

Oakdale West Estate Development Kemps Creek

Civil, Stormwater and Infrastructure Services Report DA Modification No. 3

CLIENT/ GOODMAN PROPERTY SERVICES (AUST) PTY LTD

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Appendix D – MUSIC Model & Results
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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 two Modifications have been lodged after. This report is for the Modification No. 3 changes requested to the development consent.

Purpose of Report:

This 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 revision of the report covers the civil, stormwater and infrastructure, revised in response to the SEARS updated for Modification No. 3.

The report outlines changes to the proposed components of the design including, Civil Design and Infrastructure, Road geometry and pavement design and Sedimentation and Erosion Control, Stormwater Management (On Site Detention, Piped and Overland Flows, Water Sensitive Urban Design) and Staging.

This SSDA Modification (No. 3) seeks approval for:

- Changes in arrangement and level of Precinct 2 and 3 allotments and on-lot design;
- Consequent changes to infrastructure to support Precinct 2 and 3 changes including bulk earthworks, retaining walls, stormwater, essential services and driveways for Precinct 2 building pads.

Compliance with Secretary's Environmental Assessment Reports (SEARs)

This report responds to the SEAR's issued by the NSW Department of Planning, Industry and Environment in November 2019. Table 1 below summaries all key civil / infrastructure issues raised in the SEAR's and how they have been addressed within this report.

Key Issue	Response
Soils and Water	
Justify the need for any additional fill, detail the resulting finished ground levels and describe any changes to the approved drainage design;	Additional fill for Modification No. 3 has been minimized using the constraints listed in Section 2 of this report.
A detailed and consolidated site water balance	Section 7 of the SSDA engineering report includes all site water balance details, water supply source, usage calculations and efficiency measures. Section 7 of this report explains no change for Modification No. 3
Assessment of potential impacts on surface and groundwater sources (quality and quantity), soil (including contamination, salinity and acid sulphate soil), related infrastructure, watercourses;	Assessment of potential impacts is completed in Section 3 of the SSDA engineering report. Changes to these impacts as a result of Modification No. 3 are shown in Section 3 of this report.
Describe surface and stormwater management measures designed in accordance with Penrith City Council's Water Sensitive Urban Design Policy and	A detailed description of all Stormwater Management including WSUD design principles is included within Section 6 of the SSDA and

principals, including drainage design, on-site detention, measures to treat or reuse water, and proposed uses of potable and non-potable waters	subsequent Modifications engineering reports. Parts of these measures that have changed for Modification No. 3 are described in Section 6 of this report.
A description of the proposed erosion and sediment controls during construction and operational phases of the development; and	A detailed description of the Erosion and Sediment Control measures is included within Section 3 of the SSDA and subsequent modification engineering reports. Changes to measures for Modification No. 3 are in Section 3 of this report.
Details of impact mitigation, management and monitoring measures.	A summary of the mitigation, management and monitoring measures is included within Section 3 of the SSDA and subsequent modification engineering reports. Changes to measures for Modification No. 3 are in Section 3 of this report. The CEMP developed for works in SSDA 7348 describes in detail all of the measures and will be updated prior to construction of Modification No. 3 works.
Infrastructure Requirements	
details of infrastructure required on the site and identification of any upgrades required to facilitate the development;	Refer to Section 9 within this report
details of any impacts on existing easements;	Refer to Section 9 within this report
an assessment of the impacts of the development (construction and operation) on existing infrastructure surrounding the site;	Refer to Section 8 & 9 in this report showing no changes to the existing surrounding infrastructure.
an assessment of any other risks to the integrity and security of the Water NSW pipelines corridor that may result from the development and the proposed measures to be taken to mitigate those risks and impacts including vibration on the pipelines, soil and water, and infrastructure interaction with the pipelines corridor; and	Summary of assessment of risks to Water NSW as a result of Modification No. 3 is completed in Section 9.2 of this report.
an assessment of the impacts of the development on drainage paths, in particular Ropes Creek and the impacts on the pipelines and associated corridors	Refer Section 9 and Section 3 of this report confirm no increased impact on drainage paths and Ropes Creek.

Table 1 - SEARS Compliance

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. 3 changes to the infrastructure design of the approved development.

The report responds to the Secretary's Environmental Assessment Requirements (SEARs) as they relate to Civil and Infrastructure, specifically as outlined in the SEAR Compliance Table above.

This SSDA Modification (No. 3) seeks approval for:

- Changes in arrangement and level of Precinct 2 and 3 allotments and on-lot design;
- Consequent changes to infrastructure to support Precinct 2 and 3 changes including bulk earthworks, retaining walls, stormwater, essential services and driveways for Precinct 2 building pads.

For Modification No. 3 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.

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. 3 including:

- Earthworks;
- Sedimentation and Erosion Control;
- Retaining Walls;
- Road Design;
- Stormwater Management;
- Servicing;
- Infrastructure Staging; and
- Water NSW impacts.

The proposed site plan covering the entire Oakdale West development along with all proposed lot layouts are attached within Appendix A. The changes to the masterplan can be seen in the two figures below.

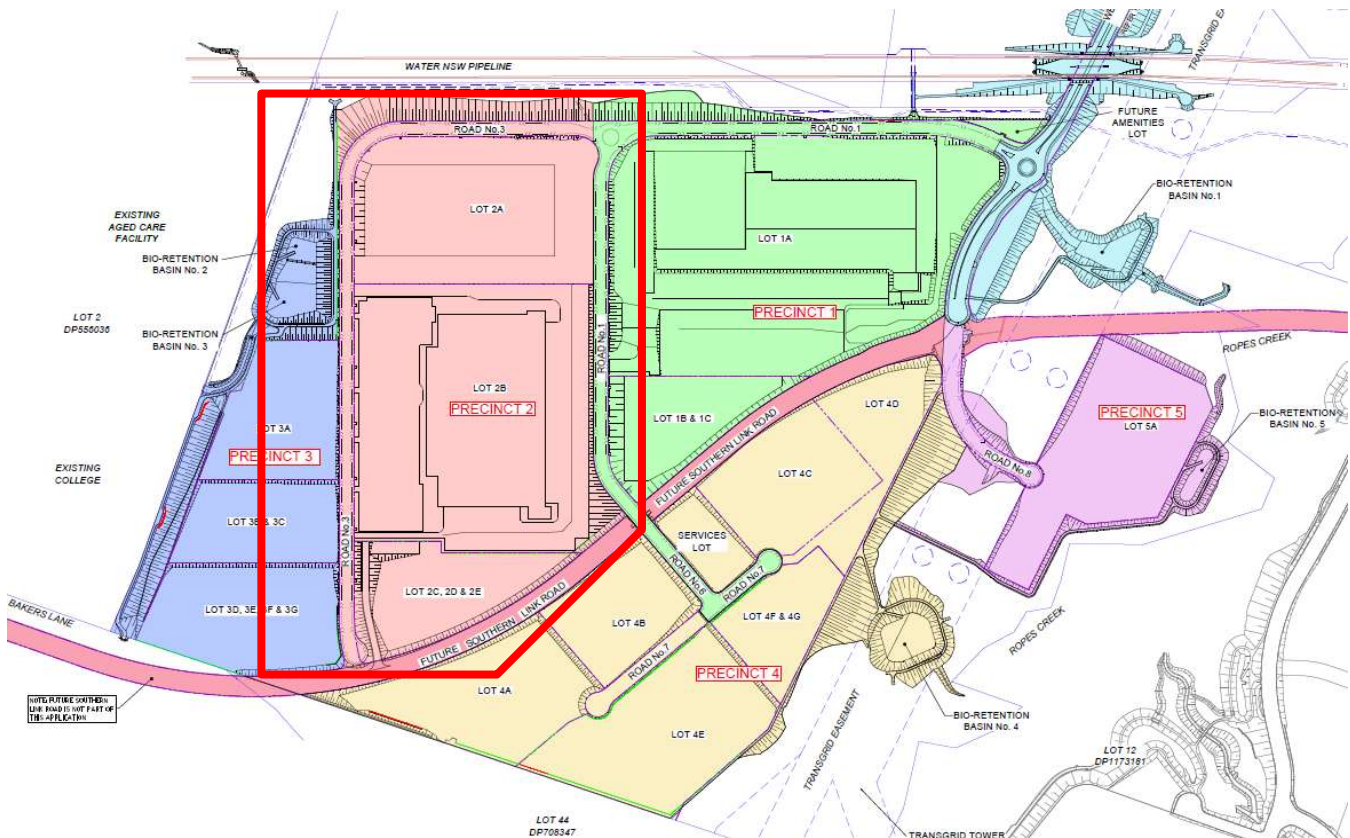


Figure 1 – Modification No. 3 Masterplan (changes highlighted in red)

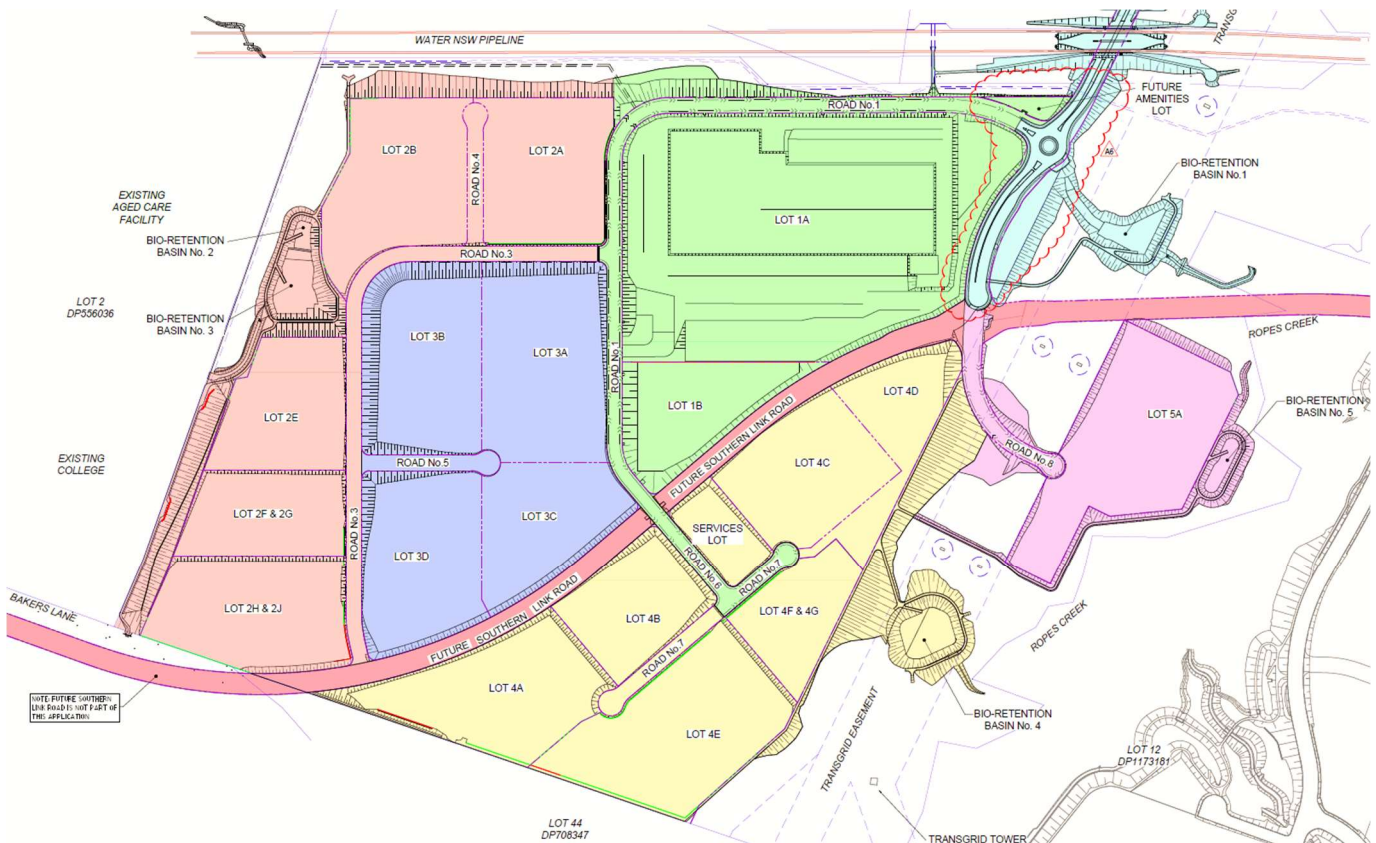


Figure 2 – Modification No. 2 Masterplan (for comparison)

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2 Earthworks

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

Subsequent to the Stage 1 consent and previous Modifications, the Precinct 2 & 3 areas are now reconfigured to suit a specific customer commitment which changes earthworks levels/shape, which informed the civil design. The earthworks design for Modification No. 3 was undertaken using the following considerations:

- Minimise the fill importation volumes where possible below the SSDA 7348 Modification No. 1 approval, which was the largest quantity of fill approved for the project;
- Minimise the height or necessity of retaining walls;
- Minimise earthworks cut in unclassified rock;
- Maximising the accessibility of the future lots along their respective facing roads.

Ultimately the pad levels were selected using the above limitations and retaining walls modified to the positions and heights as shown on the drawings. 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) and Modification No. 2 (632,387m³). The import volume remains less the Modification No. 1 approved value.

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	-412,468	561,821	78,999	3,844
2	-33,394	-5,795	-1,129,837	892,682	-276,343	41,304
3	-12,361	-6,166	-108,546	447,377	320,304	28,616
4	-18,631	-17,896	-205,979	733,279	490,773	36,152
5	-4,516	-16,247	-2,974	172,957	149,220	836
WNSLR STOCKPILE	-	-	-	-83,332	-83,332	-
TOTAL	-112,249	-73,111	-1,859,804	2,724,785	679,620	110,752

Table 2 – 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

As currently approved, no importation of general fill will be undertaken via Bakers lane. Fill importation will be completed via the WNSLR in accordance with a Construction Traffic Management Plan (CTMP) to be prepared and approved by the Secretary prior to commencement of construction. All infrastructure and precinct 1 above ground building materials will brought in through Baker's Lane, and this now includes the building materials for the Stage 2 Building (Building 2B, the subject of SSD 10397) submitted with Modification No. 3.

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, and those proposed to be modified via Modifications No. 1 and 2.

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. 3.

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. 3.

Refer to AT&L Drawings C1130 - C1137 for Erosion and Sediment Control Plans updated for this proposal, for all 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. 3. However due to reconfiguration of development lots, the temporary sediment basins in Precinct 2 and Precinct 3 have changed. The table below shows the temporary basin design for Modification No. 2 and then directly below, the revised equivalent basin for the Modification No. 3 proposal.

Parameter	Basin 2A	Basin 2B	Basin 2E	Basin 3D	Basin 3A	Basin 3B	Basin 3C	Basin 2F	Basin 2H
Volumetric Runoff Coefficient, C_v	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Contributing Area, A (ha)	4.578	4.598	10.86	4.232	4.951	3.785	4.118	3.325	3.798
$R_{(85\%ile, 5\ day)}$	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Settling Zone Volume, (m ³)	801	805	1,900	741	866	622	721	582	665
Sediment Storage Zone Volume, (m ³)	401	402	950	370	433	331	360	291	332
Total Sediment Basin Volume, (m ³)	1,202	1,207	2,851	1,111	1,300	994	1081	873	997
Parameter Above Now MOD 3:	Basin 2A		Basin 3A	Basin 2C	Basin 2B (North)		Basin 2B (South)	Basin 3B&C	Basin 3D&E
Volumetric Runoff Coefficient, C_v	0.50		0.50	0.50	0.50		0.50	0.50	0.50
Contributing Area, A (ha)	8.058		3.595	3.804	6.362		8.564	2.996	4.567
$R_{(85\%ile, 5\ day)}$	35.00		35.00	35.00	35.00		35.00	35.00	35.00
Settling Zone Volume, (m ³)	1,411		630	666	1,114		1,498	525	800
Sediment Storage Zone Volume, (m ³)	706		315	333	557		749	262	400
Total Sediment Basin Volume, (m ³)	2,117		945	999	1,617		2,248	787	1,200

Table 3 – Precinct Temporary Sediment Basins Changes in Modification No. 3

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.

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4 Retaining Walls

4.1 Retaining Walls

Retaining walls have been relocated and reprofiled to suit the amended layout where required for Modification No. 3. The changes can be seen in the two figures below, with changes indicated in pink. The revised retaining wall design is shown on drawing C1090-C1098. These have been updated for the entire estate for coordination purposes associated with delivery of the Stage 1 consent (as modified). The detailing and specifications of walls remain the same as original approval.

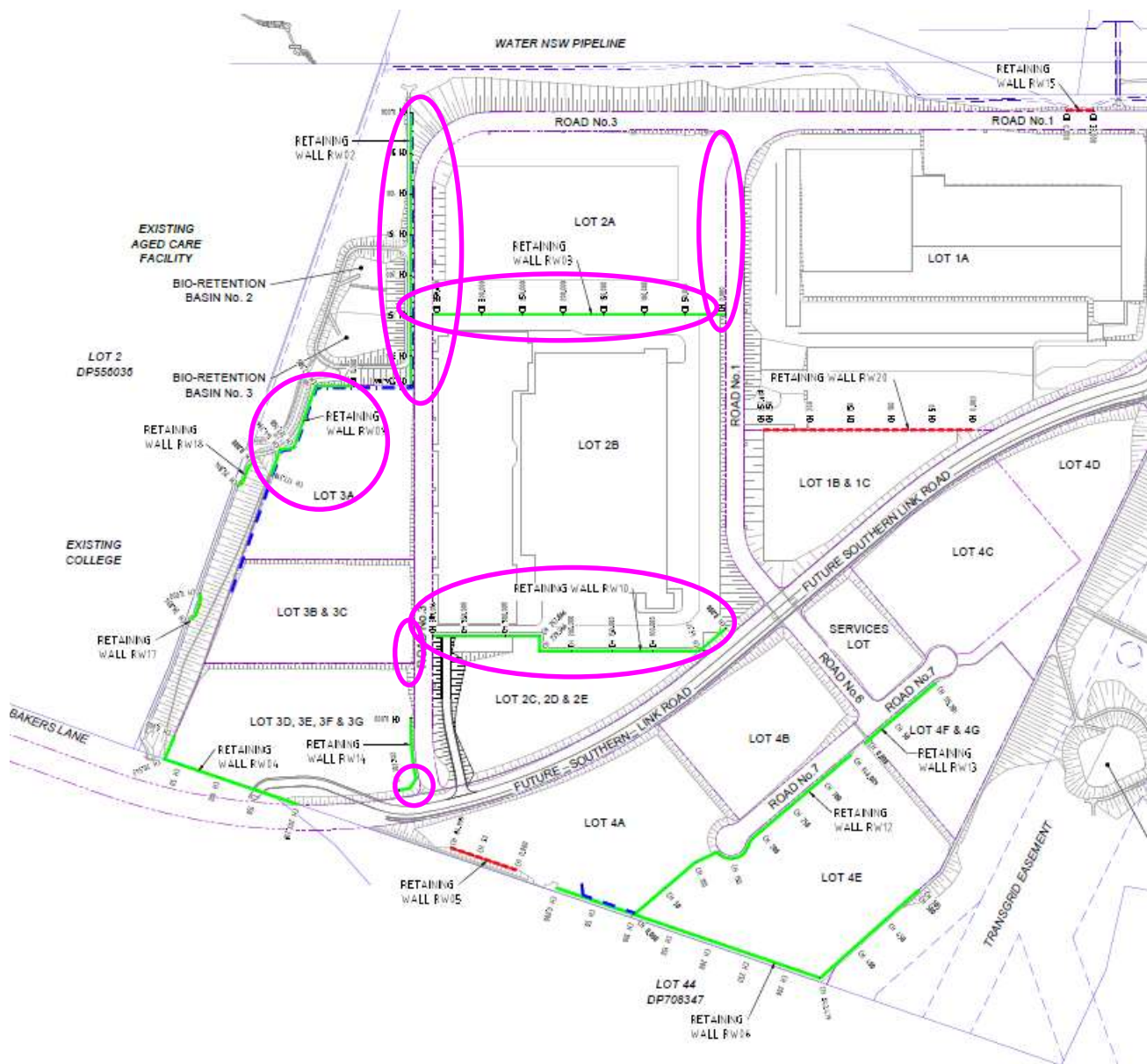


Figure 3 – Changes to Retaining Wall Locations Proposed for Modification No. 3

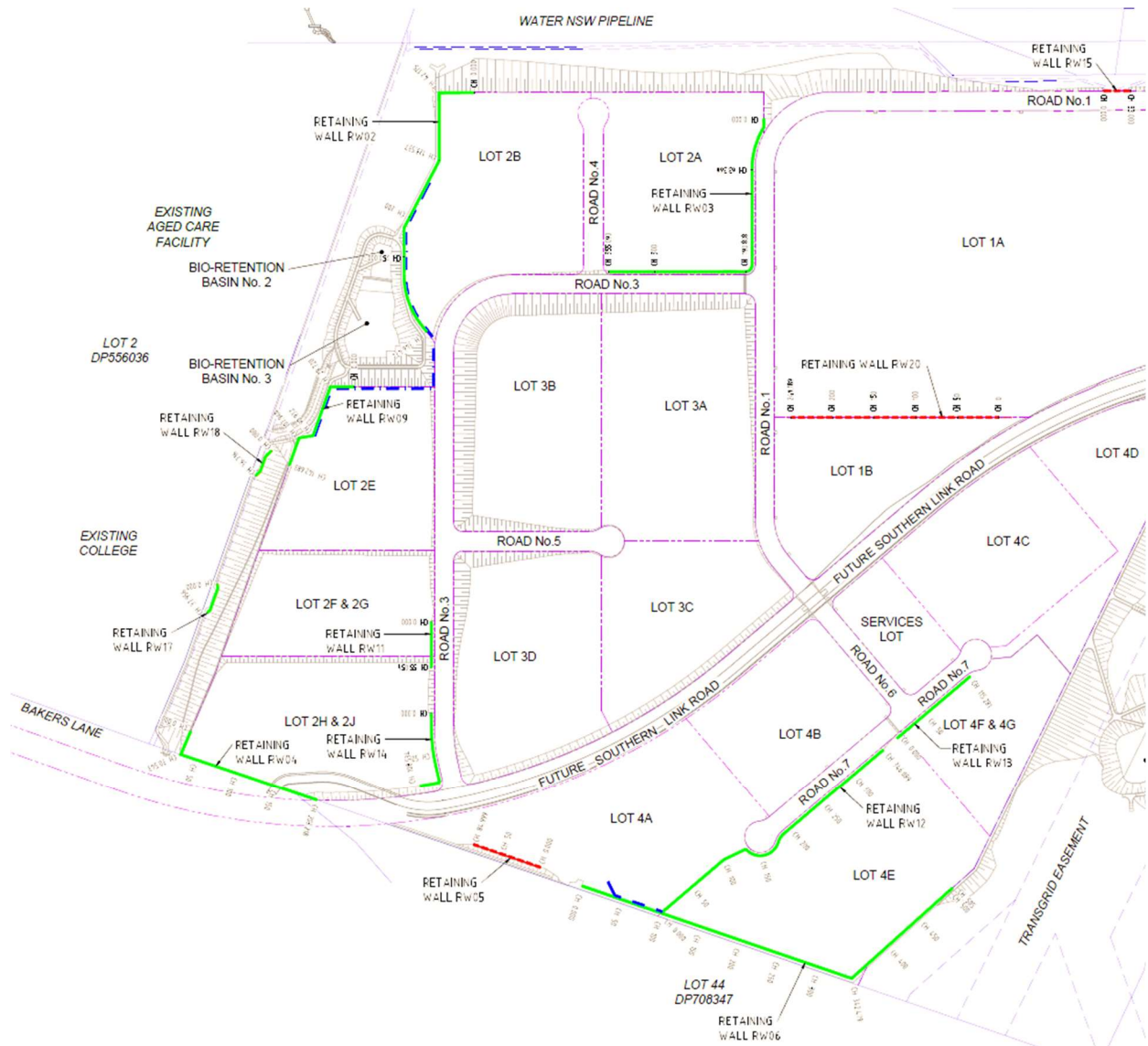


Figure 4 – Previous Retaining Wall Locations as per Modification No. 2

5 Road Design

5.1 Horizontal and Vertical Geometry

The design of estate roads within Oakdale West Estate have changed to accommodate the Lot 2B user. This includes introduction of a roundabout at the corner of Road 1, realignment of Road 3, and deletion of Road 4 and Road 5. The updated road design for the estate is shown on drawings C1040-C1055. These have been updated for the entire estate for coordination purposes associated with delivery of the Stage 1 consent (as modified). The changes to the civil road design are summarised in the figure below, with the blue overlay showing the original layout on top of the Modification No. 3 proposed design for Precinct 2 and 3.

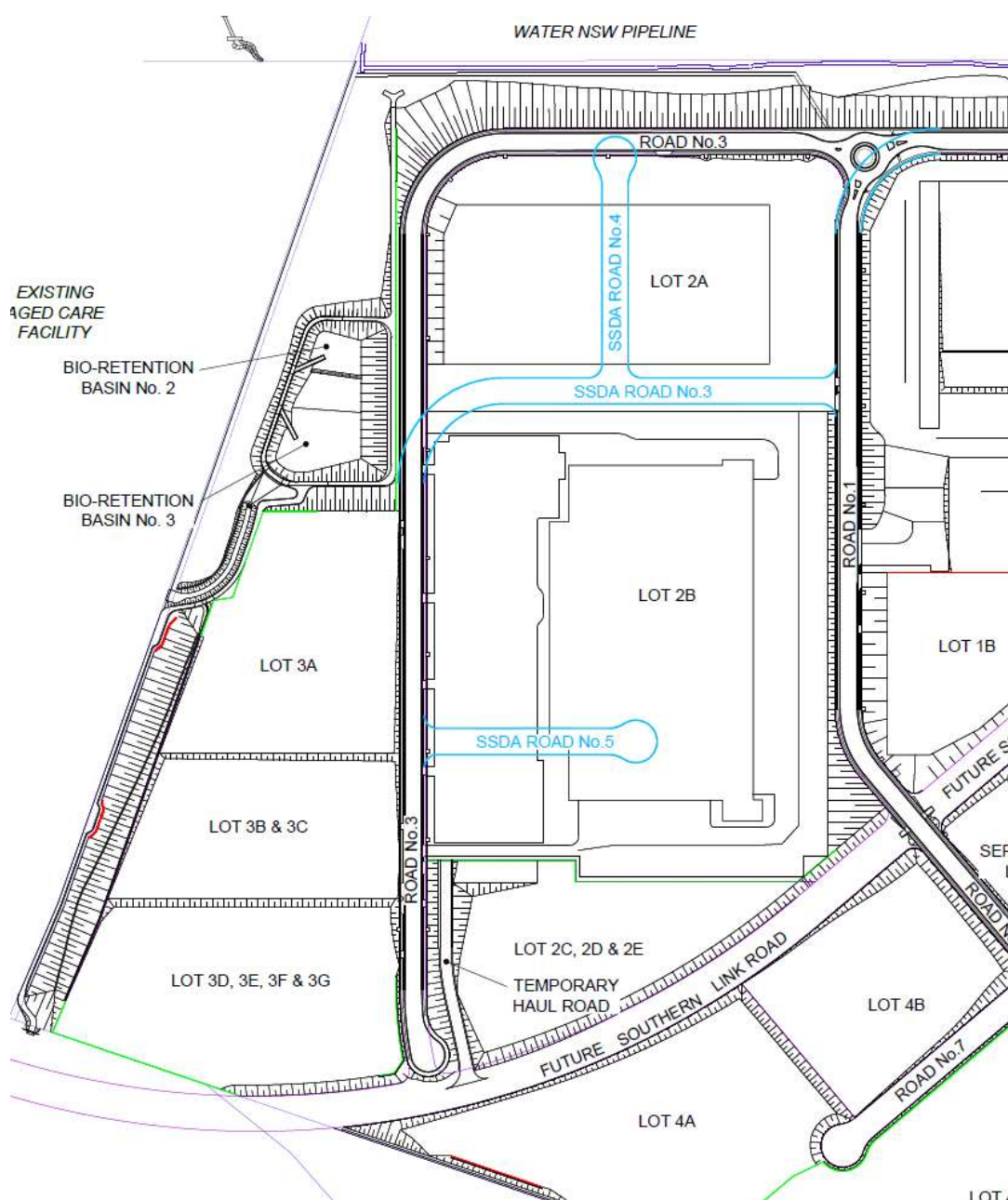


Figure 5 – Modification No. 3 Design with Overlay of SSDA Road Network

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5.2 Pavement

No change to road pavement design.

5.3 Conclusion

All road design as demonstrated through Modification No. 3 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.

6 Stormwater Management

6.1 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.

6.2 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. 3 redesign, this remains the case. Stormwater is now formalised on Road 3 which to be built concurrently with Road 1 rather than in a future stage. Comprehensive estate wide drainage design has been provided in Drawings C1110-C1115. These have been updated for the entire estate for coordination purposes associated with the deliver of the Stage 1 consent (as modified).

6.3 Council Requirements & Recommendations

All estate level stormwater drainage for the Modification No. 3 is designed to comply with the Penrith City Council Guidelines listed in the original report.

6.3.1 Modelling Software

Changes to stormwater system design for Modification No.3 is modelled. Updated DRAINs data files and output results are attached in Appendix C. Updated MUSIC modelling is summarised below. MUSIC data files and output results are attached in Appendix D.

6.3.2 Catchments

A Stormwater Catchment Plan for each Catchment and flow paths into the bio-retention basins are shown in Appendix A. The demarcation between designed Catchments 2 and 3 have been realigned to suite the Modification No. 3 design. The differences are described below in comparison to Modification No. 2:

Catchment 2

Total area is increased from 4.85Ha to 9.93Ha; includes the new Lot 2A and part of Road 3 or (old 2A and 2B amalgamated), however the outlet flow path remains the same.

Catchment 3

Total area is reduced from 38.31Ha to 32.51Ha; including the new Lots 2B, 2C, 3A, 3B&C, 3D&E and rest of Road 3 (old Lots 2A, 2E, 2F, 2G, 2H, 2J, 3A, 3B, 3C and 3D), however the outlet flow path remains the same.

6.3.3 On-Site Detention (OSD)

A summary of the OSD requirements for each discharge point and associated catchment areas that have changed in Modification No. 3 are shown in Table 4 and 5 below. The changes are specifically to Basins 2 and 3; an overlay sketch is shown in the figure below reveal changes.

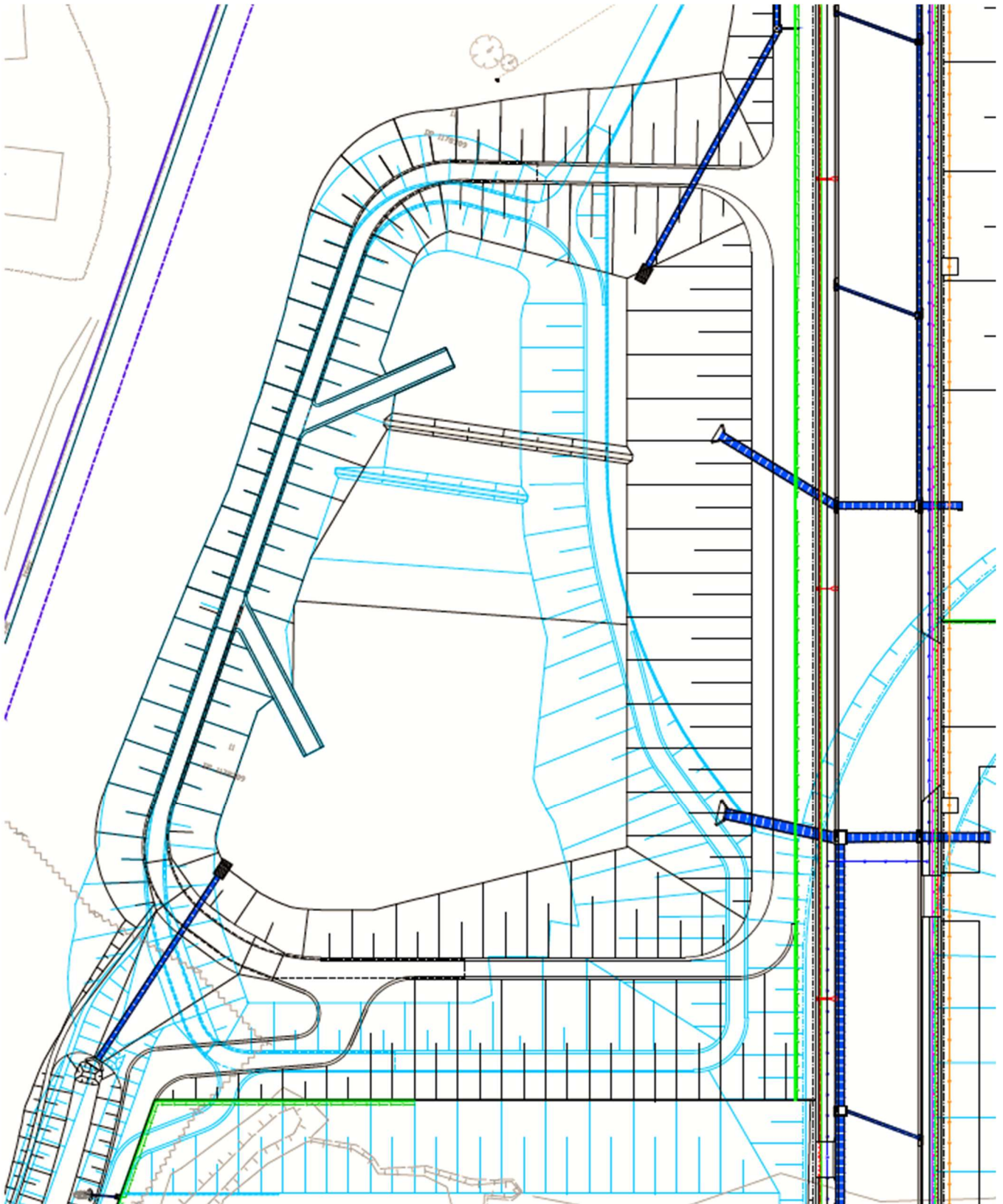


Figure 6 – Modification No. 3 Basin 2&3 Overlay with previous Design

Discharge Point B

OSD Basin no 2 has increased in volume from 14,778 m³ to 15,968m³ (capacity of the basin from extended detention RL 58.00 to Top Water Level of basin RL 59.70, including volume of basin no 3)

Duration	Pre-Developed Flows (m ³ /s)	MOD 2 Post Developed Flows (m ³ /s)	MOD 3 Post Developed Flows (m ³ /s)
1-Year ARI	0.873	0.831	0.837
2-Year ARI	2.7	1.82	1.61
5-Year ARI	5.3	3.54	3.25
10-Year ARI	6.25	4.15	4.01
20-Year ARI	7.49	4.48	4.48
100-Year ARI	9.75	5.03	5.21

Table 4 – Pre-Post Developed Flows to Discharge Point B for MOD 3 (Compared to MOD 2)

Discharge Point C

OSD Basin no 3 has increased in volume from 14,778 m³ to 15,968m³ (capacity of the basin from extended detention RL 58.00 to weir of basin RL 59.70, including volume of basin no 2)

Duration	Pre-Developed Flows (m ³ /s)	MOD 2 Post Developed Flows (m ³ /s)	MOD 3 Post Developed Flows (m ³ /s)
1-Year ARI	0.654	0.590	0.579
2-Year ARI	2.02	0.814	0.699
5-Year ARI	3.97	1.97	1.78
10-Year ARI	4.68	2.71	2.44
20-Year ARI	5.61	3.85	3.54
100-Year ARI	7.31	4.89	4.3

Table 5 – Pre-Post Developed Flows to Discharge Point C for MOD 3 (Compared to MOD 2)

6.3.4 Overland Flows

Overland flow paths are unchanged in Modification No. 3

6.3.5 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 have remained the same for the Modification No. 3 changes, which are detailed below in comparison to Modification No. 2.

6.3.5.1 Results

MUSIC modelling has been updated to suit the amended catchments and results presented as mean annual loads at the receiving node indicate that adopted target reductions are achieved. The only change proposed in Modification No. 3 is the rebalance of Basin's 2 and 3 inflows to suit the realigned divide between these two catchments.

The total resultant pollutant reduction remains above the target requirement. The specific changes in rebalancing catchments are compared below, where the increase in sources to Basin 2 is approximately the same in the reduction in Basin 3 sources.

Pollutant	Sources (Kg/yr)	Residual Load (Kg/yr)	Reduction (%)	Target Reduction (%)
Total Suspended Solids	1,900	157	91.7	85
Total Phosphorus	5.02	1.75	65.1	60
Total Nitrogen	56.5	21.0	62.7	45
Gross Pollutants	735	0.773	99.9	90

Table 6 - Pollutant Loads - Bioretention Basin 2 (MOD 2)

Pollutant	Sources (Kg/yr)	Residual Load (Kg/yr)	Reduction (%)	Target Reduction (%)
Total Suspended Solids	6,020	786	86.9	85
Total Phosphorus	12.9	4.45	65.5	60
Total Nitrogen	113	51.8	54.1	45
Gross Pollutants	1,480	15.6	98.9	90

Table 7 - Pollutant Loads - Bioretention Basin 2 (MOD 3 Changes)

Pollutant	Sources (Kg/yr)	Residual Load (Kg/yr)	Reduction (%)	Target Reduction (%)
Total Suspended Solids	23,600	3,010	87.3	85
Total Phosphorus	52.7	18.5	64.9	60
Total Nitrogen	477	215	54.8	45
Gross Pollutants	6,180	80.3	98.7	90

Table 8 - Pollutant Loads - Bioretention Basin 3 (MOD 2)

Pollutant	Sources (Kg/yr)	Residual Load (Kg/yr)	Reduction (%)	Target Reduction (%)
Total Suspended Solids	20,500	2,620	87.2	85
Total Phosphorus	40.7	14.4	64.7	60
Total Nitrogen	366	169	53.8	45
Gross Pollutants	4,870	48.2	99	90

Table 9 - Pollutant Loads - Bioretention Basin 3 (MOD 3 Changes)

6.4 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. This includes design of the stormwater network (pits and pipes), On-Site Detention basins and WSD infrastructure for the Modification No. 3 changes.

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7 Water Balance

7.1 General

The water balance was simulated using a water cycle management model as part of the MUSIC Model to allow the evaluation of various elements of the water cycle to be assessed at differing stages in the development.

Penrith City Council WSUD policy (July 2015) stipulates the rainwater tanks to meet 80% of non-potable demand including outdoor use, toilets and laundry.

The water balance completed in the SSDA Engineering Report is still reflective of the masterplan in Modification No.3. A site-specific Water Balance will be completed with the DA for the on-lot building works.

8 Services

8.1 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. 3. Development lot reticulation design has been updated to follow the new Road 3 alignment.

8.2 Communications

Communication conduits will be extended along the proposed WNSLR to service Oakdale West, the pit and pipe network will be extended and reticulated through the roadways to service the proposed lots.

Staging of the pit and pipe network will coincide with the civil stages. There is no impact on existing communications infrastructure as a result of Modification No. 3.

8.3 Gas

To service Oakdale West, conduits will be extended and reticulated through the roadways to service the proposed lots to provision for potential future gas. Modification No. 3 causes no impact of existing gas infrastructure.

8.4 Electrical

Modification No. 3 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.

8.5 Conclusion

To facilitate the works for Modification No. 3, the services designs approved by utilities stakeholders will require either re-designing or extension under a new application. The utility designs have already catered for this case because of the staged nature of this project. there is No change to the existing infrastructure surrounding the site, however only sections of the proposed servicing throughout the estate.

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

9 Infrastructure Staging

9.1 Staging

Modification No. 3 of the Stage 1 Development Approval, includes the additional infrastructure:

- New roundabout to Road 1 and construction of Road 3;
- Stormwater infrastructure associated with Road 3;
- Landscaping and public domain works within Road 3;
- Utility services to service Precinct 2 and 3, as well as the Stage 2 building DA;
- Temporary facilities and access tracks to support the Stage 2 building DA works.

The construction activities for Modification No. 3 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 and C0005 For Modification No. 3 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.

9.2 Water NSW

An assessment of risks and security of the Water NSW pipelines as result of the Modification No.3 proposal has been undertaken.

The current SSDA 7348 approval requires the provision of a new fence along the shared boundary of the site with Water NSW. This remains unchanged in Modification No. 3 and the existing rural fence will be still be upgraded to the Water NSW compliant security fence.

The CEMP developed for the project, which at the time of writing is under the review of DPIE, covers the potential impacts to the Water NSW corridor and how they will be mitigated during construction. Comparing the design of the Modification No. 3 to the approved design, shows that the batter extent essentially the same, however a reduction in the retaining wall extent in the north west corner of the site. The proposed design moves Road 3 to north, which in turn moves the building footprint for the development lots further away from the Water NSW pipelines.

The Modification No. 3 design does not change the drainage paths leaving the site, including the outlets to Ropes creek. As shown in Section 6 of this report, the post-development flows from basins outflows to the Water NSW corridor and Ropes Creek remain below the pre-development flows.

Appendix A

Proposed Site Plans, Staging and Catchment Plans



LEGEND

EXISTING BOUNDARY

EXISTING EASEMENT

PROPOSED BOUNDARY

STAGE 1 RETAINING WALLS

STAGE 1 NOISE WALLS

STAGE 1 STORMWATER PIPE

PRECINCT NO.1 ON LOT WORKS

BULK EARTHWORKS / BIO-RETENTION / OSD / BASINS* / LANDSCAPING / BATTER STABILISATION

STAGE 1 INFRASTRUCTURE WORKS

FUTURE ZONE SUBSTATION PAD & ASSOCIATED INFRASTRUCTURE WITHIN STAGE 1

TEMPORARY HAUL ROAD

* WHERE FEASIBLE, BASINS TO BE UTILISED AS TEMPORARY SEDIMENT CONTROL BASINS UNTIL 90 PER CENT COMPLETE AND THE AREA WITHIN THE RELEVANT STAGE IS STABILISED

NOTES

1. ALL SITE WIDE BATTER SLOPE LANDSCAPING/STABILISATION INCLUDED IN THIS APPROVAL

2. REFER LANDSCAPE ARCHITECT DRAWINGS FOR EXTENT OF LANDSCAPING.

Bar Scales

0 50 100 150 200 250

1 : 3000 @ A1

A13	ISSUED FOR SSD APPROVAL MOD 3	14-01-20
A12	ISSUED FOR SSD APPROVAL MOD 3	06-12-19
A11	ISSUED FOR INFORMATION MOD 3	29-11-19
A10	ISSUED FOR INFORMATION MOD 3	19-11-19
A9	ISSUED FOR INFORMATION MOD 3	12-11-19
A8	ISSUED FOR SSD APPROVAL MOD 2	18-09-19

Issue	Description	Date
THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&I		

Status		MOD 3 APPROVAL		A1	
NOT TO BE USED FOR CONSTRUCTION					

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	Designed	GB	
Height Datum	AHD	Checked	AM
Grid	MGA	Approved	AM

Client

Goodman

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Project

PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title

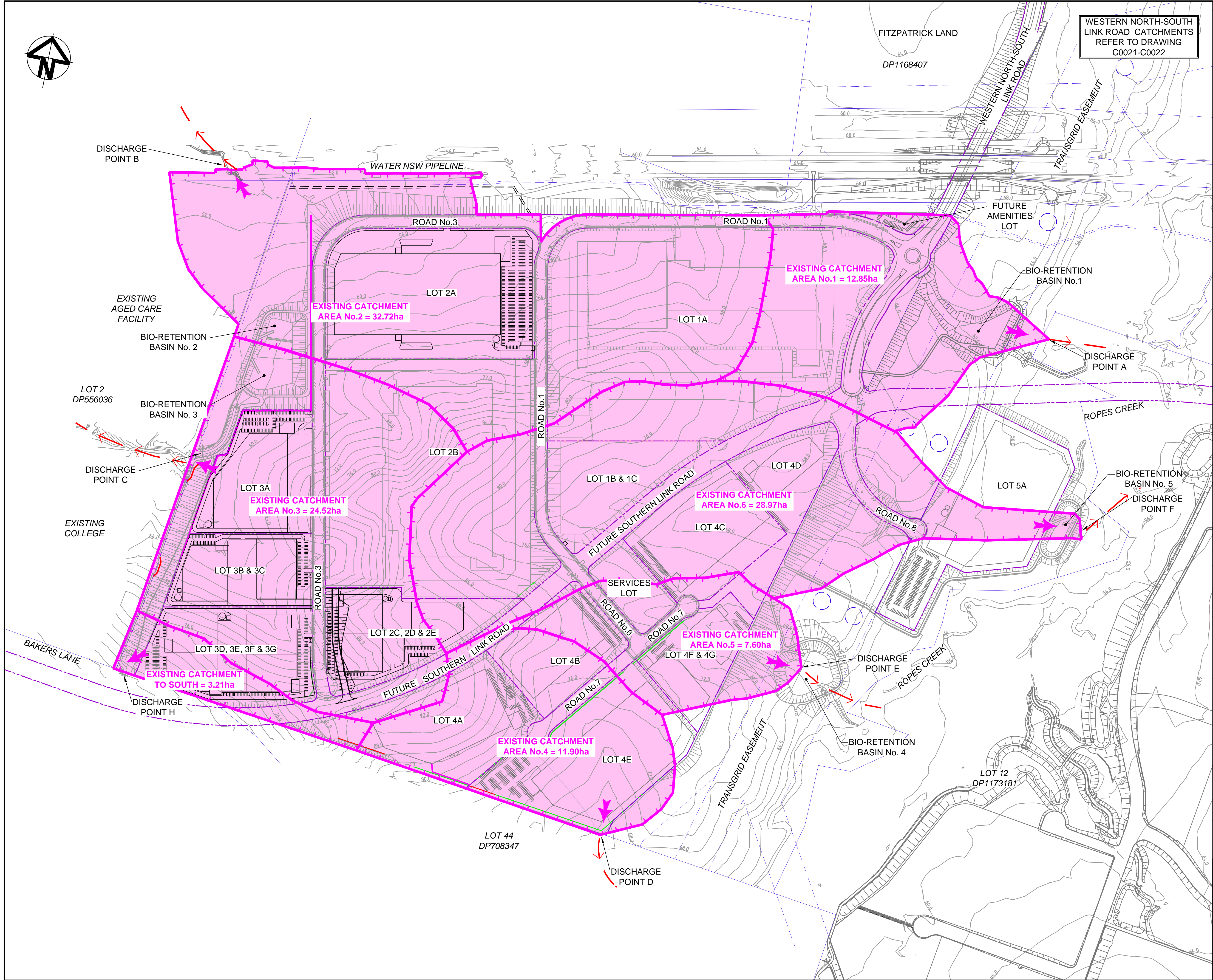
STAGE 1 SSD APPROVAL EXTENTS SHEET 1 OF 2

Drawing No.	Project No.	Issue
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100mm on Original

Date Plotted: 14 Jan 2020 - 06:01PM File Name: F:\15-272 Oakdale West\Drugs\Civil\Final\SSDA\0000_MOD 3_Masterplan Package\15-272-C0004.dwg

V1



LEGEND

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

Bar Scales

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1 : 3000 @ A1

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
A3	ISSUED FOR SSD APPROVAL	21-09-18

Issue	Description	Date
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Status		MOD 3 APPROVAL		A1	
NOT TO BE USED FOR CONSTRUCTION					

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	Designed	GB	
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Grid	MGA	Approved	AM

Client

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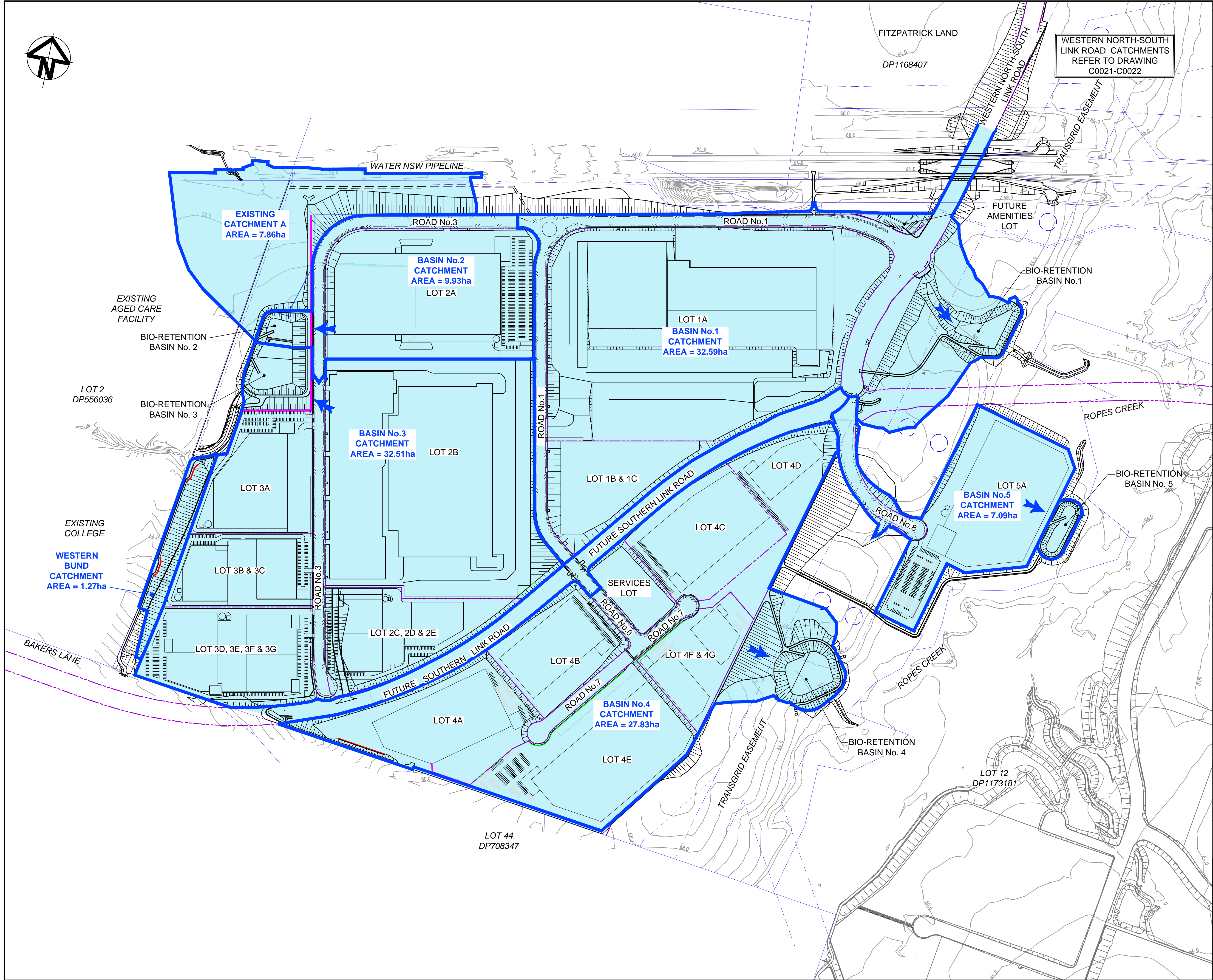
Project

PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title

STORMWATER DRAINAGE CATCHMENT PLAN (PRE-DEVELOPED)

Drawing No.	Project No.	Issue
15-272-C0007	15-272	A8



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

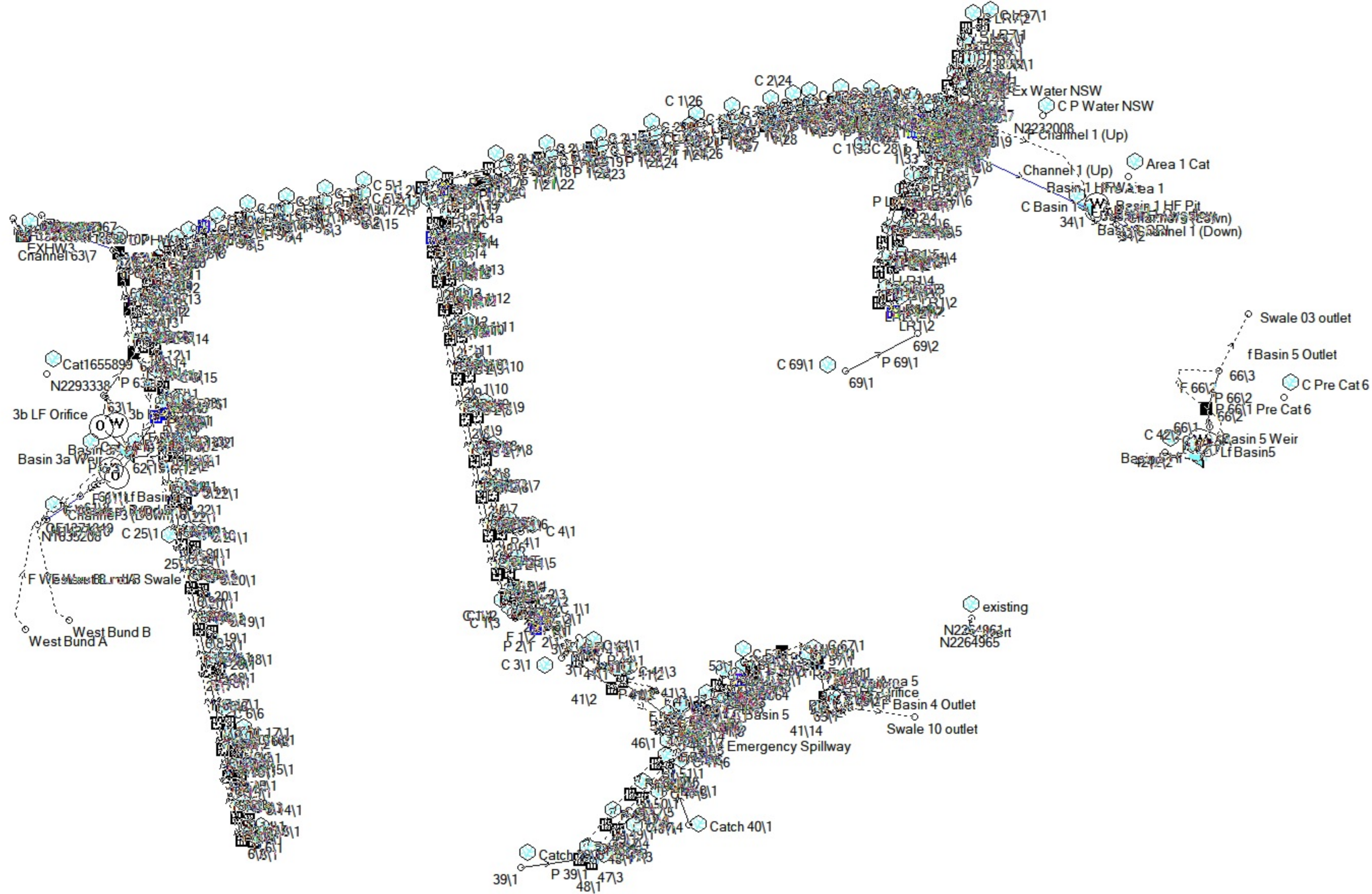
1000 SERIES - INFRASTRUCTURE PACKAGE	
DRAWING No.	DRAWING TITLE
15-272-C1000	COVER SHEET
15-272-C1001	DRAWING LIST
15-272-C1002	GENERAL NOTES
15-272-C1003	PRECINCT GENERAL ARRANGEMENT PLAN
15-272-C1004	TYPICAL SITE SECTIONS SHEET 1 OF 6
15-272-C1005	TYPICAL SITE SECTIONS SHEET 2 OF 6
15-272-C1006	TYPICAL 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 16
15-272-C1041	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 2 OF 16
15-272-C1042	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 3 OF 16
15-272-C1043	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 4 OF 16
15-272-C1044	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 5 OF 16
15-272-C1045	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 6 OF 16
15-272-C1046	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 7 OF 16
15-272-C1047	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 8 OF 16
15-272-C1048	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 9 OF 16
15-272-C1049	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 10 OF 16
15-272-C1050	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 11 OF 16
15-272-C1051	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 12 OF 16
15-272-C1052	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 13 OF 16
15-272-C1053	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 14 OF 16
15-272-C1054	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 15 OF 16
15-272-C1055	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 16 OF 16
15-272-C1060	ROAD LONGITUDINAL SECTIONS SHEET 1 OF 6
15-272-C1061	ROAD LONGITUDINAL SECTIONS SHEET 2 OF 6
15-272-C1062	ROAD LONGITUDINAL SECTIONS SHEET 3 OF 6
15-272-C1063	ROAD LONGITUDINAL SECTIONS SHEET 4 OF 6
15-272-C1064	ROAD LONGITUDINAL SECTIONS SHEET 5 OF 6
15-272-C1065	ROAD LONGITUDINAL SECTIONS SHEET 6 OF 6
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 8
15-272-C1092	RETAINING WALL PROFILES SHEET 2 OF 8
15-272-C1093	RETAINING WALL PROFILES SHEET 3 OF 8
15-272-C1094	RETAINING WALL PROFILES SHEET 4 OF 8

15-272-C1095	RETAINING WALL PROFILES SHEET 5 OF 8
15-272-C1096	RETAINING WALL PROFILES SHEET 6 OF 8
15-272-C1097	RETAINING WALL PROFILES SHEET 7 OF 8
15-272-C1098	RETAINING WALL PROFILES SHEET 8 OF 8
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



Appendix D

MUSIC Model & Results

