER
CKD	A.GANGUR
APPD	
SCALE	N.T.S.
ISSUED	3-9-24
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER SERVICES – DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE – COCONUT GROVE
LOCALITY PLAN, NOTES & LEGEND

A1

DRAWING NUMBER **B23-5711**

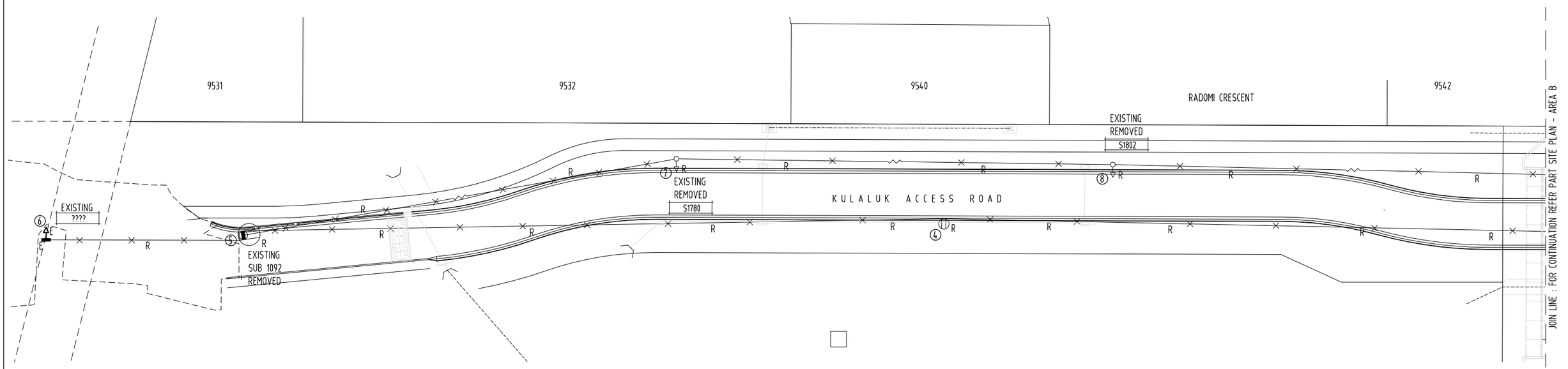
FILE No: NE550/8630

0 AMDT

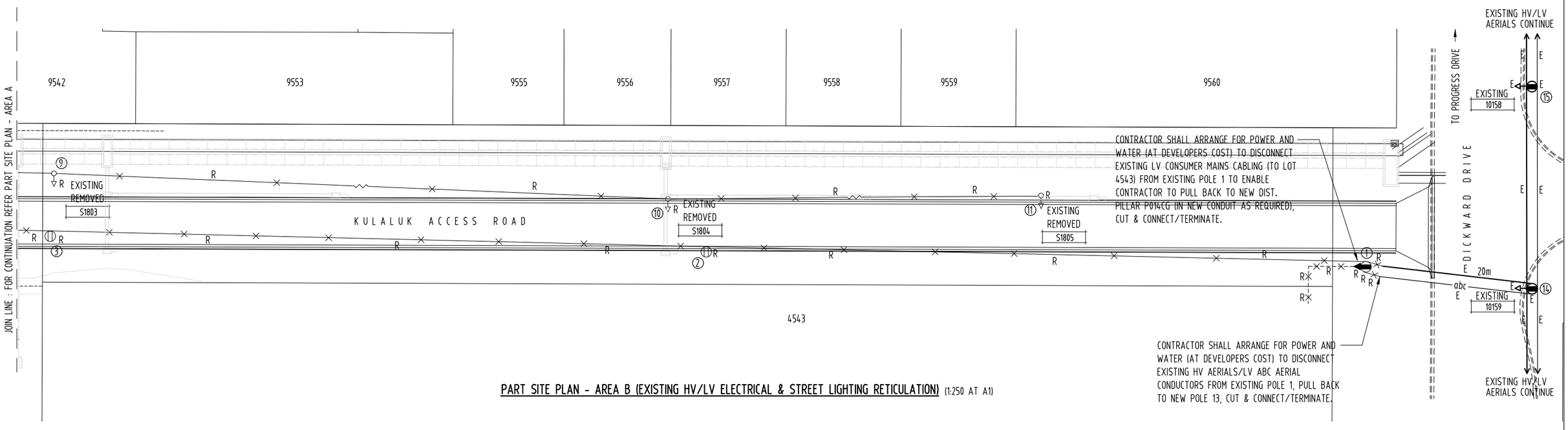
NORTH

WARNING
BEWARE OF EXISTING UNDERGROUND SERVICES. CONTRACTOR SHALL CONFIRM LOCATIONS OF SERVICES PRIOR TO EXCAVATION. COORDINATE WITH ALL RELEVANT AUTHORITIES.

GIFTED ASSETS



PART SITE PLAN - AREA A (EXISTING HV/LV ELECTRICAL & STREET LIGHTING RETICULATION) (1:250 AT A1)



PART SITE PLAN - AREA B (EXISTING HV/LV ELECTRICAL & STREET LIGHTING RETICULATION) (1:250 AT A1)

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

DEVELOPER:
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AMENDMENTS

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B23-5713	HV/LV ELECTRICAL RETICULATION
B23-5711	LOCALITY PLAN, NOTES & LEGEND

ASSOCIATED DRAWINGS

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PowerWater
NORTHERN TERRITORY

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POWER SERVICES - DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE - COCONUT GROVE
HV/LV ELECTRICAL & STREET LIGHTING RETICULATION

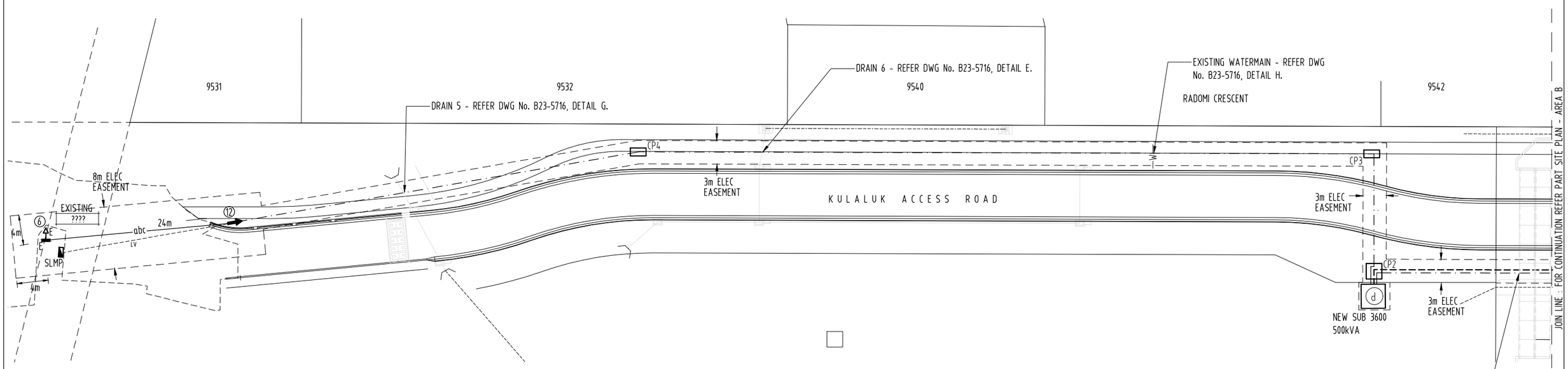
A1 | DRAWING NUMBER B23-5712 | 0 AMDT

FILE No: NE550/8630

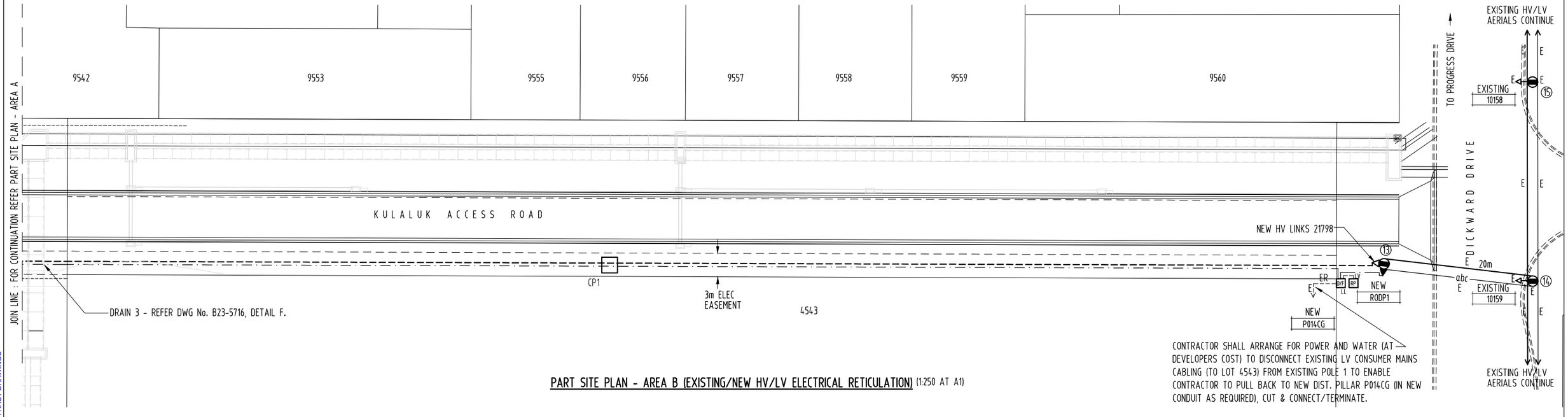
NORTH

WARNING
BEWARE OF EXISTING UNDERGROUND SERVICES. CONTRACTOR SHALL CONFIRM LOCATIONS OF SERVICES PRIOR TO EXCAVATION. COORDINATE WITH ALL RELEVANT AUTHORITIES.

GIFTED ASSETS



PART SITE PLAN - AREA A (EXISTING/NEW HV/LV ELECTRICAL RETICULATION) (1:250 AT A1)



PART SITE PLAN - AREA B (EXISTING/NEW HV/LV ELECTRICAL RETICULATION) (1:250 AT A1)

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

DEVELOPER:
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NO	DESCRIPTION	DRN	DATE	APPD
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AMENDMENTS

DRG NO	TITLE
B23-5717	HV SCHEMATICS & SINGLE LINE DIAGRAM
B23-5716	NOTES & DETAILS
B23-5715	SCHEDULES
B23-5714	CONDUIT/DUCT LAYOUT
B23-5712	HV/LV ELECTRICAL & STREET LIGHTING RETICULATION
B23-5711	LOCALITY PLAN, NOTES & LEGEND

ASSOCIATED DRAWINGS

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AGA477-1A

PowerWater
NORTHERN TERRITORY

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POWER SERVICES - DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE - COCONUT GROVE HV/LV ELECTRICAL RETICULATION

A1

DRAWING NUMBER **B23-5713**

FILE No: NE550/8630

0 AMDT

NORTH

WARNING
BEWARE OF EXISTING UNDERGROUND SERVICES. CONTRACTOR SHALL CONFIRM LOCATIONS OF SERVICES PRIOR TO EXCAVATION. COORDINATE WITH ALL RELEVANT AUTHORITIES.

GIFTED ASSETS

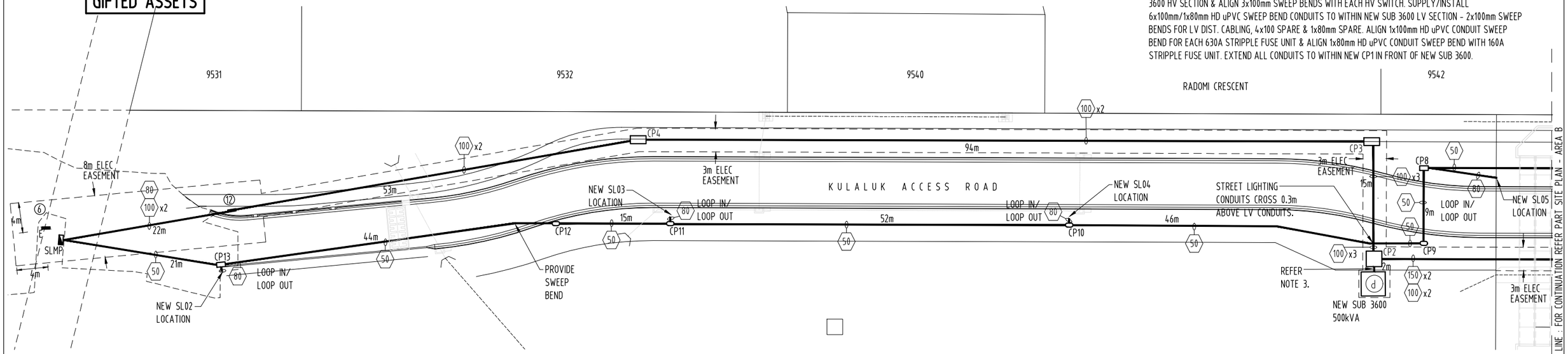
GIFTED ASSETS

NOTES

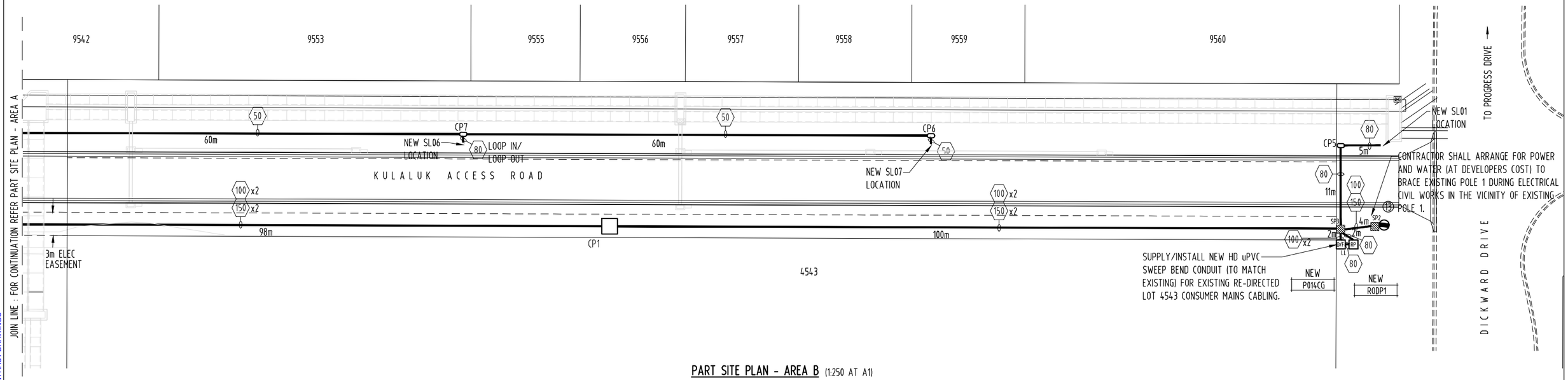
1 - ALL SPARE CONDUITS SHALL INCLUDE DRAW WIRES/FITTED WITH END CAPS.

2 - PROVIDE CONTINUOUS SWEEP BENDS IN ALL CHANGES IN CONDUIT ROUTE DIRECTIONS.

3 - CONTRACTOR SHALL SUPPLY & INSTALL 6x100mm HD uPVC SWEEP BEND CONDUITS TO WITHIN NEW SUB 3600 HV SECTION & ALIGN 3x100mm SWEEP BENDS WITH EACH HV SWITCH. SUPPLY/INSTALL 6x100mm/1x80mm HD uPVC SWEEP BEND CONDUITS TO WITHIN NEW SUB 3600 LV SECTION - 2x100mm SWEEP BENDS FOR LV DIST. CABLING, 4x100 SPARE & 1x80mm SPARE. ALIGN 1x100mm HD uPVC CONDUIT SWEEP BEND FOR EACH 630A STRIPPLE FUSE UNIT & ALIGN 1x80mm HD uPVC CONDUIT SWEEP BEND WITH 160A STRIPPLE FUSE UNIT. EXTEND ALL CONDUITS TO WITHIN NEW CP1 IN FRONT OF NEW SUB 3600.



PART SITE PLAN - AREA A (1:250 AT A1)



PART SITE PLAN - AREA B (1:250 AT A1)

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

DEVELOPER:
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B23-5712	HV/LV ELECTRICAL & STREET LIGHTING RETICULATION
B23-5711	LOCALITY PLAN, NOTES & LEGEND
AGA477-1A	

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POWER SERVICES – DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE – COCONUT GROVE
CONDUIT/DUCT LAYOUT

A1 | DRAWING NUMBER B23-5714 | 0 AMDT

FILE No: NE550/8630

GIFTED ASSETS

HV ASSET SCHEDULE

DESCRIPTION	LOCATION	STOCK CODE	SERIAL NUMBER	TEST NUMBER
PACKAGE SUBSTATION (MK-3) 11kV 500kVA (3-WAY KKT) SUB 3600	KULALUK ACCESS ROAD COCONUT GROVE	504064	TO BE PROVIDED ON "AS CONS"	TO BE PROVIDED ON "AS CONS"
11kV CABLE - SINGLE CORE 6.35/11kV 240 Sq mm Al XLPE/WBT/SCN/HDPE/NJ/PVC	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	286021	N/A	N/A
HV LINKS 21798	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	2204	N/A	N/A
12C 'SPLIT' 2 PIECE HV/LV POLE	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	503628	N/A	N/A

LV ASSET SCHEDULE

DESCRIPTION	LOCATION	STOCK CODE
DISTRIBUTION PILLAR P014CG (5-SLOTS)	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	292334
LV DISTRIBUTION CABLE - SINGLE CORE 0.6/1kV 240 Sq mm Al XLPE/NJ/MDPE	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	401015
LV SERVICE CABLE TO RODP - SINGLE CORE 0.6/1kV 25 Sq mm Cu XLPE/NJ/MDPE	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	9449/9456
10.5C 'SPLIT' 2 PIECE LV POLE	KULALUK ACCESS ROAD/DICKWARD DRIVE COCONUT GROVE	503624
ALUMINIMUM 4C 95 Sq mm XLPE (ABC) CONDUCTOR	KULALUK ACCESS ROAD COCONUT GROVE	197655

LV CONDUCTOR SCHEDULE

SPAN	LENGTH	TYPE AND REMARKS
6 TO 12	24m	ALUMINIUM 4C 95 Sqmm XLPE GRADE X-FP-90 LV (ABC CONDUCTOR)

PILLAR SCHEDULE

PILLAR	630A STRIPPLE FUSE UNIT	160A STRIPPLE FUSE UNIT	No. OF SLOTS
P014CG	3	1	5

POLE TYPE SCHEDULE

POLE	SIZE	TYPE	FOOTING	DEV.	GUY	POLE EARTH	REMARKS
1	EXIST	EXIST ('Cd')	EXIST				EXISTING POLE/EXISTING HV EDO's TO BE REMOVED. CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO DISCONNECT EXISTING HV AERIALS/LV ABC AERIAL CONDUCTORS FROM EXISTING POLE 1, PULL BACK TO NEW POLE 13, CUT & CONNECT/TERMINATE. DISCONNECT EXISTING LV CONSUMER MAINS CABLING (4x1C 120 Sq mm Cu XLPE) FROM EXISTING POLE 1 (CONTRACTOR TO PULL BACK TO NEW DIST. PILLAR P014CG & CONNECT/TERMINATE), CUT TOP SECTION OF EXISTING POLE (CONTRACTOR SHALL REMOVE LOWER SECTION INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE.
2	EXIST	EXIST	EXIST				EXISTING POLE TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
3	EXIST	EXIST	EXIST				EXISTING POLE TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
4	EXIST	EXIST	EXIST				EXISTING POLE TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
5	EXIST	EXIST	EXIST				EXISTING POLE/EXISTING SUB 1092 TO BE REMOVED. CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO DISCONNECT/REMOVE EXISTING TRANSFORMER, DISCONNECT/REMOVE EXISTING HV AERIAL CONDUCTORS BETWEEN EXISTING POLES 1/5, DISCONNECT/REMOVE EXISTING LV AERIAL CONDUCTORS BETWEEN EXISTING POLES 5/6, DISCONNECT EXISTING STREET LIGHTING TWISTED AERIAL CONDUCTOR (FROM EXISTING STREET LIGHT S1780 - CONTRACTOR SHALL REMOVE), CUT TOP SECTION OF EXISTING POLE (CONTRACTOR SHALL REMOVE LOWER SECTION INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
6	EXIST	EXIST	EXIST				EXISTING POLE. CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO DISCONNECT/REMOVE EXISTING LV AERIAL CONDUCTORS BETWEEN EXISTING POLES 5/6.
7	EXIST	EXIST	EXIST				EXISTING STREET LIGHT POLE/EXISTING LUMINAIRE S1780 TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
8	EXIST	EXIST	EXIST				EXISTING STREET LIGHT POLE/EXISTING LUMINAIRE S1802 TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
9	EXIST	EXIST	EXIST				EXISTING STREET LIGHT POLE/EXISTING LUMINAIRE S1803 TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
10	EXIST	EXIST	EXIST				EXISTING STREET LIGHT POLE/EXISTING LUMINAIRE S1804 TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
11	EXIST	EXIST	EXIST				EXISTING STREET LIGHT POLE/EXISTING LUMINAIRE S1805 TO BE REMOVED (INCLUDING COMPLETE FOOTING/FOUNDATION & BACKFILL/COMPACT HOLE).
12	10.5C	H4	FD900			TYPE A (END LV)	NEW POLE ('SPLIT' 2 PIECE TYPE) - INSTALL STRONGWAY INLINE WITH EXISTING POLE 6. CONTRACTOR SHALL SUPPLY NEW POLE/INSTALL LOWER SECTION INCLUDING POLE EARTHING/SUPPLY/INSTALL NEW 1x100mm/1x50mm HD uPVC CONDUIT SWEEP BENDS & EXTEND ONE OF EACH INTO NEW SP5/EXTEND OTHER END OF EACH 0.5m UP POLE FACE & LEAVE TOP SECTION ON SITE FOR POWER AND WATER TO INSTALL. CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO SUPPLY/INSTALL ALL POLE HARDWARE INCLUDING NEW LV SERVICE X-ARM/NEW 630A LV SOLID LINKS/NEW 3x100A FUSE BASES, PULL THROUGH NEW LV DIST. CABLING (FROM NEW SUB 3600 LV SECTION 1 OFF 630A STRIPPLE FUSE UNIT)) & NEW LV SERVICE CABLING (FROM NEW SLMP) & CONNECT/TERMINATE TO NEW 630A LV SOLID LINKS/NEW 1x100A FUSE BASE RESPECTIVELY INCLUDING DRESSING POLE FOR 2 OFF LV TERMINATIONS & SUPPLY/INSTALL 2 OFF NEW MECHANICAL PROTECTION BARRIERS. SUPPLY/INSTALL NEW LV ABC AERIAL CONDUCTOR BETWEEN EXISTING POLE 6/NEW POLE 12 & CONNECT/TERMINATE EACH END.
13	12C					TYPE 3 (HV TERM)	NEW POLE ('SPLIT') 2 PIECE TYPE) - INSTALL STRONGWAY INLINE WITH EXISTING POLE 14. CONTRACTOR SHALL SUPPLY NEW POLE/INSTALL LOWER SECTION INCLUDING POLE EARTHING/SUPPLY/INSTALL NEW 1x150mm/1x100mm HD uPVC CONDUIT SWEEP BENDS & EXTEND ONE OF EACH INTO NEW SP2/SP1/EXTEND OTHER END OF EACH 0.5m UP POLE FACE & LEAVE TOP SECTION ON SITE FOR POWER AND WATER TO INSTALL. CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO SUPPLY/INSTALL ALL POLE HARDWARE INCLUDING NEW HV/LV X-ARM's/NEW HV LINKS X-ARM/NEW HV LINKS 21798/NEW 400A LV FUSED LINKS WITH 250A FUSES. PULL THROUGH NEW HV/LV DIST. CABLING (FROM NEW SUB 3600 HV SW21799/NEW DIST. PILLAR P014CG) & CONNECT/TERMINATE TO NEW HV LINKS 21798/NEW 400A LV FUSED LINKS RESPECTIVELY INCLUDING DRESSING POLE FOR HV/LV TERMINATIONS & SUPPLY/INSTALL 2 OFF NEW MECHANICAL PROTECTION BARRIERS. DISCONNECT/EXISTING HV AERIALS/LV ABC AERIAL CONDUCTORS FROM EXISTING POLE 1, PULL BACK TO NEW POLE 13, CUT & CONNECT/TERMINATE.
14	EXIST						EXISTING POLE/EXISTING STREET LIGHT S10159.

FINAL TENSION CHART (20 deg. C used for basic tension Cal.)

SECTION	BASIC SPAN	TEMP. C° 10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	TENSION (kN) %	UTS kN	WIND
13 TO 14	20m	1.32	0.99	0.71	0.51	0.39	0.32	0.28	0.24	0.22	0.20	0.19	0.18	6	1.26	HIGH VOLTAGE FLUORINE

FINAL TENSION CHART (20 deg. C used for basic tension Cal.)

SECTION	BASIC SPAN	TEMP. C° 10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	TENSION (kN) %	UTS kN	WIND
6 TO 12	24m	6.40	5.14	4.26	3.64	3.19	2.87	2.62	2.42	2.25	2.12	2.01	1.91	8	6.30	LOW VOLTAGE ABC
13 TO 14	20m	6.99	5.40	4.26	3.49	2.97	2.61	2.35	2.14	1.98	1.85	1.74	1.65	8	6.07	

FINAL SAG CHART

ACTUAL SPAN	LENGTH	TEMP. C° 10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	SAG (m)	
13 TO 14	20m	0.05	0.07	0.09	0.13	0.17	0.21	0.24	0.27	0.30	0.33	0.35	0.37		HIGH VOLTAGE FLUORINE

FINAL SAG CHART

ACTUAL SPAN	LENGTH	TEMP. C° 10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	SAG (m)	
6 TO 12	24m	0.15	0.19	0.22	0.26	0.30	0.33	0.37	0.40	0.42	0.45	0.48	0.50		LOW VOLTAGE ABC
13 TO 14	20m	0.10	0.12	0.16	0.19	0.22	0.25	0.28	0.31	0.33	0.36	0.38	0.40		

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

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NO	DESCRIPTION	DRN	DATE	APPD
0	CONTRACT DRAWING	K.T.	3-9-23	AG

AMENDMENTS

DRG NO	TITLE
B23-5717	HV SCHEMATICS & SINGLE LINE DIAGRAM
B23-5716	NOTES & DETAILS
B23-5714	CONDUIT/DUCT LAYOUT
B23-5713	HV/LV ELECTRICAL RETICULATION
B23-5712	HV/LV ELECTRICAL & STREET LIGHTING RETICULATION
B23-5711	LOCALITY PLAN, NOTES & LEGEND
AGA477-1A	

ASSOCIATED DRAWINGS

DRAWING STATUS		APPD	DATE
P	PRELIMINARY/PROPOSED		
T	TENDERING PURPOSES ONLY		
AC	APP. FOR CONSTRUCTION		
AI	AS INSTALLED		
C	CANCELLED/SUPERSEDED		

PowerWater
NORTHERN TERRITORY

DES	A.GANGUR
DRN	K.TAVENER
CKD	A.GANGUR
APPD	
SCALE	N.T.S.
ISSUED	3-9-24
ALL DIM. IN	mm
DRAFTING STANDARD TO	A.S.1100

POWER SERVICES – DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE – COCONUT GROVE
SCHEDULES

A1 | DRAWING NUMBER B23-5715 | 0 AMDT

FILE No: NE550/8630

GIFTED ASSETS

EARTHING INSTALLATION ADVICE

POLE EARTHING

FOR NORMAL TYPE POLE EARTHING IN RURAL & URBAN AREAS REFER TO POWER AND WATER STD DWG S01-02-03-19.

COMBINED EARTHING FOR POLE HV TERMINATION:

IF MINIMUM TYPE 3 EARTHING IS NOT ADEQUATE, THEN CONTRACTOR SHALL PROVIDE HV TERMINATION EARTHING AT THIS LOCATION AS FOLLOWS:

NOTE:
EARTHING INSTALLED MUST ACHIEVE TEST RESULTS OF 30 OHMS OR LESS FOR GBS AND 1 OHM MAXIMUM WITH M.E.N. CONNECTED.

* SIX BORES TO BE DRILLED ON EACH SIDE OF THE POLE.
* BORES TO BE DRILLED TO DEPTH OF 4.6 METRES.
* SPACING BETWEEN POLE & FIRST BORE HOLE OR BETWEEN HOLES IS 8 METRES.
* ALIGNMENT OF BORE HOLES IS IN ALIGNMENT WITH CENTRELINE OF POLES.
* USE TWO BAGS OF EARTH COMPOUND TO BACKFILL HOLE WITH EXISTING SOIL & WATER.

GENERAL GUIDELINES FOR INSTALLATION OF HV TERMINATION EARTHING

AS MOST OF THE SOIL ENCOUNTERED IN THE TERRITORY IS FIRM & ROCKY, THE HAND HAMMER & MECHANICAL HAMMER ARE FOUND DIFFICULT TO USE & OFTEN CAUSE DAMAGE TO THE ELECTRODES. IT IS RECOMMENDED THAT ONLY HOLE DRILLING TO BE USED FOR THE INSTALLATION OF ELECTRODES. THE GENERAL HV TERMINATION, POLE EARTHING INSTALLATION PROCEDURE IS TO BE CARRIED OUT AS FOLLOWS:

STEP 1
MARK ON THE GROUND THE EARTHING DESIGN SPACINGS OF THE BOREHOLES TO BE DRILLED.

STEP 2
USE AUGER WITH MINIMUM DIAMETER WHERE POSSIBLE TO DRILL BOREHOLES TO DEPTHS AS SPECIFIED IN THE EARTHING DESIGN.

STEP 3
CONNECT ONE EARTH ROD WITH 70 Sq mm COPPER CONDUCTOR BY A COMPRESSION CONNECTOR (C SHAPED) BEFORE DROP IT DOWN TO THE BOTTOM OF THE BOREHOLE.

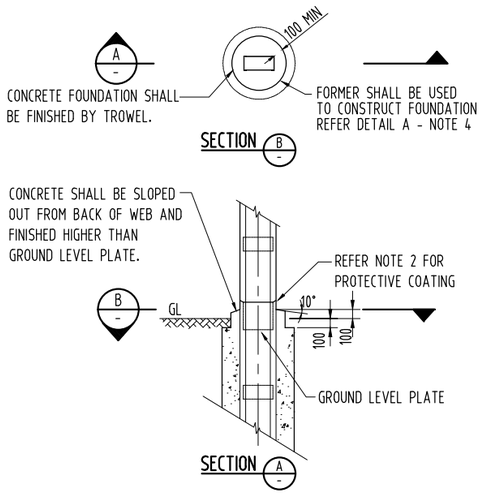
STEP 4
BACKFILL BORE HOLE WITH A WATERED MIXTURE OF EXISTING SOIL AND THE NUMBER OF SPECIFIED EARTHING COMPOUND AT 1:1 RATIO. DO NOT BACKFILL HOLE WITH EXISTING ROCKS.

STEP 5
DIG A TRENCH AT 600 mm DEPTH MAXIMUM ALONG THE CENTRES OF BORE HOLES.

STEP 6
CONNECT TAILS OF EARTH RODS FROM BORE HOLES WITH 70 Sq mm COPPER CONDUCTOR BY A COMPRESSION CONNECTOR (C SHAPED).

STEP 7
BACKFILL & LAY MARKER TAPE AT DEPTH OF 400 mm THEN COMPACT THE TRENCH.

STEP 8
AS FOR HV TERMINATION INSTALL COPPER COMPRESSION LUGS (M12 BOLT HOLE) & CONNECT TO TWO TAILS OF 70 Sq mm COPPER CONDUCTOR - ALSO REFER POWER AND WATER STANDARD DWG S01-02-03-13 FOR TYPICAL CONNECTION DETAIL.



DETAIL A - POLE STRUCTURE FOUNDATION DETAIL (N.T.S.)

NOTE
POLE STRUCTURES SHALL BE BOLTED CONNECTION.

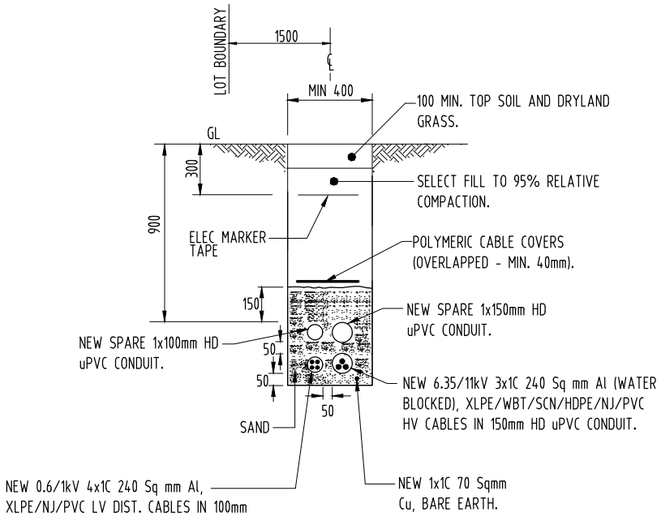
DETAIL A - NOTES

1 - REFER POWER AND WATER STANDARD DRAWING S01-04-01-21 (SHEETS 1 & 2) FOR POLE AND FOUNDATION STRENGTHS.

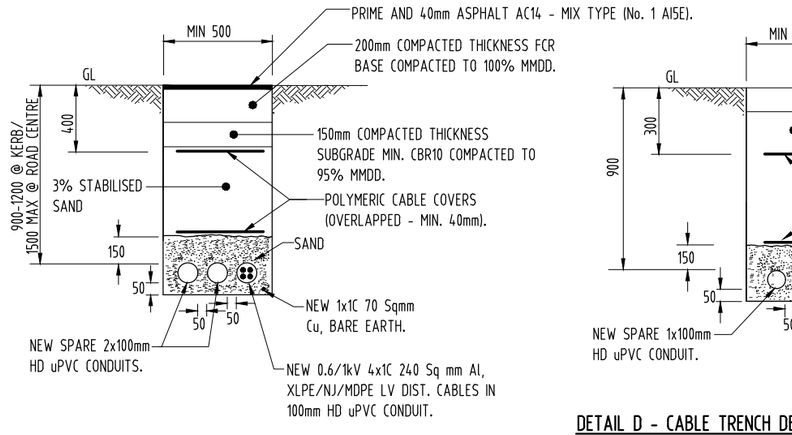
2 - A PROTECTIVE COATING SIMILAR TO WATTYL SIGMACOVER TCP COATING SHALL BE APPLIED 300mm ABOVE AND BELOW THE CENTRE LINE OF THE GROUND LEVEL PLATE.

3 - POLE INSTALLATION PROCEDURE SHALL BE IN ACCORDANCE WITH POWER AND WATER STD S01-04-04-01.

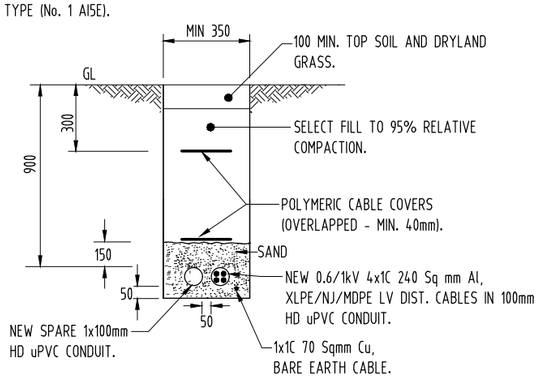
4 - CIRCULAR FORMERS SHALL BE USED ON ALL POLE FOUNDATIONS.



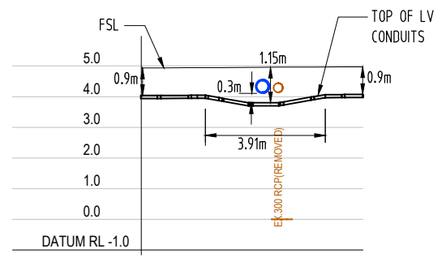
DETAIL B - CABLE TRENCH DETAIL BETWEEN SP3/CP1, CP1/CP2 (N.T.S.)



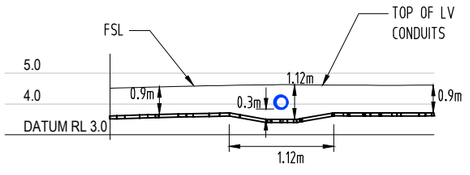
DETAIL C - ROAD CROSSING CABLE TRENCH DETAIL BETWEEN CP2/CP3 (N.T.S.)



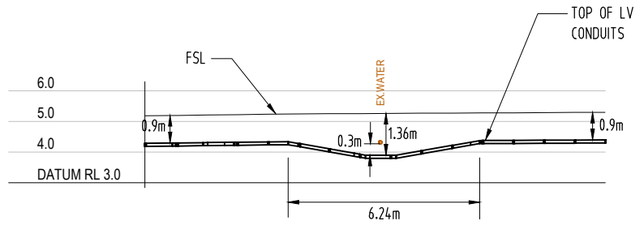
DETAIL D - CABLE TRENCH DETAIL BETWEEN CP3/POLE 12 (N.T.S.)



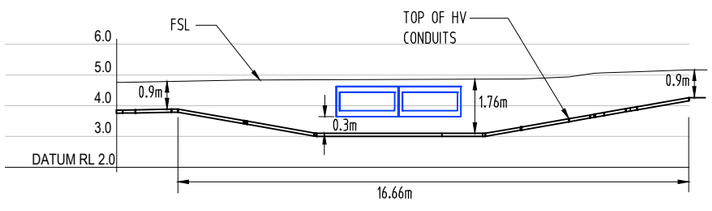
DETAIL E - CABLE TRENCH DETAIL UNDER DRAIN 6 (1:100 AT A1)



DETAIL G - CABLE TRENCH DETAIL UNDER DRAIN 5 (1:100 AT A1)



DETAIL H - CABLE TRENCH DETAIL UNDER EXISTING WATERMAIN (1:100 AT A1)



DETAIL F - CABLE TRENCH DETAIL UNDER DRAIN 3 (1:100 AT A1)

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

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NO	DESCRIPTION	DRN	DATE	APPD
0	CONTRACT DRAWING	K.T.	3-9-23	AG

AMENDMENTS

DRG NO	TITLE
B23-5717	HV SCHEMATICS & SINGLE LINE DIAGRAM
B23-5715	SCHEDULES
B23-5714	CONDUIT/DUCT LAYOUT
B23-5713	HV/LV ELECTRICAL RETICULATION
B23-5712	HV/LV ELECTRICAL & STREET LIGHTING RETICULATION
B23-5711	LOCALITY PLAN, NOTES & LEGEND

ASSOCIATED DRAWINGS

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C	CANCELLED/SUPERSEDED		
	AGA477-1A		

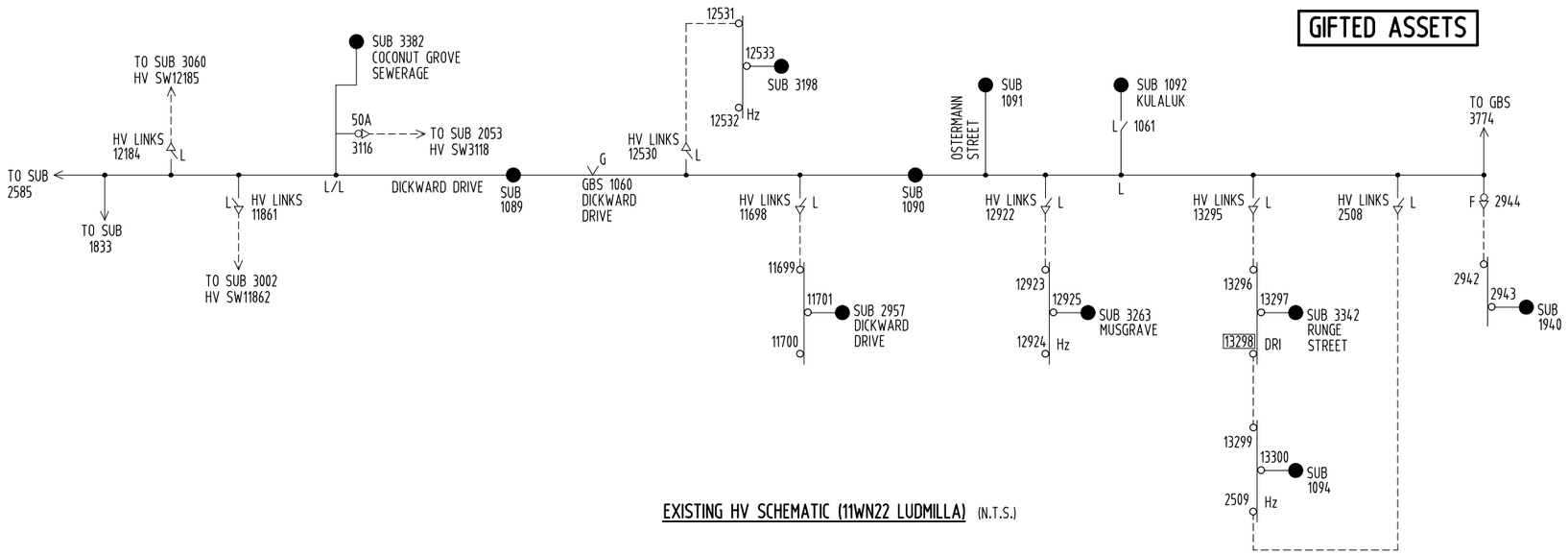
PowerWater
NORTHERN TERRITORY

DES	A.GANGUR
DRN	K.TAVENER
CKD	A.GANGUR
APPD	
SCALE	N.T.S.
ISSUED	3-9-24
ALL DIM. IN	mm
DRAFTING STANDARD	TO A.S.1100

POWER SERVICES - DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE - COCONUT GROVE
NOTES & DETAILS

A1
DRAWING NUMBER B23-5716
FILE No: NE550/8630
0 AMDT

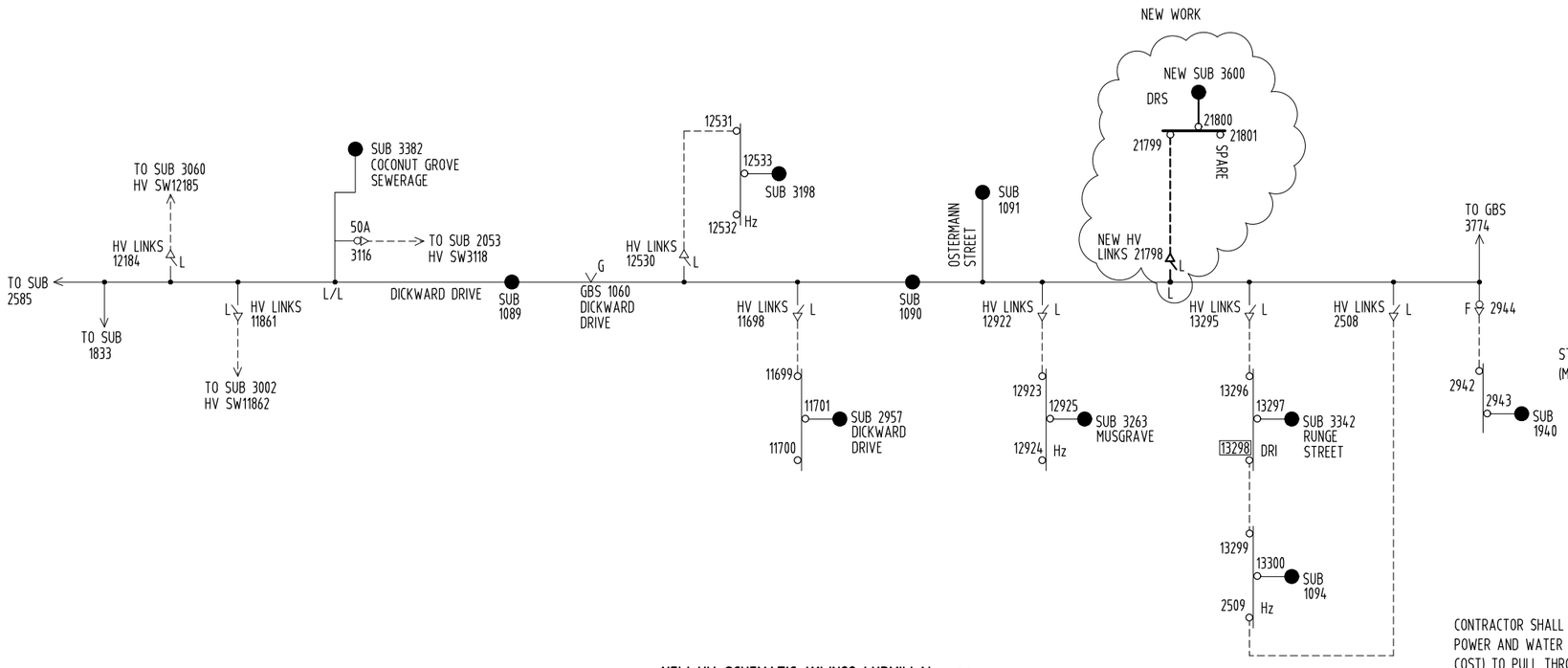
GIFTED ASSETS



EXISTING HV SCHEMATIC (11WN22 LUDMILLA) (N.T.S.)

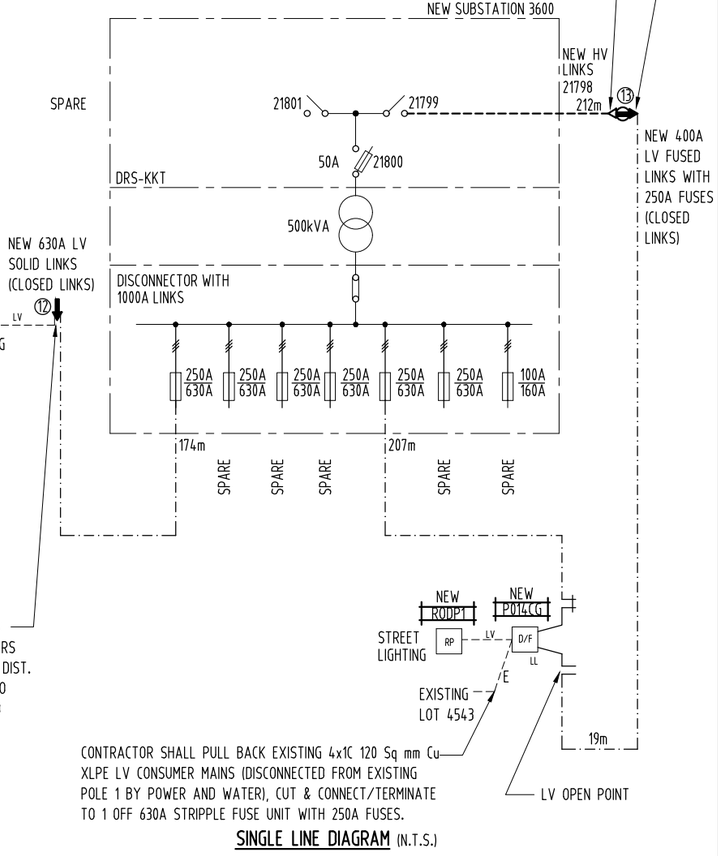
LEGEND

- HV SWITCH.
- HV FUSED SWITCH.
- LV STRIPLE FUSES.
- SUB DISCONNECTOR WITH LINKS.
- DIST. LINK PILLAR OPEN LINKS.
- DIST. LINK PILLAR CLOSED LINKS.
- NEW HV CABLE - 6.35/11kV 3x1C 240 Sq mm Al (WATER BLOCKED), XLPE/WBT/SCN/HDPE/NJ/PVC (IN HD uPVC CONDUIT) & 1x1C 70 Sq mm Cu, BARE EARTH DIRECT BURIED.
- NEW LV DISTRIBUTION CABLE - 0.6/1kV 4x1C 240 Sq mm Al, XLPE/NJ/PVC DIRECT BURIED (OR WITHIN CONDUIT AT ROAD CROSSING) & 1x1C 70 Sq mm Cu, BARE EARTH DIRECT BURIED. NOTE: WHERE COMMON HV/LV TRENCH USED; ONLY ONE OFF 1x1C 70 Sq mm Cu, BARE EARTH SHALL BE USED.
- LV NEW SINGLE PHASE LV SERVICE CABLE - 0.6/1kV 2x1C 25 Sq mm Cu, XLPE/NJ/PVC ENCLOSED IN 80mm HD uPVC CONDUIT.
- E EXISTING LV CONSUMER MAINS CABLING.



NEW HV SCHEMATIC (11WN22 LUDMILLA) (N.T.S.)

CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO PULL THROUGH NEW HV/LV DIST. CABLING & CONNECT/TERMINATE TO NEW POLE 13, NEW HV LINKS 21798/NEW 400A LV FUSED LINKS RESPECTIVELY.



CONTRACTOR SHALL ARRANGE FOR POWER AND WATER (AT DEVELOPERS COST) TO PULL THROUGH NEW LV DIST. CABLING & CONNECT/TERMINATE TO NEW POLE 12, NEW 630A LV SOLID LINKS.

CONTRACTOR SHALL PULL BACK EXISTING 4x1C 120 Sq mm Cu XLPE LV CONSUMER MAINS (DISCONNECTED FROM EXISTING POLE 1 BY POWER AND WATER), CUT & CONNECT/TERMINATE TO 1 OFF 630A STRIPPLE FUSE UNIT WITH 250A FUSES.

SINGLE LINE DIAGRAM (N.T.S.)

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

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NO	DESCRIPTION	DRN	DATE	APPD
0	CONTRACT DRAWING	K.T.	3-9-23	AG

AMENDMENTS

DRG NO	TITLE
B23-5716	NOTES & DETAILS
B23-5715	SCHEDULES
B23-5714	CONDUIT/DUCT LAYOUT
B23-5713	HV/LV ELECTRICAL RETICULATION
B23-5712	HV/LV ELECTRICAL & STREET LIGHTING RETICULATION
B23-5711	LOCALITY PLAN, NOTES & LEGEND
AGA477-1A	

ASSOCIATED DRAWINGS

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C	CANCELLED/SUPERSEDED		

PowerWater
NORTHERN TERRITORY

DES	A.GANGUR
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APPD	
SCALE	N.T.S.
ISSUED	3-9-24
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DRAFTING STANDARD TO	A.S.1100

POWER SERVICES – DARWIN DISTRIBUTION
UPGRADE POWER SUPPLY TO LOT 8630 (KULALUK COMMUNITY)
DICKWARD DRIVE – COCONUT GROVE
HV SCHEMATICS & SINGLE LINE DIAGRAM

A1 | DRAWING NUMBER B23-5717 | 0 AMDT

FILE No: NE550/8630

NORTH

WARNING

BEWARE OF EXISTING UNDERGROUND SERVICES.
CONTRACTOR SHALL CONFIRM LOCATIONS OF SERVICES PRIOR TO EXCAVATION. COORDINATE WITH ALL RELEVANT AUTHORITIES.

BILL OF MATERIAL

PITS		DUCTS		
SIZE	QTY	SIZE	QTY	MTRS
2	0	P100	12	512.3
5	2	P50	-	-
6	4	P20	-	-
8	0			
9	-			

TOTAL NUMBER OF PITS: 6
TOTAL NUMBER OF MANHOLES: 0
TOTAL NUMBER OF CONDUITS: 12
TOTAL LENGTH OF CONDUITS: 512.3 m

DESIGN & INSTALLATION SPECIFICATIONS

THIS DESIGN IS TO BE READ IN CONJUNCTION WITH:

COMMUNICATIONS ALLIANCE LTD INDUSTRY GUIDELINE G645:2017 "FIBRE READY PIT AND PIPE SPECIFICATION FOR REAL ESTATE DEVELOPMENT PROJECTS"

ALL DEPLOYMENT WORKS TO BE COMPLETED TO SPECIFICATIONS AS OUTLINED IN THE ABOVE DOCUMENTS.

SERVICES CLEARANCES

SERVICES ITEM	MINIMUM RADIAL CLEARANCES
GAS - LARGE MAIN (OVER 110mm DIA.)	300mm
SMALL MAIN (110mm DIA. OR LESS)	150mm
ELECTRICAL - HIGH VOLTAGE	300mm
LOW VOLTAGE	100mm ×2
WATER - HIGH CAPACITY MAIN	300mm
LOCAL RETICULATION	150mm
SEWER - MAIN	300mm
CONNECTION PIPE	150mm
OTHER TELECOMMUNICATIONS	100mm ×1
DRAINAGE - MAIN	300mm
CONNECTION PIPE	150mm

× 1 - REDUCED SEPARATION IS POSSIBLE WHERE ALL PARTIES ARE CONSULTED AND AGREEMENT IS REACHED

× 2 - ONLY WHERE PROTECTION BARRIERS ARE USED, FOR EXAMPLE, CONDUIT, BEDDING, MARKER TAPE & COVER BATTEN

PIT LEGEND

PIT-ID 2 — Service Drop Access Pit 650mm(L) x 280mm(W) x 565mm(D)
PIT-ID 5 — Network Boundary/Local Network Pit 700mm(L) x 450mm(W) x 650mm(D)
PIT-ID 6 — Distribution/Local Network Connection Pit 1360mm(L) x 555mm(W) x 650mm(D)
PIT-ID 8 — Distribution/Local Network Connection Pit 1360mm(L) x 555mm(W) x 860mm(D)
PIT-ID 9 — Fibre Distribution Hub Pit 2000mm(L) x 555mm(W) x 900mm(D)

PIT LIDS TO BE LABELLED "COMMS"

CONSTRUCTOR IS TO ENSURE PITS ARE INSTALLED IN NON-TRAFFICABLE AREAS, AT LEAST 15m AWAY FROM EPR ZONES AND CLEAR OF OTHER AUTHORITY EASEMENTS.

NOTES

1. COMMUNICATIONS CONDUITS, ASSOCIATED FITTINGS, CAPS, DRAW WIRE, HAUL ROPES, INSTALLATION, TRENCHING, BEDDING AND BACKFILL ARE TO BE PROVIDED IN ACCORDANCE WITH AS/ACIF S008:2006, ACIF C524:2004, AS/NZS2032:2006, AS/ACIF S009:2006 COUNCIL CIVIL WORKS SPECIFICATION, RELEVANT MANUFACTURERS RECOMMENDATIONS AND AND G645:2017 FIBRE READY PIT & PIPE SPECIFICATIONS FOR REAL ESTATE DEVELOPMENT PROJECTS.

2. 100mm & 50mm LOCAL NETWORK & LATERAL CONDUITS, 20mm & 50mm SERVICE DROP CONDUITS TO BE WHITE. BOTH ARE TO BE STAMPED "COMMUNICATIONS" AND COMPLY WITH AS/ACIFS008:2006.

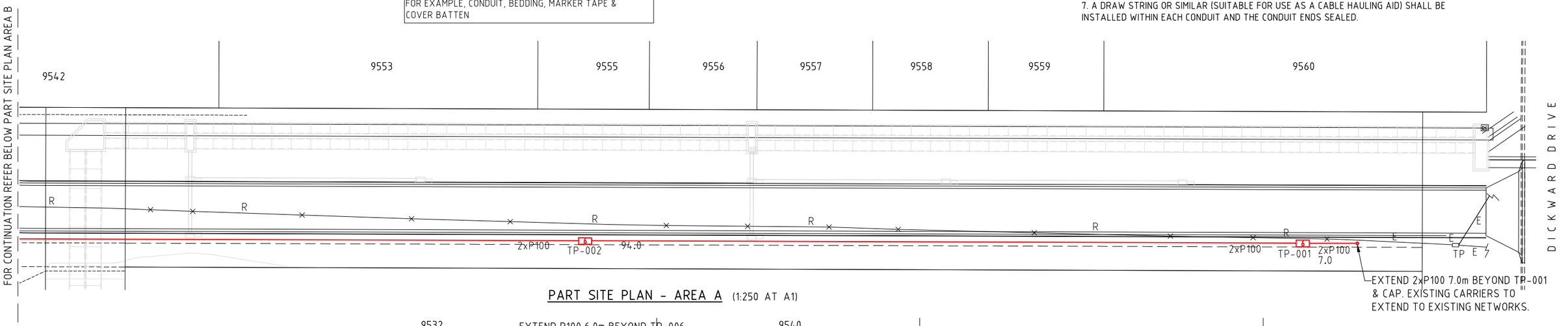
3. ALL CONDUIT BENDS SHALL BE PREFABRICATED. COMBINATIONS OF BENDS WITH ANGLES OF 15°, 22.5° AND 30° SHOULD BE USED TO CHANGE THE DIRECTION OF THE 100mm CONDUIT WHERE REQUIRED. 50mm CONDUIT BENDS UTILISED FOR LOCAL LATERAL DUCTS CAN UTILISE A 90° BEND WHERE REQUIRED.

4. THE MINIMUM RADIUS OF THE CONDUIT BENDS SHOULD BE A MINIMUM OF 8 X THE OUTER DIAMETER OF THE CONDUIT.

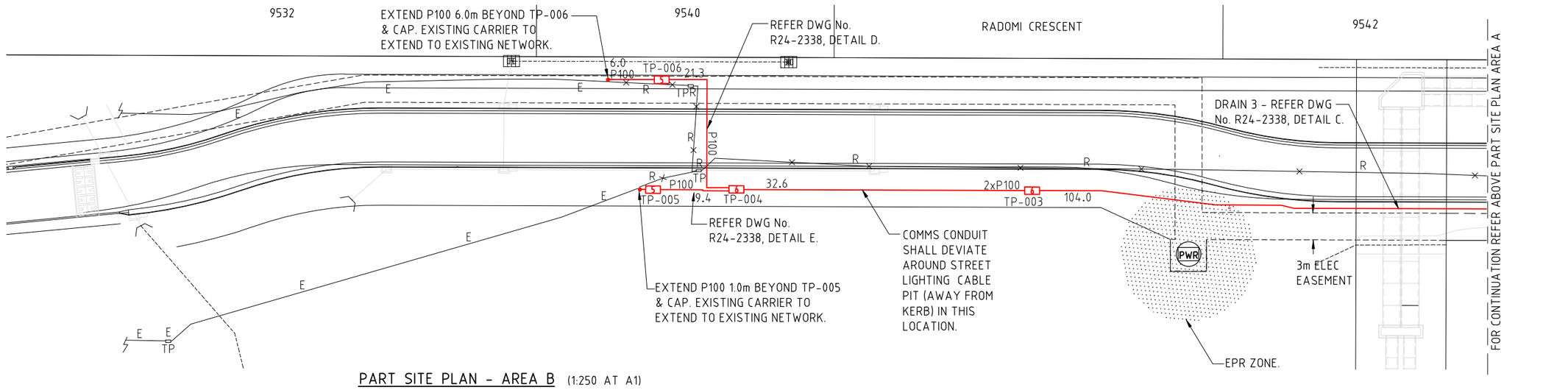
5. CONDUITS SHOULD ENTER THE PITS VIA THE END OF THE PIT ONLY AND BE LOCATED CENTRALLY WITH AT LEAST 50mm OF SPACE BETWEEN CONDUIT EXTERIOR AND THE PIT FLOOR. WHERE MULTIPLE DUCTS ENTER A PIT 25mm (MINIMUM) SEPARATION IS REQUIRED BETWEEN EACH DUCT.

6. ALL CONDUIT ENDS ARE TO FINISH SQUARE AND FLUSH WITH THE PIT END WALLS AND BE FITTED WITH BUSHES FLUSH WITH THE PIT WALL ENDS. ALL ENTRIES SHOULD BE SEALED BETWEEN THE CONDUIT EXTERIOR AND THE PIT WALL.

7. A DRAW STRING OR SIMILAR (SUITABLE FOR USE AS A CABLE HAULING AID) SHALL BE INSTALLED WITHIN EACH CONDUIT AND THE CONDUIT ENDS SEALED.



PART SITE PLAN - AREA A (1:250 AT A1)



PART SITE PLAN - AREA B (1:250 AT A1)

No.	DESCRIPTION	DATE	INIT.	COMPANY
0	CONTRACT DRAWING	5-9-24	AG	AGA

AMENDMENTS Plot Date: 05/09/2024

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AGA477-K

DRAWN	CHECKED
K.T.	A.G.
DATE: NOV 23	DATE: NOV 23
DESIGNED	CHECKED
A.G.	
DATE: NOV 23	DATE:
DESIGN PROJECT LEADER	NTG PROJECT MANAGER
DATE	DATE

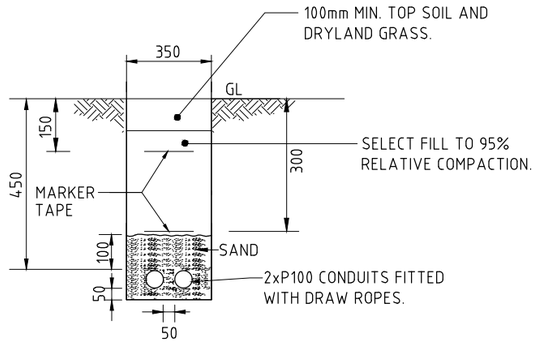
Northern Territory Government

DARWIN REGION
KULALUK

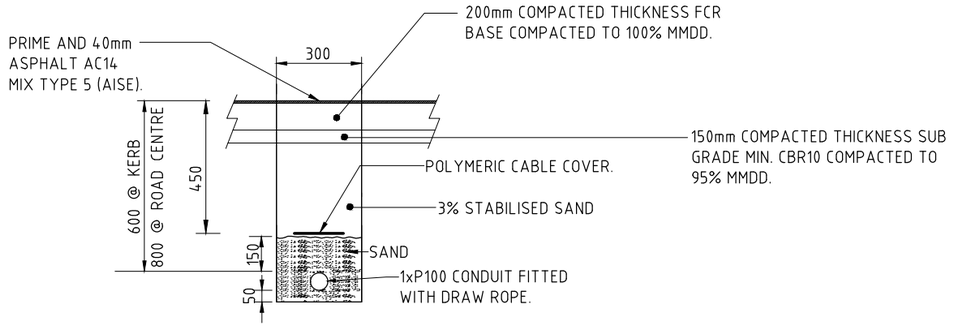
TELECOMMUNICATIONS NOTES & PIPE/PIT RETICULATION

NTG PROJECT No.	NTG ASSET No.	NTG SHEET No.	DRAWING No.	AMENDMENT	SHEET SIZE
		T1 OF 2	R24-2337	0	A1

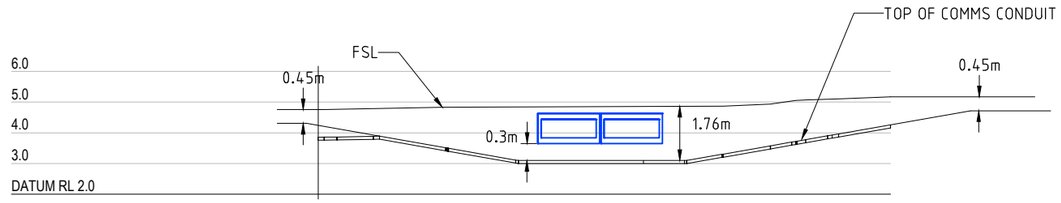
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



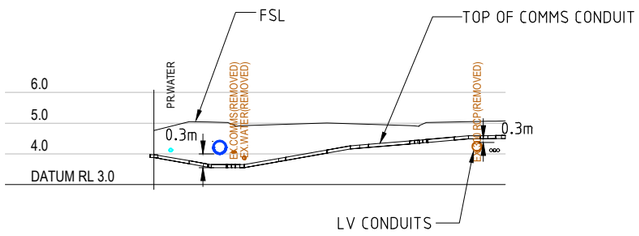
DETAIL A - TYPICAL COMMS CONDUIT TRENCH DETAIL (EXCEPT DEVIATES WHERE PASSES UNDER DRAINAGE - REFER DETAILS C & D) (N.T.S.)



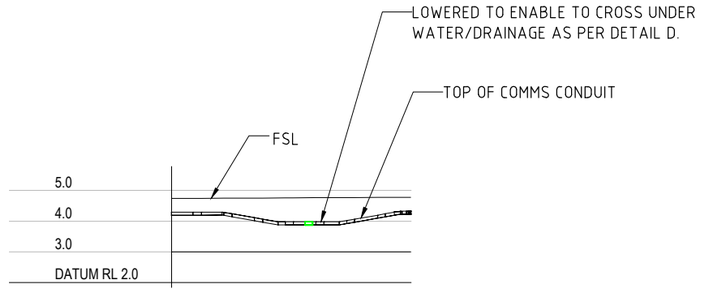
DETAIL B - TYPICAL COMMS CONDUIT TRENCH DETAIL - ROAD CROSSING (N.T.S.)



DETAIL C - COMMS CONDUIT TRENCH DETAIL UNDER DRAIN 3 (1:100 AT A1)



DETAIL D - COMMS CONDUIT TRENCH DETAIL UNDER ROAD (1:100 AT A1)



DETAIL E - COMMS CONDUIT TRENCH DETAIL PART BETWEEN TP-004/TP-005 (1:100 AT A1)

No.	DESCRIPTION	DATE	INIT.	COMPANY
0	CONTRACT DRAWING	5-9-24	AG	AGA

AMENDMENTS Plot Date: 05/09/2024

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AGA477-IC

DRAWN	CHECKED
K.T.	A.G.
DATE: NOV 23	DATE: NOV 23
DESIGNED	CHECKED
A.G.	
DATE: NOV 23	DATE:
DESIGN PROJECT LEADER	NTG PROJECT MANAGER
DATE	DATE

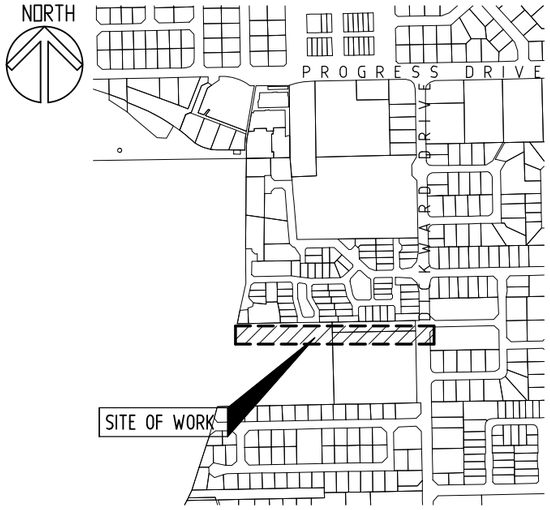
Northern Territory Government

DARWIN REGION
KULALUK

TELECOMMUNICATIONS DETAILS

NTG PROJECT No.	NTG ASSET No.	NTG SHEET No.	DRAWING No.	AMENDMENT	SHEET SIZE
		T2 OF 2	R24-2338	0	A1

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



LOCALITY PLAN (N.T.S.)

DRAWING SCHEDULE	
R24-2334	LOCALITY PLAN, NOTES, DETAIL & DRAWING SCHEDULE
R24-2335	STREET LIGHTING RETICULATION, NOTES, LEGEND & DETAILS
R24-2336	LV/STREET LIGHTING SINGLE LINE DIAGRAMS, SCHEDULES & DETAILS

STREET LIGHTING DESIGNED TO AS/NZS 1158 AS FOLLOWS:
- DICKWARD DRIVE/ACCESS ROAD INTERSECTION : AS/NZS 1158.3.1 CATEGORY PR3.
- ACCESS ROAD : AS/NZS 1158.3.1 CATEGORY PR4.

NOTES - GENERAL

1 - ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH CURRENT POWER AND WATER CONSTRUCTION METHODS, REQUIREMENTS & STANDARDS AS DETAILED IN POWER AND WATER DESIGN AND CONSTRUCTION GUIDELINES, STREET LIGHTING/UNDERGROUND MANUALS & ACCESS TO APPARATUS RULES. ROAD OWNER IS RESPONSIBLE FOR APPROVING SPECIFIC STREET LIGHTING CATEGORY COMPLIANCE AND DESIGNATED STREET LIGHTING LOCATIONS.

2 - ROAD OWNER IS RESPONSIBLE FOR APPROVING SPECIFIC STREET LIGHTING CATEGORY STANDARDS & ELECTRICAL INSTALLATION COMPLIANCE AND DESIGNATED STREET LIGHTING LOCATIONS. POWER AND WATER ONLY APPROVES THE "POINT OF SUPPLY" OR "POINT OF CONNECTION" AND CARRY OUT FINAL CONNECTION (IF REQUIRED).

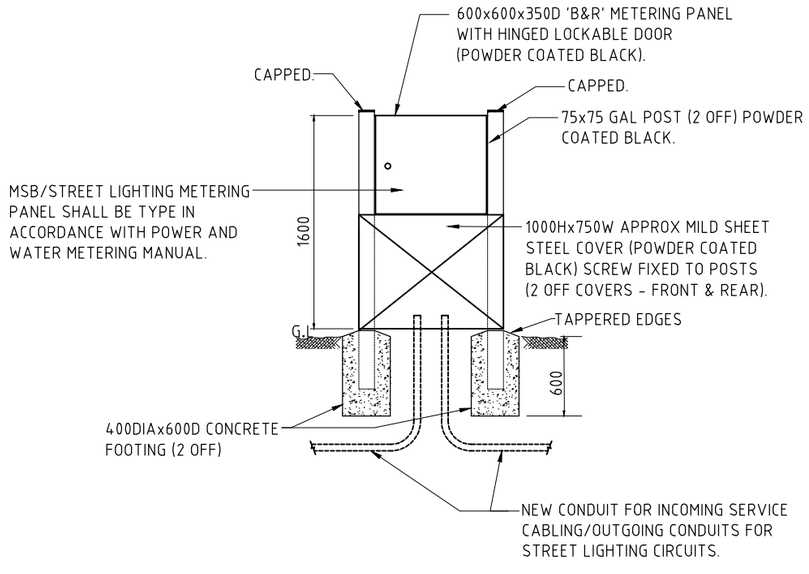
3 - ROAD OWNER SHALL ONLY ENGAGE A CONTRACTOR THAT IS CURRENTLY AUTHORISED BY POWER AND WATER CORPORATION (PWC) TO CARRY OUT WORKS IN EXISTING PWC UNDERGROUND ELECTRICITY RETICULATION.

4 - ROAD OWNER IS RESPONSIBLE FOR ALL ADMINISTRATION AND SUPERVISION OF ROAD OWNER's CONTRACTOR.

5 - ROAD OWNER's CONTRACTOR SHALL PROVIDE MINIMUM 6 WEEKS NOTICE TO PWC PRIOR TO ANY WORKS COMMENCING ON EXISTING PWC's ELECTRICAL RETICULATION INCLUDING THE SUBMISSION OF AN INSPECTION AND TEST PLAN (ITP) FOR PWC REVIEW/APPROVAL AND OBTAINING ALL RELEVANT WORK PERMITS/AUTHORISATIONS. IN ADDITION, THE ROAD OWNER's CONTRACTOR SHALL PROVIDE 5 WORKING DAYS NOTICE TO PWC FOR PWC TO DE-ENERGISE/ENERGISE EXISTING STREET LIGHT CIRCUIT/S AT THE NOMINATED "SERVICE POINT/S" (IF REQUIRED).

6 - ROAD OWNER SHALL PROVIDE A SIGNED COPY OF "CERTIFICATE OF WORKS COMPLETION - PWC SERVICE CONNECTION".

7 - ROAD OWNER SHALL PROVIDE TO PWC "ELECTRICAL CERTIFICATE OF COMPLIANCE" AND "AS CONSTRUCTED" DRAWINGS AS REQUIRED IN PWC's "POWER NETWORKS DESIGN AND CONSTRUCTION GUIDELINES". THE "AS CONSTRUCTED" DRAWINGS SHALL INCLUDE:
- 1 x A1 PAPER PRINT INDICATING "AS INSTALLED" (OF ALL DRAWINGS).
- 1 x A3 PAPER PRINT INDICATING "AS INSTALLED" (OF ALL DRAWINGS).
- 1 DIGITAL (CD) COPY OF ALL DRAWINGS ('MICROSTATION' .DGN FILES).



DETAIL A - MSB/STREET LIGHTING METERING PANEL DETAIL (N.T.S.)

NOTES - SCOPE OF WORKS

1 - CONTRACTOR SHALL CARRY OUT ALL WORKS AS DETAILED INCLUDING THE FOLLOWING:
- SUPPLY & INSTALL NEW ROAD OWNER DIST. PILLAR (RODP).
- SUPPLY & INSTALL NEW STREET LIGHTING METERING PANEL (SLMP).
- SUPPLY & INSTALL NEW STREET LIGHTING.
- SUPPLY & INSTALL NEW STREET LIGHTING CABLING/CONDUITS, TRENCHING & CABLE PITS.

2 - PRIOR TO COMMENCING WORK ON SITE, CONTRACTOR SHALL OBTAIN RELEVANT PERMITS & (AND PAY ANY ASSOCIATED COSTS) LIAISE WITH ALL RELEVANT AUTHORITIES TO ENSURE ALL EXISTING UNDERGROUND SERVICES ARE LOCATED (PRIOR TO TRENCH EXCAVATION). CONTACTS ARE 1800 245 091 (POWER AND WATER), BRADLEY BOOTS - 0427 301647 (TELSTRA) & "DIAL BEFORE YOU DIG" - 1100. THE CONTRACTOR SHALL BE RESPONSIBLE/LIABLE FOR COST OF REPAIRS TO ANY EXISTING SERVICES DAMAGED. CONTRACTOR SHALL REINSTATE ROADS, FOOTPATHS, VERGES, DRAINAGE STRUCTURE, IRRIGATION SYSTEMS, DRIVEWAYS, LANDSCAPING ETC. TO SATISFACTION OF RELEVANT COUNCIL & AUTHORITIES. CONTRACTOR SHALL REMOVE SURPLUS MATERIAL & CLEAN SITE AT COMPLETION OF WORKS. CONTRACTOR SHALL PROVIDE SUFFICIENT WARNING SIGNS & BARRIERS TO COMPLY WITH RELEVANT CURRENT WORK HEALTH ACT DURING CONSTRUCTION WORKS. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT EXISTING ACCESS IS MAINTAINED TO THE GENERAL PUBLIC DURING CONSTRUCTION WORKS. CONTRACTOR SHALL ALSO PROVIDE TRAFFIC CONTROL PLAN/DEVICES IN ACCORDANCE WITH AS 1742.3.

3 - CONTRACTOR SHALL SUPPLY & INSTALL NEW STREET LIGHT POLES (9m RIGID TYPE) IN ACCORDANCE WITH POWER AND WATER STANDARD DRAWINGS S03-01-01-01 COMPLETE WITH FOOTING & RAG BOLT ASSEMBLY IN ACCORDANCE WITH POWER AND WATER STANDARD DRAWINGS S03-01-02-01, S03-01-02-03 & S03-01-02-06. NEW STREET LIGHT LUMINAIRES SHALL BE 'GE' ECO R250 80W LED TYPE & 'GE' EVOLVE 30W LED TYPE. NEW STREET LIGHT SL01 SHALL BE 'NEMA' 7 PIN COMPLIANT WITH DALI2 DRIVER. SUPPLY & INSTALL SWITCHPACK (TYPE IN ACCORDANCE WITH STANDARD POWER AND WATER DRAWINGS S03-01-05-07 & S03-01-05-12) WITHIN EACH POLE (INCLUDING FITTED WITH 'NOVARIS' SSP1-16-15-275 SERIES CONNECTED SURGE DIVERTER) & INSTALL STREET LIGHTING CABLE DESTINATION TAGS AS PER POWER AND WATER STD DWG S02-01-08-25. ARRANGE FOR ROAD OWNER TO PROVIDE NEW NUMBER PLATE FOR NEW STREET LIGHT IN DICKWARD DRIVE ROAD RESERVE. CONTRACTOR SHALL INSTALL NEW NUMBER PLATES IN ACCORDANCE WITH POWER AND WATER STD DWG S03-01-05-03.

4 - CONTRACTOR SHALL SUPPLY & INSTALL 1 OFF NEW ROAD OWNER DIST. PILLAR GENERALLY IN ACCORDANCE WITH POWER AND WATER STD DWG S02-02-03-08 (REFER DWG No. R24-2336 LV SINGLE LINE DIAGRAM). CONTRACTOR SHALL ARRANGE FOR ROAD OWNER TO PROVIDE NUMBER PLATE FOR NEW ROAD OWNER DIST. PILLAR & CONTRACTOR SHALL INSTALL NEW ROAD OWNER DIST. PILLAR NUMBER PLATE.

5 - CONTRACTOR SHALL SUPPLY & INSTALL 1 OFF NEW POST MOUNTED MSB/STREET LIGHTING METERING PANEL. MSB/STREET LIGHT METERING PANEL SHALL HAVE MINIMUM IP56 RATING. MSB/STREET LIGHT METERING PANEL AND POST SHALL BE GALVANISED. RCD's SHALL BE 'SCHNEIDER' TYPE. NEW MSB/STREET LIGHT METERING PANEL SHALL BE CONSTRUCTED FROM 1.6mm SHEET STEEL FOLDED AND FULLY WELDED (ALL WELDS GROUND SMOOTH). ALUMINIUM GLAND PLATE SHALL BE FITTED TO BOTTOM OF MSB/STREET LIGHT METERING PANEL FOR INCOMING/OUTGOING CABLING. DOOR SHALL BE FITTED WITH LIFT OFF HINGES WITH STAINLESS STEEL PINS, LATCHES & HANDLE. NEW MSB/STREET LIGHT METERING PANEL SHALL BE FORM 1 CONSTRUCTION. CONTRACTOR SHALL PROVIDE THREE (3) COPIES OF SHOP DRAWINGS WITH 1 COPY SUBMITTED TO POWER AND WATER FOR APPROVAL PRIOR TO MANUFACTURE. ALSO REFER DETAIL A.

6 - STREET LIGHTING CABLING SHALL BE TYPE IN ACCORDANCE WITH POWER AND WATER STANDARD DWG S02-01-01-20. CONTRACTOR SHALL SUPPLY & INSTALL NEW 1x1C 35 Sq mm Cu, PVC EARTH CABLE WITH NEW STREET LIGHT CABLING (ENCLOSED IN SAME CONDUIT) TO EACH POLE. EACH POLE SHALL ALSO BE EARTHED (NOTE - POLES DO NOT INCLUDE M.E.N.). CONTRACTOR SHALL SUPPLY & INSTALL MARKER TAPE IN ACCORDANCE WITH POWER AND WATER STANDARD DRAWING S02-01-08-05. ALSO REFER DWG No. E2, DETAILS B/C & DWG No. R24-2336, DETAILS D TO G.

7 - STREET LIGHT CABLING FOR POLES SHALL BE INSTALLED IN ACCORDANCE WITH POWER AND WATER STANDARD DRAWINGS S02-02-06-02 AND S02-02-06-03.
NOTE - CABLES SHALL BE INSTALLED IN 80mm HD uPVC CONDUIT. CABLE PITS SHALL BE INSTALLED WHERE SHOWN. JOINTING SHALL BE IN ACCORDANCE WITH POWER AND WATER STANDARD DRAWING S02-02-02-13.

8 - AT COMPLETION OF WORKS, CONTRACTOR SHALL PROVIDE CERTIFICATION TO ROAD OWNER (COD) THAT STATES STREET LIGHT SL01 HAS BEEN INSTALLED SATISFACTORILY TO ENERGISE & COMMISSION INTO COD STREET LIGHTING CONTROL NETWORK.

9 - IN COMPLIANCE TO SAFETY REQUIREMENTS REGARDING ACCESS TO APPARATUS RULES, ALL OPENINGS OR TRENCHES IN FRONT OF APPLICABLE POWER ASSETS WHICH ARE CURRENTLY IN SERVICE MUST BE BACKFILLED OR HAVE SUBSTANTIAL COVER (SUITABLE STEEL PLATE OR 19mm FORM PLY SECURED TO A 150mm x 100mm TIMBER CROSS MEMBERS) OVER THE OPENING WHEN WORKS HAVE COMPLETED FOR THE DAY IN ORDER TO ALLOW POWER AND WATER's PERSONNEL SAFE ACCESS TO APPARATUS & TO PERFORM ANY SWITCHING IF REQUIRED, IN ADDITION TO CURRENT STANDARD FENCING ARRANGEMENT.

10 - CONTRACTOR SHALL PROVIDE "AS CONSTRUCTED" DRAWINGS THAT SHALL INCLUDE:
- 1 x A1 PAPER PRINT INDICATING "AS INSTALLED" (OF ALL DRAWINGS).
- 1 x A3 PAPER PRINT INDICATING "AS INSTALLED" (OF ALL DRAWINGS).
- 1 DIGITAL (CD) COPY OF ALL DRAWINGS ('MICROSTATION' .DGN & 'AUTOCAD' .DWG FILES).

No.	DESCRIPTION	DATE	INIT.	COMPANY
0	CONTRACT DRAWING	3-9-24	AG	AGA

AMENDMENTS Plot Date: 03/09/2024

AGA CONSULTING ENGINEERS PTY LTD
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AGA477-1B

DRAWN	CHECKED
K.T. DATE: NOV 23	A.G. DATE: NOV 23
DESIGNED	CHECKED
A.G. DATE: NOV 23	DATE:
DESIGN PROJECT LEADER	NTG PROJECT MANAGER
DATE	DATE

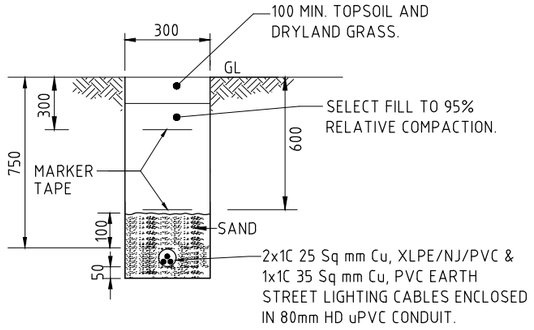
Northern Territory Government

DARWIN REGION
KULALUK

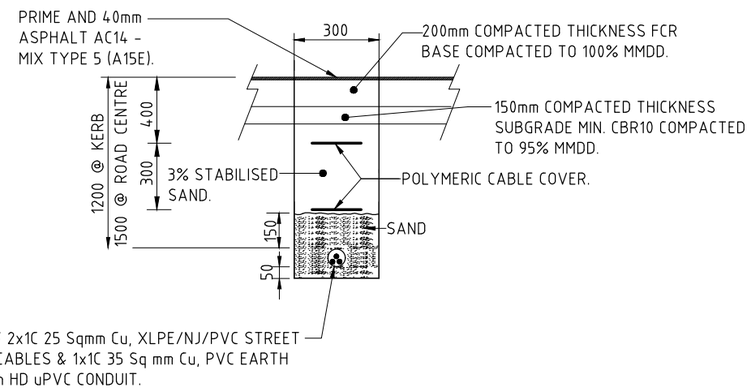
STREET LIGHTING
LOCALITY PLAN, NOTES, DETAIL & DRAWING SCHEDULE

NTG PROJECT No.	NTG ASSET No.	NTG SHEET No.	DRAWING No.	AMENDMENT	SHEET SIZE
		E1 OF 3	R24-2334	0	A1

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



DETAIL B - TYPICAL CABLE TRENCH DETAIL BTW CP5/POLE 16, CP6/CP7, CP8/POLE 19, CP9/CP10, CP10/CP11 & PART CP11/CP12 (EXCEPT DEVIATES WHERE PASSES UNDER DRAINAGE - REFER DWG No. E3 DETAILS D TO G) (N.T.S.)



DETAIL C - TYPICAL CABLE TRENCH DETAIL - ROAD CROSSING BTW RODP1/CP5, CP8/CP9, CP12/CP13 & CP13/SLMP (N.T.S.)

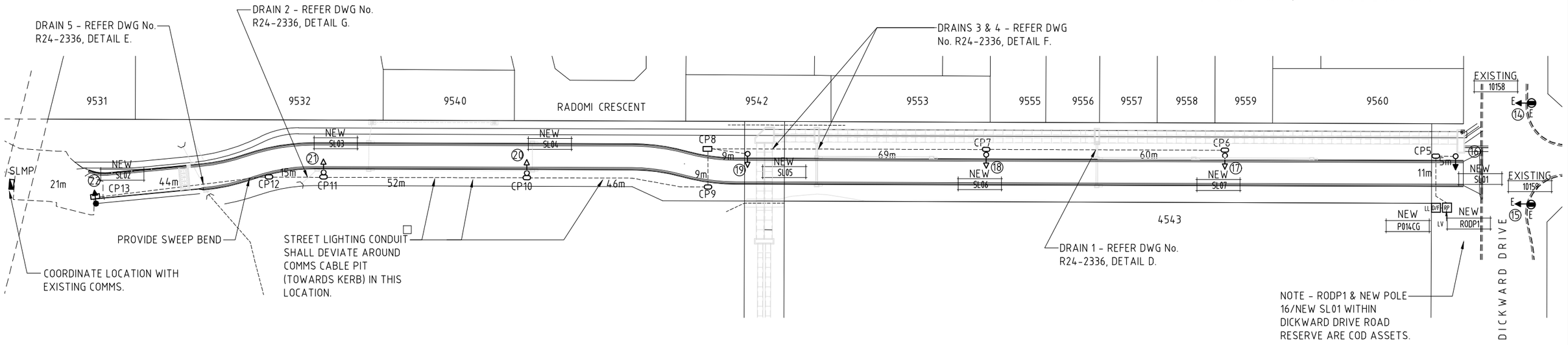
NOTES

1 - CONTRACTOR SHALL SUPPLY/INSTALL NEW 'SMART CONTROLLER ('TELENSA' TELECELL T2A1N-G-3 FCC 5 PIN NEMA DIMMING WITH GPS, GREY IN COLOUR) FOR FOR NEW STREET LIGHT SL01. COD WILL COMMISSION IT INTO COD STREET LIGHTING CONTROL NETWORK. NEW STREET LIGHT SL01 TO BE DIMMED TO 50%.

2 - NEW LV SERVICE CABLING TO NEW RODP1/NEW SLMP - AS PART OF ELECTRICAL RETICULATION WORKS.

LEGEND

- RP — NEW ROAD OWNER DIST. PILLAR.
- SLMP — NEW STREET LIGHTING METERING PANEL.
- D/P L — NEW DIST. PILLAR - AS PART OF ELECTRICAL RETICULATION WORKS.
- LV — NEW LV SERVICE CABLE - AS PART OF ELECTRICAL RETICULATION WORKS.
- NEW STREET LIGHT CABLE - 0.6/1kV 2x1C 25 Sq mm Cu, XLPE/NJ/PVC & 1x1C 35 Sq mm Cu, PVC EARTH IN 80mm HD uPVC CONDUIT.
- E — EXISTING HV/LV POLE .
- E — EXISTING STREET LIGHT - 90W LED 'PHILLIPS' ROADFLAIR LUMINAIRE ON EXISTING POWER POLE .
- NEW STREET LIGHT - 80W LED GE' ECO R250 LUMINAIRE (4000K LIGHT COLOUR TEMPERATURE) MOUNTED ON 9m POLE WITH 1.5m OUTREACH. SET BACK 1.1m FROM KERB.
- NEW STREET LIGHT - 80W LED 'GE' ECO R250 LUMINAIRE (3000K LIGHT COLOUR TEMPERATURE) MOUNTED ON 9m POLE WITH 3m OUTREACH. SET BACK 1m FROM FENCE.
- NEW STREET LIGHT - 30W LED 'GE' EVOLVE LUMINAIRE (3000K LIGHT COLOUR TEMPERATURE) MOUNTED ON 9m POLE WITH 1.5m OUTREACH. SET BACK 1.1m FROM KERB.
- CP — NEW CABLE PIT ('ACO' TYPE 52 WITH RISER/DUCTILE IRON RHINOCAST CLASS D LID/IRON FRAME.
- CP — NEW CABLE PIT (TYPE IN ACCORDANCE WITH PWC STD DWG S03-01-06-01) WITH CONCRETE SURROUND.



SITE PLAN (1:500 AT A1)

No.	DESCRIPTION	DATE	INIT.	COMPANY
0	CONTRACT DRAWING	3-9-24	AG	AGA

AMENDMENTS — Plot Date: 03/09/2024

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AGA477-18

DRAWN	CHECKED
K.T.	A.G.
DATE: NOV 23	DATE: NOV 23
DESIGNED	CHECKED
A.G.	
DATE: NOV 23	DATE:
DESIGN PROJECT LEADER	NTG PROJECT MANAGER
DATE	DATE

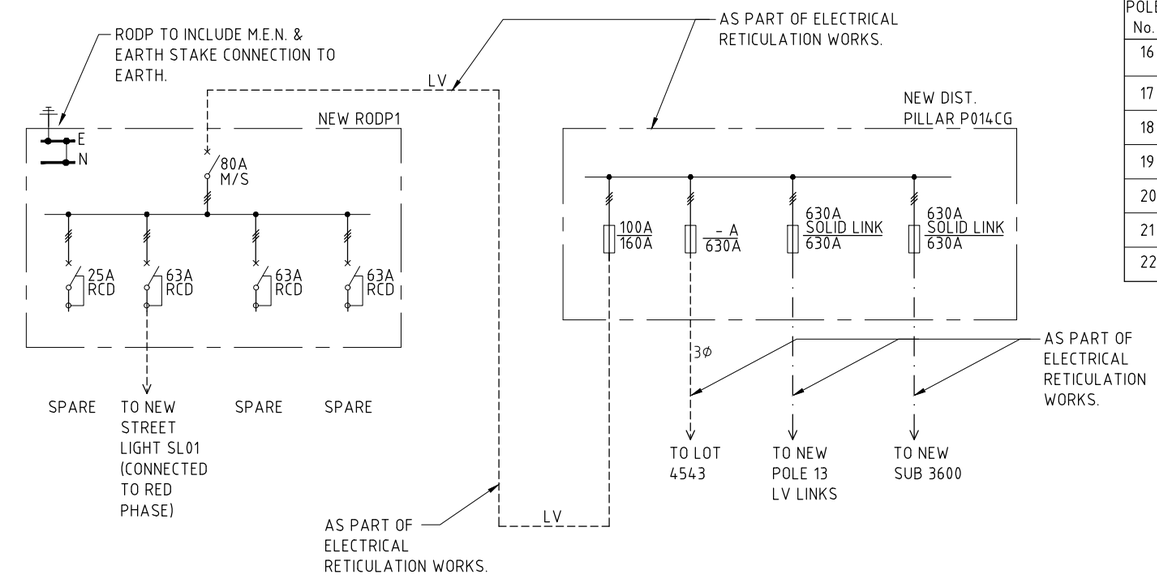
Northern Territory Government

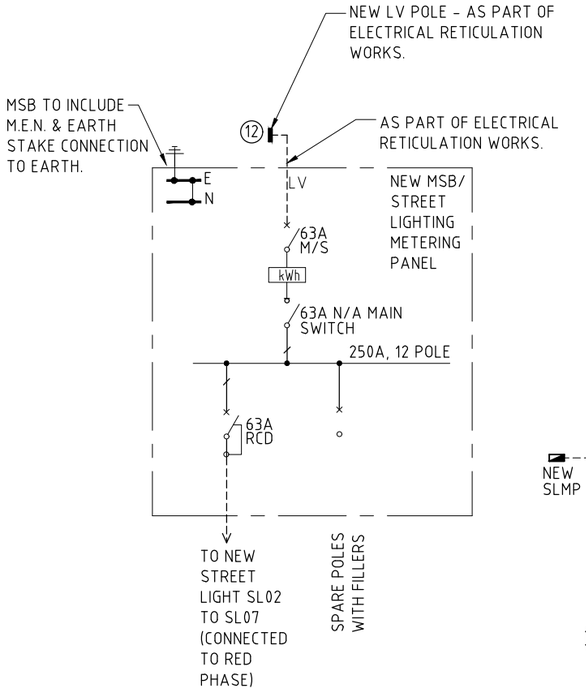
DARWIN REGION
KULALUK

STREET LIGHTING
STREET LIGHTING RETICULATION, NOTES, LEGEND & DETAILS

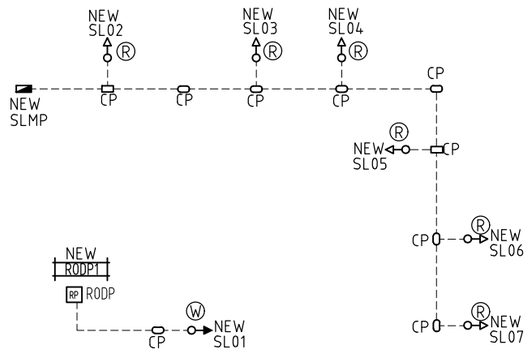
NTG PROJECT No.	NTG ASSET No.	NTG SHEET No.	DRAWING No.	AMENDMENT	SHEET SIZE
		E2 OF 3	R24-2335	0	A1

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS





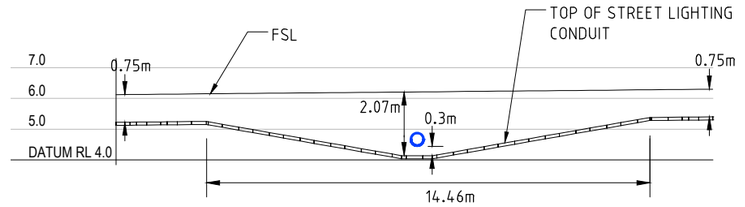
LV SINGLE LINE DIAGRAM (N.T.S.)



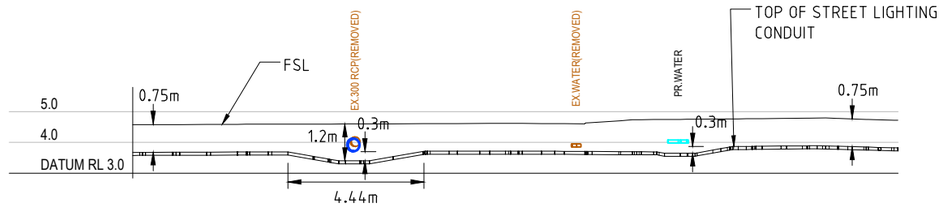
STREET LIGHTING SINGLE LINE DIAGRAMS (N.T.S.)

STREET LIGHTING POLE/LUMINAIRE SCHEDULE

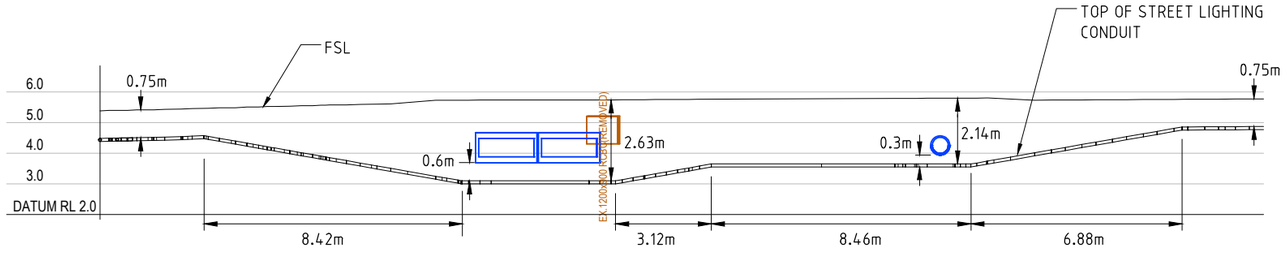
POLE No.	STREET/PATH LIGHT No.	SMART CONTROLLER No.	SIZE	TYPE	OUTREACH	LUMINAIRE TYPE	REMARKS
16	SL01	OSID : SN :	9m	RIGID	1.5m	80W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' ECO R250 80W LED LUMINAIRE.
17	SL07	N/A	9m	RIGID	1.5m	30W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' EVOLVE 30W LED LUMINAIRE.
18	SL06	N/A	9m	RIGID	1.5m	30W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' EVOLVE 30W LED LUMINAIRE.
19	SL05	N/A	9m	RIGID	1.5m	30W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' EVOLVE 30W LED LUMINAIRE.
20	SL04	N/A	9m	RIGID	1.5m	30W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' EVOLVE 30W LED LUMINAIRE.
21	SL03	N/A	9m	RIGID	1.5m	30W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' EVOLVE 30W LED LUMINAIRE.
22	SL02	N/A	9m	RIGID	3m	80W LED	NEW 'INGAL/EPS' POLE/OUTREACH WITH 'GE' ECO R250 80W LED LUMINAIRE.



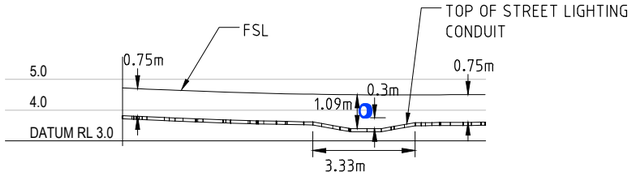
DETAIL D - CABLE TRENCH DETAIL UNDER DRAIN 1 (1:100 AT A1)



DETAIL E - CABLE TRENCH DETAIL UNDER DRAIN 2 (1:100 AT A1)



DETAIL F - CABLE TRENCH DETAIL UNDER DRAINS 3 & 4 (1:100 AT A1)



DETAIL G - CABLE TRENCH DETAIL UNDER DRAIN 5 (1:100 AT A1)

No.	DESCRIPTION	DATE	INIT.	COMPANY
0	CONTRACT DRAWING	3-9-24	AG	AGA

AMENDMENTS Plot Date: 03/09/2024

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AGA477-18

DRAWN	CHECKED
K.T.	A.G.
DATE: NOV 23	DATE: NOV 23
DESIGNED	CHECKED
A.G.	
DATE: NOV 23	DATE:
DESIGN PROJECT LEADER	NTG PROJECT MANAGER
DATE	DATE

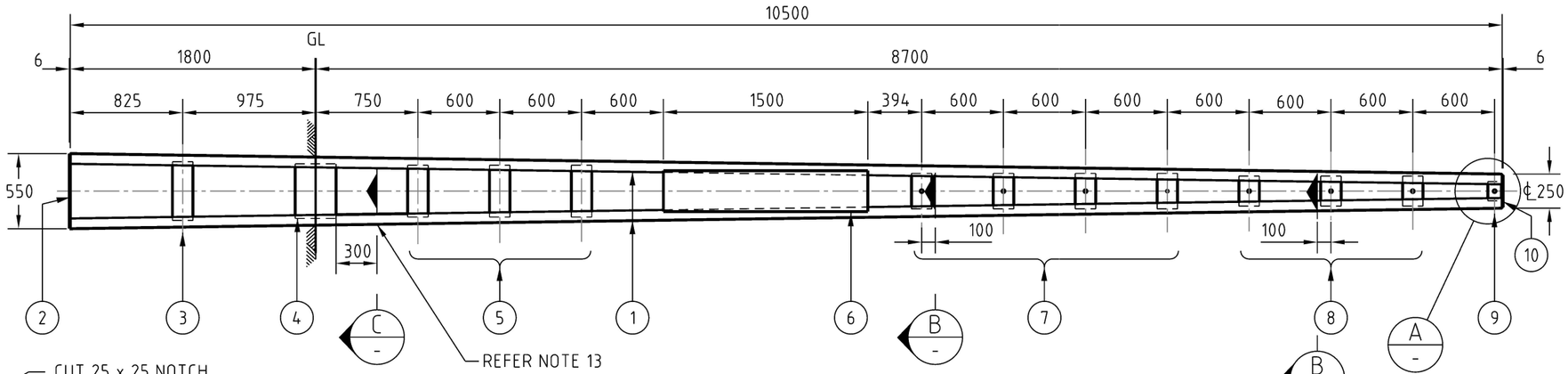
Northern Territory Government

DARWIN REGION
KULALUK

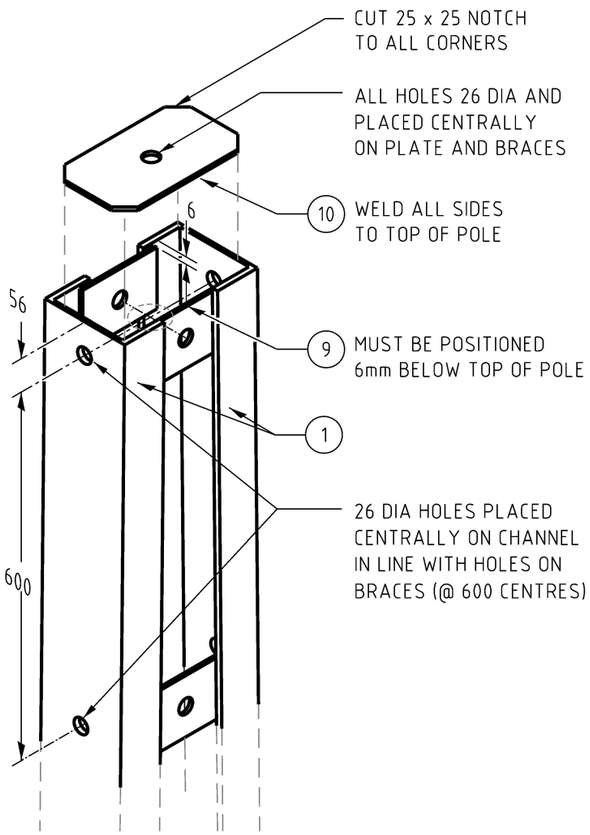
STREET LIGHTING
LV/STREET LIGHTING SINGLE LINE DIAGRAMS, SCHEDULE & DETAILS

NTG PROJECT No.	NTG ASSET No.	NTG SHEET No.	DRAWING No.	AMENDMENT	SHEET SIZE
		E3 OF 3	R24-2336	0	A1

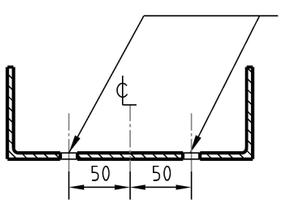
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



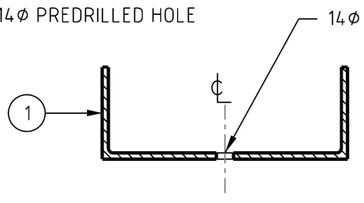
SIDE VIEW
SCALE 1:40



A ISOMETRIC VIEW
NTS



SECTION C
1:5



SECTION B
1:5

NOTES

1. TOP PLATE AND BASE PLATE DO NOT FORM PART OF THE OVERALL DIMENSION
2. BRACES AND GROUND PLATE TO BE WELDED ON INSIDE OF POLE AND TO HAVE 18mm MIN OVERLAP. ANTI-CLIMBING PLATE TO BE WELDED ON OUTSIDE OF POLE
3. ALL WELDS TO BE 6mm FILLET CONTINUOUS WELD EXCEPT ANTI-CLIMBING PLATE WHICH IS TO HAVE 6mm FILLET 150mm LONG AT BOTH ENDS AND CENTRE
4. ALL ROUGH OR BURRED EDGES ARE TO BE DRESSED CLEAN
5. STEEL TO BE GRADE 300 PLUS
6. PFC DIMENSIONS ARE TO AS 3679
7. WELDING TO COMPLY WITH AS 1554
8. TOLERANCES TO DIMENSIONS OVER 5m IS +/- 5mm
9. EACH POLE IS TO BE ENGRAVED WITH THE SIZE, TARE WEIGHT, FABRICATORS NAME AND MONTH AND YEAR OF FABRICATION
10. ENGRAVING SHALL BE IN LETTERS NO LESS THAN 10mm HIGH AND 0.05mm DEEP AND POSITIONED ON THE FIRST GUSSET PLATE ABOVE GROUND LEVEL
11. POLES TO COMPLY WITH STSP 01-002
12. SPLICE VERSION OF THE POLE 10.5B & C REFER DRG S01-01-01-31
13. 14ø PREDRILLED HOLE FOR EARTH BOND AND NEUTRAL BOND TERMINATION

LINE POLE 10.5B - TOTAL MASS 540kg

STANDARD - ITEM NUMBER: 298448
HD GALVANISED - ITEM NUMBER: 501237

LINE POLE 10.5C - TOTAL MASS 660kg

STANDARD - ITEM NUMBER: 299107
HD GALVANISED - ITEM NUMBER: 501238

ITEM	QTY. 10.5B	QTY. 10.5C	MATERIAL DESCRIPTION
1	2	-	150 x 75 PFC. 10.5m LONG
	-	2	200 x 75 PFC. 10.5m LONG
2	1	1	550 x 100 x 6 FMS, BASE PLATE
3	2	2	430 x 150 x 6 FMS, FOOTING BRACES
4	2	2	400 x 300 x 6 FMS, GROUND PLATE
5	6	6	380 x 150 x 6 FMS, BRACES UNDER A/CL PLATE
6	2	2	300 x 1500 x 6 FMS, ANTI-CLIMBING PLATE
7	8	8	260 x 150 x 10 FMS, BRACE 26 DIA. HOLE
8	6	6	220 x 150 x 10 FMS, BRACE 26 DIA. HOLE
9	2	2	140 x 100 x 10 FMS, TOP BRACE 26 DIA. HOLE
10	1	-	238 x 138 x 6 FMS, TOP PLATE 26 DIA HOLE, NOTCHED 25x25 EACH CORNER
	-	1	238 x 188 x 6 FMS, TOP PLATE 26 DIA HOLE, NOTCHED 25x25 EACH CORNER

NO	DESCRIPTION	DRN	DATE	CKD	APPD
7	AMENDED ITEM 10. REMOVED ITEMS 11, 12 & 13. IMPROVED IMAGERY. AMENDED NOTE 5. ADDED NOTES 11, 12 & 13. ADDED SECOND EARTH CONNECTION AT POLE BASE.	P.G	MAR'23	B.V.	B.C.
6	ADDED NOTE 11. REFORMATTED TEXT AND TABLE	K.T.	DEC'18	C.C.	C.C.
5	TITLEBLOCK & DRAWING NUMBER FORMATTED, GALVANISED ITEMS ADDED	A.T.	MAR'16	I.B.	A.T.
4	POLE MASS, ITEM 12 & 13 ADDED. NOTE 9 AMENDED, ITEM 10 AMENDED, 13ø HOLE FOR PADLOCK REMOVED	A.T.	MAR'16	I.B.	F.R.R.
3	13ø¢ HOLES FOR PADLOCK ADDED	A.S.	OCT'05	C.C.	F.R.R.
2	M12 X 40 LONG GALVANISED BOLTS ITEM 11 ADDED	A.S.	MAY'03	M.B.	F.R.R.
1	TITLE CHANGED TO 10.5B & 10.5C, STOCK CODE FOR 10.5C ADDED	A.S.	SEP'01	M.B.	F.R.R.
0	ISSUED FOR CONSTRUCTION	A.S.	APR'01	M.B.	F.R.R.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	M. BOCK
DRN	R. INNES
CKD	M. BOCK
APPD	F. ROBSON
SCALE	AS NOTED
ISSUED	JUL'00
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

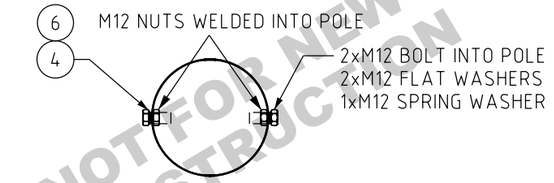
POWER STANDARD DRAWING

POLES
LINE 10.5B & 10.5C
BOLTED CONNECTIONS TYPE

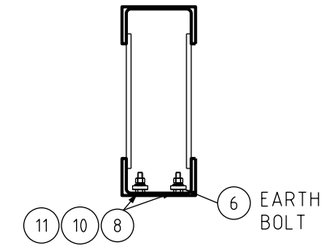
A3 | DRAWING NUMBER S01-01-01-08 | 7 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



FOR ROUND POLE CONSTRUCTION

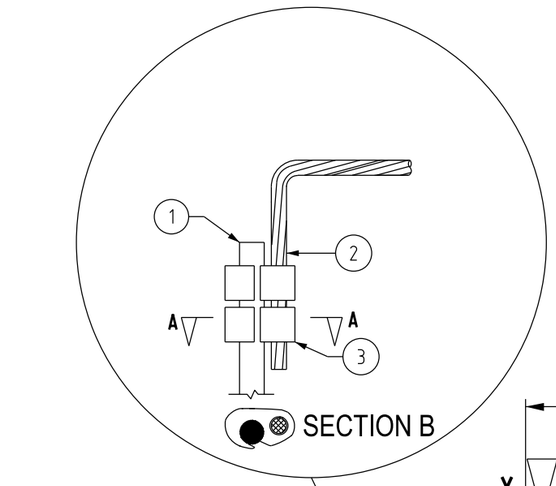


FOR UNIVERSAL POLE CONSTRUCTION

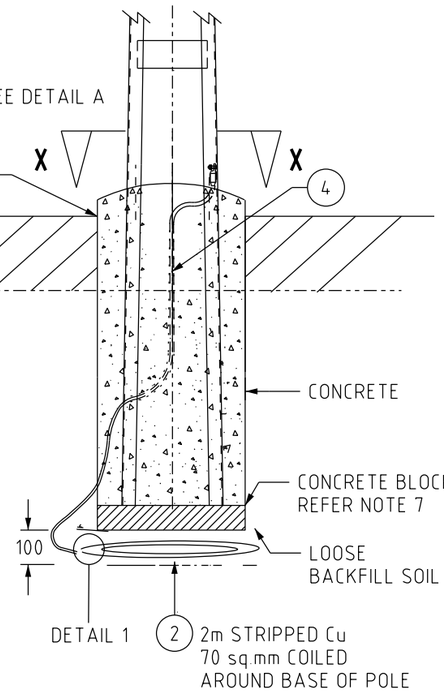
NOT FOR NEW CONSTRUCTION

X — SECTION
\- — N.T.S.

TYPE A



TYPE B



NOTES

1. ALL POLES TO BE EARTHED AS SHOWN EXCEPT WHERE SPECIAL ARRANGEMENTS ARE REQUIRED, SUCH AS FOR POLE MOUNTED SUBSTATIONS, G.B.S, METERING UNITS, CAPACITOR BANK INSTALLATIONS, CABLE TERMINATIONS, ETC., WHERE TYPE 1, 2 OR 3 EARTHING REQUIREMENTS MUST BE USED AS REQUIRED.
2. EARTHING TYPE A IS TO BE USED ON EVERY 5TH POLE IN URBAN AREAS AND EVERY 3RD POLE IN RURAL AREAS. ALL OTHER NON-SPECIAL POLES ARE TO BE EARTHED AS SHOWN IN TYPE B.
3. EARTH ELECTRODES ARE TO BE PLACED DIRECTLY BELOW THE CENTERLINE OF OVERHEAD CONDUCTORS.
4. USE 4M OF YELLOW/GREEN INSULATED CABLE FROM EARTHING BOLT TO BARE COPPER 19/2.14 (70 sqmm) CONDUCTOR. CONNECTION POINT IS TO BE 1m FROM THE BASE OF POLE.
6. FOR TYPE A, AUGER A MINIMUM DIAMETER HOLE TO A MINIMUM DEPTH OF 3 METERS, FEED 70sqmm BARE COPPER CABLE INTO THE HOLE AND BACKFILL. FOR BORED HOLES LESS THAN 75mm DIA, BACKFILL WITH A MIXTURE OF EARTHING COMPOUND AND WATER RATIOS BEING 20-30kg EARTH COMPOUND TO 10-15L WATER. FOR BORED HOLES GREATER THAN 75mm DIAMETER, BACKFILL WITH SELECTED SOIL MIXED WITH EARTHING COMPOUND AT 1:1 RATIO AND PLACED IN THE HOLE AND PROGRESSIVELY WATERED.
7. REFER TO S01-04-04-01 PWC PROCEDURE 'LINE/SERVICE POLE INSTALLATION - CIVIL WORKS' FOR THE INSTALLATION & REQUIREMENTS OF POLE CONCRETE FOUNDATIONS.
8. TYPE A ONLY: TWO INDEPENDENT EARTH CONNECTORS OR AN EXOTHERMIC EARTHINGWELD MUST BE USED ON ALL NEW JOINTS AND TERMINATIONS. EXISTING INSTALLATIONS MAY HAVE SINGLE CONNECTORS.
9. REFER TO S01-04-01-21 FOR FOUNDATION AND POLE PLACEMENT DIMENSIONS.

ITEM	TYPE A	TYPE B	DESCRIPTION	ITEM NUMBER	DRAWING REF.
11	2	1	M12 GALV. STEEL SPRING WASHER	239616	S01-01-04-43
10	2	1	M12x40 GALV. STEEL BOLT C/W NUT	503669	S01-01-04-43
8	2	1	M12 GALV. STEEL FLAT WASHER	400832	S01-01-04-43
7	4	-	'C' CONNECTOR EARTHING COMPRESSION	255786	S01-01-05-08
6	2	1	LUG COMPRESSION - Cu - 70sqm	5512	S02-01-02-11
5	6m	0.5m	MARKER TAPE	6569	S02-01-08-05
4	4m	4m	Y/Gr INSULATED COPPER 70 sq.mm	401059	S02-01-01-23
3	4	-	'6' CONNECTOR EARTHING COMPRESSION	257394	S01-01-05-08
2	6m	-	BARE COPPER CONDUCTOR -70sq.mm	9803	S01-01-05-05
1	2	-	EARTH ROD 14mm SS316	414060	S01-01-05-01

MATERIAL SCHEDULE

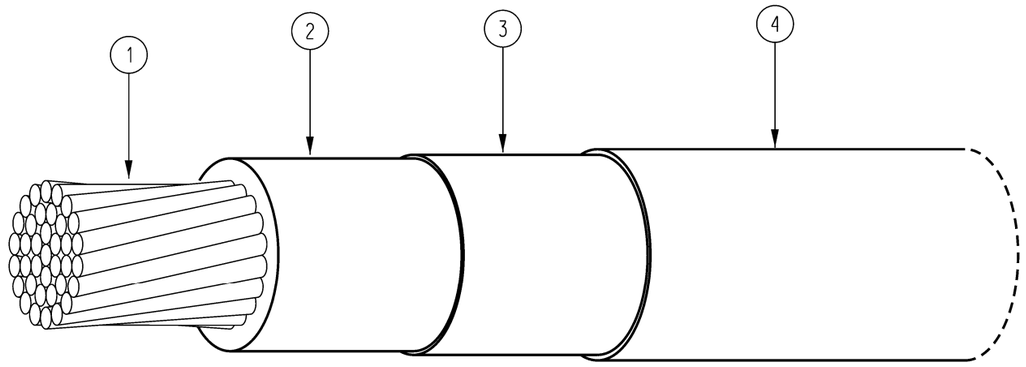
NO	DESCRIPTION	DRN	DATE	CKD	APPD
12	REMOVED NOTE 5 & ITEMS 9 & 11. ADDED DOUBLE INDEPENDENT CONNECTIONS, NOTE 8, 9 & ITEM 11. ROUND POLE 'NOT FOR NEW CONSTRUCTION'. UPDATED IMAGERY.	A.N.	OCT'21	A.N.	B.V.
11	CORRECT DIMENSION AND INCLUDE ITEM NUMBER FOR ITEM 8.	C.C.	JAN'21	B.V.	B.C.
10	CORRECTED GAL PIPE ITEM NUMBER	CWM	FEB'20	B.V.	B.V.
9	TITLEBLOCK & DRAWING NUMBERS FORMATTED	K.T.	JAN'19	C.C.	C.C.
8	ITEM NUMBER AMENDED	P.H.	APR'18	I.B.	B.C.
7	OPTION 1 & 2 REMOVED FROM TYPE 'A' EARTHING METHOD	I.B.	JUL'17	B.C.	B.C.
6	ITEM 10 & 11 ADDED, NOTE 7 ADDED, POLE FOUNDATION AMENDED	K.T.	JUN'16	I.B.	B.C.
5	ROUND POLE DETAILS ADDED	A.T.	JULY'11	B.N.	S.C.
4	ARRANGEMENT TYPE B ADDED	J.C.	SEP'10	A.T.	S.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES S.C.M.	POWER STANDARD DRAWING
DRN J.A.L.	EARTHING POLE EARTHING METHOD TYPE A & TYPE B
CKD -	
APPD F.ROBSON	
SCALE N.T.S.	
ISSUED JUN'98	A3 — DRAWING NUMBER S01-02-03-19 — 12 AMDT
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ITEM	UNITS	*1	*2	*3	*4	5
ITEM NUMBER	-	-	-	-	-	401015
CONDUCTOR AREA	sq.mm	25	35	50	185	240
CONDUCTOR DIAMETER	mm	6.0	6.9	8.2	15.7	18.5
INSULATION THICKNESS	mm	1.7	1.7	1.8	2.4	1.7
NYLON SHEATH THICKNESS MIN.	mm	0.5	0.5	0.5	0.5	0.5
SACRIFICIAL SHEATH THICKNESS	mm	0.6	0.6	1.0	1.0	1.7
CABLE OUTER DIAMETER	mm	-	-	-	-	28.5
STANDARD DRUM LENGTH	mm	500	500	1000	1000	1000
CABLE MASS	kg/100m	16	22.5	24	76.4	96.3
GROSS MASS OF STANDARD DRUM LENGTH	kg	190	270	267	864	1109
CONDUCTOR FORM	-	COMPACTED, AA1350, H68 TEMPER, ROUND		COMPACTED, AA1350, H68 TEMPER, ROUND, WATER BLOCKED		
MINIMUM NUMBER OF STRANDS	-	6	6	7	36	36
BENDING RADIUS - DURING INSTALL	mm	-	-	-	-	715
BENDING RADIUS - INSTALLED	mm	-	250		-	520
MAX PULLING TENSION	kN	-	1.5	-	9.3	12
CURRENT RATING - DIRECT BURIED	A	-	140	-	352	409
CURRENT RATING - IN DUCTS	A	-	106	-	283	333

NOTES:

1. THE CABLES SHALL BE PERMANENTLY MARKED WITH MANUFACTURERS IDENTIFICATION, YEAR OF MANUFACTURE AND VOLTAGE RATING AT INTERVALS ALONG THE OUTER PVC SHEATH OF THE CABLE.
2. THE CABLE SHALL ALSO HAVE ITS LENGTH PRINTED AT INTERVALS ALONG THE SACRIFICIAL SHEATH, CONSISTING OF CONSECUTIVE NUMBERS, NOMINALLY SPACED AT ONE METRE.
3. CABLE TO BE WOUND ON DRUM TO ENSURE LEGIBILITY OF ABOVE INFORMATION IN NOTES 1 AND 2.
4. TEMPER OF THE CONDUCTOR TO BE H68, COMPACTED TO AS 1125.
5. EXCEPT WHERE OTHERWISE STATED, THE CABLE SHALL CONFORM TO AND BE IN ACCORDANCE WITH AS 5000.1
6. REFER TO SPECIFICATION STSP 02-002.
7. WATER BLOCKING SHALL BE ACHIEVED THROUGH THE USE OF WATER BLOCKING YARN. WATER BLOCKING POWDERS SHALL NOT BE USED.
8. ALL CABLES SHALL BE CAPPED AT ALL TIMES EXCEPT WHEN THE CABLE IS IN THE JOINING OR TERMINATION PROCESS. REFER TO S02-01-02-21 & S02-01-02-15 FOR CAP DETAILS.
9. * ITEMS 1-4 NO LONGER TO BE USED. USE ITEM 5 OR COPPER EQUIVALENT IN S02-01-01-20. PARAMETERS FOR ITEMS 1-4 ARE HISTORICAL BASED ON PVC OUTER SHEATH

TAG REFERENCE	DESCRIPTION
4	MDPE - SACRIFICIAL SHEATH - BLACK UV STABILISED
3	ANTI-TERMITE JACKET - EXTRUDED NYLON 11 OR 12 - BLACK OR BLUE
2	EXTRUDED XLPE - NATURAL
1	CONDUCTOR - ALUMINIUM STRANDED AA1350 H68

NO	DESCRIPTION	DRN	DATE	CKD	APPD
29	ADDED ASTERISK TO ITEM 1-4 & NOTE 9.	P.BH.	AUG'23	B.C.	B.V.
28	AMENDED TAG REFERENCE 2.	P.BH.	FEB'23	B.C.	B.V.
27	REFORMATTED TABLES. ADDED TECHNICAL INFORMATION. MOVED APPLICATION NOTE TO NOTE 9. UPDATED TITLE.	A.N.	NOV'21	A.N.	B.V.
26	ITEM 1-4 NUMBERS REMOVED, NO LONGER TO BE USED, UPDATE NOTE *, UPDATE ITEM 5 PARAMETERS, REPLACE NOTE 6, UPDATE TAG 4 TO MDPE.	C.C.	APR'20	C.C.	B.C.
25	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	JAN'19	C.C.	C.C.
24	NOTE 8 ADDED	P.H.	DEC'17	BC	SC
23	NOTE 7 ADDED	A.T.	JUN'11	BC	SC

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	D.BIRKETT
DRN	S.JACKSON
CKD	J.HASSANEN
APPD	-
SCALE	N.T.S.
ISSUED	MAR'80
ALL DIM. IN mm	

POWER STANDARD DRAWING

CABLES
ALUMINIUM - SINGLE CORE
0.6/1kV
XLPE/NYLON/MDPE

A3

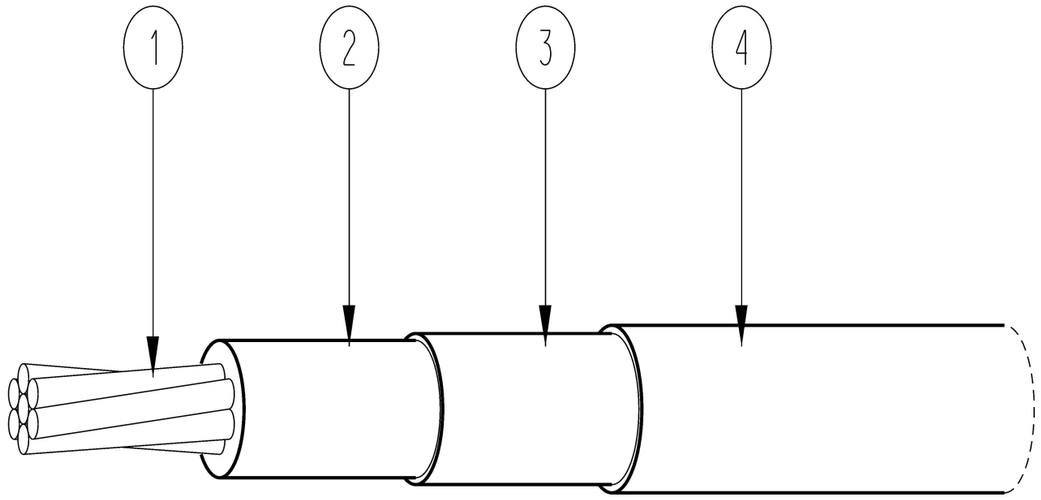
DRAWING NUMBER S02-01-01-19

29 AMDT

DRAFTING STANDARD TO A.S.1100

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ITEM	UNITS	1	2	3
ITEM NUMBER		9456 (BLACK)	9449 (RED)	505118
CONDUCTOR AREA	sq mm	25		240
CONDUCTOR DIAMETER	mm	6		18.7
INSULATION THICKNESS	mm	0.9		1.7
NYLON SHEET THICKNESS MIN	mm	0.5		0.5
SACRIFICIAL SHEATH THICKNESS	mm	1.4		1.43
CABLE OUTER DIAMETER LENGTH	mm	12.1		28.5 +/- 3
STANDARD DRUM LENGTH	mm	500		1000
CABLE MASS	kg/100m	32		246
CONDUCTOR FORM		COMPRESSED		COMPACTED
MINIMUM NUMBER OF STRANDS		7		37
BENDING RADIUS (INSTALLATION)	mm	270		713
BENDING RADIUS (INSTALLED)	mm	180		428
MAX PULLING TENSION	kN	1.8		3.5
CURRENT RATING	A	108		391

NOTES:

1. THE CABLES SHALL BE PERMANENTLY MARKED WITH MANUFACTURERS IDENTIFICATION, YEAR OF MANUFACTURE AND VOLTAGE RATING AT INTERVALS ALONG THE OUTER PVC SHEATH OF THE CABLE.
2. THE CABLE SHALL ALSO HAVE ITS LENGTH PRINTED AT INTERVALS ALONG THE SACRIFICIAL SHEATH, CONSISTING OF CONSECUTIVE NUMBERS, NOMINALLY SPACED AT ONE METRE.
3. CABLE TO BE WOUND ON DRUM TO ENSURE LEGIBILITY OF ABOVE INFORMATION IN NOTES 1 AND 2.
4. CABLE WILL COMPLY WITH AS/NZS 5000.1 AND AS 1125.
5. REFER TO SPECIFICATION STSP 02-002 FOR MORE INFORMATION.
6. ALL CABLES SHALL BE CAPPED AT ALL TIMES WHEN NOT IN USE.
7. ALL FIGURES ARE GENERIC INFORMATION AND YOU SHOULD CHECK WITH CABLE SPECIFICATIONS WHEN AND IF REQUIRED.

TAG NO	DESCRIPTION
4	MDPE SACRIFICIAL SHEATH UV STABILISED
3	ANTI-TERMITE JACKET - EXTRUDED NYLON 11 OR 12
2	CROSS LINKED POLYETHYLENE INSULATION.
1	CONDUCTOR - COPPER

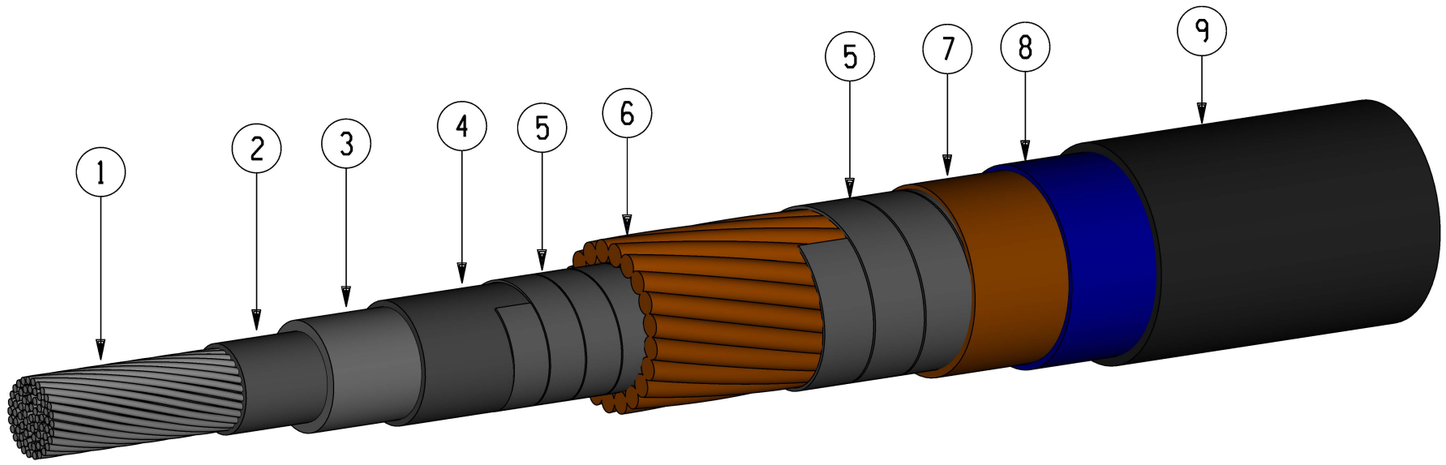
NO	DESCRIPTION	DRN	DATE	CKD	APPD
	AMENDMENTS				
16	UPDATED THE MATERIALS TABLE AND ADDED A NEW COLUMN. IMPROVED DRAWING QUALITY AND LAYOUT.	J.R.	JUL'24	B.B.	B.V.
15	CLARIFIED OUTER LAYER COLOUR. EDITED NOTE 5 & ADDED NOTE 6.	A.N.	JUN'21	A.N.	B.C.
14	REFORMATTED TABLE OF ATTRIBUTES, UPDATED INSULATION THICKNESS.	A.N.	DEC'20	C.C.C.	B.C.
13	NOMINAL INSULATION THICKNESS & NOTE 4 UPDATED	H.E.	SEP'20	H.E.	B.C.
12	UPDATE TAG 4 TO MDPE, ADD NOTE 5, UPDATE PARAMETERS.	C.C.	APR'20	C.C.	B.C.
11	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	JAN'19	C.C.	C.C.
10	TAG NO 3 COLOUR AMENDED.	RGI	APR'01	-	FRR
9	GENERAL REVISION TITLE & DRG NO CHANGED.	-	JUN'88	-	OLT

PowerWater
NORTHERN TERRITORY

DES Dr D.K.SWEETING	POWER STANDARD DRAWING
DRN J.GAMMIE	CABLES COPPER - SINGLE CORE 0.6/1KV XLPE - NYLON
CKD D.K.SWEETING	
APPD K.CHITT	
SCALE no scale	
ISSUED DEC'83	A3
ALL DIM. IN mm	DRAWING NUMBER S02-01-01-20
DRAFTING STANDARD TO A.S.1100	CAD PRODUCT - DO NOT AMEND MANUALLY

16 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ITEM	UNITS	1	2	3	4	5
ITEM NUMBER	-	286005	286013	286021	286039	500984
CONDUCTOR AREA	SQ.mm	35	95	240	400	630
CONDUCTOR DIAMETER	mm	7.0	11.5	18.6	23.6	29.9
CONDUCTOR SCREEN SEMI-CON MIN.	mm	0.3	0.3	0.3	0.3	0.3
XLPE INSULATION THICKNESS	mm	3.4	3.4	3.4	3.4	3.4
DIAMETER OVER XLPE INSULATION	mm	16.5	20	27.3	32	38
INSULATION SCREEN SEMI-CON MIN.	mm	0.6	0.6	0.6	0.6	0.6
WATER BLOCKING TAPE THICKNESS MIN.	mm	0.3	0.3	0.3	0.3	0.3
EARTH SCREEN AREA	SQ.mm	23	65	90	90	90
EARTH SCREEN FAULT RATING	kA.1s	3.3	9.2	13.1	13.1	13.1
PVC SHEATH THICKNESS	mm	1	1	1	1.5	1.5
DIAMETER OVER PVC	mm	23.5	28.5	35.6	41.7	48.4
NYLON SHEATH THICKNESS MIN.	mm	0.5	0.5	0.5	0.5	0.5
HDPE SHEATH THICKNESS	mm	2	2	2	2.5	2.5
OVERALL CABLE DIAMETER	mm	31	35	42.5	50	56.5
CABLE LENGTH ON DRUM	m	1000	1000	500	500	750
BENDING RADIUS DURING INSTALL	mm	850	1000	1250	1500	1600
BENDING RADIUS INSTALLED	mm	550	675	850	925	1100
MASS OF CABLE	kg/km	1075	1700	2580	3410	4290
CONDUCTOR FORM	-	COMPACTED, AA1350, H68 TEMPER, ROUND, WATER BLOCKED				
AC RESISTANCE @ 50Hz, 90°C	OHM/km	1.110	0.410	0.161	0.102	0.0636
INDUCTIVE REACTANCE	OHM/km	0.144	0.123	0.107	0.101	0.0950
POSITIVE SEQUENCE CAPACITANCE	uF/km	0.237	0.311	0.425	0.516	0.664
ZERO SEQUENCE RESISTANCE	OHM/km	1.66739	0.60983	0.34274	0.30330	0.28320
ZERO SEQUENCE REACTANCE	OHM/km	0.08184	0.07931	0.07473	0.07649	0.07323
CURRENT RATING - DIRECT BURIED	A	134	231	380	485	620
CURRENT RATING - IN DUCTS	A	108	189	318	417	533
CURRENT RATING - IN AIR	A	135	240	415	550	727
3PH VOLTAGE DROP @ 50Hz, 90°C	mV/A.m	1.94	0.74	0.33	0.24	0.24

NOTES:

1. EXCEPT WHERE OTHERWISE SPECIFIED THE CABLE SHALL COMPLY WITH AS1429.
2. THE CABLE SHALL BE PERMANENTLY MARKED WITH MANUFACTURERS IDENTIFICATION, YEAR OF MANUFACTURE, VOLTAGE RATING, CONDUCTOR MATERIAL AND CROSS SECTIONAL AREA, INSULATION MATERIAL AND TERMITE PROTECTION AT INTERVALS ALONG ITS OUTER SHEATH.
3. THE CABLE SHALL ALSO HAVE CONSECUTIVE NUMBERS PRINTED ALONG ITS OUTER SHEATH NOMINALLY SPACED AT ONE METRE INTERVALS.
4. THE CABLE SHALL BE WOUND ON ITS DRUM TO ENSURE THE LEGIBILITY OF NOTES 2 AND 3.
5. THE CABLE SHALL BE "DRY CURED".
6. ALL RATINGS, EXCEPT FOR 630sq.mm CABLES, ARE BASED ON CABLES IN TOUCHING TREFOIL CONFIGURATION WITH 40°C AMBIENT AIR TEMPERATURE, 25°C SOIL TEMPERATURE, 0.8m BURIAL DEPTH AND SOIL THERMAL RESISTIVITY OF 1.2°C.M/W
7. 630sq.mm CABLE RATINGS BASED ON 150mm DIAMETER HD CONDUITS IN TOUCHING TREFOIL CONFIGURATION WITH ONE CABLE PER CONDUIT, 40°C AMBIENT AIR TEMPERATURE, 25°C SOIL TEMPERATURE, 0.8m BURIAL DEPTH AND SOIL THERMAL RESISTIVITY OF 1.2°C.M/W
8. ALL CABLES SHALL BE FITTED WITH MASTIC LINED HEATSHRINK END CAPS AT ALL TIMES EXCEPT WHEN THE CABLE IS IN THE JOINTING OR TERMINATION PROCESS.
9. REFER TO STSP 02-003 FOR FURTHER DETAILS.
10. DIMENSIONS GIVEN ARE NOMINAL MEASUREMENTS.

TAG NUMBER	DESCRIPTION
9	SACRIFICIAL UV STABILISED HDPE SHEATH - COLOUR BLACK
8	ANTI-TERMITE JACKET - EXTRUDED NYLON 11 OR 12 CONTRASTING COLOUR (BLUE)
7	V-90 PVC SHEATH - COLOUR ORANGE
6	CONCENTRIC HELICAL EARTH SCREEN - COPPER C11000 'O'
5	SEMI-CONDUCTIVE WATER BLOCKING TAPE
4	EXTRUDED FREE STRIPPING SEMI-CONDUCTIVE MATERIAL
3	CROSS-LINKED POLYETHYLENE (XLPE) INSULATION - DRY CURED
2	EXTRUDED SEMI-CONDUCTIVE SCREEN BONDED TO INSULATION - NON-FREE STRIPPABLE
1	CONDUCTOR - ALUMINIUM ALLOY 1350 TEMPER H68 - WATER BLOCKED

NO	DESCRIPTION	DRN	DATE	CKD	APPD
6	REFORMATTED TABLES. UPDATE BENDING RADIUS.	A.N.	SEP'21	A.N.	B.V.
5	CABLE DIAMETER BENDING RADIUS AND WEIGHT ADDED	C.C.	JUL'20	B.C.	H.E.
4	UPDATE TITLE BLOCK AND CONSTRUCTION TO STSP 02-003	CWM	APR'20	C.C.	B.C.
3	TABLES AND NOTES UPDATED. ITEM 5. NOTE 8 ADDED	A.T.	FEB'13	B.C.	B.C.
2	WATER BLOCKING TAPE MOVED TO OUTSIDE OF EARTH SCREEN	J.C.	JUNE'10	A.T.	S.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	-
DRN	JAL
CKD	SCM
APPD	PJD
SCALE	no scale
ISSUED	JUL'95
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CABLES
ALUMINIUM - SINGLE CORE
6.35/11KV - XLPE - WATER BLOCKED
HDPE SHEATHED NYLON JACKETED

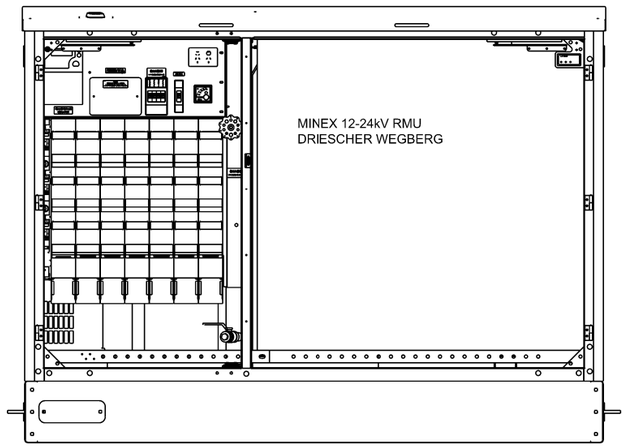
A3

DRAWING NUMBER S02-01-01-25

6 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



MK3 PACKAGE SUBSTATION GENERAL LAYOUT

SCALE 1:25

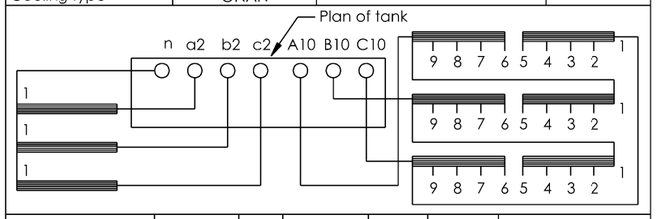
MANUFACTURER DETAILS

To AS 60076 (MEPS compliant)

WTC SERIAL NUMBER

OFF CIRCUIT TAPSELECTOR DE-ENERGISE BEFORE CHANGING TAPS

kVA			Insul. liquid Oil		MINERAL
Phase		3	Temp. rise Oil/Wdg	°C	55/60
Frequency	Hz	50	Total mass	kg	
Volts	HV		Untanking mass	kg	
(no load)	LV	433	Liquid volume	l	
Amps	HV	26.2	Pressure min/max		50/130
Amps	LV	722	(kPa abs)		
Vector group		Dyn1	Year of manufacture		
Insulation level		LI95AC28/AC10	Impedance	%	
Cooling type		ONAN			



ACROSS A10 B10 C10	HV	POS	%	CONN	LV	ACROSS a2 b2 c2
	12100	1	110.0	6-5		
	11825	2	107.5	5-7		
	11550	3	105.0	7-4		
	11275	4	102.5	4-8		
	11000	5	100.0	8-3	433	
	10725	6	97.5	3-9		
	10450	7	95.0	9-2		

A10 / A / B / C10 C B10

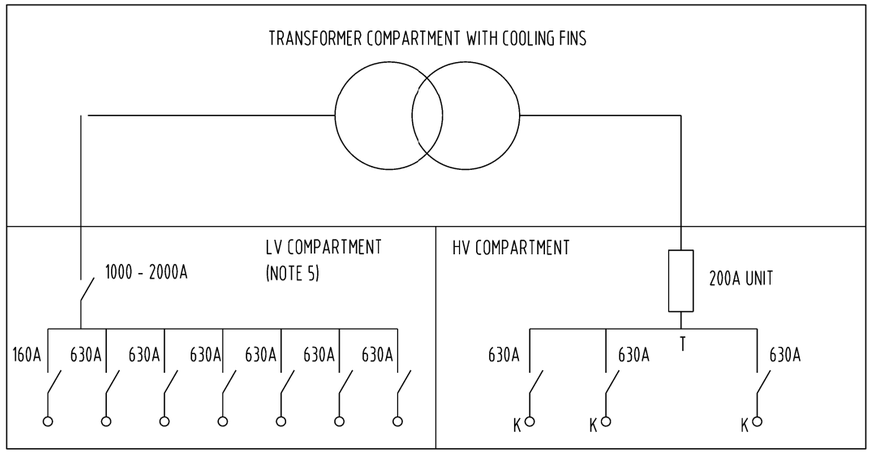
a2 / n / c2 / b2

PROPERTY OF
POWER & WATER CORPORATION

This is a Sealed Transformer

NOTES:-

1. COMPRESSION LUGS ARE TO BE USED ON ALL LV CABLE CONNECTIONS FOR XLPE AND OTHER ALUMINIUM CONDUCTORS. CABLE LUGS WITH FINAL COMPRESSION OVER INSULATION TO EXCLUDE MOISTURE ARE ESSENTIAL. REFER TO DRAWING S02-02-02-10.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE PWC SPECIFICATION STSP 02-006.
3. EACH CABLE ENTERING / LEAVING SUBSTATION IS TO HAVE A DESTINATION TAG REFER TO DRAWING S2-01-08-25.
4. CABLES IN THE HV AND LV COMPARTMENTS MUST HAVE HEAT SHRINK COLOURED SLEEVES TO MATCH PHASE AND CONNECTED TO SWITCHGEAR WITH R.W.B. FROM REAR OF CABINET TO FRONT. ALL COLOUR CODING SHALL BE ON UN-STRIPPED CABLE.
5. UNLESS SPECIFIED OTHERWISE, PACKAGE SUBSTATIONS SHALL BE SUPPLIED WITH LV PANEL INCLUDING STRIPPLE SWITCH FUSE UNITS.
6. THE CABLE TERMINATION FRAME CAN BE USED TO ASSIST IN CABLE ENTRY AND TERMINATION OF HV CABLES TO THE DRIESCHER MINEX SWITCHGEAR. REFER TO DRAWING S02-01-09-03.
7. ALL HV CABLE TERMINATIONS SHALL BE VIA 630A TYPE C SCREENED DEADBREAK CONNECTIONS.
8. LARGEST CABLE TO BE TERMINATED TO HV SWITCHGEAR IS 400sqmm ALUMINIUM.
9. ALL HV CABLE EARTH SCREENS SHALL BE CONNECTED TO THE HV EARTH BAR.
10. ALL HV CABLES SHALL BE SECURELY CLAMPED BELOW THEIR RESPECTIVE HV BUSHING USING PWC APPROVED CLAMPS. REFER TO DRAWING S02-01-09-03.
11. REFER TO DRAWING S02-02-06-37 FOR FOUNDATION DETAILS, S02-02-06-17 FOR EASEMENT DETAILS AND S02-02-05-10 AND S02-02-05-14 FOR EARTHING ARRANGEMENTS.
12. HV CABLES CONNECTING THE TRANSFORMER BUSHINGS TO THE SWITCHGEAR FUSED TEE-OFF SHALL BE TERMINATED USING DEAD BREAK ELBOWS AND INSTALLED BY THE SUBSTATION MANUFACTURER.
13. SWITCH NUMBERS SHALL BE RIVETED TO A 40 x 40 ALUMINIUM ANGLE CHANNEL. ANGLE CHANNEL SHALL BE BOLTED TO THE SWITCHGEAR MOUNTING FRAME.
14. NOMINAL TAP POSITION IS TAP 5 (100%).



EXAMPLE SHOWN IS FOR KKTK SUBSTATION WITH STRIPPLE FUSE UNIT

RATED VOLTAGE	11kV SUBSTATIONS			22kV SUBSTATIONS		
SIZE (kVA)	500	750	1000	500	750	1000
3 WAY KKT ITEM No.	503369	504059	504064	504058	504062	504063
4 WAY KKTK ITEM No.	504056	504060	504065	504057	504061	504066
OVERALL HEIGHT	1677		1807	1677		1807
DEPTH	1554					

HV CABLE TERMINATION
(COMPACT DEAD-BREAK ELBOW)
ITEM NUMBERS

CABLE TYPE	11kV	22kV
35mm² AL	503768	-
95mm² AL	503766	-
240mm² AL	503769	503772
400mm² AL	503765	503773
120mm² Cu	-	503767
240mm² Cu	503769	503772
300mm² Cu	503770	-

REFERENCE DRAWINGS AND DOCUMENTS	
DOCUMENT No.	DOCUMENT TITLE
S02-02-05-10	CABLE JOINTS AND TERMINATIONS 11 & 22kV CABLE KIT ITEM No.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
4	LV LEVELS UPDATED.	J.R.	OCT'24	J.R.	B.C.
3	CORRECTED 240 SQ.mm AL CABLE, 22kV ITEM NUMBER.	P.BH.	SEP'23	B.V.	B.C.
2	UPDATED NOTES 1, 2, 3, 6, 10 & 11. COMBINED 11 & 22kV SUBSTATION TABLES. UPDATED RATED VOLTAGES AND CURRENTS. GENERAL FORMATTING.	A.N.	NOV'20	C.C.C.	B.C.
1	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	SHW	SEP'17	MP	MP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	PWC
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	SEP'17
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

SUBSTATION
MK3 PACKAGE SUBSTATION
GENERAL ARRANGEMENT - SHEET 1 OF 4

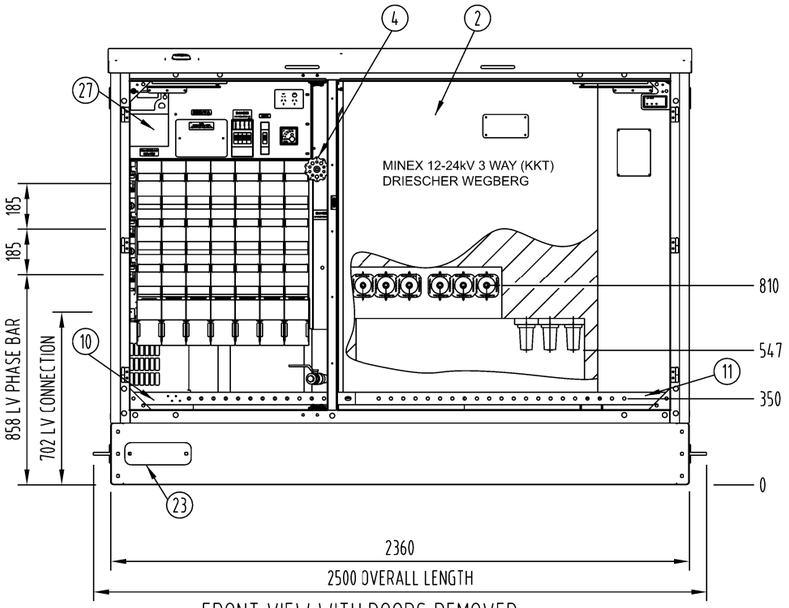
A3

DRAWING NUMBER S02-01-07-18_1

CAD PRODUCT - DO NOT AMEND MANUALLY

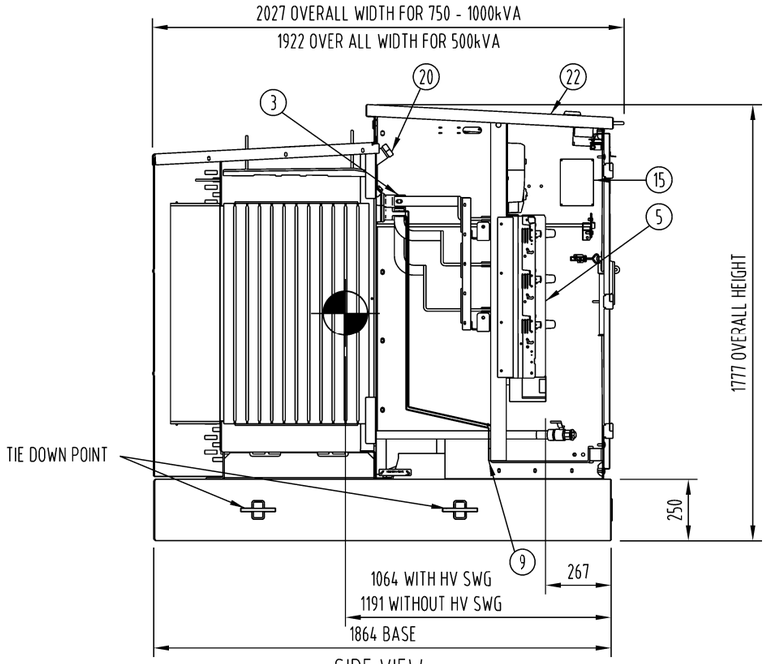
4 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



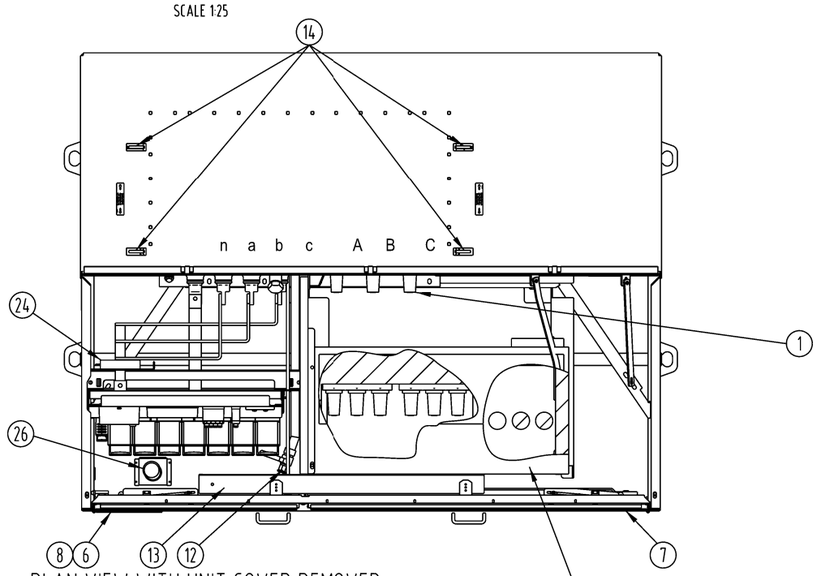
FRONT VIEW WITH DOORS REMOVED

SCALE 1:25



SIDE VIEW

SCALE 1:25



PLAN VIEW WITH UNIT COVER REMOVED

SCALE 1:25

DESCRIPTION LIST

1. HV BUSHING 630A SCREW TYPE (M16).
2. HV COMPARTMENT SUITABLE FOR FITTING MINEX 12-24kV 3 WAY AND 4 WAY RMU. CONNECT LH EARTH STUD LOCATED IN LH COMPARTMENT OF HV SWITCHGEAR TO CUBICLE HV EARTH BAR.
3. LV BUSHING 'ZEP 2/3/4M' HOLE IN PALM ø14.
4. OFF CIRCUIT TAP SELECTOR 7 POSITION -5% TO +10% WITH LOCKING FACILITIES.
5. LV SWITCHGEAR STANDARD IS LEFT TO RIGHT - 1 x 160A DIN FUSE BASE, 1 x 1000A GENERATOR / ISOLATOR STRIP, 6 x 630A FUSE STRIPS, MDI FITTED TO 'b' PHASE, EXTRA INSULATION ON 'b' PHASE BUSBAR (TX TO SWITCHGEAR), TEST BLOCK, DOUBLE GPO, 4 MINI TERASAKI CIRCUIT BREAKERS 10A 10kA, 1 MINI CIRCUIT BREAKER 2A 6kA FOR HV FAULT METER (COMPASS B), CONNECTION SWITCHGEAR BUS WORK TO HAVE BOTH ENDS FITTED WITH COLOURED HEATSHRINK TO ID. PHASES.
6. PROVISION FOR MOUNTING PWC NUMBER PLATE PANEL ON INSIDE OF LV DOOR.
7. HV DOOR INTER-LOCKED WITH LV DOOR WITH OVERCENTRE LATCH. OWNERSHIP PLATE, RMU OPERATION LABEL & OPERATING HANDLE SUPPORT (INSIDE DOOR) 3 x HINGES AND DOOR STAY.

DESCRIPTION LIST CONTINUED:

8. LV DOOR WITH SWING HANDLE (3 POINT LOCKING) WITH PROVISION FOR PAD LOCKING, DANGER PLATE (STICK-ON), 3 x HINGES AND DOOR STAY.
9. LV NEUTRAL BAR TO CONSIST OF 50 x 6.3 TINNED COPPER COMPLETE WITH 1 ø13 MOUNTING HOLE, 3 M6X1.00 TAPPED HOLES, 14 ø13 MOUNTING HOLES.
10. LV EARTH BAR 50 x 6.3 TINNED COPPER COMPLETE WITH 10 HOLES ø13, 4 M6X1.00 TAPPED HOLES & 2 ø13 MOUNTING HOLES.
11. HV EARTH BAR 50 x 6.3 TINNED COPPER COMPLETE WITH 21 HOLES ø13, PLUS 2 ø13 MOUNTING HOLES.
12. DRAIN / SAMPLE BALL VALVE ø25 NOMINAL.
13. HV / LV COMPARTMENT BATTEN LED LIGHT 40W.
14. CRANE LIFTING LUGS SLOT 40 x 60.
15. RATING AND DIAGRAM PLATE.
16. THERMOMETER POCKET IN LV COMPARTMENT.
17. FLUSH TYPE OIL GAUGE MARKED AT 15°C (BACKGROUND ON WALL OF TANK PAINTED WHITE BEHIND PERPEX) IN LV COMPARTMENT.
18. PRESSURE RELIEF VALVE IN LV COMPARTMENT.
19. SEALING PLUG IN LV COMPARTMENT.
20. FILLER CAP ø40 NOMINAL IN LV COMPARTMENT.
21. COOLING FINS.
22. CUBICLE COVER WITH INSULATION ON UNDERSIDE OF COVER AND FITTED WITH HANDLES TO AID REMOVAL OF COVER.
23. BASE FRAME 250 x 50 CHANNEL GALVANISED WITH GENERATOR CABLE ACCESS POINT (COVER PLATE BOLT ON).
24. CT 800/5A FOR MDI'S (MOUNTED ON BUSBAR TO PHASE LV BUSHINGS) REFER TO STSP 02-012
25. LIGHT SWITCH BRACKET.
26. EXTERNAL ANTENNA.
27. MULTIFUNCTIONAL SMART METER & COMMUNICATION UNIT (MOUNTED ON LV BOARD).
28. REMOVABLE 50 x 6.3 TINNED COPPER NEUTRAL LINK TO BE PROVIDED BOLTED INTO PLACE WITH SS316 SPRING AND FLAT WASHERS BETWEEN THE LV NEUTRAL BAR AND LV EARTH BAR.

REFERENCE DRAWINGS AND DOCUMENTS	
DOCUMENT No.	DOCUMENT TITLE
S02-02-05-10	CABLE JOINTS AND TERMINATIONS 11 & 22kV CABLE KIT ITEM No.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
4	AMENDED SHEET 1.	J.R.	OCT'24	J.R.	B.C.
3	AMENDED SHEET 1.	P.BH.	SEP'23	B.V.	B.C.
2	UPDATED DESCRIPTIONS 9, 10, 11, 13 & 24. ADDED NOTE 28. REFORMATTED DESCRIPTION LIST.	A.N.	NOV'20	C.C.C.	B.C.
1	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	SHW	SEPT'17	MP	MP

AMENDMENTS

PowerWater

NORTHERN TERRITORY

DES	PWC
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	SEP'17
ALL DIM. IN mm	

DRAFTING STANDARD TO A.S.1100

POWER STANDARD DRAWING

SUBSTATION
MK3 PACKAGE SUBSTATION
GENERAL ARRANGEMENT - SHEET 2 OF 4

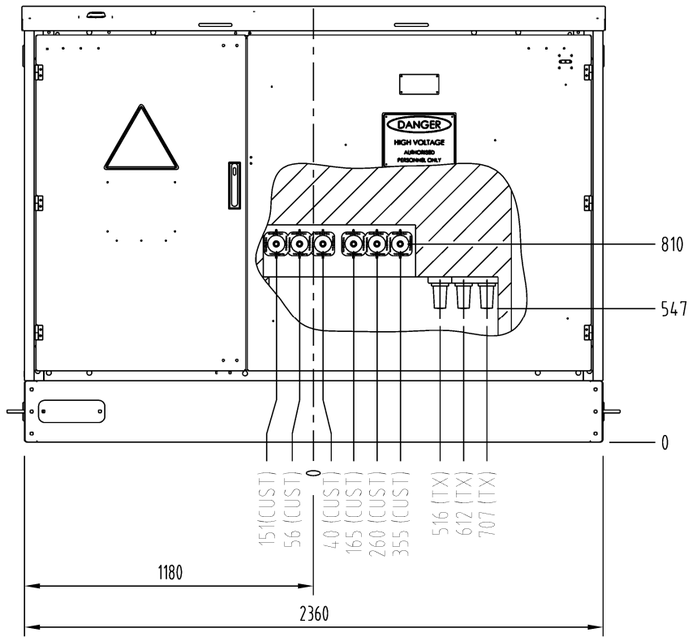
A3

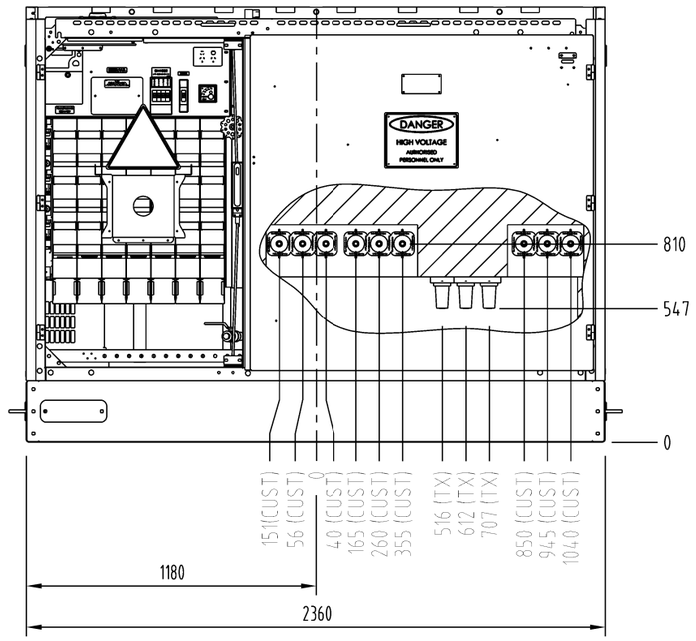
DRAWING NUMBER S02-01-07-18_2

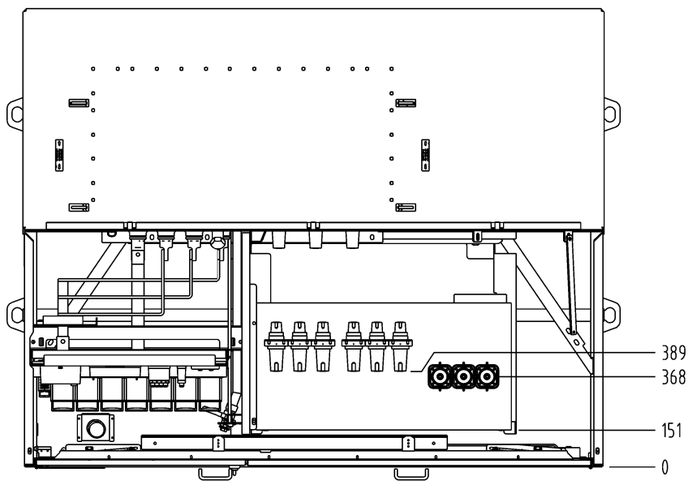
4 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

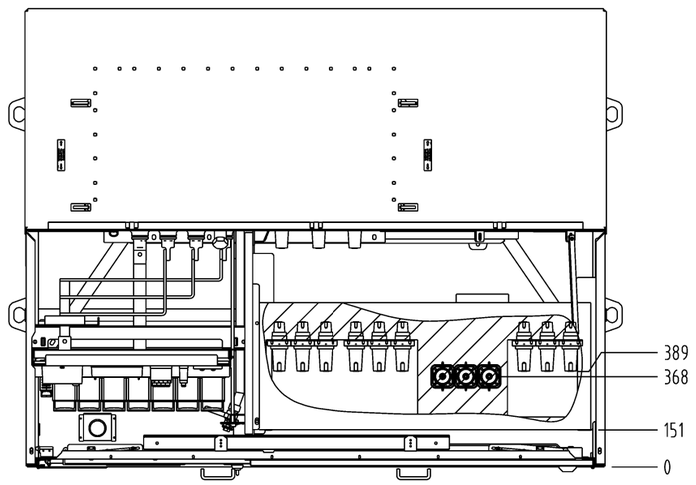






HV SWITCHGEAR CONNECTION LOCATION FOR 3 WAY MINEX (KKT)

SCALE 1:25



HV SWITCHGEAR CONNECTION LOCATION FOR 4 WAY MINEX (KKTK)

SCALE 1:25

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

REFERENCE DRAWINGS AND DOCUMENTS

DOCUMENT No	DOCUMENT TITLE
S02-02-05-10	CABLE JOINTS AND TERMINATIONS 11kV AND 22kV CABLE KIT KEY NUMBER

NO	DESCRIPTION	DRN	DATE	CKD	APPD
3	AMENDED SHEET 1.	J.R.	OCT'24	J.R.	B.C.
2	AMENDED SHEET 1.	P.BH.	SEP'23	B.V.	B.C.
1	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	SHW	SEPT'17	MP	MP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	PWC
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	SEP'17
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

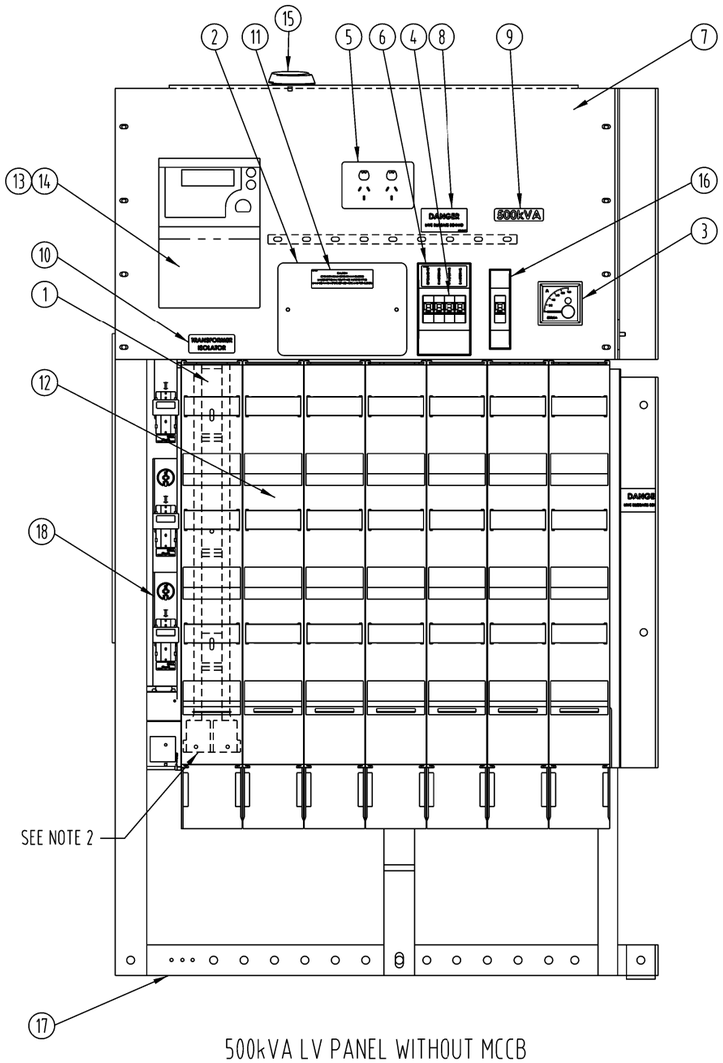
SUBSTATION
MK3 PACKAGE SUBSTATION
GENERAL ARRANGEMENT - SHEET 3 OF 4

A3

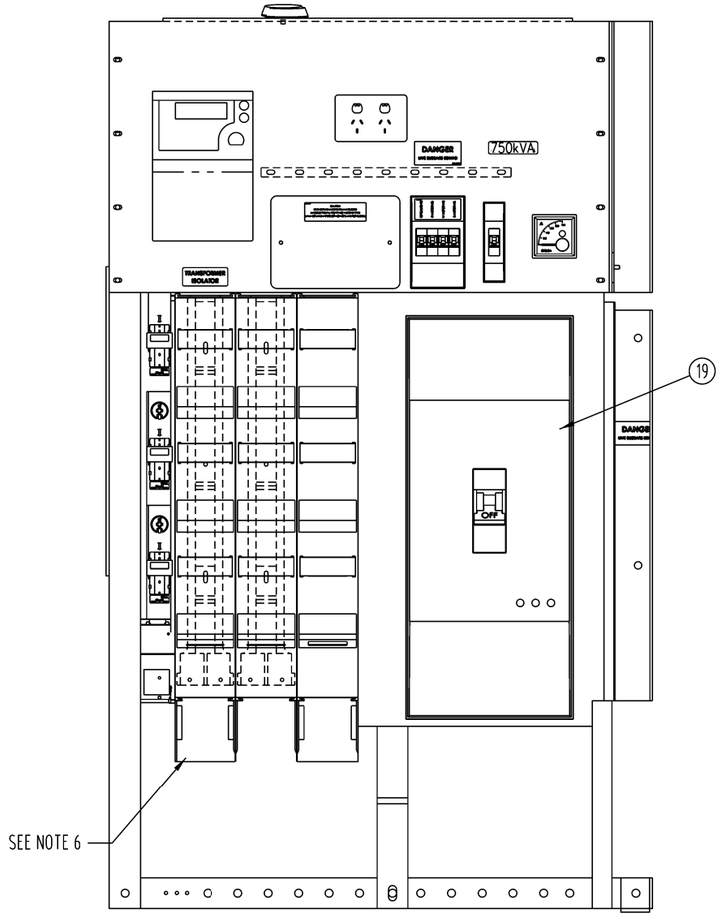
DRAWING NUMBER S02-01-07-18_3

3 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY



500kVA LV PANEL WITHOUT MCCB



(EXAMPLE FOR 750kVA ONLY)

500 - 1000kVA LV PANEL WITH MCCB

ITEM No.	DESCRIPTION	DEFAULT QTY.
1	JEAN MULLER 1000/2000A GENERATOR ISOLATOR	1
2	BOX TEST IPD-KWHTB02	1
3	METER MAX DEMAND 0-800/5A WHITE	1
4	CIRCUIT BREAKER TERSAKI 10A 10kA 1 PHASE DTCB10110C	4
5	SOCKET GPO 10A CLIPSAL 25	1
6	CIRCUIT BREAKER ENCLOSURE 4CC4WE_CLI	1
7	BARRIER - PERSPEX COVER	1
8	LABEL - DANGER	2
9	LABEL - 500-1000kVA	1
10	LABEL - TRANS ISOLATOR	1
11	LABEL - IMPORTANT SHORTENING LINKS	1
12	JEAN MULLER 630A NH3 SWITCH FUSE DISCONNECTOR	6
13	METER 800/5A CT (PWC) (NOT SHOWN) IAW STSP 02-012	1
14	SMART METER COMMUNICATION UNIT TLM	1
15	SMART METER ANTENNA	1
16	CIRCUIT BREAKER CLIPSAL 2A 6kA 1 PHASE 4CB102/6	1
17	LV NEUTRAL BAR	1
18	JEAN MULLER 160A FUSE STRIP SL00-3X (L5461001T)	1
19	TERASAKI CIRCUIT BREAKER	1

NOTES:

1. ALL CONNECTING BUS WORK TO BE MARKED BOTH ENDS WITH COLOURED HEAT SHRINK TO IDENTIFY PHASES.
2. THE GENERATOR LUGS TO BE MARKED WITH COLOURED DOTS TO IDENTIFY PHASES.
3. ALL CURRENT CARRYING BOLTED CONNECTIONS SHALL BE VIA CLASS 8.8 STAINLESS STEEL BOLTS TO THE FOLLOWING TORQUE SPECIFICATIONS:
   - M8 : 10 - 15Nm
   - M10 : 30 - 35Nm
   - M12 : 35 - 40Nm

   ALL CONNECTIONS SHALL USE A SPRING WASHER BETWEEN A FLAT WASHER AND THE NUT. WHERE CAPTIVE NUTS ARE USED THE SPRING WASHER SHALL BE ON THE BOLT SIDE OF THE CONNECTION. ALL STAINLESS STEEL BOLTS REQUIRE A COATING OF ANTI-SIEZE BEFORE INSTALLATION. WHERE MULTIPLE BOLTS ARE USED TO MAKE A CONNECTION, DO NOT APPLY FULL TORQUE TO THE BOLTS ON THE FIRST PASS.
4. TO AVOID POSSIBLE CONTACT BY EXTERNAL SOURCES ALL LV BUSHING TO SWITCHBOARD BUSBARS SHALL BE COVERED BY COLOURED HEATSHRINK.
5. 1000A GENERATOR / ISOLATOR STRIP (PWC ITEM No. 406808) SHALL BE USED FOR 500kVA. 2000A GENERATOR / ISOLATOR STRIP (PWC ITEM No. 406811) SHALL BE USED FOR 750-1000kVA.
6. THE NUMBER OF 630A FUSE STRIPS AVAILABLE ON A MCCB LV PANEL DEPENDS ON THE SIZE OF THE MCCB AND THE SIZE OF THE PACKAGE. REFER TO S02-01-04-08 FOR SWITCH-FUSE DISCONNECTORS & S02-01-04-10 FOR FUSES.
7. ALL MCCB KITS ARE INSTALLED BY MANUFACTURER ON REQUEST AT THE TIME OF ORDERING THE PACKAGE SUB AND MCCB KIT. REFER TO STSP 02-013.

LV PANEL SWITCHGEAR WITHOUT MCCB FITTED (L TO R)	
500kVA	1x 160A DIN FUSE STRIP (407050) 1x 1000A GENERATOR ISOLATOR STRIP (406808) 6x 630A SWITCH-FUSE DISCONNECTOR STRIPS (11866)
750 & 1000kVA	1x 160A DIN FUSE STRIP (407050) 1x 2000A GENERATOR ISOLATOR STRIP (406811) 5x 630A SWITCH-FUSE DISCONNECTOR STRIP (11866)

MCCB KITS	ITEM NUMBER
800A	503922
1250A	503923
1600A	503919
2000A	503924

LV PANEL SWITCHGEAR WITH MCCB FITTED (L TO R)	
500kVA	1x 160A DIN FUSE STRIP (407050) 1x 1000A GENERATOR ISOLATOR STRIP (406808) 2x 630A SWITCH-FUSE DISCONNECTOR STRIPS (11866)
750 & 1000kVA	1x 160A DIN FUSE STRIP (407050) 1x 2000A GENERATOR ISOLATOR STRIP (406811) 1x 630A SWITCH-FUSE DISCONNECTOR STRIP (11866)

REFERENCE DRAWINGS AND DOCUMENTS	
DOCUMENT No.	DOCUMENT TITLE
S02-02-05-10	CABLE JOINTS AND TERMINATIONS 11 & 22kV CABLE KIT ITEM No.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
4	AMENDED SHEET 1.	J.R.	OCT'24	J.R.	B.C.
3	AMENDED SHEET 1.	P.BH.	SEP'23	B.V.	B.C.
2	UPDATED TABLE FORMAT & NOTES 5, 6 & 7. ITEMS 1, 12 & 13 DESCRIPTION UPDATED. EDITED NEUTRAL BAR. REFORMATTED LV SWITCHGEAR DESCRIPTION WITH ITEM NUMBERS.	A.N.	NOV'20	C.C.C.	B.C.
1	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	SHW	SEPT'17	MP	MP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	PWC
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	SEP'17
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

SUBSTATION
MK3 PACKAGE SUBSTATION
GENERAL ARRANGEMENT - SHEET 4 OF 4

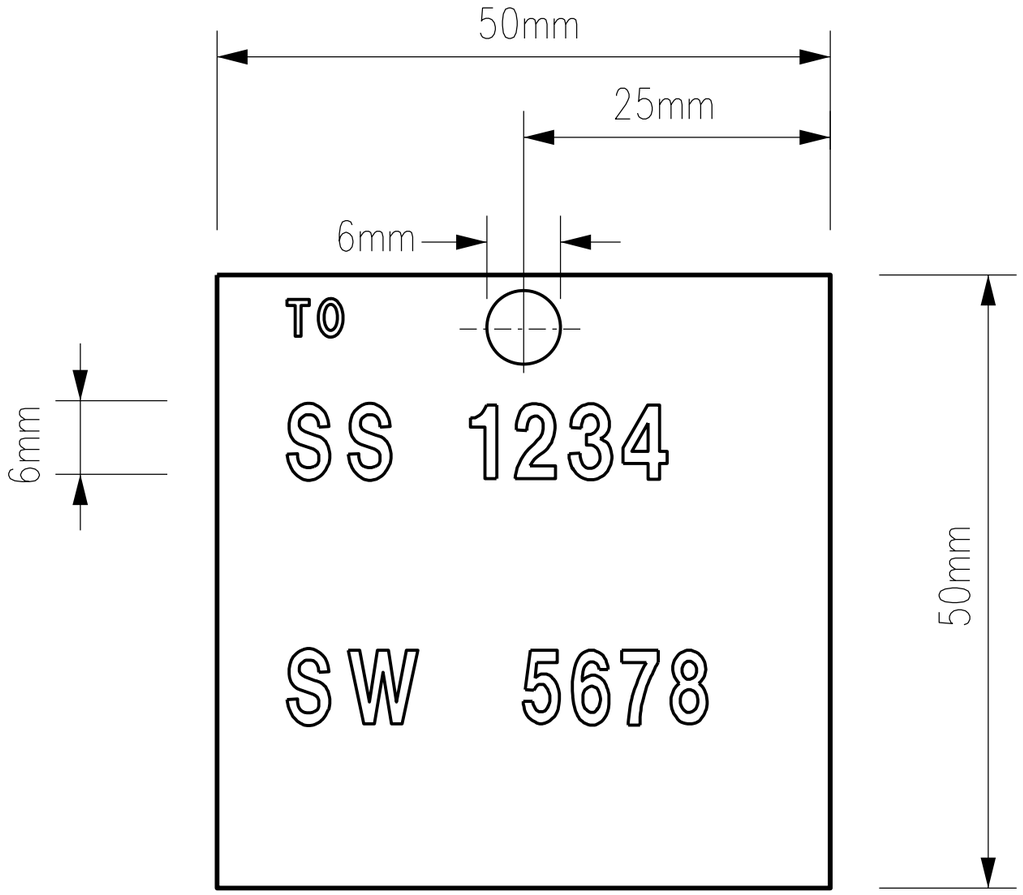
A3

DRAWING NUMBER S02-01-07-18_4

CAD PRODUCT - DO NOT AMEND MANUALLY

4 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ITEM 1
HV DESTINATION TAG
ITEM NUMBER - 501663

CRITCHLEY K-TYPE TAG COMPONENT ITEM NUMBERS:

CARRIER STRIP, 7 DIGIT: 412490

CHARACTER	ITEM NUMBER
A	412454
B	412455
C	412456
D	412457
E	412458
F	412459
G	412460
H	412461
I	412462
J	412463
K	412464
L	412465

CHARACTER	ITEM NUMBER
M	412466
N	412467
O	412468
P	412469
Q	412470
R	412471
S	412472
T	412473
U	412474
V	412475
W	412476
X	412477

CHARACTER	ITEM NUMBER
Y	412478
Z	412479
0	412489
1	412480
2	412481
3	412482
4	412483
5	412484
6	412485
7	412486
8	412487
9	412488

NOTES

1. INCLUDED ON TAG IS SWITCH/SUBSTATION/LOT/CIRCUIT BREAKER/POLE NUMBER AND DESTINATION.
2. TAG SHALL BE ALUMINUM OF AT LEAST 2.0mm THICKNESS, TEXT SHALL BE STAMPED ONTO THE TAG.
3. MINIMUM HEIGHT OF TEXT IS 6mm FOR HV DESTINATION TAG.
   MINIMUM DEPTH OF TEXT IMPRINT IS 1mm.
   HV TAG SHALL BE HELD BY STAINLESS STEEL CABLE TIE REFER S02-01-09-01.
4. TAGS SHALL BE USED FOR ALL CABLES GOING UNDERGROUND, INCLUDING BUT NOT LIMITED TO CABLES ON CABLE TERMINATION POLES, INSIDE PACKAGE SUBSTATIONS, LV PILLARS, RING MAIN UNITS, SWITCHING STATIONS AND ZONE SUBSTATIONS.
5. LV TAGGING SHALL BE VIA CRITCHLEY K-TYPE TAGS. CRITCHLEY TAGS SHALL BE HELD TO THE CABLE WITH NYLON CABLE TIES.
6. ALL CRITCHLEY K-TYPE CHARACTERS SHALL BE BLACK TEXT ON YELLOW BACKGROUND.
   ALL CRITCHLEY ITEM NUMBERS ARE FOR A PACK OF 500.

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
6	AMENDED NOTE 6	P.G.	SEPT'23	P.BH	B.V.
5	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
4	ITEM 1 STOCK CODE ADDED	C.M.	NOV'13	B.C.	B.C.
3	CRITCHLEY TYPE TAG CODES ADDED. NOTE 5&6 ADDED NOTES 1 & 3 AMENDED	A.T.	MAY'13	B.C.	B.C.
2	ITEM 2 (LV DESTINATION TAG) REMOVED	A.S.	MAY'07	R.S.	S.C.
1	TAG THICKNESS CHANGED TO 1.0mm	A.S.	FEB'06	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	K.I.	FEB'05	C.C.	C.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	C.C.
DRN	K.I.
CKD	C.C.
APPD	C.C.
SCALE	1:5
ISSUED	FEB '05
ALL DIM. IN mm	

POWER STANDARD DRAWING

SIGNS
DESTINATION TAGS
DISTRIBUTION CABLING

A3

DRAWING NUMBER S02-01-08-25

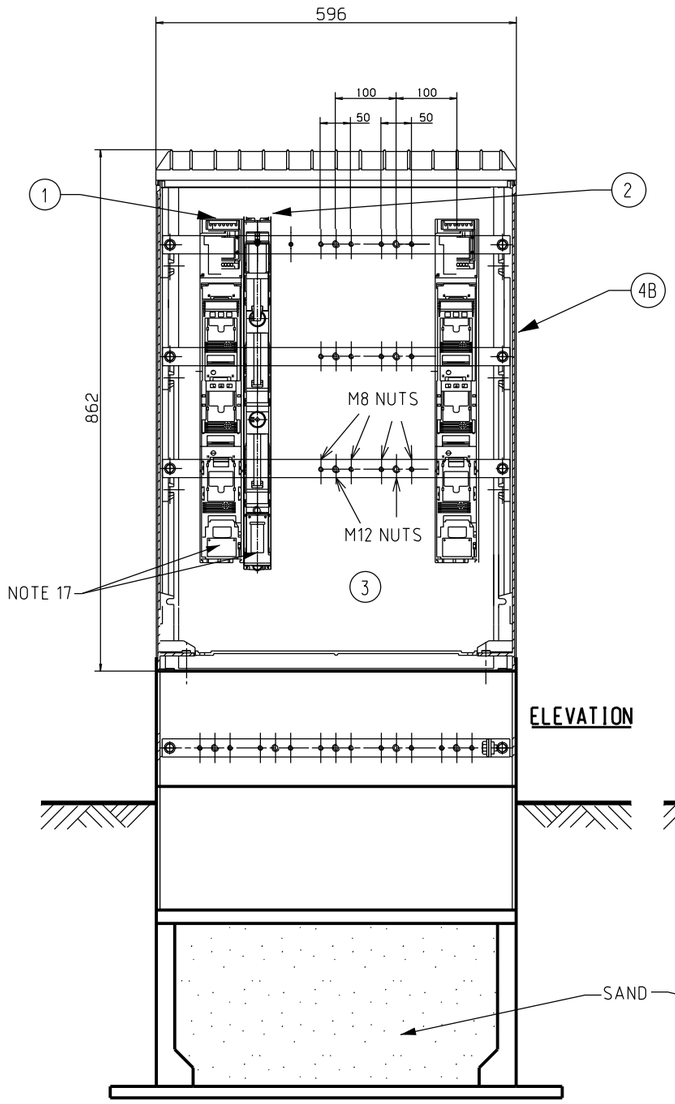
6 AMDT

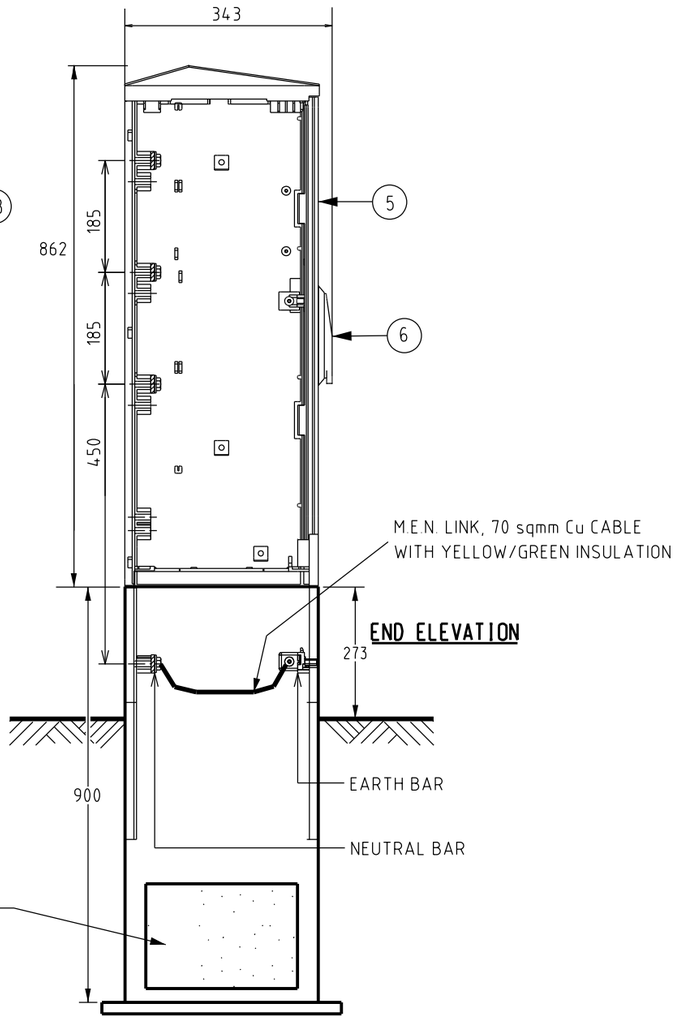
DRAFTING STANDARD TO A.S.1100

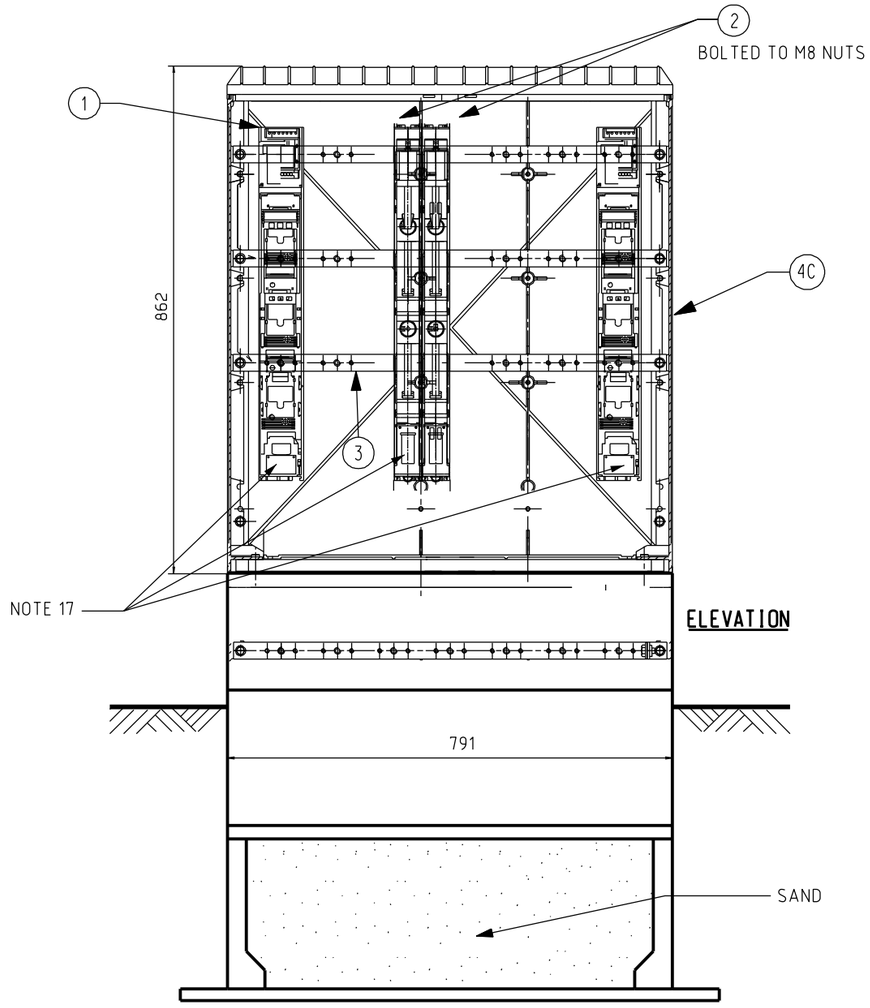
CAD PRODUCT - DO NOT AMEND MANUALLY

ITEM REF.	ITEM DES.	ITEM NUMBER	DWG REF.
1	FUSE SWITCH BASE 630A	11866	S02-01-04-08
2	FUSE SWITCH BASE 160A	407050	S02-01-04-18
3	50mm WIDE PERSPEX COVER WITH M8 NYLON BOLTS	502205	-
3A	100mm WIDE PERSPEX COVER WITH M12 NYLON BOLTS	502204	-

ITEM REF.	ITEM DES.	ITEM NUMBER
4A	PILLAR BOX - 3 BAYS - 396 WIDE	292326
4B	PILLAR BOX - 5 BAYS - 596 WIDE	292334
4C	PILLAR BOX - 7 BAYS - 791 WIDE	292342
5	REPLACEMENT DOOR - 5 BAY PILLAR	414557
6	REPLACEMENT LOCKING LEVER	414558
7	STANDOFF 'Z' BRACKET KIT	502207
8	REPLACEMENT DOOR - 3 BAY PILLAR	504915
9	REPLACEMENT DOOR - 7 BAY PILLAR	504916







APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
14	SHEET 2 AMENDED.	P.BH.	OCT'22	B.V.	B.C.
13	ITEM 8 & 9 ADDED.	P.BH.	JUN'22	B.V.	B.C.
12	REMOVED NEUTRAL BUSBAR EXTENSION, AMEND SHEET 2.	A.N.	JAN'22	B.V.	B.C.
11	REFORMATTED TABLES. ADDED ITEM 7. SHEET 2 AMENDED.	A.N.	AUG'21	C.C.C.	B.V.
10	SHEET 2 AMENDED.	H.E.	SEP'20	B.V.	B.V.
9	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
8	ITEMS 3 AND 3A ADDED	A.T.	APR'14	B.C	B.C.
7	ITEMS 5 AND 6 ADDED	A.T.	SEP'11	B.C	S.C
6	NOTES MOVED TO SHEET 2, 7 SLOT PILLAR ADDED	C.M.	FEB'10	B.C	S.C

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	-
DRN	R.INNES
CKD	-
APPD	F.ROBSON
SCALE	NO SCALE
ISSUED	APR'01
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

STRIPLE FUSE PILLAR FRONT OPENING SHEET 1 OF 2

A3

DRAWING NUMBER S02-02-03-08_1

CAD PRODUCT - DO NOT AMEND MANUALLY

14 AMDT

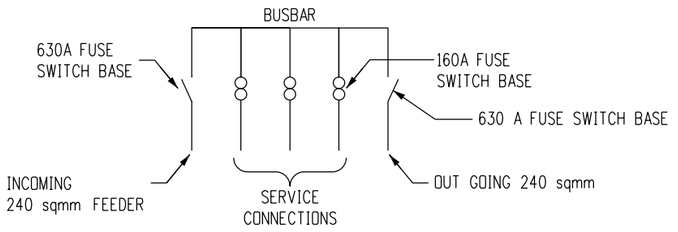
NOTES

1. FUSE PILLARS CONSTRUCTED FROM IMPACT RESISTANT, GLASS FIBRE REINFORCED POLYESTER. EXTRA COATING FOR UV PROTECTION REQUIRED.
2. PADLOCK HASP AND STAPLE PREFERRED.
3. 630A BUS BARS REQUIRED FOR ALL ACTIVE PHASE, NEUTRAL BUS BAR AND EARTH BUS BAR.
4. FOR CONSUMER CONNECTIONS 100 AMP, DIN SIZE 00 STRIPLE FUSES (ITEM NUMBER 286237) TO BE INSTALLED IN 160AMP STRIPLE FUSE SWITCH BASE.
5. ALL BOLT HOLES SHALL HAVE CAPTIVE NUTS FITTED.
6. 630 AMP FUSE SWITCH BASES SHALL BE INSTALLED TO BOTH SIDES OF ACTIVE BUS BARS AND SHALL BE FITTED WITH SOLID LINKS. (ITEM NUMBER 502716).
8. BUS BAR PHASE SEQUENCE, FROM TOP TO BOTTOM, IS RED, WHITE, BLUE, NEUTRAL.
9. IF A NON-OPEN POINT FUSED TERMINATION PILLAR IS SUPPLYING A MAXIMUM OF 1 CUSTOMER PER PHASE, THE INCOMING FEEDER CAN BE A 0.6/1kV/25 sq mm Cu/XLPE/NYLON/PVC CABLE. OTHERWISE IT SHALL BE THE STANDARD POWER AND WATER LOW VOLTAGE 240 sq mm AL XLPE CABLE.
10. ALL EXPOSED ACTIVE BUS BARS SHALL BE COVERED WITH PERSPEX SHEETING ATTACHED WITH NYLON BOLTS.
11. NEUTRAL AND EARTH BUS BARS SHALL BE THE SAME SIZE AS THE ACTIVE PHASE BUS BARS.
12. REFER TO DRAWINGS S02-02-03-12 FOR STRIPLE FUSE PILLAR EASEMENT DETAILS.
13. ALL CABLES SHALL HAVE THEIR FULL DESTINATION OR LOT TAGGED ON THE CABLE, INCLUDING NEUTRAL, WITH TAGS SECURED TO THE CABLE WITH NYLON CABLE TIES. PHASING AND LOT DESTINATION SHALL BE LABELLED ONTO THE BASE OF THE 160AMP FUSE SWITCH BASE. E.G. R:L1234, W:L1235, B:L1236 USING BRADY BMP71 PRINTER, BLACK INK (ITEM NUMBER: 502497) AND WHITE RIBBONS (ITEM NUMBER:502498) (BLACK-M71-R6000)
14. ALL ASSOCIATED EQUIPMENT WITHIN THE PILLAR SHALL BE SUPPLIED AND INSTALLED BY THE PROJECT DEVELOPER AND READY FOR FINAL CONNECTION BY PWC.
15. ALL FUSE PILLARS SHALL USE THE PWC 1-13 LOCKING SYSTEM.
16. REFER TO S02-02-02-10 FOR CABLE TERMINATION AND HEATSHRINK APPLICATION.
17. ALL CURRENT CARRYING BOLTED CONNECTIONS SHALL BE VIA CLASS 8.8 STAINLESS STEEL BOLTS TO THE FOLLOWING TORQUESPECIFICATIONS:
    - M8: 10-15NM
    - M10: 30-35NM
    - M12: 35-40NM

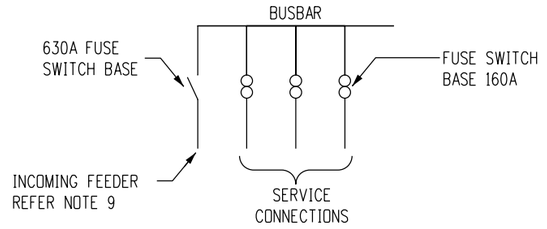
    ALL CONNECTIONS MUST USE A SPRING WASHER BETWEEN A FLAT WASHER AND THE NUT. WHERE CAPTIVE NUTS ARE USED THE SPRING WASHER MUST BE ON THE BOLT SIDE OF THE CONNECTION. ALL STAINLESS STEEL BOLTS REQUIRE A COATING OF ANTI-SEIZE BEFORE INSTALLATION. WHERE MULTIPLE BOLTS ARE USED TO MAKE A CONNECTION, DO NOT APPLY FULL TORQUE TO THE BOLTS ON THE FIRST PASS.
18. ALL UNMETERED SERVICE PROVISIONS WILL BE 25SQMM COPPER CABLE. REFER TO STANDARD DRAWING S02-01-01-20 FOR DETAILS. FOR PROVISION OF AN EXISTING STREETLIGHT SERVICE AN INLINE SUBMERSIBLE FUSE WILL BE FITTED AND ACCESSIBLE IN THE PILLAR FOR ISOLATION OF THE SERVICE BY AN AUTHORISED STREET LIGHT MAINTENANCE WORKERS. REFER TO ITEM No. 400921 FOR DETAILS OR THE ROAD OWNER CAN SUBMIT AN ALTERNATE PROPOSED FUSE ARRANGMENT TO PWC FOR APPROVAL. FOR NEW STREET LIGHT SERVICES AN INLINE FUSE IS NOT REQUIRED, THE UNMETERED SERVICE MAINS ARE CONNECTED DIRECTLY TO THE ROAD OWNERS STREETLIGHT PILLAR. REFER TO NP003 INSTALLATION RULES FOR SERVICE DETAILS AND NP007 FOR STREETLIGHT DESIGN AND CONSTRUCTION REQUIREMENTS.
19. AVOID LOCATING PILLAR IN A THOROUGHFARE WHERE THERE IS SIGNIFICANT PEDESTRIAN TRAFFIC OR LOCATIONS WHERE THE PUBLIC CONGREGATE SUCH AS BUS STOPS OR COMMERCIAL BUILDING ACCESS POINTS.
20. WHEN PILLAR IS INSTALLED IN PARKS OR RESERVES, PROTECT PILLAR FROM MAINTENANCE TRAFFIC BY USE OF PROTECTIVE BOLLARDS. REFER TO S02-02-06-28_2 FOR DETAILS.

FUSED RESIDENTIAL PILLAR

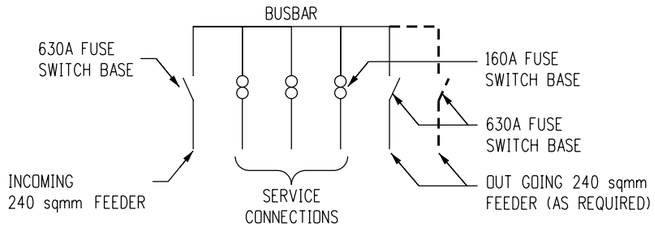
SINGLE LINE DIAGRAM



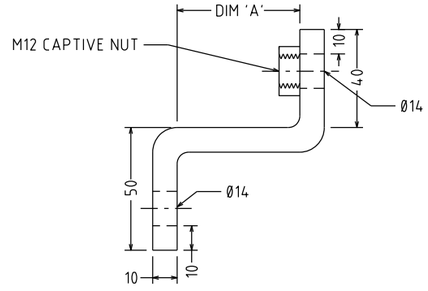
NON-OPEN POINT FUSED TERMINATION PILLAR



3 WAY/LINK/OPEN POINT FUSED PILLAR

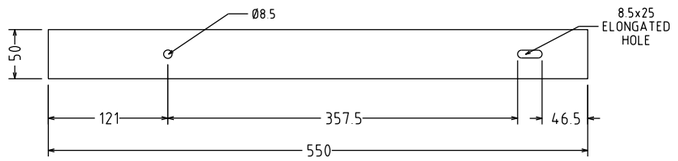


ITEM 7: STANDOFF 'Z' BRACKET KIT



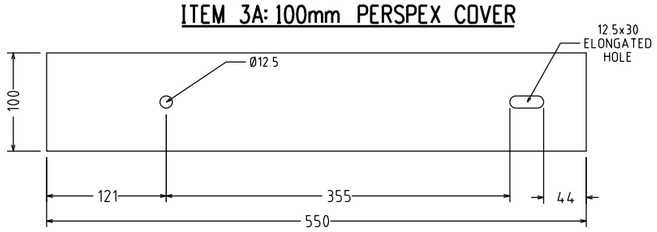
ITEM NUMBER: 502207
MATERIAL: 30x10mm TINNED COPPER
KIT CONTAINS:
- 1x 'Z' BRACKET WITH DIM 'A': 50mm
- 1x 'Z' BRACKET WITH DIM 'A': 90mm
- 4x SS304 M12 BOLTS AND GALV. STEEL WASHERS

ITEM 3: 50mm PERSPEX COVER



ITEM NUMBER: 502205
MATERIAL: 3mm CLEAR PERSPEX
SUPPLIED WITH 2x M8 NYLON BOLTS AND WASHERS

ITEM 3A: 100mm PERSPEX COVER



ITEM NUMBER: 502204
MATERIAL: 3mm CLEAR PERSPEX
SUPPLIED WITH 2x M12 NYLON BOLTS AND WASHERS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
17	ADDED NOTES 19 & 20.	P.BH.	OCT'22	B.V.	B.C.
16	SHEET 1 AMENDED.	P.BH.	JUN'22	B.V.	B.C.
15	REMOVE ITEM A, NEUTRAL BUSBAR EXTENSION & NOTE 7. AMEND SHEET 1.	A.N.	JAN'22	B.V.	B.C.
14	UPDATED NOTES 6 & 13 ITEM NUMBER. CHANGE STOCK CODES TO ITEM NUMBERS. REFORMATTED NOTES. ADDED ITEM 3, 3A & 7 IMAGES.	A.N.	AUG'21	C.C.C.	B.V.
13	NOTE 18 ADDED	H.E.	SEP'20	B.V.	B.V.
12	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
11	NOTE 6, 13 AMENDED. SINGLE LINE DIAGRAM UPDATED	C.C.	APR'15	I.B.	B.C.
10	NOTE 13 UPDATED	A.T.	APR'14	B.C.	B.C.

AMENDMENTS

PowerWater NORTHERN TERRITORY

DES	-
DRN	R.INNES
CKD	-
APPD	F.ROBSON
SCALE	NO SCALE
ISSUED	APR'01
ALL DIM. IN mm	

POWER STANDARD DRAWING

STRIPLE FUSE PILLAR FRONT OPENING SHEET 2 OF 2

A3

DRAWING NUMBER S02-02-03-08_2

17 AMDT

DRAFTING STANDARD TO A.S.1100

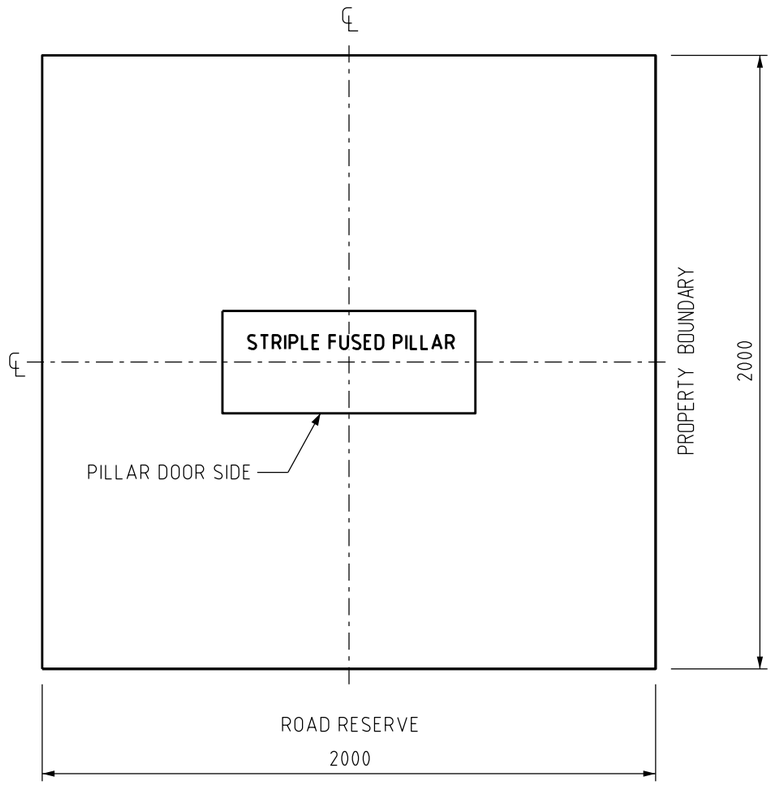
CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

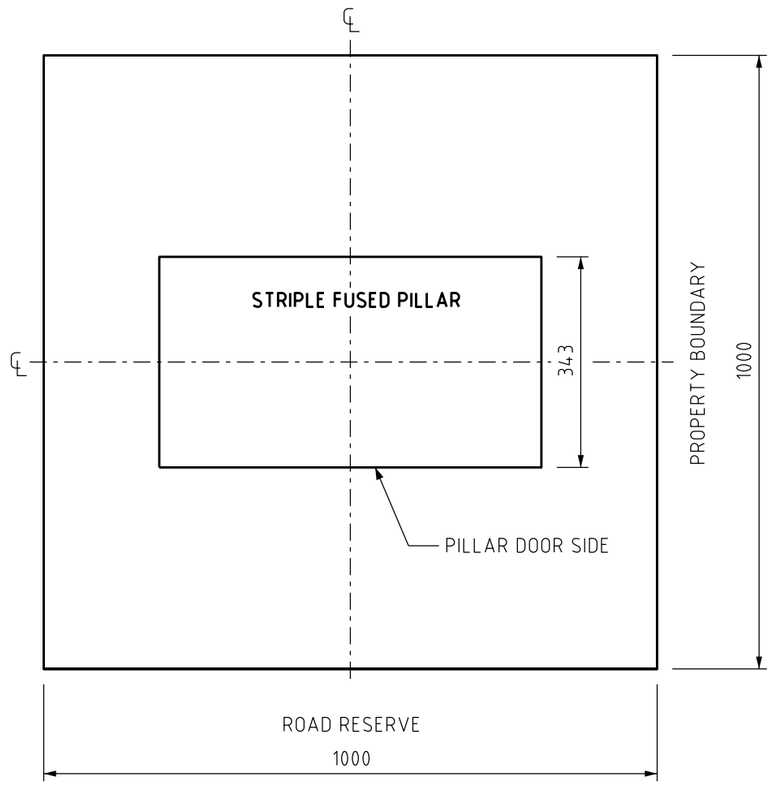
NOTES

1. REFER TO S02-02-03-08 FOR PILLAR DETAILS.

2. FOR IRREGULAR POSITIONED PROPERTY BOUNDARIES, PILLAR SHALL BE POSITIONED PARALLEL TO ROAD RESERVE WITH CENTRE OF PILLAR POSITIONED ON CENTRE OF EASEMENT.



LV PILLAR ORIENTATION
7 SLOT PILLAR



LV PILLAR ORIENTATION
3 AND 5 SLOT PILLAR

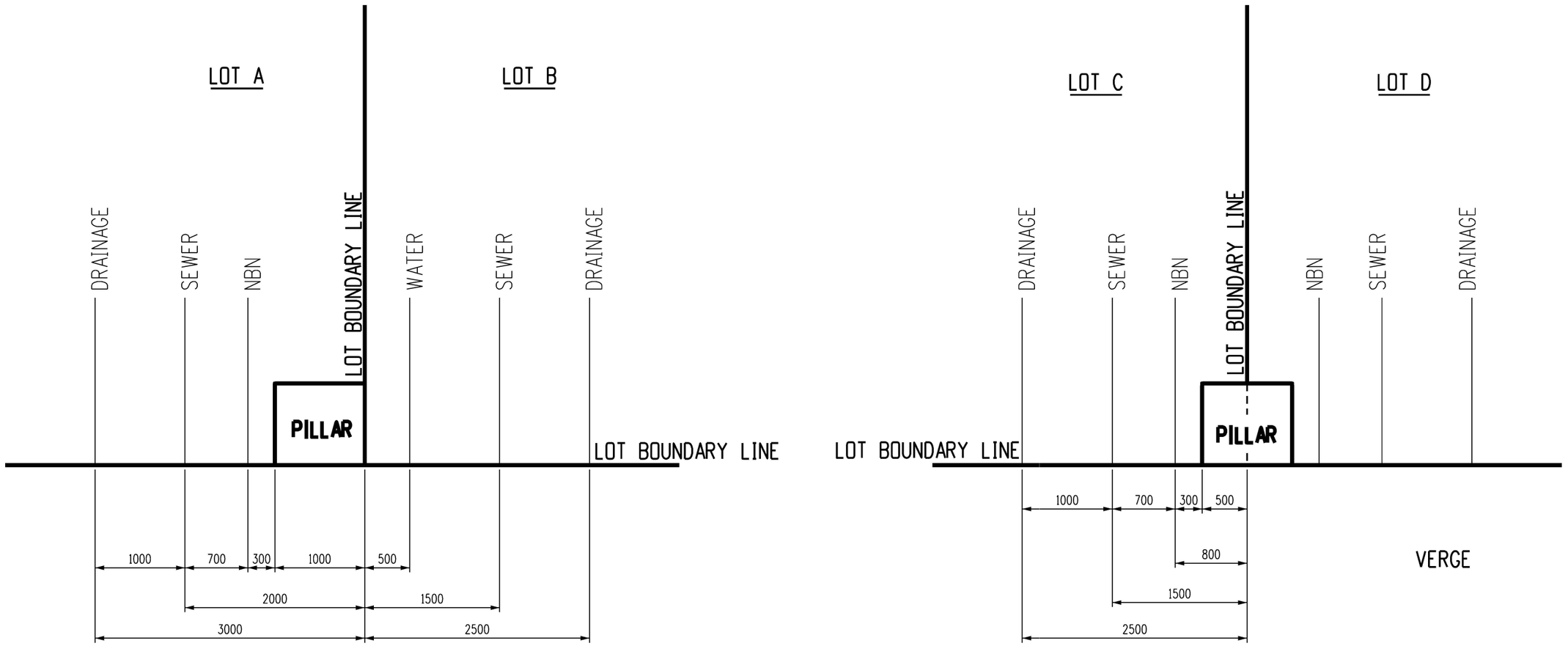
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
4	ADDED NOTE 2. AMENDED IMAGERY TO CENTRE PILLAR IN EASEMENT	C.C.	APR'20	B.V	B.C
3	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
2	3 & 5 SLOT PILLAR ORIENTATION AMENDED	P.H.	OCT'17	B.C.	B.V
1	NOTES ADDED	C.M.	MAR'10	A.T.	S.C.
0	ISSUED FOR CONSTRUCTION	J.C.	MAR'10	A.T.	S.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES A.T.	POWER STANDARD DRAWING
DRN J.C.	DISTRIBUTION PILLARS STRIPLE FUSED PILLARS LV PILLAR ORIENTATION
CKD A.T.	
APPD A.T.	
SCALE MAR'10	
ISSUED N.T.S.	A3 DRAWING NUMBER S02-02-03-12
ALL DIM. IN mm	4 AMDT
DRAFTING STANDARD TO A.S.1100	CAD PRODUCT - DO NOT AMEND MANUALLY



TYPICAL OFFSETS FOR ELEC/NBN/SEWER/DRAINAGE/WATER

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
1	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	C.C.	JUN'18	I.B.	B.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	C.YIK
DRN	C.COPPINS
CKD	I.BASHIR
APPD	B.CHEUNG
SCALE	1:10
ISSUED	25.06.2018
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

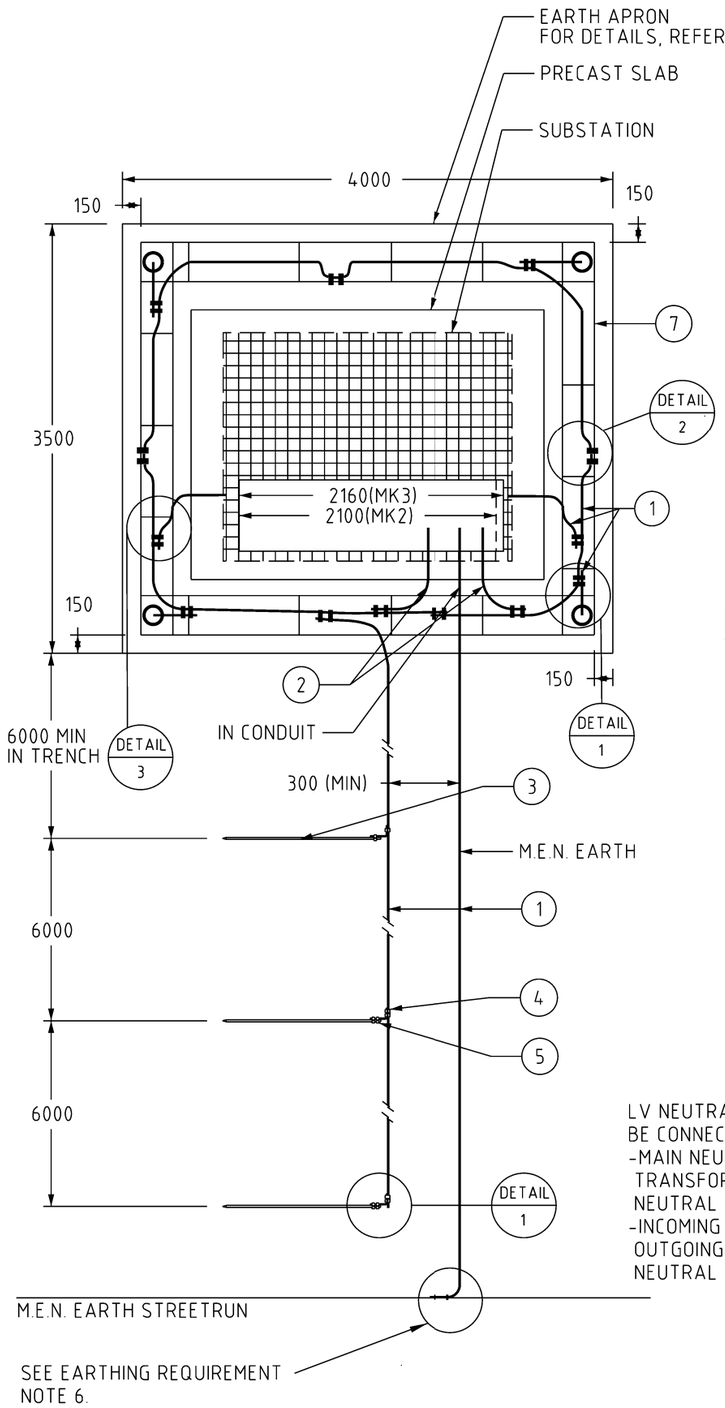
DISTRIBUTION PILLARS PROPERTY BOUNDARY SERVICE ALLOCATION

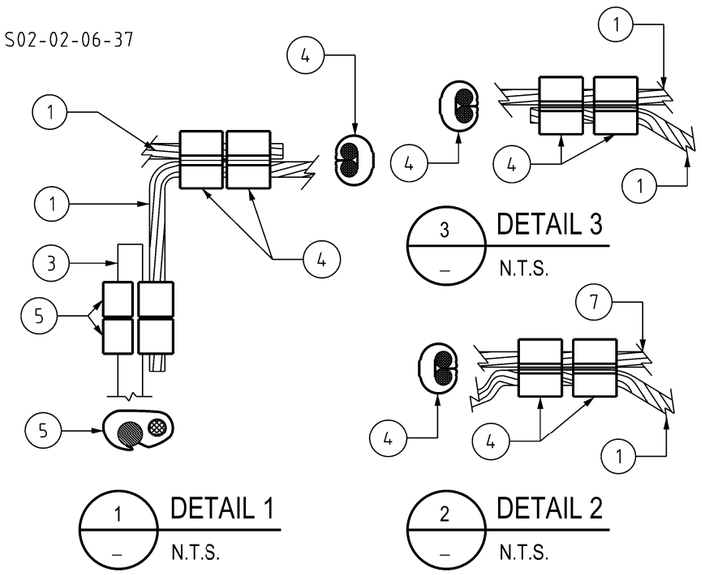
A3

DRAWING NUMBER S02-02-03-13

1 AMDT

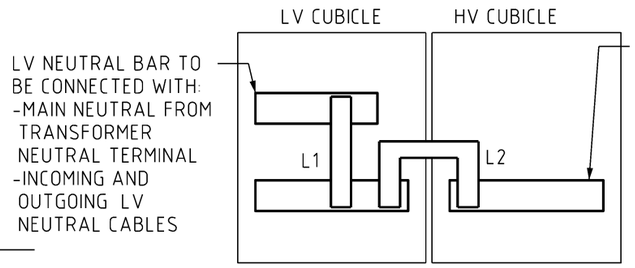
CAD PRODUCT - DO NOT AMEND MANUALLY





EARTHING REQUIREMENT

1. FOR SUBSTATION EARTH, WITH LINKS 1 AND 2 OPEN, THE RECORDED EARTH RESISTANCE VALUE SHOULD NOT BE GREATER THAN 30 OHMS.
2. FOR CMEN EARTH, WITH LINKS 1 AND 2 CLOSED, THE RECORDED EARTH RESISTANCE VALUE SHOULD NOT BE GREATER THAN 1 OHM.
3. IF ANY OF THE ABOVE VALUES CANNOT BE ACHIEVED, REFER TO THE PROJECT MANAGER.
4. 1 SPARE 10mm THREAD BOLT AND NUT FOR OPERATOR EARTHS ON THE HV AND LV EARTH BARS.
5. WHERE ACCESS IS LIMITED, EARTHING STAKES IN THE EASEMENT CAN BE RELOCTED TO THE CABLE TRENCH TO ENSURE THE SUBSTATION EARTH RESISTANCE IS LESS THAN 30 OHMS.
6. TWO INDEPENDENT EARTHING CONNECTORS MUST BE USED FOR ALL EARTHING INTERCONNECTIONS. ALTERNATIVELY CADWELD MAY BE USED. MEN TEE OFF SHALL BE CONNECTED VIA 2 x "C" COMPRESSION CONNECTOR 300mm APART OR CADWELD.



EARTHING TERMINATION ARRANGEMENT

NOTES:

1. EARTHING FOR A PACKAGE SUBSTATION CONSISTS OF FOUR EARTH ELECTRODES IN THE EASEMENT AND IF REQUIRED THREE EARTH ELECTRODES IN THE CABLE ENTRY TRENCH.
2. IN THE EASEMENT: FOUR BORE HOLES TO BE DRILLED AT CORNERS. FOR EACH HOLE:
   - AUGER DIAMETER TO BE USED SHOULD NOT BE GREATER THAN 150mm.
   - BORE DEPTH IS 3m.
   - EARTH ELECTRODE SHALL BE MADE FROM EITHER BARE 70 sq.mm COPPER CONDUCTOR OR 70 sq.mm BARE COPPER CONDUCTOR WITH AN EARTH STAKE ATTACHED VIA TWO PROFILE "6" COMPRESSION CONNECTOR BEFORE LOWERING THE STAKE INTO THE BORE HOLE. ATTACH THE 70 sq.mm COPPER CONDUCTOR TO THE EARTH GRID AS SHOWN IN DETAIL 1.
   - BACKFILL BORE HOLE FIRST WITH WATERED SLURRY MIXTURE OF ONE BAG OF EARTHING COMPOUND AND SOIL AT 1:1 RATIO, THEN TOP UP WITH EXISTING SOIL.
3. IF REQUIRED TO ACHIEVCE EARTHING REQUIREMENT NOTE 1, THREE ADDITIONAL EARTH ELECTRODES ARE TO BE INSTALLED AT THE BOTTOM OF THE CABLE ENTRY TRENCH WITH A DISTANCE OF 6m BETWEEN ELECTRODES AND TO A DEPTH OF 3m. A HAMMER CAN BE USED TO DRIVE CONNECTED EARTH RODS INTO THE GROUND, OR ALTERNATIVELY THE EARTH ELECTRODES CAN BE AS PER NOTE 2. DO NOT LET ANY OTHER EARTHING SYSTEM MAKE CONTACT WITH THE SUBSTATION EARTH. SEPERATE THIS LOCAL EARTH NETWORK AS FAR AS POSSIBLE FROM THE M.E.N. EARTH NETWORK.
4. EQUIPOTENTIAL EARTH MESH 400mm WIDE SHALL BE LAID ACROSS USING CONCRETE MESH CHAIRS AND CONNECTED TO FOUR EARTH ELECTRODES IN THE EASEMENT AS SHOWN BEFORE FORMING THE CONCRETE APRON FROM THE EASEMENT BOUNDARY TO THE SUBSTATION PAD FOUNDATION.
5. FOR THE MARK 2 SUBSTATION FOUNDATION DETAILS, REFER TO DRG NO S02-02-06-31.
6. FOR THE MARK 3 SUBSTATION FOUNDATION DETAILS, REFER TO DRG NO S02-02-06-37 & S02-01-05-12.
7. M.E.N. EARTH (FROM DISTRIBUTION SYSTEM) MUST NOT BE BROUGHT INTO ELECTRICAL CONTACT WITH FOUNDATION SO THAT TESTING CAN CAN BE CARRIED OUT. M.E.N. SHALL BE IN CONDUIT WHERE PASSING THROUGH SUBSTATION FOUNDATIONS.
8. TRAFFIC BOLLARDS WITHIN 1m OF EASEMENT FOR THE PURPOSE OF PROTECTING THE SUBSTATION SHALL BE CONNECTED TO PERIMETER EARTHING CONDUCTOR BY 70 sq.mm COPPER CONDUCTOR WHICH WILL BE SET INSIDE THE POST AND LUGGED OFF ONTO A BARRIER BOLT. BOLLARDS ONLY TO BE EARTHED IF LOCATED IN EASEMENT.
9. BOND THE SUBSTATION FOUNDATION TO THE SUBSTATION EARTH RING VIA 70 sq.mm BARE COPPER CABLE USING THE M12 FERRULES EMBEDED IN THE FOUNDATION STAINLESS STEEL FASTENERS TO BE USED.
10. FOR ANY EARTH CONNECTIONS TO EXISTING COPPER FLAT BAR USE EXOTHERMIC EARTH WELD CONNECTION. CADWELD IS ALSO PERMITTED AS AN ALTERNATIVE TO CRIMPING. REFER TO DRG NO S01-01-05-03 FOR DETAILS.
11. APPLY GREEN & YELLOW HEAT SHRINK TO LOCAL SUBSTATION EARTH TAIL CONNECTIONS FOR IDENTIFICATION PURPOSES, AS TO BE CONSISTANT WITH PREVIOUS INSTALLATION BEING INSULATED CABLE.

ITEM	QTY	DESCRIPTION	ITEM NUMBER	DRG REF
7	4	EQUIPOTENTIAL EARTHING MASONRY WIRE MESH, GALVANISED, 400MM X 7.2MM DIA	288415	-
6	4	EARTHING COMPOUND.(BAG)	10876	-
5	AR	COMPRESSION CONNECTOR, "6" PROFILE, 70 sq.mm	257394	S01-01-05-08
4	AR	COMPRESSION CONNECTOR, "C" PROFILE , 70-70 sq.mm	255786	S01-01-05-08
3	AR	EARTH ROD, SS316, 14mm DIA	414060	S01-01-05-01
2	AR	CABLE, Cu, INSULATED, Y/GR, 70 sq.mm	401059	S02-01-01-23
1	AR	70sq.mm BARE COPPER CONDUCTOR.	9803	S01-01-05-05

MATERIAL SCHEDULE

NO	DESCRIPTION	DRN	DATE	CKD	APPD
11	AMENDED EARTH MESH POSITION. AMENDED EARTH RING. UPDATED LOCAL EARTH TAIL TO INSULATED CABLE. ADDED LABELS AND DIMENSION. RE-ADDED ITEM 2. AMENDED LABELS.	P.BH.	JUL'23	B.C.	B.V.
10	UPDATE ITEMS 2, 3, 4, 5. UPATED EARTHING REQUIREMENT6 & NOTE 10. EARTHING DESIGN CHANGED.	A.N.	OCT'21	A.N.	B.V.
9	UPDATE EARTHING MESH DETAILS	H.E.	SEP'20	B.C.	B.V.
8	INCLUDE REFERENCE TO CADWELD PLUS	C.C.	NOV'19	B.C.	B.V.
7	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
6	NOTE 8 & EARTH NOTE 6 AMENDED	C.C.	OCT'18	B.V.	B.C.
5	ALTERED MEASUREMENTS	CWM	AUG'17	B.V.	B.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	A.TAYLOR
DRN	C.COPPINS
CKD	B.CHEUNG
APPD	B.CHEUNG
SCALE	N.T.S.
ISSUED	AUGUST 2011
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

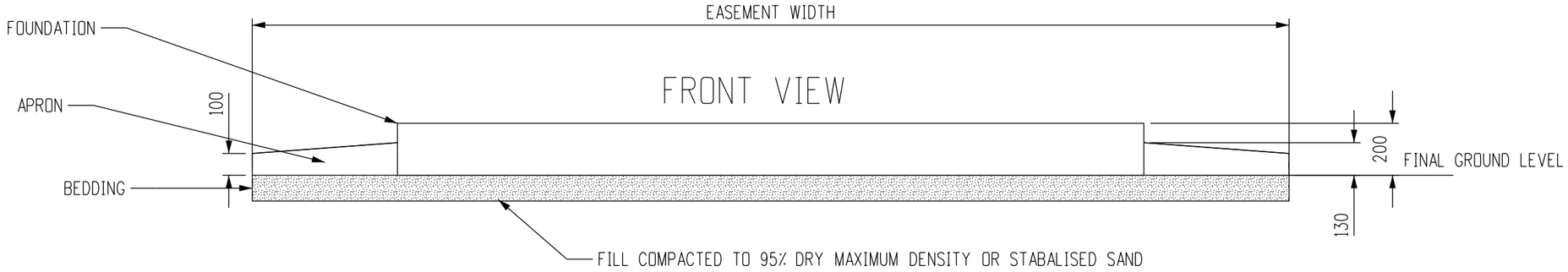
POWER STANDARD DRAWING

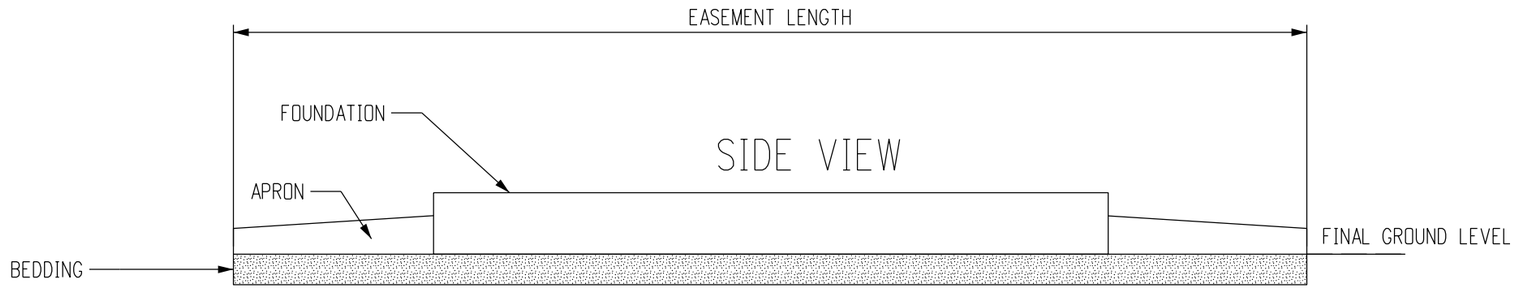
EARTHING
PACKAGE SUBSTATION MK2 AND MK3
CONSTRUCTION DETAILS

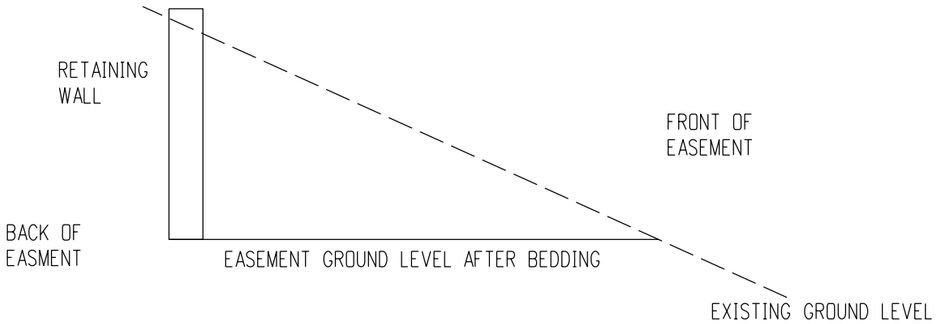
A3 | DRAWING NUMBER S02-02-05-10 | 11 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS







EXAMPLE SIDE VIEW OF EASEMENT ON SLOPED GROUND
DETAIL A

NOTES:

1. EASEMENT GROUND SHALL BE LEVEL REGARDLESS OF EXISTING GROUND PROFILE, REFER DETAIL A.
2. WHERE REQUIRED, A RETAINING WALL SHALL BE BUILT ALONG THE OUTER EDGE OF THE EASEMENT WITH THE ABILITY TO DIVERT FLOWING WATER AROUND THE EASEMENT.
3. ALL RETAINING WALLS SHALL BE CERTIFIED BY A CIVIL ENGINEER.
4. OPTIONAL 50mm WIDE CONCRETE STRIP FOOTING CAN BE BUILT ALONG THE EASEMENT EDGE.
5. THIS DRAWING SHALL BE APPLICABLE TO ALL GROUND MOUNTED INSTALLATIONS E.G. SUBSTATIONS, RMUS, ETC.
6. FOUNDATION AND APRON SHALL BE FINISHED TO PREVENT WATER POOLING. ADDITIONAL GUTTERING OR DRAINAGE MAY BE REQUIRED IN PROBLEM AREAS.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
5	SPELLING MISTAKE CORRECTED	CWM	JUNE'20	B.V.	B.V.
4	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
3	CONCRETE APRON DIMENSION CHANGES	P.H.	DEC'17	B.C.	B.V.
2	ADJUSTED FOUNDATION	CWM	AUG'17	B.V.	B.C.
1	CONCRETE APRON RAISED	A.T.	MAR'15	I.B.	B.C.
0	ISSUED FOR CONSTRUCTION	A.T.	JUL'13	B.C.	B.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	A.T.
DRN	A.T.
CKD	B.C.
APPD	B.C.
SCALE	N.T.S.
ISSUED	MAY'13
ALL DIM. IN mm	

POWER STANDARD DRAWING

GROUND LEVEL DETAILS
PACKAGE SUBSTATIONS AND
RING MAIN UNITS

A3

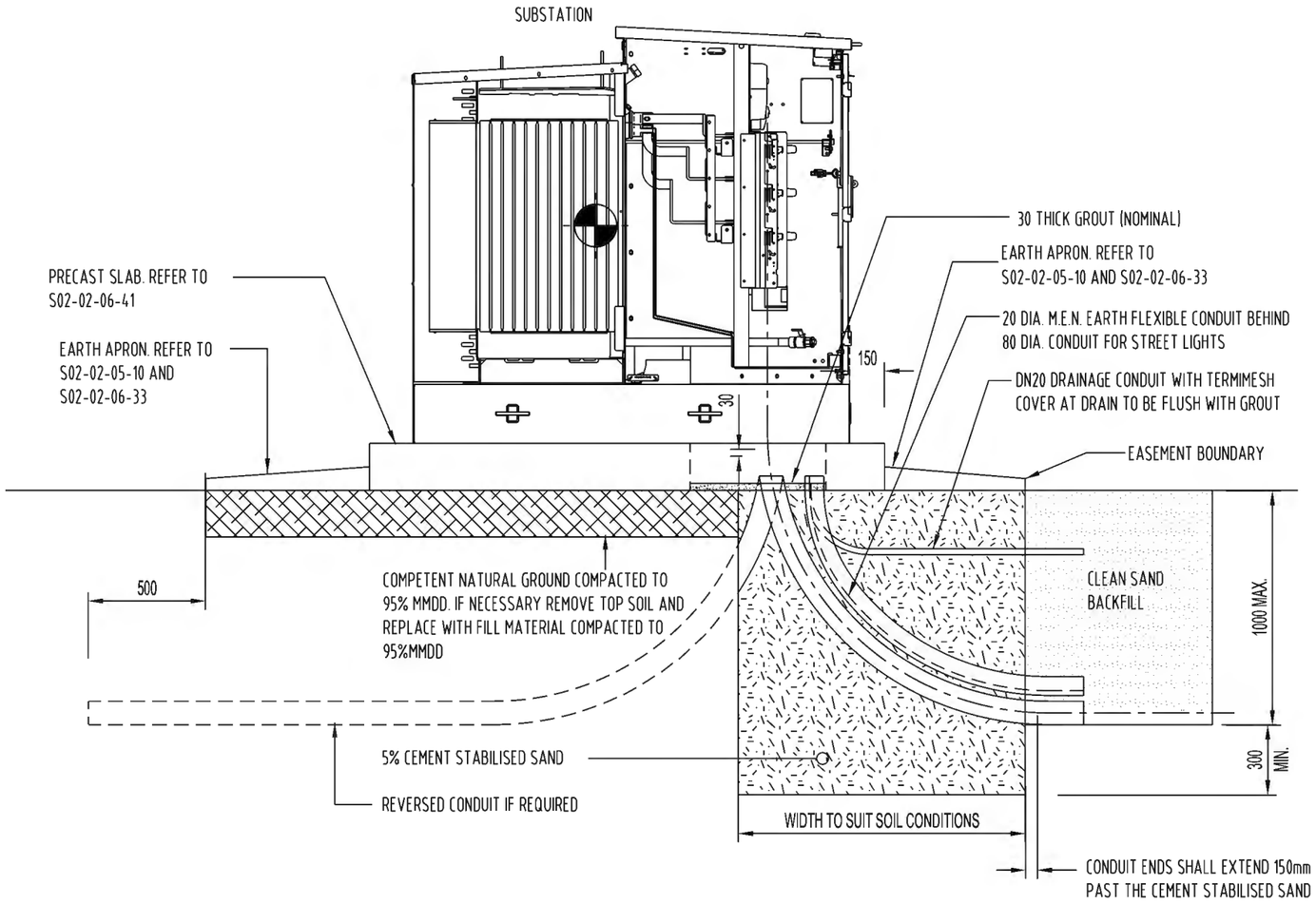
DRAWING NUMBER S02-02-06-33

5 AMDT

DRAFTING STANDARD TO A.S.1100

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ELEVATION
SCALE 1:25

GENERAL NOTES:-

1. INSTALLATION DETAILS ARE PROVIDED FOR THE GENERAL 4000x3500 EASEMENT.
2. CIVIL FOUNDATION IS DESIGNED FOR PWC STANDARD SPECIFICATION SOIL TYPE 1, 2 & 3 AND LIMITED TO THE PWC APPROVED 500kVA, 750kVA OR 1000kVA MK3 PACKAGE SUBSTATION (5100 KG MAX.) FITTED WITH EITHER A 3 WAY OR 4 WAY RMU.
3. FOR OTHER SOIL TYPES THE PWC STANDARD CIVIL DESIGN MUST BE REVIEWED AND THE AMENDED DESIGN SUBMITTED TO PWC FOR APPROVAL
4. FOR ALL OTHER HEAVIER SUBSTATIONS OR THOSE WITH DIFFERENT CENTRE OF GRAVITY REQUIRES THE FOUNDATION DESIGN TO BE REVIEWED AND SUBMITTED TO PWC FOR APPROVAL.
5. MK3 PACKAGE SUBSTATION FOUNDATION AND EARTHING, REFER TO S02-02-06-31 SHEET 2 AND S02-02-05-10 FOR DETAILS.
6. HEAVY DUTY ORANGE 100mm DIAMETER CONDUITS WITH 1200mm RADIUS BENDS SHALL BE USED FOR HV AND LV CABLE ENTRY. EACH HV CABLE SHALL OCCUPY ONE SINGLE 100mm CONDUIT. 4 x 240mm^2 LV CABLES SHALL BE INSTALLED IN EACH 100mm CONDUIT ON THE LV SIDE.
7. IT IS PREFERRED THAT 400mm^2 CABLES SHALL BE TERMINATED IN SWITCH BAYS 1 AND/OR 2.
8. ALL CONDUITS (EXCEPT FOR DRAIN) SHALL BE CUT LEVEL 30mm ABOVE THE FINISHED GROUT LEVEL.
9. SWITCH BAY 3 IS RESERVED FOR THE FUSED TRANSFORMER TEE-OFF.
10. ALL CONDUIT ENDS SHALL BE SEALED WITH PWC APPROVED SEALANT. REFER TO PWC STANDARD DRAWING S02-01-09-06.
11. REFER TO DRAWING S02-01-07-18 FOR CENTRE OF GRAVITY DETAILS.
12. SUBSTATION DETAILS ARE NOT TO BE COPIED NOR THE INFORMATION HEREON DIVULGED TO ANY THIRD PARTY OR USED FOR THE MAKING OF APPARATUS WITHOUT THE WRITTEN PERMISSION OF WILSON TRANSFORMER CO. PTY. LTD.
13. THE PRECAST SLAB AS PER S02-01-05-12 SHALL BE USED WHEN AVAILABLE. THE MARK 2 SLAB AS PER S02-02-06-31_2 CAN ALTERNATIVELY BE USED. REFER TO S02-02-06-42 FOR ALTERNATE CONDUIT LOCATIONS.
14. INSTALL SUITABLE OUTDOOR NEUTRAL CURING SILICON BEAD AT EDGE OF CONCRETE SLAB CABLE VOID NO GREATER THAN 20mm WIDTH TO LIMIT WATER INGRESS INTO CABLE VOID. THIS SHALL BE DONE PRIOR TO THE PLACEMENT OF THE SUBSTATION

CIVIL NOTES:-

1. THE CONTRACTOR IS RESPONSIBLE FOR ASSESSING SOIL CONDITIONS PRIOR TO COMMENCING WORK. HAZARD IDENTIFICATION AND RISK ASSESSMENT ARE REQUIRED PRIOR TO THE COMMENCEMENT OF WORKS.
2. THIS CIVIL DESIGN IS APPROVED FOR THE FOLLOWING SOIL CONDITIONS. OTHER SOIL CONDITIONS REQUIRE ENGINEERING DESIGN.
   - 2a - SOIL GROUP 1: (GOOD BEARING CAPACITY 300kPa) WELL COMPACTED ROCK SOIL. HARD CLAY AND WELL BONDED SAND AND GRAVEL WITH GOOD SURFACE WATER DRAINAGE AND FOOTING NORMALLY ABOVE WATER TABLE.
   - 2b - SOIL GROUP 2: (MEDIUM BEARING 200kPa) COMPACT MEDIUM CLAY. WELL BONDED SANDY LOAM. BONDED SAND AND GRAVEL WITH REASONABLE SURFACE DRAINAGE.
   - 2c - SOIL GROUP 3: (POOR BEARING 100kPa) SOFT CLAY. POOR COMPACTED SAND AND SOILS THAT TEND TO ABSORB LARGE AMOUNTS OF WATER, PROVIDED THESE DO NOT DEVELOP INTO SLUSH.
3. CEMENT STABILISED SAND SHALL BE 5% CEMENT WITH COHESION = 1000kPa AND A FRICTION ANGLE = 30 DEGREES. THE CONTRACTOR SHALL PERFORM TESTS ON SITE TO PROVE THE REQUIRED STRENGTH IS ACHIEVED.
4. MAXIMUM ALLOWABLE SURCHARGE IS 15kPa. THE CONTRACTOR IS RESPONSIBLE FOR ACCESSING SOIL CONDITIONS PRIOR TO COMMENCING WORK. KEEP ALL EXCAVATION AND LIFTING PLANT A MINIMUM OF 2000mm FROM THE EXCAVATION EDGE.
5. THE PRECAST SLAB SHALL BE FOUNDED ON COMPETENT NATURAL GROUND COMPACTED TO 95% MMDD. IF TOP SOIL IS PRESENT, REMOVE AND REPLACE WITH FILL MATERIAL THAT IS FREE OF ORGANIC MATTER, HAS A MINIMUM SOAKED CBR AT 95% MMDD OF 20% AT 2.5mm AND A PLASTICITY INDEX BETWEEN 2% AND 15%, COMPACTED TO 95% MMDD.
6. FOR SUBSTATIONS REQUIRING A REVERSED LV CONDUIT FOR CUSTOMER CABLE ENTRY CONDUIT, A 450mm WIDE TRENCH SHALL BE EXCAVATED AND BACKFILLED WITH 5% CEMENT STABILISED SAND. EXCAVATION POSITION TO SUIT CABLE POSITION REQUIREMENTS.
7. IF SUBSTATION IS ADJACENT TO PAVING THEN ENSURE PAVING IS FLUSH WITH EDGE OF EARTH APRON.
8. ENSURE 30 THICK GROUT (NOMINAL) IS SLOPED TOWARD DRAIN TO ENSURE ADEQUATE DRAINAGE.
9. RETAINING WALL OR PIERS AS PER MK2 CIVIL INSTALLATION (S02-02-06-31) MAY BE USED ONLY IF EXCAVATION SPACE RESTRICTIONS EXIST FOR BROWNFIELDS INSTALLATION. USE MK2 INSTALLATION METHODS AS REQUIRED FOR THIS SENARIO.
10. ALL LIFTING ANCHORS TO BE GROUTED OR CONCRETE FILLED TO BE FLUSH WITH CONCRETE SLAB FACE.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
8	SHEET 2 AMENDED.	P BH.	SEP'23	B.V.	B.C.
7	AMENDED GENERAL NOTES 6 & 10. INCLUDED CIVIL NOTE 10, CORRECTED DIMENSIONS	R.A.	OCT'21	B.V.	A.N.
6	GENERAL NOTES UPDATED. SHEET 2, 3 & 4 AMENDED	C.C.	JUL'21	B.V.	B.C.
5	AMENDED NOTE 13 IN PAGE 1 & NOTE 6 IN PAGE 4 TO REFERENCE RENUMBERED PRECAST SLAB DRAWING	R.A.	MAY'21	C.C.C.	B.C.
4	AMENDED DRAWING FRAME & FONTS	CWM	FEB 2020	BV	BV
3	ADD NOTE 14, AND REMOVE EXPANDING FOAM REFERENCE	CWM	NOV 2019	BV	BV
2	TITLE BLOCK & DRAWING NUMBER FORMATTED	KT	FEB 19	CC	CC
1	INCLUDE BROWNFIELDS WALL INSTALLATION NOTES	PH	APR 18	BC	BV
0	ISSUED FOR CONSTRUCTION	SHW	SEPT 17	MP	MP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	HT
DRN	SHW
CKD	MP
APPD	CS
SCALE	
ISSUED	Sept 2017
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CIVIL, MK3 PACKAGE SUBSTATION GENERAL ARRANGEMENT CABLE ENTRY AND FOUNDATION DETAILS ELEVATION - SHEET 1 OF 4

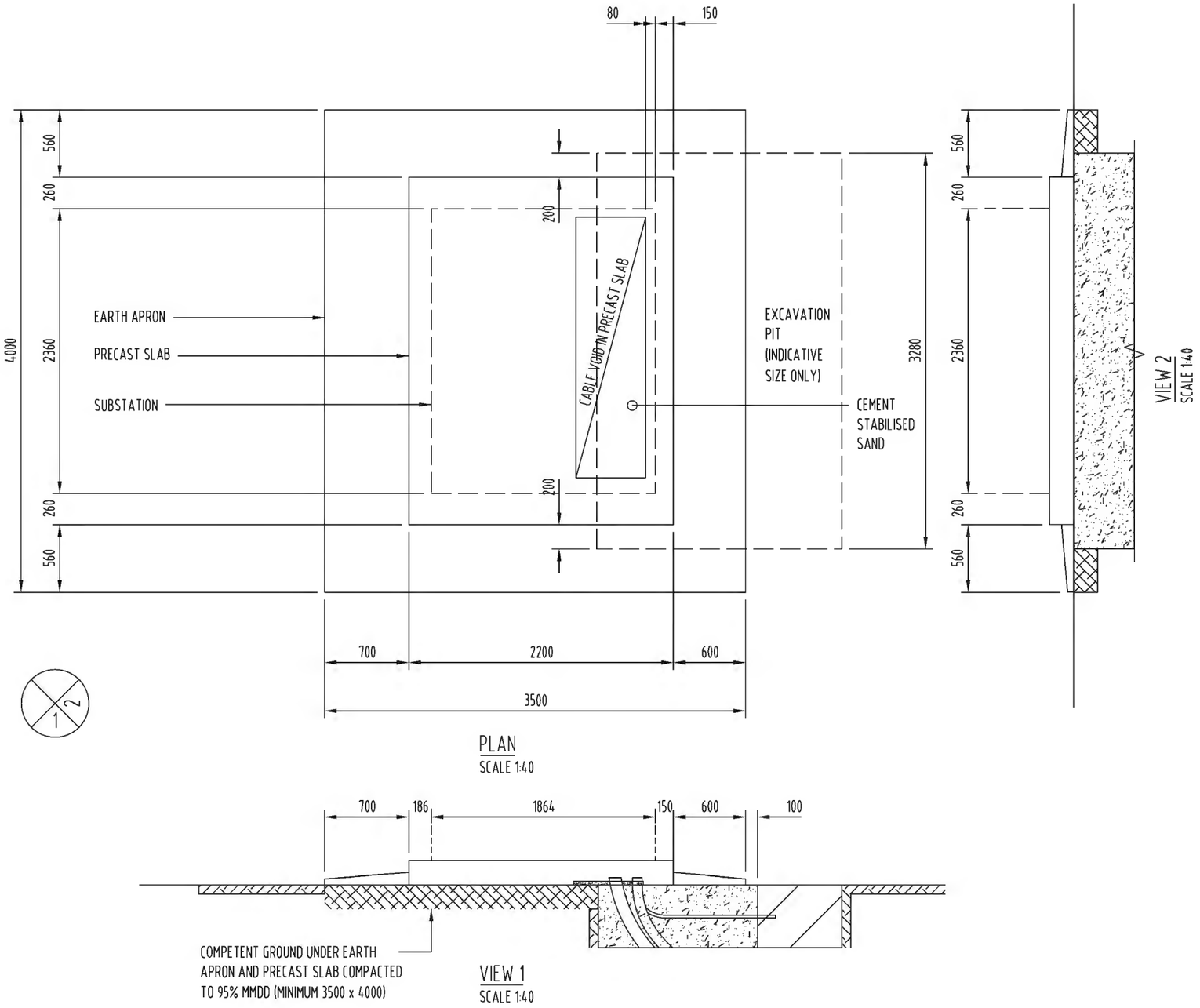
A3

DRAWING NUMBER S02-02-06-37_1

8 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

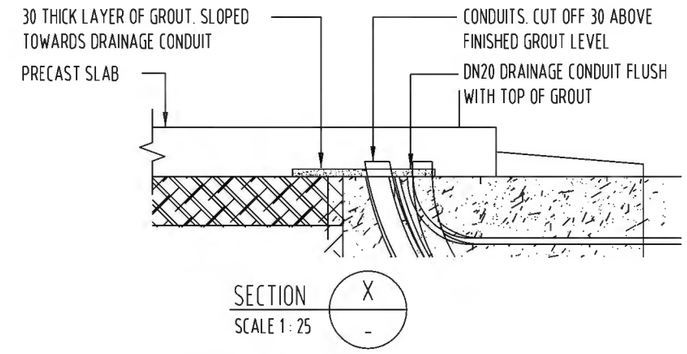
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



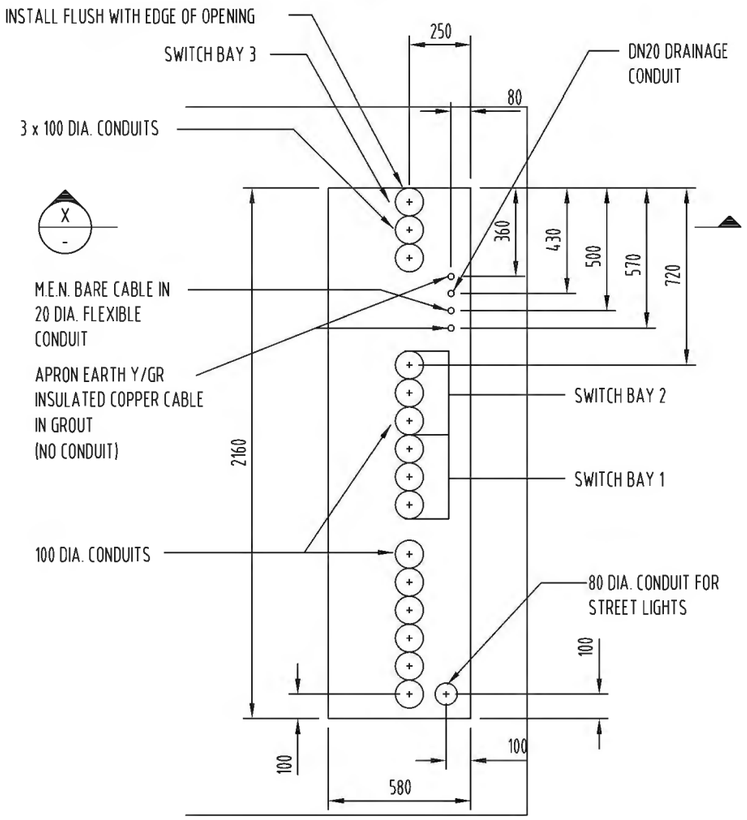
PLAN
SCALE 1:40

VIEW 2
SCALE 1:40

VIEW 1
SCALE 1:40



SECTION X
SCALE 1:25



CONDUIT ENTRY DETAILS
SCALE 1:25

NO	DESCRIPTION	DRN	DATE	CKD	APPD
8	APRON EARTH CABLE AMENDED.	P.BH.	SEP'23	B.V.	B.C.
7	AMENDED SHEETS 1, 3 & 4. ADDED ADDITIONAL BARE EARTH CABLE IN SHEET 2.	R.A.	OCT'21	B.V.	A.N.
6	NOTE 1 & 2 ADDED	C.C.	JUL'21	B.V.	B.C.
5	AMENDED NOTE 13 IN PAGE 1 & NOTE 6 IN PAGE 4 TO REFERENCE RENUMBERED PRECAST SLAB DRAWING.	R.A.	MAY'21	C.C.C	B.C.
4	AMENDED DRAWING FRAME & FONTS	CWM	FEB 2020	BV	BV
3	SHEET 1 AMENDED	CC	NOV 19	BV	BV
2	TITLE BLOCK & DRAWING NUMBER FORMATTED	KT	FEB 19	CC	CC
1	INCLUDE BROWNFIELDS WALL INSTALLATION NOTES	PH	APR 18	BC	BV
0	ISSUED FOR CONSTRUCTION	SHW	SEPT 17	MP	MP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	HT
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	Sept 2017
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

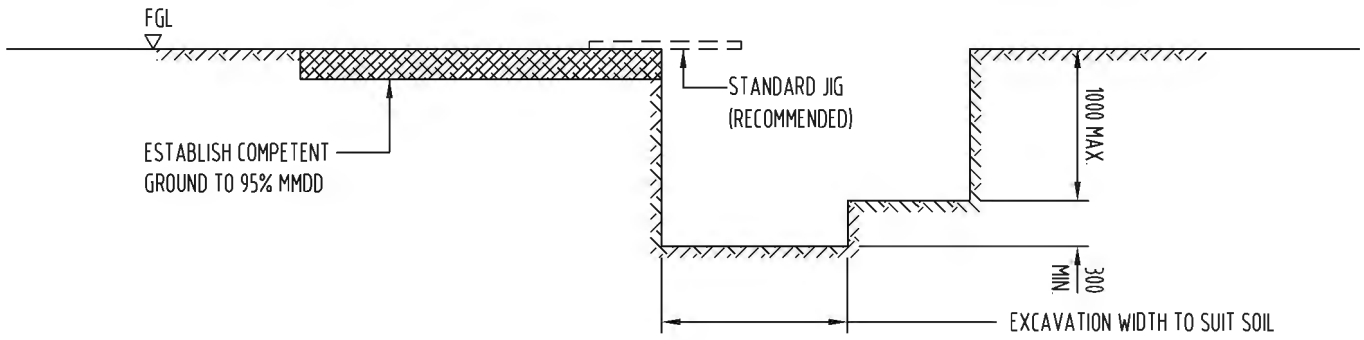
POWER STANDARD DRAWING

CIVIL, MK3 PACKAGE SUBSTATION CABLE ENTRY AND FOUNDATION DETAILS SETOUT DRAWING - SHEET 2 OF 4

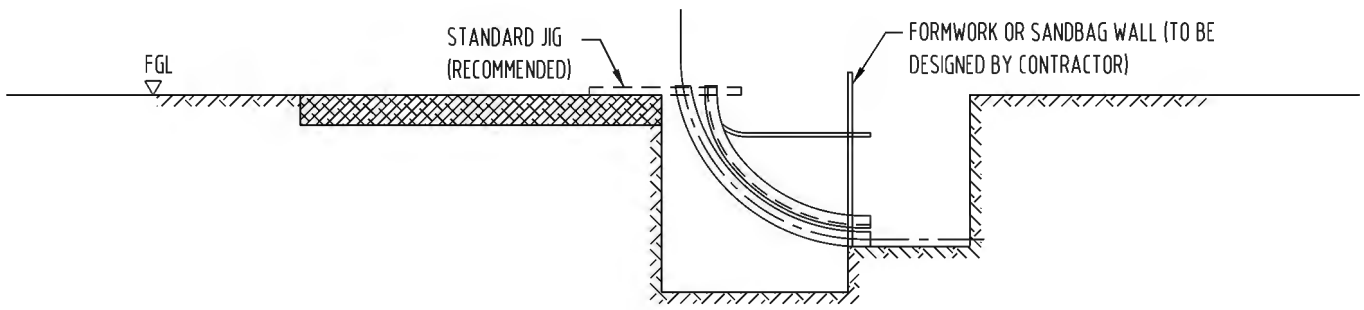
A3 | DRAWING NUMBER S02-02-06-37_2 | 8 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

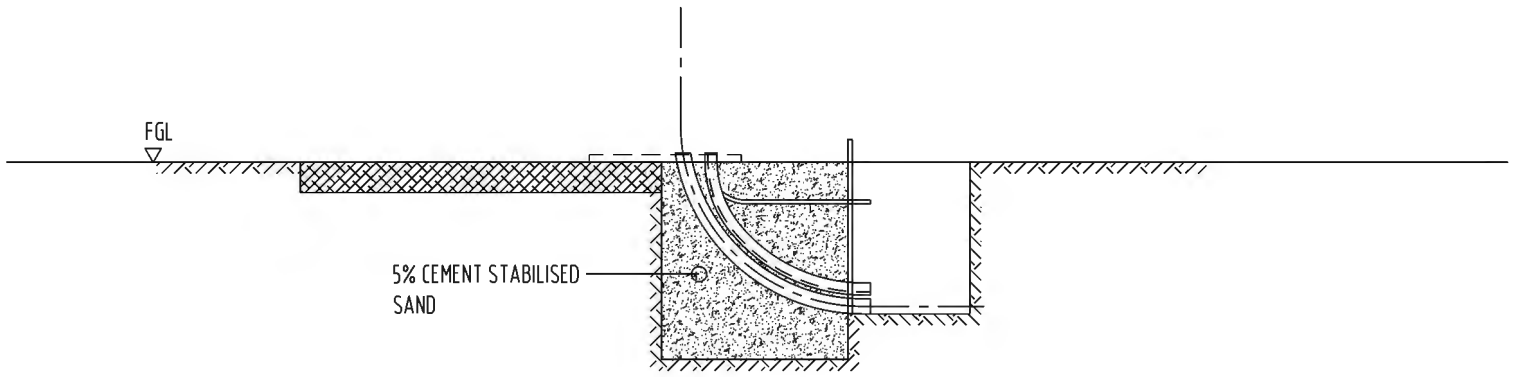
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



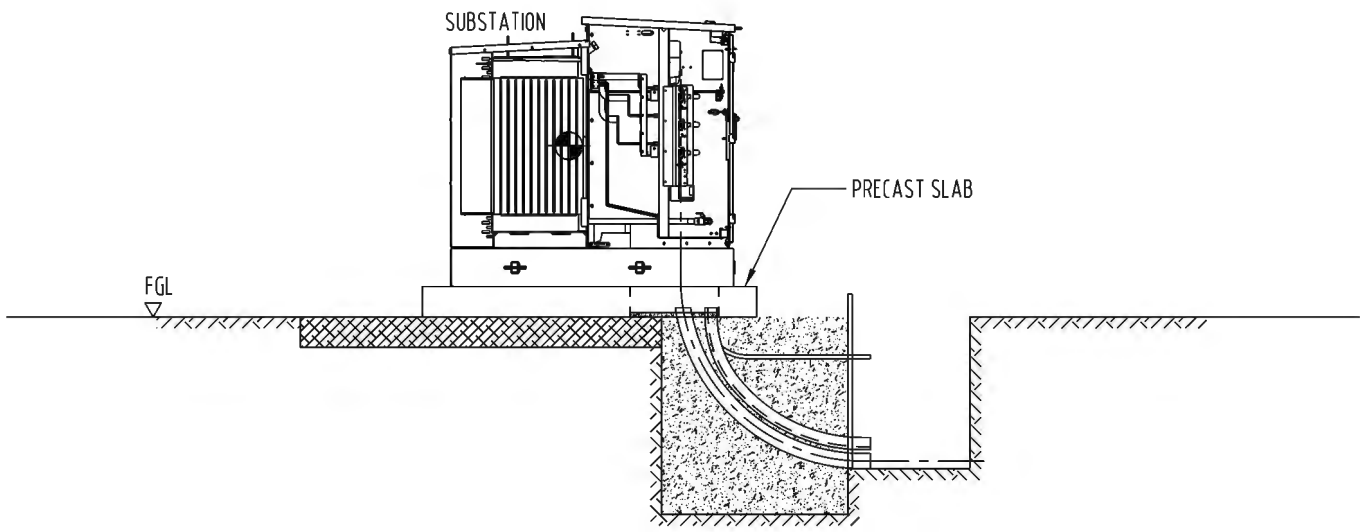
STEP 1 - COMPACT PAD FOR SLAB, INSTALL STANDARD JIG AND EXCAVATE SITE



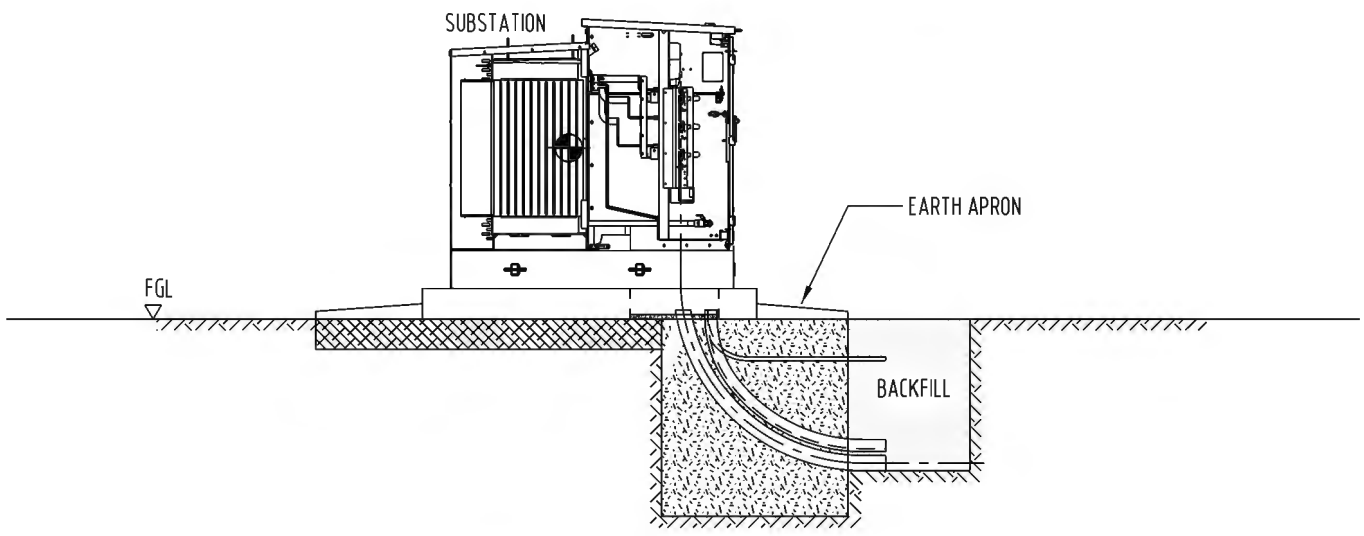
STEP 2 - INSTALL THE CONDUITS USING THE STANDARD JIG AND FORMWORK FOR THE CEMENT STABILISED SAND



STEP 3 - PLACE 5% CEMENT STABILISED SAND AND ALLOW IT TO ACHIEVE REQUIRED STRENGTH



STEP 4 - INSTALL PRECAST CONCRETE SLAB, REMOVE JIG, GROUT CONDUIT ENTRY AND INSTALL SUBSTATION INCLUDING CABLES, EARTHING AND TERMINATIONS



STEP 5 - BACKFILL THE PIT AND INSTALL EARTH APRON. MAKE EXISTING PAVING FLUSH WITH EARTH APRON AS REQUIRED

CONSTRUCTION SEQUENCE

SCALE 1:50

CONSTRUCTION SEQUENCE NOTES:-

1. ESTABLISH COMPETENT NATURAL GROUND OR SELECT FILL BASE FOR THE SLAB AND COMPACT TO 95% MMDD.
2. MARK OUT THE SITE AND POSITION THE STANDARD JIG. REFER DRAWING S02-02-06-38.
3. EXCAVATE THE PIT.
4. INSTALL THE CONDUITS.
5. PLACE THE 5% CEMENT STABILISED SAND AND ALLOW FOR IT TO REACH THE REQUIRED STRENGTH.
6. REMOVE THE JIG AND INSTALL THE PRECAST SLAB.
7. GROUT THE CONDUIT ENTRY OPENING AND CUT OFF THE CONDUITS 30mm ABOVE THE GROUT. ALL LIFTING ANCHORS TO BE GROUTED OR CONCRETE-FILLED TO BE FLUSH WITH CONCRETE SLAB FACE.
8. INSTALL THE MK3 SUBSTATION.
9. BACKFILL THE PIT.
10. INSTALL THE EARTH APRON.

AMENDMENTS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
8	AMENDED SHEET 2.	PBH.	SEP'23	B.V.	B.C.
7	AMENDED NOTE 7.	R.A.	OCT'21	B.V.	A.N.
6	CONSTRUCTION SEQUENCE NOTES UPDATED & ADDITIONAL NOTE ADDED	C.C.	JUL'21	B.V.	B.C.
5	AMENDED NOTE 13 IN PAGE 1 & NOTE 6 IN PAGE 4, TO REFERENCE RENUMBERED PRECAST SLAB DRAWING	R.A.	MAY'21	C.C.C.	B.C.
4	AMENDED DRAWING FRAME & FONTS	CWM	FEB 2020	B.V.	B.V.
3	SHEET 1 AMENDED	CWM	NOV 2019	B.V.	B.V.
2	TITLE BLOCK & DRAWING NUMBER FORMATTED	KT	FEB 19	C.C.	C.C.
1	INCLUDE BROWNFIELDS WALL INSTALLATION NOTES	PH	APR 18	B.C.	B.V.
0	ISSUED FOR CONSTRUCTION	SHW	SEPT 17	M.P.	M.P.

PowerWater
NORTHERN TERRITORY

POWER STANDARD DRAWING

CIVIL, MK3 PACKAGE SUBSTATION
CABLE ENTRY AND FOUNDATION DETAILS
CONSTRUCTION SEQUENCE - SHEET 3 OF 4

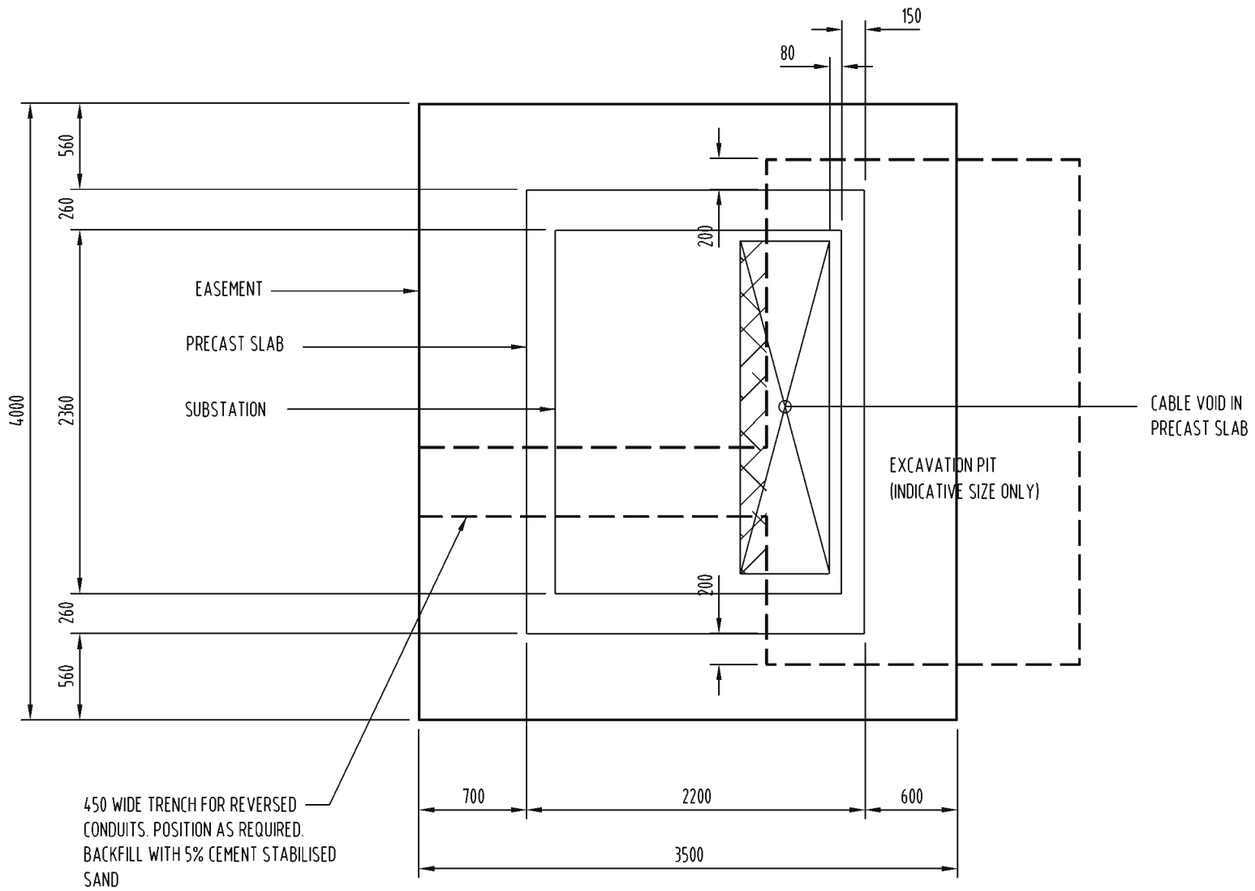
DES	HT
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	Sept 2017
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

A3

DRAWING NUMBER S02-02-06-37_3

AMDT 8

CAD PRODUCT, DO NOT AMEND MANUALLY
APPROVED FOR CONSTRUCTION 25/11/2021 SS



PLAN
SCALE 1:40

CONSTRUCTION SEQUENCE NOTES:-

1. ESTABLISH COMPETENT NATURAL GROUND OR SELECT FILL BASE FOR THE SLAB AND COMPACT TO 95% MMDD.
2. MARK OUT THE SITE AND POSITION THE STANDARD JIG. REFER DRAWING S02-02-06-38.
3. EXCAVATE THE PIT AND THE 450 WIDE TRENCH.
4. INSTALL THE CONDUITS.
5. PLACE THE 5% CEMENT STABILISED SAND AND ALLOW FOR IT TO REACH THE REQUIRED STRENGTH.
6. REMOVE THE JIG AND INSTALL THE PRECAST SLAB. REFER DRAWING S02-01-05-12.
7. GROUT THE CONDUIT ENTRY OPENING AND CUT OFF THE CONDUITS 30mm ABOVE THE GROUT. ALL LIFTING ANCHORS TO BE GROUTED OR CONCRETE-FILLED TO BE FLUSH WITH CONCRETE SURFACE.
8. INSTALL THE MK3 SUBSTATION.
9. BACKFILL THE PIT AND THE REMAINING 450 WIDE TRENCH LENGTH.
10. INSTALL THE EARTH APRON. REFER DRAWINGS S02-02-05-10 AND S02-02-06-33.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
8	AMENDED SHEET 2.	P.BH.	SEP'23	B.V.	B.C.
7	AMENDED NOTE 7	R.A.	OCT'21	B.V.	A.N.
6	CONSTRUCTION SEQUENCE NOTES UPDATED	C.C.	JUL'21	B.V.	B.C.
5	AMENDED NOTE 13 IN PAGE 1 & NOTE 6 IN PAGE 4 TO REFERENCE RENUMBERED PRECAST SLAB DRAWING	R.A.	MAY'21	C.C.C.	B.C.
4	AMENDED DRAWING FRAME & FONTS	CWM	FEB 2020	BV	BV
3	SHEET 1 AMENDED	CWM	NOV 2019	BV	BV
2	TITLE BLOCK & DRAWING NUMBER FORMATTED	KT	FEB 19	CC	CC
1	INCLUDE BROWNFIELDS WALL INSTALATION NOTES	PH	APR 18	BC	BV
0	ISSUED FOR CONSTRUCTION	SHW	SEPT 17	MP	MP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	HT
DRN	SHW
CKD	MP
APPD	CS
SCALE	AS SHOWN
ISSUED	Sept 2017
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CIVIL, MK3 PACKAGE SUBSTATION
CABLE ENTRY AND FOUNDATION DETAILS
CONSTRUCTION SEQUENCE - REVERSED
CONDUIT ARRANGEMENT SHEET 4 OF 4

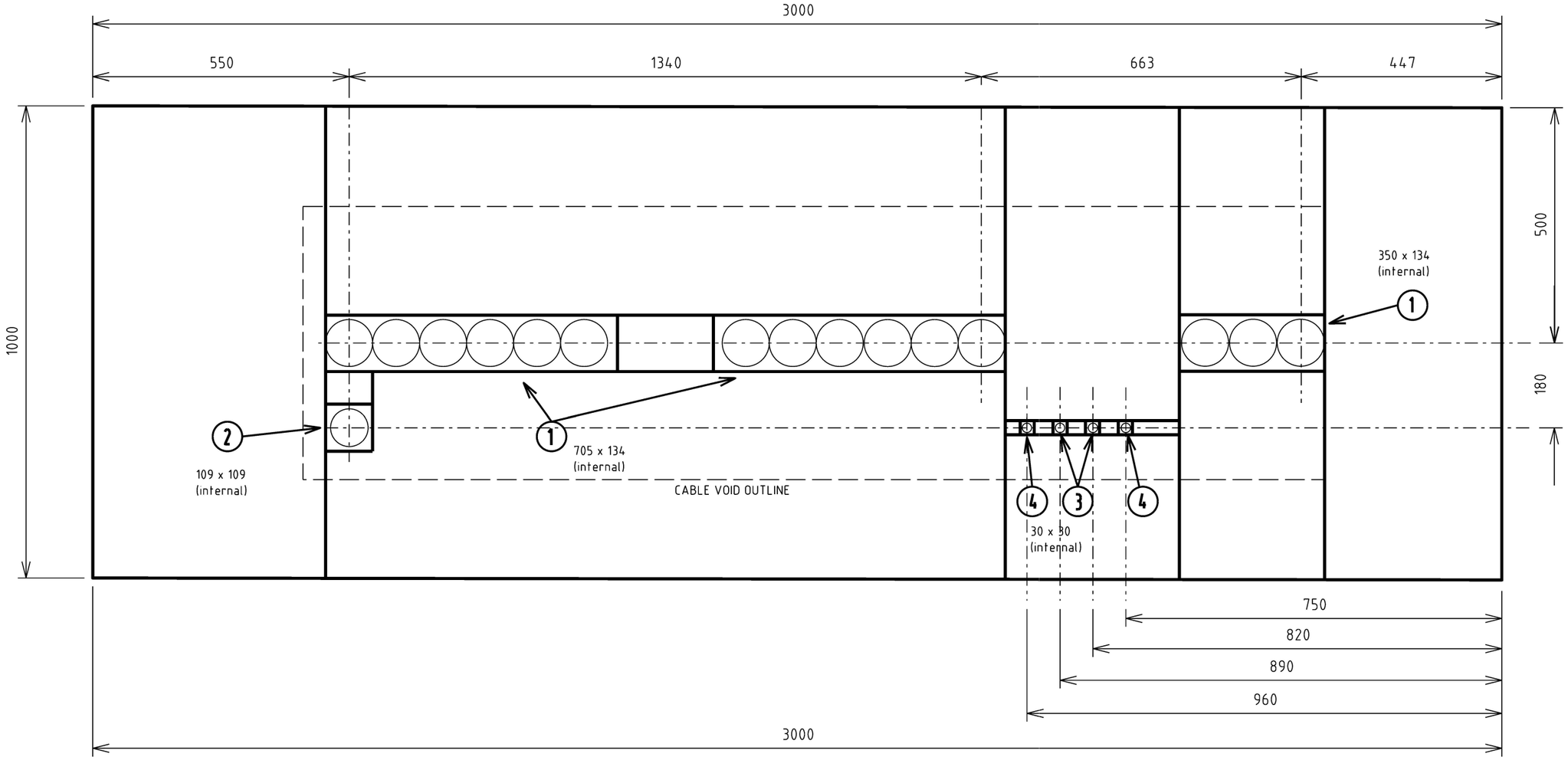
A3

DRAWING NUMBER S02-02-06-37_4

CAD PRODUCT - DO NOT AMEND MANUALLY

8 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



REFERENCE DRAWINGS:

S02-02-06-37 - CIVIL, MK3 PACKAGE SUBSTATION GENERAL ARRANGEMENT CABLE ENTRY AND FOUNDATION DETAILS
S02-02-06-36 - CIVIL, CABLE CLAMPING ARRANGEMENTS IN FOUNDATION SLABS
S02-02-06-33 - GROUND LEVEL DETAILS PACKAGE SUBSTATIONS AND RMUs
S02-02-06-18 - CIVIL, HV CONSUMERS SWITCHING STATION - METERING FROM CONSTRUCTION DETAILS
S02-02-06-17 - CIVIL, SUBSTATION RING MAIN UNIT & LV PILLAR EASEMENT DETAILS
S02-02-06-10 - CIVIL, STANDARD CABLE PITS PLAN & DETAILS

ALL CONDUITS ASSUMED TO BE HEAVY DUTY ORANGE AS PER PWC STANDARD DRAWING S02-01-09-02

1. 15x 100mm ϕ CONDUITS - O.D. 114.2
2. 1x 80mm ϕ CONDUITS - O.D. 89.0
3. 2x 20mm ϕ CONDUITS - O.D. 20.0
4. 2x 70mm² Y/GR INSULATED COPPER CABLE (NO CONDUIT).

NB.: CONDUIT DIMENSIONS ARE NOMINAL

NOTES

- JIG DESIGN IS TO BE USED FOR CONCRETE SLAB S02-01-05-12 ONLY
- 3000 x 1000 mm FRAME SIZE RECOMMENDATION ONLY
- RECOMMEND CONDUIT APERTURE TO BE ADJUSTABLE
- APERTURE SIZES (1), (2), (3), & (4) ARE RECOMMENDATIONS ONLY
- FRAME MATERIAL & ASSEMBLY IS TO BE CHOICE OF CONTRACTOR & THEIR REQUIREMENTS.
- JIG SHOULD INCORPORATE FIXING POINTS IN ORDER TO ACCURATELY & SECURELY FIX IN DESIRED POSITION.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
	AMENDMENTS				
4	ADDED ADDITIONAL EARTH LOCATION	P.G	SEP'23	BC	B.V.
3	CONCRETE SLAB DRAWING NUMBER REFERENCE IN NOTES, AMENDED (SHEET 1), TEXT & TITLEBLOCK FORMATTING CORRECTED, REFERENCE DRAWINGS MOVED TO NOTES	R.A.	SEP'21	C.C.C.	B.V.
2	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
1	DIMENSION CORRECTION	CWM	AUG'18	IB	B.VDS
0	ISSUED FOR CONSTRUCTION	CWM	SEP'17	B.VDS	B.C

PowerWater
NORTHERN TERRITORY

DES	B.VDS
DRN	CWM
CKD	I.B.
APPD	B.C.
SCALE	N.T.S.
ISSUED	SEP'17
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

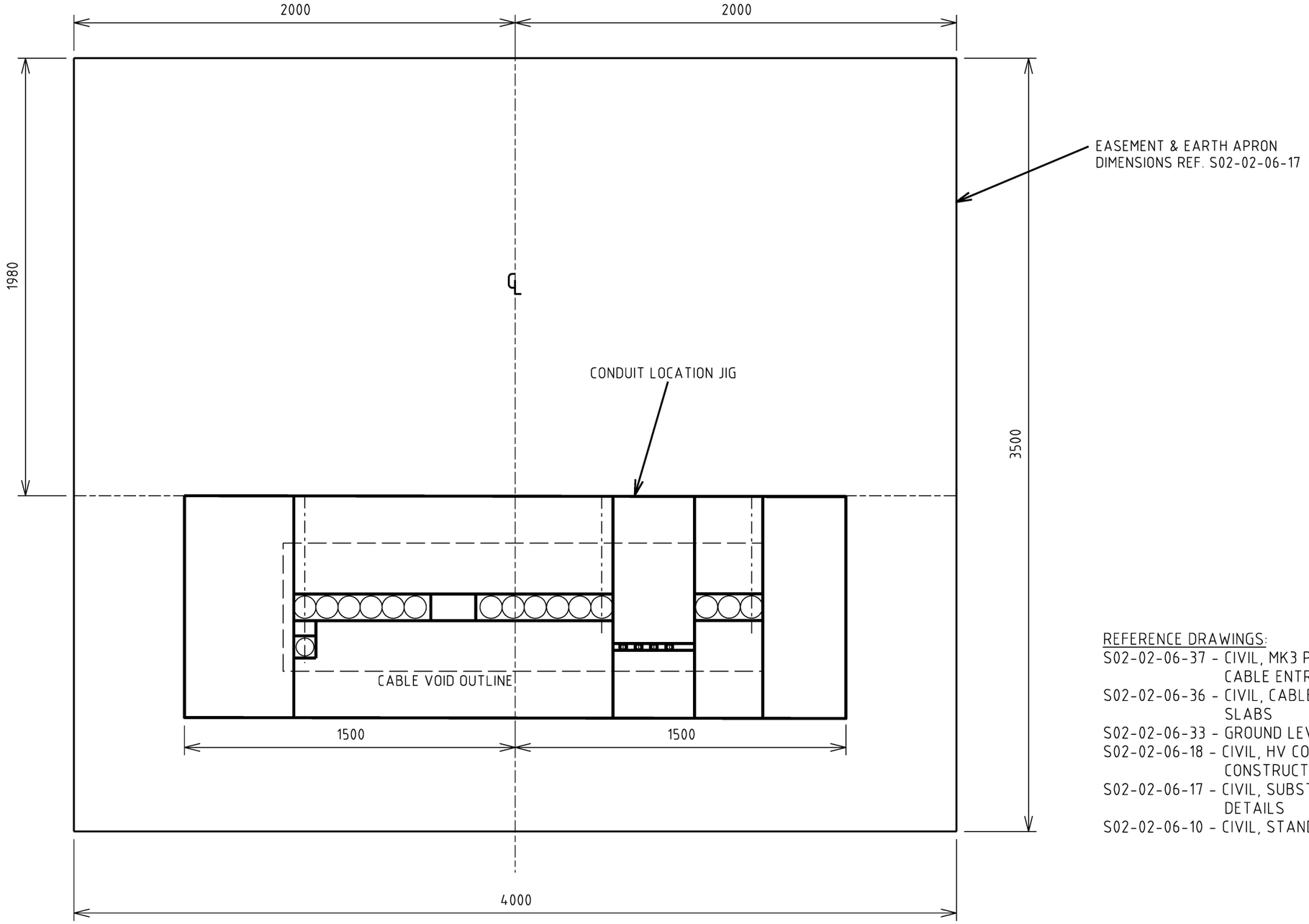
POWER STANDARD DRAWING

MARK 3 PACKAGE SUBSTATION CONDUIT LOCATION JIG SETUP & POSITION WITH MARK 3 CONCRETE SLAB SHEET 1 OF 2

A3 | DRAWING NUMBER S02-02-06-40_1 | 4 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



REFERENCE DRAWINGS:

S02-02-06-37 - CIVIL, MK3 PACKAGE SUBSTATION GENERAL ARRANGEMENT CABLE ENTRY AND FOUNDATION DETAILS
S02-02-06-36 - CIVIL, CABLE CLAMPING ARRANGEMENTS IN FOUNDATION SLABS
S02-02-06-33 - GROUND LEVEL DETAILS PACKAGE SUBSTATIONS AND RMUs
S02-02-06-18 - CIVIL, HV CONSUMERS SWITCHING STATION - METERING FROM CONSTRUCTION DETAILS
S02-02-06-17 - CIVIL, SUBSTATION RING MAIN UNIT & LV PILLAR EASEMENT DETAILS
S02-02-06-10 - CIVIL, STANDARD CABLE PITS PLAN & DETAILS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
4	ADDED ADDITIONAL EARTH LOCATION	P.G	FEB'19	BC	BC
3	CONCRETE SLAB DRAWING NUMBER REFERENCE IN NOTES, AMENDED (SHEET 1), TEXT & TITLEBLOCK FORMATTING CORRECTED, REFERENCE DRAWINGS MOVED TO NOTES	R.A.	SEP'21	C.C.C.	B.V.
2	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
1	SHEET 1 AMENDED	CWM	AUG'18	IB	B.VDS
0	ISSUED FOR CONSTRUCTION	CWM	SEP'17	B.VDS	B.C

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	B.VDS
DRN	CWM
CKD	I.B.
APPD	B.C.
SCALE	N.T.S.
ISSUED	APR'17
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

MARK 3 PACKAGE SUBSTATION CONDUIT LOCATION JIG SETUP & POSITION WITH MARK 3 CONCRETE SLAB SHEET 2 OF 2

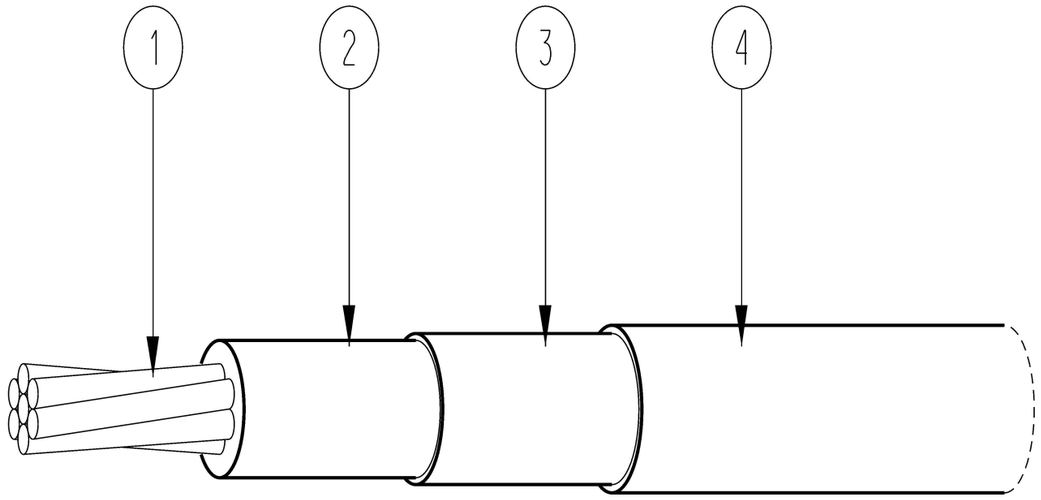
A3

DRAWING NUMBER S02-02-06-40_2

CAD PRODUCT - DO NOT AMEND MANUALLY

4 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



ITEM	UNITS	1	2	3
ITEM NUMBER		9456 (BLACK)	9449 (RED)	505118
CONDUCTOR AREA	sq mm	25		240
CONDUCTOR DIAMETER	mm	6		18.7
INSULATION THICKNESS	mm	0.9		1.7
NYLON SHEET THICKNESS MIN	mm	0.5		0.5
SACRIFICIAL SHEATH THICKNESS	mm	1.4		1.43
CABLE OUTER DIAMETER LENGTH	mm	12.1		28.5 +/- 3
STANDARD DRUM LENGTH	mm	500		1000
CABLE MASS	kg/100m	32		246
CONDUCTOR FORM		COMPRESSED		COMPACTED
MINIMUM NUMBER OF STRANDS		7		37
BENDING RADIUS (INSTALLATION)	mm	270		713
BENDING RADIUS (INSTALLED)	mm	180		428
MAX PULLING TENSION	kN	1.8		3.5
CURRENT RATING	A	108		391

NOTES:

1. THE CABLES SHALL BE PERMANENTLY MARKED WITH MANUFACTURERS IDENTIFICATION, YEAR OF MANUFACTURE AND VOLTAGE RATING AT INTERVALS ALONG THE OUTER PVC SHEATH OF THE CABLE.
2. THE CABLE SHALL ALSO HAVE ITS LENGTH PRINTED AT INTERVALS ALONG THE SACRIFICIAL SHEATH, CONSISTING OF CONSECUTIVE NUMBERS, NOMINALLY SPACED AT ONE METRE.
3. CABLE TO BE WOUND ON DRUM TO ENSURE LEGIBILITY OF ABOVE INFORMATION IN NOTES 1 AND 2.
4. CABLE WILL COMPLY WITH AS/NZS 5000.1 AND AS 1125.
5. REFER TO SPECIFICATION STSP 02-002 FOR MORE INFORMATION.
6. ALL CABLES SHALL BE CAPPED AT ALL TIMES WHEN NOT IN USE.
7. ALL FIGURES ARE GENERIC INFORMATION AND YOU SHOULD CHECK WITH CABLE SPECIFICATIONS WHEN AND IF REQUIRED.

TAG NO	DESCRIPTION
4	MDPE SACRIFICIAL SHEATH UV STABILISED
3	ANTI-TERMITE JACKET - EXTRUDED NYLON 11 OR 12
2	CROSS LINKED POLYETHYLENE INSULATION.
1	CONDUCTOR - COPPER

NO	DESCRIPTION	DRN	DATE	CKD	APPD
	AMENDMENTS				
16	UPDATED THE MATERIALS TABLE AND ADDED A NEW COLUMN. IMPROVED DRAWING QUALITY AND LAYOUT.	J.R.	JUL'24	B.B.	B.V.
15	CLARIFIED OUTER LAYER COLOUR. EDITED NOTE 5 & ADDED NOTE 6.	A.N.	JUN'21	A.N.	B.C.
14	REFORMATTED TABLE OF ATTRIBUTES, UPDATED INSULATION THICKNESS.	A.N.	DEC'20	C.C.C.	B.C.
13	NOMINAL INSULATION THICKNESS & NOTE 4 UPDATED	H.E.	SEP'20	H.E.	B.C.
12	UPDATE TAG 4 TO MDPE, ADD NOTE 5, UPDATE PARAMETERS.	C.C.	APR'20	C.C.	B.C.
11	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	JAN'19	C.C.	C.C.
10	TAG NO 3 COLOUR AMENDED.	RGI	APR'01	-	FRR
9	GENERAL REVISION TITLE & DRG NO CHANGED.	-	JUN'88	-	OLT

PowerWater
NORTHERN TERRITORY

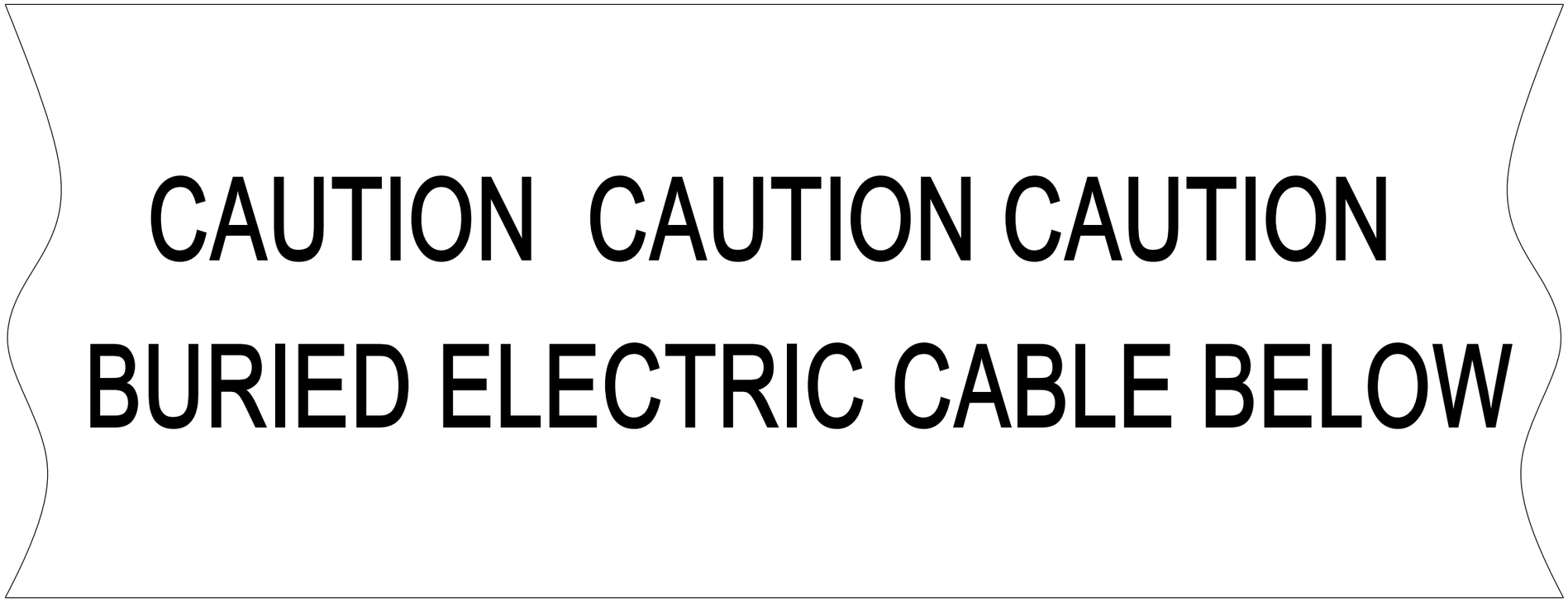
DES Dr D.K.SWEETING	POWER STANDARD DRAWING
DRN J.GAMMIE	CABLES COPPER - SINGLE CORE 0.6/1KV XLPE - NYLON
CKD D.K.SWEETING	
APPD K.CHITT	
SCALE no scale	
ISSUED DEC'83	A3
ALL DIM. IN mm	DRAWING NUMBER S02-01-01-20
DRAFTING STANDARD TO A.S.1100	CAD PRODUCT - DO NOT AMEND MANUALLY

16 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NOTES

1. THE TAPE SHALL BE ORANG WITH BLACK LETTERING AS SHOWN
2. THE TAPE SHALL BE 150mm WIDE
3 THE TAPE SHALL CONFORM IN ALL RESPECTS TO A.S. 2648 PART 1.
4. LENGTH 500m/ROLL



ITEM NUMBER 6569

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
9	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
8	REDRAWN IN CAD	C.C.	NOV'10	A.T.	S.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	A.TAYLOR
DRN	C.COPPINS
CKD	A.TAYLOR
APPD	A.TAYLOR
SCALE	N.T.S
ISSUED	NOV'10
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

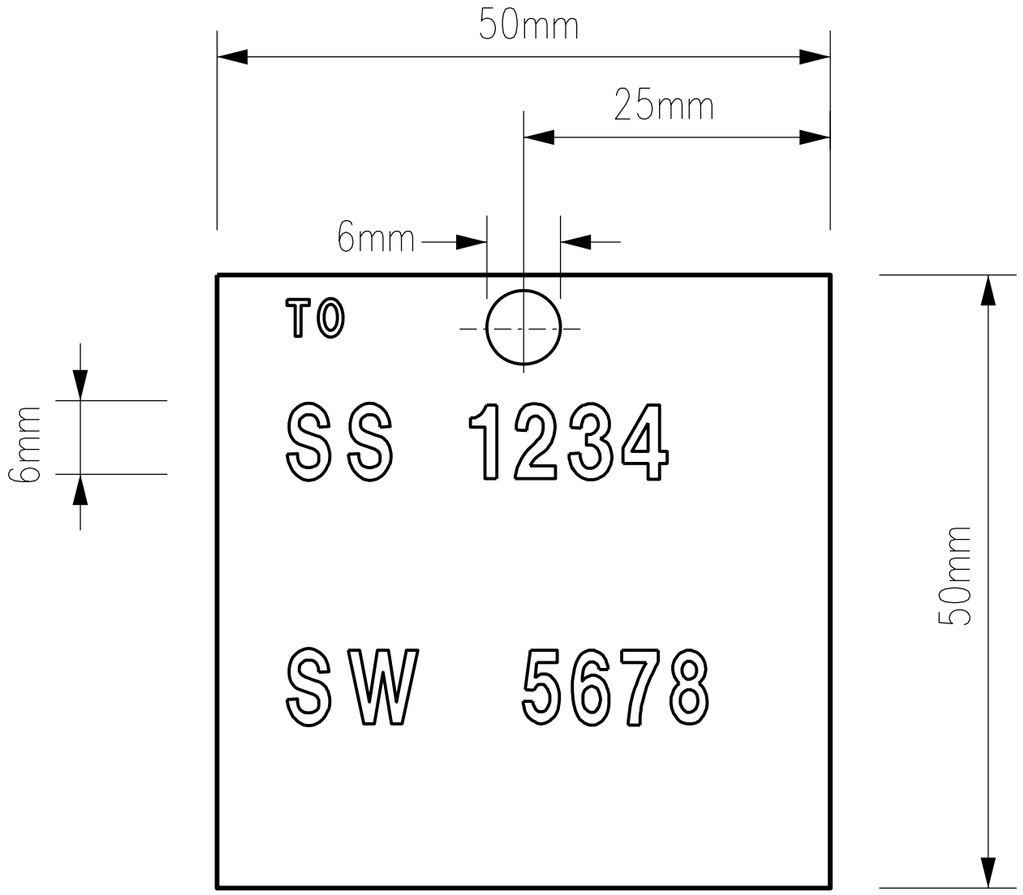
SIGNS
CABLE MARKER
ORANGE TAPE
UNDERGROUND

A3

DRAWING NUMBER S02-01-08-05

CAD PRODUCT - DO NOT AMEND MANUALLY

9 AMDT



ITEM 1
HV DESTINATION TAG
ITEM NUMBER - 501663

CRITCHLEY K-TYPE TAG COMPONENT ITEM NUMBERS:

CARRIER STRIP, 7 DIGIT: 412490

CHARACTER	ITEM NUMBER
A	412454
B	412455
C	412456
D	412457
E	412458
F	412459
G	412460
H	412461
I	412462
J	412463
K	412464
L	412465

CHARACTER	ITEM NUMBER
M	412466
N	412467
O	412468
P	412469
Q	412470
R	412471
S	412472
T	412473
U	412474
V	412475
W	412476
X	412477

CHARACTER	ITEM NUMBER
Y	412478
Z	412479
0	412489
1	412480
2	412481
3	412482
4	412483
5	412484
6	412485
7	412486
8	412487
9	412488

NOTES

1. INCLUDED ON TAG IS SWITCH/SUBSTATION/LOT/CIRCUIT BREAKER/POLE NUMBER AND DESTINATION.
2. TAG SHALL BE ALUMINUM OF AT LEAST 2.0mm THICKNESS, TEXT SHALL BE STAMPED ONTO THE TAG.
3. MINIMUM HEIGHT OF TEXT IS 6mm FOR HV DESTINATION TAG.
   MINIMUM DEPTH OF TEXT IMPRINT IS 1mm.
   HV TAG SHALL BE HELD BY STAINLESS STEEL CABLE TIE REFER S02-01-09-01.
4. TAGS SHALL BE USED FOR ALL CABLES GOING UNDERGROUND, INCLUDING BUT NOT LIMITED TO CABLES ON CABLE TERMINATION POLES, INSIDE PACKAGE SUBSTATIONS, LV PILLARS, RING MAIN UNITS, SWITCHING STATIONS AND ZONE SUBSTATIONS.
5. LV TAGGING SHALL BE VIA CRITCHLEY K-TYPE TAGS. CRITCHLEY TAGS SHALL BE HELD TO THE CABLE WITH NYLON CABLE TIES.
6. ALL CRITCHLEY K-TYPE CHARACTERS SHALL BE BLACK TEXT ON YELLOW BACKGROUND.
   ALL CRITCHLEY ITEM NUMBERS ARE FOR A PACK OF 500.

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
6	AMENDED NOTE 6	P.G.	SEPT'23	P.BH	B.V.
5	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
4	ITEM 1 STOCK CODE ADDED	C.M.	NOV'13	B.C.	B.C.
3	CRITCHLEY TYPE TAG CODES ADDED. NOTE 5&6 ADDED NOTES 1 & 3 AMENDED	A.T.	MAY'13	B.C.	B.C.
2	ITEM 2 (LV DESTINATION TAG) REMOVED	A.S.	MAY'07	R.S.	S.C.
1	TAG THICKNESS CHANGED TO 1.0mm	A.S.	FEB'06	C.C.	C.C.
0	ISSUED FOR CONSTRUCTION	K.I.	FEB'05	C.C.	C.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	C.C.
DRN	K.I.
CKD	C.C.
APPD	C.C.
SCALE	1:5
ISSUED	FEB '05
ALL DIM. IN mm	

POWER STANDARD DRAWING

SIGNS
DESTINATION TAGS
DISTRIBUTION CABLING

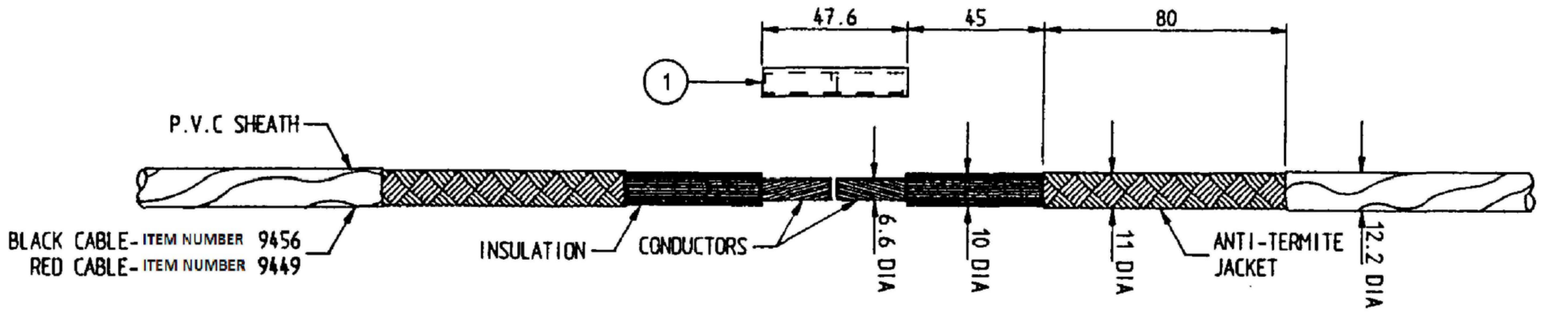
A3

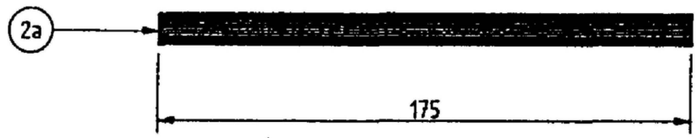
DRAWING NUMBER S02-01-08-25

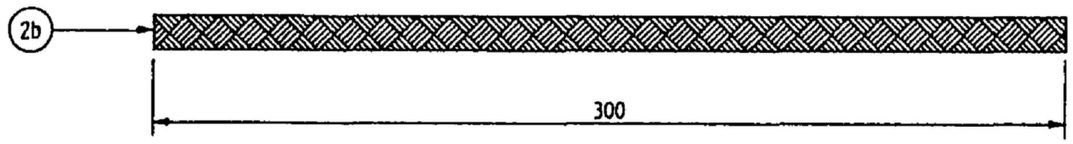
6 AMDT

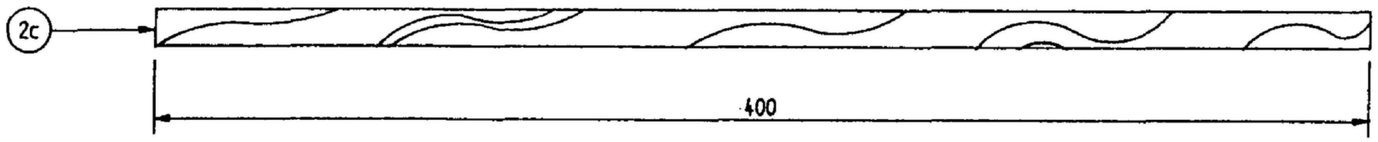
DRAFTING STANDARD TO A.S.1100

CAD PRODUCT - DO NOT AMEND MANUALLY









JOINT COMPONENTS

1 COPPER COMPRESSION LINK 25 sq mm 19/1.35mm (ITEM NUMBER 156422)

2 KIT, CABLE JOINT, LV, 25 sq mm RAYCHEM PART No CJK25-PAWA 1 (ITEM NUMBER 8979) CONSISTING OF
- a: 175mm LENGTH OF WCSM 19/6 SHRINK RATIO
- b: 300mm LENGTH OF OBTF 19/7 SHRINK RATIO
- c: 400mm LENGTH OF MWTM 25/8 SHRINK RATIO

INSTRUCTIONS

A BARE THE CONDUCTOR TO SUIT THE COMPRESSION LINK USED
B UNCOVER 45 mm OF THE INSULATION
C UNCOVER 80 mm OF THE ANTI-TERMITE JACKET
D SLIDE THE TUBING 2a, 2b AND 2c ALONG THE CABLE
E CRIMP THE LINK ONTO THE CONDUCTOR
F POSITION THE 175 mm LENGTH CENTRALLY OVER THE JOINT AND SHRINK
G SLIDE THE 300 mm LENGTH CENTRALLY OVER THE JOINT AND SHRINK. MAKE SURE THIS TUBING IS FULLY RECOVERED ONTO THE ANTI-TERMITE JACKET OF THE CABLE AT BOTH ENDS
H SLIDE THE 400 mm LENGTH CENTRALLY OVER THE JOINT AND SHRINK

NO	DESCRIPTION	DRN	DATE	CKD	APPD
6	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	APR'19	C.C.	C.C.
5	REVISED AND REDRAWN	R.T.F.	APR'90	-	N.S.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	A.T.
DRN	R.T.F.
CKD	N.S.
APPD	B.T.K.
SCALE	1:2
ISSUED	APR'90
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CABLE JOINTING & TERMINATIONS
JOINT CABLE LV
25 sq mm COPPER SINGLE CORE XLPE

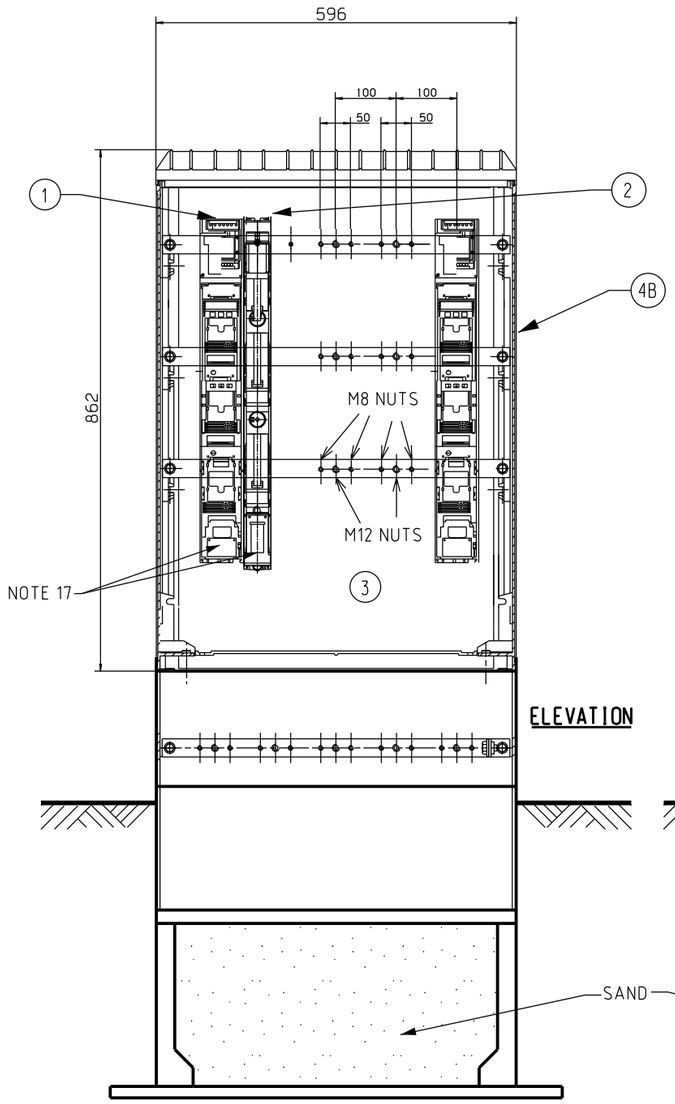
A3 | DRAWING NUMBER S02-02-02-13 | 6 AMDT

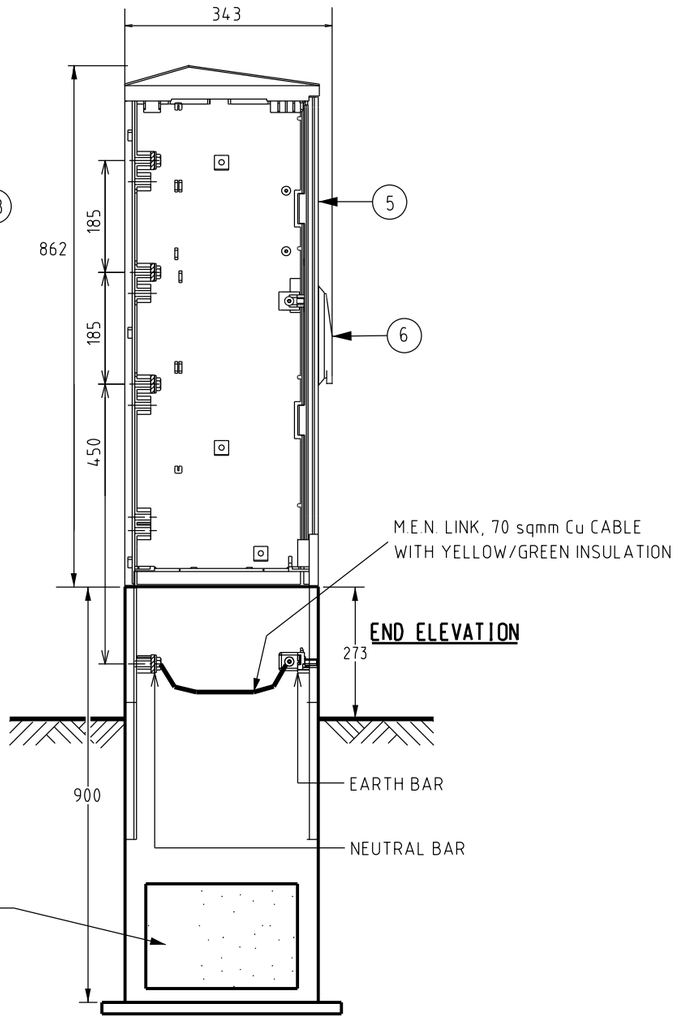
CAD PRODUCT - DO NOT AMEND MANUALLY

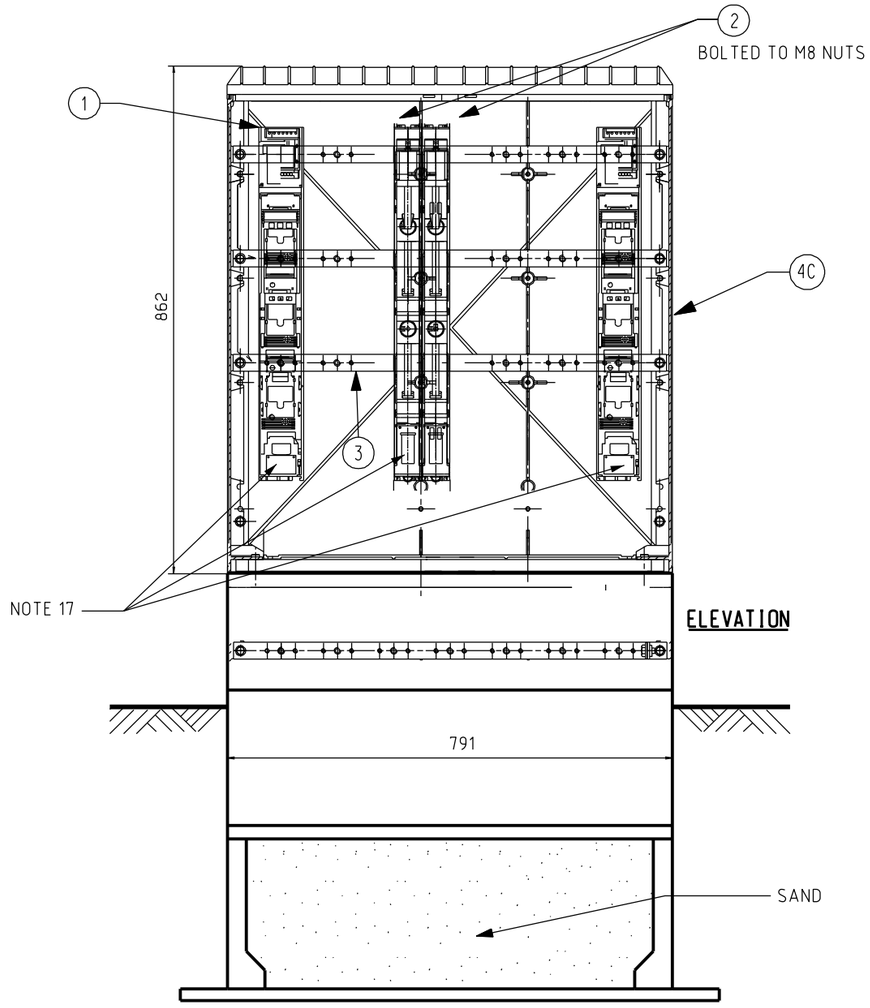
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

ITEM REF.	ITEM DES.	ITEM NUMBER	DWG REF.
1	FUSE SWITCH BASE 630A	11866	S02-01-04-08
2	FUSE SWITCH BASE 160A	407050	S02-01-04-18
3	50mm WIDE PERSPEX COVER WITH M8 NYLON BOLTS	502205	-
3A	100mm WIDE PERSPEX COVER WITH M12 NYLON BOLTS	502204	-

ITEM REF.	ITEM DES.	ITEM NUMBER
4A	PILLAR BOX - 3 BAYS - 396 WIDE	292326
4B	PILLAR BOX - 5 BAYS - 596 WIDE	292334
4C	PILLAR BOX - 7 BAYS - 791 WIDE	292342
5	REPLACEMENT DOOR - 5 BAY PILLAR	414557
6	REPLACEMENT LOCKING LEVER	414558
7	STANDOFF 'Z' BRACKET KIT	502207
8	REPLACEMENT DOOR - 3 BAY PILLAR	504915
9	REPLACEMENT DOOR - 7 BAY PILLAR	504916







APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
14	SHEET 2 AMENDED.	P.BH.	OCT'22	B.V.	B.C.
13	ITEM 8 & 9 ADDED.	P.BH.	JUN'22	B.V.	B.C.
12	REMOVED NEUTRAL BUSBAR EXTENSION, AMEND SHEET 2.	A.N.	JAN'22	B.V.	B.C.
11	REFORMATTED TABLES. ADDED ITEM 7. SHEET 2 AMENDED.	A.N.	AUG'21	C.C.C.	B.V.
10	SHEET 2 AMENDED.	H.E.	SEP'20	B.V.	B.V.
9	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
8	ITEMS 3 AND 3A ADDED	A.T.	APR'14	B.C	B.C.
7	ITEMS 5 AND 6 ADDED	A.T.	SEP'11	B.C	S.C
6	NOTES MOVED TO SHEET 2, 7 SLOT PILLAR ADDED	C.M.	FEB'10	B.C	S.C

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	-
DRN	R.INNES
CKD	-
APPD	F.ROBSON
SCALE	NO SCALE
ISSUED	APR'01
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

STRIPLE FUSE PILLAR FRONT OPENING SHEET 1 OF 2

A3

DRAWING NUMBER S02-02-03-08_1

CAD PRODUCT - DO NOT AMEND MANUALLY

14 AMDT

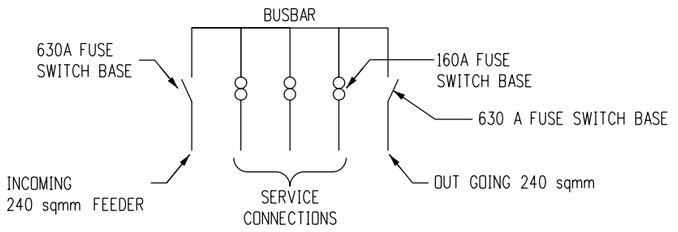
NOTES

1. FUSE PILLARS CONSTRUCTED FROM IMPACT RESISTANT, GLASS FIBRE REINFORCED POLYESTER. EXTRA COATING FOR UV PROTECTION REQUIRED.
2. PADLOCK HASP AND STAPLE PREFERRED.
3. 630A BUS BARS REQUIRED FOR ALL ACTIVE PHASE, NEUTRAL BUS BAR AND EARTH BUS BAR.
4. FOR CONSUMER CONNECTIONS 100 AMP, DIN SIZE 00 STRIPLE FUSES (ITEM NUMBER 286237) TO BE INSTALLED IN 160AMP STRIPLE FUSE SWITCH BASE.
5. ALL BOLT HOLES SHALL HAVE CAPTIVE NUTS FITTED.
6. 630 AMP FUSE SWITCH BASES SHALL BE INSTALLED TO BOTH SIDES OF ACTIVE BUS BARS AND SHALL BE FITTED WITH SOLID LINKS. (ITEM NUMBER 502716).
8. BUS BAR PHASE SEQUENCE, FROM TOP TO BOTTOM, IS RED, WHITE, BLUE, NEUTRAL.
9. IF A NON-OPEN POINT FUSED TERMINATION PILLAR IS SUPPLYING A MAXIMUM OF 1 CUSTOMER PER PHASE, THE INCOMING FEEDER CAN BE A 0.6/1kV/25 sq mm Cu/XLPE/NYLON/PVC CABLE. OTHERWISE IT SHALL BE THE STANDARD POWER AND WATER LOW VOLTAGE 240 sq mm AL XLPE CABLE.
10. ALL EXPOSED ACTIVE BUS BARS SHALL BE COVERED WITH PERSPEX SHEETING ATTACHED WITH NYLON BOLTS.
11. NEUTRAL AND EARTH BUS BARS SHALL BE THE SAME SIZE AS THE ACTIVE PHASE BUS BARS.
12. REFER TO DRAWINGS S02-02-03-12 FOR STRIPLE FUSE PILLAR EASEMENT DETAILS.
13. ALL CABLES SHALL HAVE THEIR FULL DESTINATION OR LOT TAGGED ON THE CABLE, INCLUDING NEUTRAL, WITH TAGS SECURED TO THE CABLE WITH NYLON CABLE TIES. PHASING AND LOT DESTINATION SHALL BE LABELLED ONTO THE BASE OF THE 160AMP FUSE SWITCH BASE. E.G. R:L1234, W:L1235, B:L1236 USING BRADY BMP71 PRINTER, BLACK INK (ITEM NUMBER: 502497) AND WHITE RIBBONS (ITEM NUMBER:502498) (BLACK-M71-R6000)
14. ALL ASSOCIATED EQUIPMENT WITHIN THE PILLAR SHALL BE SUPPLIED AND INSTALLED BY THE PROJECT DEVELOPER AND READY FOR FINAL CONNECTION BY PWC.
15. ALL FUSE PILLARS SHALL USE THE PWC 1-13 LOCKING SYSTEM.
16. REFER TO S02-02-02-10 FOR CABLE TERMINATION AND HEATSHRINK APPLICATION.
17. ALL CURRENT CARRYING BOLTED CONNECTIONS SHALL BE VIA CLASS 8.8 STAINLESS STEEL BOLTS TO THE FOLLOWING TORQUESPECIFICATIONS:
    - M8: 10-15NM
    - M10: 30-35NM
    - M12: 35-40NM

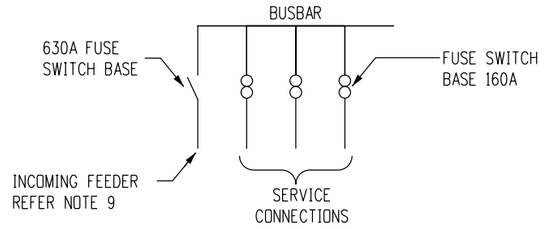
    ALL CONNECTIONS MUST USE A SPRING WASHER BETWEEN A FLAT WASHER AND THE NUT. WHERE CAPTIVE NUTS ARE USED THE SPRING WASHER MUST BE ON THE BOLT SIDE OF THE CONNECTION. ALL STAINLESS STEEL BOLTS REQUIRE A COATING OF ANTI-SEIZE BEFORE INSTALLATION. WHERE MULTIPLE BOLTS ARE USED TO MAKE A CONNECTION, DO NOT APPLY FULL TORQUE TO THE BOLTS ON THE FIRST PASS.
18. ALL UNMETERED SERVICE PROVISIONS WILL BE 25SQMM COPPER CABLE. REFER TO STANDARD DRAWING S02-01-01-20 FOR DETAILS. FOR PROVISION OF AN EXISTING STREETLIGHT SERVICE AN INLINE SUBMERSIBLE FUSE WILL BE FITTED AND ACCESSIBLE IN THE PILLAR FOR ISOLATION OF THE SERVICE BY AN AUTHORISED STREET LIGHT MAINTENANCE WORKERS. REFER TO ITEM No. 400921 FOR DETAILS OR THE ROAD OWNER CAN SUBMIT AN ALTERNATE PROPOSED FUSE ARRANGMENT TO PWC FOR APPROVAL. FOR NEW STREET LIGHT SERVICES AN INLINE FUSE IS NOT REQUIRED, THE UNMETERED SERVICE MAINS ARE CONNECTED DIRECTLY TO THE ROAD OWNERS STREETLIGHT PILLAR. REFER TO NP003 INSTALLATION RULES FOR SERVICE DETAILS AND NP007 FOR STREETLIGHT DESIGN AND CONSTRUCTION REQUIREMENTS.
19. AVOID LOCATING PILLAR IN A THOROUGHFARE WHERE THERE IS SIGNIFICANT PEDESTRIAN TRAFFIC OR LOCATIONS WHERE THE PUBLIC CONGREGATE SUCH AS BUS STOPS OR COMMERCIAL BUILDING ACCESS POINTS.
20. WHEN PILLAR IS INSTALLED IN PARKS OR RESERVES, PROTECT PILLAR FROM MAINTENANCE TRAFFIC BY USE OF PROTECTIVE BOLLARDS. REFER TO S02-02-06-28_2 FOR DETAILS.

FUSED RESIDENTIAL PILLAR

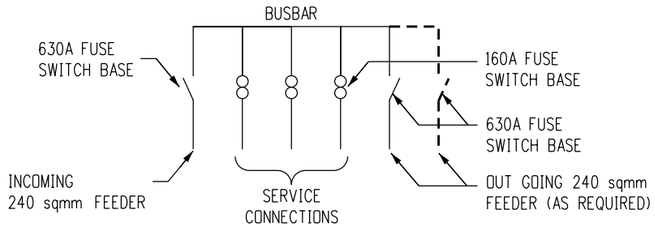
SINGLE LINE DIAGRAM



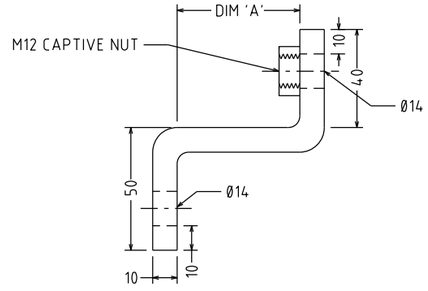
NON-OPEN POINT FUSED TERMINATION PILLAR



3 WAY/LINK/OPEN POINT FUSED PILLAR

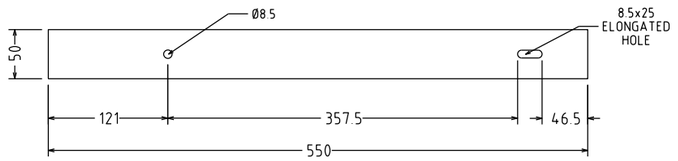


ITEM 7: STANDOFF 'Z' BRACKET KIT



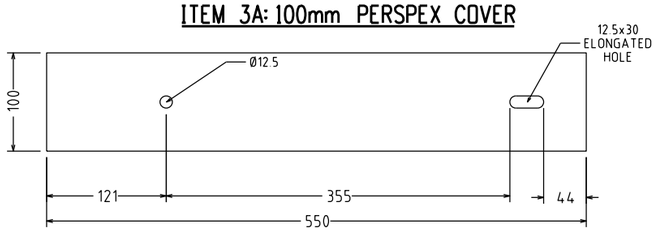
ITEM NUMBER: 502207
MATERIAL: 30x10mm TINNED COPPER
KIT CONTAINS:
- 1x 'Z' BRACKET WITH DIM 'A': 50mm
- 1x 'Z' BRACKET WITH DIM 'A': 90mm
- 4x SS304 M12 BOLTS AND GALV. STEEL WASHERS

ITEM 3: 50mm PERSPEX COVER



ITEM NUMBER: 502205
MATERIAL: 3mm CLEAR PERSPEX
SUPPLIED WITH 2x M8 NYLON BOLTS AND WASHERS

ITEM 3A: 100mm PERSPEX COVER



ITEM NUMBER: 502204
MATERIAL: 3mm CLEAR PERSPEX
SUPPLIED WITH 2x M12 NYLON BOLTS AND WASHERS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
17	ADDED NOTES 19 & 20.	P.BH.	OCT'22	B.V.	B.C.
16	SHEET 1 AMENDED.	P.BH.	JUN'22	B.V.	B.C.
15	REMOVE ITEM A, NEUTRAL BUSBAR EXTENSION & NOTE 7. AMEND SHEET 1.	A.N.	JAN'22	B.V.	B.C.
14	UPDATED NOTES 6 & 13 ITEM NUMBER. CHANGE STOCK CODES TO ITEM NUMBERS. REFORMATTED NOTES. ADDED ITEM 3, 3A & 7 IMAGES.	A.N.	AUG'21	C.C.C.	B.V.
13	NOTE 18 ADDED	H.E.	SEP'20	B.V.	B.V.
12	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
11	NOTE 6, 13 AMENDED. SINGLE LINE DIAGRAM UPDATED	C.C.	APR'15	I.B.	B.C.
10	NOTE 13 UPDATED	A.T.	APR'14	B.C.	B.C.

AMENDMENTS

PowerWater NORTHERN TERRITORY

DES	-
DRN	R.INNES
CKD	-
APPD	F.ROBSON
SCALE	NO SCALE
ISSUED	APR'01
ALL DIM. IN mm	

POWER STANDARD DRAWING

STRIPLE FUSE PILLAR FRONT OPENING SHEET 2 OF 2

A3

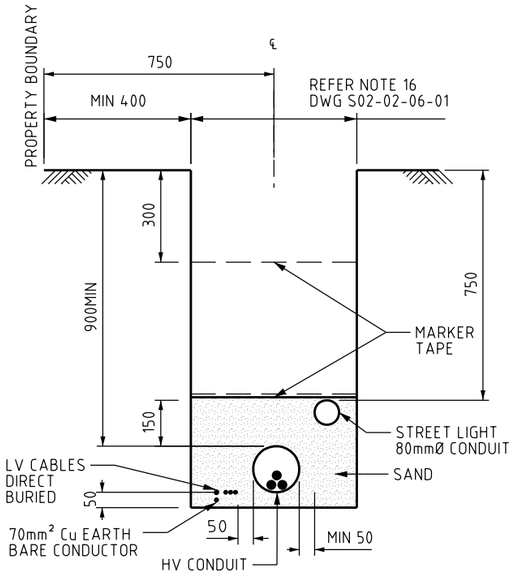
DRAWING NUMBER S02-02-03-08_2

17 AMDT

DRAFTING STANDARD TO A.S.1100

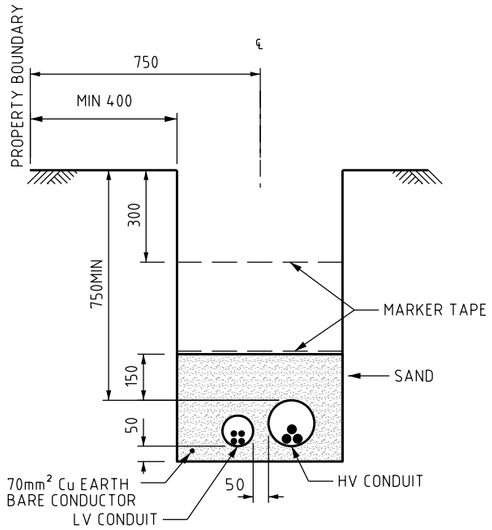
CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



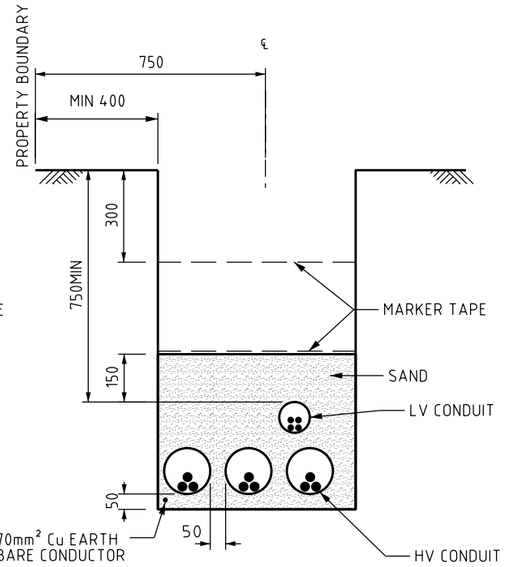
TYPICAL SUBDIVISION

SCALE 1:20



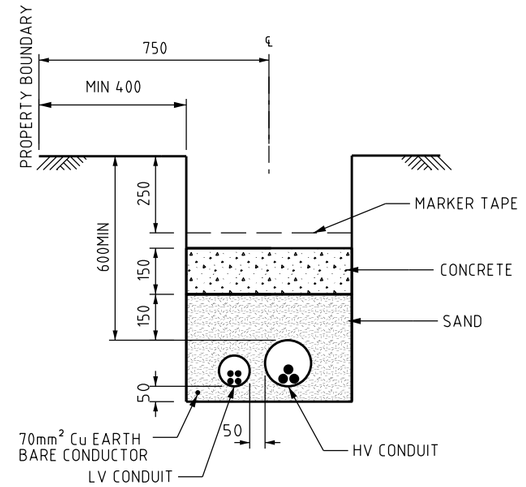
DUCTED (POWER ONLY)

SCALE 1:20



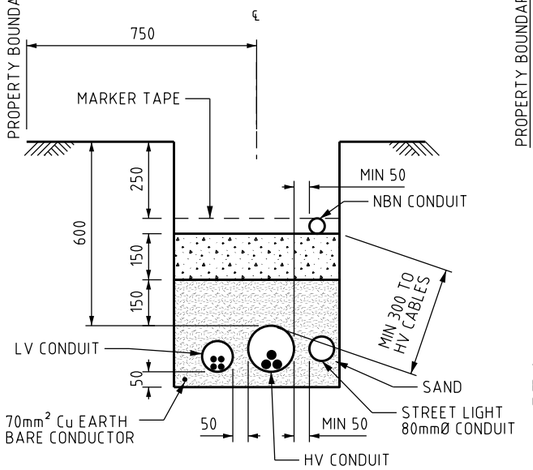
MULTI LAYERED DUCTS (POWER ONLY)

SCALE 1:20



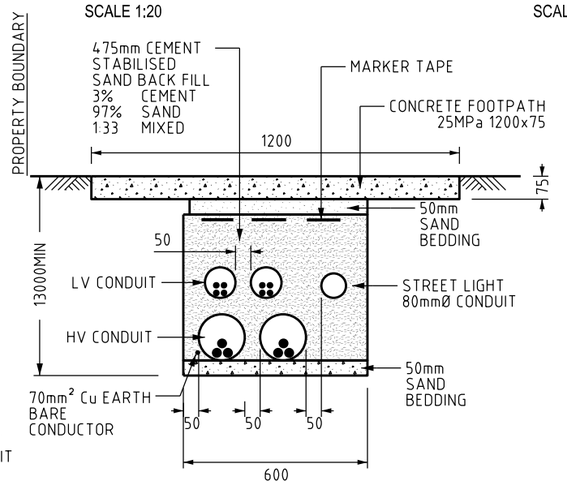
ROCK (POWER ONLY)

SCALE 1:20



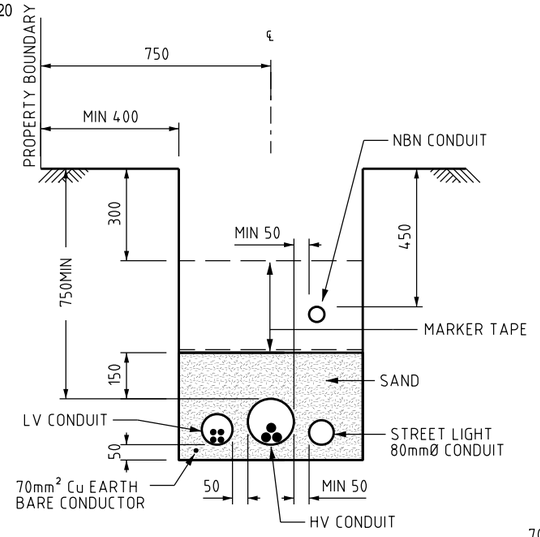
STREETLIGHT & NBN SHARED IN ROCK

SCALE 1:20



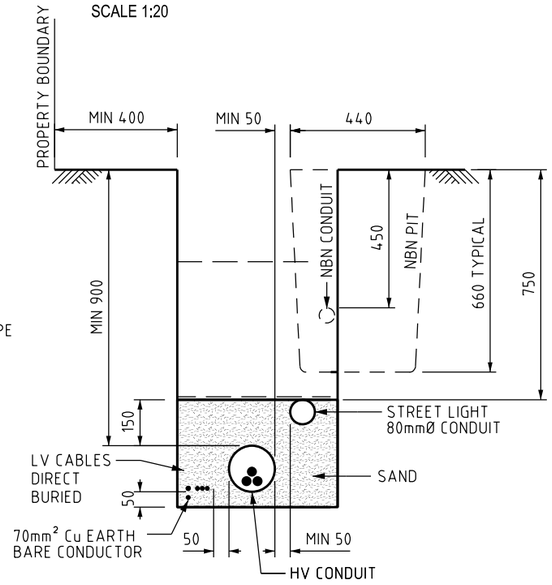
TRENCH SECTION IN FOOTPATH (POWER UNDER GROUNDING PROJECT - PWC ONLY)

SCALE 1:20



STREETLIGHT & NBN SHARED - DUCTED

SCALE 1:20



STREETLIGHT & NBN PIT SHARED (SUBDIVISION)

SCALE 1:20

NOTES:

1. REFER TO DRAWING S02-02-06-01 FOR ALL TRENCHING NOTES
2. CABLES BENEATH NBN EQUIPMENT MUST BE IN CONDUIT
3. 300mm HORIZONTAL SEPARATION BETWEEN ALL DIRECT BURIED CABLES AND NBN
4. REPLACE MARKER TAPE WITH POLYMERIC CABLE COVERS WHEN:
   - WITHIN 15 METERS OF A RMU OR SUBSTATION
   - 7.5 METERS EITHER SIDE OF A CABLE JOINT
   - OUTSIDE OF FOOTPATH ALLOCATION REFER TO S02-02-06-03
5. ALL TRENCH MAX DEPTH AT 1200 UNLESS PRIOR APPROVAL

NO	DESCRIPTION	DRN	DATE	CKD	APPD
13	AMEN STREETLIGHT CONDUIT POSITION. UPDATE TELSTA REFERENCE TO NBN.	C.C.	NOV'21	B.V.	A.N
12	MIN DEPTH ADDED, ADDED TRENCH SECTION IN FOOTPATH & ADDED NOTE 5.	C.C.	JUN'19	B.V.	B.C.
11	UPDATED ROCK TRENCH DEPTH	C.C.	DEC'18	B.V.	B.C.
10	UPDATE TO STANDARD CABLE IN CONDUIT REPRESENTATION & TITLE CHANGE	P.H.	APR'18	I.B.	B.C.
9	NOTE 4 ADDED, EARTH CONDUCTOR RELOCATED, SAND DEPTH INCREASED	A.T.	APR'11	B.C.	S.C.
8	CONDUIT SPACING ADDED	C.M.	AUG'10	A.T.	S.C.
7	EARTH STRAP CHANGED TO 70mm² Cu CONDUCTOR	J.C.	DEC'08	A.T.	S.C.
6	REDRAWN, TELSTRA PIT AMENDED & NOTE ADDED	A.S.	JAN'06	-	-

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	C.CAMILLERI
DRN	A.SCHMID
CKD	C.CAMILLERI
APPD	-
SCALE	1:20
ISSUED	JANUARY 2006
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CIVIL
TRENCH SECTIONS WITHIN PWC ROAD RESERVE
ALLOCATIONS
ALL AREAS

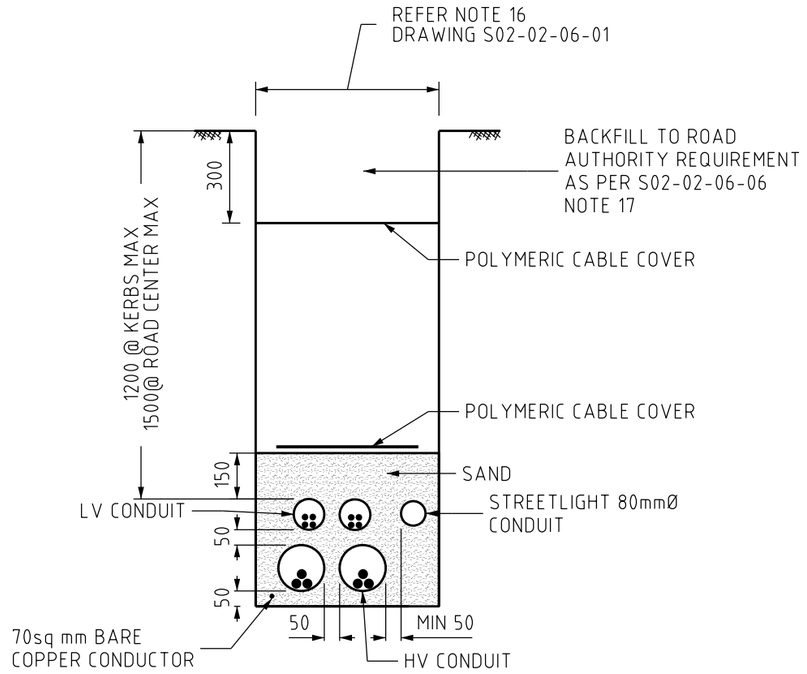
A3

DRAWING NUMBER S02-02-06-02

13 AMDT

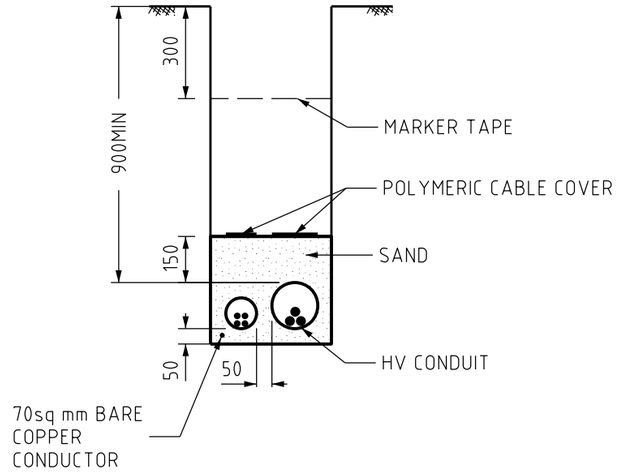
CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



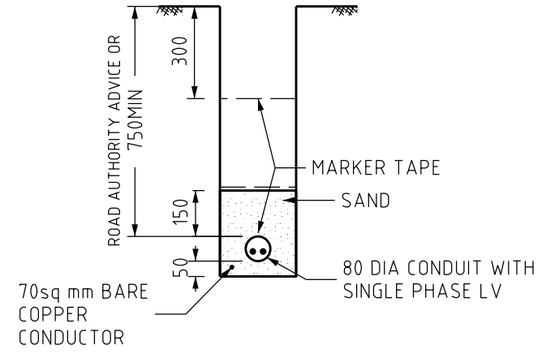
ROAD CROSSING TYPICAL (BETWEEN KERBS)

SCALE 1:20



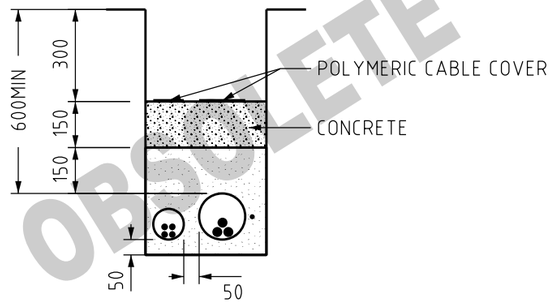
DUCTED (OUTSIDE TYPICAL 750 ALIGNMENT)

SCALR 1:20



STREET LIGHTING CIRCUITS (ONLY)

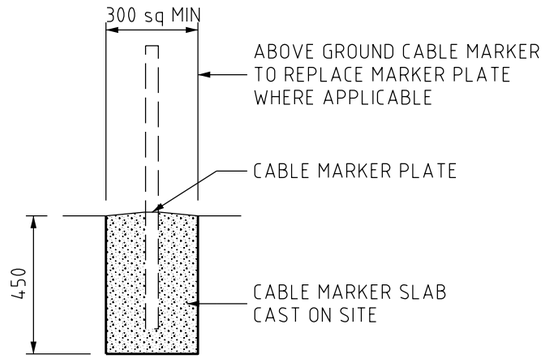
SCALE 1:20



OBSOLETE

ROAD CROSSING (BETWEEN KERBS)

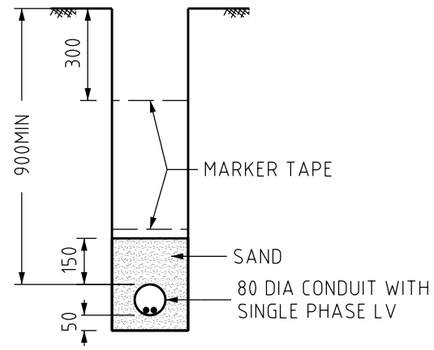
SCALE 1:20



CABLE MARKERS

SCALE 1:20

REFER NOTE 13
DRAWING S02-02-06-01



HOUSE SERVICES (ONLY)

SCALE 1:20

NOTES:

1. REFER TO DRAWING S02-02-06-01 FOR ALL TRENCHING NOTES.
2. POLYMERIC CABLE COVERS REQUIRED IN ALL TRENCH SECTIONS OUTSIDE OF THE FOOTPATH ALLOCATION EXCEPT FOR STREETLIGHT AND SERVICE TRENCHES.
3. POLYMERIC CABLE COVERS TO BE INSTALLED OVER AND EXTENDED 2m EITHER SIDE OF CABLE JOINTS AND 2m IN FRONT OF TERMINATIONS (eg PACKAGE SUBSTATIONS AND RMUs)
4. ALL TRENCH MAX DEPTH AT 1200 UNLESS PRIOR APPROVAL

NO	DESCRIPTION	DRN	DATE	CKD	APPD
14	AMEND STREETLIGHT CONDUIT POSITION. UPDATE DIMENSIONS. ROAD CROSSING CROSS SECTION MADE OBSOLETE.	C.C	NOV'21	B.V.	A.N.
13	MIN & MAX DEPTH ADDED & NOTE 4 ADDED.	C.C	JUN'19	B.V.	B.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	N.S.
DRN	G.I.
CKD	N.S.
APPD	B.TK.
SCALE	1:15
ISSUED	JUNE 1991
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CIVIL
TRENCH SECTIONS OUTSIDE OF PWC
ROAD RESERVE ALLOCATION
ALL AREAS

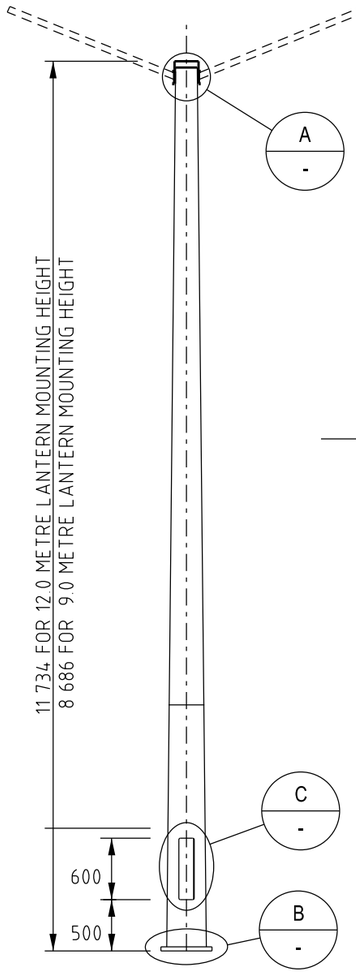
A3

DRAWING NUMBER S02-02-06-03

14 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

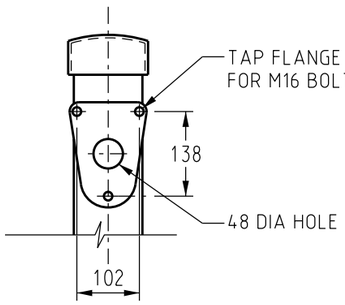


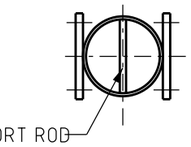
ITEM 1 - 12.0m SINGLE OUTREACH
ITEM NUMBER 112888

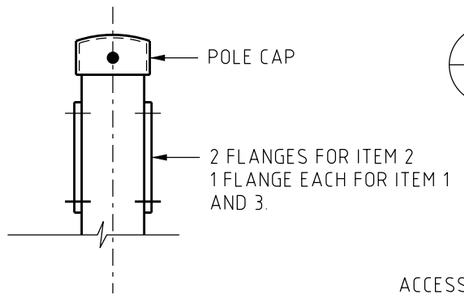
ITEM 2 - 12.0m DOUBLE OUTREACH
ITEM NUMBER 112896

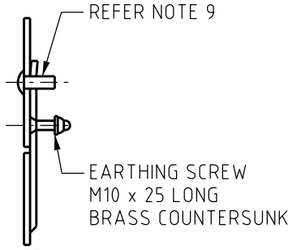
ITEM 3 - 9.0 m SINGLE OUTREACH
ITEM NUMBER 8953

ITEM 4 - 9.0 m DOUBLE OUTREACH
ITEM NUMBER 504554

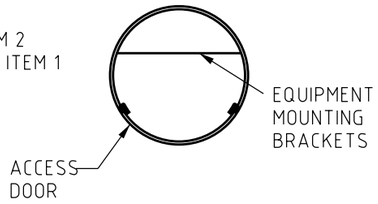




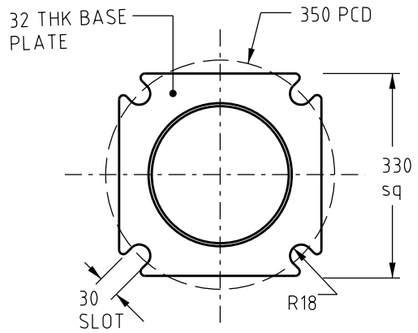




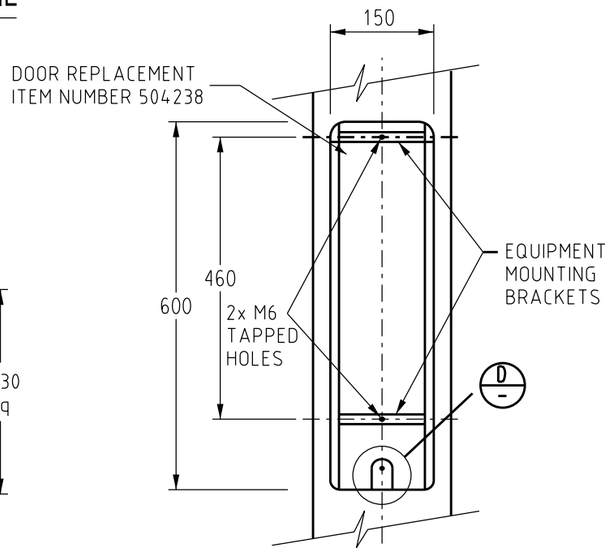
D - DETAIL
SCALE 1:5



A - OUTREACH MOUNTING PLATE - DETAIL
SCALE 1:10



B - BASE PLATE - DETAIL
SCALE 1:15



C - EQUIPMENT ACCESS - DETAIL
SCALE 1:10 (DOOR REMOVED FOR CLARITY)

NOTES :

1. ALL WELDING AND WELD PREPARATION SHALL BE IN ACCORDANCE WITH AS1554.
2. CIRCUMFERENTIAL WELDS TO BE FILLET. LONGITUDINAL WELDS TO BE SINGLE BUTT TYPE. LONGITUDINAL WELDS TO BE MADE BY CONTINUOUS AUTOMATIC PROCESS AND ARE NOT TO BE DRESSED SMOOTH.
3. AFTER FABRICATION ALL COMPONENTS TO BE ACID DE-SCALED AND HOT DIPPED GALVANIZED TO AS4680.
4. WIND LOADINGS TO COMPLY WITH THE REQUIREMENTS OF AS1170.2 - SECTION 4 DESIGNS ARE TO BASED ON -
   - MAXIMUM WIND SPEED OF Vu = 61m/sec DERIVED FROM A DESIGN LIFE OF 25 YEARS.
   - MAXIMUM WIND SPEED OF Vs = 28m/sec DERIVED FROM A DESIGN LIFE OF 25 YEARS WITH A MAXIMUM DEFLECTION LIMIT OF 5% OF NOMINAL LENGTH.
   - REGION 'C' AND TERRAIN CATEGORY '2'
5. COLUMNS ARE TO CONFORM TO THE REQUIREMENTS OF AS4100 AND AS1798.
6. COLUMNS ARE TO HAVE CONTINUOUS TAPER OVER THEIR ENTIRE LENGTH AND A STEEL THICKNESS OF NOT LESS THAN 3mm.
7. TWO PIECE COLUMNS MUST BE ASSEMBLED PRIOR TO DELIVERY.
8. ACCESS DOORS ARE NOT INTERCHANGEABLE. ENSURE THAT INDIVIDUAL COLUMNS AND DOORS ARE SUITABLY MATCHED AND MARKED.
9. EQUIPMENT ACCESS DOOR TO BE PROVIDED (DETAIL C) HAVING 'TAMPER PROOF' LOCKING DEVICE. DOOR ACCESS SCREW TO BE M10 STAINLESS STEEL I.S.O. METRIC BUTTON HEAD SOCKET TYPE.
10. ALL COLUMNS ARE TO BE MANUFACTURED TO ACCEPT THE MOUNTING OF OUTREACHES AS SHOWN ON DRAWING S03-01-01-10.
11. ALL POLE MANUFACTURERS SHALL COMPLY WITH ISO 3834.
12. ROUND OR OCTAGONAL POLE SHAPES ACCEPTABLE.

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
26	BASE PLATE SLOT SIZE ROLLED BACK	J.R.	DEC'23	B.C.	B.V.
25	NOTES 2 & 4 AMENDED. NOTE 12 ADDED. BASE PLATE SLOT AND THICKNESS SIZE AMENDED.	P.BH.	MAR'23	B.C.	B.V.
24	NOTES 3 & 4 AMENDED.	P.BH.	JAN'23	B.C.	B.V.
23	ITEM 4 ADDED	CWM	MAR'20	B.C.	B.C.
22	ADDED DOOR ITEM NUMBER &STOCK CODE REPLACED WITH ITEM NUMBER	C.C.	JUL'19	B.V.	B.C.
21	GALVANIZING STANDARD UPDATED TO AS4680 NOTE 11 ADDED.	A.T	JAN'13	B.C.	B.C
20	BASE PLATE - DETAIL B AMENDED	J.C.	NOV'08	B.C.	S.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	-
DRN	A.DAVIS
CKD	R.INNES
APPD	F.ROBSON
SCALE	AS SHOWN
ISSUED	APRIL '98
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

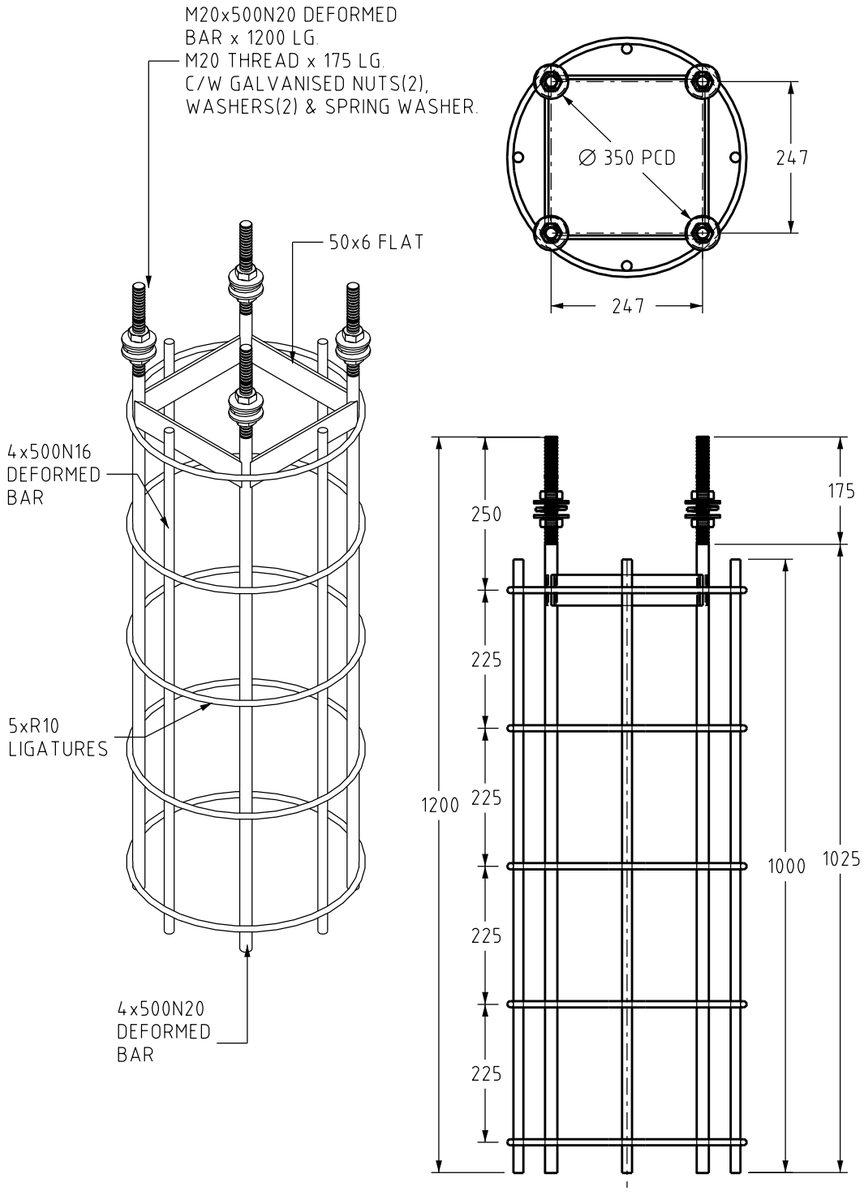
COLUMN TAPERED STEEL
9.0 METRE AND 12.0 METRE
OUTREACH TYPE

A3

DRAWING NUMBER S03-01-01-01

26 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY



ITEM 1 - RAG BOLT REINFORCEMENT ASSEMBLY - TYPE 5

(ITEM NUMBER - 11809)

NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3679 Pt1 AND AS/NZS4671. AND PWC SPECIFICATION STSP01-002 FABRICATED STEEL ITEMS.
2. ALL WELDING AND WELD PREPARATION TO BE TO AS1554. FILLET WELDS TO BE 6mm UNLESS NOTED OTHERWISE.
3. 50x6 FLAT BAR TO BE WELDED TO RAG BOLTS ONLY.
4. RAG BOLTS SHALL BE GRADE 500N DEFORMED BARS. MINIMUM 175mm THREAD (TO AS1275)SHALL BE CUT IN THE BARS
5. PITCH CIRCLE DIAMETER (P.C.D.) OF RAG BOLTS IS CRITICAL.
6. THE 175mm THREADED SECTION OF THE RAG BOLTS TOGETHER WITH THE ASSOCIATED NUTS AND WASHERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AS 2312. NUTS AND WASHERS SHALL BE GRADE 8.8 AND AFTER GALVANISING BE FIRM FITTING ON THE THREADED SECTION OF THE RAG BOLTS -IN ACCORDANCE WITH AS 1112,AS 1237 AND AS 1252, AS APPROPRIATE.
7. DESIGN OF RAG BOLT REINFORCEMENT FOUNDATION IS BASED ON SOIL WHICH HAS A SHEAR STRENGTH OF NOT LESS THAN 200kPa i.e.,COMPACT MEDIUM CLAY,WELL BONDED SANDY LOAM, BONDED SAND AND GRAVEL WITH REASONABLE SURFACE WATER DRAINAGE (OR BETTER CONDITIONS THAN DESCRIBED). ANY SOIL CONDITIONS HAVING A SHEAR STRENGTH OF LESS THAN 200kPa i.e.,SOFT CLAY,POOR COMPACTED SAND AND SOILS THAT TEND TO ABSORB LARGE AMOUNTS OF WATER, WILL REQUIRE SPECIAL FOUNDATION DESIGN OF LARGER DIMENSION.

TYPE APPLICATION

ITEM 1: TYPE 5 - FOR USE WITH 4.5 AND 5.5 METRE POST TOP TAPERED STEEL COLUMNS.

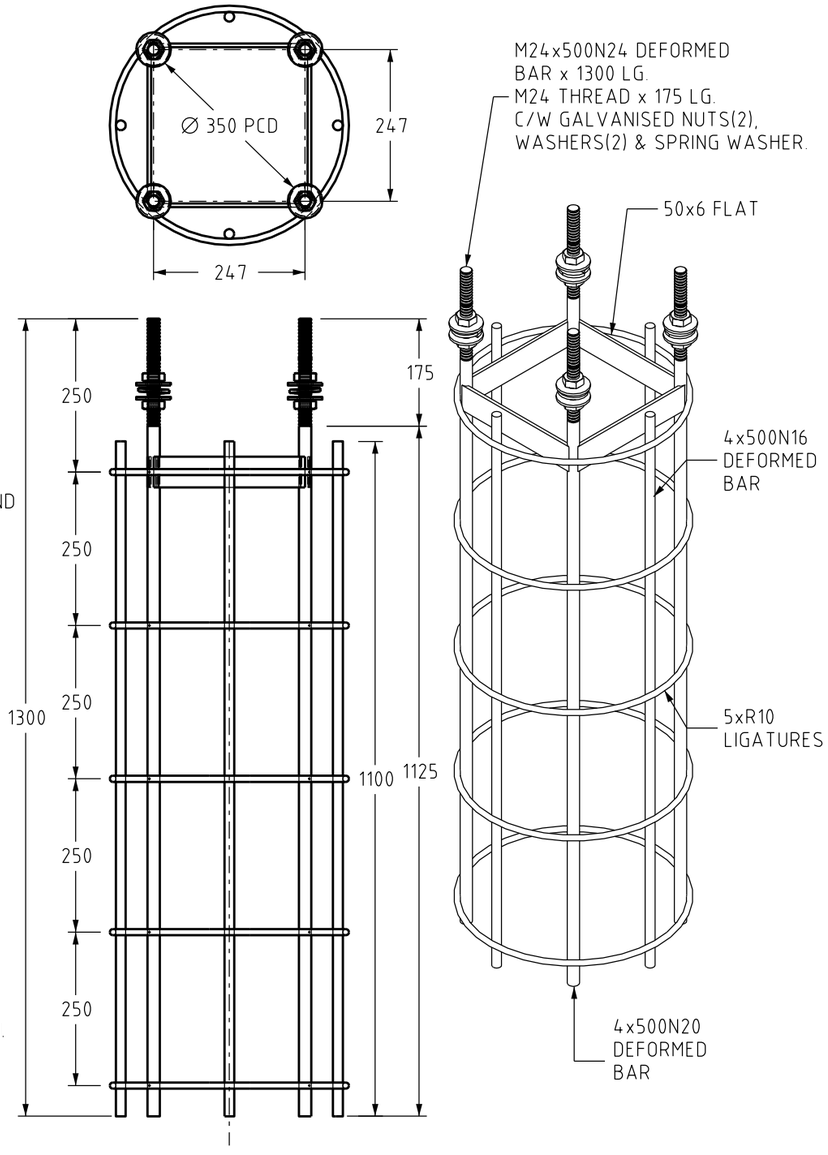
ITEM 2: TYPE 9 - FOR USE WITH 6.5 METRE AND 9.0 METRE TAPERED STEEL COLUMN AND OUTREACH.

REFERENCE DRAWINGS

S03-01-02-02 - RAG BOLT REINFORCEMENT TYPE 12 & TYPE 18

S03-01-02-03 - RAG BOLT REINFORCEMENT,FOUNDATION ARRANGEMENTS

S03-01-02-06 - RAG BOLT REINFORCEMENT, BAR - DEFORMED



ITEM 2 - RAG BOLT REINFORCEMENT ASSEMBLY - TYPE 9

(ITEM NUMBER - 6668)

NO	DESCRIPTION	DRN	DATE	CKD	APPD
17	DEFORMED BARS LENGTH ROLLBACK	J.R.	DEC'23	B.C.	B.V.
16	DEFORMED BARS LENGTH AMENDED	P.BH.	FEB'23	B.V.	B.C.
15	REPOSITIONED PCD POINTER AND NOTE 1 AMENDED	C.C.	JAN'21	B.V.	B.C.
14	REMOVE 12.0m COLUMN OPTION FROM TYPE 9.	C.C.	MAY'19	B.C.	B.V.
13	INCLUDE 6.5m OUTREACH WITH TYPE 9	P.H.	OCT'17	B.V.	I.B.
12	THREAD SIZES CORRECTED	A.T.	JUL'11	B.N.	S.C.
11	REFERENCE TO "ROD" REMOVED	A.B.	APR'10	A.T.	S.C.
10	REDRAWN ON 3D. UPDATED TO AS/NZS4671	J.C.	AUG'09	A.T.	S.C.

AMENDMENTS

PowerWater

NORTHERN TERRITORY

DES	A.TAYLOR
DRN	J.COPPINS
CKD	A.TAYLOR
APPD	S.C.
SCALE	1:10
ISSUED	AUGUST 2009
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

RAG BOLT REINFORCEMENT
TYPE 5 AND TYPE 9
FABRICATION DETAILS

A3

DRAWING NUMBER S03-01-02-01

CAD PRODUCT - DO NOT AMEND MANUALLY

17 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

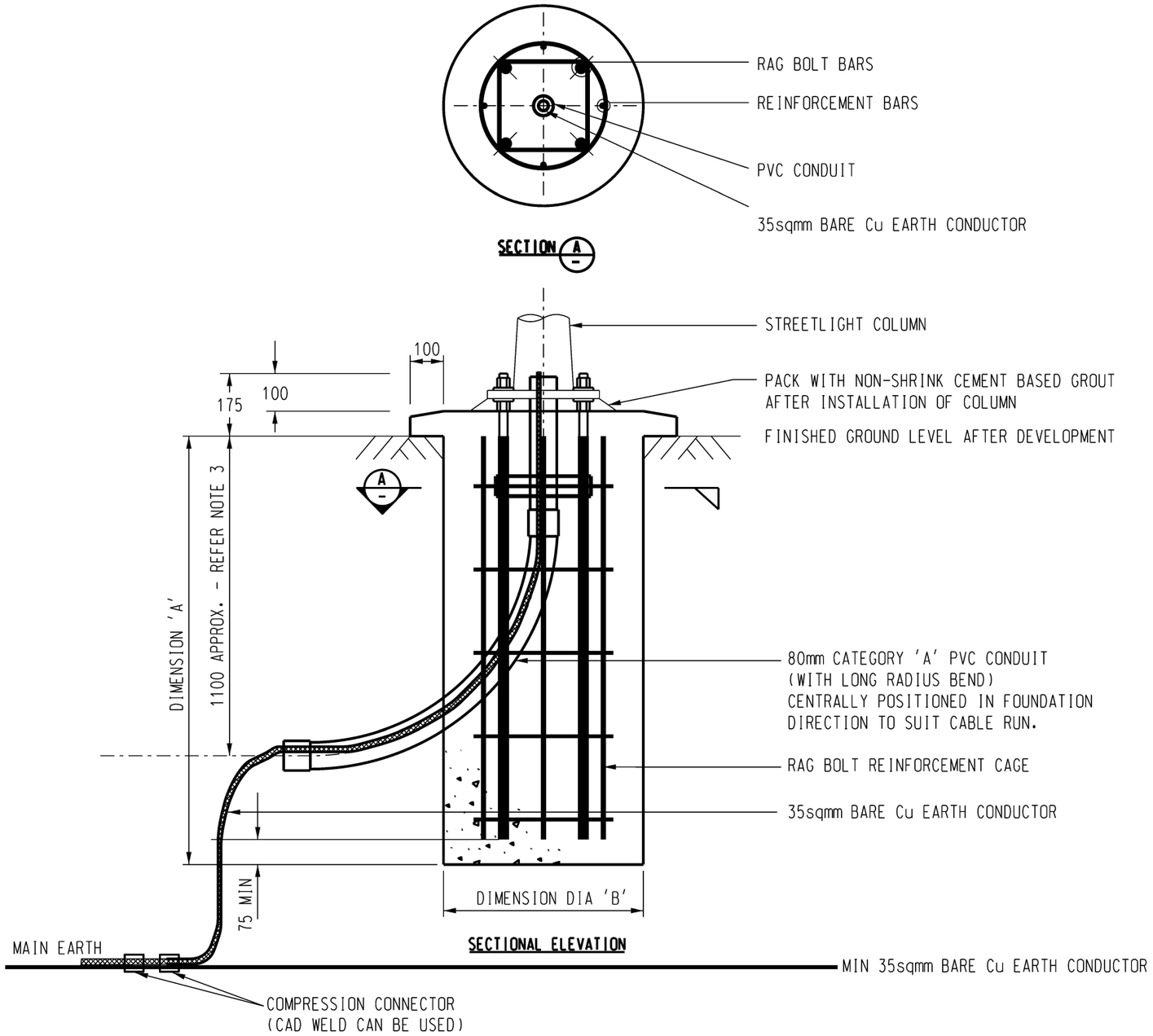


TABLE 01: FOUNDATION SELECTION				
COLUMN DESCRIPTION	RAG BOLT ITEM NUMBER	FOUNDATION DIMENSIONS 'A'	FOUNDATION DIMENSIONS 'B'	RAG BOLT TYPE
5.5 METRE POST TOP & SINGLE OUTREACH	11809	1200	600	5
6.5 & 9 METRE SINGLE & DOUBLE OUTREACH	6668	1400	600	9
12 METRE SINGLE & DOUBLE OUTREACH	11825	1800	600	12
18 METRE POST TOP 3 WAY SPIGOT	11841	2600	900	18

NOTES :

1. ALL REINFORCEMENT, CONCRETE AND CONCRETE MATERIALS SHALL BE IN ACCORDANCE WITH AS3600.
2. MINIMUM COMPRESSIVE DESIGN STRENGTH (F'c) SHALL BE 32MPa AT 28 DAYS.
3. WHERE CONNECTION TO STREETLIGHT COLUMN IS FROM A CABLE PIT, DEPTH OF CONDUIT FOR CABLE ENTRY TO BE DEPENDENT ON LOCATION AND DEPTH OF CABLE PIT.
4. COVER TO REINFORCEMENT SHALL BE 75mm MINIMUM.

REFERENCE DRAWINGS

S03-01-02-01 RAG BOLT REFORCEMENT TYPE 5 & TYPE 9
S03-01-02-02 RAG BOT REINFORCEMENT TYPE 12 & TYPE 18
S03-01-02-06 RAG BOLT REINFORCEMENT, BAR - DEFORMED

NO	DESCRIPTION	DRN	DATE	CKD	APPD
22	TABLE 01 AMENDED. NOTE 2 AMENDED.	P.BH.	MAR'23	B.V.	B.C.
21	TITLEBLOCK & DRAWING NUMBERS FORMATTED	K.T.	FEB'19	C.C.	C.C.
20	EXTRA EARTH CONNECTOR ADDED	C.C.	AUG'17	I.B.	B.C.
19	FINISHED GROUND LEVEL ADDED	A.T.	APR'13	B.C.	B.C.
18	CHANGE 70sqmm TO 35sqmm	K.I.	SEP 05	C.C.	C.C.
17	ADD 70sqmm Cu EARTH DETAILS	K.I.	APR 05	C.C.	C.C.
16	REDRAWN ON CAD	A.D	05/98	R.I.	F.R.
15	NOTE 3 AMENDED	gmck	12/91	-	NS

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	-
DRN	A.DAVIS
CKD	R.INNES
APPD	F.ROBSON
SCALE	1:15
ISSUED	MAY'98
ALL DIM. IN mm	

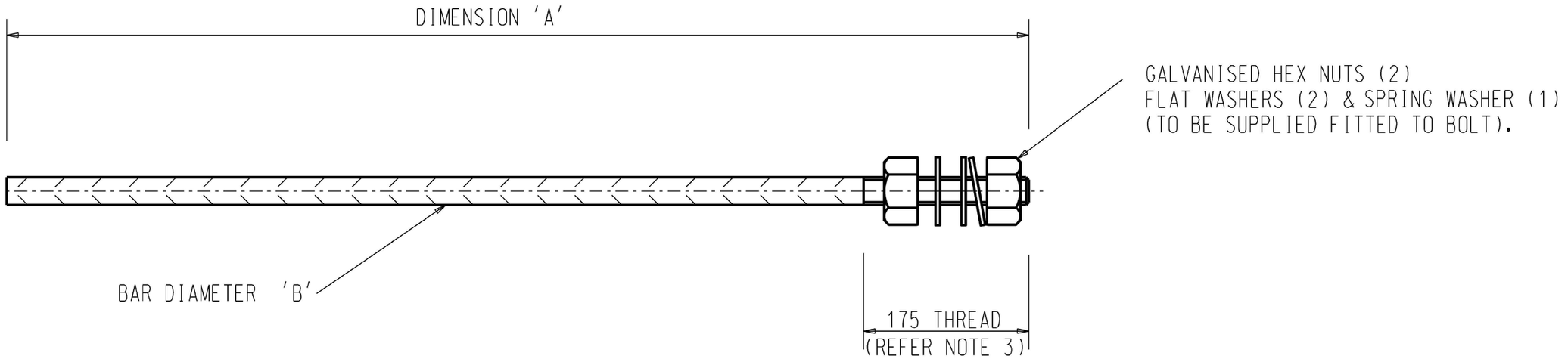
POWER STANDARD DRAWING

RAG BOLT REINFORCEMENT TYPE 5, 9, 12, AND 18 FOUNDATION ARRANGEMENT

A3 | DRAWING NUMBER S03-01-02-03 | 22 AMDT

DRAFTING STANDARD TO A.S.1100 | CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



BAR - DEFORMED (GRADE 500N)

ITEM	ITEM NUMBER	DIM. 'A'	DIA. 'B'	THREAD
1	196071	1300	20	M20
2	196089	1500	24	M24
3	196055	1900	30	M30
4	196063	2700	36	M36

NOTES

1. DEFORMED BAR TO BE IN ACCORDANCE WITH AS/NZS 4671.
2. DEFORMED BAR SHALL BE GRADE 500N. MINIMUM 175 mm THREAD (TO AS 1275) SHALL BE CUT STRICTLY IN ACCORDANCE WITH TEMPCORE INSTRUCTIONS.
3. THE 175 mm THREADED SECTION OF THE DEFORMED BAR SHALL BE HOT DIPPED GALVANISED IN ACCORDANCE WITH AS 1650.
4. NUTS AND WASHERS (TO AS 1252) TO BE GRADE 8.8, GALVANISED AND FIRM FITTING ON CORROSION PROTECTED THREAD.

REFERENCE DRAWINGS

S03-01-02-01 - RAG BOLT REINFORCEMENT TYPE 5 AND TYPE 9.
S03-01-02-02 - RAG BOLT REINFORCEMENT TYPE 12 AND TYPE 18.

NO	DESCRIPTION	DRN	DATE	CKD	APPD
7	TABLE AMENDED.	P.BH.	FEB'23	B.C.	B.V.
6	TITLEBLOCK & DRAWING NUMBERS FORMATTED	K.T.	FEB'19	C.C.	C.C.
5	UPDATED TO AS/NZS 4671	C.W.M.	NOV'09	S.C.	S.C.
4	NOTES AMENDED	J.A.L.	APR'95	S.C.M.	P.J.D.
3	NOTE 3 REWORDED FOR CLARIFICATION.	gmck	JUN'91	-	A.T.
2	FLAT WASHER NOW 'EXTRA LARGE' NOW 'LARGE' (AS PER AS 1237)	gmck	MAR'89	-	B.T.K.
1	FLAT WASHER NOW 'EXTRA LARGE' AND NOTES REVISED	gmck	DEC'88	-	B.T.K.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	
DRN	gmck
CKD	G.McKINNON
APPD	G.SCHUBERT
SCALE	B.T.KENT
ISSUED	JAN'88
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

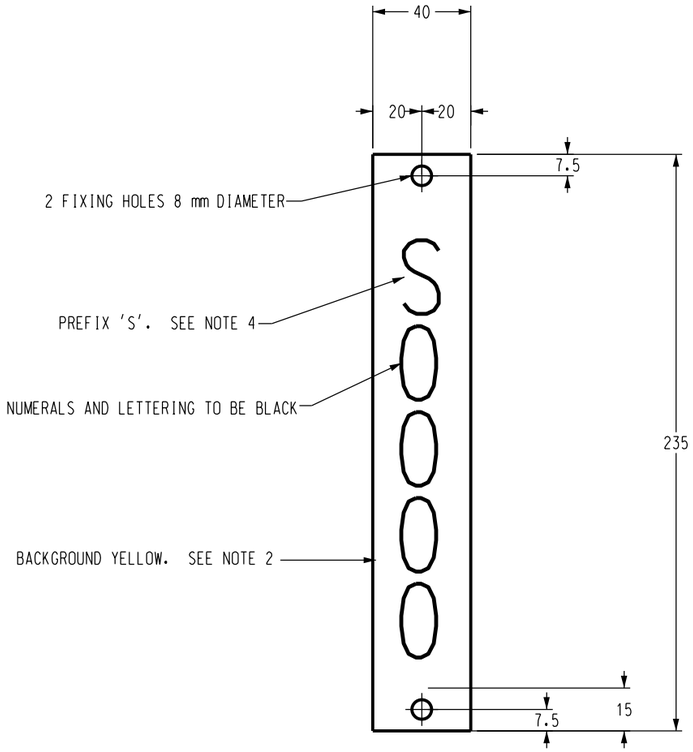
POWER STANDARD DRAWING

RAG BOLT REINFORCEMENT
BAR - DEFORMED
FABRICATION DETAILS

A3 | DRAWING NUMBER S03-01-02-06 | 7 AMDT

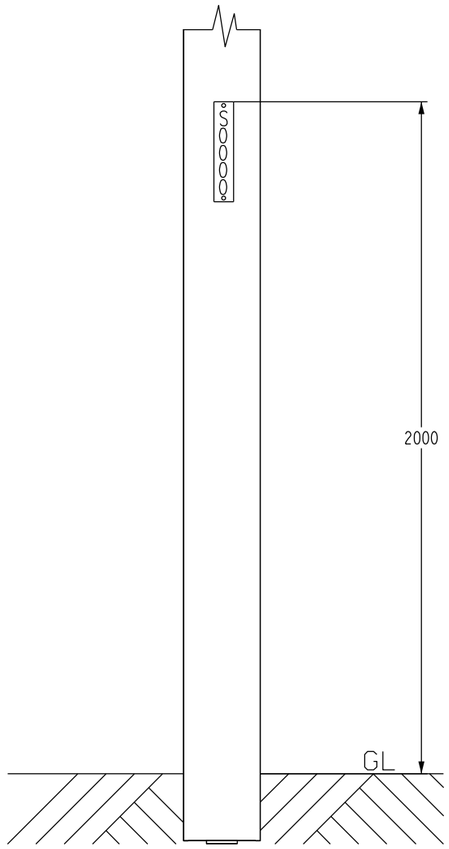
CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



NUMBER PLATE

SCALE 1:2.5



NUMBER PLATE INSTALLATION DETAILS

SCALE N.T.S

NOTES

1 FOR OUTDOOR USE UNDER EXTREME TROPICAL CONDITIONS

2 MATERIAL TO BE 1.0mm THICK ALUMINIUM - BACKGROUND COVERED WITH YELLOW 'REFLECTOLITE' VINYL

3 LETTERING AND NUMERALS (TO AS1744) TO BE EMBOSSED TO A HEIGHT OF 1.5mm MIN AND 2.5mm MAX. TWO COATS OF SUITABLE ENAMEL PAINT SHALL BE APPLIED TO THE EMBOSSING

4 THE LETTER 'S' IS TO PREFIX THE NUMERALS WHICH WILL BE SPECIFIED AT TIME OF PURCHASE

5 ALTERNATIVE FINISHES WILL BE CONSIDERED PROVIDED THAT SUCH FINISHES BE CAPABLE OF WITHSTANDING SEVERE TROPICAL CONDITIONS ESPECIALLY ULTRA VIOLET LIGHT. WHERE ALTERNATIVE FINISHES ARE PROPOSED COMPLETE TECHNICAL INFORMATION AND DETAILS OF PERFORMANCE SHALL BE PROVIDED TO FACILITATE TECHNICAL ASSESSMENT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
13	AMEND NUMBER PLATE PREFIX AND ADD LABEL VIEWS	P.BH.	JUL'22	B.V.	B.C.
12	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
11	NUMBER PLATE POSITION ON POLE ADDED	C.C.	NOV'12	A.T.	B.C.
10	STOCK CODED ADDED	N.S.	MAY'93	N.F.S.	B.K.
9	REDRAWN IN CAD, NOTES AMENDED	N.S.	DEC'92	N.F.S.	B.K.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	R. HAIGH
DRN	N.S.
CKD	N.F.S.
APPD	B. KENT
SCALE	AS SHOWN
ISSUED	DEC'92
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

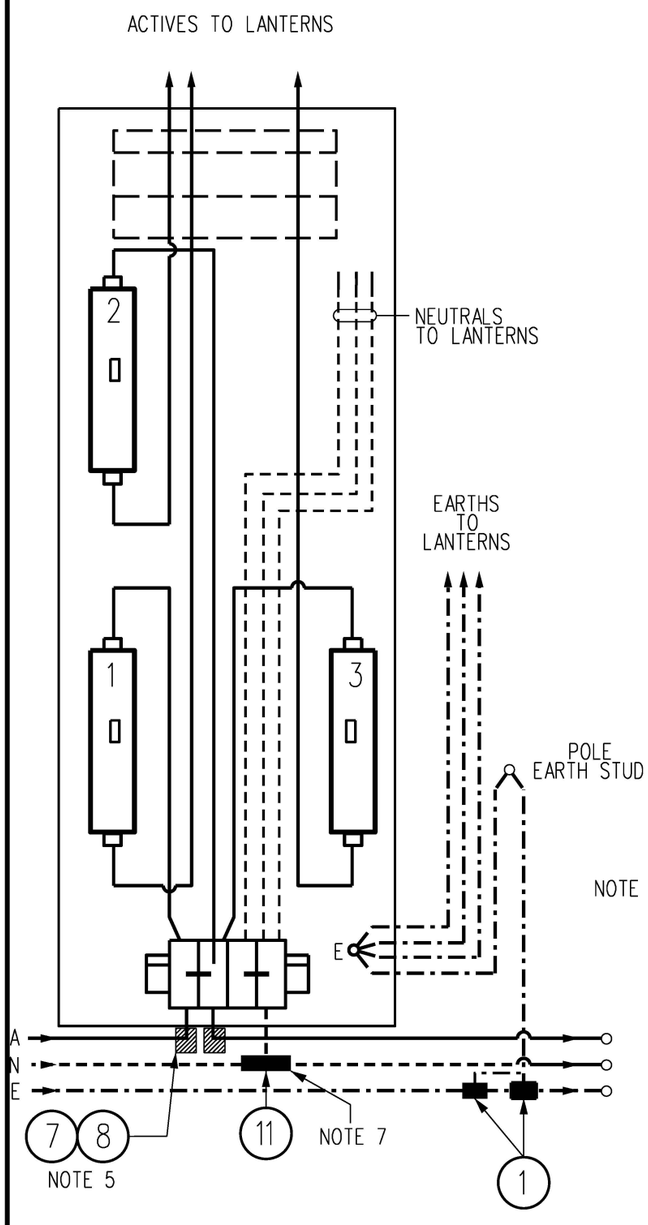
CONTROL DATA
COLUMN
NUMBER PLATE

A3

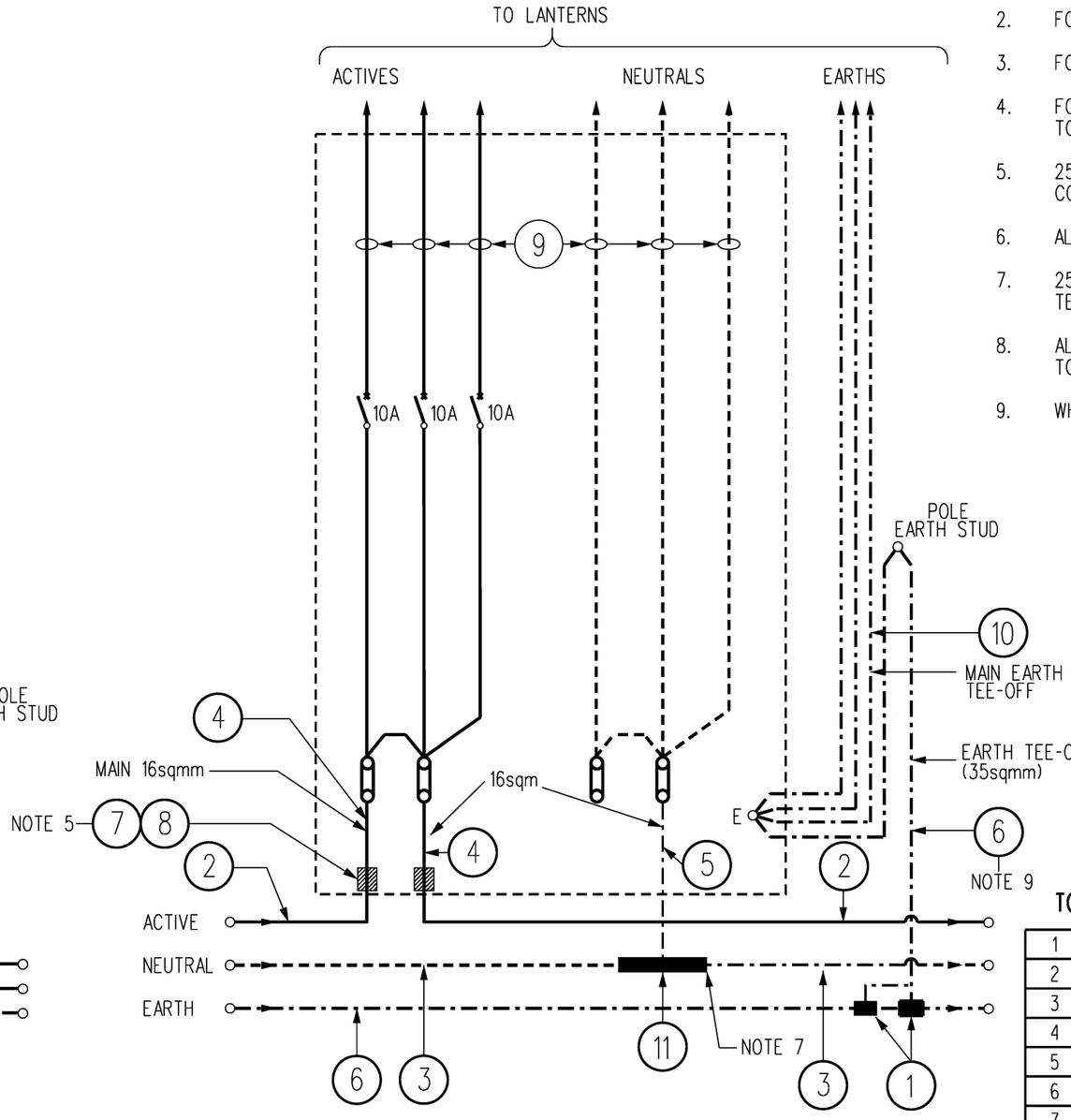
DRAWING NUMBER S03-01-05-03

CAD PRODUCT - DO NOT AMEND MANUALLY

13 AMDT



WIRING DIAGRAM



SCHEMATIC WIRING DIAGRAM

NOTES:

1. DIAGRAM SHOWS ARRANGEMENT FOR 18M COLUMNS.
2. FOR SINGLE LAMP APPLICATIONS FIT ONE CIRCUIT BREAKER AT POSITION 1.
3. FOR DOUBLE LAMP APPLICATINS FIT TWO CIRCUIT BREAKERS AT POSITIONS 1 & 2.
4. FOR ADDITIONAL MAINS TEE OFF, CONNECT 25sqmm CABLES (ACTIVE AND NEUTRAL) TO TOP SIDE OF TERMINAL LINK BLOCK.
5. 25sqmm MAINS SHALL BE TERMINATED TO 16SQMM WITHIN THE COLUMN USING COPPER CONNECTIONS ANDS THICK WALLED HEAT SHRINK.
6. ALL CRIMP CONNECTIONS SHALL BE DONE AS PER S02-02-02-10.
7. 25sqmm NEUTRAL CABLES SHALL BE T-CONNECTED INTO POLE USING 3 WAY TERMINAL BLOCK (CABAC TB503) WITH 16sqmm CABLE. TIGHTENING TORQUE 10-14NM.
8. ALL CABLES SHALL HAVE DESTINATION TAG WITH CRITCHLEY K-TYPE TAG SECURED TO THE CABLE WITH NYLON CABLE TIES.
9. WHERE CABLE PITS ARE USED A EARTH JOINT USING 35 / 35 'C' CRIMP IS ALLOWED

CABLE SIZES

INCOMING & OUTGOING MAINS - 25sqmm (35sqmm EARTH)

LANTERN CABLE - FROM TERMINAL LINKS THROUGH TO LANTERN, REFER S02-01-01-14

4sqmm TWIN/ECC
RED - ACTIVE
BLACK - NEUTRAL
YELLOW/GREEN - EARTH

MAIN EARTH TEE OFF - 6sqmm GREEN/YELLOW

ITEM 11 REFER NOTE 7

TO BE READ IN CONJUNCTION WITH CONSTRUCTION DRG No. S03-01-05-12

ITEM	QTY.	ITEM NUMBER	DESCRIPTION	DRAWING No.
1	2	406821	35sqmm 'C' CLAMP	S01-01-05-08
2	AR	9449	25sqmm CU CABLE - RED	S02-01-01-20
3	AR	9456	25sqmm CU CABLE - BLACK	S02-01-01-20
4	AR	1644	16sqmm CU CABLE - RED	S02-01-01-23
5	AR	1636	16sqmm CU CABLE - BLACK	S02-01-01-23
6	AR	9829	35sqmm CU BARE EARTH WIRE	S01-01-05-05
7	2	5272	16 - 25sqmm COMPRESSION LINK	-
8	AR	3129	HEATSHRINK TO SUIT CU LINK	S02-01-02-15
9	AR	2733	4sqmm TWIN/ECC CABLE	S02-01-01-14
10	AR	2774	6sqmm CU Y/GR INSULATED CABLE	S02-01-01-23
11	1	502906	3 WAY TERMINAL BLOCK (SEE NOTE 7)	

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
12	NOTES REFORMATTED	R.A.	AUG'21	C.C.C.	B.V.
11	TITLEBLOCK & DRAWING NUMBERS FORMATTED	K.T.	FEB'19	C.C.	C.C.
10	EXTRA EARTH CRIMP ADDED, NOTE 9 ADDED	C.C.	AUG'17	I.B.	B.C.
9	NOTE 7, ITEM 5 UPDATED	A.T.	MAY'16	I.B.	B.C.
8	ITEM 11 ADDED, NOTE 7 AMENDED, MATERIAL TABLE UPDATED	A.S	FEB'15	I.B.	B.C.
7	NOTE 6 ADDED	A.T.	MAY'12	B.C.	S.C.
6	CABLE SIZES/NOTES 5 ADDED	RAJ	AUG'06	RAJ	S.C.
5	TEE OFF AMENDED	RAJ	AUG'06	RAJ	S.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	G.S.
DRN	HT
CKD	N.F.S.
APPD	B.T.Kent
SCALE	NTS
ISSUED	..
ALL DIM. IN mm	

POWER STANDARD DRAWING

CONTROL DATA SWITCH PACK WIRING DIAGRAM

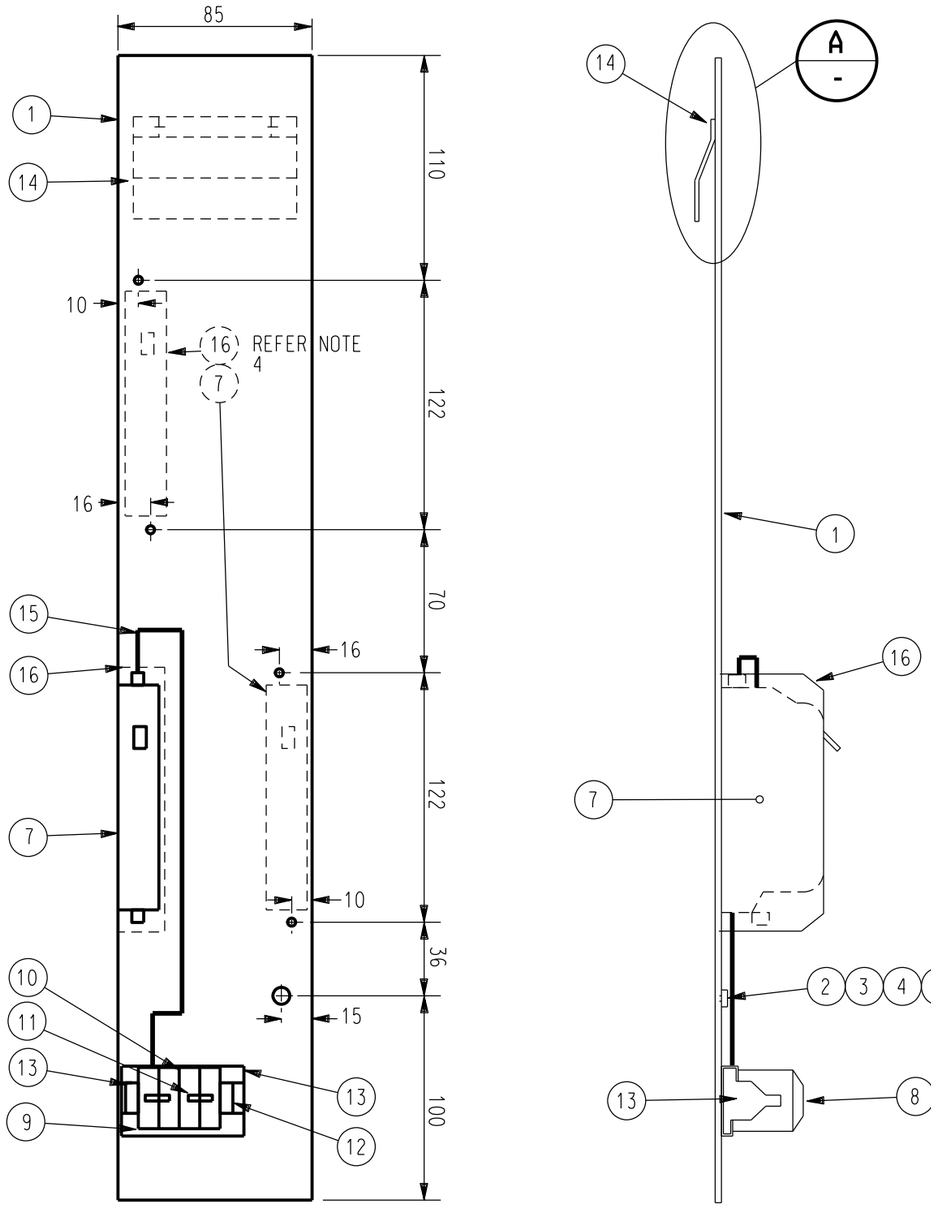
A3

DRAWING NUMBER S03-01-05-07

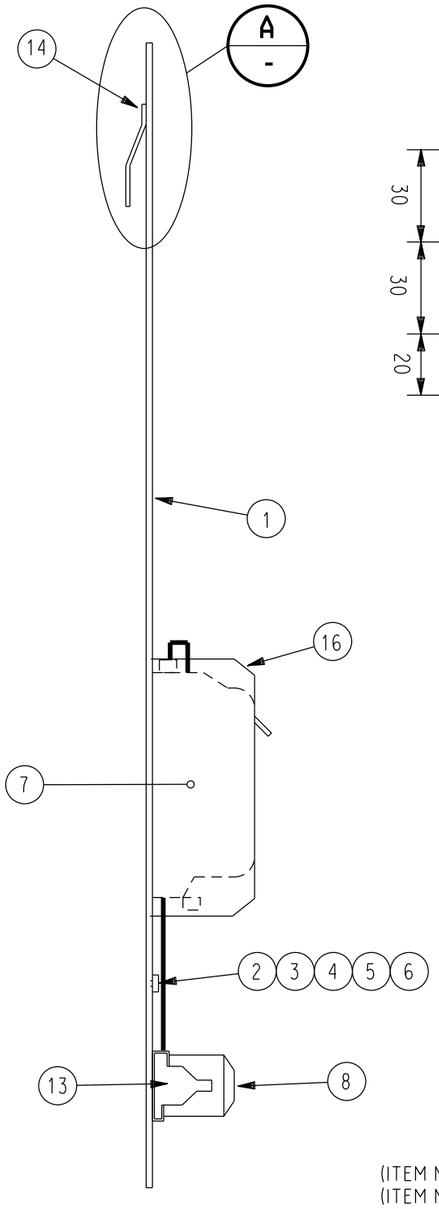
12 AMDT

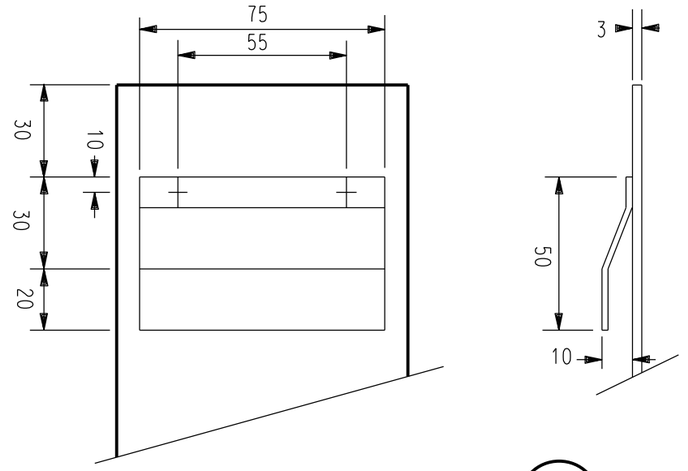
DRAFTING STANDARD TO A.S.1100

CAD PRODUCT - DO NOT AMEND MANUALLY



ITEM 1 - SWITCH PACK LIGHTING COLUMN





MOUNTING DETAIL A -

TO BE READ IN CONJUNCTION WITH S03-01-05-07 WIRING DIAGRAM

(ITEM NUMBER 285254 - SINGLE BREAKER)
(ITEM NUMBER 415500 - DOUBLE BREAKER)
(ITEM NUMBER 415505 - TRIPLE BREAKER)

NOTES:

1. ALL MOUNTING HOLES TO BE 4mm DIA
2. SECURE RAIL AND CIRCUIT BREAKER/S WITH SELF-TAPPING SCREWS (COUNTERSUNK FOR RAILS).
3. MOUNTING BRACKET TO BE RIVETED TO BASEPLATE.
4. WHEN USED WITH DOUBLE OR TRIPLE OUTREACH COLUMNS USE ADDITIONAL BREAKER(S) IN POSITION SHOWN.
5. REFER TO STSP 02-015 FOR MORE INFORMATION.

ITEM REF.	QTY.	DESCRIPTION	ITEM NUMBER
16	1	SURFACE MOUNTING ENCLOSURE C/W DIN RAIL	251819
15	1	CABLE 4sqmm Cu PVC RED SDI	-
14	1	MOUNTING BRACKET	-
13	1	TERMINAL 'C' RAIL	6536
12	2	DIN RAIL END CLAMP	7278
11	2	DIN RAIL BRIDGE BAR - C/W SUPPORTS	-
10	1	TERMINAL BLOCK, SPACER PLATE	7393
9	4	TERMINAL BLOCK 35sqmm	7229
8	1	END PLATE	7252
7	1	CIRCUIT BREAKER 10A 9kA	251827
6	2	SS316 M5 NUT	-
5	1	SS316 M5 BOLT	-
4	1	SS316 M5 SPLIT SPRING WASHER	-
3	1	SS316 M5 FLAT WASHER	-
2	1	SS316 M5 STANKO LUG	-
1	1	ALUMINIUM BASE PLATE 560x85x3mm	-

MATERIAL SCHEDULE

NO	DESCRIPTION	DRN	DATE	CKD	APPD
10	SHEET 2 AMENDED.	P.BH.	MAR'24	B.C.	B.V.
9	REMOVED DOUBLE INSULATED ITEM AND NOTE, CORRECTED ITEM 10 DESCRIPTION. REFORMATTED TABLE. ADDED NOTE 5.	A.N.	AUG'21	C.C.C.	B.V.
8	TITLEBLOCK & DRAWING NUMBERS FORMATTED	K.T.	FEB'19	C.C.	C.C.
7	SHEET 2 ADDED	A.T.	SEP'16	I.B.	B.C.
6	S/C FOR DOUBLE AND TRIPLE CB PANEL ADDED	A.T.	FEB,12	B.C.	S.C
5	ADDED TERMINAL BLOCK SI26	J.C	FEB,08	B.C.	S.C
4	DOUBLE INSULATED CONTROL ADDED	A.S.	JULY'07	B.C.	S.C
3	ITEM 15 CHANGED	K.I.	MAR'07	R.S.	S.C
2	S03-01-05-13 REFERENCE CHANGED TO S03-01-05-07	K.I.	MAR'05	C.C.	C.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	A.T.
DRN	gmck
CKD	N.F.S.
APPD	B.KENT
SCALE	N.T.S.
ISSUED	NOV'92
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

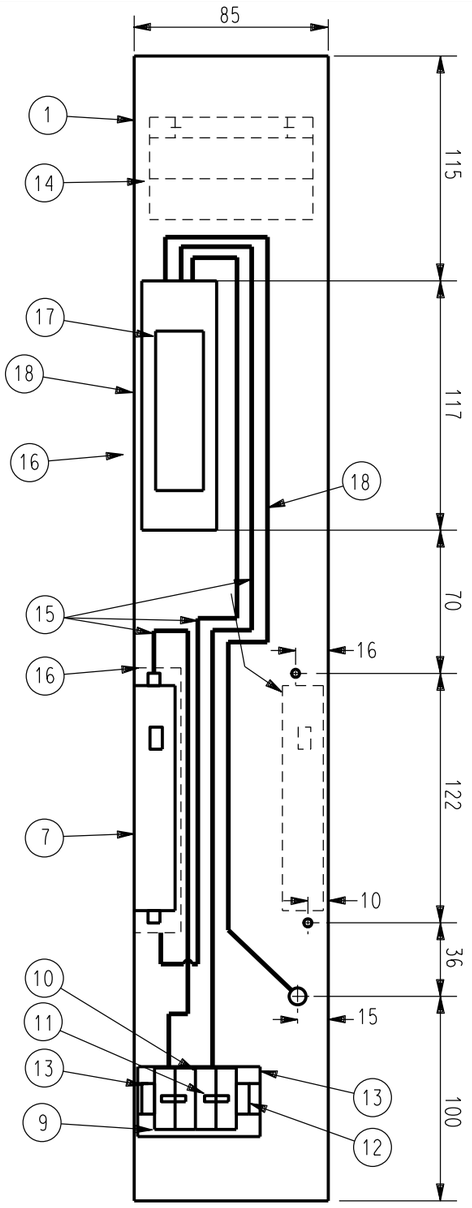
CONTROL DATA
SWITCH PACK
LIGHTING COLUMNS
INTEGRAL - SINGLE PHASE

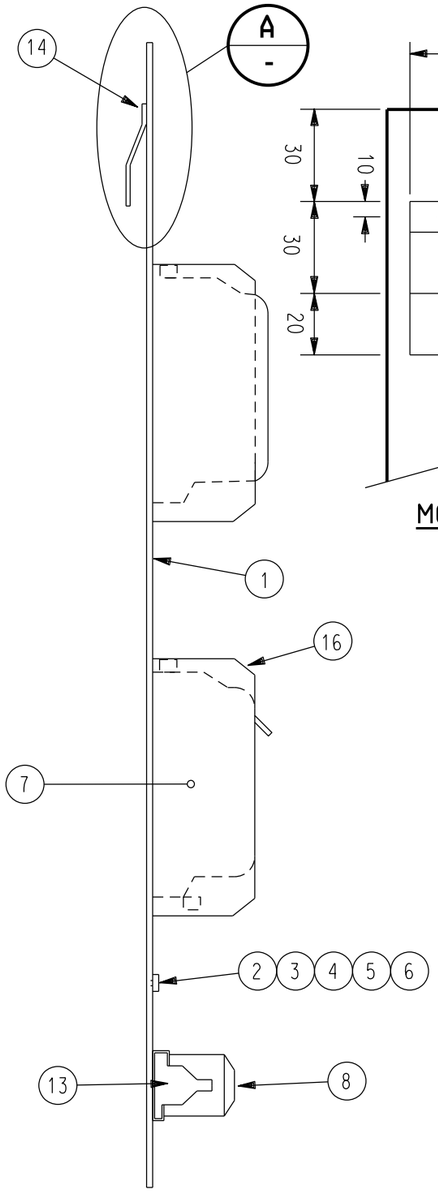
A3 DRAWING NUMBER S03-01-05-12_1

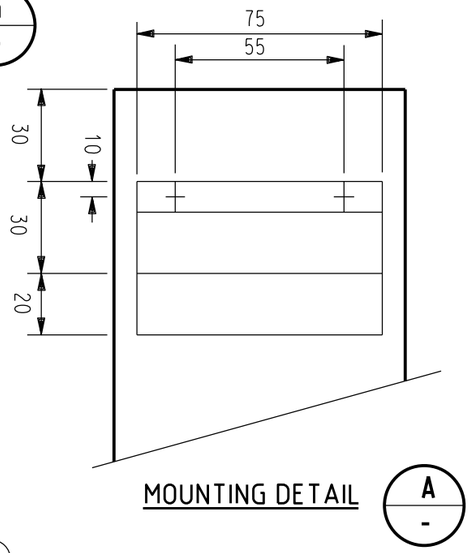
CAD PRODUCT - DO NOT AMEND MANUALLY

10 AMDT

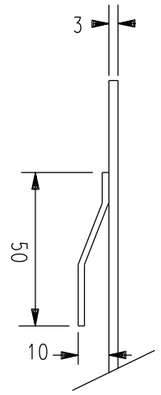
APRODOCS T23-1357 - 137 CONTRACT DRAWINGS







MOUNTING DETAIL A -



NOTES:

1. ALL MOUNTING HOLES TO BE 4mm DIA
2. SECURE RAIL AND CIRCUIT BREAKER/S WITH SELF-TAPPING SCREWS (COUNTERSUNK FOR RAILS).
3. MOUNTING BRACKET TO BE RIVETED TO BASEPLATE.
4. WHEN USED WITH DOUBLE OR TRIPLE OUTREACH COLUMNS USE ADDITIONAL BREAKER(S) IN POSITION SHOWN.
5. REFER TO STSP 02-015 FOR MORE INFORMATION.

ITEM 1 - SWITCH PACK LIGHTING COLUMN WITH SURGE PROTECTOR

TO BE READ IN CONJUNCTION WITH S03-01-05-18 WIRING DIAGRAM

ITEM REF.	QTY.	DESCRIPTION	ITEM NUMBER
18	1	CABLE 4sqmm Cu PVC GREEN/YELLOW	
17	AR	SERIES SURGE PROTECTION 15kA	503737
16	1	SURFACE MOUNTING ENCLOSURE C/W DIN RAIL	251819
15	1	CABLE 4sqmm Cu PVC RED SDI	-
14	1	MOUNTING BRACKET	-
13	1	TERMINAL 'C' RAIL	6536
12	2	DIN RAIL END CLAMP	7278
11	2	DIN RAIL BRIDGE BAR - C/W SUPPORTS	-
10	1	TERMINAL BLOCK, SPACER PLATE	7393
9	4	TERMINAL BLOCK 35sqmm	7229
8	1	END PLATE	7252
7	1	CIRCUIT BREAKER 10A 9kA	251827
6	2	SS316 M5 NUT	-
5	1	SS316 M5 BOLT	-
4	1	SS316 M5 SPLIT SPRING WASHER	-
3	1	SS316 M5 FLAT WASHER	-
2	1	SS316 M5 STANKO LUG	-
1	1	ALUMINIUM BASE PLATE 560x85x3mm	-

MATERIAL SCHEDULE

NO	DESCRIPTION	DRN	DATE	CKD	APPD
10	REFERENCE DRAWING CHANGED.	P.BH.	MAR'24	B.C.	B.V.
9	ADDED SURGE ARRESTER WIRING & NOTE 5. REMOVED REFERENCE TO DOUBLE INSULATED BOARDS. CHANGED ITEM 18, CORRECTED ITEM 10 DESCRIPTION.	A.N.	AUG'21	C.C.C.	B.V.
8	TITLEBLOCK & DRAWING NUMBERS FORMATTED	K.T.	FEB'19	C.C.	C.C.
7	PAGE 2 ADDED LED ARRANGMENT	K.T.	JUN'16	A.T.	B.C.
6	S/C FOR DOUBLE AND TRIPLE CB PANEL ADDED	A.T.	FEB.12	B.C.	S.C
5	ADDED TERMINAL BLOCK S126	J.C	FEB.08	B.C.	S.C
4	DOUBLE INSULATED CONTROL ADDED	A.S.	JULY'07	B.C.	S.C
3	ITEM 15 CHANGED	K.I.	MAR'07	R.S.	S.C
2	S03-01-05-13 REFERENCE CHANGED TO S03-01-05-07	K.I.	MAR'05	C.C.	C.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	A.T.
DRN	gmck
CKD	N.F.S.
APPD	B.KENT
SCALE	N.T.S.
ISSUED	NOV'92
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

POWER STANDARD DRAWING

CONTROL DATA
SWITCH PACK
LIGHTING COLUMNS
INTEGRAL - SINGLE PHASE

A3

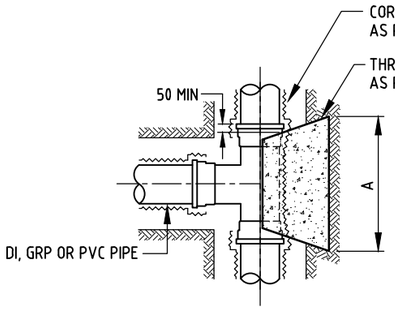
DRAWING NUMBER S03-01-05-12_2

CAD PRODUCT - DO NOT AMEND MANUALLY

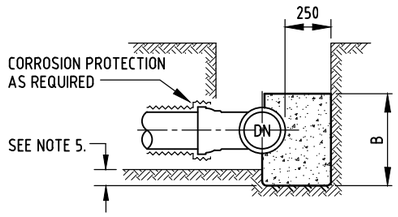
10 AMDT

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS

REFER TO W1-2-05B FOR MINIMUM THRUST BLOCK AREA m^2 - TABLES & OTHER DETAILS

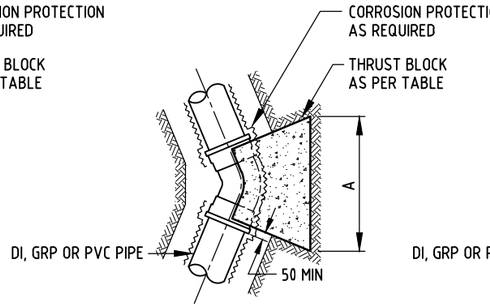


PLAN



ELEVATION

THRUST BLOCK FOR TEES
(FOR HORIZONTAL THRUST)



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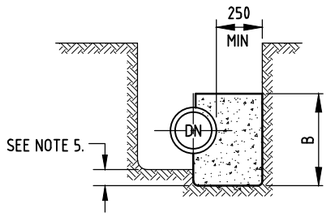
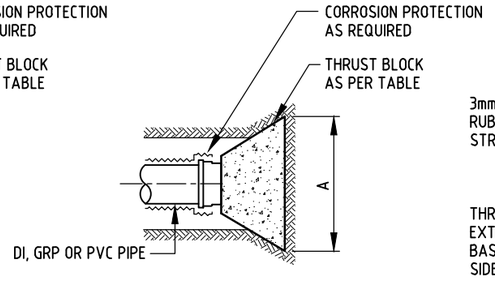


ELEVATION

THRUST BLOCK FOR BENDS
(FOR HORIZONTAL THRUST)



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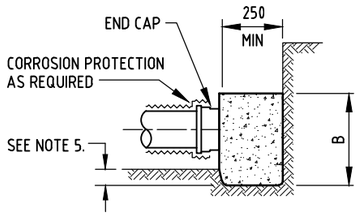
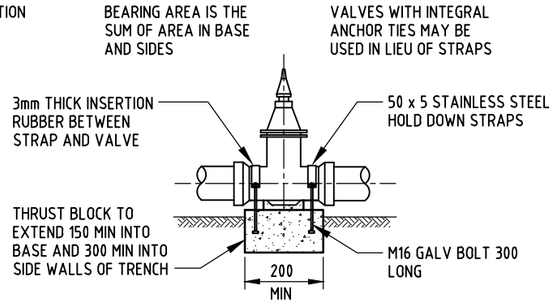
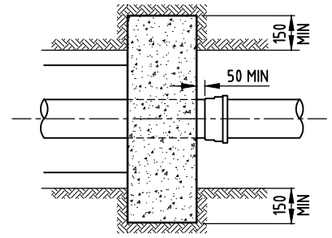


ELEVATION

THRUST BLOCK FOR DEAD ENDS
(FOR HORIZONTAL THRUST)



VALVES WITHOUT SEPARATE IN-LINE ANCHORAGE
(FOR HORIZONTAL THRUST)



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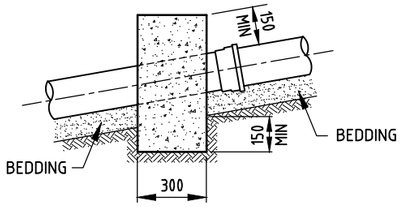


ELEVATION

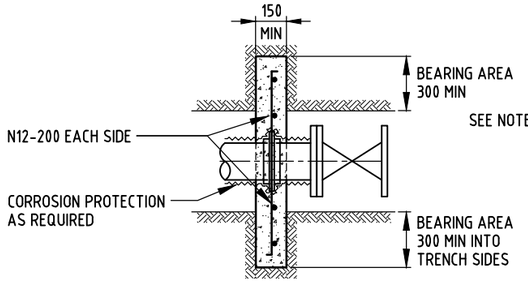
GRADIENT ANCHOR BLOCKS
(SLOPE OF 1:6 OR STEEPER)
(REFER ANCHOR BLOCK SPACING TABLE)

NOTES

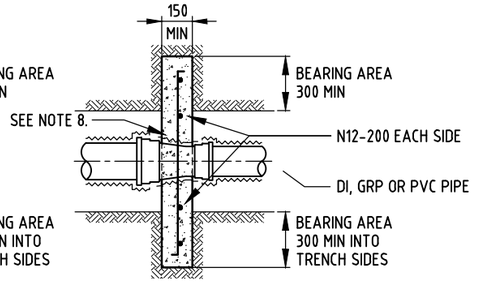
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. CAST THE THRUST AREA OF ALL THRUST BLOCKS AGAINST A CLEAN FACE OF UNDISTURBED NATURAL SOIL. THRUST BLOCKS NOT TO INTERFERE WITH OTHER SERVICES.
3. DESIGN PRESSURES OTHER THAN 1200 kPa REDUCE OR INCREASE THE MINIMUM THRUST AREA BY THE RATIO OF THE DESIGN PRESSURES EXCEPT WHERE THE MINIMUM THRUST AREA IS <0.1 m^2.
4. DESIGN PRESSURES OTHER THAN 1200 kPa REDUCE OR INCREASE THE MINIMUM ANCHOR BLOCK VOLUME TO SUIT PRESSURE.
5. FINISH THRUST BLOCKS APPROXIMATELY 100mm ABOVE THE TOP OF THE FITTING OR BEARING PAD AND EXTEND TO THE FLOOR OF TRENCH OR DEEPER IF NECESSARY TO ACHIEVE THE REQUIRED THRUST AREA. MAXIMUM ENCASEMENT TO BE 180°.
6. THE MINIMUM THRUST AREA FOR IN-LINE TAPER THRUST BLOCKS TO BE EQUAL TO THE DIFFERENCE BETWEEN THE THRUST AREAS FOR DEAD ENDS OF EQUIVALENT DIAMETER TO THOSE EACH SIDE OF TAPER.
7. FOR DOWNWARDS VERTICAL THRUST, THE ALLOWABLE BEARING PRESSURES FOR THE VARIOUS SOILS MAY BE TAKEN AS TWICE THAT FOR HORIZONTAL THRUST SHOWN.
8. WHEN SETTING DUCTILE IRON PIPES AND FITTINGS IN CONCRETE, THEY SHALL BE EXTERNALLY PROTECTED WITH TWO THICKNESSES OF BLUEBOSS POLYETHYLENE SLEEVING OR EQUIVALENT TO AS.3680 PLACED BETWEEN FITTINGS AND THRUST BLOCKS.
9. WHEN SETTING PVC PRESSURE PIPES IN CONCRETE A COMPRESSIBLE MEMBRANE OF CLOSED CELL FOAM OR FELT SHALL SURROUND THE PIPE AND FITTING TO PERMIT PIPE MOVEMENT IN THE CONCRETE.
10. CONCRETE FOR THRUST AND ANCHOR BLOCKS SHALL BE CLASS N25 IN ACCORDANCE WITH AS.1379 AND AS.3600.
11. THRUST BLOCKS ARE TO BE FORMED WITH A MINIMUM CLEARANCE OF 50mm FROM SOCKETS. LEAVE SUFFICIENT SPACE AT FLANGED JOINTS FOR FUTURE DISMANTLING OF JOINTS.
12. FOR LONGITUDINAL ANCHOR BLOCKS ON DUCTILE IRON OR STEEL PIPE USE FACTORY FITTED PUDDLE FLANGES.
13. INLINE THRUST BLOCKS FOR TAPERS, TEMP. END STOPS AND VALVES DN150 OR LESS ONE STEEL BAR REINFORCEMENT CAGE & GREATER THAN DN225 TO DN300 TWO STEEL BAR REINFORCEMENT CAGES.
14. THRUST BLOCK SIZE FOR PIPES LARGER THAN DN300 WILL NEED TO BE CALCULATED BY THE CONSULTING ENGINEER.
15. THRUST BLOCKS ARE TO BE FORMED USING PLY. SAND BAGS CAN BE USED TO HOLD FORM WORK IN PLACE.

GRADIENT	MAX. SPACING (m)
1:2	6
1:3	11
1:4	13
1:5	17
1:6	22

ANCHOR BLOCK SPACING



PLAN



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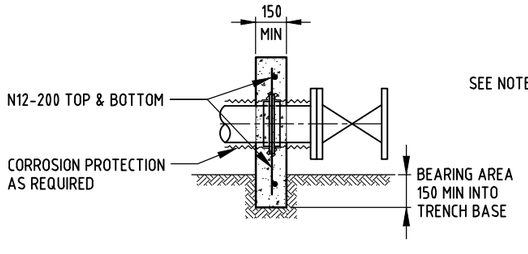
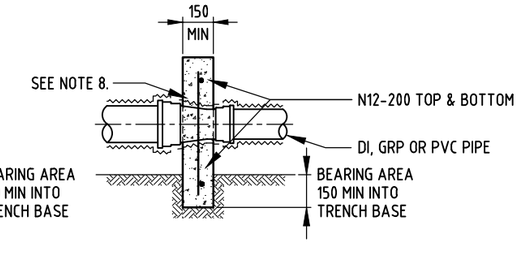


ELEVATION



ELEVATION

IN-LINE THRUST BLOCKS FOR TAPERS, TEMP. END STOPS AND VALVES
(FOR HORIZONTAL THRUST)

NO	DESCRIPTION	DRN	DATE	CKD	APPD
3	GENERAL AMENDMENTS 2021.	PW	JUNE'21	IL	DC
2	REDRAWN IN AUTOCAD.	AW	OCT'18	JR	DC
1	TRENCH DETAILS DELETED. ANCHOR BLOCK SPACING CHANGED.	AW	JUN'11	RJ	JP

AMENDMENTS

PowerWater
NORTHERN TERRITORY

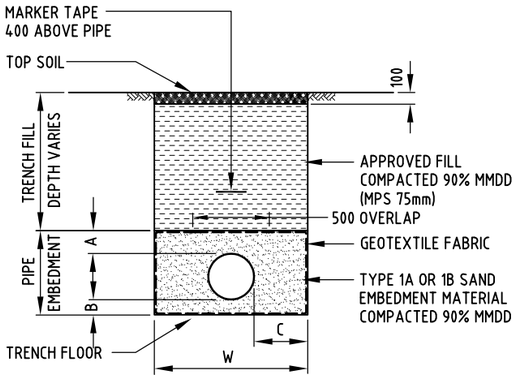
DES	
DRN	ME
CHK	
APPD	
SCALE	N.T.S.
ISSUED	DEC'88
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

WATER STANDARD DRAWING
MAINLAYING
THRUST AND ANCHOR BLOCK DETAILS
FOR DN100 TO DN300 PRESSURE MAIN

A3 | DRAWING NUMBER W1-2-05A | 3 AMDT

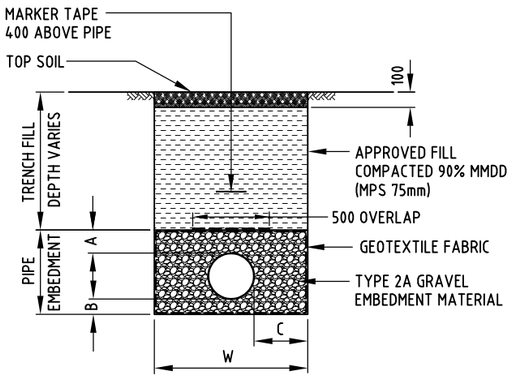
CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS



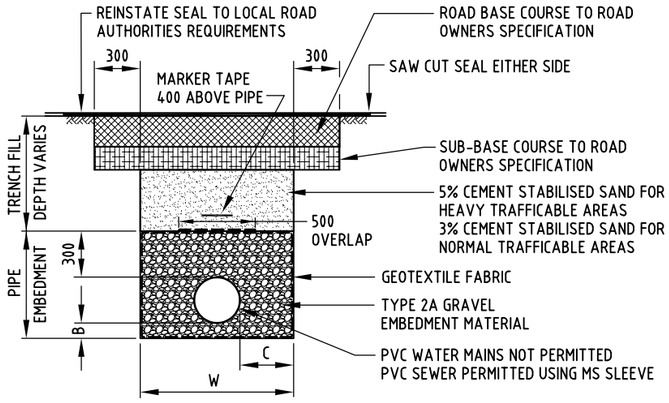
TRENCH DETAIL 1

GENERAL AREA UP TO AND INCLUDING DN300



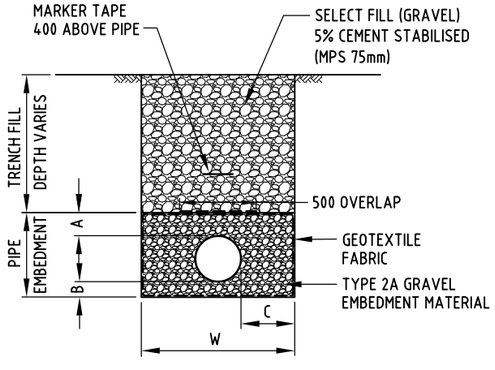
TRENCH DETAIL 2

GENERAL AREA



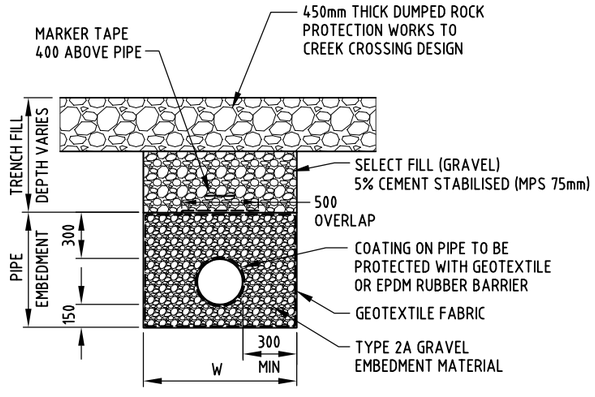
TRENCH DETAIL 3

ROAD CROSSING



TRENCH DETAIL 4

DRAIN CROSSING



TRENCH DETAIL 5

CREEK CROSSING

MINIMUM COVER	ROAD RESERVE OR NORMAL TRAFFICABLE AREAS CREEK CROSSING OPEN UNLINED DRAINS	750mm
	NON-TRAFFICABLE AREA (EASEMENT, PARK, ETC..)	600mm
	NTG MAJOR ROADS OR HEAVY TRAFFICABLE AREAS	1500mm
	NOTE: PVC NOT TO BE USED UNDER ROADS. STRUCTURAL SLAB WILL BE REQUIRED OVER PIPE BEDDING IF ABOVE MINIMUM COVER CANNOT BE MAINTAINED.	

EMBEDMENT MATERIAL

HOLD POINT: PROVIDE NATA TEST CERTIFICATES TO THE SUPERINTENDENT/CERTIFIER NOT LESS THAN THAN SEVEN DAYS PRIOR TO PLACING EMBEDMENT MATERIAL IN THE EXCAVATION AND STATE THE SOURCE OF THE MATERIAL. DO NOT PLACE ANY EMBEDMENT UNTIL MATERIAL HAS BEEN APPROVED.

TYPE 1 EMBEDMENT MATERIAL: SAND FREE OF CLAY, DUST, SALT OR ORGANIC MATTER.

SIEVE SIZE	PERCENTAGE PASSING BY DRY WEIGHT	
	TYPE 1A	TYPE 1B
4.75 mm		90 - 100
2.36 mm	100	75 - 100
1.18 mm	95 - 100	45 - 95
600 um	80 - 100	20 - 80
300 um	40 - 80	5 - 40
150 um	0 - 6	0 - 6
75 um	0 - 6	0 - 6

LINEAR SHRINKAGE OF MATERIALS PASSING A 425 um SIEVE SHALL BE LESS THAN 2.5%.

TYPE 2 EMBEDMENT MATERIAL: SINGLE SIZE GRAVEL COMPRISING OF CLEAN, HARD, SOUND CRUSHED ROCK, WITH A LOS ANGELES ABRASION LOSS (LA) OF LESS THAN 30, NON-PLASTIC AND FREE OF ORGANIC MATTER.

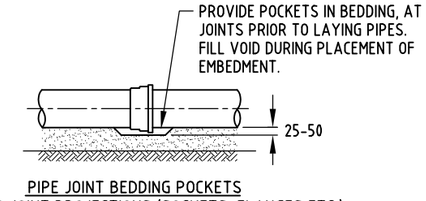
SIEVE SIZE	PERCENTAGE PASSING BY DRY WEIGHT	
	TYPE 2A (10mm SINGLE SIZE)	TYPE 2B (20mm SINGLE SIZE)
19.0 mm	100	100
9.5 mm	95 - 100	0 - 5
4.75 mm	0 - 5	0 - 1

NOTES

1. TRENCHFILL COMPACTION TO ACHIEVE 90% MMDD MIN. OR 95% UNDER ROADS.
2. ALL TRENCHES ARE TO BE FULLY REINSTATED TO EXISTING NATURAL SURFACE LEVEL.
3. WHERE THE WATER MAIN PASSES THROUGH TURNOUT DRAINS, TABLE DRAINS AND OPEN UNLINED DRAINAGE CHANNEL, THE FINISHED SURFACE SHALL BE REINSTATED TO MATCH EXISTING PROFILE.
4. PROVIDE VERTICAL GEOTEXTILE BARRIER AT BOUNDARY BETWEEN DIFFERENT BEDDING TYPES.
5. MPS - MAXIMUM PARTICLE SIZE.
6. MINIMUM OVERLAP FOR GEOTEXTILE CAN BE REDUCED TO 400mm WHERE TRENCH WIDTH IS LESS THAN 500mm.
7. USE RESTRAINED JOINTS UNDER MAJOR ROADS, HEAVY TRAFFICABLE AND CBD AREAS.
8. TYPE 2A MATERIAL SHALL BE USED FOR DN750 OR GREATER EXCEPT FOR SINTAKOTED MSCL PIPE WHERE SUPPORTED BY MANUFACTURER.
9. PLACE TRENCHFILL IN LOOSE LAYERS AND COMPACT EACH LAYER SEPERATELY. LAYERS SHALL NOT EXCEED 200MM (TRAFFICABLE AREAS) AND 300MM (NON TRAFFICABLE AREAS).
10. ROAD REINSTATEMENT TO MEET ROAD OWNERS SPECIFICATIONS.
11. GEOTEXTILE FABRIC TO WSA PS 355. CEMENT STABILISED SAND TO WSA PS 352 AND VIBRATED WHEN PLACED.

PIPE SIZE (DN)	MINIMUM TRENCH WIDTH (W)	EMBEDMENT DIMENSIONS		
		A	B	C
150	450 (a)	100	100	100
200	600	150	100	150
225	600	150	100	150
250	600	150	100	150
300	750	150	100	150
375	900	150	100	200
450	900	150	100	200

(a). WHERE WORKER ACCESS IS REQUIRED THE MINIMUM WIDTH SHOULD BE 600mm.



PIPE JOINT BEDDING POCKETS
FOR JOINT PROJECTIONS (SOCKETS, FLANGES ETC.)

NO	DESCRIPTION	DRN	DATE	CKD	APPD
2	GENERAL AMENDMENTS 2022.	PW	JUNE'22	JC	DC
1	REDRAWN, RENUMBERED, & AMENDED 2021.	PW	JUNE'21	JR	DC
0	ISSUED FOR INFORMATION.	AW	OCT'18	JR	DC

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	TM
DRN	AW
CHK	JR
APPD	DC
SCALE	N.T.S.
ISSUED	OCT' 19
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

WATER STANDARD DRAWING
MAINLAYING
DN150 - DN450
TRENCHING DETAILS 1, 2, 3, 4, 5

A3 | DRAWING NUMBER W1-2-21A | 2 AMDT

CAD PRODUCT - DO NOT AMEND MANUALLY

APRODOCS T23-1357 - 137 CONTRACT DRAWINGS