23rd January 2013

The General Manager
Penrith City Council
601 High Street
PENRITH NSW 2760

Attention: Schandel Jefferys

Dear Schandel,

DEVELOPMENT APPLICATION (DA)
PROPOSED RIPARIAN CORRIDOR CHANNEL CONSTRUCTION AND ASSOCIATED EARTHWORKS, JORDAN SPRINGS, WESTERN PRECINCT, ST MARYS

1.0 INTRODUCTION

This Statement of Environmental Effects (SEE) is submitted to Penrith City Council (PCC) in support of a Development Application (DA) for the proposed construction of the Riparian Corridor within Jordan Springs, Western Precinct, St. Marys, including the following:

- Construction of a stormwater channel; and
- Associated civil works including bulk earthworks and tree removal.

This report has been prepared by the Applicant, Lend Lease (LL) as agent for Maryland Development Company.

This report should be read in conjunction with the following:

- DA form and application fees;
- Location Plan, prepared by Lend Lease (**Appendix A**);
- Neighbour Notification Plan, prepared by Lend Lease (**Appendix B**);
- Jordan Springs Concept Plan, prepared by Lend Lease (**Appendix C**);
- Existing Conditions Plans, prepared by Lend Lease (**Appendix D**);
- Tree Plans and Existing Tree Schedule, prepared by Lend Lease (**Appendix E**);
- Previously lodged Plans of Subdivision, prepared by Whelans Insites (**Appendix F**);
- Engineering Plans for the North-South channel, prepared by SKM (**Appendix G**);
- Engineering Plans for the East-West channel, prepared by SKM(**Appendix H**);
- Erosion and Sediment Control Plans, prepared by SKM (**Appendix I**);
- Previously Approved North / South and East / West Open Channel Hydraulic Report, prepared by SKM (**Appendix J**);
- Waste Management Plan, prepared by Lend Lease (**Appendix K**);
- Species Impact Statement (SIS), prepared by Cumberland Ecology (**Appendix L**).

This report describes the site and its environs, the proposed development and includes an assessment of the proposal in terms of the matters for consideration as listed under Section

79C(1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Within this report, references to the 'subject site' mean the land to which this DA relates.

Lend Lease

2.0 SITE LOCATION AND DESCRIPTION

2.1 Background

The St Marys site was endorsed by the NSW Government for inclusion on the Urban Development Program (UDP) in 1993. The St Marys site is located approximately 45km west of the Sydney CBD, 5km north-east of the Penrith City Centre and 12km west of the Blacktown City Centre.

The St Marys site has an area of approximately 1,545ha and is approximately 7km east to west and 2km north to south. The site is bounded by Forrester Road and Palmyra Avenue in the east, The Northern Road in the west, Ninth Avenue and Palmyra Avenue in the north and the Dunheved Industrial Area, Dunheved Golf Club and Cambridge Gardens, Werrington Gardens and Werrington County residential estates in the south.

The St Marys site, which has been rezoned for a variety of uses, comprises 6 development precincts – Western, Central, North and South Dunheved, Ropes Creek and Eastern Precincts. Developable areas within these Precincts are shown on **Figure 1**.

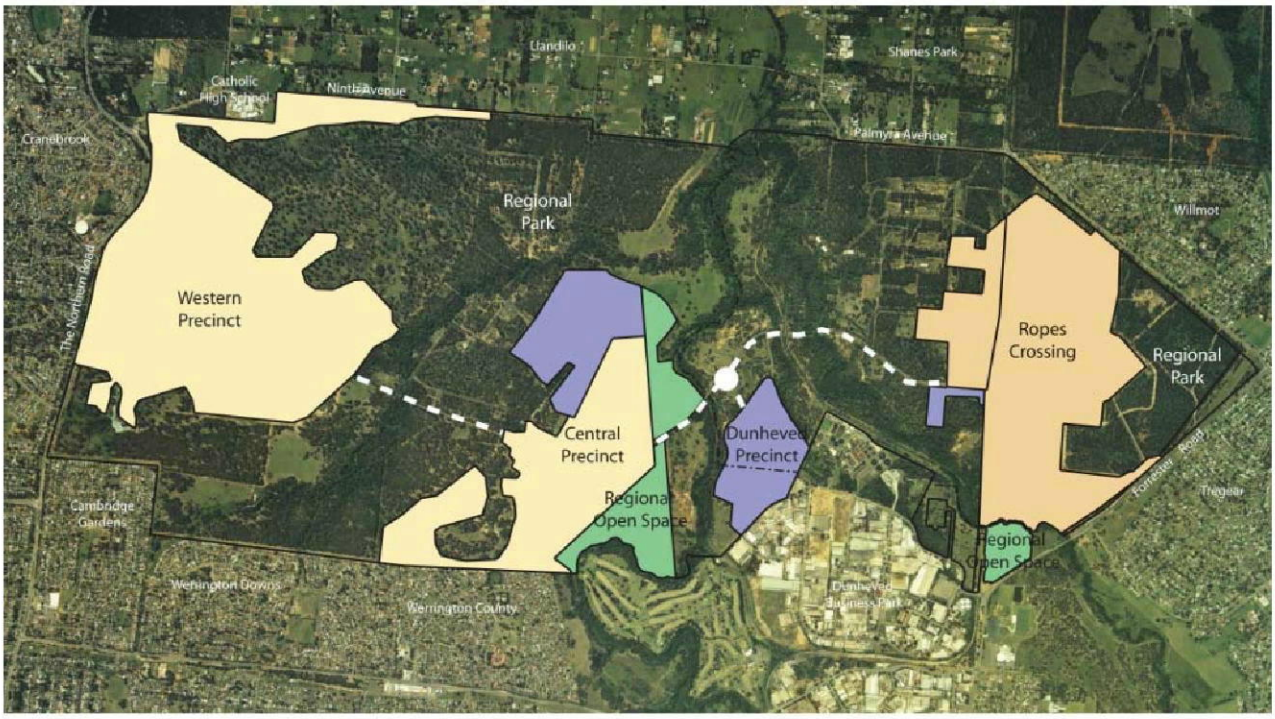

Figure 1 – St Marys Development Precincts

On 16 June 2003 the Minister for Infrastructure, Planning and Natural Resources announced the "release" of the Eastern, North and South Dunheved Precincts. Subsequently, on 29 September 2006, the Minister released the remaining precincts, allowing "Precinct Plans" to be released for each area.

A Precinct Plan for the Western Precinct (the WPP) and accompanying Development Control Strategy (DCS) were adopted by Penrith City Council on 23rd March 2009. Construction of roads, services, landscaping and housing has been undertaken. The WPP required the preparation and adoption by Council of a Concept Plan prior to the approval of any subdivision proposal within the Western Precinct. The Concept Plan provides the next level of specificity of detail in relation to the matters addressed in the WPP and is intended for use by Council as an assessment tool for the consideration of future DAs.

2.2 Site Description and Ownership

The land to which this DA refers is the suburb of Jordan Springs which comprises the Western Precinct of the St Mary's development. The site is owned by St Marys Land Limited and is being developed by Lend Lease under the name of Maryland Development Company.

The subject land of this DA is currently located in the following allotments:

- Part lot 19 in a subdivision of lot 8 in DP 1176874
- Part lot 19 in proposed lot 1 in a subdivision of proposed lot 3996, in a proposed further subdivision of lot 11 in DP1176163
- Lot 3995 in a proposed subdivision of lot 11 in DP1176163
- Lot 4000 in a proposed subdivision of lot 11 in DP1176163

These allotments have been created in previous Development Applications to subdivide the parent lot into the subject lots. The previously lodged Plans of Subdivision are included at **Appendix F**.

For site context, refer to **Appendix A** for the Site Location Plan.

2.3 Relevant Western Precinct Subdivision DAs

This DA will require consideration within the context of previous DAs lodged adjacent to the subject site (refer **Table 1**). The scope of each DA and its status is provided.

Lend Lease

Table 1- Associated Western Precinct subdivision DAs

Development Application	Proposal	Status
Stage 2A subdivision application (DA11/0514)	• 75 Residential lots, 1 public reserve, 5 residue lots and public roads	Approved 11th April 2012
Stage 2B subdivision application (DA11/0515)	• 70 Residential lots, 1 residue lot and public roads	Approved 11th April 2012
Stage 2C subdivision application (DA11/0516)	• 111 Residential lots, 1 residue lot and public roads	Approved 11th April 2012
Stage 2D subdivision application (DA11/0517)	• 102 Residential lots and public roads	Approved 11th April 2012
Stage 3A subdivision application (DA11/0511)	• 139 Residential lots, 7 residue lots and public roads	Approved 15th August 2011
Stage 3B subdivision application (DA11/0512)	• 138 Residential lots, 1 public reserve, 3 residue lots and public roads	Approved 15th August 2011
Retail Site subdivision application (DA11/1047)	• 3 residue lots	Approved 19th December 2011
Childcare Centre and CRH subdivision application (DA11/1360)	• 1 Childcare Centre site, 1 Community Resource Hub site and 1 residue allotment	Approved 2nd March 2012
Stage 1H subdivision application (DA11/1333)	• 29 residential lots	Approved 3rd April 2012
Riparian Corridor subdivision application (DA11/1088)	• 5 residue lots	Approved 13th November 2012
Living Street subdivision application (DA11/1094)	• 22 residential lots and public roads	Approved 10th October 2012
Mixed Use site 4-lot subdivision application (DA12/0101)	• 1 Mixed Use Development site, 1 future road reserve and 2 residue allotments	Approved 15th May 2012
Temporary Builders Display Village Car Park (DA12/0291)	• 1 temporary car park for the Builders Display Village	Approved 26th June 2012
Stage 4 subdivision application (DA12/0897)	• 292 lots, 1 public reserve and public roads	Approved 10th December 2012
Permanent Trunk Sewer EIS (DA12/0910)	• Construction of Sewer Main infrastructure	Approved 10th December 2012

3.0 DESCRIPTION OF PROPOSAL

This section of the report provides a detailed description of the proposed development. Specifically, the proposed works include the construction of two trapezoidal channels detailed as follows:

- A North / South channel running approximately through the centre of the site, commencing at Greenwood Parkway and passing through the Jordan Springs Lake, before continuing to the South of the lake and terminating at the East / West channel; and

- An East / West channel which transitions from an existing open channel to the West of the Village 4 entry road, intercepting the North / South channel and developing into a full-width channel, terminating at the culverts beneath Road 21, which connect to the future detention basin (East Lake).

The two trapezoidal channels are engineered to accommodate projected flows for the development with a freeboard of 500mm or more.

An additional DA is to be submitted concurrently with this subject DA for the landscape embellishment works within the Riparian Corridor. Therefore, this subject DA will not provide comprehensive details for the additional works to be undertaken in the Riparian Corridor.

3.1 Location of subject site

The subject site is located in the Central to South Eastern corner of the Western Precinct. It is encased by future development areas on each boundary.

Refer to the Site Location Plan at **Appendix A**.

3.2 Existing site conditions

The Existing Site Conditions plan (refer **Appendix D**) illustrates that the proposed channel follows the natural gradient of the land in its existing condition.

There are existing trees on the site, some of which will require removal. All trees on site have been identified and are specified on the Tree Plan and Existing Tree Schedule in **Appendix E**.

3.3 Consultation with Council

A pre-lodgement meeting was held between Lend Lease and Penrith City Council on Thursday 27th September 2012. Minutes from that meeting are yet to be provided by Council. The matters discussed are summarised below with an appropriate response provided in italics.

- Clarification is required for whether the areas will be dedicated as reserve or drainage reserve, and how this suits the planning agreement.

The correct title for the Riparian Corridor is drainage reserve. The land will be dedicated accordingly at a later stage through a linen plan to be lodged with Council.

- Peak flow is required to match pre-development levels in accordance with the Deed obligations.

The channel has been designed by engineers to contain the projected stormwater flows for the development, and ensure that the downstream impact does not exceed pre-development levels. Further details are provided in the following sections.

- Hydraulic information will need to be provided to support the proposal.

*A hydraulic report was submitted with the Riparian Corridor subdivision DA (DA11/1088), and is included in the DA at **Appendix J**.*

- If trees are to be retained in the Southern section of the North / South Riparian Corridor, water pooling is to be avoided.

The trees are earmarked for retention. Drainage of the site will occur through the retention of a small existing swale. This detail is included in the subsequent landscape embellishment DA.

- Retained trees must be adequately protected during construction.

Noted. Adequate separations and protection will be put in place prior to construction, and checked by the Principal Certifying Authority prior to construction.

- The links across the proposed channels must be above the 1 in 100 flood level.

*Earthworks and culverts in the channels will ensure that the crossings are above the 1 in 100 level. Refer to the hydrology report at **Appendix J** and the engineering plans at **Appendices G** and **H**.*

- Details of any structures within the channels which modify the flow of water are to be provided.

Structures within the channels have been minimised to reduce the disruption of flow, however the construction of culverts to allow for crossings are proposed. The number of crossings has been agreed with Greg Brady from Office of Water. Refer to the hydrology report and engineering plans for details.

Consultation has also been undertaken with Greg Brady from NSW Office of Water in relation to the Riparian Corridors and proposed channels, and its relationship with the future proposed East Lake, which will be the detention basin ultimately for all stormwater in the catchment prior to entering the Regional Park.

A DA will be lodged for the East Lake at a later stage, and therefore further details will be submitted as part of a future DA. However, the matters raised which are relevant to the subject DA are summarised below, with an appropriate response provided in italics.

- Erosion and sediment control details are to be provided in the earthwork DA, and details of stormwater management during the construction period.

*An erosion and sediment control plan has been prepared by SKM and is provided at **Appendix I**.*

- Ensure that there is no backflow into the East / West Channel from the East Lake.

The construction level of East Lake will be designed to ensure that there is no backflow into the East / West channel. The box culvert under Road 21 located immediately upstream of the proposed East Lake has been designed to safely convey the same flow capacity as the open channel (1 in 100 year flood). Therefore, there will be no backflow from the box culverts.

- Additional detail is to be provided for the intersection of channels.

An energy dissipation area has been included to provide scour protection at the intersection of the North / South and East / West channels. Refer to the engineering plans for details.

4.0 ASSESSMENT OF PLANNING ISSUES

Section 79C(1) of the Environmental Planning and Assessment Act 1979 declares that the Consent Authority, in assessing a DA, must take into account a range of issues relevant to the proposal, including the suitability of the site, and the impacts of the site and surrounds imposed by the proposal.

The following matters are reviewed in accordance with the proposed subdivision.

4.1 Flooding and Stormwater Drainage

The Water, Soils and Infrastructure Report that forms part of the WPP and prepared by SKM contains an analysis of the existing water, drainage and soil characteristics of the Western Precinct. The report establishes that the site is not affected by the Probably Maximum Flood level from the Hawkesbury Nepean River system, or the 100 year ARI level in South Creek, located to the west of the subject site.

Additionally, the report details the hydrological modelling and water quality for the site once development of the residential subdivision is complete. An engineered design of the stormwater channel is detailed at **Appendices G** and **H** to meet the quantity and quality requirements specified in the report. Ultimately, the proposed East Lake will provide stormwater quality treatment for stormwater runoff prior to entering the South Creek Catchment beyond the precinct boundary.

In the interim, three temporary sedimentation basins are located at various locations along the channel. Details of the interim solution are provided at **Appendix I**. Additional details on interim stormwater management strategy will be provided at Construction Certificate stage when the full channel construction engineering plans are produced.

Both the interim and ultimate solutions will provide sufficient stormwater detention for 100 year Average Recurrence Interval (ARI) rainfall events.

To prevent large solids from entering the channel, Gross Pollutant Traps are included in the stormwater system of adjacent residential areas, and will treat most stormwater runoff before entering the Riparian Corridor.

4.2 Earthworks and Ground Contouring

Bulk earthworks are proposed as part of the channel construction. Details are provided in the engineering plans prepared by SKM, included at **Appendices G** and **H**.

The land will be graded to formally create the channels, which will generally follow the natural slope of the land and the existing informal stormwater channels across the site. The extent of earthworks and contouring is required to ensure that the channel will provide the sufficient capacity for stormwater flows projected by hydraulic modelling. The parameters for the design of the channels, which determines the extent of earthworks, are as follows:

- The open channels must fully contain the 1 in 100 year peak water level;
- A minimum of 500mm freeboard depth;
- The slope of the bank to achieve a gradient generally of 1 in 4; and
- A channel depth no greater than 1.5m.

Details of the hydraulic modelling and results are included in the report prepared by SKM, which was lodged and subsequently approved as part of the Riparian Corridor Subdivision DA (DA11/1088). A copy of the approved report is included at **Appendix J** for reference.

4.3 Erosion and Sediment Control

The construction and future landscape embellishment of the channels will provide sufficient erosion and sediment control in the longer term. Energy dissipation areas are proposed to slow the velocity of the water at pinch points and prevent scouring, specifically at culverts and at the intersecting point of the two channels.

An erosion and sediment control plan has been prepared by SKM for implementation during the construction phase (refer **Appendix I**). A series of sediment basins will treat stormwater before it is released downstream, and will ultimately flow into the sediment basin in the proposed location of the East Lake. Sediment fences will also be utilised to prevent sediment and siltation entering the waterways. The plan will ensure that water entering the Jordan Springs lake will be clean.

Shortly after the construction of the channel, a combination of turf and trees will be planted to ultimately protect the channel banks and provide erosion control. The landscaping and embellishment works will occur in accordance with the Vegetation Management Plan and landscape plans which will be subject to a separate DA, to be lodged concurrently with the channel construction DA.

4.4 Soil Salinity

The Soil and Water Management Plan contained within the Western Precinct Plan includes possible measures to address potential soil salinity issues, should they occur.

A salinity review has previously been undertaken for the entire Western Precinct by Geotech Testing Pty Ltd. This has been endorsed by Penrith City Council as part of previous DAs.

4.5 Explosive Ordnance Material

In accordance with the Contamination Management Plan (CMP), processes are in place for when potential ordnance material is uncovered. These processes have previously been approved as part of the Western Precinct Plan by Penrith City Council.

4.6 Access and Traffic

A series of culvert crossings have been provided across the channel for vehicle and pedestrian access. These are generally provided as part of separate Development Applications which have

been approved previously, with the exception of the pedestrian crossing, which traverses the East / West channel. The crossing increases pedestrian accessibility between Village 4 and Village 2 / Road 21, and the bus stop located on that road.

The earthwork and culvert details are provided in this DA, however the embellishment details for the crossing will be provided under the separate landscape embellishment DA.

4.7 Landscaping and Maintenance

The slope of the banks is proposed to achieve a 1 in 4 gradient, to ensure the ease of maintenance of landscaped areas, particularly the extensive turf areas which will require routine mowing.

No landscaping works are proposed as part of this DA. Landscaping and maintenance will be detailed in a separate Development Application to be lodged concurrently with the subject DA, specifically for the embellishment of the Riparian Corridors.

4.8 Tree Removal

The proposal includes tree removal as part of the channel works. The Tree Plan and Existing Tree Schedule are included at **Appendix E**, which identify the trees to be removed and the reasons for removal.

4.9 Ecology

A Species Impact Statement (SIS) has been prepared by Cumberland Ecology and is included at **Appendix L**.

In summary, the SIS states that the proposed development will not have a significant adverse impact on the relevant threatened species and ecological communities. The subject site is vegetated by poor quality, exotic dominated derived native grassland which lacks habitat for most threatened native species, and, as a result of significant historic disturbance, is unlikely to naturally regenerate into woodland.

In addition, it is predicted in the SIS that the known occurrences of threatened flora and fauna on the site will be secure in the long term as a result of the dedication of the 900ha Regional Park.

4.10 Heritage

There are 4 European Heritage items located within the Western Precinct, as listed under SREP30. The subject site is not located in the vicinity of any of these heritage items.

An Aboriginal Heritage Assessment has previously been undertaken by Jo McDonald Cultural Heritage Management Pty Ltd, and an associated report produced in 2008 titled *Archaeological assessment of Indigenous Heritage values in the Western Precinct of the St. Marys Site, St*

Marys. Subsequently, an Aboriginal Heritage Impact Permit (AHIP) has been granted for the whole of the Western Precinct. The AHIP includes the subject development site.

4.11 Contamination

The St Marys Precinct has been subject to extensive investigation and remediation to ensure that the land is suitable for development. The Environmental Protection Agency (EPA), now DECCW, has been involved in the process of preparing the Site Audit Statements (SAS) for the Precinct. The specific SAS which encompasses the subject site is CHK001/1. A copy of this SAS has been submitted to Penrith City Council previously.

4.12 Waste Management

The Waste Management Plan (WMP) included at **Appendix L** will ensure that reuse and recycling of construction materials is maximised both on and off the site and that waste is minimised as far as practicable.

4.13 Social and Economic Impacts

The proposed channel will provide important stormwater drainage infrastructure for Jordan Springs, to allow the development of Urban zoned land to be undertaken in accordance with the concept plan and other Environmental Planning Instruments as endorsed by Penrith City Council and the State Government. SREP 30 establishes the development framework for the St. Marys site, which continues to deliver economic development and employment opportunities.

Further, the proposed development will continue the utilisation of construction jobs as well as longer term economic benefits associated with flow on effects from establishing a new residential community.

4.14 The public interest

The proposed development is consistent with the Development Control Strategy and Western Precinct Plan. These documents have been subject to public exhibition and assessment by Penrith City Council, leading to its subsequent adoption. The proposal represents Council's planning objectives for the Western Precinct.

5.0 DEVELOPMENT ASSESSMENT UNDER RELEVANT PLANNING INSTRUMENTS AND CONTROLS

Section 79C(1) of the Environmental Planning and Assessment Act states that the consent authority must take into account a range of matters relevant to the development in determining an application, and specifically the provisions of environmental planning instruments.

The following planning instruments and documents are relevant to the proposed development:

- Sydney Regional Environmental Plan No. 30 – St Marys (SREP 30);
- St Marys Environmental Planning Strategy (St Marys EPS);
- Western Precinct Plan (including Development Control Strategy and Concept Plan); and
- Penrith Development Control Plan 2006 (DCP).

The following assessment of these instruments only includes those matters under Section 79C(1) that are relevant to the proposal. These planning instruments have been used to determine the social, economic and natural and built environmental impacts.

5.1 Sydney Regional Environmental Plan No. 30 – St Marys (SREP 30)

SREP 30 contains planning objectives, principles and provisions to control development within the Precincts shown in figure 1. Overall, the proposed subdivision is not inconsistent with the achievement of the performance or zone objectives, and reflects the aims of the development control strategies of SREP 30.

Part 5 specifies the performance objectives for development on the St. Marys site. The proposal is consistent with these objectives in that it:

- Retains stands of significant trees within the Riparian corridor where possible;
- Does not impact the heritage significance of items of environmental heritage and their settings;
- Utilises effective erosion and sediment control measures in accordance with industry standards;
- Contributes to the stormwater management measures on site to ensure that there is no net adverse impact upon the water quality, and minimal impact on downstream flood levels in the South Creek and Hawkesbury – Nepean catchments; and
- Manages the flood risk to both people and property.

Further, it is noted that development for the purpose of “drains” and “flood mitigation works” is permitted in the Urban Zone, with consent of the consent authority.

5.2 St Marys Environmental Planning Strategy (St Marys EPS)

The St Marys EPS establishes guidelines and strategies for the future development of land under SREP 30, specifically in relation to matters of conservation, cultural heritage, water cycle and soils, transport, urban form, energy and waste, human services, employment and contamination.

These guidelines and objectives reflect those included within SREP 30, of which the proposed development is generally compliant. Additionally, the proposal facilitates the implementation of the strategies which have been put in place to achieve the performance objectives for the site. Specifically, the proposal is consistent with the performance objectives in that it:

- Retains significant stands of trees where practicable;
- Is designed to minimise the impact of stormwater on the proposed Regional Park;
- Has been constructed along the existing drainage line and to accommodate increased stormwater runoff from urban areas; and
- Has been designed to reduce constraints on the flow of floodwaters through the channels by minimising the number of pinch points and obstacles.

5.3 St Marys Western Precinct Plan (WPP)

The Western Precinct Plan (WPP) identifies the distribution of major land uses including the location and function of open space and public facilities within the Western Precinct.

The channels are generally in accordance with the locations indicated on the Framework Plan in the WPP, and are generally compliant with the objectives specified in the WPP. The proposal is compliant with Section 4.11 *Water Cycle and Soils* specifically, in that it:

- Facilitates the stability of the watercourse within the Riparian Zone;
- Allows for a vegetation buffer either side of the channel;
- Provides no net impact upon the water quality in South Creek and Hawkesbury – Nepean Catchments; and
- Limits the extent of works within the Riparian Corridor to drainage works and a pedestrian / cycle crossing in a location as approved in the Framework Plan.

5.4 Western Precinct Development Control Strategy (DCS)

The DCS contains specific development standards for urban design, built form and environmental management to ensure the implementation of the development principles as specified in the WPP.

There are no principles or objectives which are relevant to the subject channel construction DA. However, the proposal will not prevent or hinder the achievement of the relevant objectives in subsequent DAs, including the landscape embellishment DA for the Riparian Corridor.

5.5 Penrith Development Control Plan 2006 (DCP)

The 2006 DCP was amended in 2010, however the subject site is located on land which was excluded from the Penrith Development Control Plan 2010. Where the Precinct Plan does not specify development objectives, the DCP will provide guiding principles.

A review of the relevant criteria of the Penrith Development Control Plan 2006 confirms that the proposed development is consistent with the relevant controls and objectives of all Parts in the 2006 DCP. Particularly, Section 2.4 ("Erosion and Sediment Control") applies as a result of the disturbance of land, and also the changes in the velocity and volume of runoff entering directly into a watercourse. In accordance with the objectives of this section, the proposal will:

- Reduce the amount of sediment and contaminated water which leaves the site;
- Ensure prompt rehabilitation of the subject site through revegetation of the Riparian Corridors; and
- Provide details on erosion and sediment control.

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6.0 Conclusion

The proposed development is consistent with the objectives and controls within the planning instruments relevant to this site.

The proposal is in accordance with the Development Control Strategy and Western Precinct Plan, and represents Council's planning objectives for the Western Precinct. Under SREP 30 objectives, the proposal is permissible with consent according to clause 40, and is consistent with the Urban Zone objectives.

In light of the merits of the proposal, and in absence of any significant adverse environmental, social or economic impacts, we request that the application be approved, subject to appropriate conditions of consent.

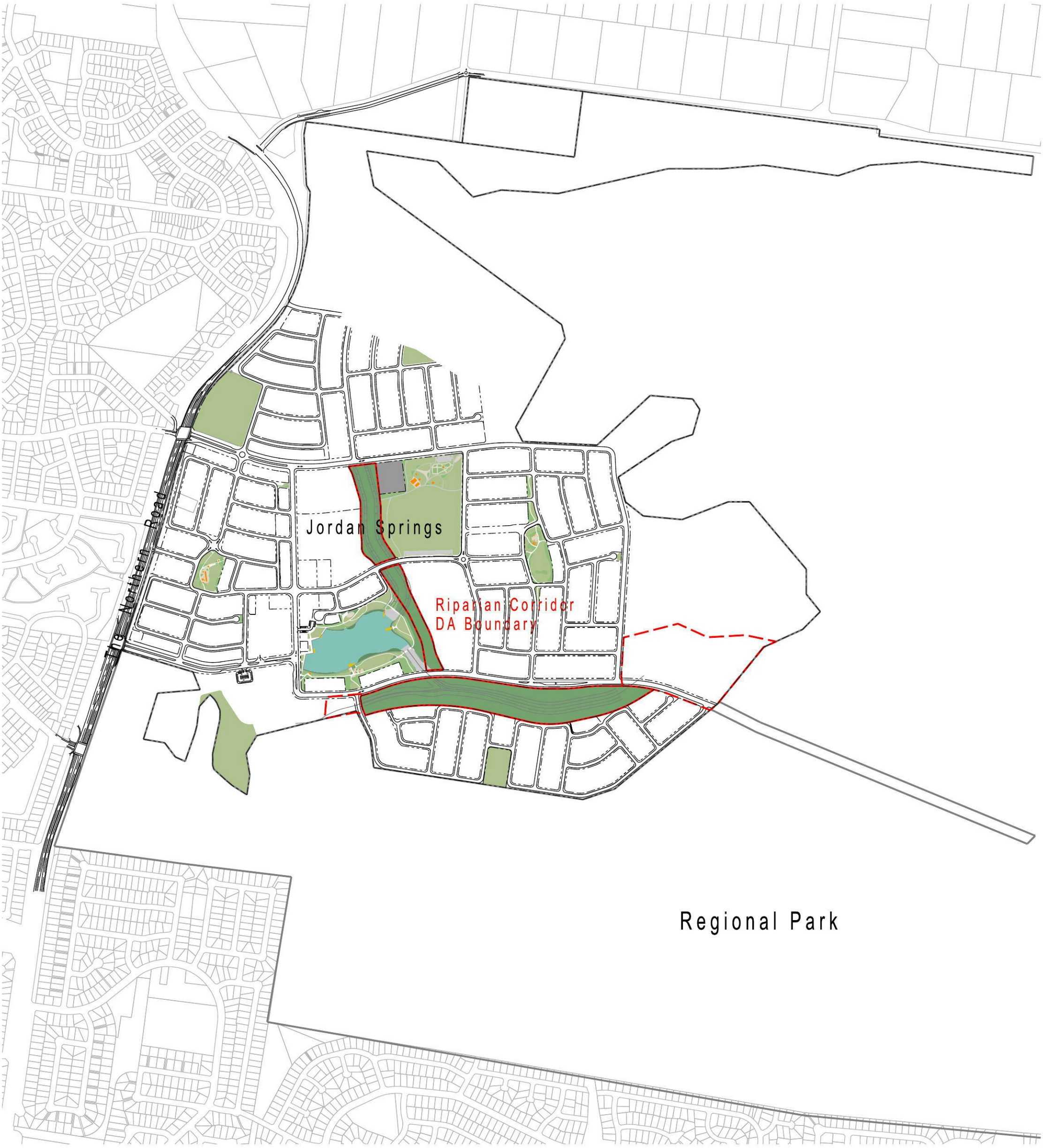
Should you require further clarification on any of the above items or require additional plans or documentation, please do not hesitate to contact me on 0439 094 730.

Yours faithfully,

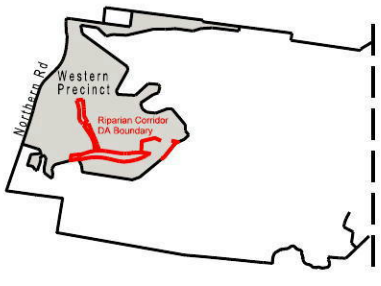
Angus Fulton
Statutory Planner
COMMUNITIES

Lend Lease

Appendix A
Location Plan, prepared by Lend Lease



KEY PLAN



0 100m 200m 400m 600m

NOTES

Issue	Amendment	Date
A	Council Lodgement Issue	11.01.13

LEGEND

DA Boundary

Developer

Lend Lease

Cnr Jordan Springs Blvd and Lakeside Pde
Jordan Springs NSW 2747
PO Box 1870, Penrith NSW 2751
p.02 8016 6500

ABN 19 087 876 864

©

Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

Drawing Title

Riparian Corridor DA

Location Plan

Scale AT A3	1:10000
Drawn by	RS/LM
Drawing No.	WP TNROval Loc

Issue A

Lend Lease

Appendix B
Neighbour Notification Plan, prepared by Lend Lease

Xavier College

Regional Park

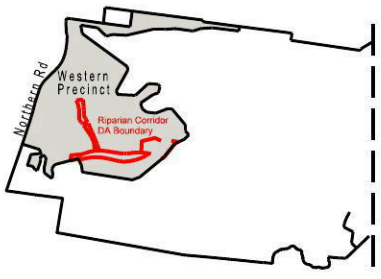
Jordan Springs

The Northern Road

Riparian Corridor DA Boundary

Regional Park

KEY PLAN



0 100m 200m 400m 600m

NOTES

Issue	Amendment	Date
A	Council Submission Issue	11.01.13

LEGEND

DA Boundary

Developer

Lend Lease

Cnr Jordan Springs Blvd and Lakeside Pde
Jordan Springs NSW 2747
PO Box 1870, Penrith NSW 2751
p.02 8016 6500

ABN 19 087 876 864

©

Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

Drawing Title

Riparian Corridor DA

Neighbour Notification Plan

Scale AT A3	1:10000
Drawn by	RS/LM
Drawing No.	WP OA Rip Notification

Issue A

Lend Lease

Appendix C
Jordan Springs Concept Plan, prepared by Lend Lease

Regional Park

VILLAGE 3

VILLAGE 2

VILLAGE 1

VILLAGE 4

Village 4 DA Boundary

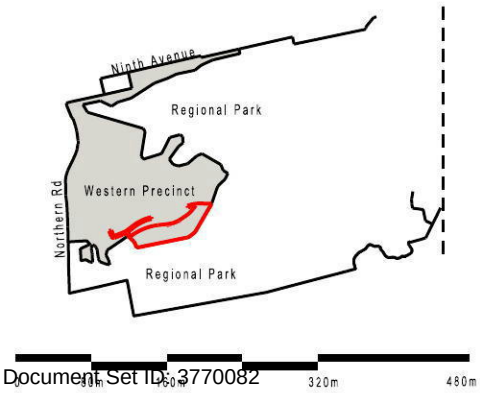
The Northern Road

Regional Park

Village Boundary
Water Management Basin/Lake
Riparian Corridor
Open Space
Precinct Boundary
Possible Residential Density
Village Centre retail/mixed use
Regional Park activity nodes
Possible Residential/Education
Education
Proposed Electrical Substation
Signalised Intersection
Left In - Left Out Intersection
Collector Road Pedestrian Cycle Route
Principal Pedestrian Cycle Route
Village Centre Character Area
Indicative Future Subdivision Pattern

Note: Plan indicative only subject to change at DA Stage.

KEY PLAN



NOTES

Issue	Amendment	Date
A	Council Submission Issue	11.09.12
B	Council Submission Issue - AMENDED	10.01.13

LEGEND

DA Boundary

Developer

Lend Lease

Cnr Jordan Springs Blvd and Lakeside Pde
Jordan Springs NSW 2747
PO Box 1870, Penrith NSW 2751
p.02 8016 6500
ABN 19 087 876 864

©

Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

Drawing Title

Village 4 DA

Concept Plan

Scale AT A3	1:8000
Drawn by	RS/LM
Drawing No.	WP Concept for SIS

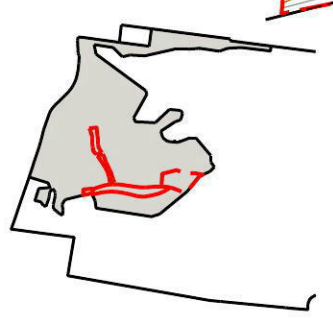
Issue B

Lend Lease

Appendix D
Existing Conditions Plans, prepared by Lend Lease

Riparian Corridor DA Boundary

KEY PLAN



NOTES

Issue	Amendment	Date
A	Council Lodgement	14.12.12

NOTES

DA Boundary

Existing tree

35.0 Existing contour

Top of bank

Bottom of bank

Existing structure/road

Developer

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Ropes Crossing Boulevard,
Ropes Crossing NSW 2760
p.02 9673 8800 f.02 9673 8888
ABN 88 000 966 085 ©

Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

Drawing Title

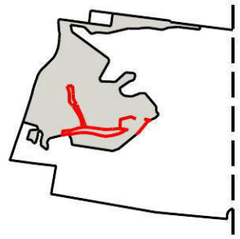
Riparian Corridor DA (N/S)

Existing Conditions Plan

Scale AT A3	1:2000
Drawn by	RAS
Drawing Number	WP OA RiparianNS EC

Issue A

KEY PLAN



Issue	Amendment	Date
A	Council Lodgement	11.01.13

NOTES

DA Boundary

Existing tree

35.0 Existing contour

Top of bank

Bottom of bank

Existing structure/road

Developer

Lend Lease

Ropes Crossing Boulevard,
Ropes Crossing NSW 2760
p.02 9673 8800 f.02 9673 8888

ABN 88 000 966 005 ©

Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

Drawing Title

Riparian Corridor (E/W)

Existing Conditions Plan

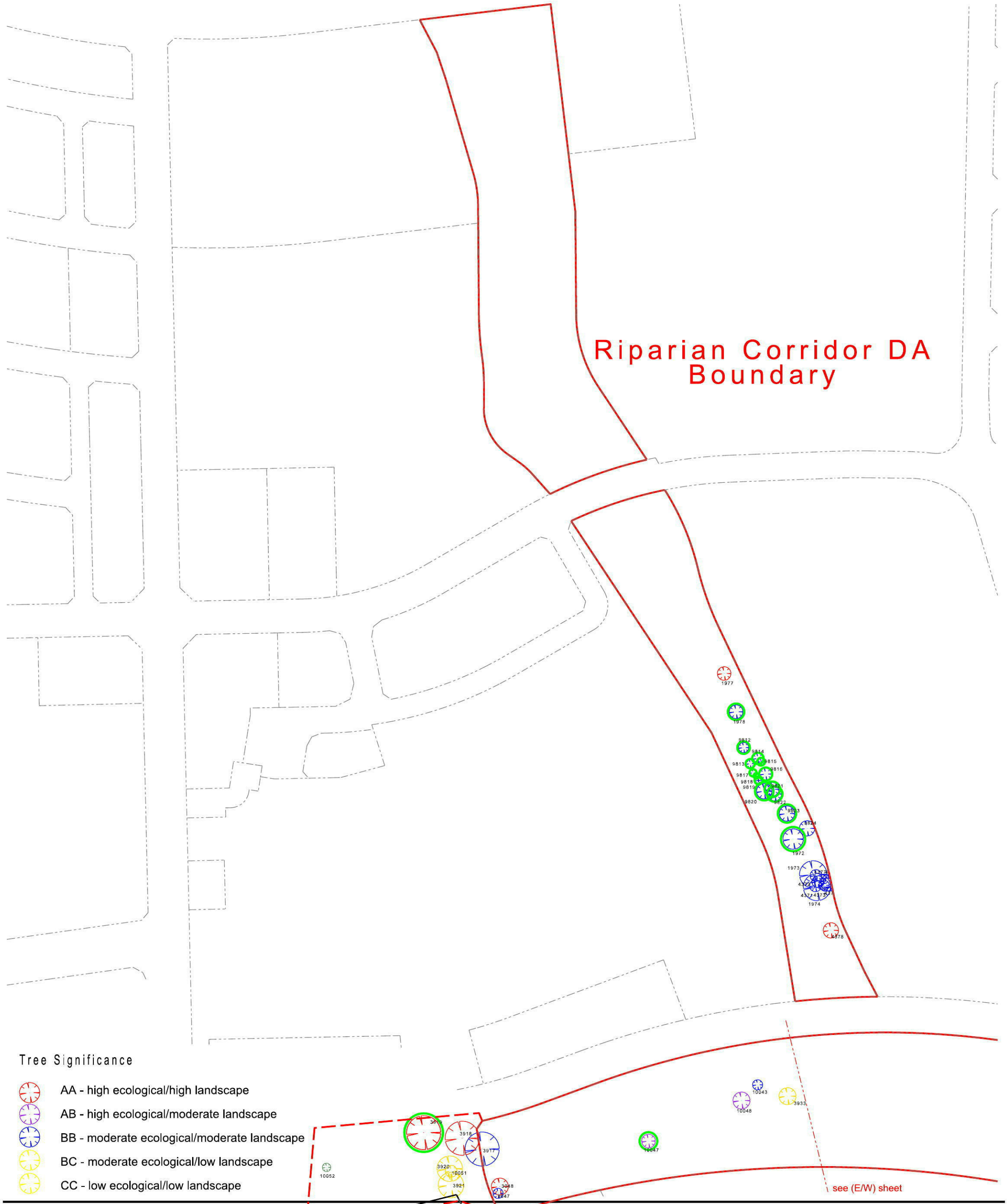
Scale AT A3	1:3000
Drawn by	RAS
Drawing Number	WP OA RiparianEW EC

Issue A

0 10m 20m 40m 60m

Lend Lease

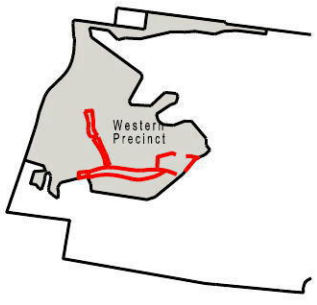
Appendix E
Tree Plans and Existing Tree Schedule, prepared by Lend Lease



Tree Significance

- AA - high ecological/high landscape
- AB - high ecological/moderate landscape
- BB - moderate ecological/moderate landscape
- BC - moderate ecological/low landscape
- CC - low ecological/low landscape

KEY PLAN



NOTES

Issue	Amendment	Date
A	Council Lodgement	14.12.12

NOTES

DA Boundary

Tree to be Retained

Tree to be Removed

All Trees to be Removed unless otherwise shown

Developer

Lend Lease

Ropes Crossing Boulevard,
Ropes Crossing NSW 2760
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Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

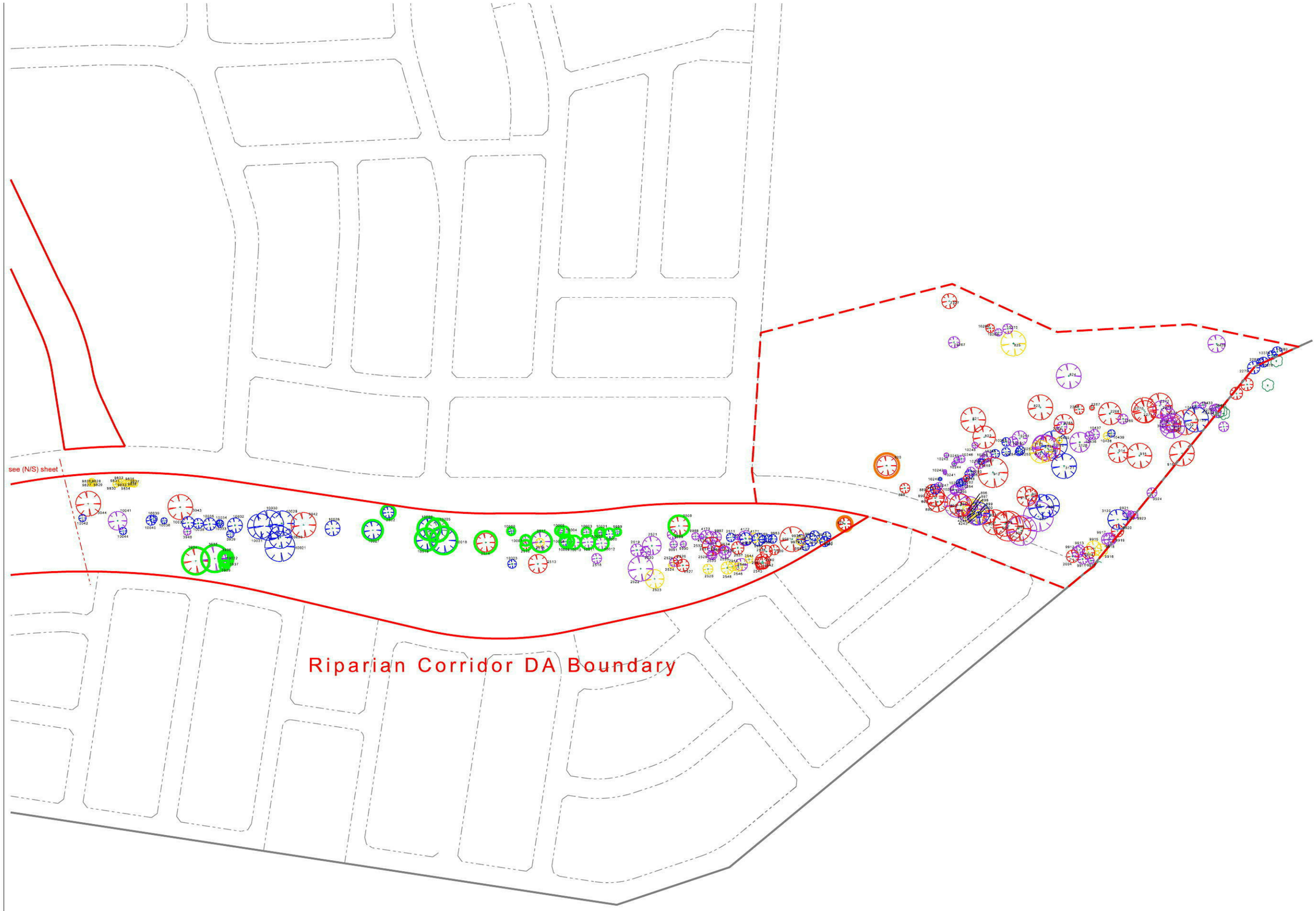
Drawing Title

Riparian Corridor DA (N/S)

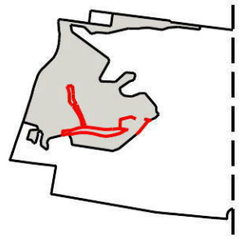
Tree Plan

Scale AT A3	1:2000
Drawn by	RAS
Drawing Number	WP OA RiparianNS TRP

Issue A



KEY PLAN



Issue	Amendment	Date
A	Council Lodgement	11.01.13

NOTES

DA Boundary

Tree to be Retained

Tree to be Removed

Retain & Relocate tree

All Trees to be Removed unless otherwise shown

Tree Significance

AA - high ecological/high landscape

AB - high ecological/moderate landscape

BB - moderate ecological/moderate landscape

BC - moderate ecological/low landscape

CC - low ecological/low landscape

Developer

Lend Lease

Ropes Crossing Boulevard,
Ropes Crossing NSW 2760
p.02 9673 8800 f.02 9673 8888

ABN 88 000 966 085 ©

Development Manager: Lend Lease Development Pty Ltd

Project

JORDANSPRINGS

Drawing Title

Riparian Corridor (E/W)

Tree Plan

Scale AT A3	1:3000
Drawn by	RAS
Drawing Number	WP OA RiparianEW TRP

Issue A

0 10m 20m 40m 60m

							A. High	B. Mod.	C. Low	A. High	B. Mod.	C. Low		
TREE TAG NO.	**SPECIES**	**TO BE RETAINED**	**TRUNK DIA.**	**CANOPY SPREAD**	**TREE HEIGHT**	**NO OF TRUNKS**	**1. Ecological Significance**			**2. Landscape Significance**			**3. Comments**	**DA STAGE**
820	Phoenix canariensis	YES	0.80	16	8		Y			Y			Retain & relocate	Rip
821	Angophora floribunda	NO	1.10	20	20		Y			Y			Impacts from earthworks for future Detention Basin	Rip
822	Angophora floribunda	NO	0.90	18	18		Y			Y			Impacts from earthworks for future Detention Basin	Rip
823	Angophora floribunda	NO	1.00	20	20		Y			Y			Impacts from earthworks for future Detention Basin	Rip
824	Eucalyptus molucanna	NO	1.00	20	22		Y				Y		Impacts from earthworks for future Detention Basin	Rip
825	DEAD	NO	0.90	20	24									Rip
888	Eucalyptus tereticornis	NO	1.10	8	18		Y			Y			Impacts from earthworks for adjacent development site	Rip
889	Angophora floribunda	NO	0.50	10	16		Y			Y			Impacts from earthworks for adjacent development site	Rip
890	Eucalyptus molucanna	NO	0.90	16	22		Y			Y			Impacts from earthworks for adjacent development site	Rip
891	Angophora floribunda	NO	0.50	14	18		Y			Y			Impacts from earthworks for adjacent development site	Rip
892	Eucalyptus tereticornis	NO	0.90	16	16		Y			Y			Impacts from earthworks for adjacent development site	Rip
893	Angophora floribunda	NO	1.10	20	24		Y				Y		Impacts from earthworks for adjacent development site	Rip
894	Eucalyptus tereticornis	NO	0.60	18	22		Y			Y			Impacts from earthworks for adjacent development site	Rip
895	Eucalyptus crebra	NO	0.3 & 0.3	12	20		Y			Y			Impacts from earthworks for adjacent development site	Rip
896	Eucalyptus tereticornis	NO	0.50	20	24		Y				Y		Impacts from earthworks for adjacent development site	Rip
897	DEAD	NO	0.40	12	18								Impacts from earthworks for adjacent development site	Rip
898	DEAD	NO	0.70	20	24								Impacts from earthworks for adjacent development site	Rip
899	Eucalyptus tereticornis	NO	0.80	18	24			Y			Y		Impacts from earthworks for adjacent development site	Rip
900	Eucalyptus tereticornis	NO	0.60	16	22		Y				Y		Impacts from earthworks for adjacent development site	Rip
901	Eucalyptus crebra	NO	0.60	10	18		Y			Y			Impacts from earthworks for adjacent development site	Rip
902	Eucalyptus tereticornis	NO	1.00	20	26		Y			Y			Impacts from earthworks for adjacent development site	Rip
903	Eucalyptus tereticornis	NO	1.00	20	26		Y			Y			Impacts from earthworks for adjacent development site	Rip
904	Eucalyptus tereticornis	NO	1.20	24	26		Y			Y			Impacts from earthworks for adjacent development site	Rip
905	Eucalyptus tereticornis	NO	1.00	20	24		Y			Y			Impacts from earthworks for adjacent development site	Rip
906	Eucalyptus tereticornis	NO	1.20	24	26		Y				Y		Impacts from earthworks for adjacent development site	Rip
907	Eucalyptus tereticornis	NO	1.30	24	26		Y				Y		Impacts from earthworks for future Detention Basin	Rip
908	Eucalyptus crebra	NO	1.10	20	26			Y			Y		Impacts from earthworks for future Detention Basin	Rip
909	Eucalyptus crebra	NO	0.90	18	26			Y			Y		Impacts from earthworks for future Detention Basin	Rip
910	Eucalyptus crebra	NO	0.80	16	24								Impacts from earthworks for future Detention Basin	Rip
911	Eucalyptus crebra	NO	0.50	10	18								Impacts from earthworks for future Detention Basin	Rip
912	Eucalyptus tereticornis	NO	1.00	24	21		Y			Y			Impacts from earthworks for future Detention Basin	Rip
913	Eucalyptus eugenoides	NO	0.50	18	18				Y			Y	Impacts from earthworks for future Detention Basin	Rip
914	Eucalyptus molucanna	NO	0.60	16	18		Y			Y			Impacts from earthworks for future Detention Basin	Rip
915	Eucalyptus molucanna	NO	0.90	20	20		Y			Y			Impacts from earthworks for future Detention Basin	Rip
916	Eucalyptus molucanna	NO	0.90	20	22		Y			Y			Impacts from earthworks for future Detention Basin	Rip
925	Phoenix canariensis	YES	0.80	10	11		Y			Y			Retain & relocate	Rip
1972	Eucalyptus tereticornis	YES	0.90	12	20			Y			Y			Rip
1973	Eucalyptus tereticornis	NO	0.90	16	23			Y			Y		Impacts from earthworks for adjacent development site	Rip
1974	Eucalyptus molucanna	NO	0.40	16	19			Y			Y		Impacts from earthworks for adjacent development site	Rip
1977	Eucalyptus crebra	NO	0.60	8	19		Y			Y			Impacts from earthworks for adjacent development site	Rip
1978	Melaleuca decora	YES	0.80	8	22			Y			Y			Rip
2004	Eucalyptus tereticornis	NO	0.60	10	23		Y			Y			Impacts from earthworks for adjacent development site	Rip
2264	Eucalyptus molucanna	NO	0.50	8	22		Y				Y		Impacts from earthworks for future Detention Basin	Rip
2265	Eucalyptus molucanna	NO	0.50	16	22		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2266	Eucalyptus molucanna	NO	0.40	8	16		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2267	Eucalyptus molucanna	NO	0.30	4	10		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2268	Angophora floribunda	NO	0.70	18	23		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2269	Eucalyptus crebra	NO	0.30	8	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
2270	Eucalyptus crebra	NO	0.60	20	22		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2271	Eucalyptus molucanna	NO	0.70	18	22		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2272	Eucalyptus molucanna	NO	0.70	20	22		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2273	Angophora floribunda	NO	0.40	14	20		Y				Y		Impacts from earthworks for future Detention Basin	Rip
2274	Alocasaurina	NO	0.40	12	19		Y				Y		Impacts from earthworks for future Detention Basin	Rip
2275	Eucalyptus tereticornis	NO	0.30	8	18		Y				Y		Impacts from earthworks for future Detention Basin	Rip

2279	Angophora floribunda	NO	0.40	10	20			Y			Y		Impacts from earthworks for future Detention Basin	Rip
2280	Allocasaurina cunninghamiana	NO	0.20	6	13			Y				Y	Impacts from earthworks for future Detention Basin	Rip
2327	Eucalyptus meliodora	NO	0.80	12	18		Y			Y			Impacts from earthworks for future Detention Basin	Rip
2502	Eucalyptus tereticornis	NO	0.80	9	12			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2509	Eucalyptus tereticornis	YES	0.7 & 0.5	15	25		Y			Y				Rip
2510	Eucalyptus tereticornis	NO	0.30	4	15		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2511	Eucalyptus molucanna	NO	0.40	7	20			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2513	Eucalyptus molucanna	NO	0.70	15	30		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
2514	Eucalyptus fibrosa	YES	0.60	15	25		Y			Y				Rip
2515	Eucalyptus fibrosa	YES	0.50	7	25		Y			Y				Rip
2516	DEAD	NO	0.50	8	30									Rip
2517	Eucalyptus tereticornis	YES	0.60	15	30		Y				Y			Rip
2518	Eucalyptus molucanna	NO	0.50	8	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2519	Eucalyptus eugenoides	NO	0.60	10	20		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2520	Eucalyptus molucanna	NO	0.60	8	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2521	Eucalyptus molucanna	NO	0.5 & 0.5	15	20		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2522	Eucalyptus molucanna	NO	1.00	20	30		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2523	DEAD	NO	1.00	15	25									Rip
2524	Eucalyptus tereticornis	NO	0.40	5	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2525	Eucalyptus tereticornis	NO	0.80	7	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2526	Eucalyptus tereticornis	NO	0.50	7	25		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
2527	Eucalyptus tereticornis	NO	0.70	10	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2528	DEAD	NO	0.60	8	30									Rip
2529	Eucalyptus tereticornis	NO	0.40	7	20		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2530	Eucalyptus molucanna	NO	0.40	7	24		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2531	Eucalyptus molucanna	NO	0.40	6	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2532	Eucalyptus eugenoides	NO	0.60	15	25		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
2533	Eucalyptus molucanna	NO	0.40	7	20		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
2534	Eucalyptus molucanna	NO	0.30	5	20		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
2535	Eucalyptus tereticornis	NO	0.50	7	25		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2536	Eucalyptus molucanna	NO	1.00	10	30		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
2537	Eucalyptus tereticornis	NO	0.60	10	25		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
2538	Eucalyptus tereticornis	YES	0.5 & 0.5	10	30		Y			Y				Rip
2539	Eucalyptus tereticornis	YES	0.50	8	25		Y			Y				Rip
2540	Eucalyptus eugenoides	YES	0.70	12	25		Y			Y				Rip
2541	Eucalyptus eugenoides	YES	0.50	10	25		Y			Y				Rip
2542	Eucalyptus tereticornis	YES	0.60	10	25		Y			Y				Rip
2543	Angophora floribunda	YES	0.40	5	20		Y			Y				Rip
2544	DEAD	YES	0.30	6	15									Rip
2545	Eucalyptus eugenoides	YES	0.50	10	25		Y				Y			Rip
2546	DEAD	NO	0.50	7	25		Y				Y			Rip
2547	Eucalyptus tereticornis	NO	0.30	7	25			Y				Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
2548	Eucalyptus tereticornis	NO	0.60	10	30			Y				Y	Impacts from earthworks for Riparian Corridor channel construction	Rip

3047	Eucalyptus tereticornis	NO	0.70	6	16			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
3048	Eucalyptus tereticornis	NO	0.60	10	16		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
3120	Eucalyptus eugenoides	NO	0.70	16	22			Y			Y		Impacts from earthworks for future Detention Basin	Rip
3121	Angophora floribunda	NO	0.70	20	24			Y			Y		Impacts from earthworks for future Detention Basin	Rip
3122	Angophora floribunda	NO	0.70	22	24			Y			Y		Impacts from earthworks for future Detention Basin	Rip
3123	Eucalyptus eugenoides	NO	0.80	20	24		Y			Y			Impacts from earthworks for future Detention Basin	Rip
3124	Eucalyptus tereticornis	NO	0.60	20	24		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3125	Eucalyptus tereticornis	NO	0.50	18	24		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3126	Eucalyptus molucanna	NO	0.60	16	24		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3127	Eucalyptus molucanna	NO	0.40	12	25		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3128	Eucalyptus molucanna	NO	0.20	12	24		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3129	Eucalyptus molucanna	NO	0.30	10	23		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3130	Eucalyptus molucanna	NO	0.30	20	24		Y				Y		Impacts from earthworks for future Detention Basin	Rip
3131	Eucalyptus molucanna	NO	0.40	12	25		Y			Y			Impacts from earthworks for future Detention Basin	Rip
3132	Eucalyptus tereticornis	NO	0.60	20	24		Y			Y			Impacts from earthworks for future Detention Basin	Rip
3133	Eucalyptus tereticornis	NO	0.90	20	23			Y			Y		Impacts from earthworks for future Detention Basin	Rip
3917	Eucalyptus tereticornis	NO	0.80	20	25			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
3918	Eucalyptus molucanna	NO	0.60	20	25		Y			Y			Impacts from earthworks for adjacent development site	Rip
3919	Eucalyptus tereticornis	YES	0.60	20	20		Y			Y				Rip
3920	Eucalyptus molucanna	NO	0.60	15	20				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
3921	Eucalyptus tereticornis		0.60	15	20				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
3932	Eucalyptus tereticornis	NO	0.50	10	15		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
3933	Eucalyptus molucanna	NO	0.40	10	10				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
3934	Eucalyptus molucanna	YES	0.70	20	20		Y			Y				Rip
3935	Angophora floribunda	YES	0.60	20	20		Y				Y			Rip
3936	Angophora floribunda	YES	0.40	10	20		Y				Y			Rip
3937	Angophora floribunda	YES	0.30	10	20		Y				Y			Rip
3938	Eucalyptus molucanna	YES	0.30	6	10		Y				Y			Rip
3939	Eucalyptus molucanna	NO	0.30	6	6			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
3940	Eucalyptus molucanna	NO	0.30	6	10		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
3942	Eucalyptus molucanna	NO	0.40	8	8		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
3943	Eucalyptus molucanna	NO	1.20	20	20		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
3944	Eucalyptus molucanna	NO	0.80	20	19		Y			Y			Impacts from earthworks for Riparian Corridor channel construction	Rip
4169	Angophora floribunda	NO	0.20	6	14			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
4171	Eucalyptus tereticornis	NO	0.40	8	14								Impacts from earthworks for Riparian Corridor channel construction	Rip
4172	Eucalyptus fibrosa	NO	0.80	12	16		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
4173	Eucalyptus fibrosa	NO	0.30	10	16		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
4174	Eucalyptus fibrosa	NO	0.35	11	16		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
4175	Angophora floribunda	NO	0.20	4	9		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
4243	Eucalyptus tereticornis	NO	0.40	5	20			Y			Y		Impacts from earthworks for adjacent development site	Rip
4244	Eucalyptus tereticornis	NO	0.40	4	20			Y				Y	Impacts from earthworks for adjacent development site	Rip
4245	Angophora floribunda	NO	0.40	5	20			Y			Y		Impacts from earthworks for adjacent development site	Rip
4371	Eucalyptus tereticornis	NO	0.50	7	18			Y			Y		Impacts from earthworks for adjacent development site	Rip
4372	Eucalyptus tereticornis	NO	0.60	7	18			Y			Y		Impacts from earthworks for adjacent development site	Rip
4373	Eucalyptus tereticornis	NO	0.40	6	18			Y			Y		Impacts from earthworks for adjacent development site	Rip
4374	Eucalyptus tereticornis	NO	0.60	8	20			Y			Y		Impacts from earthworks for adjacent development site	Rip
4375	Eucalyptus molucanna	NO	0.60	10	20			Y			Y		Impacts from earthworks for adjacent development site	Rip
4377	Eucalyptus molucanna	NO	0.40	7	20			Y			Y		Impacts from earthworks for adjacent development site	Rip

4426	Eucalyptus tereticornis	NO	0.70	14	19		Y				Y			Rip
9812	Eucalyptus tereticornis	YES	0.40	6	11			Y			Y			Rip
9813	Eucalyptus tereticornis	YES	0.30	5	9	3		Y			Y			Rip
9814	Eucalyptus tereticornis	YES	0.40	6	8	2		Y			Y			Rip
9815	Eucalyptus tereticornis	YES	0.25	4	8	3		Y			Y			Rip
9816	Eucalyptus tereticornis	YES	0.50	7	10	2		Y			Y			Rip
9817	Eucalyptus tereticornis	YES	0.35	4	8	2		Y			Y			Rip
9818	Eucalyptus tereticornis	YES	0.35	3	7			Y			Y			Rip
9819	Eucalyptus tereticornis	YES	0.25	4	8			Y			Y			Rip
9820	Eucalyptus tereticornis	YES	0.30	4	9			Y			Y			Rip
9821	Eucalyptus tereticornis	YES	0.30	5	8	2		Y			Y			Rip
9822	Eucalyptus tereticornis	YES	0.40	4	8	3		Y			Y			Rip
9823	Eucalyptus tereticornis	YES	0.40	5	9	3		Y			Y			Rip
9824	Eucalyptus tereticornis	NO	0.40	4	9	2		Y			Y		Impacts from earthworks for adjacent development site	Rip
9826	Angophora floribunda	NO	0.25	5	11				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9827	Angophora floribunda	NO	0.25	5	13				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9828	Angophora floribunda	NO	0.30	6	11				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9829	Angophora floribunda	NO	0.25	5	11				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9830	Angophora floribunda	NO	0.20	5	10				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9831	Angophora floribunda	NO	0.25	3	6	2			Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9832	Angophora floribunda	NO	0.40	5	11	2			Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9833	Angophora floribunda	NO	0.40	6	8				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9834	Angophora floribunda	NO	0.25	6	13				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9835	Angophora floribunda	NO	0.30	6	12				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9836	Angophora floribunda	NO	0.20	5	12				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9837	Angophora floribunda	NO	0.30	6	12				Y			Y	Impacts from earthworks for Riparian Corridor channel construction	Rip
9910	Eucalyptus tereticornis	NO	0.60	5	16		Y				Y		Impacts from earthworks for adjacent development site	Rip
9911	Eucalyptus tereticornis	NO	0.25	8	15		Y				Y		Impacts from earthworks for adjacent development site	Rip
9912	Eucalyptus molucanna	NO	0.25	9	15		Y				Y		Impacts from earthworks for adjacent development site	Rip
9913	Eucalyptus tereticornis	NO	0.30	8	15		Y				Y		Impacts from earthworks for adjacent development site	Rip
9914	Eucalyptus molucanna	NO	0.40	10	18		Y			Y			Impacts from earthworks for adjacent development site	Rip
9915	Angophora floribunda	NO	0.50	12	24			Y				Y	Impacts from earthworks for future Detention Basin	Rip
9916	Angophora floribunda	NO	0.40	10	24			Y				Y	Impacts from earthworks for future Detention Basin	Rip
9917	Eucalyptus tereticornis	NO	0.35	10	18		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9918	Eucalyptus tereticornis	NO	0.35	10	20		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9919	Eucalyptus tereticornis	NO	0.35	6	22		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9920	Eucalyptus tereticornis	NO	0.40	10	24		Y			Y			Impacts from earthworks for future Detention Basin	Rip
9921	Eucalyptus tereticornis	NO	0.30	6	13		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9922	Eucalyptus molucanna	NO	0.20	5	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9923	Eucalyptus molucanna	NO	0.30	6	16		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9924	Angophora floribunda	NO	0.30	8	17		Y				Y		Impacts from earthworks for future Detention Basin	Rip
9974	Callistamon salignus	NO	0.40	7	8			Y			Y		Impacts from earthworks for adjacent development site	Rip
9975	Angophora floribunda	NO	0.40	8	8			Y			Y		Impacts from earthworks for adjacent development site	Rip
9976	Angophora floribunda	NO	0.25	10	12			Y			Y		Impacts from earthworks for adjacent development site	Rip
9977	Eucalyptus tereticornis	NO	0.25	4	10			Y				Y	Impacts from earthworks for adjacent development site	Rip
9978	Angophora floribunda	NO	0.35	7	15			Y			Y		Impacts from earthworks for adjacent development site	Rip
9979	Angophora floribunda	NO	0.25	8	12			Y				Y	Impacts from earthworks for adjacent development site	Rip
9980	Angophora floribunda	NO	0.25	8	14			Y			Y		Impacts from earthworks for adjacent development site	Rip
9981	Eucalyptus tereticornis	NO	0.50	20	26		Y			Y			Impacts from earthworks for adjacent development site	Rip
9982	Eucalyptus tereticornis	NO	0.25	6	15			Y			Y		Impacts from earthworks for adjacent development site	Rip
9983	Angophora floribunda	NO	0.30	7	11			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip

9984	Angophora floribunda	NO	0.20	6	9			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9985	Eucalyptus tereticornis	NO	0.30	10	18			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9986	Eucalyptus tereticornis	NO	0.35	10	20			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9987	Eucalyptus molucanna	NO	0.25	8	15		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9988	Angophora floribunda	NO	0.20	6	10		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9989	Eucalyptus molucanna	NO	0.30	8	12		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9990	Eucalyptus molucanna	NO	0.20	5	11		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9991	Angophora floribunda	NO	0.25	6	11		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
9999	Eucalyptus tereticornis	YES	0.20	5	11	2		Y			Y			Rip
10000	Eucalyptus molucanna	YES	0.40	8	13			Y			Y			Rip
10001	Eucalyptus tereticornis	YES	0.20	6	11		Y				Y			Rip
10002	Eucalyptus molucanna	YES	0.25	6	10		Y				Y			Rip
10003	Angophora floribunda	YES	0.25	7	12		Y				Y			Rip
10004	Eucalyptus molucanna	YES	0.30	8	14		Y				Y			Rip
10005	Eucalyptus molucanna	YES	0.20	6	14		Y				Y			Rip
10006	Eucalyptus tereticornis	YES	0.20	5	12			Y			Y			Rip
10007	Angophora floribunda	YES	0.25	7	14		Y				Y			Rip
10008	Eucalyptus molucanna	YES	0.20	8	11			Y			Y			Rip
10009	Eucalyptus molucanna	YES	0.35	10	14		Y				Y			Rip
10010	Eucalyptus molucanna	YES	0.35	10	15		Y				Y			Rip
10011	Eucalyptus molucanna	YES	0.40	10	18		Y				Y			Rip
10012	Eucalyptus fibrosa	YES	0.35	10	14	3	Y				Y			Rip
10018	Angophora floribunda	YES	0.35	5	10			Y			Y			Rip
10019	Angophora floribunda	YES	0.40	8	11			Y			Y			Rip
10020	Angophora floribunda	NO	0.30	7	9			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10021	Angophora floribunda	NO	0.30	6	8	2							Impacts from earthworks for Riparian Corridor channel construction	Rip
10022	Eucalyptus molucanna	YES	0.40	8	11	3	Y				Y			Rip
10023	Angophora floribunda	NO	0.80	7	7			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10025		YES	0.20	5	8									Rip
10026	Angophora floribunda	YES	0.30	5	9									Rip
10027	Angophora floribunda	YES	0.35	6	9			Y			Y			Rip
10028	Angophora floribunda	NO	0.25	4	7			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10029	Angophora floribunda	NO	0.25	4	8	2		Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10030	Angophora floribunda	NO	0.40	5	8			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10031	Angophora floribunda	NO	0.40	10	12								Impacts from earthworks for Riparian Corridor channel construction	Rip
10032	Angophora floribunda	NO	0.40	12	12	2		Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10033	Angophora floribunda	NO	0.40	6	9			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10034	Angophora floribunda	NO	0.20	5	8			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10035	Eucalyptus molucanna	NO	0.40	10	12			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10036	Angophora floribunda	NO	0.30	8	15			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10037	Angophora floribunda	NO	0.30	10	12	2		Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10038	Eucalyptus molucanna	NO	0.50	5	10	2		Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10039	Eucalyptus molucanna	NO	0.35	6	9			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10040	Angophora floribunda	NO	0.30	8	11			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip

10041	Eucalyptus tereticornis	NO	0.40	15	15		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10042	Eucalyptus molucanna	NO	0.25	6	9			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10043	Eucalyptus molucanna	NO	0.25	6	15	2		Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10044	Eucalyptus molucanna	NO	0.30	6	11			Y			Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10047	Alocasaurina	YES	0.40	8	13	3	Y				Y			Rip
10048	Eucalyptus tereticornis	NO	0.90	10	15		Y				Y		Impacts from earthworks for Riparian Corridor channel construction	Rip
10051		NO	0.25	7	9				Y			Y	Impacts from earthworks for adjacent development site	Rip
10052		NO	0.20	5	9								Impacts from earthworks for Riparian Corridor channel construction	Rip
10239	Angophora floribunda	NO	0.25	8	3			Y			Y		Impacts from earthworks for adjacent development site	Rip
10240	Angophora floribunda	NO	0.20	3	8			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10241	Angophora floribunda	NO	0.20	3	10			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10242	Eucalyptus crebra	NO	0.25	3	10			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10243	Eucalyptus tereticornis	NO	0.30	4	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10244	Eucalyptus tereticornis	NO	0.30	4	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10245	Angophora floribunda	NO	0.30	5	14		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10246	Eucalyptus tereticornis	NO	0.40	6	15		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10247	Angophora floribunda	NO	0.25	6	11		Y				Y		Impacts from earthworks for adjacent development site	Rip
10248	Angophora floribunda	NO	0.20	5	11	4	Y				Y		Impacts from earthworks for future Detention Basin	Rip
10249	Angophora floribunda	NO	0.20	7	10			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10250	Eucalyptus molucanna	NO	0.30	8	11		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10251	Eucalyptus tereticornis	NO	0.60	12	18		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10252	Angophora floribunda	NO	0.20	7	9			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10253	Angophora floribunda	NO	0.20	6	10			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10254	Eucalyptus tereticornis	NO	0.25	7	11			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10255	Angophora floribunda	NO	0.25	7	11			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10256	Angophora floribunda	NO	0.30	8	13		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10257	Eucalyptus tereticornis	NO	0.30	7	10		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10258	Angophora floribunda	NO	0.20	5	10			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10259	Eucalyptus tereticornis	NO	0.30	8	10		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10260	Eucalyptus tereticornis	NO	0.30	7	13	2	Y				Y		Impacts from earthworks for future Detention Basin	Rip
10261	Eucalyptus tereticornis	NO	2.50	7	10			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10262	Angophora floribunda	NO	0.20	6	13			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10263	Eucalyptus tereticornis	NO	0.40	6	16			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10264	Eucalyptus tereticornis	NO	0.30	8	16		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10265	Angophora floribunda	NO	0.35	9	18		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10266	Angophora floribunda	NO	0.20	7	13	2	Y				Y		Impacts from earthworks for future Detention Basin	Rip
10267	Melaleuca decora	NO	0.70	9	13		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10268	Eucalyptus tereticornis	NO	0.40	7	8	2	Y			Y			Impacts from earthworks for future Detention Basin	Rip
10269	Angophora floribunda	NO	0.50	6	11		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10270	Angophora floribunda	NO	0.35	8	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10378	Allocasuarina cunninghamiana	NO	0.40	8	18			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10379	Allocasuarina cunninghamiana	NO	0.30	7	18			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10380	Allocasuarina cunninghamiana	NO	0.35	8	15			Y			Y		Impacts from earthworks for future Detention Basin	Rip
10431	Angophora floribunda	NO	0.20	6	13		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10432	Eucalyptus tereticornis	NO	0.20	5	11		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10433	Eucalyptus molucanna	NO	0.20	5	11		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10434	Eucalyptus molucanna	NO	0.20	6	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10435	Eucalyptus molucanna	NO	0.25	5	8			Y				Y	Impacts from earthworks for future Detention Basin	Rip
10436	Eucalyptus molucanna	NO	0.25	7	12		Y				Y		Impacts from earthworks for future Detention Basin	Rip
10437	Angophora floribunda	NO	0.25	8	13	2	Y				Y		Impacts from earthworks for future Detention Basin	Rip
10438	Eucalyptus molucanna	NO	0.40	6	10			Y				Y	Impacts from earthworks for future Detention Basin	Rip
10439	Eucalyptus tereticornis	NO	0.20	6	9			Y			Y		Impacts from earthworks for future Detention Basin	Rip

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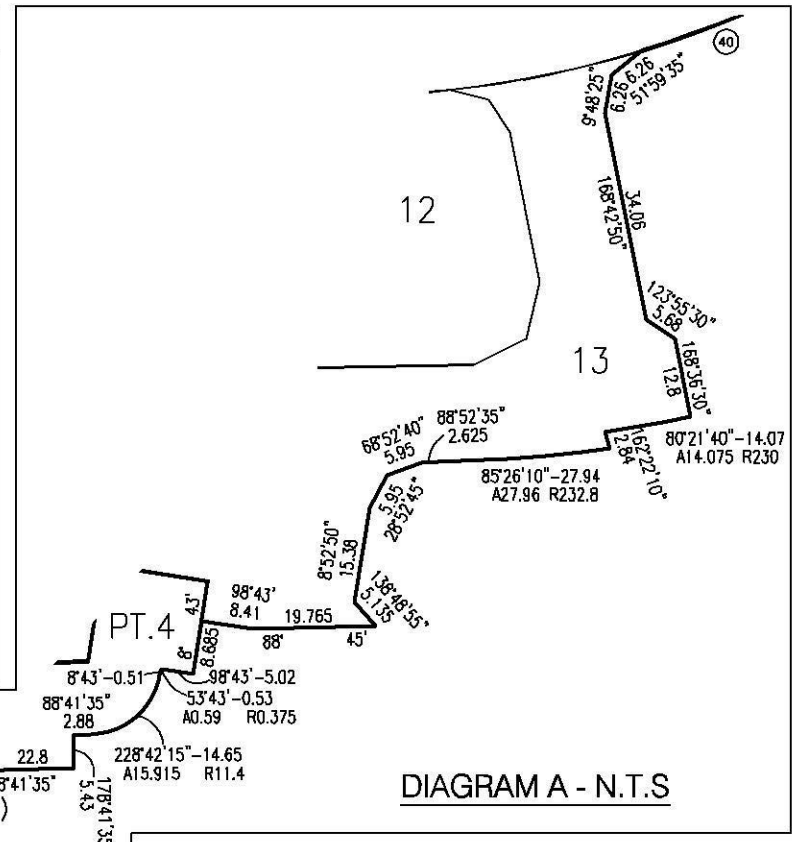
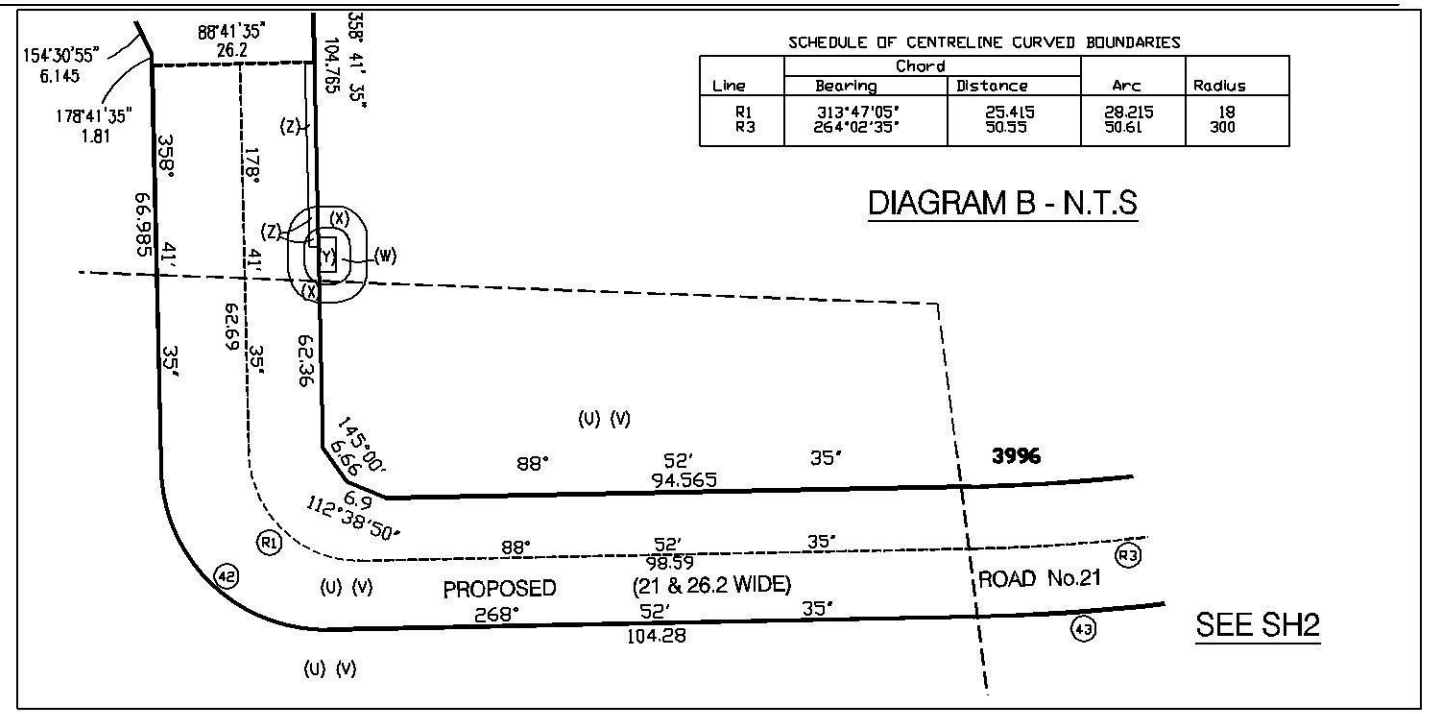
Appendix F
Approved Plans of Subdivision, prepared by Whelans Insites

SCHEDULE OF CURVED BOUNDARIES

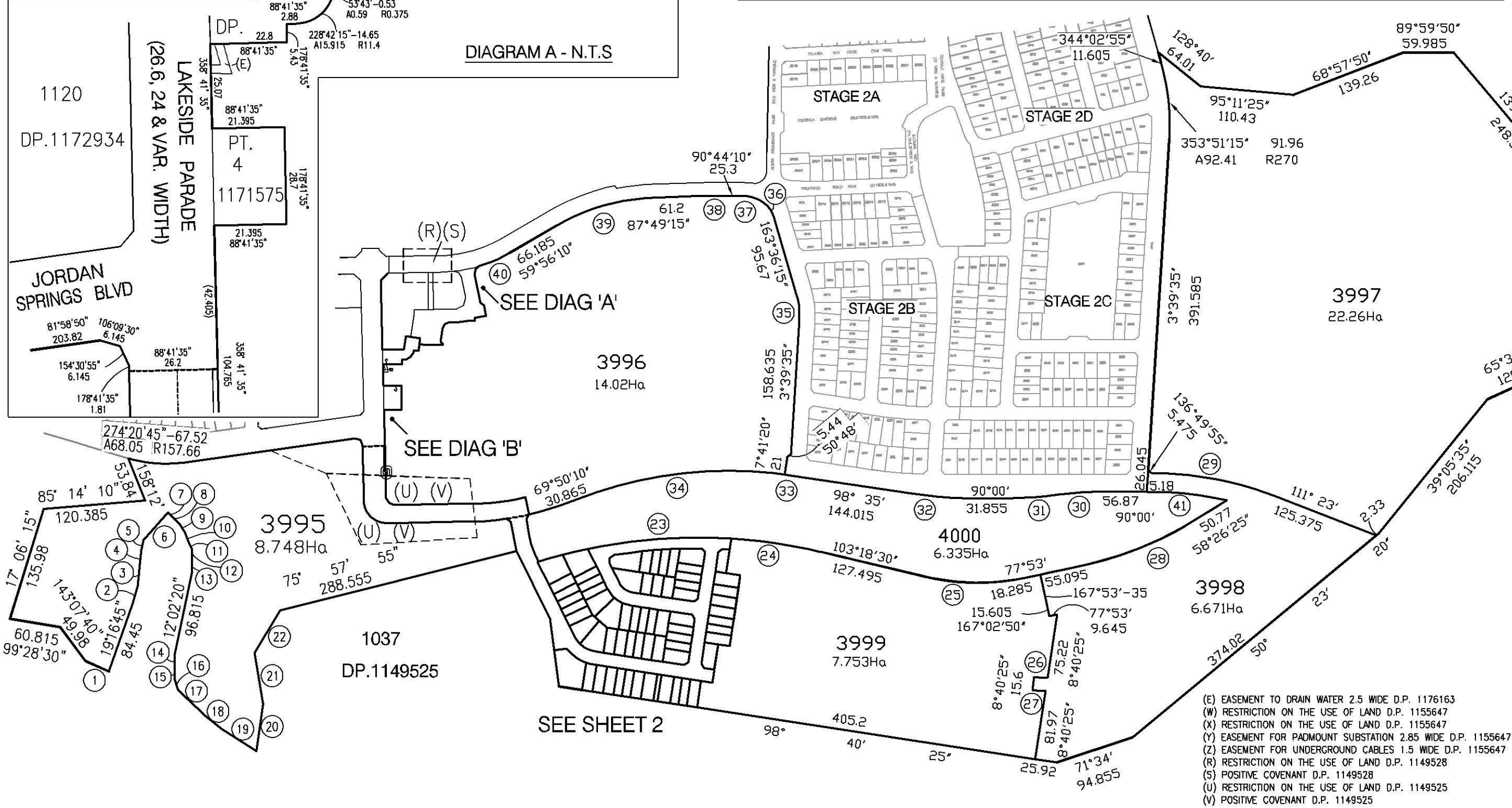
Line	Chord Bearing	Chord Distance	Arc	Radius
1	113°58'55"	30.11		
2	194°42'50"	22.645		
3	186°16'55"	25.125		
4	187°11'20"	17.615		
5	10°25'40"	11.15		
6	41°43'55"	44.195		
7	313°52'40"	3.16		
8	315°25'30"	14.78		
9	326°36'10"	12.69		
10	337°30'40"	13.945		
11	335°40'55"	8.6		
12	358°53'20"	11.29		
13	2°42'15"	16.975		
14	359°53'20"	16.935		
15	1°05'30"	14.69		
16	342°56'15"	12.33		
17	312°21'25"	45.135		
18	310°03'50"	24.01		
19	302°16'	48.765		
20	8°07'35"	57.075		
21	350°32'10"	60.815		
22	30°57'50"	58.295		
23	85°53'10"	170.755	171.275	634.4
24	98°27'50"	107.15	107.275	634.4
25	270°35'45"	117.555	118.525	267.1
26	272°44'15"	15.965	15.995	77.2
27	273°44'45"	15.94	15.96	92.8
28	68°09'45"	133.12	133.76	394.16
29	100°42'25"	152.275	153.16	411
30	86°10'40"	52.665	52.705	395
31	266°10'40"	67.335	67.385	505
32	274°17'30"	75.58	75.65	505
33	98°09'05"	7.47	7.47	495
34	83°46'40"	238.515	240.885	495
35	173°37'55"	31.065	31.225	89.2
36	144°13'55"	20.035	20.42	30.2
37	107°47'55"	27.11	27.515	46.2
38	89°16'45"	19.875	19.88	390.7
39	73°52'40"	115.995	117.145	240.7
40	246°30'40"	38.89	38.975	169.8



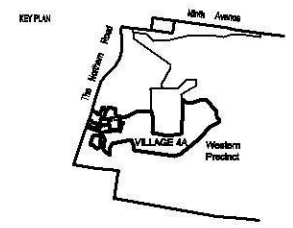


SCHEDULE OF CENTRELINE CURVED BOUNDARIES

Line	Chord Bearing	Chord Distance	Arc	Radius
R1	313°47'05"	25.415	28.215	18
R3	264°02'35"	50.55	50.61	300



(E) EASEMENT TO DRAIN WATER 2.5 WIDE D.P. 1176163
(W) RESTRICTION ON THE USE OF LAND D.P. 1155647
(X) RESTRICTION ON THE USE OF LAND D.P. 1155647
(Y) EASEMENT FOR PADMOUNT SUBSTATION 2.85 WIDE D.P. 1155647
(Z) EASEMENT FOR UNDERGROUND CABLES 1.5 WIDE D.P. 1155647
(R) RESTRICTION ON THE USE OF LAND D.P. 1149528
(S) POSITIVE COVENANT D.P. 1149528
(U) RESTRICTION ON THE USE OF LAND D.P. 1149525
(V) POSITIVE COVENANT D.P. 1149525



Issue	Amendment	Date
A	AMEND LOTS 4048 TO 4082	4-6-12
B	ADD ACCESS EASES	8-6-12
C	AMEND HEADING	25-6-12

NOTES

NO BOUNDARY SURVEY HAS BEEN UNDERTAKEN. DIMENSIONS AND AREA(S) SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO CONFIRMATION BY BOUNDARY SURVEY

LOT NUMBERING IS SUBJECT TO CHANGE ON PREPARATION OF FINAL DEPOSITED PLAN.
ORIGIN OF MGA BASED SITE CO-ORDINATES FROM PM 14713 AND PLANE DISTANCES HAVE BEEN USED.
CO-ORDINATES FOR PM 14713 WERE DEDUCED BY WHELANS FROM SURROUNDING BSM & PM'S ON PUBLIC RECORD. CO-ORDINATES FOR PM 14713 HAVE BEEN ADOPTED AR 282202.1906 6356056.6204

Developer

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Prepared by

WHELANS INSITES

D646-V4-001c.dwg

Project

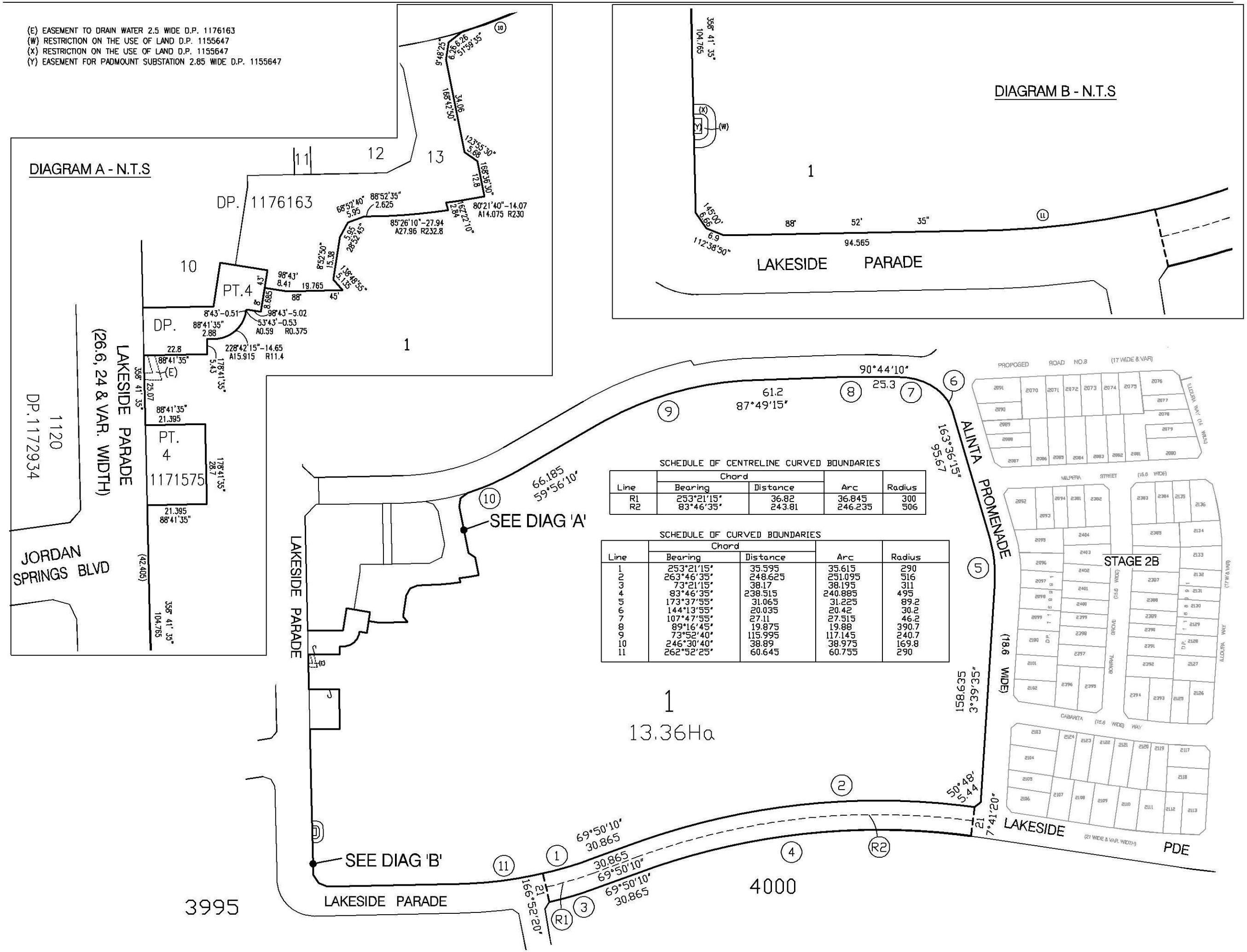
St Marys Development
Western Precinct - VILLAGE 4 STG A

Drawing Title

PLAN OF SUBDIVISION OF LOT 11
IN DP. 1176163

CONTRACT DW6544	SHEET 1 OF 2
Scale 1:2500 @ A1	DATE 24-5-12
Drawn	LAB
Checked	JMAV
Job No	D646
Drawing Number	D646-V4-001c
Project Web DCR No.	Issue W

(E) EASEMENT TO DRAIN WATER 2.5 WIDE D.P. 1176163
(W) RESTRICTION ON THE USE OF LAND D.P. 1155647
(X) RESTRICTION ON THE USE OF LAND D.P. 1155647
(Y) EASEMENT FOR PADMOUNT SUBSTATION 2.85 WIDE D.P. 1155647

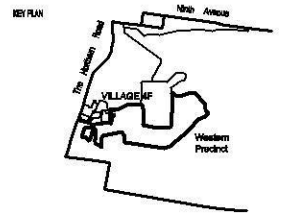


SCHEDULE OF CENTRELINE CURVED BOUNDARIES

Line	Chord Bearing	Chord Distance	Arc	Radius
R1	253°21'15"	36.82	36.845	300
R2	83°46'35"	243.81	246.235	506

SCHEDULE OF CURVED BOUNDARIES

Line	Chord Bearing	Chord Distance	Arc	Radius
1	253°21'15"	35.595	35.615	290
2	263°46'35"	248.625	251.095	516
3	73°21'15"	38.17	38.195	311
4	83°46'35"	238.515	240.885	495
5	173°37'55"	31.065	31.225	89.2
6	144°13'55"	20.035	20.42	30.2
7	107°47'55"	27.11	27.515	46.2
8	89°16'45"	19.875	19.88	390.7
9	73°52'40"	115.995	117.145	240.7
10	246°30'40"	38.89	38.975	169.8
11	262°52'25"	60.645	60.755	290



Issue	Amendment	Date
B	AMEND HEADING	27-03-13

NOTES

NO BOUNDARY SURVEY HAS BEEN UNDERTAKEN. DIMENSIONS AND AREA(S) SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO CONFIRMATION BY BOUNDARY SURVEY

LOT NUMBERING IS SUBJECT TO CHANGE ON PREPARATION OF FINAL DEPOSITED PLAN.

ORIGIN OF MGA BASED SITE CO-ORDINATES FROM PM 147113 AND PLANE DISTANCES HAVE BEEN USED.
CO-ORDINATES FOR PM 147113 WERE DEDUCED BY WHELAN'S FROM SURVEYORS SKM & PMW ON PUBLIC RECORD. CO-ORDINATES FOR PM 147113 HAVE BEEN ADOPTED AS 290202.1606 5826005.6024

Developer

Lend Lease

St Marys NSW 1790
(+61 2) 9825 6000 (+61 2) 9912 6999
ABN 70 081 475 754

©

Prepared by

Whelans INSITES
Spatial Consulting
Pty. Ltd. 1300 422 601

D646-V4-006b.dwg

Project

St Marys Development
Western Precinct - VILLAGE 4 STG F

Drawing Title

PLAN OF SUBDIVISION OF LOT 3996
A SUBDIVISION OF LOT 11
IN DP. 1176163

0 10m 20m 50m 100m

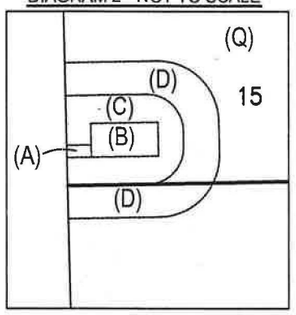
CAD REF: D646-V4	SHEET 1 OF 1
Scale: 1:2000 @ A1	DATE: 4-6-12
Drawn:	LAB
Checked:	JMcM
Job No:	D646
Drawing Number:	D646-V4-006b
Project Web GDA No.	W
Issue:	B

Issue	Amendment	Date
A	ADD CRITICAL FILE	
B	REMOVE VARIOUS LOTS FROM SUBDIVISION	13-3-12

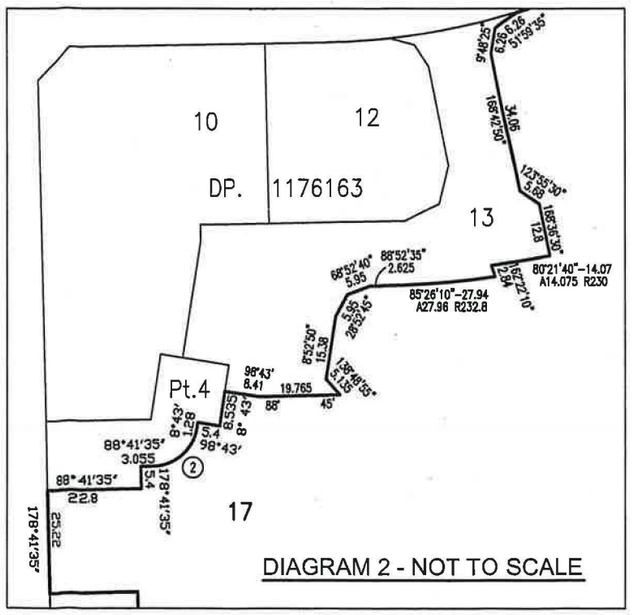
SCHEDULE OF CURVED BOUNDARIES

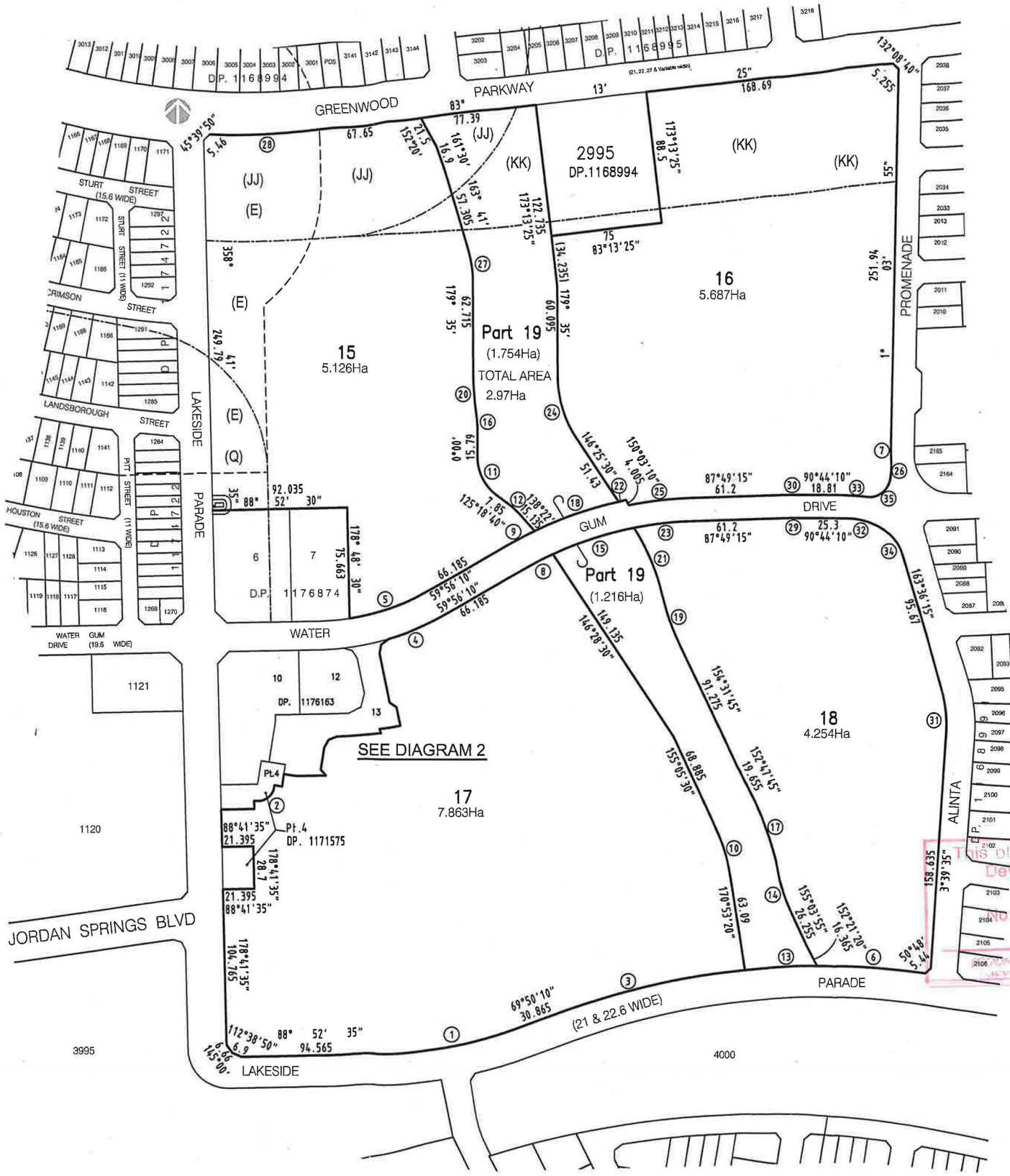
Line	Chord Bearing	Chord Distance	Arc	Radius
1	79°21'20"	95.925	96.37	290
2	228°42'15"	14.16	15.355	11
3	76°59'25"	128.525	128.86	514
4	246°30'40"	38.89	38.975	149.8
5	79°36'52"	55.495	55.815	150.2
6	83°07'25"	73.68	73.745	516
7	359°08'55"	13.81	13.815	286.5
8	62°21'35"	20.365	20.37	240.7
9	61°52'25"	17.605	17.605	240.3
10	162°59'25"	34.355	34.445	125
11	332°39'20"	30.315	31.5	33
12	131°50'24"	11.37	11.395	58
13	86°50'15"	40.47	40.49	516
14	342°17'40"	25.17	25.235	100
15	71°41'38"	57.095	58.035	240.7
16	175°59'35"	13.955	13.97	100
17	161°49'35"	58.185	58.395	200
18	70°27'05"	60.2	60.335	240.3
19	340°30'55"	36.505	36.57	175
20	355°47'25"	26.46	26.48	200
21	157°07'16"	49.725	49.945	152.5
22	77°39'50"	5.195	5.195	240.3
23	83°12'35"	38.7	38.74	240.7
24	343°04'15"	44.515	45.14	70
25	83°10'05"	41.42	41.465	256.5
26	183°56'25"	11.445	11.475	40
27	171°53'41"	19.365	19.425	70
28	267°48'35"	76.92	77	481
29	89°16'45"	19.875	19.88	390.7
30	89°16'45"	20.48	20.48	464.5
31	173°37'55"	31.065	31.225	89.2
32	107°47'55"	27.11	27.515	46.2
33	93°31'	19.445	19.61	200
34	144°13'55"	20.035	20.42	30.2
35	233°28'20"	19.715	21.675	14.5

DIAGRAM 2 - NOT TO SCALE



(A) EASEMENT FOR UNDERGROUND CABLES 1 WIDE (D.P. 1168994)
(B) EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE (D.P. 1168994)
(C) RESTRICTION ON THE USE OF LAND (D.P. 1168994)
(D) RESTRICTION ON THE USE OF LAND (D.P. 1168994)
(E) POSITIVE COVENANT (DP. 1158660)
(JJ) POSITIVE COVENANT (DP. 1168994)
(KK) POSITIVE COVENANT (DP. 1168995)
(Q) RESTRICITION ON THE USE OF LAND (DP. 1149528)





Project
St Marys Development
Jordan Springs
RIPARIAN CORRIDOR

Drawing Title
Plan of subdivision of Lot 8 in DP. 1176874 & Lot 1 in a subdivision of Lot 3996 a proposed subdivision of Lot 5 in DP. 1176163

Developer
Lend Lease

Prepared by
WHELAN INSITES
CAD REF: D646-RIP-001b.dwg
DATE OF PLAN: 21-9-11

NOTE:
(C) BOUNDARY SURVEY HAS BEEN UNDERTAKEN. DIMENSIONS AND AREA(S) SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO COMPLETION BY BOUNDARY SURVEY.
LOT REALIGNMENT IS SUBJECT TO CHANGE ON PREPARATION OF FINAL DEPOSITED PLAN.
ORIGIN OF MGA BASED SITE CO-ORDINATES FROM PM 117113 AND PLANE DISTANCES HAVE BEEN USED.
CO-ORDINATES FOR PM 140113 WERE DEDUCED BY WHELAN FROM SURROUNDING GM J PVS GDA PUBLIC RECORD. CO-ORDINATES FOR PM 117113 HAVE BEEN ADOPTED AS 392261.1 EE 6348125.6231

This plan/document relates to:
Development Application
No: 111088
COUNCIL DOES NOT ATTEST TO THE ACCURACY OF OR THE SUITABILITY OF THE DOCUMENT

DIAGRAM - 1:1500 @ A1

Scale	1:500	SHEET 1 OF 1
Drawn		LAS
Checked		JAW
CAD Ref No	D646RIP	Job No / Draft
Drawing Number	D646-RIP-001b.dwg	
Project Wide DCR No.	00-000-0-000A	Issue B

Lend Lease

Appendix G
Engineering Plans for the North-South channel, prepared by SKM

Lend Lease

JORDAN SPRINGS
NORTH TO SOUTH OPEN CHANNEL

DRAWING INDEX

DRAWING No	DRAWING TITLE
EN02754-C-501	COVER SHEET AND DRAWING INDEX
EN02754-C-510	OPEN CHANNEL LAYOUT PLAN - SHEET 1 OF 2
EN02754-C-511	OPEN CHANNEL LAYOUT PLAN - SHEET 2 OF 2
EN02754-C-515	TRANSITION DETAIL OF OPEN CHANNEL BASE AT ROAD 8 BOX CULVERT
EN02754-C-516	TRANSITION DETAIL OF OPEN CHANNEL BASE AT ROAD 9 HEADWALL
EN02754-C-531	LONGITUDINAL SECTIONS MC03 - SHEET 1 OF 2
EN02754-C-532	LONGITUDINAL SECTIONS MC03 - SHEET 2 OF 2
EN02754-C-551	CROSS SECTIONS MC03 - SHEET 1 OF 3
EN02754-C-552	CROSS SECTIONS MC03 - SHEET 2 OF 3
EN02754-C-553	CROSS SECTIONS MC03 - SHEET 3 OF 3

SCALE 1:5000 (A1) 50 0 50 100 150 200 250
SCALE 1:10000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	D A ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: COVER SHEET AND DRAWING INDEX

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:5000	EN02754	EN02754-C-501	2

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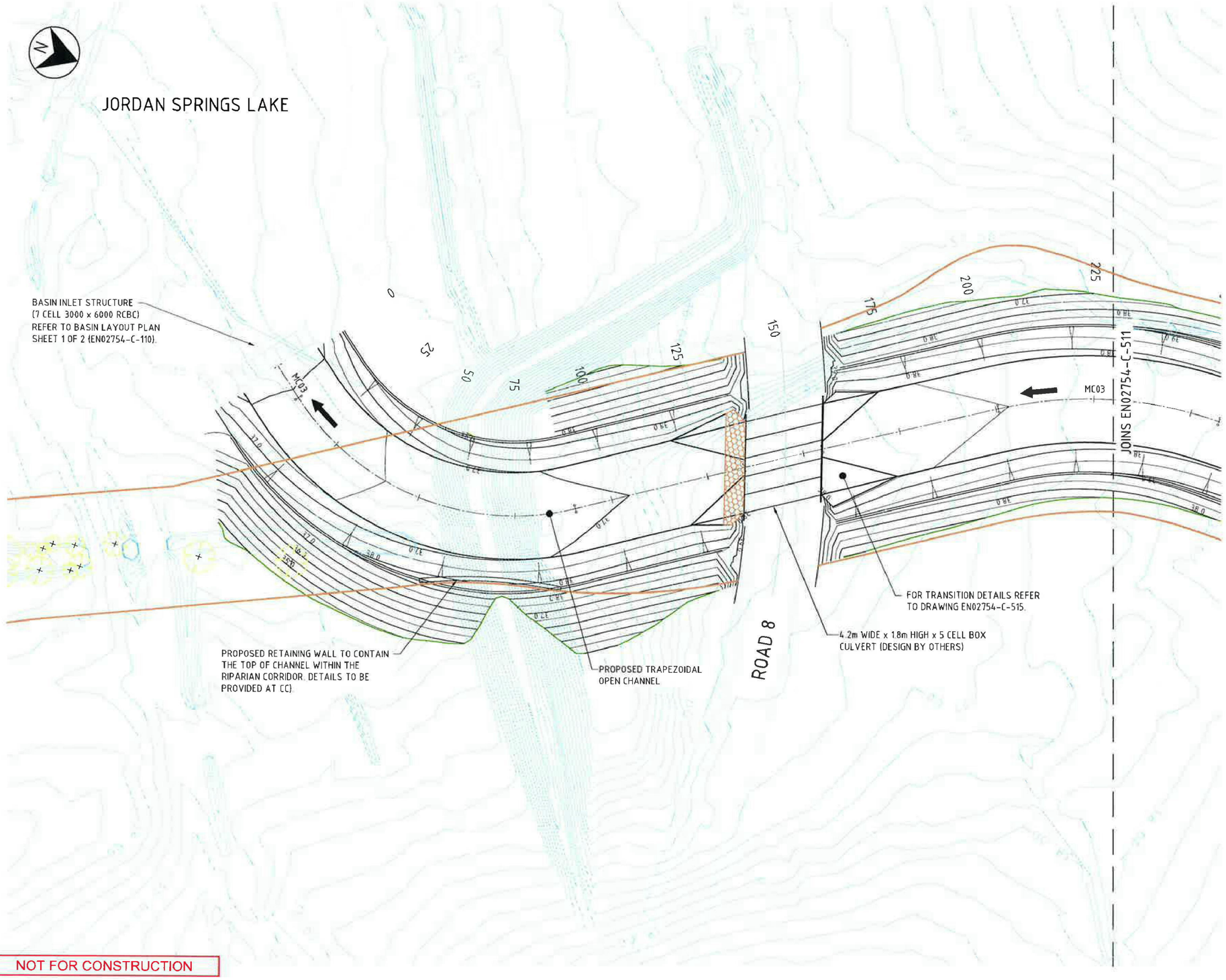

LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXISTING SURFACE CONTOUR
- EXTENT OF REGRADING
- EXISTING TREES
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-NTH-STH-CHANNEL_A 12da

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
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NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	D.A. ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: OPEN CHANNEL LAYOUT PLAN
SHEET 1 OF 2

SCALE	SKM PROJECT No	DRAWING No	AMDT
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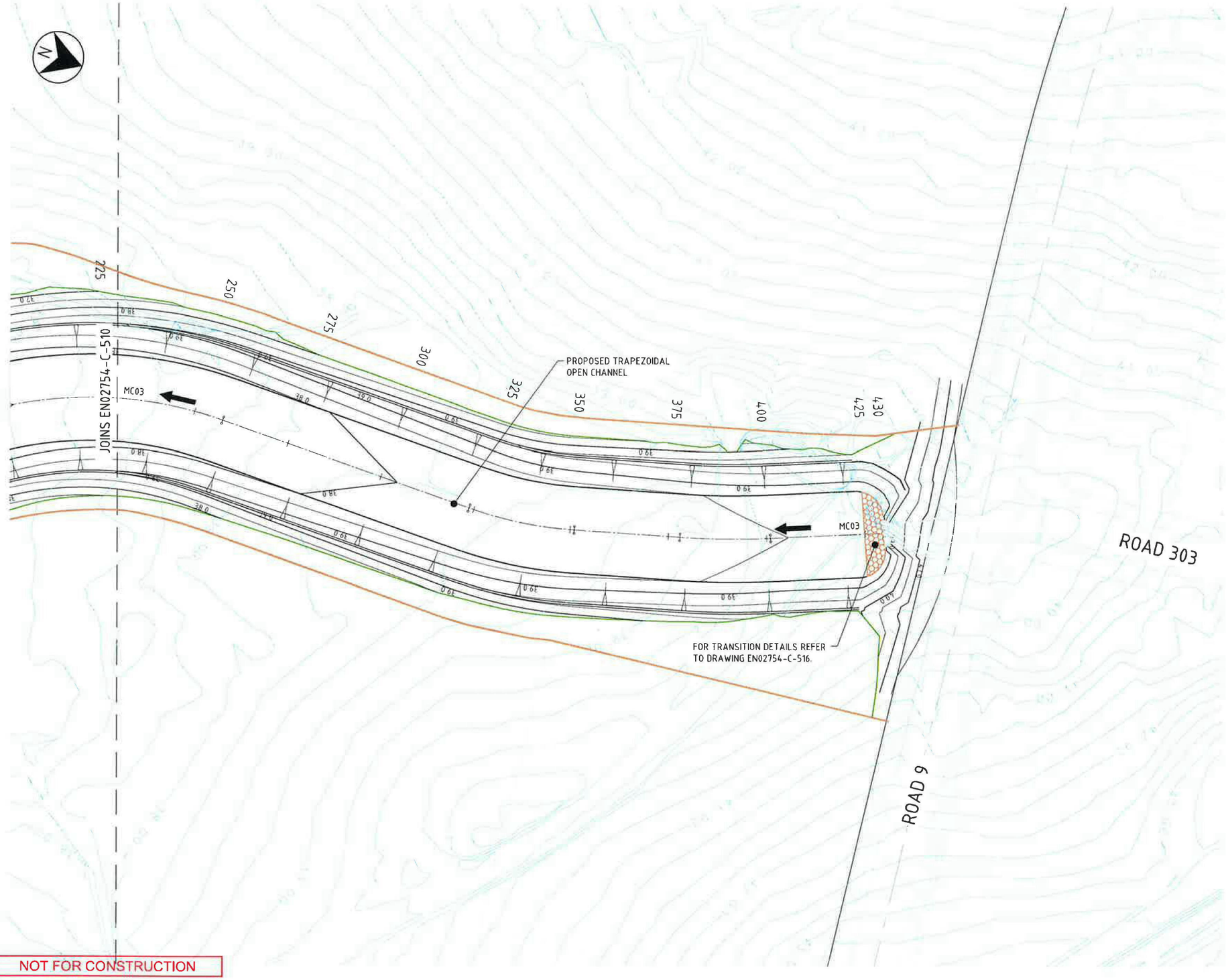
Plot Date 05 Dec 2012 @ 09:46:44 Login Name lbarrett Cad File I:\ENVIR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-510-511.dwg



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXISTING SURFACE CONTOUR
- EXTENT OF REGRADING
- EXISTING TREES
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-NTH-STH-CHANNEL_A 12da

SCALE 1:500 (A1) 5 0 5 10 15 20 25
SCALE 1:1000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	D.A. ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
160 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: OPEN CHANNEL LAYOUT PLAN
SHEET 2 OF 2

SCALE	SKM PROJECT No	DRAWING No	AMDT
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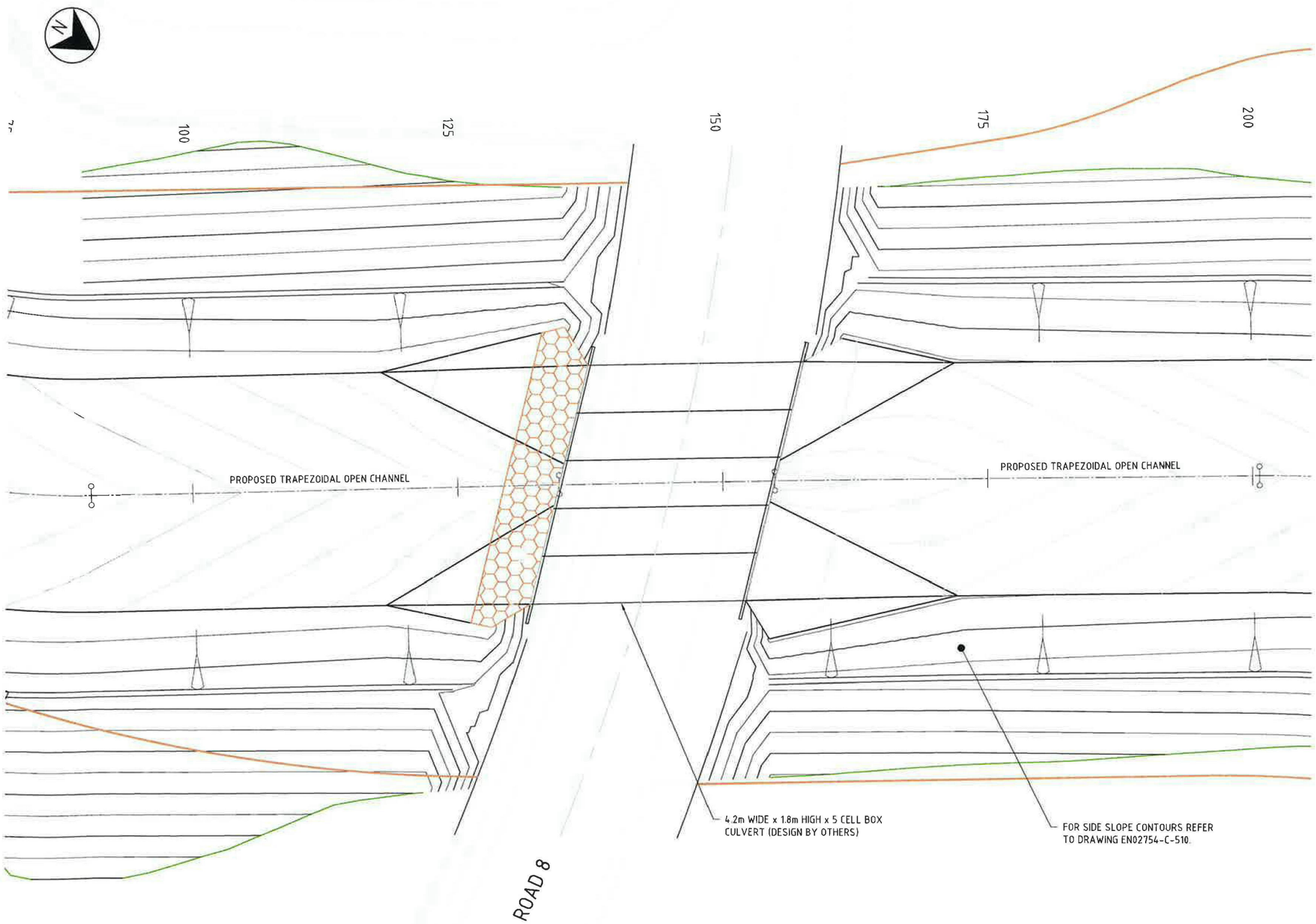


LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXTENT OF REGRADING
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-NTH-STH-CHANNEL_A 12da

SCALE 1:200 (A1) SCALE 1:400 (A3) 2 0 2 4 6 8 10

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	DA ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

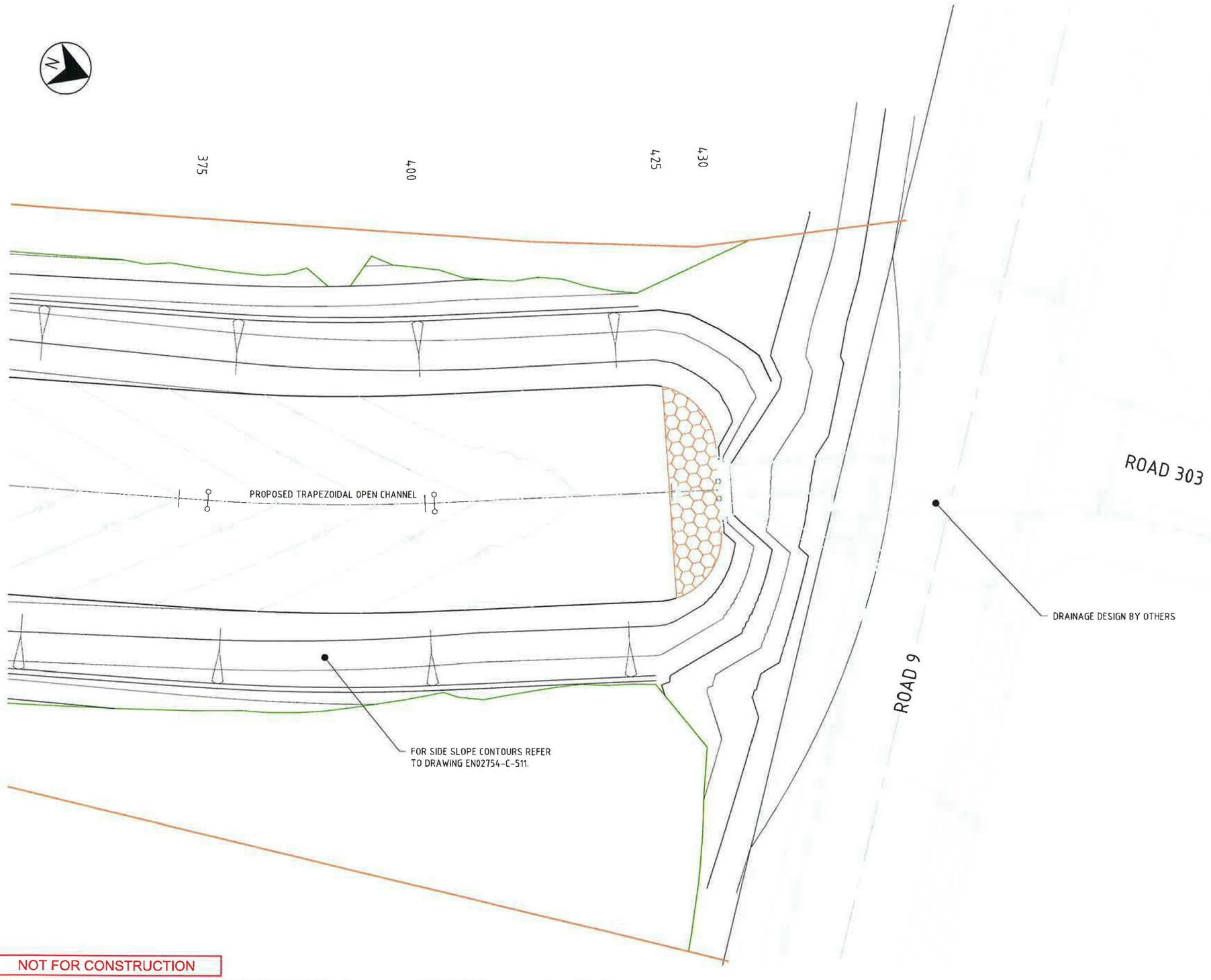
DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: TRANSITION DETAIL OF OPEN CHANNEL BASE AT ROAD 8 BOX CULVERT

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:200	EN02754	EN02754-C-515	2

A1

Plot Date 05 Dec 2012 @ 09:51:31 Login Name lbarnett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-515-516.dwg



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXTENT OF REGRADING
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-NTH-STH-CHANNEL_A 12da

SCALE 1:200 (A1)
SCALE 1:400 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	D.A. ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: TRANSITION DETAIL OF OPEN CHANNEL BASE AT ROAD 9 HEADWALL

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:200	EN02754	EN02754-C-516	2

A1

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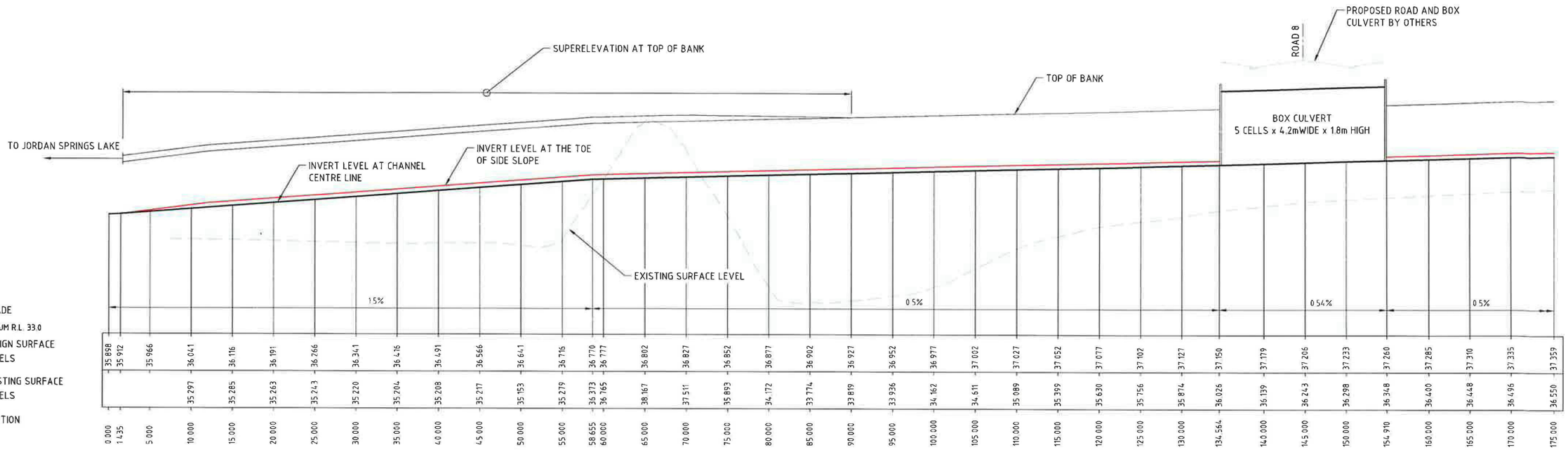

STATION	DESIGN SURFACE LEVELS (GRADE, DATUM R.L. 33.0)	EXISTING SURFACE LEVELS
0.000	35.898	
1.435	35.912	
5.000	35.966	
10.000	36.041	35.297
15.000	36.116	35.285
20.000	36.191	35.263
25.000	36.266	35.243
30.000	36.341	35.220
35.000	36.416	35.204
40.000	36.491	35.208
45.000	36.566	35.217
50.000	36.641	35.253
55.000	36.716	35.279
58.655	36.770	36.373
60.000	36.777	36.765
65.000	36.802	38.167
70.000	36.827	37.511
75.000	36.852	35.893
80.000	36.877	34.172
85.000	36.902	33.774
90.000	36.927	33.819
95.000	36.952	33.936
100.000	36.977	34.162
105.000	37.002	34.611
110.000	37.027	35.089
115.000	37.052	35.399
120.000	37.077	35.630
125.000	37.102	35.756
130.000	37.127	35.874
134.564	37.150	36.025
140.000	37.179	36.139
145.000	37.206	36.243
150.000	37.233	36.298
154.910	37.260	36.348
160.000	37.285	36.400
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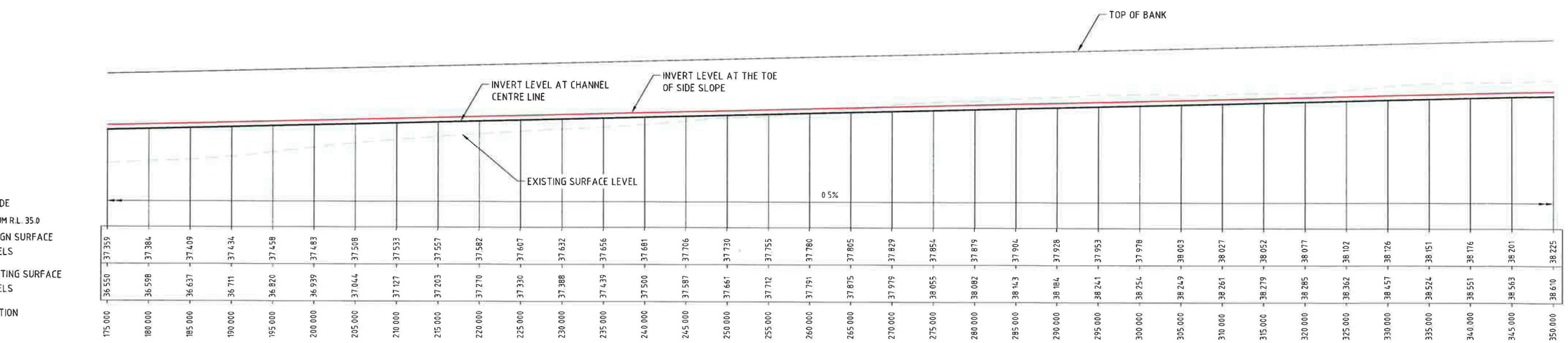
170.000	37.335	36.496
175.000	37.359	36.550

LONGITUDINAL SECTION ALONG OPEN CHANNEL MC03



STATION	DESIGN SURFACE LEVELS (GRADE, DATUM R.L. 35.0)	EXISTING SURFACE LEVELS
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185.000	37.409	36.637
190.000	37.434	36.711
195.000	37.458	36.820
200.000	37.483	36.939
205.000	37.508	37.044
210.000	37.533	37.127
215.000	37.557	37.203
220.000	37.582	37.270
225.000	37.607	37.330
230.000	37.632	37.388
235.000	37.656	37.439
240.000	37.681	37.500
245.000	37.706	37.587
250.000	37.730	37.661
255.000	37.755	37.712
260.000	37.780	37.791
265.000	37.805	37.875
270.000	37.829	37.979
275.000	37.854	38.055
280.000	37.879	38.082
285.000	37.904	38.143
290.000	37.928	38.184
295.000	37.953	38.241
300.000	37.978	38.254
305.000	38.003	38.249
310.000	38.027	38.261
315.000	38.052	38.279
320.000	38.077	38.285
325.000	38.102	38.362
330.000	38.126	38.457
335.000	38.151	38.524
340.000	38.176	38.551
345.000	38.201	38.563
350.000	38.225	38.610

LONGITUDINAL SECTION ALONG OPEN CHANNEL MC03

HORIZ 1:250 (A1) 1:500 (A3)
VERT 1:50 (A1) 1:100 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	D.A. ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

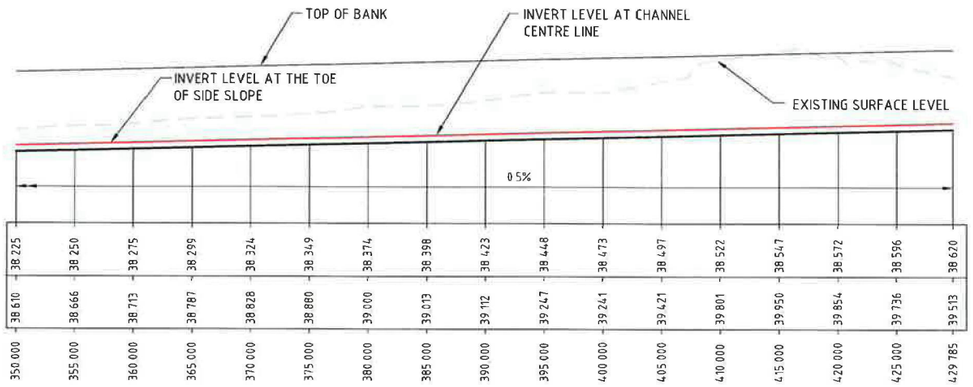
CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: LONGITUDINAL SECTION MC03
SHEET 1 OF 3

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:50 V	EN02754	EN02754-C-531	2

Plot Date 05 Dec 2012 @ 09:01:51 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-531-532.dwg



STATION	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS
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360.000	38.275	38.713
365.000	38.299	38.787
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375.000	38.349	38.880
380.000	38.374	39.000
385.000	38.398	39.013
390.000	38.423	39.112
395.000	38.448	39.247
400.000	38.473	39.241
405.000	38.497	39.421
410.000	38.522	39.801
415.000	38.547	39.950
420.000	38.572	39.854
425.000	38.596	39.736
429.785	38.620	39.513

GRADE

DATUM R.L. 37.0

LONGITUDINAL SECTION ALONG OPEN CHANNEL MC03

HORIZ 1:250 (A1) 1:500 (A3)
VERT 1:50 (A1) 1:100 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JH	JC	JW	D A ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE

PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

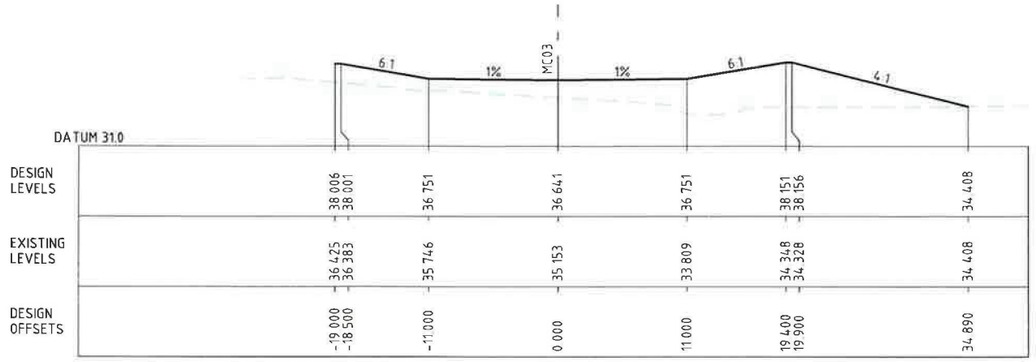
DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: LONGITUDINAL SECTION MC03
SHEET 2 OF 3

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:50 V	EN02754	EN02754-C-532	2

Plot Date 05 Dec 2012 @ 09:00:50 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-531-532.dwg

A1



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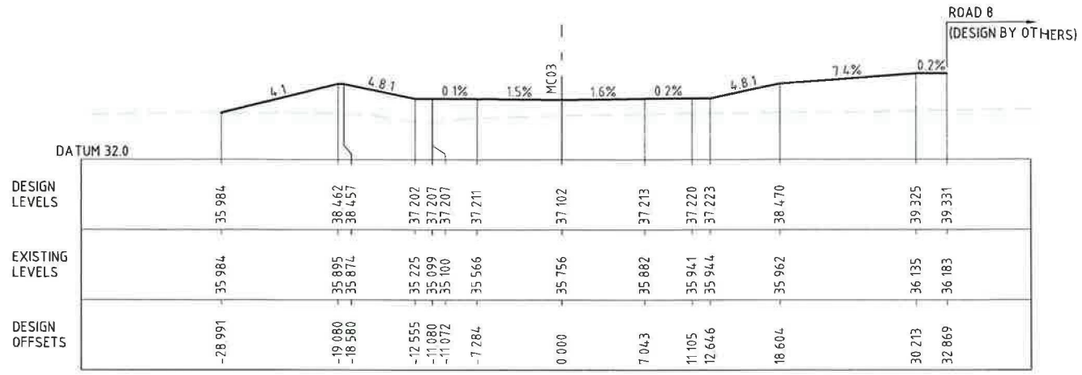

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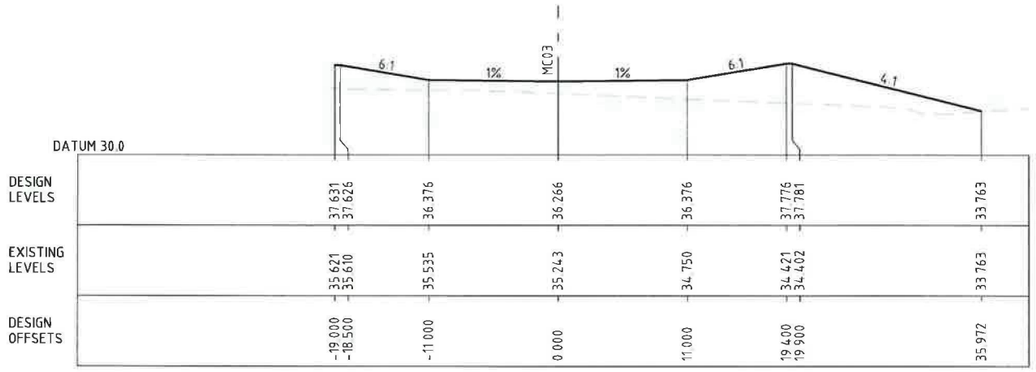

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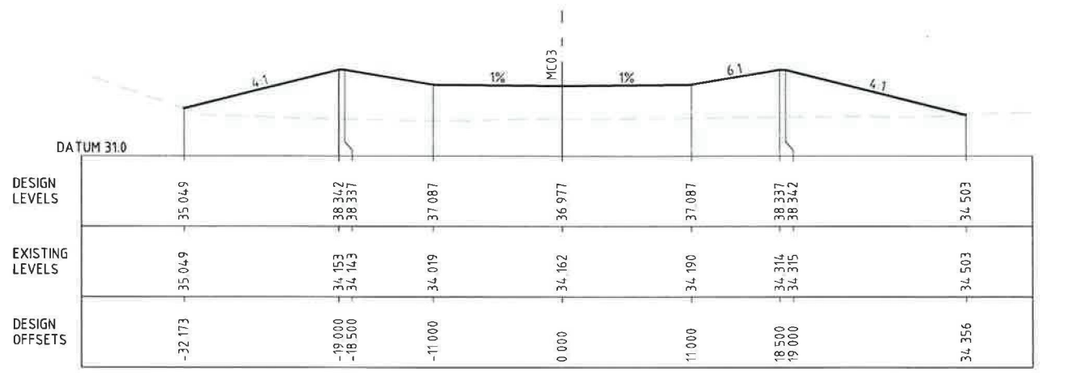

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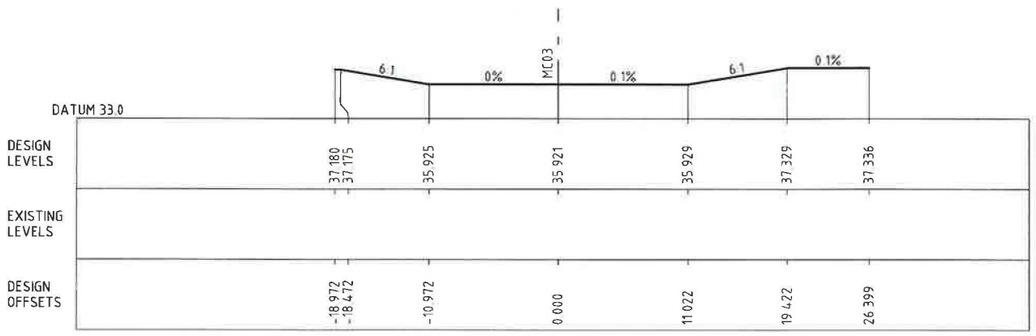

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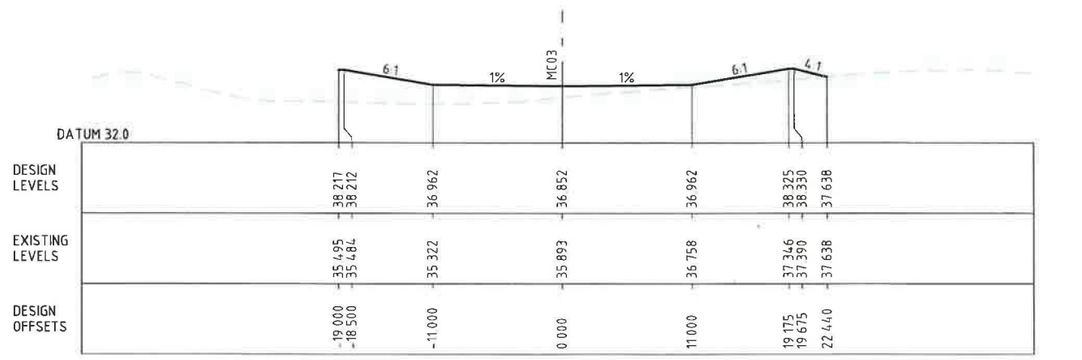

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SCALE 1:250 (A1) 2.5 0 2.5 5 7.5 10 12.5
SCALE 1:500 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JC	JC	JW	D.A. ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

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Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

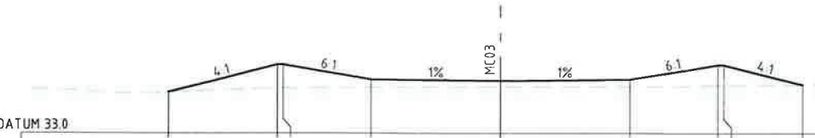
CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC03
SHEET 1 OF 3

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-551	2

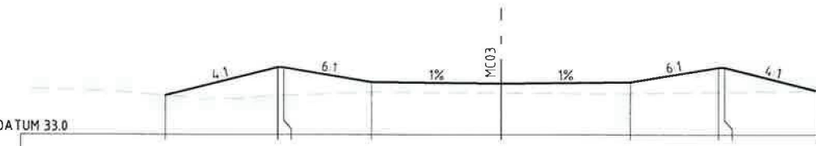
Plot Date 05 Dec 2012 @ 08:48:23 Login Name bbarrett Cad File I:\ENVIR\Projects\EN0275\Deliverables\Drawings\Civil\Dwg\EN02754C-551-553.dwg



DATUM 33.0

DESIGN LEVELS	36.523	38.848 38.843	37.593	37.483	37.593	38.843 38.848	37.163
EXISTING LEVELS	36.523	36.822 36.830	36.904	36.939	36.972	37.062 37.069	37.163
DESIGN OFFSETS	-28.302	-19.000 -18.500	-11.000	0.000	11.000	18.500 19.000	25.742

200



DATUM 33.0

DESIGN LEVELS	36.336	38.724 38.719	37.469	37.359	37.469	38.719 38.724	36.743
EXISTING LEVELS	36.336	36.300 36.321	36.605	36.550	36.501	36.606 36.613	36.743
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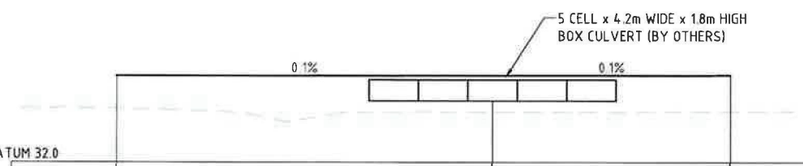
175



DATUM 32.0

DESIGN LEVELS	39.369	37.233	39.435
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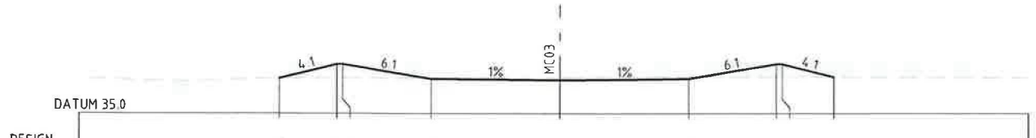
DESIGN OFFSETS	-31.915	0.000	20.216

150



DATUM 35.0

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EXISTING LEVELS	38.004	38.025 38.026	38.016	38.055	38.108	38.129 38.131	38.118
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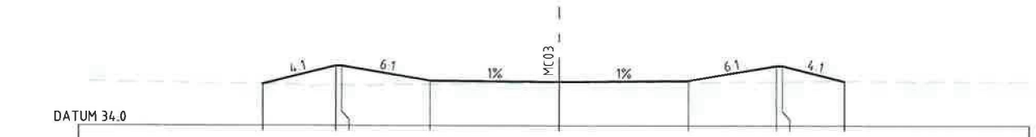
275



DATUM 34.0

DESIGN LEVELS	37.544	39.095 39.090	37.840	37.730	37.840	39.090 39.095	37.773
EXISTING LEVELS	37.544	37.501 37.464	37.546	37.661	37.700	37.737 37.740	37.773
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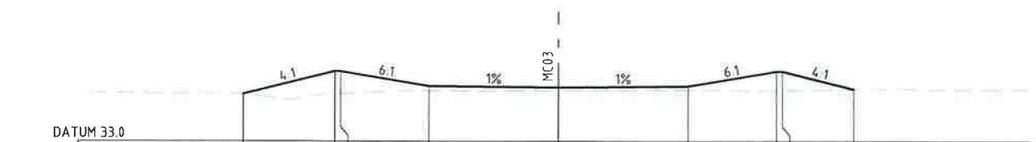

DATUM 33.0

DESIGN LEVELS	37.020	38.972 38.967	37.717	37.607	37.717	38.967 38.972	37.455
EXISTING LEVELS	37.020	37.055 37.078	37.319	37.330	37.347	37.324 37.336	37.455
DESIGN OFFSETS	-26.808	-19.000 -18.500	-11.000	0.000	11.000	18.500 19.000	25.068

225

SCALE 1:250 (A1)
SCALE 1:500 (A3)
2.5 0 2.5 5 7.5 10 12.5

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JC	JC	JW	D.A ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC03
SHEET 2 OF 3

SCALE	SKM PROJECT No	DRAWING No	AMDT
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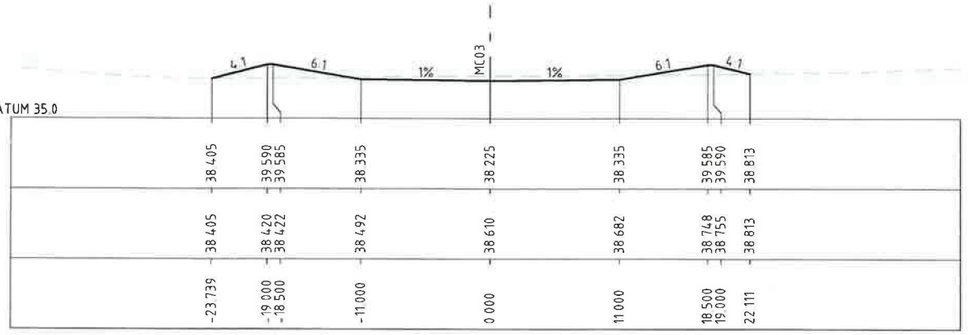
Plot Date 05 Dec 2012 @ 08:45:18 Login Name lbarrett Cad File I:\ENWR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-551-553.dwg



DESIGN LEVELS	38.405	39.590 39.585	38.335	38.225	38.335	39.585 39.590	38.813
EXISTING LEVELS	38.405	38.420 38.422	38.492	38.610	38.682	38.748 38.755	38.813
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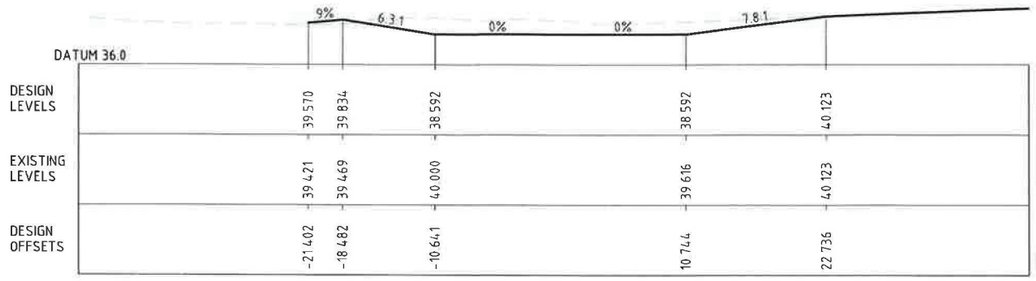
350



DESIGN LEVELS	39.570	39.834	38.592	38.592	40.123
EXISTING LEVELS	39.421	39.469	40.000	39.616	40.123
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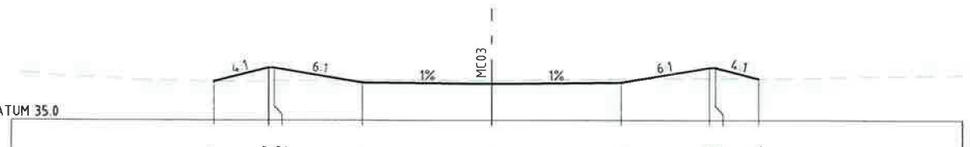
425



DESIGN LEVELS	38.307	39.467 39.462	38.212	38.102	38.212	39.462 39.467	38.544
EXISTING LEVELS	38.307	38.337 38.342	38.384	38.362	38.493	38.542 38.533	38.544
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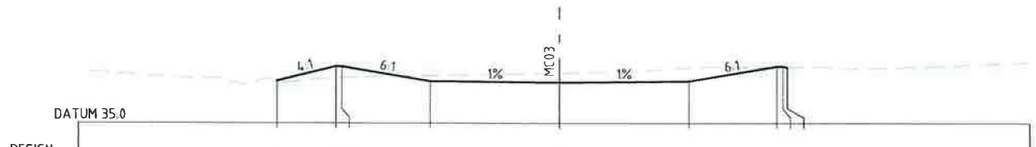
325



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EXISTING LEVELS	38.588	38.830 38.851	39.057	39.241	39.712	39.744 39.743 39.741	
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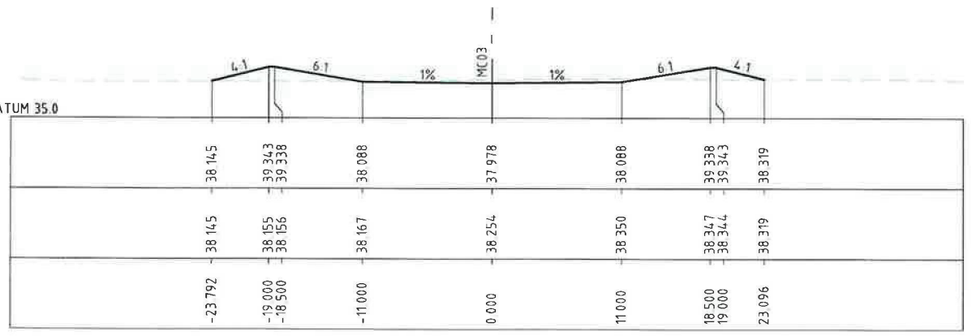
400



DESIGN LEVELS	38.145	39.343 39.338	38.088	37.978	38.088	39.338 39.343	38.319
EXISTING LEVELS	38.145	38.155 38.156	38.167	38.254	38.350	38.347 38.344	38.319
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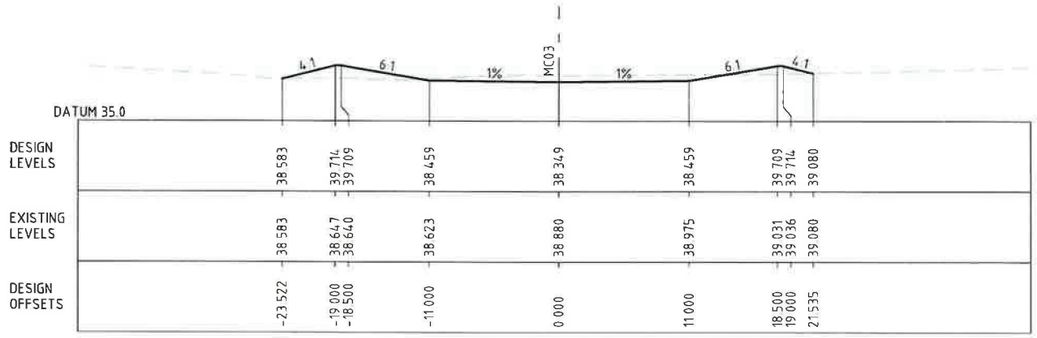


DESIGN LEVELS	38.583	39.714 39.709	38.459	38.349	38.459	39.709 39.714	39.080
EXISTING LEVELS	38.583	38.647 38.640	38.623	38.880	38.975	39.031 39.036	39.080
DESIGN OFFSETS	-23.522	-19.000 -18.500	-11.000	0.000	11.000	18.500 19.000	21.535

375

SCALE 1:250 (A1) 2.5 0 2.5 5 7.5 10 12.5
SCALE 1:500 (A3)

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
2	05.12.12	LB	JC	JC	JW	D.A. ISSUE
1	09.03.12	IH	JC	JC	JW	DA ISSUE TO LEND LEASE FOR COMMENTS
0	06.02.12	IH	JH	JC	JW	PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS NORTH TO SOUTH OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LA	IH	JC	JW
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC03
SHEET 3 OF 3

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-553	2

A1

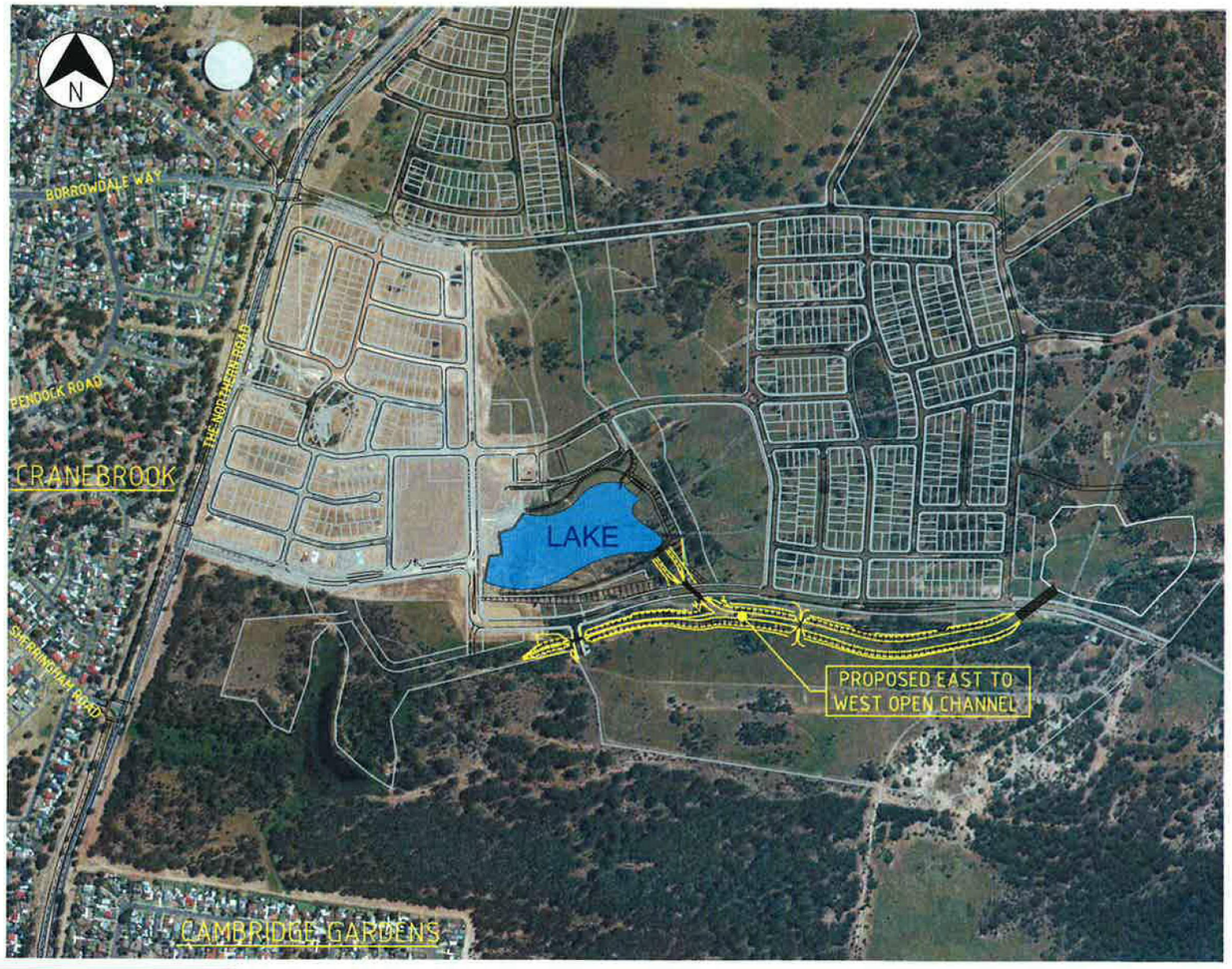
Plot Date 05 Dec 2012 @ 08:44:30 Login Name: lbarrett Cad File: I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-551-553.dwg

Lend Lease

Appendix H
Engineering Plans for the East-West channel, prepared by SKM

Lend Lease

JORDAN SPRINGS
EAST TO WEST OPEN CHANNEL



DRAWING INDEX

DRAWING No	DRAWING TITLE
EN02754-C-601	COVER SHEET AND DRAWING INDEX
EN02754-C-610	OPEN CHANNEL LAYOUT PLAN - SHEET 1 OF 4
EN02754-C-611	OPEN CHANNEL LAYOUT PLAN - SHEET 2 OF 4
EN02754-C-612	OPEN CHANNEL LAYOUT PLAN - SHEET 3 OF 4
EN02754-C-613	OPEN CHANNEL LAYOUT PLAN - SHEET 4 OF 4
EN02754-C-631	LONGITUDINAL SECTIONS MC01 - SHEET 1 OF 3
EN02754-C-632	LONGITUDINAL SECTIONS MC01 - SHEET 2 OF 3
EN02754-C-633	LONGITUDINAL SECTIONS MC01 - SHEET 3 OF 3
EN02754-C-634	LONGITUDINAL SECTIONS MC02 - SHEET 1 OF 1
EN02754-C-651	CROSS SECTIONS MC01 - SHEET 1 OF 8
EN02754-C-652	CROSS SECTIONS MC01 - SHEET 2 OF 8
EN02754-C-653	CROSS SECTIONS MC01 - SHEET 3 OF 8
EN02754-C-654	CROSS SECTIONS MC01 - SHEET 4 OF 8
EN02754-C-655	CROSS SECTIONS MC01 - SHEET 5 OF 8
EN02754-C-656	CROSS SECTIONS MC01 - SHEET 6 OF 8
EN02754-C-657	CROSS SECTIONS MC01 - SHEET 7 OF 8
EN02754-C-658	CROSS SECTIONS MC01 - SHEET 8 OF 8

SCALE 1:5000 (A1) 50 0 50 100 150 200 250
SCALE 1:10000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

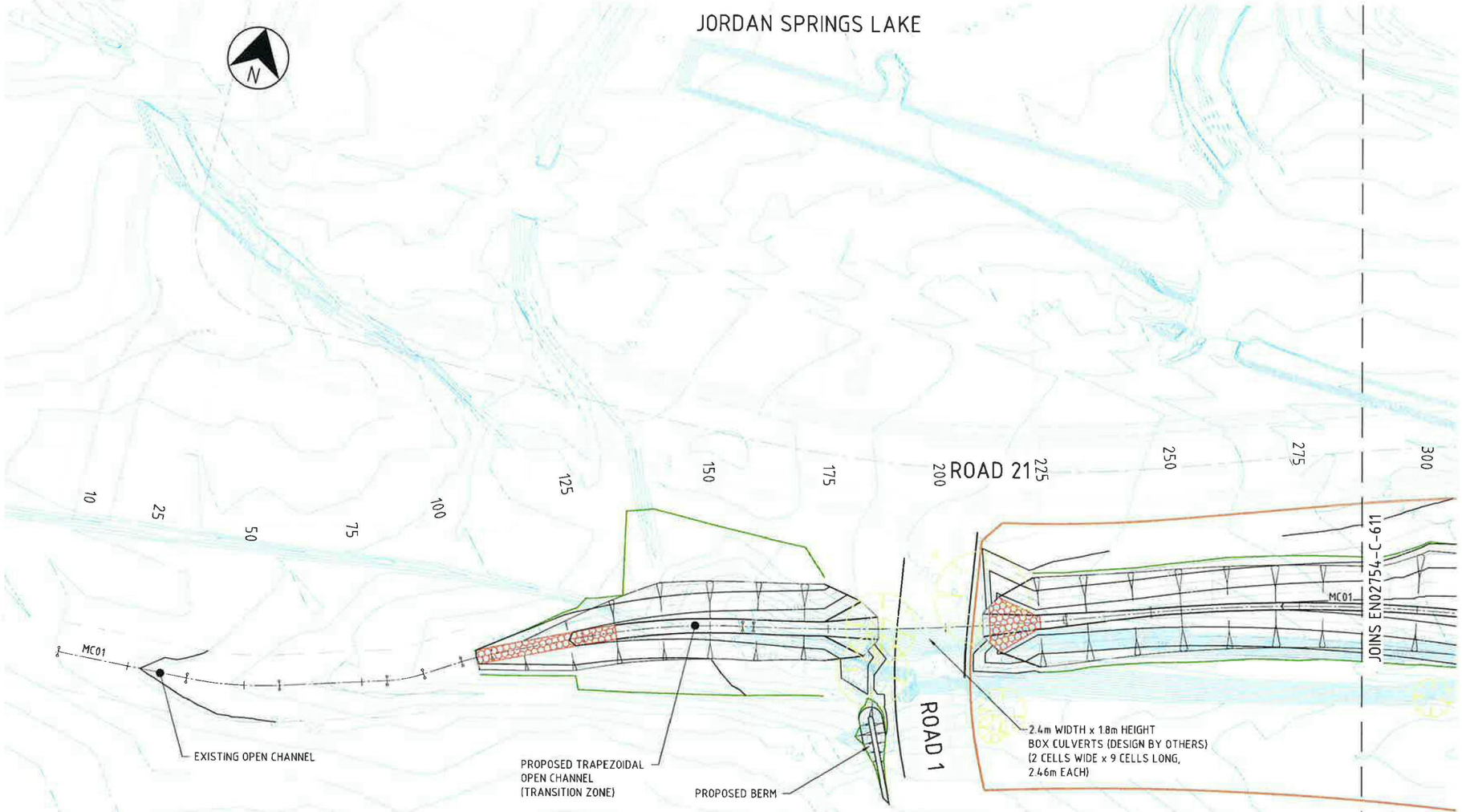
Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: | DESIGN REVIEW: JC

TITLE: COVER SHEET AND DRAWING INDEX
SCALE: 1:5000 | SKM PROJECT No: EN02754 | DRAWING No: EN02754-C-601 | AMDT: 3

Plot Date 05 Dec 2012 @ 10:29:45 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-601.dwg



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXISTING SURFACE CONTOUR
- EXTENT OF REGRADING
- EXISTING TREES
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-EAST-WEST-CHANNEL_0 12da

SCALE 1:500 (A1) 5 0 5 10 15 20 25
SCALE 1:1000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

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100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: OPEN CHANNEL LAYOUT PLAN
SHEET 1 OF 4

SCALE: 1:500 | SKM PROJECT No: EN02754 | DRAWING No: EN02754-C-610 | AMDT: 3

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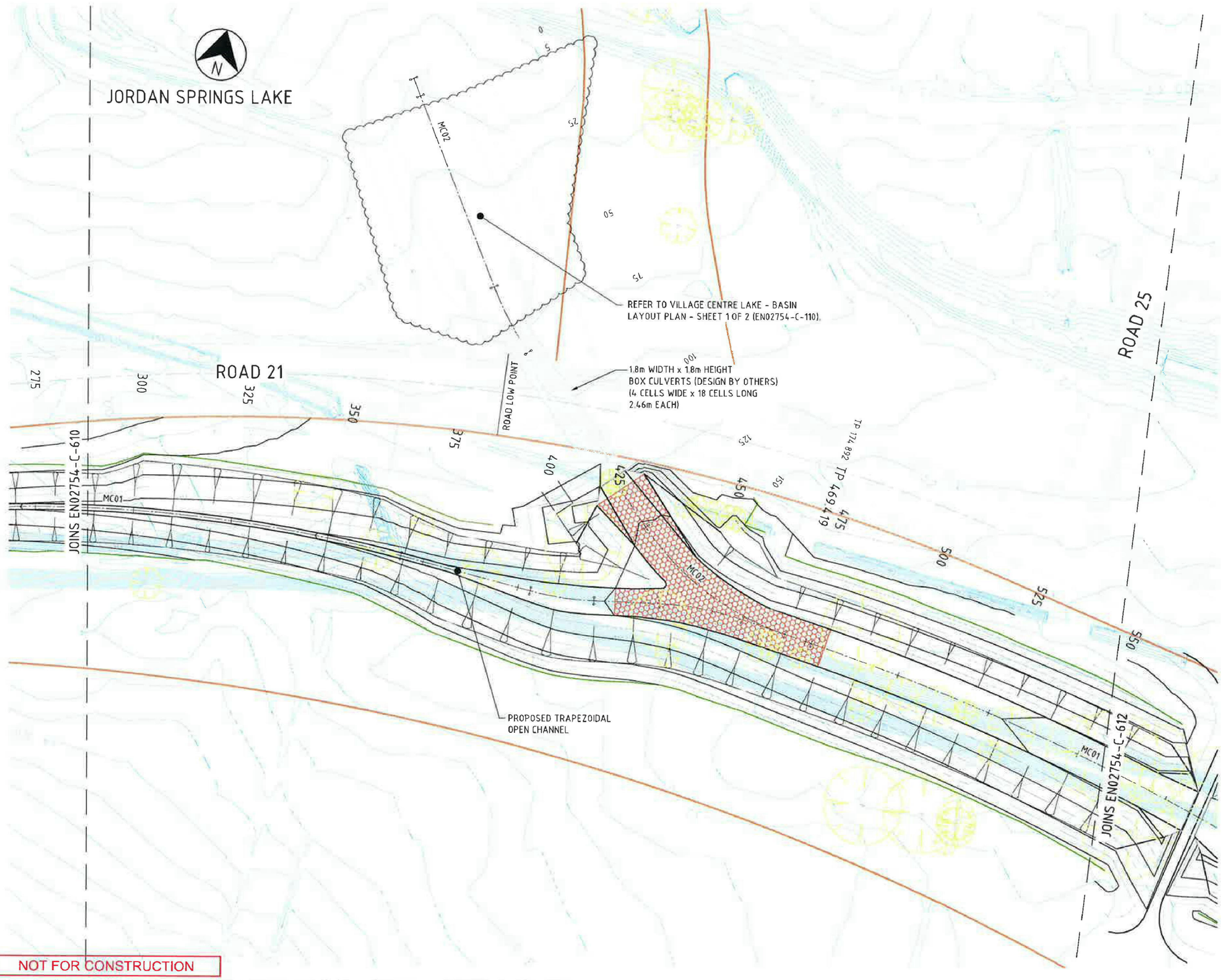
Plot Date 05 Dec 2012 @ 13:53:59 Login Name lbarrett Cad File I:\ENVIR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-610-613.dwg



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXISTING SURFACE CONTOUR
- EXTENT OF REGRADING
- EXISTING TREES
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-EAST-WEST-CHANNEL_0 12da

SCALE 1:500 (A1) 5 0 5 10 15 20 25
SCALE 1:1000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

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Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

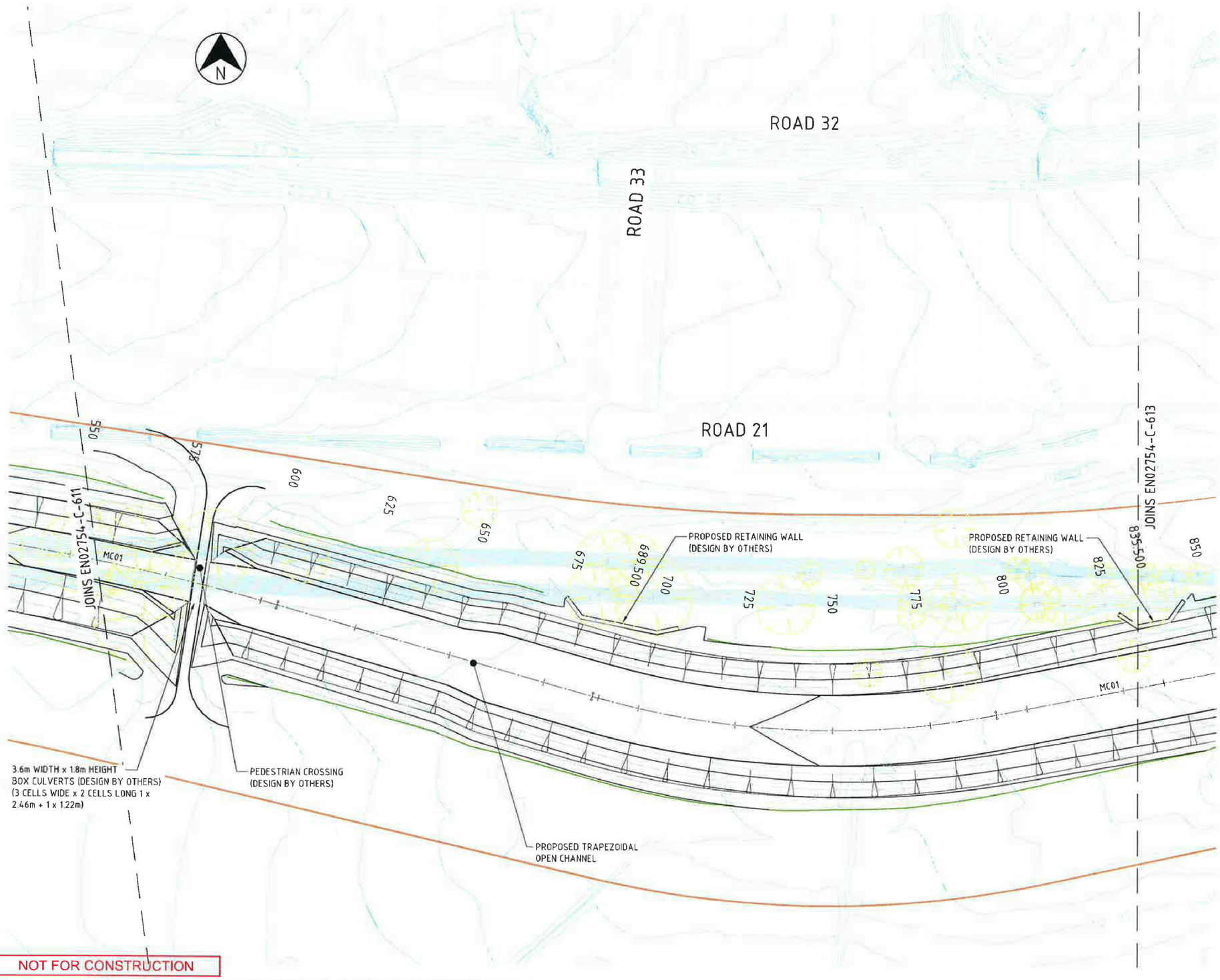
CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LB	IH	JC	
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: OPEN CHANNEL LAYOUT PLAN
SHEET 2 OF 4

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:500	EN02754	EN02754-C-611	3

Plot Date 05 Dec 2012 @ 13:54:32 Login Name lbarnett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-611-613.dwg



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXISTING SURFACE CONTOUR
- EXTENT OF REGRADING
- EXISTING TREES
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-EAST-WEST-CHANNEL_0 12da

SCALE 1:500 (A1) 5 0 5 10 15 20 25
SCALE 1:1000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL

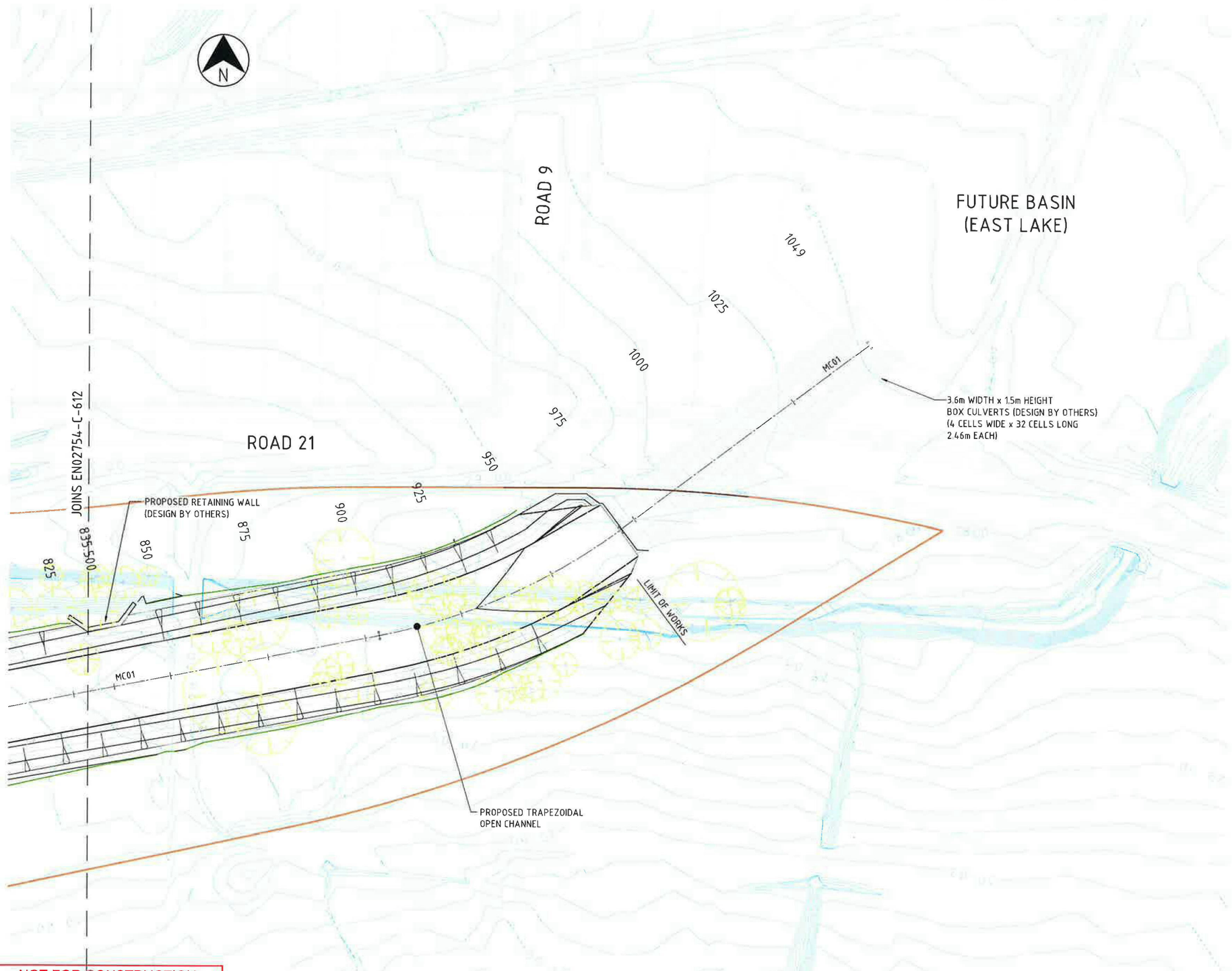
DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LB	IH	JC	
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: OPEN CHANNEL LAYOUT PLAN
SHEET 3 OF 4

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:500	EN02754	EN02754-C-612	3

A1

Plot Date 05 Dec 2012 @ 13:55:05 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-610-613.dwg



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- RIPARIAN CORRIDOR BOUNDARY
- EXISTING SURFACE CONTOUR
- EXTENT OF REGRADING
- EXISTING TREES
- ENERGY DISSIPATION AREA

NOTES

ALL ROADWORKS, INCLUSIVE OF BOX CULVERTS, ARE TO BE DESIGNED BY OTHERS (UNO)

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
EN02754-DRAINAGE-EAST-WEST-CHANNEL_0 12da

SCALE 1:500 (A1) 5 0 5 10 15 20 25
SCALE 1:1000 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

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Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

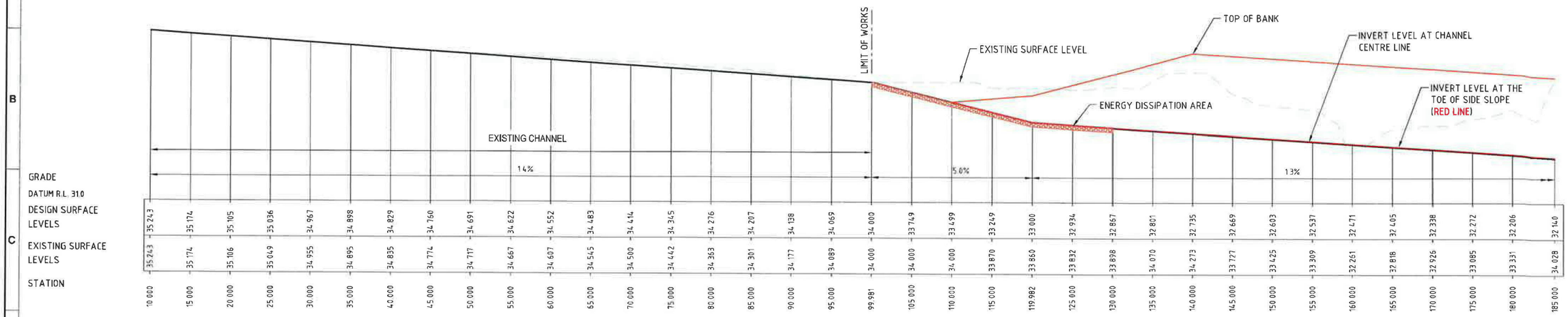
CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: OPEN CHANNEL LAYOUT PLAN
SHEET 4 OF 4

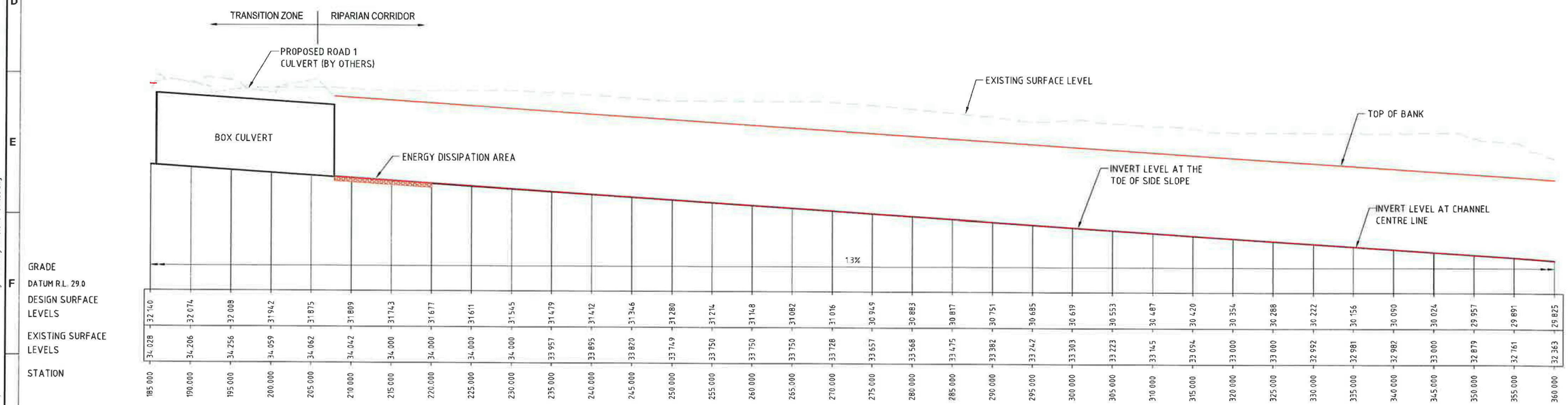
SCALE	SKM PROJECT No	DRAWING No	AMDT
1:500	EN02754	EN02754-C-613	3

A1

Plot Date 05 Dec 2012 @ 13:55:39 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-610-613.dwg



LONGITUDINAL SECTION ALONG OPEN CHANNEL MC01



LONGITUDINAL SECTION ALONG OPEN CHANNEL MC01

NOT FOR CONSTRUCTION

HDRIZ 1:250 (A1) 1:500 (A3)
VERT 1:50 (A1) 1:100 (A3)

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	DA ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

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Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

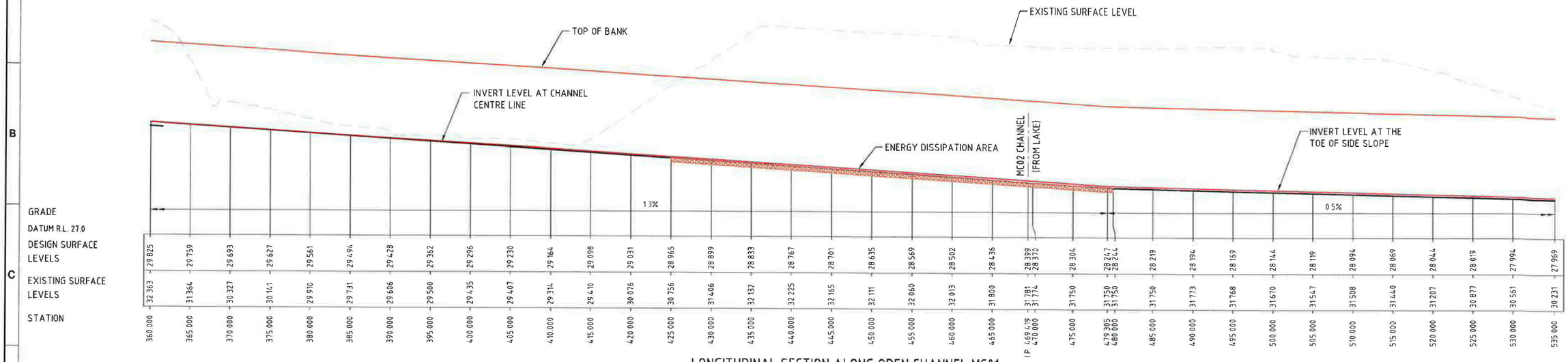
CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: LONGITUDINAL SECTION MC01
SHEET 1 OF 3

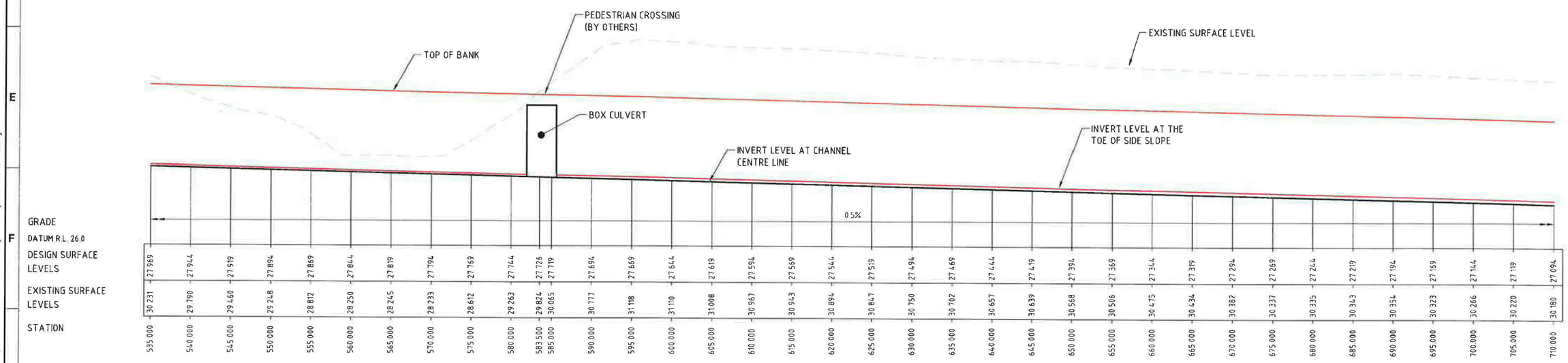
SCALE: 1:250 H, 1:50 V | SKM PROJECT No: EN02754 | DRAWING No: EN02754-C-631 | AMDT: 3

A1

Plot Date 05 Dec 2012 @ 12:17:22 Login Name lbarrett Cad File I:\ENV\Projects\EN02754\Deliverables\Drawings\Civil\Dwgs\EN02754C-631-633.dwg



LONGITUDINAL SECTION ALONG OPEN CHANNEL MC01



LONGITUDINAL SECTION ALONG OPEN CHANNEL MC01

HORIZ 1:250 (A1) 1:500 (A3) 2.5 0 2.5 5 7.5 10 12.5
VERT 1:50 (A1) 1:100 (A3) 0.5 0 0.5 1 1.5 2 2.5

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

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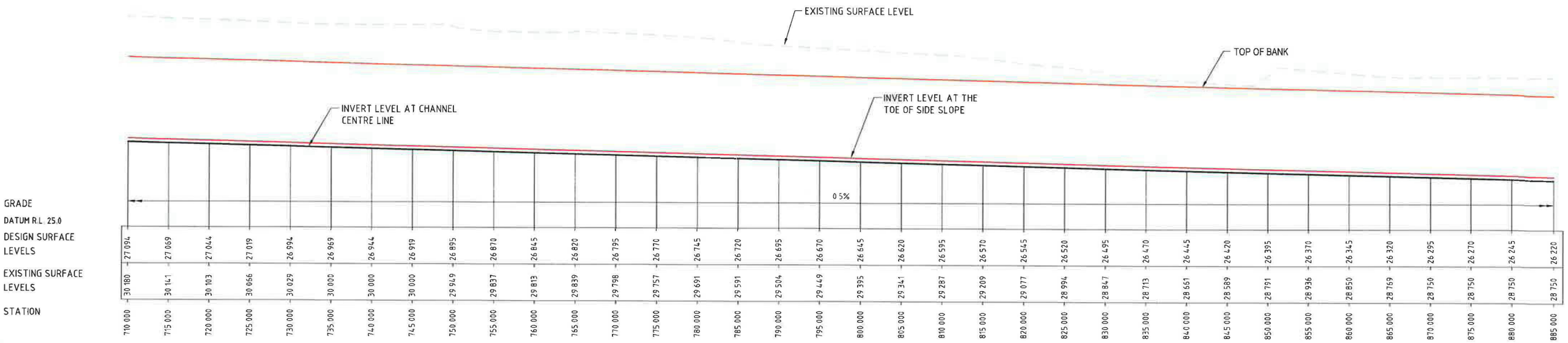
SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: LONGITUDINAL SECTION MC01
SHEET 2 OF 3

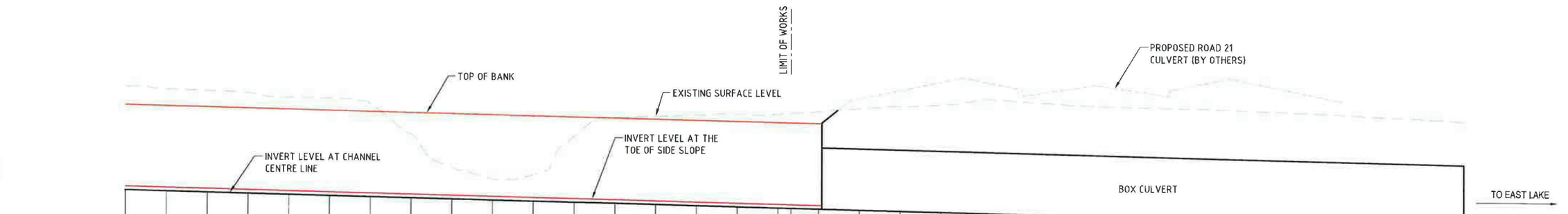
SCALE: 1:250 H, 1:50 V | SKM PROJECT No: EN02754 | DRAWING No: EN02754-C-632 | AMDT: 3

Plot Date 05 Dec 2012 @ 10:31:38 Login Name lbarrett Cad File I:\ENVIR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-631-633.dwg



STATION	GRADE (DATUM R.L. 25.0) DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS
710 000	27 094	30 180
715 000	27 069	30 141
720 000	27 044	30 103
725 000	27 019	30 066
730 000	26 994	30 029
735 000	26 969	30 000
740 000	26 944	30 000
745 000	26 919	30 000
750 000	26 895	29 949
755 000	26 870	29 837
760 000	26 845	29 819
765 000	26 820	29 839
770 000	26 795	29 798
775 000	26 770	29 757
780 000	26 745	29 691
785 000	26 720	29 591
790 000	26 695	29 504
795 000	26 670	29 449
800 000	26 645	29 395
805 000	26 620	29 341
810 000	26 595	29 287
815 000	26 570	29 209
820 000	26 545	29 077
825 000	26 520	28 994
830 000	26 495	28 847
835 000	26 470	28 713
840 000	26 445	28 661
845 000	26 420	28 589
850 000	26 395	28 791
855 000	26 370	28 936
860 000	26 345	28 850
865 000	26 320	28 769
870 000	26 295	28 750
875 000	26 270	28 750
880 000	26 245	28 750
885 000	26 220	28 750

LONGITUDINAL SECTION ALONG OPEN CHANNEL MC01



STATION	GRADE (DATUM R.L. 24.0) DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS
885 000	26 220	28 750
890 000	26 195	28 694
895 000	26 170	28 657
900 000	26 145	28 615
905 000	26 120	28 495
910 000	26 095	28 482
915 000	26 070	28 388
920 000	26 045	27 607
925 000	26 020	26 811
930 000	25 995	26 520
935 000	25 970	26 606
940 000	25 945	27 553
945 000	25 920	28 015
950 000	25 895	28 053
955 000	25 870	28 091
960 000	25 845	28 114
965 000	25 820	28 114
966 605	25 812	28 135
970 000	25 795	28 179
975 000	25 770	28 253
980 000	25 745	28 318
985 000	25 720	28 352
990 000	25 695	28 486
995 000	25 670	28 440
1000 000	25 645	28 370
1005 000	25 620	28 326
1010 000	25 595	28 298
1015 000	25 570	28 278
1020 000	25 545	28 252
1025 000	25 520	28 210
1030 000	25 496	28 167
1035 000	25 471	28 118
1040 000	25 446	28 066
1045 000	25 421	28 013
1049 116	25 400	27 967

LONGITUDINAL SECTION ALONG OPEN CHANNEL MC01

HORIZ 1:250 (A1) 1:500 (A3) — 2.5 0 2.5 5 7.5 10 12.5
VERT 1:50 (A1) 1:100 (A3) — 0.5 0 0.5 1 1.5 2 2.5

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: LONGITUDINAL SECTION MC01
SHEET 3 OF 3

SCALE: 1:250 H, 1:50 V | SKM PROJECT No: EN02754 | DRAWING No: EN02754-C-633 | AMDT: 3

A1

Plot Date 05 Dec 2012 @ 10:32:24 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-631-633.dwg

LONGITUDINAL SECTION ALONG OPEN CHANNEL MC02

NOT FOR CONSTRUCTION

HORIZ 1:250 (A1) 1:500 (A3) 2.5 0 2.5 5 7.5 10 12.5
VERT 1:50 (A1) 1:100 (A3) 0.5 0 0.5 1 1.5 2 2.5

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P MGR	APP'D P DIR	AMENDMENT
1	05.12.12	LB	JH	JC	JW	DA ISSUE
0	27.11.12	LB	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE

Lend Lease

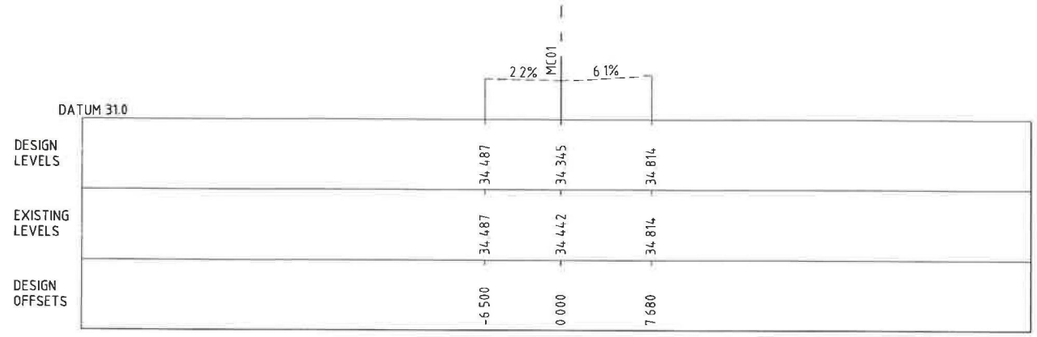
SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: SM | DRAFTING CHECK: JH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

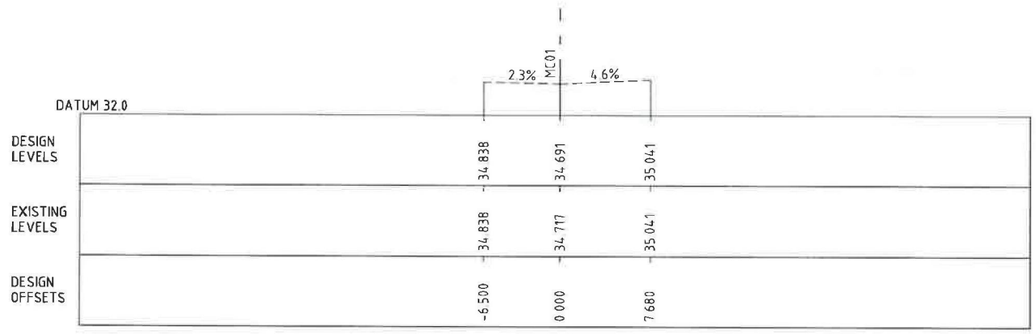
TITLE: LONGITUDINAL SECTION MC02
SHEET 1 OF 1

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:50 V	EN02754	EN02754-C-634	1

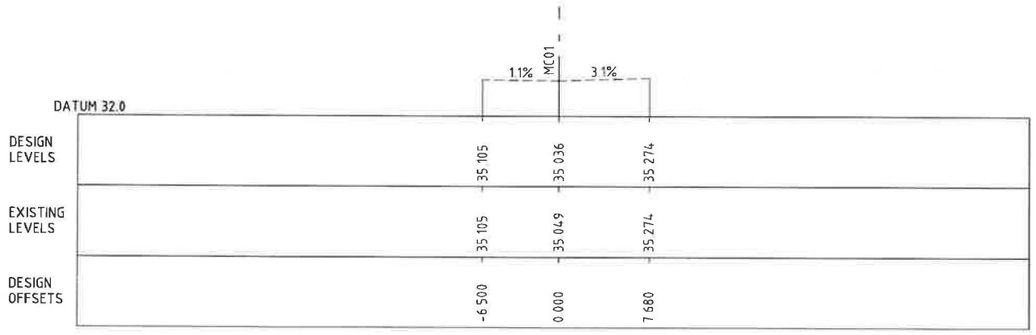
Plot Date 05 Dec 2012 @ 12:08:24 Login Name lbarnett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-634.dwg



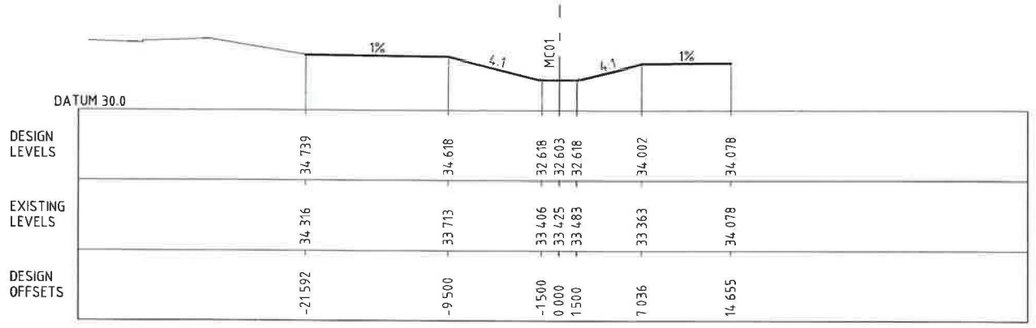
75 - EXISTING



50 - EXISTING



25 - EXISTING



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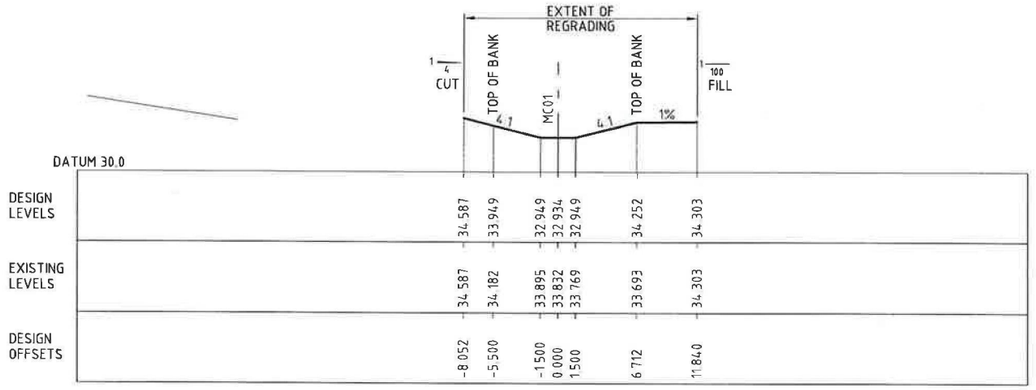

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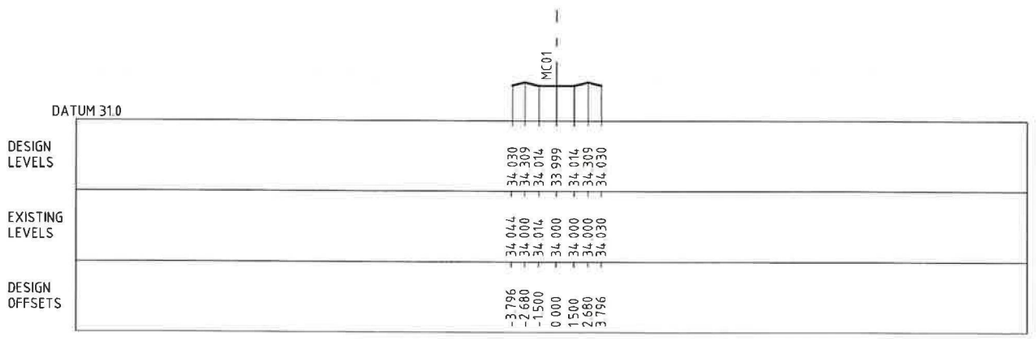

100

SCALE 1:250 (A1) 2.5 0 2.5 5 7.5 10 12.5
SCALE 1:500 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	DA ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

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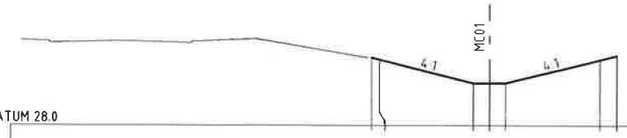
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: CROSS SECTIONS MC01
SHEET 1 OF 8

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-651	3

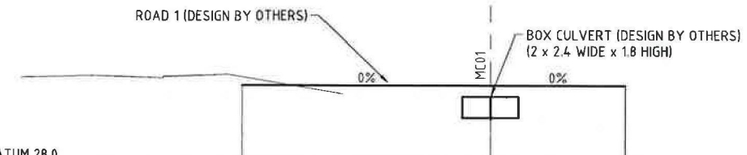
Plot Date 05 Dec 2012 @ 10:34:17 Login Name: lbarrett Cad File: I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-651-658.dwg



DATUM 28.0

DESIGN LEVELS	33.799	31.625	33.625
	33.625	31.611	33.983
		31.625	
EXISTING LEVELS	33.799	33.969	30.876
	33.805	34.000	31.221
		34.000	
DESIGN OFFSETS	-10.071	-1.373	9.373
	-9.373	0.000	10.807
		1.373	

225



DATUM 28.0

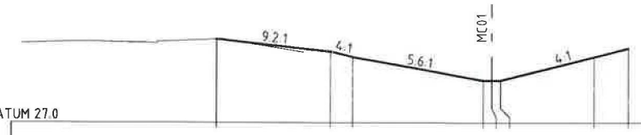
DESIGN LEVELS	34.700	31.942	34.700
EXISTING LEVELS	34.000	34.059	31.765
DESIGN OFFSETS	-21.151	0.000	11.448

200

DATUM 29.0

DESIGN LEVELS	34.085	32.286	33.462
		32.286	
		32.272	
		32.286	
		32.287	
EXISTING LEVELS	34.286	33.535	32.757
		33.450	
		33.085	
		32.723	
		32.624	
DESIGN OFFSETS	-9.139	-1.950	6.605
		-1.582	
		0.000	
		1.543	
		1.901	

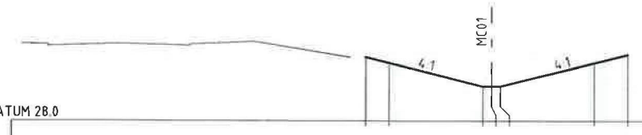
175



DATUM 27.0

DESIGN LEVELS	34.156	33.101	30.626	32.626	33.354
		32.626	30.619		
			30.626		
EXISTING LEVELS	33.000	33.101	33.274	31.944	30.340
		33.127	33.303		
			33.332		
DESIGN OFFSETS	-23.465	-13.761	-0.750	8.750	11.661
		-11.861	0.000		
			0.750		

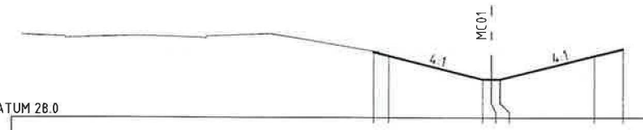
300



DATUM 28.0

DESIGN LEVELS	33.452	32.957	30.957	32.957	33.662
			30.949		
			30.957		
EXISTING LEVELS	33.452	33.486	33.641	32.253	30.690
			33.657		
			33.673		
DESIGN OFFSETS	-10.730	-8.750	-0.750	8.750	11.570
			0.000		
			0.750		

275



DATUM 28.0

DESIGN LEVELS	33.613	33.288	31.288	33.288	33.886
			31.280		
			31.288		
EXISTING LEVELS	33.613	33.631	33.739	31.058	30.671
			33.749		
			33.791		
DESIGN OFFSETS	-10.050	-8.750	-0.750	8.750	11.145
			0.000		
			0.750		

250

SCALE 1:250 (A1) 2.5 0 2.5 5 7.5 10 12.5
SCALE 1:500 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

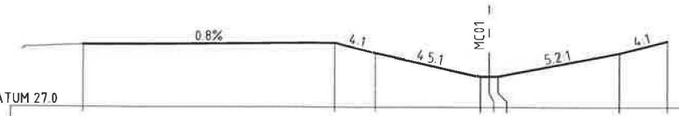
SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: JH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: CROSS SECTIONS MC01
SHEET 2 OF 8

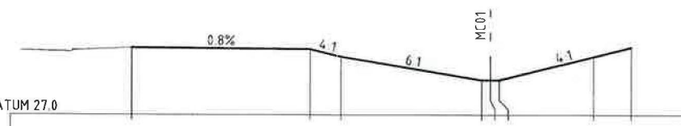
SCALE: 1:250 H, 1:250 V | SKM PROJECT No: EN02754 | DRAWING No: EN02754-C-652 | AMDT: 3

Plot Date 05 Dec 2012 @ 10:35:00 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-651-658.dwg



DESIGN LEVELS	32.329	32.500	31.634	29.634 / 29.627 / 29.634	31.634	32.653
EXISTING LEVELS	32.309	32.500	32.500	30.634 / 30.141 / 29.741	32.750	32.653
DESIGN OFFSETS	-34.677	-13.202	-9.739	-0.750 / 0.000 / 0.750	11.050	15.126

375

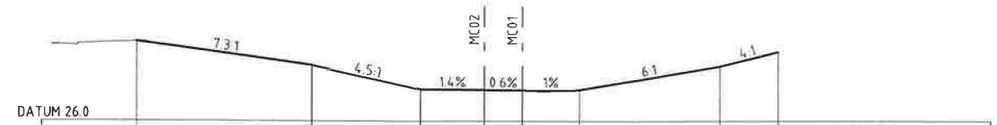


DESIGN LEVELS	32.726	32.608	31.965	29.965 / 29.957 / 29.965	31.965	32.771
EXISTING LEVELS	32.359	32.608	32.784	32.902 / 32.879 / 32.809	30.000	31.144
DESIGN OFFSETS	-30.560	-15.320	-12.750	-0.750 / 0.000 / 0.750	8.750	11.976

350

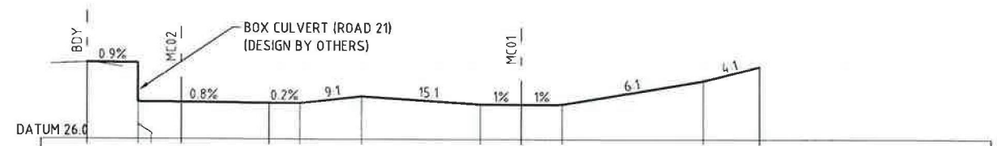
DESIGN LEVELS	33.441	32.788	32.296	30.296 / 30.288 / 30.296	32.296	32.866
EXISTING LEVELS	32.798	32.788	32.792	33.000 / 33.000 / 33.000	30.963	30.106
DESIGN OFFSETS	-26.778	-14.719	-12.750	-0.750 / 0.000 / 0.750	8.750	11.032

325



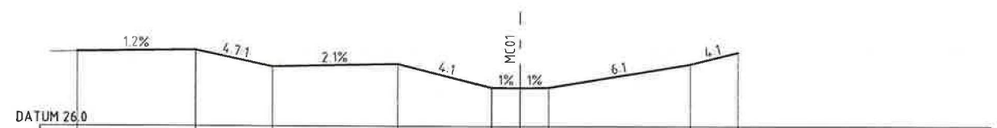
DESIGN LEVELS	32.810	30.792	28.732	28.654	28.635	28.684	30.684	31.930
EXISTING LEVELS	32.085	31.898	31.997	32.059	32.111	30.905	32.041	31.930
DESIGN OFFSETS	-32.781	-17.947	-8.720	-3.276	0.000	4.889	16.889	21.873

450



DESIGN LEVELS	32.540	32.500 / 29.167	29.140	29.080	29.074	29.660	29.000	28.965	29.000	31.000	32.200
EXISTING LEVELS	32.267	32.064 / 32.063	31.595	32.176	32.295	32.250	32.327	30.756	29.177	32.250	32.200
DESIGN OFFSETS	-36.946	-32.591 / -32.585	-28.935	-21.470	-18.843	-13.594	-3.500	0.000	3.500	15.500	20.299

425



DESIGN LEVELS	32.370	32.492	31.098	31.320	29.320	29.296	29.320	31.320	32.334
EXISTING LEVELS	32.312	32.328	32.408	32.425	30.406	29.435	29.500	32.453	32.334
DESIGN OFFSETS	-37.703	-27.634	-21.073	-10.437	-2.437	0.000	2.437	14.436	18.491

400

SCALE 1:250 (A1) 2.5 0 2.5 5 7.5 10 12.5
SCALE 1:500 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

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DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LB	IH	JC	
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC01
SHEET 3 OF 8

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-653	3

A1

Plot Date 05 Dec 2012 @ 10:35:41 Login Name: lbarrett Cad File: H:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-651-658.dwg

DATUM 25.0

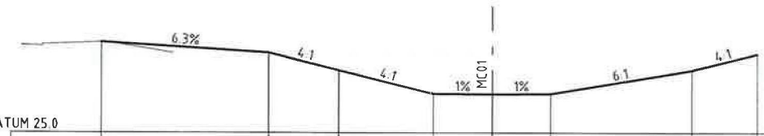
DESIGN LEVELS	31.692	30.069	28.069	28.019	28.069	30.069	31.282
EXISTING LEVELS	31.692	31.707	31.562	30.877	28.447	31.369	31.282
DESIGN OFFSETS	-19.495	-13.000	-5.000	0.000	5.000	17.000	21.852

525

DATUM 25.0

DESIGN LEVELS	32.487	31.757	30.194	28.194	28.144	28.194	30.194	31.597
EXISTING LEVELS	31.771	31.757	31.892	31.779	31.670	29.551	31.729	31.597
DESIGN OFFSETS	-33.218	-19.253	-13.000	-5.000	0.000	5.000	17.000	22.614

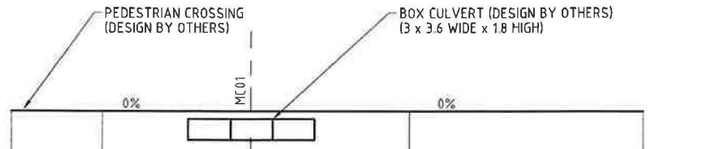
500



DATUM 25.0

DESIGN LEVELS	32.750	31.853	30.354	28.354	28.304	28.354	30.354	31.750
EXISTING LEVELS	31.905	31.853	32.057	31.798	31.750	30.44	31.750	31.750
DESIGN OFFSETS	-33.215	-18.998	-13.000	-5.000	0.000	5.000	17.000	22.584

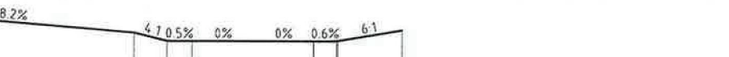
475



DATUM 25.0

DESIGN LEVELS	30.200	30.200	27.726	30.200	30.200
EXISTING LEVELS	31.348	31.056	27.824	31.029	31.406
DESIGN OFFSETS	-20.366	-12.657	0.000	13.587	33.537

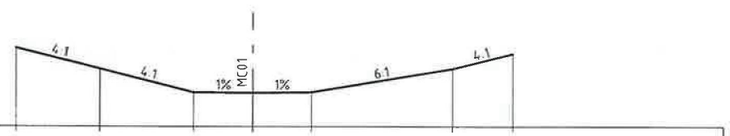
583.5



DATUM 25.0

DESIGN LEVELS	30.200	28.510	27.806	27.796	27.800	27.812	28.740
EXISTING LEVELS	31.351	31.094	29.468	28.230	31.000	30.999	30.830
DESIGN OFFSETS	-30.772	-10.235	-7.405	-5.267	5.063	7.055	12.604

575



DATUM 25.0

DESIGN LEVELS	31.721	29.944	27.944	27.894	27.944	29.944	31.218
EXISTING LEVELS	31.721	31.463	31.294	29.248	29.053	31.078	31.218
DESIGN OFFSETS	-20.109	-13.000	-5.000	0.000	5.000	17.000	22.095

550

SCALE 1:250 (A1) SCALE 1:500 (A3) 2.5 0 2.5 5 7.5 10 12.5

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	DA ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
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Lend Lease

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL

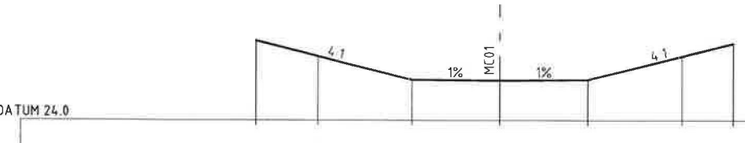
DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LB	IH	JC	
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC01
SHEET 4 OF 8

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-654	3

Plot Date 05 Dec 2012 @ 10:36:22 Login Name lbarrett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-651-658.dwg

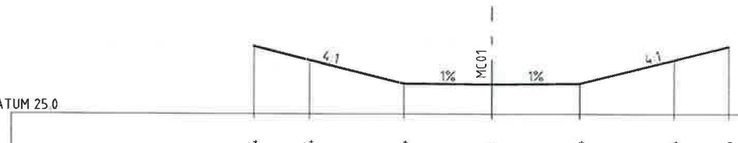
A1



DATUM 24.0

DESIGN LEVELS	30.790	29.469	27.469	27.394	27.469	29.469	30.565
EXISTING LEVELS	27.750	30.018	30.724	30.568	30.473	30.503	30.565
DESIGN OFFSETS	-20.784	-15.500	-7.500	0.000	7.500	15.500	19.884

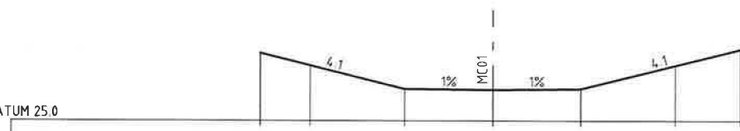
650



DATUM 25.0

DESIGN LEVELS	30.774	29.594	27.594	27.519	27.594	29.594	30.756
EXISTING LEVELS	30.011	27.750	31.000	30.847	30.667	30.704	30.756
DESIGN OFFSETS	-20.220	-15.500	-7.500	0.000	7.500	15.500	20.148

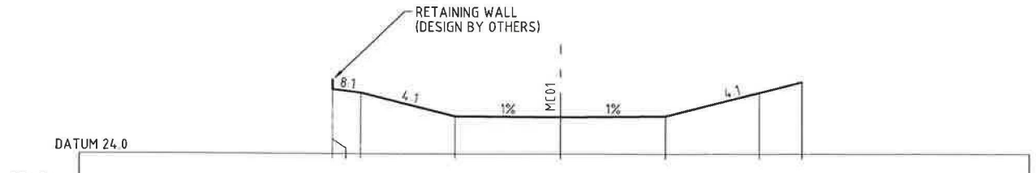
625



DATUM 25.0

DESIGN LEVELS	30.775	29.719	27.719	27.644	27.719	29.719	31.104	30.200
EXISTING LEVELS	30.775	30.750	27.919	31.110	30.916	31.025	31.104	31.197
DESIGN OFFSETS	-19.724	-15.500	-7.500	0.000	7.500	15.500	21.042	33.441

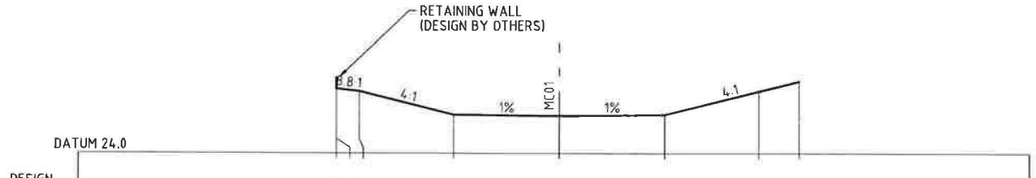
600



DATUM 24.0

DESIGN LEVELS	30.326 29.531 29.234	27.234	27.144	27.234	29.234	30.141
EXISTING LEVELS	30.325 30.325 30.313	30.235	30.266	30.242	30.178	30.141
DESIGN OFFSETS	-19.388 -19.383 -17.000	-9.000	0.000	9.000	17.000	20.626

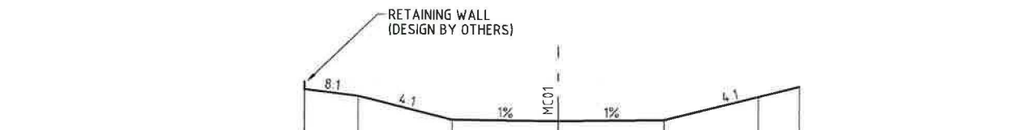
700



DATUM 24.0

DESIGN LEVELS	30.439 29.508 29.287	27.287	27.197	27.287	29.287	30.142
EXISTING LEVELS	30.432 30.432 30.401	30.383	30.353	30.241	30.158	30.142
DESIGN OFFSETS	-18.942 -18.937 -17.002	-9.002	0.000	8.998	16.998	20.419

689.5



DATUM 24.0

DESIGN LEVELS	30.561 29.925	29.359	27.359	27.269	27.359	29.359	30.225
EXISTING LEVELS	30.209 30.214	30.621	30.449	30.337	30.250	30.232	30.225
DESIGN OFFSETS	-21.545 -21.539	-17.000	-9.000	0.000	9.000	17.000	20.462

675

SCALE 1:250 (A1) 2.5 0 2.5 5 7.5 10 12.5
SCALE 1:500 (A3)

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
3	05.12.12	LB	JH	JC	JW	D.A ISSUE
2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
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PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LB	IH	JC	
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC01
SHEET 5 OF 8

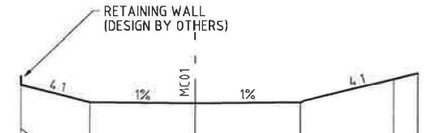
SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-655	3

Plot Date 05 Dec 2012 @ 10:37:05 Login\Name lbarrett Cad File I:\ENVIRN\Projects\EN02754\Deliverables\Drawings\civil\Dwg\EN02754C-651-658.dwg

DATUM 24.0

DESIGN LEVELS	29.696	28.860	26.860	26.770	26.860	28.860	29.654
EXISTING LEVELS	29.696	29.724	29.750	29.757	29.640	29.665	29.654
DESIGN OFFSETS	-20.345	-17.000	-9.000	0.000	9.000	17.000	20.179

775



DATUM 23.0

DESIGN LEVELS	28.750 28.025	26.557	26.467	26.557	28.557	29.062
EXISTING LEVELS	28.750 28.750	28.701	28.708	28.901	29.041	29.062
DESIGN OFFSETS	-14.874 -14.869	-9.000	0.000	9.000	17.000	19.019

835.5

DATUM 24.0

DESIGN LEVELS	29.872	28.985	26.985	26.895	26.985	28.985	29.777
EXISTING LEVELS	29.872	29.910	29.970	29.949	29.923	29.777	29.777
DESIGN OFFSETS	-20.552	-17.000	-9.000	0.000	9.000	17.000	20.171

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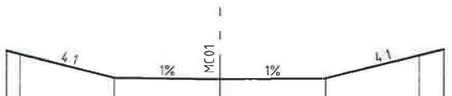


DATUM 24.0

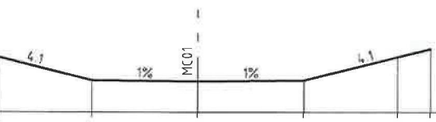
DESIGN LEVELS	28.895 28.610	26.610	25.520	26.610	28.610	29.124
EXISTING LEVELS	28.895 28.861	28.872	28.994	29.134	29.124	29.124
DESIGN OFFSETS	-18.142 -17.000	-9.000	0.000	9.000	17.000	19.057

825

DATUM 24.0

DESIGN LEVELS	30.000	29.109	27.109	27.019	27.109	29.109	30.014
EXISTING LEVELS	30.000	30.000	30.036	30.066	30.000	30.000	30.014
DESIGN OFFSETS	-20.562	-17.000	-9.000	0.000	9.000	17.000	20.619

725



DATUM 24.0

DESIGN LEVELS	29.250 28.735	26.735	26.645	26.735	28.735	29.423
EXISTING LEVELS	29.250 29.250	29.359	29.395	29.400	29.435	29.423
DESIGN OFFSETS	-19.061 -17.000	-9.000	0.000	9.000	17.000	19.752

800

SCALE 1:250 (A1) SCALE 1:500 (A3) 2.5 0 2.5 5 7.5 10 12.5

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
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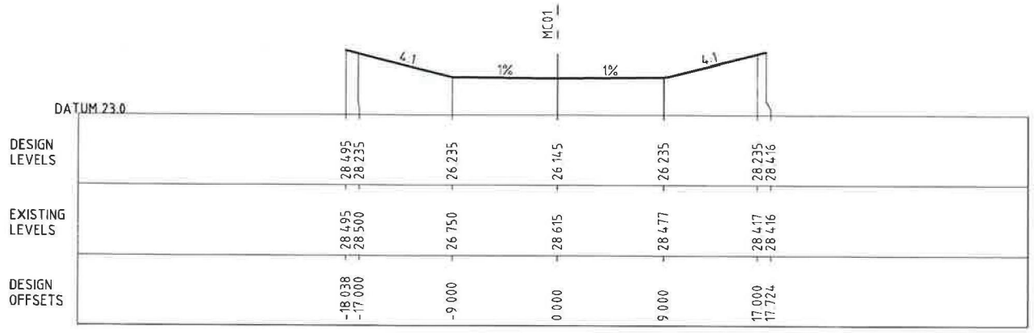
LB	IH	JC	
DESIGNED	DESIGN REVIEW		
SK	JC		

TITLE: CROSS SECTIONS MC01
SHEET 6 OF 8

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:250 H, 1:250 V	EN02754	EN02754-C-656	3

Plot Date 05 Dec 2012 @ 10:37:48 Login Name lbarnett Cad File I:\ENVR\Projects\EN02754\Deliverables\Drawings\Civil\Dwg\EN02754C-651-653.dwg



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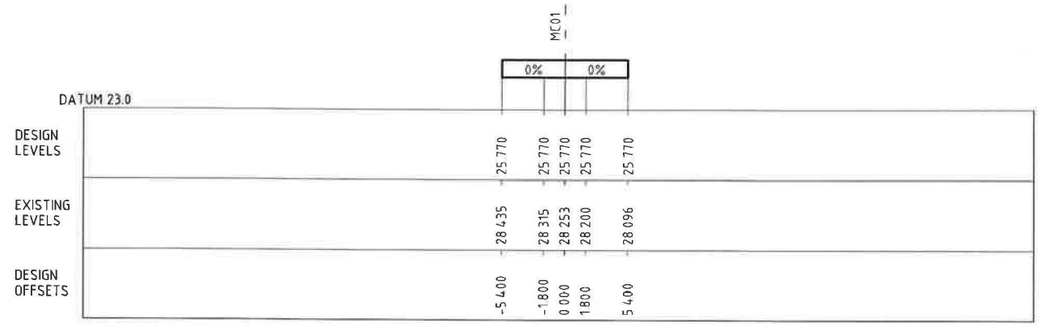

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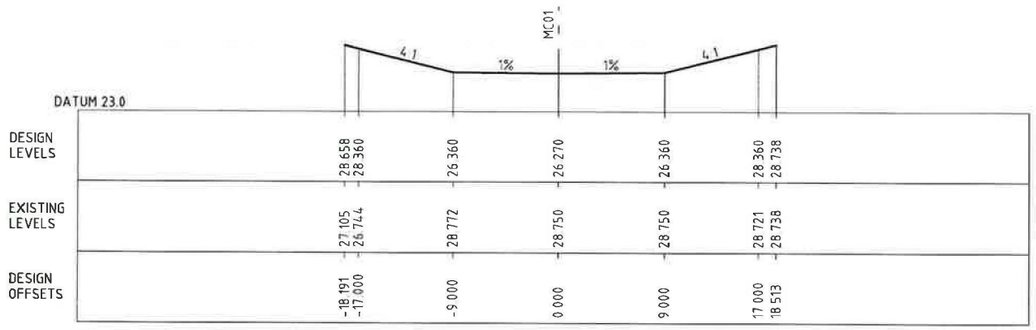

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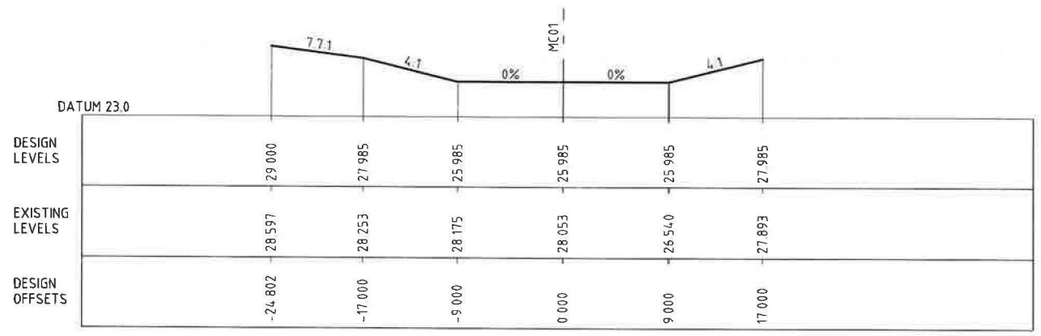

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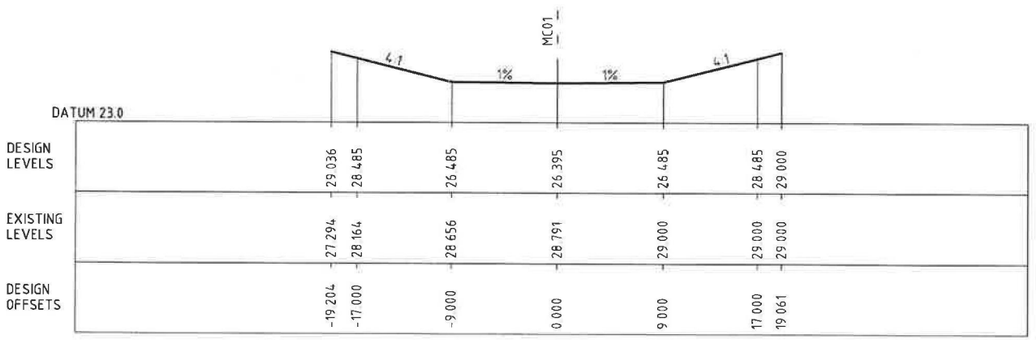

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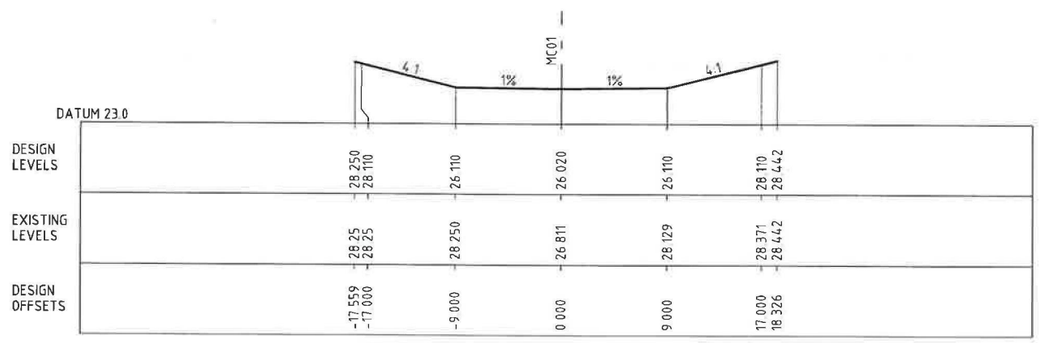

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NOT FOR CONSTRUCTION

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1	18.09.12	CG	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
0	08.06.12	IH	JH	JC		PRE-DA ISSUE TO LEND LEASE FOR COMMENTS

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
LB	IH	JC	
DESIGNED SK	DESIGN REVIEW JC		

TITLE: CROSS SECTIONS MC01
SHEET 7 OF 8

SCALE	SKM PROJECT No	DRAWING No	AMDT
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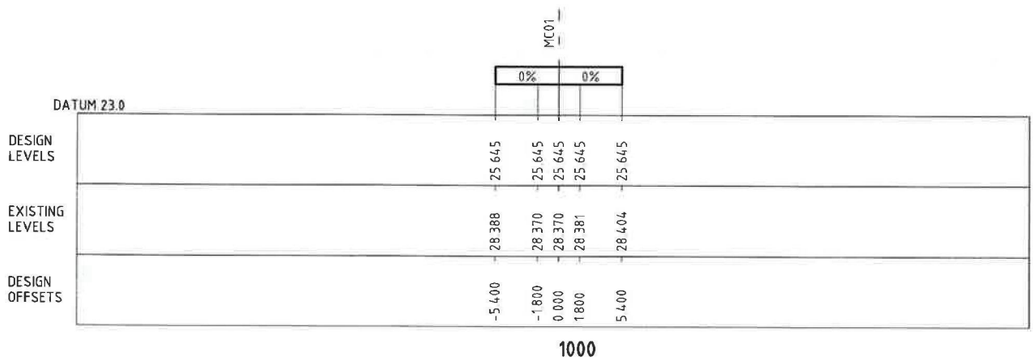

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2	27.11.12	SM	JH	JC		AMENDED BOX CULVERT LOCATIONS FOR DA ISSUE
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Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS EAST TO WEST OPEN CHANNEL
DRAFTER: LB | DRAFTING CHECK: IH | REVIEWED PROJECT MANAGER: JC | APPROVED PROJECT DIRECTOR:
DESIGNED: SK | DESIGN REVIEW: JC

TITLE: CROSS SECTIONS MC01
SHEET 8 OF 8

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A1

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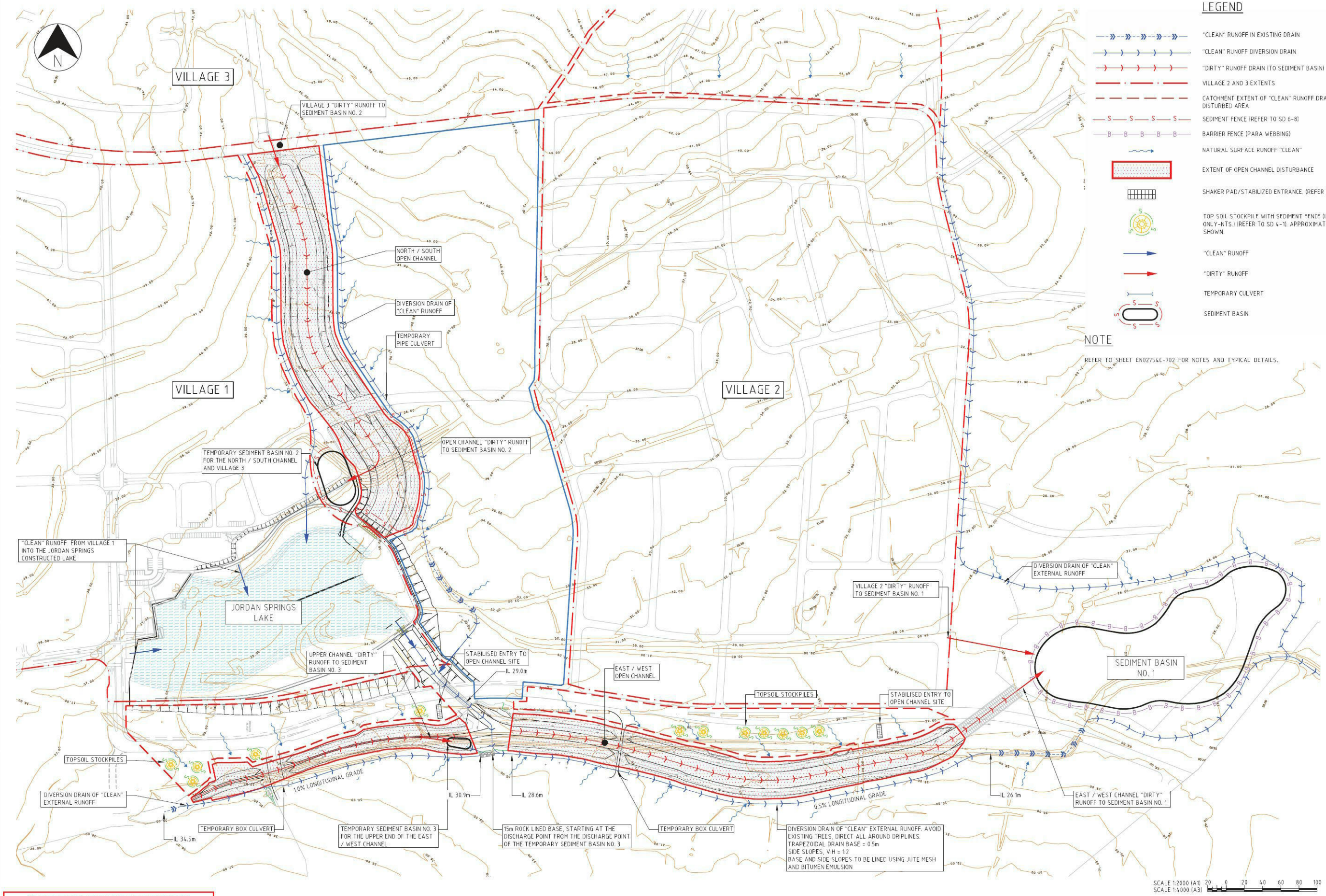
Appendix I
Erosion and Sediment Control Plans, prepared by SKM



LEGEND

- "CLEAN" RUNOFF IN EXISTING DRAIN
- "CLEAN" RUNOFF DIVERSION DRAIN
- "DIRTY" RUNOFF DRAIN (TO SEDIMENT BASIN)
- VILLAGE 2 AND 3 EXTENTS
- CATCHMENT EXTENT OF "CLEAN" RUNOFF DRAINING TOWARDS DISTURBED AREA
- SEDIMENT FENCE (REFER TO SD 6-8)
- BARRIER FENCE (PARA WEBBING)
- NATURAL SURFACE RUNOFF "CLEAN"
- EXTENT OF OPEN CHANNEL DISTURBANCE
- SHAKER PAD/STABILIZED ENTRANCE. (REFER TO SD 6-14)
- TOP SOIL STOCKPILE WITH SEDIMENT FENCE (LOCATION INDICATIVE ONLY-NTS.) (REFER TO SD 4-1). APPROXIMATE LOCATION AS SHOWN.
- "CLEAN" RUNOFF
- "DIRTY" RUNOFF
- TEMPORARY CULVERT
- SEDIMENT BASIN

NOTE

REFER TO SHEET EN02754C-702 FOR NOTES AND TYPICAL DETAILS.

NOT FOR CONSTRUCTION

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
A	22.01.13	LB	JC	JC		ISSUED FOR COMMENTS FOR D.A.

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE

PROJECT: JORDAN SPRINGS OPEN CHANNELS

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
SM	LB	JC	
DESIGNED	DESIGN REVIEW		
JC	JC		

TITLE: EROSION AND SEDIMENT CONTROL PLAN (ESCP) FOR THE OPEN CHANNELS

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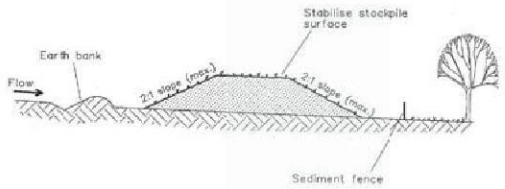
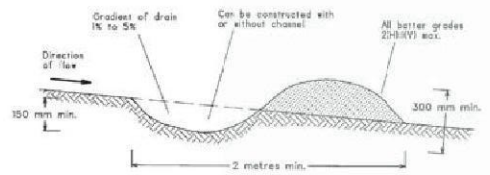


Construction Notes

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

STOCKPILES — **SD 4-1**

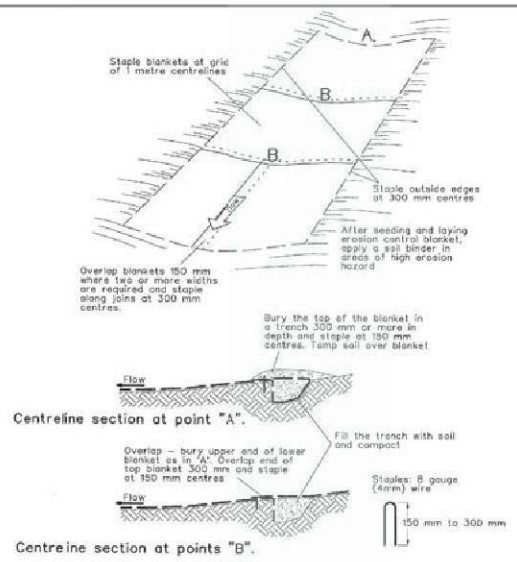


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

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

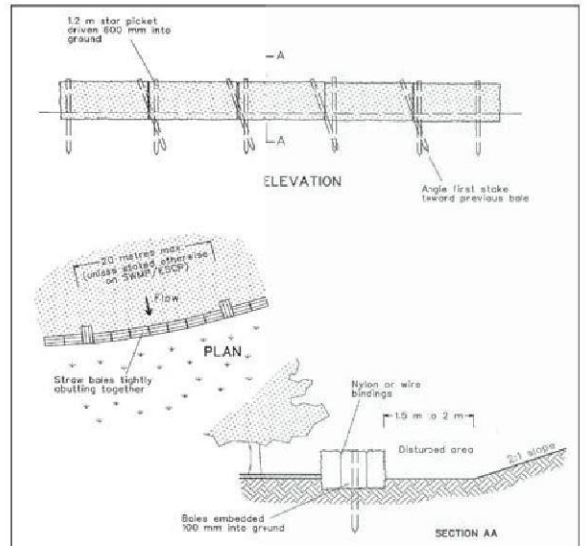
EARTH BANK (LOW FLOW) — **SD 5-5**



Construction Notes

1. Remove any rocks, clods, sticks or grass from the surface before laying matting
2. Ensure that topsoil is at least 75 mm deep
3. Complete fertilising and seeding before laying the matting.
4. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first.
5. Lay the fabric in "shingle-fashion", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end (Standard Drawing 5-7b).
6. Ensure that the full width of flow in the channel is covered by the matting up to the design storm event, usually in the 10-year ARI time of concentration storm event.
7. Divert water from the structure until vegetation is stabilised properly.

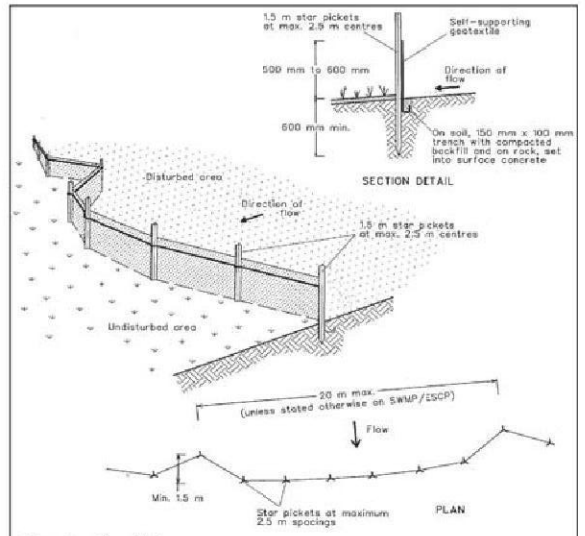
RECP : CONCENTRATED FLOW — **SD 5-7**



Construction Notes

1. Construct the straw bale filter as close as possible to being parallel to the contours of the site.
2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. Straws are to be placed parallel to ground.
3. Ensure that the maximum height of the filter is one bale.
4. Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickets are used and they protrude above the bales, ensure they are fitted with safety caps.
5. Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.
6. Establish a maintenance program that ensures the integrity of the bales is retained - they could require replacement each two to four months.

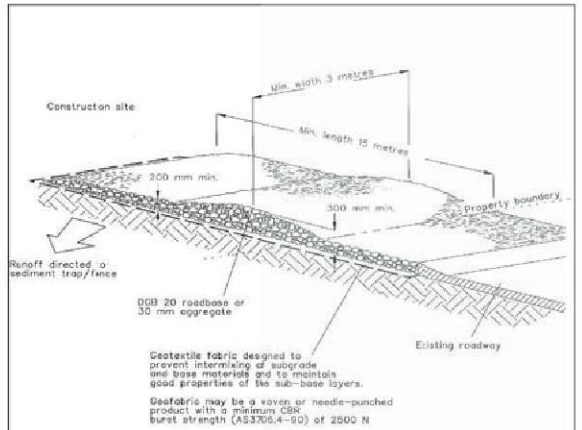
STRAW BALE FILTER — **SD 6-7**



Construction Notes

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

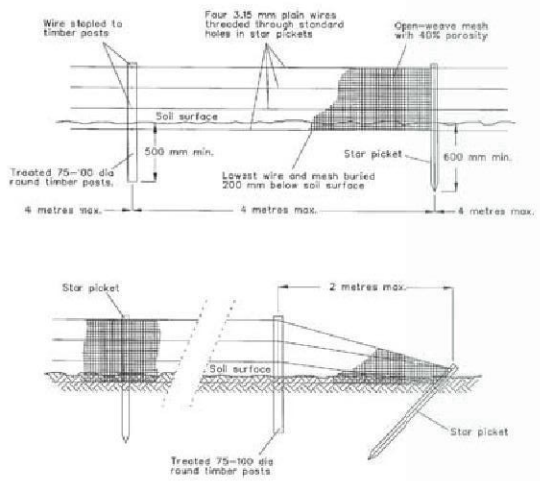
SEDIMENT FENCE — **SD 6-8**



Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

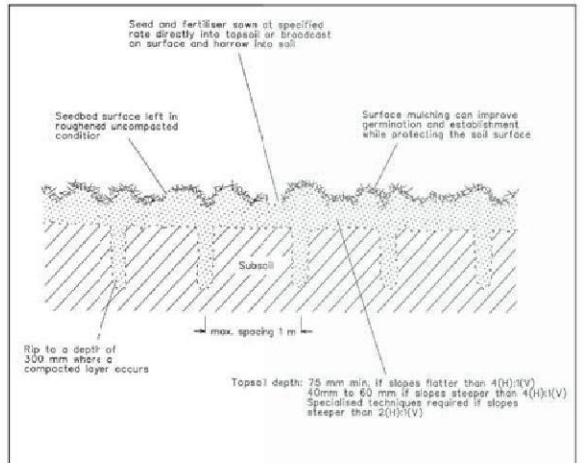
STABILISED SITE ACCESS — **SD 6-14**



Construction Notes

1. Install the fence to the height specified in the ESCP/SWMP.
2. Cut a channel 200 mm deep along the fence line.
3. Place wire and light resistant, open-weave polymer mesh with 40 percent porosity on the prevailing wind side of fence.
4. Fasten the mesh to all wires using ring fasteners at 100 mm to 150 mm intervals on top wire and 300 mm intervals on other wires.
5. Use one 75-mm to 100-mm diameter treated round timber post every 20 metres.
6. Where star pickets are used, ensure they are fitted with safety caps.

CONTROL OF WIND EROSION — **SD 6-15**



Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

SEEDBED PREPARATION — **SD 7-1**

NOTES

1. THE SEQUENCE OF CONSTRUCTION SHALL BE AS FOLLOWS:
   A) THE CONSTRUCTION OF THE SEDIMENT BASINS Nos 1,2 AND 3 WITH ALL ASSOCIATED EROSION AND SEDIMENT CONTROLS.
   B) IDENTIFY LOCATION OF ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES ON SITE.
   C) INSTALLATION OF BARRIER AND SEDIMENT FENCES.
   D) INSTALLATION OF ALL DIVERSION DRAINS AND LEVEL SPREADERS.
   E) INSTALLATION OF ALL REMAINING EROSION AND SEDIMENT CONTROLS.
   F) CLEARING AND REGRADING OF OPEN CHANNEL, TO BULK EARTHWORKS PLAN.
   G) DEWATERING IF REQUIRED.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS FOR "EROSION AND SEDIMENT CONTROL DCP AND CODE OF PRACTICE" ON DEVELOPMENT SITES OF PENRITH CITY COUNCIL AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE 'BLUE BOOK', SOILS AND CONSTRUCTION LANDCOM 2004, DECCW 2008 VOLUMES 1 AND 2, AND ANY ADDITIONAL REQUIREMENTS BY PENRITH CITY COUNCIL.
3. REFER TO ALL TYPICAL SWMP DETAILS IN BLUE BOOK (EG; SD6-3) FOR CONSTRUCTION DETAILS. ALSO REFER TO MOST RELEVENT TYPICAL DETAILS ON DRAWING EN02754-C-702.
4. WIND EROSION CONTROLS (NOT SHOWN ON THIS PLAN) SHALL BE CONSTRUCTED AS REQUIRED BY THE SITE SUPERINTENDENT. REFER TO SD6-15 TYPICAL DETAIL ON DRAWING EN02754-C-702.
5. ESCP DETAILS ON THIS LAYOUT ARE SCHEMATIC ONLY. ANY ADDITIONAL INFORMATION REQUIRED IS TO BE OBTAINED FROM THE SITE SUPERINTENDENT. ADDITIONAL CONTROLS AND CHANGES TO THIS PLAN MAY BE NECESSARY DURING THE PROCESS OF IMPLEMENTATION OF THE ESCP. ONGOING INSPECTIONS BY A QUALIFIED SUPERINTENDENT ARE REQUIRED TO PROVIDE RELEVANT CHANGES, AS REQUIRED. THE ESCP IDENTIFIES THE EROSION AND SEDIMENT CONTROLS NEEDED ON SITE, BUT ARE NOT CONSTRUCTION DRAWINGS. REFERENCE NEEDS TO BE MADE TO TYPICAL DETAILS IN THE BLUE BOOK.
6. PROVIDE JUTE MESH LINING FOR ALL DIVERSION DRAINS AND THE OPEN CHANNELS AND SPRAY WITH BITUMEN EMULSION.
7. IF STRAW BALES ARE USED IN CONJUNCTION AND IN ADDITION TO SEDIMENT FENCES, THE STRAW BALES SHALL BE WEED FREE.
8. ALL DISTURBED AND REGRADED AREAS INCLUDING EMBANKMENTS THAT ARE EXPOSED FOR LONGER THAN 2 WEEKS, SHALL BE REHABILITATED AS SOON AS POSSIBLE BY HYDROSEEDING OR AS DIRECTED BY THE SITE SUPERINTENDENT.
9. WATER CAPTURED IN THE EAST SEDIMENT BASIN WILL BE USED FOR REUSE ON SITE FOR DUST SUPPRESSION PURPOSES OR DISCHARGED DOWNSTREAM WITH APPROVAL. GYPSUM FLOCCULATION MAY BE REQUIRED IF SETTLEMENT OF SOIL PARTICLES DOES NOT OCCUR IN THE SEDIMENT BASIN.
10. THIS EROSION AND SEDIMENT CONTROL PLAN IS FOR THE OPEN CHANNELS ONLY.
11. SEDIMENT BASIN NO. 1 WILL BE DESIGNED TO TREAT ALL THE "DIRTY" RUNOFF FROM THE EAST / WEST CHANNEL AND VILLAGE 2.
12. ALL EXTERNAL RUNOFF TO BE DIVERTED AROUND THE CONSTRUCTION AREAS, AS REQUIRED.
13. ALL DETAILS SHOWN ON THIS DRAWING ARE REFERENCED FROM 'THE BLUE BOOK' - MANAGING URBAN STORMWATER (MUS): SOILS AND CONSTRUCTION BY LANDCOM. IT IS THE RESPONSIBILTY OF THE CONTRACTOR ON SITE TO HAVE THE LATEST PUBLICATION.

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
A	22.01.13	LB	JC	JC		ISSUED FOR COMMENTS FOR D.A.

Lend Lease

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS OPEN CHANNELS

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
SM	LB	JC	
DESIGNED	DESIGN REVIEW		
JC	JC		

TITLE: EROSION AND SEDIMENT CONTROL DETAILS

SCALE	SKM PROJECT No	DRAWING No	AMDT
NTS	EN02754	EN02754-C-702	A

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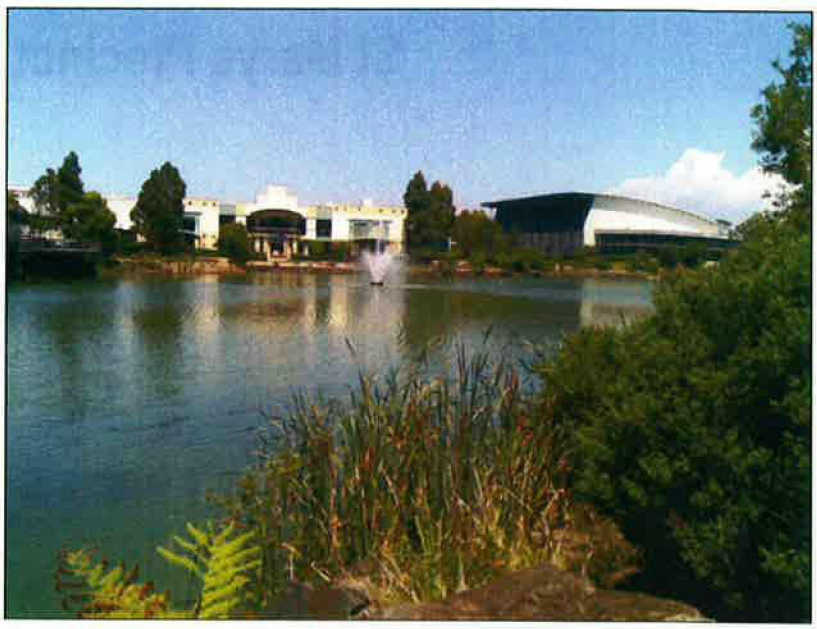
Appendix J
Previously Approved North / South and East / West Open Channel Hydraulic Report, prepared by SKM

St Marys Western Precinct Development – Lend Lease



North/South and East/West Open Channel Report

- 21 June 2012

St Marys Precinct Development

North/South and East/West Open Channel Report

- 21 June 2012

Sinclair Knight Merz
ABN 37 001 024 095
100 Christie Street
St Leonards NSW 2065 Australia
Postal Address
PO Box 164 St Leonards NSW 2065 Australia
Tel: +61 2 9928 2100
Fax: +61 2 9928 2500
Web: www.globalskm.com

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Author:	Amy Bentley
Project manager:	John Constandopoulos
Name of organisation:	Lend Lease
Name of project:	St Marys Precinct Development
Name of document:	Open Channel Report
Document version:	Final
Project number:	EN02754

1. Introduction

1.1. Purpose

The purpose of this report is to provide design details on the proposed open channels in the Western Precinct, St Marys. Penrith City Council (Council), in response to the *Development Application No. DA11/1088 for the riparian corridor subdivision proposal at Jordan Springs* requested the following information:

1) *The riparian corridor shall wholly contain any local overland flows for the 1% Annual Exceedance Probability (1 in 100 year) local storm event.*
2) *A local overland flow flood report shall be submitted to demonstrate that all flows from the developed catchments will be contained within the corridor.*
3) *The extents of the 1% AEP shall be shown on revised plans to ensure flows do not encroach into adjoining developable lots.*

This report has been prepared to address the specific comments and summarises work undertaken for a hydraulic assessment of the open channels in the Western Precinct, St Marys. It provides the open channel and box culvert dimensions which are required to meet the needs of the design criteria. This report provides details of the hydraulic modelling method, modelling parameters adopted and results.

1.2. Study Area

The study area includes open channels draining to two proposed detentions basins, Jordan Springs Lake in the centre of the site and Village 2 Lake to the south east corner of the Western Precinct site. The existing catchment areas are predominantly rural, with some urban development on the western fringes of the catchment. The developed case has a fully urban catchment. The trunk drainage network comprises two open channels (North-South and East-West) which are further divided into three open channel reaches[1] as shown below:

- North-South channel
  - MC03 - running south into Jordans Spring Lake (MC03),
  - MC02 - carries outflows from the lake to the east/west channel (MC02)
- East/west channel
  - MC01 - follows a west-east course to drain to Village 2 Lake.

The layout of the trunk drainage network is shown in **Figure 1.**

[1] MCXX refers to the naming conventions adopted in the hydraulic model.

- **Figure 1 Trunk Drainage Layout for the north/south and east/west open channels**

2. Hydraulic Model Set Up

2.1. Objective

The objective of the assessment is to size the open channels and box culverts to adequately accommodate the 100 year ARI flood event. A number of design criteria are to be met to satisfy Council requirements. These are presented below.

2.2. Design Criteria

Design criteria have been agreed with Penrith City Council and are stated below. SKM have assessed blockage as part of the design and this is discussed in **Section 2.3.5** the document.

1) Open channels must fully contain the 1 in 100 year peak water level with a minimum freeboard of 0.5m.
2) Water depth in the channel should not exceed 1.5m.
3) Velocity x depth consideration

2.3. Hydraulic Model Set Up

2.3.1. Overview

Hydraulic models of the trunk drainage system have been developed in HEC-RAS (V 4.1.0). Cross sections at 20m intervals were extracted from the 12D CAD model and inputted into HEC-RAS.

The models are steady state, meaning they model peak flows for the 100 year ARI event, rather than a full event flow hydrograph. The models are run in a mixed flow regime to allow adequate representation of subcritical and supercritical flows in the model.

2.3.2. Model Parameters

Manning's n values were selected in consultation with the landscape architects, Penrith City Council and to ensure consistency with previous work. In all but the MC03 reach, a Manning's n value of 0.07 was selected based on the final open channels being heavily vegetated and landscaped. A Manning's n value of 0.04 was selected for reach MC03 where it is expected that the channel will be smoother.

2.3.3. Flow distribution

Peak flows were extracted from the XP-RAFTS hydrology model for the site. This model was used to determine detention requirements for Jordan Springs Lake and Village 2 Lake. Details of the hydrology model can be found in previous reports *(St Marys Stage 1 Western Precinct Detention requirements – March 2010 and St Marys Stage 3 Western Precinct Detention*

Requirements – November 2011). Peak flows were inputted to the upstream cross section in the model, with a number of flow change points located further downstream where smaller drainage lines/tributaries joined. The inflow points were selected to be consistent with those used in the hydrology model.

2.3.4. Channel sizing

Channels were sized by modifying the bottom width of the channel and retaining the side slopes as they were extracted from the 12D model.

2.3.5. Box culverts

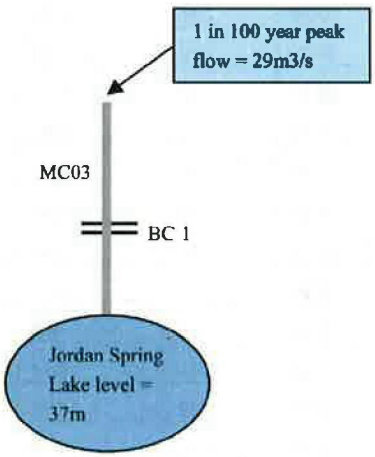
Box culverts were sized using information provided on the long sections and road elevations. Standard Industry dimensions have been adopted for the box culverts. A Manning's n value of 0.012 has been adopted for the culverts and a 30 to 75 degree flared wingwall was assumed in the design. A blockage factor of 25% has also been modelled for the box culverts to test the sensitivity of the system to blockage.

3. Hydraulic Results – north/south channel

3.1. Channel MC03 Details

A 460m reach of channel MC03 was modelled including a box culvert where the channel passes under Road 8. The southern end of the channel outfalls to Jordan Springs Lake. For the purposes of the hydraulic modelling, the tailwater boundary has been selected as the peak water level within the lake (37mAHD). This water level has been taken from the hydrology model used to estimated required detention volume. The adopted lake water level includes a 0.2m safety factor, as the actual maximum level in the lake is 36.8mAHD. Adopting the peak water level in the basin ensures any potential backwater effects are taken into account in the sizing of the channels. All flow from the surrounding catchments is inputted at the upstream end of the model for the reach. No further inflows join the channel along the reach.

- **Figure 2 Schematic of North-south channel (MC03)**



3.2. Results

The results for this reach are shown in **Table 1** with key outputs of water depth, velocity, velocity-depth product, freeboard and peak flow. A long section plot of maximum water levels (with and without culvert blockage is provided in **Figure 3**). It can be seen in the long section that peak water levels are contained within the channel for the 100 year ARI event, with a freeboard of 0.5m or more. If the culvert is blocked, freeboard is reduced in the upstream part of the reach. In the area immediately upstream of the culvert, the freeboard is reduced to 0.1m but the water is still contained within the channel area. This is shown in **Figure 3**.

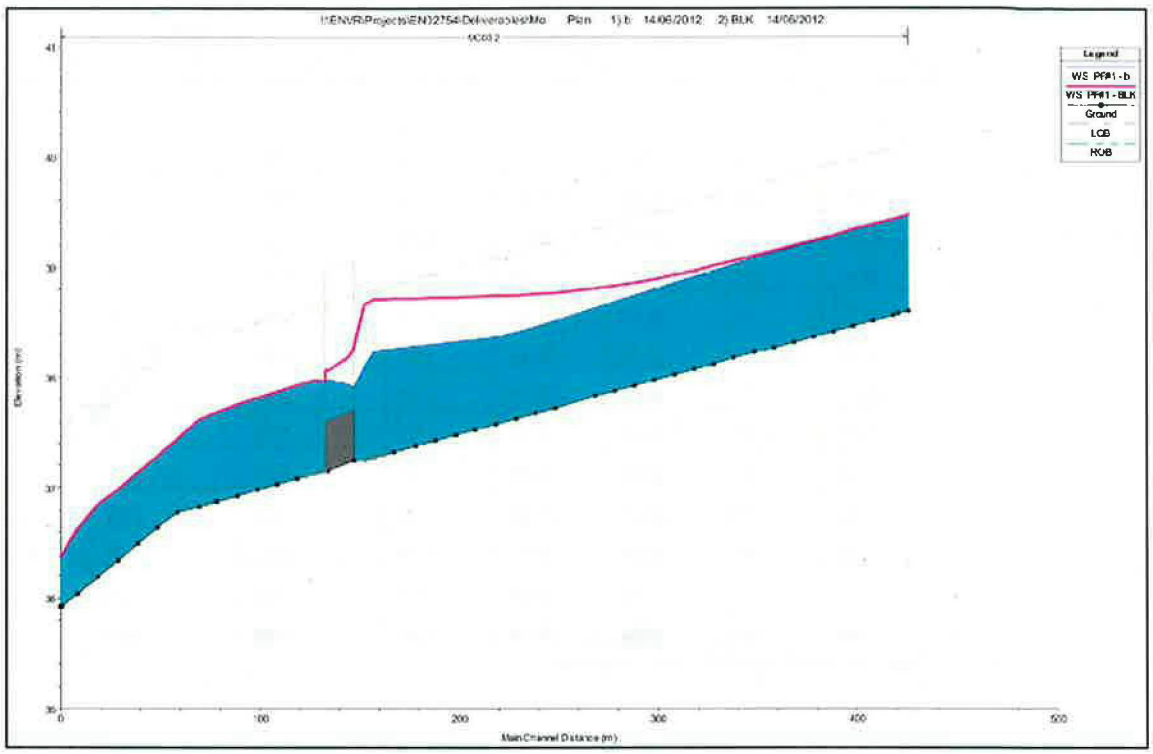
Table 1 MC03 Results

Cross Section	100 year ARI flow	Channel Invert Level	100 year Water Level	Velocity	100 year ARI Water Depth	Velocity depth product	Top of bank elevation	Freeboard
	(m3/s)	(m)	(m)	(m/s)	(m)		(mAHD)	(m)
427.45	29	38.61	39.47	1.38	0.86	1.19	40.12	0.6
422.45	29	38.58	39.44	1.37	0.86	1.18	40.09	0.7
419.95	29	38.57	39.43	1.36	0.86	1.17	40.08	0.6
409.95	29	38.52	39.38	1.34	0.86	1.15	40.03	0.6
399.95	29	38.47	39.33	1.35	0.86	1.16	39.98	0.6
389.95	29	38.42	39.28	1.37	0.86	1.18	39.93	0.6
379.95	29	38.37	39.23	1.37	0.86	1.18	39.88	0.7
369.95	29	38.32	39.18	1.37	0.86	1.18	39.83	0.6
359.95	29	38.27	39.13	1.36	0.86	1.17	39.78	0.6
349.95	29	38.23	39.08	1.38	0.85	1.17	39.74	0.7
339.96	29	38.18	39.03	1.38	0.85	1.17	39.69	0.7
329.96	29	38.13	38.97	1.39	0.84	1.17	39.64	0.7
319.96	29	38.08	38.91	1.4	0.83	1.16	39.59	0.7
309.96	29	38.03	38.86	1.39	0.83	1.15	39.54	0.7
299.96	29	37.98	38.81	1.39	0.83	1.15	39.49	0.7
289.96	29	37.93	38.75	1.41	0.82	1.16	39.44	0.7
279.96	29	37.88	38.69	1.43	0.81	1.16	39.39	0.7
269.96	29	37.83	38.63	1.4	0.8	1.12	39.34	0.7
249.96	29	37.73	38.52	1.41	0.79	1.11	39.24	0.7
239.96	29	37.68	38.46	1.37	0.78	1.07	39.19	0.7
229.96	29	37.63	38.41	1.32	0.78	1.03	39.14	0.7
219.96	29	37.58	38.38	1.2	0.8	0.96	39.09	0.7
209.97	29	37.53	38.35	1.05	0.82	0.86	39.04	0.7
199.97	29	37.48	38.33	0.97	0.85	0.82	38.99	0.7
189.97	29	37.43	38.31	0.93	0.88	0.82	38.94	0.6
179.97	29	37.38	38.29	0.91	0.91	0.83	38.89	0.6
168.97	29	37.33	38.27	0.87	0.94	0.82	38.84	0.6
164.07*	29	37.31	38.25	0.92	0.94	0.86	38.82	0.6
159.17*	29	37.28	38.24	0.97	0.96	0.93	38.79	0.5
154.27*	29	37.26	38.09	1.79	0.83	1.49	38.77	0.7
134.67*	29	37.16	37.97	1.7	0.81	1.38	38.67	0.7
129.77*	29	37.13	37.98	1.36	0.85	1.16	38.64	0.7
124.87*	29	37.11	37.96	1.36	0.85	1.16	38.62	0.7

Cross Section	100 year ARI flow	Channel Invert Level	100 year Water Level	Velocity	100 year ARI Water Depth	Velocity depth product	Top of bank elevation	Freeboard
119.97	29	37.08	37.93	1.36	0.85	1.16	38.59	0.7
109.97	29	37.03	37.88	1.4	0.85	1.19	38.54	0.7
99.97	29	36.98	37.82	1.42	0.84	1.19	38.49	0.7
89.97	29	36.93	37.76	1.45	0.83	1.20	38.44	0.7
79.97	29	36.88	37.69	1.49	0.81	1.21	38.46	0.8
71.22	29	36.83	37.62	1.53	0.79	1.21	38.48	0.9
59.98	29	36.78	37.44	1.92	0.66	1.27	38.44	1.0
49.98	29	36.64	37.29	1.97	0.65	1.28	38.3	1.0
39.99	29	36.49	37.14	1.97	0.65	1.28	38.15	1.0
29.99	29	36.34	36.99	1.97	0.65	1.28	38	1.0
20	29	36.19	36.85	1.9	0.66	1.25	37.85	1.0
10	29	36.04	36.63	2.17	0.59	1.28	37.68	1.1
2	29	35.92	36.38	2.4	0.46	1.10	37.48	1.1
1.65	29	35.92	36.38	2.36	0.46	1.09	37.48	1.1

*Interpolated model cross section

- **Figure 3 Schematic of MC03 (with and without blockage)**



3.3. Riparian Corridor

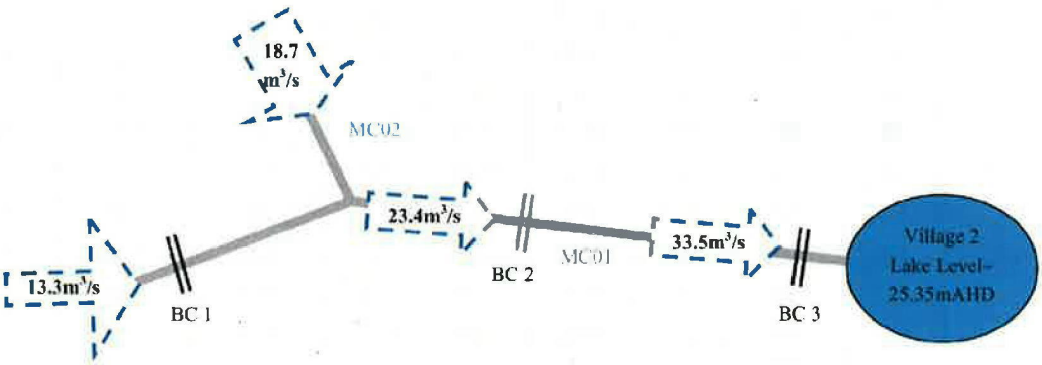
The extent of the riparian corridor is shown on the DA submission drawings EN02754-C-510 to EN02754-C-511. The open channel is situated within this corridor. The 100 year peak water level is contained within the channel and is therefore contained within the riparian corridor.

4. Hydraulic Results – east/west channel

4.1. Channel MC01 Details

A 1049m reach of channel MC01 was modelled including three box culverts, following a west-east course to drain to Village 2 Lake. The maximum water level in Village 2 Lake has been taken from the hydrology model used to size the detention basins. A conservative peak level of 25.35mAHD has been included to ensure any backwater impacts are taken into account in the model. MC02 outfalls from Jordan Springs Lake and joins MC01 approximately 500m west of the Village 2 Lake. The schematic in **Figure 4** shows the flow distribution and locations of box culverts in the model.

- **Figure 5 Schematic of East-west channel (MC01)**



4.2. Results

The results for reach MC01 are shown in **Table 2** with key outputs of water depth, velocity, velocity-depth product, freeboard and peak flow. The model chainages for this reach differ from the drawing chainages. For ease of reference both are provided in the table below. A long section plot of maximum water levels (with and without culvert blockage is provided in **Figure 5**).

- **Table 2 MC01 Results without blockage**

Model Cross Section	Chainage shown on drawings	100 year ARI flow	Channel Invert Level	100 year Water Level	Velocity	100 year ARI Water Depth	Velocity depth product	Top of Bank Elevation	Freeboard
		(m3/s)	(m)	(m)	(m/s)	(m)		(mAHD)	(m)
1045	20	13.3	35.13	35.71	0.83	0.58	0.48	35.97	Note 1
1025	40	13.3	34.89	35.52	0.91	0.63	0.57	35.98	Note 1

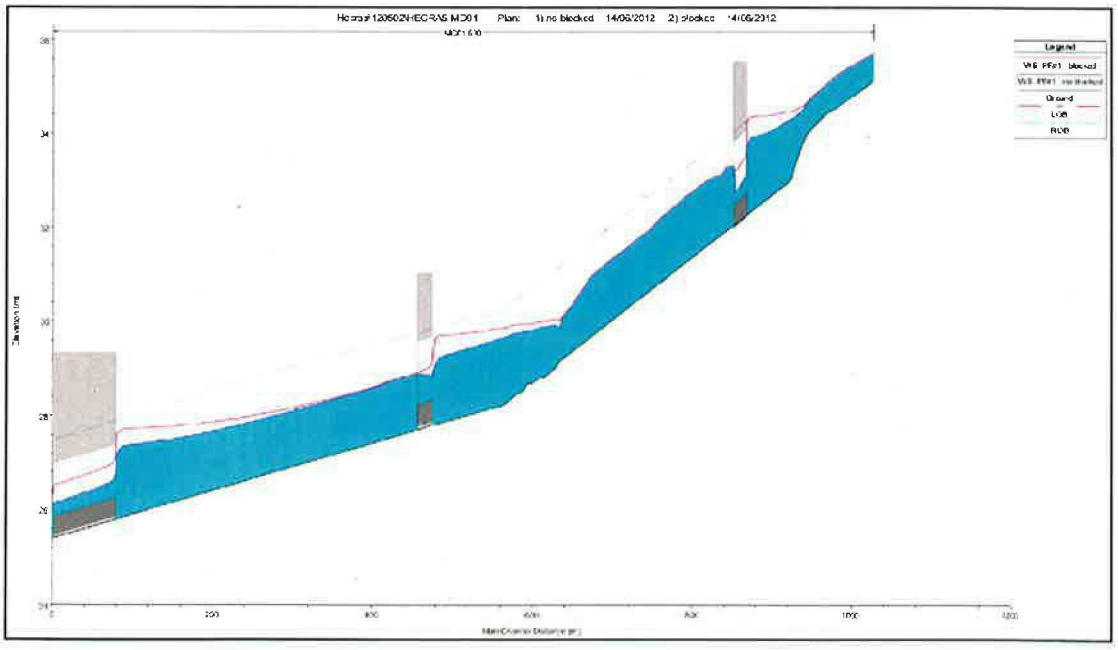
Model Cross Section	Chainage shown on drawings	100 year ARI flow	Channel Invert Level	100 year Water Level	Velocity	100 year ARI Water Depth	Velocity depth product	Top of Bank Elevation	Freeboard
1005	60	13.3	34.65	35.32	0.99	0.67	0.66	35.8	Note 1
985	80	13.3	34.43	35.05	1.07	0.62	0.66	35.66	Note 1
965	100	13.3	34.09	34.74	1.31	0.65	0.85	35.39	Note 1
945	120	13.3	33.3	34.35	1.31	1.05	1.38	34.76	Note 1
925	140	13.3	32.81	34.15	1.21	1.34	1.62	34.71	Note 1
905	160	13.3	32.55	33.99	1.06	1.44	1.53	34.78	0.8
885	180	13.3	32.28	33.71	2	1.43	2.86	34.48	0.8
865	200	13.3	32.02	33.3	2.18	1.28	2.79	34.19	0.9
845	220	13.3	31.75	33.09	1.22	1.34	1.63	34.05	1.0
825	240	13.3	31.49	32.89	1.26	1.4	1.76	33.8	0.9
805	260	13.3	31.23	32.61	1.37	1.38	1.89	33.8	1.2
785	280	13.3	30.96	32.33	1.4	1.37	1.92	33.59	1.3
765	300	13.3	30.7	32	1.5	1.3	1.95	33.35	1.4
745	320	13.3	30.43	31.73	1.29	1.3	1.68	33.06	1.3
725	340	13.3	30.17	31.47	1.29	1.3	1.68	32.77	1.3
705	360	13.3	29.9	31.2	1.3	1.3	1.69	32.11	0.9
685	380	13.3	29.64	30.86	1.51	1.22	1.84	32.5	1.6
665	400	13.3	29.37	30.36	1.6	0.99	1.58	31.54	1.2
645	420	13.3	29.03	29.94	0.77	0.91	0.70	32.25	2.3
625	440	13.3	28.81	29.89	0.58	1.08	0.63	31.99	2.1
605	460	13.3	28.57	29.79	0.66	1.22	0.81	31.85	2.1
585	480	23.4	28.31	29.69	1.05	1.38	1.45	31.26	1.6
565	500	23.4	28.17	29.59	1	1.42	1.42	31.13	1.5
545	520	23.4	28.07	29.49	1.01	1.42	1.43	31.03	1.5
525	540	23.4	27.97	29.38	1.01	1.41	1.42	30.93	1.6
505	560	23.4	27.87	29.27	1.02	1.4	1.43	30.83	1.6
465	600	23.4	27.67	28.87	1.56	1.2	1.87	30.96	2.1
445	620	23.4	27.57	28.78	1.03	1.21	1.25	30.92	2.1
425	640	23.4	27.47	28.66	1.06	1.19	1.26	30.73	2.1
405	660	23.4	27.37	28.53	1.05	1.16	1.22	30.52	2.0
385	680	23.4	27.27	28.44	0.94	1.17	1.10	30.25	1.8
365	700	23.4	27.17	28.34	0.94	1.17	1.10	30.1	1.8
345	720	23.4	27.07	28.24	0.94	1.17	1.10	30.05	1.8
325	740	23.4	26.97	28.15	0.93	1.18	1.10	29.95	1.8
305	760	23.4	26.87	28.05	0.93	1.18	1.10	29.76	1.7

Model Cross Section	Chainage shown on drawings	100 year ARI flow	Channel Invert Level	100 year Water Level	Velocity	100 year ARI Water Depth	Velocity depth product	Top of Bank Elevation	Freeboard
285	780	23.4	26.77	27.96	0.92	1.19	1.09	29.7	1.7
265	800	23.4	26.67	27.88	0.91	1.21	1.10	29.26	1.4
245	820	23.4	26.57	27.79	0.89	1.22	1.09	29.14	1.4
225	840	23.4	26.47	27.71	0.87	1.24	1.08	29.1	1.4
205	860	23.4	26.37	27.64	0.85	1.27	1.08	28.92	1.3
185	880	23.4	26.27	27.57	0.82	1.3	1.07	28.68	1.1
165	900	23.4	26.17	27.51	0.79	1.34	1.06	28.46	0.9
145	920	23.4	26.07	27.46	0.76	1.39	1.06	28.31	0.8
125	940	23.4	25.97	27.41	0.72	1.44	1.04	28.26	0.9
105	960	23.4	25.87	27.37	0.69	1.5	1.04	28.11	0.7

Note 1: Existing channel – Freeboard criteria does not apply

In the upper reach of the east- west channel there is a transition from the existing open channel to the proposed channel. The existing channel cannot accommodate the 100 year flows which will result in some overbank flow in the downstream direction for approximately 100m upstream of the first culvert on Channel MC01. The maximum water levels along this reach is 35.05m. The right and left overbank areas have been graded to ensure this flow is directed back into the channel before Culvert 1. A bund has been proposed on the right bank to protect any flow from bypassing the channel.

- **Figure 6 Long Section Plot of Channel MC01 (with and without blockage)**



4.3. Riparian Corridor

The extent of the riparian corridor is shown on the DA submission drawings EN02754-C-610 to EN02754-C-613. The open channel is situated within this corridor. The 100 year peak water level is contained within the channel and is therefore contained within the riparian corridor.

5. Conclusion

This report provides an assessment of the open channels which have been designed as part of the St Mary's Western Precinct development.

The hydraulic modelling presented assesses the 100 year ARI event and its behaviour in the proposed channel. The results demonstrate that all Q100 flows are contained within the channel during this event, with adequate freeboard. A reach of the existing channel at the upstream end of the proposed east-west channel will encounter some out of bank flow. The proposed grading and bund in this area provides a safe passage for the flood waters to return to the channel. A sensitivity analysis of the impact of blockage has been included in the assessment. If a blockage factor of 0.25 is applied, the maximum water level is increased and freeboard allowances reduced. However, the peak flows are still contained within the channel.

Lend Lease

Appendix K
Waste Management Plan, prepared by Lend Lease

WASTE MANAGEMENT PLAN

Lend Lease

Proposed Development: *Riparian Corridor DA*
Site Address: *Lend Lease Site Office, Lakeside Parade, Jordan Springs, NSW 2747*
Buildings and Other Structures on Site: *Nil*
Brief Description of Proposal: *Proposed Riparian Corridor Channel Construction and Associated Earthworks*

Date: *17/01/2013*
Applicants Name: *Maryland Development Company Pty Ltd*
Applicants Address: *PO Box 1870 Penrith NSW 2751*
Applicants Representative: *Ahmad Ali*
Telephone: *8016 6500*
Mobile: *0447 776 411*

MATERIALS ON SITE		DESTINATION		
		Reuse and Recycling		Disposal
Type of Materials	Estimated	ON-SITE	OFF-SITE	OFF-SITE
	Vol. (m^3)	Specify proposed reuse or on-site recycling methods	Specify contractor and recycling outlet	Specify contractor and landfill site
Excavation Material - Cut	*2,000*	*Cut to fill material*		
Excavation Material - Fill	*23,000*	*Stockpiled Fill from site to be used as Fill*		
Top Soil	*12299.75*	*Reuse as Topsoil within Work Area*		
Bricks		*N/A*		
Concrete		*N/A*		
Timber (Trees)	*47*	*Reuse as mulch within the site*		
Rubbish Generated from Construction	*5*			*Council Approved Landfill Site*

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Appendix L
Species Impact Statement (SIS), prepared by Cumberland Ecology