

#### BULK EARTHWORKS REPORT CSR EASTERN LANDS, ERSKINE PARK

June 2006 Report No. W03033.12-01 Prepared for CSR Limited











BROWN CONSULTING Engineers & Managers



PEOPLE & PROJECTS

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June 2006

#### DOCUMENT CONTROL

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#### PROJECT APPLICATION FOR BULK EARTHWORKS CSR EASTERN LANDS, ERSKINE PARK

#### FOR CSR LIMITED

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#### PROJECT APPLICATION FOR BULK EARTHWORKS

#### **CSR EASTERN LANDS, ERSKINE PARK**

#### 1 INTRODUCTION

Brown Consulting has been engaged by CSR Limited to provide engineering and servicing input for an application to undertake bulk earthworks on CSR's property located within the Erskine Park Employment Area; refer to **Figure 1.1**. This report describes the bulk earthworks in support of the Application. It also provides information for the application for approval of a concept plan for the project.

#### 1.1 Objectives

Brown Consulting's tasks were to review existing planning documentation; provide advice on bulk earthworks; internal road layout options; liaise with service authorities and other consultants and provide advice on sewer, water, electricity, gas and telecommunications. The bulk earthworks design has been prepared taking into account the objectives of the Development Control Plan for the Erskine Park Employment Area. To meet the objectives of the DCP this report will demonstrate the following:

- Describe the proposed road network to access the development.
- Provide preliminary bulk earthworks levels.
- Provide preliminary advice on the availability of services.
- Provide a concept sediment and erosion control plan for the bulk earthworks.



#### 1.2 Description of Study Area

The site is located within the Penrith City Council Local Government Area and located in the suburb of Erskine Park. Proposed lots to which the subject Project Application relates is shown in **Figure 1.2** and is identified as the development zone within this report. Land to the east of the Enviroguard landfill site is also generally referred to as the 'eastern lands'.



Figure 1.2 – Site Plan

The site is bounded by Lenore Lane to the north, private property to the east, Sydney Water water supply pipelines and a Crown road reserve to the south and the Enviroguard landfill site to the west.

Penrith City Council has issued development consent for the creation of Lots 1, 2 and 3 shown in Figure 1.2 under DA 04/1599, these lots are referred to as the Bluescope Steel and Lysaght development lots.

The Minister for Infrastructure and Planning has granted consent as State Significant Development for the creation of Lot 6 shown in Figure 1.2 under DA-284-11-2004-i.

The site is located in the South Creek catchment and drains via 2 small creeks, which converge immediately south of the low point immediately in Erskine Park Road within Lot 16 DP 259146, which is currently being developed by the Walker Corporation. The site generally drains from east to west and is gently undulating, except for around the ex-quarry site where steep batters with terraces have been formed by the stripping and stockpiling of overburden material.

#### 1.3 Proposed Works

The proposed development includes bulk earthworks over the remainder of CSR eastern lands to form pads for later development.

The bulk earthworks levels have been set after considering the need to balance the overall cut to fill operation over the development zone (including provision for a sufficient quantity of material for capping of the Enviroguard Landfill site), consideration of the overall stormwater master plan for the site and the need to provide lead in utility services to facilitate future development.

#### 2 BULK EARTHWORKS

Bulk earthworks are proposed over the portion of the site identified as being the development zone. This work is separate to the bulk earthworks operations approved under DA 04/1599 (Lots 1, 2 and 3) and bulk earthworks approved under DA-284-11-2004-i (Lot 6). To ensure a balance of cut to fill however, works will be required across all lots within the eastern lands. A stockpile of surplus material generated from the earthworks undertaken on Lots 1, 2 and 3 is currently located over proposed pads 5 and 9 and this material will need to be included within the earthworks proposed by this application.

The earthworks are aimed at providing a framework and master plan to ensure a balance in the overall earthworks quantities. The proposed preliminary bulk earthworks levels aim to minimise the potential for a large surplus of material following completion of work within the development zone. Further refinement of the

proposed levels will need to be undertaken prior to issue of the construction certificate and commencement of the bulk earthworks.

Whilst the expectation is that any deficiency in material required to make up the nominated bulk earthworks levels, can be made up by importing additional material, it is understood that Penrith Council have strict controls over what material can be imported to the Erskine Park Employment Area and as such the preference is that the need for imported material be minimised.

In addition to the proposed bulk earthworks levels within the development zone, this report has taken into consideration the ultimate balance of earthworks from all proposed development, including provision of a sufficient quantity of material to cap the Enviroguard Landfill site to the west with a layer of clay. The quantity of material required for the Enviroguard capping layer is understood to be between 100,000 m<sup>3</sup> and 150,000 m<sup>3</sup>.

#### 2.1 Earthworks Quantities

The proposed levels for the various pads is shown on the 'Overall Engineering and Bulk Earthworks Plan' included in the appendix. It is anticipated that material will need to be cut to a depth of 6 metres in height and that the depth of fill on some parts of the site will measure 10 metres in height.

Topsoil is to be stripped from the site prior to the commencement of any filling activities. Geotechnical reports prepared for the CSR land at Erskine Park indicate that the average depth of topsoil over the site is 200 mm. The topsoil will be placed in temporary stockpiles and either reused in landscape areas on the site or removed off site for reuse at an alternate site.

The pad levels have been determined taking into consideration the existing contours, proposed road grading of internal roads, proposed road levels for Lenore Lane and overall earthworks quantities.

Earthworks batters around the perimeter of the site have been nominally set at 1:4 (vertical : horizontal), however previous development applications have proposed the construction of some retaining walls and the location of these walls has been considered.

The **Table 2.1** below provides a summary of the expected bulk earthworks quantities proposed as part of this application.

Pad	Proposed Level (m AHD)	Top Soil (m <sup>3</sup> )	Cut (m <sup>3</sup> )	<b>Fill</b> (m <sup>3</sup> )	Balance (m <sup>3</sup> )
4	49.2 - 49.7	15,840	- 21,860	262,730	240,870
5	53.2 – 52.7	21,250	- 76,310	202,850	126,540
5A	53.5 - 50.0	540	- 470	13,540	13,070
7	61 - 60.5	10,500	- 108,840	19,900	- 88,940
8	58.2 – 57.7	5,720	- 46,730	15,670	- 31,060
9	56.2 - 55.7	9,290	- 110,609	21,280	- 89,239
4 (creek)	Varies	Included above	- 3,360	15,040	11,680
5 (creek)	Varies	Included above	- 63,030	2,690	60,340
Balance		63,140	- 431,209	553,700	122,491

#### 

\* Cut and Fill Volumes do not include topsoil and make no allow for 300mm imported sandstone capping.

Table 2.2 provides an estimate of the quantity of other earth material available on site. This material has been or will be generated from either earthworks operations currently being completed on site, approved works yet to be commenced or from existing on site stockpiles.

TABLE 2.2 – OTHER MATERIAL AVAI	LABLE ON SITE (Not Proposed under this Application)
Source	Quantity of Material Available
	(m <sup>3</sup> )
Lots 1, 2 and 3	- 85,000
Site Stockpiles	- 92,000
Road 3	- 81,000
Lot 21	- 61,000
Balance	- 319,000

#### 

From Table 2.1 above it can be seen that approximately an additional 125,000m<sup>3</sup> of material will be required to establish the nominated pad levels. Table 2.2 confirms the availability of approximately 320,000m<sup>3</sup> of material from other areas of the site that is not part of this application.

Previous experience with the on site clay materials suggest that these clays will break down when exposed to weathering. To protect the clay fill within the pads, it is proposed that a 1000mm thick rock capping will be provided. This rock capping will be sourced from rock excavated on the site and to be stabilised to the recommendations provided in the Geotechnical Engineer's report. Over the rock layer, a nominal 150mm thick topsoil layer will be provided. This topsoil layer will be seeded to minimise the potential for erosio to occur.

In addition to the bulk earthworks figures above the construction of roads 1, 2 and 3 has also been considered, the material generated from the construction of these roads has also been included figures provided in Table 2.2.

The figures above make no allowance for material required outside the CSR Eastern Lands and proposed development of the 'Western Lands' under DA 04/2795 and DA 04/1221. These lots are expected to require material in the order of 40,000 to 50,000m<sup>3</sup>, however it is understood that this material will be sourced from another site.

A summary of the overall earthworks figures above is shown in **Table 2.3** below.

TABLE 2.3 – EARTHWORKS QUANTIT	IES SUMMARY
Section	Balance (m <sup>3</sup> )
Pads 4, 5, 7, 8 and 9	+ 122,491
Lot 21	- 61,000
Lots 1, 2, 3	- 85,000
Road 3	- 81,000
Site Stockpiles	- 92,000
Quarry Capping (Clay)	+ 150,000
Balance	-46,509

The balance of materials left as part of the bulk earthworks is proposed to placed to reduce existing batter slopes and/or stockpiled on Pad 10 (the area known as the southern lands).

#### 2.2 Staging of Earthworks

Based on the expected earthworks quantities and Brown Consulting understanding of CSR's program for development the eastern lands an indicative staging of the earthworks is provided below.

From the earthworks required to form Lots 1, 2 and 3 a surplus of material has been generated in the order of 85,000m<sup>3</sup> of material, which is currently stockpiled on proposed pads 5 and 9. To facilitate the proposed earthworks the material from Lots 1, 2 and 3 and the existing on site stockpiles (92,000m<sup>3</sup>) will need to be removed and placed on proposed pad 4. It is estimated that pad 4 will require approximately 240,000m<sup>3</sup> of fill material to make up the nominated pad level of 49.2 to 49.7, adding the material from Lots 1, 2 and 3 and the existing site stockpiles to pad 4 still leaves a requirement of 163,000m<sup>3</sup>.

From **Table 2.1** it can be seen that pads 7, 8 will yield a surplus of material in the order of 120,000m<sup>3</sup> of material. This material will be used to make up the majority of the remainder of material required for Pads 4 and 5. Once pad 4 is complete the material required to be set aside for capping of the Enviroguard landfill site is likely to be placed south of the landfill site. Access to this area will need to be via pad 4 as building works have commenced on Lot 3.

Earthworks have recently been completed on Lot 21, the surplus material (61,000m<sup>3</sup>) generated from this project is likely to be placed as fill on pads 4 and 5. Included in the work being completed for Lot 21 is the formation of Road 3, again the surplus of material (81,000m<sup>3</sup>) generated could be placed as fill on pad 5. Pad 5 requires approximately 140,000m<sup>3</sup> of material to make up the nominated pad level

Following completion of the works outlined above, pad will require formation. Pad 9 will generate a surplus of material of approximately 99,000m<sup>3</sup>, which could be taken and placed as capping material for the landfill area.

#### 2.3 Earthworks Operations

It is recommended that the contractor prepare an Environmental Management Plan (EMP) to address how the proposed site works will be managed and coordinated taking into consideration this report, the project application conditions of consent and other reports as required. This section of the report is provided as a guide for the contractor and highlights some of the issues that should be identified in the EMP.

Prior to the commencement of the bulk earthworks on the site all soil and water management measures are to be installed / constructed as required by the approved soil and water management plan. Further detail of the proposed soil and water management measures is provided in the next section of this report.

In addition to the soil and water management features the limits of the development zone are to be clearly defined and marked to prevent unauthorised access by construction traffic to areas outside of the development zone.

Following installation of the soil and water management measures and identifying the limits of development, it is recommended that the site be progressively stripped of existing topsoil and vegetation. Vegetation should be retained in areas not subject to earthworks for as long as possible to limit the potential for dust generation from exposed areas. Were areas need to be stripped to enable earthworks to progress the contractor will need to provide appropriate dust control measures.

It is proposed that the earthworks be completed using standard earth moving machinery. All earthworks are to be completed under the supervision of a Geotechnical Engineer. The scope of services to be provided by the geotechnical testing authority must comply with Level 1 geotechnical testing as defined in Appendix B of AS 3798 –1996.

Whilst it is understood that an Environmental Site Assessment has been completed and no specific contamination has been found in the area to be developed. As a result no special contamination related measures or safeguards are considered necessary, the contractor's EMP should include a contingency provision for the appropriate characterisation and off site disposal of any unanticipated, sub surface affected materials encountered during earthworks.

#### **3 SOIL & WATER MANAGEMENT DURING CONSTRUCTION**

Sedimentation and erosion controls will be constructed prior to commencement of any work to minimise the discharge of sediment from the site. The controls will be designed and installed in accordance with the requirements of the NSW Department of Housing 'Soils & Construction' manual.

#### 3.1 Temporary Sediment & Erosion Controls

The engineering bulk earthworks drawings show the concept sediment and erosion control plan for the development.

- A single all weather access way at the front of the property consisting of 50-75mm aggregate or similar material at a minimum thickness of 150mm, laid over geo-fabric and constructed prior to commencement of works.
- A shaker pad will be used at the entrance to the site to remove clay from vehicles leaving the site so as to maintain public roads in a clean condition.
- The sediment control basins should be located where the proposed water quality basins will be constructed. Once the majority of the site has been constructed the basins should then be converted to their ultimate use as a water quality control basins.
- Disturbed areas will be rehabilitated with indigenous plant species, landscaped and treated by approved methods of erosion mitigation such as mulching, revegetation with native grasses or other suitable stabilising processes within fifteen days of the completion of works.
- All runoff and erosion controls will be installed before any works are carried out at the site.
- Upslope clean surface runoff will be diverted via diversion drains and sediment fencing around the disturbed areas.
- Installing *SoilLocker* at the down-slope of the disturbed areas and batters to capture sediment and debris escaping from the site.
- *SoilLocker* shall be installed on the boundary of the creek buffer area.
- Topsoil stockpiling stripped from the construction site shall be diverted away from drainage lines, stormwater inlets and be suitably covered by impervious membrane material and screened by sediment fencing.
- Sediment end erosion controls shall be inspected weekly or after each storm event for litter, sediment, and organic waste accumulation. All sediment/debris shall be removed within two (2) working days.



#### 3.2 Sediment Basin Concept Design

The basins will be designed to capture the first 25mm runoff from the 75th percentile, 5-day rainfall event, as per the NSW Department of Housing Guidelines. An additional 50% capacity will be provided for storage of sediment.

The concept design is based on the equation:  $V = 10.C_v.A.R_{5day 75th\% ile}$ 

As recommended by the *NSW Department of Housing (1998)*, a volumetric runoff coefficient ( $C_v$ ) of 0.5 has been adopted for the construction phase. The outlet to each of the basins will be a slow control discharge. A spillway will be incorporated into the basin designs for an overflow.

#### 3.3 Sediment Basin Flocculation & Discharge Water Quality Criteria

Runoff captured in the sediment basins will be treated with an approved flocculating agent before discharging water, as the catchment contains soils that are classified as fine dispersible, which do not readily settle from suspension. The flocculation should ensure that discharges contain no more than 50 mg/L of suspended solids or 30 NTU before being discharged.

#### 4 ROAD ACCESS

#### 4.1 Road Network

Previously approved development applications have approved the proposed road network. Generally these roads will be the point of access to the proposed bulk earthworks pads however it is likely that these roads will not be completed or dedicated as public road until such time as the bulk earthworks operations have been completed.

Templar Road (Road 1) will serve as an access point to the site from Lenore Lane and will primarily run north – south. This road was approved as part of DA 04/1599. Part of this application is the proposed construction of a permanent cul-de-sac and water quality basin at the southern end of this road. The proposed water quality basin is to be located in the centre of the cul-de-sac with a loop road construction around the basin to allow 'u' turn truck movements.

A temporary cul-de-sac has previously been approved and constructed at the end of Templar Road. It is proposed to remove this cul-de-sac and replace it with the one described above.

Lockwood Road (Road .3) is currently being extended from Templar Road in an easterly direction, temporarily a cul de sac will be constructed at the CSR eastern boundary however it is likely that the adjoining owner will extend this road onto their property at a later date. This work is being undertaken under a previous development consent.

Road 2 will also serve as an access point to the CSR Eastern Lands from Lenore Lane, however this road is proposed as a cul de sac and is unlikely to have any other roads connected to it. Road 2 will have its intersection with Lenore Lane west of the intersection between Templar Road and Lenore Lane. The Road 2 intersection with Lenore Lane has been aligned to coincide with the proposed PacLib intersection north of Lenore Lane.

The construction of roads 2 and 3 are not part of this application.

It is understood that plans exist to extend Lenore Lane east through to Eastern Creek and ultimately make connection with the M7 Motorway. Currently Lenore Lane connects with Erskine Park Road west of the CSR Eastern Lands, Erskine Park Road currently provides access to the M4 Motorway.

#### 5 SERVICES

The availability of services has been investigated, a summary of the findings is given below for electricity, water, sewer, telecommunications and gas. Generally this application being lodged is for bulk earthworks only and therefore the permanent supply of services is not required for this development application.

#### 5.1 Electricity

The availability of electricity has been investigated. In industrial subdivisions conduits are laid throughout the estate for the high voltage system the high voltage lines are then reticulated to service individual requirements. Additional substations may be required to service each lot dependent on the required power usage. The site will be connected to the new zone substation constructed by Integral Energy on Erskine Park Road.

Discussions will need to be held with Integral Energy once the power requirements of individual future developments are known. Power is available within the area to service the ultimate industrial use as envisaged in the Concept Plan Application subject to applications being lodged with Integral Energy.

Arrangements have been made to provide a temporary construction power to the Bluescope and Lysaght sites (lots 2 and 3), similar arrangements are envisaged to enable the bulk earthworks operations to proceed.

#### 5.2 Sewer

The availability of sewer services has been investigated and confirmed. As part of the Bluescope Steel and Lysaght development the sewer mains will be extended to the south eastern corner of the Bluescope Steel lot, the sewer main will require extension to service future lots and further development to the east.

The sewer system has capacity for development envisaged in the Concept Plan.

#### 5.3 Water

The provision of water has been investigated and it has been confirmed that by extension from existing mains, water can be provided for drinking and fire services. Water can be supplied at a rate of 20 l/s, which is adequate for street hydrants and normal water usage, but will not supply a sprinkler system within the buildings. Should sprinkler systems be required, these will need to be designed by a hydraulic engineer as part of the building design and will probably require a storage tank and booster pump.

The water system has capacity for development envisaged in the Concept Plan.

#### 5.4 Gas

Gas mains are to be extended to the Erskine Park site to meet the requirements of the Bluescope Steel and Lysaght development. Agility has previously advised that their policy is not to supply street mains within an industrial/commercial complex until requested by an individual consumer. The provision of gas will then be based upon their own cost analysis of the particular circumstances.

Following a request from CSR Agility have indicated that they will be extending their mains to service the Erskine Park Employment Lands.

The gas system has capacity for development envisaged in the Concept Plan.

#### 5.5 Telecommunications

Contact has been made with Telstra who advised verbally that they envisaged no difficulty in providing services. The telecommunications system has capacity for development envisaged in the Concept Plan.



#### **APPENDICES**

All drawings have been prepared by Brown Consulting (NSW) Pty Ltd. The applicable Project No. is W03033.12.

- 1 Drawing No. DA101 Rev 05 Overall Engineering Plan
- 2 Drawing No. DA102 Rev 05 Bulk Earthwork Plan
- 3 Drawing No. DA103 Rev 05 Bulk Earthworks Sections 1
- 4 Drawing No. DA104 Rev 05 Bulk Earthworks Sections 2
- 5 Drawing No. DA105 Rev 05 Bulk Earthworks Sections 3
- 6 Drawing No. DA106 Rev 05 Bulk Earthworks Sections 4
- 7 Drawing No. DA107 Rev 05 Bulk Earthworks Sections 5
- 8 Drawing No. DA108 Rev 05 Bulk Earthworks Sections 6
- 9 Drawing No. DA109 Rev 05 Bulk Earthworks Sections 7
- 10 Drawing No. DA110 Rev 05 Erosion and Sediment Control Plan
- 11 Drawing No. DA111 Rev 05 Erosion and Sediment Control Plan
- 12 Drawing No. DA112 Rev 05 Basin 3 Retaining Wall Plan and Sections

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JOB No. W03033.12-100 ISSUE 5

# \* BULK EARTHWORKS STREAMWORKS AND STORMWATER CONCEPT PLAN PROJECT APPLICATION

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	DRAWING SCHEDL
DRAWING No.	TITLE
DA101 DA102	OVERALL ENGINEERING PLAN BULK EARTHWORKS PLAN
DA103	<b>BULK EARTHWORKS SECTION 1</b>
DA104	<b>BULK EARTHWORKS SECTION 2</b>
DA105	<b>BULK EARTHWORKS SECTION 3</b>
DA106	<b>BULK EARTHWORKS SECTION 4</b>
DA107	<b>BULK EARTHWORKS SECTION 5</b>
DA108	<b>BULK EARTHWORKS SECTION 6</b>
DA109	BULK EARTHWORKS SECTION 7
DA110	EROSION AND SEDIMENT CONTROL
DA111	EROSION AND SEDIMENT CONTROL
DA112	BASIN 3 RETAINING WALL LONGITUD

Brown Consulting (NSM) Fly Ltd Level 2, 82 Waterloo Road Macquarie Park NSW Australia 2113 Telephone: 02 9900 1000 Facsimile: 02 9900 1099	PLAN PLAN DINAL SECTION	
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AMENDMENTS		01 01/09/05 ISSUE FOR COMMENTS RAP RAP AGEA ISO 9001	02 02/09/05 ISSUE FOR DA APPROVAL RAP RAP RAP ROTIONAL	REVISED LAYOUT WITH AVERAGE 30m BUFFER RAP RAP	. ر	05 02/06/06   REVISED PAD LEVELS   RAP   RAP   DEVICE STOCOMISTRUCTION LISE V			Disclaimer and Copyright:	
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45	59.32	57.355	57.987			
60	59.3	57.464	57.985			
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195	59.8	58.335	58.131			
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255	60.89	58.713	60.748			
270	61.35	58.934	60.748			
285	61.68	59.227	60.748			
300	61.69	59.597	60.748			
315	61.63	60.004	60.748			
330	61.23	60.413	60.748			
345	61.41	60.715	60.748			
360	61.54	60.995	60.748			
375	61.92	61.295	60.748			
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420	63.32	62.321	60.748			
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450	64.8	63.066	60.778			
465	65.46	63.449	60.807			
480	65.95	63.833	60.835			
495	66.29	64.216	60.863			
510	66.39	64.588	60.892			
525	66.53		60.92			

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### SECTION 1 SCALE 1:1000 (H) DA01 SCALE 1:200 (V)

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			<u>59.59</u> 58.58 59.358.37	5 55.956						
Le ve		210	<u>58.84</u> 58.154							
Level 2, 82 Wate Telept			58.52 58.114 58.2 58.09	+ 55.958 9 55.959						
		255	57.77	55.96						
Brown Cc Macquarie Par 1900 1000 Fac		282.32	57.43 56.99 61.244	55.96					_	
Brown Consulting (NSW) Pty Ltd oo Road Macquarie Park NSW Australia 2113 one: 02 9900 1000 Facsimile: 02 9900 1099 Sydney			61.253							
			<u>61.261</u> <u>61.27</u>							
<u>ה</u>	SECTION SCALE 1:1000 (H) SCALE 1:200 (V)		<u>61.278</u> 61.287							
VERIFICATION INITIALS SIGNATURE	10N 2 000 (H) DA01		61.296							
DATE Client: Project:			<u>61.304</u> <u>61.313</u>							
		420	61.321							
			<u>61.33</u> <u>61.338</u>							
CSR LIMITED			61.347			LOT				
CSR LIMITED			<u>61.355</u> <u>61.364</u>			21 UNDER CO				
			<u>61.373</u> 61.381							
			61.39			2 Z				
Drawing:			<u>61.398</u> 61.407							
		585	61.415							
BULK EA			<u>61.424</u> <u>61.433</u>							
BULK EARTHWORKS SECTION 2			61.441							
			<u>61.45</u> <u>61.458</u>							
			61.467							
Drawn by: AK Design by: AK / WA		705	<u>61.475</u> <u>61.484</u>							
by: AK Sheet: 4 OF 12 by: AK / WA Scale: 1:1000 (H) 1:200 (V)		715.6 716.1 719.59	61.49 61.29 64.783							

AMENDMENTS	REV DATE DESCRIPTION BY VER APP	01 01/09/05 ISSUE FOR COMMENTS RAP RAP	02   02/09/05   ISSUE FOR DA APPROVAL   RAP   RA	03 08/11/2005 REVISED LAYOUT WITH AVERAGE 30m BUFFER RAP RAP	04 01/02/06 GENERAL AMENDMENTS RAP RAP	05   02/06/06   REVISED PAD LEVELS   RAP   RAP   RAP					
C Brown Consulting (NSW) Pty Ltd		ACEA ISO 9001							Disclaimer and Copyright:		
Singapore A				Sydney	Telephone: 02 9900 T000 Facsimile: 02 9900 T099		Level 2. 82 Waterloo Road Macquarie Park NSW Australia 2113	Brown Consulting (NSW) Pty Ltd			
				Project:				INITIALS SIGNATURE DATE	VERIFICATION Client:		

NOTE: SHALE LEVELS SUPPLIED BY	CHAINAGE	EXISTING	SHALE	DESIGN	DATUM 39 RO
NOTE: SHALE LEVELS DETERMINED FROM BORE HOLE LOGS SUPPLIED BY DOUGLAS PARTNERS PTY LTD	0 5.06 5.53 5.56 9.22 10.38 15 18.67	50.69 50.65 50.64 50.64 50.51 50.48 50.39 50.43	49.241 49.266 49.268 49.268 49.281 49.285 49.296 49.296 49.3	51.365 51.229 51.19 51.34 51.48 51.206 52.311 53.187	
SDC	30 45	50.58 50.73	49.303 49.307	53.182 53.176	
	60	50.95	49.313	53.17	
	75	51	49.327	53.163	
	90	51.52	49.518	53.157	
		21.22	47.510		
	105	52.13	49.99	53.151	
	120	52.79	50.708	53.145	
	135	53.54	51.502	53.138	
	15.0	E/ 21	E 2 20E	E2 122	
	150	54.31	52.295	53.132	
	165	55.13	53.013	53.126	
	180	55.64	53.592	53.12	PAD 5
	195	55.82	54.02	53.113	
SCAI SCAI	210	55.63	54.227	53.107	
SEALE 1:1000 (H) SCALE 1:200 (V)	225	55.23	54.343	53.101	
00 (H) 0 (V) DA01	240	54.02		53.095	
01	248.75 255	53.64 53.35		53.091 53.098	
	270	52.43		53.116	
	285	52.88		53.133	
	205	52.00		55.155	
	300	53.29		53.151	
	315	53.89		53.168	
	330	54.66		53.186	
	342.31	53.5		53.2	
	345	61.131			
	360	61.139			
	375	61.148			
	390	61.156			
	405	61.164			
	420	61.173			LOT 21
	435	61.181			21 UNDE

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NOTE: SHALE LEVELS DETERMINED FROM BORE HOLE LOGS SUPPLIED BY DOUGLAS PARTNERS PTY LTD PROJECT NO: 36316A BY LINETYPE ----- -----

CONTINUED ABOVE

	525	61.232			
					LOT
	540	61.24			2
					UND
	555	61.249			
	570	61.257			SNO
	570				TRU
	585	61.265			21 UNDER CONSTRUCTION
					Z
	600	61.274			
	615	61.282			
	( 20	(1 201			
ននាល	630	61.291			
SCALE 1:1000 (H) SCALE 1:200 (V)	645	61.299			
SEZ	660	61.307			
DA01					
	675	61.316			
	690	61.324			
	705	61.333			
	720	61.341			
	735	61.35			
	750	61.358			
	765	61.366			
	775.57 776.07	61.372 61.173			
	779.85	64.948			
				I	

			DOL	Drawing:			
م مراسط میں			SECTION 3		PRE		
40 50 50 T	Drawing No: DA105	Project No: W03033.12	Design by: AK / WA	Drawn by: AK	/NIMI		
10 00 00 00	Rev: 05	1:200 (V)	Scale: 1:1000 (H)	Sheet: 5 OF 12	ARY		

435	61.181		6
450	61.19		ER CONS
465	61.198		TRUC
480	61.206		
495	61.215		
510	61.223		

CONTINUED BELOW

30m BUFFER ON ONFNTS									
RAP RAP BY	RAP		405	46.78	45.498	49.673		CONTINUED ABOVE	<u> </u>
	RAP RAP		420	47.29	45.703	49.686			
			426.11 435	47.49 47.78	45.775 45.865	49.690 52.692			
DT SCAL Brown Cc	laimer anc L DIMEI N SITE B RIOR TO		<u>444.97</u> 450	47.94	45.914	49.672 50.510		•	
RITTEN DIMENSIONS ONL DT SCALE. Brown Consulting (NSW) Pty Ltd	Disclaimer and Copyright: ALL DIMENSIONS T ON SITE BY SUPER PRIOR TO CONSTR								
SIONS () NSW) Pty	TO BE		465	47.94	46.006	52.95			
ארא, הע td	Disclaimer and Copyright: ALL DIMENSIONS TO BE CHECKED ON SITE BY SUPERINTENDANT PRIOR TO CONSTRUCTION. USE		480	47.87	45.998	52.94			
	, 1		495	48	45.944	52.93			 
Quality Endorsed Company ISO 9001 Lic 4084			510	48.25	45.844	52.92			
			525	48.54	45.772	52.91			
			<b>F</b> / 0						
			540	50.79	46.372	52.9			\ \
	E.		552.09 555	49.69 49.65	47.012 47.157	52.891 52.894			
	evel 2, 8		570	49.43	47.858	52.91			
	Brown Consulting (NSW) Pty Ltd Level 2, 82 Waterloo Road Macquarie Park NSW Australia 2113 Telephone: 02 9900 1000 Facsimile: 02 9900 1099		585	49.74	48.505	52.925			
	Brow Waterloo Road Macquarie Telephone: 02 9900 1000	<u>ଟ ଟା(</u> ପ	600	49.49	49.107	52.941			
	2 9900 . 1d Macq	SECTION SCALE 1:1000 (H) SCALE 1:200 (V)						PAD	
	Brown ( Iuarie Pc 1000 Fi	(V) 00 (V) 00 (F)	615	49.48		52.956		<u>ज</u>	
	Brown Consulting (NSW) Pty Ltd Įuarie Park NSW Australia 2113 1000 Facsimile: 02 9900 1099	DA01	630	49.49		52.972			
	ng (NSV V Austra 1: 02 99	$\rightarrow$	645	49.97		52.988			
Sydney Canberra Brisbane Melbourne Singapore	V) Pty Lte lia 2113 00 1099		660	50.61		53.003			
			675	50.91		53.019			
VERIFY APPROVED	ם מ		075	50.71					
	VERIFICATION		<u>690</u>	51.21		53.034			
	SIGNAT		705	51.66		53.05			
			720	52.04		53.065			
	DATE		735	52.3		53.081			
Project:	Client:								
			750	52.36		53.096			
EĄ			765 768.17	52.36 52.4		53.112 53.115			
EASTERN SITE WORKS SUBDIVISION BULK EARTHWORKS			777.85 780	52.5 52.48		51.365 51.327	-	SOU SOU	
B	C		787.69 788.11	52.44 52.45		51.193 51.185			
	CSR LIMITED		789.49 791.85	52.48 52.54		50.93 50.871			
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	M		794.26	52.6		50.556			
×S S			794.68 795	52.61 52.61		50.856 50.862			
	Ü		795.15 795.47	52.61 52.62		50.865 50.921			
ΩË			798.53 808.94	52.66 52.81		50.988 52.81			
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+ +	RAP	4	405	46.78	45.498	49.673		
RAP	RAP		420	47.29	45.703	49.686		
			426.11	47.49	45.775	49.690		
Z S	<ul> <li>ALL DIMENSIONS TO BE CHECKED</li> <li>ON SITE BY SUPERINTENDANT</li> <li>PRIOR TO CONSTRUCTION. USE</li> <li>WORTTEN DIMENSIONS ON Y DO</li> </ul>		435	47.78	45.865	52.692		
	TE B	5 2	<u>444.97</u> 450	47.94 47.99	45.914 45.966	49.672 50.510		
						50.510		
	INSTR	<u>.</u> 2 7	465	47.94	46.006	52.95		
UNC				+ / . / +	40.000			
			480	47.87	45.998	52.94		i
Ϋ́, μ			400	47.07	45.770	52.74		
			495	48	45.944	52.93		
			475	40	45.744			
Quality Endorsed			510	48.25	45.844	52.92		
ality 'sed	<<<<<		510	+0.25	+5.0++	52.72		
h			525	48.54	45.772	52.91		
				40.54	45.112	52.71		
		-	540	50.79	46.372	52.9		
			0+0	17.00	<u>+0.212</u>	7.1		
			552.09	49.69	47.012	52.891		
			555	49.65	47.157	52.894		
	Leve		570	49.43	47.858	52.91		
	Brown Consulting (NSW) Pty Ltd Level 2, 82 Waterloo Road Macquarie Park NSW Australia 2113 Telephone: 02 9900 1000 Facsimile: 02 9900 1099		010	47.43	41.000	17.70		
	2 Wc Tele		585	49.74	1.8 505	52.925		
	Brown Consulting (NSW) Pty Ltd Waterloo Road Macquarie Park NSW Australia 2113 Telephone: 02 9900 1000 Facsimile: 02 9900 1099		200	47.14	48.505	52.725		
_	po Ro ne: 0	(0)(0)	600	1010	1 0 107	52.941		
	ad 1) 12 99	SCALE 1:1000 (H) SCALE 1:200 (V)	600	49.49	49.107	52.941		
	Vacdi I		6 1E	1010		E2 0E4		PAD
	Brow Uarie 000		615	49.48		52.956		<u>σ</u>
	n Co Parl Fac		(20			50.070		
	vnsult < NSV simil		630	49.49		52.972		
	Brown Consulting (NSW) Pty Ltd  uarie Park NSW Australia 2113 1000 Facsimile: 02 9900 1099							
	NSW strali 990		645	49.97		52.988		
Syc	) Pty a 21 0 10							
Sydney	Ltd 13 99		660	50.61		53.003		
		1	675	50.91		53.019		
DESIGN	DRAFTING		675	14.00		55.017		
			690	51.21		53.034		
	IITIAL	_	090	51.21		55.054		
			705	5166				
	INITIALS SIGNATURE	ICATI	705	51.66		53.05		
			720	52.07				
			720	52.04		53.065		
	DATE		735	52.3		53.081		
Project:		2	201	د.2د		100.00		
čt	Ē		750	52.36		53.096		
				טכ.גר		070.00		
			765	52.36		53.112		
			765	52.36		53.112		
			777.85	52.5		51.365		
   			780	52.48		51.327		
	$\mathbf{O}$		787.69 788.11	52.44 52.45		51.193 51.185		
í	CSR LIMITED		789.49	52.48		50.93		
	Ъ		791.85 792.4	52.54 52.56		50.871 50.567		
5			793.48	52.58		50.53		,N
2	$\leq$		794.26 794.68	52.6 52.61		50.556 50.856		
$\dot{\mathbf{b}}$			795	52.61		50.862		
			795.15 795.47	52.61 52.62		50.865 50.921		
) )			798.53	52.66		50.988		
			808.94	52.81		52.81		
)		1						

PROJECT NO: 36316A BY LINETYPE	SUPPLIED BY DOUGLAS PARTNERS PTY LTD	SHALE LEVELS DETERMINED FROM BORE HOLE LOGS	NOTE:

NOTE SHALE I SUPPLI	CHAINAGE	EXISTING	SHALE	DESIGN	DATUM 31
NOTE: SHALE LEVELS DETERMINED FROM BORE HOLE LOGS SUPPLIED BY DOUGLAS PARTNERS PTY LTD	0 3.59 11.5 15 16.81 22.41	46.38 44.9 43.88 43.88 43.88 43.88 43.88		45.897 44.96 43.37 43.377 43.381 44.499	DRAINAGE
BORE HOLE LOGS PTY LTD	30 45 45.24 60	43.84 45.74 45.8 43.31		46.114 49.306 49.357 49.37	
	75	43.24		49.383	
	90	43.24		49.396	
	105	43.25		49.409	
	120	44.01		49.422	
	135	46.09		49.436	
	150	45.26		49.449	
	165	45.68		49.462	
s slv	180	46.06		49.475	
SECTION SCALE 1:1000 (H) SCALE 1:200 (V)	195	46.39		49.488	
$\rightarrow$	210	46.71	41.941	49.502	
DA01	225	46.71	42.74	49.515	
	240	46.54	43.358	49.528	
	255	46.39	43.669	49.541	PAD 4
	270	46.31	43.734	49.554	
	285	46.37	43.794	49.568	
	300	46.04	43.871	49.581	
	315	45.66	43.972	49.594	
	330	45.88	44.151	49.607	
	345	46.06	44.393	49.62	
	360	46.21	44.684	49.633	
	375	46.3	44.988	49.647	
	390	46.39	45.26	49.66	
	405	46.78	45.498	49.673	

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	Drawing:			
E E	2			
SECTIO				
SECTION 4				
الم م الم الم				
ign by: AK/WA W03033.12 Wing No: DA106				
Scale: 1:1000 1:200	Sheet: 6 OF 12			

AMENDMENTS	REV DATE DESCRIPTION	01   01/09/05   ISSUE FOR COMMENTS	02 02/09/05 ISSUE FOR DA APPROVAL	03 08/11/2005 REVISED LAYOUT WITH AVERAGE 30m BUFFER	04 01/02/06 GENERAL AMENDMENTS	05 02/06/06 REVISED PAD LEVELS			
	BY VER APP	RAP RAP	RAP RAP	RAP RAP	RAP RAP	RAP RAP			
Brown Consulting (NSW) Pty Lta		ACEA					ON SITE BY SUPERINTENDANT	ALL DIMENSIONS TO BE CHECKED	Disclaimer and Copyright:
F	( +00+	ISO 9001	mpany	ndorsed		< 	< 	<	< 
							AV9		
Singapore 7	Melbourne			Svdnev	1elephone: 02 9900 1000 Facsimile: 02 9900 1099		Level 2. 82 Waterloo Road Macauarie Park NSW Australia 2113	Brown Consulting (NSW) Pty Ltd	
	Melbourne	Brisbane			Ielephone:         02         9900         I 000         Facsimile:         02         9900         I 099         Facsicity         I <th></th> <th>2.82 Waterloo Road Macauarie Park NSW Australia 2113 Devetine</th> <th></th> <th>VERIFICATION</th>		2.82 Waterloo Road Macauarie Park NSW Australia 2113 Devetine		VERIFICATION
							Road Macauarie Park NSW Australia 2113	INITIALS SIGNATURE DATE	

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					CONTINUED ABOVE
	495	52.798	48.018		
	510	52.743	47.683		
	525	52.688	47.514		
		50 (20			
	540	52.632	47.368		
	555	52.577	47.211		
					LOT
	570	52.522	47.048		ω
	585	52.467	46.879		
		52.407			
	600	52.411	46.706		
		60.257			
	614.68 615	52.357 52.284	46.568		
	<u>626.41</u> 630	50.14 50.06	46.464	<u>49.681</u> <u>49.678</u>	
	645	49.69	46.244	49.665	
	660	48.29	46.075	49.651	
	000	40.27	40.075		
	675	48.02	45.899	49.637	
SCALE 1:200 (V)					
<u>-</u> TIC	690	47.92	45.673	49.624	
NCE	705	47.68	45.37	49.61	
(DA01					
$\bigcirc$	720	47.39	44.974	49.597	
	735	46.97	44.491	49.583	
					P / / / / / / / / / / / / / / / / / / /
	750	46.69	43.802	49.569	
	765	46.23	42.918	49.556	
	105	10.23			
	780	45.47	41.921	49.542	
	705				
	795	44.95		49.529	
	810	44.67		49.515	
	825	44.07		49.501	
	840	44.48		49.488	
	849.01	44.53		49.481	
	855	44.59		47.514	
	860.65	44.69		45.647	CREEK N 1
	870 877.97	44.88 45.05		45.419	
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NOTE: SHALE LEVELS DETERMINED FROM BORE HOLE LOGS SUPPLIED BY DOUGLAS PARTNERS PTY LTD PROJECT NO: 36316A BY LINETYPE	
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SECTION 5 SCALE 1:200 (V) DA01

CHAINAGE	EXISTING	SHALE	DESIGN	DATUM 31	LENORE	
0	53.725					
0.75 0.92	53.729 53.599			/		
8.54	53.386	50.146				ヲ
9.04	53.347	50.134				7
9.07 12.55	53.497 53.36	50.133 50.063				
15	52.808	50.108			X	١
18.1	52.11	50.161			SR	
19.46 21.07	52.11 51.711	50.192 50.229				7
22.57	51.561	50.265			DRAINAGE SWALE	
24.07	51.712	50.298		<b></b>		-
25.68 27.38	52.112 52.113	50.333 50.369				
30	52.55	50.422				
30.69 42.85	52.664 53.016	50.436 50.68				
45	53.021	50.721		<u> </u>		
60	53.052	51.013		]/		
75 90	53.084 53.115	51.302 51.579				
105	53.147	51.83		Ľ/		1
120	53.178	52.088				
135	53.21	52.361				_
150	53.241	52.657				
165	53.273	52.911				
180	53.304	53.084			T 2	1
195	53.336	53.2				
210	53.367	53.269				
225	53.399	53.293				
240	53.43	53.274				   
255	53.462	53.22				   
270	53.493	53.132				
285		52.978				
<u>287.02</u> 292.68	53.529 53.544	52.948 52.861	<u> </u>	—		+
300	53.544	52.861				
315	53.462					1
	53.406					
330						_
345	53.351					
360	53.296					
375	53.241	51.428				-
390	53.185	51.085				-
405	53.13	50.711				
420	53.075	50.308				-
435	53.019	49.878				-
450	52.964	49.423				
465	52.909	48.95				

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480 52.854 48.469	
495 52.798 48.018	
	CONTINUED BELOW

AMENDMENTS	REV DATE DESCRIPTION	01 01/09/05 ISSUE FOR COMMENTS	02 02/09/05 ISSUE FOR DA APPROVAL	03 08/11/2005 REVISED LAYOUT WITH AVERAGE 30m BUFFER	04   01/02/06   GENERAL AMENDMENTS	05   02/06/06   REVISED PAD LEVELS			
(C	BY VER APP	RAP   RAP	RAP   RAP   N	RAP	RAP RAP	RAP RAP			
C Brown Consulting (NSW) Pty Ltd		ACEA				DRIOR TO CONSTRUCTION LISE	ON SITE BY SUPERINTENDANT	ALL DIMENSIONS TO BE CHECKED	Disclaimer and Copyright:
		ISO 9001	Company	Endorsed					
					lele		Level 2, 82 W		
Singapore 71	Melbourne		_	Sydney	1 elephone: 02 9900 1000 Facsimile: 02 9900 1099		Level 2. 82 Waterloo Road Macauarie Park NSW Australia 2113	Brown Consulting (NSW) Pty Ltd	
	Melbourne			` '	phone: 02 9900 1000 Facsimile: 02 9900 1099		aterloo Road Macauarie Park NSW Australia 2113 Devetine	INITIALS SIGNATURE DATE	VERIFICATION

SECTION 6 SCALE 1:1000 (H) DA01 SCALE 1:200 (V)

420	56.64	54.945	53.185			1
435	56.33	54.882	53.165			
		54.002	55.105			
1 50	F( 22					
450	56.22	54.914	53.146			
465	56.11	54.979	53.126			
480	55.86	54.71	53.106			
495	55.57	54.145	53.087			
510	55.37	53.611	53.067			
010		55.011				/
505	-					1
<u>525</u> 525.03	54.98 54.98	53.142 53.142	53.048 53.047			
525.05	51.70					
540	54.16	52.745	53.043			
						/
555	53.03	52.419	53.039			/
570	52.32	52.156	53.034			
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585	51.61		53.03		PA D	
נטר	10.10					
					<b>σ</b>	
600	50.56		53.025		/	
615	50.73		53.021		+	
630	50.99		53.016			
645	51.12		53.012			
660	51.62		53.008			
550	20.10					
(75						
675	52.25		53.003			
690	53.32	52.308	52.999			$\setminus$
705	54.42	52.517	52.994			
720	55.13	52.494	52.99			
735	55.66	51.881	52.985			
750		51.051	<b>5</b> 2 001			
750	56.14	ן כע.ו כ	52.981		/ /	
758.18	56.26		52.978		·	
<u>765</u> 769.1	56.38 56.32		51.616 50.617		s o	
					SOUTHERN	
780	56.15		50.317			
<u>782.24</u> 783.24	56.11 56.06		50.255 50.005			
784.22	56.01		49.976		REEK	
784.52 786.05	56		49.676			
786.05 787.35	55.92 55.86		49.6 49.665		!	$\rightarrow$
787.66	55.84		49.965			$\neg$
<u>788.86</u> 795	<u>55.78</u> 55.47		50.001 51.822			/
<u>795</u> 805.02	55.47		54.794			1
810	54.42		54.428	//		
<u>825</u> 834.37	<u>53.32</u> 52.64		53.326 52.637			
834.57 834.54	52.64		52.637			
834.71	52.49	1	52.494	- <u>1</u> -1		

NOTE: SHALE LEVELS DETERMINED FROM BORE HOLE LOGS SUPPLIED BY DOUGLAS PARTNERS PTY LTD PROJECT NO: 36316A BY LINETYPE	CHAINAGE	EXISTING	SHALE	DESIGN		DATUM 39	
IERMIN	0	54.09	53.455	55.73			<u> </u>
VED FI VARTI	9.16	54.34	53.487	55.479			
ROM	9.66	54.36	53.498	55.439			
BOR	9.69	54.36	53.499	55.589		+/⁄⊨	
'ΥΕ   ΤΗ	14.17 15	54.52 54.55	53.621 53.645	55.77 55.437		⁺/F≥	
	16.25	54.6	53.682	54.939		┇╔╤	
0GS	17.32	54.64	53.715	54.519		110	
	<u>17.72</u> 19.25	54.65 54.71	53.727 53.774	53.529 53.394		╧╢╎	
	20.77	54.76	53.821	53.558			DRAINAGE
	22.4 24.64	54.83 54.91	53.874 53.946	53.973 53.994		┼╢┌╧	
	30	55.11	54.123	57.162		╈	
	31.11	55.16	54.161	57.819		₽∥	
	45 60	55.7 56.38	54.656 55.226	57.85 57.884		$+ \parallel /$	
	75	57.06	55.83	57.917			
	90	57.8	56.469	57.951		$\downarrow$	
	105	58.6	57.137	57.984			P +
	120	59.45	57.832	58.018			
	135	60.25	58.552	58.052			
	150	61	59.289	58.085			
	165	61.81	59.912	58.119			
8 8 K 0	180	58.452	60.344	58.152			
SECTION SCALE 1:1000 (H) SCALE 1:200 (V)	188.3	58.471	60.484	58.171			۲ ۲
	195 197.58	56.796 56	60.542 60.557	56.496 55.850			
	198.68	56.125	60.559			$\mathbb{I}_{-}$	RO
	203.15 203.18	55.951 55.801	60.574 60.574			┼╢┍┷┙	
	203.63	55.841	60.576			t/	
	209.68 210	56.023 56.013	60.59 60.591			┼╢══	
	215.73	55.841	60.598				
	216.18	55.801	60.598			<b>↓∥</b> ,	
	216.21 219.68	55.951 56.085	60.598 60.6			╈	
	220.78	55.96	60.601	55.810		⋣∥,	
	222.31	56.493	60.6 60.601	56.193		+	
	225 240	56.489 56.466	60.582	56.189 56.166		$\pm \parallel$	
	255	62.51	60.529	56.144		$\square$	
	270 285	61.86 61.21	60.401 60.099	56.121 56.098		$\downarrow$	
	300	60.41	59.516	56.076			
	315	59.82	58.478	56.053			PAD 9
	330	59.25	57.536	56.03			
	345	58.89	56.775	56.008			
	360	58.48	56.166	55.985			
	375	58.13	55.695	55.962			
	390	57.61	55.347	55.94			
	404.61	57.15	55.108	55.918			<u>                                      </u>

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AMENDMENTS	REV DATE   DESCRIPTION   BY   VER   APP	01   01/09/05   ISSUE FOR COMMENTS   RAP   RAP   ACEA	RAP RAP	REVISED LAYOUT WITH AVERAGE 30m BUFFER RAP RAP	RAP RAP	05 02/06/06 REVISED PAD LEVELS			Disclaimer and Copyright:
Singapore	Melbourne	ISO 9001 Brisbane		Endorsed Sydney			Level 2 82 Waterloo Road Macquarie Park NSW Australia 2113	Brown Consulting (NSW) Pty Ltd	
				Project:				INITIALS SIGNATURE DATE	VERIFICATION Client:
	EASTERN SITE WORKS SUBDIVISION BULK EARTHWORKS					2			

NOTE: SHALE LEVELS DETERMINED FROM BORE HOLE LOGS SUPPLIED BY DOUGLAS PARTNERS PTY LTD PROJECT NO: 36316A BY LINETYPE —	CHAINAGE
BY AS F	0
	3.87
ET Y ET Y	4.03
PERS PE	5.46
PT	9.55
-¥ # □ - +	11.54
- T P	15
	23.15
SDC	30
	31.7
	34.88
	41.81
	0 3.87 4.03 5.46 9.55 11.54 15 23.15 30 31.7 34.88 41.81 45 48.99 52.91 58.37
	48.99
	52.91
	58.37

CHAINAGE	EXISTING	SHALE	DESIGN	DATUM 45	
0	61.33		61.33		
<u>3.87</u> 4.03	61.39 61.42		61.394 61.423	1	
<u>4.05</u> 5.46	61.56		61.558		
9.55	61.86		61.856		
11.54	61.97		61.975	//	
1 <u>5</u> 23.15	62.1		62.105 62.412		
<u>25.15</u> 30	62.41 62.63		62.628		
31.7	62.68		62.681		
34.88	62.74		62.742		
<u>41.81</u> 45	62.89 63.03	61.429	62.892 63.028		
48.99	63.20	61.470	63.198		
52.91	63.35	61.511	62.216		
58.37	63.46	61.567	60.851		i
<u>50</u> 75	63.49 63.63	61.584 61.725	60.847 60.813		
7 <u>0</u>	63.46	61.83	60.779		
105	(2.2	(1002			
105	63.2	61.903	60.745		
120	62.76	61.886	60.712		
122.49	62.71	61.874	60.706		
135	62.49	61.793	60.745	PAD	
				D 7	
150	62.26	61.662	60.793		i
165	62.16	61.506	60.84		
180	62.16	61.333	60.888		
100	102.10	ددد.۱۰	00.000		I
					li
195	61.88	61.142	60.935		l'
					Ľ
209.7	61.282	60.936	60.982		
210.89	60.985	60.918	60.985		
215.05	59.944	60.856			<u> </u>
2 <u>15.55</u> 220.02	60.069 59.895	60.848 60.779			
<u>220.02</u> 220.05	59.745	60.779		6	
220.5	59.785	60.772		!	
225	59.92	60.701	<u>├</u>		
<u>226.55</u> 232.67	59.966 59.779	60.676 60.576			
233.05	59.745	60.57			
233.08	59.895	60.57			
236.56		60.511	<u> </u>		
<u>237.05</u> 240	59.904 60.641	60.503 60.453	+ +	<u> </u> +₩/	
243.04	61.399	60.4			
255	61.392	60.186			
<u>270</u> 285	<u>61.382</u> 61.372	59.902 59.606	+	<u> </u>	
<u>285</u> 300	61.372	59.606			
315	61.352	59.057			
330	61.342	58.943			
	(4				
345	61.332	59.026			
360	61.323	59.348			
375	61.313	59.77			
ر , .					
390	61.303	60.22	<u>├</u>		
405	61.293	60.622			
. 20	61 202	60.022			
+20	61.283	60.932			
435	61.273	61.118			
				21	
¥50	61.263	61.154			
+65	61.254	60.998	<u> </u>		
480	61.244				
.05	61 227				
495	61.234				
510	61.224				
	61.214				
525	14				
525	01.211				

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SCALE 1:1000 (H) SCALE 1:200 (V)	SECTION
DA01	F

6 ronn 10 ronnn 10 ronn 10 ronn 10 ronn 10 ronn 10 ro			SECTIONS 7		PREL
40 50 60	Drawing No: DA109	Project No: W03033.12	Design by: AK/WA	Drawn by: AK	MINA
70 J 90 100	Rev: 05		Scale: 1:1000 (H)	Sheet: 9 OF 12	ARY

P

540	61.204					
555	61.194	58.021				
570	61.185	57.5				
585	61.175	56.995				
600	61.165	56.506				
615	61.155	56.057				
622/1	61.149	55.873				
623.41						
625.6	58.637	55.834		⊬		
630	58.492	55.764			 	



ſ	03 08/1 02 02 REV C	02 01		2
¢	ISIONS ONLY, DO	Disclaimer and Copyright:	<ul> <li>5 TOPSOL SHALL BE RESPECAD AND STABLISED AS SOON AS POSSIBLE DISTUBBED WATES WALL BELEFF WITH A SCARFED SUPPACE ENDERANCE WATER INFLITEATION AND ASSIST EVINOL IN TOSU UNDER SHALL TEMPORARILY REHABILITIATE ANY DISTUBBED APEAS WITHIN 60 DAYS, WHERE FINAL SHAPING HAS OCCURED THE CONTRACTOR</li> </ul>	<ul> <li>EROSION CONTROL MEASURES:</li> <li>CONTROLS AFFECTED BY WORKS ARE TO BE RE-ESTABLISHED PRIOR TO THE COMPLETION OF EACH DAYS WORK</li> <li>THE CONTRACTOR IS TO STABLISE TOPSOL STOCKPLE AND ALL DISTURBED RAFEAS AS SOON AS THEY REACH FINAL LEVELS: STABLISHED OR ALL DISTURBED RAFEAS AS SOON AS THEY REACH FINAL LEVELS: STABLISHED OR OWNED RATE OTHER METHOD APPROVED BY SUPERIMENDENT AND COUNCIL ENGINEER. ALL SEED OTHER METHOD APPROVED BY SUPERIMENDENT AND COUNCIL ENGINEER. ALL SEED OTHER METHOD APPROVED BY SUPERIMENDENT AND COUNCIL ENGINEER. ALL SEED OTHER METHOD APPROVED BY SUPERIMENDENT AND COUNCIL SPECIFICATION FOR OTHER AFEAS.</li> <li>ARECOMMENDED LIST OF PLANT SPECIES FOR TEMPORARY COVER IS: - APANESE MILLET ZSK4/na SUMMER - APANESE MILLET ZSK4/na SUMMER - APANESE MILLET TOK4/na MITTER SUBSOL AND TOPSOLITESTING.</li> <li>- DURATURF PARK BLEND WRIGHT STEPHENSON SEED MIX1+ COVER CROP - ONTS (RYECONN) DISTOF PLANT SPECIES FOR PERMANENT GRASSING 5: - DURATURF PARK BLEND WRIGHT STEPHENSON SEED MIX1+ COVER CROP - APANESE MILLET ' Dive/na - APANESE MILLET ' DIVE/NENT GRASSING SEED MIX1+ COVER CROP - APANESE MILLET ' DIVE/na - APANESE MILLET ' DIVE/NE APANENT GRASSING SEED MIX1+ COVER CROP - APANESE MILLET ' DIVE/NA - ATCHE/NIG AGENT (CURASOL OR SIMILAR) - ATCHE/NIG AGENT (CURASOL OR SIMILAR) - ATCHE/NIG AGENT (CURASOL OR SIMILAR) - MULCHO SK40/na - MULCHO SK40/na - MULCHO SK40/na - MULCHO SK40/na - MULCHO APANINA - MULCHO APANINA - ATCHE/NIG AGEN / ATTH</li></ul>
		VERIFICATION Brown Consulting (NSW) Pty Ltd INITIALS SIGNATUR Level 2, 82 Waterloo Road Macquarie Park NSW Australia 2113 DRAFTING Telephone: 02 9900 1000 Facsimile: 02 9900 1099	TOPSOL OVER S OTHERWISE , NOT EXCEED 2 NOT EXCEED 2 NOT EXCEED 2 S POINT TO AL S POINT TO AL INTAIN ENCES EI ENT FENCES EI NITAIN ENTER IN ANY ANY AREAS ONTRACTOR SH - ANY ADDITION OF ANY ADDITION OF ALLOG BOOK SHALL AVAILABLE TO ONTRACTOR S AL LOG BOOK SHALL ONTRACTOR S AL LOG BOOK SHALL ONTRACTOR S ONTRACTOR S ONTR	SEDIMENT CONTROL MEASURES:         SEDIMENT CONTROL MEASURES SHOLD BE CONSTRUCTED TO LIMIT SLOPE LENGTH, WHERE POSSIBLE, IN ACCORDANCE WITH THE FOLLOWING: RECOMMENDED MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.         SLOPE MAXIMUM SPACING OF DEPOINT FRAPS IN ACCORDANCE WITH DRAWINGS IN THIS SHEET COMPLETION OF PANING.         SEDIMENT TRAPS AND BASINS ARE TO BE MAINTAINED SUCH THAT.         IAL STORMWARE SERVICE OWLET ION OF PANING.         SEDIMENT TRAPS AND BASINS ARE TO BE MAINTAINED SUCH THAT.         IAL STORMWARE SERVICE DOR REPARED AS REQUIRED TO ENSURE SERVICE ABULTY OF BOTH THE SERVICED OR REPARED AS REQUIRED TO ENSURE SERVICE ABULTY OF BOTH THE COMPLETION AND RESTORATION OF SITE REMOVE ALL MATERIALS AND FILL OWNERS DOWNE COMPLETION AND RESTORATION OF SITE REMOVE ALL MATERIALS AND FILL OWNERS DOWNE THE DOR MAXY'S SEDIMENT TRAPS, AND SEDIMENT TRAPS.         SOLICOWING COMPLETION WAND RESTORATION OF SITE. REMOVE ALL MATERIALS AND FILL DIVERSION DAVING, WATTHEOUNGLING SENTICIPANE TO BE RETAINED         SOLICOWING COMPLETION OF THE CONTRACT TO BE RETAINED
	Project: EASTERN SITE WORKS SUBDIVISION BULK EARTHWORKS	DATE Client: CSR LIMITED	Construction site Construction site Centexcille Centex	Bytis Solpe 1: 2 or Jess Bytis Solpe 1: 2 or Jess Course aggregate Wrapped in geatextile Rock Check Dam

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