LENDLEASE

Jordan Springs East Stage 3C

Road Safety Audit - Concept Design

JULY 2019

PUBLIC

Jordan Springs East Stage 3C

Road Safety Audit - Concept Design

LENDLEASE

PUBLIC
PROJECT NO 2197037A
DATE: JULY 2019

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REV	DATE	DETAILS
	29/5/2019	Draft
A	16/07/2019	Final

	NAME	DATE	SIGNATURE
Prepared by:	Qian Liu Nicholas Reedy	16/07/2019	
Reviewed by:	Ryan Miller	16/07/2019	
Approved by:	Ryan Miller	16/07/2019	

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1 SUMMARY

Audited Project:	**Jordan Springs East Stage 3C Concept Design Road Safety Audit**
Audited for:	Lendlease
Address:	Level 2, 88 Phillip Street Parramatta NSW 2150
Telephone:	02 9277 2566
Project Manager:	Gareth Williams Development Manager, NSW/ACT Communities Gareth.williams@lendlease.com
Auditors:	Ryan Miller (Level 3), Qian Liu (Level 2), Nicholas Reedy (Active Observer)
Audit Type:	Concept Design
Commencement Meeting:	NA
Audit Date:	8–24 May 2019
Completion Meeting:	TBA
Previous Audit:	None

This Road Safety Audit has been commissioned by Lendlease and assessed the road design of Stage 3C in Jordan Springs East.

The audit identified eight medium risk safety issues related to the road design. The auditors also identified three 'note only' items. These issues were identified during the audit and are for the attention of the design team. There is no obligation to respond to these issues.

2 INTRODUCTION

2.1 Audit scope

The purpose of this concept design audit is to identify potential road safety issues for road users based upon the road design associated with the development of Jordan Springs East Stage 3C. The road design drawings have been prepared by Cardno for Lendlease.

2.2 Proposed design

Jordan Springs East is located within the Penrith City Council Local Government Area (LGA) and forms part of the St Mary's development site. It is bounded by existing residential development in the suburbs of Werrington County and Werrington Downs to the south, land zoned for Regional Open Space to the east, and land zoned for Regional Park to the north and west. There is also an area zoned for Drainage that adjoins the northern boundary of the precinct.

Jordan Springs East covers an area of approximately 133.1 hectares and is envisaged to hold approximately 1,400 dwellings across a total of 1,238 lots to accommodate a population between 3,900 and 4,300. It is also envisaged to accommodate approximately 760 jobs in light industrial and light manufacturing sectors.

The delivery of the Jordan Springs East Master Plan is staged. The Precinct Plan amendment (2016), currently under consideration by the Council, estimates the total yield from Jordan Springs East will be 1,436 residential dwellings, with approximately 38 hectares of employment land use.

Stage 3C proposes to consist of 59 low-density residential dwellings located towards the east of the precinct. The location of Stage 3C in the Jordan Springs East development site is presented in Figure 2.1.

Figure 2.1 Location of Stage 3C in Jordan Spring East

2.3 Audited documentation

The following drawings prepared by Cardno were provided to the audit team:

Table 2.1 Schedule of Supplied Documents

Drawing number/ Report name	Revision	Description
CV-CARDNO-ST03C-1001	2 – 20/12/2018	Cover Sheet & Drawing Schedule
CV-CARDNO-ST03C-1011	2 – 20/12/2018	General Notes and Legends
CV-CARDNO-ST03C-1021	2 – 20/12/2018	Context Plan
CV-CARDNO-ST03C-1031	2 – 20/12/2018	General Arrangement Plan
CV-CARDNO-ST03C-1041	2 – 20/12/2018	Development Application Staging and Road Hierarchy Plan
CV-CARDNO-ST03C-1101	2 – 20/12/2018	Erosion and Sedimentation Control Plan
CV-CARDNO-ST03C-1131	2 – 20/12/2018	Erosion and Sedimentation Control Details
CV-CARDNO-ST03C-1251	2 – 20/12/2018	Typical Road Cross Sections and Pavement Details
CV-CARDNO-ST03C-1301	2 – 20/12/2018	Civil Works and Stormwater Drainage Plan
CV-CARDNO-ST03C-1351	2 – 20/12/2018	Road Longitudinal Sections Road 027, 028 and 028a

Drawing number/ Report name	Revision	Description
CV-CARDNO-ST03C-1601	2 – 20/12/2018	Civil Works Details Sheet 1
CV-CARDNO-ST03C-1602	2 – 20/12/2018	Civil Works Details Sheet 2
CV-CARDNO-ST03C-1701	2 – 20/12/2018	Pavement, Signage and Linemarking Plan
CV-CARDNO-ST03C-2201	2 – 20/12/2018	Stormwater Drainage Details Sheet 1
CV-CARDNO-ST03C-2202	2 – 20/12/2018	Stormwater Drainage Details Sheet 2
CV-CARDNO-ST03C-2301	2 – 20/12/2018	Internal Stormwater Catchment Plan

The design drawings are attached in Appendix A.

2.4 Procedures and reference material

The procedures used are those described in the *Guidelines for Road Safety Audit Practices* (Roads and Maritime Services, 2011), the *Guide to Road Safety: Part 6 Managing Road Safety Audits* (Austroads, Edition 1.0, 2019), and the *Guide to Road Safety: Part 6A Implementing Road Safety Audits* (Austroads, Edition 1.2, 2019). Other specific documents and manuals referred to during this audit were:

- Roads and Traffic Authority 1988, *Road Design Guide*
- Austroads 2019, *Guide to Road Design: Set*
- Austroads 2019, *Guide to Traffic Management: Set*
- Austroads 2017, *Cycling Aspects of Austroads Guides*
- Penrith City Council, *Design Guidelines for Engineering Works for Subdivisions and Developments*, November 2013
- Penrith City Council, *Engineering Construction Specification for Civil Works*, June 2016.

2.5 Audit team

The audit team comprised the following members:

- Ryan Miller, Level 3 lead road safety auditor
- Qian Liu, Level 2 road safety auditor
- Nick Reedy, Active observer.

2.6 Responding to the audit

An audit provides an opportunity for an independent team to highlight potential road safety problems and have them formally considered by the Project Manager in conjunction with all other project considerations. The responsibility of responding to the findings of a road safety audit rests with the Designer and/or the Project Manager, not with the Auditor(s). The Designer and/or Project Manager is under no obligation to accept the audit findings. It is also noted that it is not the role of the Auditor(s) to agree to, or approve the Project Manager's responses to the audit.

3 ROAD SAFETY AUDIT PROGRAM

3.1 Commencement meeting

A formal commencement meeting was not held on this audit. However, email correspondence took place between Dane Bryan (ADW Johnson) and WSP audit team on Wednesday 8 May 2019, outlining the audit scope and relevant audit materials.

3.2 Site inspection

The audit team did not conduct a site visit as a part of the audit. The site is currently inaccessible for such a visit to be undertaken.

3.3 Completion meeting

A completion meeting will be held as advised by the client.

4 ROAD SAFETY AUDIT FINDINGS

4.1 The risk assessment system

Each hazard has been recorded and assessed in accordance with the *Guide to Road Safety: Part 6A Implementing Road Safety Audits* (Austroads, Edition 1.2, 2019). The guide recommends a risk matrix be used to determine the level of risk associated with each hazard. This matrix is described below.

4.1.1 Estimated crash frequency

The probable frequency of an incident occurring as a direct result of the hazard was determined using the criteria displayed in Table 4.1.

Table 4.1 Crash frequency

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Source: Austroads 2019, *Guide to Road Safety Part 6A: Implementing Road Safety Audits*

4.1.2 Estimated crash severity

The likely severity of the incident which occurred as a direct result of hazard was determined using the criteria in Table 4.2.

Table 4.2 Crash severity

Severity	Description	Examples
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on a freeway Car runs into crowded bus stop Bus and petrol tanker collision Collapse of a bridge or tunnel
Serious	Likely death or serious injury	High or medium-speed vehicle collision High or medium-speed collision with a fixed roadside object Pedestrian or cyclist struck by a car
Minor	Likely minor injury	Some low-speed vehicle collisions Cyclist falls from bicycle at low speed Left-turn rear-end crash in a slip lane
Limited	Likely trivial injury or property damage only	Some low-speed vehicle collisions Pedestrian walks into object (no head injury) Car reverses into post

Source: Austroads 2019, *Guide to Road Safety Part 6A: Implementing Road Safety Audits*

4.1.3 Deemed level of risk

The risk matrix in Table 4.3 was used to assess the level of risk for each hazard. The matrix uses the Frequency and Severity mentioned above to determine the likely level of risk for each hazard.

Table 4.3 Level of risk

	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

Source: Austroads 2019, *Guide to Road Safety Part 6A: Implementing Road Safety Audits*

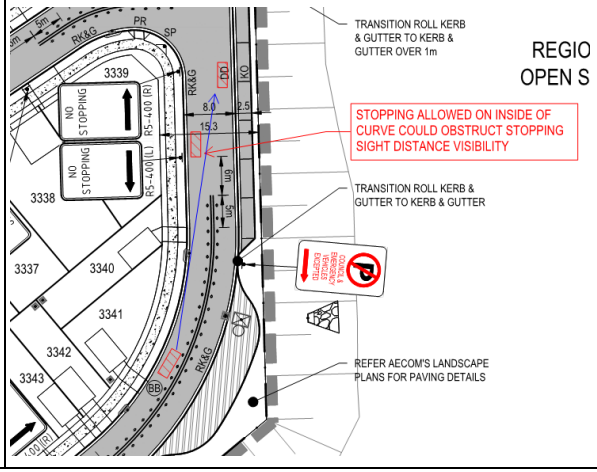
4.2 Road Safety Audit findings

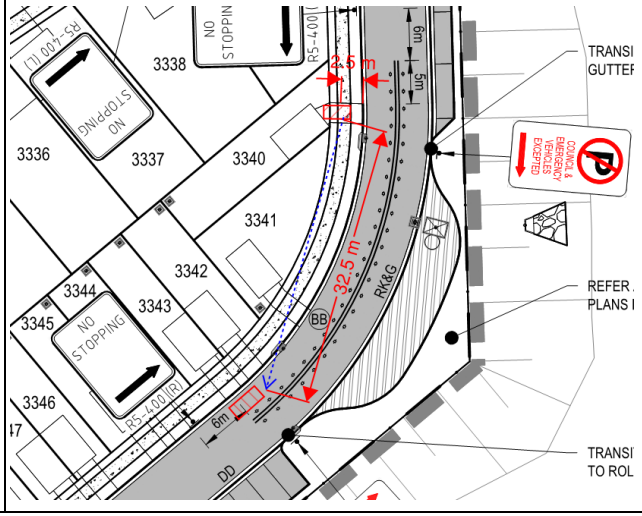
The audit findings are documented in Table 4.4 which provides:

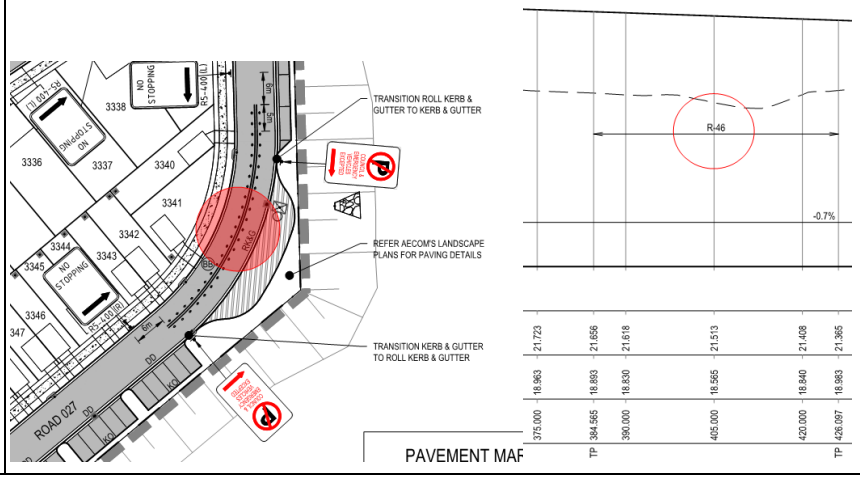
- Specific details of each of the audit findings identified during the audit
- A risk level rating for each of the audit findings.

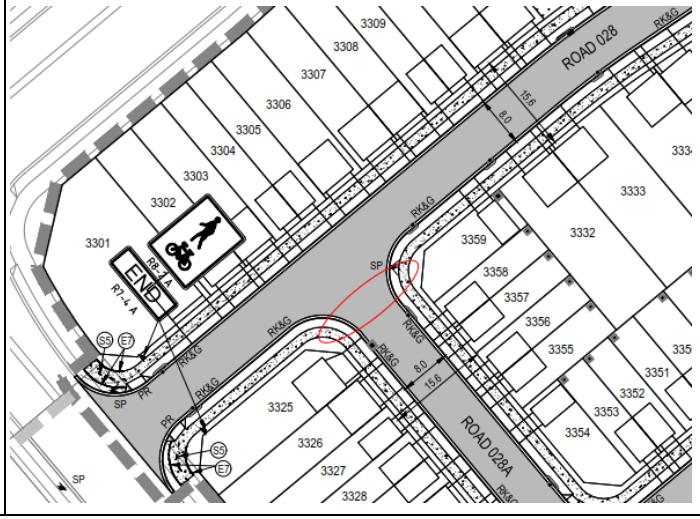
In accordance with Roads and Maritime preferred practice, this road safety audit does not include recommended actions.

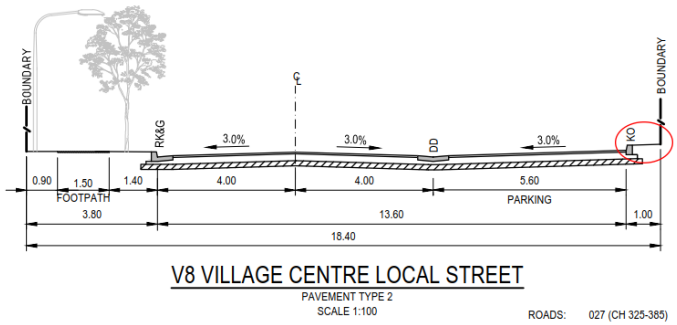
Table 4.4 Road Safety Audit findings

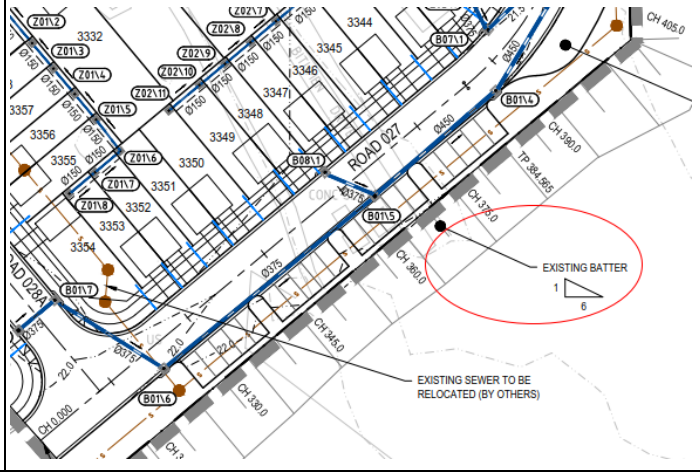
No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
1	CV-CARDNO-ST03C-1701 Road 027 Road Alignment	Parking is permitted on the inside of the curve for northbound vehicles (on Road 027). A parked car in this area restricts the visibilty of oncoming southbound traffic. There increases the likelihood of head on collisions due to northbound vehicles manouvring to avoid parked cars, turning into the path of oncoming traffic. This is compunded by the narrow road width (8 m) which would need to allow for parked cars and two way articulation. 	Medium (Occasional/ Minor)	Noted – No parking signs to be provided.

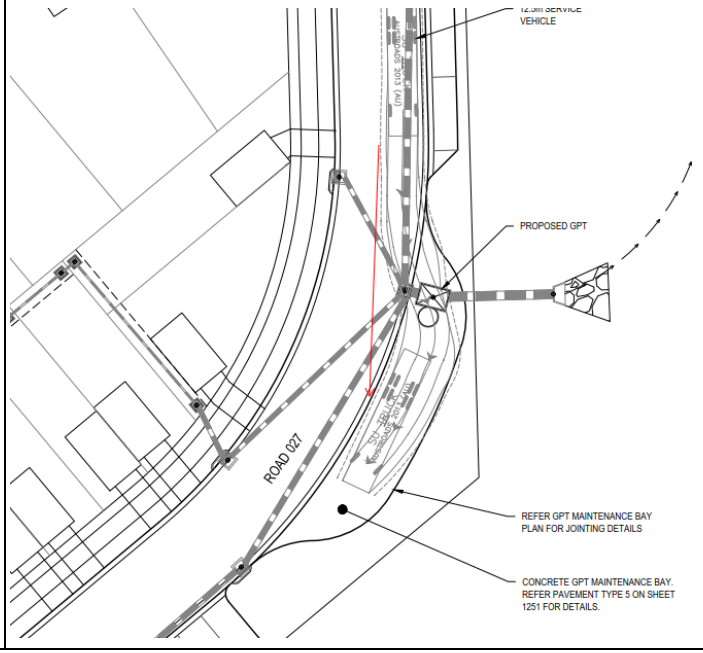
No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
2	CV-CARDNO-ST03C-1701 Road 027 Road Alignment	Lot 3340 is located on the inside curve for northbound vehicles (on Road 027). This provides poor sight distance for egress increasing the likelihood of vehicle collisions. AS2890.1 CL3.2.4 requires 45 m sight distance for a 50 km/h design speed. Approximately 30 m is provided at this location without the sight envelop crossing future private property. 	Medium (Occasional/ Minor)	Horizontal curve radius in accordance with Penrith City Council design guidelines. No stopping signs to be provided as per Item No. 1.

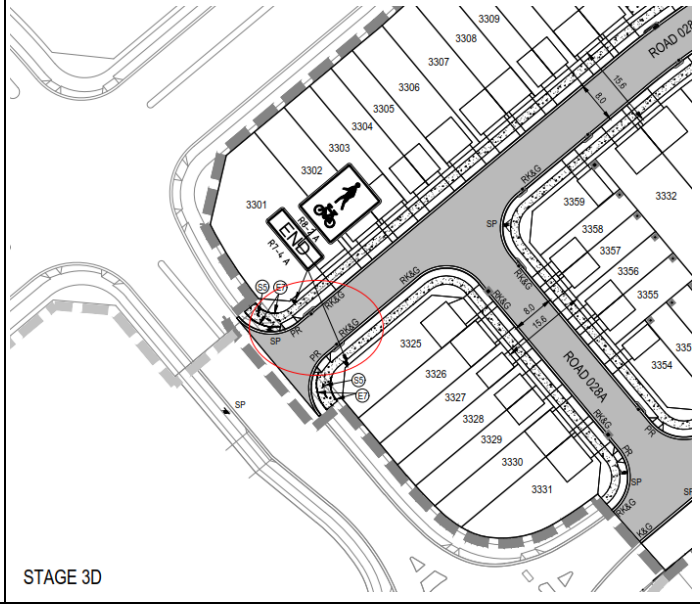
No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
3	CV-CARDNO-ST03C-1701, CV-CARDNO-ST03C-1351	There is a sharp, 46 m radius horizontal curve on Road 027 (CH384.565–CH426.097). It is assumed that there is adverse crossfall in this location. This radius is likely to increase the likelihood of collisions due to northbound vehicles understeering the corner and colliding with oncoming traffic. Austroad Guide to Road Design Part 3 Section 7.states a minimum radius of 60 m is required for 3% super elevation and a design speed of 50 km/h. 	Medium (Occasional/ Minor)	Horizontal curve radius in accordance with Penrith City Council design guidelines. As agreed with Penrith City Council, superelevation is not required on local streets given the low speed environment.

No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
4	CV-CARDNO-ST03C-1701 Corner of Roads 028A and 028 Pedestrian/cyclist infrastructure	Where Road 028A intersects with Road 028, no provision of pram ramp has been made. This would result in access difficulty for less abled people or even tripping over. 	Medium (Probable/ Limited)	Noted – Pedestrian crossing to be provided.

No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
5	CV-CARDNO-ST03C-1701, CV-CARDNO-ST03C-1301, CV-CARDNO-ST03C-1251 Adjacent to the 90-degree angle parking Pedestrian/cyclist infrastructure	The path adjacent to the angle parking is narrow. Whilst this path is not dedicated for footpath use, pedestrians, particularly people in wheelchairs or with prams may find it difficult to access the parked vehicles. Any tow bar that overhangs this narrow path also could lead to pedestrian tripping overs. There is 1 in 6 batter adjacent to the path which appears not to be protected by any barrier. Pedestrians could fall off the batter may lead to injuries. 	Medium (Probable/ Limited)	Pedestrian paths are to be provided within the regional open space as part of a separate package of works.

No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
		 		

No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
6	CV-CARDNO-ST03C-1701 Road 027 Pedestrian/cyclist infrastructure	No allocation for disabled parking or pram ramps have been provided for on street parking provisions. This area is designated as Village centre which may make access for people with disabilities difficult. AS2890 CL4.5.1 states that a propotion of all parking should be allocated for people with disabilities.	Medium (Probable/ Limited)	Parking for people with disabilities is to be provided within stage 3D works.
7	CV-CARDNO-ST03C-1601 GPT maintenance access area Heavy vehicle infrastructure	The GPT maintenance bay is located at the road curve where driver's sight line to the approaching traffic from the north may be limited. This could result in vehicular collisions involving service vehicles. 	Medium (Occasional/ Minor)	Drivers sights lines are unobstructed.

No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
8	CV-CARDNO-ST03C-1701 The southern end of Road 028 Pedestrian/cyclist infrastructure	There is no signposting to indicate the start of the shared path, facing north. Pedestrians along the footpaths of Road 028 who are not aware of the cyclists' presence, may not be able to safely transition onto the shared path. This could lead to cyclists colliding with pedestrians. 	Medium (Occasional/ Minor)	Noted – Signage to be added.

No.	Drawings/Location/ Road safety category	Description of findings	Risk rating (Frequency/ Severity)	Designer responses
9	Swept paths	Swept paths for service vehicle (i.e. garbage truck) access throughout the development have not been provided for this audit. Swept path assessment should be undertaken to achieve a design of traffic devices that would ensure safe navigation, whilst managing a low-speed environment for local roads. Insufficient navigation space may lead to an increased risk of side-swipe collisions.	NOTE ONLY	
10	Drainage	No drainage report/flow depths/ponding levels are provided. Longitudinal grades at the following locations are less than 1%: — Road 027 – CH 282 to CH 497. Water on the road surface may increase the likelihood of a crash by causing aquaplaning, or reducing the friction between the pavement and a vehicle tyre. This may affect vehicles' stopping distance and directional control.	NOTE ONLY	
11	Lighting	Lighting plans have not been provided for this audit. Inadequate lighting at any designated pedestrian crossing points and intersections have the potential to increase the crash risk.	NOTE ONLY	

5 FORMAL STATEMENT

The findings and opinions in this report are based on examination of the design drawings as well as the specific road and environs, and might not address all concerns existing at the time of the audit. The Auditors have endeavoured to identify features of the design and/or the road that could be modified or removed to improve safety. It should be noted that although every effort has been made to identify potential safety hazards, no guarantee can be made that every deficiency has been identified. It must also be recognised that safety cannot be guaranteed since no road can be regarded as safe. While every effort has been made to ensure the accuracy of this report, it is made available strictly on the basis that anyone relying on it does so at their own risk, without any liability to the Auditors.

R. Miller

Ryan Miller
Level 3 Road Safety Auditor
Identification number: RSA-02-0223

Signature date: 29/05/2019

Q. Li

Qian Liu
Level 2 Road Safety Auditor
Identification number: RSA-02-1291

Signature date: 29/05/2019

Nick Reedy
Active observer
Identification number: RSA-02-1428

Signature date: 29/05/2019

APPENDIX A

SUPPLIED AUDIT DOCUMENTS

Cardno
Shaping the Future

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LENDLEASE

JORDAN SPRINGS EAST STAGE 3C - CIVIL WORKS DEVELOPMENT APPLICATION

SCHEDULE OF DRAWINGS

DRAWING No.	DESCRIPTION
CV-CARDNO-ST03C-1001	COVER SHEET & DRAWING SCHEDULE
CV-CARDNO-ST03C-1011	GENERAL NOTES & LEGENDS
CV-CARDNO-ST03C-1021	CONTEXT PLAN
CV-CARDNO-ST03C-1031	GENERAL ARRANGEMENT PLAN
CV-CARDNO-ST03C-1041	DEVELOPMENT APPLICATION STAGING AND ROAD HIERARCHY PLAN
CV-CARDNO-ST03C-1101	EROSION AND SEDIMENTATION CONTROL PLAN
CV-CARDNO-ST03C-1131	EROSION AND SEDIMENTATION CONTROL DETAILS
CV-CARDNO-ST03C-1251	TYPICAL ROAD CROSS SECTIONS AND PAVEMENT DETAILS
CV-CARDNO-ST03C-1301	CIVIL WORKS AND STORMWATER DRAINAGE PLAN
CV-CARDNO-ST03C-1351	ROAD LONGITUDINAL SECTIONS ROAD 027, 028 & 028A
CV-CARDNO-ST03C-1601	CIVIL WORKS DETAILS SHEET 1
CV-CARDNO-ST03C-1602	CIVIL WORKS DETAILS SHEET 2
CV-CARDNO-ST03C-1701	PAVEMENT, SIGNAGE & LINEMARKING PLAN
CV-CARDNO-ST03C-2201	STORMWATER DRAINAGE DETAILS SHEET 1
CV-CARDNO-ST03C-2202	STORMWATER DRAINAGE DETAILS SHEET 2
CV-CARDNO-ST03C-2301	INTERNAL STORMWATER CATCHMENT PLAN

Rev.	Date	Description	Des.	Verif.	Appd.
2	20.12.18	REISSUED FOR COORDINATION	BJD		ARM
1	06.08.18	DRAFT - ISSUED FOR COORDINATION	BJD		ARM

Drawn	Date 06.08.18
MCD	
Checked	Date 06.08.18
DAC	
Designed	Date 06.08.18
BJD	
Verified	Date
Approved	
ARM	06.08.18

Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD		A1

Drawing Number: CV-CARDNO-ST03C-1001
Revision: 2

XREFs:
CAD File: N:\Parramatta\Projects\899\FY14\020_CENTRAL PRECINCT, ADJ ST MARYS\Drawings\29 Jordan Springs East Stage 3C\Drawings\CV-CARDNO-ST03C-1001-DWG(2).dwg

GENERAL

1. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH PENRITH CITY COUNCIL ENGINEERING CONSTRUCTION SPECIFICATION FOR CIVIL WORKS.
2. PENRITH CITY COUNCIL STANDARD DETAILS TO BE USED AT ALL TIMES.

SITEWORKS NOTES

1. ORIGIN OF LEVELS:- REFER SURVEY NOTES.
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO CARDNO.
3. MAKE SMOOTH CONNECTION WITH EXISTING WORKS AND SURFACES.
4. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
5. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)
6. PROVIDE 10mm WIDE EXPANSION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS.
7. ASPHALTIC CONCRETE SHALL CONFORM TO R.M.S. SPECIFICATION R116.
8. ALL BASECOURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH R.M.S. FORM 3051, COMPACTED TO MINIMUM 98% MODIFIED DENSITY IN ACCORDANCE WITH AS 1289 5.2.1 FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m³ OF BASECOURSE MATERIAL PLACED.
9. ALL SUB-BASE COURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH R.M.S. FORM 3051, AND COMPACTED TO MINIMUM 95% MODIFIED DENSITY IN ACCORDANCE WITH A.S 1289 5.2.1 FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 100m³ OF SUB-BASE COURSE MATERIAL PLACED.
10. AS AN ALTERNATIVE TO THE USE OF IGNEOUS ROCK AS A SUB-BASE MATERIAL IN (9) A CERTIFIED RECYCLED CONCRETE MATERIAL COMPLYING WITH R.M.S. FORM 3051 WILL BE CONSIDERED. SUBJECT TO MATERIAL SAMPLES AND APPROPRIATE CERTIFICATIONS BEING PROVIDED TO THE SATISFACTION OF PENRITH CITY COUNCIL AND THE SUPERINTENDENT.
11. A HANDRAIL OR SAFETY BARRIER IS TO BE PROVIDED AT THE TOP OF ALL HEADWALLS AND RETAINING WALLS GREATER THAN 1m HIGH IN ACCORDANCE WITH THE LENDLEASE GMR'S.

BULK EARTHWORKS NOTES

1. ORIGIN OF LEVELS: REFER SURVEY NOTES
2. STRIP ALL TOPSOIL/ORGANIC MATERIAL FROM CONSTRUCTION AREA AND STOCK PILE AS DIRECTED BY SUPERINTENDENT FOR FUTURE REUSE.
3. EXCAVATED MATERIAL TO BE USED AS STRUCTURAL FILL PROVIDED THE PLACEMENT MOISTURE CONTENT OF THE MATERIAL IS +/- 2% OF THE OPTIMUM MOISTURE CONTENT.
4. COMPACT FILL AREAS AND SUBGRADE TO NOT LESS THAN:

LOCATION	STANDARD DRY DENSITY (AS 1289 E 5.1.1.)
UNDER BUILDING SLABS ON GROUND	98%
UNDER ROADS AND CARPARKS	100%
LANDSCAPED AREAS UNLESS NOTED OTHERWISE	98%

5. FOR NON COHESIVE MATERIAL, COMPACT TO 75% DENSITY INDEX.
6. BEFORE PLACING FILL, PROOF ROLL EXPOSED SUBGRADE WITH AN 8 TONNE (MIN) DEADWEIGHT SMOOTH DRUM VIBRATORY ROLLER TO DETECT THEN REMOVE SOFT SPOTS (AREAS WITH MORE THAN 2mm MOVEMENT UNDER ROLLER).
7. FREQUENCY OF COMPACTION TESTING SHALL BE NOT LESS THAN:-
   (A) 1 TEST PER 1,000m² OF FILL PLACED PER LAYER OF FILL.
   (B) 3 TESTS PER VISIT
   (C) 1 TEST PER 1000m² OF EXPOSED SUBGRADE "LEVEL 1" TESTING SHALL BE TESTING IN ACCORDANCE WITH AS 3798 (1996).
8. FILLING TO BE PLACED IN MAXIMUM 300mm - LOOSE LAYERS AND COMPACTED AS SPECIFIED
9. NO FILLING SHALL TAKE PLACE TO EXPOSED SUBGRADE UNTIL THE AREA HAS BEEN PROOF ROLLED IN THE PRESENCE OF A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER AND APPROVAL GIVEN IN WRITING THAT FILLING CAN PROCEED.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONTROL OF EROSION AND SEDIMENTATION TO THE SATISFACTION OF COUNCIL, NSW OFFICE OF WATER, SYDNEY WATER, THE OFFICE OF ENVIRONMENT AND HERITAGE, AND LENDLEASE'S REPRESENTATIVE. TO THIS END, THE EROSION AND SEDIMENTATION CONTROLS SHOWN ON THE DRAWINGS SHALL ONLY BE USED AS A GUIDE BY THE CONTRACTOR, AND REPRESENT THE MINIMUM REQUIREMENT ONLY.
2. THE CONTRACTOR SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS DOCUMENTED OR AS OTHERWISE DIRECTED BY THE SUPERINTENDENT.
   ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH
   a. LOCAL AUTHORITY REQUIREMENTS
   b. EPA REQUIREMENTS
   c. NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
3. MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
4. WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
5. CONTRACTOR IS TO ENSURE ALL EROSION & SEDIMENT CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFECTIVELY. REPAIRS AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.

LAND DISTURBANCE

6. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE WILL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   a. INSTALL A SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
   b. CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
   c. INSTALL SEDIMENT BASIN AS SHOWN ON PLAN (D) INSTALL SEDIMENT TRAPS AS SHOWN ON PLAN.
   d. UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. WHERE POSSIBLE, PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL

7. DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
8. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS IS PRACTICABLE AFTER THE COMPLETION OF CONSTRUCTION ACTIVITIES.

SEDIMENT CONTROL

9. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
10. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
11. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
12. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.
13. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
14. ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:
   a. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE
   b. ENSURING THAT NOTHING IS NAILED TO THEM
   c. PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS.
   (I) ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5 METRES OR HALF THE DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND THE TRUNK, WHICH EVER IS THE GREATER
   (II) A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE (E.G. A GRAVEL BED) IS PLACED UNDER ALL FILL LAYERS OF MORE THAN 300 MILLIMETRES DEPTH
   (III) CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.

NOISE

EPA AND COUNCIL REQUIREMENTS MUST BE ADHERED TO REGARDING LEVEL OF NOISE AND WORKING HOURS TO ENSURE THAT RESIDENTS AND OTHER APPLICABLE NEIGHBORS TO THE SITE ARE NOT DISTURBED UNREASONABLY. THE GENERATION OF NOISE MUST BE MINIMISED.

DUST

DUST MUST BE MINIMISED TO ENSURE THERE IS NO HEALTH RISK OR LOSS OF AMENITY.

STAGING OF WORKS

STRIPPING WORKS ARE TO BE STAGED TO MINIMISE EXTENT OF EXPOSED AREA. WEATHER CONDITIONS TO BE ASSESSED PRIOR TO UNDERTAKING STRIPPING.

STOCKPILE PROTECTION

SEDIMENT RETENTION STRUCTURES TO BE PLACED DOWNSLOPE OF ANY STOCKPILES. STOCKPILE IN PLACE > 28 DAYS TO BE TEMPORARILY GRASSED.

VEHICLE AND ROAD MANAGEMENT

SITE ACCESS TO BE RESTRICTED TO ALLOCATED TRUCK ROUTES. EXTERNAL ROADS TO BE SWEPT REGULARLY FOR DURATION OF WORKS.

EXISTING UNDERGROUND SERVICES NOTES

THE LOCATIONS OF UNDERGROUND SERVICES SHOWN IN THIS SET OF DRAWINGS HAVE BEEN PLOTTED FROM SURVEY INFORMATION AND SERVICE AUTHORITY INFORMATION. THE SERVICE INFORMATION HAS BEEN PREPARED ONLY TO SHOW THE APPROXIMATE POSITIONS OF ANY KNOWN SERVICES AND MAY NOT BE AS CONSTRUCTED OR ACCURATE. CARDNO CAN NOT GUARANTEE THAT THE SERVICES INFORMATION SHOWN ON THESE DRAWINGS ACCURATELY INDICATES THE PRESENCE OR ABSENCE OF SERVICES OR THEIR LOCATION AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN FROM ANY CAUSE WHATSOEVER.

CONTRACTORS SHALL TAKE DUE CARE WHEN EXCAVATING ONSITE INCLUDING HAND EXCAVATION WHERE NECESSARY.
CONTRACTORS ARE TO CONTACT THE RELEVANT SERVICE AUTHORITY PRIOR TO COMMENCEMENT OF EXCAVATION WORKS. CONTRACTORS ARE TO UNDERTAKE A SERVICES SEARCH, PRIOR TO COMMENCEMENT OF WORKS ON SITE. SEARCH RESULTS ARE TO BE KEPT ON SITE AT ALL TIMES.

STORMWATER DRAINAGE NOTES

1. STORMWATER DESIGN CRITERIA:
   (A) AVERAGE RECURRENCE INTERVAL:
   5 YEAR ARI PIPED DRAINAGE
   100 YEAR ARI OVERLAND FLOW
   (B) RAINFALL INTENSITIES: TIME OF CONCENTRATION:
   5 MINUTES
   5 YEAR ARI= 126mm/hr
   100 YEAR ARI= 219mm/hr
2. PIPES 375 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS '2' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
3. PIPES 300 DIA AND LESS SHALL BE DWV GRADE (CLASS SN8) uPVC WITH SOLVENT WELDED JOINTS.
4. EQUIVALENT STRENGTH FRC PIPES MIN CLASS 3 MAY BE USED SUBJECT TO PRIOR APPROVAL BY PENRITH CITY COUNCIL.
5. ALL PIPES ARE TO BE UNIFORMLY SUPPORTED ALONG THE LENGTH OF THE BARREL BY SUITABLE FILL MATERIAL. REFER TO BEDDING SUPPORT TYPE.
6. PIPES WITH SOCKETS SHALL BE LAID IN BEDDING WHERE SUITABLE RECESSES HAVE BEEN PROVIDED TO ENSURE PIPES DO NOT BEAR ON THEIR SOCKETS.
7. PIPES TO BE INSTALLED TO TYPE HS1 SUPPORT IN ACCORDANCE WITH AS 3725 (2007) IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75).
8. REFER TO AS/NZS 3725:2007 TABLE B1 FOR REQUIRED FILL DEPTHS ABOVE PIPE BARREL PRIOR TO USE OF COMPACTION MACHINERY OR TRAVERSING OF PIPES BY GENERAL SITE EQUIPMENT.
9. WHERE WORKING METHODS REQUIRE HIGHER CLASS PIPE, THE CONTRACTOR SHALL REFER TO AS 3725 (2007) TO DETERMINE THE APPROPRIATE PIPE CLASS. PROPOSED PIPE CLASS SHALL BE REVIEWED BY CARDNO PRIOR TO INSTALLATION.
10. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500.3 (2015).
11. THE USE OF PRECAST PITS IS ONLY PERMITTED WITH THE PRIOR APPROVAL OF PENRITH CITY COUNCIL.
12. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
13. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED uPVC DWV SEWER GRADE PIPE IS TO BE USED.
14. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
15. GRATES AND COVERS SHALL CONFORM TO AS 3996. MINIMUM CLASS C. UNLESS NOTED OTHERWISE.
16. ALL BOX CULVERTS SHALL BE STRUCTURALLY DESIGNED BY THE MANUFACTURER AND DELIVERED TO SITE AS FIT FOR PURPOSE.
17. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.

STORMWATER DRAINAGE NOTES CONTINUED

18. ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS.

TELSTRA - DUTY OF CARE NOTE

TELSTRA'S PLANS SHOW ONLY THE PRESENCE OF CABLES AND PLANT. THEY ONLY SHOW THEIR POSITION RELATIVE TO ROAD BOUNDARIES, PROPERTY FENCES ETC. AT THE TIME OF INSTALLATION AND TELSTRA DOES NOT WARRANT OR HOLD OUT THAT SUCH PLANS ARE ACCURATE THEREAFTER DUE TO CHANGES THAT MAY OCCUR OVER TIME. DO NOT ASSUME DEPTH OR ALIGNMENT OF CABLES OR PLANT AS THESE VARY SIGNIFICANTLY. THE CONTRACTOR HAS A DUTY OF CARE WHEN EXCAVATING NEAR TELSTRA CABLES AND PLANT.
BEFORE USING MACHINE EXCAVATORS TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG POTHOLING TO IDENTIFY IT'S LOCATION TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO IT'S PROPERTY AND LOSSES CAUSED TO TELSTRA AND IT'S CUSTOMERS.

SURVEY NOTES

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY RPS GROUP PLC (FORMERLY WHELANS INSITES), BEING REGISTERED SURVEYORS. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. CARDNO DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT CARDNO.

THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM THE ORIGINAL SURVEY DOCUMENTS.

1. ORIGIN OF MGA BASED SITE CO-ORDINATES FROM PM 147113 AND PLANE DISTANCES HAVE BEEN USED.
2. CO-ORDINATES FOR PM 147113 WERE DEDUCED BY WHELANS FROM SUROUNDING SSM & PM'S ON PUBLIC RECORD. CO-ORDINATES FOR PM 147113 HAVE BEEN ADOPTED AS 292202.160E 6266005.820N
3. CONTOUR INTERVAL 0.25m
4. LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (AHD) USING SSM 79753 WITH RL OF 19.758 (ACC 2) LOCATED ON LINKS ROAD.
5. FEATURES SHOWN INCLUDING TREES AND LEVELS ARE TO BE USED ONLY FOR CONCEPT PLANNING DESIGN. DATA SHOWN SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. PRIOR TO CONSTRUCTION ANY FEATURE OR LEVEL SHOULD BE VERIFIED IF THE LOCATION OR HEIGHT IS TO HAVE SIGNIFICANT IMPACT ON DESIGN OR CONSTRUCTION.
6. TREES SHOWN HAVE A TRUNK DIAMETER OF 300MM OR GREATER.
7. TREE CAPTURE CONFIDENCE INTERVAL OF 99%

ROOF WATER KERB OUTLETS

1. KERB OUTLETS TO BE PROVIDED IN ACCORDANCE WITH PENRITH CITY COUNCILS CIVIL WORKS SPECIFICATION AT EACH LOT WHERE INTERALLOTMENT DRAINAGE IS NOT PROVIDED
2. KERB OUTLETS ARE TO BE CONSTRUCTED AT THE SAME TIME KERBS ARE POURED.
3. ALIGNMENT OF KERB OUTLET PIPE TO BE ADJUSTED ON SITE TO AVOID SERVICE CLASHES.

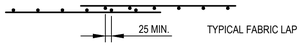
STREET FURNITURE

1. ALL LIGHT POLES, STREET NAMES AND BUS SHELTERS IN THIS SUBDIVISION WILL BE GALVANISED BLACK POWDER COATED TO THE SATISFACTION OF PENRITH CITY COUNCIL. FURTHER THAT THESE LIGHT POLES WILL COMPLY WITH COUNCIL'S SPECIFICATIONS.
2. ALL LIGHT POLES ARE TO BE TYPE 'MACARTHUR'. REFER ELECTRICAL DESIGN DRAWINGS.

REINFORCEMENT NOTES

1. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
2. SPLICES IN THE REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN. THE WRITTEN APPROVAL OF THE ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICES. WHERE THE LAP LENGTH IS NOT SHOWN IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT.
3. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER.
4. REINFORCEMENT SYMBOLS -
   N - DENOTES GRADE 400N TEMPCORE DEFORMED BARS TO AS 1302
   R - DENOTES GRADE 250R HOT ROLLED PLAIN BARS TO AS 1302
   SL - DENOTES HARD-DRAWN WIRE REINFORCING FABRIC TO AS 1304
   W - DENOTES HARD-DRAWN PLAIN WIRE TO AS 1303
5. REINFORCEMENT COGS AND EXTENSIONS TO BE IN ACCORDANCE WITH AS3600.

5. THE FIGURES FOLLOWING THE FABRICS SYMBOL 'SL' IS THE REFERENCE NUMBER FOR FABRIC TO AS 1304.
6. ALL REINFORCEMENT FABRIC SHALL COMPLY WITH AS1303 AND AS1304 AND SHALL BE SUPPLIED AS FLAT SHEETS.



FABRIC SHALL BE LAPPED 2 TRANSVERSE WIRES PLUS 50mm. BUNDLED BARS SHALL BE TIED TOGETHER AT 30 BAR DIAMETER CENTRES WITH 3 WRAPS OF WIRE.
7. PLACE SUFFICIENT BAR CHAIRS UNDER BOTTOM REINFORCING RODS AND TOP CROSSRODS IN SLABS TO ALLOW THEM TO BE SUPPORTED IN THEIR CORRECT POSITIONS DURING CONCRETING (NOT GREATER THAN 900mm CENTRES BOTH WAYS)
8. REINFORCEMENT LAYERS DENOTED THUS UNO -
   TT - DENOTES TOP BARS LAID LAST IN TOP
   T - DENOTES TOP BARS LAID FIRST IN TOP
   B - DENOTES BOTTOM BARS LAID SECOND IN BOTTOM
   BB - DENOTES BOTTOM BARS LAID FIRST IN BOTTOM
9. WHERE TRANSVERSE TIE BARS ARE NOT SHOWN PROVIDE N12-300 SPLICED WHERE NECESSARY AND LAP WITH MAIN BARS 450mm UNLESS NOTED OTHERWISE.
10. MINIMUM LAP LENGTHS UNLESS NOTED OTHERWISE SHALL BE -
    500 FOR N12 BARS
    600 FOR N16 BARS
    900 FOR N20 BARS
    1000 FOR N24 BARS
    1200 FOR N28 BARS
    1500 FOR N32 BARS
    1800 FOR N36 BARS

CONCRETE NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
2. CONCRETE QUALITY
   ALL REQUIREMENTS OF THE CURRENT ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.

ELEMENT	AS 3600 F'c MPa AT 28 DAYS	SPECIFIED SLUMP	NOMINAL AGG. SIZE
VEHICULAR BASE	32	60	20
KERBS AND PATHS	25	80	20
PITS, FOUNDATIONS & CULVERT BASE SLABS	40	80	20

- CEMENT TYPE SHALL BE (ACSE SPECIFICATION) TYPE SL
- PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379.

3. NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY CARDNO.
4. CLEAR CONCRETE COVER TO ALL REINFORCEMENT FOR DURABILITY SHALL BE 40mm TOP AND 70mm FOR EXTERNAL EDGES UNLESS NOTED OTHERWISE.
5. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1m CENTRES BOTH WAYS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
6. THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE INCLUDING SLABS ON GROUND AND FOOTINGS SHALL BE COMPACTED AND CURED IN ACCORDANCE WITH R.T.A. SPECIFICATION R83.

PROPOSED WORKS LEGEND

- PROPOSED CONTOURS
- SITE BOUNDARY
- BATTER SLOPE (1 in 4)
- EXTENT OF WORKS
- EXISTING STAGING BOUNDARY
- TREES TO BE REMOVED AS PART OF BULK EARTHWORKS PACKAGE.
- TREES TO BE RETAINED
- BATTERS
- 1001 — LOT NUMBERS
- K&G — KERB & GUTTER REFER PENRITH CITY COUNCIL STANDARD DETAIL.
- RK&G — ROLL KERB & GUTTER REFER PENRITH CITY COUNCIL STANDARD DETAIL.
- DD — DISH DRAIN REFER PENRITH CITY COUNCIL STANDARD DETAIL.
- KO — KERB ONLY REFER PENRITH CITY COUNCIL STANDARD DETAIL.
- PR — PRAM RAMP REFER PENRITH CITY COUNCIL FOR DETAIL.
- INDICATIVE GARAGE/DRIVEWAY LOCATION ONLY
- Ø375 — STORMWATER PIPELINE
- STORMWATER DRAINAGE PITS
- CONCRETE HEADWALL
- 4\2 — DRAINAGE LINE No. / DRAINAGE PIT No.
- ROOF WATER KERB OUTLET
- EXISTING WATER COURSES AS PER 1:10000 TOPOGRAPHIC MAPS
- SCOUR PROTECTION

EXISTING WORKS LEGEND

- TRANSGRID PYLON
- EXISTING CONTOURS
- TRANSGRID EASEMENT
- TRANSGRID OVERHEAD ELECTRICAL
- EXISTING SEWER

Rev.	Date	Description	Des.	Verif.	Appd.
2	20.12.18	REISSUED FOR COORDINATION	BJD		ARM
1	06.08.18	DRAFT - ISSUED FOR COORDINATION	BJD		ARM

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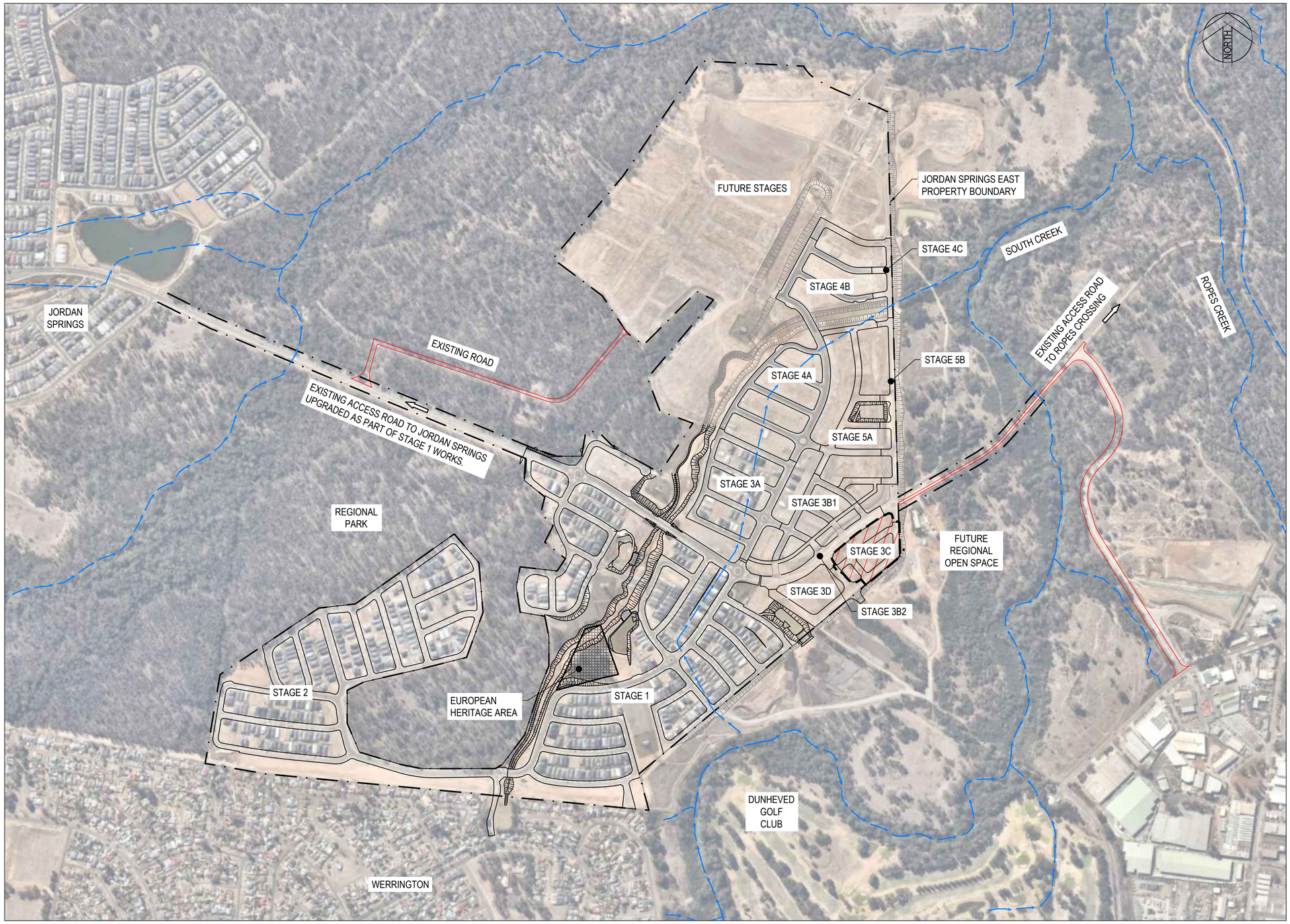
		Date
Drawn	MCD	06.08.18
Checked	DAC	06.08.18
Designed	BJD	06.08.18
Verified		
Approved	ARM	06.08.18

Client: LENDLEASE
Project: JORDAN SPRINGS EAST STAGE 3C - CIVIL WORKS DEVELOPMENT APPLICATION
Title: GENERAL NOTES & LEGENDS
Status: FOR INFORMATION ONLY NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: | Size: A1
Drawing Number: CV-CARDNO-ST03C-1011 | Revision: 2



CONTEXT PLAN
SCALE 1:5000

LEGEND

- STAGE 3C EXTENT
- JORDAN SPRINGS EAST PROPERTY BOUNDARY
- EXISTING WATER COURSES AS PER 1:10000 TOPOGRAPHIC MAPS

0 100 200 300 400 500m

SCALE 1:5000 @A1

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Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: CONTEXT PLAN

Status: FOR INFORMATION ONLY
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Datum		Scale	Size
AHD		1:5000	A1

Drawing Number: CV-CARDNO-ST03C-1021

Revision: 2

DATE PLOTTED: 20 December 2018 10:18 AM BY - MARY DOZA

XREFs: XR-899140120-CI-MASTERPLAN; Xref-899140120-Client Logos; XR-899140120-29-CI-DESIGN
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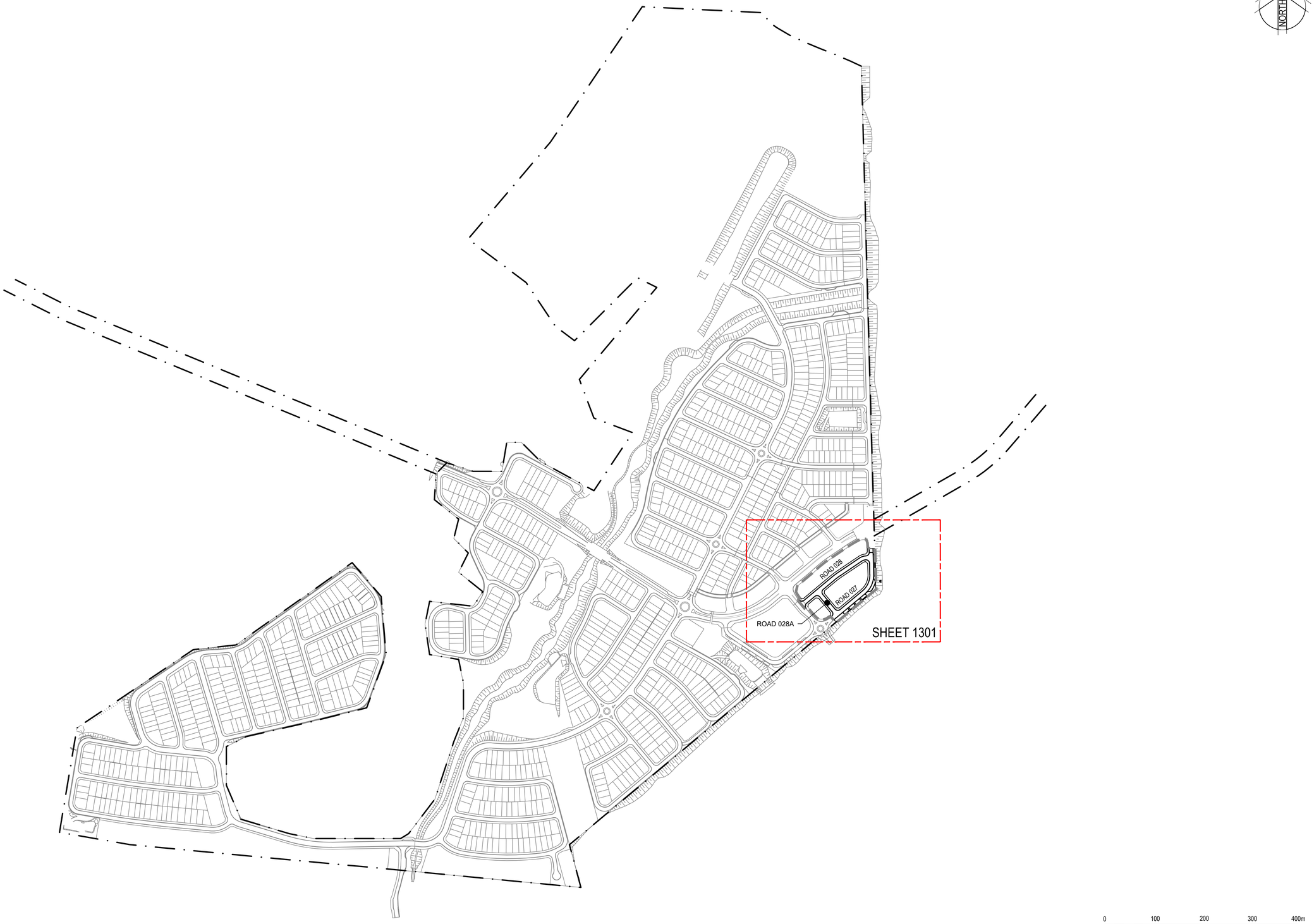

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Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: GENERAL ARRANGEMENT PLAN

Status: FOR INFORMATION ONLY
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Datum	Scale	Size
AHD	1:4000	A1

Drawing Number: CV-CARDNO-ST03C-1031
Revision: 2

NOTES:

1. BASED ON INFORMATION PROVIDED BY LENDLEASE (09/11/18).
2. EXTENT OF FUTURE STAGES SUBJECT TO REFINEMENT.
3. ROAD AND LOT LAYOUTS OUTSIDE OF PROPOSED STAGING BOUNDARIES ARE BASED ON A PRELIMINARY MASTERPLAN PREPARED BY LENDLEASE AND IS SUBJECT TO FUTURE REFINEMENT.

LEGEND

- STAGE BOUNDARY
- PROPOSED LOTS
- A2 ACCESSWAY
- BRIDGE
- B1 BUS LINK
- C2 COLLECTOR ROAD MAIN STREET
- JORDANS CONNECTOR ROAD REFER DRAWING SET 89914020-JC01 FOR TYPICAL CROSS SECTIONS.
- L1 MINOR LOCAL STREET
- L2 PEDESTRIAN PRIORITY
- L3 LOCAL STREET POSSIBLE BUS ROUTE
- P1 PARK EDGE ROAD
- P2 PARK EDGE ROAD POSSIBLE BUS LINK
- V1-V8 VILLAGE CENTRE REFER DRAWING SET CV-CARDNO-ST03D AND DRAWING 1251 OF THIS SET FOR TYPICAL CROSS SECTIONS

0 100 200 300 400m

SCALE 1:4000 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
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Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: DEVELOPMENT APPLICATION STAGING AND ROAD HIERARCHY PLAN

Status: FOR INFORMATION ONLY
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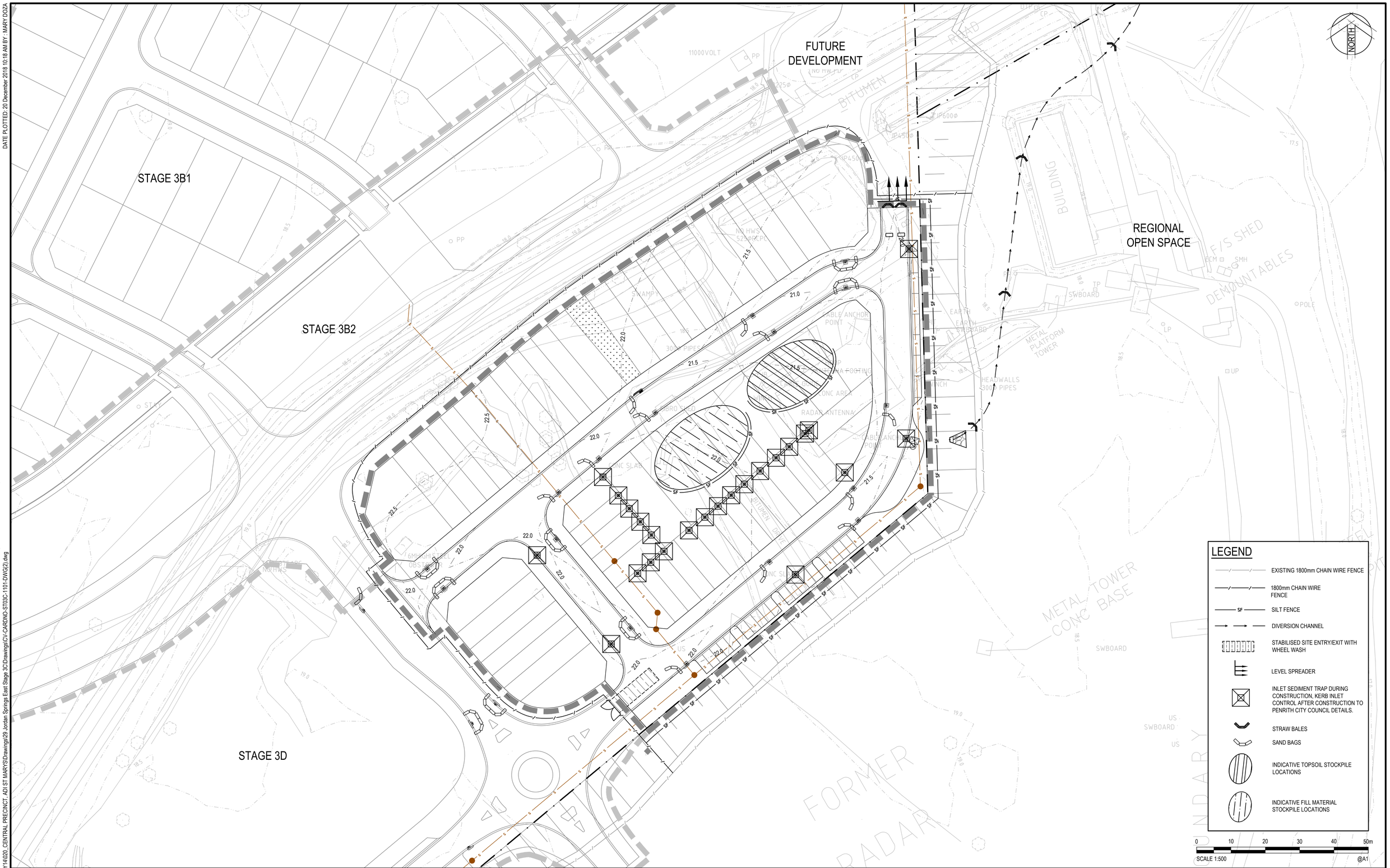
Datum		Scale	Size
AHD		1:4000	A1

Drawing Number: CV-CARDNO-ST03C-1041 Revision: 2



LEGEND

- EXISTING 1800mm CHAIN WIRE FENCE
- 1800mm CHAIN WIRE FENCE
- SF — SILT FENCE
- DIVERSION CHANNEL
- STABILISED SITE ENTRY/EXIT WITH WHEEL WASH
- LEVEL SPREADER
- INLET SEDIMENT TRAP DURING CONSTRUCTION, KERB INLET CONTROL AFTER CONSTRUCTION TO PENRITH CITY COUNCIL DETAILS.
- STRAW BALES
- SAND BAGS
- INDICATIVE TOPSOIL STOCKPILE LOCATIONS
- INDICATIVE FILL MATERIAL STOCKPILE LOCATIONS

0 10 20 30 40 50m

SCALE 1:500 @A1

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Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: EROSION AND SEDIMENTATION CONTROL PLAN

Status: FOR INFORMATION ONLY
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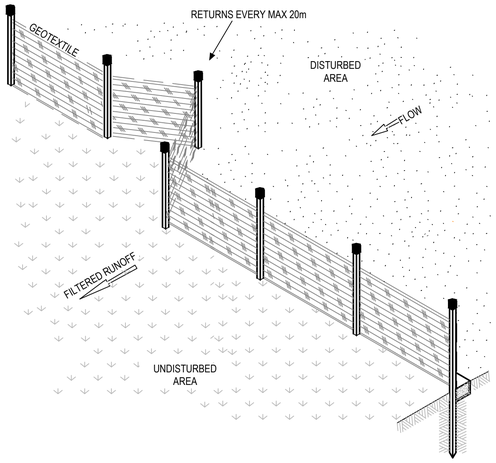
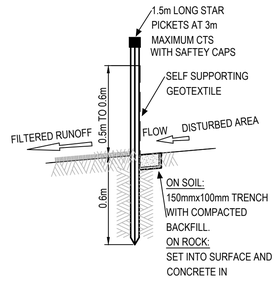
Datum	Scale	Size
AHD	1:500	A1

Drawing Number: CV-CARDNO-ST03C-1101

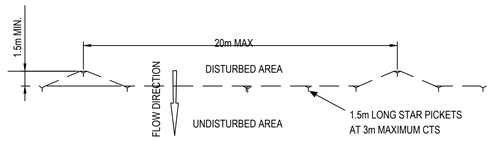
Revision: 2



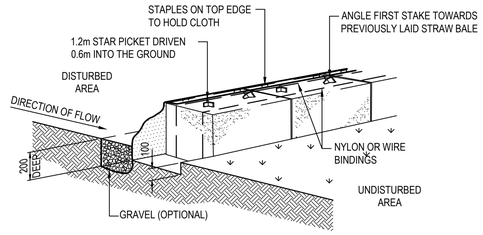
SILT FENCE
NOT TO SCALE



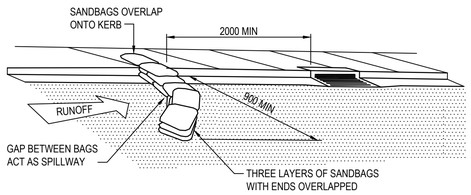
SILT FENCE SECTION
NOT TO SCALE



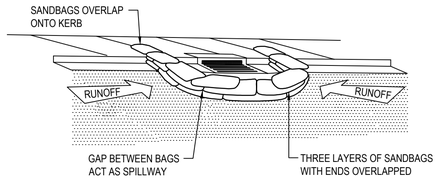
SILT FENCE PLAN
NOT TO SCALE



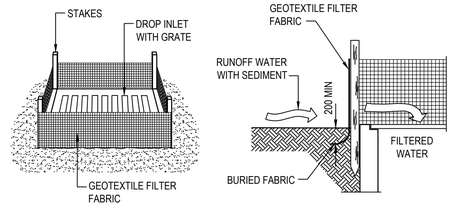
SEDIMENT FENCE (GEOTEXTILE FILTER FABRIC & STRAW BALE)
NOT TO SCALE



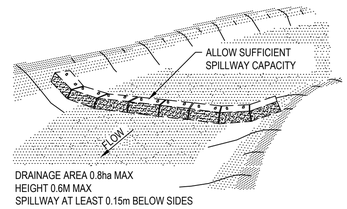
SEDIMENT TRAP FOR KERB INLET (ON GRADE - SANDBAG)
NOT TO SCALE



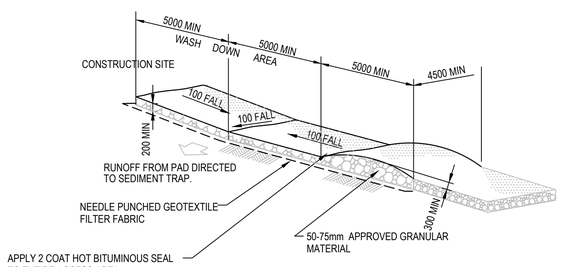
SEDIMENT TRAP FOR KERB INLET (AT LOW POINT - SANDBAG)
NOT TO SCALE



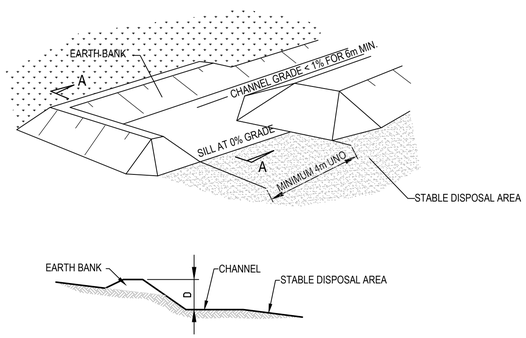
SEDIMENT TRAP FOR DROP INLET (GEOTEXTILE FILTER FABRIC)
NOT TO SCALE



CHECK DAM - STRAW BALE
NOT TO SCALE



STABILISED SITE ENTRY/EXIT WITH WHEEL WASH
NOT TO SCALE



LEVEL SPREADER DETAIL
NOT TO SCALE

Rev.	Date	Description	Des.	Verif.	Appd.
2	20.12.18	REISSUED FOR COORDINATION	BJD		ARM
1	06.08.18	DRAFT - ISSUED FOR COORDINATION	BJD		ARM

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		Date
Drawn	MCD	06.08.18
Checked	DAC	06.08.18
Designed	BJD	06.08.18
Verified		Date
Approved	ARM	06.08.18

Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

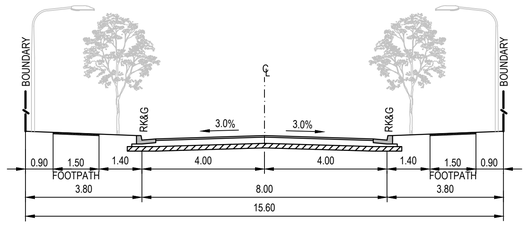
Title: EROSION AND SEDIMENTATION CONTROL DETAILS

Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: CV-CARDNO-ST03C-1131

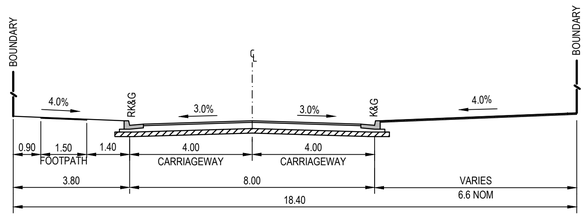
Revision: 2



L1 MINOR LOCAL STREET

PAVEMENT TYPE 2
SCALE 1:100

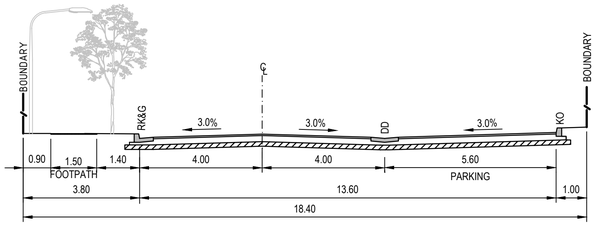
ROADS: 028, 028A



V7 VILLAGE CENTRE LOCAL STREET

PAVEMENT TYPE 2
SCALE 1:100

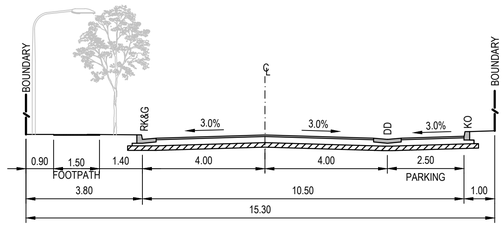
ROADS: 027 (CH301-325, CH385-425, CH467-478)



V8 VILLAGE CENTRE LOCAL STREET

PAVEMENT TYPE 2
SCALE 1:100

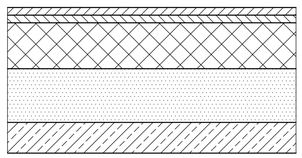
ROADS: 027 (CH 325-385)



V9 VILLAGE CENTRE LOCAL STREET

PAVEMENT TYPE 2
SCALE 1:100

ROADS: 027 (CH425-467)



50mm AC10 WEARING COURSE (2x25mm AC10)
FINAL 25mm LAYER TO BE CONSTRUCTED AFTER
80% OF HOUSING CONSTRUCTION COMPLETED

7mm SINGLE COAT FLUSH SEAL

BASE COURSE DGB20 COMPACTED
TO MINIMUM MODIFIED DENSITY
RATIO OF 98%

SUB BASE DGS40 COMPACTED TO
MINIMUM MODIFIED DENSITY
RATIO OF 95%

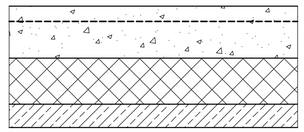
COMPACTED SUBGRADE TO
MINIMUM DENSITY RATIO OF 100%

ASSUMED CBR: REFER TABLE BELOW
ASSUMED ESA: $5x10^4$

PAVEMENT TYPE 2

SCALE 1:10

PAVEMENT 2 DESIGN		
DESIGN SUBGRADE	CBR 3%	CBR 5%
WEARING SURFACE	50mm AC10	50mm AC10
SINGLE COAT FLUSH SEAL	7mm	7mm
BASECOURSE	150mm	150mm
SUBBASE	275mm	175mm
TOTAL THICKNESS	475mm	375mm



SL82 MESH (50mm TOP COVER)
170mm 32MPa CONCRETE

150mm DGB20

COMPACTED SUBGRADE TO 100%
STANDARD MAXIMUM DRY DENSITY

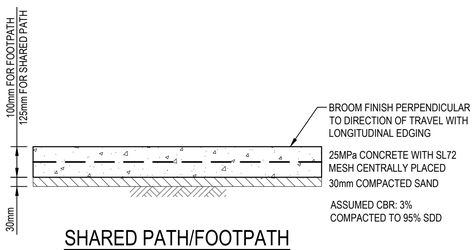
ASSUMED CBR: 3%

PAVEMENT TYPE 5
(CONCRETE MAINTENANCE AND HARDSTAND)

SCALE 1:10

NOTE

1. PROVIDE TCJ AT 4m SPACING.
2. EVERY THIRD JOINT TO BE DEJ.
3. REFER DRAWING 1601 FOR JOINT DETAILS



BROOM FINISH PERPENDICULAR
TO DIRECTION OF TRAVEL WITH
LONGITUDINAL EDGING

25MPa CONCRETE WITH SL72
MESH CENTRALLY PLACED

30mm COMPACTED SAND

ASSUMED CBR: 3%
COMPACTED TO 95% SDD

SHARED PATH/FOOTPATH

SCALE 1:10

NOTES

1. SAWCUT PATH OR TROWELLED DUMMY JOINT AT 2m SPACING.
2. EVERY THIRD JOINT TO BE FULL DEPTH DOWELLED EXPANSION JOINT.
3. REFER DRAWING 1601 FOR JOINT DETAILS.

NOTES

1. STREET SCAPES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO DETAILED LANDSCAPING DESIGN AND APPROVAL.
2. FOOTPATHS TO BE GRADED AT MAXIMUM 2.5%. REMAINING VERGE AREAS TO BE GRADED TO ACHIEVE OVERALL 4.0% GRADE FROM TOP OF KERB TO ROAD RESERVE BOUNDARY.
3. CONSTRUCTION OF FOOTPATH AND SHARED PATH TO BE DEFERRED UNTIL DIRECTED BY THE SITE SUPERINTENDENT.
4. REFER DRAWING 1701 FOR PAVEMENT PLAN.

0 0.2 0.4 0.6 0.8 1m
SCALE 1:10 @A1

0 1 2 4 6 8 10m
SCALE 1:100 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
2	20.12.18	REISSUED FOR COORDINATION	BJD		ARM
1	06.08.18	DRAFT - ISSUED FOR COORDINATION	BJD		ARM

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		Date
Drawn	MCD	06.08.18
Checked	DAC	06.08.18
Designed	BJD	06.08.18
Verified		Date
Approved	ARM	06.08.18

Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

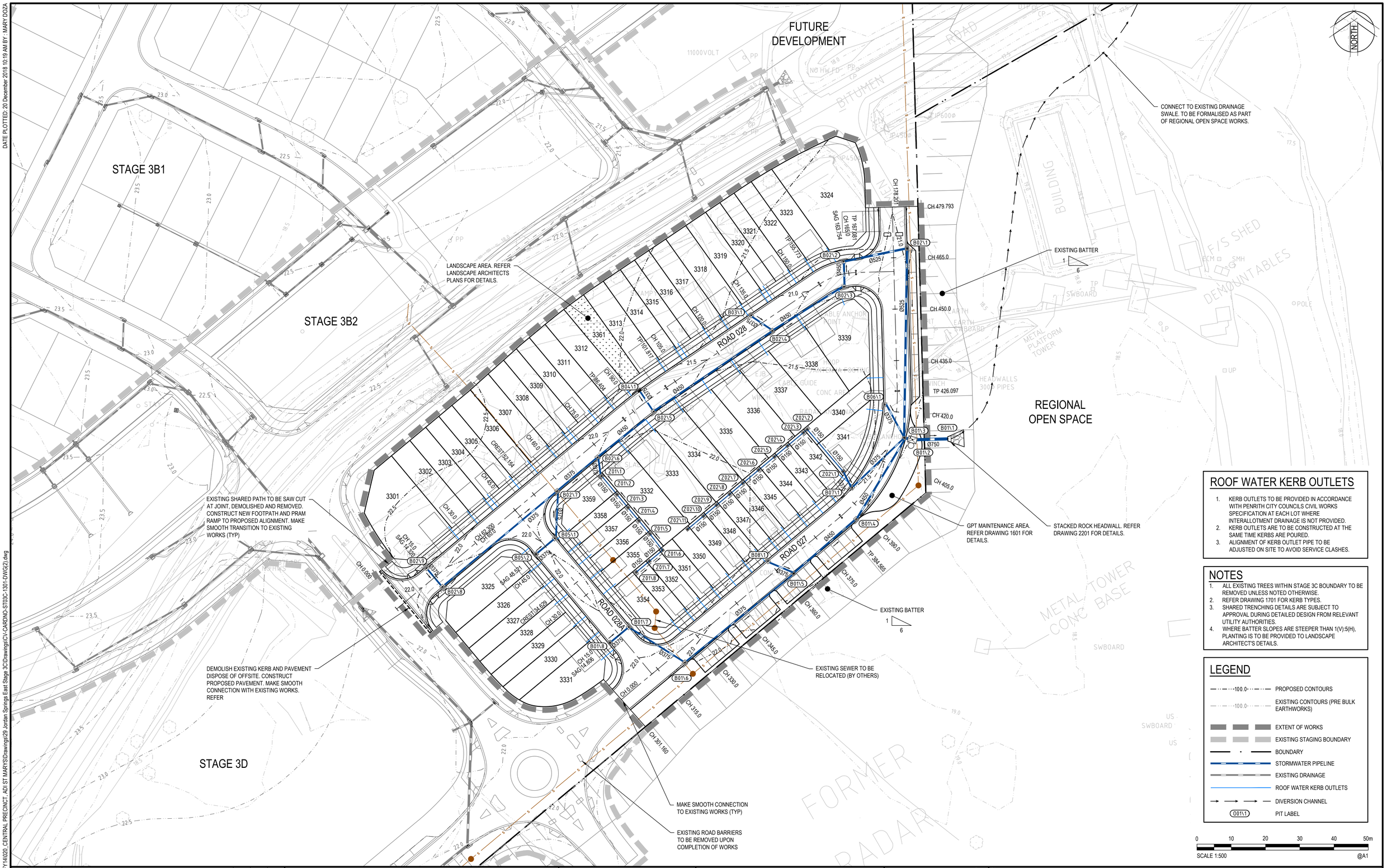
Title: TYPICAL ROAD CROSS SECTIONS
AND PAVEMENT DETAILS

Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: CV-CARDNO-ST03C-1251
Revision: 2

XREF's: X-Contours-Existing-500; XR-89914020-29-CI-DESIGN; XR-89914020-29-CI-STAGE BOUNDARIES; Xref-89914020-Client Logos; XR-89914020-22-CI-DRAINAGE; XR-89914020-21-CI-DRAINAGE; XR-89914020-20-CI-DRAINAGE; XR-89914020-25-CI-DRAINAGE; XR-89914020-CI-MASTERPLAN; XR-89914020-CI-EXISTING SERVICES; XR-89914020-CI-EXISTING TREES;
CAD File: N:\Parramatta\Projects\899\PY\14020_CENTRAL PRECINCT, ADJ ST MARYS\Drawings\29 Jordan Springs East Stage 3C\Drawings\CV-CARDNO-ST03C-1301-DWG(2).dwg
DATE PLOTTED: 20 December 2018 10:19 AM BY - MARY DOZA



ROOF WATER KERB OUTLETS

1. KERB OUTLETS TO BE PROVIDED IN ACCORDANCE WITH PENRITH CITY COUNCILS CIVIL WORKS SPECIFICATION AT EACH LOT WHERE INTERALLOTMENT DRAINAGE IS NOT PROVIDED.
2. KERB OUTLETS ARE TO BE CONSTRUCTED AT THE SAME TIME KERBS ARE POURED.
3. ALIGNMENT OF KERB OUTLET PIPE TO BE ADJUSTED ON SITE TO AVOID SERVICE CLASHES.

NOTES

1. ALL EXISTING TREES WITHIN STAGE 3C BOUNDARY TO BE REMOVED UNLESS NOTED OTHERWISE.
2. REFER DRAWING 1701 FOR KERB TYPES.
3. SHARED TRENCHING DETAILS ARE SUBJECT TO APPROVAL DURING DETAILED DESIGN FROM RELEVANT UTILITY AUTHORITIES.
4. WHERE BATTER SLOPES ARE STEEPER THAN 1(V):5(H), PLANTING IS TO BE PROVIDED TO LANDSCAPE ARCHITECT'S DETAILS.

LEGEND

- PROPOSED CONTOURS
- EXISTING CONTOURS (PRE BULK EARTHWORKS)
- EXTENT OF WORKS
- EXISTING STAGING BOUNDARY
- BOUNDARY
- STORMWATER PIPELINE
- EXISTING DRAINAGE
- ROOF WATER KERB OUTLETS
- DIVERSION CHANNEL
- PIT LABEL

0 10 20 30 40 50m

SCALE 1:500 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
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Verified		Date
Approved	ARM	06.08.18

Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: CIVIL WORKS AND STORMWATER DRAINAGE PLAN

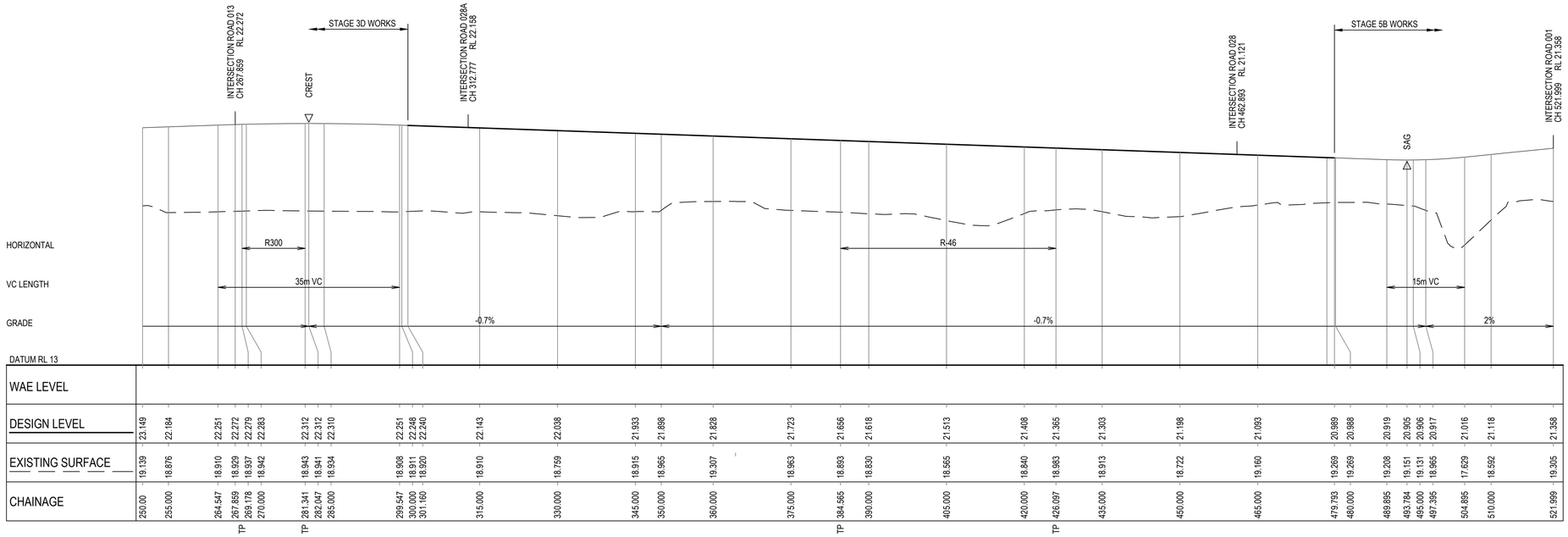
Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		1:500	A1

Drawing Number: CV-CARDNO-ST03C-1301

Revision: 2

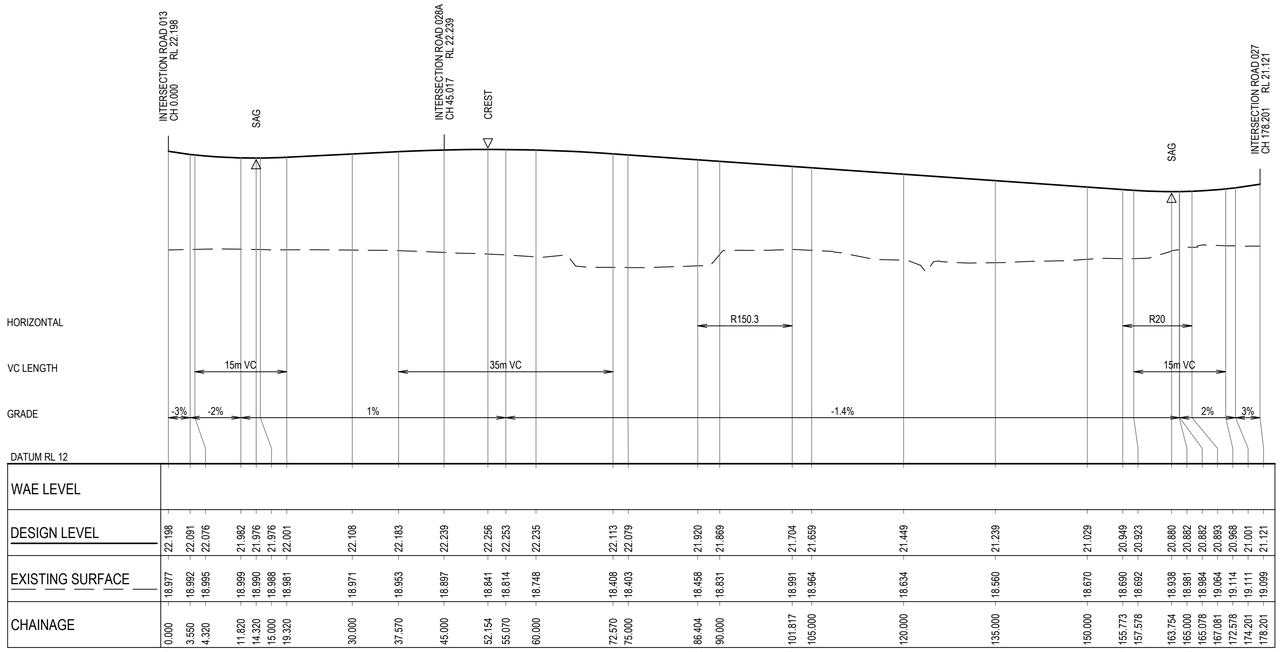
NOTE:
EXISTING LEVELS SHOWN ARE PRE BULK EARTHWORKS. PRIOR TO THE COMMENCEMENT OF CIVIL WORKS, THE BULK EARTHWORKS CONTRACTOR WILL COMPLETE BULK EARTHWORKS OPERATIONS, WHICH INCLUDES FINISHED SURFACE LEVELS EXCEPT FOR AREAS WITHIN THE ROAD THE RESERVE. IN AREAS OF FILL, THE CIVIL CONTRACTOR WILL RECEIVE SUB-GRADE LEVEL +100mm. IN AREAS OF CUT, THE CIVIL CONTRACTOR WILL RECEIVE SUB-GRADE LEVELS.



CHAINAGE	250.00	255.000	264.547	TP 267.659	269.178	270.000	TP 281.341	282.047	285.000	299.547	300.000	301.160	315.000	330.000	345.000	350.000	360.000	375.000	TP 384.565	390.000	405.000	420.000	TP 426.097	435.000	450.000	465.000	479.793	480.000	489.895	493.784	495.000	497.395	504.895	510.000	521.999
EXISTING SURFACE	19.139	18.876	18.910	18.929	18.937	18.942	18.943	18.941	18.934	18.908	18.911	18.920	18.910	18.759	18.915	18.965	19.307	18.963	18.893	18.830	18.565	18.840	18.983	18.913	18.722	19.160	19.269	19.269	19.208	19.151	19.131	18.963	17.629	18.592	19.305
DESIGN LEVEL	23.149	22.184	22.251	22.272	22.279	22.283	22.312	22.312	22.310	22.251	22.248	22.240	22.143	22.038	21.933	21.898	21.828	21.723	21.656	21.618	21.513	21.408	21.365	21.303	21.198	21.093	20.989	20.988	20.919	20.905	20.906	20.917	21.016	21.118	21.358
WAE LEVEL																																			

ROAD 027 LONGITUDINAL SECTION

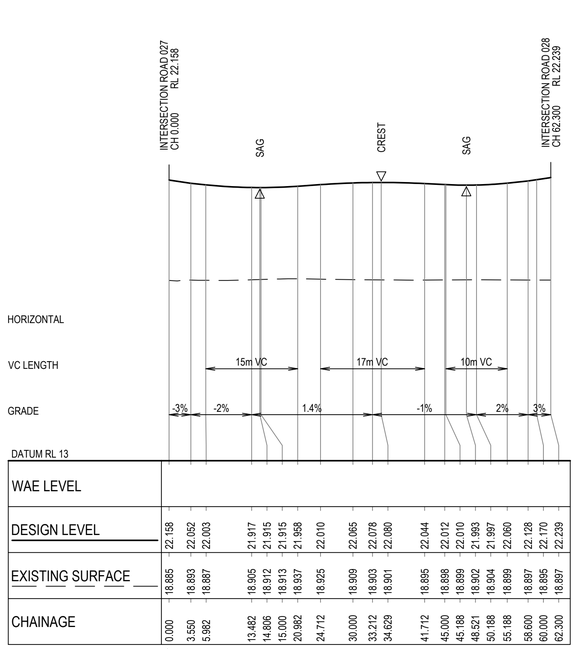
1:500 HORI.
1:100 VERT.



CHAINAGE	TP 0.000	3.550	4.320	11.820	14.320	15.000	19.320	30.000	37.570	45.000	52.154	55.070	60.000	72.570	75.000	TP 86.404	90.000	TP 101.817	105.000	120.000	135.000	150.000	TP 155.773	157.578	TP 163.754	165.000	165.078	167.081	172.578	174.201	178.201
EXISTING SURFACE	18.977	18.992	18.995	18.999	18.990	18.988	18.981	18.971	18.953	18.897	18.841	18.814	18.748	18.408	18.403	18.458	18.831	18.991	18.964	18.634	18.560	18.670	18.690	18.692	18.938	18.981	18.984	19.064	19.114	19.111	19.099
DESIGN LEVEL	22.198	22.091	22.076	21.982	21.976	21.976	22.001	22.108	22.183	22.239	22.256	22.253	22.235	22.113	22.079	21.920	21.869	21.704	21.659	21.449	21.239	21.029	20.949	20.923	20.880	20.882	20.882	20.893	20.968	21.001	21.121
WAE LEVEL																															

ROAD 028 LONGITUDINAL SECTION

1:500 HORI.
1:100 VERT.



CHAINAGE	TP 0.000	3.550	5.982	13.482	14.806	15.000	20.982	24.712	30.000	33.212	34.629	41.712	45.000	45.188	48.521	50.188	55.188	58.800	60.000	62.300
EXISTING SURFACE	18.885	18.893	18.887	18.905	18.912	18.913	18.937	18.925	18.909	18.903	18.901	18.895	18.898	18.899	18.902	18.904	18.899	18.897	18.895	18.897
DESIGN LEVEL	22.158	22.052	22.003	21.917	21.915	21.915	21.958	22.010	22.065	22.078	22.080	22.044	22.012	22.010	21.993	21.997	22.060	22.128	22.170	22.239
WAE LEVEL																				

ROAD 028A LONGITUDINAL SECTION

1:500 HORI.
1:100 VERT.

0 1 2 4 6 8 10m
SCALE 1:100 @A1
0 10 20 30 40 50m
SCALE 1:500 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
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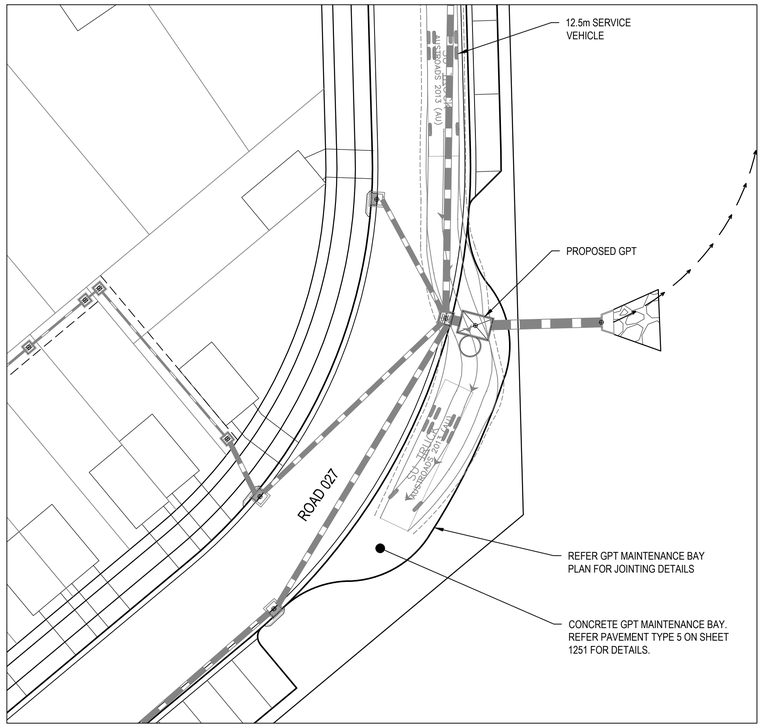
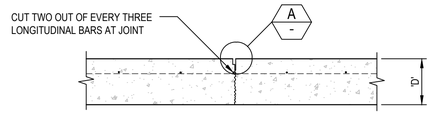
Approved	ARM	06.08.18

Client: LENDLEASE
Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION
Title: ROAD LONGITUDINAL SECTIONS
ROAD 027, 028 & 028A

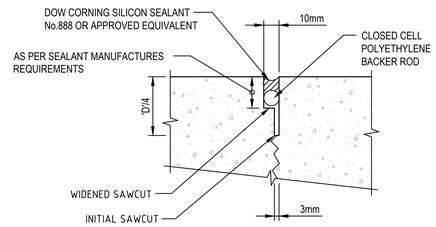
Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: CV-CARDNO-ST03C-1351 | Revision: 2



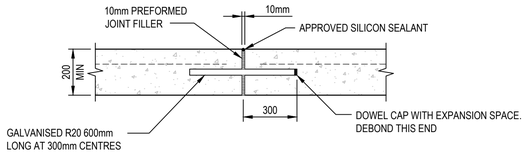
GPT MAINTENANCE ACCESS AREA
ROAD 027
SCALE 1:250



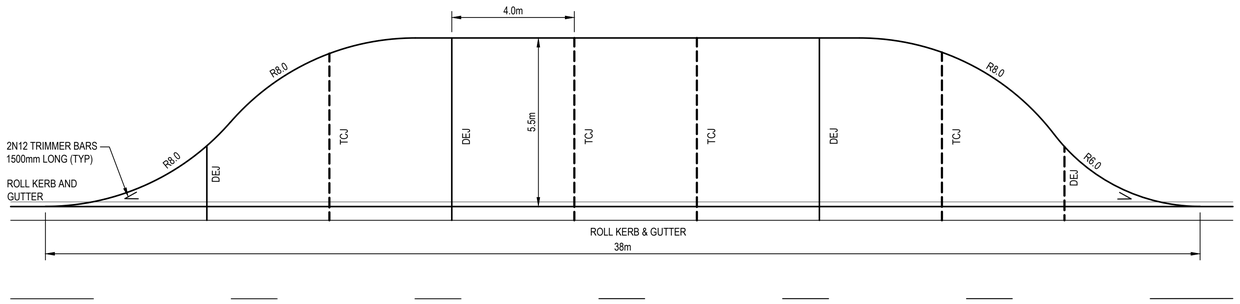
TRANSVERSE CONTRACTION JOINT (TCJ)
SCALE 1:10



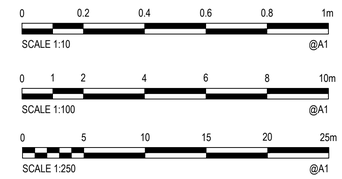
DETAIL A
NTS



DOWELED EXPANSION JOINT (DEJ)
SCALE 1:10



CONCRETE GPT MAINTENANCE BAY PLAN
SCALE 1:100



Rev.	Date	Description	Des.	Verif.	Appd.
2	20.12.18	REISSUED FOR COORDINATION	BJD		ARM
1	06.08.18	DRAFT - ISSUED FOR COORDINATION	BJD		ARM

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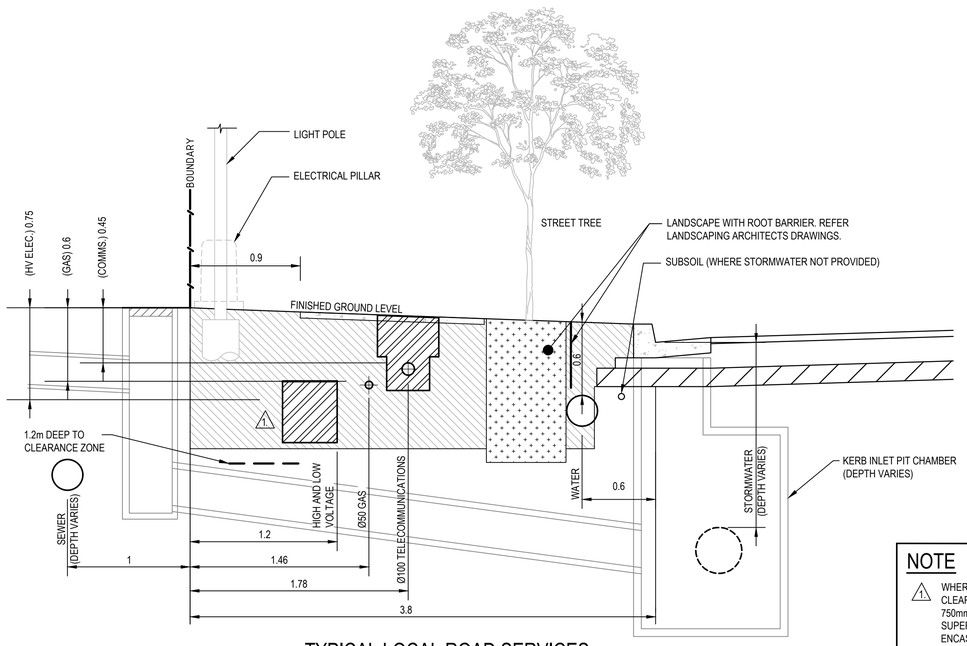
Drawn	MCD	06.08.18
Checked	DAC	06.08.18
Designed	BJD	06.08.18
Verified		Date
Approved	ARM	06.08.18

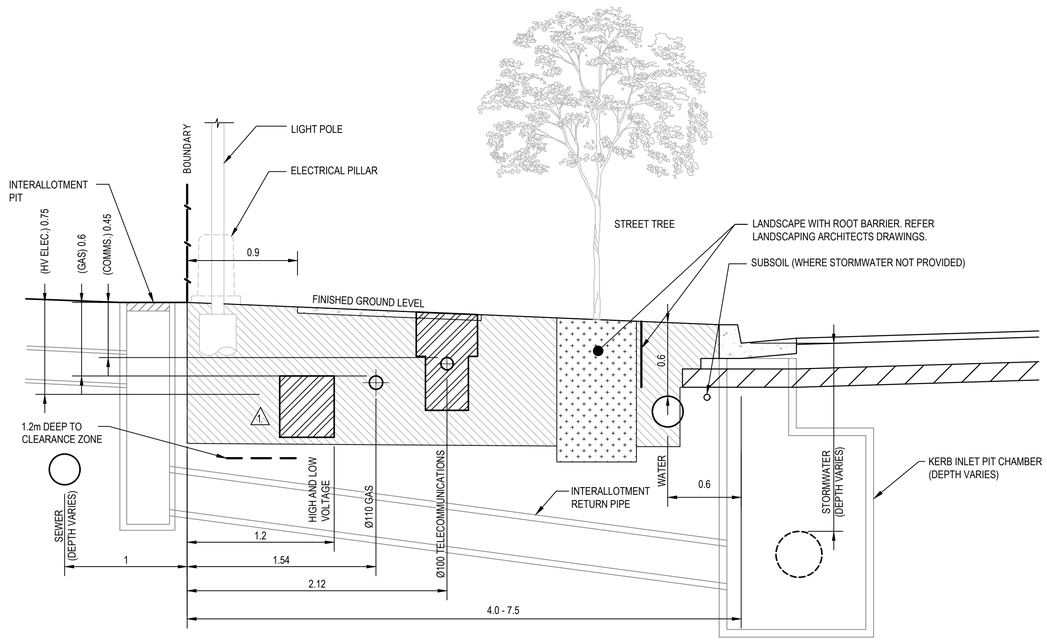
Client: LENDLEASE
Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION
Title: CIVIL WORKS DETAILS
SHEET 1

Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: CV-CARDNO-ST03C-1601
Revision: 2



TYPICAL LOCAL ROAD SERVICES TRENCH EXCAVATION

SCALE 1:25



TYPICAL COLLECTOR ROAD SERVICES TRENCH EXCAVATION

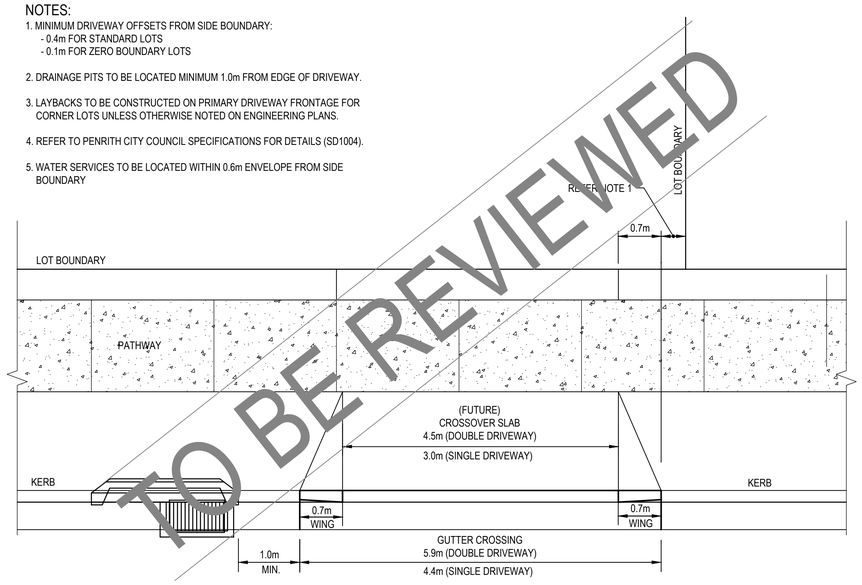
SCALE 1:25

NOTE

1. WHERE STORMWATER ENCROACHES INTO ELECTRICAL CLEARANCE ZONE, COVER MAY BE REDUCED FROM 750mm TO 500mm AND CONDUITS CONCRETE ENCASED. SUPERINTENDENT IS TO APPROVE CONCRETE ENCASEMENT PRIOR TO WORKS COMMENCING UNLESS SPECIFIED ON CERTIFIED ELECTRICAL DRAWINGS.

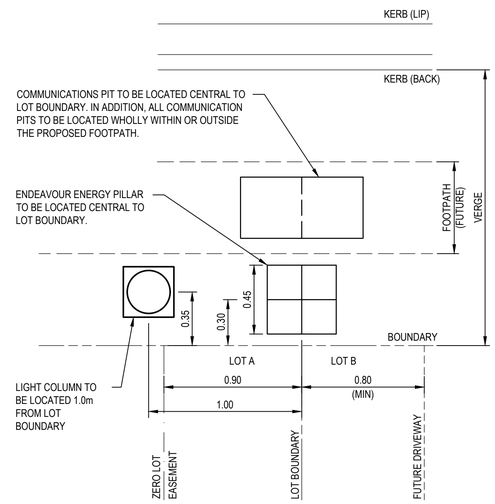
NOTES:

1. MINIMUM DRIVEWAY OFFSETS FROM SIDE BOUNDARY:
   - 0.4m FOR STANDARD LOTS
   - 0.1m FOR ZERO BOUNDARY LOTS
2. DRAINAGE PITS TO BE LOCATED MINIMUM 1.0m FROM EDGE OF DRIVEWAY.
3. LAYBACKS TO BE CONSTRUCTED ON PRIMARY DRIVEWAY FRONTAGE FOR CORNER LOTS UNLESS OTHERWISE NOTED ON ENGINEERING PLANS.
4. REFER TO PENRITH CITY COUNCIL SPECIFICATIONS FOR DETAILS (SD1004).
5. WATER SERVICES TO BE LOCATED WITHIN 0.6m ENVELOPE FROM SIDE BOUNDARY



TYPICAL DRIVEWAY LOCATION DETAIL

N.T.S.



TYPICAL SURFACE UTILITY LAYOUT

SCALE 1:20

(LIGHT COLUMN AND ELECTRICAL PILLAR)

0 0.5 1 1.5 2m
SCALE 1:20 @A1

0 0.5 1 1.5 2 2.5m
SCALE 1:25 @A1

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Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: CIVIL WORKS DETAILS
SHEET 2

Status: FOR INFORMATION ONLY
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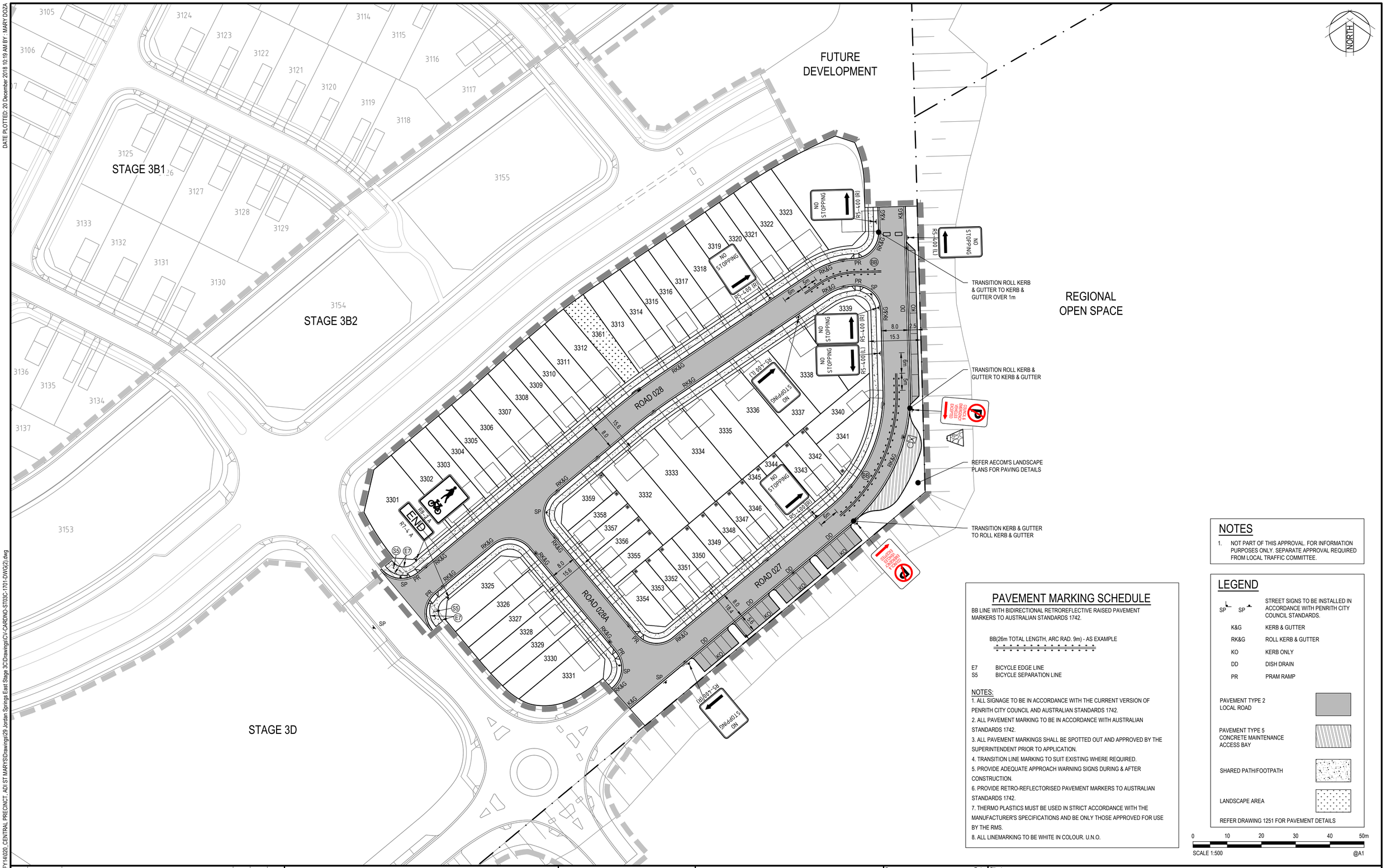
Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: CV-CARDNO-ST03C-1602
Revision: 2



PAVEMENT MARKING SCHEDULE

BB LINE WITH BIDIRECTIONAL RETROREFLECTIVE RAISED PAVEMENT MARKERS TO AUSTRALIAN STANDARDS 1742.

BB(26m TOTAL LENGTH, ARC RAD. 9m) - AS EXAMPLE

E7 BICYCLE EDGE LINE
S5 BICYCLE SEPARATION LINE

NOTES:

1. ALL SIGNAGE TO BE IN ACCORDANCE WITH THE CURRENT VERSION OF PENRITH CITY COUNCIL AND AUSTRALIAN STANDARDS 1742.
2. ALL PAVEMENT MARKING TO BE IN ACCORDANCE WITH AUSTRALIAN STANDARDS 1742.
3. ALL PAVEMENT MARKINGS SHALL BE SPOTTED OUT AND APPROVED BY THE SUPERINTENDENT PRIOR TO APPLICATION.
4. TRANSITION LINE MARKING TO SUIT EXISTING WHERE REQUIRED.
5. PROVIDE ADEQUATE APPROACH WARNING SIGNS DURING & AFTER CONSTRUCTION.
6. PROVIDE RETRO-REFLECTORISED PAVEMENT MARKERS TO AUSTRALIAN STANDARDS 1742.
7. THERMO PLASTICS MUST BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND BE ONLY THOSE APPROVED FOR USE BY THE RMS.
8. ALL LINEMARKING TO BE WHITE IN COLOUR. U.N.O.

NOTES

1. NOT PART OF THIS APPROVAL. FOR INFORMATION PURPOSES ONLY. SEPARATE APPROVAL REQUIRED FROM LOCAL TRAFFIC COMMITTEE.

LEGEND

SP SP	STREET SIGNS TO BE INSTALLED IN ACCORDANCE WITH PENRITH CITY COUNCIL STANDARDS.
K&G	KERB & GUTTER
RK&G	ROLL KERB & GUTTER
KO	KERB ONLY
DD	DISH DRAIN
PR	PRAM RAMP

PAVEMENT TYPE 2 LOCAL ROAD

PAVEMENT TYPE 5 CONCRETE MAINTENANCE ACCESS BAY

SHARED PATH/FOOTPATH

LANDSCAPE AREA

REFER DRAWING 1251 FOR PAVEMENT DETAILS

0 10 20 30 40 50m
SCALE 1:500 @A1

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Client: LENDLEASE

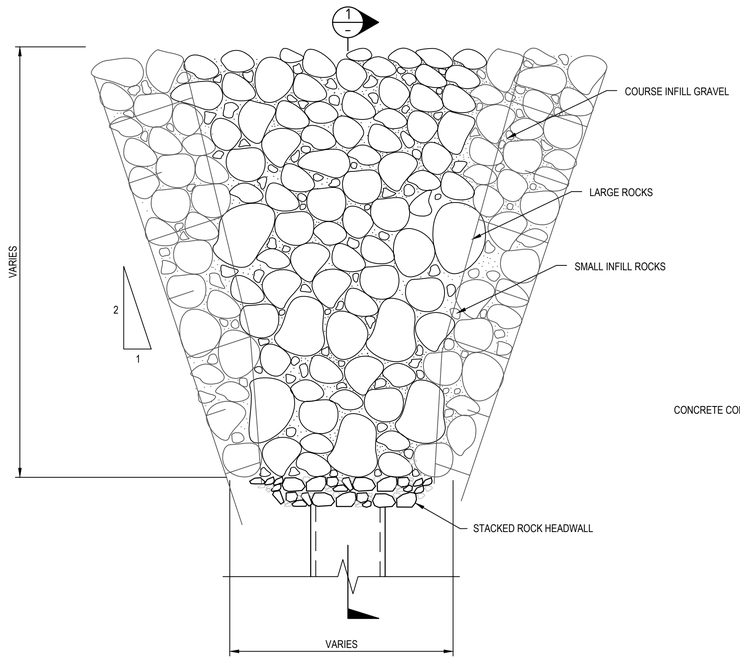
Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: PAVEMENT, SIGNAGE & LINEMARKING PLAN

Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	1:500	A1

Drawing Number: CV-CARDNO-ST03C-1701
Revision: 2



TYPICAL OUTLET HEADWALL SCOUR PROTECTION PLAN

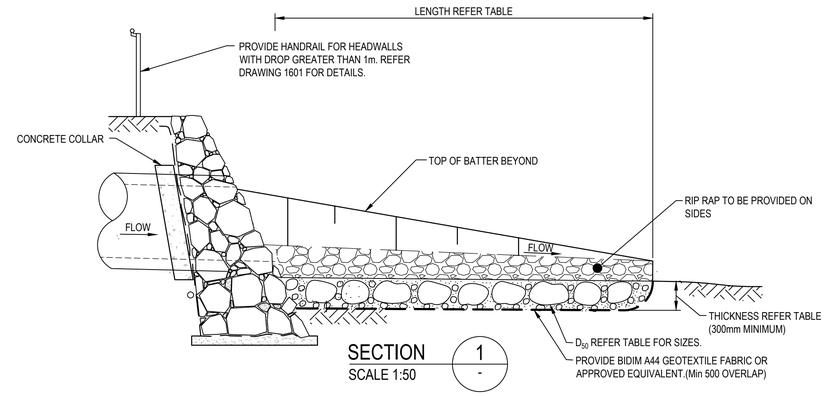
SCALE 1:50

HEADWALL RIP-RAP SCOUR PROTECTION (MINIMUM DIMENSIONS)

OUTLET NUMBER	LENGTH (mm)	WIDTH (mm)	THICKNESS (mm)	D_{50} (mm)
x	x	x	x	x

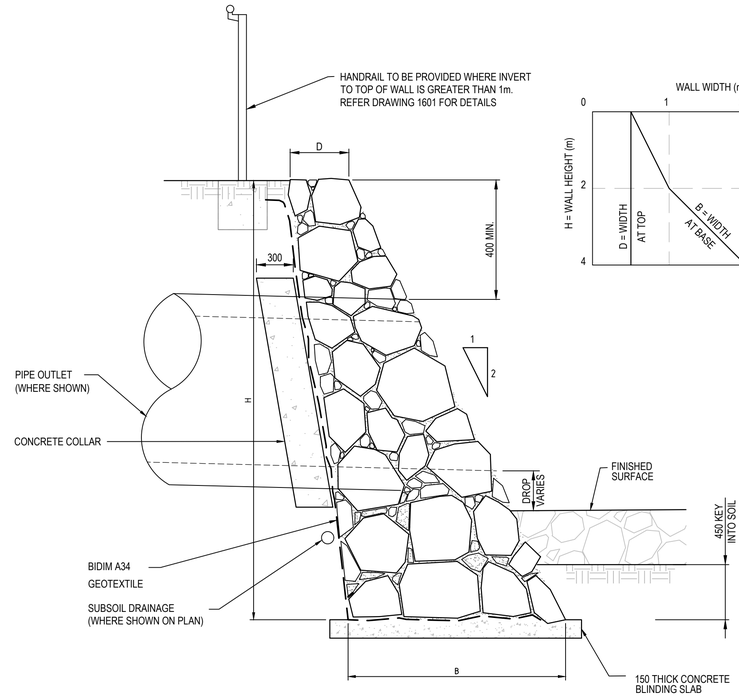
NOTE:

1. TABLE VALUES TO BE DETERMINED AT DETAILED DESIGN.



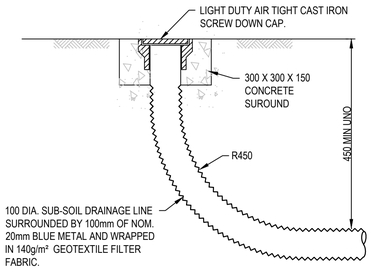
TYPICAL OUTLET HEADWALL SCOUR PROTECTION DETAIL

SCALE 1:50



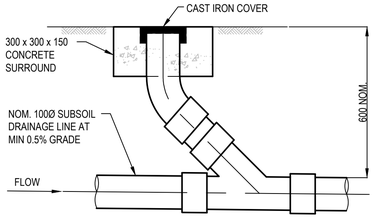
STACKED ROCK HEADWALL

SCALE 1:25



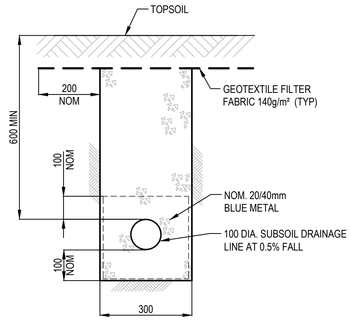
FLUSHING POINT

SCALE 1:10



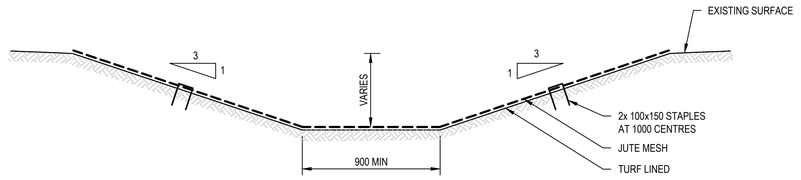
INTERMEDIATE RISER

SCALE 1:10



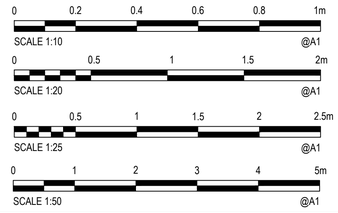
SUBSOIL IN LANDSCAPED AREAS

SCALE 1:10



TYPICAL SECTION THROUGH DIVERSION CHANNEL

SCALE 1:20



NOTES:

ROCK RIPRAP

1. ALL RIPRAP MUST CONSIST OF ANGULAR RUN-OF-QUARRY DURABLE ROCK PLACED OVER A 200MM LAYER OF ANGULAR COBBLES D50=100MM MIXED WITH GRAVEL D50=10MM.
2. ALL ROCK IS TO BE A HARD, DURABLE ROCK WITH A POINT INDEX LOAD IS50 GREATER THAN 1.0MPA AS DETERMINED IN ACCORDANCE WITH AS4133.4.1:2007.
3. RIPRAP IS TO BE PLACED BY HAND AND CROW-BARERED INTO PLACE TO ENSURE FIT WITH MINIMUM VOIDS.
4. ALL ROCK AND COBBLES TO BE PLACED WITH TOPSOIL. GAPS IN RIPRAP TO BE PLANTED AS SPECIFIED IN LANDSCAPING PLANS
   - 4.1. M50 - 60KG (NDW 300MD)
   - 4.2. M15 - 25KG
   - 4.3. 100 - 120KG

SUBSOIL DRAINAGE BEHIND KERB

REFER PENRITH CITY COUNCIL STANDARD DRAWING SD2004 FOR DETAILS.

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Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: STORMWATER DRAINAGE DETAILS
SHEET 1

Status: FOR INFORMATION ONLY
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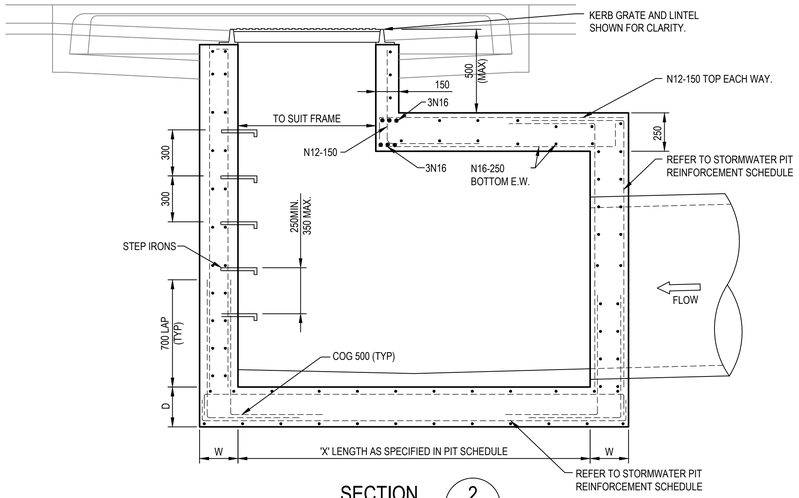
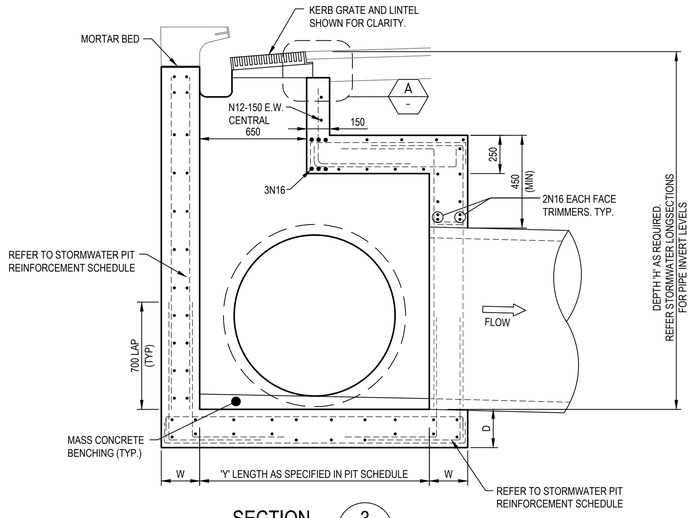
Datum		Scale	Size
AHD		AS SHOWN	A1

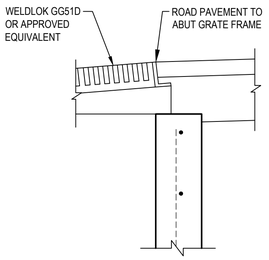
Drawing Number: CV-CARDNO-ST03C-2201
Revision: 2



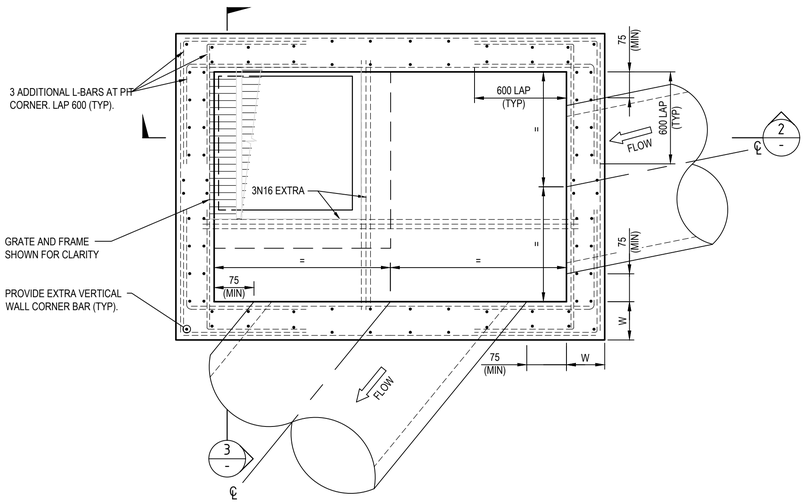
SECTION 2
SCALE 1:20



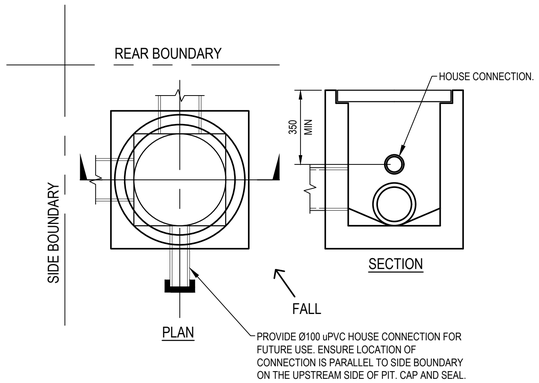
SECTION 3
SCALE 1:20



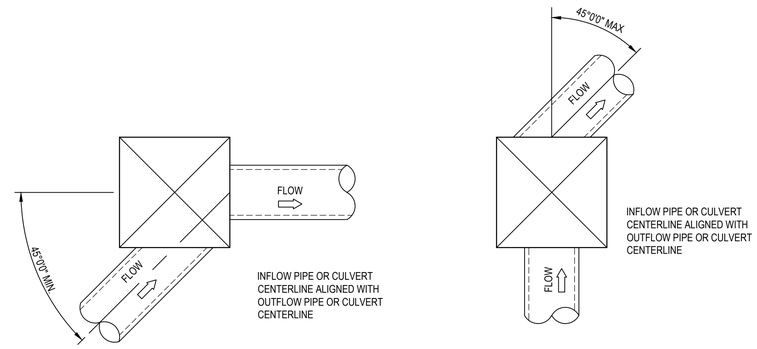
DETAIL A
SCALE 1:10



NON PENRITH CITY COUNCIL STANDARD STORMWATER PIT
SCALE 1:20



PENRITH CITY COUNCIL STANDARD INTERALLOTMENT DRAINAGE PIT
SCALE 1:20



DEFLECTION ANGLE GREATER THAN 45° (SIDE OF PIT)
SCALE 1:25

PIT ALIGNMENT REQUIREMENTS

TYPICAL DETAILS OF STORMWATER PIPE OR CULVERT ALIGNMENTS THROUGH STORMWATER PITS. STORMWATER PIPE OR CULVERT ALIGNMENTS NOT SHOWN SHOULD BE CONSTRUCTED SIMILARLY IN ORDER TO STREAMLINE FLOWS FROM UPSTREAM TO DOWNSTREAM AND MINIMISE HEADLOSS.

IMPORTANT NOTE: PIT STANDARD DETAILS

PENRITH COUNCIL STANDARD GRATED GULLY PITS DETAIL, SD2001 TO BE USED FOR PIT DETAILS WHERE:
A. PIT INTERNAL WIDTH IN ANY DIRECTION IS LESS THAN OR EQUAL TO 1200mm, AND
B. PIT DEPTH FROM SETOUT POINT TO INVERT IS LESS THAN OR EQUAL TO 2000mm.

FOR PITS WIDER THAN 1200mm AND/OR DEEPER THAN 2000mm REFER TO THE BELOW TABLE AND DETAILS.

NON PCC STORMWATER PIT REINFORCEMENT SCHEDULE						
PIT DIMENSIONS(mm)		WALL DIMENSIONS(mm)		VERTICAL REINFORCEMENT	HORIZONTAL REINFORCEMENT	BASE REINFORCEMENT
LENGTH 'X','Y'	DEPTH 'H'	BASE THICKNESS 'D'	WALL THICKNESS 'W'			
1200<X,Y<3300	2000<H<3900	230	230	N12-200 E.F.	N12-200 E.F.	N12-200 E.F.
X,Y<1200	H<6000	230	230	N16-250 E.F.	N16-250 E.F.	N16-250 E.F.

NOTE: PIT REINFORCEMENT TO BE SELECTED USING MAXIMUM PIT DIMENSION

NOTES:

1. PIT REINFORCEMENT TO BE SELECTED USING MAXIMUM PIT DIMENSION.
2. MINIMUM COVER TO REINFORCING AND CONCRETE STRENGTH AS SPECIFIED ON SHEET 1011.

0 0.2 0.4 0.6 0.8 1m
SCALE 1:10 @A1

0 0.5 1 1.5 2m
SCALE 1:20 @A1

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Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION
Title: STORMWATER DRAINAGE DETAILS
SHEET 2

Status: FOR INFORMATION ONLY
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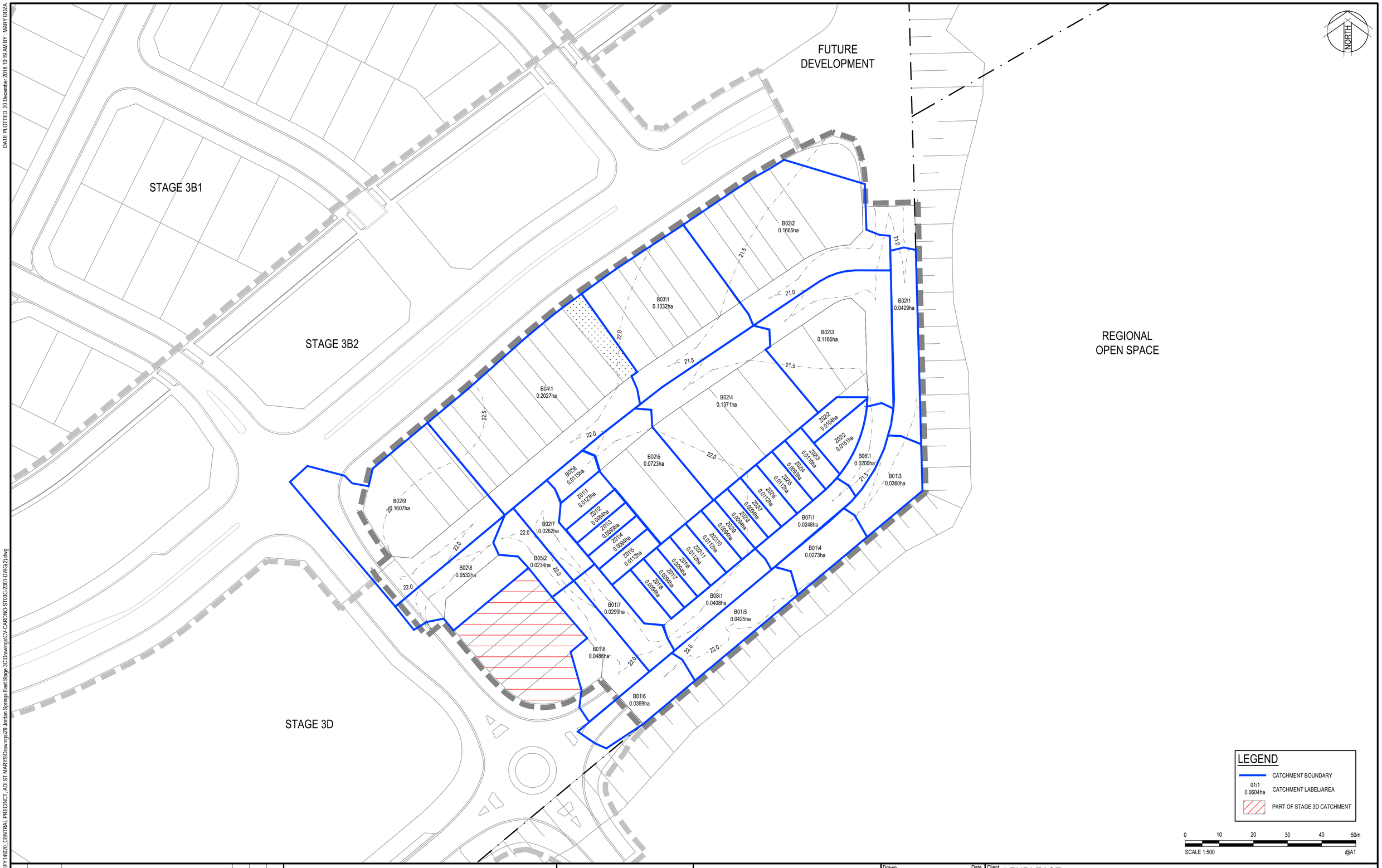
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: CV-CARDNO-ST03C-2202 | Revision: 2



LEGEND

- CATCHMENT BOUNDARY
- 01/1 0.0604ha — CATCHMENT LABEL/AREA
- PART OF STAGE 3D CATCHMENT

0 10 20 30 40 50m

SCALE 1:500 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
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Verified		Date
Approved	ARM	06.08.18

Client: LENDLEASE

Project: JORDAN SPRINGS EAST
STAGE 3C - CIVIL WORKS
DEVELOPMENT APPLICATION

Title: INTERNAL STORMWATER CATCHMENT PLAN

Status: FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		1:500	A1

Drawing Number: CV-CARDNO-ST03C-2301

Revision: 2