at&l

Oakdale West Estate Development Kemps Creek

Civil, Stormwater and Infrastructure Services Report

SSDA Modification No. 6

CLIENT/ GOODMAN PROPERTY SERVICES (AUST) PTY LTD

DATE/ OCTOBER 2020

CODE/ REP004-01-15-272

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Abbreviations

DPIE	Department of Planning, Industry and the Environment
OWE	Oakdale West Estate
WNSLR	Western North South Link Road
TfNSW	Transport for NSW
OEH	Office of Environment and Heritage
EP	Equivalent Persons
ET	Equivalent Tenancy
IWM	Integrated Water Management
GPS	Goodman Property Services (Aust) Pty Ltd
STP	Sewerage Treatment Plant
SWC	Sydney Water Corporation
WELS	Water Efficiency Labelling
EIS	Environmental Impact Statement
SSDA	State Significant Development Application
RMS	Roads and Maritime Service
EPLR	Erskine Park Link Road
SEPZS	South Erskine Park Zone Substation

Executive Summary

Goodman Property Services (Aust) Pty Ltd is developing the Oakdale West site for the purposes of providing a warehouse and distribution complex. The Oakdale West development has been approved by DPIE, and five Modifications have been lodged after. This report is for the Modification No. 6 changes requested to the development consent.

Purpose of Report:

The Oakdale West Infrastructure Civil Engineering Report was originally prepared to address the Secretary's Environmental Assessment Requirements (SEARs) for the project relevant to earthworks, stormwater, roadworks and infrastructure servicing. This report is provided to supplement the original report, covering changes of the modification where relevant and required under the original SEARs.

The report outlines changes to the proposed components of the design including: earthworks, erosion and sediment, road geometry, stormwater management (on site detention, piped and overland flows, catchments, water sensitive urban design), servicing and staging.

This SSDA Modification (No. 6) seeks approval for:

- Changes in arrangement of Precinct 3 allotments;
- Rectification of temporary works and positioning of Road 3 interim cul-de-sac;
- Inclusion of Road 8 into Stage 1 approval.

1 Introduction

This report has been prepared to inform a State Significant Development Application (SSDA 7348) for the staged development of the Oakdale West Estate (OWE), specifically to assess the potential impacts of the Modification No. 6 changes to the infrastructure design of the approved development.

This SSDA Modification (No. 6) seeks approval for:

- Changes in arrangement of Precinct 3 allotments;
- Rectification of temporary works and positioning of Road 3 interim cul-de-sac;
- Inclusion of Road 8 into Stage 1 approval.

For Modification No. 6 changes, refer to updated civil drawings Masterplan (0000 Series) and Infrastructure (1000 Series). These proposed changes will amend the Stage 1 consent originally approved by way of SSD 7348 and subsequently MOD 3.

1.1 Scope of Report

Objective of Report

The objective of this civil, stormwater and infrastructure services report is to outline the design criteria used for the Engineering design of all components of the development and compare to the requirements of the Penrith City Council Development Control Plans (DCP) and the existing SSDA 7348 approval and subsequent modifications.

This report should be read in conjunction with the AT&L Civil Engineering drawings as indicated within Appendix B.

Summary

This report generally discusses the design philosophy behind the following components of the design for Oakdale West Estate (OWE) Modification No. 6 including:

- Earthworks;
- Sedimentation and Erosion Control;
- Road Design;
- Stormwater Management;
- Servicing;
- Infrastructure Staging; and
- Transgrid impacts.

The proposed site plan covering the entire Oakdale West development, along with all proposed lot layouts, are attached 0000 Series and 1000 Series Drawings Attached to the application.

2 Earthworks

2.1 Changes to Cut/Fill Requirements of Stage 1 (SSD 7348)

The Precinct 3 areas are now reconfigured to suit customer needs which is reflected in new lot shape which in turn alters the earthworks slightly. The earthworks design for Modification No. 6 was undertaken using the following considerations:

- Maintain a similar quantity of import for the project and same nominal Bulk Earthwork Levels (BEL);
- Minimise any noticeable changes in the earthworks surface or retaining walls;
- Minimise earthworks cut in unclassified rock;
- Maximising the accessibility of the future buildings 3B and 3C facing roads.

Ultimately the pad levels and retaining walls are unchanged, however are slightly modified to the match the change in lot shape. Road 8 earthworks have also been updated to suit the detailed design. The resulting bulk earthworks volumes are shown in Table 3 below. The total balance or import of fill is shown by the cell highlighted in bold. This can be compared to the respective cell in Stage 1 Approval (495,833m3), Modification No. 1 (748,501m3), Modification No. 2 (632,387m3) and Modification No. 3 (505,865m3). The import volume remains similar to Modification No. 3:

EARTHWORKS VOLUMES

	A	B	C	D	E = A+B+C+D	F
PRECINCT	EXISTING TOPSOIL STRIPPING VOLUME (cu.m) REFER NOTE No.1	EXCAVATION OF EXISTING CREEKS AND DAMS (cu.m) REFER NOTE No.3	NET CUT (cu.m)	NET FILL (cu.m)	BALANCE (cu.m)	APPROXIMATE VOLUME OF SELECT MATERIAL IMPORT FOR RETAINING WALLS
1	-43,347	-27,007	-428,359	549,579	50,866	3,843
2	-33,395	-5,795	-1,172,561	880,760	-330,991	47,443
3	-12,116	-6,166	-114,725	404,790	271,783	26,430
4	-18,485	-17,896	-213,049	717,397	467,967	38,164
5	-4,788	-16,247	-3,446	163,186	138,705	832
WNSLR STOCKPILE	-	-	-	-83,332	-83,332	-
TOTAL	-112,131	-73,111	-1,932,140	2,632,380	**514,998**	116,712

Table 1 – Cut/Fill Summary

Note these volumes are based on the current design, further detailed design may alter these. – (Negative) balance indicates net cut whilst + (positive) balance indicates import required

For ease of coordination, a comprehensive Estate-wide set of bulk earthworks drawings have been prepared which are intended to replace the previous Stage 1 approved drawings in Modification No. 3. They are compared below, so it is possible to see how minor the earthworks surface changes are.

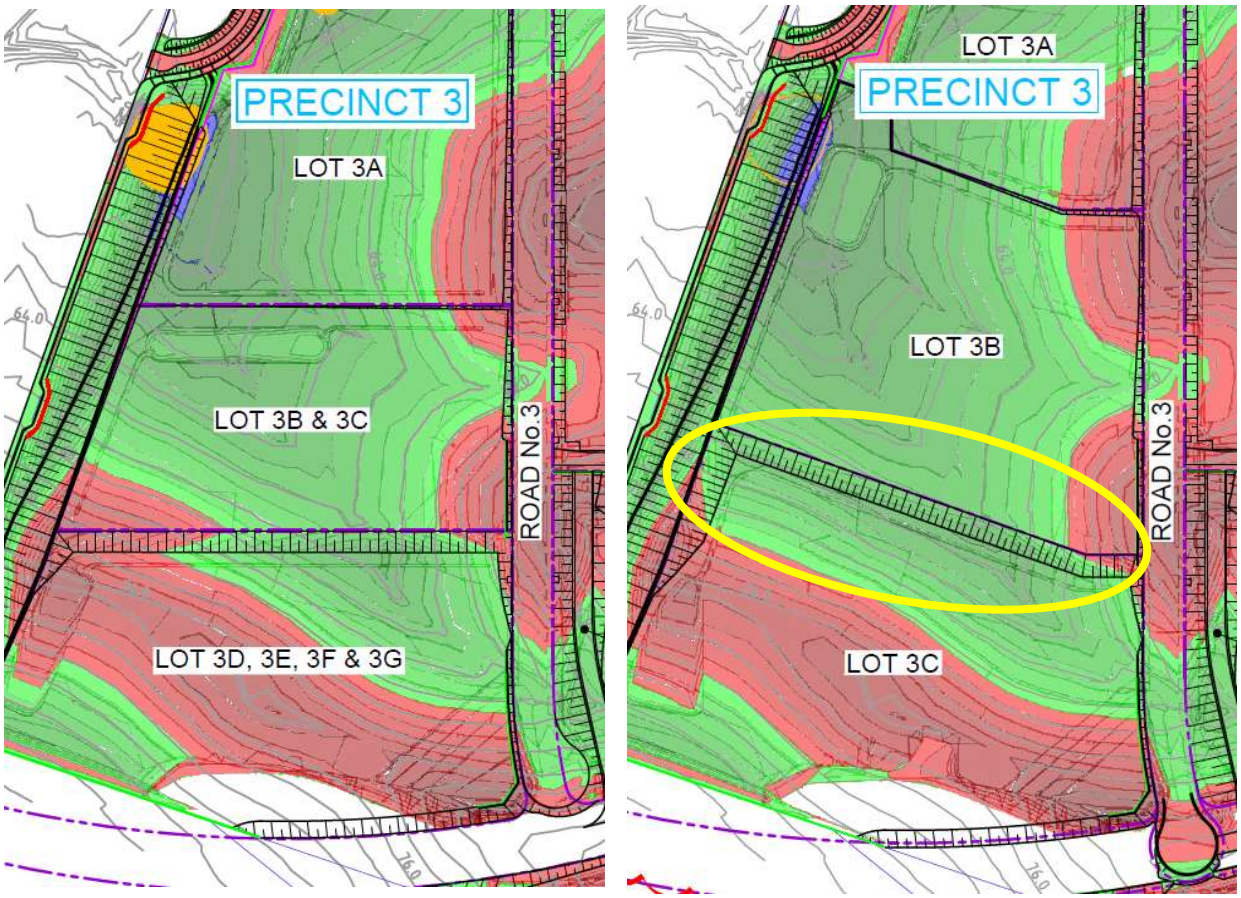


Figure 1 – Previously Approved Modification No. 3 (left) and Modification No. 6 (right)

3 Sedimentation and Erosion Control

3.1 Sedimentation and Erosion Control (Construction)

The previous Soil and Water Management Plan (SWMP) prepared in accordance with the NSW Department of Housing Publication titled: Managing Urban Stormwater – Soils and Construction (2004) for the whole site, remains relevant and the key objectives have not changed. Sources of pollution, potential impacts and RULSE Analysis remain the same for the Modification No. 6.

3.2 Soil and Water Management Plan

3.2.1 Overall Strategy

The original construction methodology will be followed to minimise the impact of sedimentation due to construction works because it is still applicable to works proposed in Modification No. 6.

Refer to AT&L Drawings C1130 and C1133 for Erosion and Sediment Control Plans updated for this proposal, which show proposed control and protection measures across the site until completion of on lot works.

Suitable temporary erosion and sediment controls shall be designed, adopted and maintained by the contractor throughout all stages of works, by an expert consultant. The contractor shall also design and implement controls at completion of the bulk earthworks where shown on AT&L drawings or where otherwise directed by the Superintendent or Penrith City Council's engineers.

Such controls shall be in accordance with the relevant requirements in the latest version of the managing urban stormwater: soils and construction guideline (landcom).

3.2.2 Design of Sediment and Erosion Control Measures

Suitable erosion and sediment controls shall be provided by the Contractor and maintained throughout all stages of works, including at completion of the bulk earthworks.

There is no change to the design requirements in Modification No. 6. However due to reconfiguration of development lots, the temporary sediment basins in Precinct 3 have changed. The table below shows the temporary basin design for Modification No. 3 and then directly beside, the revised equivalent basin for the Modification No. 6 proposal.

Parameter	Basin 3A	Basin 3B	Basin 3C	Now MOD 6:	Basin 3A	Basin 3B	Basin 3C
Volumetric Runoff Coefficient, C_v	0.50	0.50	0.50	**Volumetric Runoff Coefficient, C_v**	0.50	0.50	0.50
Contributing Area, A (ha)	4.951	3.785	4.118	**Contributing Area, A (ha)**	2.128	3.951	5.072
$R_{(85\ \%ile,\ 5\ day)}$	35.00	35.00	35.00	**$R_{(85\ \%ile,\ 5\ day)}$**	35.00	35.00	35.00
Settling Zone Volume, (m^3)	866	622	721	**Settling Zone Volume, (m3)**	372	691	880
Sediment Storage Zone Volume, (m^3)	433	331	360	**Sediment Storage Zone Volume, (m3)**	186	346	440
Total Sediment Basin Volume, (m^3)	**1,300**	**994**	**1,081**	**Total Sediment Basin Volume, (m^3)**	558	1037	1320

Table 2 – Precinct Temporary Sediment Basins Changes in Modification No. 6

3.3 Site Inspection and Maintenance

The inspection and maintenance requirements outlined previously have not changed and must still be carried out while either earthworks or quarrying is being conducted, and all areas re-established.

3.3.1 Sediment Basin Maintenance

Sediment basin maintenance remains the same as the SSDA Engineering Report

3.4 Conclusion

The erosion control measures proposed for the site will comply with the requirements of Penrith City Council Engineering Guidelines and The Department of Environment, Climate Change and Water (DECC).

The amended SWMP will ensure that the best management practice is applied to the development site in controlling and minimising the negative impacts of soil erosion.

4 Road Design

4.1 Horizontal and Vertical Geometry

The Road 3 Temporary Cul-de-sac is prosed to be replaced with an Interim Cul-de-sac now that the Waratah Project is able to utilise the WNSLR instead of Bakers Lane for construction access.

Previously, this cul-de-sac temporarily encroached on to Lot 2C, so the construction access road on the SLR alignment could be used without impact. The cul-de-sac proposed in Modification 6 will be interim until the final permanent intersection is designed and constructed by TfNSW. The proposal also means removing the construction access road from Lot 3C as it will no longer be required. It will now terminate at the interim Cul-de-sac. The updated road design for the estate is shown on drawings C1040.

The changes to the civil road design are summarised in the figure below, with the blue overlay showing the original layout (Modification No. 3) on proposed design in this submission.

Figure 2 – Modification No. 6 Design of Road 3 Interim Cul-de-sac with Temporary Mod. 3 Cul-de-sac overlay (blue)

Road 8 in the consent is approved as a future road. Modification No. 6 seeks to include Road 8 construction in the Stage 1 scope. Road 8 has now been designed in detail as shown in the updated 1000 series drawings. This inclusion is now referenced in masterplan drawing C0004 where the image in the figure below has been taken from.

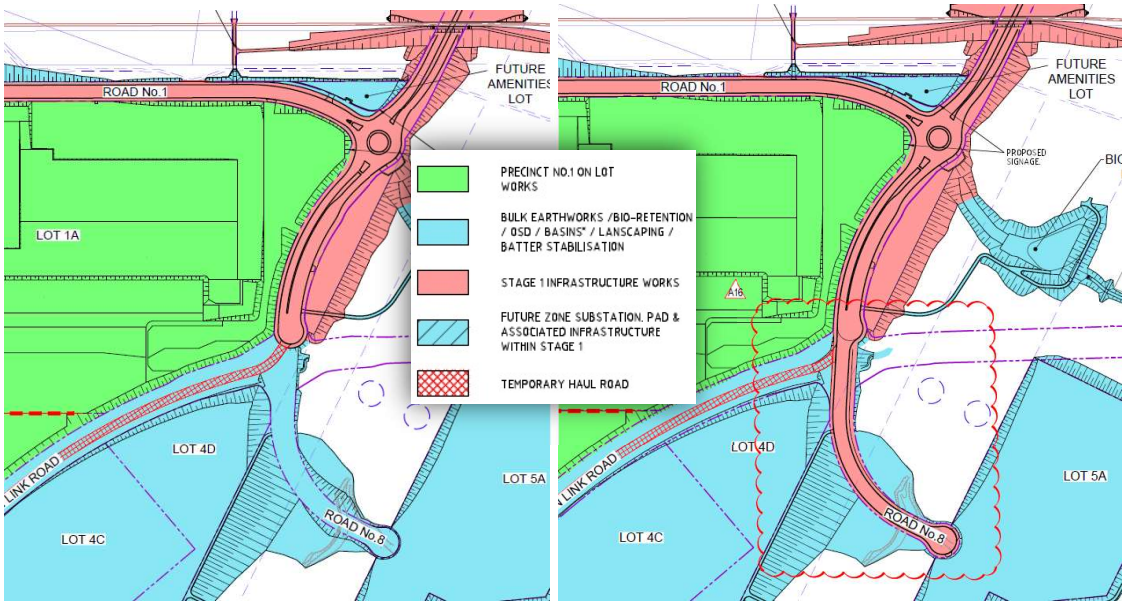


Figure 1 – Modification No 3 Interim Approval vs Modification No. 6 Stage 1 inclusion of Road 8

4.2 Pavement

No change to road pavement design.

4.3 Conclusion

All road design as demonstrated through Modification No. 6 changes above, remains in accordance with Austroads Standards and the requirements of Penrith City Council, as a minimum. There are no changes to the road pavement designs or estate road carriageway typical widths shown in the original report and consent.

5 Stormwater Management

5.1 Existing Site Stormwater Drainage

Refer to Drawing C1068 within Appendix A for a pre-development stormwater catchment plan indicating the location of these catchments. This has not changed.

5.2 Proposed Site Stormwater Drainage

The main objective for the stormwater drainage design of the proposed development is to ensure post-developed catchment flows do not exceed the pre-developed catchment flows. With the Modification No. 6, this remains the case. Stormwater is now formalised on Road 8 which is to be built concurrently in Stage 1 works. Comprehensive estate wide drainage design has been provided in Drawings C1110-C1115.

5.3 Council Requirements & Recommendations

All estate level stormwater drainage for the Modification No. 6 is designed to comply with the Penrith City Council Guidelines listed in the original report.

5.3.1 Modelling Software

Changes to stormwater system design for Modification No. 6 are modelled using DRAINs Software. Updated DRAINs data files and output results are attached in Appendix C. MUSIC modelling is unchanged – Basin 5 remains well under the water quality targets.

5.3.2 Catchments

A Stormwater Catchment Plan for each Catchment and flow paths into the bio-retention basins are shown in Appendix A. While the shape of the land is slightly different for the new precinct 3 lot layouts, the actual catchment 3 and calculations are not changed in Modification 6. However, in detailing Road 8, there is a change to the catchment for Basin 5. This is minor and basically is taking more of the natural overland flow into the basin to prevent ponding next to Road 8. The differences are described below in comparison to Modification No. 6:

Catchment 3

Unchanged

Catchment 5

Total area is increased from 7.09Ha to 11.87 Ha; including the additional existing overland water not previously considered.

5.3.3 On-Site Detention (OSD)

A summary of the OSD requirements for each discharge point and associated catchment areas that have changed in Modification No. 6 are shown in Table 4 below. The changes are specifically to Basins 5 and are hydraulic only; which has not change in physical shape of the basin.

Discharge Point F

OSD Basin no 5 has not changed is size however the catchment has been corrected to include water that would have pooled on the side of Road 8. The volume remains at 2,620 m^3 (capacity of the basin from extended detention RL 57.30 to Top Water Level of basin RL 58.20), however the outflows has changed slightly for the extra catchment added from the last change in Modification No. 2.

Duration	Pre-Developed Flows (m^3/s)	MOD 2 Post Developed Flows (m^3/s)	MOD 6 Post Developed Flows (m^3/s)
1-Year ARI	0.773	0.379	0.378
2-Year ARI	2.39	0.392	0.475
5-Year ARI	4.70	0.784	1.21
10-Year ARI	5.53	1.14	1.68
20-Year ARI	6.63	1.57	2.01
100-Year ARI	8.63	2.03	2.663

Table 1 – Pre-Post Developed Flows to Discharge Point F for MOD 6 (Compared to MOD 2)

5.3.4 Overland Flows

Overland flow paths are unchanged in Modification No. 6

5.3.5 Water Sensitive Urban Design (WSUD)

The WSUD strategy, MUSIC Model and subsequent WSUD designs prepared by AT & L are based upon requirements within the Penrith City Council C3 Water Management DCP. The parameters and results remain the same for the Modification No. 6 changes.

5.4 Conclusion

As highlighted in the above section, all stormwater drainage within the Oakdale West development has been designed in accordance with the Penrith City Council Engineering Guidelines. As described above, the proposed Modification No. 6 is generally consistent with the previously lodged modifications. This include design of the stormwater network (pits and pipes), On-Site Detention basins and WSD infrastructure.

6 Services

6.1 Sydney Water

The LASP for potable water (GHD 2016) and LASP for sewer (GHD 2016) have been used for the design of Trunk infrastructure throughout the site. No changes to this are requested for Modification No. 6.

A new reticulation design has been completed and will be submitted with Sydney Water to follow the new Road 8 alignment and provide services for future development of Lot 5A.

6.2 Communications

Communication conduits are already extended along the proposed WNSLR and reticulated through the roadways to service the proposed lots at Oakdale West.

Similarly, NBN pit and pipe will be extended along Road 8 from the WNSLR as part of Modification No. 6.

6.3 Gas

To service Oakdale West, empty conduits will be reticulated through the roadways to service the proposed lots to provision for potential future gas. This will continue along Road 8. Modification No. 6 causes no impact of existing gas infrastructure.

6.4 Electrical

Modification No. 6 proposes no change to the agreement with Endeavour Energy for the provision of the land and infrastructure to facilitate the new South Erskine Park Zone Substation or connections to existing electrical infrastructure in the interim.

A new reticulation design has been completed and will be submitted with Endeavour Energy to follow the new Road 8 alignment and provide services and streetlighting for its entire length.

6.5 Conclusion

To facilitate the works for Modification No. 6, the services designs approved by utilities stakeholders will require to be extended under a new application to each service authority. There is no change to the existing infrastructure surrounding the site, however only additions for the serving of Road 8.

Internal reticulation will be coordinated at the Construction Certificate (CC) stage of works and applications to the relevant authorities.

7 Infrastructure Staging

7.1 Staging

Modification No. 6 of the Stage 1 Development Approval, includes the additional infrastructure:

- Construction of Road 8;
- Stormwater infrastructure associated with Road 8;
- Landscaping and public domain works within Road 8;
- Utility services to service Road 8 and Precinct 5;
- Temporary facilities and access tracks to support the Stage 2 building DA works.

The construction activities for Modification No. 6 are an extension of the existing scope of work and therefore fall within the staging and activity classifications covered in the original SSDA engineering report.

Refer to civil drawings C0004 for Modification No. 6 civil infrastructure works extent.
There are no changes to previously approved works existing easements on the lands defined in the SSDA 7348, including Transgrid easements through the site.

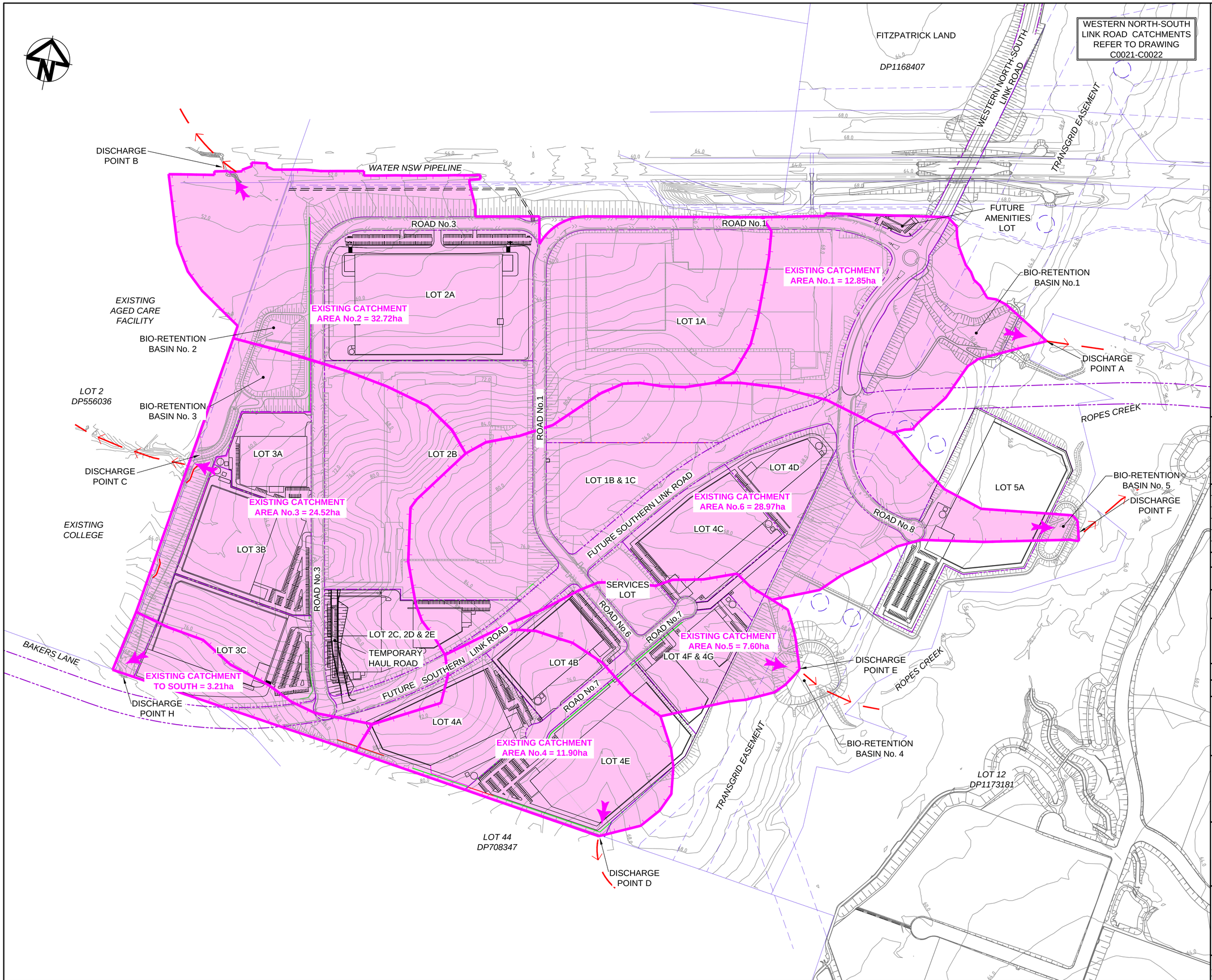
7.2 Transgrid

As stated above, Road 8 has always been considered in the assessment of SSDA 7348. Transgrid original consultation and requirements are still applicable as their development guideline. These requirements, such as limiting height of streetlighting to 4.3m, are incorporated into design.

The Road 8 design is not changed in any major way, as it is not more just an inclusion to be built in Stage 1 of construction. Transgrid will however likely review again and provide additional comments to this consent. In consultation, the developer will be urging Transgrid to look at the modification only and not reassess the entire development which is already approved.

Appendix A

Proposed Site Catchment Plans



LEGEND

- EXISTING BOUNDARY
- EXISTING EASEMENT
- PROPOSED BOUNDARY
- EXISTING STORMWATER FLOW PATH
- EXISTING STORMWATER CATCHMENT BOUNDARY
- FLOW DIRECTION

Bar Scales

0 50 100 150 200 250

1 : 3000 @ A1

Issue	Description	Date
A9	ISSUED FOR SSD APPROVAL MOD 6	20-10-20
A8	ISSUED FOR SSD APPROVAL MOD 3	06-12-19
A7	ISSUED FOR INFORMATION MOD 3	19-11-19
A6	ISSUED FOR INFORMATION MOD 3	12-11-19
A5	ISSUED FOR SSD APPROVAL MOD 2	24-07-19
A4	ISSUED FOR INFORMATION MOD 2	07-06-19

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A1

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Project
PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title
STORMWATER DRAINAGE CATCHMENT PLAN (PRE-DEVELOPED)

Drawing No.	Project No.	Issue
15-272-C0007	15-272	A9

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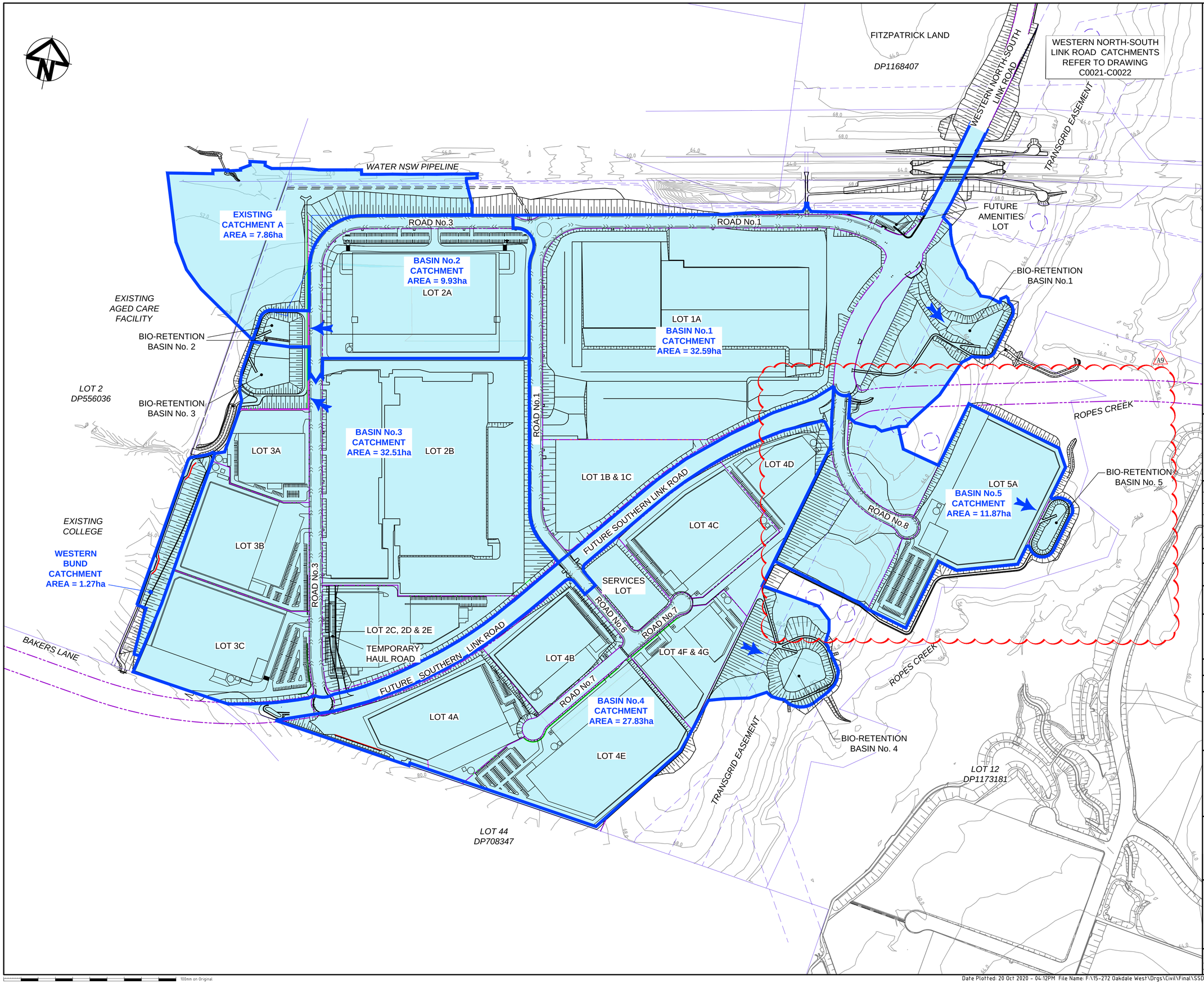

LEGEND

- EXISTING BOUNDARY
- EXISTING EASEMENT
- PROPOSED BOUNDARY
- STORMWATER CATCHMENT BOUNDARY
- FLOW DIRECTION

Bar Scales

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1 : 3000 @ A1

Issue	Description	Date
A9	ISSUED FOR SSD APPROVAL MOD 6	20-10-20
A8	ISSUED FOR SSD APPROVAL MOD 3	06-12-19
A7	ISSUED FOR INFORMATION MOD 3	19-11-19
A6	ISSUED FOR INFORMATION MOD 3	12-11-19
A5	ISSUED FOR SSD APPROVAL MOD 2	24-07-19
A4	ISSUED FOR INFORMATION MOD 2	07-06-19

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Client: Goodman

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Project: PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title: STORMWATER DRAINAGE CATCHMENT PLAN (DEVELOPED)

Drawing No.	Project No.	Issue
15-272-C0008	15-272	A9

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Appendix B

AT&L – Updated Drawings List of Civil Works

0000 SERIES - MASTER PLAN PACKAGE	
DRAWING No.	DRAWING TITLE
15-272-C0000	COVER SHEET
15-272-C0001	GENERAL ARRANGEMENT MASTER PLAN
15-272-C0002	EXISTING SITE PLAN
15-272-C0003	PRECINCT PLAN
15-272-C0004	STAGE 1 SSD APPROVAL EXTENTS SHEET 1 OF 2
15-272-C0005	STAGE 1 SSD APPROVAL EXTENTS SHEET 2 OF 2
15-272-C0006	CUT\FILL PLAN
15-272-C0007	STORMWATER DRAINAGE CATCHMENT PLAN (PRE-DEVELOPED)
15-272-C0008	STORMWATER DRAINAGE CATCHMENT PLAN (DEVELOPED)
15-272-C0009	EROSION AND SEDIMENT CONTROL MASTER PLAN
15-272-C0010	TYPICAL SECTIONS SHEET 1
15-272-C0011	TYPICAL SECTIONS SHEET 2
15-272-C0012	TYPICAL SECTIONS SHEET 3
15-272-C0013	TYPICAL SECTIONS SHEET 4
15-272-C0020	WESTERN NORTH-SOUTH LINK ROAD GENERAL ARRANGEMENT PLAN
15-272-C0021	WESTERN NORTH-SOUTH LINK ROAD STORMWATER DRAINAGE CATCHMENT PLAN (PRE-DEVELOPED)
15-272-C0022	WESTERN NORTH-SOUTH LINK ROAD STORMWATER DRAINAGE CATCHMENT PLAN (DEVELOPED)
15-272-C0023	WESTERN NORTH-SOUTH LINK ROAD PROPOSED LAND ACQUISITION PLAN

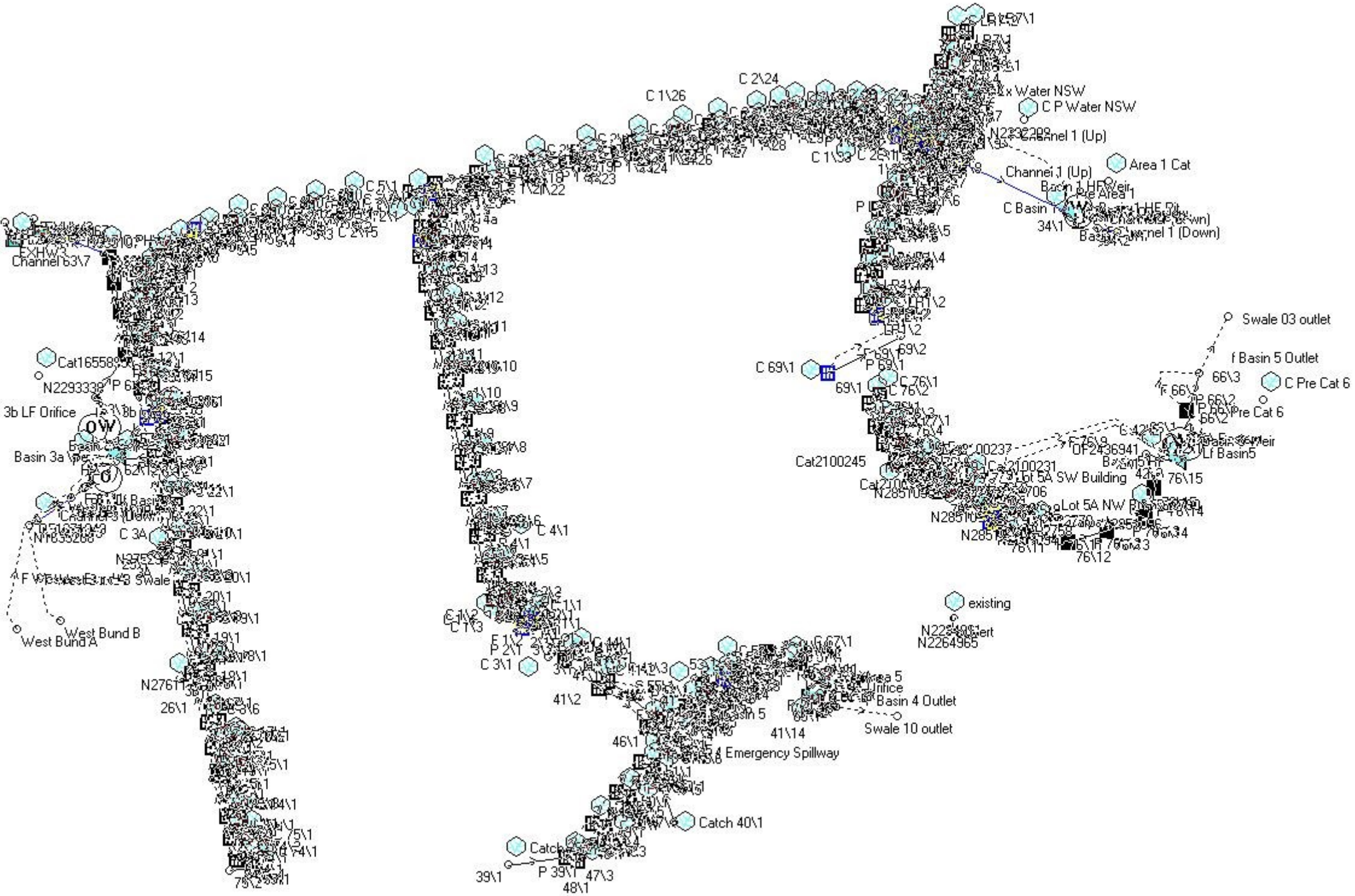
1000 SERIES - INFRASTRUCTURE PACKAGE	
DRAWING No.	DRAWING TITLE
15-272-C1000	COVER SHEET
15-272-C1001	DRAWING LIST
15-272-C1002	GENERAL NOTES
15-272-C1003	PRECINCT GENERAL ARRANGEMENT PLAN
15-272-C1004	TYPICAL SITE SECTIONS SHEET 1 OF 6
15-272-C1005	TYPICAL SITE SECTIONS SHEET 2 OF 6
15-272-C1006	TYPICAL SITE SECTIONS SHEET 3 OF 6
15-272-C1007	TYPICAL SITE SECTIONS SHEET 4 OF 6
15-272-C1008	TYPICAL SITE SECTIONS SHEET 5 OF 6
15-272-C1009	TYPICAL SITE SECTIONS SHEET 6 OF 6
15-272-C1010	TYPICAL ROAD SECTIONS
15-272-C1011	CONTOUR PLAN
15-272-C1014	BULK EARTHWORKS CUT\FILL PLAN
15-272-C1015	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 1 OF 20
15-272-C1016	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 2 OF 20
15-272-C1017	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 3 OF 20
15-272-C1018	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 4 OF 20
15-272-C1019	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 5 OF 20
15-272-C1020	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 6 OF 20
15-272-C1021	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 7 OF 20
15-272-C1022	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 8 OF 20

15-272-C1023	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 9 OF 20
15-272-C1024	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 10 OF 20
15-272-C1025	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 11 OF 20
15-272-C1026	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 12 OF 20
15-272-C1027	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 13 OF 20
15-272-C1028	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 14 OF 20
15-272-C1029	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 15 OF 20
15-272-C1030	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 16 OF 20
15-272-C1031	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 17 OF 20
15-272-C1032	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 18 OF 20
15-272-C1033	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 19 OF 20
15-272-C1034	EARTHWORKS AND STORMWATER DRAINAGE PLAN SHEET 20 OF 20
15-272-C1040	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 1 OF 18
15-272-C1041	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 2 OF 18
15-272-C1042	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 3 OF 18
15-272-C1043	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 4 OF 18
15-272-C1044	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 5 OF 18
15-272-C1045	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 6 OF 18
15-272-C1046	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 7 OF 18
15-272-C1047	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 8 OF 18
15-272-C1048	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 9 OF 18
15-272-C1049	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 10 OF 18
15-272-C1050	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 11 OF 18
15-272-C1051	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 12 OF 18
15-272-C1052	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 13 OF 18
15-272-C1053	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 14 OF 18
15-272-C1054	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 15 OF 18
15-272-C1055	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 16 OF 18
15-272-C1056	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 17 OF 18
15-272-C1057	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 18 OF 18
15-272-C1060	ROAD LONGITUDINAL SECTIONS SHEET 1 OF 7
15-272-C1061	ROAD LONGITUDINAL SECTIONS SHEET 2 OF 7
15-272-C1062	ROAD LONGITUDINAL SECTIONS SHEET 3 OF 7
15-272-C1063	ROAD LONGITUDINAL SECTIONS SHEET 4 OF 7
15-272-C1064	ROAD LONGITUDINAL SECTIONS SHEET 5 OF 7
15-272-C1065	ROAD LONGITUDINAL SECTIONS SHEET 6 OF 7
15-272-C1066	ROAD LONGITUDINAL SECTIONS SHEET 7 OF 7
15-272-C1070	WESTERN BOUNDARY LAYOUT AND SECTIONS
15-272-C1071	SOUTHERN BOUNDARY LAYOUT AND SECTIONS
15-272-C1080	BIO-RETENTION BASIN 2 AND 3 DETAIL PLAN SHEET 1 OF 2
15-272-C1081	BIO-RETENTION BASIN 2 AND 3 DETAIL PLAN SHEET 2 OF 2
15-272-C1082	BIO-RETENTION BASIN 4 DETAIL PLAN SHEET 1 OF 2
15-272-C1083	BIO-RETENTION BASIN 4 DETAIL PLAN SHEET 2 OF 2
15-272-C1084	BIO-RETENTION BASIN 5 DETAIL PLAN
15-272-C1086	STORMWATER DRAINAGE CATCHMENT PLAN (PRE-DEVELOPED)
15-272-C1087	STORMWATER DRAINAGE CATCHMENT PLAN (POST-DEVELOPED)
15-272-C1090	RETAINING WALL GENERAL ARRANGEMENT PLAN
15-272-C1091	RETAINING WALL PROFILES SHEET 1 OF 9

15-272-C1092	RETAINING WALL PROFILES SHEET 2 OF 9
15-272-C1093	RETAINING WALL PROFILES SHEET 3 OF 9
15-272-C1094	RETAINING WALL PROFILES SHEET 4 OF 9
15-272-C1095	RETAINING WALL PROFILES SHEET 5 OF 9
15-272-C1096	RETAINING WALL PROFILES SHEET 6 OF 9
15-272-C1097	RETAINING WALL PROFILES SHEET 7 OF 9
15-272-C1098	RETAINING WALL PROFILES SHEET 8 OF 9
15-272-C1099	RETAINING WALL PROFILES SHEET 9 OF 9
15-272-C1110	STAGE 1 SERVICES AND UTILITIES COORDINATION PLAN SHEET 1 OF 6
15-272-C1111	STAGE 1 SERVICES AND UTILITIES COORDINATION PLAN SHEET 2 OF 6
15-272-C1112	STAGE 1 SERVICES AND UTILITIES COORDINATION PLAN SHEET 3 OF 6
15-272-C1113	STAGE 1 SERVICES AND UTILITIES COORDINATION PLAN SHEET 4 OF 6
15-272-C1114	STAGE 1 SERVICES AND UTILITIES COORDINATION PLAN SHEET 5 OF 6
15-272-C1115	STAGE 1 SERVICES AND UTILITIES COORDINATION PLAN SHEET 6 OF 6
15-272-C1120	EXISTING TRANSGRID OVERHEAD ELECTRICAL CABLES PLAN
15-272-C1121	EXISTING TRANSGRID OVERHEAD ELECTRICAL CABLES LONGITUDINAL SECTIONS
15-272-C1122	EXISTING TRANSGRID OVERHEAD ELECTRICAL CABLES TYPICAL SECTIONS SHEET 1 OF 2
15-272-C1123	EXISTING TRANSGRID OVERHEAD ELECTRICAL CABLES TYPICAL SECTIONS SHEET 2 OF 2
15-272-C1130	EROSION AND SEDIMENT CONTROL PLAN SHEET 1 OF 7
15-272-C1131	EROSION AND SEDIMENT CONTROL PLAN SHEET 2 OF 7
15-272-C1132	EROSION AND SEDIMENT CONTROL PLAN SHEET 3 OF 7
15-272-C1133	EROSION AND SEDIMENT CONTROL PLAN SHEET 4 OF 7
15-272-C1134	EROSION AND SEDIMENT CONTROL PLAN SHEET 5 OF 7
15-272-C1135	EROSION AND SEDIMENT CONTROL PLAN SHEET 6 OF 7
15-272-C1136	EROSION AND SEDIMENT CONTROL PLAN SHEET 7 of 7
15-272-C1137	EROSION AND SEDIMENT CONTROL DETAILS

Appendix C

DRAINs Model


C 1\26
C 2\24
C P Water NSW
Channel 1 (Up)
Area 1 Cat
Channel 1 (Up)
C Basin
Channel 1 (Down)
Channel 63\7
Swale 03 outlet
f Basin 5 Outlet
C Pre Cat 6
Pre Cat 6
C 69\1
Cat165558
3b LF Orifice
Basin 3a
Cat2100245
Lot 5A SW Building
Lot 5A NW
LF Basin5
C 3A
Swale
West Bund B
West Bund A
existing
N2264965
C 3\1
41\2
Basin 4 Outlet
Swale 10 outlet
41\14
46\1
Emergency Spillway
Catch 40\1
39\1
P 39\1
47\3
48\1
26\1