PROJECT: PROPOSED RESIDENTIAL FLAT BUILDING DEVELOPMENT

PLANSET: CIVIL ENGINEERING SERVICES

CLIENT: TSA DREAMSCAPES

LOCALITY PLAN
NOT TO SCALE

LGA: LIVERPOOL CITY COUNCIL

484-488 BRINGELLY ROAD, AUSTRAL, NSW.

LOT 6&7 DP1203674

DRAWING LIST

DWG NO.	REV	DWG TITLE
GENERAL		
PS01-A000	C	COVER SHEET
PS01-A010	C	DEVELOPMENT OVERVIEW & VIEWPORT REFERENCE PLAN
CONSTRUCTION MANAGEMENT WORKS		
PS01-B300	A	SEDIMENT AND EROSION CONTROL PLAN
PS01-B310	A	SEDIMENT AND EROSION CONTROL DETAILS
EARTHWORKS		
PS01-C100	C	GRADING PLAN
PS01-C500	B	EARTHWORKS CUT & FILL PLAN
ROADWORK		
PS01-D100	C	ROADWORKS PLAN
PS01-D200	C	PROPOSED ROAD 1 (21-MRC01) & BRINGELLY ROAD (21-MRC02) LONGITUDINAL SECTION & TYPICAL SECTION (SHEET 01)
PS01-D210	C	PROPOSED ROAD 3 (21-MRC-03) LONGITUDINAL SECTION (SHEET 02)
DRAINAGE WORKS		
PS01-E100	B	DRAINAGE LAYOUT PLAN
PS01-E200	A	DRAINAGE DETAILS
PS01-E201	A	PIT SCHEDULE & SWALE TYPICAL SECTIONS
PS01-E400	A	DRAINAGE CATCHMENT PLAN
PS01-E600	A	OSD CATCHMENT PLAN, MODEL & RESULTS
PS01-E700	A	WATER QUALITY CATCHMENT PLAN, MODEL & RESULTS

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE

GRID	DATUM	PROJECT MANAGER
---	---	SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

martens & Associates Pty Ltd
Consulting Engineers
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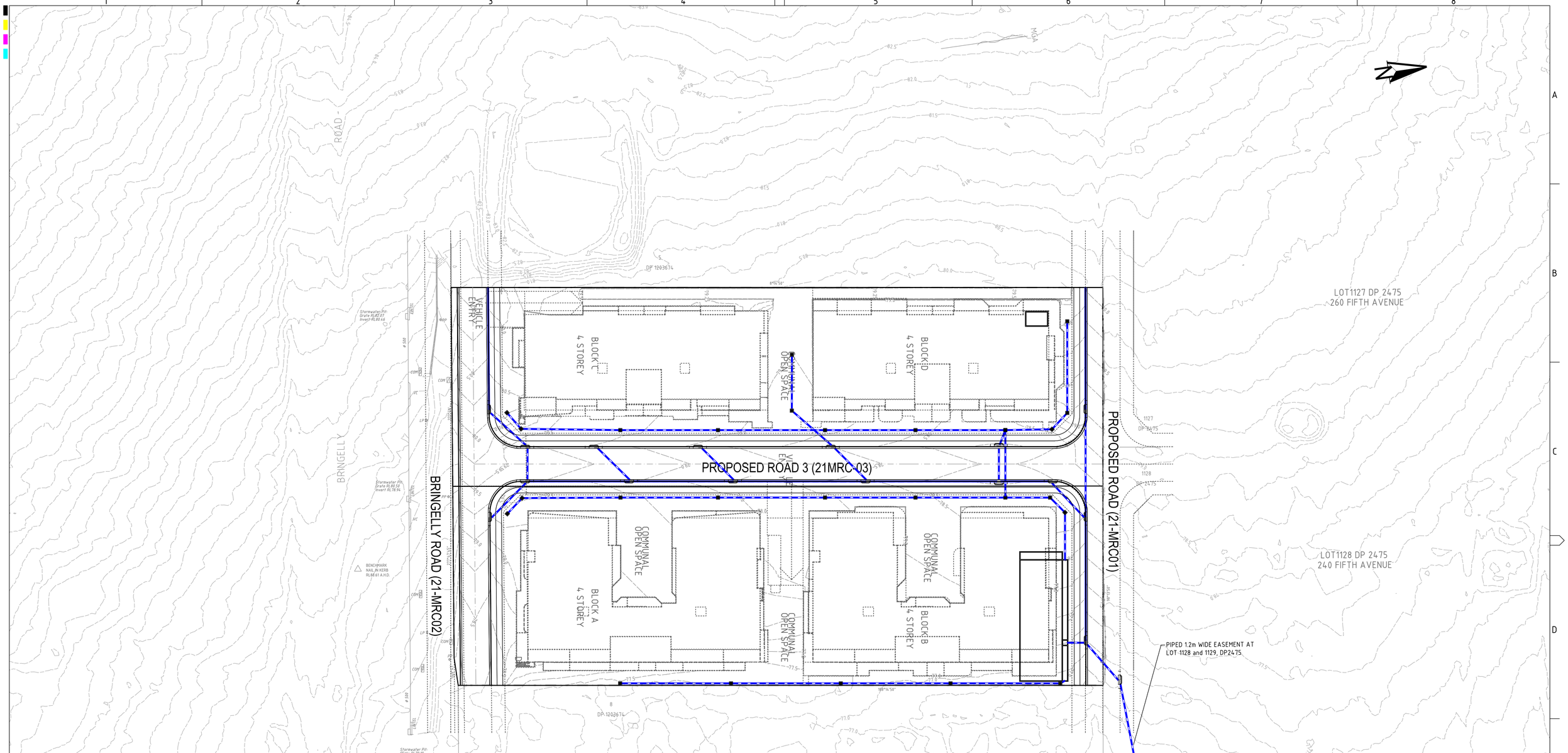
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: COVER SHEET

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-A000	C



GENERAL NOTES

1. THIS PLAN IS FOR DEVELOPMENT APPLICATION PURPOSE AND NOT FOR CONSTRUCTION. DESIGN TO BE REVIEWED AND UPDATED FOR CONSTRUCTION CERTIFICATE.
2. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH, AND THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT AUSTRALIAN STANDARDS, COUNCIL SPECIFICATIONS, AND ALL PROJECT CONSULTANT'S PLANS AND REPORTS.
3. INTERNAL SURVEY INFORMATION SHOWN BASED ON SURVEY INFORMATION PROVIDED BY SDG LAND DEVELOPMENT SOLUTIONS SURVEYORS.
4. EXTERNAL SITE BOUNDARY BASED ON INFORMATION PROVIDED BY SDG LAND DEVELOPMENT SOLUTIONS.
5. LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
6. FINAL SURFACE CONTOURS ARE BASED ON PROPOSED AND EXISTING SURFACE.

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE: A1 (A3) 1:500 (1:1,000) — 0 5 10 15 20 25 30 35 40 45 50 METRES

GRID	DATUM	PROJECT MANAGER
---	---	SL

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All measurements in millimetres unless otherwise specified.

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PROJECT NAME/PLANSET TITLE

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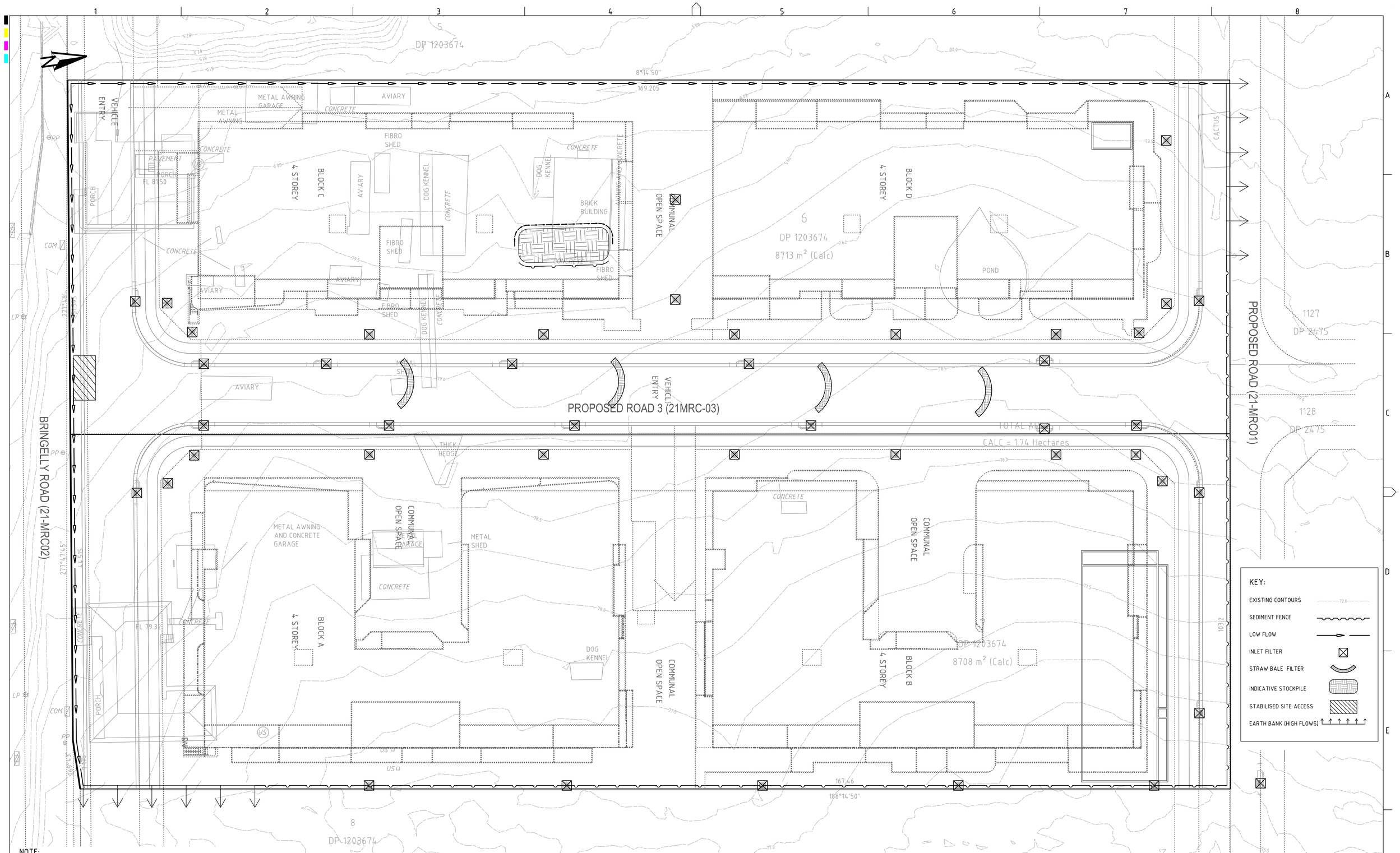
DRAWING TITLE: DEVELOPMENT OVERVIEW PLANS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-A050	C



NOTE:
- TO BE READ IN CONJUNCTION WITH SEDIMENT AND EROSION CONTROL DETAILS
- NO SEDIMENT BASIN REQUIRED FOR THE PROPOSED ON PS01-B310

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE: A1 (A3) 1:250 (1:500) — 0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE: PROPOSED RESIDENTIAL FLAT BLD. DEV.
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DRAWING TITLE: SEDIMENT AND EROSION CONTROL PLAN

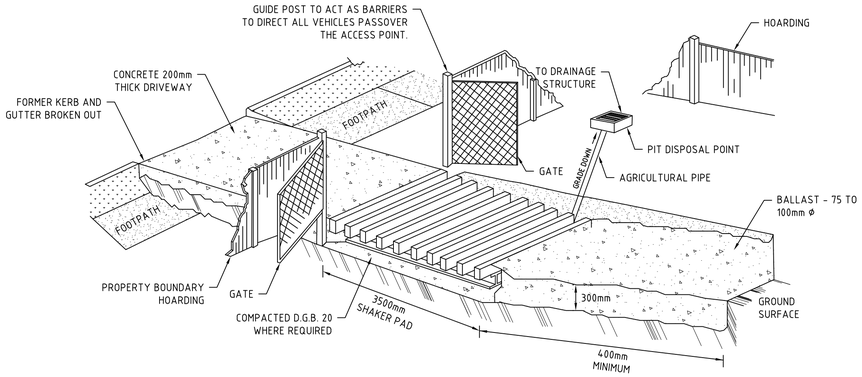
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-B300	A

STABILISED ACCESS POINT

TYPE II SAP

THE TYPE II SAP DESIGN IS MORE DEFINED IN THAT IT REQUIRES AN AREA OF BALLAST WITHIN THE SITE COMBINED WITH A SHAKER PAD; ADJACENT THE SHAKER PAD AND IN THE PUBLIC WAY IS A TEMPORARY (CONCRETE) VEHICULAR CROSSING. (SEE DIAGRAM)

STABILISED ACCESS POINT - TYPE 2



IN BOTH TYPE I AND TYPE II SAP'S, THE TEMPORARY VEHICULAR CROSSING MUST:

- CONNECT TO AN EXISTING GUTTER LAYBACK (WHERE THE KERB AND GUTTER EXIST) . IF A GUTTER LAYBACK DOES NOT EXIST THEN THE CONNECTION MUST BE MADE TO THE GUTTER BY REMOVING THE ADJCENT KERB SECTION ONLY.
- CONNECT TO A DISH CROSSING (WHERE KERB AND GUTTER DOES NOT EXIST). IF A DISH CROSSING DOES NOT EXIST, THEN IT MUST BE CONSTRUCTED IN ACCORDANCE WITH DETAILS CONTAINED IN COUNCIL'S ISSUED FOOTPATH CROSSING LEVELS.

IT SHOULD BE NOTED THAT THESE TYPES OF SAPS ARE CONSIDERED TO BE APPLICABLE FOR THE MAJORITY OF ACTIVITIES HOWEVER SOME SITES MAY REQUIRE SPECIAL CONSIDERATION.

SHAKER PAD (CATTLE GRID)

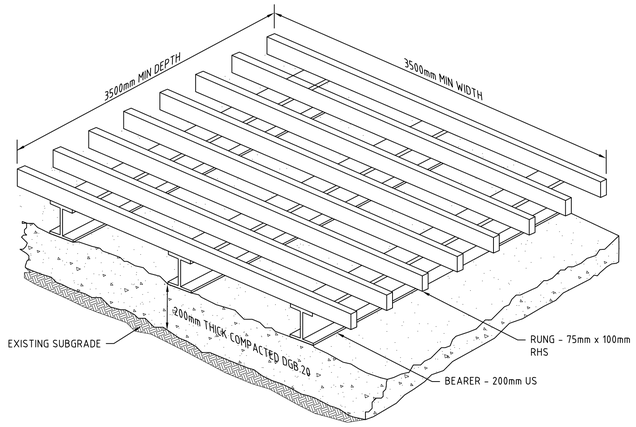
A CORRECTLY DESIGNED AND INSTALLED SHAKER PAD WILL ASSIST IN PREVENTING SEDIMENT TRANSFERE FROM A SITE. ANY STABILISED ACCESS POINT (SAP) CAN BE DESIGNED WITH A SHAKER PAD (COMPULSOPRY IN TYPE II SAP'S)

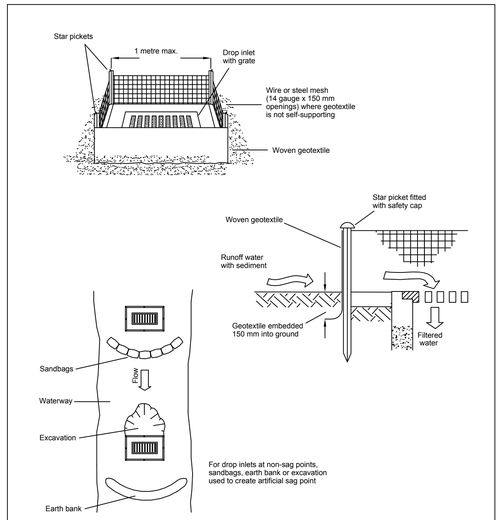
SHAKER PADS CAN BE DESIGNED AND CONSTRUCTED TO ENABLE RE-USE ON FUTURE PROJECTS.

THE SHAKER PAD:

- MUST BE DESIGNED AND CERTIFIED BY A PRACTICING STRUCTURAL ENGINEER. THE CERTIFIED DESIGN SHOULD BE SUBMITTED WITH THE RELEVENT APPLICATION.
- CAN BE CONSTRUCTED FROM ANY SUITABLE MATERIAL.
- MUST BE LOCATED ON A SUITABLY PREPARED AND COMPACTED SUB-GRADE/BASE MATERIAL.
- MUST BE SITUATED SUCH THAT THE RUNGS OF THE SHAKER PAD ARE LEVEL WITH THE ADJOINING NATURAL SURFACE.
- MUST BE A MINIMUM OF 3.5m IN LENGTH.
- MUST BE A MINIMUN OF 3.5m IN WIDTH.
- MUST HAVE CLEAR SPACING BETWEEN RUNGS OF 200 - 250mm.
- RUNGS MUST HAVE A MAXIMUM WIDTH (BEARING AREA) OF 75mm.
- MUST HAVE A MINIMUM CLEAR DEPTH OF 300mm IE FORM THE ROP OF THE RUNG TO THE FINISHED SUB-GRADE/BASE LEVEL.

THE SHAKER PAD MUST BE PROVIDED WITH SUITABLE BARRIERS AT THE SIDES TO ENSURE THAT ALL TYERS OF VEHICLES LEAVING THE SITE TRAVERSE THE DEVICE.

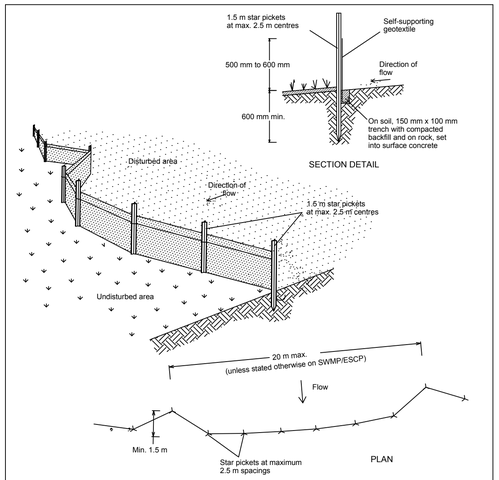




Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

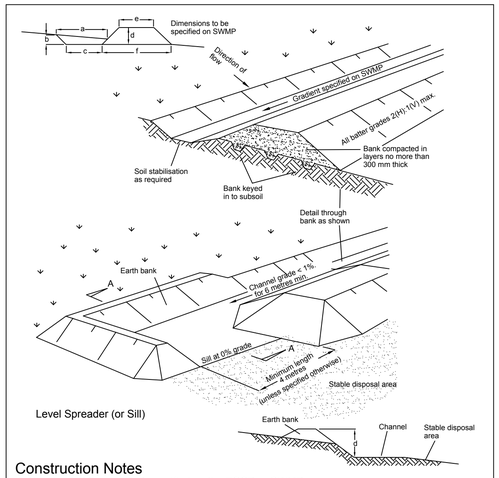
GEOTEXTILE INLET FILTER ☒ SD 6-12



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

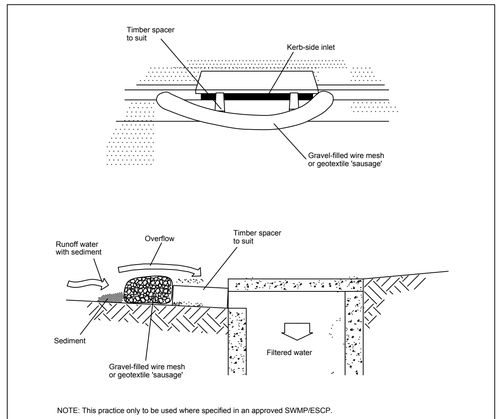
SEDIMENT FENCE SD 6-8



Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

EARTH BANK (HIGH FLOWS) SD 5-6

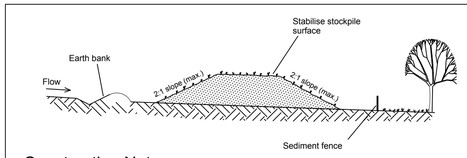


NOTE: This practice only to be used where specified in an approved SWMP/ESCP.

Construction Notes

1. Install filters to kerb inlets only at sag points.
2. Fabricate a sleeve made from geotextile or wire mesh longer than the length of the inlet pit and fill it with 25 mm to 50 mm gravel.
3. Form an elliptical cross-section about 150 mm high x 400 mm wide.
4. Place the filter at the opening leaving at least a 100-mm space between it and the kerb inlet. Maintain the opening with spacer blocks.
5. Form a seal with the kerb to prevent sediment bypassing the filter.
6. Sandbags filled with gravel can substitute for the mesh or geotextile providing they are placed so that they firmly abut each other and sediment-laden waters cannot pass between.

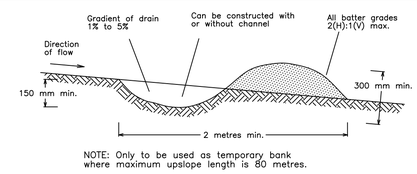
MESH AND GRAVEL INLET FILTER ☒ SD 6-11



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES SD 4-1



NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) SD 5-5

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE

GRID	DATUM	PROJECT MANAGER
---	---	SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE

PROPOSED RESIDENTIAL FLAT BLD. DEV.

CIVIL ENGINEERING SERVICES

484-488 BRINGELLY ROAD, AUSTRAL, NSW.

martens & Associates Pty Ltd

Consulting Engineers

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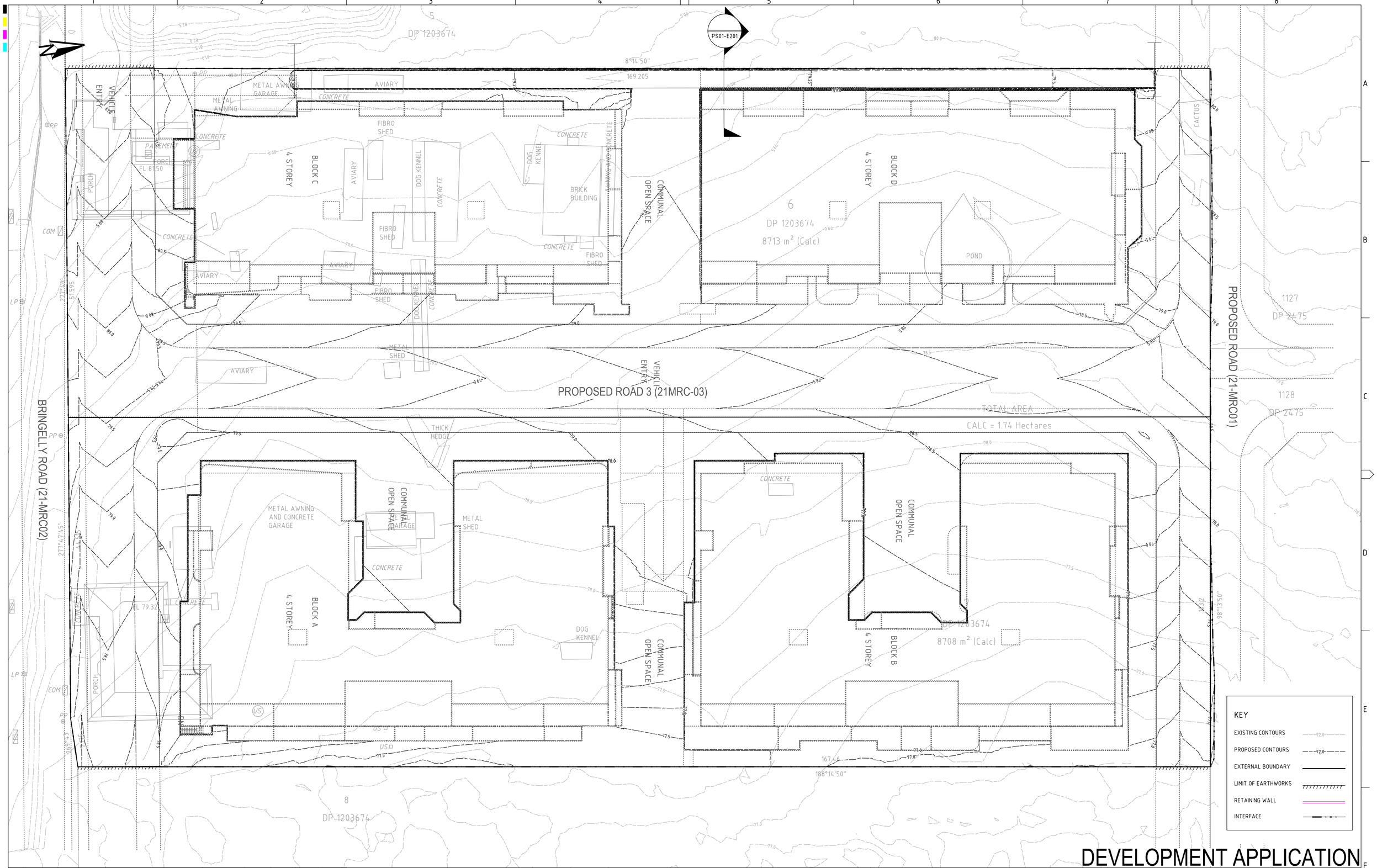
DRAWING TITLE: SEDIMENT AND EROSION CONTROL DETAILS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-B310	A



DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**DA SUBMISSION**	**11/07/2017**	**KH**	**CT/LJ/PD**	**SL**	**SL**
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE: 0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES — A1 (A3) 1:250 (1:500)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

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PROJECT NAME/PLANSET TITLE: PROPOSED RESIDENTIAL FLAT BLD. DEV.

CIVIL ENGINEERING SERVICES

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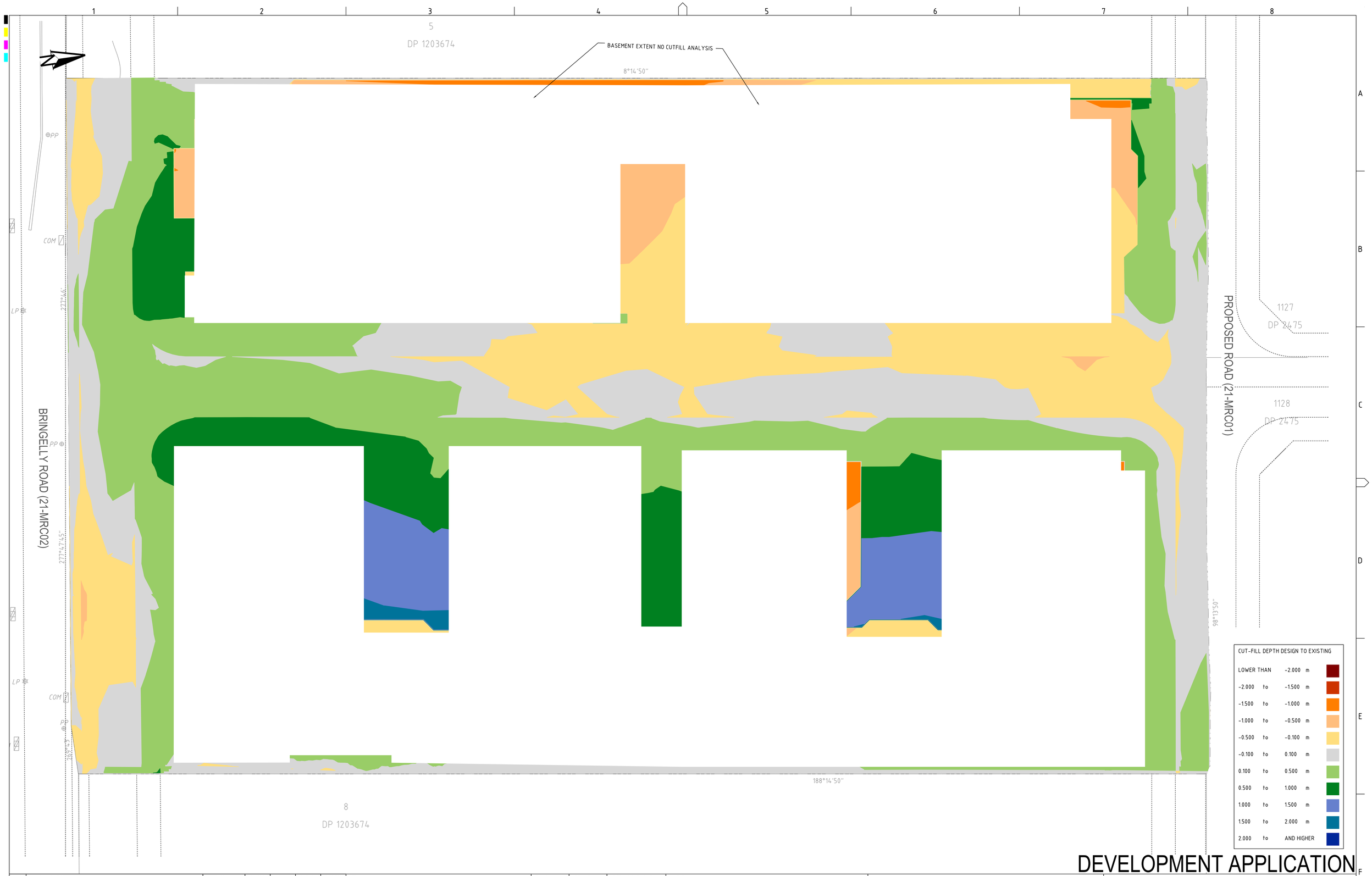
DRAWING TITLE: GRADING PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-C100	C

PRINTED ..... USER: KHASAN

A1 / A3 LANDSCAPE (A3LC_v02.0.01)

DRAWING ID: P1705935-PS01-R03-C100



DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE: 0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES — A1 (A3) 1:250 (1:500)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE: PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

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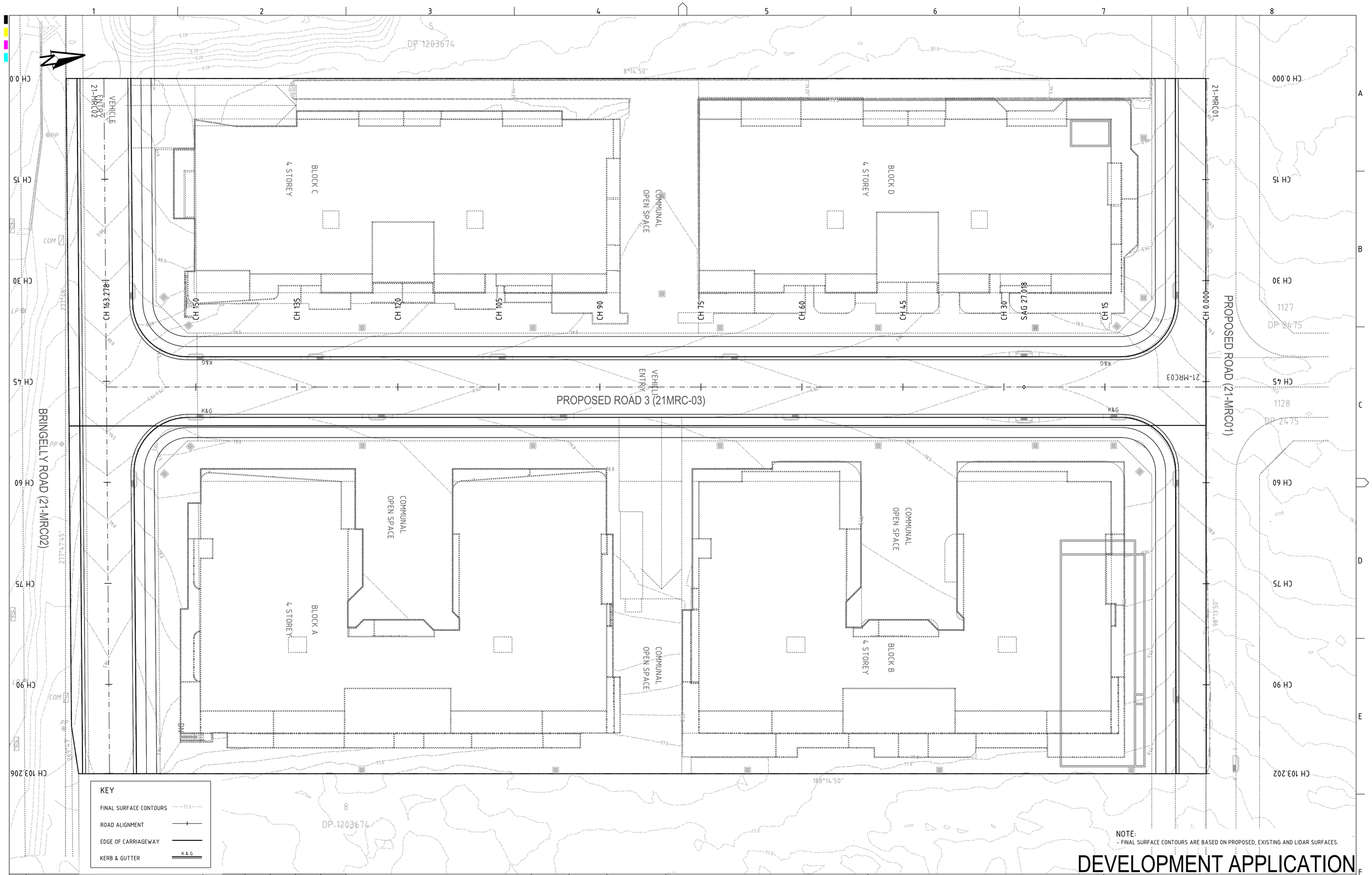
DRAWING TITLE: EARTHWORKS CUT & FILL PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-C500	B

PRINTED ---- USER: KHASAN
A1 / A3 LANDSCAPE (A3LC_v02.0.01)
DRAWING ID: P1705935-PS01-R03-C500



NOTE:
- FINAL SURFACE CONTOURS ARE BASED ON PROPOSED, EXISTING AND LIDAR SURFACES.

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**DA SUBMISSION**	**11/07/2017**	**KH**	**CT/LJ/PD**	**SL**	**SL**
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES
A1 (A3) 1:250 (1:500)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

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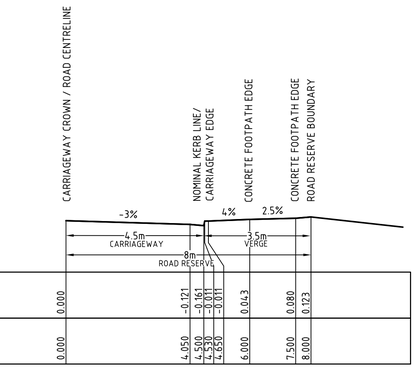
DRAWING TITLE
ROADWORKS PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-D100	C

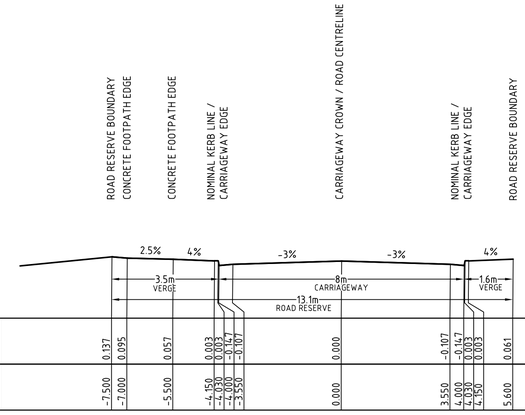
PRINTED: ---- USER: AMSAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1705935-PS01-R03-D100



DESIGN LEVELS	0.000	-0.121	-0.161	-0.011	-0.011	0.043	0.080	0.123	
OFFSET	0.000	4.050	4.500	4.530	4.650	6.000	7.500	8.000	

PROPOSED ROAD 1 (21-MRC01) TYPICAL SECTION

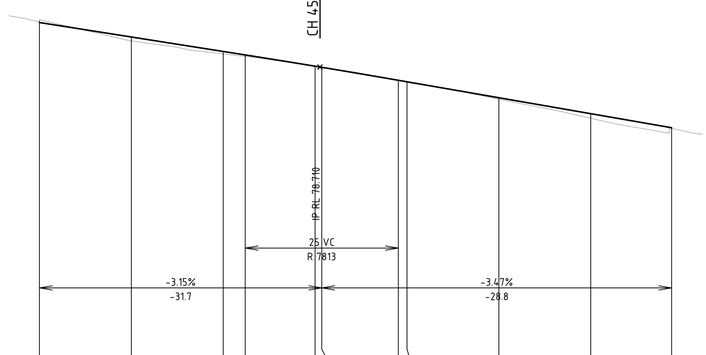
SCALE: 1:100



DESIGN LEVELS	0.137	0.095	0.057	0.003	0.003	-0.107	0.000	-0.107	-0.147	0.003	0.003	0.061
OFFSET	-7.500	-7.000	-5.500	-4.150	-4.030	-3.650	-3.550	0.000	3.550	4.000	4.150	5.600

PROPOSED ROAD 2 (21-MRC02) TYPICAL SECTION

SCALE: 1:100



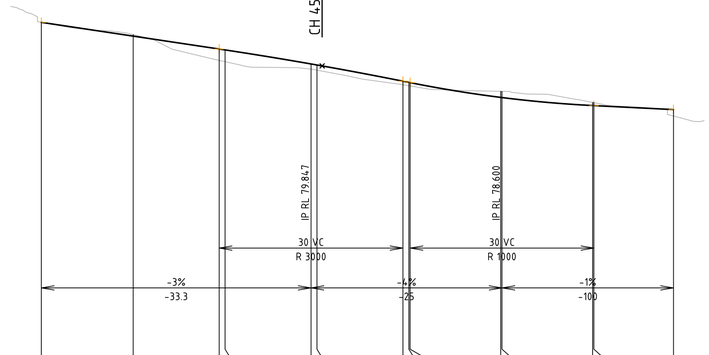
VERTICAL CURVE LENGTH (m)
VERTICAL CURVE RADIUS (m)
VERTICAL GRADE (%)
VERTICAL GRADE (1 IN ...)
HORIZONTAL CURVE RADIUS (m)

DATUM RL 69.000

DESIGN SURFACE LEVELS	80.162	79.690	79.217	79.104	78.736	78.700	78.277	78.228	77.707	77.187	76.728
EXISTING SURFACE LEVELS	80.204	79.560	79.137	79.056	78.737	78.703	78.268	78.214	77.658	77.037	76.702
CUT / FILL DEPTH	-0.042	0.130	0.080	0.048	-0.000	-0.003	0.008	0.013	0.049	0.150	0.027
CHAINAGE	0.000	15.000	30.000	33.589	45.000	46.089	58.589	60.000	75.000	90.000	103.202

PROPOSED ROAD1 (21-MRC01) LONG. SECTION (ON ROAD ALIGNMENT)

SCALE: HORIZONTAL - 1:500
VERTICAL - 1:100



VERTICAL CURVE LENGTH (m)
VERTICAL CURVE RADIUS (m)
VERTICAL GRADE (%)
VERTICAL GRADE (1 IN ...)
HORIZONTAL CURVE RADIUS (m)

DATUM RL 70.000

DESIGN SURFACE LEVELS	81.168	80.718	80.297	80.268	79.809	79.716	79.247	79.208	79.200	78.718	78.713	78.452	78.450	78.320
EXISTING SURFACE LEVELS	81.168	80.768	79.926	79.884	79.638	79.609	79.132	79.099	79.092	78.917	78.916	78.555	78.547	78.110
CUT / FILL DEPTH	-0.000	-0.050	0.371	0.384	0.171	0.167	0.115	0.109	0.108	-0.199	-0.204	-0.102	-0.096	0.210
CHAINAGE	0.000	15.000	29.038	30.000	44.038	45.000	59.038	60.000	60.206	75.000	75.206	90.000	90.206	103.206

BRINGELLY ROAD (21-MRC02) LONG. SECTION (ON ROAD ALIGNMENT)

SCALE: HORIZONTAL - 1:500
VERTICAL - 1:100

NOTE:
- PROPOSED CENTERLINE LEVELS TO MATCH DESIGN LEVEL OF FUTURE ROAD (ROAD 04) PREPARED BY MOTT MACDONALD DRAWING (REF: MMD367991-C-DR-00-DA-0100 P3) FOR 230-260 FIFTH AVENUE, AUSTRAL, STAGE 1 -CIVIL WORKS.

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES
A1 (A3) 1:250 (1:500)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

CLIENT
TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
PROPOSED ROAD 1 (21-MRC01) & BRINGELLY ROAD (21-MRC02)
LONGITUDINAL SECTION & TYPICAL SECTION
(SHEET 01)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-D200	C

DESIGN LEVELS	0.122	0.080	0.042	-0.012	-0.012	-0.162	-0.122	0.000	-0.122	-0.162	-0.012	-0.012	0.042	0.080	0.122	
OFFSET	-8.000	-7.500	-6.000	-4.650	-4.530	-4.500	-4.050	0.000	4.050	4.500	4.530	4.650	6.000	7.500	8.000	

PROPOSED ROAD 3 (21-MRC03) TYPICAL SECTION

SCALE: 1:100

DESIGN SURFACE LEVELS	78.710	78.574	78.333	78.274	78.237	78.243	78.274	78.379	78.529	78.679	78.829	78.979	79.129	79.279	79.620	79.430	79.495	79.620	79.745
EXISTING SURFACE LEVELS	78.712	78.586	78.495	78.511	78.339	78.339	78.273	78.316	78.530	78.769	78.844	79.033	78.891	78.980	79.082	79.107	79.242	79.416	79.577
CUT / FILL DEPTH	-0.002	-0.011	-0.162	-0.237	-0.102	-0.096	0.001	0.063	-0.000	-0.089	-0.015	-0.054	0.238	0.299	0.338	0.323	0.253	0.204	0.169
CHAINAGE	0.000	4.518	15.000	19.518	27.018	30.000	34.518	45.000	60.000	75.000	90.000	105.000	120.000	135.000	149.102	150.000	154.102	159.102	163.278

PROPOSED ROAD 3 (21-MRC03) LONG. SECTION (ON ROAD ALIGNMENT)

SCALE: HORIZONTAL - 1:500
VERTICAL - 1:100

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**DA SUBMISSION**	**11/07/2017**	**KH**	**CT/LJ/PD**	**SL**	**SL**
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE
A1 (A3) 1:500 (1:1,000) 0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:100 (1:200) 0 1 2 3 4 5 6 7 8 9 10 METRES

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

CLIENT
TSA DREAMSCAPES

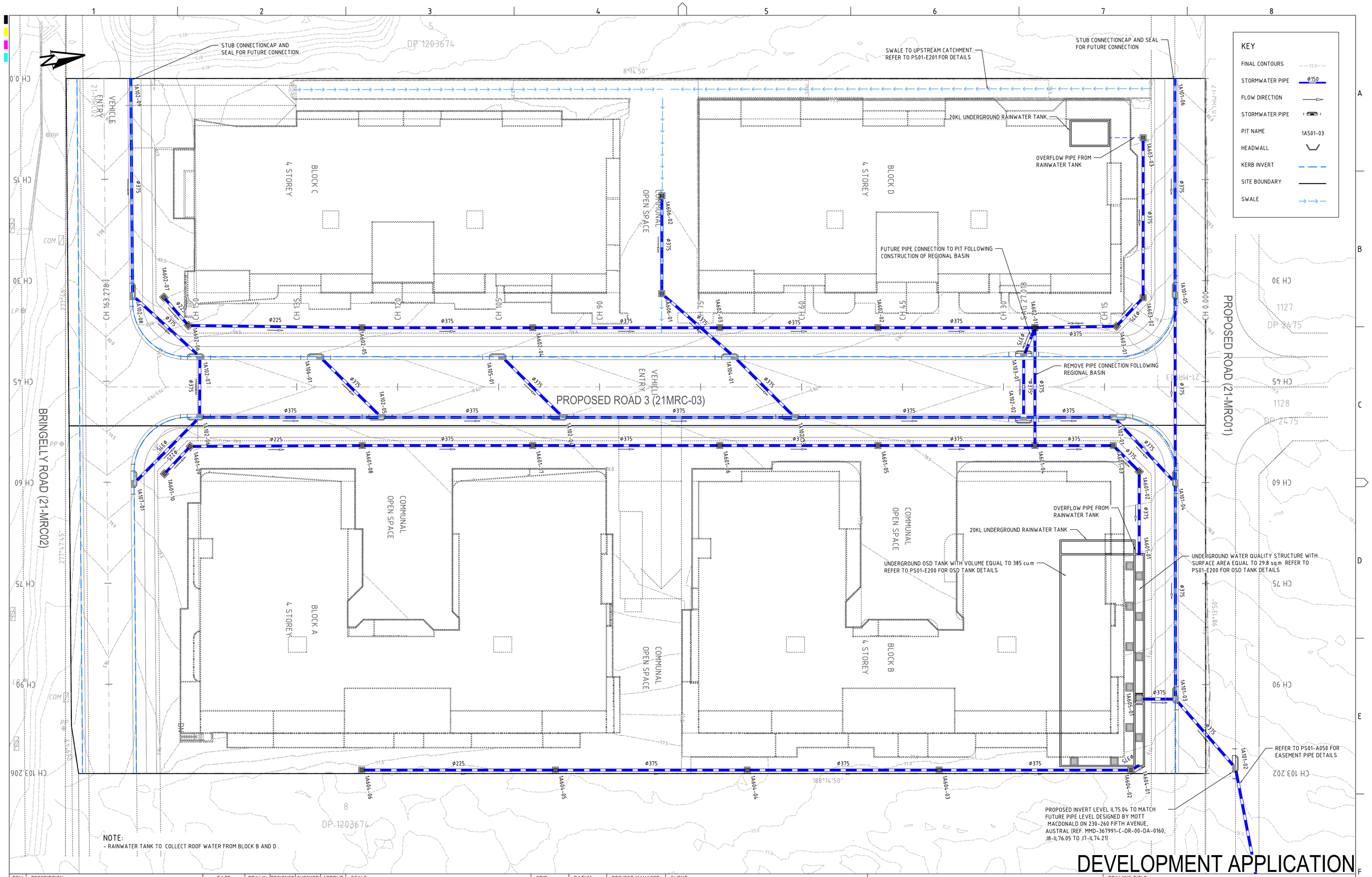
PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
PROPOSED ROAD 3 (21-MRC-03) LONGITUDINAL SECTION (SHEET 02)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-D210	C

PRINTED: --- USER INVASIVE
A1 / A3 LANDSCAPE (A:\LC__v02.0.01)
DRAWING ID: P1705935-PS01-R03-D210



NOTE:
- RAINWATER TANK TO COLLECT ROOF WATER FROM BLOCK B AND D .

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**DA SUBMISSION**	**11/07/2017**	KH	CT/LJ/PD	SL	SL
B	ADDITIONAL INFORMATION	05/06/2017	LJ	LJ	SL	
A	INITIAL RELEASE	02/06/2017	KH/LJ	CT/LJ		

SCALE: A1 (A3) 1:250 (1:500) — 0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES

GRID: MGA | DATUM: mAHD | PROJECT MANAGER: SL

CLIENT: TSA DREAMSCAPES

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All measurements in millimetres unless otherwise specified.

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PROJECT NAME/PLANSET TITLE: PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

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Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
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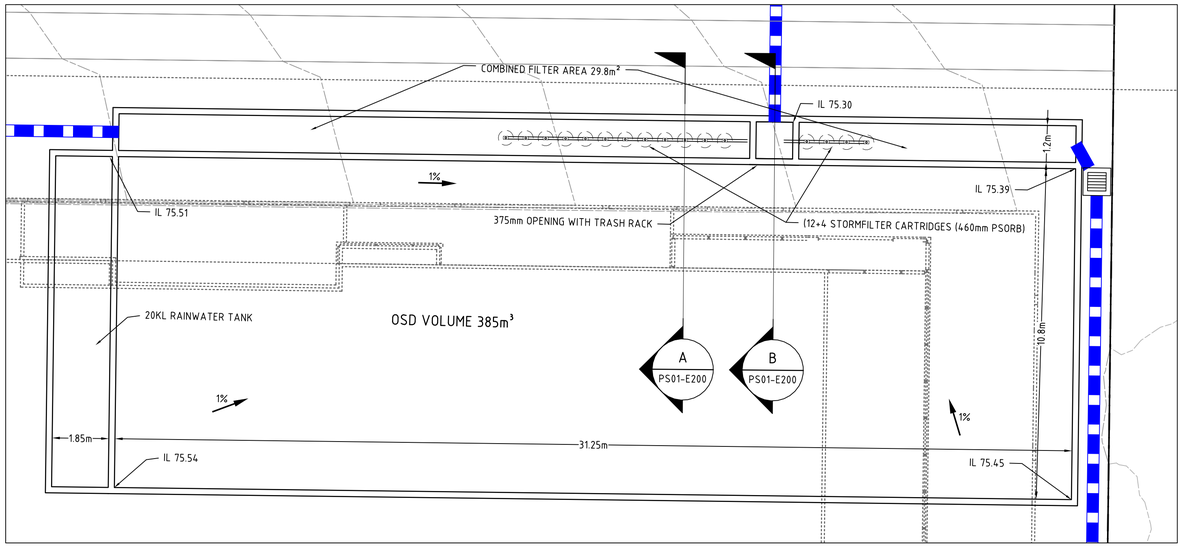
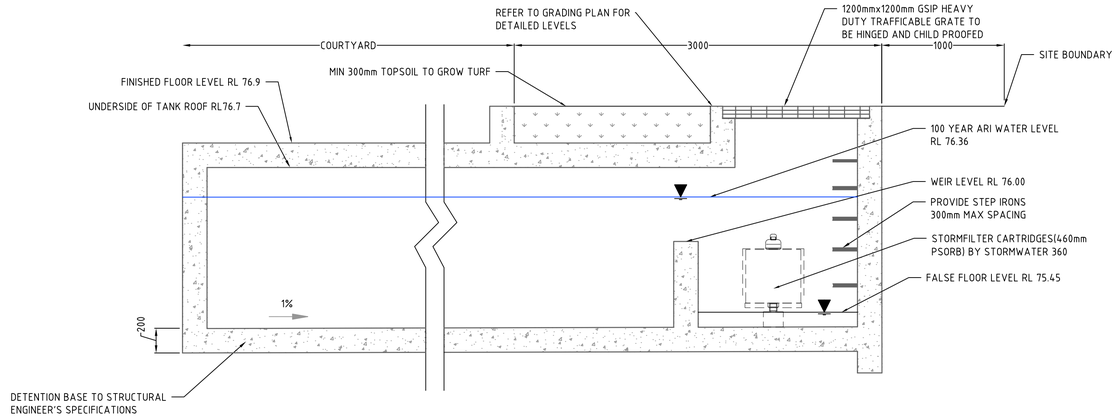
DRAWING TITLE: DRAINAGE LAYOUT PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-E100	C

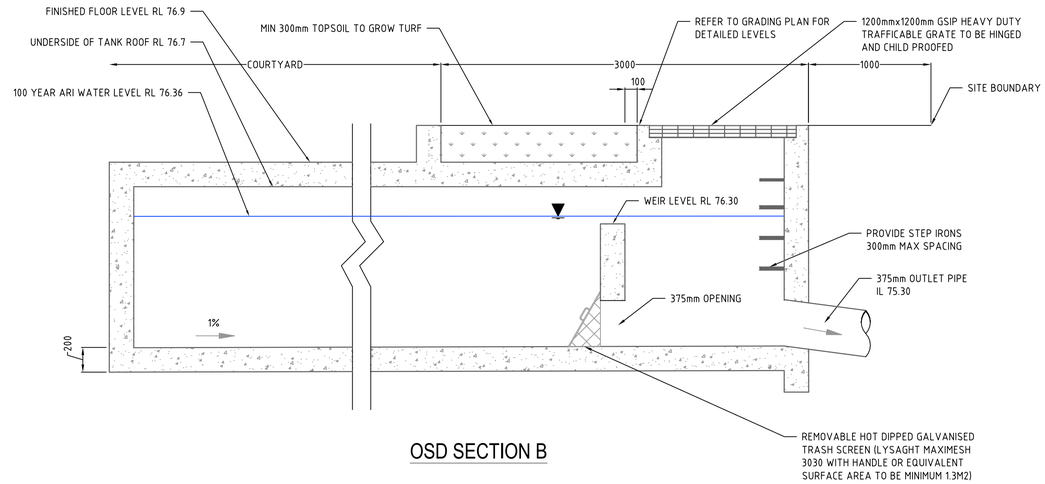


OSD TANK PLAN

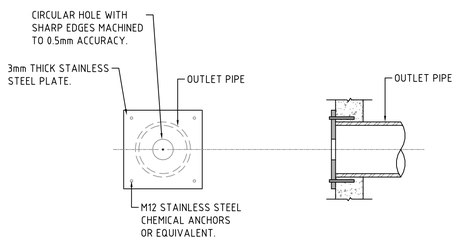
SCALE 1:100



OSD SECTION A

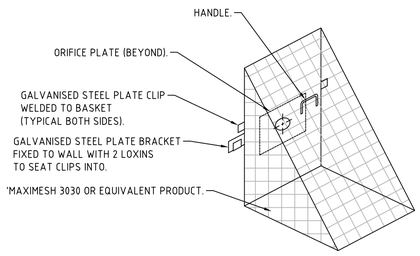


OSD SECTION B



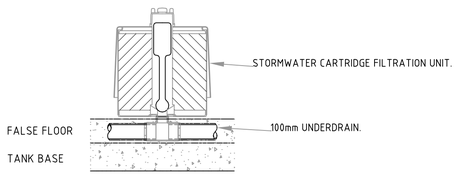
ORIFICE PLATE DETAIL

NOT TO SCALE



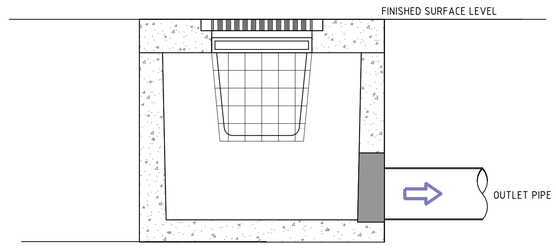
TRASH SCREEN DETAIL

NOT TO SCALE



STORMFILTER CARTRIDGES (460mm PSORB) DETAIL

NOT TO SCALE



TYPICAL ENVIROPOD DETAIL

NOT TO SCALE

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE

GRID	DATUM	PROJECT MANAGER
---	---	SL

CLIENT
TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

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Email: mail@martens.com.au Internet: www.martens.com.au

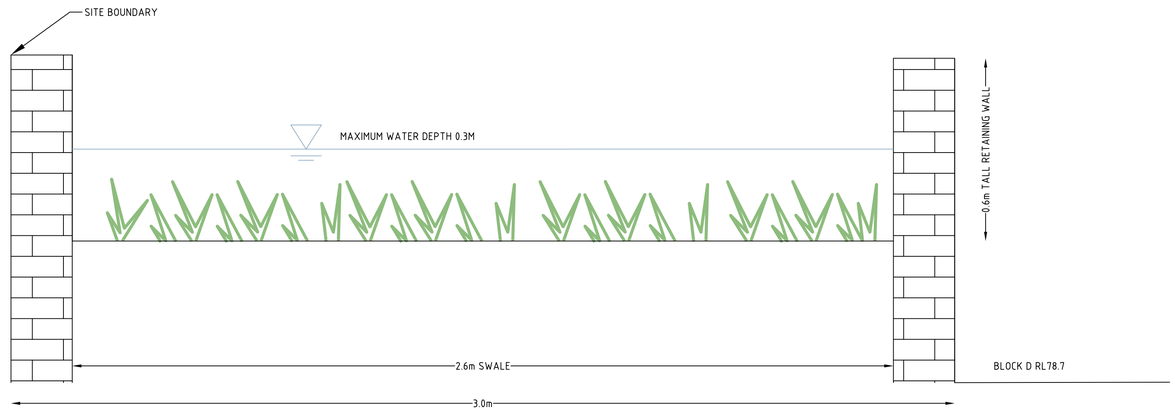
DRAWING TITLE
DRAINAGE DETAILS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-E200	A

PIT SCHEDULE

Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A101-06	STUB CONNECTION	296563.868	6241485.504	0	0			375	78.991	79.366	0.375	setout level to maximum pipe obvert
1A101-05	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296595.678	6241480.926	0.9	0.9	375	77.992	375	77.964	78.988	1.024	xy setout to setout string
1A101-04	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296623.293	6241476.951	0.9	0.9	375	77.07	375	76.158	78.065	1.907	xy setout to setout string
1A101-03	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296655.08	6241472.376	0.9	0.9	375	75.837	375	75.152	76.95	1.799	xy setout to setout string
1A101-02	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296666.472	6241479.726	0.9	0.9	375	75.057	375	75.037	76.79	1.753	xy setout to setout string
1A101-01	HEADWALL	296733.786	6241482.717	0	0	375	74.7			75.075	0.375	setout level to maximum pipe obvert
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A102-09	STUB CONNECTION	296541.615	6241332.004	0	0			375	80.009	80.384	0.375	setout level to maximum pipe obvert
1A102-08	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296573.535	6241327.642	0.9	0.9	375	79.055	375	79.035	80.051	1.016	xy setout to setout string
1A102-07	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296583.96	6241336.236	0.9	0.9	375	78.329	375	78.292	79.262	0.97	xy setout to setout string
1A102-06	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296592.861	6241334.908	0.9	0.9	375	78.202	375	78.066	79.262	1.197	xy setout to setout string
1A102-05	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296596.733	6241361.619	0.9	0.9	375	77.796	375	77.776	79.016	1.241	xy setout to setout string
1A102-04	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296600.605	6241388.33	0.9	0.9	375	77.506	375	77.486	78.771	1.285	xy setout to setout string
1A102-03	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296605.545	6241422.413	0.9	0.9	375	77.141	375	77.121	78.509	1.387	xy setout to setout string
1A102-02	KERB INLET PIT - GRATE & 1.8m LINTEL - SAG	296610.42	6241456.05	0.9	0.9	375	76.782	375	76.466	78.075	1.61	xy setout to setout string
1A102-01	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296612.339	6241469.292	0.9	0.9	375	76.332	375	76.312	78.195	1.883	xy setout to setout string
1A101-04	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296623.293	6241476.951	0.9	0.9	375	76.178			78.065	1.907	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A602-01	GSIP 900x900	296623.293	6241476.951	0.6	0.6			375	77.046	78.065	1.018	
1A103-01	KERB INLET PIT - GRATE & 1.8m LINTEL - SAG	296601.516	6241457.358	0.9	0.9	375	76.91	375	76.89	78.075	1.186	xy setout to setout string
1A102-02	KERB INLET PIT - GRATE & 1.8m LINTEL - SAG	296610.42	6241456.05	0.9	0.9	375	76.8			78.075	1.61	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A104-01	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296595.343	6241414.77	0.9	0.9			375	77.269	78.468	1.199	xy setout to setout string
1A102-03	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296605.545	6241422.413	0.9	0.9	375	77.141			78.509	1.387	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A105-01	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296590.394	6241380.627	0.9	0.9			375	77.838	78.813	0.975	xy setout to setout string
1A102-04	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296600.605	6241388.33	0.9	0.9	375	77.71			78.771	1.285	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A106-01	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296586.514	6241353.861	0.9	0.9			375	78.108	79.083	0.975	xy setout to setout string
1A102-05	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296596.733	6241361.619	0.9	0.9	375	77.98			79.016	1.241	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A107-01	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296601.179	6241323.865	0.9	0.9			375	78.224	79.054	0.83	xy setout to setout string
1A102-06	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296592.861	6241334.908	0.9	0.9	375	78.086			79.262	1.197	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A601-10	GRATED SURFACE INLET PIT 600x600	296600.422	6241328.53	0.6	0.6			225	78.852	79.389	0.537	
1A601-09	GRATED SURFACE INLET PIT 600x600	296596.947	6241332.91	0.6	0.6	225	78.796	225	78.776	79.529	0.754	
1A601-08	GRATED SURFACE INLET PIT 600x600	296600.484	6241358.217	0.6	0.6	225	78.52	375	78.5	79.311	0.811	
1A601-07	GRATED SURFACE INLET PIT 600x600	296604.116	6241383.276	0.6	0.6	375	78.247	375	78.227	79.058	0.831	
1A601-06	GRATED SURFACE INLET PIT 600x600	296608.103	6241410.784	0.6	0.6	375	77.949	375	77.929	78.78	0.851	
1A601-05	GRATED SURFACE INLET PIT 600x600	296611.472	6241434.027	0.6	0.6	375	77.694	375	77.674	78.547	0.873	
1A601-04	GRATED SURFACE INLET PIT 900x900	296614.819	6241457.117	0.6	0.6	375	77.441	375	77.432	78.373	0.941	
1A601-03	GRATED SURFACE INLET PIT 900x900	296616.494	6241468.62	0.6	0.6	375	77.316	375	77.296	78.474	1.178	
1A601-02	GRATED SURFACE INLET PIT 900x900	296620.874	6241471.891	0.6	0.6	375	77.241	375	77.221	78.413	1.192	
1A601-01	TANK - INLET	296633.123	6241470.116	0	0	375	77.098			77.992	0.895	
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A602-07	GRATED SURFACE INLET PIT 600x600	296574.46	6241332.199	0.6	0.6			225	79.471	80.28	0.81	
1A602-06	GRATED SURFACE INLET PIT 600x600	296579.143	6241335.221	0.6	0.6	225	78.959	225	78.939	79.715	0.776	
1A602-05	GRATED SURFACE INLET PIT 600x600	296583.159	6241360.687	0.6	0.6	225	78.67	375	78.615	79.313	0.698	
1A602-04	GRATED SURFACE INLET PIT 900x900	296586.797	6241385.786	0.6	0.6	375	78.362	375	78.342	79.059	0.718	
1A602-03	GRATED SURFACE INLET PIT 600x600	296590.784	6241413.294	0.6	0.6	375	78.064	375	78.044	78.802	0.759	
1A602-02	GRATED SURFACE INLET PIT 600x600	296594.153	6241436.537	0.6	0.6	375	77.809	375	77.789	78.546	0.758	
1A602-01	GRATED SURFACE INLET PIT 900x900	296597.5	6241459.627	0.6	0.6	375	77.555	375	77.424	78.38	0.956	
1A601-04	GRATED SURFACE INLET PIT 900x900	296614.819	6241457.117	0.6	0.6	375	77.249			78.373	0.941	
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A603-03	GRATED SURFACE INLET PIT 600x600	296571.879	6241479.58	0.9	0.9			375	79.196	80.021	0.824	
1A603-02	GRATED SURFACE INLET PIT 600x600	296595.393	6241476.172	0.6	0.6	375	78.375	375	78.313	79.168	0.855	
1A603-01	GRATED SURFACE INLET PIT 600x600	296599.026	6241471.628	0.6	0.6	375	77.802	375	77.768	78.597	0.829	
1A602-01	GRATED SURFACE INLET PIT 900x900	296599.026	6241471.628	0.6	0.6	375	77.567			78.597	1.55	
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A604-06	GRATED SURFACE INLET PIT 600x600	296648.172	6241351.212	0.6	0.6			225	76.718	77.431	0.713	
1A604-05	GRATED SURFACE INLET PIT 900x900	296652.302	6241379.708	0.6	0.6	225	76.43	375	76.41	77.356	0.946	
1A604-04	GRATED SURFACE INLET PIT 900x900	296656.391	6241407.913	0.6	0.6	375	76.125	375	76.105	77.279	1.174	
1A604-03	GRATED SURFACE INLET PIT 900x900	296660.479	6241436.118	0.6	0.6	375	75.82	375	75.8	76.965	1.165	
1A604-02	GRATED SURFACE INLET PIT 900x900	296664.567	6241464.324	0.9	0.9	375	75.515	375	75.495	76.842	1.348	
1A604-01	TANK - INLET	296664.049	6241465.628	0	0	375	75.481			76.884	1.654	
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A605-01	TANK - OUTLET	296654.393	6241467.634	0	0			375	75.205	77.248	2.042	
1A101-03	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296655.08	6241472.376	0.9	0.9	375	75.172			76.95	1.799	xy setout to setout string
Pit				INTERNAL		INLET		OUTLET		PIT		
Name	TYPE	EASTING	NORTHING	WD	LEN	DIA	INV LEV	DIA	INV LEV	SETOUT RL	DEPTH	REMARKS
1A606-02	GRATED SURFACE INLET PIT 900x900	296570.156	6241407.597	0.9	1.1			375	77.597	79	1.403	
1A606-01	GRATED SURFACE INLET PIT 900x900	296584.549	6241405.485	0.9	1.1	375	77.451	375	77.431	78.901	1.47	
1A104-01	KERB INLET PIT - GRATE & 1.8m LINTEL - ON GRADE	296595.343	6241414.77	0.9	0.9	375	77.289			78.468	1.199	xy setout to setout string

NOTE:
1. xy setout to pit centre
2. setout level to pit cover level
3. some setout xy or z levels have special setout data. See individual manhole remarks



SWALE TYPICAL SECTION

NOT TO SCALE

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE

GRID	DATUM	PROJECT MANAGER
---	---	SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

martens & Associates Pty Ltd
Consulting Engineers
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Water
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Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
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DRAWING TITLE
PIT SCHEDULE & SWALE TYPICAL SECTIONS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-E201	A

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE: 0 5 10 15 20 25 30 35 40 45 50 METRES — A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE: PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

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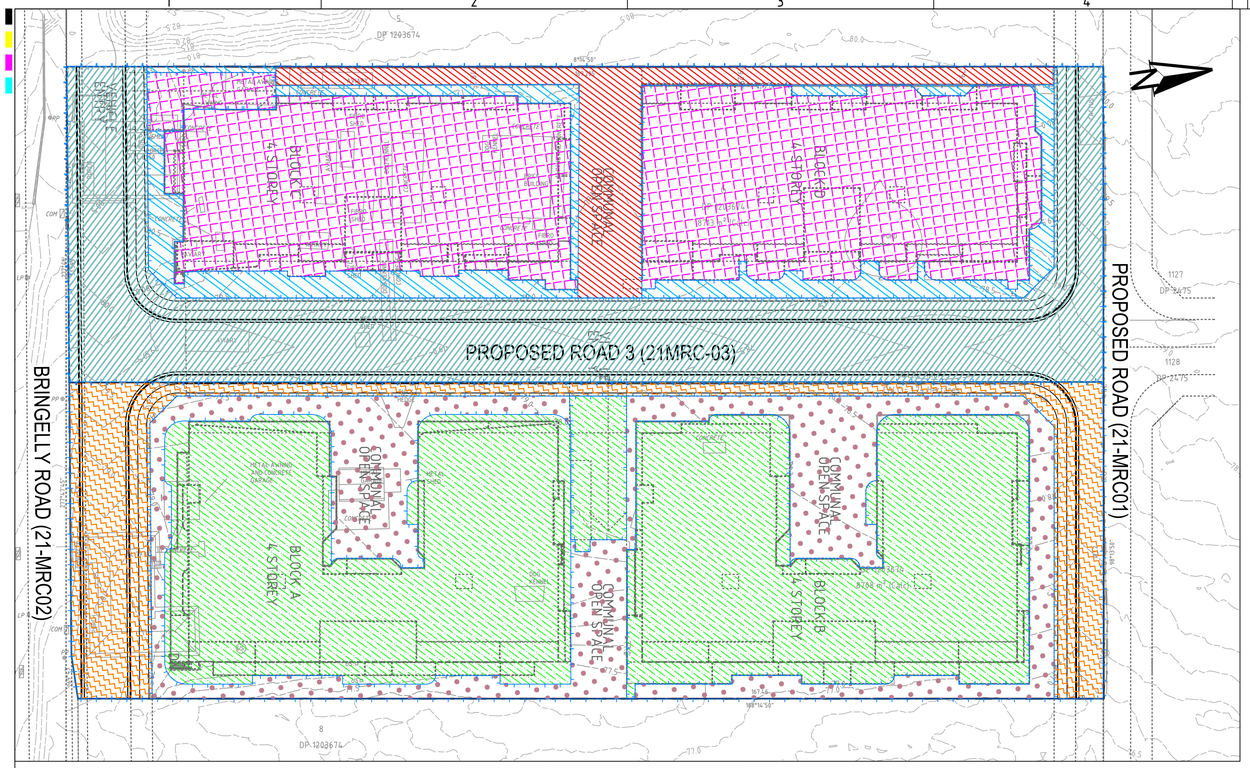
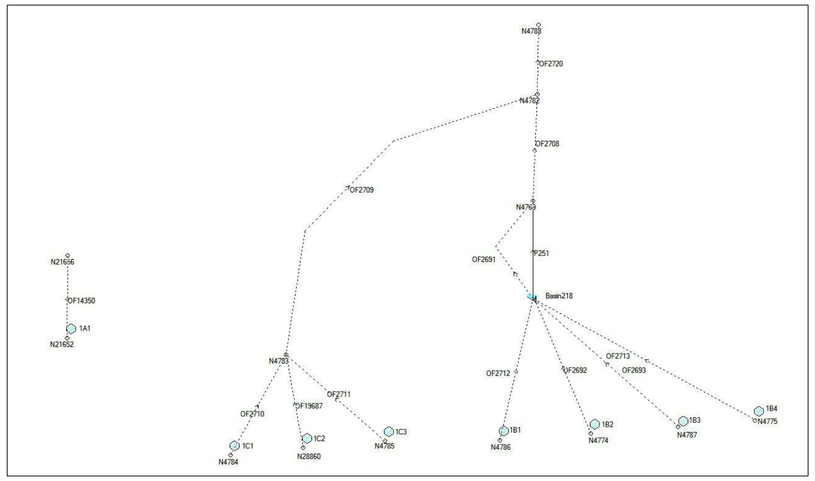
DRAWING TITLE: DRAINAGE CATCHMENT PLAN

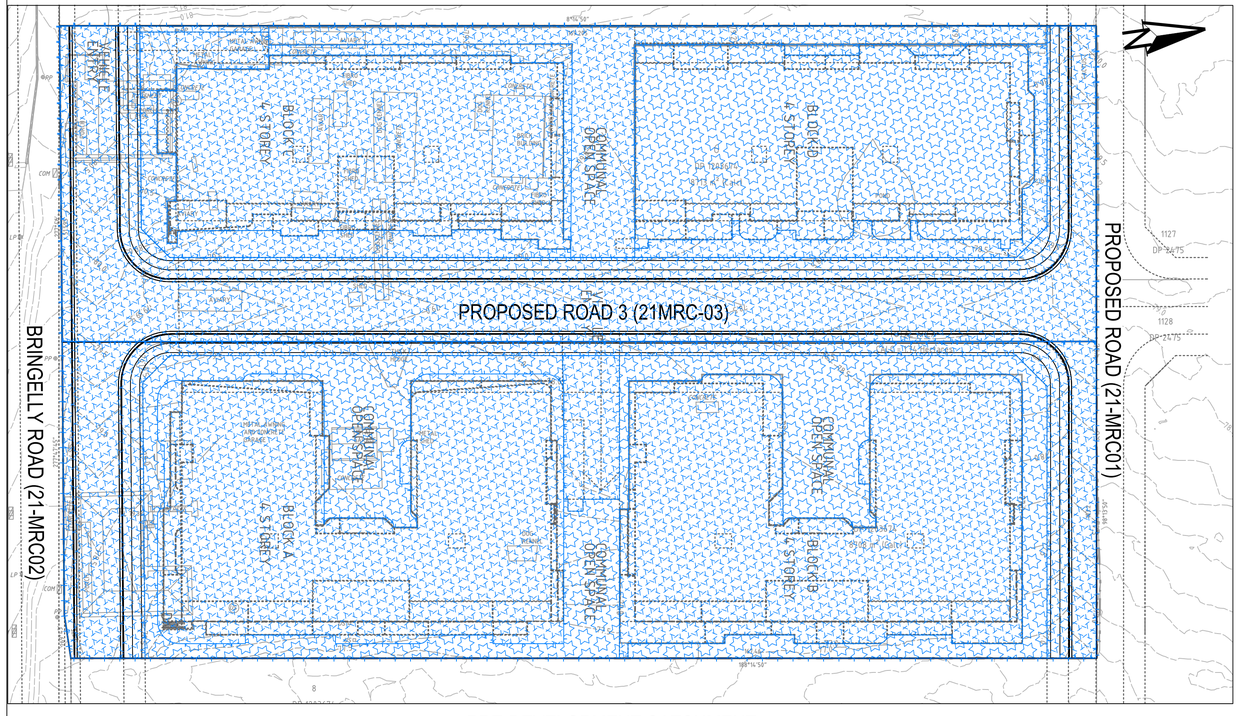
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-E400	A



POST DEVELOPMENT CATCHMENT



DRAIN LAYOUT



PRE-DEVELOPMENT CATCHMENT

P1705935DRN01V02 OSD CATCHMENT

SCENARIO	CATCHMENT	KEY	NODE NAME	DESCRIPTION	AREA (ha)	% PERVIOUS	% IMPERVIOUS
PRE DEVELOPMENT	ENTIRE SITE		1A1	ENTIRE SITE	1.742	92%	8%
POST DEVELOPMENT	TO OSD		1B1	WEST LANDSCAPED	0.082	100%	0%
			1B2	WEST BUILDING	0.401	0%	100%
			1B3	EAST LANDSCAPED	0.204	100%	0%
			1B4	EAST BUILDING	0.523	0%	100%
	BYPASS OSD		1C1	WEST ROAD	0.313	23%	77%
			1C2	WEST LANDSCAPED	0.074	100%	0%
			1C3	EAST ROAD	0.145	23%	77%
				TOTAL AREA	1.742		= 100% OF TOTAL AREA

P1705935DRN01V02 DRAINS RESULTS

OSD MODELLING RESULT (Cu.m/s)		
ARI	Pre Development	Post Development
5 YEAR	0.37	0.261
10 YEAR	0.431	0.292
20 YEAR	0.519	0.335
50 YEAR	0.605	0.361
100 YEAR	0.695	0.401

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE: 0 5 10 15 20 25 30 35 40 45 50 METRES — A1 (A3) 1:500 (1:1,000)

GRID: MGA | DATUM: mAHD | PROJECT MANAGER: SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
484-488 BRINGELLY ROAD, AUSTRAL, NSW.

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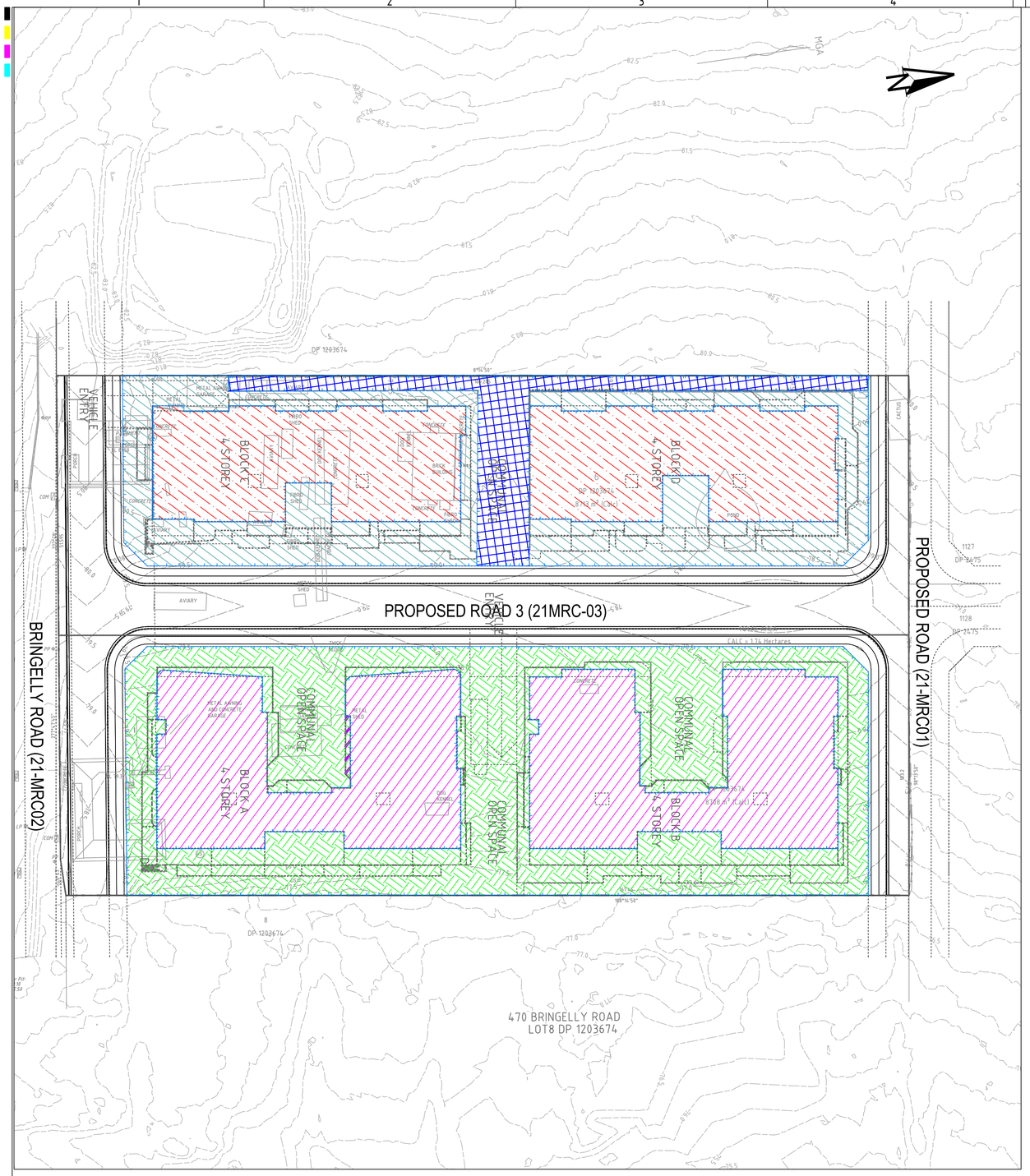
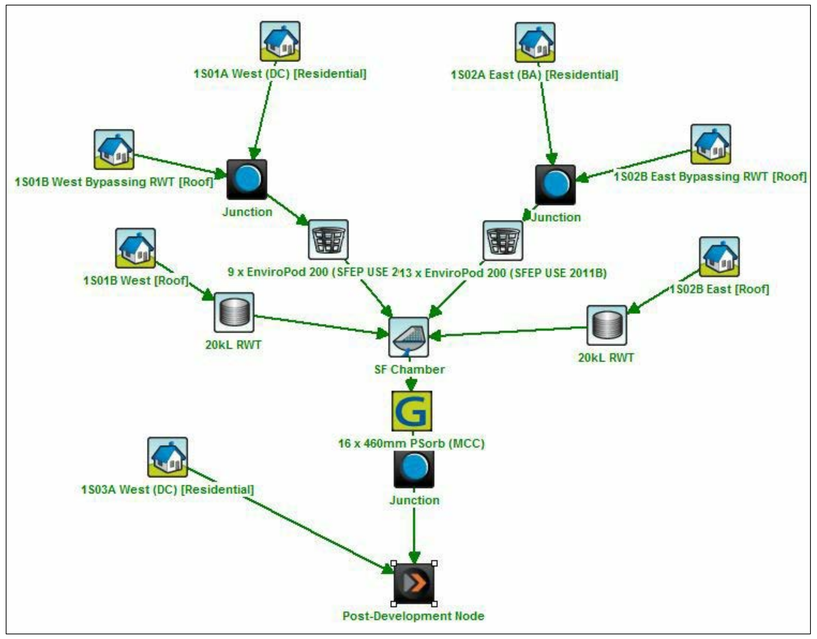
DRAWING TITLE: OSD CATCHMENT PLAN, MODEL & RESULTS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-E600	A



MUSIC CATCHMENT



MUSIC MODEL LAYOUT

Treatment Train Effectiveness - Post-Development Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	7.2	6.63	8
Total Suspended Solids (kg/yr)	581	85.9	85.2
Total Phosphorus (kg/yr)	1.46	0.482	66.9
Total Nitrogen (kg/yr)	15.7	7.82	50.3
Gross Pollutants (kg/yr)	201	0	100

MUSIC RESULTS

MUSIC CATCHMENTS (P1705935MUS01V02)

KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
	RESIDENTIAL WEST	1S01A	0.222	62	LIVERPOOL CITY COUNCIL WSUD TECHNICAL GUIDELINES
	ROOFS WEST	1S01B	0.261	100	LIVERPOOL CITY COUNCIL WSUD TECHNICAL GUIDELINES
	RESIDENTIAL EAST	1S02A	0.393	43	LIVERPOOL CITY COUNCIL WSUD TECHNICAL GUIDELINES
	ROOFS EAST	1S02B	0.334	100	LIVERPOOL CITY COUNCIL WSUD TECHNICAL GUIDELINES
	SWALE BYPASS	1S03A	0.074	0	LIVERPOOL CITY COUNCIL WSUD TECHNICAL GUIDELINES
		TOTAL - OVERALL	1.284		= 100 % OF OVERALL AREA
		TOTAL - IMPERVIOUS	0.902		= 70 % OF OVERALL AREA
		TOTAL - PERVIOUS	0.382		= 30 % OF OVERALL AREA

NOTES:
1. ASSUMED 50% OF ROOF AREA DRAINS TO RAINWATER TANK.

MUSIC MODELLING RESULTS (P1705935MUS01V02)

MUSIC NODE	POST DEVELOPMENT NODE			
PARAMETER	SOURCES	RESIDUAL LOAD	% REDUCTION	% TARGET
TOTAL SUSPENDED SOLIDS (KG/YR)	581	85.9	85.2	85
TOTAL PHOSPHORUS (KG/YR)	1.46	0.482	66.9	65
TOTAL NITROGEN (KG/YR)	15.7	7.82	50.3	45
GROSS POLLUTANTS (KG/YR)	201	0	100	90

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	DA SUBMISSION	11/07/2017	KH	CT/LJ/PD	SL	SL

SCALE: 0 5 10 15 20 25 30 35 40 45 50 METRES — A1 (A3) 1:500 (1:1,000)

GRID: MGA | DATUM: mAHD | PROJECT MANAGER: SL

CLIENT: TSA DREAMSCAPES

PROJECT NAME/PLANSET TITLE: PROPOSED RESIDENTIAL FLAT BLD. DEV.
CIVIL ENGINEERING SERVICES
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DRAWING TITLE: WATER QUALITY CATCHMENT PLAN, MODEL & RESULTS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1705935	PS01	R03	PS01-E700	A

DRAWING ID: P1705935-PS01-R03-E700

PRINTED: ---- USER: MASAN

A1 / A3 LANDSCAPE (A1LC__v02.0.01)