Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:19:29 PM

Insp ID: 763	Group 3 - Tennant Creek, Elliott	Ngalpa Ngalpa

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:19:29 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:16:25 PM

Insp ID: 764	Group 3 - Tennant Creek, Elliott	Ngalpa Ngalpa

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	2
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:16:25 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:06:22 PM

Insp ID: 765	Group 3 - Tennant Creek, Elliott	Ngalpa Ngalpa

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:06:22 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 2:03:25 PM

Insp ID: 766 Group 3 - Tennant Creek, Elliott Ngalpa Ngalpa

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	

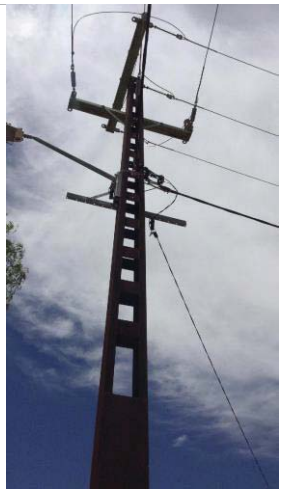
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 1:57:48 PM

Insp ID: 767	Group 3 - Tennant Creek, Elliott	Ngalpa Ngalpa

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	3
Street Light Height	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 1:57:48 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 1:51:20 PM

Insp ID: 769	Group 3 - Tennant Creek, Elliott	Ngalpa Ngalpa

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	2
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 1:51:20 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 3:22:38 PM

Insp ID: 749 Group 3 - Tennant Creek, Elliott Ngalpa Ngalpa

What Category are you capturing:	Transformers
What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	PVC insulated black
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Cut out fuse
Transformer Comment:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 3:22:38 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 1:54:26 PM

Insp ID: 768 Group 3 - Tennant Creek, Elliott Ngalpa Ngalpa

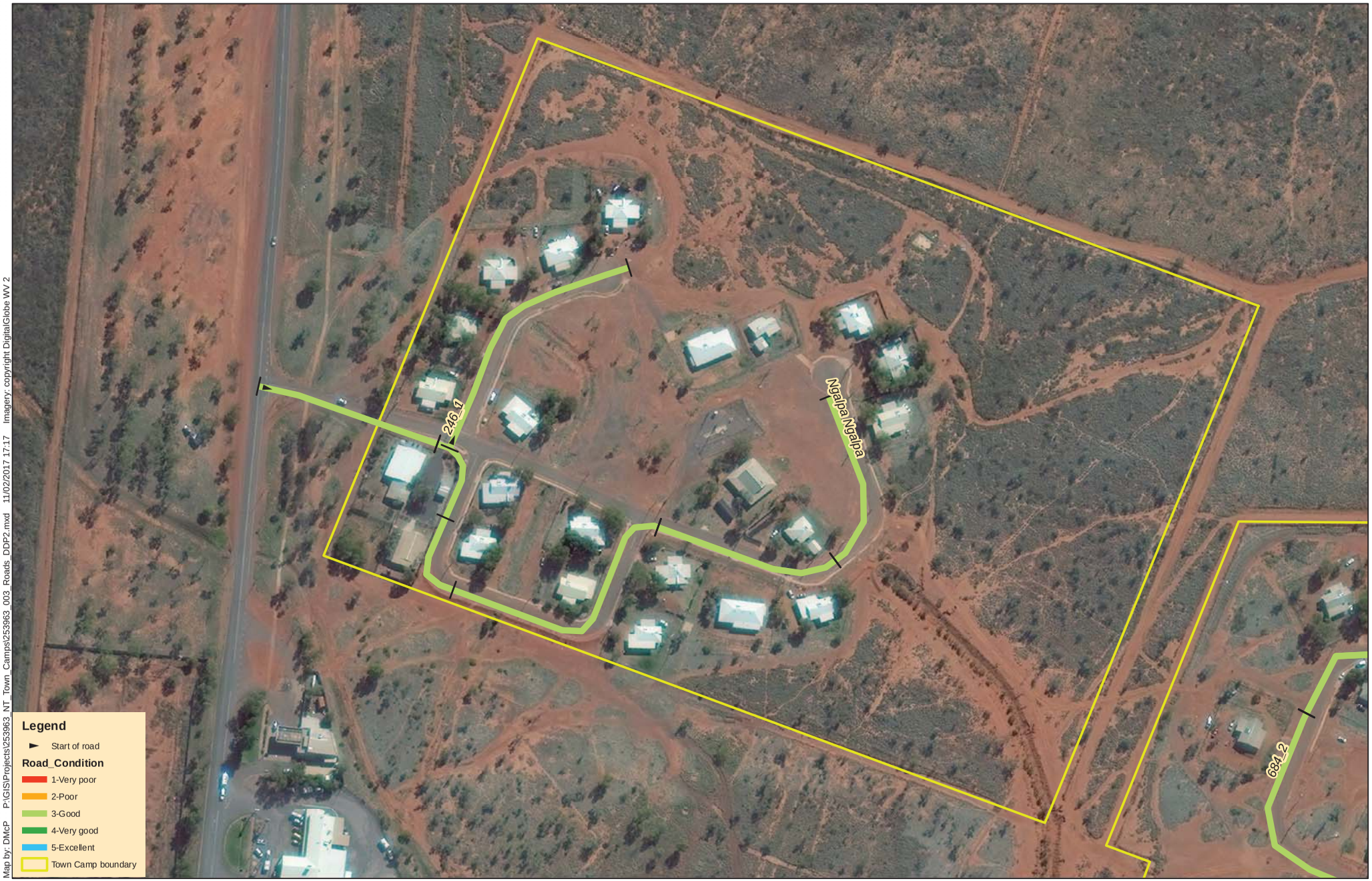
What Category are you capturing:	Transformers
What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	PVC insulated black
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Cut out fuse
Transformer Comment:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 30/11/2016 1:54:26 PM

Road map



Legend

Start of road

Road_Condition

1-Very poor

2-Poor

3-Good

4-Very good

5-Excellent

Town Camp boundary

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

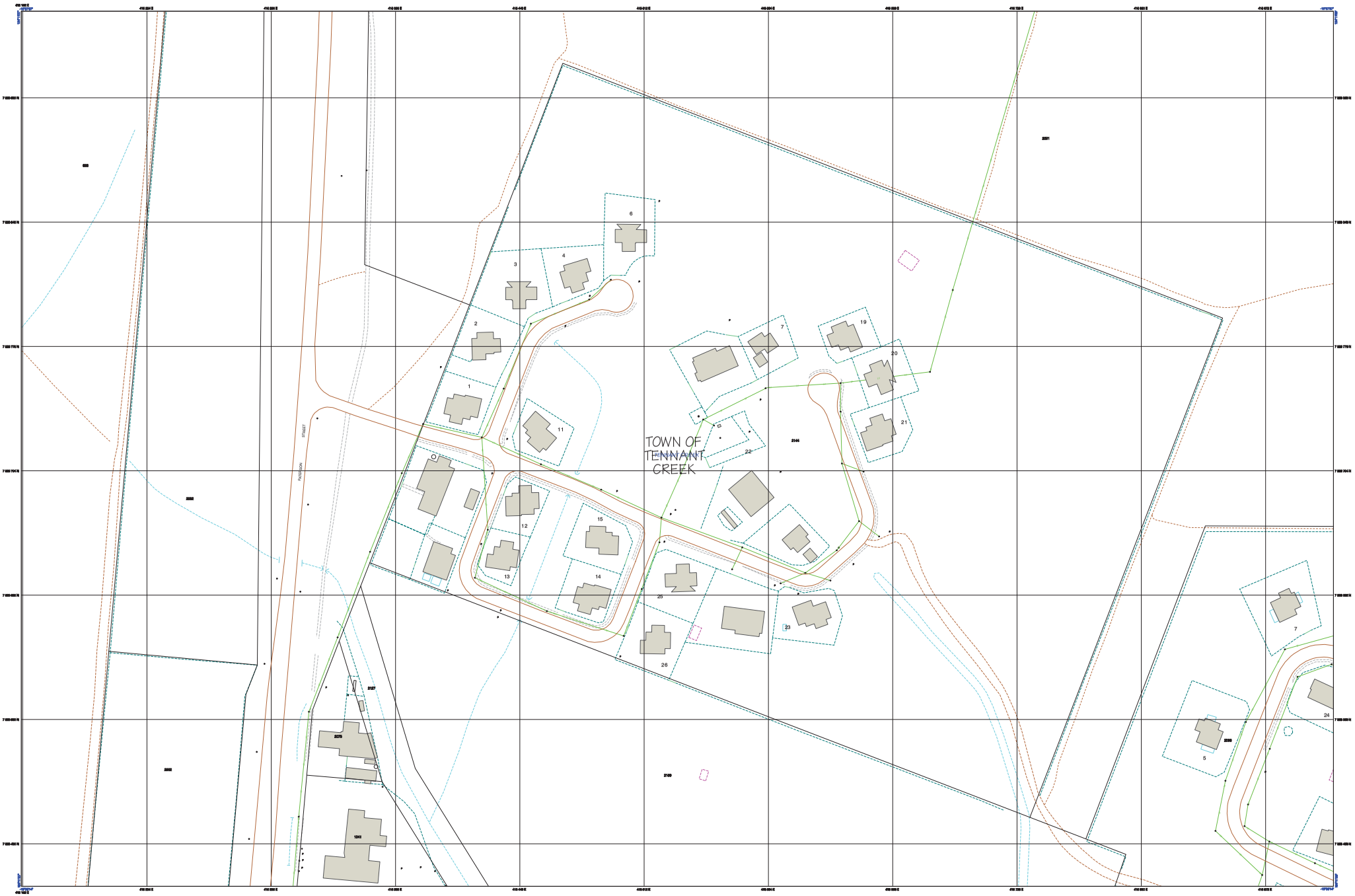
Coordinate system: GDA 1994

NT Town Camp Road Assessments

246 - Ngalpa Ngalpa (Tennant Creek)

1060

Existing drawings



LEGEND

SOURCE INFORMATION

Locality Diagram

SERVICED LAND AVAILABILITY PROGRAM

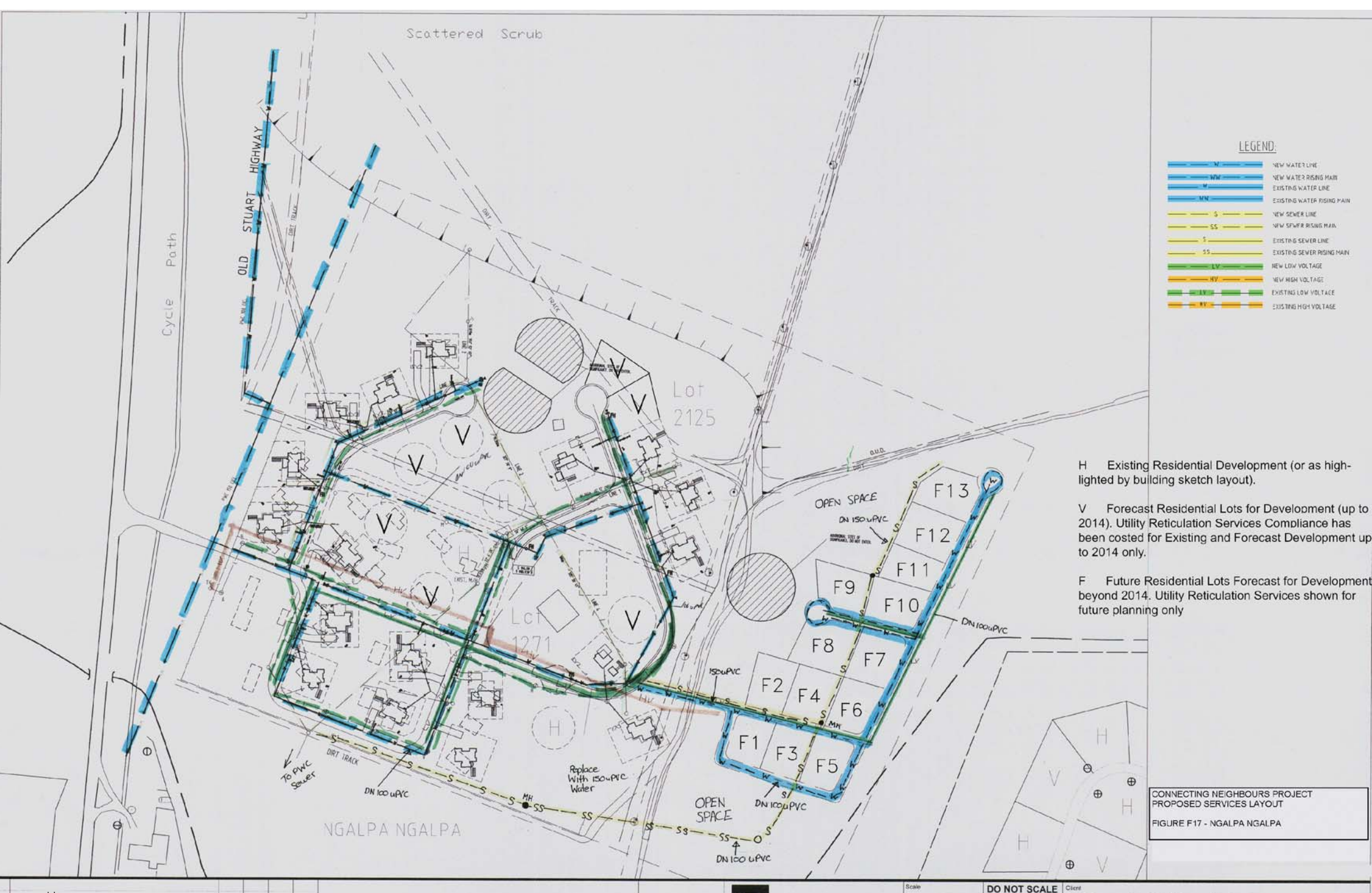
SLAP Map

Ngalpa Ngalpa (Tennant Creek Town Camp)

Mulga Camp

Barkly Shire Council

Community ID: 246



H Existing Residential Development (or as high-lighted by building sketch layout).

V Forecast Residential Lots for Development (up to 2014). Utility Reticulation Services Compliance has been costed for Existing and Forecast Development up to 2014 only.

F Future Residential Lots Forecast for Development beyond 2014. Utility Reticulation Services shown for future planning only

CONNECTING NEIGHBOURS PROJECT
PROPOSED SERVICES LAYOUT

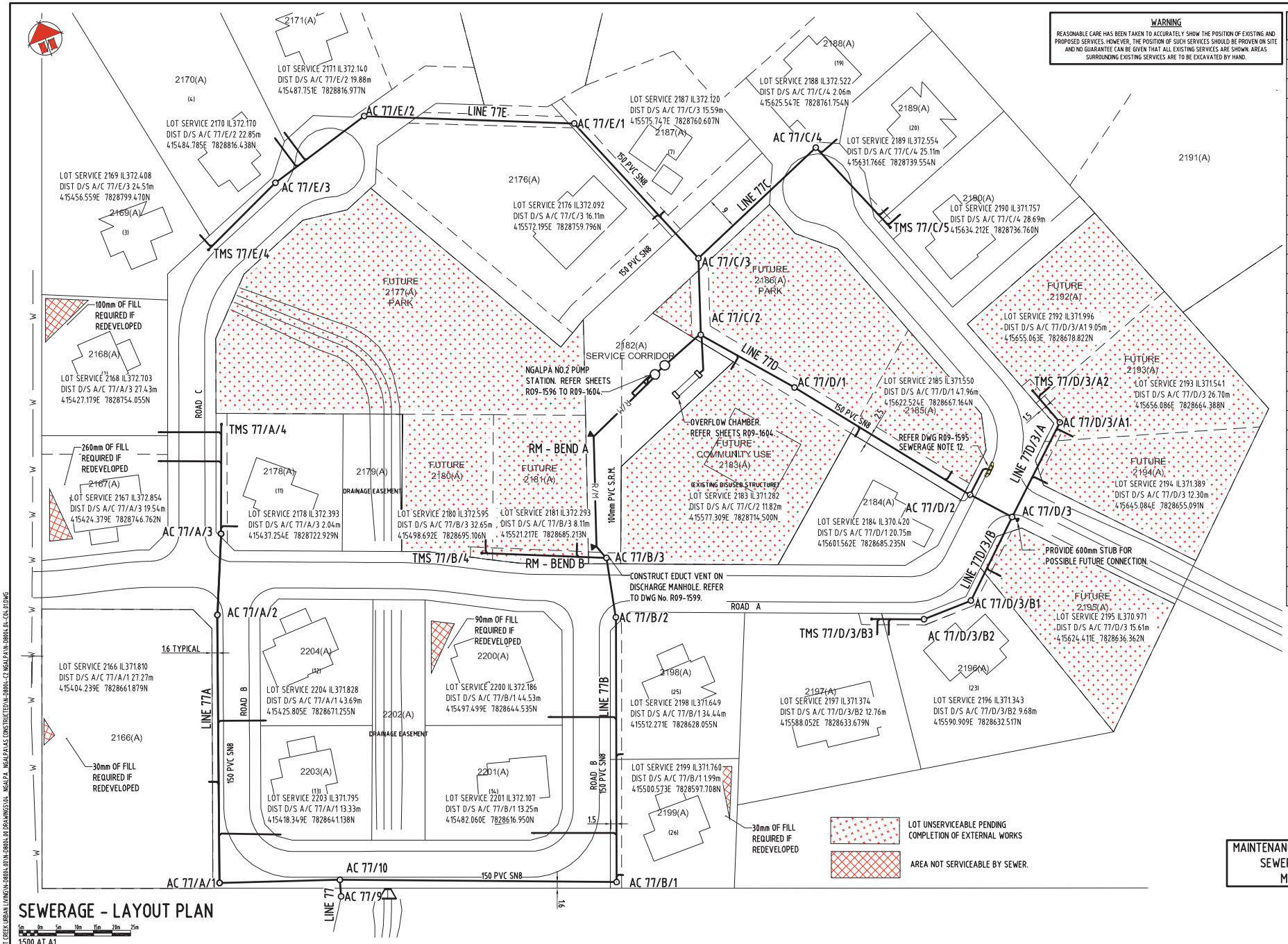
FIGURE F17 - NGALPA NGALPA

1063

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

GHD
MANAGEMENT ENGINEERING ENVIRONMENT

Scale	DO NOT SCALE	Client	
Drawn	Designed	Project	Connecting Neighbours Project
Drafting Check	Design Check	Title	
Approved			
Date		Original Size	A1
This Drawing must not be used for Construction unless signed as Approved		Drawing No:	Rev: A



WARNING

REASONABLE CARE HAS BEEN TAKEN TO ACCURATELY SHOW THE POSITION OF EXISTING AND PROPOSED SERVICES. HOWEVER, THE POSITION OF SUCH SERVICES SHOULD BE PROVEN ON SITE AND NO GUARANTEE CAN BE GIVEN THAT ALL EXISTING SERVICES ARE SHOWN. AREAS SURROUNDING EXISTING SERVICES ARE TO BE EXCAVATED BY HAND.

SETTING OUT TABLE

STRUCTURE	EASTING	NORTHING
AC 77/9	415427.679	7828619.680
AC 77/10	415428.969	7828623.968
AC 77/A/1	415398.426	7828634.886
AC 77/A/2	415423.916	7828702.473
AC 77/A/3	415432.719	7828722.518
TMS 77/A/4	415443.471	7828750.009
AC 77/B/1	415498.317	7828596.519
AC 77/B/2	415523.875	7828663.153
AC 77/B/3	415527.295	7828678.993
TMS 77/B/4	415496.404	7828692.325
AC 77/C/2	415572.668	7828725.894
AC 77/C/3	415579.549	7828745.373
AC 77/C/4	415619.813	7828761.807
TMS 77/C/5	415630.812	7828734.491
AC 77/D/1	415591.154	7828703.552
AC 77/D/2	415624.849	7828659.520
AC 77/D/3	415633.256	7828649.840
AC 77/D/3/A1	415654.474	7828668.990
TMS 77/D/3/A2	415650.719	7828679.563
AC 77/D/3/B1	415614.739	7828632.914
AC 77/D/3/B2	415601.354	7828632.642
TMS 77/D/3/B3	415587.883	7828637.697
AC 77/E/1	415561.422	7828791.341
AC 77/E/2	415509.334	7828813.626
AC 77/E/3	415480.502	7828805.464
TMS 77/E/4	415457.145	7828795.146
RM - BEND A	415535.890	7828710.730
RM - BEND B	415525.896	7828682.800

NOTE
MANHOLES AC77/B/3 AND AC 77/B/2 SHALL BE MINIMUM CLASS N40, TYPE SR CONCRETE. FULL INTERIOR OF MANHOLES SHALL BE POLYURETHANE COATED TO PWC APPROVAL. REFER NOTE 8 (R09-1595)

MAINTENANCE HOLES MANUFACTURED BY ROCLA. SEWER PIPE & MAINTENANCE SHAFTS MANUFACTURED BY VINIDEX.

SEWERAGE - LAYOUT PLAN

1:500 AT A1.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
5	AS CONSTRUCTED	05.07.11	DMB
4	AS CONSTRUCTED	21.04.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.09	DMB
1	ISSUE FOR CONSTRUCTION	21.09.09	DMB

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The Association of Consulting Engineers Australia
N-D8004.04

territory housing
IPT-02-246-CVL-DWG-0056

DRAWN	SGE	CHECKED	JTL
DATE	MAY 2008	DATE	JUN 2010
DESIGNED	SGE	CHECKED	DMB
DATE	MAY 2008	DATE	JUN 2010
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE - LAYOUT PLAN

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.01 OF 35	R08-1842	5	A1

G:\PROJECTS\2004-0PUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.00\N-D8004.00 DRAWINGS\N- D8004.00 NGALPA NGALPA\AS CONSTRUCTED\N-D8004.04-C2 NGALPA N-D8004.04-C04.01.DWG

GENERAL NOTES

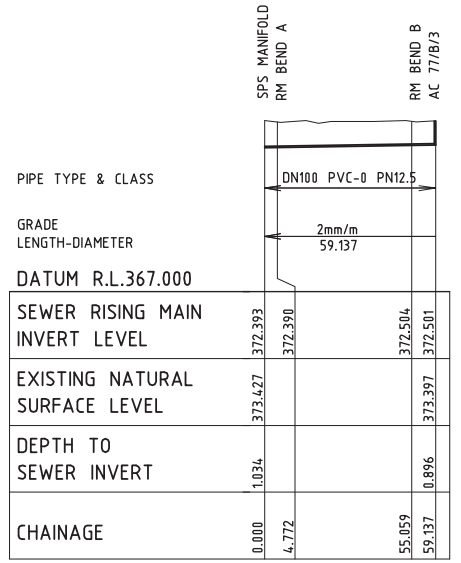
1. DESIGN AND CONSTRUCTION OF THE WATER AND SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE POWERWATER CONNECTION CODE AND ASSOCIATED DOCUMENTS.
2. ALL LEVELS GIVEN ARE TO AHD.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
4. MINIMUM COVER TO PIPE IS 750mm IN TRAFFICABLE AREA, 600mm IN OTHER AREAS.
5. PRIOR TO COMMENCEMENT OF WORKS THE CONSTRUCTOR SHALL CHECK THE LOCATION OF ALL UNDERGROUND SERVICES AND CONFIRM FINISHED SURFACE LEVELS AND CHECK THE MATERIAL, DIAMETER, ALIGNMENT, LEVEL AND LOCATION OF EXISTING PIPEWORK AT THE CONNECTION POINT.
6. IT IS NOT GUARANTEED THAT ALL SERVICES ARE SHOWN ON THE DRAWING.
7. OBTAIN PERMIT(S) FROM THE RELEVANT ROAD AUTHORITY PRIOR TO ROAD EXCAVATION.
8. ALL WATER AND SEWER (HYDRAULIC) WORKS SHALL BE CARRIED OUT AS SHOWN ON THE LATEST AMENDMENT OF THE DESIGN DRAWINGS.
9. CONSTRUCTION SITE DRAWINGS MUST BE SIGNED AS 'APPROVED FOR CONSTRUCTION' BY A LAND DEVELOPMENT OFFICER.
10. SEVEN (7) DAYS NOTICE HAS TO BE GIVEN TO LAND DEVELOPMENT, POWERWATER WITH A 'NOTICE OF INTENTION TO START WORK' PRIOR TO COMMENCEMENT OF WORK
    NORTHERN REGION-FACSIMILE 89 247212
    SOUTHERN REGION-FACSIMILE 89 517347.
11. ANY CHANGES TO THIS DRAWING, REQUIRED OR DESIRED DURING THE CONSTRUCTION PHASE MUST BE AUTHORISED BY A LAND DEVELOPMENT OFFICER.
12. ALL MATERIALS USED IN THE CONSTRUCTION OF WORKS TO BE CONNECTED TO POWERWATER INFRASTRUCTURE ARE TO BE AS NOMINATED IN POWERWATER'S "WATER AND SEWER MAINS PRODUCT MANUAL".
13. 'AS CONSTRUCTED' DRAWINGS MUST BE PROVIDED TO LAND DEVELOPMENT, POWERWATER PRIOR TO HANDOVER INSPECTION.
14. SUPERINTENDENT TO CONTACT LAND DEVELOPMENT, POWERWATER TO ARRANGE FOR HANDOVER INSPECTIONS. SEVEN (7) DAYS NOTICE MUST BE PROVIDED PRIOR TO HANDOVER INSPECTIONS.
15. CONNECTIONS TO EXISTING WATER AND SEWER MAINS WILL ONLY BE CARRIED OUT WHEN ALL WORKS UPSTREAM OF THE CONNECTION ARE COMPLETE (IE. TESTED, DISINFECTED WHERE APPLICABLE, BACKFILLED AND CERTIFICATES SUBMITTED) IN ACCORDANCE WITH THE APPROVED DESIGN DRAWINGS AND HAVE SATISFACTORILY PASSED FINAL HANDOVER INSPECTION.
16. POWERWATER PERSONNEL SHALL INSTALL ALL WATER AND SEWER CONNECTIONS TO EXISTING MAINS ONLY AFTER ACCEPTANCE OF THE WORK HAS BEEN ACHIEVED. THE CONSTRUCTOR IS RESPONSIBLE FOR ALL CONNECTION FEES, MATERIALS AND LABOUR FOR EXCAVATION, BACKFILLING AND REINSTATEMENT.
17. THE CONTRACTOR IS TO ARRANGE AND ATTEND A MEETING WITH PWC, THE HYDRAULIC CERTIFIER AND THE DEVELOPER PRIOR TO COMMENCEMENT OF SITE WORKS.
18. 'AS CONSTRUCTED' DRAWINGS AND OTHER INSTALLATION DOCUMENTATION MUST BE PROVIDED TO SERVICES DEVELOPMENT, POWER AND WATER PRIOR TO HANDOVER INSPECTION. ENSURE ALL AS CONSTRUCTED INFORMATION HAS BEEN PICKED UP BY THE SURVEYOR PRIOR TO BACKFILLING.
19. 'AS CONSTRUCTED' DRAWINGS TO BE CERTIFIED BY THE CERTIFYING ENGINEER. 'AS CONSTRUCTED' SURVEY BY A REGISTERED SURVEYOR. PROVIDE AS HARD COPY 1 x A3 PAPER, 1 x A1 FILM; AS WELL AS DIGITAL MICROSTATION DGN. FOR WATER SHOW POSITION (CO-ORDINATES TO MGA 94 & LEVELS TO AHD) FOR ALL VALVES, FIRE HYDRANTS, TEES, BEND AND LINE ENDS. SHOW SEPARATION DISTANCES/LEVELS FOR INTERSECTING SERVICES. FOR SEWER SHOW POSITION (CO-ORDINATES TO MGA 94 & LEVELS TO AHD) OF ALL ACCESS CHAMBERS, ACCESS SHAFTS, INSPECTION OPENINGS, SEPARATION DISTANCES/LEVELS TO CROSSING SERVICES, ALL OTHER VALUES REQUIRED TO CERTIFY COMPLIANCE OF THE DRAWINGS. SHOW FINISHED SURFACE LEVEL AT LOT CORNERS TO VERIFY LOT COVERAGE. PROVIDE MANUFACTURER AND MODEL DETAILS FOR ALL MAIN COMPONENTS.

SEWERAGE

1. ALL GRAVITY SEWER PIPES SHALL BE uPVC CLASS SN8 WITH STYRENE-BUTADIENE RUBBER RING JOINTS (SBR), UNLESS NOTED OTHERWISE.
2. SEWERS 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.
3. ALL GRAVITY SEWERS ARE DN150, UNLESS NOTED OTHERWISE.
4. THE SUPERINTENDENT SHALL DETERMINE SEWER PIPE BEDDING TYPE AFTER INSPECTION OF THE EXCAVATED TRENCH.
5. MAINTENANCE HOLE COVERS SLABS SHALL FINISH AT;
   a) FINISHED SURFACE LEVEL IN ROAD RESERVES AND FOOTPATHS AND MATCH CROSS FALL TO A MAXIMUM OF 2 DEGREES (42mm ACROSS THE DIAMETER OF A 1200mm MH COVER); AND
   b) 150mm ABOVE SURFACE LEVEL IN PRIVATE PROPERTY AND OPEN SPACE.
6. THE CONSTRUCTOR SHALL INSCRIBE THE MAINTENANCE HOLE COVER WITH THE IDENTIFYING NUMBER AS SHOWN ON THE DRAWINGS.
7. ALL NEW SEWER MANHOLES/ACCESS CHAMBERS ARE TO BE 1200mm DIA. EPOXY COATED.
8. WHERE REQUIRED, POLYURETHANE COATING OF NEW OR EXISTING MANHOLES SHALL BE ELASTON (W80) SPRAY POLYURETHANE ELASTOMER OR PWC APPROVED EQUIVALENT. APPLY IN 2 COATS EACH OF 2.0mm THICKNESS IN CONTRASTING COLOURS. SPRAY IN A CONTINUOUS APPLICATION WITH NO DRY JOINTS.
9. BEDDING OF PIPE BELOW INSPECTION OPENINGS MUST BE COMPACTED TO MIN 90% OF MODIFIED MAXIMUM DRY DENSITY. USE APPROVED BEDDING AND FULLY FLOOD OR COMPACT BY APPROVED TECHNIQUES.
10. USE CONCRETE WITH 20mm MAXIMUM AGGREGATE AND 80mm NOMINAL SLUMP COMPLYING WITH AS 1379. USE GRADE N20 CONCRETE FOR THRUST BLOCKS AND GRADE N32 CONCRETE FOR ALL OTHER PURPOSES UNLESS NOTED OTHERWISE. POUR THRUST BLOCKS AGAINST UNDISTURBED GROUND. PROVIDE FELT OR APPROVED PLASTIC BOND BREAKER BETWEEN PIPE / FITTINGS AND CONCRETE.
11. USE HEAVY DUTY INSPECTION OPENING OPTION FOR DRAWING NUMBERS W2-1-05, W2-1-06 & W2-2-07.
12. SECONDARY OVERFLOW TO OUTLET INTO STORMWATER SYSTEM. PROVIDE 300mm WALL MOUNTED FLAP GATE. MODEL: WATERGATES SP FCA-L1.

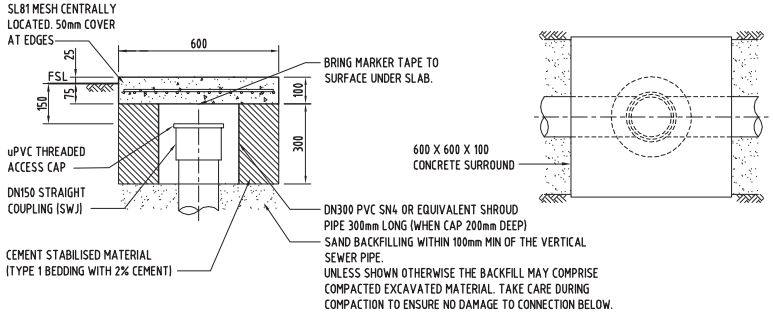
HOUSE CONNECTIONS

LOT NO.	DISTANCE FROM DOWNSTREAM ACCESS CHAMBER (m)	DOWNSTREAM ACCESS CHAMBER NO.	IL OF HOUSE CONNECTION AT IO (m)	DISTANCE HOUSE CONNECTION EXTENDS INTO PROPERTY (m)	HOUSE CONNECTION TYPE
2169	24.51	77/E/3	372.408	1.6m	1
2170	22.85	77/E/2	372.170	3.6m	1
2171	19.88	77/E/2	372.140	1.6m	1
2176	16.11	77/C/3	372.092	0.3m	2
2187	15.59	77/C/3	372.120	0.3m	2
2192	9.05	77/D/3/A1	371.996	2.4m	1
2193	26.70	77/D/3	371.541	2.8m	1
2194	12.30	77/D/3	371.389	1.2m	1
2197	12.76	77/D/3/B2	371.374	2.4m	1
2196	9.68	77/D/3/B2	371.343	2.4m	1
2195	15.61	77/D/3	370.971	2.4m	1
2185	47.96	77/D/1	371.550	0.3m	2
2184	20.75	77/D/1	370.420	0.3m	1
2183	11.82	77/C/2	371.282	1.6m	2
2190	28.69	77/C/4	371.757	2.4m	1
2189	25.11	77/C/4	372.554	1.2m	2
2188	2.06	77/C/4	372.522	1.2m	2
2180	32.65	77/B/3	372.595	2.0m	1
2181	8.11	77/B/3	372.293	1.8m	1
2200	44.53	77/B/1	372.186	3.4m	4
2198	34.44	77/B/1	371.649	0.3m	1
2201	13.25	77/B/1	372.107	4.4m	4
2199	1.99	77/B/1	371.760	0.3m	1
2168	27.43	77/A/3	372.703	2.2m	4
2167	19.54	77/A/3	372.854	2.2m	4
2178	2.04	77/A/3	372.393	2.4m	1
2204	43.69	77/A/1	371.828	1.4m	4
2166	27.27	77/A/1	371.810	2.4m	1
2203	13.33	77/A/1	371.795	1.4m	4



SEWER RISING MAIN - LONGITUDINAL SECTION

HORIZONTAL 1:1000 AT A1
VERTICAL 1:100 AT A1



ON LOT CONNECTION INSPECTION OPENING DETAIL

NTS

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
5	AS CONSTRUCTED	05.07.11	DMB
4	AS CONSTRUCTED	21.04.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.09	DMB
1	ISSUE FOR CONSTRUCTION	21.09.09	DMB

AMENDMENTS

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The Association of Consulting Engineers Australia
N-D8004.04

territory housing

IPT-02-246-CVL-DWG-0057

DRAWN	CHECKED
SGE	JTL
DATE MAY 2008	DATE JUN 2010
DESIGNED	CHECKED
SGE	DMB
DATE MAY 2008	DATE JUN 2010
DESIGN PROJECT LEADER	PROJECT OFFICER
DATE	DATE

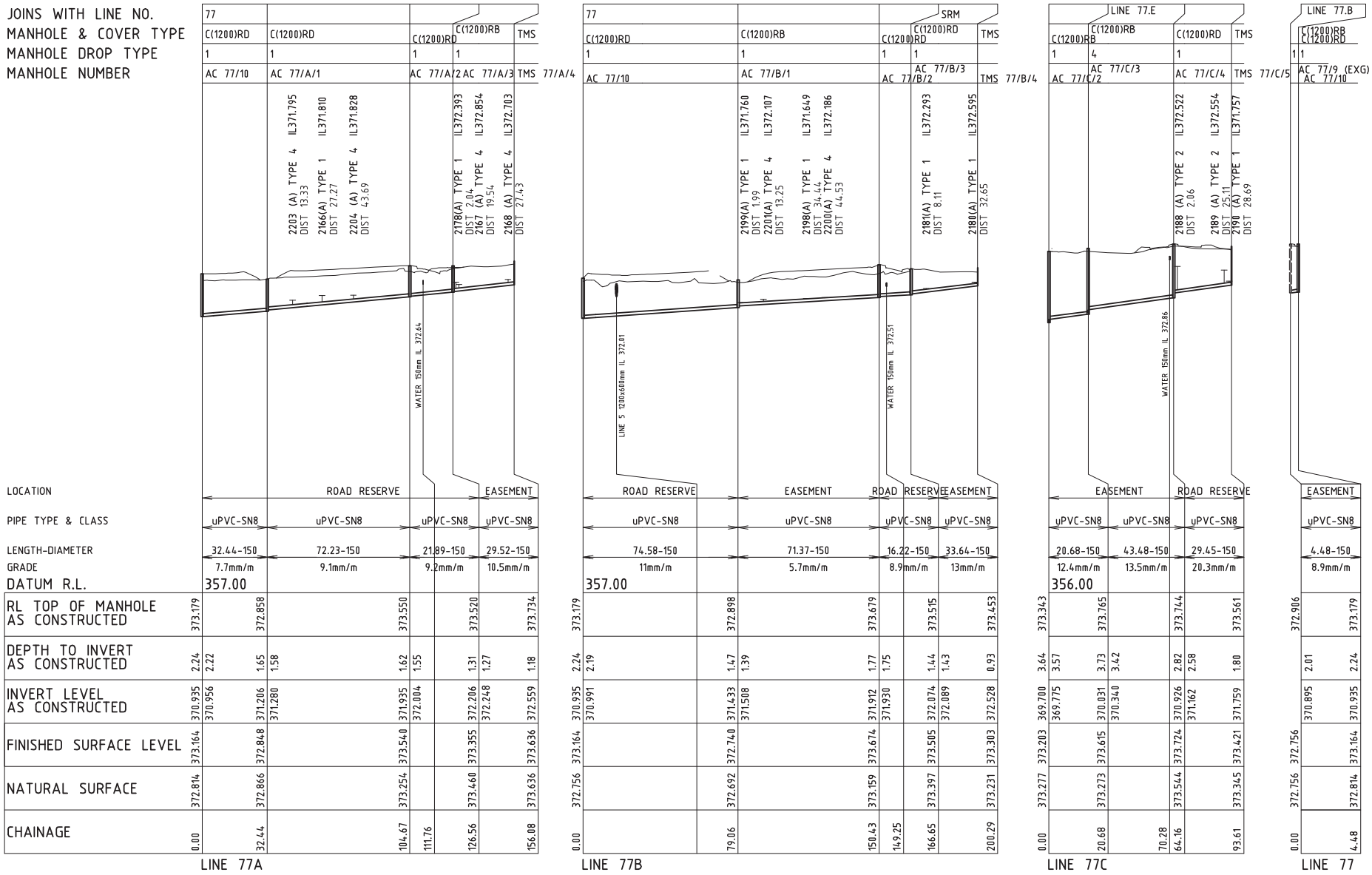
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE - NOTES AND RISING MAIN LONGITUDINAL SECTION

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.02 OF 35	R09-1595	5	A1

G:\PROJECTS 2008-09\QS1W-0809A - TENNANT CREEK URBAN LIVING\N-0800A.01\N-0800A.01 DRAWINGS\N - NGALPA NGALPA AS CONSTRUCTED\N-0800A-C2 NGALPA AN-0809A.04 - C04.02.DWG



SEWER LONGITUDINAL SECTIONS LINES 77A, 77B, 77 & 77C

HORIZONTAL 1:1000 AT A1
VERTICAL 1:100 AT A1

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
5	AS CONSTRUCTED	05.07.11	DMB
4	AS CONSTRUCTED	21.04.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.09	DMB
1	ISSUE FOR CONSTRUCTION	21.09.09	DMB

AMENDMENTS

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The Association of Consulting Engineers Australia
N-D8004.04

territory housing
IPT-02-246-CVL-DWG-0058

DRAWN	SGE	CHECKED	JTL
DATE	MAY 2008	DATE	JUN 2010
DESIGNED	SGE	CHECKED	DMB
DATE	MAY 2008	DATE	JUN 2010
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

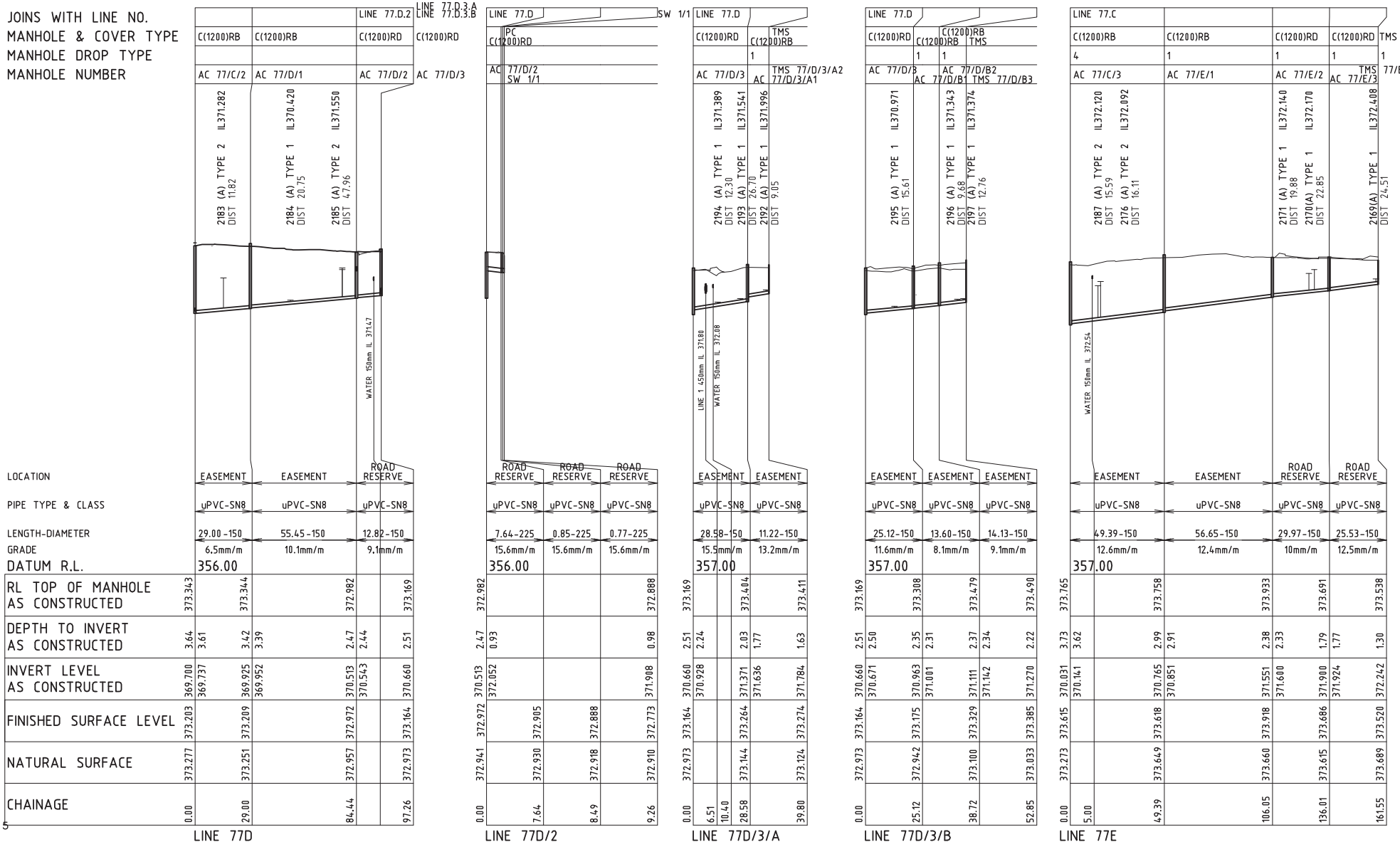
TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE - LONGITUDINAL SECTIONS, LINES 77, 77A, 77B & 77C

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.03 OF 35	R08-1843	5	A1

G:\PROJECTS\2008-OPUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.00\N-D8004.00 DRAWINGS\04 - NGALPA\AS CONSTRUCTED\N-D8004-C2-NGALPA\N-D8004.04-C04.03.DWG

1966



SEWERAGE - LONGITUDINAL SECTIONS LINES 77D, 77D2, 77D3A, 77D3B & 77E

HORIZONTAL 1:1000 AT A1
VERTICAL 1:100 AT A1

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
5	AS CONSTRUCTED	05.07.11	DMB
4	AS CONSTRUCTED	21.04.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.09	DMB
1	ISSUE FOR CONSTRUCTION	21.09.09	DMB

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territory housing
IPT-02-246-CVL-DWG-0059

DRAWN	SGE	CHECKED	JTL
DATE	MAY 2008	DATE	JUN 2010
DESIGNED	SGE	CHECKED	DMB
DATE	MAY 2008	DATE	JUN 2010
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE - LONGITUDINAL SECTIONS, LINES 77D, 77D2, 77D3A, 77D3B, & 77E

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.04 OF 35	R08-1844	5	A1

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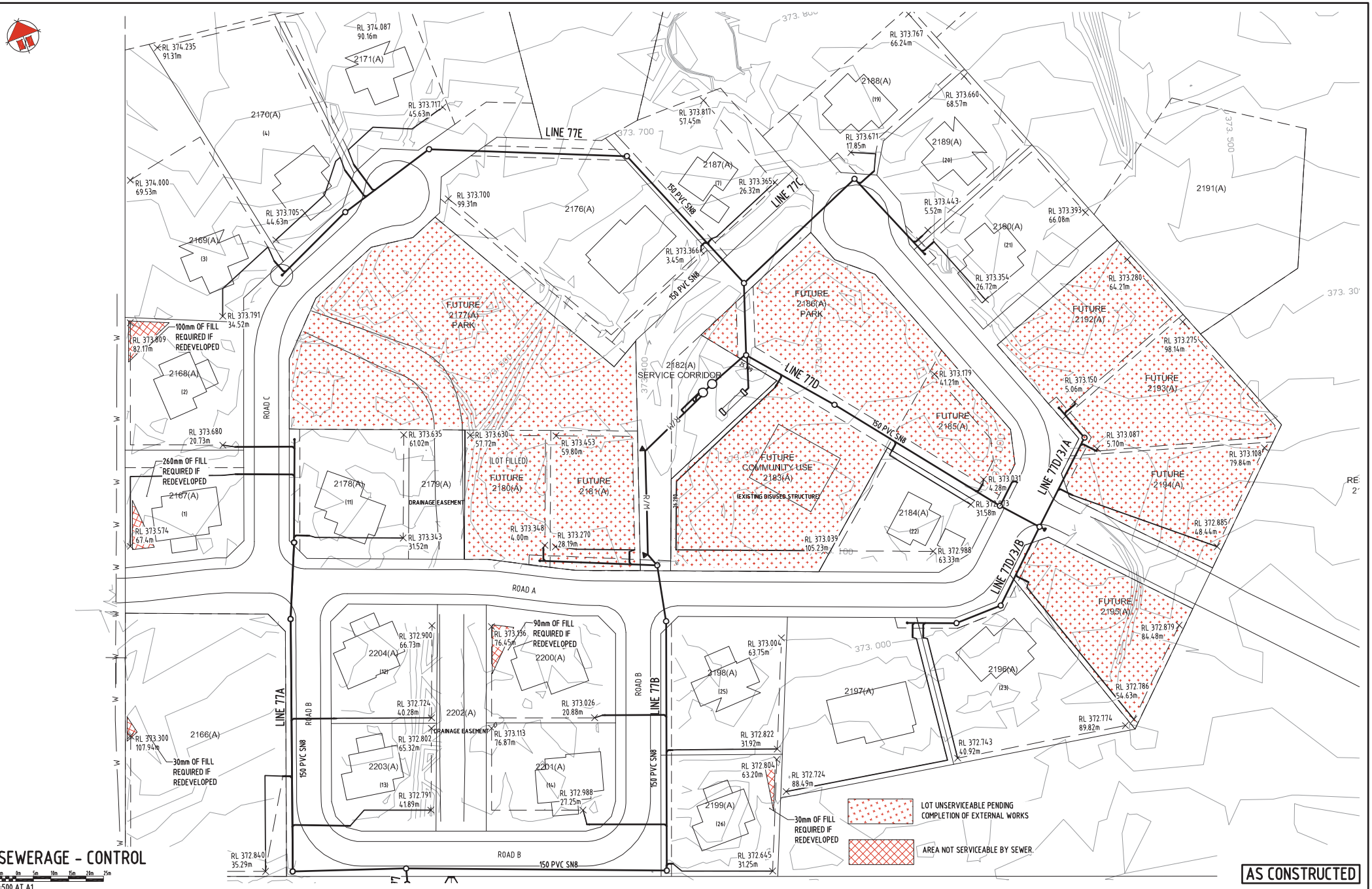
1667



No.	DESCRIPTION	DATE	INT.
2	AS CONSTRUCTED	05.07.11	DMB
1	AS CONSTRUCTED	21.04.11	DMB

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NFA-02-246-CVL-DWG-0001

DRAWN	SGE	CHECKED	JTL
DATE	MAY 2008	DATE	JUN 2008
DESIGNED	SGE	CHECKED	DMB
DATE	MAY 2008	DATE	JUN 2008
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE - CONTROL

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.11 OF 35	B10-14935	2	A1

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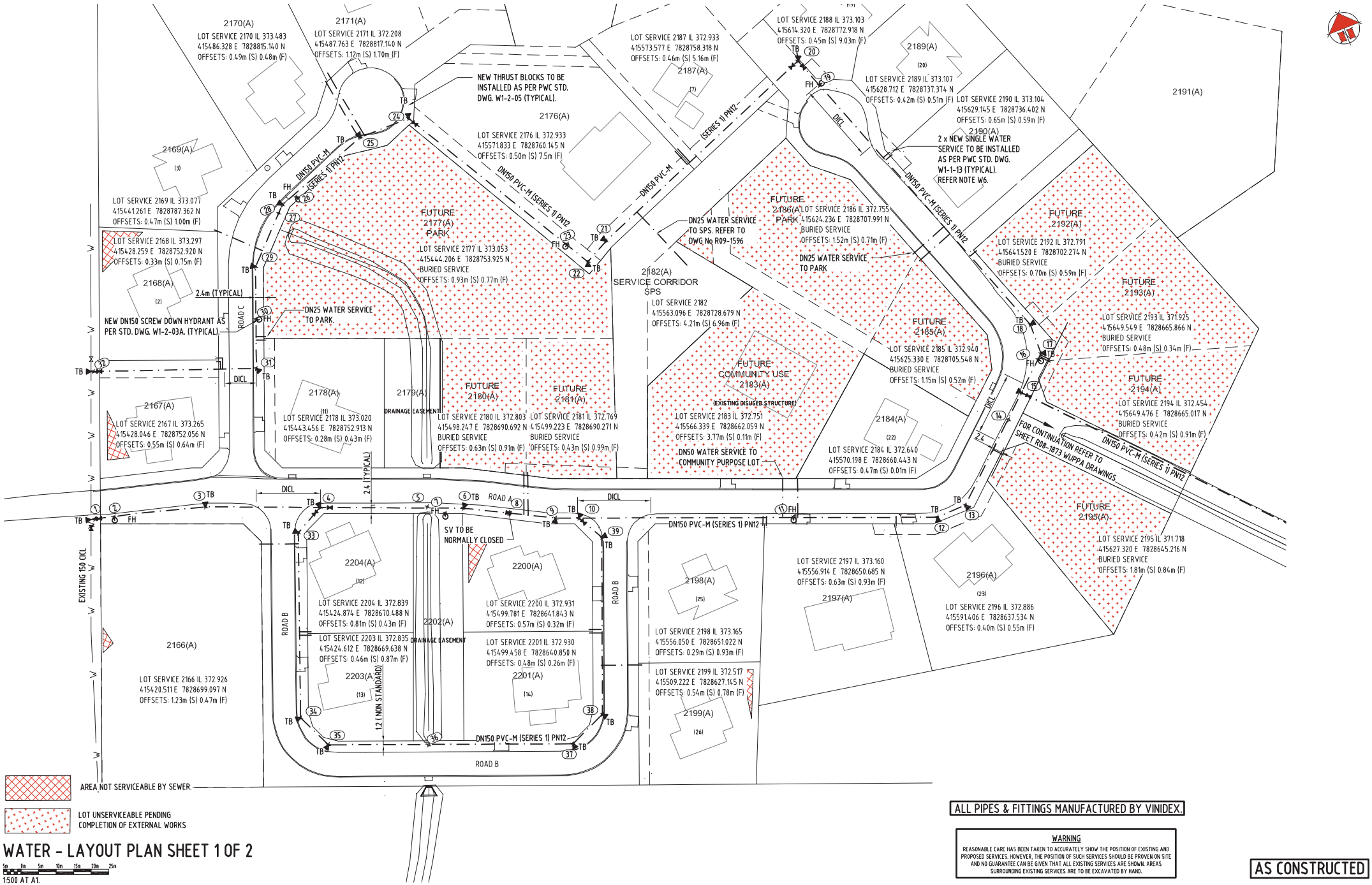

WATER - LAYOUT PLAN SHEET 1 OF 2

5m 0m 5m 10m 15m 20m 25m
1:500 AT A1.

ALL PIPES & FITTINGS MANUFACTURED BY VINIDEX.

WARNING

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AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
	AMENDMENTS		
5	AS CONSTRUCTED	05.07.11	DMB
4	AS CONSTRUCTED	21.04.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
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1	ISSUE FOR CONSTRUCTION	21.09.09	DMB

N-D8004.04

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IPT-02-246-CVL-DWG-0066

DRAWN SGE	DATE MAY 2008	CHECKED JTL	DATE JUN 2010
DESIGNED SGE	DATE MAY 2008	CHECKED DMB	DATE JUN 2010
DESIGN PROJECT LEADER	DATE	PROJECT OFFICER	DATE

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
WATER - LAYOUT PLAN SHEET 1 OF 2

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND	SHEET SIZE
-	-	C05.01 OF 35	R08-1845	5	A1

G:\PROJECTS 2008-0P\US\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.00 DRAWINGS\04 - NGALPA - NGALPA\AS CONSTRUCTED\N-D8004-C2 NGALPA\N-D8004.04-C05.01.DWG

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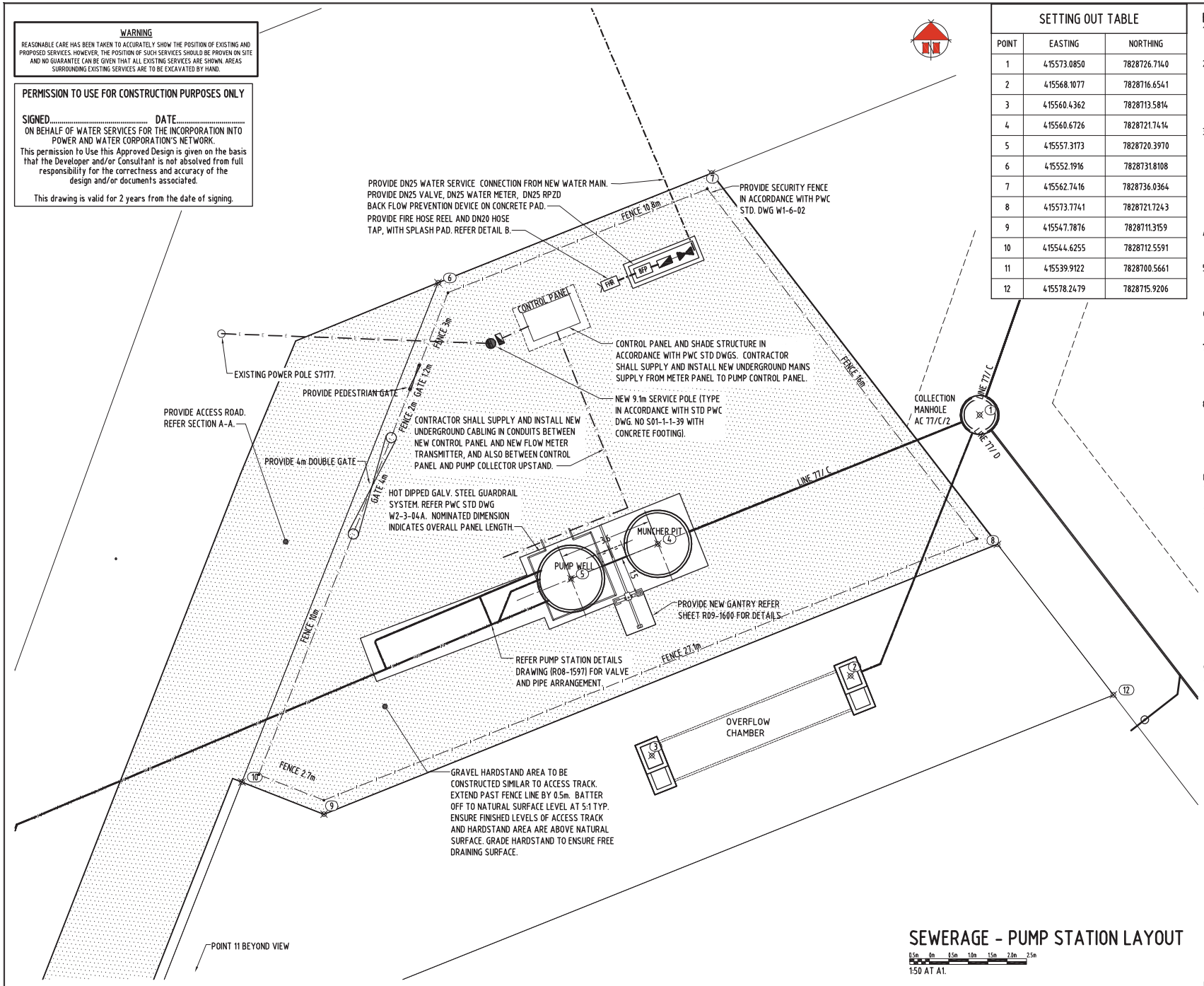
PERMISSION TO USE FOR CONSTRUCTION PURPOSES ONLY

SIGNED..... DATE.....

ON BEHALF OF WATER SERVICES FOR THE INCORPORATION INTO POWER AND WATER CORPORATION'S NETWORK.

This permission to Use this Approved Design is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents associated.

This drawing is valid for 2 years from the date of signing.



SEWERAGE - PUMP STATION LAYOUT

0.5m 0m 0.5m 1.0m 1.5m 2.0m 2.5m

1:50 AT A1.

SETTING OUT TABLE

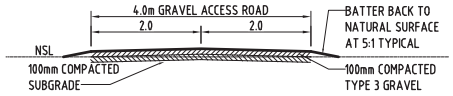
POINT	EASTING	NORTHING
1	415573.0850	7828726.7140
2	415568.1077	7828716.6541
3	415560.4362	7828713.5814
4	415560.6726	7828721.7414
5	415557.3173	7828720.3970
6	415552.1916	7828731.8108
7	415562.7416	7828736.0364
8	415573.7741	7828721.7243
9	415547.7876	7828711.3159
10	415544.6255	7828712.5591
11	415539.9122	7828700.5661
12	415578.2479	7828715.9206

ELECTRICAL NOTES

1. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS/NZS 3000, AS/NZS 3008.1.1, PWC REGULATIONS & STANDARD PWC DRAWINGS B06-4751 TO B06-4766 INCLUSIVE.
2. CONTRACTOR SHALL SUPPLY & INSTALL NEW OVERHEAD TWISTED AERIAL SUPPLY TO NEW PUMP STATION SERVICE POLE. POLE SHALL BE 9.1m SERVICE POLE (TYPE IN ACCORDANCE WITH PWC STANDARD DWG S01-1-39 & INSTALLED IN ACCORDANCE WITH PWC STANDARD DWG B03-4762). CABLING SHALL BE 4 CORE 16 Sq mm Cu, TWISTED AERIALS & BE RUN BETWEEN EXISTING PWC POWER POLES & NEW SERVICE POLE IN PUMP STATION COMPOUND.
3. CONTRACTOR SHALL SUPPLY & INSTALL NEW SEWERAGE PUMP STATION CONTROL PANELS/CUBICLES THAT SHALL BE PLINTH MOUNTED ON 1800x1600 N20 CONCRETE BASE SLAB (100 THICK, F82 MESH CENTRALLY LOCATED) TOP OF PANELS SHALL BE 2000 ABOVE CONC. BASE IN ACCORDANCE WITH STD PWC DRAWING. CONTRACTOR SHALL SUPPLY & INSTALL 'SHADE STRUCTURE' IN ACCORDANCE WITH PWC STD DWGS B06-4763. SERVICE POLE SHALL ALSO BE FITTED WITH A PWC METER PANEL & FLOODLIGHTS WITH SWITCH NOT ON LIGHT SENSOR IN ACCORDANCE WITH STD PWC DRAWING. NOTE: LUMINAIRE TO BE MOUNTED ON A PROPRIETRY STREET LIGHT ARM TO SUPERINTENDENT APPROVAL.
4. CONTRACTOR SHALL SUPPLY & INSTALL NEW INCOMING SUPPLY CABLING FROM MAINS CONNECTION BOX ON SERVICE POLE TO NEW PUMP CONTROL PANEL/CUBICLE VIA PWC METER BOX IN ACCORDANCE WITH PWC STD DRAWING B06-4762.
5. CONTRACTOR SHALL SUPPLY & INSTALL POWER CABLING TO SEWERAGE PUMPS AND MUFFIN MONSTER VIA UPSTANDS/DECONTACTOR PLUGS & SOCKETS IN ACCORDANCE WITH PWC STD DRAWING. CABLING SHALL BE RUN UNDERGROUND WITH MINIMUM 600 COVER TO TOP OF CONDUITS.
6. CONTRACTOR SHALL SUPPLY & INSTALL 1 OFF FLOW METER AT PUMP STATION FLOW METER SHALL BE LOCATED IN ABOVE GROUND DELIVERY PIPEWORK IN PUMP STATION COMPOUND, REFER TO DRAWING R09-1597.
7. CONTRACTOR SHALL SUPPLY & INSTALL CONTROL CABLING BTW FLOAT SWITCHES (VIA CONNECTOR UPSTAND) TO CONTROL PANEL/CUBICLE (RUN UNDERGROUND IN 50 HD uPVC CONDUIT). SUPPLY & INSTALL CONTROL CABLING FROM FLOW METER/TRANSMITTER TO CONTROL PANEL (RUN UNDERGROUND IN 50 HD uPVC CONDUIT). PROVIDE MINIMUM 600 COVER TO TOP OF CONDUITS.
8. AT COMPLETION OF WORKS, CONTRACTOR SHALL CARRY OUT TESTING/COMMISSIONING OF COMPLETE ELECTRICAL SYSTEM AT PUMP STATION TO THE SATISFACTION OF THE SUPERINTENDENT. PROVIDE O&M MANUALS AND ALL RELEVANT PAPERWORK AS DETAILED. IN ADDITION, CONTRACTOR SHALL PROVIDE 'AS INSTALLED' DRAWINGS INCLUDING COPIES OF STANDARD PWC DRAWINGS & INCORPORATE WITHIN O&M MANUALS.

GENERAL NOTES

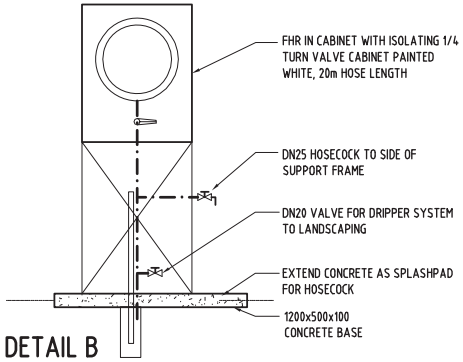
1. EXISTING CONCRETE SLAB TO BE DEMOLISHED, AND NEW GRAVEL HARDSTAND AREA TO BE CONSTRUCTED.
2. EXISTING FENCE TO BE REMOVED. REUSE EXISTING FENCING MATERIALS WHERE POSSIBLE IN CONSTRUCTION OF NEW FENCE.



SECTION A-A

0.5m 0m 0.5m 1.0m 1.5m 2.0m 2.5m

1:50 AT A1.



DETAIL B

NTS

No.	DESCRIPTION	DATE	INIT.
6	COORDINATES ADDED	28.10.2010	JTL
5	ISSUE FOR CONSTRUCTION (FENCING DIMENSIONS UPDATED ONLY)	26.08.2010	JTL
4	ISSUE FOR CONSTRUCTION (PENDING AUTHORITY APPROVAL)	30.06.2010	DMB
3	ISSUE FOR CONSTRUCTION	12.01.2010	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.2009	DMB
1	ISSUE FOR CONSTRUCTION	21.09.2009	DMB

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The Association of Consulting Engineers Australia

N-D8004.04

territory housing

IPT-02-246-CVL-DWG-0060

DRAWN	SGE	CHECKED	JTL
DATE	MAY 2008	DATE	JUN 2010
DESIGNED	SGE	CHECKED	DMB
DATE	MAY 2008	DATE	JUN 2010
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

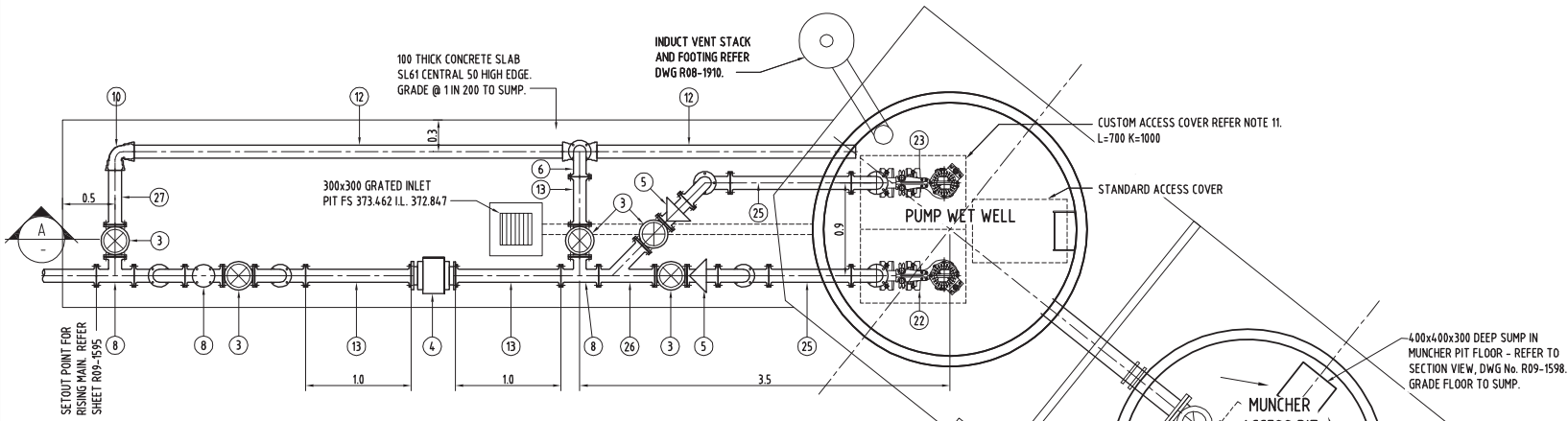
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE PUMP STATION - SITE LAYOUT PLAN

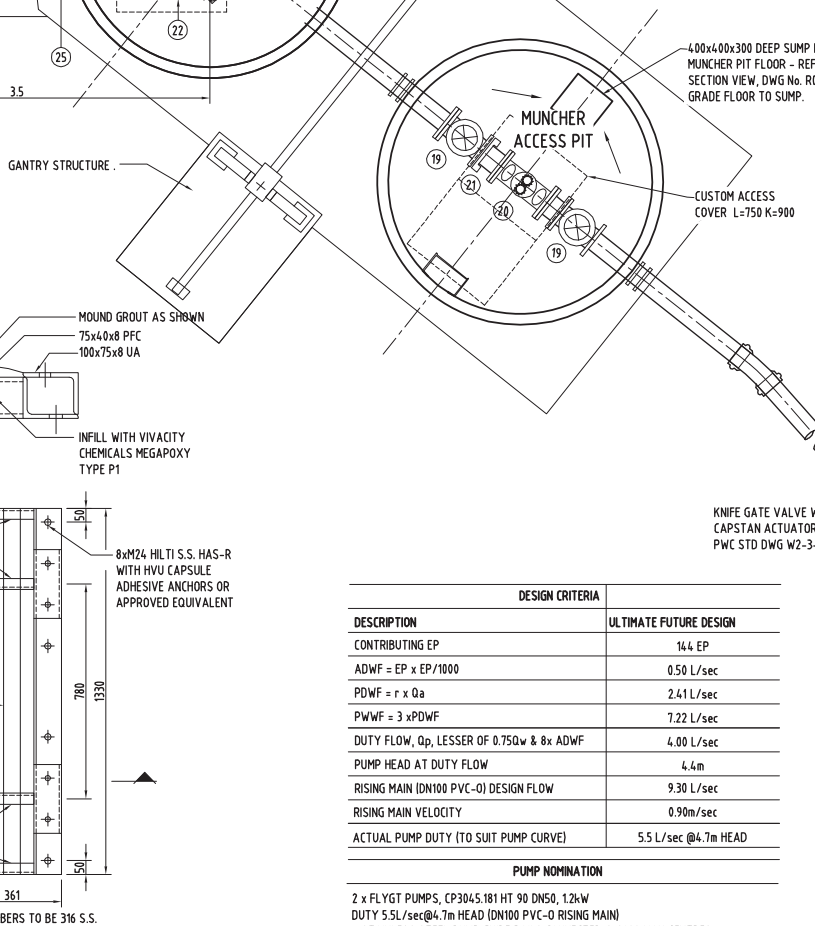
1070

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND	SHEET SIZE
-	-	C04.05 OF 35	R09-1596	6	A1



PUMP STATION LAYOUT PLAN

N.T.S.

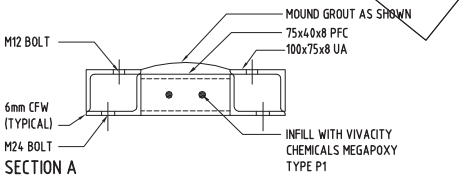


NOTES:

1. ALL DICL PIPEWORK TO COMPLY WITH WASAA STANDARDS FOR USE IN SEWER SYSTEMS.
2. ALL FLANGES DRILLED TO AS2129 TABLE 'C'
3. SEE SITE PLAN FOR LOCATION OF ELECTRICAL CONTROL CABINETS AND HOSECOCK.
4. ALL REQUIRED BRACKETRY IN WET WELL TO BE CONSTRUCTED OF STAINLESS STEEL (GRADE 316) AS PER STD. DWG. No. W2-3-02.
5. ALL ANCHORS IN WET WELL TO BE APPROVED STAINLESS STEEL GRADE 316 WITH GRADE 304 NUTS UNLESS OTHERWISE APPROVED.
6. FOR SETOUT DETAILS AT TOP OF LADDER REFER TO W2-2-04 SECTIONS A & E
7. ALL VALVES TO BE CLOCKWISE CLOSING.
8. PUMP WELL AND ACCESS CHAMBER BASES TO BE CONSTRUCTED AGAINST UNDISTURBED GROUND.
9. WET WELL TO BE COATED WITH POLYURETHANE COATING. REFER SEWERAGE NOTE 8 DWG R08-1595.
10. ALL CONCRETE SHALL BE SULPHATE RESISTANT (SR), CLASS N50 (50 MPa f'c, 20mm MAX. AGGREGATE), SUPPLIED & PLACED IN ACCORDANCE WITH AS3600.
11. ALL CUSTOM ACCESS CHAMBER COVERS WITHIN PUMP STATION COMPOUND TO BE 2 PART HINGED ALUMINIUM CHEQUER PLATE COVER FABRICATED IN ACCORDANCE WITH PWC STD. DWG. W2-3-02. DIMENSIONS AS NOTED ON PLAN.
12. FLOWMETER TO BE EARTHED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
13. MOUNT PUMPS ON SS BASE PLATE SET INTO WET WELL CONCRETE FLOOR. REFER DETAILS.
14. LEVELS TO BE MEASURED USING FLYGT PRESSURE TRANSDUCER WITH MOUNTING BRACKET AND HOOK FOR CABLE. LOCATE NEAR TOP OF WELL

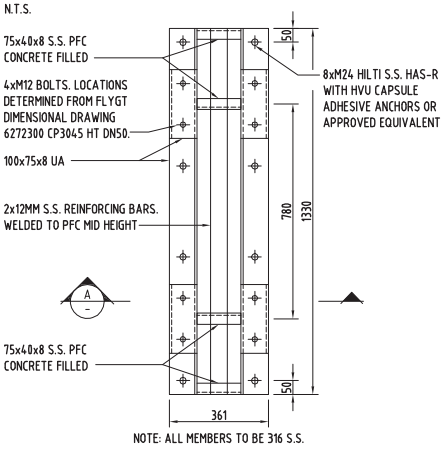
MANUALS:

1. PROVIDE FULL OPERATION AND MAINTENANCE MANUALS FOR THE PUMP STATION COMPLETE WITH AS CONSTRUCTED DRAWINGS AND COMMISSIONING TEST RESULTS.
2. ONE ELECTRONIC COPY OF THE MANUALS AND FOUR HARD COPY MANUALS ARE TO BE PROVIDED. INCLUDE DESIGN CALCULATIONS, COMMISSIONING TEST RESULTS TOGETHER WITH ALL SET POINT VALUES. INCLUDE ALL TECHNICAL INFORMATION REQUIRED TO SATISFACTORILY OPERATE, MAINTAIN AND REFURBISH THE EQUIPMENT.
3. THE MANUALS ARE TO BE COMPREHENSIVE AND FULLY INDEXED, SUBSECTIONS ARE TO BE CLEARLY MARKED AND TABBED FOR QUICK REFERENCE. A DRAFT COPY OF THE DRAWINGS AND MANUALS ARE TO BE AVAILABLE AT THE TIME OF COMMISSIONING.
4. THE FORMAT IS TO BE A4. BOUND IN A4 RING, LOOSE LEAF HARD COVER BINDER. FINAL COPIES OF ALL DRAWINGS AND MANUALS ARE TO BE PROVIDED PRIOR TO FINAL ACCEPTANCE OF THE WORKS BY POWER AND WATER. DRAWINGS IN MANUALS TO BE A3 IF READABLE, OTHERWISE A1.
5. FULL NAMEPLATE INFORMATION IS TO BE RECORDED AND PRESENTED IN SUMMARY SHEETS FOR ITEMS SUCH AS PUMPS, VALVES PRESSURE TRANSDUCERS, FLOWMETERS. INCLUDE MANUFACTURER/SUPPLIERS CONTACT DETAILS FOR ALL SIGNIFICANT ITEMS OF PLANT.



SECTION A

N.T.S.



NOTE: ALL MEMBERS TO BE 316 S.S.

SS PUMP MOUNT BASE PLATE DETAIL

N.T.S.

DESIGN CRITERIA	
DESCRIPTION	**ULTIMATE FUTURE DESIGN**
CONTRIBUTING EP	144 EP
ADWF = EP x EP/1000	0.50 L/sec
PDWF = r x Qa	2.41 L/sec
PWWF = 3 xPDWF	7.22 L/sec
DUTY FLOW, Qp, LESSER OF 0.75Qw & 8x ADWF	4.00 L/sec
PUMP HEAD AT DUTY FLOW	4.4m
RISING MAIN (DN100 PVC-O) DESIGN FLOW	9.30 L/sec
RISING MAIN VELOCITY	0.90m/sec
ACTUAL PUMP DUTY (TO SUIT PUMP CURVE)	5.5 L/sec @4.7m HEAD

PUMP NOMINATION

2 x FLYGT PUMPS, CP3045.181 HT 90 DN50, 1.2kW
DUTY 5.5L/sec@4.7m HEAD (DN100 PVC-O RISING MAIN)

- STAINLESS STEEL PUMP GUIDE RAILS CONNECTED @ 2000 MAX CENTRES.
- THE SPECIFIED PUMP PERFORMANCE DUTY WILL BE TESTED ON SITE AND MUST BE MET WITH NO NEGATIVE TOLERANCE.

PIPEWORK SCHEDULE	
No.	**DESCRIPTION**
1	WELDED OR BOLTED FLANGE (TYP)
2	PUDDLE FLANGE (TYP)
3	DN100 ISOLATING VALVE - SAUNDERS DIAPHRAGM VALVE - TYPE KB
4	DN100 ABB MAGMASTER FLANGED FLOWMETER -CONVERTER & DISPLAY MOUNTED IN CONTROL PANEL. REFER NOTE 12.
5	ITT FLYGT - HDL TYPE 5087 SINKING BALL NON-RETURN VALVE (TYP)
6	DN100 90° BEND DICL FL-FL (TYP)
7	DISMANTLING JOINT
8	DN100 DICL FL-FL TEE (TYP)
9	STAINLESS STEEL OVERFLOW BAFFLE (TYP). PWC STD DWG W2-3-02.
10	DN100 90° BEND DICL SOC-SOC (TYP)
11	DN100 DICL SOC-SOC-FL TEE
12	DN100 CLASS 12 uPVC (LENGTH TO SUIT)
13	DN100 DICL K9 PIPE FL-FL (LENGTH TO SUIT)
14	DN100 PE100 PN16 PIPE FL-FL (LENGTH TO SUIT)
15	DN100 BLANK FL TAPPED 50 BSP
16	DN50 S/S BALL VALVE & 50 BSP S/S FERRULES
17	DN50 SEWAGE GAS RELEASE VALVE (VENTOMAT RGX TYPE)
18	KNIFE GATE VALVE WITH CAPSTAN ACTUATOR (PWC STD DWG W2-3-01.)
19	DN150 ISOLATING VALVE - SAUNDERS DIAPHRAGM VALVE
20	ITT JWC MM300004T-1206 MUFFIN MONSTER (38 l/sec)
21	DN150 SPIGOT TO FLANGE CONNECTION + DISMANTLING JOINT CLASS 35
22	FLYGT PUMP -A
23	FLYGT PUMP -B
24	DN100 90° BEND STAINLESS STEEL FL-FL GRADE 316
25	DN100 STAINLESS STEEL GRADE 316 (LENGTH TO SUIT)
26	DN100 DICL 45° ANGLE BRANCH FL-FL
27	DN100 DICL K9 PIPE FL-SP (LENGTH TO SUIT)
28	DN100-DN50 PE100 PN16 FL-SP REDUCER (BUTT WELD TO RISER)
29	DN150 uPVC CLASS SN8 DWV 11.25° BEND (SO-SO) (TOTAL BEND 10.8°)

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3	ISSUE FOR CONSTRUCTION	12.01.2010	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.2009	DMB
1	ISSUE FOR CONSTRUCTION	21.09.2009	DMB

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The Association of Consulting Engineers Australia
N-D8004.04

territory housing
IPT-02-246-CVL-DWG-0061

DRAWN	CHECKED
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DATE MAY 2008	DATE JUN 2010
DESIGNED	CHECKED
SGE	DMB
DATE MAY 2008	DATE JUN 2010
DESIGN PROJECT LEADER	PROJECT OFFICER
DATE	DATE

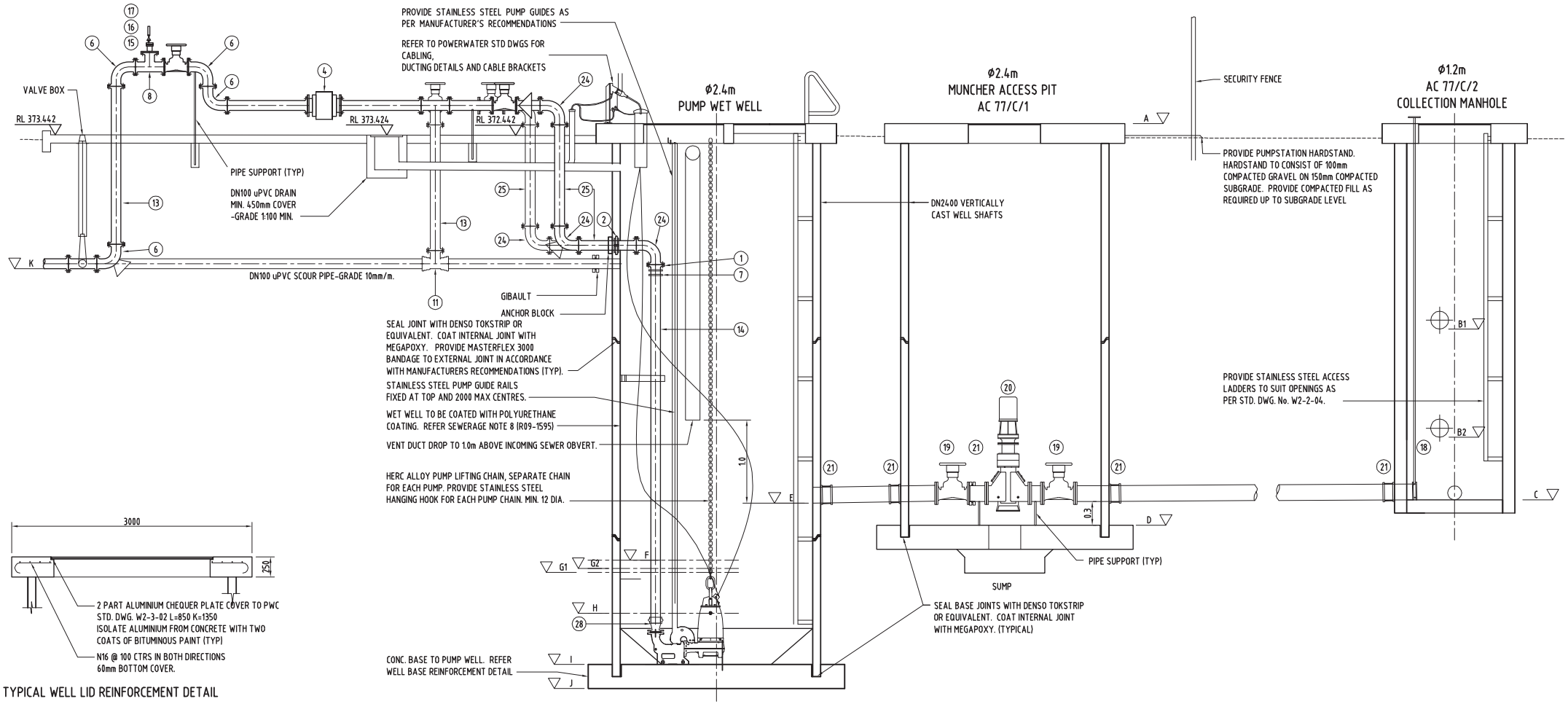
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE PUMP STATION - LAYOUT PLAN

1071

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.06 OF 35	R09-1597	4	A1

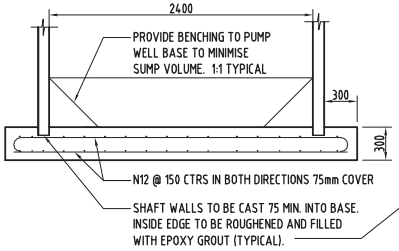


TYPICAL WELL LID REINFORCEMENT DETAIL

N.T.S.

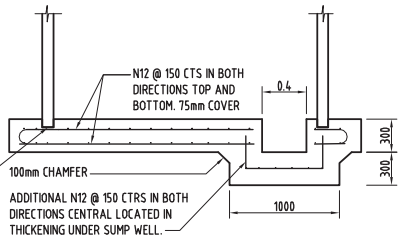
PUMP STATION SECTION VIEW (SECTION A)

N.T.S.



TYPICAL WELL BASE REINFORCEMENT DETAIL

N.T.S.



MUNCHER PIT - SUMP

N.T.S.

WARNING

REASONABLE CARE HAS BEEN TAKEN TO ACCURATELY SHOW THE POSITION OF EXISTING AND PROPOSED SERVICES. HOWEVER, THE POSITION OF SUCH SERVICES SHOULD BE PROVEN ON SITE AND NO GUARANTEE CAN BE GIVEN THAT ALL EXISTING SERVICES ARE SHOWN. AREAS SURROUNDING EXISTING SERVICES ARE TO BE EXCAVATED BY HAND.

LEVEL SCHEDULE

No.	DESCRIPTION	LEVEL
A	TOP OF MANHOLES	373.572
B1	OVERFLOW OUTLET LEVEL TO TANK	371.680
B2	OVERFLOW RETURN LEVEL	371.281
C	INVERT OF COLLECTION AC DISCHARGE	369.680
D	BOTTOM OF MUNCHER PIT	369.288
E	INVERT OF PUMP WELL INCOMING SEWER	369.570
F	HIGH LEVEL ALARM (PUMP 2 START + 200)	368.972
G1	PUMP START LEVEL - (PUMP 1)	368.672
G2	PUMP START LEVEL - (PUMP 2) PUMP 1 + 100	368.772
H	PUMP STOP LEVEL (NOMINAL)	368.452
I	BOTTOM OF PUMP WELL	367.897
J	BASE OF PUMP WELL	367.597
K	INVERT OF RISING MAIN	372.395

No.	DESCRIPTION	DATE	INIT.
4	ISSUE FOR CONSTRUCTION (PENDING AUTHORITY APPROVAL)	30.06.2010	DMB
3	ISSUE FOR CONSTRUCTION	12.01.2010	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.2009	DMB
1	ISSUE FOR CONSTRUCTION	21.09.2009	DMB

AMENDMENTS

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The Association of Consulting Engineers Australia
N-D8004.04

territory housing

IPT-02-246-CVL-DWG-0062

DRAWN	SGE	CHECKED	JTL
DATE	MAY 2008	DATE	JUN 2010
DESIGNED	SGE	CHECKED	DMB
DATE	MAY 2008	DATE	JUN 2010
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

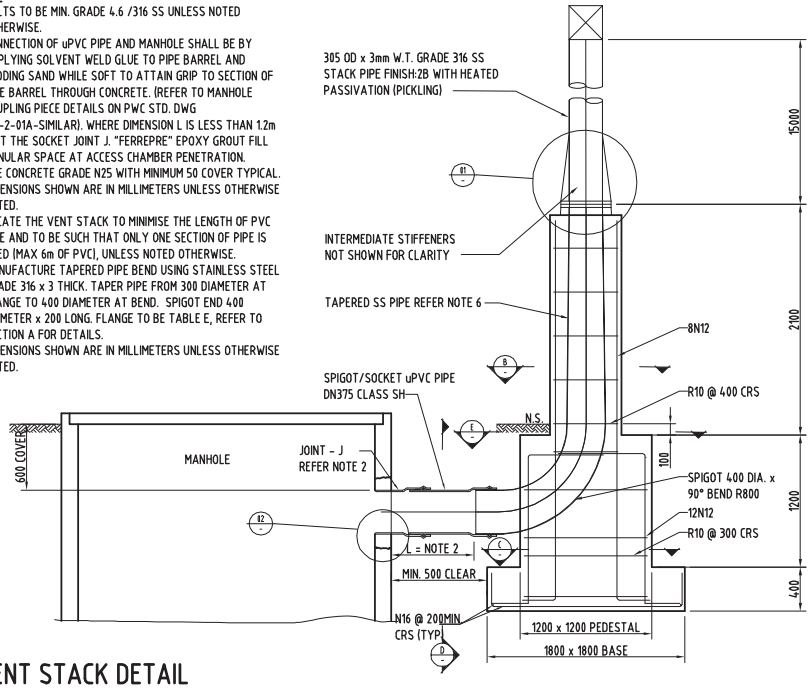
SEWERAGE PUMP STATION - SECTIONAL VIEW

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.07 OF 35	R09-1598	4	A1

1072

NOTES

1. BOLTS TO BE MIN. GRADE 4.6 /316 SS UNLESS NOTED OTHERWISE.
2. CONNECTION OF uPVC PIPE AND MANHOLE SHALL BE BY APPLYING SOLVENT WELD GLUE TO PIPE BARREL AND BEDDING SAND WHILE SOFT TO ATTAIN GRIP TO SECTION OF PIPE BARREL THROUGH CONCRETE. (REFER TO MANHOLE COUPLING PIECE DETAILS ON PWC STD. DWG W2-2-01A-SIMILAR). WHERE DIMENSION L IS LESS THAN 1.2m OMIT THE SOCKET JOINT J. "FERREPRE" EPOXY GROUT FILL ANNULAR SPACE AT ACCESS CHAMBER PENETRATION.
3. USE CONCRETE GRADE N25 WITH MINIMUM 50 COVER TYPICAL.
4. DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
5. LOCATE THE VENT STACK TO MINIMISE THE LENGTH OF PVC PIPE AND TO BE SUCH THAT ONLY ONE SECTION OF PIPE IS USED (MAX 6m OF PVC), UNLESS NOTED OTHERWISE.
6. MANUFACTURE TAPERED PIPE BEND USING STAINLESS STEEL GRADE 316 x 3 THICK. TAPER PIPE FROM 300 DIAMETER AT FLANGE TO 400 DIAMETER AT BEND. SPIGOT END 400 DIAMETER x 200 LONG. FLANGE TO BE TABLE E, REFER TO SECTION A FOR DETAILS.
7. DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.



VENT STACK DETAIL

N.T.S.

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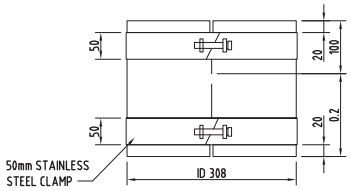
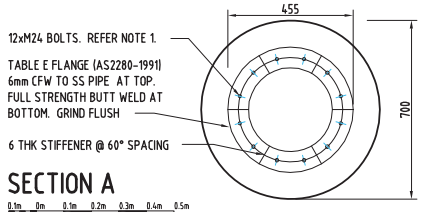


ADAPTER TO FIT THE INDUCT COWL ON THE STACK PIPE. GRADE 316 STAINLESS STEEL, WALL THICKNESS 1.6mm. 308 ID TO SLIDES 100mm OVER INDUCT COWL (306mm OD) AND 150mm OVER STACK PIPE (305mm OD).

CLAMP DETAIL

50mm 0mm 50mm 100mm 150mm 200mm 250mm

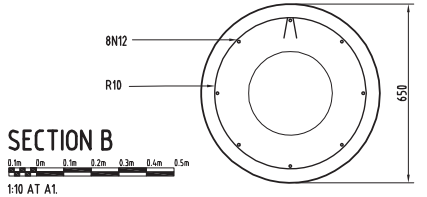
1:5 AT A1.



SECTION A

0.1m 0m 0.1m 0.2m 0.3m 0.4m 0.5m

1:10 AT A1.



SECTION B

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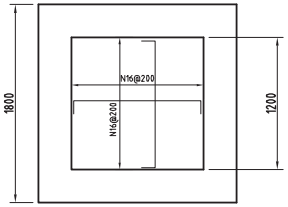
1:10 AT A1.



SECTION C

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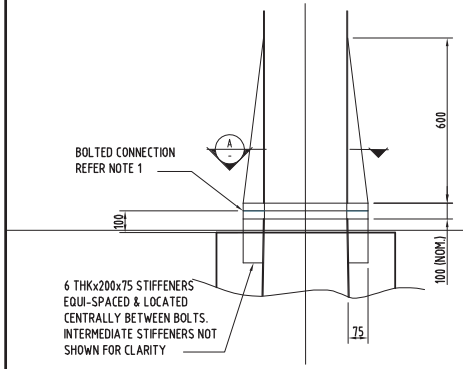
1:25 AT A1.



DETAIL 1

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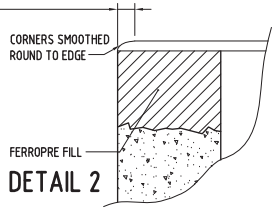
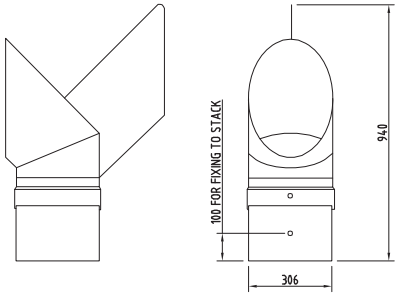


DETAIL 2

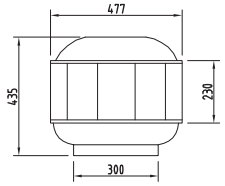


INDUCT VENT:
EDMONDS INDUCT, MODEL 300mm. NECK DIMENSIONS 298mm ID AND 306mm OD. 140mm FOR ADAPTER TO SLIDE OVER OUTSIDE. TO BE CONNECTED TO STACK WITH S/S CLAMP REFER CLAMP DETAIL. POWDER COAT FINISH TO MATCH STAINLESS STEEL VENT PIPE.

INDUCT DETAIL

100mm 0mm 100mm 200mm 300mm 400mm 500mm

1:10 AT A1.

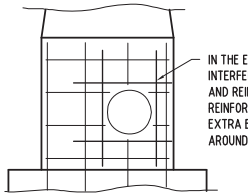


EDUCT VENT:
SUREDRAT EDUCT, MODEL h300.
THROAT AREA: 0.0745 (m2)
MATERIAL: 316 STAINLESS STEEL SHAFT WITH A GLASS FILLED NYLON BEARING HOLDER TO RESIST HYDROGEN SULPHIDE GAS.
ROTATION BEARINGS: DOUBLE ROW BALL BEARINGS (UPPER BEARING).
WIND SPEED RATING: 205 KM/H (56.9 m/s)
TO BE CONNECTED TO STACK WITH 4 OFF NO. 4 (3.2mm) MONEL BLIND RIVETS, LOCATED AT EQUAL DISTANCE AROUND CIRCUMFERENCE.
POWDER COAT FINISH TO MATCH STAINLESS STEEL VENT PIPE.

EDUCT DETAIL

100mm 0mm 100mm 200mm 300mm 400mm 500mm

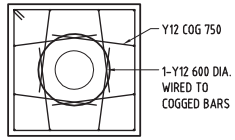
1:10 AT A1.



SECTION D

0.2m 0m 0.2m 0.4m 0.6m 0.8m 1.0m

1:25 AT A1.



SECTION E

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1:25 AT A1.

No.	DESCRIPTION	DATE	INIT.
4	ISSUE FOR CONSTRUCTION (PENDING AUTHORITY APPROVAL)	30.06.2010	DMB
3	ISSUE FOR CONSTRUCTION	12.01.2010	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.2009	DMB
1	ISSUE FOR CONSTRUCTION	21.09.2009	DMB

AMENDMENTS

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N-D8004.04

territory housing

IPT-02-246-CVL-DWG-0063

DRAWN SGE	DATE MAY 2008	CHECKED JTL	DATE JUN 2010
DESIGNED SGE	DATE MAY 2008	CHECKED DMB	DATE JUN 2010
DESIGN PROJECT LEADER	DATE	PROJECT OFFICER	DATE

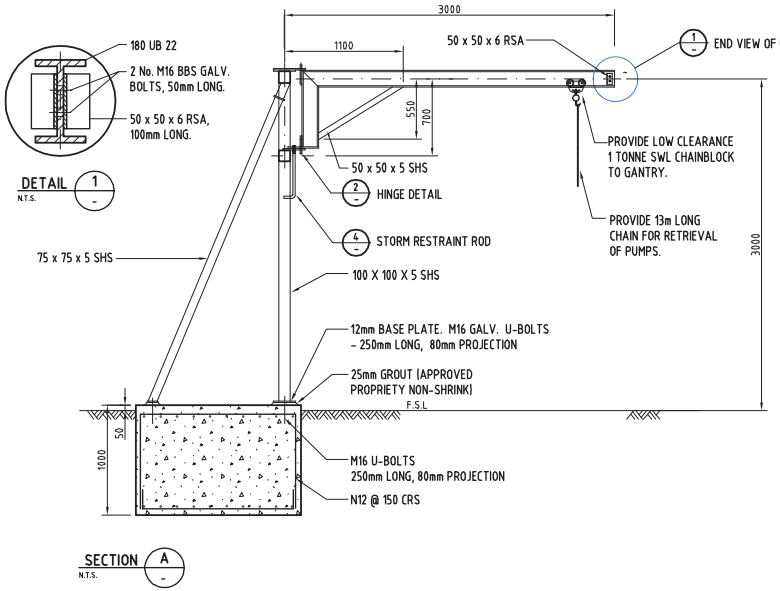
Northern Territory Government
Department of Planning and Infrastructure

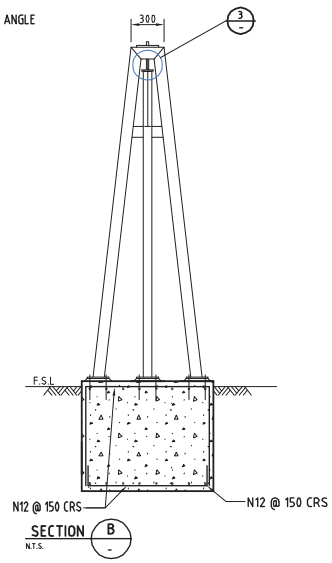
TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

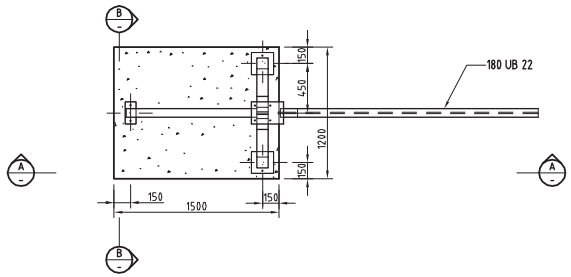
SEWERAGE PUMP STATION - INDUCT/EDUCT VENT STACK

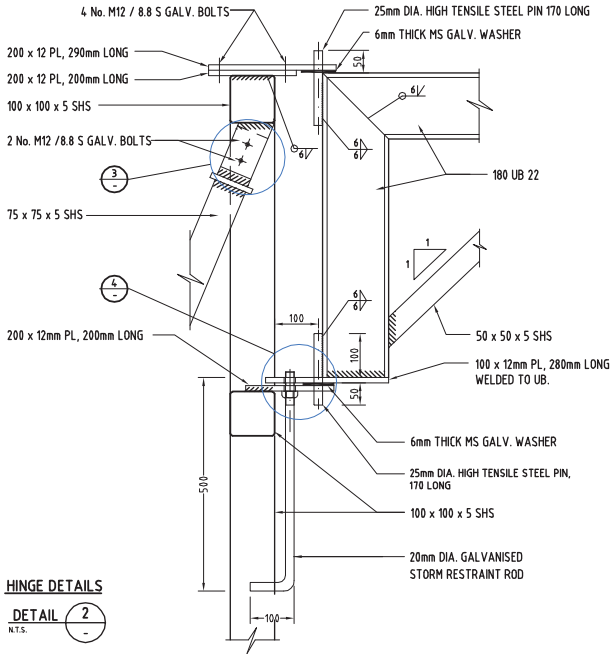
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.08 OF 35	R09-1599	4	A1

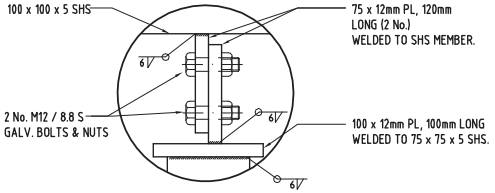
1073

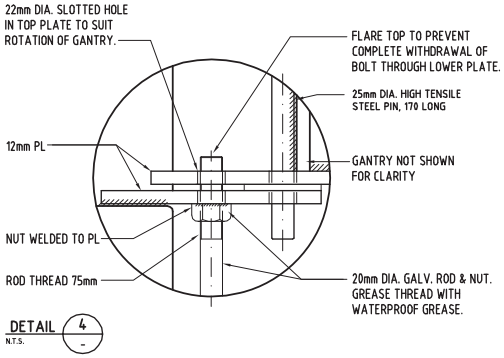












STEELWORK

1. STEELWORK SHALL COMPLY WITH AS4100 AND AS1554. ALL WELDS S CFW, UNLESS NOTED OTHERWISE.
2. GALV BOLTS TO AS1111. BOLT HOLE CLEARANCE 2mm. HD BOLT HOLE CLEARANCE 5mm.
3. DESIGN LOAD FOR MONORAIL = 625kg SWL CLASS 1. MONORAIL CAPACITY TO BE MARKED ON 180 UB 22 IN ACCORDANCE WITH AS1418.

PAINTING

1. ALL STEELWORK SHALL BE PREPARED IN ACCORDANCE WITH NATSPEC AND SHALL THEN BE PRIMED WITH AN APPROVED INORGANIC ZINC SILICATE TO A DRY FILM THICKNESS OF 0.075mm APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. HOT DIPPED GALVANISING AFTER MANUFACTURE IS ALSO ACCEPTABLE.
2. AFTER ERECTION ANY DAMAGE SHALL BE MADE GOOD WITH AN APPROVED COMPATABILE INORGANIC EPOXY ZINC PRIMER.

CONCRETE

1. CONCRETE SHALL BE CLASS N32 (F'c 32MPa) 20mm MAX AGGREGATE. ALL WORK SHALL COMPLY WITH AS3600 AND AS1379.
2. UNLESS OTHERWISE NOTED, COVER TO ALL REINFORCEMENT SHALL BE 50mm.

WARNING

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PERMISSION TO USE FOR CONSTRUCTION PURPOSES ONLY

SIGNED..... DATE.....

ON BEHALF OF WATER SERVICES FOR THE INCORPORATION INTO POWER AND WATER CORPORATION'S NETWORK.

This permission to Use this Approved Design is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents associated.

This drawing is valid for 2 years from the date of signing.

No.	DESCRIPTION	DATE	INIT.
4	ISSUE FOR CONSTRUCTION (PENDING AUTHORITY APPROVAL)	30.06.2010	DMB
3	ISSUE FOR CONSTRUCTION	12.01.2010	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.2009	DMB
1	ISSUE FOR CONSTRUCTION	21.09.2009	DMB

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N-D8004.04

territory housing
IPT-02-246-CVL-DWG-0064

DRAWN SGE	DATE AUG 2008	CHECKED JTL	DATE JUN 2010
DESIGNED SGE	DATE AUG 2008	CHECKED DMB	DATE JUN 2010
DESIGN PROJECT LEADER	DATE	PROJECT OFFICER	DATE

Northern Territory Government
Department of Planning and Infrastructure

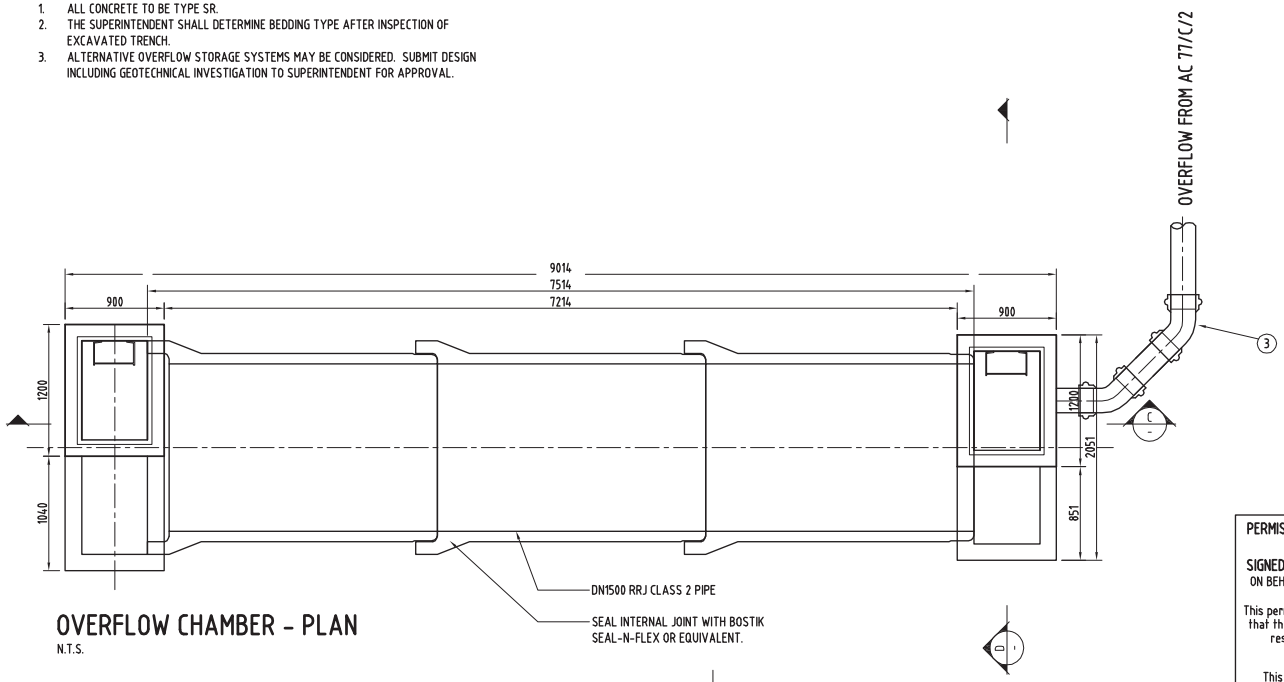
TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE PUMP STATION - GANTRY DETAILS

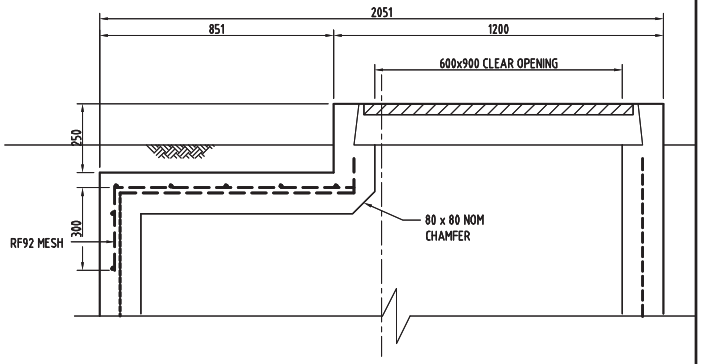
1074

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND	SHEET SIZE
-	-	C04.09 OF 35	R09-1600	4	A1

NOTES:
1. ALL CONCRETE TO BE TYPE SR.
2. THE SUPERINTENDENT SHALL DETERMINE BEDDING TYPE AFTER INSPECTION OF EXCAVATED TRENCH.
3. ALTERNATIVE OVERFLOW STORAGE SYSTEMS MAY BE CONSIDERED. SUBMIT DESIGN INCLUDING GEOTECHNICAL INVESTIGATION TO SUPERINTENDENT FOR APPROVAL.



OVERFLOW CHAMBER - PLAN
N.T.S.



OVERFLOW CHAMBER CLASS RB COVER
NTS

PERMISSION TO USE FOR CONSTRUCTION PURPOSES ONLY

SIGNED..... DATE.....
ON BEHALF OF WATER SERVICES FOR THE INCORPORATION INTO POWER AND WATER CORPORATION'S NETWORK.
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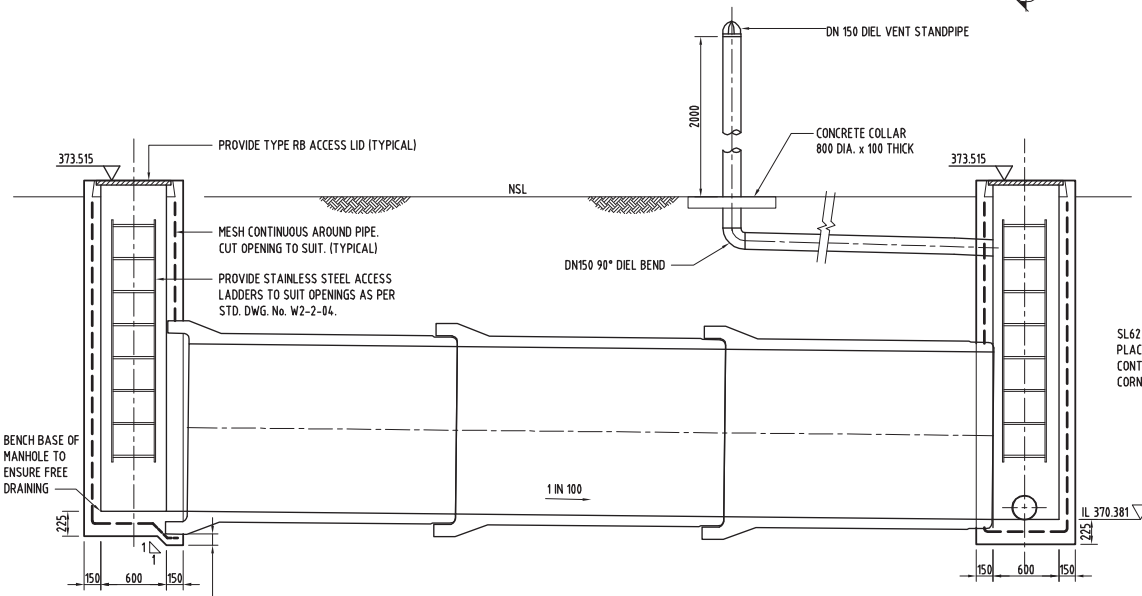
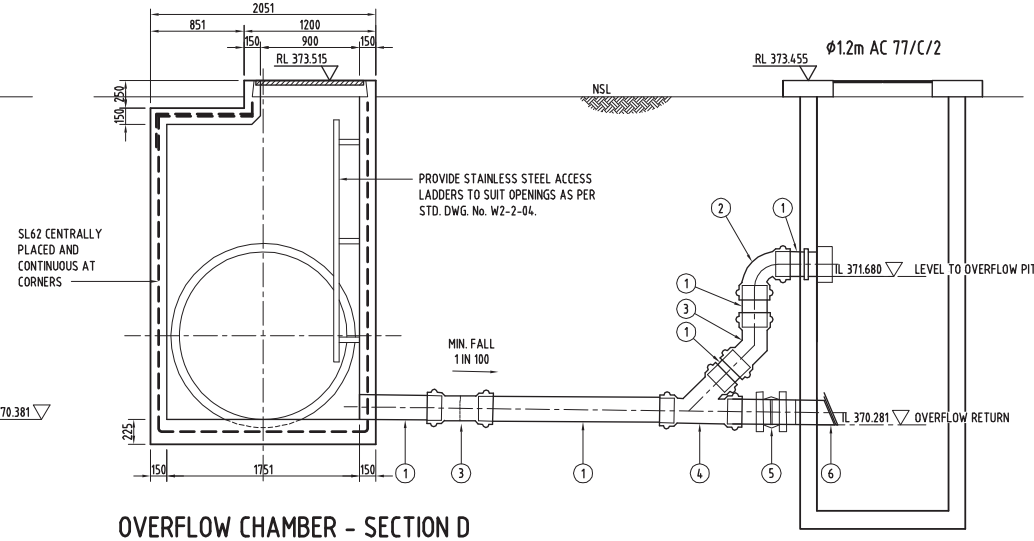
PIPEWORK SCHEDULE

No.	DESCRIPTION
1	DN225 PVC CLASS SN8 DWV STANDARD SPIGOT CONNECTOR
2	DN225 uPVC CLASS SN8 DWV 90° BEND (SO-SO)
3	DN225 uPVC CLASS SN8 DWV 45° BEND (SO-SO)
4	DN225 PVC CLASS SN8 DWV EQUAL SLOPE JUNCTION (SO-SO-SO)
5	DN225 GIBAULT
6	300mm FLAP GATE MODEL FCS-H1 'WATERGATES SP' S.S. GRADE 316 WALL MOUNTED

REFER TO SHEET R09-1597 FOR NOTES.



OVERFLOW CHAMBER - SECTION C
N.T.S.



OVERFLOW CHAMBER - SECTION D
N.T.S.

No.	DESCRIPTION	DATE	INIT.
4	ISSUE FOR CONSTRUCTION [PENDING AUTHORITY APPROVAL]	30.06.2010	DMB
3	ISSUE FOR CONSTRUCTION	12.01.2010	DMB
2	ISSUE FOR PWC SEWERAGE RE-ALIGNMENT	11.12.2009	DMB
1	ISSUE FOR CONSTRUCTION	21.09.2009	DMB

AMENDMENTS

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N-D8004.04

territory housing
IPT-02-246-CVL-DWG-0065

DRAWN	SGE	CHECKED	JTL
DATE	AUG 2008	DATE	JUN 2010
DESIGNED	SGE	CHECKED	DMB
DATE	JUN 2010	DATE	-
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
NGALPA NGALPA (246) - LOTS 1271 AND 2125 PATERSON STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE PUMP STATION - OVERFLOW CHAMBER

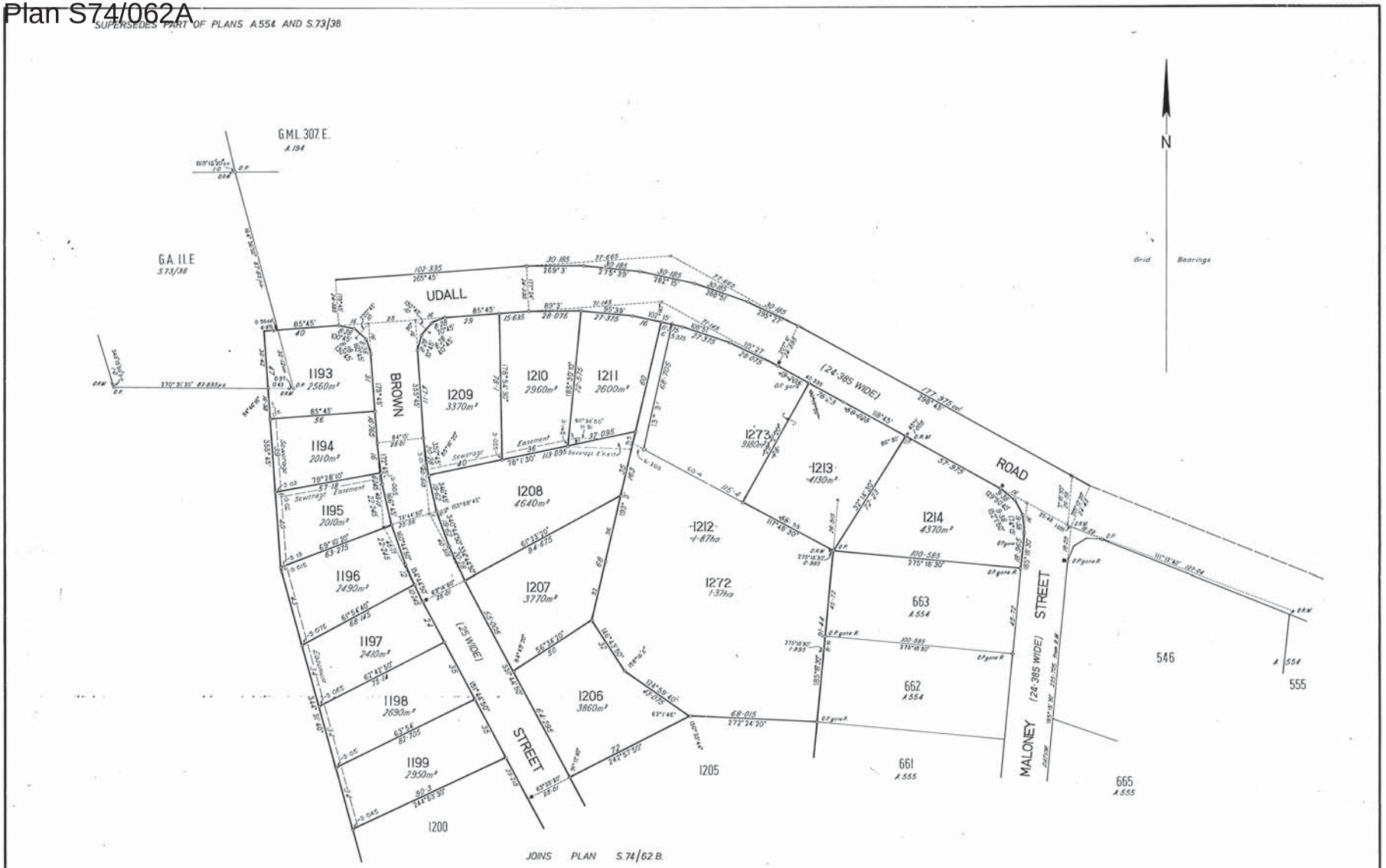
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.10 OF 35	R09-1604	4	A1

1075

G:\PROJECTS 2008-09\SLN_08964 - TENNANT CREEK URBAN LIVING\SLN-08964-00\N-D8004.00 DRAWINGS\04_NGALPA_NGALPA\N09-1604.DWG

Survey Plan S74/062A

SUPERSEDES PART OF PLANS A.554 AND S.73/38



REFERENCE MARKS ARE AT ONE METRE UNLESS OTHERWISE SHOWN.

20 15 10 5 0 30 40 60 80 100 METRES

SURVEYOR'S CERTIFICATE

I, G.W. Cathels hereby certify that the survey represented on this plan was carried out by me or under my immediate supervision and was completed on 16th April 1975, and that this survey has been executed in accordance with the Licensed Surveyors Ordinance 1933–1937 and the Regulations thereunder.

Date 1/5/75 G.W. Cathels Licensed Surveyor

SURVEY APPROVED

Date 5.11.1976 Surveyor-General

File No.
Instruction No. S74/062
Field Book No.
Drawn J.D. Molloy 13-8-76
Charted on TENNANT CREEK 2680, 4x5
Compared with F.B. D.A.D.
Examined D.A.D. 20.7.76
Calculation Book No.

Passed
Date 5.11.76

AMENDMENTS

No.	REFERENCE	DETAILS	APPROVED	DATE
1.	File 574/62 Folio 78 Volume 3 Book 34	Lots 1212 and 1213 cancelled. Lots 1272 and 1273 created. Survey approved as amended.	Supervising Surveyor	30-7-79
2.	File 574/62 Folios 104, 106	Sewerage Easement additions to Lots 1193 to 1199 and Lots 1209 to 1211. The easements are in favour of the Northern Territory of Australia.	Supervising Surveyor	24-5-83
3.	File 574/62 Folios 109 and 114.	Sewerage Easement additions to Lot 1205 and Sewerage Easement over Lot 1211 amended.	Supervising Surveyor	6/9/83

NORTHERN TERRITORY ADMIN.

LEGEND

Concrete Block
Concrete Post
Post, Peg or Stake
Reference Mark
Lockspit
Fence Post

AZIMUTH

A. Assumed from A.554 and A.555
B. Observed at ... and related to the ... Meridian of Longitude. Convergence ... of arc.
C. From Lat/Lon Datum ... derived

LOTS 1193-1199, AND 1206-1214
1206-1211, 1214, 1272 AND 1273
TOWN OF TENNANT CREEK

SCALE 1:1000

S.74/62.A.

SHEET 1 of 3

SUPERSEDES LOT 1205 (PART) AND LOT 1210 (PART) AMENDED COPY TO L.T.O. 25-8-82. AMENDED COPY TO L.T.O. 8-6-83

Viewed at 08.02.21 on 23/02/2017 by L2B.

Date Registered: 17/08/2001 **Volume** 639 **Folio** 012
Duplicate Certificate as to Title issued? No

SEARCH CERTIFICATE

CROWN LEASE IN PERPETUITY 01191

Lot 1273 Town of Tennant Creek from plan(s) S 74/062A
Area under title is 9180 square metres

Owner:
Julalikari Housing Incorporated
of PO Box 158, Tennant Creek NT 0861

Registered Date	Dealing Number	Description
		Previous title is **Volume** 639 **Folio** 011
17/08/2001	472777	Notice of a Right to a Grant of Interest
End of Dealings		

Commencement Date: 17 August 2001} Expiry Date: In Perpetuity}

Reservations:

1. Reservation of a right of entry and inspection.

2. Reservation of all minerals, mineral substances and ores in or upon the land, including gems, stones, sands, valuable earths and fossil fuels.

3. Reservation of a power of resumption.

Provisions:

1. The lease will be in perpetuity.

2. The annual rent for the lease ("called the rent") will be nil

3. The lease is granted under and subject to the Crown Lands Act ("the Act") and the Regulations for the time being in force thereunder, and is conditional upon compliance by the Lessee and will, subject to the Crown Lands Act and the Regulations be liable to be determined and forfeitured for non-compliance with any such lease condition.

4. The Lessee may at any time surrender the lease in the manner prescribed under the Crown Lands Act.

5. For the purpose of section 58 of the Crown Lands Act the Lessee agrees that the Minister may at his absolute discretion determine the Lessee's rights in improvements.

Conditions and Covenants:

1. Subject to the Crown Lands Act, the Lessee will not use the leased land for a purpose other than the purpose for which it is leased, viz: Aboriginal Communal Living.

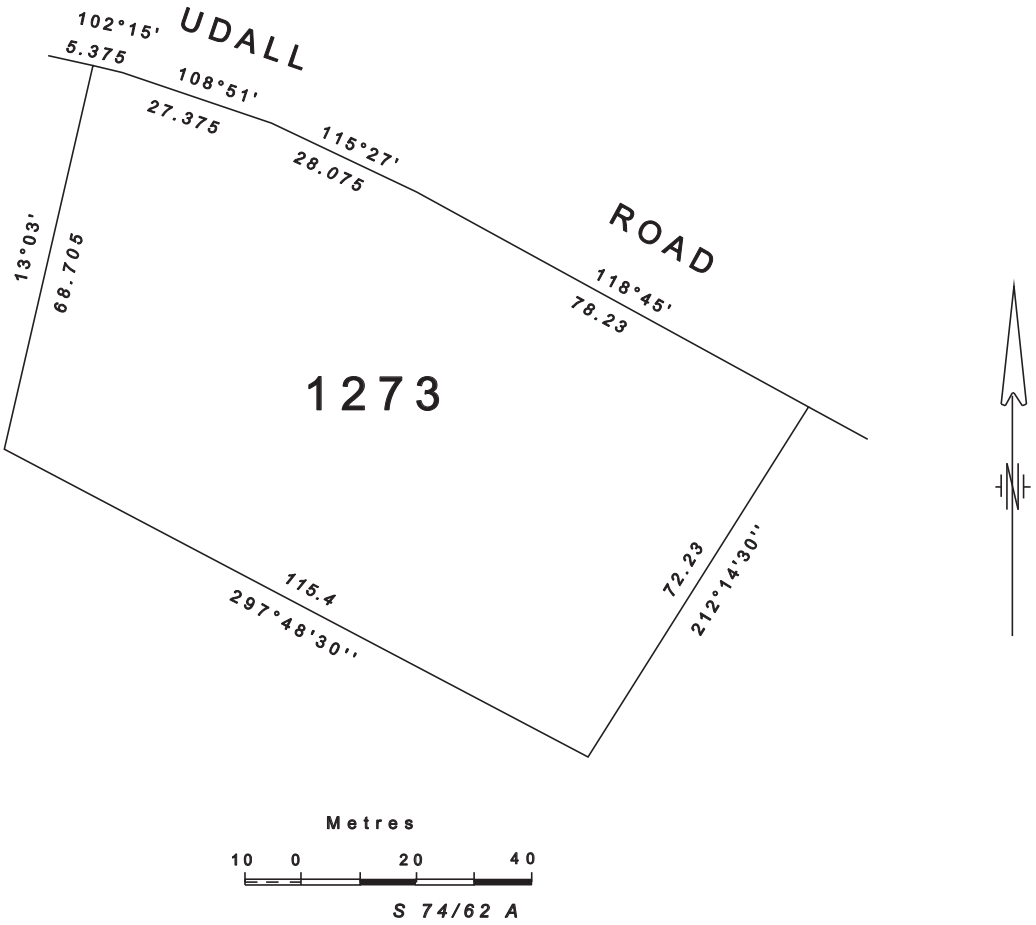
2. The Lessee will pay rates and taxes which may at any time become due in respect of the leased land.

3. The Lessee will at all times comply with any Control Plan and/or Development Permit under the Planning Act affecting the leased land.

4. The Lessee will in respect of the land included in the lease, ensure that at all times and to the satisfaction of the Minister, the land is kept clean, tidy and free of weeds, debris, dry herbage, rubbish, carcasses of animals and other unsightly or offensive poisonous, toxic or hazardous matter and harbour for insects, pests and the breeding of mosquitoes

5. If the Lessee fails to observe and carry out or cause to be observed or carried out the conditions of condition 4 above on his part, the Territory shall have the right to enter onto the demised premises and do all things necessary to that end and the expense and cost thereof, as determined by the Minister, shall be borne and payable by the Lessee on demand.

6. The Lessee will at all times maintain and repair and keep in repair all improvements on the leased land to the satisfaction of the Minister.



Date Registered: 17/08/2001 **Volume** 639 **Folio** 012
Duplicate Certificate as to Title issued? No

NORTHERN TERRITORY OF AUSTRALIA

Record of Administrative Interests and Information

Record of Administrative Interests and Information
The information contained in this record of Administrative Interests only relates to the below parcel reference.

Parcel Reference: Lot 01273 Town of Tennant Creek plan(s) S 74/062A

(See section 38 of the Land Title Act)

Note: The Record of Administrative Interests and Information is not part of the Land Register and is not guaranteed by the Northern Territory of Australia, and the NT Government accepts no Liability for any omission, misstatement or inaccuracy contained in this statement.

Registrar General

Government Land Register
(none found)

Custodian - Registrar General (+61 8 8999 6252)

Current Title
CUFT 639 012 (order 1)

Tenure Type
CROWN LEASE IN PERPETUITY 1191

Tenure Status
Current

Area Under Title
9180 square metres

Owners
Julalikari Housing Incorporated
PO Box 158, Tennant Creek NT 0861

Easements
(none found)

Scheme Name
(none found)

Scheme Body Corporate Name
(none found)

Reserved Name(s)
(none found)

Unit Entitlements
(none found)

Transfers
(none found)

Tenure Comments
(none found)

Historic Titles
CUFT 639 011 (order 1)
CUCL 191 040 (order 1)
Visit the website http://www.nt.gov.au/justice/bdm/land_title_office/

Custodian - Surveyor General (+61 8 8995 5362)

Address
29 UDALL RD, TENNANT CREEK

Survey Plan
S 74/062A

Survey Status
Approved

Parcel Status
CURRENT

Parcel Area
9180 square metres

Map Reference
Code 730 Scale 2500 Sheet 22.32

Parent Parcels
(none found)

Parcel Comments
SUBD OF LOTS 1212 & 1213. WARRAMUNGA PABULU HOUSING ASSOCIATION VID E S74/62/94. S2008/31 LOTS 2368(A) TO 2375(A) S2008/30 LOTS 2328(A) TO 2367(A) SEE S2008/29 LOTS 2298(A) TO 2327(A)ALLOCATION OF ADMIN PARCELS AT MUNJI MARIA TOWN CAMP LOT 1273 TENNANT CREEK

Survey Comments
(none found)

Proposed Easements
(none found)

Municipality
BARKLY SHIRE

Region
BARKLY

Custodian - Valuer General (+61 8 8995 5375)

Owner's Last Known Address
Department of Housing, PROPERTY RATES OFFICER, GPO BOX 4621, DARWIN NT 0801

Parcels in Valuation
Lot 01273 Town of Tennant Creek

Unimproved Capital Value

$91,000 on 01/07/2015
$91,000 on 01/07/2012
$70,000 on 01/07/2010
$24,000 on 01/07/2004
$28,250 on 01/07/2001
$28,250 on 01/07/1998
$25,000 on 01/07/1995
$24,750 on 01/07/1992
$24,750 on 01/01/1990
$18,750 on 01/01/1987
$17,000 on 01/01/1984
$2,000 on 01/01/1981

Valuation Improvements

01/02/1996 House x 5
15/09/1988 Residential other
01/11/1983 Special uses other
Improvement type(ABOR EING)

Custodian - Property Purchasing (+61 8 8999 6631)

Acquisitions

(none found)

Custodian - Building Advisory Service (+61 8 8999 8965)

Building Control Areas

BBTEN001 - Building Control Area	TENNANT CREEK BUILDING AREA

Building Permits

Application Number:	5 of 7
Description:	DWELLING (HOUSE 4)
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling
Area:	144 square metres
Certification:	Single Dwelling - Full Code - *issued on* 15/12/1998

Application Number:	1 of 7
Description:	HOUSE
Number of Residental Units:	0
Australian Bureau of Statistics Type:	(none found)
Building Class:	House
Area:	177 square metres
Certification:	House - Full Code - *issued on* 26/05/1988

Visit the website http://www.nt.gov.au/building/

Custodian - Town Planning and Development Assessment Services (+61 8 8999 6046)

Planning Scheme Zone
CL (Community Living)

Interim Development Control Orders
(none found)

Planning Notes
(none found)

Planning Applications
(none found)

Custodian - Power and Water Corporation (1800 245 092)

Meters on Parcel

Power Water - Electricity	1
Power Water - Water	1

For Account balances, contact the Power and Water Corporation.

Custodian - Pool Fencing Unit (+61 8 8924 3641)

Swimming Pool/Spa Status
(none found)

For more information, contact the Pool Fencing Unit (+61 8 8924 3641).

Custodian - Mines and Energy (+61 8 8999 5322)

For information on possible Exploration Licences, contact Mines & Energy or visit the website http://www.nt.gov.au/d/Minerals_Energy/

For information on possible Petroleum Titles, contact Mines & Energy for further details.

Custodian - NT Environment Protection Authority (+61 8 8924 4218)

Results of site contamination assessment
(none found)

For further information contact Environment Protection Authority or visit the website https://ntepa.nt.gov.au/waste-pollution/contaminated-land

Custodian - Heritage Branch (+61 8 8999 5039)

Heritage Listing:
(none found)

For further information on heritage places contact Heritage Branch or visit the website https://nt.gov.au/property/land/heritage-register-search-for-places-or-objects

Other Interests
For Account balances, contact Barkly Shire Council

N
2093
UDALL ROAD
1211
1273
1208
1214
1272
1207
663

Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Village Camp

Village Camp

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
    - NP001.1_Design and Construction of Network Assets – General Requirements
    - NP001.3_General Specification for Overhead Electrical Reticulation
    - NP001.6_General Specification for URD Subdivisions
    - NP003_Installation Rules_V3
    - NP007_Service Rules

- NP027_Capture of Newly Installed Street Lighting Information
- NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/) – NBN rollout maps

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.
- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

3.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

3.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

It should be noted that there are currently no legal services easements within the town camps, except for a few cases where a town service passes through the town camp. Therefore it is recommended that easements are created over any infrastructure owned by PWC and any future assets to be gifted to PWC, to allow the service providers access to the infrastructure.

3.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

3.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This

generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some town camps with direct connections to the town supply, they risk contaminating the entire town's water supply.

4 Available information

As the site investigations were limited to accessible / visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of Village Camp on 2 December 2016 to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendices.

5 Sewerage

5.1 Ownership and boundaries

The internal reticulation sewer within Village Camp are owned by Julalikari Housing Incorporated, however are the responsibility of Far North - T & J Contractors to maintain. The connection to town sewer and the town sewer is owned by Power and Water Corporation.

Village Camp is currently serviced by a DN150 PVC reticulation main which discharges to a pump station. The rising main from the pump station is DN100 PVC which connects to the external existing town sewer.

As-constructed drawings from the SIHIP program (2011) can be found in Appendices. Land Title information show that there is a sewerage easement within Village Camp however it does not cover the internal sewer network.

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on the number of houses, which for Village Camp is 12. The sewerage bill is charged to the Department of Housing and Community Development.

It is not known what contribution the residents make towards the sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manhole covers, as all other sewerage infrastructure is below ground. A comprehensive review of all available documentation, including reviewing as-constructed drawings and having discussions with Power and Water Corporation was conducted. The following table compares the assets that have been constructed, according to the as-constructed drawings, and the assets assessed during the inspections conducted by Aurecon.

Table 2 Sewerage assets inspected

Asset type	Number of assets as per documentation	Number of assets assessed during inspection
Manholes	16	10

As per Table 2, a number of manholes were not assessed during the inspections, this is likely due to access limitations such as manholes being located within private property or outside of the town camp. As other manholes along the same sewer line were investigated, it is assumed that all assets have been constructed as per the as-constructed drawings. The condition ratings of the manholes inspected are as follows:

Table 3 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manholes			10	2		12
Pump station				1		1

Figure 1 Sewer manhole, condition: good

Figure 2 Sewage pump station, condition: *very good*

Figure 3 Sewage pump station, condition: very good

5.3 Current performance and risks

5.3.1 Current sewer network performance

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.
- As Village Camp disposes to a pump station, the capacity of the pump station has also been assessed.

The current number of houses in Village Camp is 16, including four non-house dwellings, this multiplied by 9 EP per house gives a total current EP of 144. The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used.

Table 4 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	144	150	1.0	16.50	1.78	11%

Table 4 above shows that the capacity of the existing sewer network is adequate for the current peak population.

It is likely that due to the low flows in the pipe that the self-cleansing minimum velocity will not be achieved.

5.3.2 Current sewage pump station performance

The capacity of the pump station was checked against the following criteria, based on PWC guidelines:

- Less than 12 pump starts per hour (for pumps less than 15kW),
- Minimum velocity 0.9 m/s,
- Maximum velocity 2.5 m/s,
- Overflow storage equal to three hours of peak dry weather flow.

Detailed design drawings of the pump station were available so an assessment of the current performance could be undertaken. The design EP for the pump station was 192 EP, although the current EP for the community is only 144 EP, so it is expected that the capacity is sufficient.

Using the current EP of 144, it appears that the minimum velocity in the rising main is insufficient for self-cleansing. This would indicate that the pumps need to be upgraded to provide a faster flow rate.

The overflow storage is also insufficient, as there is not enough storage for three hours of peak dry weather flow. The overflow storage capacity should also be upgraded to meet PWC guidelines.

5.4 Future demands

The future demand analysis showed that one additional house is required to provide permanent accommodation for residents that are currently living in non-house dwellings. The type and location of house, number of bedrooms, etc. will need to be determined by the Department of Housing and Community Development when this work is undertaken.

An allowance of 9 EP has already been provided for each temporary house (caravans, structures, etc) in the current demand calculations, so the future EP will not increase since the residents from the temporary housing will be living in the new accommodation and the number of tenants will not be increased.

The location of the new house is assumed to be close to the existing houses such that significant extension of the existing sewerage infrastructure would not be required. This means that no additional sewerage infrastructure upgrades would be required to cater for the new house, other than what has already been recommended for the current demand, and not including a new house drain and connection to the existing network. The cost estimates for these works have been allowed for the in the upgrades for current demand.

5.5 Recommended works

5.5.1 Works required to existing infrastructure for current demand

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. In this case, there was no infrastructure requiring immediate maintenance.

To be in accordance with PWC guidelines, it is recommended that the following works are constructed, however these will require further engineering design.

- Two new pumps to increase velocity in rising main
- Increase capacity of overflow storage

5.5.2 Works required to existing infrastructure for future demand

The upgrades required for the single new house include a new house drain and new connection to the existing network.

6 Water supply

6.1 Ownership and boundaries

The water supply infrastructure was upgraded to PWC standards as part of the SIHIP program. The reticulation servicing the community is a DN150 PVC looped main, with multiple supply points (refer Appendices for as constructed drawings).

The water supply assets within Village Camp are believed to be owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain. The water is supplied from DN150 CICL and DN200 PVC water mains outside of the community, which are the responsibility of PWC.

6.1.1 Connection methods and billing

Through consultation with PWC it has been determined that the water usage is currently charged as a fixed daily rate for 12 house water meters within Village Camp. The bill is issued to the Department of Housing and Community Services. It is not known what contribution the residents make towards water bills.

It is proposed that PWC measure the water supply to the entire community, as opposed to individual lots within the community. This requires the installation of a bulk water meter on the water mains located at the community boundary. Under this scheme, the water bill for the entire community is the responsibility of the governing body, being Julalikari Housing Incorporated for Village Camp. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the individual lot meters are maintained in addition to the proposed use of a bulk water meter. This will assist the governing body with distributing bills to residents, the identification of any leaks in the network, and meeting PWC standards should the town camp be subdivided in the future.

A total of 12 residential lot water meters were assessed during the inspection. Bennett Design reported 16 dwellings in the community, however only 13 on these dwellings were permanent houses.

6.2 Existing infrastructure condition assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters. The assessment was limited to services that could be assessed above ground; no below ground services were inspected. A comprehensive review of all available documentation, including reviewing as-constructed drawings and having discussions with Power and Water Corporation was conducted. The following table compares the assets that have been constructed, according to the as-constructed drawings, and the assets assessed during the inspections conducted by Aurecon.

Table 5 Water supply assets inspected

Asset type	Number of assets as per documentation	Number of assets assessed during inspection
Fire hydrants	7	6
Water meter (residential lots)	13	12

As per Table 5, a fire hydrant and a water meter were not assessed during the inspections, this is likely due to overgrown flora or restricted property access as previously discussed. The condition of each asset is as follows:

Table 6 Water asset condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Fire hydrants			6			6
Water meter (residential lots)		1	10	1		12

Figure 4 Fire hydrant, condition: *good*

Figure 5 Water meter (residential lot), condition: *poor*

A single residential lot water meter was assessed as being in poor condition due to broken handles. The missing handles should be replaced.

6.3 Current performance and risks

The current demand of the community was calculated based on the following design assumptions:

- The nominal peak day flow is 1300 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the southern region of NT. It was assumed that the nominal peak day flow of 1300 L/capita/day also applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.

- The peak hour factors are listed in PWC's Supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.

Table 7 shows the calculated demand.

Table 7 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
16	144	2.16	6.48

The system is expected to meet PWC flow (peak hour and fire flow) requirements.

The assessment of water supply for firefighting has been based on the size of the water mains and the condition of the accessible fire hydrants. Additional hydrants have been recommended where it appears the existing number of hydrants are insufficient. In the case of Village Camp no additional fire hydrants appear to be required at this time.

The existing network is believed to have sufficient capacity and appears the pipe sizes are to compliant with PWC standards. The as-constructed drawings show a section of the water main is installed in a dedicated water main easement. However, as detailed in Section 3.2 the land title documents, refer appendices, indicate no formal easements are located within the community.

6.4 Future demands

The future demand analysis showed that one additional house is required to provide permanent accommodation for residents that are currently living in non-house dwellings. The type and location of house, number of bedrooms, etc. will need to be determined by the Department of Housing and Community Development when this work is undertaken.

An allowance of 9 EP has already been provided for each temporary house (caravans, structures, etc.) in the current demand calculations, so the future EP will not increase since the residents from the temporary housing will be living in the new accommodation and the number of tenants will not be increased.

The location of the new house is assumed to be close to the existing houses such that significant extension of the existing water supply infrastructure would not be required. This means that no additional water supply infrastructure upgrades would be required to cater for the new house, other than what has already been recommended for the current demand, and not including a new residential water meter. The cost estimates for these works have been allowed for the in the upgrades for current demand.

6.5 Recommended works

6.5.1 Works required to existing infrastructure for current demand

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following maintenance works are recommended;

- Clear dirt and grass covering fire hydrants covers, x 4

- Restore broken handle on residential lot water meter

The community is viewed overall as a large single lot and as previously detailed, proposed to have the water usage measured accordingly. In order to measure the water usage as a single lot, a bulk water meter should be installed. Since the existing network has three supply points, two should be disconnected and reconnected creating network looping. This allows the single remaining point to be metered. The cost estimates for upgrades at Village Camp include;

- Disconnect two of three supply points and reconnect to water main creating a looped network.
- Install bulk water meter
- Install up to one residential lot water meter

6.5.2 Works required to existing infrastructure for future demand

The upgrades required to supply water to the new house include a new residential lot meter and connection to the network.

7 Roadworks

7.1 Ownership and boundaries

The roads within Village Camp are owned by Julalikari Housing Incorporated, however are the responsibility of Far North - T & J Contractors to maintain.

Village Camp consists of sealed roads and unsealed 'short-cuts'. The unsealed 'short-cuts' were not assessed during the inspection as they are not formal roads.

7.2 Existing infrastructure condition assessment

Road furniture including signs, foot paths and car parks were inspected. Table 8 below summarise the condition of the road furniture as assessed during the site inspection.

Table 8 Roadworks condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Footpaths			2	2		4
Signs	2		2	1	1	6

Figure 6 Sign, condition: *very poor*

Figure 7 Footpath, condition: *good*

The footpaths at Village Camp were assessed as being in good to very good condition. Some sections of the footpaths were covered by dirt, grass cuttings and other debris. It is recommended that theses section are cleared for aesthetic purposes.

Two signs were assessed as being in very poor condition. In both these cases the sign was missing altogether, however the post remained in place. It is recommended that these two signs are replaced.

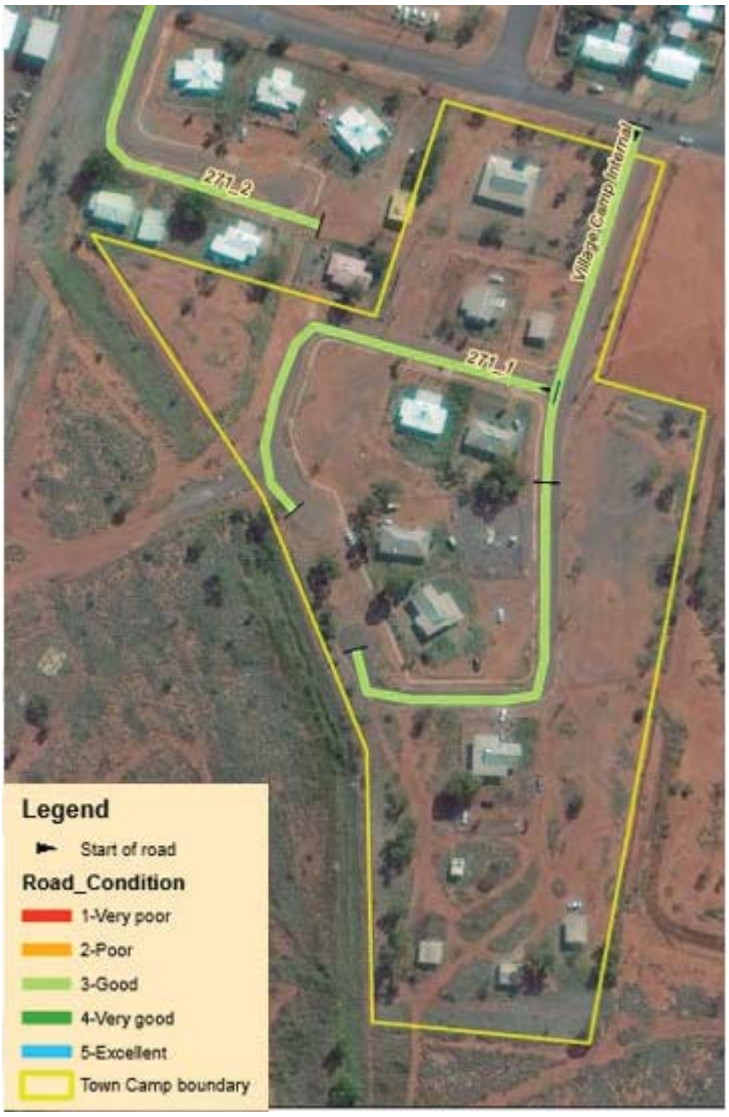


Figure 8 Village Camp road network

Table 9 below details the condition of the roads within Village Camp for specific segments. Figure 8 shows a map of the road network with the condition ratings, road name, and chainage direction. Note, the percentage refers to the percentage of that particular road segment which experiences the defect.

Figure 9 Village Camp Internal, condition: *good*

Figure 10 271_1, condition: *good*

Table 9 Road network condition assessment

Road Name	Chainage start (km)	Chainage end (km)	Road segment condition (1-5)	Defects and associated condition
271_1	0	0.18	3	-30% bleeding (3) -gutters filled with dirt in some sections
271_2	0	0.16	3	-20% bleeding (3) -gutters filled with dirt in some sections
Village Camp Internal	0	0.15	3	-30% bleeding (3) -gutters filled with dirt in some sections
	0.15	0.32	3	-20% bleeding (3) -gutters filled with dirt in some sections

7.3 Current performance and risks

The road network is sufficient for the current number of houses. It was noted during the site inspections that a number of unsealed ‘short-cuts’ had been created and were regularly used. It is not recommended that these paths are formalised.

The road conditions were assessed as good. It is recommended that some minor works are undertaken to clear soil and other debris build up in the gutters. This will improve the stormwater drainage and prevent blockages in the stormwater drainage pipes.

7.4 Future demands

The addition of one new house will not require any upgrades to the road network. The additional house will require minor upgrades to the kerb to provide a layover kerb for a driveway.

7.5 Recommended works

7.5.1 Works required to existing infrastructure for current demand

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Replace two signs
- Clear dirt and debris covering footpaths, approximately 300 m
- Clear road gutters of soil and debris build, approximately 600 m

7.5.2 Works required to existing infrastructure for future demand

Works required to provide for one additional house include upgrading the existing kerb to a layover kerb.

8 Stormwater drainage

8.1 Ownership and boundaries

The stormwater drainage assets within Village Camp are believed to be owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain.

Stormwater drainage infrastructure outside of the community is owned by Barkly Regional Council.

8.2 Existing infrastructure condition assessment

The site investigation for the stormwater infrastructure included assessing the condition of swales, culverts, headwalls, and side entry pits (SEP). Only the above ground infrastructure was assessed. As the inspection was undertaken outside of a storm event and no CCTV of the pipes was undertaken, flooding due to blockages or damage to the underground infrastructure could not be assessed. Table 10 below summarises the condition of the stormwater assets as assessed during the inspection.

Table 10 Stormwater condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
SEP			8	11		19
Swale		1				1

Figure 11 Swale, condition: *poor*

Figure 12 Two bay side entry pit, condition: *good*

Figure 13 One bay side entry pit, condition: *good,* blockage: *100%*

8.3 Current performance and risks

The detailed performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project. However based on the condition of the stormwater infrastructure assessed it would appear to be operating somewhat adequately. The blocked pits are reducing the effectiveness of the stormwater drainage network.

It was noted during the inspection that the swale is not connected to any underground drainage and appears to be causing ponding. It is recommended that a headwall and new pipe are installed so that water can drain from the swale into the existing underground drainage. As shown in Figure 11, a side entry pit is located near the swale, so it is assumed that an underground pipe can be connected.

There were also a number of side entry pits that were blocked up to 100%. It is recommended that these pits are cleared of any blockages. It is likely that the

underground drainage will also be blocked and will require further cleaning. As the underground drainage could not be assessed, no works have been recommended.

8.4 Future demands

The addition of one new house in the community will not have an impact on the stormwater drainage infrastructure, and no upgrades are required as a result.

8.5 Recommended works

8.5.1 Works required to existing infrastructure for current demand

The following works are recommended to upgrade or improve the current infrastructure:

- Install new headwall, and pipe to connect to existing underground drainage.
- Clear blockages from eight side entry pits (currently blocked between 20% and 100%)

8.5.2 Works required to existing infrastructure for future demand

No upgrades required.

9 Community structures

9.1 Ownership and boundaries

The community structures within Village Camp are believed to be owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of a playground. The following table shows the condition rating given to the community structures.

Table 11 Community structures condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Playground		1				1

There were two playground areas next to a shelter with a sand flooring. It appears as though there used to be equipment under the shelter. It was noted during the inspection that there was broken glass in the sand, and broken equipment.

Figure 14 Shelter, in poor condition

12.2 Current performance and risks

They playgrounds were in poor condition in both condition assessment and appearance. It is recommended that the playgrounds are either covered, or the playground equipment moved to be beneath the existing shelter. The sand flooring will also require cleaning to remove broken glass, and other debris.

9.3 Future demands

The population of Village Camp is not expected to increase with the addition of one new house, as this house will provide permanent accommodation for residents that currently live in temporary housing. No additional community structures are required.

9.4 Recommended works

9.4.1 Works required to existing infrastructure for current demand

The following works are recommended to upgrade the community structures:

- Repair broken equipment
- Move playground to beneath the shade structure

9.4.2 Works required to existing infrastructure for future demand

No upgrades required.

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section 3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the Point Of Supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure, and aerial low voltage infrastructure where installed with aerial high voltage infrastructure, to minimise the possibility of the community or it's contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

PWC advise that most of Tennant Creek/Alice Springs Town Camps have undergone upgrades under the SIHIP program with the intent to normalise the services to look like an urban subdivision but have never been formally handed over to PWC for operations and maintenance.

Village Camp community electrical reticulation systems is supplied by a transformer to an overhead reticulation scheme to individual house and overhead power pole mount street lights.

PWC advise that the Point Of Supply is the LV terminals of the substations and that they own and are responsible for the first pole mount substation and upstream infrastructure.

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Village Camp community are responsible for maintain all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), LV distribution feeders, distribution pillars, consumers' mains and consumer switchboards and street lights.

10.2 Existing infrastructure condition assessment

Table 12 shows the condition rating given to the Distribution panels. The Distribution panel was in the pump station and not accessible.

Table 12 Distribution panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Distribution panels						1(status unknown)

The street lights were of a low voltage overhead feeder design, mercury type M125D. Table 13 shows the condition rating given to the street lights. The street lights have 33.33% operational rating and 66.66% inoperable.

Table 13 Street light on O/H pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light on O/H pole		12	6			18

Table 14 shows the condition rating given to the transformer. The transformer was of pole mount substation design. The transformer was visually accessed to be in good condition.

Table 14 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			1			1

Table 15 shows the condition rating given to the Overhead poles. The overhead poles are of Weld Construction (Universal Pole construction).

Table 15 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			20			20

Table 16 shows the condition rating given to the Metering panels.

Table 16 Meter Panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid Meter			10			10
Post-paid Meter			1			1
Switchboard		1	8			9

Table 17 shows the condition rating given to the switchboards associated to dwellings.

Table 17 Switchboard condition assessment (Housing footprint)

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard		1	8			9

The details of the individual inspections and photographs of each infrastructure item are included in Appendices.

10.3 Current performance and risks

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Street lighting loads were ignored as they are not significant.

The calculated maximum demand of the Village Camp community transformer is 27% of rated capacity based on 4.5kVA/dwelling. The calculated maximum demand is within the total capacity of the substation on site.

Table 18 Village Camp current demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA
271	Village Camp	12	200	54	84

A tabulated summary of all the community transformers in in Appendices.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.

- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

There is one new development currently planned for Village Camp community. Calculated future maximum demand of the Village Camp community transformer is 29% of rated capacity based on 4.5kVA/dwelling. The calculated future maximum demand is within the total capacity of the substation on site.

Table 19 Village Camp future demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA
271	Village Camp	13	200	58.5	91

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Replace twelve street lights 125W
- Replace one switchboard inside the metering panel
- Replace one switchboard associated to dwellings

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits and telephone booths. There were no telephone booths found at Village Camp.

Appendices contains the individual reports.

Table 20 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication pit			3			3

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Village Camp is displayed in the Figure 15 below. NBN is available to residents via a fixed telecommunication line on application to an appropriate NBN access provider.

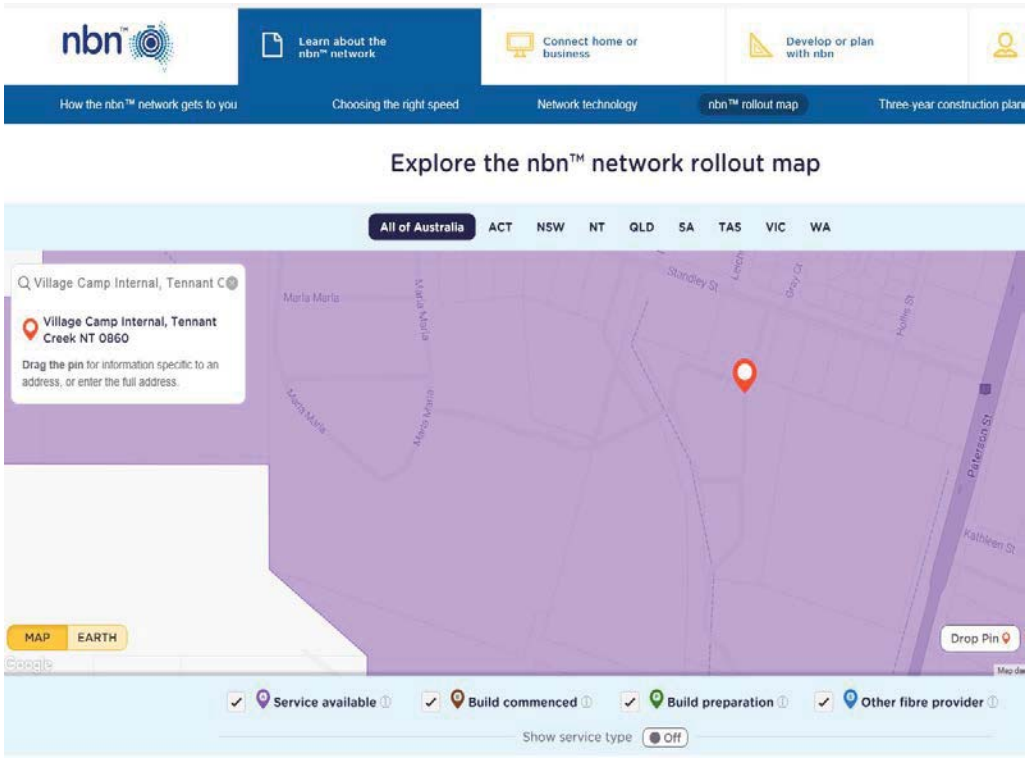


Figure 15 NBN Network Availability map

The NBN rollout map confirms that NBN is planned to be made available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

11.5 Recommended works

Representatives from NBN's Land Access and Stake Holder management teams are currently engaged with Yilli Housing and NT Housing to look at how camps will be serviced. It is expected that any existing premises in these camps will have some type of NBN service via the NBN brownfields rollout in the future.

No works are required at Village Camp because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

12 Cost estimates

Table 21 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure, to upgrade the existing network to meet current design standards, and to upgrade the existing network to cater for the future design. Note, the minor infrastructure upgrades required for the one new house have been included in the upgrades to meet current design cost estimate. The estimates take into account a 30% contingency, are inclusive of GST, and a location factor has been applied to town camps outside of Darwin.

Table 21 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 69,000
Water supply	$ 2,000	$ 86,000
Roadworks	$ 38,000	$ 0
Stormwater drainage	$ 10,000	$ 7,000
Community structures	$ 21,000	$ 0
Electrical	$ 22,000	$ 0
Communications	$ 0	$ 0
Miscellaneous provisions	$ 23,000	$ 30,000
Total (including GST)	**$ 116,000**	**$ 192,000**
Grand total	**$ 308,000**	

The cost estimates are a preliminary estimate only. Since Aurecon has no control over the cost of labour, materials, equipment or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Aurecon cannot guarantee actual costs will not vary from these estimates.

13 Summary

The following works are recommended for Village Camp community:

Sewerage

- Two new pumps to increase velocity in rising main
- Increase capacity of overflow storage

Water supply

- Clear dirt and grassing covering fire hydrants covers, x 4
- Restore broken handle on residential lot water meter
- Install new bulk water meter at the community boundary
- Install up to one residential lot water meter

Roadworks

- Replace two signs
- Clear dirt and debris covering footpaths, approximately 300 m
- Clear road gutters of soil and debris build, approximately 600 m

Stormwater drainage

- Install new headwall, and pipe to connect to existing underground drainage.
- Clear blockages from eight side entry pits (currently blocked between 20% and 100%)

Community structures

- Repair broken equipment
- Move playground to beneath the shade structure

Electrical services

- Replace twelve street lights 125W
- Replace one switchboard inside the metering panel
- Replace one switchboard associated to dwellings

Communications

- No works are required because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

Civil inspection reports

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

Sewerage

- Manholes (12)
- Pump Station (1)

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

271 - Village Camp (Tennant Creek)

1120

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

271 - Village Camp (Tennant Creek)

1121

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
271 - Village Camp (Tennant Creek)

1122

Northern Territory Town Camps

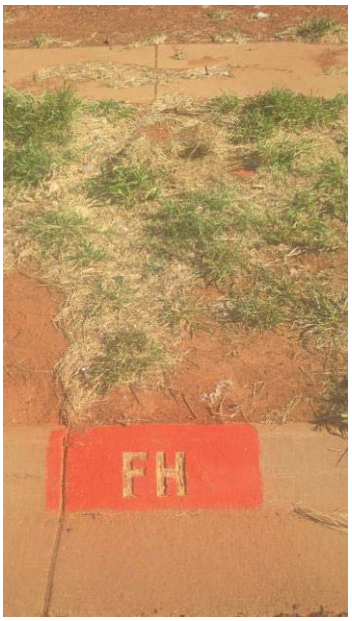
Civil Infrastructure

Inspection Date 2/12/2016 8:23:12 AM

Insp ID: 1621	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Covered in dirt



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:07:21 AM

Insp ID: 1632	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Grass growing over lid

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:52:04 AM

Insp ID: 1642	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	

Northern Territory Town Camps

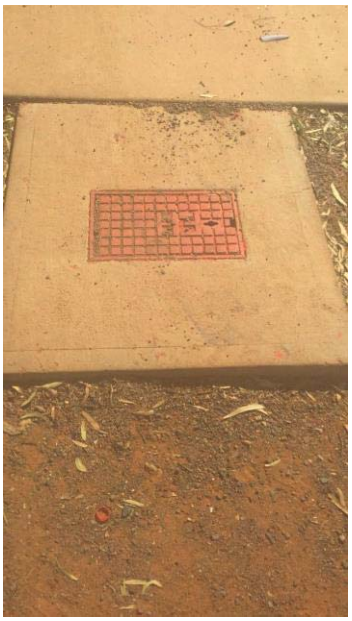
Civil Infrastructure

Inspection Date 2/12/2016 8:55:27 AM

Insp ID: 1648	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:46:04 AM

Insp ID: 1657	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Paint fading on kerb. Lid half covered with dirt

Northern Territory Town Camps

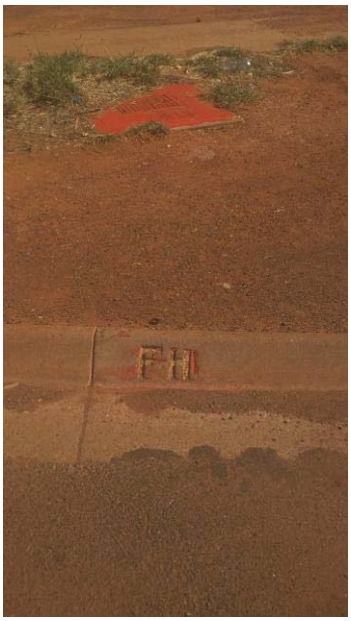
Civil Infrastructure

Inspection Date 2/12/2016 9:10:06 AM

Insp ID: 1668	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Paint on kerb faded



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:19:03 AM

Insp ID: 1626	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	Village Camp Internal
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	3 - Good
Comment:	Needs tidy up
General Comment:	Rhs of road

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:50:19 AM

Insp ID: 1644	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	Village Camp Internal
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	4 - Very Good
Comment:	Needs general tidy up , right side of road only
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:43:05 AM

Insp ID: 1658	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	271_1
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	3 - Good
Comment:	Needs tidy up, some graffiti
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:03:24 AM

Insp ID: 1674 Group 3 - Tennant Creek, Elliott Village Camp

Road Name:	271_2
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	4 - Very Good
Comment:	Needs tidy up
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:19:55 AM

Insp ID: 1625 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	8/1
Comments:	Graffiti

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:12:10 AM

Insp ID: 1629 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	7/2
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:11:12 AM

Insp ID: 1630 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	7/1
Comments:	Graffiti

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:06:01 AM

Insp ID: 1633	Group 3 - Tennant Creek, Elliott	Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	450
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	4 - Very Good
Notes on Lid:	7/3
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:55:10 AM

Insp ID: 1639 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	2/14
Comments:	Graffiti

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:54:11 AM

Insp ID: 1649 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	3/3
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:53:20 AM

Insp ID: 1650	Group 3 - Tennant Creek, Elliott	Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	4 - Very Good
Notes on Lid:	3/4
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:47:51 AM

Insp ID: 1655	Group 3 - Tennant Creek, Elliott	Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	3/6
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:31:46 AM

Insp ID: 1660 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	8/1
Comments:	

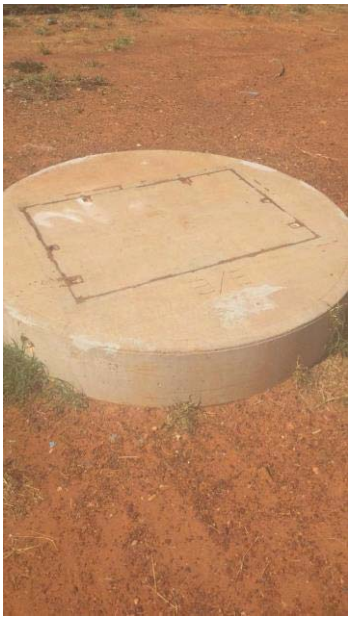
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:18:05 AM

Insp ID: 1661	Group 3 - Tennant Creek, Elliott	Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	3/8
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:14:43 AM

Insp ID: 1664 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	3/7
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:07:58 AM

Insp ID: 1670	Group 3 - Tennant Creek, Elliott	Village Camp

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	450
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	Covered in dirt

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:13:06 AM

Insp ID: 1618 Group 3 - Tennant Creek, Elliott Village Camp

Road Name:	Village Camp Internal
What are you inspecting:	Pavements
Ch From (km):	0.15
Ch To (km):	0.32
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	20	3 - Good	20% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

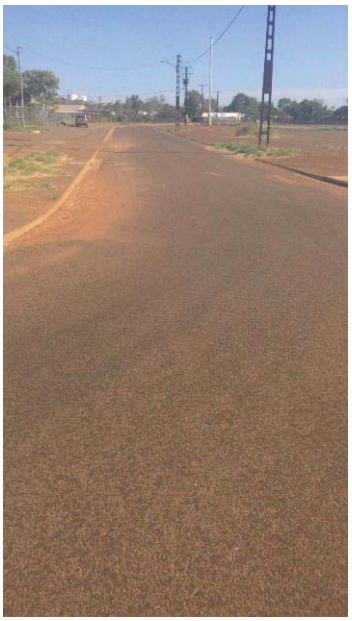
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:13:06 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:13:06 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:59:30 AM

Insp ID: 1635 Group 3 - Tennant Creek, Elliott Village Camp

Road Name:	Village Camp Internal
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.15
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	30	3 - Good	30% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:59:30 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:59:30 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:43:52 AM

Insp ID: 1652 Group 3 - Tennant Creek, Elliott Village Camp

Road Name:	271_1
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.18
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	30	3 - Good	30% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:43:52 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:43:52 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:04:45 AM

Insp ID: 1673 Group 3 - Tennant Creek, Elliott Village Camp

Road Name:	271_2
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.16
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	20	3 - Good	20% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:04:45 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:04:45 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:08:13 AM

Insp ID: 1631 Group 3 - Tennant Creek, Elliott Village Camp

What Sewerage Asset are you capturing:	Pump Station
No of Pumps in Pump Station:	2
Cabinet Condition:	4 - Very Good
Cabinet Comment:	
Alarm Light:	Yes
Alarm Light Condition:	4 - Very Good
Overhead Light:	Yes
Overhead Light Condition:	4 - Very Good
Light Comments:	
Davit Crane Present:	Yes
Davit Crane Capacity (kg):	
Davit Crane Condition:	4 - Very Good
Davit Crane Comments:	
Fence TYPE:	Standard Security Fence (3 Strands barbed)
PS Fence Height (m):	1.8
PS Gates Locked:	Yes
PS Fence Condition:	4 - Very Good
Fence Comment:	
Flow meter type:	
Flow meter condition:	
Flow meter comments:	
Macerator Pump Make/Model:	
Manufacturers Date:	
Macerator Pump:	
Macerator Pump Condition:	
Macerator Pump Comments:	
Outgoing Pipe Diameter (mm):	
Valves:	
Outgoing Pipe Comments:	
Water Supply to pump station:	Yes
Fire hose reel:	No
Access cover locked:	Yes
Safety grid beneath access cover:	No Access

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:08:13 AM

Condition:	
Cabinet Locked:	No Access
Cabinet Lock Condition:	
Hand rails around entrance:	Yes
Fixed or removable:	
Rail Condition:	
Safety Comments:	

Pump Station Pumps section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:08:13 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:24:12 AM

Insp ID: 1620	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Both
Condition:	3 - Good
Blockage (%):	100
Comment:	Rhs blocked 100, lhs blocked 60%

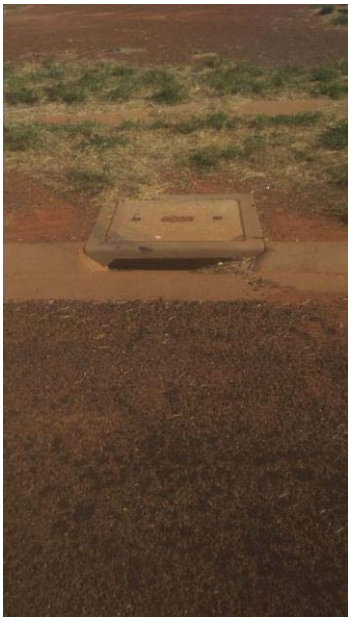
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:21:27 AM

Insp ID: 1623	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	4 - Very Good
Blockage (%):	10
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:20:43 AM

Insp ID: 1624	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Left
Condition:	4 - Very Good
Blockage (%):	10
Comment:	

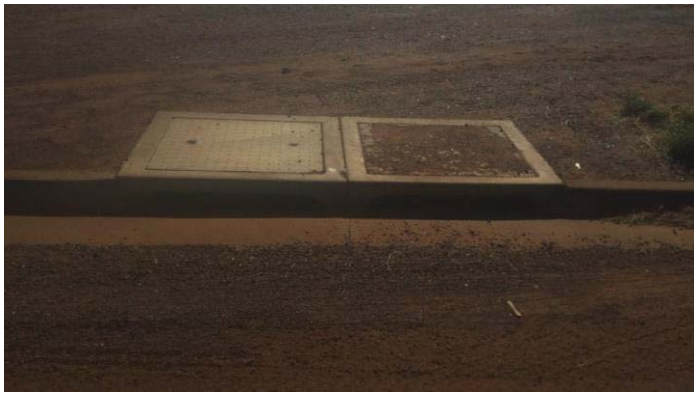
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:18:15 AM

Insp ID: 1627	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	4 - Very Good
Blockage (%):	0
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:17:29 AM

Insp ID: 1628	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:04:33 AM

Insp ID: 1634	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Both
Condition:	3 - Good
Blockage (%):	40
Comment:	Graffiti, concrete cracks

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:58:33 AM

Insp ID: 1636	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Both
Condition:	3 - Good
Blockage (%):	10
Comment:	Image 1 left, image 2 right

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:54:04 AM

Insp ID: 1640	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Both
Condition:	4 - Very Good
Blockage (%):	0
Comment:	Image 1 left. Image 2 right

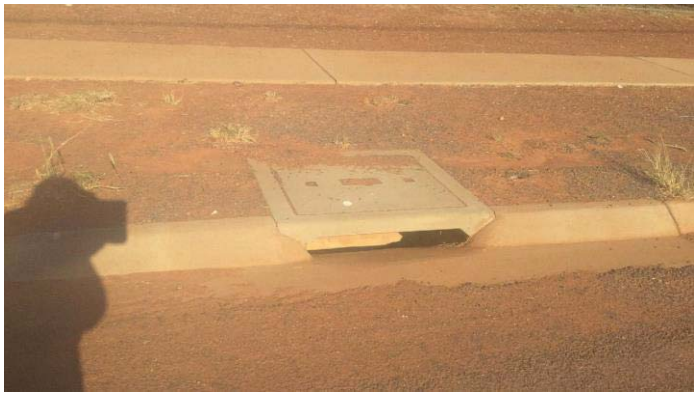
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:51:20 AM

Insp ID: 1643	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	4 - Very Good
Blockage (%):	0
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:56:30 AM

Insp ID: 1647	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Both
Condition:	4 - Very Good
Blockage (%):	20
Comment:	

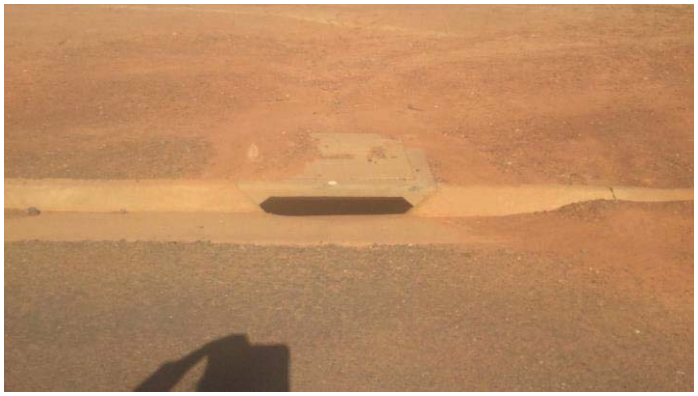
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:50:22 AM

Insp ID: 1653	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	4 - Very Good
Blockage (%):	0
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:48:46 AM

Insp ID: 1654	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Both
Condition:	4 - Very Good
Blockage (%):	40
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:17:06 AM

Insp ID: 1662	Group 3 - Tennant Creek, Elliott	Village Camp

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	10
Comment:	Some graffiti

Northern Territory Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:13:21 AM

Insp ID: 1665 Group 3 - Tennant Creek, Elliott Village Camp

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Sand
Roof Type:	Tin Roof
Width (mm):	
Length (mm):	
Appearance:	2
Appearance Comment:	
Condition:	2 - Poor
Comment:	Glass in sand, broken equipment

Northern Territory Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:12:17 AM

Insp ID: 1666	Group 3 - Tennant Creek, Elliott	Village Camp

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Natural ground
Roof Type:	Not Covered
Width (mm):	
Length (mm):	
Appearance:	2
Appearance Comment:	
Condition:	2 - Poor
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:56:51 AM

Insp ID: 1637	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	271_1
What are you inspecting:	Signs
Type of Sign:	Give Way
Sign Condition:	3 - Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:56:12 AM

Insp ID: 1638	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	271_1
What are you inspecting:	Signs
Type of Sign:	Street name
Sign Condition:	1 - Very Poor
Sign Comment:	No sign
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:49:44 AM

Insp ID: 1645	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	Village Camp Internal
What are you inspecting:	Signs
Type of Sign:	Liquor act warning
Sign Condition:	4 - Very Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:46:05 AM

Insp ID: 1646	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	Village Camp Internal
What are you inspecting:	Signs
Type of Sign:	Give Way
Sign Condition:	5 - Excellent
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:52:22 AM

Insp ID: 1651	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	271_1
What are you inspecting:	Signs
Type of Sign:	Street name
Sign Condition:	1 - Very Poor
Sign Comment:	No sign
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:01:58 AM

Insp ID: 1675	Group 3 - Tennant Creek, Elliott	Village Camp

Road Name:	271_2
What are you inspecting:	Signs
Type of Sign:	Give Way
Sign Condition:	3 - Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:15:35 AM

Insp ID: 1663 Group 3 - Tennant Creek, Elliott Village Camp

Stormwater Infrastructure:	Swales
Type of lining:	Natural Grasses
Are dimensions uniform along drain:	No
Base Width (m):	
Overall Width (m):	5
Swale Depth (m):	1
Length of Batter 1 (m):	
Length of Batter 2 (m):	
Swale Condition:	2 - Poor
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	No culverts, not a defined Swale

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:25:30 AM

Insp ID: 1619	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Two meters, outside of lot

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:22:26 AM

Insp ID: 1622	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 7:52:55 AM

Insp ID: 1641	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	No tap handle

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:47:06 AM

Insp ID: 1656	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	4 - Very Good
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 8:41:39 AM

Insp ID: 1659	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Two meters, outside of lots

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:11:02 AM

Insp ID: 1667	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handle, no bollards

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:08:40 AM

Insp ID: 1669	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Two meters, outside of lot

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 2/12/2016 9:07:18 AM

Insp ID: 1671	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Outside of lot

Northern Territory Town Camps

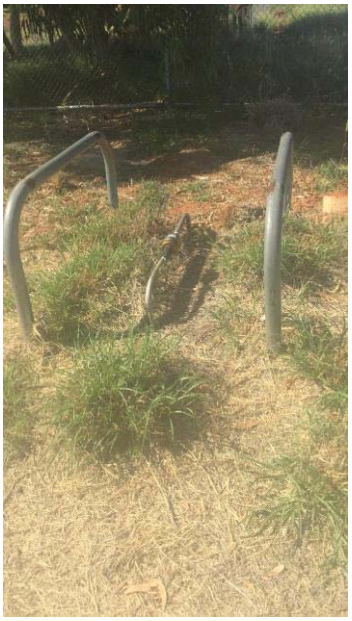
Civil Infrastructure

Inspection Date 2/12/2016 9:06:28 AM

Insp ID: 1672	Group 3 - Tennant Creek, Elliott	Village Camp

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Outside of lot



Electrical inspection reports

Legend

Electrical infrastructure

- 11KV HV/LV Pole
- 11KV Line Pole
- 11KV Pole Mounted Substation
- 11kV Air break switch
- 11kV Current transformer
- 11kV Package Substation
- 11kV Switch Fuse
- 11kV Switchgear
- LV Metering
- LV Line Pole
- LV Service Pole
- LV switch
- Street Lighting on HV Pole
- Transformer
- Town Camp roads
- NT cadastre
- Town Camp boundary

Electrical survey points

- 1234 Other Values
- 1234 Distribution Panel
- 1234 Overhead Poles
- 1234 Street Light
- 1234 Transformers

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_004_Elec_DDP_report.mxd 23/02/2017 12:22

A3 scale: 1:2,000

0 20 40 60 80 100 m

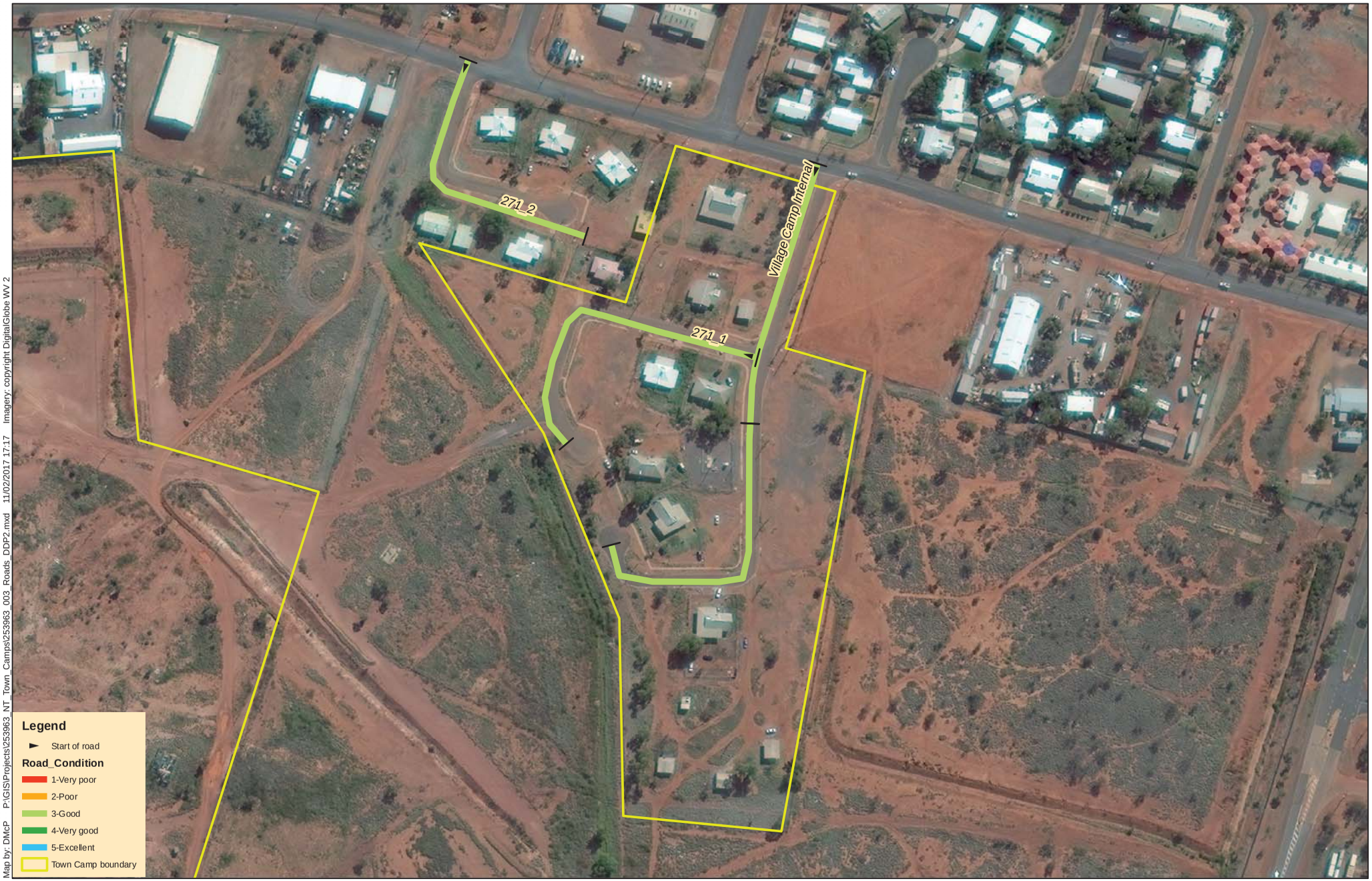
Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

271 - Village Camp (Tennant Creek)

Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

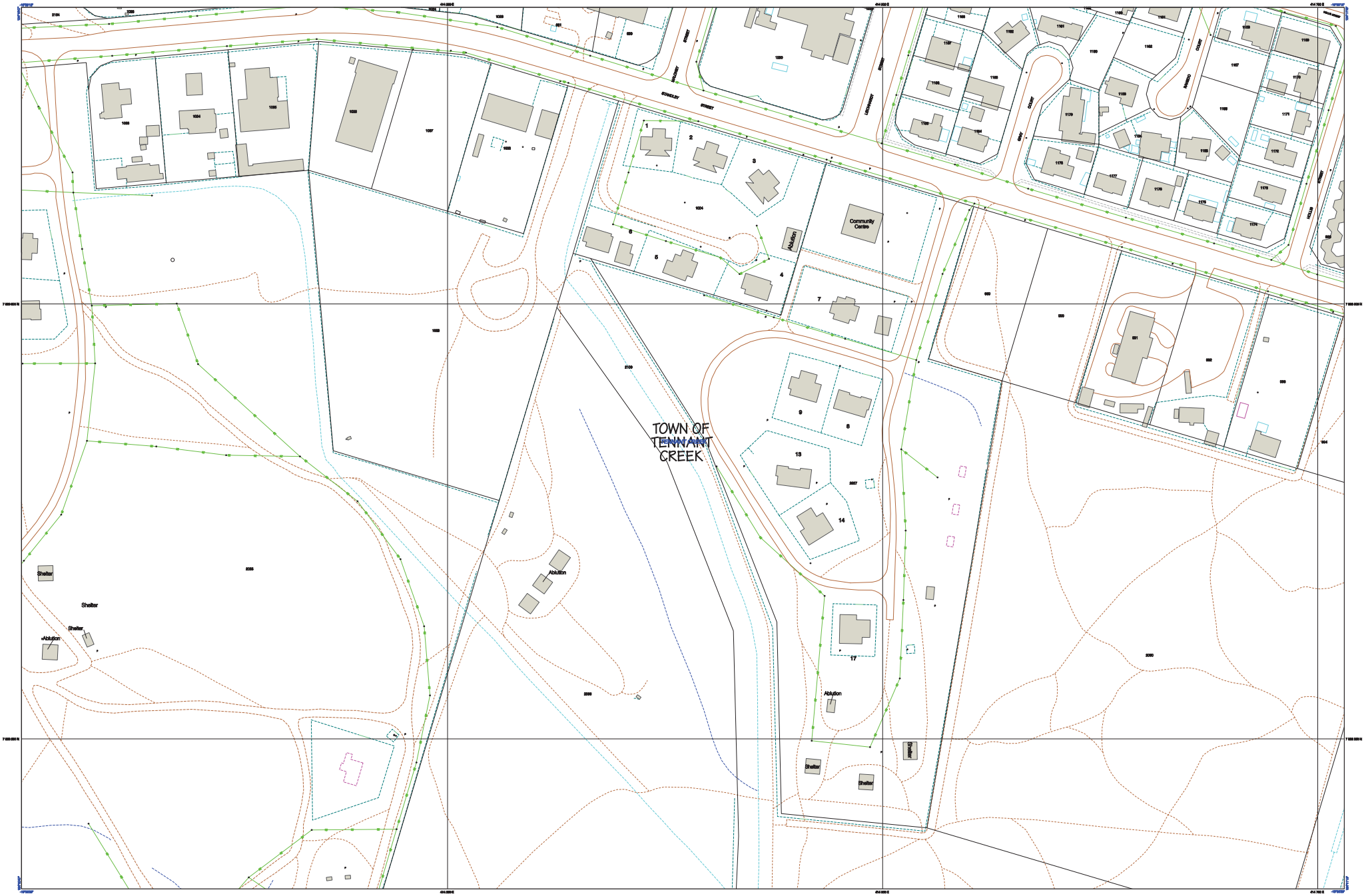
Coordinate system: GDA 1994

NT Town Camp Road Assessments

271 - Village Camp (Tennant Creek)

1194

Existing drawings



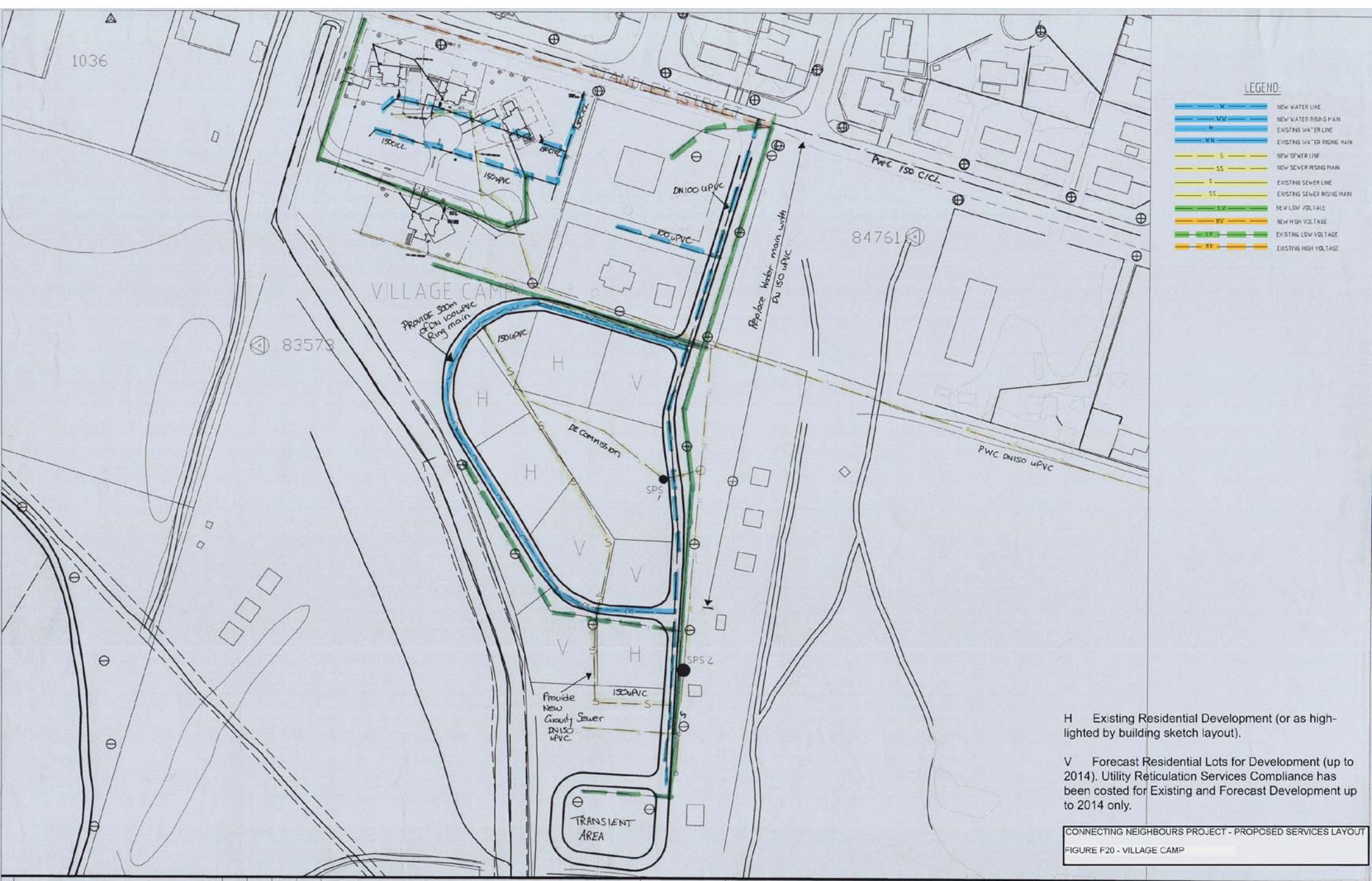
LEGEND

SOURCE INFORMATION

CONTOUR INTERVAL :
HORIZONTAL DATUM :
VERTICAL DATUM :
PROJECTION :
CURRENCY OF TOPOGRAPHY : 31 May 2009
SOURCE MAP SCALE : 2000
ZONE UTM : 53
DATE GENERATED : 23 June 2022

Locality Diagram

SERVICED LAND AVAILABILITY PROGRAM
SLAP Map
Village Camp (Tennant Creek Town Camp)
Nyinkkanyunu
Barkly Shire Council
Community ID: 271



H Existing Residential Development (or as highlighted by building sketch layout).

V Forecast Residential Lots for Development (up to 2014). Utility Reticulation Services Compliance has been costed for Existing and Forecast Development up to 2014 only.

CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT

FIGURE F20 - VILLAGE CAMP

1197

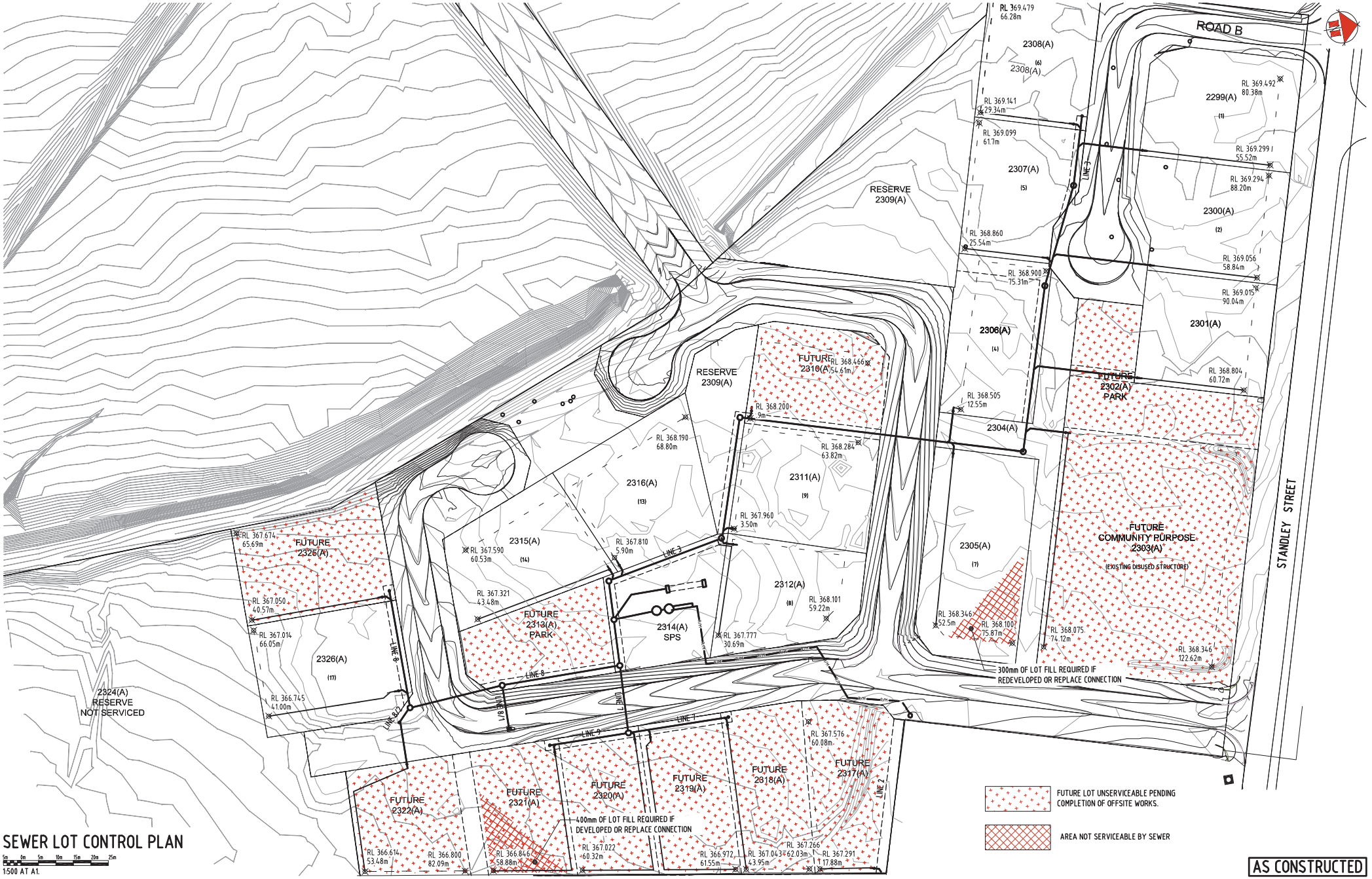
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

GHD MANAGEMENT ENGINEERING ENVIRONMENT

Scale 1:250	DO NOT SCALE	Client	
Drawn	Designed	Project	Connecting Neighbours Project
Drafting Check	Design Check	Title	
Approved		Original Size	A1
Date		Drawing No:	Rev: A

This Drawing must not be used for Construction unless signed as Approved

Cad File No: D:\43\20637\DWG\ VillageCamp.dwg Plot Date: 28 August 2004 - 3:04 PM



SEWER LOT CONTROL PLAN

1:500 AT A1.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
3	AS CONSTRUCTED	24.06.11	DMB
2	AS CONSTRUCTED	10.06.11	DMB
1	AS CONSTRUCTED	29.03.11	DMB

AMENDMENTS

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The Association of Consulting Engineers Australia
N-D8004.07

territory housing

NFA-02-271-CVL-DWG-0003

DRAWN	SGE	CHECKED	-
DATE	DEC 08	DATE	-
DESIGNED	SGE	CHECKED	-
DATE	DEC 08	DATE	-
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE - CONTROL

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.10 OF -	B10-14937	3	A1

G:\PROJECTS\2008-0PUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8041.04\N-D8041.04 DRAWINGS\07 VILLAGE & SORRY CAMP\CURRENT\N-D8004.07-C04.10.DWG

SETTING OUT TABLE			
STRUCTURE	EASTING	NORTHING	COVER LEVEL
2/13	414607.723	7826440.093	367.012
2/14	414520.679	7826466.824	367.901
3/1	414483.530	7826390.000	367.629
3/2	414472.397	7826390.484	367.823
3/3	414465.904	7826424.304	368.326
3/4	414432.872	7826435.487	368.421
3/6	414456.543	7826513.502	368.612
3/7	414410.961	7826527.796	369.158
3/8	414384.169	7826540.865	369.468
3/9	414365.089	7826546.696	369.374
7/1	414496.679	7826389.359	367.625
7/2	414516.086	7826388.480	367.430
7/3	414516.591	7826417.368	367.573

SETTING OUT TABLE			
STRUCTURE	EASTING	NORTHING	COVER LEVEL
8/1	414496.441	7826355.284	367.436
8/2	414498.152	7826328.272	367.359
8/2/1	414501.782	7826324.513	367.065
8/3	414464.275	7826328.211	367.323
9/1	414515.649	7826365.713	367.254
EDV1	414525.160	7826468.603	0.000
RM BEND A	414483.793	7826414.028	366.662
RM BEND B	414500.511	7826413.695	366.731
RM BEND C	414501.369	7826445.805	366.831
RM BEND D	414517.046	7826452.378	366.810

SEWERAGE LAYOUT PLAN

1:500 AT A1.

GENERAL NOTES

1. DESIGN AND CONSTRUCTION OF THE WATER AND SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE POWERWATER CONNECTION CODE AND ASSOCIATED DOCUMENTS.
2. ALL LEVELS GIVEN ARE TO AHD.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
4. MINIMUM COVER TO PIPE IS 750mm IN TRAFFICABLE AREA, 600mm IN OTHER AREAS.
5. PRIOR TO COMMENCEMENT OF WORKS THE CONSTRUCTOR SHALL CHECK THE LOCATION OF ALL UNDERGROUND SERVICES AND CONFIRM FINISHED SURFACE LEVELS AND CHECK THE MATERIAL, DIAMETER, ALIGNMENT, LEVEL AND LOCATION OF EXISTING PIPEWORK AT THE CONNECTION POINT.
6. IT IS NOT GUARANTEED THAT ALL SERVICES ARE SHOWN ON THE DRAWING.
7. OBTAIN PERMIT(S) FROM THE RELEVANT ROAD AUTHORITY PRIOR TO ROAD EXCAVATION.
8. ALL WATER AND SEWER (HYDRAULIC) WORKS SHALL BE CARRIED OUT AS SHOWN ON THE LATEST AMENDMENT OF THE DESIGN DRAWINGS.
9. CONSTRUCTION SITE DRAWINGS MUST BE SIGNED AS 'APPROVED FOR CONSTRUCTION' BY A LAND DEVELOPMENT OFFICER.
10. SEVEN (7) DAYS NOTICE HAS TO BE GIVEN TO LAND DEVELOPMENT, POWERWATER WITH A 'NOTICE OF INTENTION TO START WORK' PRIOR TO COMMENCEMENT OF WORK
    NORTHERN REGION–FACSIMILE 89 247212
    SOUTHERN REGION–FACSIMILE 89 517347.
11. ANY CHANGES TO THIS DRAWING, REQUIRED OR DESIRED DURING THE CONSTRUCTION PHASE MUST BE AUTHORISED BY A LAND DEVELOPMENT OFFICER.
12. ALL MATERIALS USED IN THE CONSTRUCTION OF WORKS TO BE CONNECTED TO POWERWATER INFRASTRUCTURE ARE TO BE AS NOMINATED IN POWERWATER'S "WATER AND SEWER MAINS PRODUCT MANUAL".
13. 'AS CONSTRUCTED' DRAWINGS MUST BE PROVIDED TO LAND DEVELOPMENT, POWERWATER PRIOR TO HANDOVER INSPECTION.
14. SUPERINTENDENT TO CONTACT LAND DEVELOPMENT, POWERWATER TO ARRANGE FOR HANDOVER INSPECTIONS. SEVEN (7) DAYS NOTICE MUST BE PROVIDED PRIOR TO HANDOVER INSPECTIONS.
15. CONNECTIONS TO EXISTING WATER AND SEWER MAINS WILL ONLY BE CARRIED OUT WHEN ALL WORKS UPSTREAM OF THE CONNECTION ARE COMPLETE (IE. TESTED, DISINFECTED WHERE APPLICABLE, BACKFILLED AND CERTIFICATES SUBMITTED) IN ACCORDANCE WITH THE APPROVED DESIGN DRAWINGS AND HAVE SATISFACTORILY PASSED FINAL HANDOVER INSPECTION.
16. POWERWATER PERSONNEL SHALL INSTALL ALL WATER AND SEWER CONNECTIONS TO EXISTING MAINS ONLY AFTER ACCEPTANCE OF THE WORK HAS BEEN ACHIEVED. THE CONSTRUCTOR IS RESPONSIBLE FOR ALL CONNECTION FEES, MATERIALS AND LABOUR FOR EXCAVATION, BACKFILLING AND REINSTATEMENT.
17. THE CONTRACTOR IS TO ARRANGE AND ATTEND A MEETING WITH PWC, THE HYDRAULIC CERTIFIER AND THE DEVELOPER PRIOR TO COMMENCEMENT OF SITE WORKS.
18. 'AS CONSTRUCTED' DRAWINGS AND OTHER INSTALLATION DOCUMENTATION MUST BE PROVIDED TO SERVICES DEVELOPMENT, POWER AND WATER PRIOR TO HANDOVER INSPECTION. ENSURE ALL AS CONSTRUCTED INFORMATION HAS BEEN PICKED UP BY THE SURVEYOR PRIOR TO BACKFILLING.
19. 'AS CONSTRUCTED' DRAWINGS TO BE CERTIFIED BY THE CERTIFYING ENGINEER. 'AS CONSTRUCTED' SURVEY BY A REGISTERED SURVEYOR. PROVIDE AS HARD COPY 1 x A3 PAPER, 1 x A1 FILM; AS WELL AS DIGITAL MICROSTATION DGN. FOR WATER SHOW POSITION (CO-ORDINATES TO MGA 94 & LEVELS TO AHD) FOR ALL VALVES, FIRE HYDRANTS, TEES, BEND AND LINE ENDS. SHOW SEPARATION DISTANCES/LEVELS FOR INTERSECTING SERVICES. FOR SEWER SHOW POSITION (CO-ORDINATES TO MGA 94 & LEVELS TO AHD) OF ALL ACCESS CHAMBERS, ACCESS SHAFTS, INSPECTION OPENINGS, SEPARATION DISTANCES/LEVELS TO CROSSING SERVICES, ALL OTHER VALUES REQUIRED TO CERTIFY COMPLIANCE OF THE DRAWINGS. SHOW FINISHED SURFACE LEVEL AT LOT CORNERS TO VERIFY LOT COVERAGE. PROVIDE MANUFACTURER AND MODEL DETAILS FOR ALL MAIN COMPONENTS.

SEWERAGE

1. ALL GRAVITY SEWER PIPES SHALL BE uPVC CLASS SN8 WITH STYRENE–BUTADIENE RUBBER RING JOINTS (SBR), UNLESS NOTED OTHERWISE.
2. SEWERS 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.
3. ALL GRAVITY SEWERS ARE DN150, UNLESS NOTED OTHERWISE.
4. THE SUPERINTENDENT SHALL DETERMINE SEWER PIPE BEDDING TYPE AFTER INSPECTION OF THE EXCAVATED TRENCH.
5. MAINTENANCE HOLE COVERS SLABS SHALL FINISH AT;
   a) FINISHED SURFACE LEVEL IN ROAD RESERVES AND FOOTPATHS AND MATCH CROSS FALL TO A MAXIMUM OF 2 DEGREES (42mm ACROSS THE DIAMETER OF A 1200mm MH COVER); AND
   b) MIN. 150mm ABOVE SURFACE LEVEL IN PRIVATE PROPERTY AND OPEN SPACE.
6. THE CONSTRUCTOR SHALL INSCRIBE THE MAINTENANCE HOLE COVER WITH THE IDENTIFYING NUMBER AS SHOWN ON THE DRAWINGS.
7. ALL NEW SEWER MANHOLES/ACCESS CHAMBERS ARE TO BE 1200mm DIA.
8. WHERE REQUIRED, POLYURETHANE COATING OF NEW OR EXISTING MANHOLES SHALL BE ELASTON (W80) SPRAY POLYURETHANE ELASTOMER OR PWC APPROVED EQUIVALENT. APPLY IN 2 COATS EACH OF 2.0mm THICKNESS IN CONTRASTING COLOURS. SPRAY IN A CONTINUOUS APPLICATION WITH NO DRY JOINTS.
9. BEDDING OF PIPE BELOW INSPECTION OPENINGS MUST BE COMPACTED TO MIN 90% OF MODIFIED MAXIMUM DRY DENSITY. USE APPROVED BEDDING AND FULLY FLOOD OR COMPACT BY APPROVED TECHNIQUES.
10. USE CONCRETE WITH 20mm MAXIMUM AGGREGATE AND 80mm NOMINAL SLUMP COMPLYING WITH AS 1379. USE GRADE N20 CONCRETE FOR THRUST BLOCKS AND GRADE N32 CONCRETE FOR ALL OTHER PURPOSES UNLESS NOTED OTHERWISE. POUR THRUST BLOCKS AGAINST UNDISTURBED GROUND. PROVIDE FELT OR APPROVED PLASTIC BOND BREAKER BETWEEN PIPE / FITTINGS AND CONCRETE.
11. USE HEAVY DUTY INSPECTION OPENING OPTION FOR DRAWING NUMBERS W2–1–05, W2–1–06 & W2–2–07.
12. ALL PROPERTY SERVICES TO LOTS TO BE GRADED AT MINIMUM OF 1:100 WITH DN150 PIPE.
13. SECONDARY OVERFLOW TO OUTLET INTO STORMWATER SYSTEM. PROVIDE 300mm WALL MOUNTED FLAP GATE.. MODEL: WATER GATES SP FGA–L1

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
AMENDMENTS			
9	AS CONSTRUCTED	28.07.11	DMB
8	AS CONSTRUCTED	24.06.11	DMB
7	AS CONSTRUCTED	10.06.11	DMB
6	AS CONSTRUCTED	29.03.11	DMB
5	ISSUE FOR PWC APPROVAL – LINE 3 SEWER REDESIGN	14.05.10	DMB
4	ISSUE FOR PWC APPROVAL – SECONDARY SEWER REDESIGN	02.03.10	MJE

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ACEA The Association of Consulting Engineers Australia
N-D8004.07

territory housing
IPT-02-271-CVL-DWG-0045

DRAWN	CD	CHECKED	JTL
DATE	DEC 08	DATE	DEC 08
DESIGNED	CD	CHECKED	DMB
DATE	DEC 08	DATE	DEC 08
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

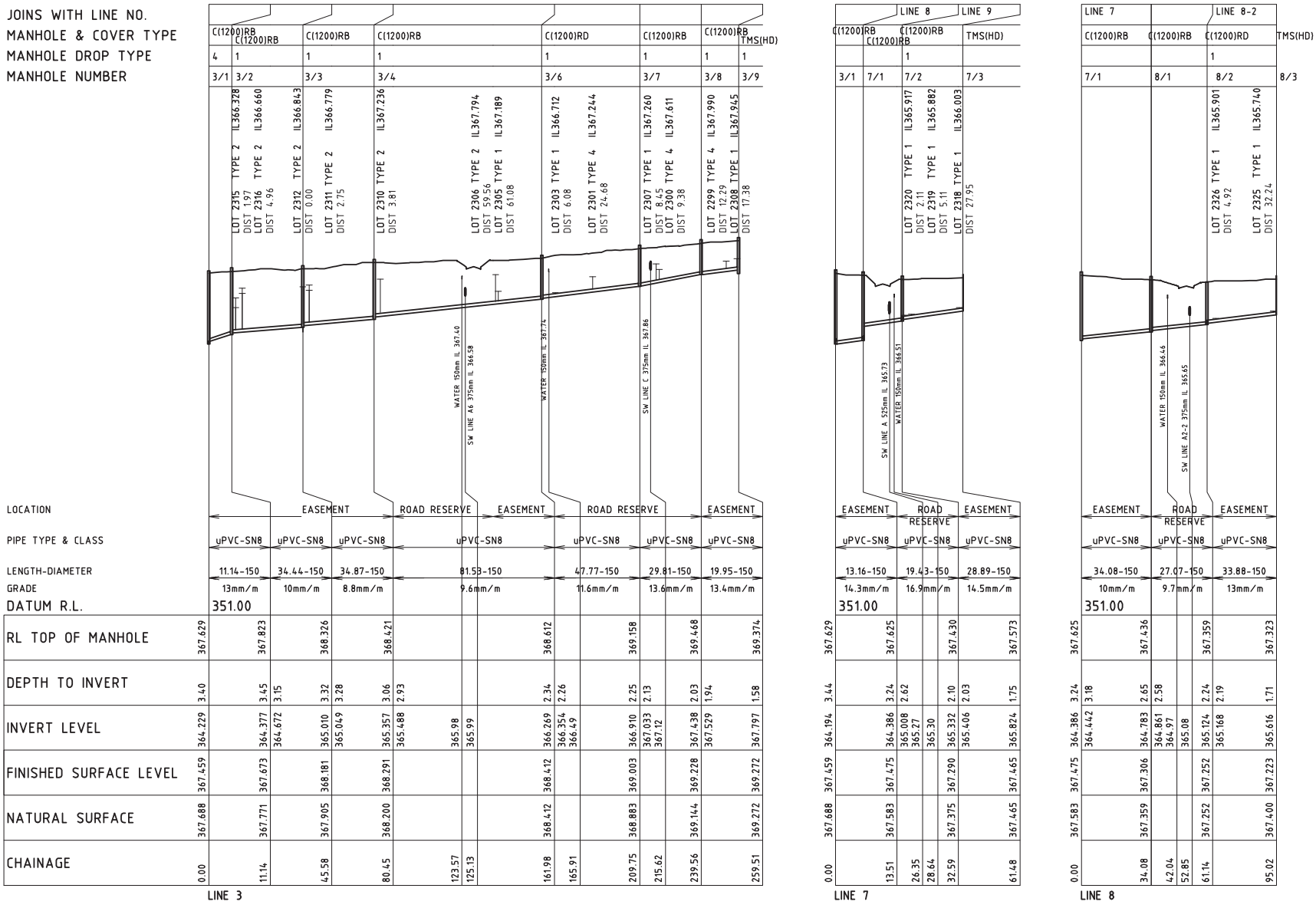
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE – LAYOUT PLAN

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
–	–	C04.01 OF –	R08–1931	9	A1

1100



SEWERAGE - LONG SECTION

10m 0m 10m 20m 30m 40m 50m
1m 0m 1m 2m 3m 4m 5m

HORIZONTAL 1:1000 AT A1
VERTICAL 1:100 AT A1

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
8	AS CONSTRUCTED	24.06.11	DMB
6	AS CONSTRUCTED	29.03.11	DMB
5	ISSUE FOR PWC APPROVAL - LINE 3 SEWER REDESIGN	14.05.10	DMB
4	ISSUE FOR PWC APPROVAL - SECONDARY SEWER REDESIGN	02.03.10	MJE
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB

AMENDMENTS

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N-D8004.07

territory housing
IPT-02-271-CVL-DWG-0046

DRAWN	CD	CHECKED	JTL
DATE	DEC 08	DATE	DEC 08
DESIGNED	CD	CHECKED	DMB
DATE	DEC 08	DATE	DEC 08
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE - LONG SECTIONS SHEET 1 OF 2

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.02 OF -	R08-1932	8	A1

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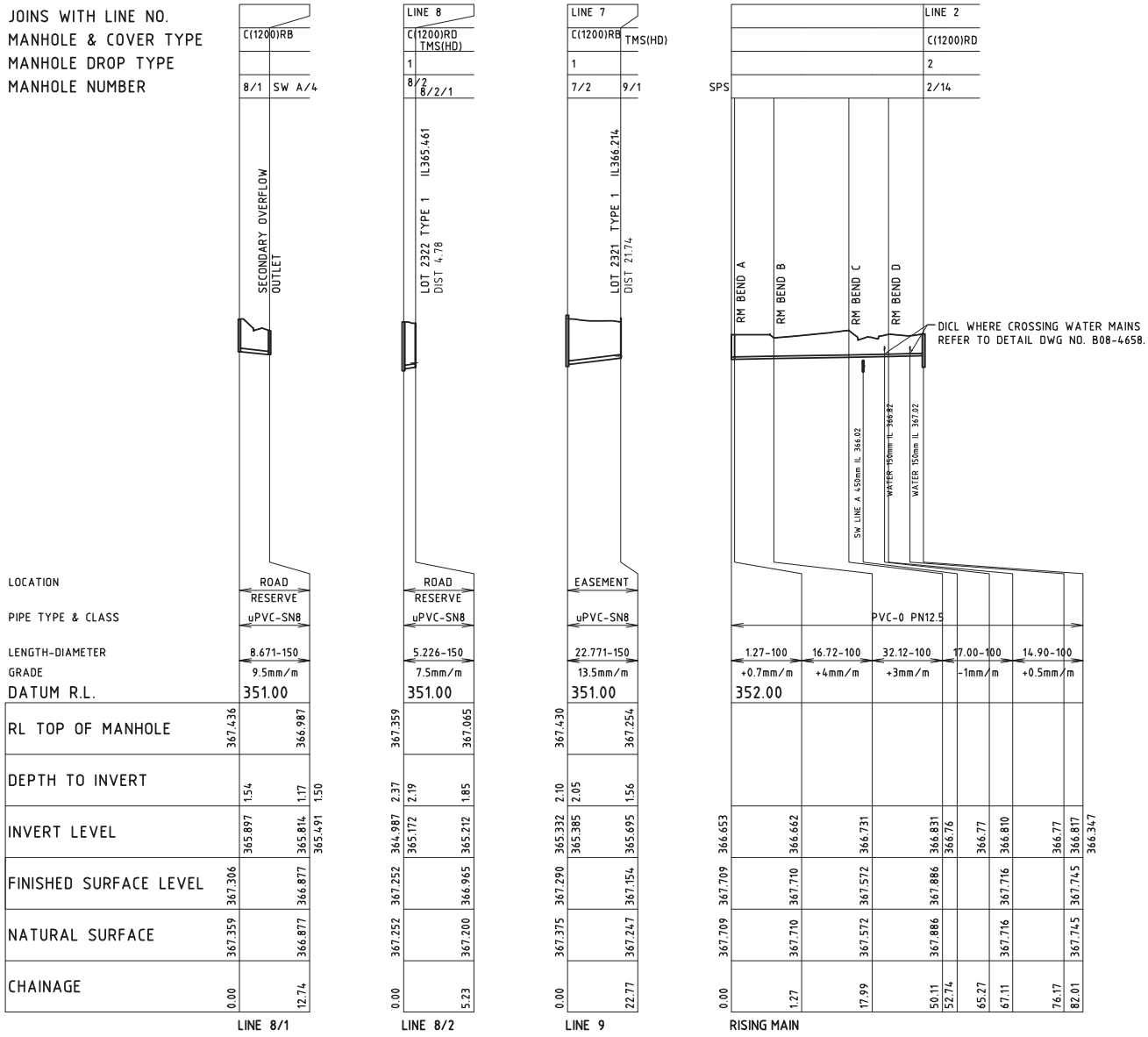
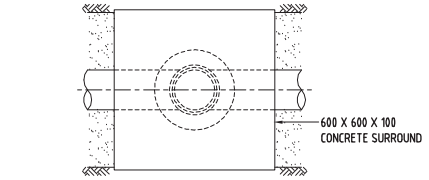


SEWERAGE - LONG SECTION

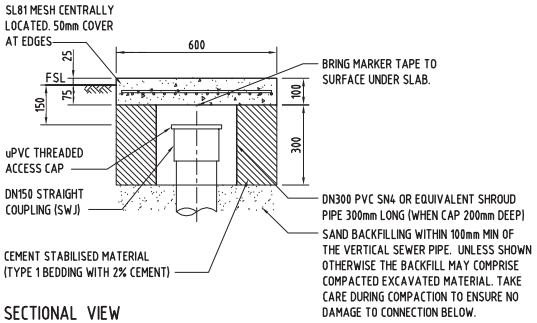
HORIZONTAL 1:1000 AT A1
VERTICAL 1:100 AT A1

HOUSE CONNECTIONS

LOT NO.	DISTANCE FROM DOWNSTREAM A/C (m)	DOWNSTREAM ACCESS CHAMBER NO.	IL OF HOUSE CONNECTION AT 10 (m)	DISTANCE HOUSE CONNECTION EXTENDS INTO PROPERTY (m)	HOUSE CONNECTION TYPE
2308	17.38	3/8	367.945	5.26	1
2299	12.29	3/8	367.990	2.40	4
2300	9.38	3/7	367.611	1.93	4
2307	8.45	3/7	367.260	1.92	1
2301	24.68	3/6	367.244	3.29	4
2303	6.08	3/6	366.712	2.09	1
2305	61.08	3/4	367.189	1.95	1
2306	59.56	3/4	367.794	2.17	2
2310	3.81	3/4	367.236	6.16	2
2311	2.75	3/3	366.779	3.06	2
2312	0.00	3/3	366.843	2.06	2
2316	4.96	3/2	366.660	2.74	2
2315	1.97	3/2	366.328	2.57	2
2318	27.95	7/2	366.003	4.92	1
2319	5.11	7/2	365.882	4.99	1
2320	2.11	7/2	365.917	4.94	1
2325	32.25	8/2	365.740	4.28	1
2326	4.92	8/2	365.901	4.82	1
2322	4.78	8/2	365.461	2.60	1
2321	21.74	7/2	366.214	4.93	1



PLAN VIEW



SECTIONAL VIEW

ON LOT CONNECTION INSPECTION OPENING DETAIL

NTS

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
9	AS CONSTRUCTED	28.07.11	DMB
8	AS CONSTRUCTED	24.06.11	DMB
7	AS CONSTRUCTED	10.06.11	DMB
6	AS CONSTRUCTED	29.03.11	DMB
5	GENERAL AMENDMENTS	14.05.10	DMB
4	ISSUE FOR PWC APPROVAL - SECONDARY SEWER REDESIGN	02.03.10	MJE

AMENDMENTS

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The Association of Consulting Engineers Australia
N-D8004

territory housing
IPT-02-271-CVL-DWG-0047

DRAWN	CD	CHECKED	JTL
DATE	DEC 08	DATE	DEC 08
DESIGNED	CD	CHECKED	DMB
DATE	DEC 08	DATE	DEC 08
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE - LONG SECTIONS SHEET 2 OF 2

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.03 OF -	R08-1933	9	A1

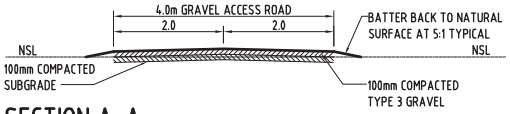
G:\PROJECTS\2008-OPUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004-MW-D8004.00 DRAWINGS\07 - VILLAGE & SORRY - CAMP\CURRENT\N-D8004-07-C04.03.DWG

ELECTRICAL NOTES

1. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS/NZS 3000, AS/NZS 3008.1.1, PWC REGULATIONS & STANDARD PWC DRAWINGS B06-4751 TO B06-4766 INCLUSIVE.
2. CONTRACTOR SHALL SUPPLY & INSTALL NEW OVERHEAD TWISTED AERIAL SUPPLY TO NEW PUMP STATION SERVICE POLE. POLE SHALL BE 9.1m SERVICE POLE (TYPE IN ACCORDANCE WITH PWC STANDARD DWG S01-1-39 & INSTALLED IN ACCORDANCE WITH PWC STANDARD DWG B06-4762). CABLING SHALL BE 4 CORE 16 Sq mm Cu, TWISTED AERIALS & BE RUN BETWEEN EXISTING PWC POWER POLES & NEW SERVICE POLE IN PUMP STATION COMPOUND.
3. CONTRACTOR SHALL SUPPLY & INSTALL NEW SEWERAGE PUMP STATION CONTROL PANELS/CUBICLES THAT SHALL BE PLINTH MOUNTED ON 1800x1600 N20 CONCRETE BASE SLAB (100 THICK, F82 MESH CENTRALLY LOCATED) TOP OF PANELS SHALL BE 2000 ABOVE CONC. BASE IN ACCORDANCE WITH STD PWC DRAWING. CONTRACTOR SHALL SUPPLY & INSTALL 'SHADE STRUCTURE' IN ACCORDANCE WITH PWC STD DRAWING B06-4763. SERVICE POLE SHALL ALSO BE FITTED WITH A PWC METER PANEL & FLOODLIGHTS WITH SWITCH NOT ON LIGHT SENSOR IN ACCORDANCE WITH STD PWC DRAWING. NOTE: LUMINAIRE TO BE MOUNTED ON A PROPRIETRY STREET LIGHT ARM TO SUPERINTENDENT APPROVAL.
4. CONTRACTOR SHALL SUPPLY & INSTALL NEW INCOMING SUPPLY CABLING FROM MAINS CONNECTION BOX ON SERVICE POLE TO NEW PUMP CONTROL PANEL/CUBICLE VIA PWC METER BOX IN ACCORDANCE WITH PWC STD DRAWING B06-4762.
5. CONTRACTOR SHALL SUPPLY & INSTALL POWER CABLING TO SEWERAGE PUMPS AND MUFFIN MONSTER VIA UPSTANDS/DECONTACTOR PLUGS & SOCKETS IN ACCORDANCE WITH PWC STD DRAWINGS. CABLING SHALL BE RUN UNDERGROUND WITH MINIMUM 600 COVER TO TOP OF CONDUITS.
6. CONTRACTOR SHALL SUPPLY & INSTALL 1 OFF FLOW METER AT PUMP STATION FLOW METER SHALL BE LOCATED IN ABOVE GROUND DELIVERY PIPEWORK IN PUMP STATION COMPOUND. REFER TO DRAWING R08-1935.
7. CONTRACTOR SHALL SUPPLY & INSTALL CONTROL CABLING BTW FLOAT SWITCHES (VIA CONNECTOR UPSTAND) TO CONTROL PANEL/CUBICLE (RUN UNDERGROUND IN 50 HD uPVC CONDUIT). SUPPLY & INSTALL CONTROL CABLING FROM FLOW METER/TRANSMITTER TO CONTROL PANEL (RUN UNDERGROUND IN 50 HD uPVC CONDUIT). PROVIDE MINIMUM 600 COVER TO TOP OF CONDUITS.
8. AT COMPLETION OF WORKS, CONTRACTOR SHALL CARRY OUT TESTING/COMMISSIONING OF COMPLETE ELECTRICAL SYSTEM AT PUMP STATION TO THE SATISFACTION OF THE SUPERINTENDENT. PROVIDE O&M MANUALS AND ALL RELEVANT PAPERWORK AS DETAILED. IN ADDITION, CONTRACTOR SHALL PROVIDE 'AS INSTALLED' DRAWINGS INCLUDING COPIES OF STANDARD PWC DRAWINGS & INCORPORATE WITHIN O&M MANUALS.

GENERAL NOTES

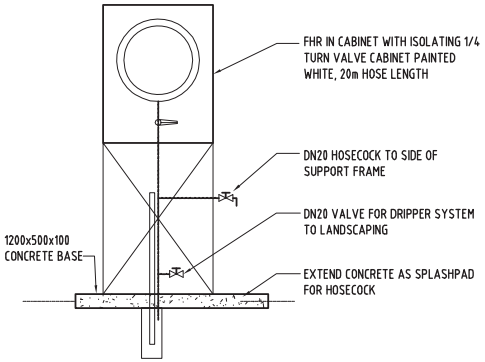
1. EXISTING CONCRETE SLAB TO BE DEMOLISHED, AND NEW GRAVEL HARDSTAND AREA TO BE CONSTRUCTED.
2. EXISTING FENCE TO BE REMOVED. REUSE EXISTING FENCING MATERIALS WHERE POSSIBLE IN CONSTRUCTION OF NEW FENCE.



SECTION A-A

0.5m 0m 0.5m 1.0m 1.5m 2.0m 2.5m

1:50 AT A1.



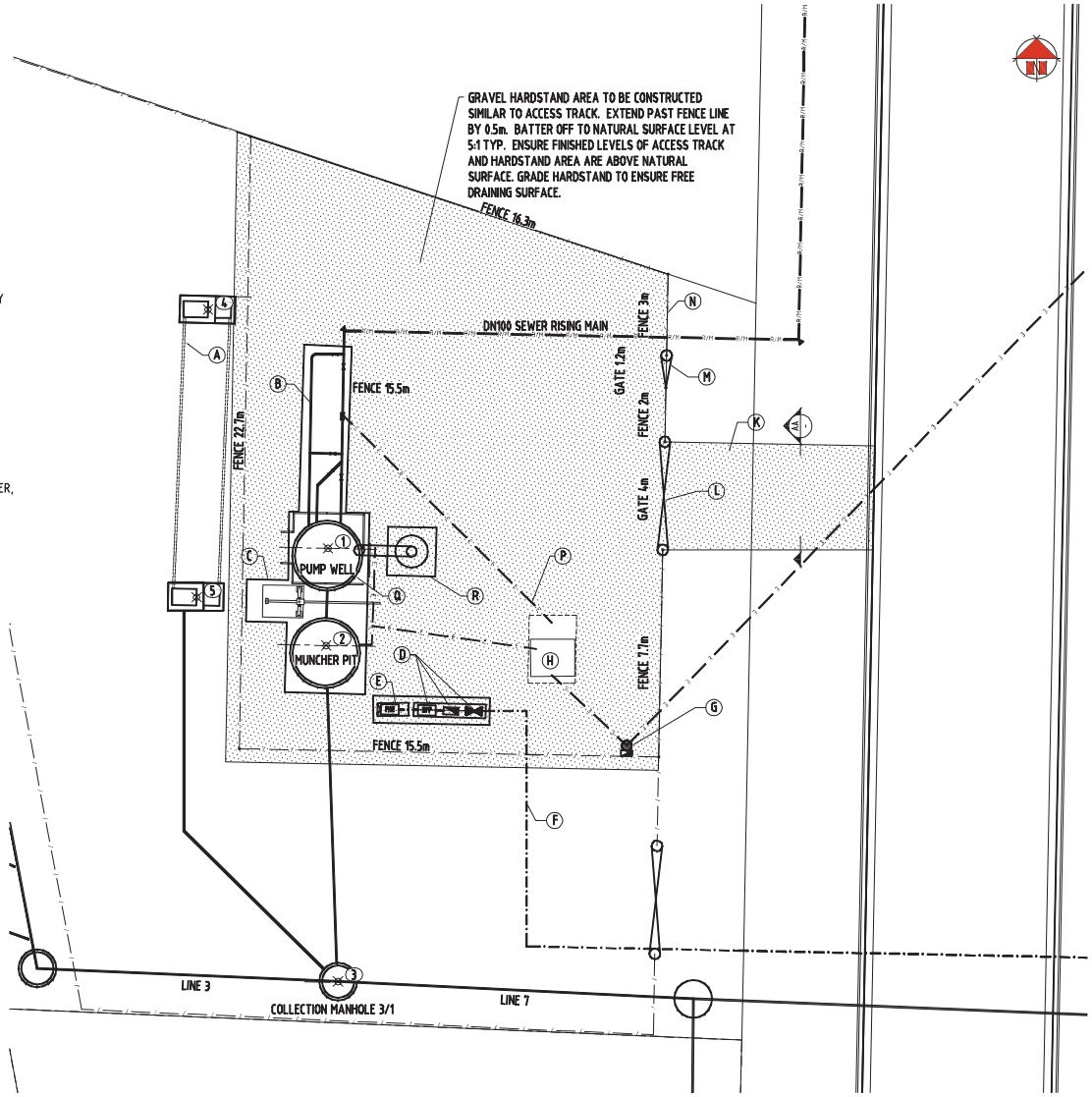
DETAIL 1

NTS

LAYOUT SCHEDULE

- (A) OVERFLOW CHAMBER (REFER TO SHEET R09-1605 FOR OVERFLOW DETAILS).
- (B) REFER PUMP STATION DETAILS DRAWING (R08-1935) FOR VALVE AND PIPE ARRANGEMENT.
- (C) NEW GANTRY REFER SHEET R09-1941 FOR DETAILS.
- (D) DN25 VALVE, DN25 WATER METER, DN25 RPZD BACK FLOW PREVENTION DEVICE ON CONCRETE PAD .
- (E) FIRE HOSE REEL AND DN20 HOSE TAP, WITH SPLASH PAD. REFER DETAIL 1.
- (F) DN25 WATER SERVICE CONNECTION FROM NEW WATER MAIN.
- (G) EXISTING LV POWER POLE
- (H) CONTROL PANEL & SHADE STRUCTURE IN ACCORDANCE WITH PWC STD DWGS. CONTRACTOR SHALL SUPPLY AND INSTALL NEW UNDERGROUND MAINS SUPPLY FROM METER PANEL TO PUMP CONTROL PANEL.
- (K) ACCESS ROAD. REFER SECTION A-A.
- (L) 4m DOUBLE GATE
- (M) PEDESTRIAN GATE
- (N) SECURITY FENCE IN ACCORDANCE WITH PWC STD. DWG W1-6-02
- (P) CONTRACTOR SHALL SUPPLY AND INSTALL NEW UNDERGROUND CABLING IN CONDUITS BETWEEN NEW CONTROL PANEL AND NEW FLOW METER TRANSMITTER, AND ALSO BETWEEN CONTROL PANEL AND PUMP COLLECTOR UPSTAND.
- (Q) HOT DIPPED GALV. STEEL GUARDRAIL SYSTEM. REFER PWC STD DWG W2-3-04A.
- (R) VENT STACK

SETTING OUT TABLE		
POINT	EASTING	NORTHING
1	414483.158	7826406.039
2	414483.087	7826402.440
3	414483.530	7826390.000
4	414478.720	7826414.881
5	414478.294	7826404.225



PUMP STATION LAYOUT PLAN

1.0m 0m 1.0m 2.0m 3.0m 4.0m 5.0m

1:100 AT A1.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
8	AS CONSTRUCTED	26.08.11	JTL
7	AS CONSTRUCTED	20.06.11	JTL
6	ISSUE FOR CONSTRUCTION (FENCING DIMENSIONS UPDATED ONLY)	26.08.10	JTL
5	ISSUE FOR PWC APPROVAL - ALLOTMENT RECONFIGURED	13.05.10	DMB
4	ISSUE FOR PWC APPROVAL - SEWER REDESIGN	02.03.10	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB

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territory housing

IPT-02-271-CVL-DWG-0048

DRAWN	CD	CHECKED	JTL
DATE	DEC 08	DATE	DEC 08
DESIGNED	CD	CHECKED	BMD
DATE	DEC 08	DATE	DEC 08
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

SEWERAGE PUMP STATION - LAYOUT PLAN

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.04 OF -	R08-1934	8	A1

1202

NOTES:

1. ALL DICL PIPEWORK TO COMPLY WITH WASAA STANDARDS FOR USE IN SEWER SYSTEMS.
2. ALL FLANGES DRILLED TO AS2129 TABLE 'C'
3. SEE SITE PLAN FOR LOCATION OF ELECTRICAL CONTROL CABINETS AND HOSECOCK.
4. ALL REQUIRED BRACKETRY IN WET WELL TO BE CONSTRUCTED OF STAINLESS STEEL (GRADE 316) AS PER STD. DWG. No. W2-3-02.
5. ALL ANCHORS IN WET WELL TO BE APPROVED STAINLESS STEEL GRADE 316 WITH GRADE 304 NUTS UNLESS OTHERWISE APPROVED.
6. FOR SETOUT DETAILS AT TOP OF LADDER REFER TO W2-2-04 SECTIONS A & E
7. ALL VALVES TO BE CLOCKWISE CLOSING.
8. PUMP WELL AND ACCESS CHAMBER BASES TO BE CONSTRUCTED AGAINST UNDISTURBED GROUND.
9. WET WELL TO BE COATED WITH POLYURETHANE COATING. REFER SEWERAGE NOTE 8 DWG R08-1931.
10. ALL CONCRETE SHALL BE SULPHATE RESISTANT (SR), CLASS N50 (50 MPa f'c, 20mm MAX. AGGREGATE), SUPPLIED & PLACED IN ACCORDANCE WITH AS3600.
11. ALL CUSTOM ACCESS CHAMBER COVERS WITHIN PUMP STATION COMPOUND TO BE 2 PART HINGED ALUMINIUM CHEQUER PLATE COVER FABRICATED IN ACCORDANCE WITH PWC STD. DWG. W2-3-02. DIMENSIONS AS NOTED ON PLAN.
12. FLOWMETER TO BE EARTHED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDTIONS.
13. MOUNT PUMPS ON SS BASE PLATE SET INTO WET WELL CONCRETE FLOOR. REFER DETAIL DWG R08-1936.
14. LEVES TO BE MEASURED USING FLYGT PRESSURE TRANSDUCER WITH MOUNTING BRACKET AND HOOK FOR CABLE. LOCATE NEAR TOP OF WELL

MANUALS:

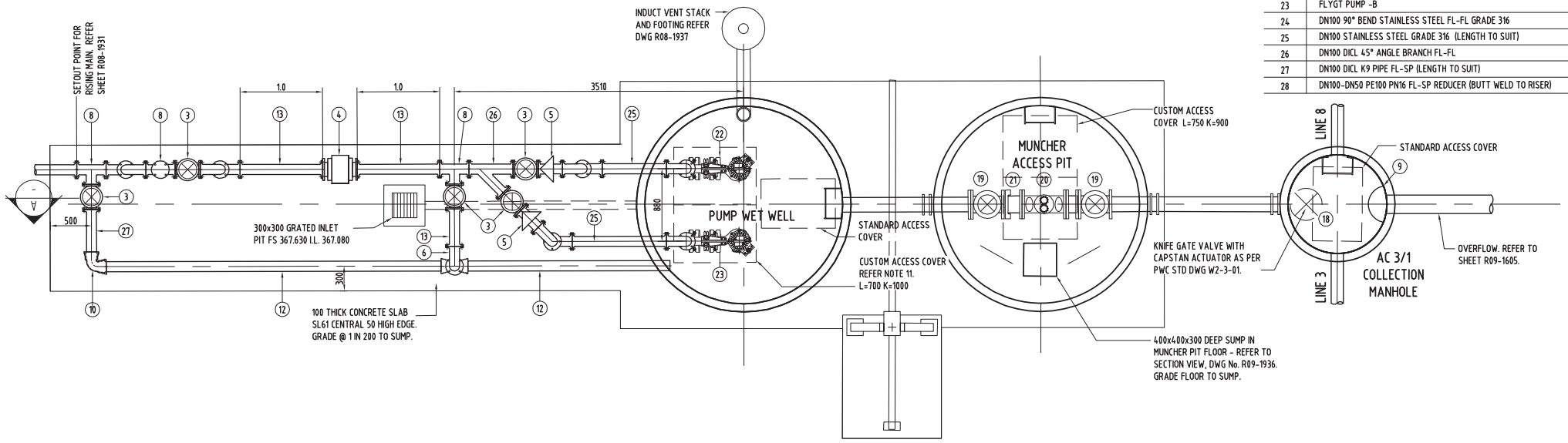
1. PROVIDE FULL OPERATION AND MAINTENANCE MANUALS FOR THE PUMP STATION COMPLETE WITH AS CONSTRUCTED DRAWINGS AND COMMISSIONING TEST RESULTS.
2. ONE ELECTRONIC COPY OF THE MANUALS AND FOUR HARD COPY MANUALS ARE TO BE PROVIDED. INCLUDE DESIGN CALCULATIONS, COMMISSIONING TEST RESULTS TOGETHER WITH ALL SET POINT VALUES. INCLUDE ALL TECHNICAL INFORMATION REQUIRED TO SATISFACTORILY OPERATE, MAINTAIN AND REFURBISH THE EQUIPMENT.
3. THE MANUALS ARE TO BE COMPREHENSIVE AND FULLY INDEXED, SUBSECTIONS ARE TO BE CLEARLY MARKED AND TABBED FOR QUICK REFERENCE. A DRAFT COPY OF THE DRAWINGS AND MANUALS ARE TO BE AVAILABLE AT THE TIME OF COMMISSIONING.
4. THE FORMAT IS TO BE A4. BOUND IN A4 RING, LOOSE LEAF HARD COVER BINDER. FINAL COPIES OF ALL DRAWINGS AND MANUALS ARE TO BE PROVIDED PRIOR TO FINAL ACCEPTANCE OF THE WORKS BY POWER AND WATER. DRAWINGS IN MANUALS TO BE A3 IF READABLE, OTHERWISE A1.
5. FULL NAMEPLATE INFORMATION IS TO BE RECORDED AND PRESENTED IN SUMMARY SHEETS FOR ITEMS SUCH AS PUMPS, VALVES PRESSURE TRANSDUCERS, FLOWMETERS. INCLUDE MANUFACTURER/SUPPLIERS CONTACT DETAILS FOR ALL SIGNIFICANT ITEMS OF PLANT.

DESIGN CRITERIA	
DESCRIPTION	**ULTIMATE FUTURE DESIGN**
CONTRIBUTING EP	192 EP
ADWF = EP x ADDWF	0.67 L/sec
PDWF = r x Qa	2.99 L/sec
PWWF = 3 xPDWF	8.96 L/sec
DUTY FLOW, Qp , LESSER OF 0.75Qw & 8x ADWF	5.33 L/sec
PUMP HEAD AT DUTY FLOW	4.6m
RISING MAIN (DN100 PVC-O) DESIGN FLOW	8.90 L/sec
RISING MAIN VELOCITY	0.9 m/sec
ACTUAL PUMP DUTY (TO SUIT PUMP CURVE)	5.5L/sec @4.7m HEAD

PUMP NOMINATION

2 x FLYGT PUMPS, CP3045.181 HT 90 DN50, 1.2kW
DUTY 5.5 L/sec@4.7m HEAD STAINLESS STEEL PUMP GUIDE RAILS CONNECTED @ 2000 MAX CENTRES.
- THE SPECIFIED PUMP PERFORMANCE DUTY WILL BE TESTED ON SITE AND MUST BE MET WITH NO NEGATIVE TOLERANCE.

PIPEWORK SCHEDULE	
No.	**DESCRIPTION**
1	WELDED OR BOLTED FLANGE (TYP)
2	PUDDLE FLANGE (TYP)
3	DN100 ISOLATING VALVE - SAUNDERS DIAPHRAGM VALVE - TYPE KB
4	DN100 ABB MAGMASTER FLANGED FLOWMETER-CONVERTER & DISPLAY MOUNTED IN CONTROL PANEL. REFER NOTE 12.
5	ITT FLYGT - HDL TYPE 5087 SINKING BALL NON-RETURN VALVE (TYP)
6	DN100 90° BEND DICL FL-FL (TYP)
7	DISMANTLING JOINT
8	DN100 DICL FL-FL TEE (TYP)
9	STAINLESS STEEL OVERFLOW BAFFLE (TYP). PWC STD DWG W2-3-02.
10	DN100 90° BEND DICL SOC-SOC (TYP)
11	DN100 DICL SOC-SOC-FL TEE
12	DN100 CLASS 12 uPVC (LENGTH TO SUIT)
13	DN100 DICL K9 PIPE FL-FL (LENGTH TO SUIT)
14	DN100 PE100 PN16 PIPE FL-FL (LENGTH TO SUIT)
15	DN100 BLANK FL TAPPED 50 BSP
16	DN50 S/S BALL VALVE & 50 BSP S/S FERRULES
17	DN50 SEWAGE GAS RELEASE VALVE (VENTOMAT RGX TYPE)
18	KNIFE GATE VALVE WITH CAPSTAN ACTUATOR (PWC STD DWG W2-3-01.)
19	DN150 ISOLATING VALVE - SAUNDERS DIAPHRAGM VALVE
20	ITT JWC MM300004T-1206 MUFFIN MONSTER (38 l/sec)
21	DN150 SPIGOT TO FLANGE CONNECTION + DISMANTLING JOINT CLASS 35
22	FLYGT PUMP -A
23	FLYGT PUMP -B
24	DN100 90° BEND STAINLESS STEEL FL-FL GRADE 316
25	DN100 STAINLESS STEEL GRADE 316 (LENGTH TO SUIT)
26	DN100 DICL 45° ANGLE BRANCH FL-FL
27	DN100 DICL K9 PIPE FL-SP (LENGTH TO SUIT)
28	DN100-DN50 PE100 PN16 FL-SP REDUCER (BUTT WELD TO RISER)



PUMP STATION LAYOUT PLAN

N.T.S.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
4	AS CONSTRUCTED	31.03.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC APPROVAL - SEWER REDESIGN	26.11.09	CD
1	ISSUE FOR CONSTRUCTION	02.10.09	CD

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territory housing
IPT-02-271-CVL-DWG-0049

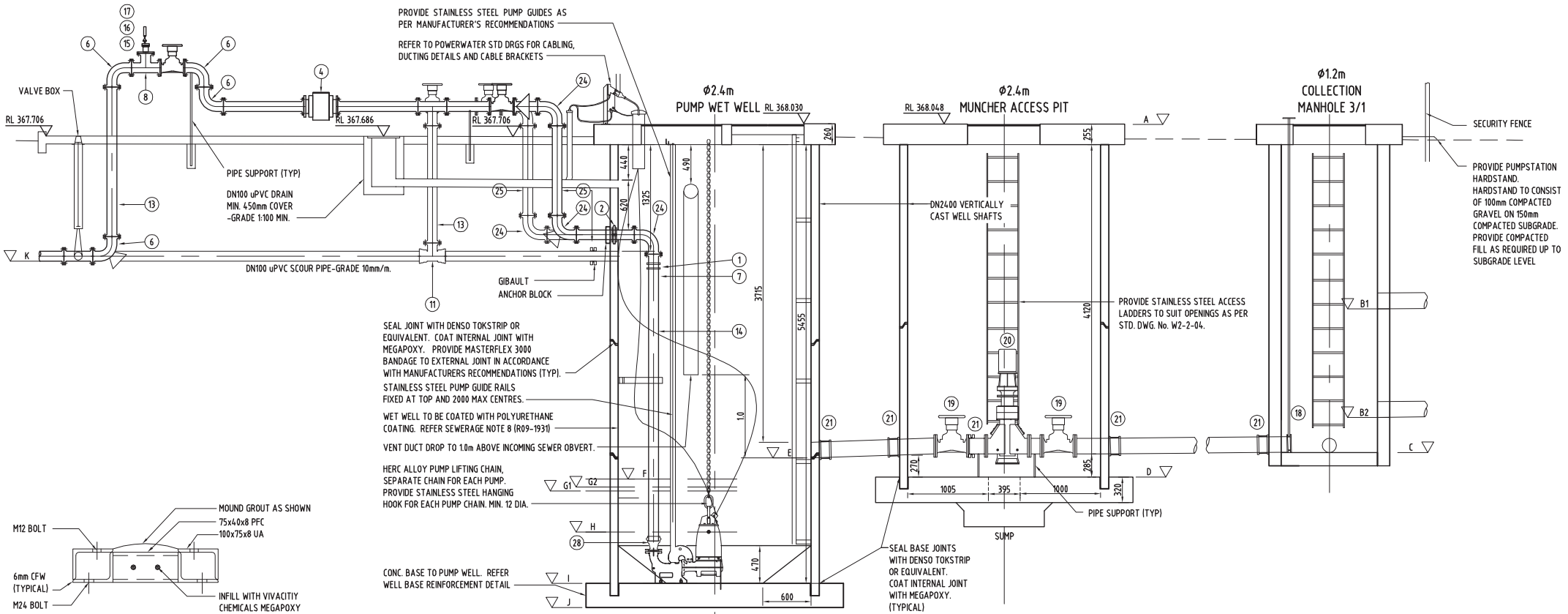
DRAWN	CD	CHECKED	JTL
DATE	DEC 08	DATE	DEC 08
DESIGNED	CD	CHECKED	DMB
DATE	DEC 08	DATE	DEC 08
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

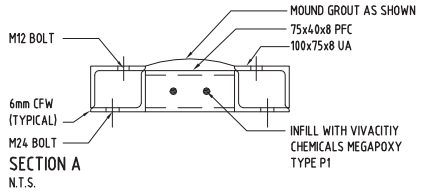
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE PUMP STATION - DETAILS SHEET 1 OF 4

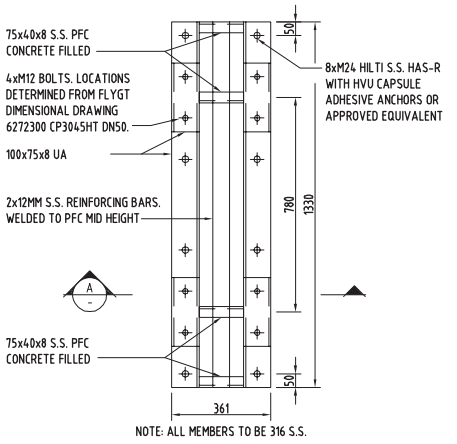
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SIZE
-	-	C04.05 OF -	R08-1935	4	A1

G:\PROJECTS\2008-OPUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.00\N-D8004.00 DRAWINGS\07 VILLAGE & SORRY CAMP\CURRENT\N-D8004.72-C04.05.DWG





SECTION A
N.T.S.

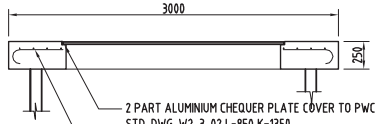


SS PUMP MOUNT BASE PLATE DETAIL
N.T.S.

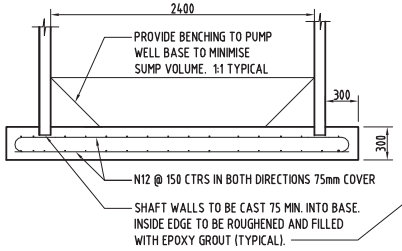
PUMP STATION SECTION VIEW (SECTION A)
N.T.S.

LEVEL SCHEDULE

No.	DESCRIPTION	LEVEL
A	TOP OF MANHOLES	368.048
B1	OVERFLOW OUTLET LEVEL TO TANK	365.600
B2	OVERFLOW RETURN LEVEL	364.200
C	INVERT OF COLLECTION AC DISCHARGE	363.987
D	BOTTOM OF MUNCHER PIT	363.388
E	INVERT OF PUMP WELL INCOMING SEWER	363.905
F	HIGH LEVEL ALARM (PUMP 2 START + 200)	363.430
G1	PUMP START LEVEL - (PUMP 1)	363.130
G2	PUMP START LEVEL - (PUMP 2) PUMP 1 + 100	363.230
H	PUMP STOP LEVEL (NOMINAL)	362.870
I	BOTTOM OF PUMP WELL	362.315
J	BASE OF PUMP WELL	362.015
K	INVERT OF RISING MAIN	366.653



TYPICAL WELL LID REINFORCEMENT DETAIL
N.T.S.



TYPICAL WELL BASE REINFORCEMENT DETAIL
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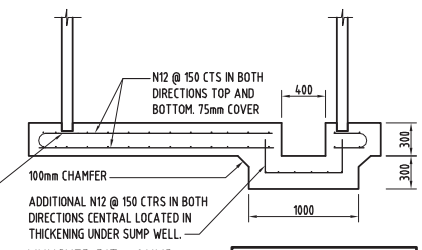

MUNCHER PIT - SUMP
N.T.S.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
4	AS CONSTRUCTED	23.08.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC APPROVAL - SEWER REDESIGN	26.11.09	CD
1	ISSUE FOR CONSTRUCTION	02.10.09	CD

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territory housing

IPT-02-271-CVL-DWG-0050

DRAWN	CD	CHECKED	JTL
DATE	DEC 08	DATE	DEC 08
DESIGNED	CD	CHECKED	DMB
DATE	DEC 08	DATE	DEC 08
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS

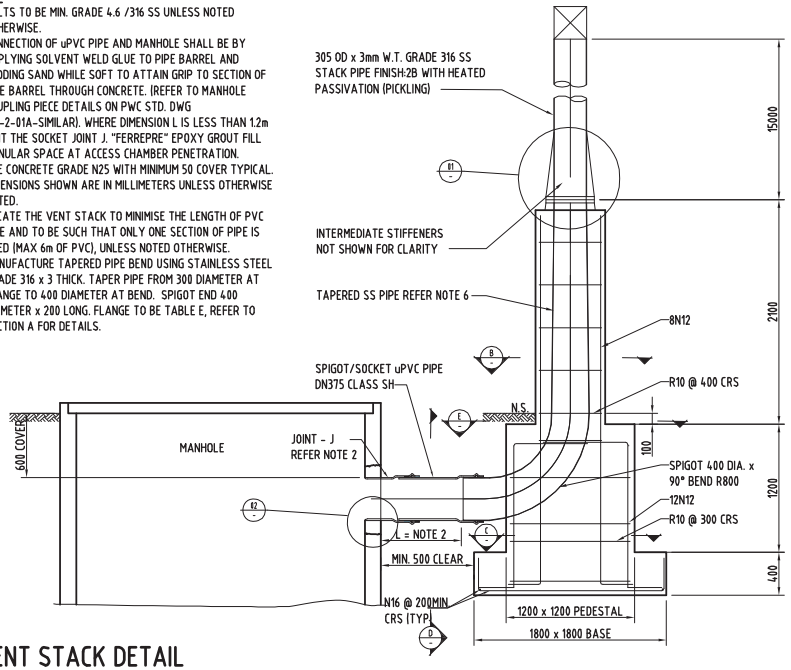
SEWERAGE PUMP STATION - DETAILS SHEET 2 OF 4

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.06 OF -	R08-1936	4	A1

1204

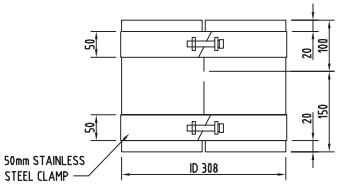
NOTES

1. BOLTS TO BE MIN. GRADE 4.6 /316 SS UNLESS NOTED OTHERWISE.
2. CONNECTION OF uPVC PIPE AND MANHOLE SHALL BE BY APPLYING SOLVENT WELD GLUE TO PIPE BARREL AND BEDDING SAND WHILE SOFT TO ATTAIN GRIP TO SECTION OF PIPE BARREL THROUGH CONCRETE. (REFER TO MANHOLE COUPLING PIECE DETAILS ON PWC STD. DWG W2-2-01A-SIMILAR). WHERE DIMENSION L IS LESS THAN 1.2m OMIT THE SOCKET JOINT J. "FERREPRE" EPOXY GROUT FILL ANNULAR SPACE AT ACCESS CHAMBER PENETRATION.
3. USE CONCRETE GRADE N25 WITH MINIMUM 50 COVER TYPICAL.
4. DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
5. LOCATE THE VENT STACK TO MINIMISE THE LENGTH OF PVC PIPE AND TO BE SUCH THAT ONLY ONE SECTION OF PIPE IS USED (MAX 6m OF PVC), UNLESS NOTED OTHERWISE.
6. MANUFACTURE TAPERED PIPE BEND USING STAINLESS STEEL GRADE 316 x 3 THICK. TAPER PIPE FROM 300 DIAMETER AT FLANGE TO 400 DIAMETER AT BEND. SPIGOT END 400 DIAMETER x 200 LONG. FLANGE TO BE TABLE E, REFER TO SECTION A FOR DETAILS.



VENT STACK DETAIL

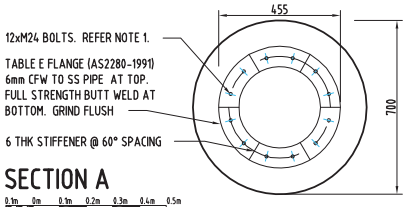
N.T.S.



ADAPTER TO FIT THE INDUCT COWL ON THE STACK PIPE. GRADE 316 STAINLESS STEEL, WALL THICKNESS 1.6mm. 308 ID TO SLIDES 100mm OVER INDUCT COWL (306mm OD) AND 150mm OVER STACK PIPE (305mm OD).

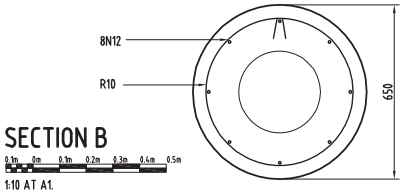
CLAMP DETAIL

1:5 AT A1.



SECTION A

1:10 AT A1.



SECTION B

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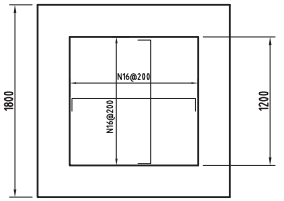
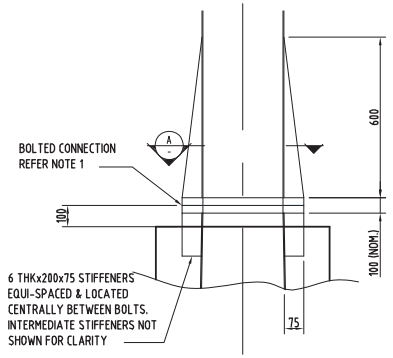
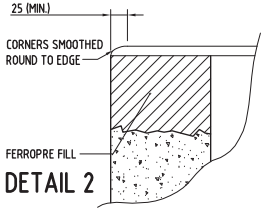


SECTION C

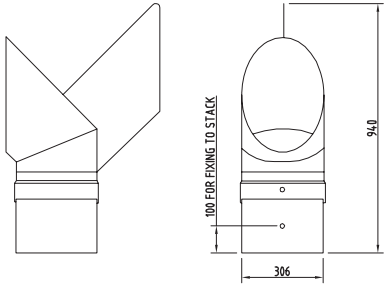
1:25 AT A1.



DETAIL 1



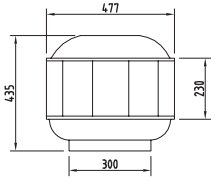
DETAIL 2



INDUCT VENT:
EDMONDS INDUCT, MODEL 300mm. NECK DIMENSIONS 298mm ID AND 306mm OD. 140mm FOR ADAPTER TO SLIDE OVER OUTSIDE. TO BE CONNECTED TO STACK WITH S/S CLAMP REFER CLAMP DETAIL.
POWDER COAT FINISH TO MATCH STAINLESS STEEL VENT PIPE.

INDUCT DETAIL

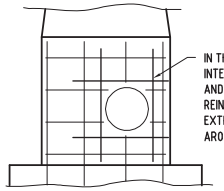
1:10 AT A1.



EDUCT VENT:
SUREDRAT EDUCT, MODEL h300.
THROAT AREA: 0.0745 (m2)
MATERIAL: 316 STAINLESS STEEL SHAFT WITH A GLASS FILLED NYLON BEARING HOLDER TO RESIST HYDROGEN SULPHIDE GAS.
ROTATION BEARINGS: DOUBLE ROW BALL BEARINGS (UPPER BEARING).
WIND SPEED RATING: 205 KM/H (56.9 m/s)
TO BE CONNECTED TO STACK WITH 4 OFF NO. 4 (3.2mm) MONEL BLIND RIVETS, LOCATED AT EQUAL DISTANCE AROUND CIRCUMFERENCE.
POWDER COAT FINISH TO MATCH STAINLESS STEEL VENT PIPE.

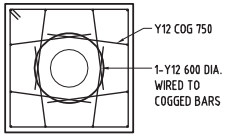
EDUCT DETAIL

1:10 AT A1.



SECTION D

1:25 AT A1.



SECTION E

1:25 AT A1.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
4	AS CONSTRUCTED	31.03.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC APPROVAL - SEWER REDESIGN	26.11.09	CD
X	ISSUE FOR CONSTRUCTION	02.12.09	DMB

AMENDMENTS

OPUS QANTEC McWILLIAM
A.B.N. 79 086 342 065
Level 1, 60 Smith Street
Darwin NT 0801
GPO Box 4083 Darwin NT 0801
Telephone: (08) 8981 7500
Facsimile: (08) 8941 1862
E-Mail: darwin@opusqmcw.com.au
The Association of Consulting Engineers Australia
N-D8004.07

territory housing

IPT-02-271-CVL-DWG-0051

DRAWN CD DATE DEC 08	CHECKED JTL DATE DEC 08
DESIGNED CD DATE DEC 08	CHECKED DBB DATE DEC 08
DESIGN PROJECT LEADER DATE	PROJECT OFFICER DATE

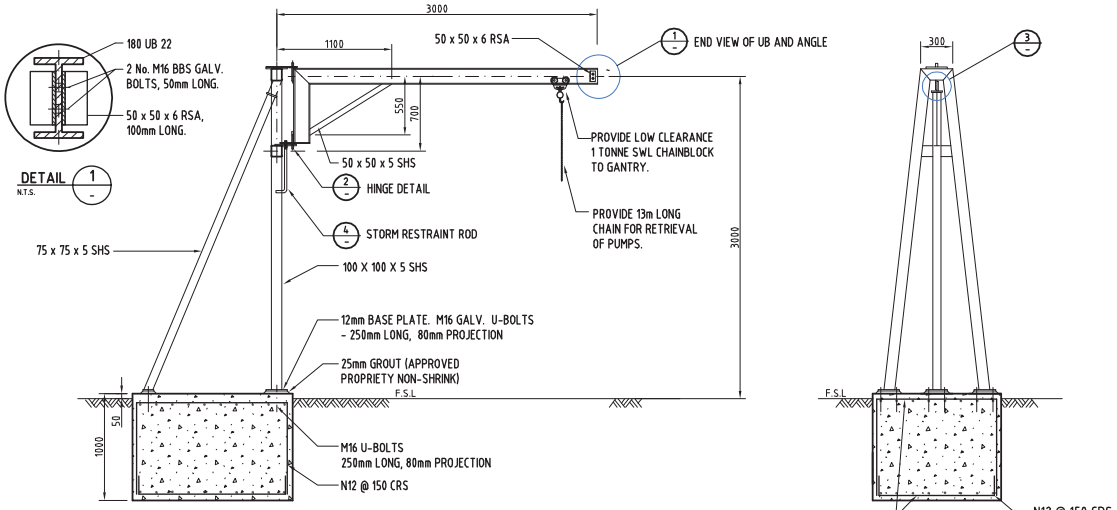
Northern Territory Government
Department of Planning and Infrastructure

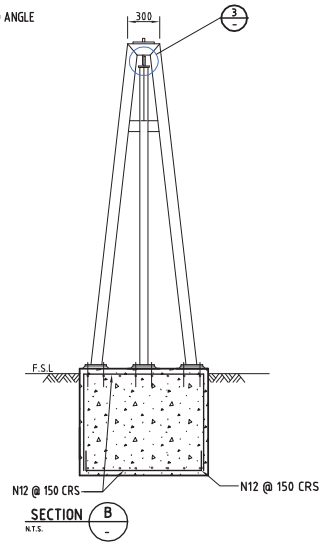
TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE PUMP STATION - DETAILS SHEET 3 OF 4

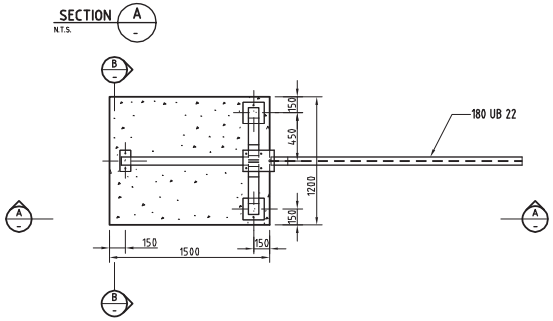
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.07 OF -	R08-1937	4	A1

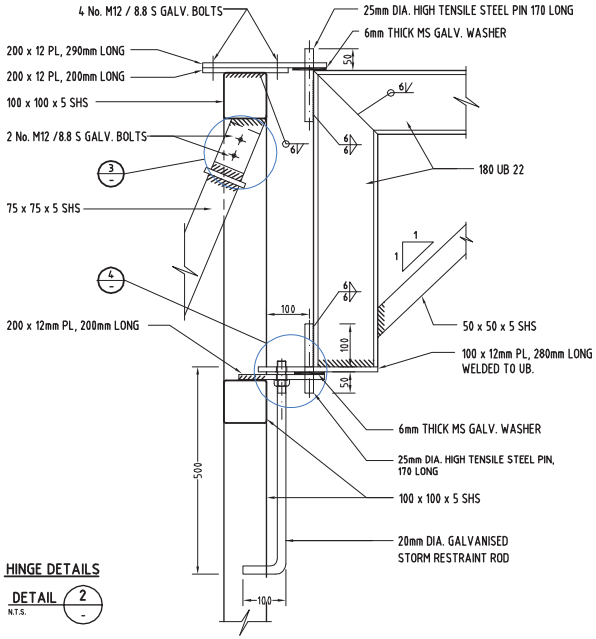
G:\PROJECTS\2008-OPUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.10\N-D8004.10 DRAWINGS\07 VILLAGE & SORRY CAMP\CURRENT\N-D8004.P27-CVL-T1.DWG

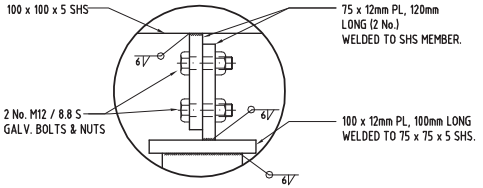
1205

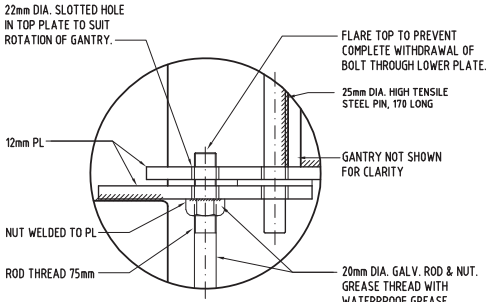












STEELWORK

1. STEELWORK SHALL COMPLY WITH AS4100 AND AS1554. ALL WELDS 5 CFW, UNLESS NOTED OTHERWISE.
2. GALV BOLTS TO AS1111. BOLT HOLE CLEARANCE 2mm. HD BOLT HOLE CLEARANCE 5mm.
3. DESIGN LOAD FOR MONORAIL = 625kg SWL CLASS 1. MONORAIL CAPACITY TO BE MARKED ON 180 UB 22 IN ACCORDANCE WITH AS1418.

PAINTING

1. ALL STEELWORK SHALL BE PREPARED IN ACCORDANCE WITH NATSPEC AND SHALL THEN BE PRIMED WITH AN APPROVED INORGANIC ZINC SILICATE TO A DRY FILM THICKNESS OF 0.075mm APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. HOT DIPPED GALVANISING AFTER MANUFACTURE IS ALSO ACCEPTABLE.
2. AFTER ERECTION ANY DAMAGE SHALL BE MADE GOOD WITH AN APPROVED COMPATABILE INORGANIC EPOXY ZINC PRIMER.

CONCRETE

1. CONCRETE SHALL BE CLASS N32 (F'c 32MPa) 20mm MAX AGGREGATE. ALL WORK SHALL COMPLY WITH AS3600 AND AS1379.
2. UNLESS OTHERWISE NOTED, COVER TO ALL REINFORCEMENT SHALL BE 50mm.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
4	AS CONSTRUCTED	31.03.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC APPROVAL - SEWER REDESIGN	26.11.09	CD
1	ISSUE FOR CONSTRUCTION	02.10.09	CD

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territory housing
IPT-02-271-CVL-DWG-0052

DRAWN CD DATE DEC 08	CHECKED JTL DATE DEC 08
DESIGNED CD DATE DEC 08	CHECKED DMB DATE DEC 08
DESIGN PROJECT LEADER DATE	PROJECT OFFICER DATE

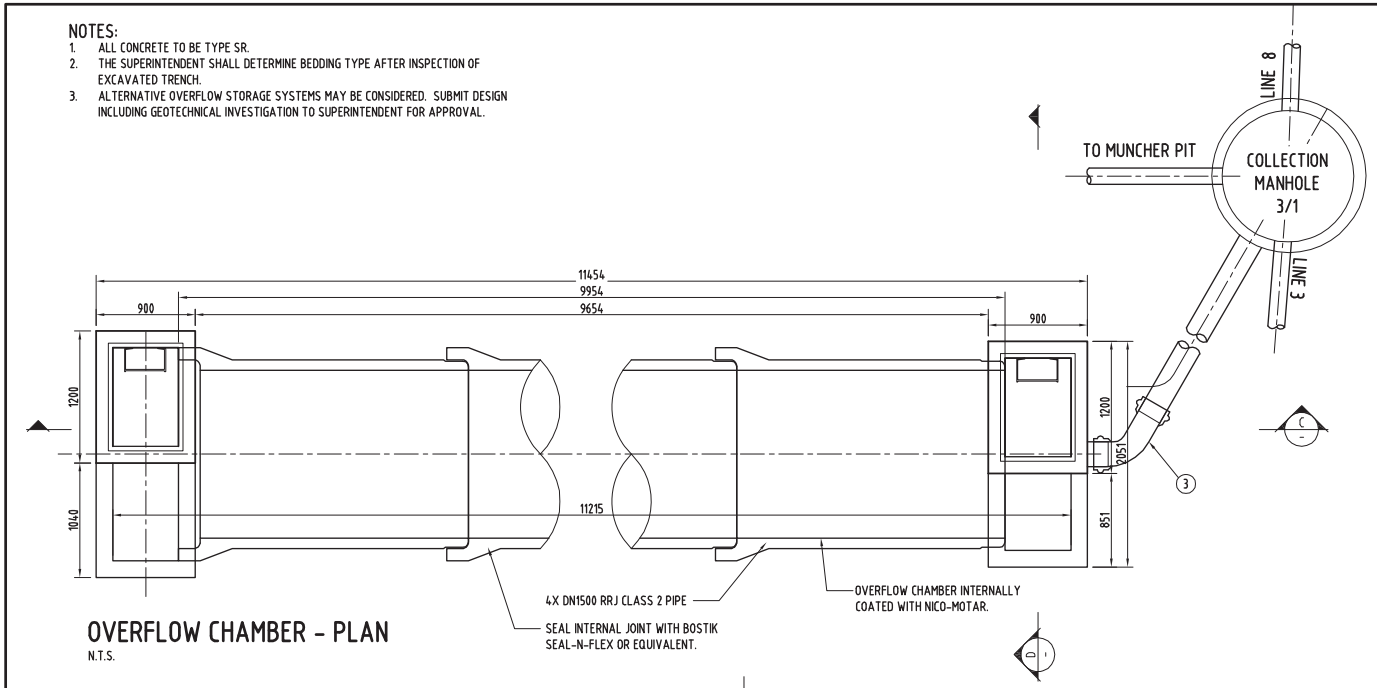
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE PUMP STATION - DETAILS SHEET 4 OF 4

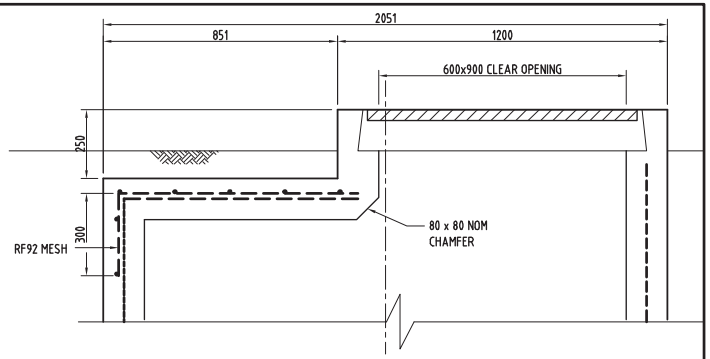
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.08 OF -	R08-1941	4	A1

G:\PROJECTS\2008-OPUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.00\N-D8004.00 DRAWINGS\07 VILLAGE & SORRY CAMP\CURRENT\N-D8004.P7-C04.08.DWG

NOTES:
1. ALL CONCRETE TO BE TYPE SR.
2. THE SUPERINTENDENT SHALL DETERMINE BEDDING TYPE AFTER INSPECTION OF EXCAVATED TRENCH.
3. ALTERNATIVE OVERFLOW STORAGE SYSTEMS MAY BE CONSIDERED. SUBMIT DESIGN INCLUDING GEOTECHNICAL INVESTIGATION TO SUPERINTENDENT FOR APPROVAL.



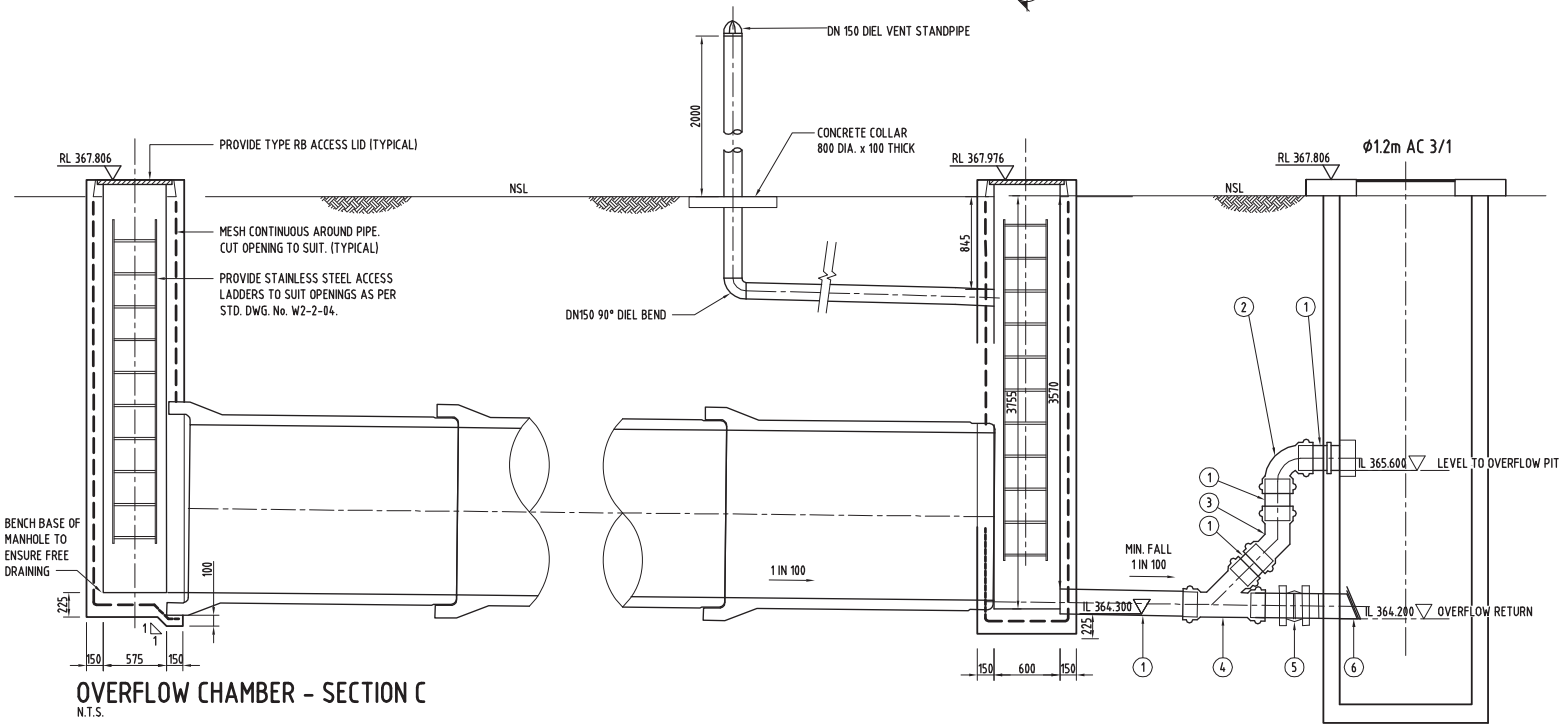
OVERFLOW CHAMBER - PLAN
N.T.S.



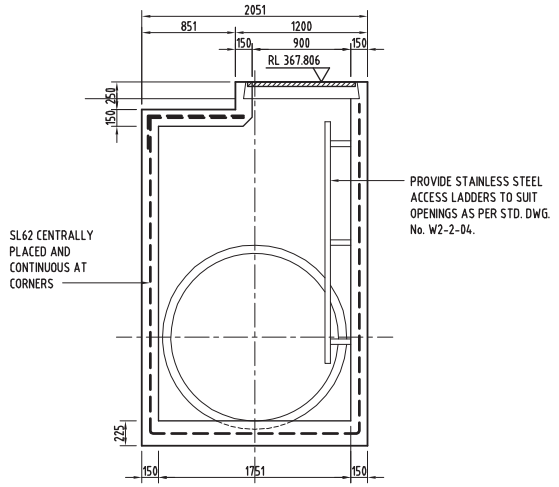
OVERFLOW CHAMBER CLASS RB COVER
NTS

PIPEWORK SCHEDULE	
No.	DESCRIPTION
1	DN225 PVC CLASS SN8 DWV STANDARD SPIGOT CONNECTOR
2	DN225 uPVC CLASS SN8 DWV 90° BEND (SO-SO)
3	DN225 uPVC CLASS SN8 DWV 60° BEND (SO-SO)
4	DN225 PVC CLASS SN8 DWV EQUAL SLOPE JUNCTION (SO-SO-SO)
5	DN225 GIBAULT
6	300mm FLAP GATE MODEL FCS-H1 'WATERGATES SP' S.S. GRADE 316 WALL MOUNTED

REFER TO SHEET R08-1935 FOR NOTES.



OVERFLOW CHAMBER - SECTION C
N.T.S.



OVERFLOW CHAMBER - SECTION D
N.T.S.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
4	AS CONSTRUCTED	23.08.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB
2	ISSUE FOR PWC APPROVAL - SEWER REDESIGN	26.11.09	CD
1	ISSUE FOR CONSTRUCTION	02.10.09	CD

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The Association of Consulting Engineers Australia
N-D8004

territory housing
IPT-02-271-CVL-DWG-0053

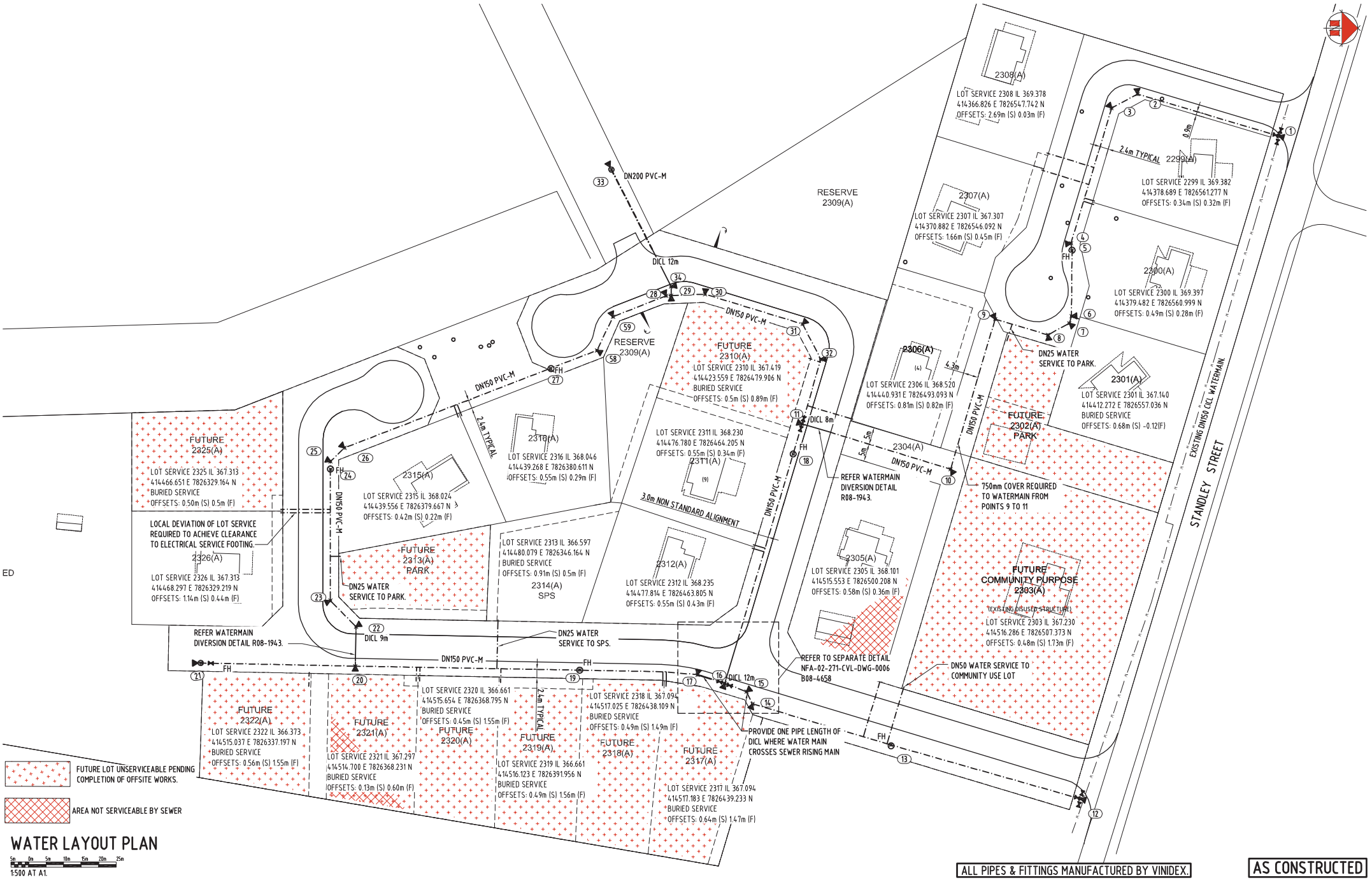
DRAWN	SGE	CHECKED	-
DATE	DEC 08	DATE	-
DESIGNED	SGE	CHECKED	-
DATE	DEC 08	DATE	-
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
SEWERAGE PUMP STATION - DETAILS SHEET 5 OF 5

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C04.09 OF -	R09-1605	4	A1

1207



WATER LAYOUT PLAN

5m 0m 5m 10m 15m 20m 25m
1:500 AT A1.

ALL PIPES & FITTINGS MANUFACTURED BY VINIDEX.

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.
	AMENDMENTS		
7	AS CONSTRUCTED	28.07.11	DMB
6	AS CONSTRUCTED	24.06.11	DMB
5	AS CONSTRUCTED	10.06.11	DMB
4	AS CONSTRUCTED	29.03.11	DMB
3	ISSUE FOR CONSTRUCTION	12.01.10	DMB

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The Association of Consulting Engineers Australia
N-D8004.07

territory housing
IPT-02-271-CVL-DWG-0054

DRAWN CD DATE DEC 08	CHECKED JTL DATE DEC 08		
DESIGNED CD DATE DEC 08	CHECKED DMB DATE DEC 08		
DESIGN PROJECT LEADER DATE	PROJECT OFFICER DATE		

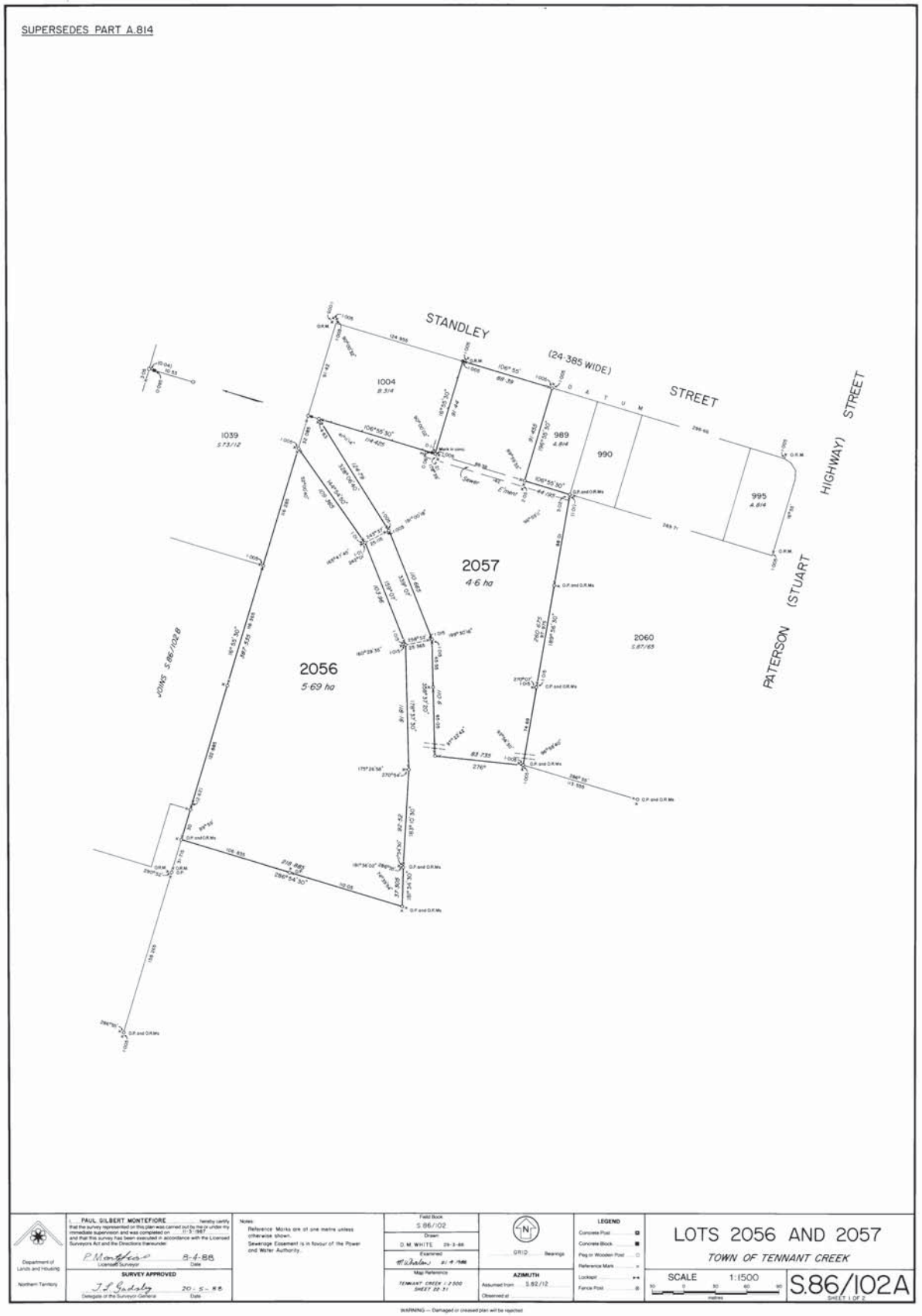
Northern Territory Government
Department of Planning and Infrastructure

TENNANT CREEK
VILLAGE AND SORRY CAMP (271), LOT 2057 STANDLEY STREET TENNANT CREEK
INFRASTRUCTURE DESIGN PROJECT FOR TENNANT CREEK URBAN LIVING AREAS
WATER - LAYOUT PLAN

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	C05.01 OF -	R08-1938	7	A1

G:\PROJECTS\2008-OPUS\N-D8004 - TENNANT CREEK URBAN LIVING\N-D8004.00\N-D8004.00 DRAWINGS\07 VILLAGE & SORRY CAMP\CURRENT\N-D8004.07-C05.01.DWG

Survey Plan S86/102A



Viewed at 08:02:29 on 23/02/2017 by L2B.

Date Registered: 27/05/1993 **Volume** 311 **Folio** 019
Duplicate Certificate as to Title issued? Yes

SEARCH CERTIFICATE

CROWN LEASE IN PERPETUITY 01113

Lot 2057 Town of Tennant Creek from plan(s) S 86/102A
Area under title is 4 hectares 6000 square metres

Owner:
Julalikari Housing Incorporated
of PO Box 158, Tennant Creek NT 0861

Easements:
Sewerage Easement to Power and Water Authority

Registered Date	Dealing Number	Description
		Previous title is **Register Book**CUCL **Volume** 200 **Folio** 099
26/11/1996	364700	Statutory Notice - Prescribed Property
27/05/1993	284559	Notice of a Right to a Grant of Interest

End of Dealings

IMPORTANT MESSAGE: This title information is compiled from the paper register and may be incomplete. Please refer to the scanned image of the paper title for further details. Contact Land Titles Office staff for assistance.

Commencement Date: 6th April, 1993

Expiring Date: In Perpetuity

Reservations:

All reservations and rights to which this grant is made subject by the Crown Lands Act.

Provisions:

1. This lease is granted under and subject to the Act and the Regulations for the time being in force thereunder, and is conditional upon compliance by the Lessee with the covenants and conditons to be complied with by the Lessee, and will, subject to the Act and the Regulations, be liable to be determined and forfeited for non-compliance with any such covenant or condition.

2. The Lessee may at any time surrender the lease in the manner prescribed under the Act.

3. For the purposes of Sections 58 & 59 of the Act the Lessee agrees that the Minister may at his absolute discretion determine the Lessee's rights in improvements and whether compensation is payable for improvements following surrender, expiry, termination or forfeiture of this lease.

Lease Conditions:

1. The lease purpose is Aboriginal Residential Complex and Ancillary.

2. The Lessee wil pay rates and taxes which may at any time become due in respect of the leased land.

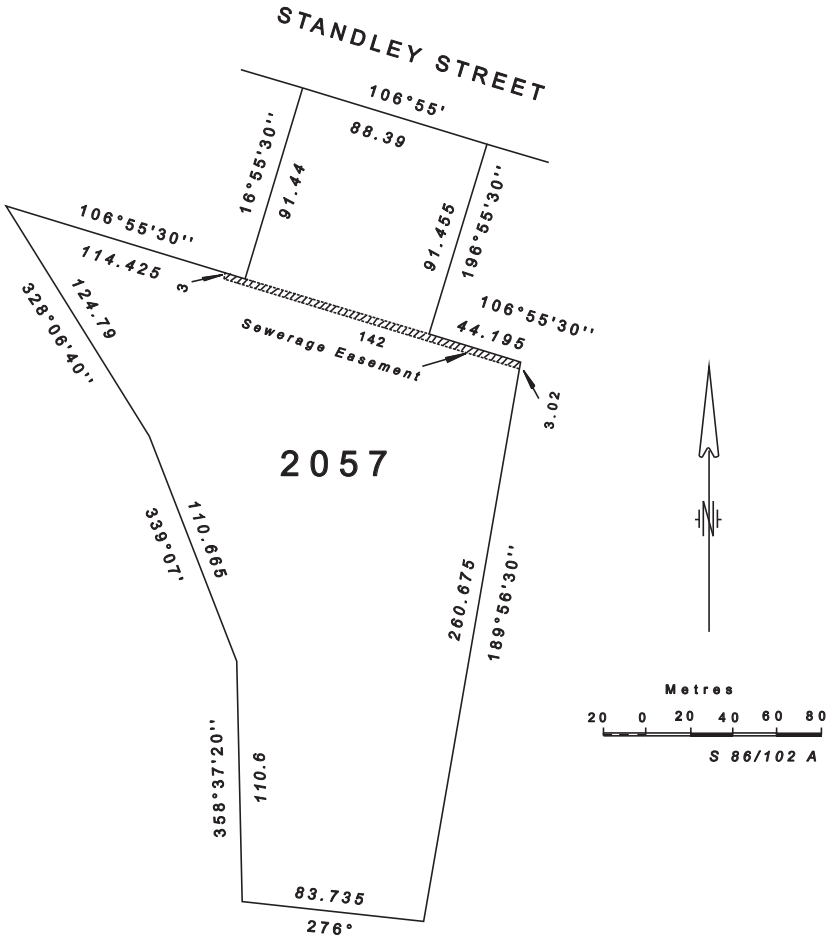
3. The Lessee will at all times maintain and repair and keep in repair all buildings and improvements on the leased land all to the satisfaction of the Minister.

4. The Lessee wil comply with any Planning Instrument affecting the land.

5. The Lessee will maintain landscaping of the whole of the front boundary (driveways excepted) of the leased land with suitable vegetation which will provide a screen at least 2 metres high.

6. All electrical and water reticulation plus sewerage will conform at all times with the appropriate by-laws, standards and specifications of the Power and Water Authority.

7. That the leased land will be dust suppressed and adequately drained for stormwater, all such drainage will conform at all times with the appropriate by-laws, standards and specifications of the Department of Transport and Works and the Town Engineer, Tennant Creek Town Council.



Date Registered: 27/05/1993 **Volume** 311 **Folio** 019
Duplicate Certificate as to Title issued? Yes

NORTHERN TERRITORY OF AUSTRALIA

Record of Administrative Interests and Information

Record of Administrative Interests and Information
The information contained in this record of Administrative Interests only relates to the below parcel reference.

Parcel Reference: Lot 02057 Town of Tennant Creek plan(s) S 86/102A

(See section 38 of the Land Title Act)

Note: The Record of Administrative Interests and Information is not part of the Land Register and is not guaranteed by the Northern Territory of Australia, and the NT Government accepts no Liability for any omission, misstatement or inaccuracy contained in this statement.

Registrar General

Government Land Register
(none found)

Custodian - Registrar General (+61 8 8999 6252)

Current Title
CUFT 311 019 (order 1)

Tenure Type
CROWN LEASE IN PERPETUITY 1113

Tenure Status
Current

Area Under Title
4 hectares 6000 square metres

Owners
Julalikari Housing Incorporated
PO Box 158, Tennant Creek NT 0861

Easements
Sewerage Easement to Power and Water Authority

Scheme Name
(none found)

Scheme Body Corporate Name
(none found)

Reserved Name(s)
(none found)

Unit Entitlements
(none found)

Transfers
(none found)

Tenure Comments
(none found)

Historic Titles
CUCL 200 099 (order 2)
CUCL 200 099 (order 1)
Visit the website http://www.nt.gov.au/justice/bdm/land_title_office/

Custodian - Surveyor General (+61 8 8995 5362)

Address
33 STANDLEY ST, TENNANT CREEK

Survey Plan
S 86/102A

Survey Status
Approved

Parcel Status
CURRENT

Parcel Area
4 hectares, 6000 square metres

Map Reference
(none found)

Parent Parcels
Lot 00987 Town of Tennant Creek plan(s) A 000814
Lot 00988 Town of Tennant Creek plan(s) A 000814
Lot 01005 Town of Tennant Creek plan(s) S 82/012

Parcel Comments
SUBDIVISION OF LOTS 987,988 & 1005 (NOW CANCELLED) INTO LOT 2057 VIDE S86/102. NOTICE OF DETERM OF A CL(T) GRANTED TO JULALIKARI COUNCIL INC. FOR ABORIGINAL SOCIAL & CULTURAL AREA (VILLAGE CAMP- NYINK KANYUNU) VIDE NTG G16 22/4/87.SEE S2008/29 LOTS 2298(A) TO 2327(A)ALLOCATION OF ADMIN PARCELS AT VILLAGE AND SORRY TOWN CAMP LOTS 1004 AND 2057 TENNANT CREEK

Survey Comments
SURVEY ON PLANS A - B

Proposed Easements
(none found)

Municipality
BARKLY SHIRE

Region
BARKLY

Custodian - Valuer General (+61 8 8995 5375)

Owner's Last Known Address
Department of Housing, PROPERTY RATES OFFICER, GPO BOX 4621, DARWIN NT 0801

Parcels in Valuation
Lot 02057 Town of Tennant Creek

Unimproved Capital Value
$105,000 on 01/07/2015
$106,000 on 01/07/2012
$82,000 on 01/07/2010
$26,500 on 01/07/2004
$31,250 on 01/07/2001
$31,250 on 01/07/1998
$29,500 on 01/07/1995
$39,000 on 01/07/1992
$47,000 on 01/01/1990
$43,000 on 01/01/1987

Valuation Improvements
01/02/1996 House x 15
15/09/1988 Land

Custodian - Property Purchasing (+61 8 8999 6631)

Acquisitions
(none found)

Custodian - Building Advisory Service (+61 8 8999 8965)

Building Control Areas

BBTEN001 - Building Control Area	TENNANT CREEK BUILDING AREA

Building Permits

Application Number:	8 of 8
Description:	HOUSE
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling
Area:	181 square metres
Certification:	Single Dwelling - Full Code - *issued on* 03/12/2003

Visit the website http://www.nt.gov.au/building/

Custodian - Town Planning and Development Assessment Services (+61 8 8999 6046)

Planning Scheme Zone
CL (Community Living)

Interim Development Control Orders
(none found)

Planning Notes
(none found)

Planning Applications

File Number
PA1990/0288

Type
Development

Date Received
24/05/1990

Application Purpose
COMMUNITY CENTRE THIS SITE IS ON STANDLEY CRESCENT

Application Status
Approved

Other Affected Parcels
(none found)

Instrument Signed
28/05/1990

Instrument Number

Instrument Issued
Not Complete

Instrument Status
Current

Custodian - Power and Water Corporation (1800 245 092)

Meters on Parcel

Power Water - Electricity	2
Power Water - Water	1

For Account balances, contact the Power and Water Corporation.

Custodian - Pool Fencing Unit (+61 8 8924 3641)

Swimming Pool/Spa Status
(none found)

For more information, contact the Pool Fencing Unit (+61 8 8924 3641).

Custodian - Mines and Energy (+61 8 8999 5322)

For information on possible Exploration Licences, contact Mines & Energy or visit the website http://www.nt.gov.au/d/Minerals_Energy/

For information on possible Petroleum Titles, contact Mines & Energy for further details.

Custodian - NT Environment Protection Authority (+61 8 8924 4218)

Results of site contamination assessment
(none found)

For further information contact Environment Protection Authority or visit the website https://ntepa.nt.gov.au/waste-pollution/contaminated-land

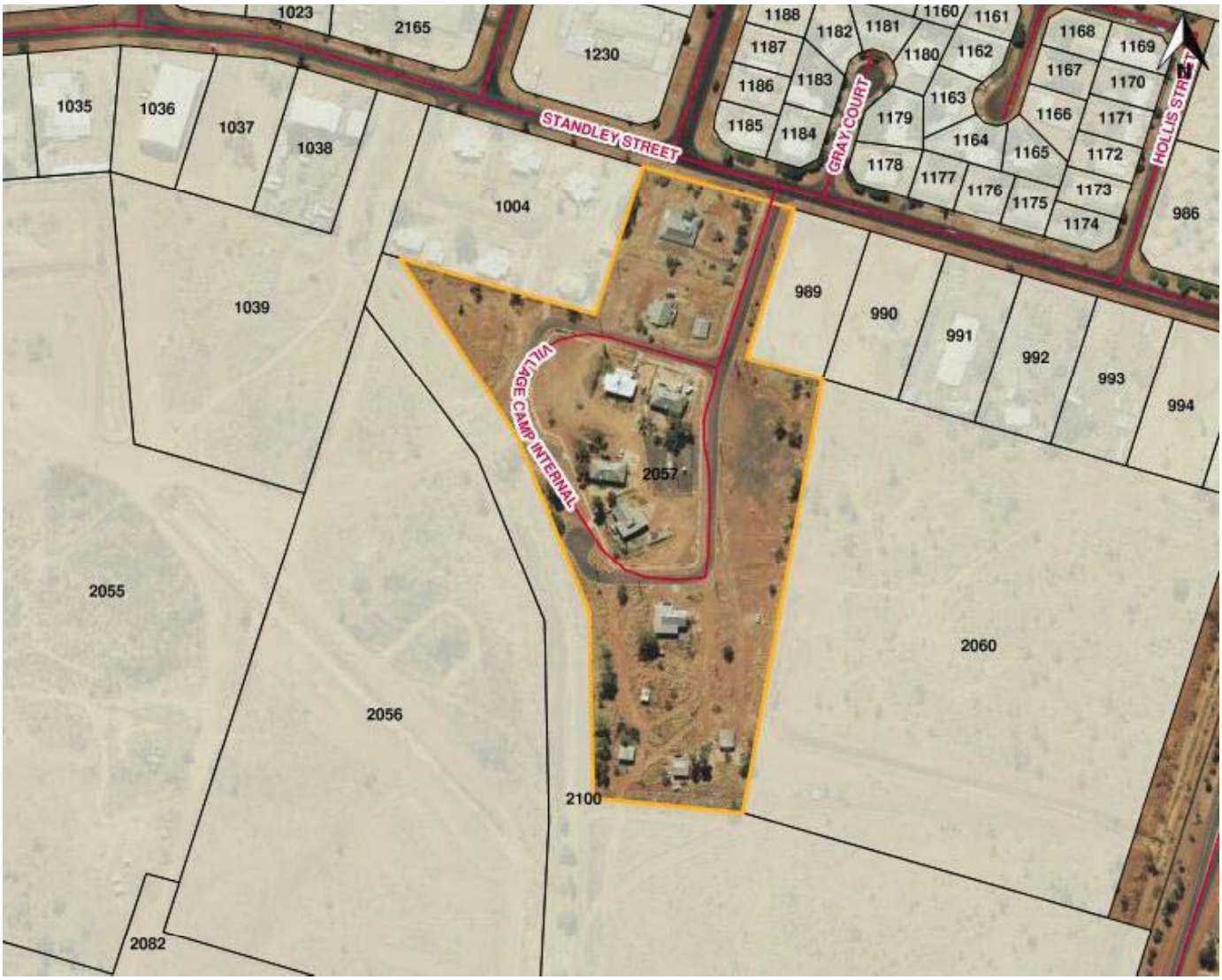
Custodian - Heritage Branch (+61 8 8999 5039)

Heritage Listing:
(none found)

For further information on heritage places contact Heritage Branch or visit the website
https://nt.gov.au/property/land/heritage-register-search-for-places-or-objects

Other Interests

For Account balances, contact Barkly Shire Council



Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Tingkarli

Tingkarli

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
    - NP001.1_Design and Construction of Network Assets – General Requirements
    - NP001.3_General Specification for Overhead Electrical Reticulation
    - NP001.6_General Specification for URD Subdivisions
    - NP003_Installation Rules_V3
    - NP007_Service Rules

- NP027_Capture of Newly Installed Street Lighting Information
- NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/) – NBN rollout maps

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.

- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

3.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

3.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

It should be noted that there are currently no legal services easements within the town camps, except for a few cases where a town service passes through the town camp. Therefore it is recommended that easements are created over any infrastructure owned by PWC and any future assets to be gifted to PWC, to allow the service providers access to the infrastructure.

3.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

3.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This

generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some town camps with direct connections to the town supply, they risk contaminating the entire town's water supply.

4 Available information

As the site investigations were limited to accessible / visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of the Tingkarli community on Thursday 1 December 2016 to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendices.

5 Sewerage

5.1 Ownership and boundaries

The sewer network in Tingkali consists of reticulation gravity main that discharges to a pump station. The pump station then pumps the sewage via a DN80 rising main.

The sewer network has not been upgraded recently, while all other town camps in Tennant Creek have received upgrades as part of the SIHIP program.

The sewer infrastructure inspected is assumed to be owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain.

There are currently no easements over the sewerage infrastructure according to the Land Title, refer Appendices.

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on the number of houses, which for Tingkarli is 12. The sewerage bill is charged to the Department of Housing and Community Development.

It is not known what contribution the residents make towards the sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manhole covers, as all other sewerage infrastructure is below ground. A total of 8 manholes and one pump station was inspected, with condition ratings as follows.

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manholes			8			8
Pump station			1			1

Figure 1 Sewage pump station, condition: *good*

Figure 2 Sewage pump station gate, condition: *good*

Figure 3 Sewer manhole, condition: *good*

Figure 4 Sewer manhole, condition: *good*

5.3 Current performance and risks

5.3.1 Current sewer network performance

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.
- As Tingkarli disposes to a pump station, the capacity of the pump station has also been assessed.

The current number of houses in Tingkarli is 12, plus two non-house dwellings, this multiplied by 9 EP per house gives a total current EP of 126. The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used.

Table 3 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	126	150	1.0	16.50	1.64	10%

Table 3 above shows that the capacity of the existing sewer network is adequate for the current peak population. It is likely that that since the flows are relatively low, the minimum velocity for self-cleansing is not achieved.

The age or condition of the underground pipework is not known, so it is recommended that the pipework is upgraded to meet PWC standards.

5.3.2 Current sewage pump station performance

The capacity of the pump station was checked against the following criteria, based on PWC guidelines:

- Less than 12 pump starts per hour (for pumps less than 15kW),
- Minimum velocity 0.9 m/s,
- Maximum velocity 2.5 m/s,
- Overflow storage equal to three hours of peak dry weather flow.

As detailed drawings of the pump station were available, refer Appendices, an assessment of the current performance could be undertaken.

The existing drawings had a design EP of 352, which is significantly higher than the assumed current EP for Tingkarli. For the purpose of the assessment, the current EP was used.

It was found that the pump station complies with current PWC standards, as the minimum velocity in the rising main is greater than 0.9 m/s and less than 2.5 m/s, and there is sufficient overflow storage provided.

No upgrades are currently required to the pump station.

5.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

5.5 Recommended works

It is recommended that the pipework is upgraded to DN150 PVC in accordance with PWC standards. Approximately 1200 m of reticulation main has been allowed for. The cost estimates do not include upgrading the rising main between Tingkarli and Wuppa.

6 Water supply

6.1 Ownership and boundaries

The water supply infrastructure was upgraded to PWC standards as part of the SIHIP program. The water reticulation servicing Tingkarli is a DN150 PVC ring main, (refer Appendices).

The water supply assets within Tingkarli are believed to be owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain. The water is supplied from a water main outside of the community, which are the responsibility of PWC.

PWC have advised that they currently maintain the water assets up to the residential lot water meters, although there is no formal agreement covering this maintenance.

Figure 5 shows the extent of water services.

Figure 5 Tingkarli water supply network

6.1.1 Connection methods and billing

Through consultation with PWC it has been determined that the water usage is currently charged as a fixed daily rate for 12 house water meters within Tingkarli. The bill is issued to the Department of Housing and Community Services. It is not known what contribution the residents make towards water bills.

It is proposed that PWC measure the water supply to the entire community using a bulk water meter, as opposed to individual bills for the individual lots within the community. This requires the installation of a bulk water meter on the water mains located at the community boundary. Under this scheme, the water bill for the entire community is the responsibility of the governing body, being Julalikari Housing Incorporated for Tingkarli. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the individual lot meters are maintained in addition to the proposed use of bulk water meters. This will assist the governing body with distributing bills to residents, the identification of any leaks in the network, and meeting PWC standards should the town camp be subdivided in the future.

A total of ten water meters were assessed during the inspection. Bennett Design reported 12 permanent dwellings. Therefore, up to two additional water meters are required to cover the properties without an existing water meter. Note, some water meters may have been present however, not visible due to overgrown flora or restricted property access. Consequently, water meters may not have been discovered during the inspection.

6.2 Existing infrastructure condition assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters. The assessment was limited to services that could be assessed above ground; no below ground services were inspected. A comprehensive review of all available documentation, including reviewing as-constructed drawings and having discussions with Power and Water Corporation was conducted. The following table compares the assets that have been constructed, according to the as-constructed drawings, and the assets assessed during the inspections conducted by Aurecon.

Table 4 Water supply assets inspected

Asset type	Number of assets as per documentation	Number of assets assessed during inspection
Fire hydrants	9	9
Water meter (residential lots)	13	10

As per Table 4, a number of water meters were not assessed during the inspections, this is likely due to overgrown flora or restricted property access as previously discussed. The condition of each asset is as follows:

Table 5 Water asset condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Fire hydrants		1	8			9
Water meter (residential lots)	1	1	8			10

Figure 6 Fire hydrant, condition: *poor*

Figure 7 Water meter (lot), condition: *very poor*

In general, the fire hydrants were in good condition, however one was almost entirely covered by debris and requires general clearing.

The water meters were typically in good condition. Two need maintenance works including a full replacement of a missing water meter, and replacing handles for other. Note, only qualified personnel are to undertake maintenance, specifically on the missing water meter, as it is understood that the water meter pipes are sometimes used to earth electrical supplies which poses a safety hazard when disconnected.

6.3 Current performance and risks

- The current demand of the community was calculated based on the following design assumptions:
- The nominal peak day flow is 1300 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the southern region of NT. It was assumed that the nominal peak day flow of 1300 L/capita/day also applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The peak hour factors are listed in PWC's Supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.

Table 6 shows the calculated demand.

Table 6 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
14	126	1.89	5.67

The system is expected to meet PWC flow (peak hour and fire flow) requirements.

The assessment of water supply for firefighting has been based on the size of the water mains and the condition of the accessible fire hydrants. Additional hydrants have been recommended where it appears the existing number of hydrants are insufficient. In the case of Tingkarli, the existing fire hydrants are expected to provide adequate coverage throughout the community and no additional hydrants are required.

The existing network is believed to have sufficient capacity and appears the pipe sizes are to compliant with PWC standards. The as-constructed drawings show a section of the water main is installed in a dedicated water main easement, however the Land Titles indicate no formal easements are located within the community.

6.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

6.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following maintenance works are recommended;

- Clear dirt and overgrown grass from two fire hydrants
- Replace one lot water meter
- Replace two tap handles
- Repair leak to one residential lot water meter

The community is viewed overall as a large single lot and as previously detailed, proposed to have the water usage measured accordingly. In order to measure the water usage as a single lot, a bulk water meter should be installed. Since the existing network has two supply points, one should be disconnected and reconnected creating network looping. This allows the remaining point to be metered. The cost estimates for upgrades at Tingkarli include;

- Disconnect secondary supply point and loop dead ends
- Install new bulk water meter
- Install up to two new lot water meters

7 Roadworks

7.1 Ownership and boundaries

The roads within Tingkarli are owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain.

7.2 Existing infrastructure condition assessment

The road network within Tingkarli consists primarily of sealed roads. There are also numerous tracks which appear to be used frequently which are not included in the inspection and report. Road furniture including signs, foot paths and car parks were also inspected. Table 7 below summarise the condition of the road furniture as assessed during the site inspection.

Table 7 Roadworks condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Footpaths			3	1		4
Signs	2	1	1			4

Figure 8 Sign, condition: *very poor*

Figure 9 Footpath, condition: *very good*

The signs in Tingkarli are generally in poor condition. There were two sign posts that had no sign, which are believed meant to be street name signs. One give way sign was bent and chipped paint.

The footpaths were generally in good and very good condition. Some sections of the paths require a general tidy up, to remove weeds and debris, etc. One path had a broken down car impeding on the path which should also be moved.

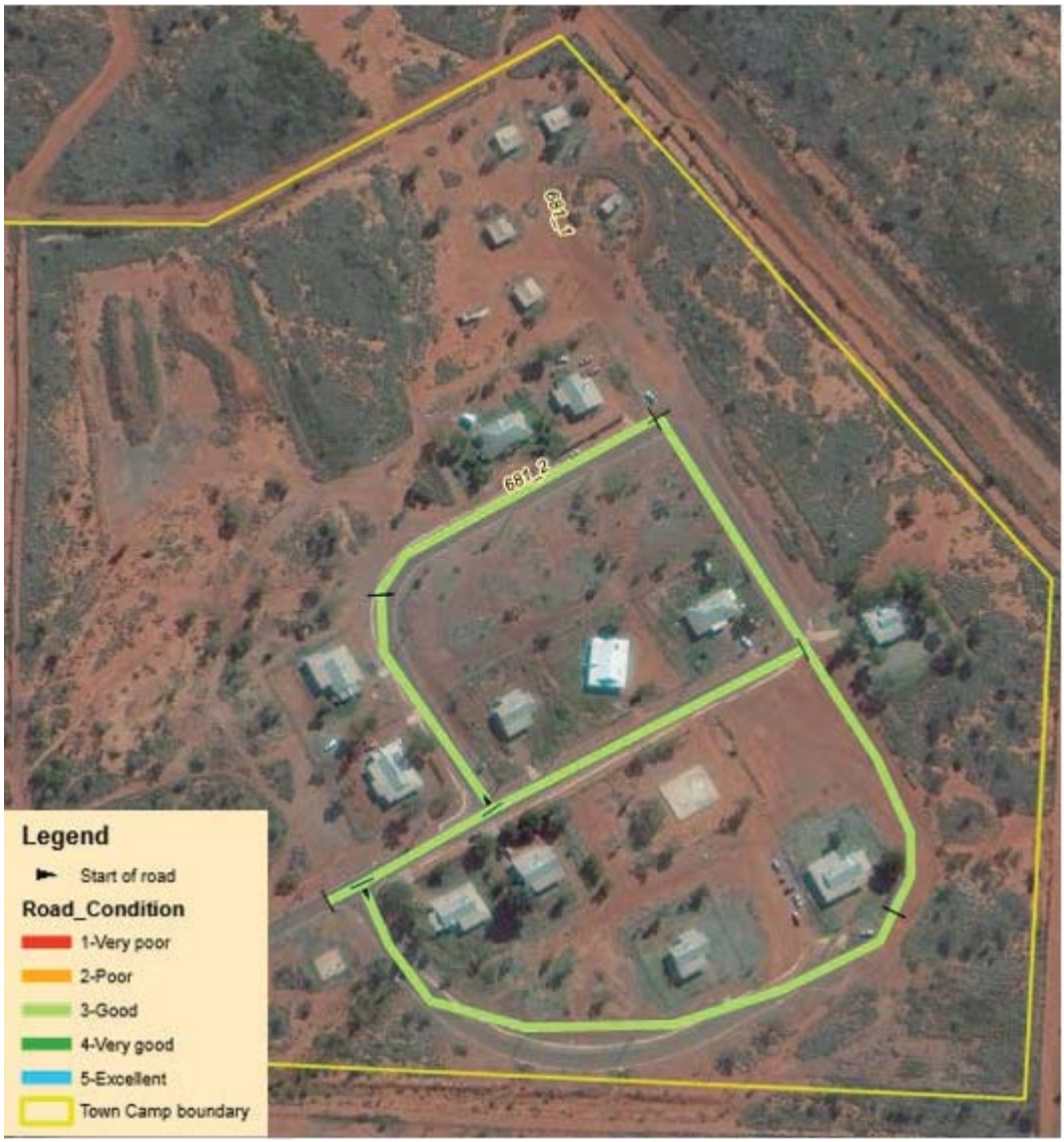


Figure 10 Tingkarli community road network

Table 8 below details the condition of the roads within Tingkarli community for specific segments. Figure 10 shows a map of the community's road network with the condition ratings, road name, and chainage direction. Note, the percentage refers to the percentage of that particular road segment which experiences the defect.

Table 8 Road network condition assessment

Road Name	Chainage start (km)	Chainage end (km)	Road segment condition (1-5)	Defects and associated condition
681_1	0	0.35	3	-gutters filled with dirt (3) -40% of road has bleeding defects (3) -50% of road has poor general appearance
681_2	0	0.1	3	
	0.1	0.23	3	-gutters filled with dirt (3) -30% of road has bleeding defects (3)
Tinkarli Town Camp Internal	0.45	0.66	3	-gutters filled with dirt (3) -30% of road has bleeding defects (3)

Figure 11 Road 681_2, condition: *good*

Figure 12 Tingkarli Town Camp Internal road, condition: *good*

7.3 Current performance and risks

The road network in Tingkarli is in good condition, although there were bleeding defects, gutters filled with dirt and were in generally poor appearance. The layout of the road network is sufficient for the current number of houses.

It was noted during the site inspections that a number of unsealed ‘short-cuts’ had been created and were regularly used. It is not recommended that these paths are formalised. It is also recommended that a road safety audit is undertaken to determine where signage, line marking, etc. are required.

7.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

7.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Install two street name signs (signs only)
- Replace one give way sign
- Clean out gutters – approximately 200 m
- General tidy up road – approximately 150 m

8 Stormwater drainage

8.1 Ownership and boundaries

The stormwater drainage assets within Tingkarli are believed to be owned by Julalikari Housing Incorporated, but are the responsibility of Far North – T&J Contractors to maintain.

Stormwater drainage infrastructure outside of the community is owned by Barkly Regional Council.

8.2 Existing infrastructure condition assessment

The site investigation for the stormwater infrastructure included assessing the condition of swales, culverts, headwalls, and side entry pits (SEP). Only the above ground infrastructure was assessed. As the inspection was undertaken outside of a storm event and no CCTV of the pipes was undertaken, flooding due to blockages or damage to the underground infrastructure could not be assessed. Table 9 below summarises the condition of the stormwater assets as assessed during the inspection.

Table 9 Stormwater condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Culverts			3			3
SEP		2	21	2		25
Swales			3			3

Figure 13 One bay side entry pit, condition: *poor*

Figure 14 One bay side entry pit, condition: *poor*

Figure 15 Swale, condition, *good*

Two side entry pits were assessed as having poor condition, this was due to one pit having a broken lid (refer Figure 13), and the second pit having damage to the concrete (refer Figure 14). The functionality of the second pit is not affected by the concrete damage so no repairs are recommended. The first pit should have the lid replaced to avoid further damage.

8.3 Current performance and risks

The detailed performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project. However based on the condition of the stormwater infrastructure assessed it would appear to be operating adequately.

8.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

8.5 Recommended works

The following works are recommended to upgrade or improve the current infrastructure:

- Clear blockages from 13 side entry pits (currently blocked between 20% and 90%)
- Replace one side entry pit lid

9 Community structures

9.1 Ownership and boundaries

There were no community structures at Tingkarli community.

9.2 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section 3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the Point Of Supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure, and aerial low voltage infrastructure where installed with aerial high voltage infrastructure, to minimise the possibility of the community or it's contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

PWC advise that most of Tennant Creek/Alice Springs Town Camps have undergone upgrades under the SIHIP program with the intent to normalise the services to look like an urban subdivision but have never been formally handed over to PWC for operations and maintenance.

The Tingkarli community electrical reticulation systems is supplied by a transformer to an overhead reticulation scheme to individual house.

PWC advise that the Point Of Supply is the LV terminals of the substations and that they own and are responsible for the first pole mount substation and upstream infrastructure.

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Tingkarli community are responsible for maintain all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), LV distribution feeders, distribution pillars, consumers' mains and consumer switchboards and street lights.

10.2 Existing infrastructure condition assessment

Table 10 shows the condition rating given to the street lights. The street lights were of a low voltage overhead feeder design, sodium lamp type, S70D. The street lights have 54% operational rating and 46% inoperable.

Table 10 Street light on O/H pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light on O/H Pole		11	13			24

Table 11 shows the condition rating given to the transformer. The transformer was of pole mount substation design. The transformer was visually accessed to be in good condition.

Table 11 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			1			1

Table 12 shows the condition rating given to the Overhead poles. The overhead poles are of Weld Construction (Universal Pole construction).

Table 12 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			24			24

Table 13 shows the condition rating given to the Metering panels. All assessed meters in this community are prepaid digital meters.

Table 13 Meter Panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid Meter			9			9
Switchboard		1	4			5

Table 14 shows the condition rating given to the switchboards associated to dwellings.

Table 14 Switchboard condition assessment (housing footprint)

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard			10			10

The details of the individual inspections and photographs of each infrastructure item are included in Appendices.

10.3 Current performance and risks

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Street lighting loads were ignored as they are not significant.

The calculated maximum demand of the Tingkarli community transformer is 27% of rated capacity based on 4.5kVA/dwelling. The calculated maximum demand is within the total capacity of the substation on site.

Table 15 Tingkarli current demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
681	Tingkarli	12	200	54	84	

A tabulated summary of all the community transformers in in Appendices.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.
- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Replace 11 street lights 70W
- Replace one switchboard inside the metering panel

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits and telephone booths.

Appendices contains the individual reports.

Table 16 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication pit		1	1			2

Table 17 Telephone booth condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Phone booth						2 (status is unknown)

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Tingkarli is displayed in the Figure 16 below. NBN is available to residents via a fixed telecommunication line on application to an appropriate NBN access provider.

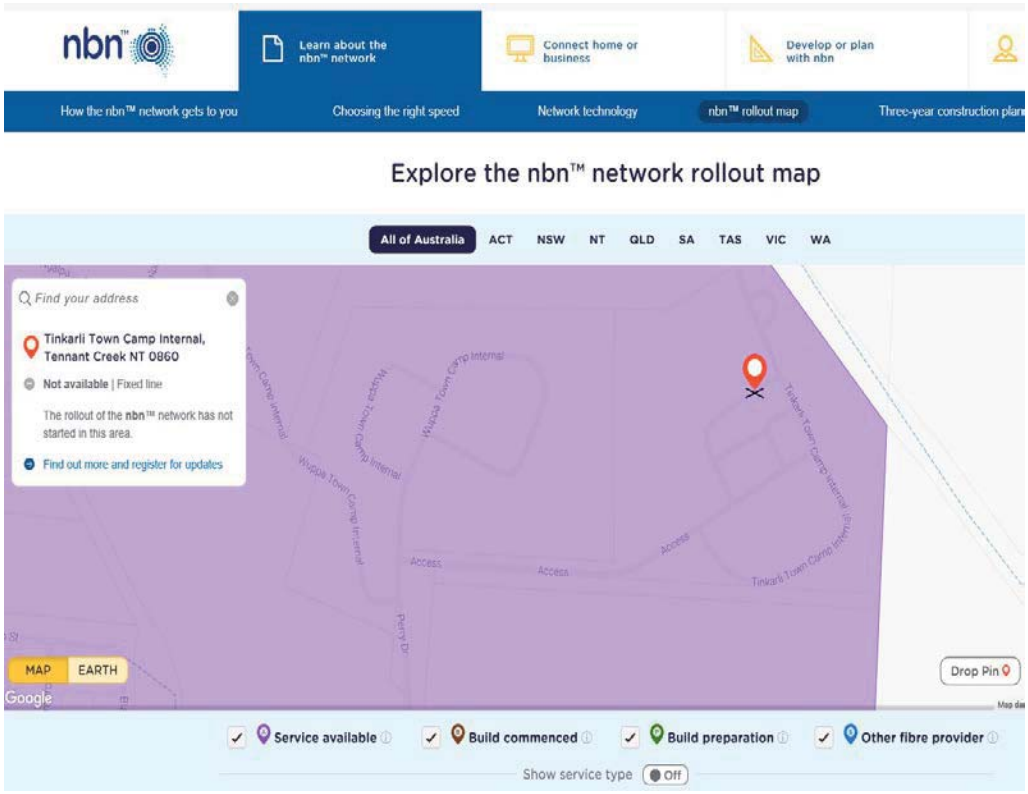


Figure 16 NBN network availability map

The NBN rollout map confirms that NBN is planned to be made available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

11.5 Recommended works

Representatives from NBN's Land Access and Stake Holder management teams are currently engaged with Yilli Housing and NT Housing to look at how camps will be serviced. It is expected that any existing premises in these camps will have some type of NBN service via the NBN brownfields rollout in the future.

No works are required at Tingkarli because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

12 Cost estimates

Table 18 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure and to upgrade the existing network to meet current design standards. There are no upgrades required for the future design. The estimates take into account a 30% contingency, are inclusive of GST, and a location factor has been applied to town camps outside of Darwin.

Table 18 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 1,047,000
Water supply	$ 4,000	$ 106,000
Roadworks	$ 18,000	$ 0
Stormwater drainage	$ 16,000	$ 0
Community structures	$ 0	$ 0
Electrical	$ 14,000	$ 0
Communications	$ 0	$ 0
Miscellaneous provisions	$ 18,000	$ 150,000
Total (including GST)	**$ 70,000**	**$ 1,303,000**
Grand total	**$ 1,373,000**	

The cost estimates are a preliminary estimate only. Since Aurecon has no control over the cost of labour, materials, equipment or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Aurecon cannot guarantee actual costs will not vary from these estimates.

13 Summary

The following works are recommended for Tingkarli community:

Sewerage

- 1200 m of DN150 PVC reticulation main, including new manholes and housing connections.

Water supply

- Clear dirt and overgrown grass from two fire hydrants
- Replace one lot water meter
- Replace two tap handles
- Repair leak to one residential lot water meter
- Disconnect secondary supply point and loop dead ends
- Install new bulk water meter
- Install up to two new lot water meters

Roadworks

- Install two street name signs (signs only)
- Replace one give way sign
- Clean out gutters – approximately 200 m
- General tidy up road – approximately 150 m

Stormwater drainage

- Clear blockages from 13 side entry pits (currently locked between 20% and 90%)
- Replace one side entry pit lid

Community structures

- No community structures so no upgrades required

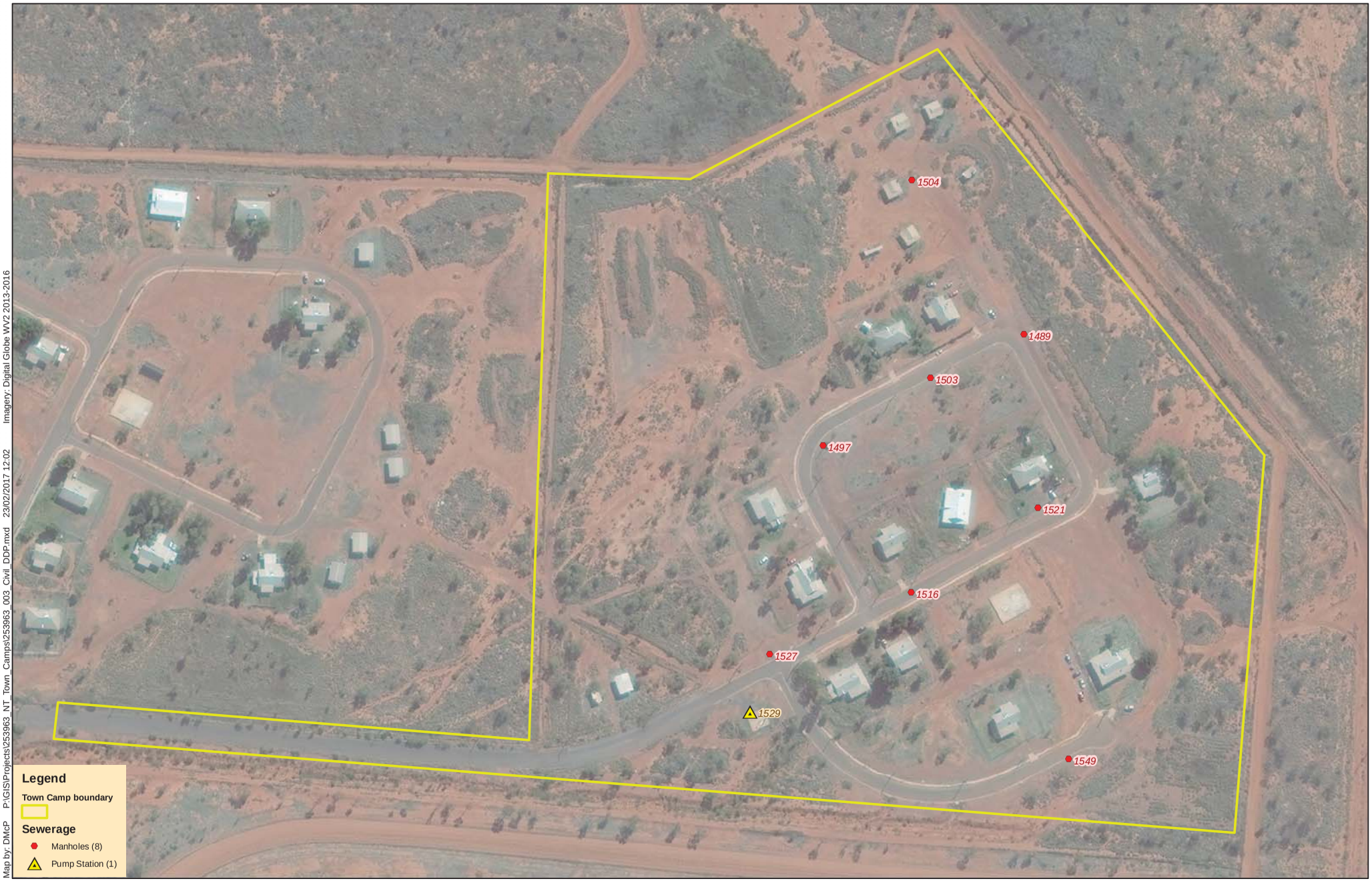
Electrical services

- Replace 11 street lights 70W
- Replace one switchboard inside the metering panel

Communications

- No works are required because NBN is available to residents on application to an appropriate NBN access provider.

Civil inspection reports



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

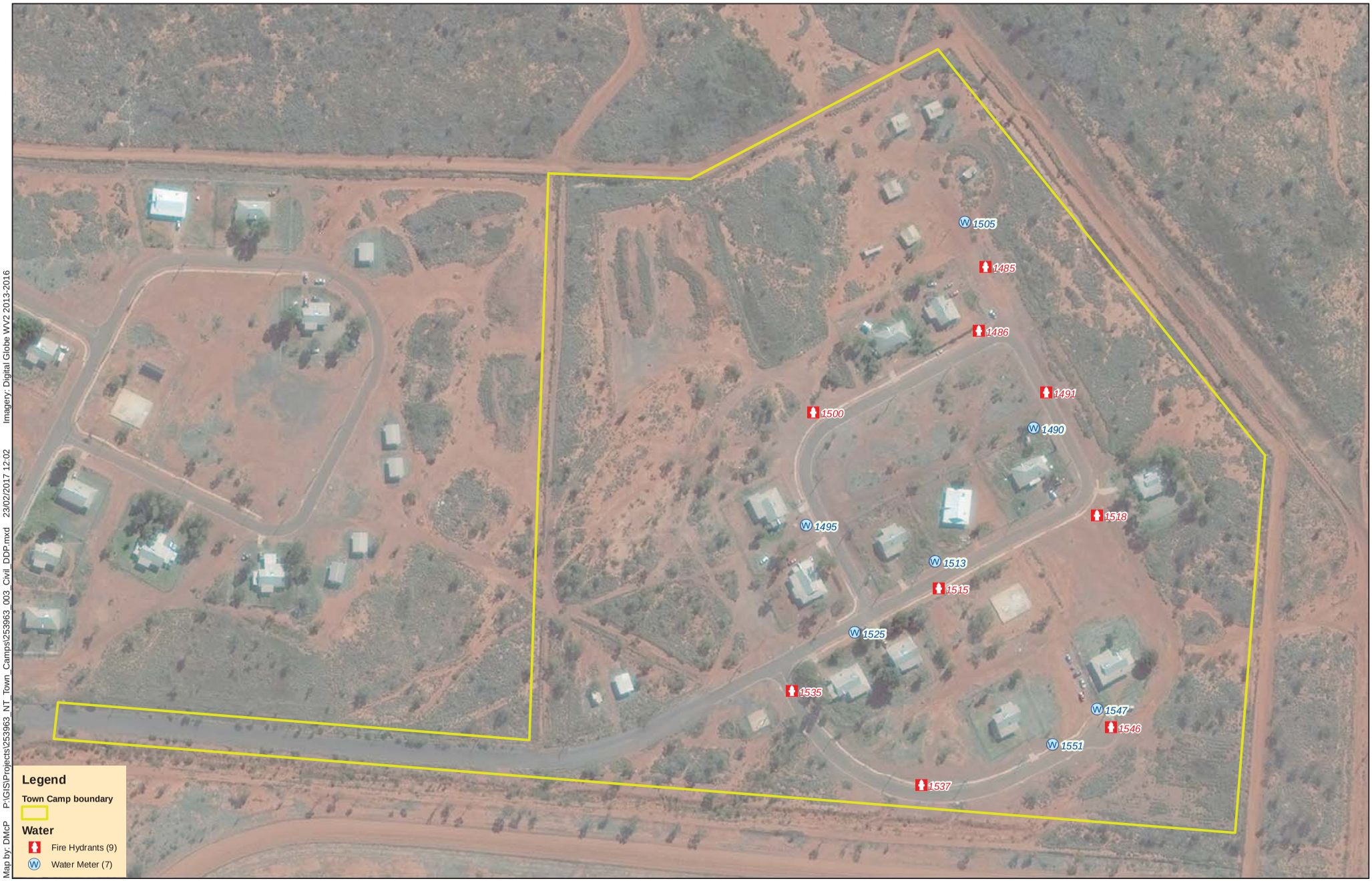
0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

681 - Tinkarli (Tennant Creek)



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

Water

- Fire Hydrants (9)
- Water Meter (7)

A3 scale: 1:2,000

0 20 40 60 80 100 m

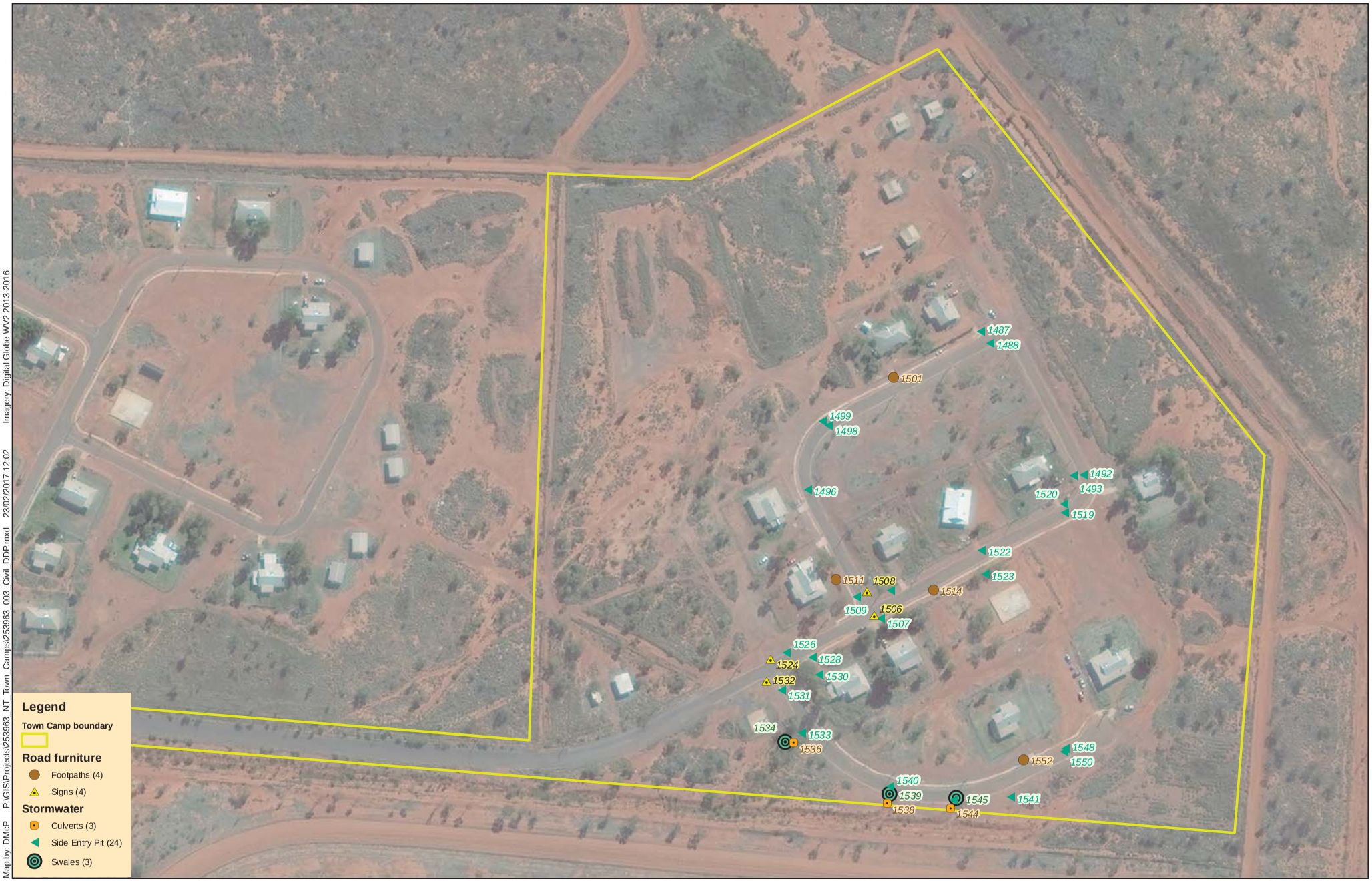
Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

681 - Tinkarli (Tennant Creek)



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
681 - Tinkarli (Tennant Creek)

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:10:39 PM

Insp ID: 1536 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	Culverts
Culvert Type:	RCP
Diameter (mm):	450
Width (mm):	
Culvert Depth (mm):	
Culvert Length (m):	
Culvert Condition:	3 - Good
Culvert Blockage (%):	0
Culvert Comments:	
Culvert Head Wall:	No
Safety Grate:	
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:16:56 PM

Insp ID: 1538 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	Culverts
Culvert Type:	RCP
Diameter (mm):	375
Width (mm):	
Culvert Depth (mm):	
Culvert Length (m):	
Culvert Condition:	3 - Good
Culvert Blockage (%):	0
Culvert Comments:	
Culvert Head Wall:	No
Safety Grate:	
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	
End Wall:	Yes
End Wall condition:	4 - Very Good
EW Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:27:25 PM

Insp ID: 1544 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	Culverts
Culvert Type:	RCP
Diameter (mm):	375
Width (mm):	
Culvert Depth (mm):	
Culvert Length (m):	
Culvert Condition:	3 - Good
Culvert Blockage (%):	20
Culvert Comments:	Blocked with rock
Culvert Head Wall:	No
Safety Grate:	
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	
End Wall:	Yes
End Wall condition:	4 - Very Good
EW Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:51:57 AM

Insp ID: 1485	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:50:37 AM

Insp ID: 1486	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:43:12 AM

Insp ID: 1491	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	

Northern Territory Town Camps

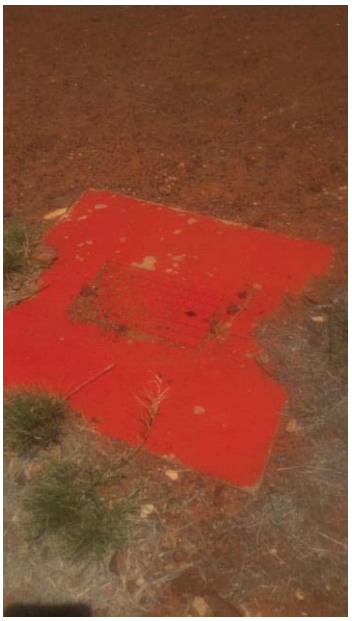
Civil Infrastructure

Inspection Date 1/12/2016 11:07:12 AM

Insp ID: 1500	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Paint starting to peel



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:33:10 AM

Insp ID: 1515	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Covered in grass and weeds

Northern Territory Town Camps

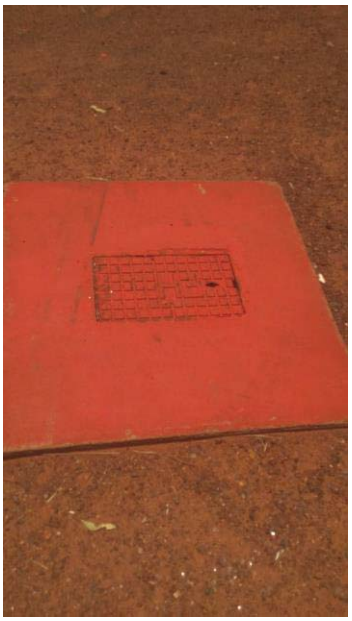
Civil Infrastructure

Inspection Date 1/12/2016 11:41:58 AM

Insp ID: 1518	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:04:59 PM

Insp ID: 1535	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	2 - Poor
FH Comment:	Covered in grass/debris

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:18:59 PM

Insp ID: 1537	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:37:59 PM

Insp ID: 1546	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Erosion around lid

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:05:55 AM

Insp ID: 1501 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_2
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	3 - Good
Comment:	Broken down cars on footpath
General Comment:	Needs tidy up

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:21:07 AM

Insp ID: 1511 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_2
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	3 - Good
Comment:	Needs tidy up, covered in dirt
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:33:55 AM

Insp ID: 1514 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	Tinkarli Town Camp Internal
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	
Footpath Condition:	4 - Very Good
Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:31:51 PM

Insp ID: 1552 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_1
What are you inspecting:	Foot Paths
Footpath Width (mm):	1200
Footpath Type:	Concrete
Footpath Condition:	3 - Good
Comment:	Needs tidy up
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:46:19 AM

Insp ID: 1489 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:10:12 AM

Insp ID: 1497	Group 3 - Tennant Creek, Elliott	Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:03:22 AM

Insp ID: 1503 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:57:33 AM

Insp ID: 1504 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	EX101/6
Comments:	Covered in paint

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:32:11 AM

Insp ID: 1516 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	EX101C/1
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:39:28 AM

Insp ID: 1521 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	EX101C/2
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:52:32 AM

Insp ID: 1527 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	EX101/2
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:33:33 PM

Insp ID: 1549 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	101B/1
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:35:12 AM

Insp ID: 1494 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_1
What are you inspecting:	Pavements
Ch From (km):	0.05
Ch To (km):	0.35
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	20	3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

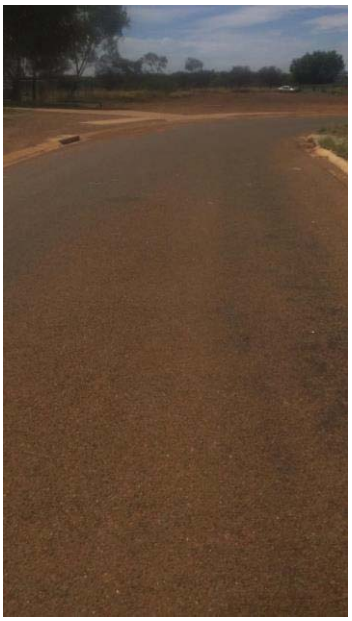
Linemarking Section

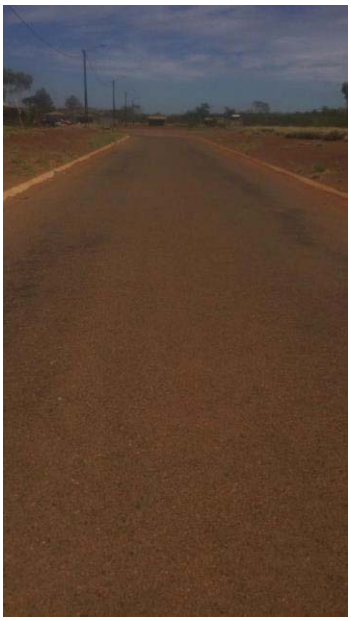
Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:35:12 AM





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:35:12 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:04:19 AM

Insp ID: 1502 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_2
What are you inspecting:	Pavements
Ch From (km):	0.1
Ch To (km):	0.23
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	30	3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:04:19 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:04:19 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:19:01 AM

Insp ID: 1512 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_2
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.1
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	30	3 - Good	30% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:19:01 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:19:01 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:29:27 AM

Insp ID: 1517 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	Tinkarli Town Camp Internal
What are you inspecting:	Pavements
Ch From (km):	0.45
Ch To (km):	0.66
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	30	3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	Gutters filled with dirt

Shoulders Section

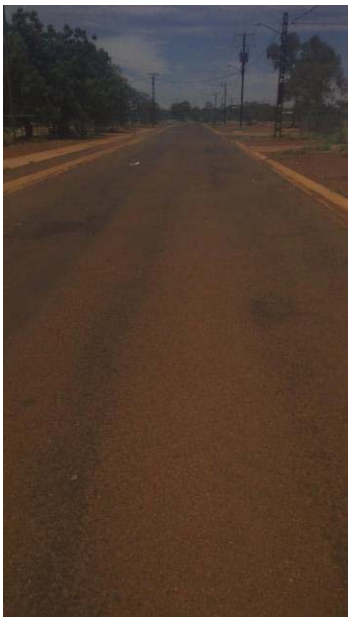
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:29:27 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:29:27 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:28:45 PM

Insp ID: 1543 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_1
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.25
Road Type:	Sealed - spray seal
Section Width (m):	7.2
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Bleeding	40	3 - Good	40 % of road
General Appearance	50	3 - Good	50% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Kerb and Gutter	3 - Good	

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:28:45 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:28:45 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:01:32 PM

Insp ID: 1529 Group 3 - Tennant Creek, Elliott Tingkarli

What Sewerage Asset are you capturing:	Pump Station
No of Pumps in Pump Station:	2
Cabinet Condition:	4 - Very Good
Cabinet Comment:	
Alarm Light:	No
Alarm Light Condition:	
Overhead Light:	Yes
Overhead Light Condition:	3 - Good
Light Comments:	
Davit Crane Present:	Yes
Davit Crane Capacity (kg):	
Davit Crane Condition:	
Davit Crane Comments:	
Fence TYPE:	Standard Security Fence (3 Strands barbed)
PS Fence Height (m):	1.8
PS Gates Locked:	Yes
PS Fence Condition:	3 - Good
Fence Comment:	
Flow meter type:	
Flow meter condition:	
Flow meter comments:	
Macerator Pump Make/Model:	
Manufacturers Date:	
Macerator Pump:	
Macerator Pump Condition:	
Macerator Pump Comments:	
Outgoing Pipe Diameter (mm):	
Valves:	
Outgoing Pipe Comments:	
Water Supply to pump station:	Yes
Fire hose reel:	No
Access cover locked:	Yes
Safety grid beneath access cover:	No Access

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:01:32 PM

Condition:	
Cabinet Locked:	No Access
Cabinet Lock Condition:	
Hand rails around entrance:	Yes
Fixed or removable:	
Rail Condition:	
Safety Comments:	

Pump Station Pumps section

Pump Capacity	Pump Make	Manufacture Date	Pump Chain	Condition	Comments

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:01:32 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:48:45 AM

Insp ID: 1487	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:47:14 AM

Insp ID: 1488	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	0
Comment:	

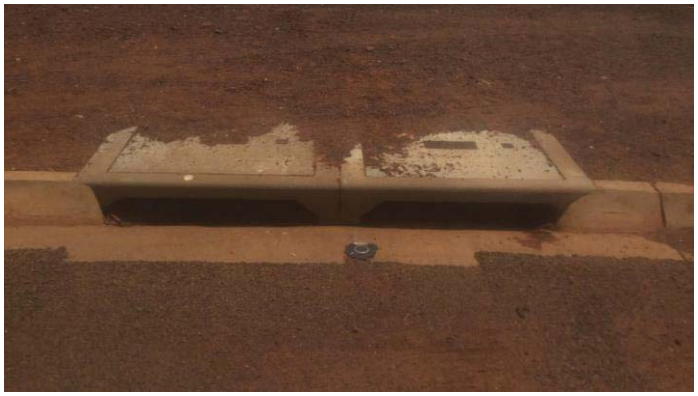
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:42:17 AM

Insp ID: 1492	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	10
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:41:19 AM

Insp ID: 1493	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	3
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	40
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:11:04 AM

Insp ID: 1496 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Both
Condition:	3 - Good
Blockage (%):	40
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:09:26 AM

Insp ID: 1498	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	40
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:08:31 AM

Insp ID: 1499	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	0
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:24:22 AM

Insp ID: 1507	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	20
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:22:58 AM

Insp ID: 1509 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	90
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:22:04 AM

Insp ID: 1510	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	3
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	40
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:41:11 AM

Insp ID: 1519	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	20
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:40:20 AM

Insp ID: 1520 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Left
Condition:	2 - Poor
Blockage (%):	0
Comment:	Broken lid

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:38:33 AM

Insp ID: 1522	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:37:39 AM

Insp ID: 1523	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	0
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:45:24 AM

Insp ID: 1526	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:54:09 AM

Insp ID: 1528	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:00:50 PM

Insp ID: 1530	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	3
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	70
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:00:06 PM

Insp ID: 1531	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	50
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:06:18 PM

Insp ID: 1533	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	50
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:12:40 PM

Insp ID: 1540	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	4 - Very Good
Blockage (%):	10
Comment:	

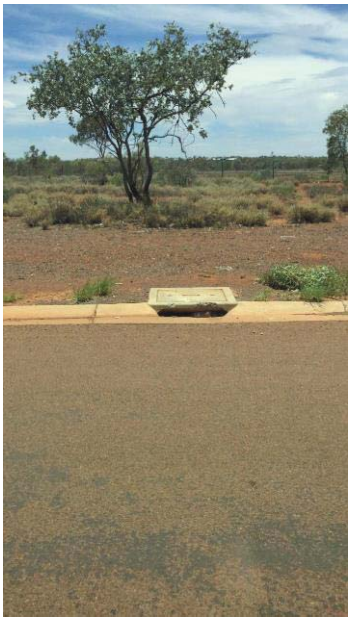
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:23:08 PM

Insp ID: 1541	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	1
On grade or sag pit:	
Both sides of road:	Right
Condition:	2 - Poor
Blockage (%):	30
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:24:28 PM

Insp ID: 1542	Group 3 - Tennant Creek, Elliott	Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Right
Condition:	3 - Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:36:09 PM

Insp ID: 1548 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	2
On grade or sag pit:	
Both sides of road:	Left
Condition:	3 - Good
Blockage (%):	20
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:33:51 PM

Insp ID: 1550 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	SEP
Number of Bays:	3
On grade or sag pit:	
Both sides of road:	Right
Condition:	4 - Very Good
Blockage (%):	10
Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:26:28 AM

Insp ID: 1506 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	Tinkarli Town Camp Internal
What are you inspecting:	Signs
Type of Sign:	Street name
Sign Condition:	1 - Very Poor
Sign Comment:	No sign
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:23:42 AM

Insp ID: 1508 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_2
What are you inspecting:	Signs
Type of Sign:	Give Way
Sign Condition:	2 - Poor
Sign Comment:	Bent sign, chipped paint
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:45:57 AM

Insp ID: 1524 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_1
What are you inspecting:	Signs
Type of Sign:	Street name
Sign Condition:	1 - Very Poor
Sign Comment:	No sign
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:58:18 AM

Insp ID: 1532 Group 3 - Tennant Creek, Elliott Tingkarli

Road Name:	681_1
What are you inspecting:	Signs
Type of Sign:	Give Way
Sign Condition:	3 - Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:06:02 PM

Insp ID: 1534 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	Swales
Type of lining:	Natural Grasses
Are dimensions uniform along drain:	No
Base Width (m):	3
Overall Width (m):	12
Swale Depth (m):	2.5
Length of Batter 1 (m):	
Length of Batter 2 (m):	
Swale Condition:	3 - Good
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Approximate dimensions

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:15:34 PM

Insp ID: 1539 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	Swales
Type of lining:	No Lining
Are dimensions uniform along drain:	
Base Width (m):	3
Overall Width (m):	8
Swale Depth (m):	1.5
Length of Batter 1 (m):	
Length of Batter 2 (m):	
Swale Condition:	3 - Good
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Approximate Dimensions

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:26:25 PM

Insp ID: 1545 Group 3 - Tennant Creek, Elliott Tingkarli

Stormwater Infrastructure:	Swales
Type of lining:	No Lining
Are dimensions uniform along drain:	No
Base Width (m):	2
Overall Width (m):	8
Swale Depth (m):	1.5
Length of Batter 1 (m):	
Length of Batter 2 (m):	
Swale Condition:	3 - Good
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Approximate dimensions

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:45:13 AM

Insp ID: 1490	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	18
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:14:12 AM

Insp ID: 1495	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	No tap handles

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 10:55:59 AM

Insp ID: 1505	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	1 - Very Poor
Lot Water Meter Comment:	No meter, not connected

Northern Territory Town Camps

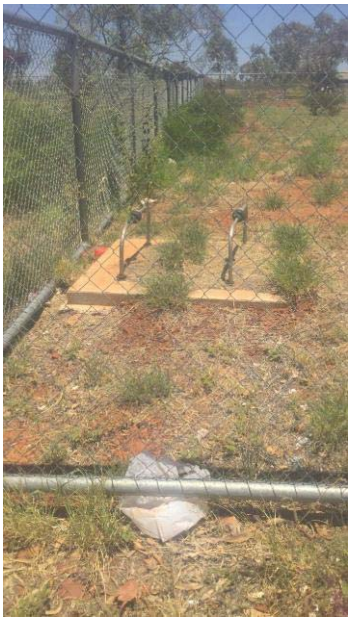
Civil Infrastructure

Inspection Date 1/12/2016 11:35:11 AM

Insp ID: 1513	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Two meters in one lot



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 11:46:50 AM

Insp ID: 1525	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	No tap handles

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:35:58 PM

Insp ID: 1547 Group 3 - Tennant Creek, Elliott Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	11
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	Leaking

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 1/12/2016 12:32:37 PM

Insp ID: 1551	Group 3 - Tennant Creek, Elliott	Tingkarli

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	

Electrical inspection reports

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_004_Elec_DDP_report.mxd 23/02/2017 12:22

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

681 - Tinkarli (Tennant Creek)

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:23:05 AM

Insp ID: 825	Group 3 - Tennant Creek, Elliott	Tingkarli

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:18:59 AM

Insp ID: 828 Group 3 - Tennant Creek, Elliott Tingkarli

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	2
Underground Comments:	

Northern Territory Town Camps

Communications Infrastructure

Inspection Date 1/12/2016 12:13:00 PM

Insp ID: 811	Group 3 - Tennant Creek, Elliott	Tingkarli

What Comms Category are you capturing:	General
Telstra Comms Drawing Available:	No
Facility upgrade not in drawings:	No
Which telecoms carriers are present in the town camp:	Telstra
How many Communications Pit(s) are allocated in this town camp:	

Northern Territory Town Camps

Communications Infrastructure

Inspection Date 1/12/2016 11:53:31 AM

Insp ID: 816	Group 3 - Tennant Creek, Elliott	Tingkarli

What Comms Category are you capturing:	General
Telstra Comms Drawing Available:	No
Facility upgrade not in drawings:	No
Which telecoms carriers are present in the town camp:	Telstra
How many Communications Pit(s) are allocated in this town camp:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 7/12/2016 8:57:24 AM

Insp ID: 3447	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 5/12/2016 1:50:58 PM

Insp ID: 3534	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

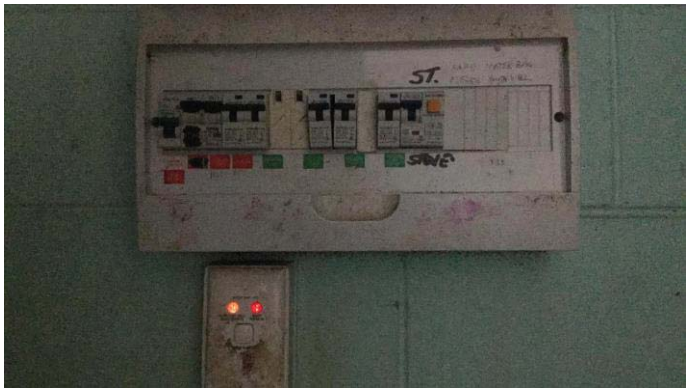
Meter Type: Electrical

Meter Switchboard Cond:

Meter Condition:

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 5/12/2016 1:34:14 PM

Insp ID: 3536	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	3
Meter Condition:	3
Meter Comment:	Indoor SB, Cond 3
Comments:	

Northern Territory Town Camps

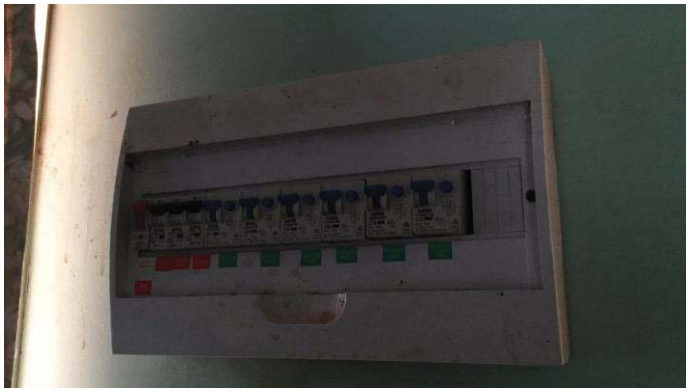
Electrical Infrastructure

Inspection Date 5/12/2016 1:22:24 PM

Insp ID: 3538 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid	
Meter Switchboard Cond:		
Meter Condition:	3	
Meter Comment:	Condition of CB not assessed.	Indoor SB, Cond 3
Comments:		



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 5/12/2016 1:05:10 PM

Insp ID: 3541	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid	
Meter Switchboard Cond:		
Meter Condition:	3	
Meter Comment:	Condition of CB not assessed.	Indoor SB, Cond 3
Comments:		

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 5/12/2016 2:11:50 PM

Insp ID: 3547 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 5/12/2016 1:51:33 PM

Insp ID: 3548	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type: Electrical

Meter Switchboard Cond:

Meter Condition:

Meter Comment: Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 5/12/2016 1:31:55 PM

Insp ID: 3550	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

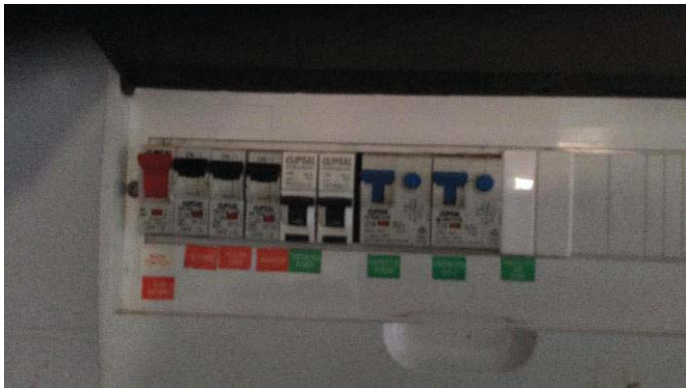
Electrical Infrastructure

Inspection Date 5/12/2016 1:16:45 PM

Insp ID: 3552	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	3
Meter Condition:	3
Meter Comment:	Indoor SB, Cond 3
Comments:	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/01/2017 11:03:31 AM

Insp ID: 3563 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

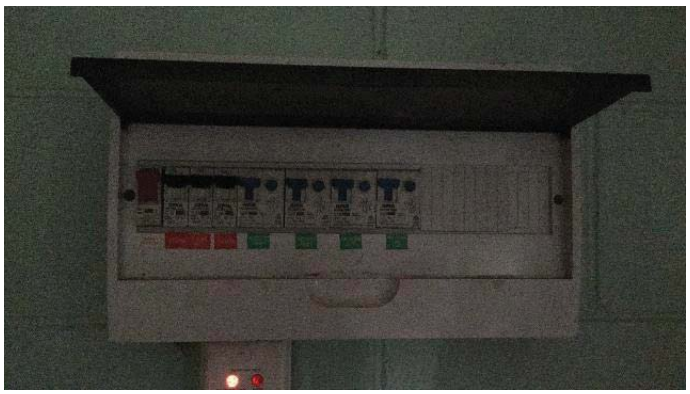
Electrical Infrastructure

Inspection Date 9/01/2017 10:38:46 AM

Insp ID: 3579	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid	
Meter Switchboard Cond:	2	
Meter Condition:	3	
Meter Comment:	Condition of CB not assessed.	Indoor SB, Cond 3
Comments:		



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 1:00:49 PM

Insp ID: 802 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 1:00:49 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 1:00:49 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:48:51 PM

Insp ID: 803	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:48:51 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:46:20 PM

Insp ID: 804 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 13
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:46:20 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:43:37 PM

Insp ID: 805 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 10
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:43:37 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:33:57 PM

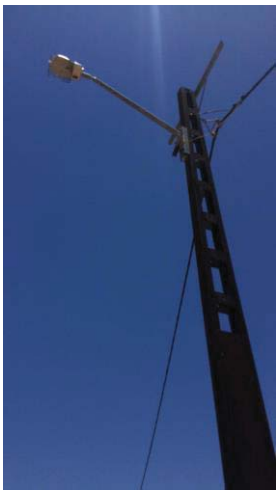
Insp ID: 806 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 09
Street Light Watts	70
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:33:57 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:30:24 PM

Insp ID: 807 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:30:24 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:25:51 PM

Insp ID: 808 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:25:51 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:18:01 PM

Insp ID: 810 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 12
Street Light Watts	80
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:18:01 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:12:14 PM

Insp ID: 812 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 98
Street Light Watts	70
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:12:14 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:07:15 PM

Insp ID: 813	Group 3 - Tennant Creek, Elliott	Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 09
Street Light Watts	70
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:07:15 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:04:24 PM

Insp ID: 814 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 12:04:24 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:56:08 AM

Insp ID: 815 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:56:08 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:52:32 AM

Insp ID: 817 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 10
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:52:32 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:49:50 AM

Insp ID: 818 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 13
Street Light Watts	70
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:49:50 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:41:52 AM

Insp ID: 819 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 10
Street Light Watts	125
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:41:52 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:39:00 AM

Insp ID: 820 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M125D 09
Street Light Watts	125
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:39:00 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:36:12 AM

Insp ID: 821 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:36:12 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:33:51 AM

Insp ID: 822 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 10
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:33:51 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:27:46 AM

Insp ID: 823 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 06
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:27:46 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:25:27 AM

Insp ID: 824 Group 3 - Tennant Creek, Elliott Tingkarli

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 12
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 1/12/2016 11:25:27 AM