CIVIL ENGINEERING MATTERS
LOTS 2 & 3 BILAMBIL ROAD BILAMBIL
PROPOSED SUBDIVISIONAL DEVELOPMENT

REVISION F
OUR REF: O8418

REVISION	DATE	AMENDMENTS
A	4/08/08	-
B	4/08/08	Final Report for Submission
C	19/09/08	Effluent Disposal Proposal Amended
D	2/12/08	General Revision
E	15/03/09	Revised Layout
F	20/05/09	Amended Council Requirements

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Lots 2 & 3
Bilambil Road
Bilambil

Civil Engineering
Response to Director General's Environmental Assessment Requirements

Note that Item Numbers reflect the requirement summary.

General

This report has been prepared in order to provide response to DGEARs in relation to civil engineering aspects of the project.

The site is located at the corner of Hogans Road, Bilambil Road and Urliup Road in Bilambil (Lots 2 & 3 on DP244652). The site is approximately 4.6Ha in area.

The site is to be developed as a residential subdivision comprising 57 allotments. Details of the proposed development are contained on CLA Drawing Nos 08418 – 001 to 009 inclusive.

Site Grading

The site is characterised by an isolated rock outcropping rising to a maximum of 20m above the adjacent plain. The outcropping is essentially contained within the confines of the subject sites. There is significant evidence of quarrying in the past, and it is obvious that such quarrying operations were undertaken without regard to practice that would be the norm today. In it's current state, the site not only provides an unsightly appearance, it also comprises a significant threat to the integrity of the receiving environment as a result of uncontrolled runoff from the significantly disturbed surface and is regarded as a potential danger to those who might trespass on account of the unprotected sheer faces left on cessation of the quarrying operations.

The design of the site grading has been undertaken with the following aims in mind:

a) Limitation of surface discontinuity at property boundary
b) Limitation of the general nature of the more rounded topography in the adjacent areas
c) Limitation in the use of earth retaining structures
d) Efficient control of stormwater runoff

The proposed earthworks are described in the CLA Consultant Drawings 08418-003,004 and 005 attached.

These drawings indicate that, with the exception of the boundary between the proposed commercial area and the existing hall finished surface matches existing surface at the boundaries of the development.

The finished landform presents a surface more in keeping with the general topography of the area.

It will be noted that in one particular area, the depth of the required excavation exceeds 5m. This is required to achieve an acceptable grading of the site. The area of such excavation represents approximately 10% of the site as a whole.

The use of retaining walls has been limited to three locations, as follows:

a) The area bounded by the new roads, where the wall height is limited to a maximum of 1m along the property frontage boundary, and
b) A larger retaining wall at the rear of the proposed commercial site. It will be understood that this wall has been proposed as a generality in order to create a level building pad over the whole of the site. This wall is not a pre requisite to the development proposal. In fact it is recommended that the earthworks in this area not be finalised until finalisation of the building approval of the commercial premises per se.
c) Adjacent to the existing flow path in lot 2, where the height of the wall is less than 1m.

The maximum grade of the finished allotments is approximately 20%. In the main, batter slopes are significantly less than this. The Applicant advises us that the allotments exhibiting higher grades will be the subject of individual house design to ensure attractive and practical use of these lots. No access grades to all allotments exceed 25%.

Generally, the grading of the site is such that the water table will not be intercepted either in association with the earthworks (including the detention pond), or in the construction of the proposed engineering services.

Services Generally

4.1 We are advised that the site is readily serviced with potable water, power and telecommunication facilities. Council has advised the provision of a suitable sewer outlet is problematic. The capacity of the Bilambil Heights sewer system is currently under review by Tweed Shire Council. The outfall requirements for this development are dependant on the results of this investigation. In order to provide surety to the development proposal, the Developer and Council have agreed a draft statement of commitments, specifying the worst case solution to the problem. A copy of the draft Statement of Commitments is given at Attachment 5.

A proposed solution to this issue has been prepared, and has been provided to Council directly for review and concurrence. Details of the proposed solution are provided below.

It is not proposed to stage any of the external infrastructure provision.

It is proposed to provide sewerage services to a number of allotments by means of a low pressure pump system, such as the E one system or Mono PCC Eco 1-60 system. Details of the Mono system, including WSAA review, are given at Attachment 6.

Effluent Disposal

The provision of sewerage services to the site will entail the construction of a pumping station, to be located approximately where shown on CLA Drawing 08418-002. The nearest point of connection available in the reticulation system is pump station SPS2038 in Peninsula Drive.

Council has advised however that, due to capacity issues, they are not able to approve connection to the reticulation system upstream of this pumping station.

Council has confirmed however that the nominated point of sewage disposal for the development is Pump Station SPS2018 Gollan Drive. The anticipated route of the required rising main is shown on CLA Drawing 08418-010.

Flood Assessment

Council has nominated the design flood level consistent with the level of the 100-year ARI event. In this instance, that level has been nominated as RL3.500. Note that this level has been based on the historical flood level in the area. Calculated flood level, based upon the 36 hour duration flood in the Tweed Valley is approximately RL2.500.

It will be understood that the site is generally well above this level. A small area of the site (approximately 1,350m2) lies to a maximum depth of 0.700m below the design flood level. The area is generally constrained within the site, however it does extend to the Bilambil Road Reserve. The area is currently drained via the Bilambil Road table drain.

In accordance with accepted practice, the potential flood storage volume lost as a result of the filling is replaced by compensatory excavation associated with the construction of the detention pond. It is anticipated that the volume of flood storage lost as a result of the development is approximately 470m3. It is anticipated that this volume will be compensated for by the orderly regarding of Lot 5 and 55.

Filling this area will not impact on any adjacent property.

It is noted that the NSW Floodplain Development Manual 2005 refers to the appropriate Flood Planning Level as that defined by the Local Authority. As previously stated, this is the Q100 level. It is felt that the marginal quantity of filling required to achieve the proposed earthworks levels is not sufficient to warrant detailed investigation of potential impacts, particularly in the light of the compensatory earthworks proposed.

The final minimum level of the allotments has been set at RL4.400m AHD, 900mm above the nominated Q100 flood level.

The proposal satisfies the requirement for the provision of a high level evacuation route to land above the level of the probable maximum flood level (PMF). We are advised by Council that the PMF level has been assessed at RL5.5mAHD.

The Planning Scheme defines the High Level Evacuation Routs is a road or footway whose entire length has a level of not less than the design flood level (ie the Q100 Flood Level) and which provides a route to enable people to evacuate to land above the PMF. Not only is the bulk of the development site above the PMF level, the stated requirements for an evacuation route are provided by the vehicular and pedestrian access to Carool Road, at the intersection of Bilambil and Urliup Roads at a level approximately 2m above the Q100 level.

Climate Change

The DECC Guidelines – “Practical Consideration of Climate Change” (Oct 2007) recommend that development proposals consider the impact of climate change on the particular development.

The Tweed Shire Council is currently in the process of investigating these impacts, including a “high” impact case with 0.91m sea level rise and 30% increase in rainfall intensity. Draft results of that study, specifically related to the 36 hour duration event indicate an impact of the order of 1.5m increase in the flood level at the Q100 event.

It is not considered appropriate to apply this impact to the historical flood level. Rather, the calculated impact should be superimposed on the calculated flood level. Thus in considering the impact of climate change , the anticipated flood level would increase from RL3.500

(historically based) to RL4.00 (Design Based). In this instance, the development is provided with a minimum freeboard of 0.40m.

Legal Point of Discharge

Tweed Shire Council requires that stormwater runoff be discharged to a legal point of discharge, defined as a point on or adjacent to the development site, and (amongst other definitions) "a natural watercourse or waterway to which the site naturally drains". Accordingly, Bilambil Creek is nominated as the appropriate legal point of discharge. This has been confirmed by Council.

Spoil Disposal

The preliminary earthworks plans indicate a potential 19,060m3 of spoil to be removed from the site. Spoil is to be removed from site in trucks for disposal at an approved location.

Filling Impacts

Earthworks for the site have been designed so that the there is no filling at any external boundary, with the exception of a maximum of 900mm at the boundary of the site with the existing village hall. This height is consistent with the Tweed Planning Scheme.

Some additional earthworks may be required at the road frontages once detailed design in these areas takes place, however we would expect the requirement for filling to be only sufficient to achieve a free draining surface in the existing road verges.

Review of the pre development and post development contours confirms that the proposed earthworks do not serve to concentrate flows on to adjacent property, and that there is no impact on upstream properties.

Water Cycle Management

Tweed Shire Council has advised that the development does not trigger requirements for water quality improvement devices, in that the development does not have more than 50 allotments in a contributing catchment.

Roadworks

Adopted Cross Section - Internal

The adopted cross section for the internal roads is in accordance with the TSC requirements for a road designed to service less than 3,000 vehicles per day. The peak traffic load for the development, assuming only one access point, would be 342 vehicles per day, based upon anticipated traffic loading of 6 trips per allotment per day.

The adopted road cross section is indicated on the drawings.

Adopted Cross Section – External

Tweed Shire Council have specified their requirements in respect of works required in Hogans Road, Urliup Road and Bilambil Roads. These requirements have been included on the drawings.

Intersections

Road #1/Urliup Road

Urliup Road is an existing sealed road with a sealed width of approximately 6m. The road crest exhibits a substandard level of sight distance. The proposal anticipates the lowering of the existing crest by approximately 800mm in order to achieve the TSC sight distance standards. The orderly lowering of the road profile adjacent to the proposed intersection, coupled with the construction of the swales, and the reduction of the existing cut batter slope ensures that intersection sight distance standards are achieved.

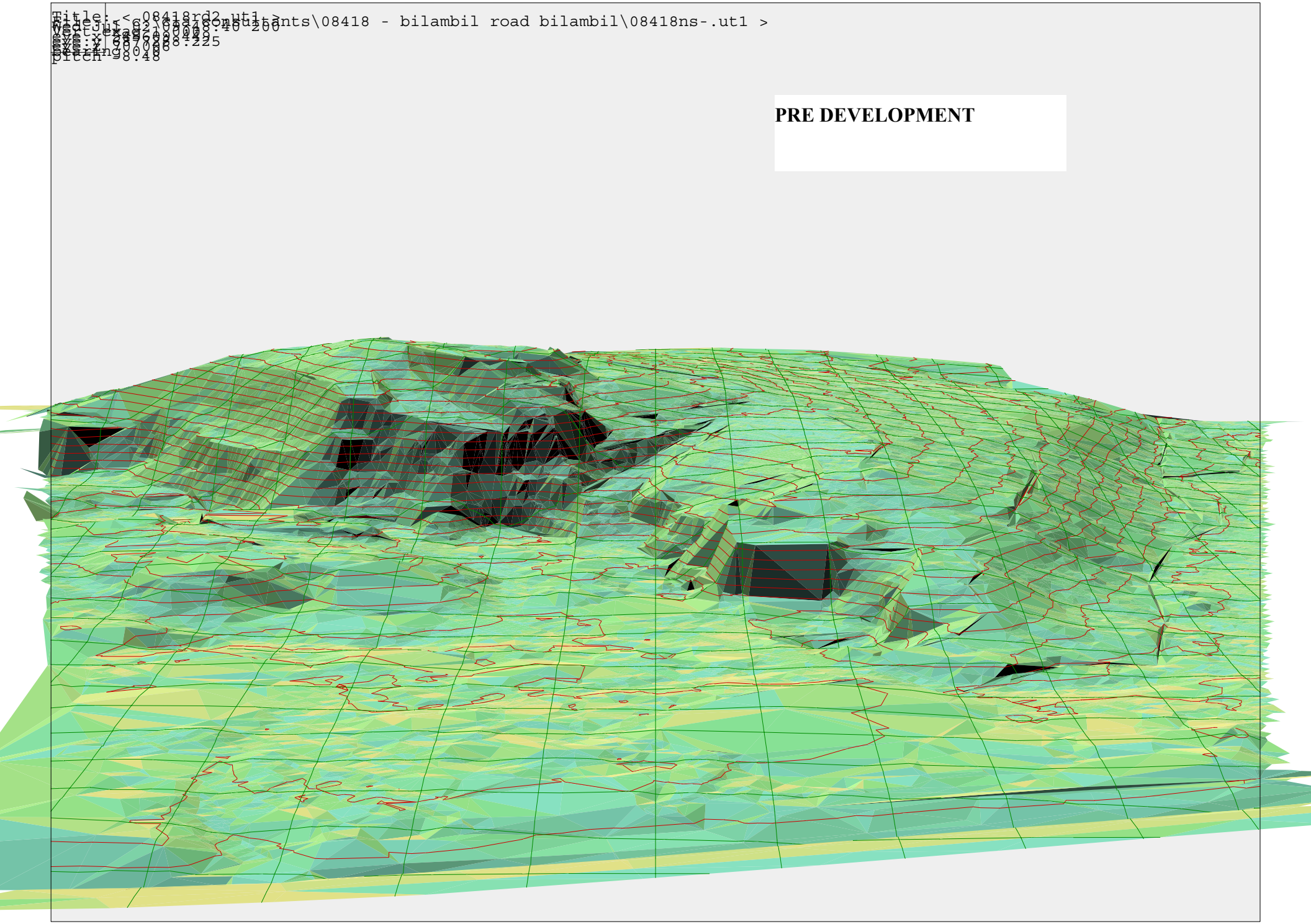
Road #1/Hogans Road

Hogans Road is an existing sealed road with a seal width of approximately 6m. The road is essentially flat, although it does grade gently down to the causeway crossing Bilambil Creek. Survey reveals sight distance available of approximately 90m, in excess of the required standard. No other issues are anticipated in respect of this intersection.

ATTACHMENTS

ATTACHMENT 1 – Perspective Images Pre and Post Development
ATTACHMENT 2 – CLA Consultant Drawings 08418-001 to 009 inclusive
ATTACHMENT 3 – Site Based Stormwater Management Report
ATTACHMENT 4 - Rising Main Alignment

ATTACHMENT 1
Perspective Images Pre and Post Development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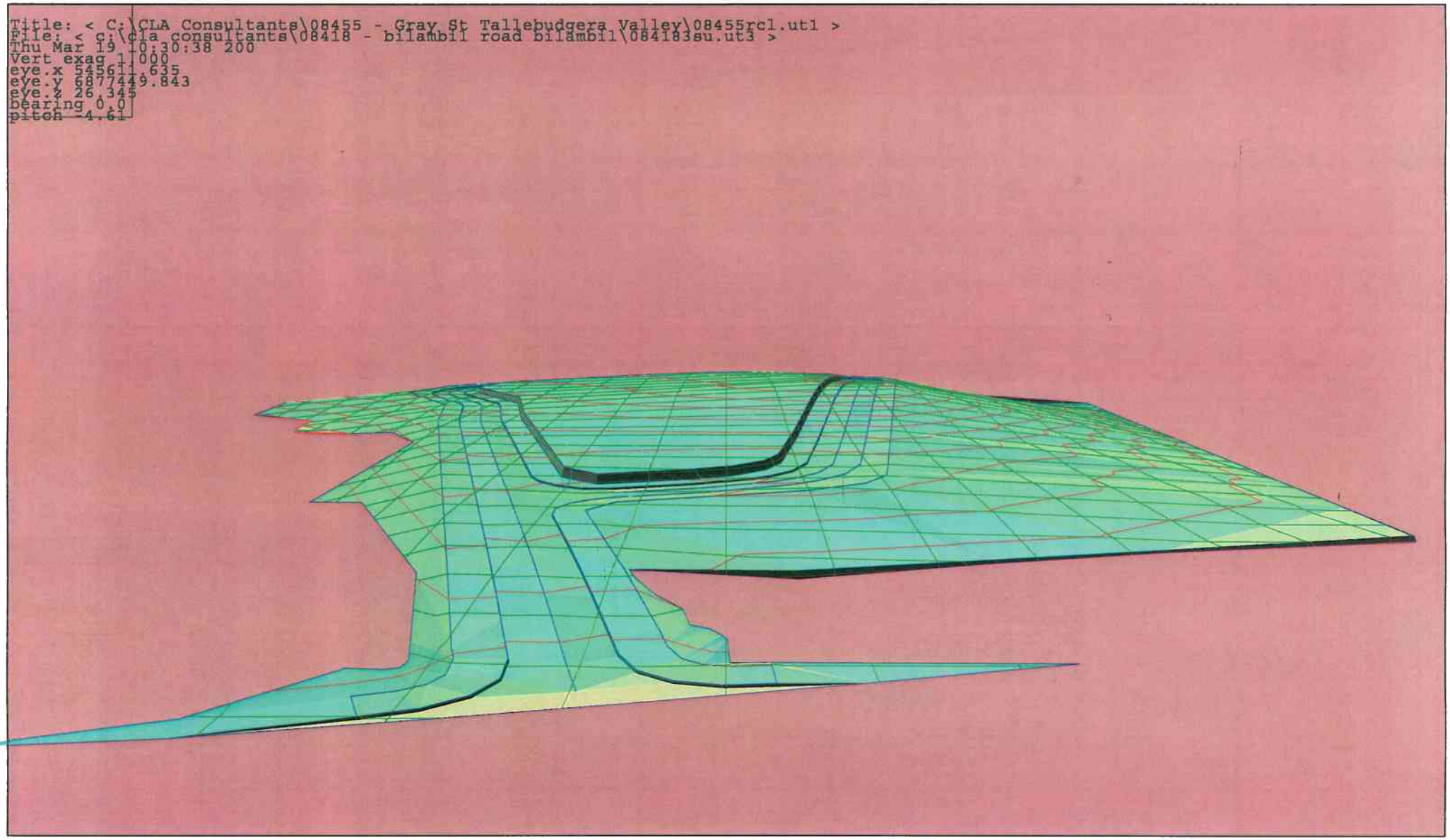
PRE DEVELOPMENT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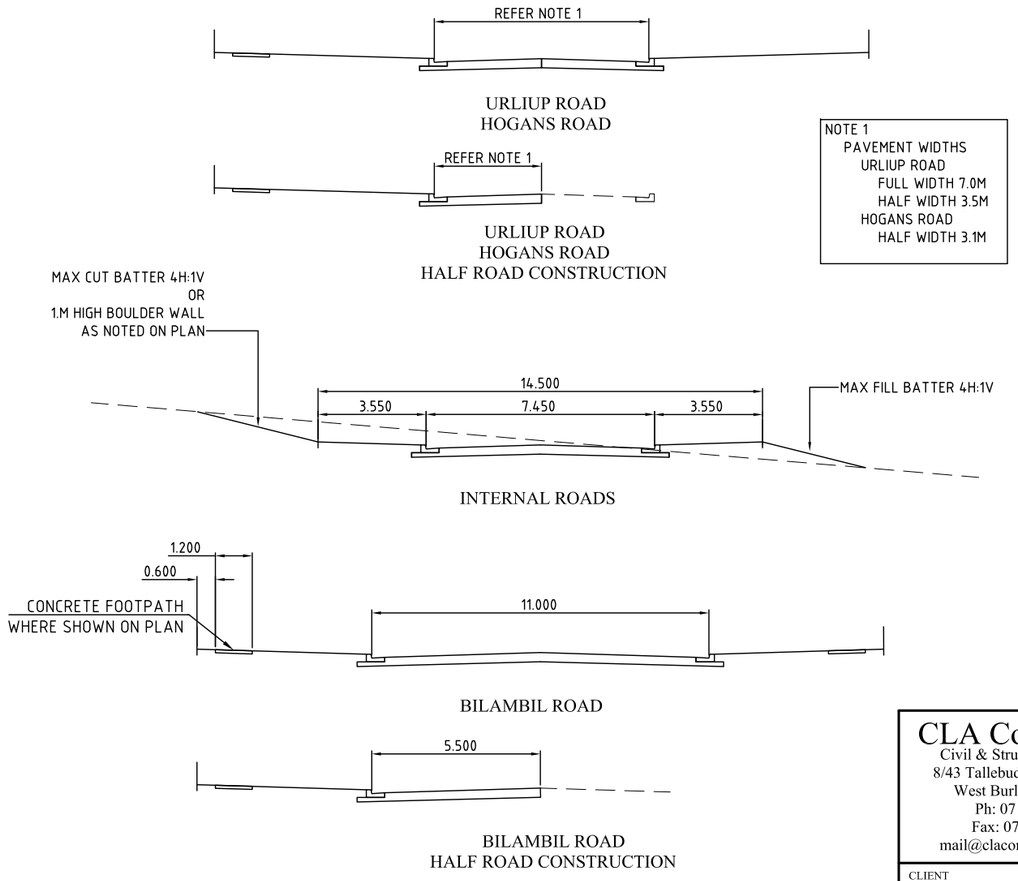
ATTACHMENT 2
CLA Consultant Drawings 08418-001 to 009 inclusive



NOTE 1
PAVEMENT WIDTHS
URLIUP ROAD
FULL WIDTH 7.0M
HALF WIDTH 3.5M
HOGANS ROAD
HALF WIDTH 3.1M

LOCALITY PLAN

DRAWING SCHEDULE

NUMBER	DESCRIPTION
08418 - 001	SITE PLAN, DRAWING SCHEDULE & NOTES
08418 - 002	GENERAL ARRANGEMENT
08418 - 003	EARTHWORKS PLAN
08418 - 003A	EARTHWORKS - ISOPACHE DETAILS
08418 - 004	EARTHWORKS - INDICATIVE SECTIONS
08418 - 005	ROAD LONG SECTIONS - SHEET 1 OF 2
08418 - 006	ROAD LONG SECTIONS - SHEET 2 OF 2
08418 - 007	SEWER LAYOUT - GENERAL ARRANGEMENT
08418 - 008	SEDIMENT & EROSION CONTROL PLAN
08418 - 009	CONSTRUCTION MANAGEMENT PLAN
08418 - 011	EXTERNAL SEWER RISING MAIN ALIGNMENT

SEWER RETICULATION
STORMWATER DRAINAGE
ROOFWATER DRAINAGE
PROPOSED ALLOTMENTS
ROAD PAVEMENTS
ROAD VERGE
PUBLIC OPEN SPACE
SEWAGE PUMP STATION

1:500 @ A1 0 10 20 30 40 50M

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PROJECT
LOTS 2 & 3
BILAMBIL ROAD
BILAMBIL

ASSOCIATED CONSULTANTS
-

PROPERTY DESCRIPTION	LOTS 2 & 3 DP244652
UBD REF.	
DESIGNED	CBL
DRAWN	ACAD
REVIEWED	CBL
DATE	15 JUNE 2008
APPROVED	FIEAust CPEng RPEQ 4293

REV.	DESCRIPTION	BY	DATE	APPR'D
D	TSC REQ'S	CBL	15/03/09	CBL
C	REV LAYOUT	CBL	15/03/09	CBL
B	DA SUBMISSION	CBL	4/08/08	CBL
A	DA PROPOSAL	CBL	14/06/08	CBL

NAME
SITE PLAN, DRAWING SCHEDULE & NOTES

PROJECT REF.	DRAWING NO.	REVISION
08418	001	D

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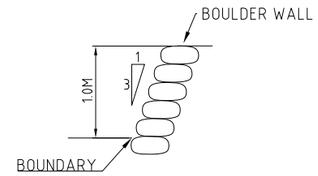
C	GEN REV	CBL	4/12/08	CBL
B	DA SUBMISSION	CBL	4/08/08	CBL
A	DA PROPOSAL	CBL	14/06/08	CBL

NAME
GENERAL ARRANGEMENT

PROJECT REF.	DRAWING NO.	REVISION
08418	002	E

CUT VOLUME 58,000M3
FILL VOLUME 39,000M3
BALANCE 19,000M3



RETAINING WALL DETAIL

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A	DA PROPOSAL	CBL	14/06/08	CBL

NAME
EARTHWORKS PLAN

PROJECT REF.	DRAWING NO.	REVISION
08418	003	D

ISOPACHE INTERVAL 1.0M

1:500 @ A1 0 10 20 30 40 50M

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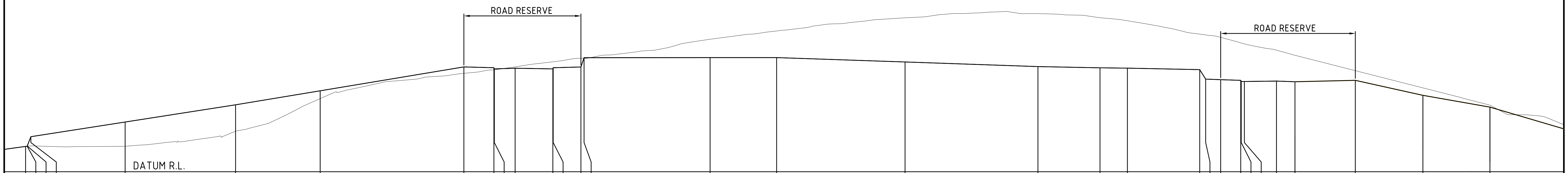
A	TSC REQ'S	CBL	20/05/09	CBL

NAME
EARTHWORKS - ISOPACHE DETAILS

PROJECT REF.	DRAWING NO.	REVISION
08418	003A	A



PEGGED CHAINAGE	FINISHED SURFACE LEVELS	NATURAL SURFACE LEVELS
12.229	3.252	
12.436	3.273	
12.447	3.306	
12.911	4.500	
25.000	6.387	3.270
39.159	8.598	
50.000	10.399	9.399
68.436	13.462	
72.286	13.366	
72.336	13.216	
75.000	13.297	13.466
79.836	13.216	
79.886	13.366	
83.436	13.455	
83.836	14.655	
100.000	14.662	17.023
108.531	14.665	
125.000	14.099	19.779
142.039	13.513	
150.000	13.347	19.782
153.515	13.303	
162.784	13.115	
163.545	11.897	
165.477	11.826	
168.042	11.745	
168.110	11.594	
168.505	11.596	
172.626	11.649	
175.000	11.565	14.964
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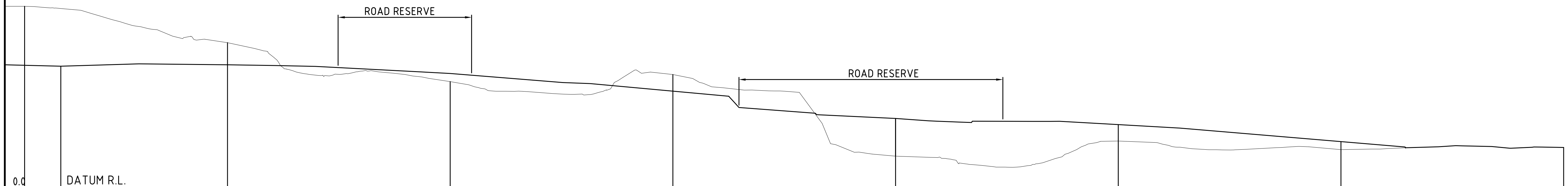
SECTION #1



PEGGED CHAINAGE	FINISHED SURFACE LEVELS	NATURAL SURFACE LEVELS
0.000	13.713	20.259
2.231		20.259
6.297	13.555	
25.000	13.707	16.188
50.000	12.741	11.831
75.000	10.757	12.618
100.000	7.694	3.473
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150.000	5.102	4.204
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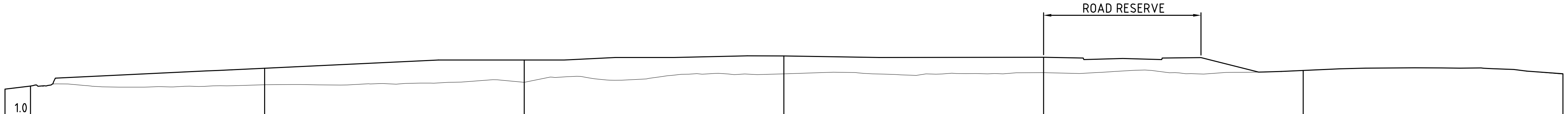
SECTION #2



PEGGED CHAINAGE	FINISHED SURFACE LEVELS	NATURAL SURFACE LEVELS
0.000	3.444	3.445
2.457	3.739	3.739
25.000	5.454	3.866
50.000	6.248	4.105
75.000	6.645	4.915
100.000	6.512	5.037
125.000	5.243	5.243
150.017	4.925	4.887

SECTION #3

VERTICAL 1:250 @ A1 0 5 10 15 20 25M

HORIZONTAL 1:250 @ A1 0 5 10 15 20 25M

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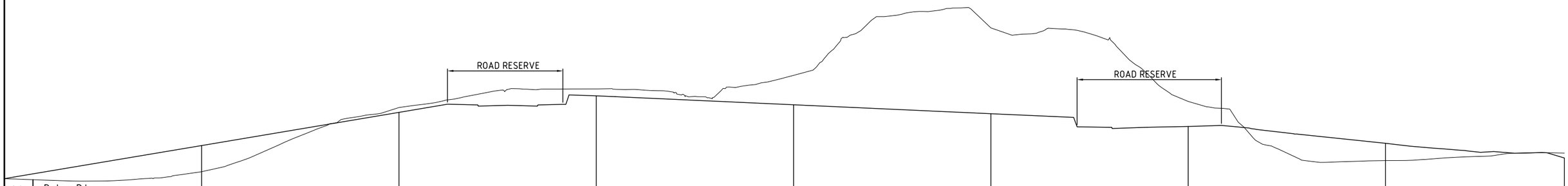
NAME
EARTHWORKS
CROSS SECTIONS
SHEET 1 OF 2

PROJECT REF.	DRAWING NO.	REVISION
08418	004	D



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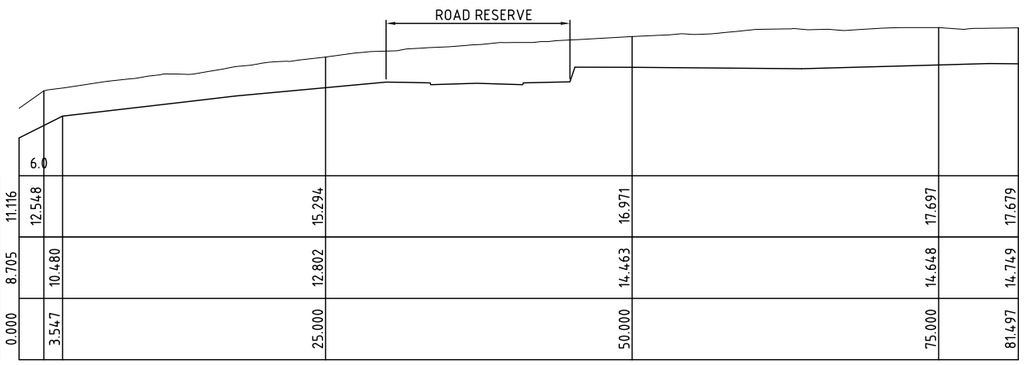
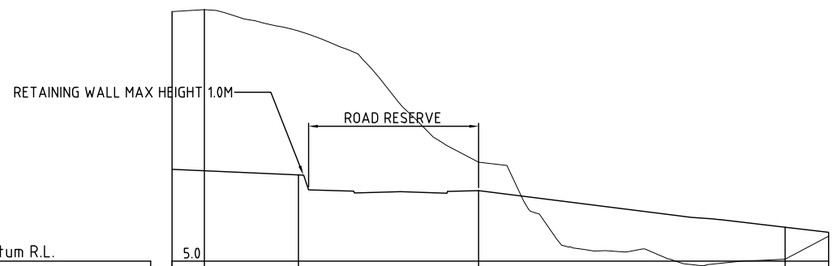
4.028	FINISHED SURFACE LEVELS	8.219	12.421	14.511	13.384	12.254	10.635	8.507	6.635		
0.000 3.637	PEGGED CHAINAGE	25.000	50.000	75.000	100.000	125.000	150.000	175.000	197.666		

SECTION #4



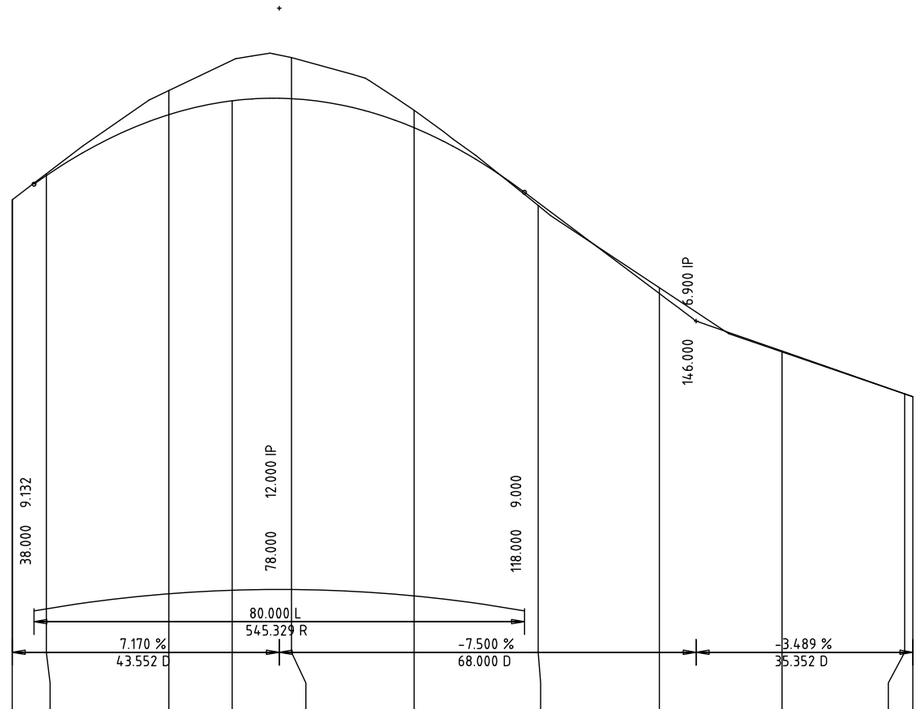
Datum R.L.	6.0						
NATURAL SURFACE LEVELS	11.116	12.548	15.294	16.971	17.697	17.679	
FINISHED SURFACE LEVELS	8.705	10.480	12.802	14.463	14.648	14.749	
PEGGED CHAINAGE	0.000	3.547	25.000	50.000	75.000	81.497	

SECTION #5



Datum R.L.	5.0					
NATURAL SURFACE LEVELS	25.343	25.498	13.061	5.159	7.035	
FINISHED SURFACE LEVELS	12.478	12.031	10.744	7.764	7.351	
PEGGED CHAINAGE	0.000	2.634	10.303	25.000	50.000	53.545

SECTION #6



Datum R.L.	0.5													
PAVEMENT LEVELS	8.877	9.132 9.272	10.266	10.534 10.533 10.526	10.053	9.000 8.833	7.350	6.412	5.714 5.667					
SURFACE LEVELS	8.877	9.148 9.301	10.660	11.256 11.196	10.337	8.965 8.786	7.444	6.397	5.712 5.667					
PEGGED CHAINAGE	34.448	38.000 40.000	60.000	77.100 78.000 80.000	100.000	118.000 120.231	140.000	160.000	180.000 181.352					
SHIFT HORIZONTAL				73.557	46.675 L 100 R	120.232								

URLIUP ROAD LONG SECTION AT ROAD #1 INTERSECTION

VERTICAL 1:250 @ A1 0 5 10 15 20 25M
HORIZONTAL 1:250 @ A1 0 5 10 15 20 25M

VERTICAL 1:50 @ A1 0 1 2 3 4 5M
HORIZONTAL 1:500 @ A1 0 10 20 30 40 50M

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CLIENT
JACKSON INTERNATIONAL PTY LTD

PROJECT
LOTS 2 & 3
BILAMBIL ROAD
BILAMBIL

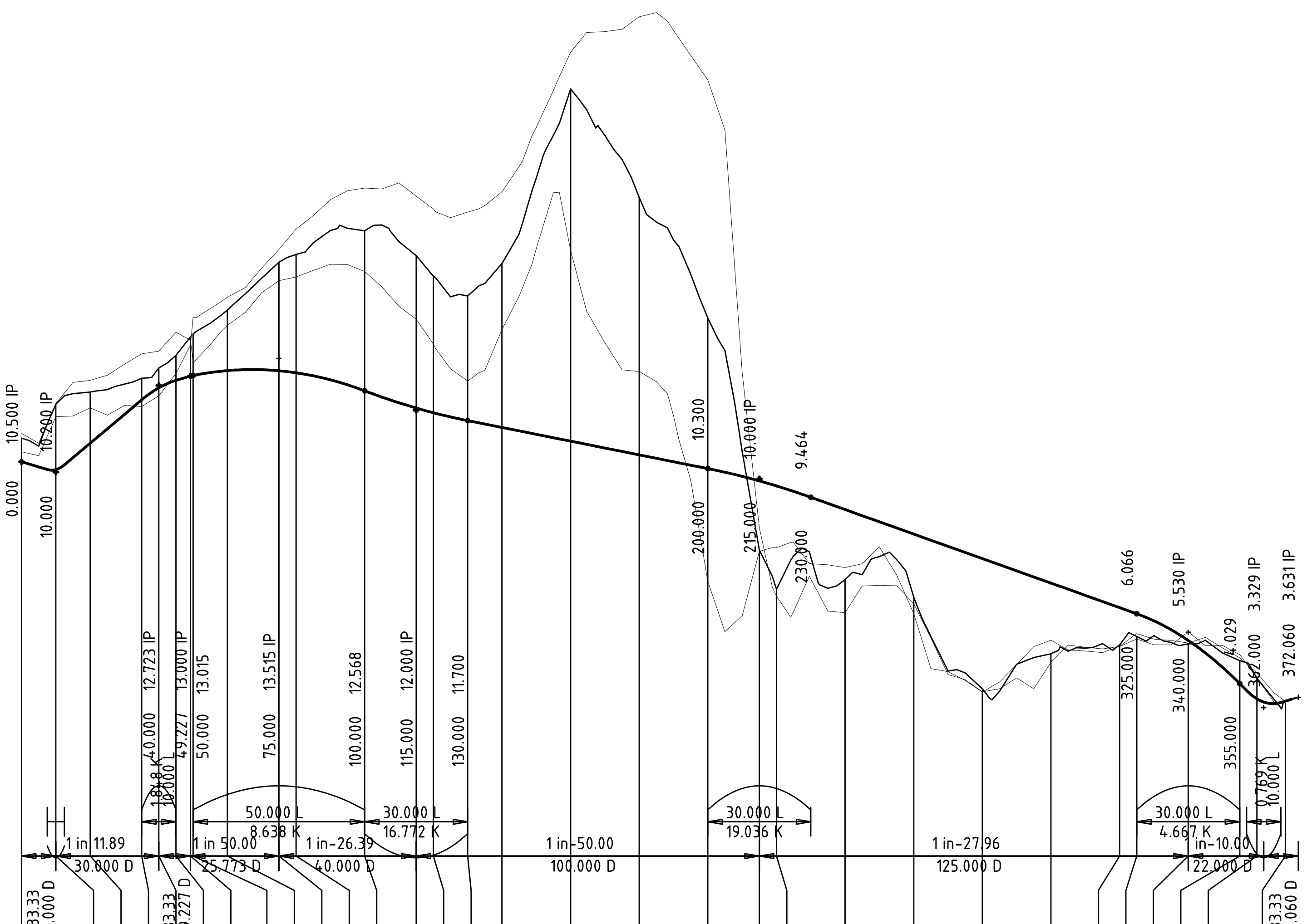
ASSOCIATED CONSULTANTS
-

PROPERTY DESCRIPTION	LOTS 2 & 3 DP244652
UBD REF.	
DESIGNED	CBL
DRAWN	ACAD
REVIEWED	CBL
DATE	15 JUNE 2008
APPROVED	FIEAust CPEng RPEQ 4293

REV.	DESCRIPTION	BY	DATE	APPR'D
D	TSC REQ'S	CBL	20/05/09	CBL
C	REV LAYOUT	CBL	15/03/09	CBL
B	DA SUBMISSION	CBL	4/08/08	CBL
A	DA PROPOSAL	CBL	14/06/08	CBL

NAME
EARTHWORKS
CROSS SECTIONS
SHEET 2 OF 2

PROJECT REF.	DRAWING NO.	REVISION
08418	005	D



DATUM R.L. -3.0

PEGGED CHAINAGE	FRONT OF KERB LEVELS LHS	FRONT OF KERB LEVELS RHS	CUT	FILL	PAVEMENT LEVELS	SURFACE LEVELS
0.000	10.401	10.401	0.687		10.500	11.187
7.500	12.177	12.177	1.326		10.275	11.600
8.815	12.177	12.177	1.648		10.255	11.904
10.000	10.172	10.172	1.906		10.271	12.177
20.000	10.942	10.942	1.492		11.041	12.533
35.000	12.204	12.204	0.631		12.303	12.934
40.000	12.557	12.557	0.581		12.656	13.236
45.000	12.774	12.774	0.731		12.873	13.605
49.226	12.901	12.901	1.142		13.000	14.141
49.227					13.000	
50.000	12.916	12.916	1.208		13.015	14.224
60.000	13.059	13.059	1.765		13.158	14.923
75.000	13.055	13.055	3.163		13.154	16.316
80.000	12.995	12.995	3.452		13.094	16.547
100.000	12.469	12.469	4.667		12.568	17.235
115.000	11.968	11.968	4.443		12.067	16.511
120.000	11.831	11.831	3.979		11.930	15.909
130.000	11.601	11.601	3.635		11.700	15.336
140.000	11.401	11.401	4.780		11.500	16.281
160.000	11.001	11.001	10.270		11.100	21.370
180.000	10.601	10.601	7.508		10.700	18.209
200.000	10.201	10.201	4.395		10.300	14.695
215.000	9.842	9.842		2.014	9.941	7.927
220.000	9.696	9.696		3.011	9.795	6.783
240.000	9.007	9.007		2.044	9.106	7.063
260.000	8.292	8.292		1.843	8.391	6.548
280.000	7.577	7.577		3.797	7.676	3.878
300.000	6.861	6.861		2.061	6.960	4.900
320.000	6.146	6.146		1.088	6.245	5.157
325.000	5.967	5.967		0.662	6.066	5.404
340.000	5.190	5.190		0.098	5.289	5.190
355.000	3.930	3.930	0.672		4.029	4.702
360.000	3.489	3.489	0.601		3.588	4.189
362.000					3.492	
364.693	3.572	3.572	0.165		3.445	3.610
368.294	3.419	3.419		0.012	3.518	3.507
370.000					3.569	3.591
372.060						3.631

EARTHWORKS QUANTITIES

CUT	159	358	307	62	67	71	16	302	865	451	3129	3465	334	563	2248	8535	8877	9292	5989	0	0	0	0	0	0	0	6	110	61	44	
FILL	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	1	0	314	849	280	1357	953	2091	1653	676	86	105	0	0	2	0

SHIFT HORIZONTAL: 0.000 | 49.227 L | 49.227 | 50.891 | 1.664 L | 25 R | 14.366 L | 65.257 | 55.337 L | 120.594 | 25.423 L | 25 R | 146.017 | 25 R | 15.908 L | 164.661 | 23.543 L | 188.204 | 25 R | 6.828 L | 195.032 | 23.736 L | 218.768 | 200 R | 10.800 L | 229.568 | 142.492 L | 372.060

VERTICAL 1:100 @ A1 — 0.0 2.0 4.0 6.0 8.0 10.0M

HORIZONTAL 1:1,000 @ A1 — 0 20 40 60 80 100M

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CLIENT: JACKSON INTERNATIONAL PTY LTD

PROJECT: LOTS 2 & 3 BILAMBIL ROAD BILAMBIL

ASSOCIATED CONSULTANTS: -

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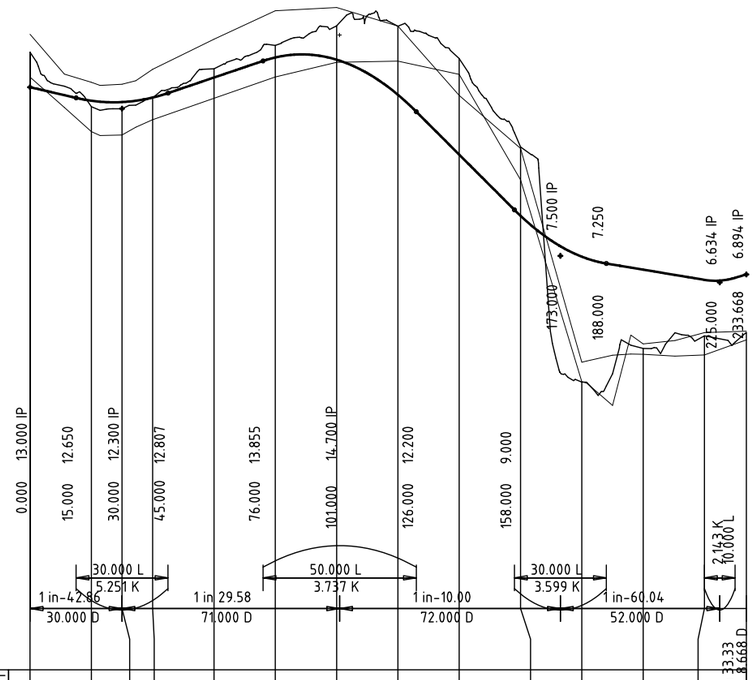
NAME: ROAD #1 LONGITUDINAL SECTION

PROJECT REF.	DRAWING NO.	REVISION
08418	006	C



DATUM R.L. -6.0

EARTHWORKS QUANTITIES	CUT		181	19	36	168	267	372	585	901	939	88	0	0	0	
	FILL		49	101	67	97	96	46	0	0	0	385	1627	1178	710	
FRONT OF KERB LEVELS	LHS	12.901	12.458	12.296	12.415	12.563	13.215	13.870	13.796	12.653	10.701	11.049 / 8.707	7.373	3.655	6.951	6.618 / 5.005
	RHS	12.901	12.458	12.296	12.415	12.563	13.215	13.870	13.796	12.653	10.701	11.049 / 8.707	7.373	3.655	6.951	6.618 / 5.005
CUT		1.141					0.285	0.393	1.105	2.236	3.132	2.515 / 2.243				
FILL			0.196	0.211	0.218	0.009							4.090	3.993	2.570	1.827 / 2.100
PAVEMENT LEVELS		13.000	12.557	12.507	12.514	12.662	13.314	13.969	13.895 / 13.864	12.752	10.800	9.000 / 8.806	7.813 / 7.472	7.250	7.050	6.717 / 6.692 / 6.784
SURFACE LEVELS		14.141	12.361	12.297	12.296	12.653	13.600	14.362	15.001	14.988	13.931	11.515 / 11.049	3.383	3.257	4.480	4.890 / 4.683 / 5.005
PEGGED CHAINAGE		0.000	11.211 L / 20.000	27.251	30.000	40.000	60.000	80.000	100.000 / 101.000	120.000	140.000	158.000 / 160.000	173.000	180.000	188.000	200.000 / 220.000 / 225.000 / 230.000 / 233.668
SHIFT HORIZONTAL		0.000	11.211 / 23.263 L / 15 R		34.474				147.087 L				181.561 / 28.821 L / 25 R		210.382 / 23.286 L	233.668

VERTICAL 1:100 @ A1 — 0.0 2.0 4.0 6.0 8.0 10.0M

HORIZONTAL 1:1,000 @ A1 — 0 20 40 60 80 100M

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NAME
ROAD #2
LONGITUDINAL SECTIONS

PROJECT REF.	DRAWING NO.	REVISION
08418	007	C

LEGEND

SILT FENCING

VEHICLE SHAKEDOWN

SEDIMENTATION POND

Sedimentation and Erosion Control

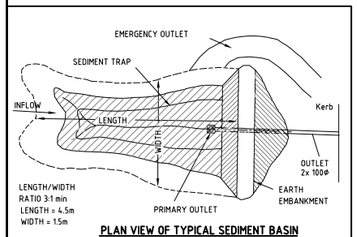
1. Sedimentation and erosion control implementation and maintenance shall be in accordance with Byron Shire Council's Development Manual as read in conjunction with the document titles "Environmental Best Management Practices". The Contractor shall make himself aware of the prevailing weather conditions and shall take all necessary precautions to secure the site at the completion of each day's work, and whenever else is considered necessary.
2. Sediment and erosion control measures shall be provided as required to prevent the movement of dust and/or silt from the site.
3. Sediment and erosion control measures shall be installed downstream of any work area prior to the commencement of work in that area.
4. Erosion and sedimentation control measures shall be installed prior to the disturbance of the site and as required during the course of the works.
5. Topsoil shall be stripped in accordance with the specification and stockpiles at locations as agreed by the superintendent and Council's designated representative.
6. All disturbed areas shall be stabilised with the provision of 75mm minimum topsoil and grass seeded, mulched, re-vegetated etc within 7 days of the completion of final allotment earthworks.
7. All sediment control measures and devices shall be inspected for structural damage after each rainfall event and at the completion of each days work. All trapped sediment shall be removed to an approved location on site for re-use on site or for subsequent removal from the site. Site disposal will only be approved when it can be established that no additional erosion can occur.
8. Sediment and erosion control measures around stockpiles shall include but not necessarily be limited to:-

a) Provision of a silt fence below the stockpile, as indicated by the natural slopes of the land,
b) Provision of grass cover if stockpile is to remain in place for more that 30 days,
c) Provision of a surface emulsion or approved equivalent to prevent wind erosion.
d) Diversion of runoff around stockpiles.

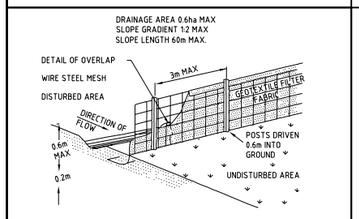
9. Place 600mm width turf at both top and toes of retaining walls and tops of new kerb.
10. Water areas of construction regularly as required to obviate potential for dust nuisance to adjoining properties and the site generally.
11. Contractor to be responsible for removal of silt that is washed onto Council or private property. from subject site.
12. Contractor to make provision for containment of waste materials on site including waste oils etc from machinery servicing.
13. Contractor to be responsible for tyhe control of dust at all times including weekends and holidays.

Construction Traffic Shakedown

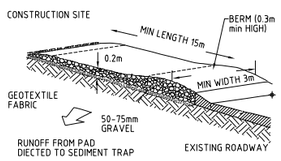
Provide construction traffic shake down device at all relevant site exit points. Clean out and maintain shake down device regularly to ensure efficient operation.



PLAN VIEW OF TYPICAL SEDIMENT BASIN



SEDIMENT FENCE



TEMPORARY CONSTRUCTION EXIT

	Prior to the Commencement of Works		
a	Submission of a copy of the Contractor's Program for the Works.	Contractor	Prior to the Pre-Start Meeting
b	Submit program for the implementation and monitoring (inspection type) of the specified sedimentation control measures for approval.	Contractor Superintendent /Council	Prior to the Pre-Start Meeting
c	Approve submitted program		Pre-Start Meeting
	During Construction		
a	Install sedimentation and control measures (measures)	Contractor	Prior to the commencement of works necessitating the measures
b	Approval of the Measures as constructed	Superintendent	Prior to the commencement of works necessitating the measures
c	Periodic inspection of the measures	Contractor Superintendent	Daily and after rainfall event At least weekly and/or in conjunction with other required inspections
d	Rectification of issues identified by periodic inspection	Contractor	Immediately
e	Inspection of adjacent roads and drains	Contractor	Daily and after rainfall event
	On Maintenance		
a	Submit program for the continued maintenance of the works during the "On Maintenance" period.	Contractor	Prior to On Maintenance inspection.
b	Approve submitted program	Superintendent in conjunction with Council	Prior to On Maintenance inspection.
c	Install/maintain sedimentation and erosion control measures		
	Installation	Contractor	Prior to On Maintenance inspection.
	Off Maintenance	Contractor	During On Maintenance Period
d	Approval of Measures as implemented	Superintendent in conjunction with Council	At On Maintenance Inspection
e	Routine inspection of implemented measures (including adjacent road network)	Contractor Superintendent	Weekly, and after each rainfall event As requested by the Contractor
f	Rectification/Reinstatement of sediment and erosion control measures	Contractor	As soon as practicably possibly (24 hours max)
	Off Maintenance		
g	Removal of Erosion and sedimentation Control Measures	Contractor	As directed by the Superintendent

SEWER RETICULATION

STORMWATER DRAINAGE

ROOFWATER DRAINAGE

PROPOSED ALLOTMENTS

ROAD PAVEMENTS

ROAD VERGE

PUBLIC OPEN SPACE

SEWAGE PUMP STATION

1:1,000 @ A1

0 20 40 60 80 100M

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NAME
WATER QUALITY MANAGEMENT CONSTRUCTION PHASE

PROJECT REF.	DRAWING NO.	REVISION
08418	008	D

CONSTRUCTION MANAGEMENT PLAN

1. TEMPORARY LOCKABLE 1.8M CHAIN MESH FENCE TO BE ERECTED AS SHOWN.
2. NOTICEBOARD SHOWING CONTACT DETAILS OF CONTRACTOR TO BE ERECTED NEAR CONSTRUCTION ENTRANCE. MUST BE VISIBLE FROM STREET.
3. ALL WORKERS TO PARK VEHICLES ON SITE WHERE POSSIBLE.
4. WATER SPRAYING OF DUST TO BE UNDERTAKEN AS REQUIRED.
5. INSTALL CONSTRUCTION ENTRANCE/EXITS ON SITE AS SHOWN ABOVE AND ON SEDIMENT AND EROSION CONTROL PLAN.
6. ALL WORKS TO BE CARRIED OUT BETWEEN 6:00AM AND 6:00PM MONDAY TO SATURDAY.
7. ALL SUITABLE EXCAVATED MATERIAL TO BE REUSED ON SITE.
8. CONSTRUCTION SKIPS TO BE PROVIDED ON SITE FOR BUILDERS' RUBBISH. TO BE EMPTIED AS REQUIRED.
9. NO HAZARDOUS OR DANGEROUS MATERIALS TO BE KEPT ON SITE.
10. ALL DELIVERIES TO BE STAGED TO AVOID CONGESTION ON PUBLIC ROADS.
11. PEDESTRIAN DETOUR TO TAKE PLACE AT ALL TIMES WHEN WORKS ARE BEING UNDERTAKEN ON PUBLIC ROAD. ARRANGE PRE-START MEETING WITH COUNCIL TO ENSURE COMPLIANCE WITH COUNCIL REQUIREMENTS.

PEDESTRIAN DETOUR

1. DIRECTION OF DETOUR TO BE CLEARLY MARKED TO PEDESTRIANS.
2. DETOUR TO BE MINIMUM 1.5M WIDE, 2.0M PREFERABLE.
3. CLEAR ALL DEBRIS FROM PEDESTRAIN PATH, MAKE GROUND FIRM AND LEVEL, ADD GRAVEL AND WHEEL ROLL AS REQUIRED.
4. ERECT CONSTRUCTION FENCING TO BOTH SIDES OF DETOUR WITHIN SUBJECT SITE.
5. ARRANGE INSPECTION WITH PARKS DEPARTMENT OF COUNCIL PRIOR TO DIVERSION OF PEDESTRIAN FLOW.
6. RESTORE ALL AREAS OUTSIDE SUBJECT SITE TO PREDEVELOPMENT CONDITION TO THE SATISFACTION OF COUNCIL.

1:500 @ A1 0 10 20 30 40 50M

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CONSTRUCTION MANAGEMENT PLAN

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