



ORIGINAL DRAWINGS
(These are the originals only if this text is RED)

MURRAY SHIRE COUNCIL
Construction Certificate Approval

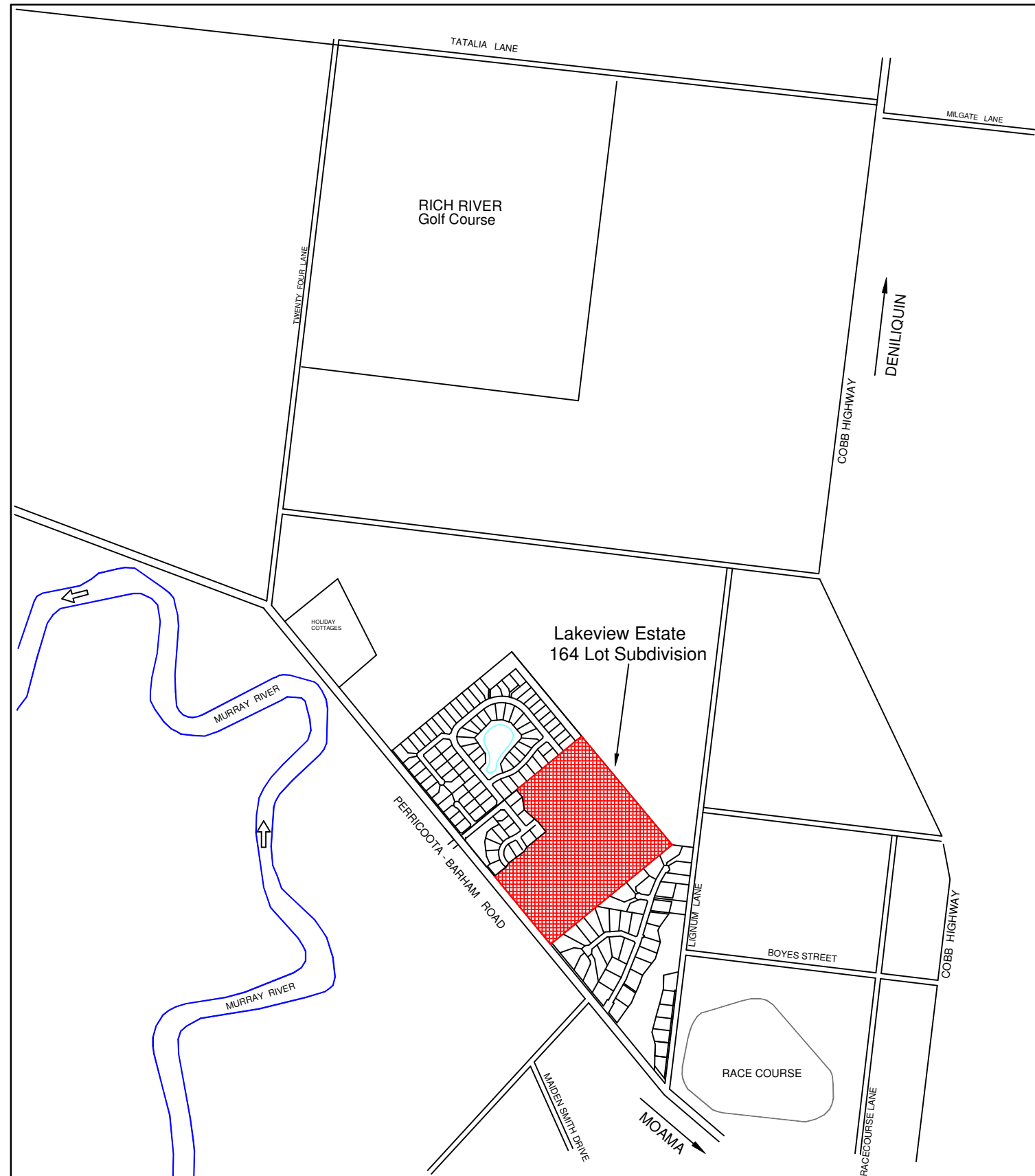
Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering

Villawood Properties Pty Ltd

Lakeview Estate - Stage 3

Drawing file: 15066 Face.dwg	LTO Ref: -	Council Ref: DA 173/11	Ref: 15066	Version: 2
---------------------------------	---------------	---------------------------	---------------	---------------



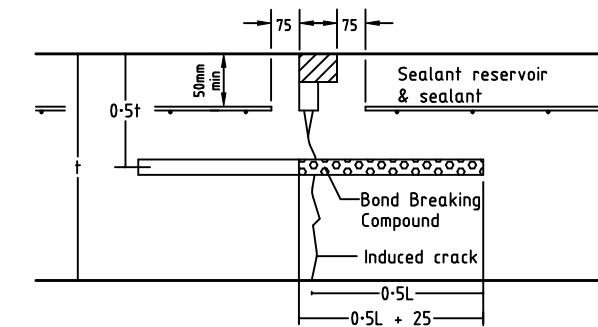
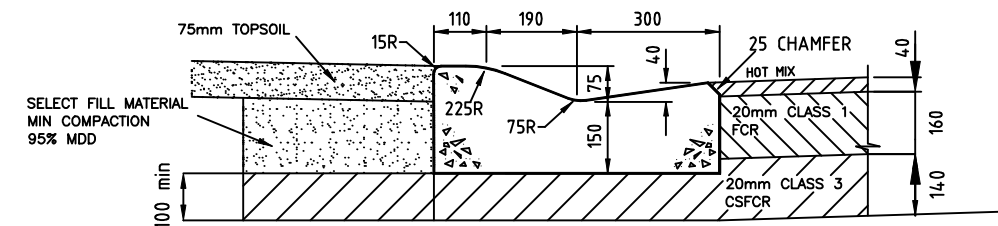
LOCALITY PLAN - MOAMA

INDEX

SHEET VERSION	DESCRIPTION	
1	2	Index & Locality Plan
2	2	General Notes & Typical Cross Sections
3	2	Overall Layout Plan
4	2	Layout Plan
5	2	Layout Plan 2
6	2	Layout Plan 3
7	2	Curve Detail
8	2	Marsanne Drive Longitudinal Section
9	2	Marsanne Drive Cross Sections
10	2	Marsanne Drive Cross Sections 2
11	2	Driveway Longitudinal & Cross Sections
12	2	Drainage Longitudinal Sections
13	2	Drainage Longitudinal Sections 2
14	2	Pit Schedule
15	2	Sewer Notes
16	2	Sewer Layout Plan
17	2	Sewer Layout Plan 2
18	2	Sewer Layout Plan 3
19	2	Sewer Longitudinal Sections
20	2	Sewer Longitudinal Sections 2
21	2	Water Notes
22	2	Water Plan

MURRAY SHIRE COUNCIL
Construction Certificate Approval
Application Number: 16/067
Approval Date: 6 November 2015
Leigh Robins
Director of Engineering

MURRAY SHIRE COUNCIL
MODIFIED SM2 K&C & PAVEMENT DETAILS



DOWELLED JOINT
 JOINTED REINFORCED PAVEMENTS
 NTS

TRANSVERSE CONTRACTION JOINT DETAILS

Ver	Revision Description	Date
6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	

Notes/Legend

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

NOT TO SCALE

All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file: 15066 Notes.dwg
 LTO Ref: -

Murray Shire Council - Moama				
Villawood Properties Pty Ltd Lakeview Estate - Stage 3				
Index & Locality Plan				
Council Ref:	Our Ref:	Version	Sheet	
DA 173/11	15066	2	1 of 22	

General Notes

- Works are to comply with the current standards and specifications of the municipality. Contract is in accordance with AS2124-1992 including annexures.
- This stage consists of lots 73 to 88.
- The contractor must adhere to the code of practise for "Safety Precautions in Trenching Operations" under the "Work Health and Safety Act 2011". All workers on this site must have a current WH&S General Induction for Construction Working NSW Certificate (White Card).
- The contractor must contact all servicing authorities to arrange service locations prior to commencement of excavation for this project.
- Easements shown on these plans are 2.0m wide drainage easements, sewer easements shown on these plans are 3.0m wide, unless indicated otherwise.
- Drainage pipes and pits are to be at 1.0m offset to property boundaries unless shown otherwise.
- Drainage pipes 300mm diameter and greater are to be rubber ring joint class 2 reinforced concrete unless shown otherwise. Pipes 225mm diameter and less are to be rubber ring joint uPVC.
- Pits (including lids) are to be constructed in accordance with the current standards of the Murray Shire Council. Side entry pits in rollover kerb & channel are to be constructed using an approved rollover type lintel.
- Property drainage connections (150mm diameter) are to be provided in all easement pits, and in road drainage pits where shown. Property drainage connections are to be 150mm diameter uPVC SN8 and to have 600mm minimum cover. Connections to extend into properties by a minimum of 1.0m in length. 150mm PVC pipes shown in the road reserve are for house drain connections. Property connections shall be marked with a PVC riser pipe to 600mm above ground.
- Step irons are not to be provided in any drainage pits.
- Pipe stubs are to consist of one full pipe length unless shown otherwise.
- Finished levels for Side Entry Pits must be determined from kerb levels, and lids should be sloped to suit nature strips etc. The FSL's indicated in the pit schedule are not kerb levels.
- All trenches crossing pavement areas or beneath kerb or footpath are to be backfilled with 3% cement stabilised fine crushed rock.
- Fill areas are to be cleared and stripped of all organic material and topsoil prior to placement of selected fill material. Fill areas are to be inspected by the supervising Engineer prior to any fill being placed. Fill is to be placed and compacted in layers, with a minimum compaction of 95% of the maximum dry density as determined by the standard compaction test being achieved. 98% of maximum dry density must be achieved within road pavement areas.
- All concrete must have a minimum compressive strength of 25MPa at 28 days. Kerb & Channel concrete must have an equivalent strength using not less than 280kg of cement per m3 of concrete.
- Maximum driveway grade for any allotment is 1 in 7.
- Minimum finished grade on any allotment is 1 in 200.
- Raw and treated water services crossing roads to be 32mm PN8 poly (if two properties being connected) or 25mm PN8 poly (if single property connected) sleeved in 50mm Class 12 uPVC service conduits.
- Raw and treated water tappings including saddles, 20mm Ø copper service connections, meter stop tap (treated) and ball valve (raw) to be provided 1m inside allotments. Tapping saddles are to be gunmetal style only.
- All sewer manhole covers are to be solid ductile iron Class D covers and frame with concrete surround.
- 50mm diameter Class 12 uPVC service conduits are to be provided for water and gas services at the locations indicated on the plans.
- Electricity cable conduits are to be installed as shown on the Power cable reticulation plan, in accordance with the requirements and specifications of Essential Energy.
- NBN conduits are to be installed as shown on the NBN cable plan.
- The location of all service conduits is to be marked 5mm into the face of both kerbs, immediately above the conduit with a uniform 50mm high letter (W,G,E,T etc.). Where conduits cross footpaths, the location is to be marked in the path (near the edge) in the same fashion.
- Nature strips are to be topsoiled to a depth of approximately 100mm using material stockpiled from stripping, or approved imported material.
- Pavement Testing. Tests to be completed at a frequency of 1 test per 500m2 of pavement with test locations approximately 1 metre offset from the kerb & measured at 2/3 of the layer depth. Court bowls to be tested in 3 locations & intersections in 2. Pavement material to be placed and compacted in layers with minimum compaction of 100% of the maximum dry density as determined by the modified compaction test being achieved.
- All drainage and sewer pipes are to be inspected via CCTV after installation with a copy to be provided to the Murray Shire Council.
- Side entry pit throat clearance to be 100mm max.
- All pit lids to be constructed by Terra Firma Industries

**MURRAY SHIRE COUNCIL
Construction Certificate Approval**

Notes/Legend
Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering

Ver	Revision Description	Date
6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015

Designed
G.McCoomb
Nov 2015

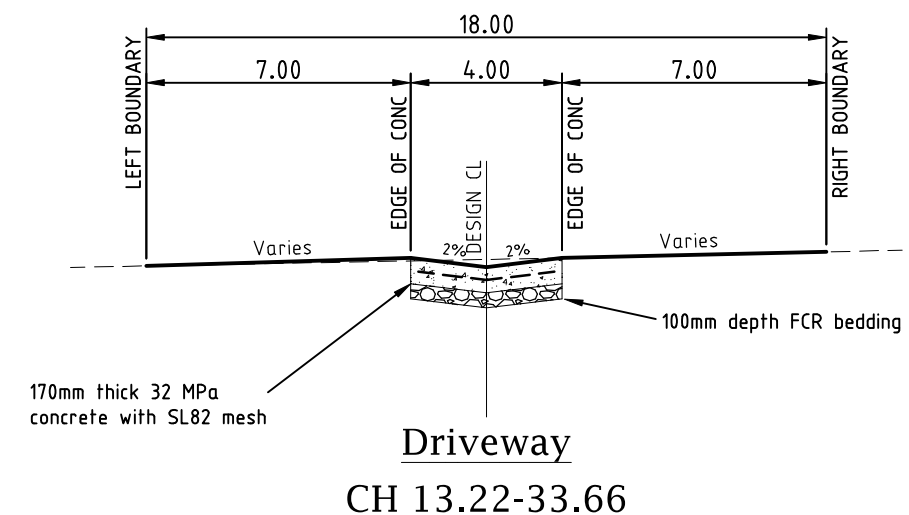
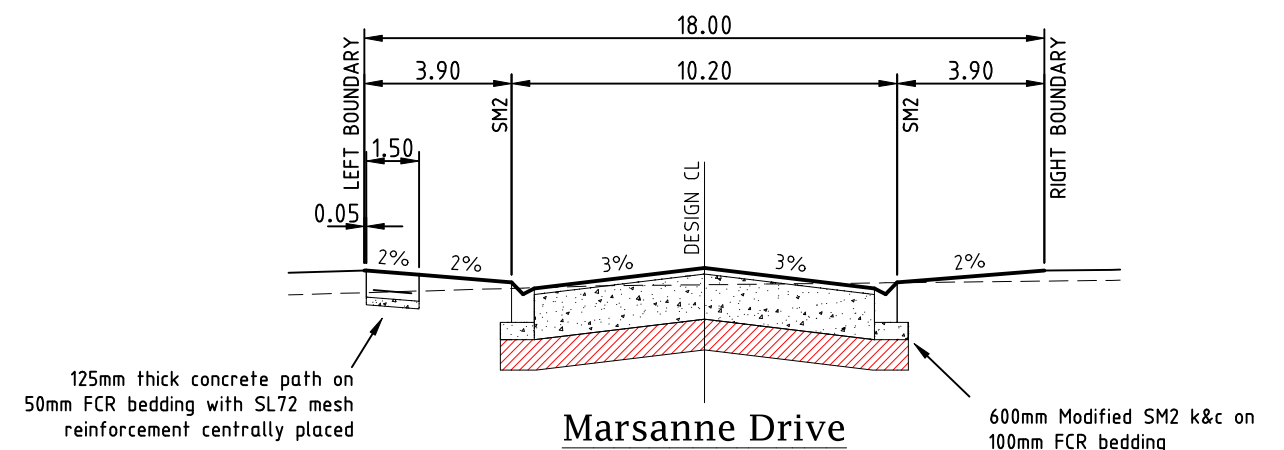
Checked
A.Mertens
Nov 2015

Approved

TERRACO
Civil Engineers
Project Managers
Development Consultants

Terraco P/L
ABN 12 681 695 776
Corner Jewell Court
& Rowena Street
Bendigo Vic 3550
Ph: 03 5442 5799
Fax: 03 5441 5506
E: info@terraco.com.au

Typical Cross Sections



Pavement Composition & Notes

- PAVEMENT COMPOSITION: MARSANNE DRIVE
 - 40mm DEPTH HOT MIX ASPHALT
 - 160mm DEPTH CONSOLIDATED 20mm CLASS 1 FCR (BASE COURSE)
 - 140mm DEPTH CONSOLIDATED 20mm CLASS 3 FCR (SUBBASE)
 - A14 BIDIM NONWOVEN GEOTEXTILE
 - 200mm DEPTH IN SITU STABILISATION OF SUBGRADE MATERIAL (3% LIME & 1% CEMENT BY MASS)
- PAVEMENT COMPOSITION: DRIVEWAY (EXPOSED AGGREGATE CONCRETE)
 - 170mm DEPTH 32 MPa CONCRETE WITH SL82 MESH REINFORCEMENT
 - 100mm DEPTH CONSOLIDATED FCR BEDDING
- The location of all service conduits is to be marked 5mm into the face of both kerbs, immediately above the conduit with a uniform 50mm high letter (W,G,E,T etc.). Where conduits cross footpaths, the location is to be marked in the path (near the edge) in the same fashion.
- Nature strips are to be topsoiled to a depth of approximately 100mm using material stockpiled from stripping, or approved imported material.

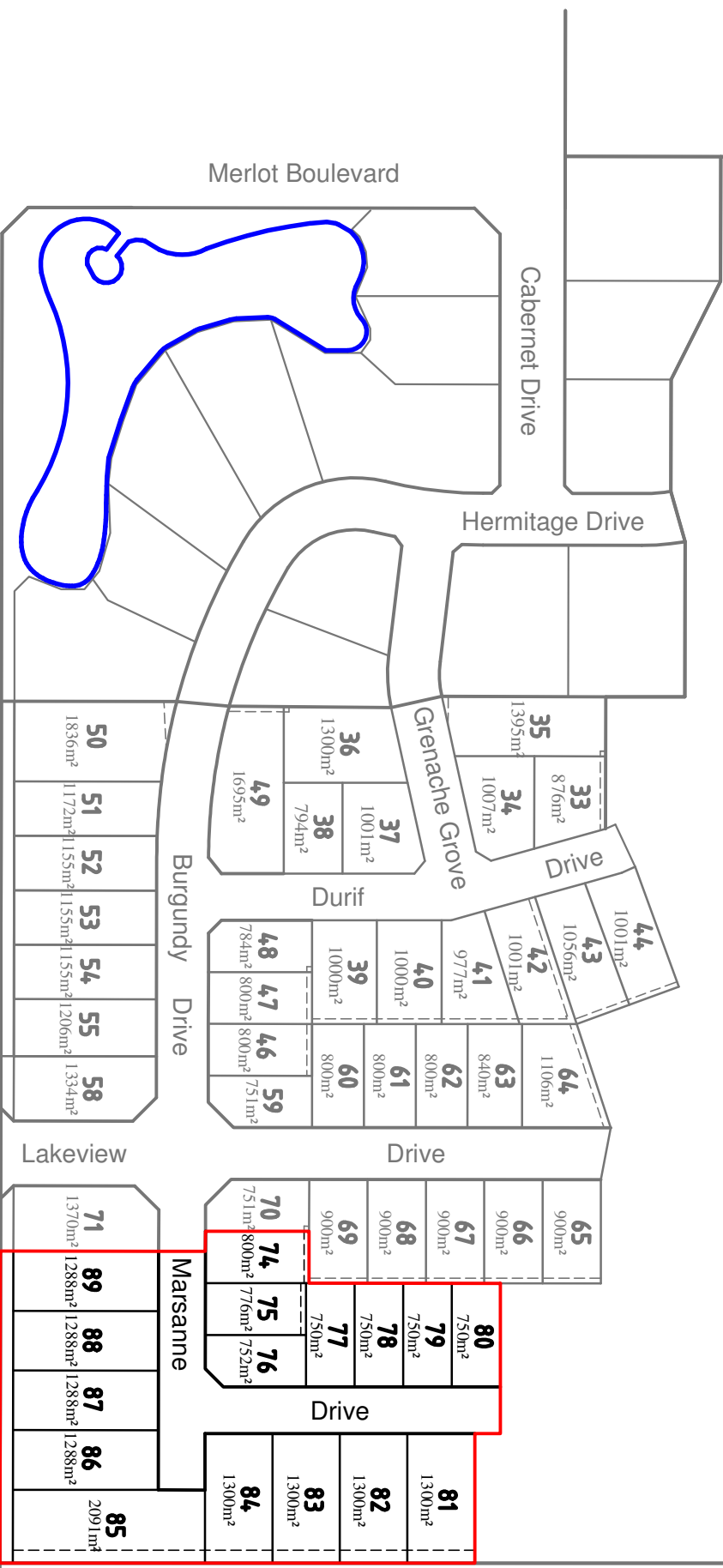
Murray Shire Council - Moama		NOT TO SCALE		Villawood Properties Pty Ltd Lakeview Estate - Stage 3	
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)		Drawing file: 15066 Notes.dwg		General Notes & Typical Cross Sections	
Council Ref: DA 173/11		LTO Ref: -		Our Ref: 15066	
Version 2		Sheet 2 of 22			

**MURRAY SHIRE COUNCIL
Construction Certificate Approval**

**Application Number: 16/067
Approval Date: 6 November 2015**

**Leigh Robins
Director of Engineering**

91
19.75ha



6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	G.McCoomb	Nov 2015
Checked	A.Mertens	Nov 2015
Approved		

Notes/Legend

TERRACCO
Civil Engineers
Project Managers
Development Consultants

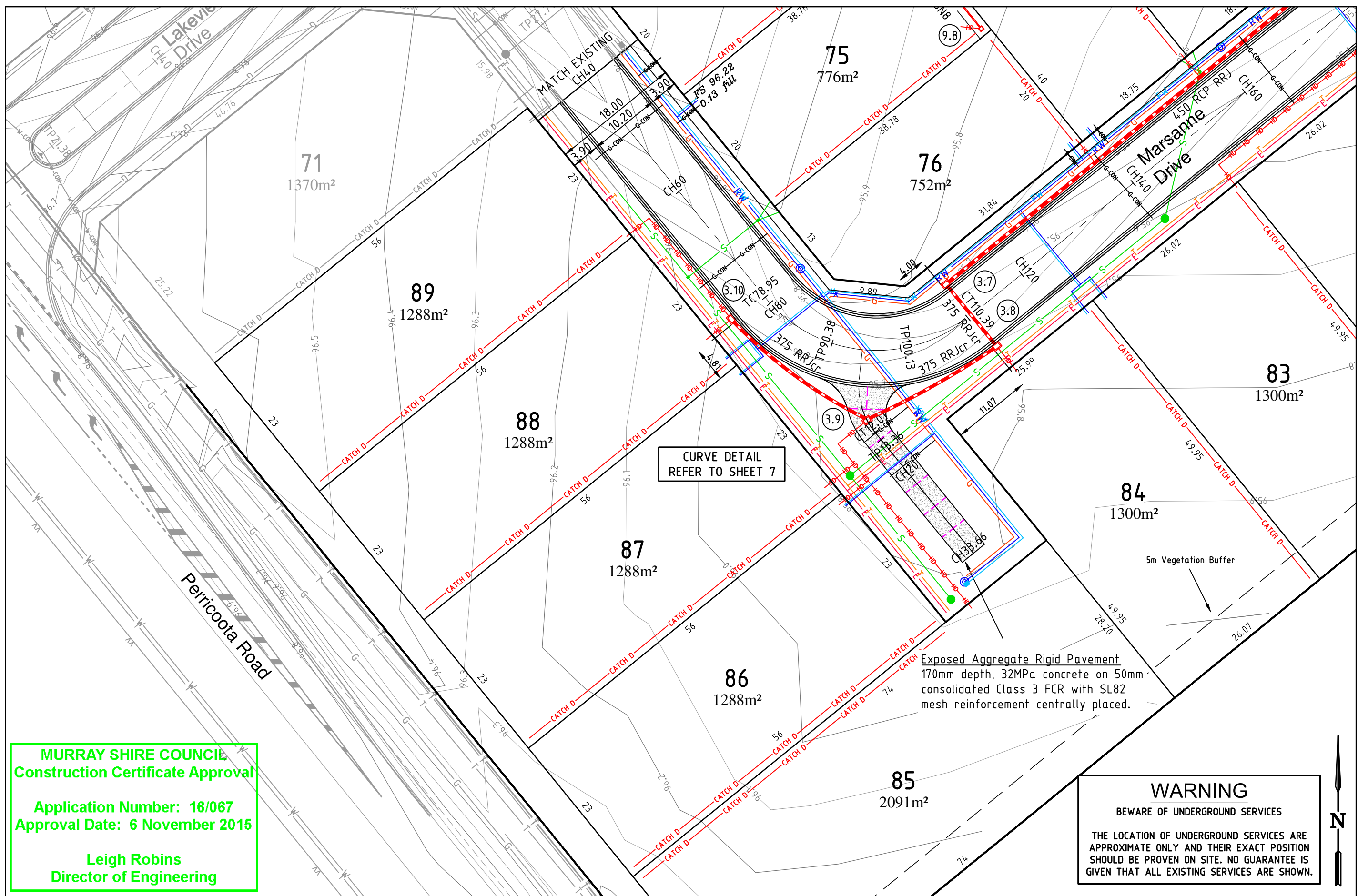
Terracco P/L
ABN 12 681 695 776
Corner Jewell Court
& Rowena Street
Bendigo VIC 3550
Ph: 03 5442 5799
Fax: 03 5441 5506
E: info@terracco.com.au

NO SCALE
All lengths are in metres
and all levels are to Australian Height Datum
(Original Sheet Size is A3)

Drawing file: LTO Ref: -

Murray Shire Council - Meema
Villawood Properties Pty Ltd
Lakeview Estate - Stage 3
Overall Layout Plan

Council Ref: DA 173/11
Our Ref: 15066
Version: 2
Sheet: 3 of 22



MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
 Approval Date: 6 November 2015

Leigh Robins
 Director of Engineering

CURVE DETAIL
 REFER TO SHEET 7

Exposed Aggregate Rigid Pavement
 170mm depth, 32MPa concrete on 50mm consolidated Class 3 FCR with SL82 mesh reinforcement centrally placed.

WARNING
 BEWARE OF UNDERGROUND SERVICES

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

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	G.McCoomb	Nov 2015
Checked	A.Mertens	Nov 2015
Approved		

Notes/Legend

PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m

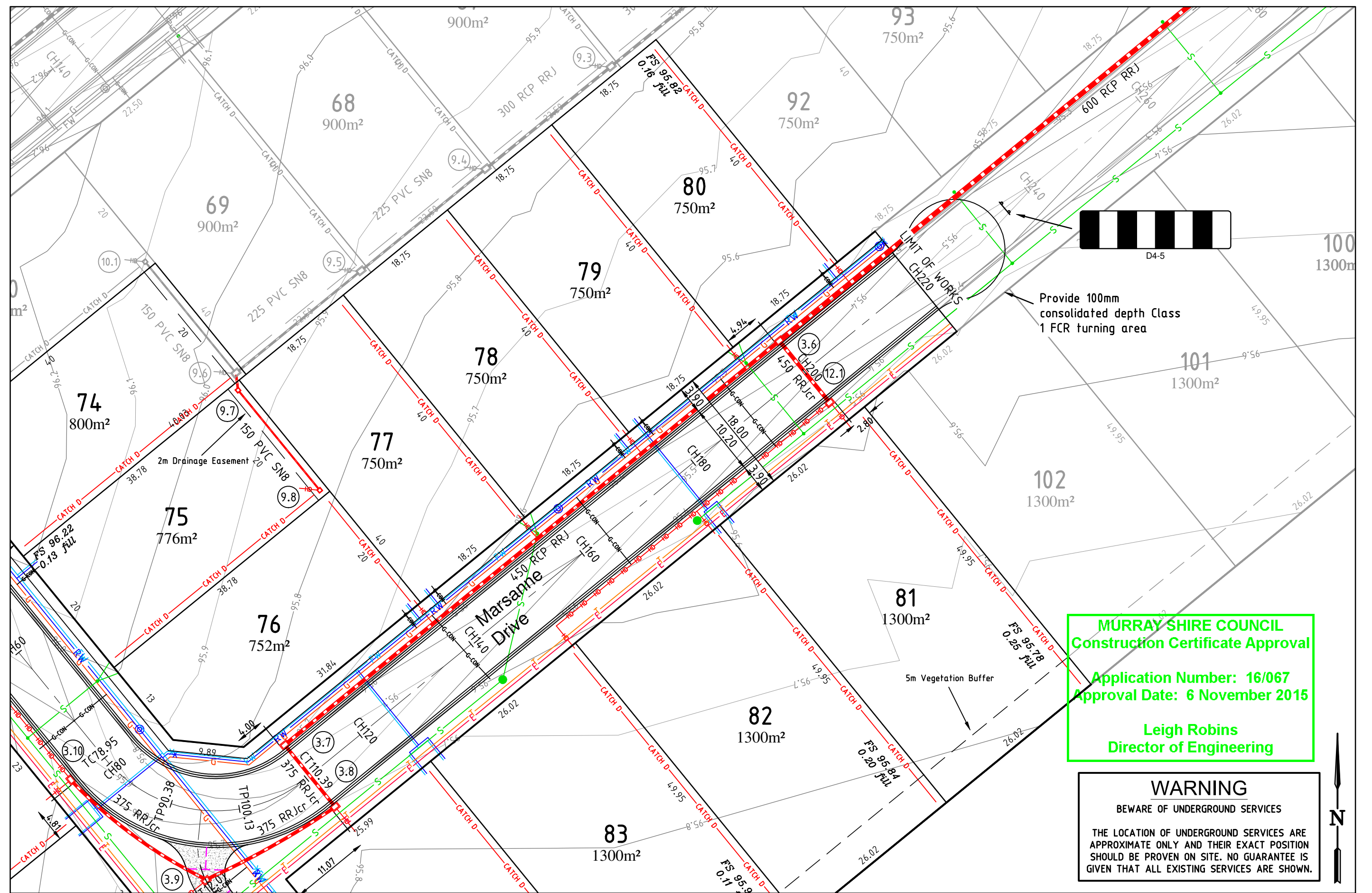
PROVIDE TRANSVERSE CONTRACTION JOINTS AT LOCATIONS MARKED.

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m)		1:500	0	5	10
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)					
Drawing file:	LTO Ref:	Council Ref:	Our Ref:	Version	Sheet
15066 Layout.dwg	-	DA 173/11	15066	2	4 of 22

Murray Shire Council - Moama					
Villawood Properties Pty Ltd					
Lakeview Estate - Stage 3					
Layout Plan					
Council Ref:	Our Ref:	Version	Sheet		
DA 173/11	15066	2	4 of 22		



MURRAY SHIRE COUNCIL
Construction Certificate Approval
 Application Number: 16/067
 Approval Date: 6 November 2015
 Leigh Robins
 Director of Engineering

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

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed G.McCoomb Nov 2015	Checked A.Mertens Nov 2015
Approved	

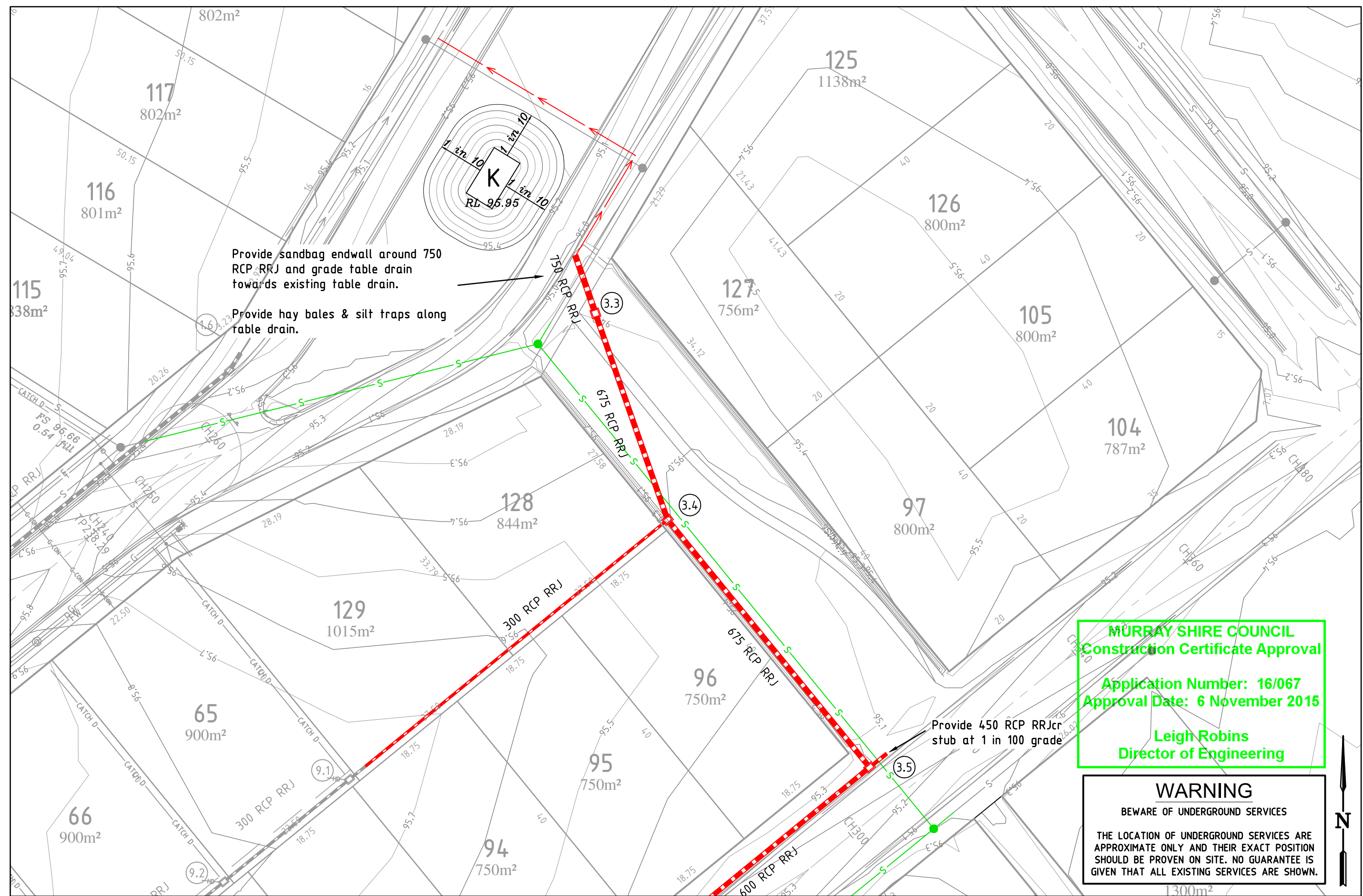
Notes/Legend
 PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m
 PROVIDE TRANSVERSE CONTRACTION JOINTS AT LOCATIONS MARKED.

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m)	1:500	0	5	10	
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)					
Drawing file:	15066 Layout.dwg	LTO Ref:	-	Council Ref:	DA 173/11

Murray Shire Council - Moama					
Villawood Properties Pty Ltd Lakeview Estate - Stage 3					
Layout Plan 2					
Council Ref:	DA 173/11	Our Ref:	15066	Version	2
Sheet	5 of 22				



MURRAY SHIRE COUNCIL
Construction Certificate Approval
 Application Number: 16/067
 Approval Date: 6 November 2015
 Leigh Robins
 Director of Engineering

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

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	

Notes/Legend
 PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m
 K INDICATES POWER KIOSK LOCATION

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

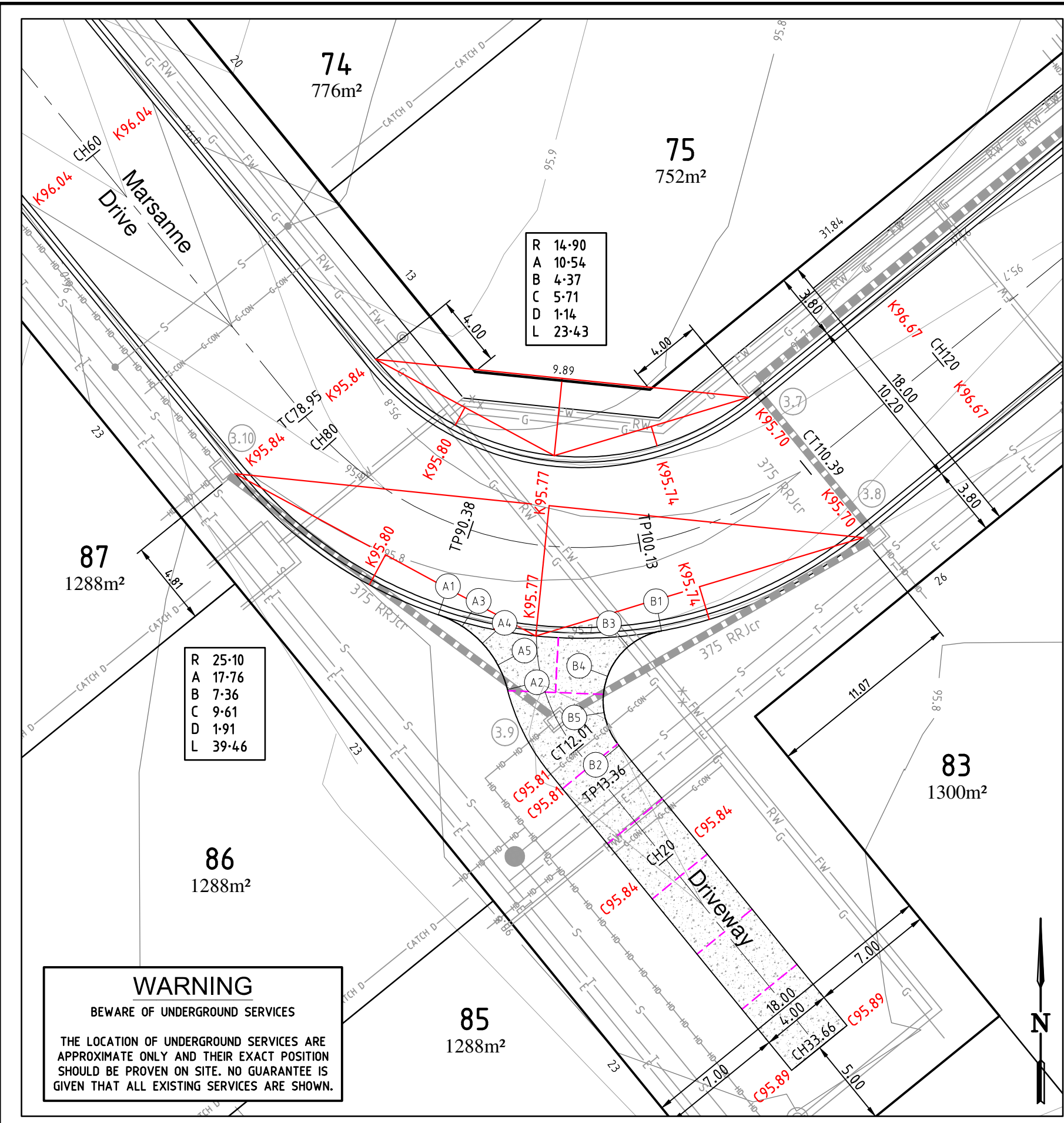
Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m) 1:500 0 5 10
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file:	LTO Ref:
15066 Layout.dwg	-

Murray Shire Council - Moama
 Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Layout Plan 3

Council Ref:	Our Ref:	Version	Sheet
DA 173/11	15066	2	6 of 22



R	14.90
A	10.54
B	4.37
C	5.71
D	1.14
L	23.43

R	25.10
A	17.76
B	7.36
C	9.61
D	1.91
L	39.46

WARNING
BEWARE OF UNDERGROUND SERVICES

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

Alignment A (Edge of Concrete)

A	1	296209.690	6002860.418	95.784
A	2	296213.587	6002856.203	95.745
A	3	296211.033	6002859.768	95.780
A	4	296212.175	6002858.807	95.779
A	5	296213.044	6002857.594	95.771

Curve no	I	Radius	Arc	Mid Ord	Qtr Ord	X	Y	I	Mid Ord RL
A 1 2	57.157	6.000	5.985	0.731	0.545	1.389	1.481	1.496	95.779

Alignment B (Edge of Concrete)

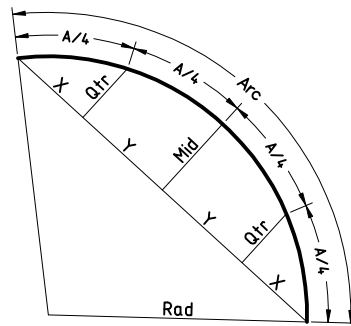
Point no	Easting	Northing	RL
B 1	296222.247	6002859.509	95.744
B 2	296219.865	6002853.049	95.700
B 3	296220.393	6002858.635	95.742
B 4	296219.215	6002856.958	95.722
B 5	296219.022	6002854.917	95.701

Curve no	I	Radius	Arc	Mid Ord	Qtr Ord	X	Y	I	Mid Ord RL
B 1 2	-118.757	-4.000	8.291	1.963	1.437	1.461	1.981	2.073	95.722

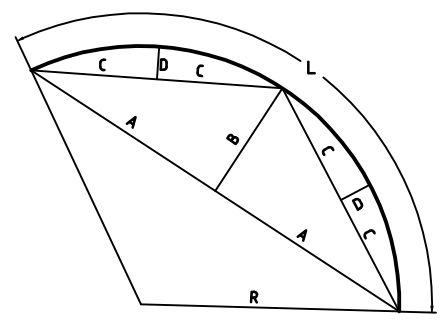
MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering



Curve Setout Detail



Curve Setout Detail

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	G.McCoomb	Nov 2015
Checked	A.Mertens	Nov 2015
Approved		

Notes/Legend

PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m

PROVIDE TRANSVERSE CONTRACTION JOINTS AT LOCATIONS MARKED.

TERRACO Civil Engineers Project Managers Development Consultants

Terraco P/L
ABN 12 681 695 776
Corner Jewell Court & Rowena Street Bendigo Vic 3550
Ph: 03 5442 5799
Fax: 03 5441 5506
E: info@terraco.com.au

Scale (m) 1:250 0 2.5 5

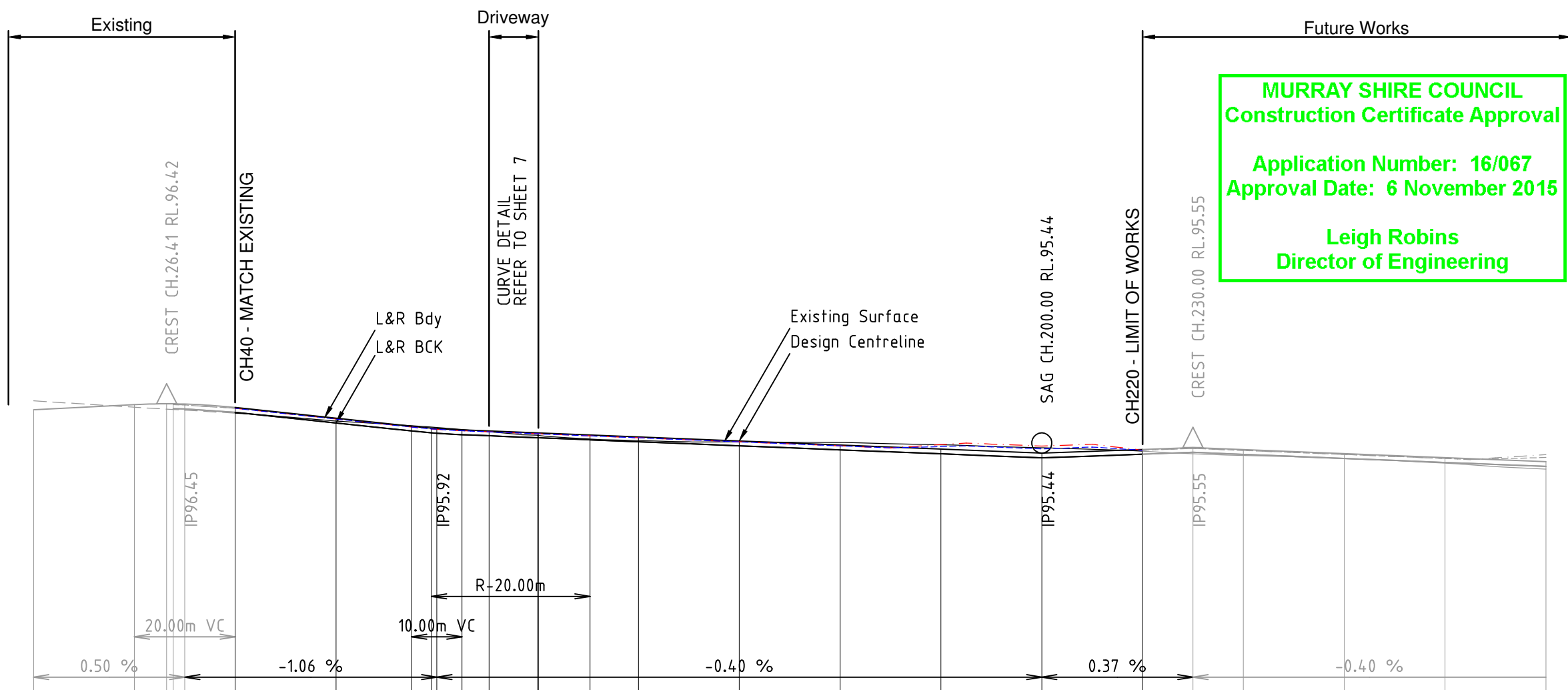
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)

Drawing file: 15066 Detail.dwg LTO Ref: - Council Ref: DA 173/11 Our Ref: 15066 Version: 2 Sheet: 7 of 22

Murray Shire Council - Moama

Villawood Properties Pty Ltd
Lakeview Estate - Stage 3

Curve Detail



MURRAY SHIRE COUNCIL
 Construction Certificate Approval
 Application Number: 16/067
 Approval Date: 6 November 2015
 Leigh Robins
 Director of Engineering

Horiz Curve Data
 V.C. Length (m)
 Design Cline Grade (%)
 DATUM R.L.90

Design Surface	96.30	96.40	96.42	96.42	96.41	96.34	96.13	95.97	95.94	95.93	95.90	95.88	95.84	95.84	95.84	95.80	95.76	95.68	95.60	95.52	95.44	95.51	95.55	95.51	95.43	95.35	95.27
Centreline Levels	96.30	96.40	96.42	96.42	96.41	96.34	96.13	95.97	95.94	95.93	95.90	95.88	95.84	95.84	95.84	95.80	95.76	95.68	95.60	95.52	95.44	95.51	95.55	95.51	95.43	95.35	95.27
Left Design Level	95.17		96.32	96.32	96.32	96.25	96.04	95.88	95.84	95.83	95.80	95.78	95.74	95.74	95.74	95.70	95.66	95.58	95.50	95.42	95.34	95.42	95.46	95.41	95.33	95.25	95.17
Back of Kerb	95.17		96.32	96.32	96.32	96.25	96.04	95.88	95.84	95.83	95.80	95.78	95.74	95.74	95.74	95.70	95.66	95.58	95.50	95.42	95.34	95.42	95.46	95.41	95.33	95.25	95.17
Right Design Level	95.18		96.32	96.32	96.32	96.25	96.04	95.88	95.84	95.83	95.81	95.78	95.74	95.74	95.74	95.70	95.67	95.59	95.51	95.43	95.35	95.42	95.45	95.41	95.34	95.26	95.18
Back of Kerb	95.18		96.32	96.32	96.32	96.25	96.04	95.88	95.84	95.83	95.81	95.78	95.74	95.74	95.74	95.70	95.67	95.59	95.51	95.43	95.35	95.42	95.45	95.41	95.34	95.26	95.18
Design Surface	95.35		96.40	96.39	96.33	96.12	95.96	95.92	95.91	95.88	95.86	95.82	95.82	95.82	95.78	95.74	95.66	95.58	95.50	95.42	95.34	95.42	95.46	95.41	95.33	95.25	95.17
Left Building Line	95.35		96.40	96.39	96.33	96.12	95.96	95.92	95.91	95.88	95.86	95.82	95.82	95.82	95.78	95.74	95.66	95.58	95.50	95.42	95.34	95.42	95.46	95.41	95.33	95.25	95.17
Design Surface	95.41		96.40	96.39	96.33	96.12	95.96	95.92	95.91	95.88	95.86	95.82	95.82	95.82	95.78	95.74	95.66	95.58	95.50	95.42	95.34	95.42	95.46	95.41	95.33	95.25	95.17
Right Building Line	95.41		96.40	96.39	96.33	96.12	95.96	95.92	95.91	95.88	95.86	95.82	95.82	95.82	95.78	95.74	95.66	95.58	95.50	95.42	95.34	95.42	95.46	95.41	95.33	95.25	95.17
Existing Surface		96.35	96.31	96.30	96.29	96.23	96.08	95.98	95.96	95.95	95.91	95.86	95.79	95.79	95.72	95.69	95.66	95.65	95.60	95.55	95.55	95.48	95.43	95.39	95.33	95.24	95.12
Chainage	0.00	20.00	26.41	27.71	30.00	40.00	60.00	75.00	78.95	80.00	85.00	90.38	100.00	100.13	110.39	120.00	140.00	160.00	180.00	200.00	220.00	230.00	240.00	260.00	280.00	300.00	

LONGITUDINAL SECTION - MARSANNE DRIVE

Scales Hor 1 : 1000
 (A3 orig) Ver 1 : 100

6			Designed	Checked
5			G.McCoomb	A.Mertens
4			Nov 2015	Nov 2015
3			Approved	
2	Additional Sewer	03/11/2015		
1	Original Issue	24/07/2015		
0	Draft	19/06/2015		
Ver	Revision Description	Date		

Notes/Legend

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

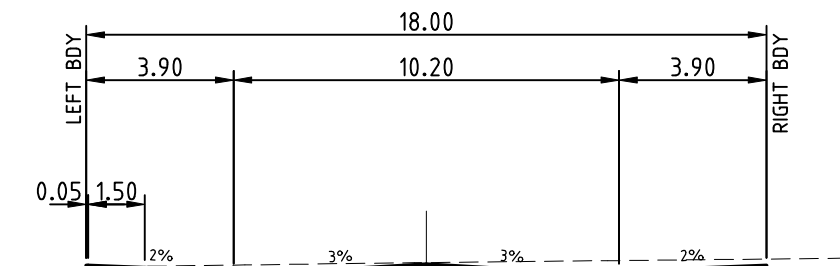
Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m)
 H 1:1000 0 10 20
 V 1:100 0 1 2
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file: 15066 Marsanne.dwg
 LTO Ref: -

Murray Shire Council - Moama
Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
Marsanne Drive Longitudinal Section

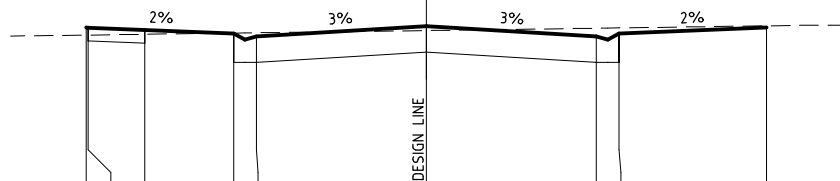
Council Ref: DA 173/11	Our Ref: 15066	Version: 2	Sheet: 8 of 22
------------------------	----------------	------------	----------------



Datum 94

Design Level	Existing Surface	Offset
95.919	95.897	-9
95.918	95.897	-8.95
95.888	95.907	-7.45
95.841	95.923	-5.1
95.801	95.927	-4.5
95.936	95.956	0
95.801	95.98	4.5
95.841	95.983	5.1
95.919	96.003	9

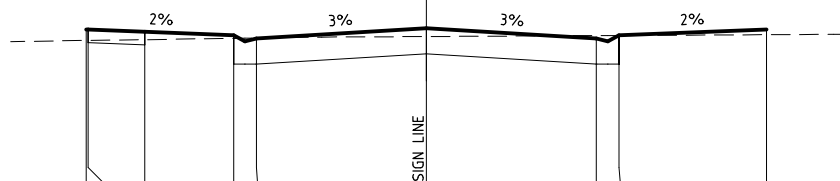
TC 78.947



Datum 94

Design Level	Existing Surface	Offset
96.115	96.016	-9
96.114	96.017	-8.95
96.084	96.027	-7.45
96.037	96.042	-5.1
95.997	96.046	-4.5
96.132	96.076	0
95.997	96.106	4.5
96.037	96.111	5.1
96.115	96.139	9

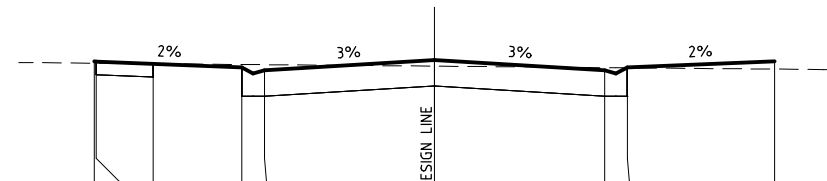
CH 60



Datum 94

Design Level	Existing Surface	Offset
96.327	96.181	-9
96.326	96.181	-8.95
96.296	96.192	-7.45
96.249	96.209	-5.1
96.209	96.213	-4.5
96.344	96.233	0
96.209	96.245	4.5
96.249	96.247	5.1
96.327	96.257	9

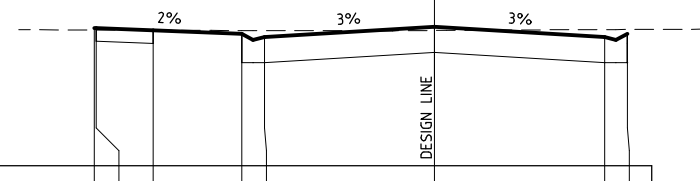
CH 40 - MATCH EXISTING



Datum 94

Design Level	Existing Surface	Offset
95.781	95.759	-9
95.78	95.758	-8.95
95.75	95.752	-7.45
95.703	95.742	-5.1
95.663	95.739	-4.5
95.798	95.72	0
95.663	95.7	4.5
95.703	95.697	5.1
95.781	95.68	9

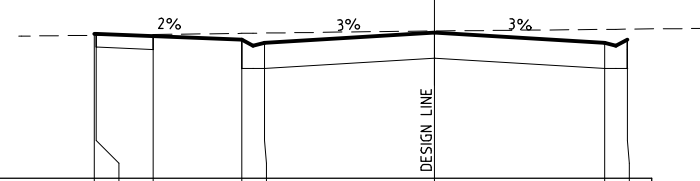
CT 110.393



Datum 94

Design Level	Existing Surface	Offset
95.823	95.796	-9
95.822	95.796	-8.95
95.792	95.794	-7.45
95.745	95.79	-5.1
95.705	95.789	-4.5
95.84	95.791	0
95.705	95.802	4.5
95.745	95.803	5.1

CH 100



Datum 94

Design Level	Existing Surface	Offset
95.911	95.893	-9
95.91	95.893	-8.95
95.88	95.903	-7.45
95.833	95.918	-5.1
95.793	95.922	-4.5
95.928	95.949	0
95.793	95.97	4.5
95.833	95.973	5.1

CH 80

MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering

Ver	Revision Description	Date
6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	

Notes/Legend

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

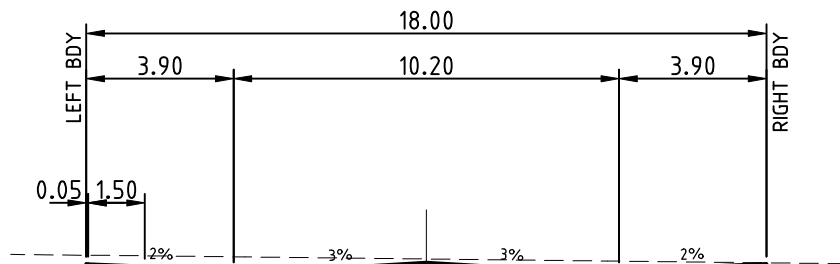
Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m)
 H 1:200 0 2 4
 V 1:100 0 1 2

All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file: 15066 Marsanne.dwg
 LTO Ref: -

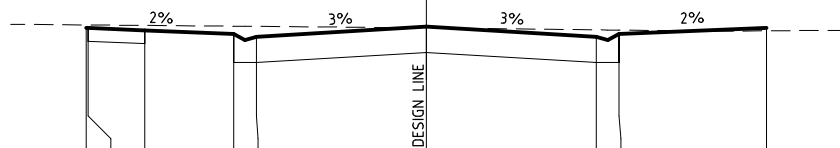
Murray Shire Council - Moama				
Villawood Properties Pty Ltd Lakeview Estate - Stage 3				
Marsanne Drive Cross Sections				
Council Ref:	Our Ref:	Version	Sheet	
DA 173/11	15066	2	9 of 22	



Datum 94

Design Level	95.583	95.582	95.552	95.505	95.465	95.6	95.465	95.505	95.583
Existing Surface	95.7	95.7	95.691	95.678	95.675	95.65	95.625	95.622	95.599
Offset	-9	-8.95	-7.45	-5.1	-4.5	0	4.5	5.1	9

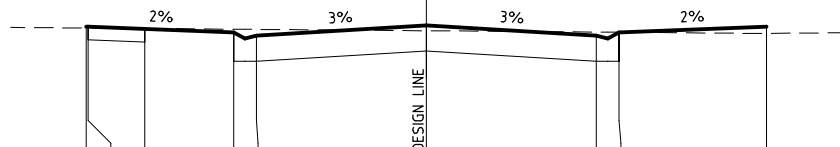
CH 160



Datum 94

Design Level	95.663	95.662	95.632	95.585	95.545	95.68	95.545	95.585	95.663
Existing Surface	95.703	95.703	95.696	95.686	95.684	95.663	95.638	95.634	95.625
Offset	-9	-8.95	-7.45	-5.1	-4.5	0	4.5	5.1	9

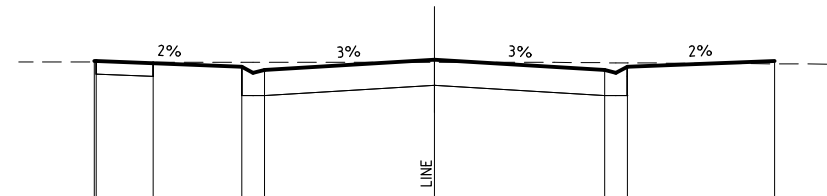
CH 140



Datum 94

Design Level	95.743	95.742	95.712	95.665	95.625	95.76	95.625	95.665	95.743
Existing Surface	95.724	95.724	95.718	95.708	95.706	95.688	95.67	95.668	95.654
Offset	-9	-8.95	-7.45	-5.1	-4.5	0	4.5	5.1	9

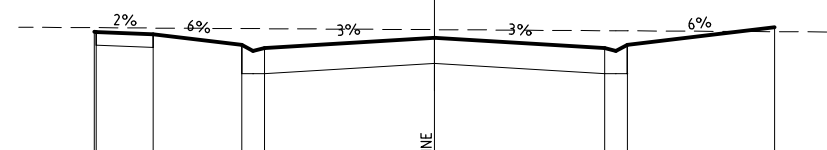
CH 120



Datum 93

Design Level	95.496	95.495	95.465	95.418	95.378	95.513	95.378	95.418	95.496
Existing Surface	95.481	95.481	95.48	95.479	95.479	95.478	95.472	95.471	95.459
Offset	-9	-8.95	-7.45	-5.1	-4.5	0	4.5	5.1	9

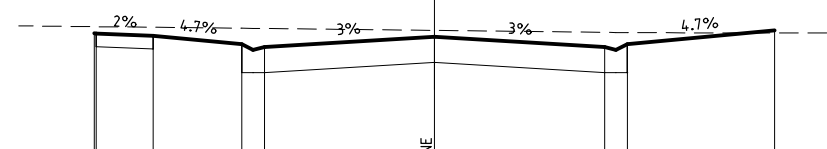
CH 220 - LIMIT OF WORKS



Datum 93

Design Level	95.519	95.516	95.486	95.345	95.305	95.44	95.305	95.345	95.519
Existing Surface	95.573	95.573	95.569	95.562	95.56	95.547	95.534	95.532	95.52
Offset	-9	-8.95	-7.45	-5.1	-4.5	0	4.5	5.1	9

CH 200



Datum 93

Design Level	95.567	95.565	95.535	95.425	95.385	95.52	95.385	95.425	95.567
Existing Surface	95.655	95.654	95.646	95.633	95.63	95.605	95.579	95.575	95.573
Offset	-9	-8.95	-7.45	-5.1	-4.5	0	4.5	5.1	9

CH 180

MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	G.McCoomb	Checked	A.Mertens	Notes/Legend
	Nov 2015		Nov 2015	
Approved				


TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

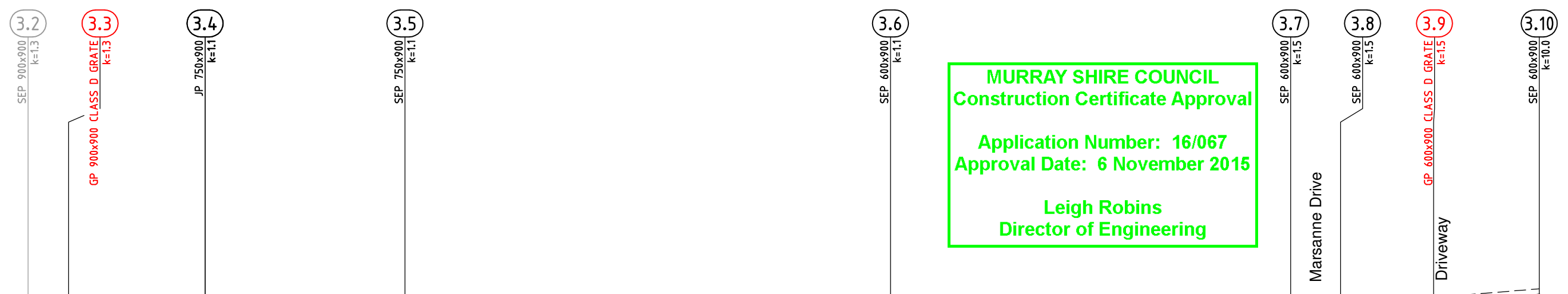
Scale (m)	H 1:200 0 2 4 V 1:100 0 1 2
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)	
Drawing file:	LTO Ref:
15066 Marsanne.dwg	-

Murray Shire Council - Moama				
Villawood Properties Pty Ltd				
Lakeview Estate - Stage 3				
Marsanne Drive Cross Sections 2				
Council Ref:	Our Ref:	Version	Sheet	
DA 173/11	15066	2	10 of 22	

MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
 Approval Date: 6 November 2015

Leigh Robins
 Director of Engineering



Design Flow (L/s) 400 388 330 201 104 95 77 29
 Pipe Capacity (L/s) 615 466 466 342 160 126 126 126
 Actual Velocity (m/s) 1.48 1.45 1.41 1.26 1.07 1.25 1.19 0.93
 Full pipe vel (m/s) 0.91 1.08 0.92 0.71 0.65 0.86 0.70 0.27

Pipe Size (mm) 750 675 675 600 450 375 375 375
 (Type) RCP RRJ RCP RRJ RCP RRJ RCP RRJ RCP RRJ RCRRJ cr RCRRJ cr RCRRJ cr
 Pipe Grade (1 in) 400 400 400 257 400 250 250 200
 (%) 0.250 0.250 0.250 0.389 0.250 0.400 0.400 0.400

Datum R.L. 86.0

Invert	93.532	93.552	93.575	93.650	93.726	93.746	93.857	93.932	94.08	94.352	94.402	94.41	94.51	94.624	94.644	94.689	94.709	94.792	94.812	94.929		
Depth to Inv. From FSL	1.47	1.45	1.32	1.24	1.27	1.25	1.31	1.24		1.02	0.97			1.09	1.07	1.02	1.00	0.87	0.85	0.93		
H.G.L. Levels	94.28	94.34	94.35	94.41	94.46	94.53	94.58	94.63		94.80	94.83			95.02	95.06	95.08	95.14	95.17	95.21	95.23		
Finished Surface	95.01		94.89		95.00		95.17			95.37				95.71		95.71		95.66		95.86		
Existing Surface	94.81		94.85		95.00		95.05			95.56				95.74		95.69		95.84		95.99		
Pipe length & Chainage	76.27	9.01	85.28	30.35	25.96	111.24	115.63	44.45	160.08	38.50	198.51	107.99	76.00	236.01	268.00	273.53	89.01	357.01	11.10	368.11	23.48	412.30

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	G.McCoomb	Nov 2015
Checked	A.Mertens	Nov 2015
Approved		

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m) H 1:1000 0 10 20
 V 1:100 0 1 2

All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file: 15066 Drainage.dwg
 LTO Ref: -

Murray Shire Council - Moama
 Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Drainage Longitudinal Sections

Council Ref:	DA 173/11	Our Ref:	15066	Version:	2	Sheet:	12 of 22
--------------	-----------	----------	-------	----------	---	--------	----------



Design Flow (L/s)
Pipe Capacity (L/s)
Actual Velocity (m/s)
Full pipe vel (m/s)

Pipe Size (mm)
(Type)
Pipe Grade (1 in)
(%)
Datum R.L.

		59	52	44	37	29	21	7	7		62
		85	78	78	78	42	42	42	42		228
		1.30	1.18	1.14	1.09	1.14	1.06	0.79	0.79		1.22
		0.84	0.74	0.63	0.52	0.73	0.53	0.18	0.18		0.39
Pipe Size (mm)		300	300	300	300	225	225	225	225		450
(Type)		RCP RRJ	RCP RRJ	RCP RRJ	RCP RRJ	PVC SN8	PVC SN8	PVC SN8	PVC SN8		RCRRJ cr
Pipe Grade (1 in)		168	200	200	200	150	150	150	150		200
(%)		0.595	0.500	0.500	0.500	0.667	0.667	0.667	0.667		0.500
Datum R.L.	87.0										87.0
Invert	93.726 93.931	94.270 94.290	94.402 94.422	94.535 94.555	94.667 94.687	94.837 94.857	95.007 95.027	95.043 95.063	95.183	94.352 94.402	94.457
Depth to Inv. From FSL	1.27 1.07	1.51 1.49	1.41 1.39	1.30 1.28	1.19 1.17	1.05 1.03	0.95 0.93	0.90 0.88	0.63	1.02 0.97	0.91
H.G.L. Levels	94.46 94.52	94.69 94.71	94.76 94.77	94.83 94.84	94.97 94.97	95.06 95.08	95.23 95.25	95.27 95.27	95.41	94.95 94.98	94.98
Finished Surface	95.00	95.78	95.81	95.84	95.86	95.89	95.95	95.94	95.82	95.37	95.37
Existing Surface	95.00	95.43	95.57	95.74	95.91	96.05	96.04	96.02	95.82	95.56	95.53
Pipe length & Chainage	0.00	56.99	22.50	79.49 22.50	101.99 22.50	124.49 22.50	146.99 22.50	169.49 2.42	171.91 18.00	189.91	0.00 11.10 11.10

MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	G.McCoomb	Nov 2015
Checked	A.Mertens	Nov 2015
Approved		

Notes/Legend

TERRACO
Civil Engineers
Project Managers
Development Consultants

Terraco P/L
ABN 12 681 695 776
Corner Jewell Court
& Rowena Street
Bendigo Vic 3550
Ph: 03 5442 5799
Fax: 03 5441 5506
E: info@terraco.com.au

Scale (m)
H 1:1000 0 10 20
V 1:100 0 1 2

All lengths are in metres
and all levels are to Australian Height Datum
(Original Sheet Size is A3)

Drawing file: 15066 Drainage.dwg
LTO Ref: -

Murray Shire Council - Moama

Villawood Properties Pty Ltd
Lakeview Estate - Stage 3
Drainage Longitudinal Sections 2

Council Ref:	Our Ref:	Version	Sheet
DA 173/11	15066	2	13 of 22

PIT SCHEDULE

Pit Name	TYPE	EASTING	NORTHING	INTERNAL WD	LEN	INLET DIA	INV LEV	OUTLET DIA	INV LEV	PIT SETOUT RL	DEPTH	REMARKS
12.1	Side Entry Pit	296303.298	6002921.066	0.600	0.900			450	94.457	95.372	0.915	
9.8	Grated Pit	296232.213	6002908.864	0.450	0.450			225	95.183	95.818	0.635	
9.7	Junction Pit	296220.831	6002922.809	0.450	0.450	225	95.063	225	95.043	95.945	0.902	
3.10	Side Entry Pit	296197.528	6002868.536	0.600	0.900			375	94.929	95.856	0.927	
3.9	Grated Pit	296216.360	6002854.508	0.600	0.900	375	94.812	375	94.792	95.664	0.873	CLASS D GRATE
3.8	Side Entry Pit	296234.345	6002864.784	0.600	0.900	375	94.709	375	94.689	95.710	1.021	
3.7	Side Entry Pit	296227.326	6002873.383	0.600	0.900	375	94.644	450	94.624	95.710	1.086	
3.6	Side Entry Pit	296296.280	6002929.665	0.600	0.900	450	94.402	600	94.352	95.372	1.020	
3.6	Side Entry Pit	296296.280	6002929.665	0.600	0.900	450	94.402					
3.5	Side Entry Pit	296379.893	6002998.010	0.750	0.900	600	93.932	675	93.857	95.175	1.318	
3.4	Junction Pit	296351.833	6003032.387	0.750	0.900	675	93.746	675	93.726	94.999	1.273	
3.4	Junction Pit	296351.833	6003032.387	0.600	0.900	300	93.931					
3.3	Grated Pit	296341.827	6003061.040	0.900	0.900	675	93.650	750	93.575	94.894	1.319	CLASS D GRATE

NOTE:

- xy setout to pit centre
- setout level to pit cover level

NOTE: THE TOP OF ALL GRATES MUST BE 150mm BELOW THE FINISHED SURFACE LEVEL

**MURRAY SHIRE COUNCIL
Construction Certificate Approval**

**Application Number: 16/067
Approval Date: 6 November 2015**

**Leigh Robins
Director of Engineering**

6			Designed G.McCoomb Nov 2015	Checked A.Mertens Nov 2015	Notes/Legend	 TERRACO Civil Engineers Project Managers Development Consultants	Terraco P/L ABN 12 681 695 776 Corner Jewell Court & Rowena Street Bendigo Vic 3550 Ph: 03 5442 5799 Fax: 03 5441 5506 E: info@terraco.com.au	Murray Shire Council - Moama Villawood Properties Pty Ltd Lakeview Estate - Stage 3 Pit Schedule				
5												
4												
3												
2	Additional Sewer	03/11/2015	Approved									
1	Original Issue	24/07/2015										
0	Draft	19/06/2015										
Ver	Revision Description	Date					Drawing file: 15066 Drainage.dwg	LTO Ref: -	Council Ref: DA 173/11	Our Ref: 15066	Version 2	Sheet 14 of 22

GENERAL NOTES

1. All works are to be carried out in accordance with Murray Shire Council and current Water Services Association of Australia standards and specifications.
2. Contract is in accordance with AS2124-1992.
3. The contractor must locate all services prior to commencement of any works.
4. Sewers are to be 150mm Ø uPVC RRJ class SN8 (SEH grade) unless shown otherwise.
5. Sewer Jump Up levels shown refer to the required level at the property connection point 1.0m inside the property boundary. All Jump Ups to be brought up a minimum of 1.0m above the surface.
6. All sewer manhole covers to be solid ductile iron Class D cover and frame with concrete surround.
7. The level of all existing outfall sewers must be checked by the contractor prior to work commencing.
8. The contractor must adhere to the code of practise as "Excavation Work Code of Practice" under section 274 of the Work Health and Safety Act 2011. All workers on this site must have a current WH&S General Induction for Construction Work in NSW Certificate (White Card).
9. The contractor is not permitted to break into an existing live pipeline, enter a live manhole, or remove the cover of an existing live manhole unless given permission by the Supervising Engineer.
10. All properties are to be fully reinstated to the satisfaction of the Supervising Engineer.
11. All new sewers must be pressure tested. Where the contractor does not have a Quality Assurance system in place, all pipes must be inspected by the Supervising Engineer.
12. Confined Space Entry must be in accordance with Work Health and Safety requirements. Contractor must not enter a Confined Space until all required information has been submitted to Terraco.
13. All hatched areas on longitudinal sections indicate 20mm Class 3 FCR backfill.
14. All future stub end to be capped.
15. All sewer pipes are to be inspected by CCTV after installation, with a copy to be provided to the Murray Shire Council.

Asset Recording Requirements

The contractor must record all construction details including invert levels and locations of manholes, sewer ends and oblique branches, and testing details, using appropriate "line sheets".

The information is to be provided to the supervising engineer in a suitable form to enable detailed "as constructed" plans to be produced. Line sheets are available from Terraco, or the contractor may use their own if approved by Terraco prior to works commencing. The information is to be provided within 1 week of the completion of the works. Claims for payment for construction may be delayed until the line sheets have been received by the supervising engineer.

The following standard backfill requirements apply to all trenching works.

For PVC pipes:

- a) Minimum bedding sand under pipe - 75mm
- b) Minimum sand backfill above pipe - 100mm
- c) Minimum sand backfill either side of pipe - 100mm

For concrete pipes:

- a) Minimum bedding sand under pipe - 75mm
- b) Minimum sand backfill to string line.
- c) Minimum sand backfill either side of pipe - 100mm

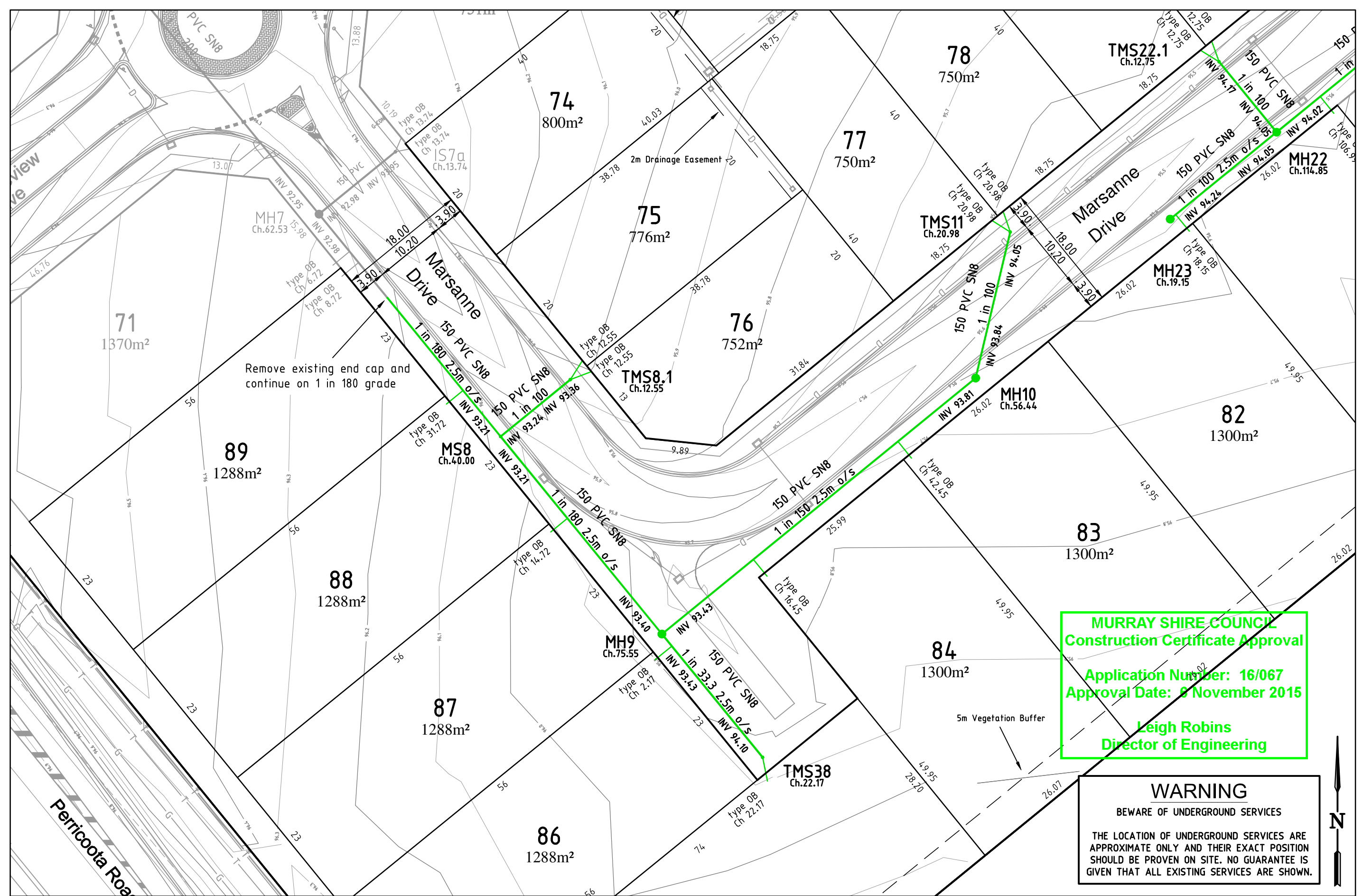
Select backfill to 100mm above the pipe. Should the excavated material be unsuitable, sand backfill to be provided a minimum 100mm above the pipe.

**MURRAY SHIRE COUNCIL
Construction Certificate Approval**

**Application Number: 16/067
Approval Date: 6 November 2015**

**Leigh Robins
Director of Engineering**

6			Designed G.McCoomb Nov 2015	Checked A.Mertens Nov 2015	Notes/Legend	 <p>TERRACO Civil Engineers Project Managers Development Consultants</p>	<p>Terraco P/L ABN 12 681 695 776 Corner Jewell Court & Rowena Street Bendigo Vic 3550 Ph: 03 5442 5799 Fax: 03 5441 5506 E: info@terraco.com.au</p>	<p>All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)</p>		<p>Murray Shire Council - Moama Villawood Properties Pty Ltd Lakeview Estate - Stage 3 Sewer Notes</p>				
5			Approved						Drawing file:	LTO Ref:	Council Ref:	Our Ref:	Version	Sheet
4									15066 Sewer.dwg	-	DA 173/11	15066	2	15 of 22
3														
2	Additional Sewer	03/11/2015												
1	Original Issue	24/07/2015												
0	Draft	19/06/2015												
Ver	Revision Description	Date												



MURRAY SHIRE COUNCIL
Construction Certificate Approval
Application Number: 16/067
Approval Date: 8 November 2015

Leigh Robins
Director of Engineering

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



6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	

Notes/Legend
 PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m

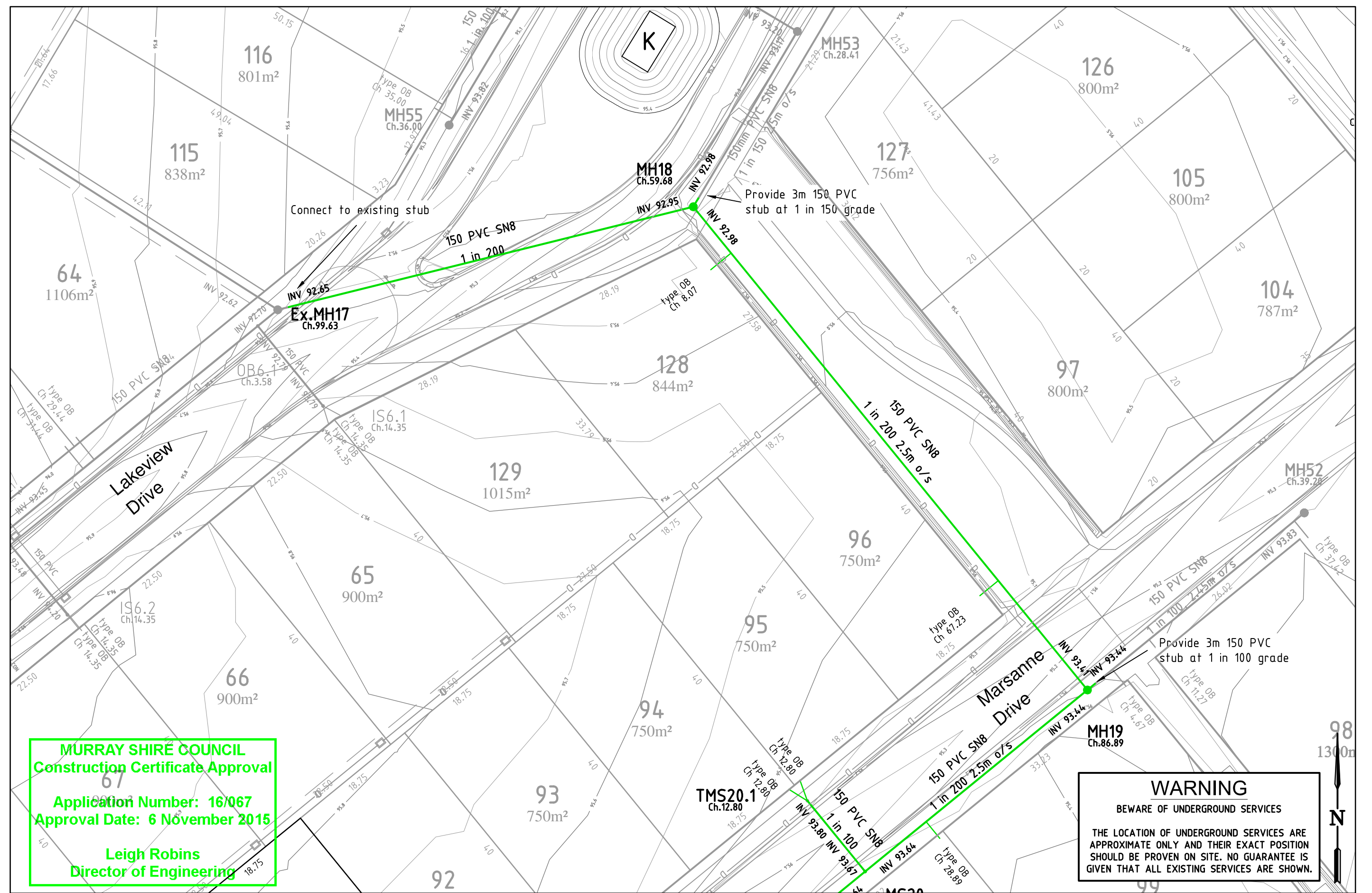
TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m) 1:500 0 5 10
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file:	LTO Ref:
15066 Sewer.dwg	-

Murray Shire Council - Moama					
Villawood Properties Pty Ltd					
Lakeview Estate - Stage 3					
Sewer Layout Plan					
Council Ref:	Our Ref:	Version	Sheet		
DA 173/11	15066	2	16 of 22		



MURRAY SHIRE COUNCIL
Construction Certificate Approval
 Application Number: 16/067
 Approval Date: 6 November 2015
 Leigh Robins
 Director of Engineering

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

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	

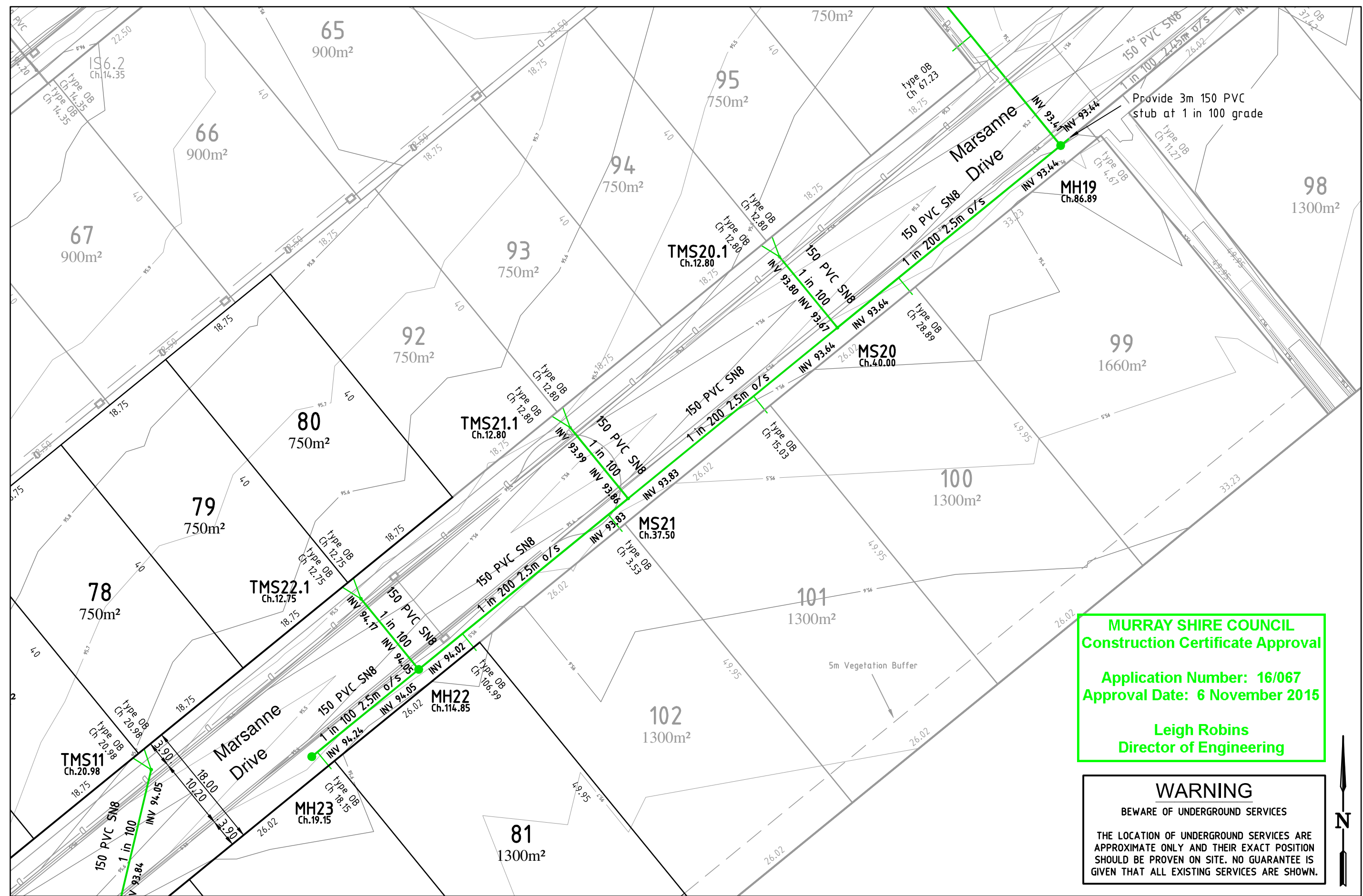
Notes/Legend
 PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m) 1:500 0 5 10
 All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)
 Drawing file: 15066 Sewer.dwg LTO Ref: -
 Council Ref: DA 173/11 Our Ref: 15066 Version: 2 Sheet: 17 of 22

Murray Shire Council - Moama
 Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Sewer Layout Plan 2



MURRAY SHIRE COUNCIL
Construction Certificate Approval
 Application Number: 16/067
 Approval Date: 6 November 2015
 Leigh Robins
 Director of Engineering

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



6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed G.McCoomb Nov 2015	Checked A.Mertens Nov 2015
Approved	

Notes/Legend
 PLEASE NOTE THAT CONTOURS SHOWN ON PLAN INDICATE THE APPROXIMATE FINISHED SURFACE. CONTOUR INTERVAL 0.1m

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

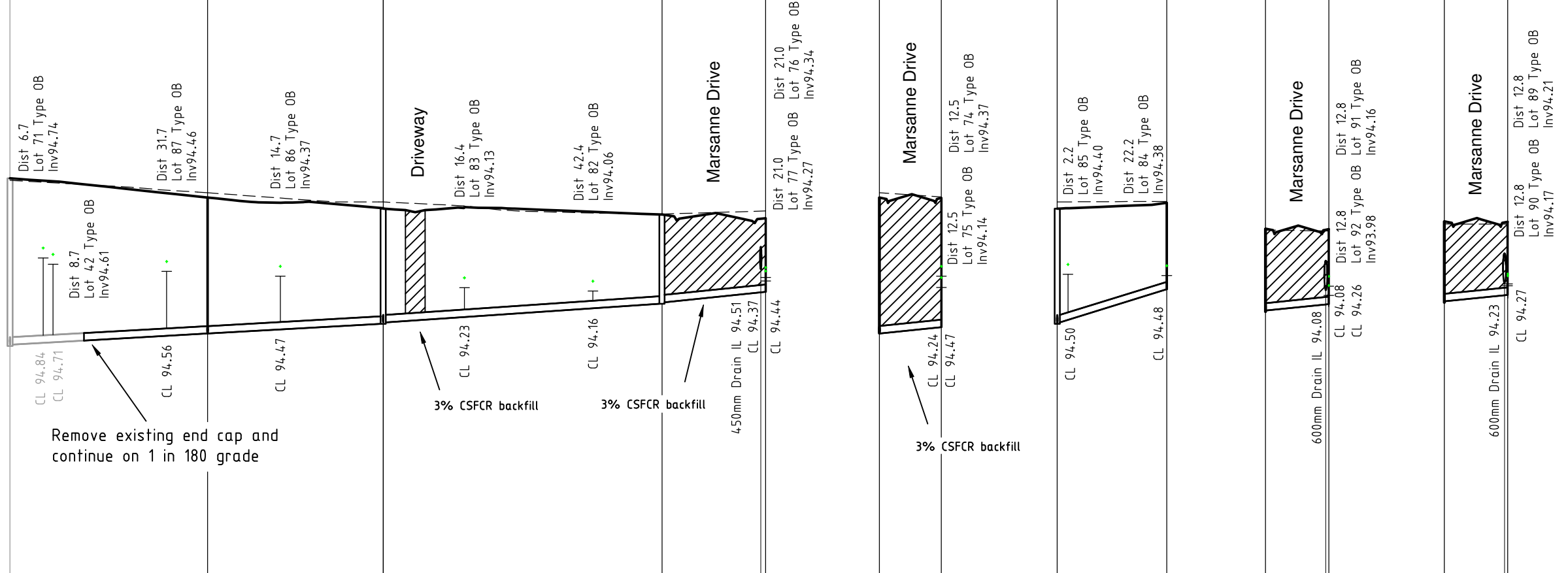
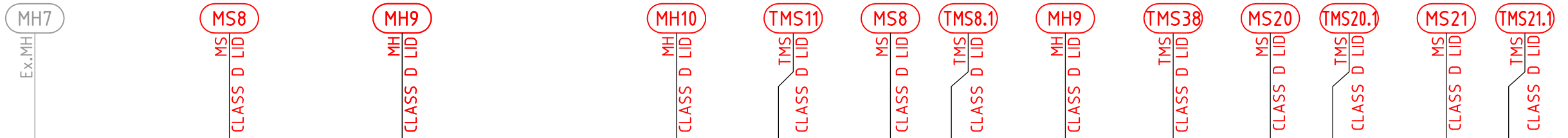
Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m) 1:500 0 5 10
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file: 15066 Sewer.dwg	LTO Ref: -
----------------------------------	---------------

Murray Shire Council - Moama
 Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Sewer Layout Plan 3

Council Ref: DA 173/11	Our Ref: 15066	Version 2	Sheet 18 of 22
---------------------------	-------------------	--------------	-------------------



Pipe Size (mm)	Type	Pipe Grade (1 in (%))	Datum R.L.	Invert	Depth to Invert From FSL	Finished Surface	Existing Surface	Chainage
150	PVC SN8	180 0.556%	85.0	92.953	3.39	96.347	96.308	252.54
150	PVC SN8	180 0.556%	85.0	92.983	3.36			40.00
150	PVC SN8	180 0.556%	85.0	93.206	2.75	95.960	96.055	292.54
150	PVC SN8	150 0.667%	85.0	93.403	2.33	95.734	95.870	328.09
150	PVC SN8	100.0 1.000%	85.0	93.809	1.80	95.614	95.626	384.52
150	PVC SN8	100.0 1.000%	85.0	93.839	1.77			20.98
150	PVC SN8	100.0 1.000%	85.0	94.049	1.49	95.538	95.686	20.00
150	PVC SN8	100.0 1.000%	85.0	94.444	1.49	95.538	95.686	404.53
150	PVC SN8	100.0 1.000%	85.0	94.444	1.49	95.538	95.686	405.51
150	PVC SN8	100.0 1.000%	85.0	93.206	2.75	95.960	96.055	0.00
150	PVC SN8	100.0 1.000%	85.0	93.236	2.72			12.55
150	PVC SN8	100.0 1.000%	85.0	93.361	2.59	95.949	95.973	12.55
150	PVC SN8	33.3 3.000%	85.0	93.403	2.33	95.734	95.870	0.00
150	PVC SN8	33.3 3.000%	85.0	93.433	2.30			22.17
150	PVC SN8	33.3 3.000%	85.0	94.098	1.75	95.852	95.881	22.17
150	PVC SN8	100.0 1.000%	85.0	93.643	1.68	95.327	95.301	0.00
150	PVC SN8	100.0 1.000%	85.0	93.673	1.65			12.80
150	PVC SN8	100.0 1.000%	85.0	93.801	1.52	95.319	95.283	12.80
150	PVC SN8	100.0 1.000%	85.0	93.830	1.65	95.477	95.424	0.00
150	PVC SN8	100.0 1.000%	85.0	93.860	1.62			12.80
150	PVC SN8	100.0 1.000%	85.0	93.988	1.48	95.469	95.423	12.80

MURRAY SHIRE COUNCIL
Construction Certificate Approval

Notes/Legend
Application Number: 16/067
Approval Date: 6 November 2015
Leigh Robins
Director of Engineering

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m)
 H 1:1000 0 10 20
 V 1:100 0 1 2
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

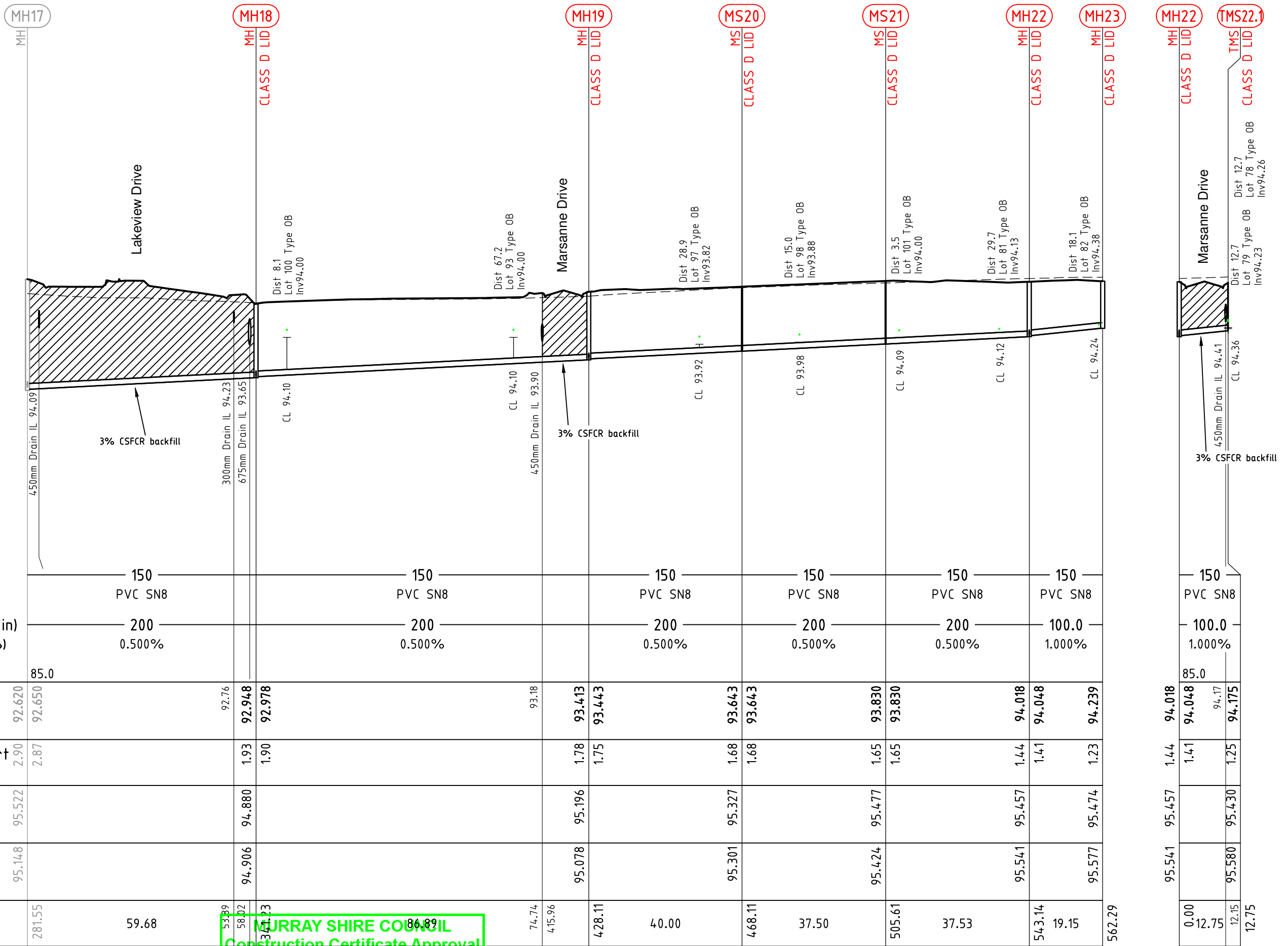
Drawing file: 15066 Sewer.dwg
 LTO Ref: -

Murray Shire Council - Moama
Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Sewer Longitudinal Sections

Council Ref: DA 173/11
 Our Ref: 15066
 Version: 2
 Sheet: 19 of 22

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	



MURRAY SHIRE COUNCIL
Construction Certificate Approval

Notes/Legend
Application Number: 16/067
Approval Date: 6 November 2015
Leigh Robins
 Director of Engineering

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m)
 H 1:1000 0 10 20
 V 1:100 0 1 2
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Murray Shire Council - Moama
Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Sewer Longitudinal Sections 2

Drawing file:	LTO Ref:	Council Ref:	Our Ref:	Version	Sheet
15066 Sewer.dwg	-	DA 173/11	15066	2	20 of 22

6			Designed	Checked
5			G.McCoomb	A.Mertens
4			Nov 2015	Nov 2015
3			Approved	
2	Additional Sewer	03/11/2015		
1	Original Issue	24/07/2015		
0	Draft	19/06/2015		
Ver	Revision Description	Date		

WATER MAIN NOTES

1. Water Main offset to be 1.55m (Filtered) and 1.85m (Raw) unless shown otherwise.
2. All works are to be carried out in accordance with the current standard's of Murray Shire Council.
3. Contract is in accordance with AS2124-1992.
4. The Contractor must locate all services prior to works commencing.
5. All water service road crossings to be 32mm PN8 poly (if two properties being connected) or 25mm PN8 poly (if single property connected). Each service to be sleeved in 50mm Class 12 uPVC.
6. The Contractor must supply all assemblies, cast iron covers, surrounds and indicator posts for stop valves (SV) and hydrants (HYD).
7. All water mains to be RRJ PVC-M Series 1 Class 9 except under road pavement where Series 1 Class 12 is to be used.
8. Water tapplings (Treated and Raw) including tapping saddles and 20mm dia. copper service connections, meter stop valve (treated) and ball valve quick action (raw) to be provided 1.0m within each lot. Tapping saddles are to be gunmetal style only. See Standard Drawing.
9. Water meter stop valve are to be installed on filtered water connections.
10. Ball valves quick action are to be installed on raw water connections
11. All stop valves are to be Anti Clockwise Closing (ACC).
12. All services to be installed to provide minimum cover to finished surface.
13. All road crossing trenches to be compacted to a minimum of 95% standard compaction ratio.
14. All road crossings for services to be backfilled with 3% stabilised FCR.

Asset Recording Requirements

The contractor must record all construction details including offsets of mains and locations of fittings such as valves, tees fire plugs etc, and testing details, using appropriate "line sheets".

The information is to be provided to the supervising engineer in a suitable form to enable detailed "as constructed" plans to be produced.

TOTAL WORK

SIZE	TYPE	CLASS	LENGTH (m)
100mm	PVC-M	9	403
100mm	PVC-M	12	40

The following standard backfill requirements apply to all trenching works.

For PVC pipes:

- a) Minimum bedding sand under pipe - 75mm
- b) Minimum sand backfill above pipe - 100mm
- c) Minimum sand backfill either side of pipe - 100mm

For concrete pipes:

- a) Minimum bedding sand under pipe - 75mm
- b) Minimum sand backfill to string line.
- c) Minimum sand backfill either side of pipe - 100mm

Select backfill to 100mm above the pipe. Should the excavated material be unsuitable, sand backfill to be provided a minimum 100mm above the pipe.

Street	Back of Kerb	Filt. Water	Raw Water	Gas	Power	Telstra	Sewer
Marsanne Drive (<CH100)	3.90	2.30 NE	2.70 NE	3.20 NE	0.90 SW	1.40 SW	2.50 SW
Marsanne Drive (>CH100)	3.90	1.70 NW	2.00 NW	2.40 NW	0.90 SE	1.40 SE	2.50 SE

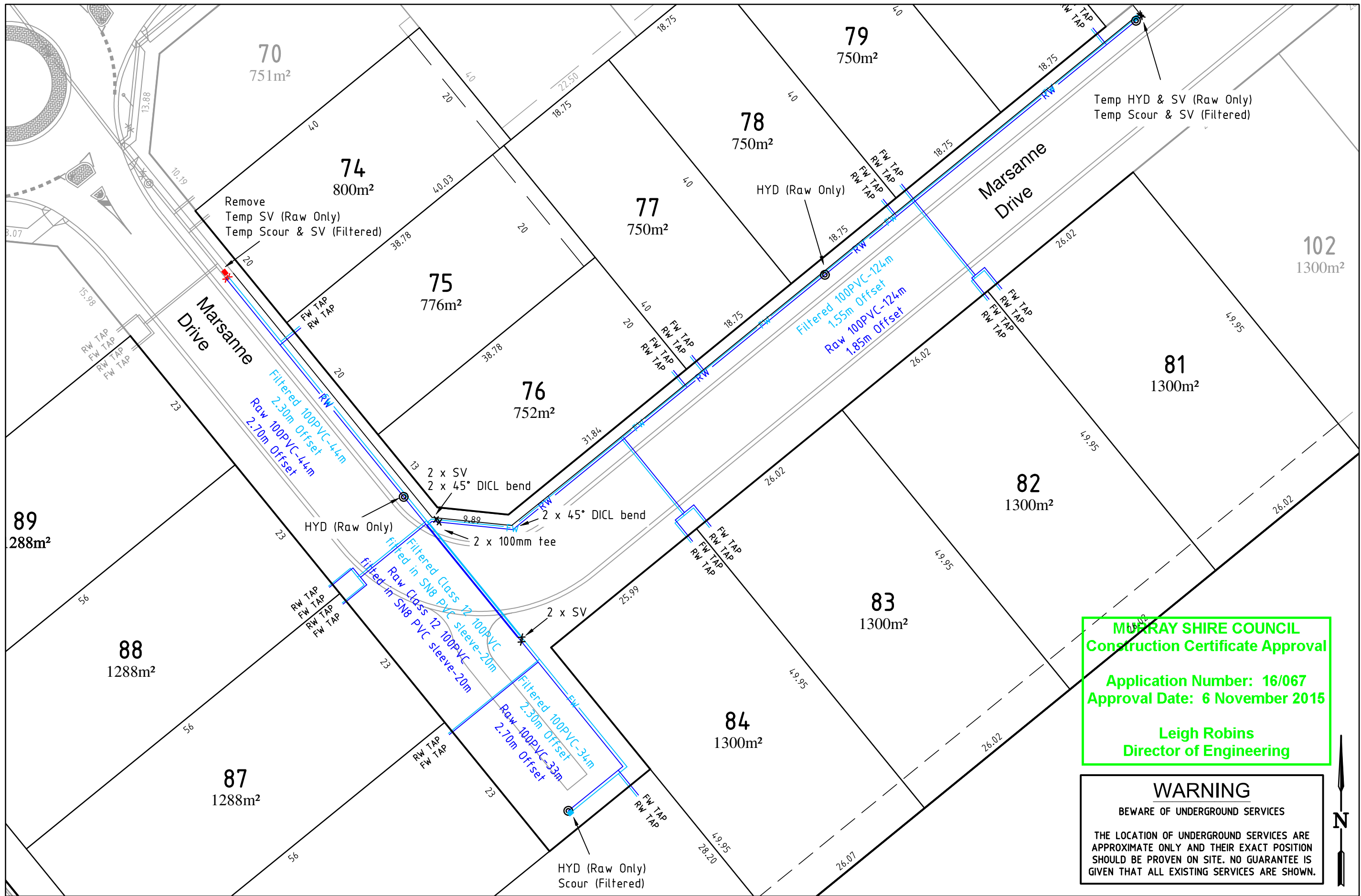
Service Offsets

MURRAY SHIRE COUNCIL
Construction Certificate Approval

Application Number: 16/067
Approval Date: 6 November 2015

Leigh Robins
Director of Engineering

6			Designed G.McCoomb Nov 2015	Checked A.Mertens Nov 2015	Notes/Legend	 TERRACO Civil Engineers Project Managers Development Consultants	Terraco P/L ABN 12 681 695 776 Corner Jewell Court & Rowena Street Bendigo Vic 3550 Ph: 03 5442 5799 Fax: 03 5441 5506 E: info@terraco.com.au	All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)		Murray Shire Council - Moama Villawood Properties Pty Ltd Lakeview Estate - Stage 3 Water Notes			
5			Approved					Drawing file: 15066 Water.dwg	LTO Ref: -	Council Ref: DA 173/11	Our Ref: 15066	Version 2	Sheet 21 of 22
4													
3													
2	Additional Sewer	03/11/2015											
1	Original Issue	24/07/2015											
0	Draft	19/06/2015											
Ver	Revision Description	Date											



MURRAY SHIRE COUNCIL
 Construction Certificate Approval
 Application Number: 16/067
 Approval Date: 6 November 2015
 Leigh Robins
 Director of Engineering

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

6		
5		
4		
3		
2	Additional Sewer	03/11/2015
1	Original Issue	24/07/2015
0	Draft	19/06/2015
Ver	Revision Description	Date

Designed	Checked
G.McCoomb	A.Mertens
Nov 2015	Nov 2015
Approved	

Notes/Legend

TERRACO
 Civil Engineers
 Project Managers
 Development Consultants

Terraco P/L
 ABN 12 681 695 776
 Corner Jewell Court
 & Rowena Street
 Bendigo Vic 3550
 Ph: 03 5442 5799
 Fax: 03 5441 5506
 E: info@terraco.com.au

Scale (m) 1:500 0 5 10
 All lengths are in metres
 and all levels are to Australian Height Datum
 (Original Sheet Size is A3)

Drawing file:	LTO Ref:
15066 Water.dwg	-

Murray Shire Council - Moama
 Villawood Properties Pty Ltd
 Lakeview Estate - Stage 3
 Water Plan

Council Ref:	Our Ref:	Version	Sheet
DA 173/11	15066	2	22 of 22