

1 2 3 4 5 6 7 8

A

B

C

D

E

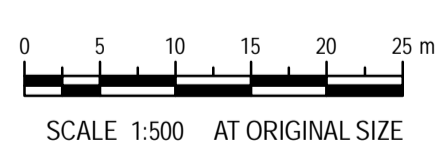
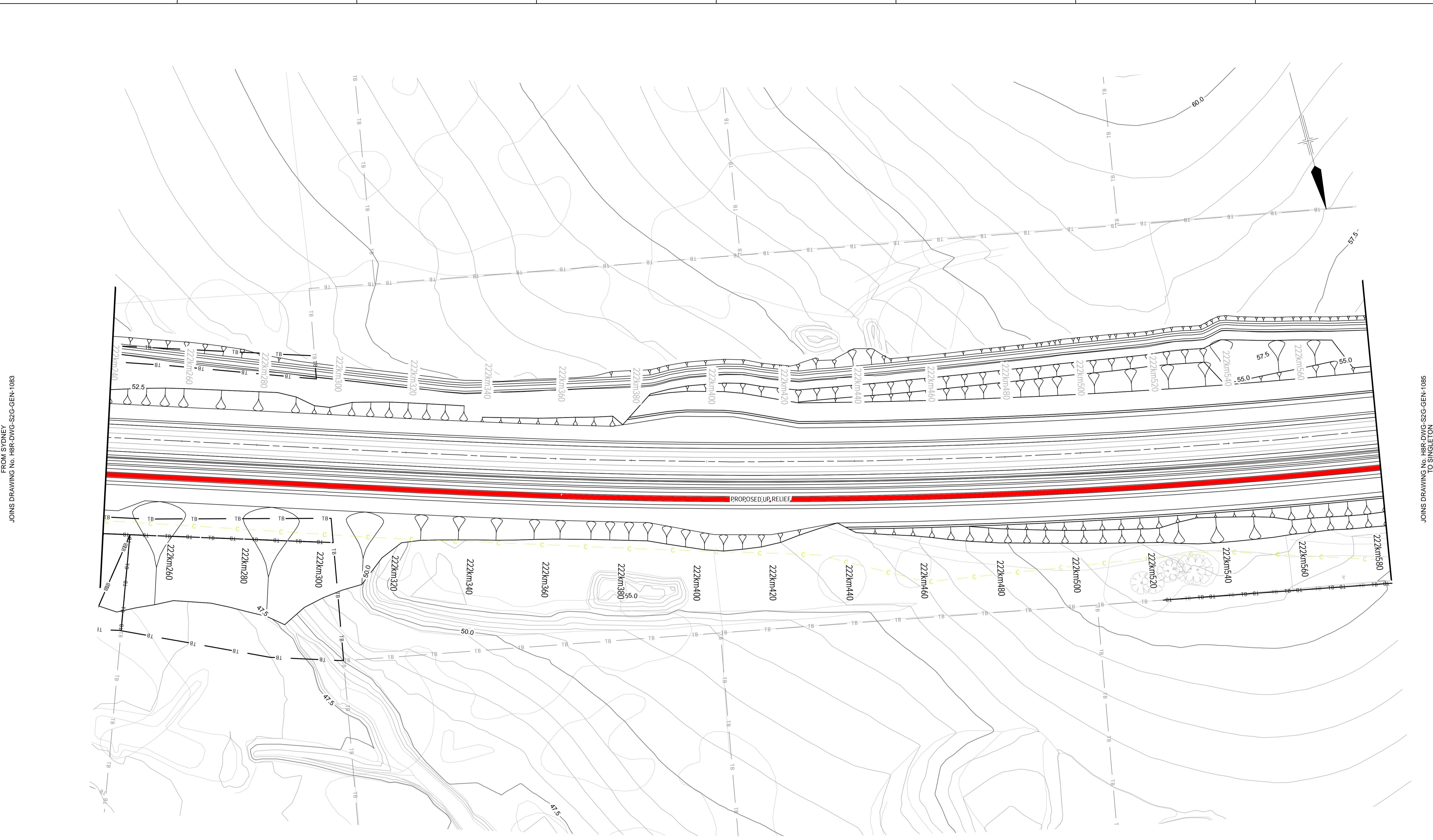
A

B

C

D

E



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ARTC APPROVAL					
Approved By					
Signed:					
Approval Date					
Rev	Date	Revision Description	Drawn	Checked	Approved
B	16.02.10	ISSUED FOR COMMENT	G.M.		
A	10.02.10	ISSUED FOR COMMENT	T.M.		

Designing Company: GHD GHD Job Number: 22-14471	Address: Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia T 61 2 4979 9999 F 61 2 4979 9988 E rtm@mail@ghd.com W www.ghd.com
Drawn T.MORTON	Designed R.STEPHENS
Drafting Check	Design Check
Approved	Date

H8R DWG NUMBER **9B**

H8R-DWG-S2G-GEN-1084

MAITLAND TO MINIMBAH - THIRD TRACK
DETAIL PLAN
CH222km240 TO CH222km580

Sheet No.
84 OF 89

Scale (A1):
1:500

1 2 3 4 5 6 7 8

PLOT DATE: 18/02/2010 10:58AM GHD FILEPATH: \\HTRS\01\GHD_Drawing\22\14471\GIS\Map\General Arrangements\H8R-DWG-S2G-GEN-1083_A1_Mapbook_20100211_A.mxd

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A

B

C

D

E

A

B

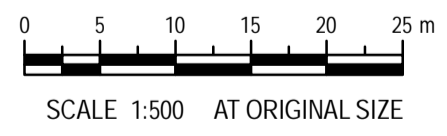
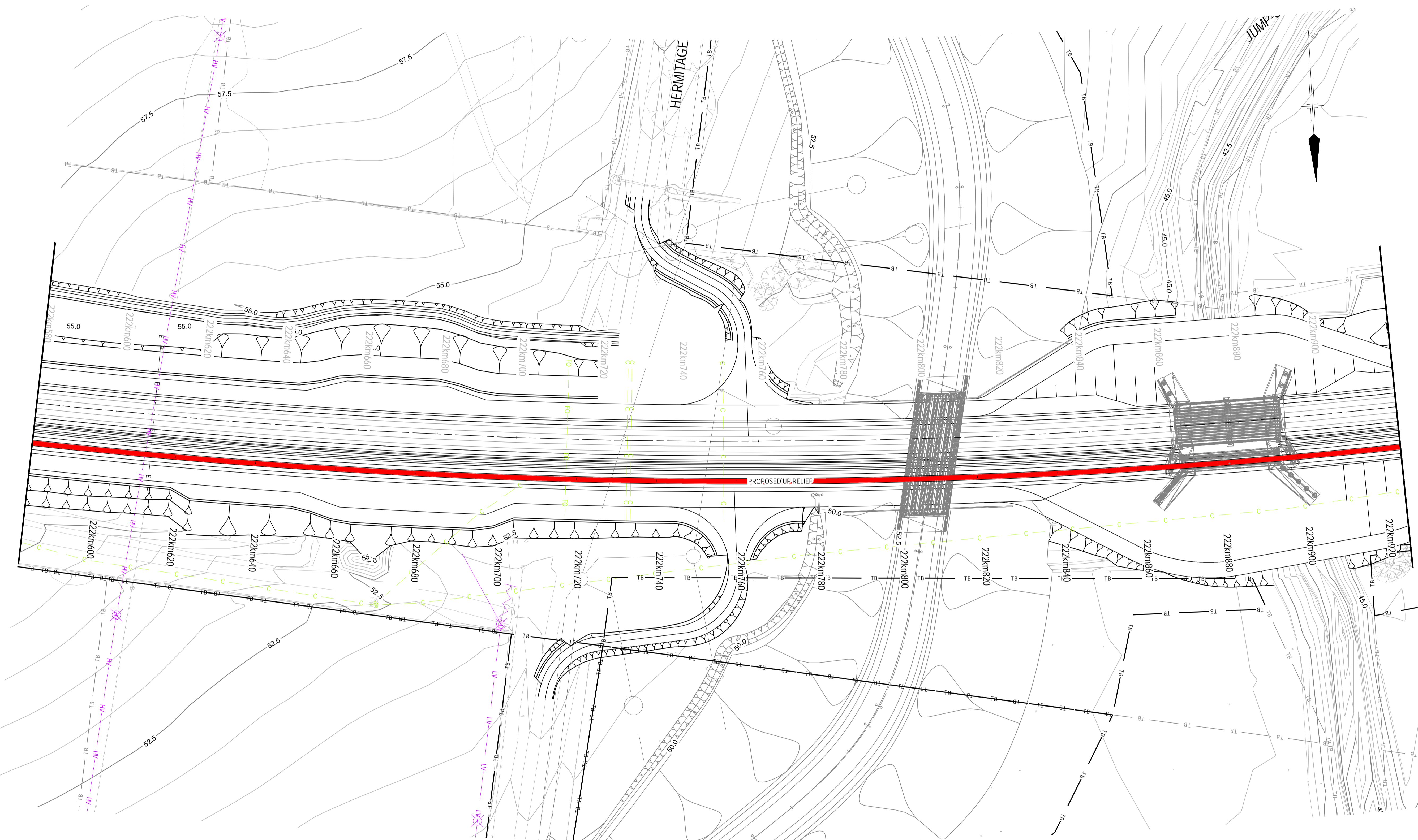
C

D

E

FROM SYDNEY
JOINS DRAWING No. H8R-DWG-S2G-GEN-1084

JOINS DRAWING No. H8R-DWG-S2G-GEN-1086
TO SINGLETON



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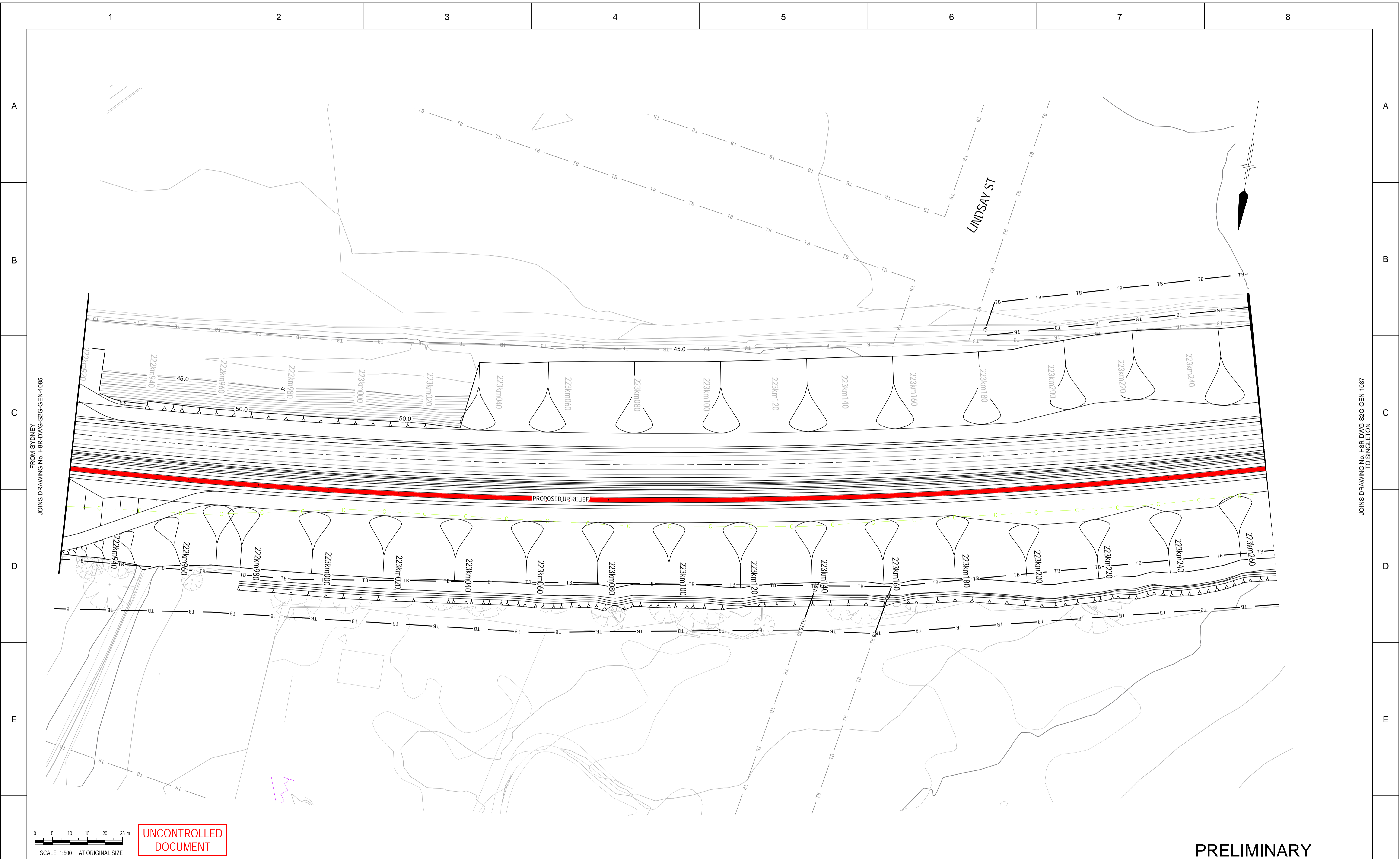
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Signed:					
Rev	Date	Revision Description	Drawn	Checked	Approved
B	16.02.10	ISSUED FOR COMMENT	G.M.		
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	H8R DWG NUMBER 9 B	H8R-DWG-S2G-GEN-1085	Sheet No. 85 OF 89
	MAITLAND TO MINIMBAH - THIRD TRACK DETAIL PLAN CH222km580 TO CH222km920		Scale (A1): 1:500

PLOT DATE: 18/02/2010 10:58AM
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1 2 3 4 5 6 7 8



0 5 10 15 20 25 m
SCALE 1:500 AT ORIGINAL SIZE

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GHD Job Number:	22-14471	Drawn:	T.MORTON
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H8R-DWG-S2G-GEN-1086

Sheet No. 86 OF 89
Scale (A1): 1:500

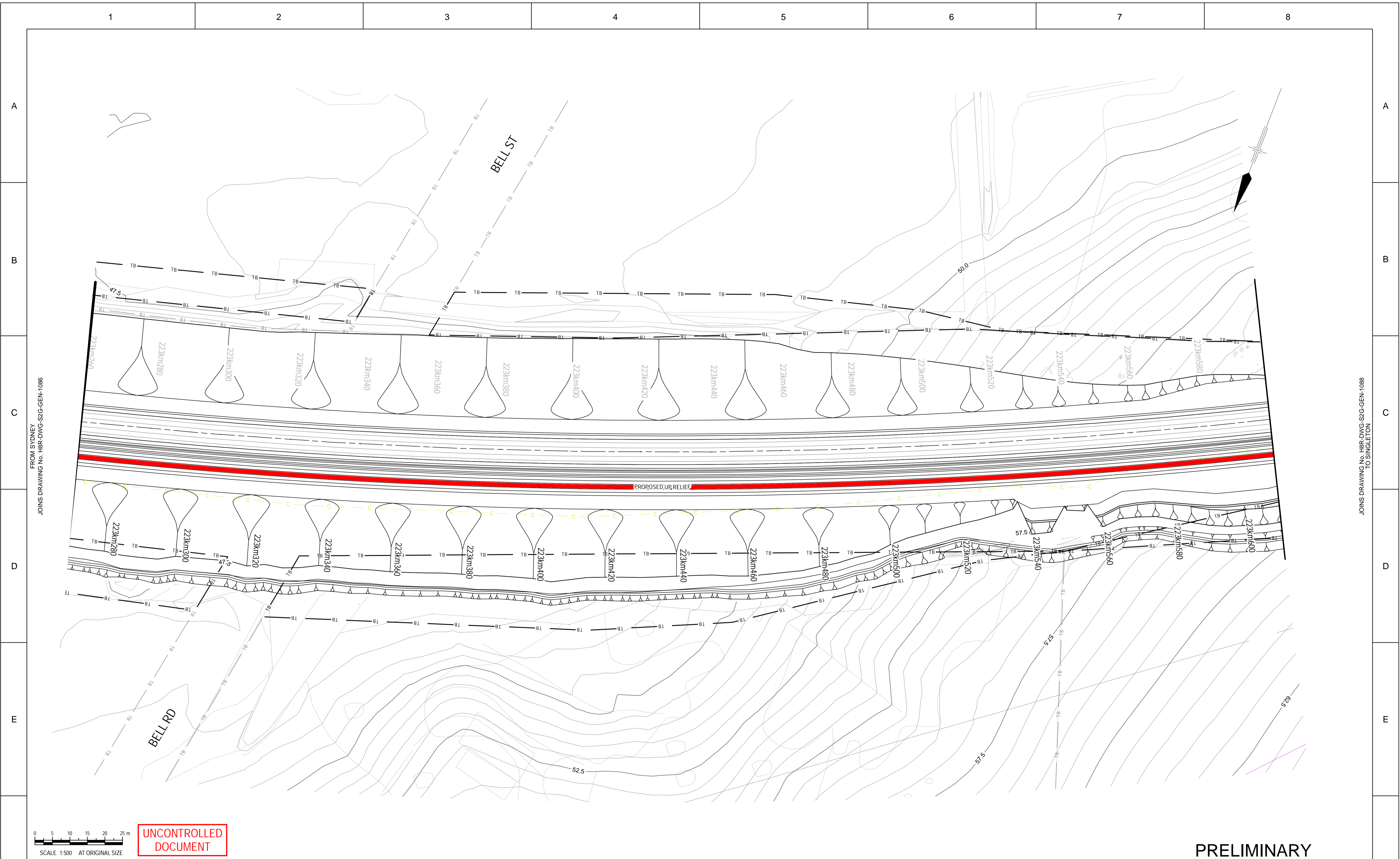
Hunter 8 ALLIANCE

MAITLAND TO MINIMBAH - THIRD TRACK
DETAIL PLAN
CH222km920 TO CH223km260

PLOT DATE: 18/02/2010 10:58AM
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FROM SYDNEY
JOINS DRAWING No. H8R-DWG-S2G-GEN-1085

TO SINGLETON
JOINS DRAWING No. H8R-DWG-S2G-GEN-1087



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B	16.02.10	ISSUED FOR COMMENT	G.M.
A	10.02.10	ISSUED FOR COMMENT	T.M.

Designing Company:
 GHD
 GHD Job Number:
 22-14471

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Drawn:
 T.MORTON

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 R.STEPHENS

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H8R-DWG-S2G-GEN-1087

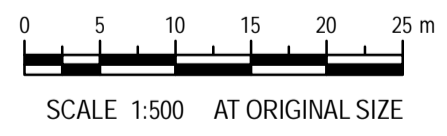
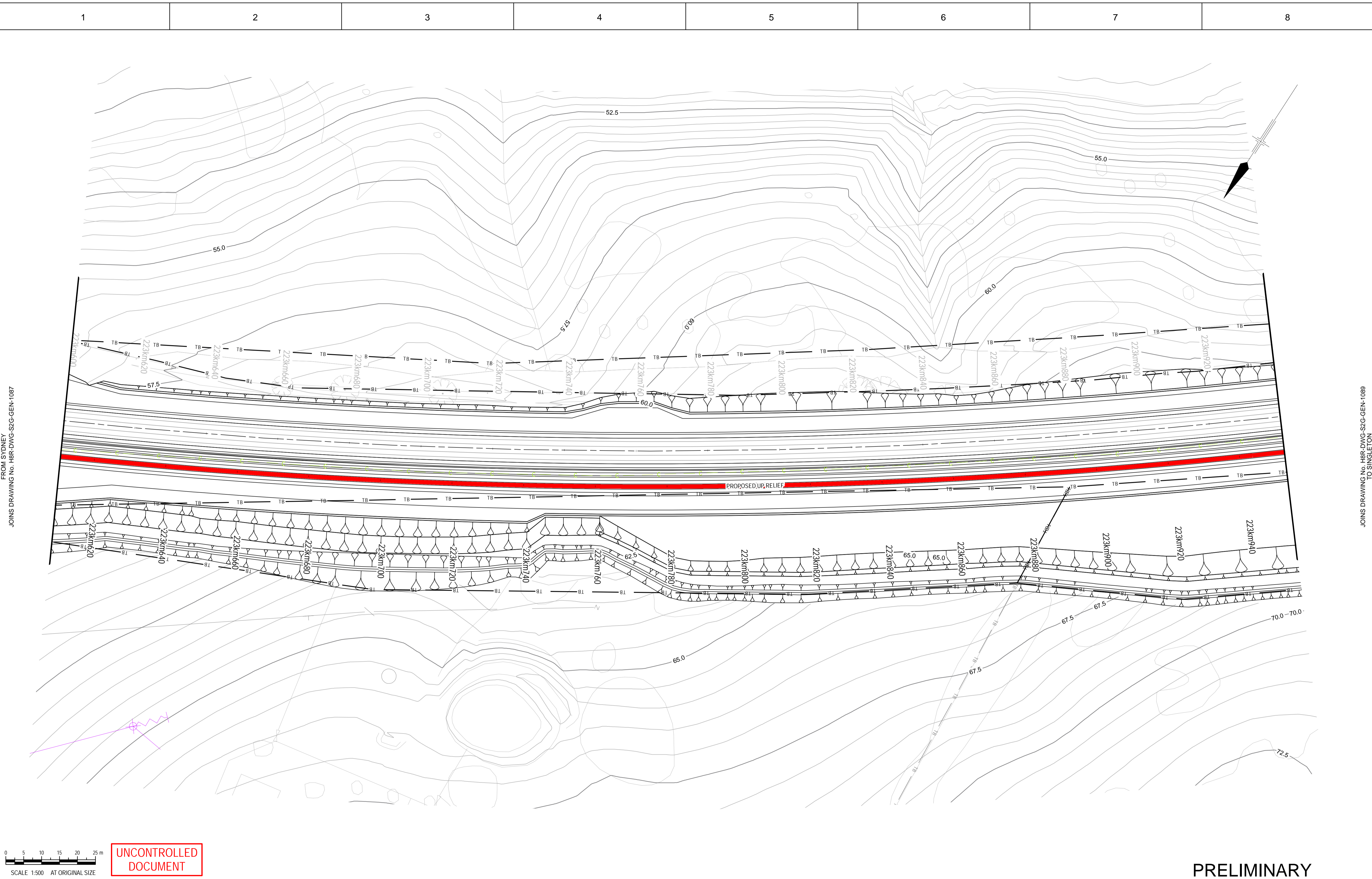
MAITLAND TO MINIMBAH - THIRD TRACK
 DETAIL PLAN
 CH223km260 TO CH223km600

Sheet No.
87 OF 89
 Scale (A1):
 1:500

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FROM SYDNEY
 JOINS DRAWING No. H8R-DWG-S2G-GEN-1086

TO SINGLETON
 JOINS DRAWING No. H8R-DWG-S2G-GEN-1088



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Rev	Date	Revision Description	Drawn	Checked	Approved
B	16.02.10	ISSUED FOR COMMENT	G.M.		
A	10.02.10	ISSUED FOR COMMENT	T.M.		

Designing Company:
 GHD
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 22-14471

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Designed:
 R.STEPHENS

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H8R-DWG-S2G-GEN-1088

MAITLAND TO MINIMBAH - THIRD TRACK
 DETAIL PLAN
 CH223km600 TO CH223km940

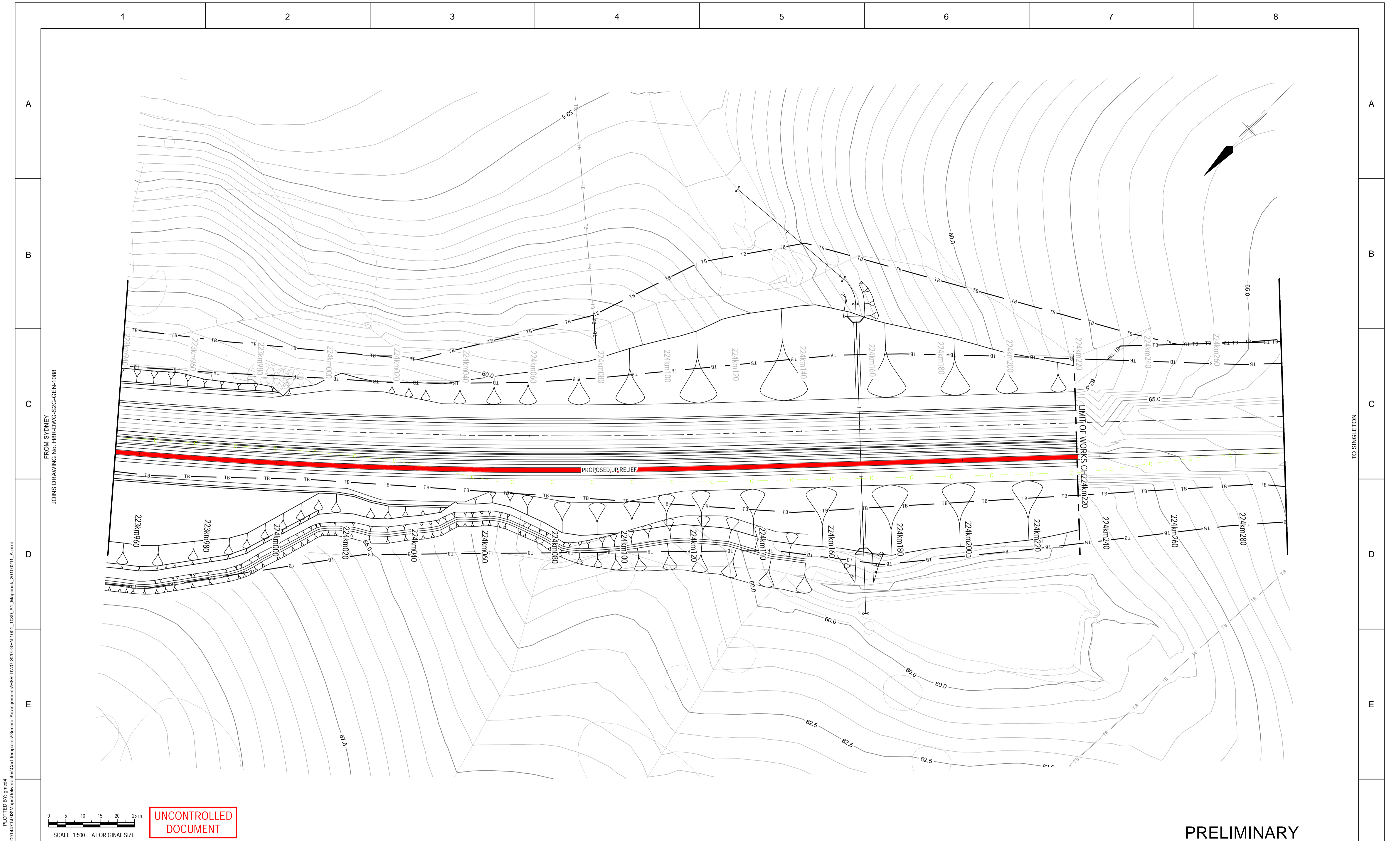
Sheet No.
88 OF 89

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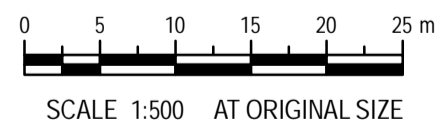
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 JOINS DRAWING No. H8R-DWG-S2G-GEN-1087

TO SINGLETON
 JOINS DRAWING No. H8R-DWG-S2G-GEN-1080



FROM SYDNEY
JOINS DRAWING No. H8R-DWG-S2G-GEN-1088

TO SINGLETON



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	A	10.02.10	ISSUED FOR COMMENT	T.M.			

Designing Company:
GHD
GHD Job Number:
22-14471

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Drawn
T.MORTON

Designed
R.STEPHENS

Design Check

Approved

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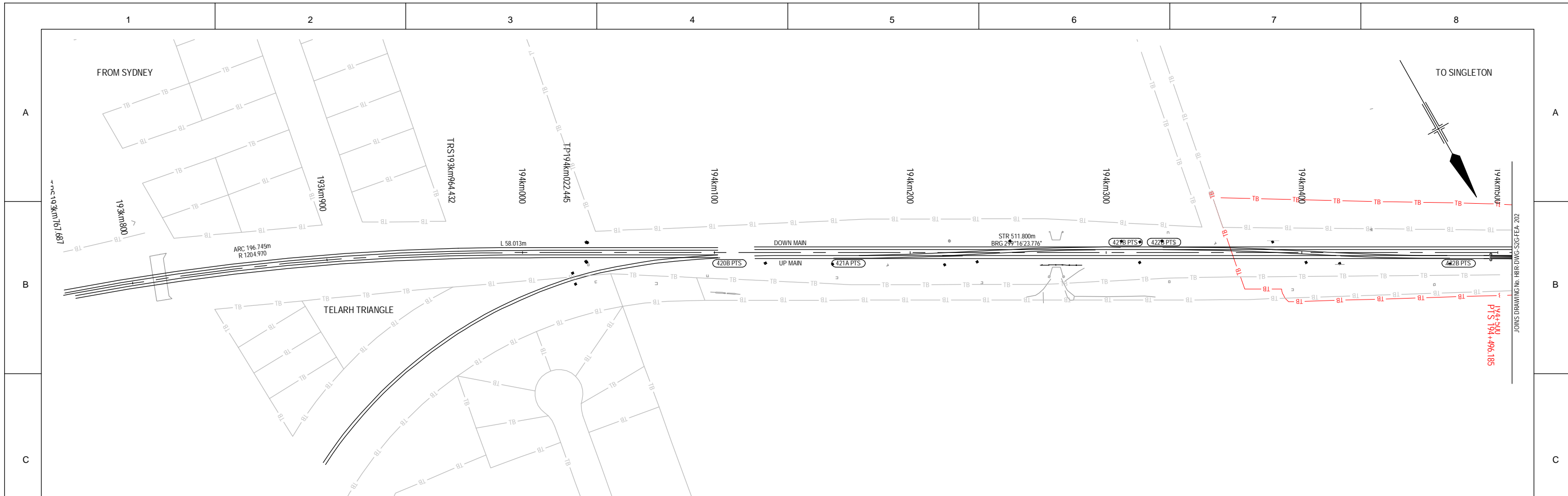
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MAITLAND TO MINIMBAH - THIRD TRACK
DETAIL PLAN
CH223km940 TO CH224km280

Sheet No.
89 OF 89

Scale (A1):
1:500

PLOT DATE: 18/02/2010 10:58AM
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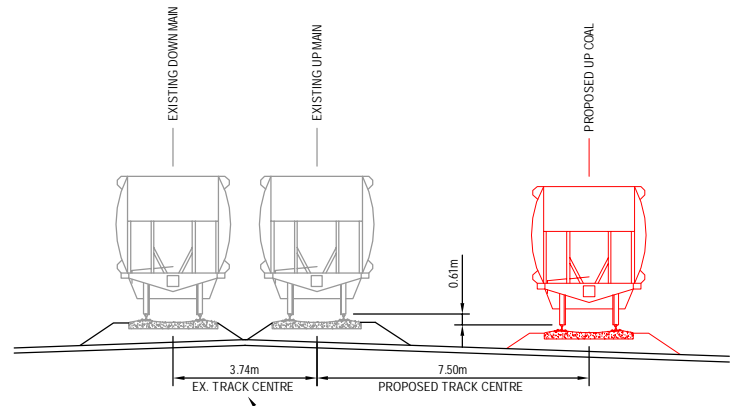
PLAN
SCALE 1:1000

LEGEND:

- PROPOSED TRACK ALIGNMENT - UP RELIEF
- PROPOSED TRACK ALIGNMENT - DOWN MAIN
- PROPOSED TRACK RE-ALIGNMENT - UP MAIN & DOWN MAIN
- PROPOSED TRACK SLEW - 300mm TO 0mm PULLS
- EXISTING TRACK ALIGNMENT
- = = = = = EXISTING TRACK TO BE REMOVED
- - - - - PROPOSED CADASTRAL BOUNDARY
- - - - - EXISTING CADASTRAL BOUNDARY

NOTES:

1. PROPOSED TRACKWORK TO BE CONSTRUCTED AND MAINTAINED TO MINIMUM 1XC STANDARD.
2. MAINLINE TRACK ALIGNMENT DATA SUPPLIED BY ARTC.
3. METRAGE ORIGIN ADOPTED AT TP 192+824.106km BASED ON ARTC MAINTENANCE ALIGNMENT.
4. PROPOSED VOSSLOH COGIFER 1200:18.5 TURNOUTS HAVE BEEN ADOPTED THROUGHOUT.
5. NORTH POINT RELATES TO ISG SYSTEM.
6. PROPOSED TRACK ALIGNMENT DESIGN BASED ON NORMAL DESIGN LIMITS.
7. MAINLINE DESIGN SPEED 115km/h XPT 130km/h UNLESS SHOWN OTHERWISE.
8. FREIGHT DESIGN SPEED 80km/h.
9. THE PROPOSED UP RELIEF HAS BEEN DESIGN IN ACCORDANCE WITH ARTC SPEED TRACE FOR LOAD COAL TRAINS.



TYPICAL SECTION - FUTURE TRACK CENTRES UP SIDE
SCALE 1:100



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ARTC APPROVAL		Approved By			
Signed:					
Rev	Date	Revision Description	Drawn	Checked	Apprv.
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471
Drawn:
P.TOBIN
Drilling Check:
H.JENNINGS*
Approved:
Date:

Address:
Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
P 61 2 4941 2706
W www.hunter8alliance.com.au

Designed:
V.ALEX / P.TOBIN
Design Check:
S.KING*

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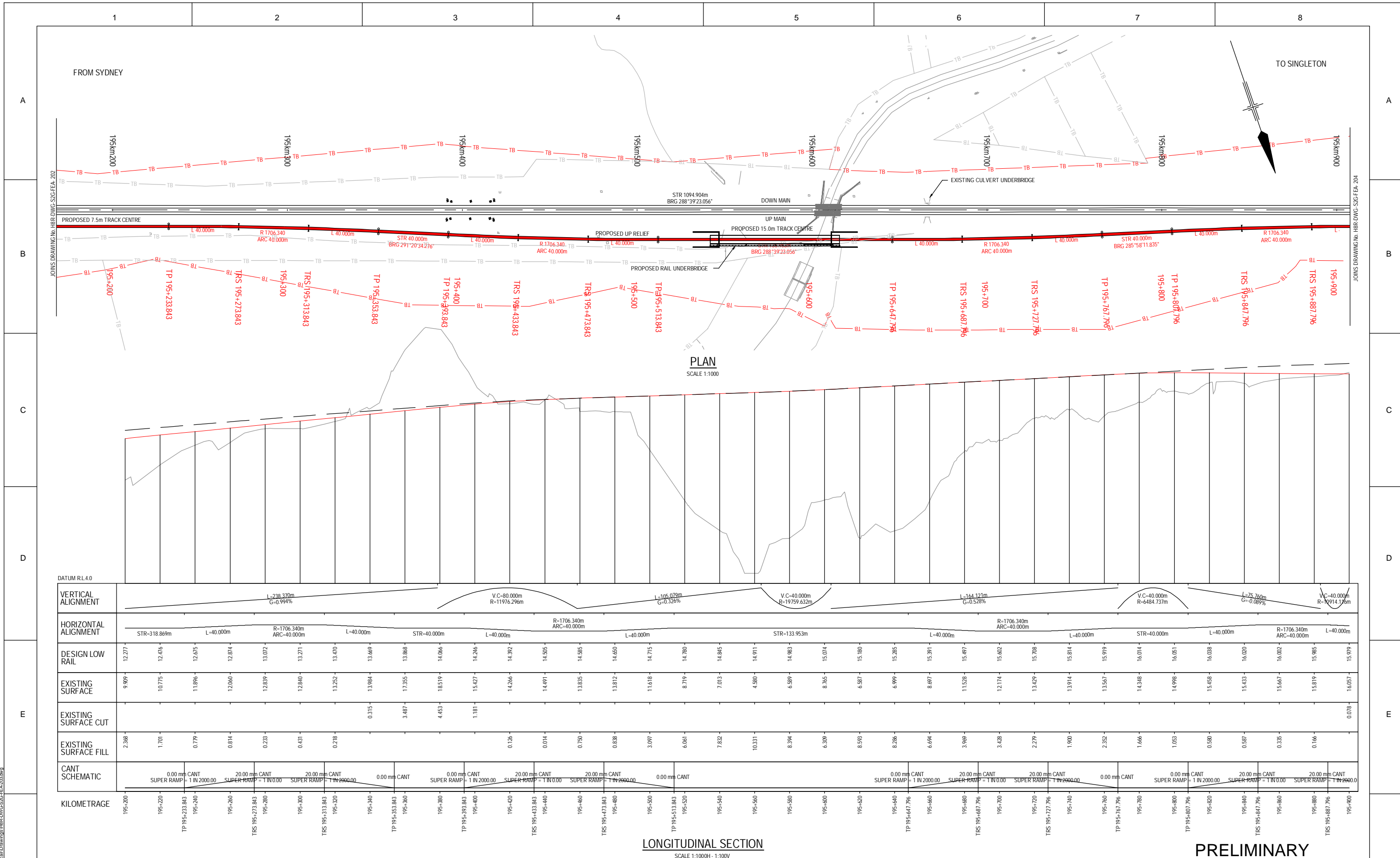
Hunter 8 ALLIANCE

H8R-DWG-S2G-FEA-201

MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL

Sheet No. 1 of 44
Scale (A1): 1:1000 - 1:100

PLOT DATE: 08 February 2010 1:55 PM PLOTTED BY: PT091
GHD FILE PATH: G:\2010\4471\GADD\H8R\DWG\S2G-FEA-201.dwg



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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A	19.06.09	ISSUED FOR CLIENT REVIEW		PT	SK*
Rev	Date	Revision Description		Drawn	Checked
					Approv.

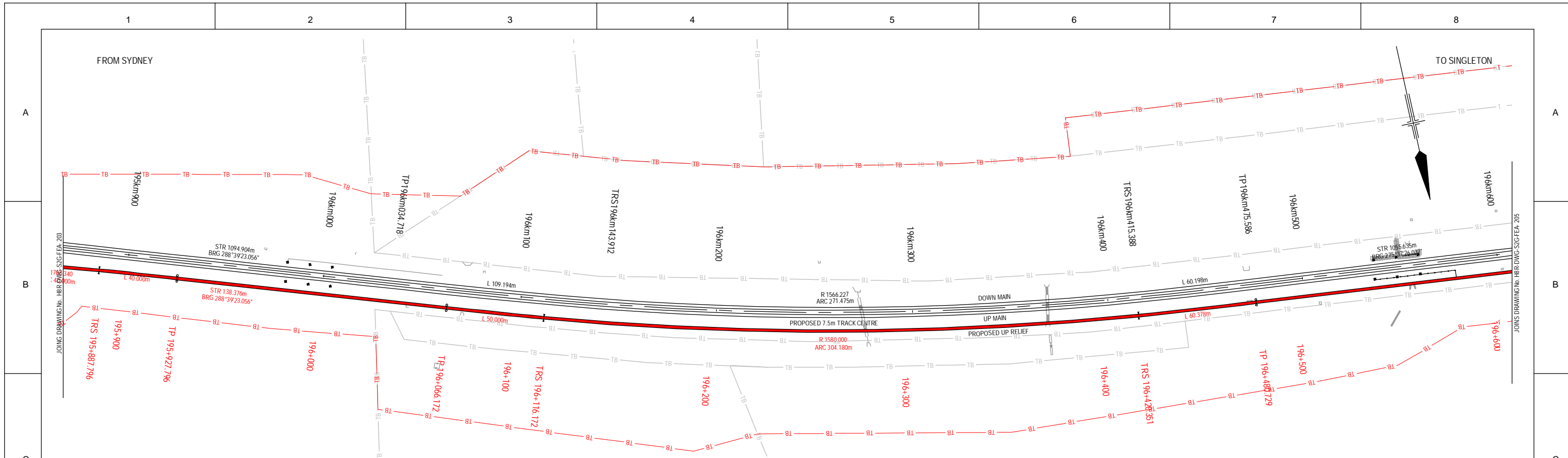
Designing Company:
GHD
GHD Job Number:
22-14471
Drawn:
P.TOBIN
Drilling Check:
H.JENNINGS*
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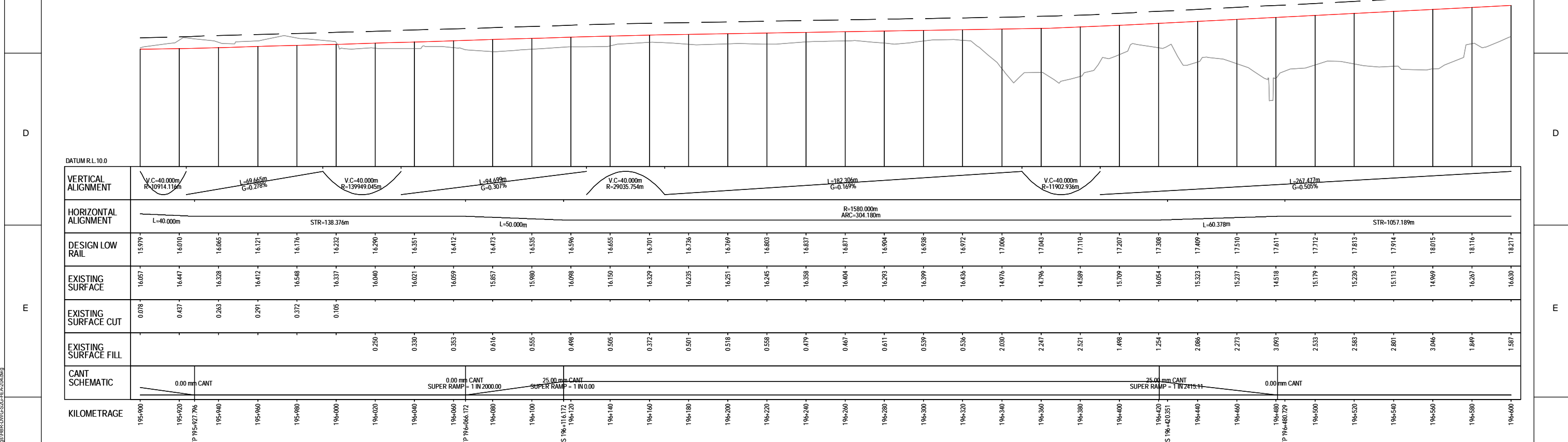


H8R DWG NUMBER: **A/B**
H8R-DWG-S2G-FEA-203
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL
Sheet No.
3 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 26 February 2010 1:55 PM PLOTTED BY: PT091
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PLAN
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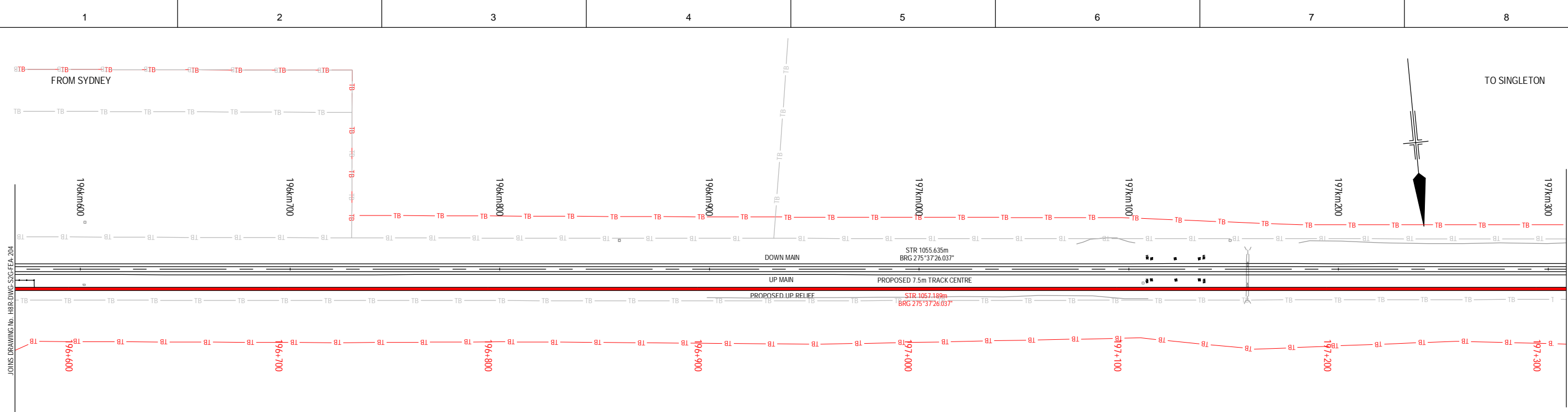


LONGITUDINAL SECTION
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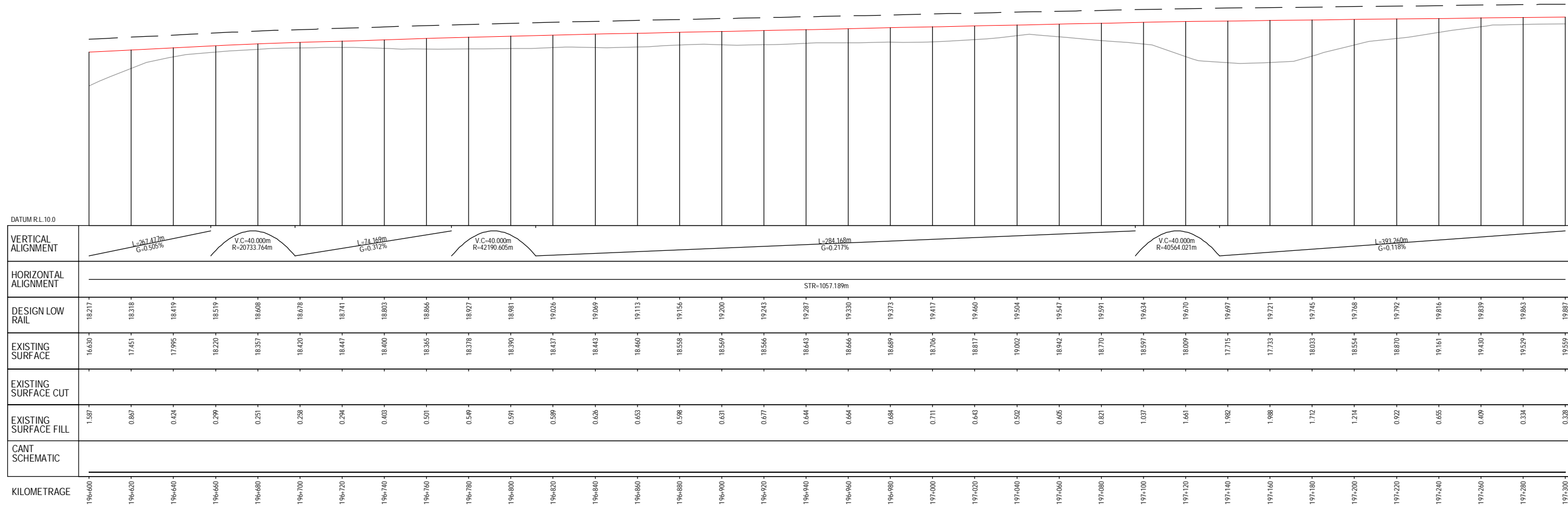
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PLOT DATE: 28 February 2010 1:58 PM PLOTTED BY: PTGB
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PLAN
SCALE 1:1000



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

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Drawn:
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Designed:
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Drafting Check:
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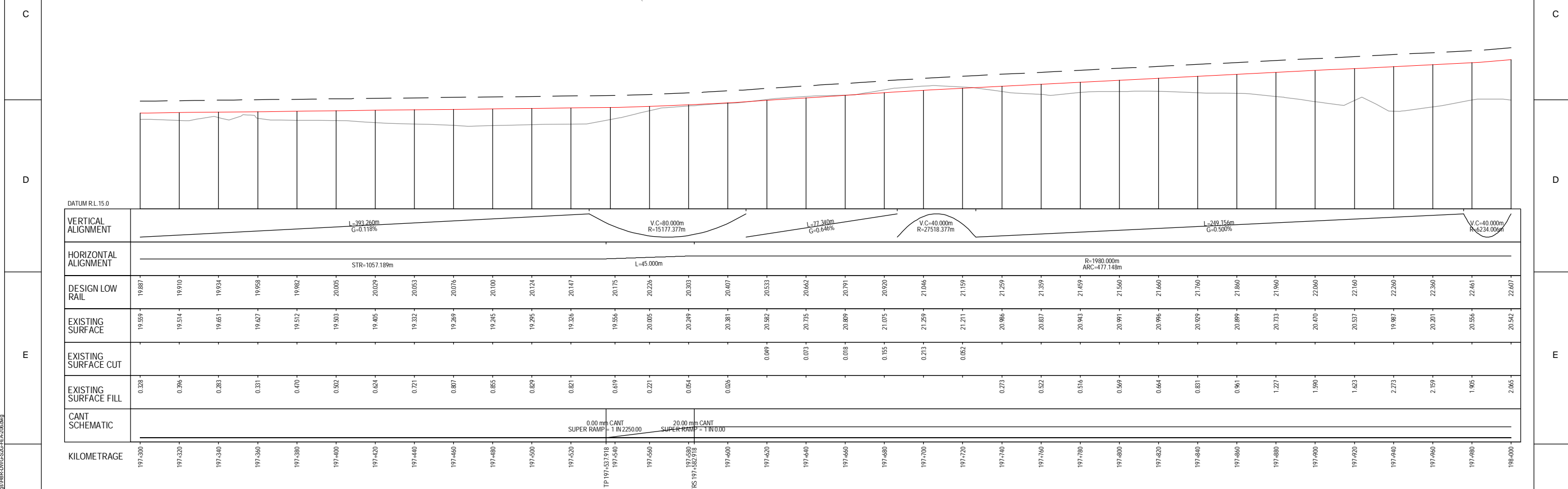
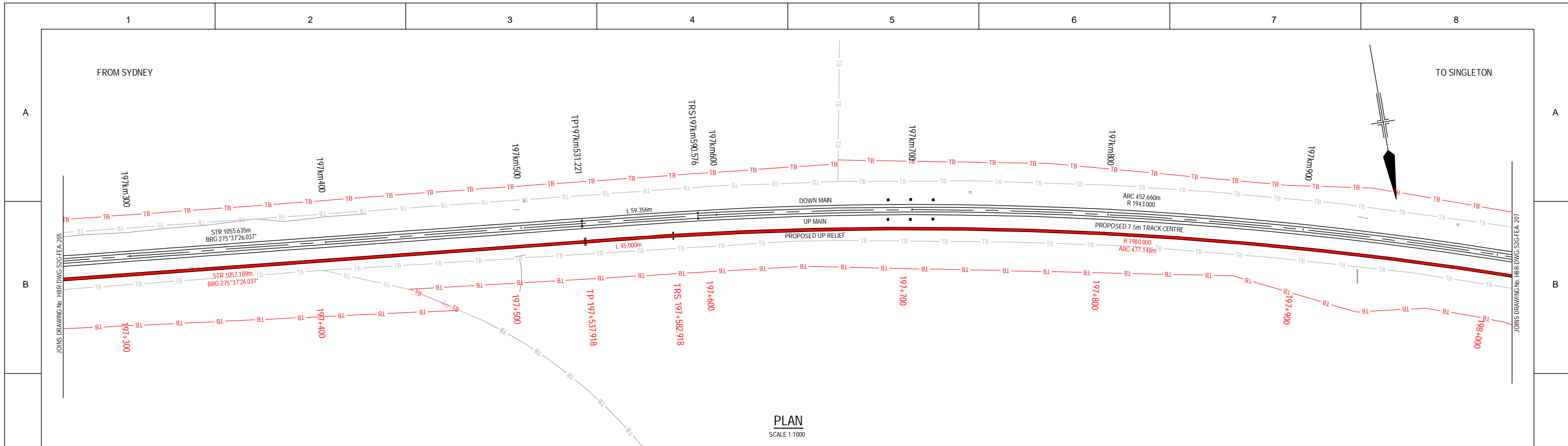
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H8R-DWG-S2G-FEA-205

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
5 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 26 February 2010 1:58 PM PLOTTED BY: PT091
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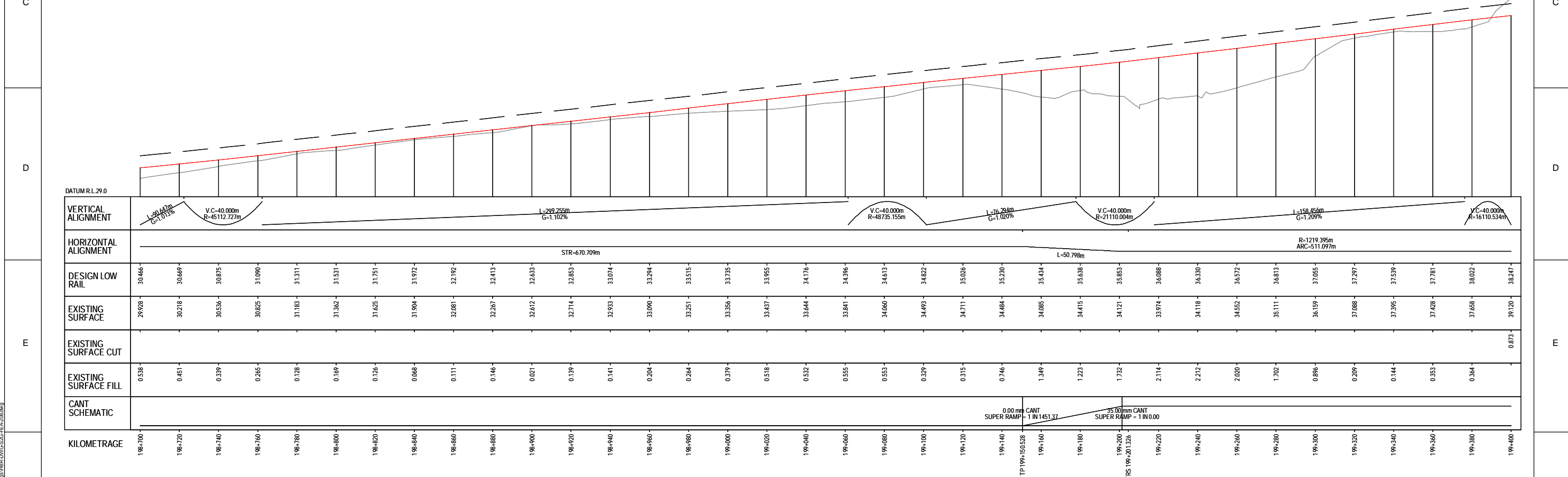
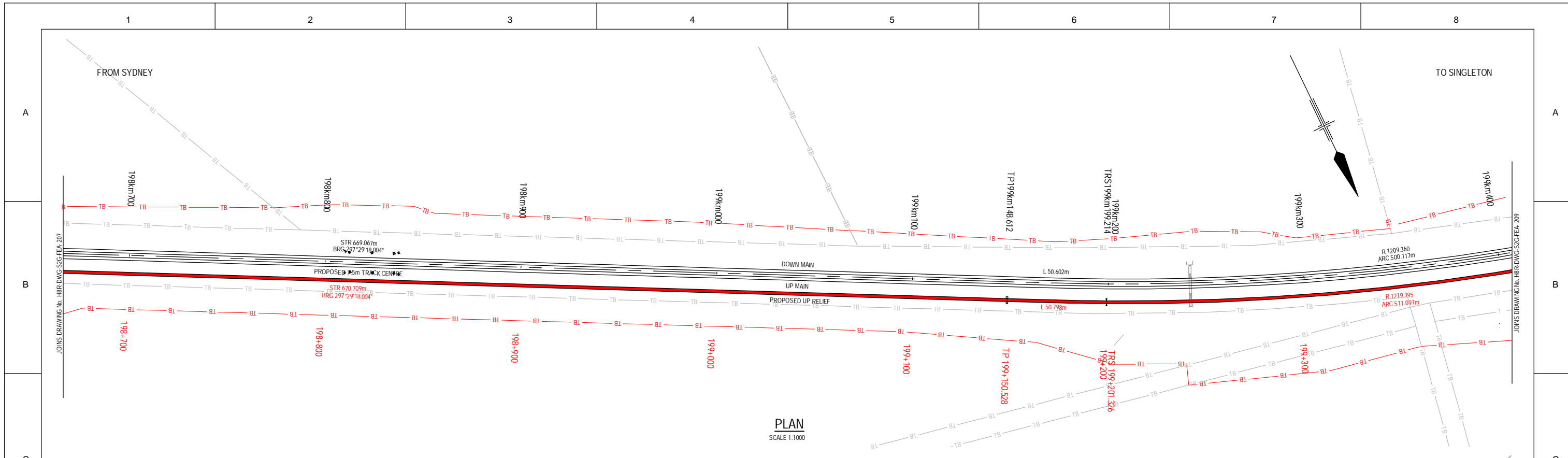


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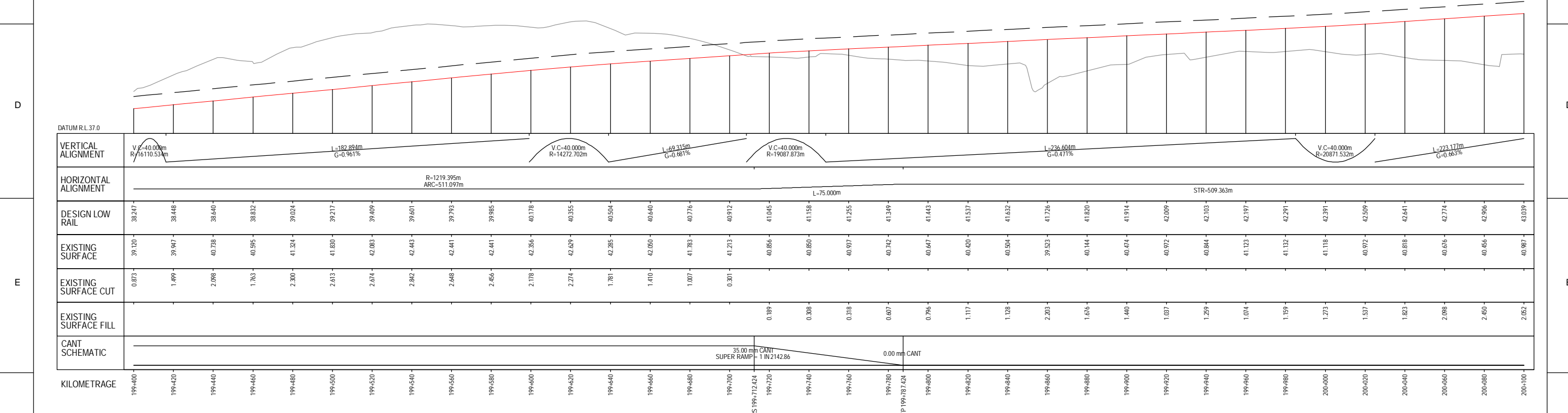
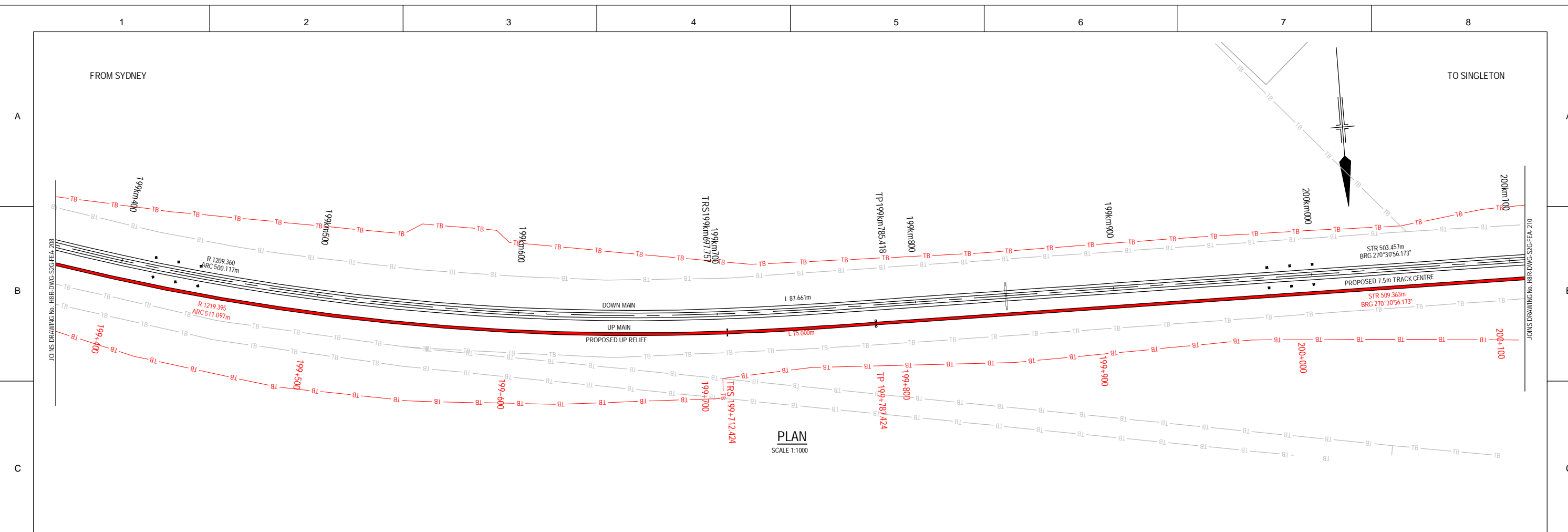


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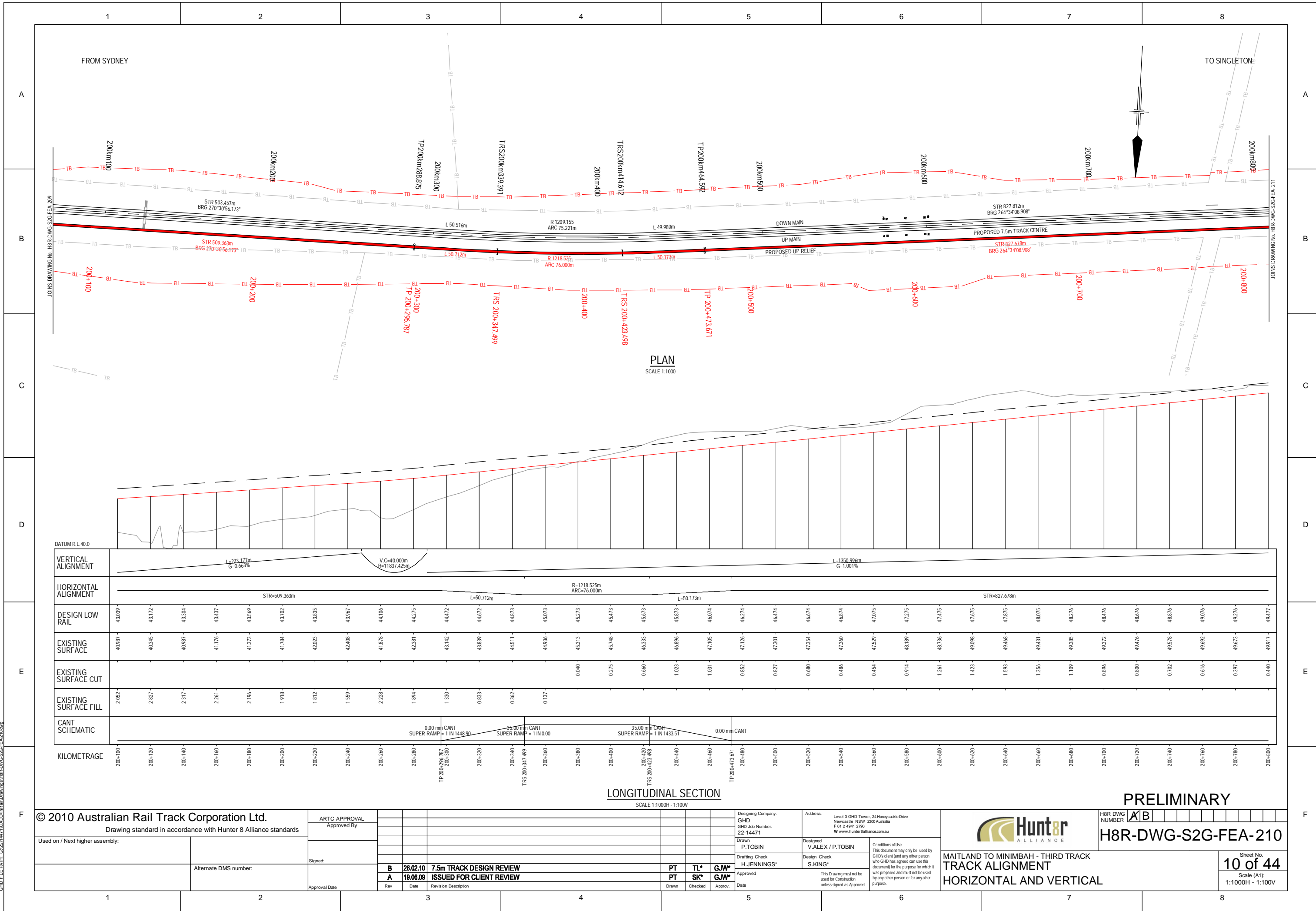


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

PRELIMINARY

© 2010 Australian Rail Track Corporation Ltd. Drawing standard in accordance with Hunter 8 Alliance standards		ARTC APPROVAL Approved By		Designing Company: GHD GHD Job Number: 22-14471		Address: Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia P 61 2 4941 2796 W www.hunter8alliance.com.au				H8R DWG NUMBER A/B		H8R-DWG-S2G-FEA-209		Sheet No. 9 of 44 Scale (A1): 1:1000H - 1:100V	
Used on / Next higher assembly:		Signed:		Drawn P.TOBIN		Designed V.ALEX / P.TOBIN				MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL					
Approval Date		Rev		Date		Description		Drawn		Checked		Approved			
		B		26.02.10		7.5m TRACK DESIGN REVIEW		PT		TL*		GJW*			
		A		19.06.09		ISSUED FOR CLIENT REVIEW		PT		SK*		GJW*			

PLOT DATE: 08 February 2010 1:57 PM PLOTTED BY: PT091
 GHD FILE PATH: G:\22\14471\GADD\H8R\DWG\S2G-FEA-209.dwg



PLAN
SCALE 1:1000

LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

PRELIMINARY

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Drawing standard in accordance with Hunter 8 Alliance standards
Used on / Next higher assembly:

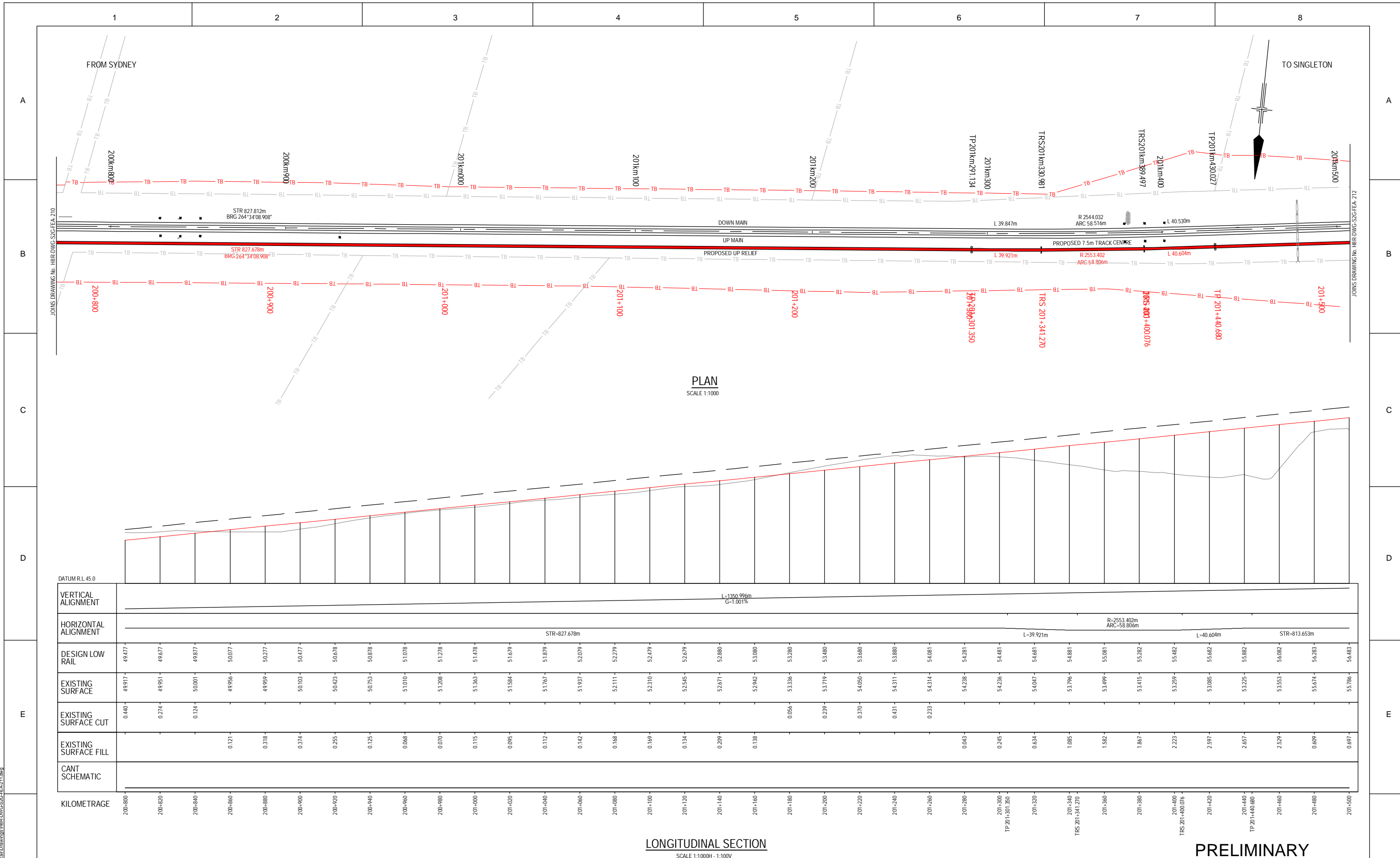
ARTC APPROVAL			
Approved By			
Signed:			
B	26.02.10	7.5m TRACK DESIGN REVIEW	
A	19.06.09	ISSUED FOR CLIENT REVIEW	
Rev	Date	Revision Description	

Designing Company: GHD GHD Job Number: 22-14471	Address: Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia P 61 2 4941 2796 W www.hunter8alliance.com.au
Drawn: P.TOBIN	Designed: V.ALEX / P.TOBIN
Drafting Check: H.JENNINGS*	Design Check: S.KING*
Approved	Approved

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H8R DWG NUMBER **A/B**
H8R-DWG-S2G-FEA-210
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL
Sheet No.
10 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 08 February 2010 1:58 PM PLOTTED BY: PT091
GHD FILE PATH: G:\22\14471\GADD\Rail\Drawings\H8R-DWG-S2G-FEA-210.dwg



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

PRELIMINARY

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Drawing standard in accordance with Hunter 8 Alliance standards
Used on / Next higher assembly:

ARTC APPROVAL		Approved By			
Signed:					
Rev	Date	Description	Drawn	Checked	Approved
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

Drawn:
P.TOBIN

Drafting Check:
H.JENNINGS*

Designed:
V.ALEX / P.TOBIN

Design Check:
S.KING*

Approved

This Drawing must not be used for Construction unless signed as Approved

Address:
Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
P 61 2 4941 2796
W www.hunter8alliance.com.au

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Hunter 8 ALLIANCE

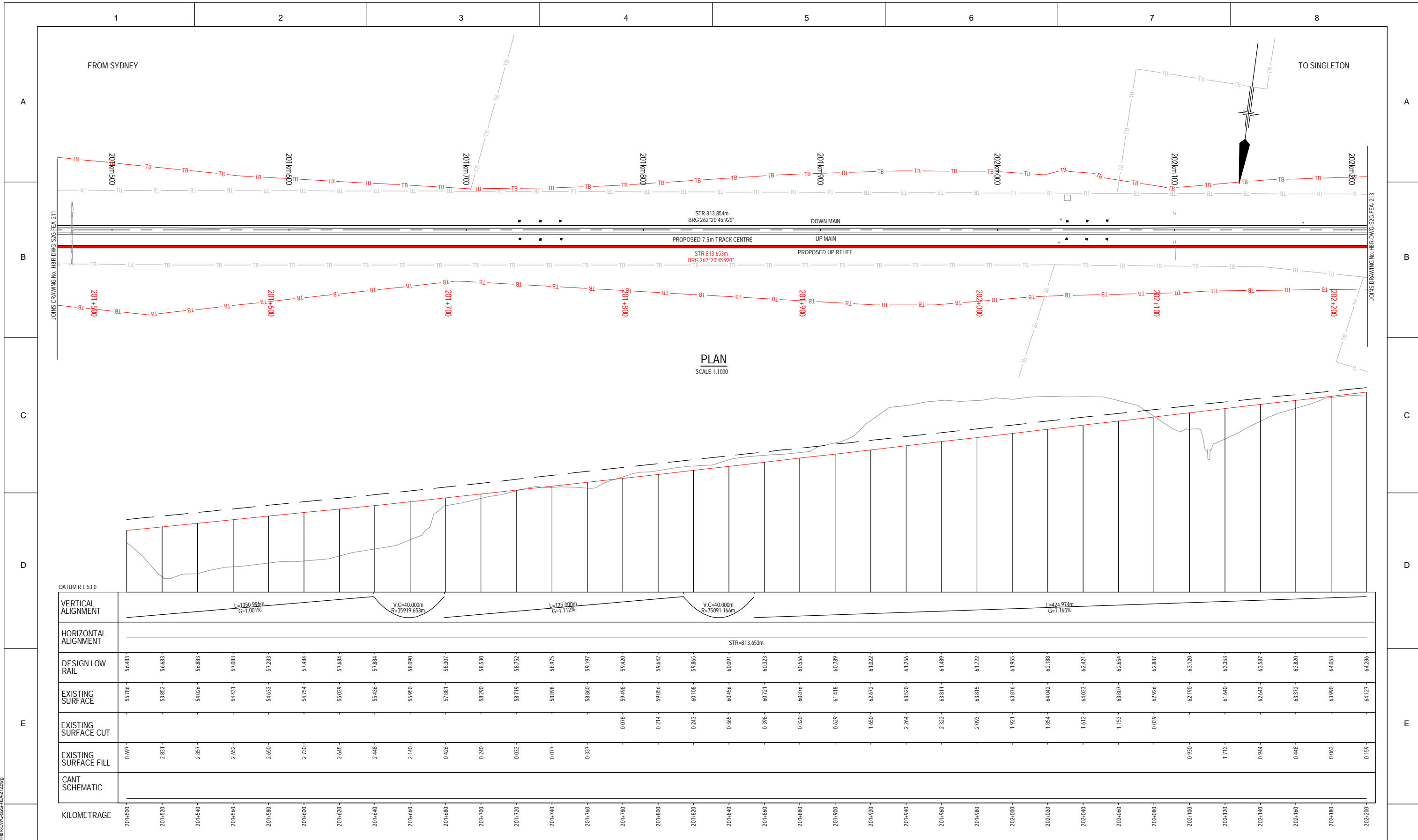
H8R DWG NUMBER **A/B**

H8R-DWG-S2G-FEA-211

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
11 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 08 February 2010 1:58 PM PLOTTED BY: PT091
GHD FILE PATH: G:\22\14471\GADD\H8R-DWG-S2G-FEA-211.dwg



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Drawing standard in accordance with Hunter 8 Alliance standards

Used on / Next higher assembly:

Alternate DMS number:

Rev	Date	Revision Description	Drawn	Checked	Appov.
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company: GHD
GHD Job Number: 22-14471

Drawn: P.TOBIN
Drilling Check: H.JENNINGS*

Designed: V.ALEX / P.TOBIN
Design Check: S.KING*

Approved: [Signature]

Address: Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
P 61 2 4941 2796
W www.hunter8alliance.com.au

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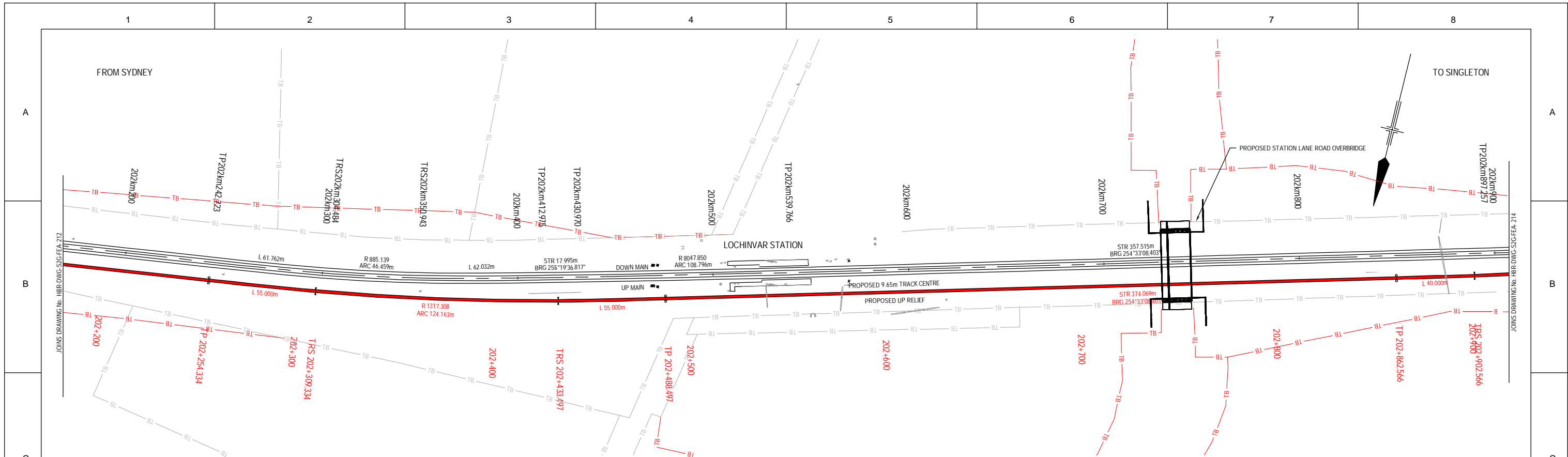
PRELIMINARY

H8R-DWG-S2G-FEA-212

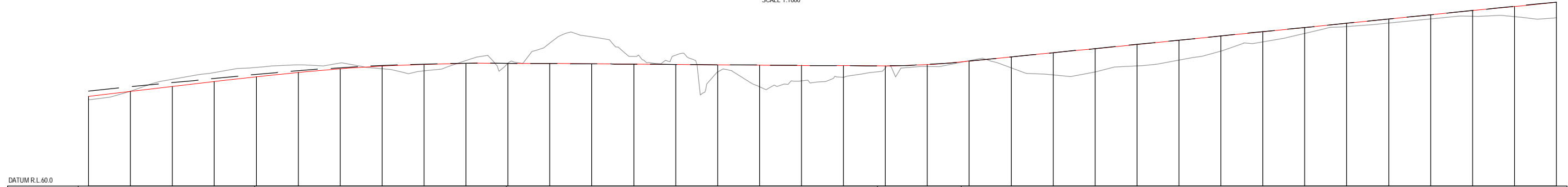
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No. 12 of 44
Scale (A1): 1:1000H - 1:100V

PLOT DATE: 08 February 2010 1:58 PM PLOTTED BY: PT091
GHD FILE PATH: G:\22\14471\GAD\00\Rail\Drawings\H8R-DWG-S2G-FEA-212.dwg

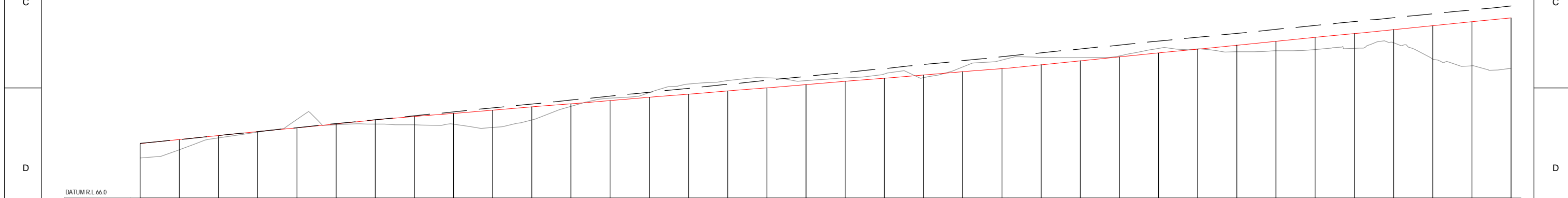
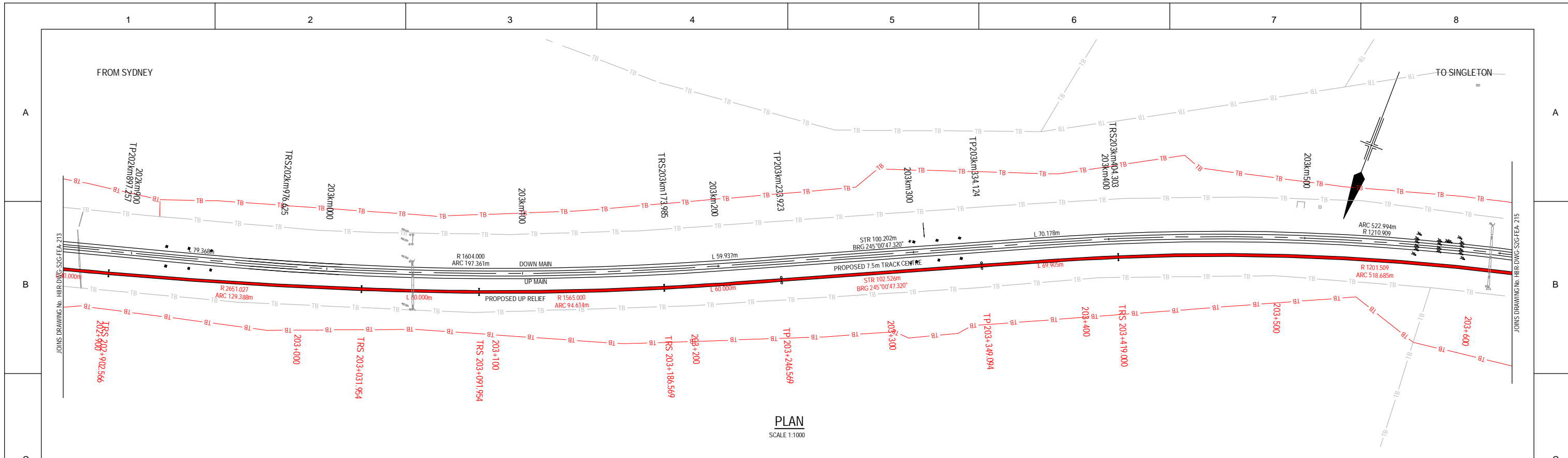


PLAN
SCALE 1:1000



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

VERTICAL ALIGNMENT	L=474.974m G=-1.165%		V.C-120.000m R=9690.105m		L=177.000m G=-0.073%		V.C-40.000m R=3705.179m		L=405.000m G=1.007%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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STR-813.653m		L=55.000m		R-1317.308m ARC=124.163m		L=55.000m		STR-374.069m		L=40.000m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
DESIGN LOW RAIL	64.286	64.519	64.752	64.985	65.218	65.451	65.684	65.917	66.150	66.383	66.616	66.849	67.082	67.315	67.548	67.781	68.014	68.247	68.480	68.713	68.946	69.179	69.412	69.645	69.878	70.111	70.344	70.577	70.810	71.043	71.276	71.509	71.742	71.975	72.208	72.441	72.674	72.907	73.140	73.373	73.606	73.839	74.072	74.305	74.538	74.771	75.004	75.237	75.470	75.703	75.936	76.169	76.402	76.635	76.868	77.101	77.334	77.567	77.800	78.033	78.266	78.499	78.732	78.965	79.198	79.431	79.664	79.897	80.130	80.363	80.596	80.829	81.062	81.295	81.528	81.761	81.994	82.227	82.460	82.693	82.926	83.159	83.392	83.625	83.858	84.091	84.324	84.557	84.790	85.023	85.256	85.489	85.722	85.955	86.188	86.421	86.654	86.887	87.120	87.353	87.586	87.819	88.052	88.285	88.518	88.751	88.984	89.217	89.450	89.683	89.916	90.149	90.382	90.615	90.848	91.081	91.314	91.547	91.780	92.013	92.246	92.479	92.712	92.945	93.178	93.411	93.644	93.877	94.110	94.343	94.576	94.809	95.042	95.275	95.508	95.741	95.974	96.207	96.440	96.673	96.906	97.139	97.372	97.605	97.838	98.071	98.304	98.537	98.770	99.003	99.236	99.469	99.702	99.935	100.168	100.401	100.634	100.867	101.100	101.333	101.566	101.799	102.032	102.265	102.498	102.731	102.964	103.197	103.430	103.663	103.896	104.129	104.362	104.595	104.828	105.061	105.294	105.527	105.760	105.993	106.226	106.459	106.692	106.925	107.158	107.391	107.624	107.857	108.090	108.323	108.556	108.789	109.022	109.255	109.488	109.721	109.954	110.187	110.420	110.653	110.886	111.119	111.352	111.585	111.818	112.051	112.284	112.517	112.750	112.983	113.216	113.449	113.682	113.915	114.148	114.381	114.614	114.847	115.080	115.313	115.546	115.779	116.012	116.245	116.478	116.711	116.944	117.177	117.410	117.643	117.876	118.109	118.342	118.575	118.808	119.041	119.274	119.507	119.740	119.973	120.206	120.439	120.672	120.905	121.138	121.371	121.604	121.837	122.070	122.303	122.536	122.769	123.002	123.235	123.468	123.701	123.934	124.167	124.400	124.633	124.866	125.099	125.332	125.565	125.798	126.031	126.264	126.497	126.730	126.963	127.196	127.429	127.662	127.895	128.128	128.361	128.594	128.827	129.060	129.293	129.526	129.759	129.992	130.225	130.458	130.691	130.924	131.157	131.390	131.623	131.856	132.089	132.322	132.555	132.788	133.021	133.254	133.487	133.720	133.953	134.186	134.419	134.652	134.885	135.118	135.351	135.584	135.817	136.050	136.283	136.516	136.749	136.982	137.215	137.448	137.681	137.914	138.147	138.380	138.613	138.846	139.079	139.312	139.545	139.778	140.011	140.244	140.477	140.710	140.943	141.176	141.409	141.642	141.875	142.108	142.341	142.574	142.807	143.040	143.273	143.506	143.739	143.972	144.205	144.438	144.671	144.904	145.137	145.370	145.603	145.836	146.069	146.302	146.535	146.768	147.001	147.234	147.467	147.700	147.933	148.166	148.399	148.632	148.865	149.098	149.331	149.564	149.797	150.030	150.263	150.496	150.729	150.962	151.195	151.428	151.661	151.894	152.127	152.360	152.593	152.826	153.059	153.292	153.525	153.758	153.991	154.224	154.457	154.690	154.923	155.156	155.389	155.622	155.855	156.088	156.321	156.554	156.787	157.020	157.253	157.486	157.719	157.952	158.185	158.418	158.651	158.884	159.117	159.350	159.583	159.816	160.049	160.282	160.515	160.748	160.981	161.214	161.447	161.680	161.913	162.146	162.379	162.612	162.845	163.078	163.311	163.544	163.777	164.010	164.243	164.476	164.709	164.942	165.175	165.408	165.641	165.874	166.107	166.340	166.573	166.806	167.039	167.272	167.505	167.738	167.971	168.204	168.437	168.670	168.903	169.136	169.369	169.602	169.835	170.068	170.301	170.534	170.767	171.000	171.233	171.466	171.699	171.932	172.165	172.398	172.631	172.864	173.097	173.330	173.563	173.796	174.029	174.262	174.495	174.728	174.961	175.194	175.427	175.660	175.893	176.126	176.359	176.592	176.825	177.058	177.291	177.524	177.757	177.990	178.223	178.456	178.689	178.922	179.155	179.388	179.621	179.854	180.087	180.320	180.553	180.786	181.019	181.252	181.485	181.718	181.951	182.184	182.417	182.650	182.883	183.116	183.349	183.582	183.815	184.048	184.281	184.514	184.747	184.980	185.213	185.446	185.679	185.912	186.145	186.378	186.611	186.844	187.077	187.310	187.543	187.776	188.009	188.242	188.475	188.708	188.941	189.174	189.407	189.640	189.873	190.106	190.339	190.572	190.805	191.038	191.271	191.504	191.737	191.970	192.203	192.436	192.669	192.902	193.135	193.368	193.601	193.834	194.067	194.300	194.533	194.766	195.000	195.233	195.466	195.699	195.932	196.165	196.398	196.631	196.864	197.097	197.330	197.563	197.796	198.029	198.262	198.495	198.728	198.961	199.194	199.427	199.660	199.893	200.126	200.359	200.592	200.825	201.058	201.291	201.524	201.757	201.990	202.223	202.456	202.689	202.922	203.155	203.388	203.621	203.854	204.087	204.320	204.553	204.786	205.019	205.252	205.485	205.718	205.951	206.184	206.417	206.650	206.883	207.116	207.349	207.582	207.815	208.048	208.281	208.514	208.747	208.980	209.213	209.446	209.679	209.912	210.145	210.378	210.611	210.844	211.077	211.310	211.543	211.776	212.009	212.242	212.475	212.708	212.941	213.174	213.407	213.640	213.873	214.106	214.339	214.572	214.805	215.038	215.271	215.504	215.737	215.970	216.203	216.436	216.669	216.902	217.135	217.368	217.601	217.834	218.067	218.300	218.533	218.766	219.000	219.233	219.466	219.699	219.932	220.165	220.398	220.631	220.864	221.097	221.330	221.563	221.796	222.029	222.262	222.495	222.728	222.961	223.194	223.427	223.660	223.893	224.126	224.359	224.592	224.825	225.058	225.291	225.524	225.757	225.990	226.223	226.456	226.689	226.922	227.155	227.388	227.621	227.854	228.087	228.320	228.553	228.786	229.019	229.252	229.485	229.718	229.951	230.184	230.417	230.650	230.883	231.116	231.349	231.582	231.815	232.048	232.281	232.514	232.747	232.980	233.213	233.446	233.679	233.912	234.145	234.378	234.611	234.844	235.077	235.310	235.543	235.776	236.009	236.242	236.475	236.708	236.941	237.174	237.407	237.640	237.873	238.106	238.339	238.572	238.805	239.038	239.271	239.504	239.737	239.970	240.203	240.436	240.669	240.902	241.135	241.368	241.601	241.834	242.067	242.300	242.533	242.766	243.000	243.233	243.466	243.699	243.932	244.165	244.398	244.631	244.864	245.097	245.330	245.563	245.796	246.029	246.262	246.495	246.728	246.961	247.194	247.427	247.660	247.893	248.126	248.359	248.592	248.825	249.058	249.291	249.524	249.757	249.990	250.223	250.456	250.689	250.922	251.155	251.388	251.621	251.854	252.087	252.320	252.553	252.786	253.019	253.252	253.485	253.718	253.951	254.184	254.417	254.650	254.883	255.116	255.349	255.582	255.815	256.048	256.281	256.514	256.747	256.980	257.213	257.446	257.679	257.912	258.145	258.378	258.611	258.844	259.077	259.310	259.543	259.776	260.009	260.242	260.475	260.708	260.941	261.174	261.407	261.640	261.873	262.106	262.339	262.572	262.805	263.038	263.271	263.504	263.737	263.970	264.203	264.436	264.669	264.902	265.135	265.368	265.601	265.834	266.067	266.300	266.533	266.766	267.000	267.233	267.466	267.699	267.932	268.165	268.398	268.631	268.864	269.097	269.330	269.563	269.796	270.029	270.262	270.495	270.728	270.961	271.194	271.427	271.660	271.893	272.126	272.359	272.592	272.825	273.058	273.291	273.524	273.757	273.990	274.223	274.456	274.689	274.922	275.155	275.388	275.621	275.854	276.087	276.320	276.553	276.786	277.019	277.252	277.485	277.718	277.951	278.184	278.417	278.650	278.883	279.116	279.349	279.582	279.815	280.048	280.281	280.514	280.747	280.980	281.213	281.446	281.679	281.912	282.145	282.378	282.611	282.844	283.077	283.310	283.543	283.776	284.009	284.242	284.475	284.708	284.941	285.174	285.407	285.640	285.873	286.106	286.339	286.572	286.805	287.038	287.271	287.504	287.737	287.970	288.203	288.436	288.669	288.902	289.135	289.368	289.601	289.834	290.067	290.300	290.533	290.766	291.000	291.233	291.466	291.699	291.932	292.165	292.398	292.631	292.864	293.097	293.330	293.563	293.79



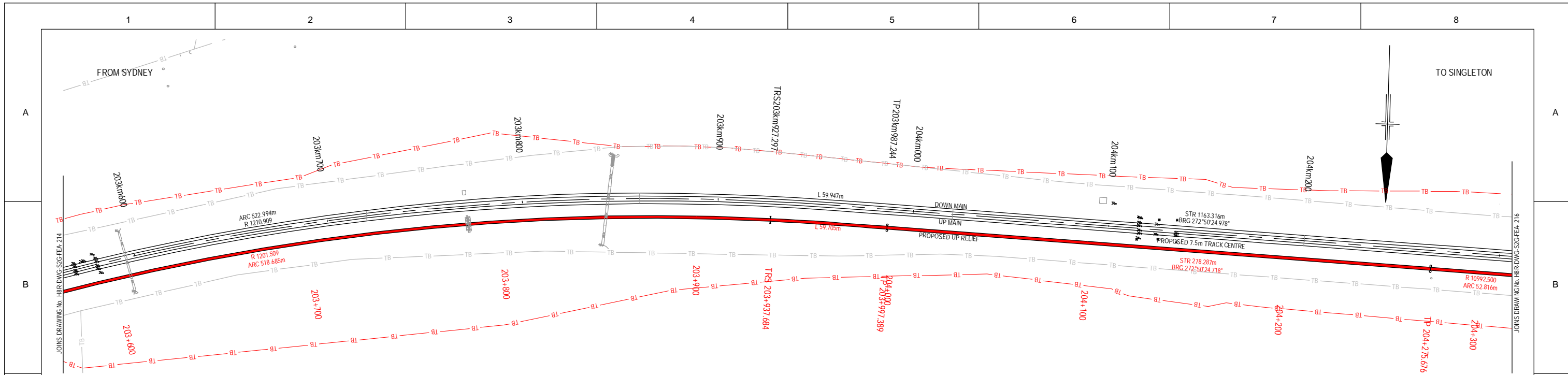
VERTICAL ALIGNMENT	L=405.000m G=-1.007%		L=321.863m G=-0.517%		L=292.136m G=-0.995%																																	
HORIZONTAL ALIGNMENT	R=2651.027m ARC=129.388m		R=1565.000m ARC=94.614m		R=1201.509m ARC=518.685m																																	
DESIGN LOW RAIL	68.779	68.981	69.182	69.383	69.585	69.786	69.987	70.188	70.389	70.590	70.791	70.992	71.193	71.394	71.595	71.796	71.997	72.198	72.399	72.600	72.801	73.002	73.203	73.404	73.605	73.806	74.007	74.208	74.409	74.610	74.811	75.012	75.213	75.414	75.615	75.816	76.017	
EXISTING SURFACE	68.037	68.466	69.062	69.357	70.000	69.737	69.771	69.734	69.762	69.607	69.987	70.684	71.099	71.382	71.813	71.994	72.131	71.992	72.132	72.334	72.162	72.978	73.034	73.177	73.149	73.249	73.619	73.603	73.457	73.575	73.639	73.918	73.082	72.743	72.606	72.606		
EXISTING SURFACE CUT					0.415								0.129	0.249	0.517	0.534	0.508	0.202	0.182	0.221	0.131	0.238	0.431	0.381	0.151	0.050	0.226	0.011	0.334	0.480	0.614	0.749	0.669	1.693	2.242	2.578		
EXISTING SURFACE FILL	0.742	0.515	0.120	0.026	0.000	0.000	0.216	0.419	0.554	0.873	0.650	0.122	0.129	0.249	0.517	0.534	0.508	0.202	0.182	0.221	0.131	0.238	0.431	0.381	0.151	0.050	0.226	0.011	0.334	0.480	0.614	0.749	0.669	1.693	2.242	2.578		
CANT SCHEMATIC	0.00 mm CANT SUPER RAMP = 1 IN 2400.00		25.00 mm CANT SUPER RAMP = 1 IN 0.00		25.00 mm CANT SUPER RAMP = 1 IN 2400.00		0.00 mm CANT		0.00 mm CANT SUPER RAMP = 1 IN 2330.18		25.00 mm CANT SUPER RAMP = 1 IN 0.00																											
KILOMETRAGE	202+900	202+920	202+940	202+960	202+980	203+000	203+020	203+040	203+060	203+080	203+100	203+120	203+140	203+160	203+180	203+200	203+220	203+240	203+260	203+280	203+300	203+320	203+340	203+360	203+380	203+400	203+420	203+440	203+460	203+480	203+500	203+520	203+540	203+560	203+580	203+600		

LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

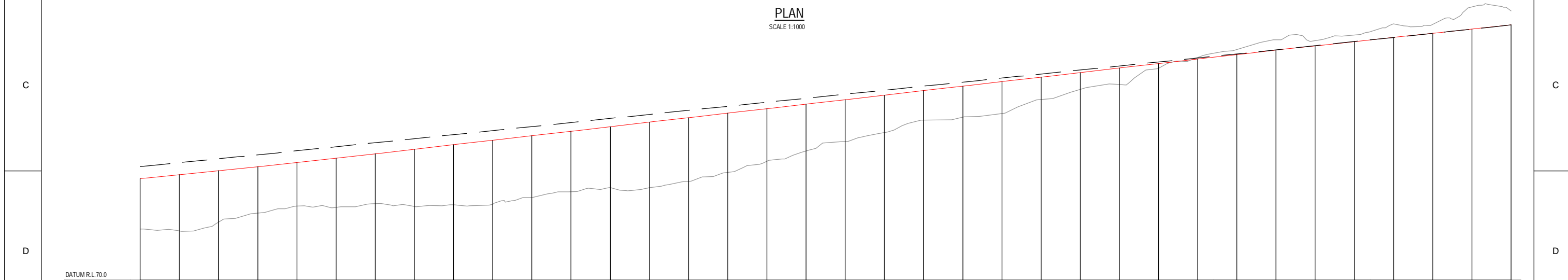
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Used on / Next higher assembly: _____		Alternate DMS number: _____		Drawn: P.TOBIN Checked: H.JENNINGS* Approved: _____		Designed: V.ALEX / P.TOBIN Design Check: S.KING*		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used for any other purpose or for any other purpose.		MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL	
1	2	3	4	5	6	7	8				

PLOT DATE: 28 February 2010 1:50 PM PLOTTED BY: PT081
 GHD FILE PATH: G:\22\14471\GADD\H8R\DWG-S2G-FEA-214.dwg



PLAN
SCALE 1:1000



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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HORIZONTAL ALIGNMENT	R=1201.509m ARC=518.685m				L=59.705m				STR=278.287m																																																									
DESIGN LOW RAIL	75.184	75.383	75.582	75.781	75.999	76.220	76.447	76.677	76.907	77.137	77.367	77.597	77.827	78.057	78.287	78.517	78.747	78.977	79.207	79.437	79.667	79.897	80.127	80.357	80.587	80.817	81.047	81.277	81.506	81.731	81.951	82.167	82.379	82.590	82.802	83.013																														
EXISTING SURFACE	72.606	72.523	72.361	73.628	73.786	73.722	73.907	73.786	73.864	73.874	74.221	74.152	74.728	74.714	75.049	75.804	76.067	76.394	77.074	77.527	78.166	78.388	78.899	79.211	79.724	79.864	80.799	81.351	81.757	82.255	82.211	82.504	83.069	83.046	83.981	83.725																														
EXISTING SURFACE CUT																												0.071	0.251	0.524	0.260	0.337	0.690	0.454	1.129	0.712																														
EXISTING SURFACE FILL	2.578	2.860	2.627	2.359	2.213	2.498	2.540	2.911	3.053	3.263	3.146	3.075	3.099	3.343	3.238	3.013	2.680	2.383	2.133	1.910	1.501	1.589	1.626	1.146	0.863	0.833	0.248																																							
CANT SCHEMATIC	30.00 mm CANT SUPER RAMP = 1 IN 1990.17																				0.00 mm CANT																																													
KILOMETRAGE	203+000	203+020	203+040	203+060	203+080	203+100	203+120	203+140	203+160	203+180	203+200	203+220	203+240	203+260	203+280	203+300	203+320	203+340	203+360	203+380	203+400	203+420	203+440	203+460	203+480	203+500	203+520	203+540	203+560	203+580	203+600	203+620	203+640	203+660	203+680	203+700	203+720	203+740	203+760	203+780	203+800	203+820	203+840	203+860	203+880	203+900	203+920	203+940	203+960	203+980	204+000	204+020	204+040	204+060	204+080	204+100	204+120	204+140	204+160	204+180	204+200	204+220	204+240	204+260	204+280	204+300

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Approved		
Signature		
Approval Date		
Rev	Date	Description
B	26.02.10	7.5m TRACK DESIGN REVIEW
A	19.06.09	ISSUED FOR CLIENT REVIEW

Designing Company:	GHD
GHD Job Number:	22-14471
Drawn:	P.TOBIN
Drilling Check:	H.JENNINGS*
Designed:	V.ALEX / P.TOBIN
Design Check:	S.KING*
Approved:	

Address: Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
61 2 4941 2796
www.hunter8alliance.com.au

Hunter 8 ALLIANCE

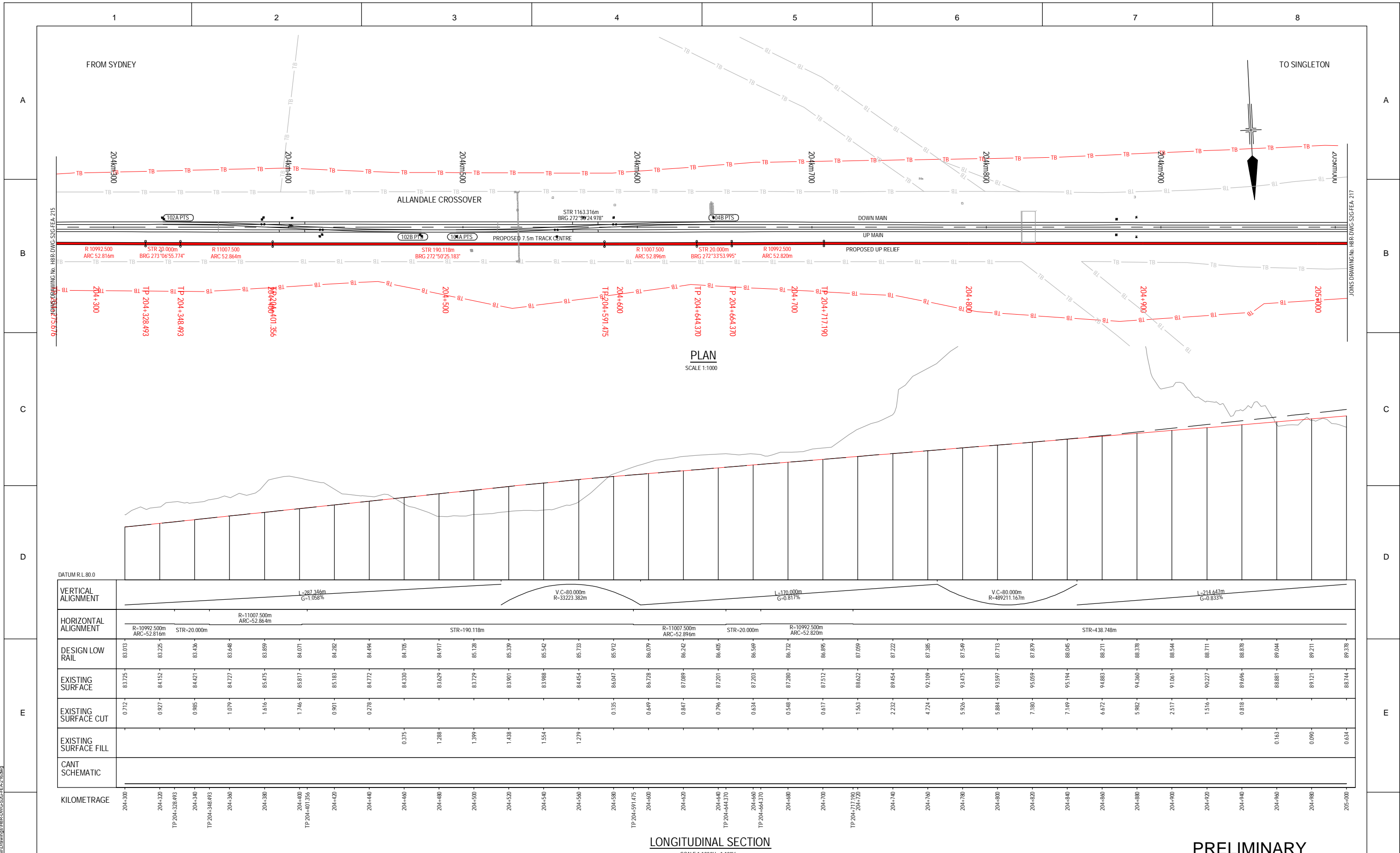
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H8R-DWG-S2G-FEA-215

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
15 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 26 February 2010 14:00 PM PLOTTED BY: PT091
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PLOT DATE: 26 February 2010 14:00 PM PLOTTED BY: PT091
 GHD FILE PATH: G:\2010\4471\ACAD\Rail\Drawings\H8R-DWG-S2G-FEA-216.dwg

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Alternate DMS number:

Rev	Date	Description	Drawn	Checked	Apprv.
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:
 GHD
 GHD Job Number:
 22-14471

Drawn:
 P.TOBIN

Drafting Check:
 H.JENNINGS*

Designed:
 V.ALEX / P.TOBIN

Design Check:
 S.KING*

Approved:

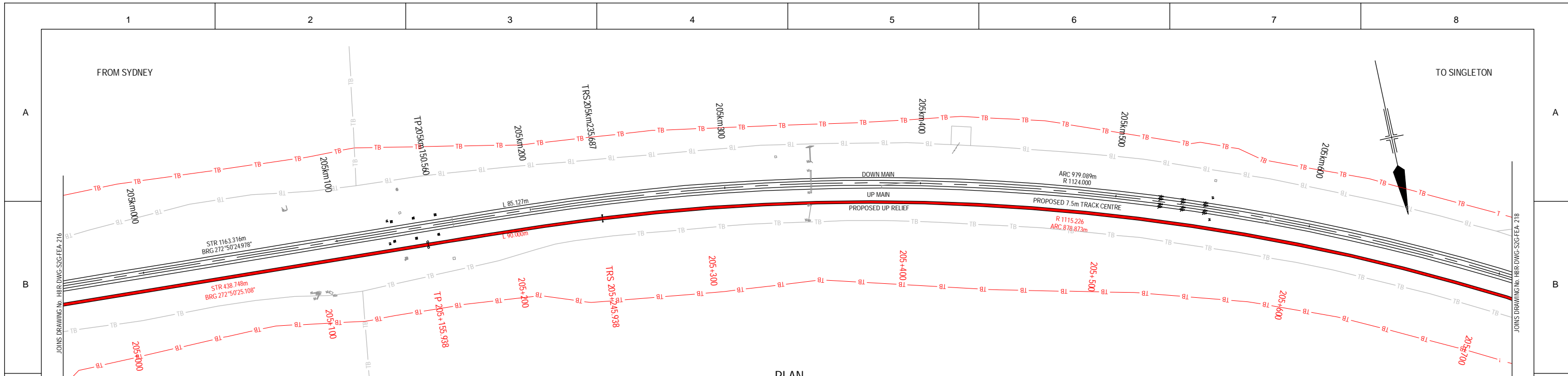
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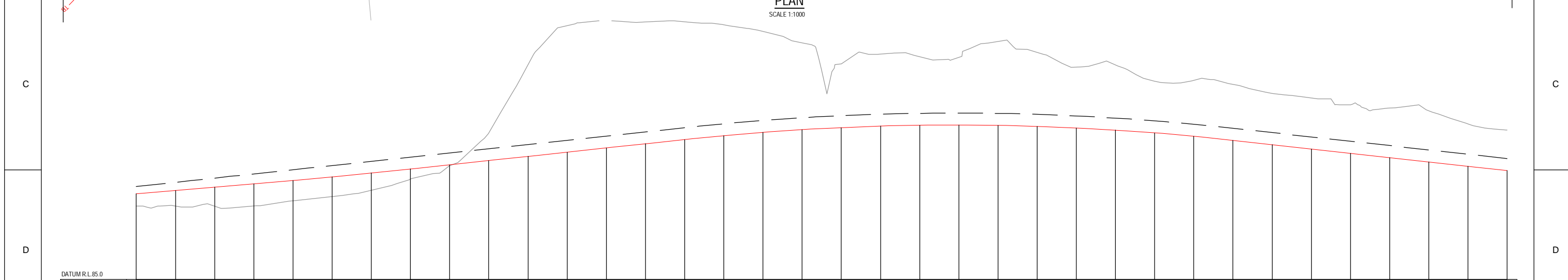
PRELIMINARY

H8R-DWG-S2G-FEA-216

Sheet No.
16 of 44
 Scale (A1):
 1:1000H - 1:100V



PLAN
SCALE 1:1000



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

VERTICAL ALIGNMENT	L=214.447m G=-0.833%		V.C.-80.000m R=33593.046m		L=139.957m G=-1.071%		V.C.-280.000m R=12894.324m		L=248.052m G=-1.100%																													
	HORIZONTAL ALIGNMENT																																					
DESIGN LOW RAIL	89378	89544	89711	89877	90050	90224	90431	90639	90853	91067	91282	91496	91710	91924	92139	92337	92505	92642	92748	92823	92867	92879	92861	92812	92732	92620	92478	92305	92100	91880	91640	91440	91220	91000	90780	90560		
EXISTING SURFACE	88744	88746	88744	88754	89014	89226	89555	90121	90797	92475	95952	97947	98221	98138	98143	97985	97653	97072	96601	96497	96352	96319	97124	96578	95825	95943	95107	94942	94483	94255	93903	93744	93594	92935	92618			
EXISTING SURFACE CUT										1.468	4.670	6.451	6.214	6.004	5.448	5.148	4.430	3.253	3.674	3.485	3.440	4.263	3.766	3.693	3.323	2.629	2.854	2.842	2.403	2.595	2.463	2.524	2.594	2.155	2.058			
EXISTING SURFACE FILL	0.634	0.798	0.967	1.123	1.036	0.990	0.876	0.510	0.054																													
CANT SCHEMATIC																																						
KILOMETRAGE	205+000	205+020	205+040	205+060	205+080	205+100	205+120	205+140	205+160	205+180	205+200	205+220	205+240	205+260	205+280	205+300	205+320	205+340	205+360	205+380	205+400	205+420	205+440	205+460	205+480	205+500	205+520	205+540	205+560	205+580	205+600	205+620	205+640	205+660	205+680	205+700		

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ARTC APPROVAL
Approved By

Approved Date

Rev	Date	Description	Drawn	Checked	Apprv.
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

Drawn:
P.TOBIN

Drafting Check:
H.JENNINGS*

Designed:
V.ALEX / P.TOBIN

Design Check:
S.KING*

Approved

Address:
Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
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W www.hunter8alliance.com.au

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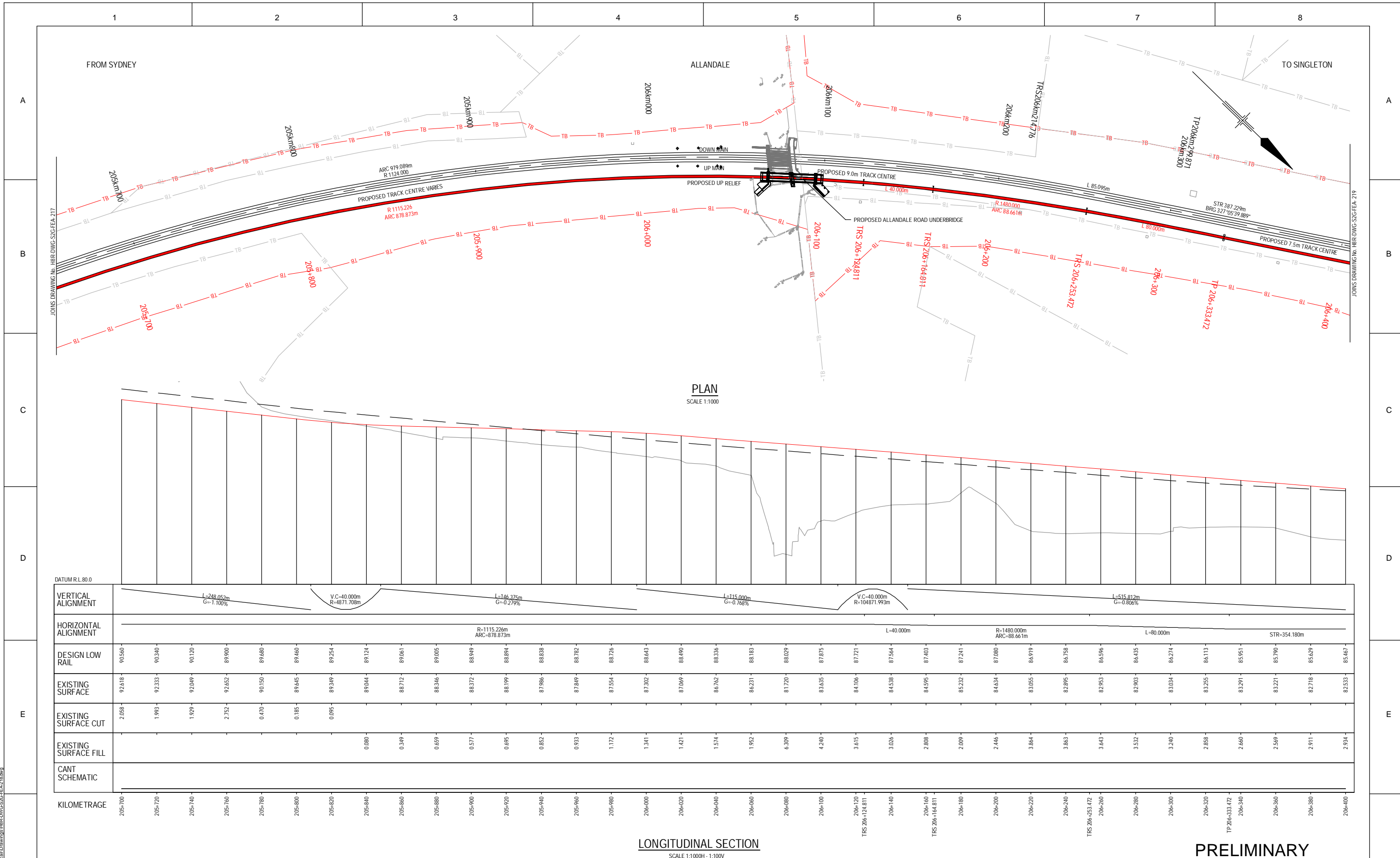
H8R DWG NUMBER
A/B

H8R-DWG-S2G-FEA-217

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
17 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 08 February 2010 14:01 PM PLOTTED BY: PT091
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Drilling Check	H.JENNINGS	Conditions of Use:	This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.
Approved		Approved	
Rev	Date	Revision Description	Date
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT TL* GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT SK* GJW*

Designing Company: GHD
GHD Job Number: 22-14471

Address: Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
Ph +61 2 4941 2798
W www.hunter8alliance.com.au

Drawn: P.TOBIN
Design: V.ALEX / P.TOBIN
Design Check: S.KING
Drilling Check: H.JENNINGS

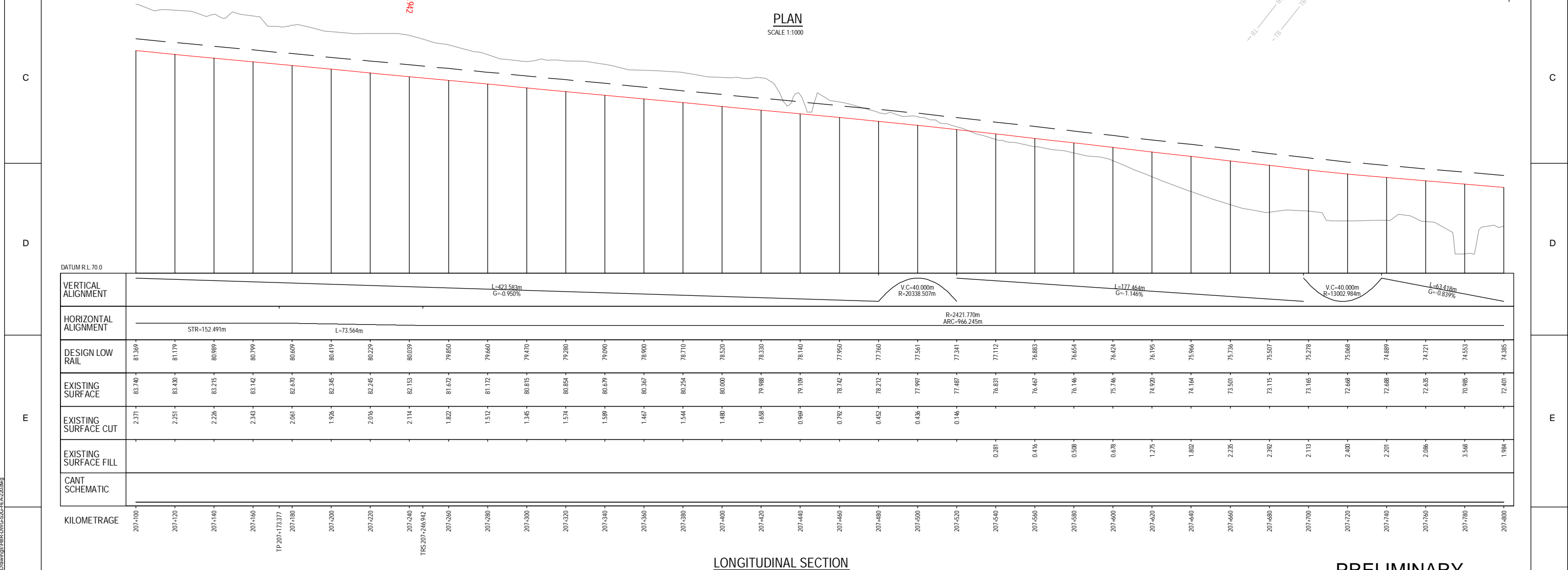
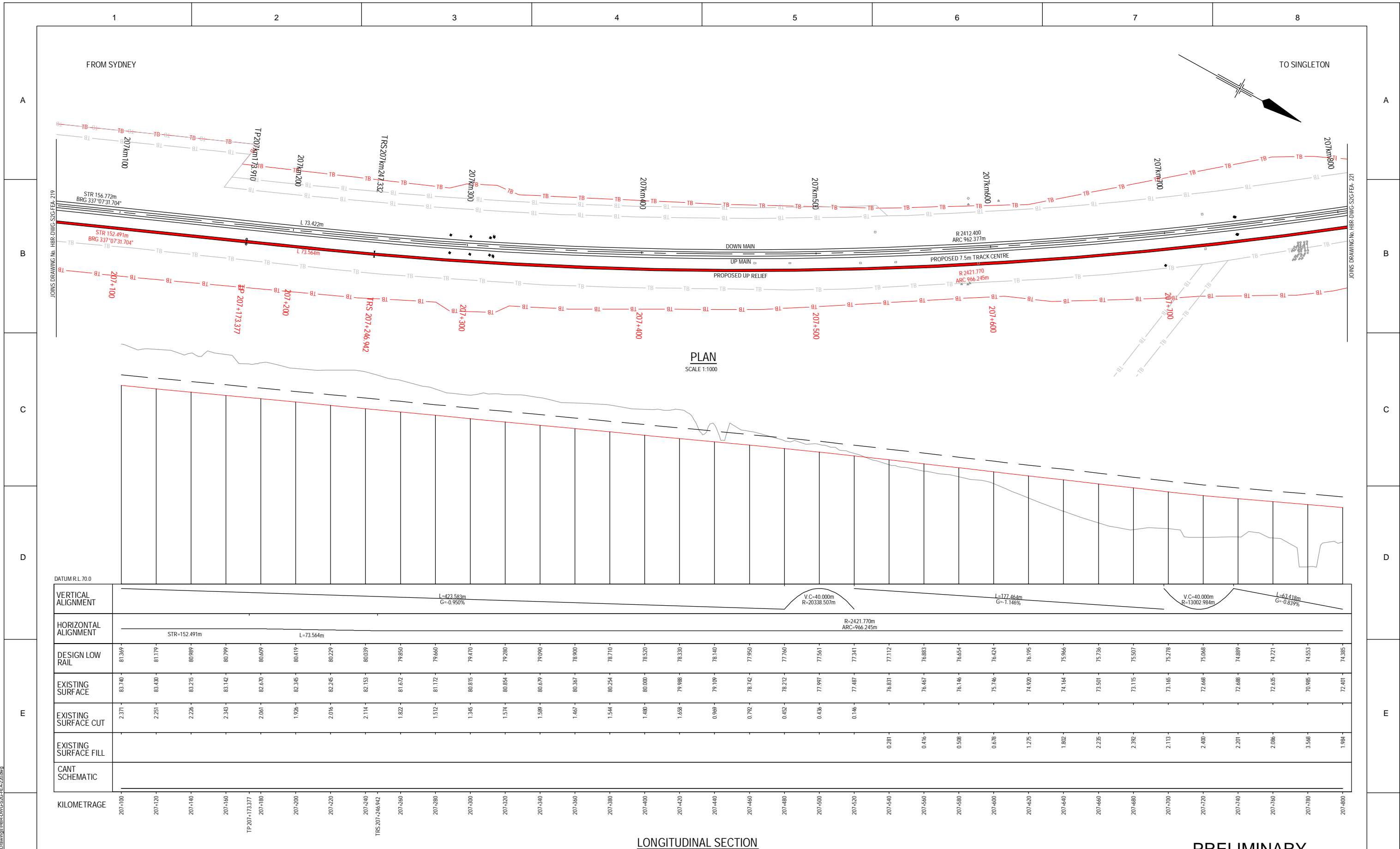
Approved: [Signature]

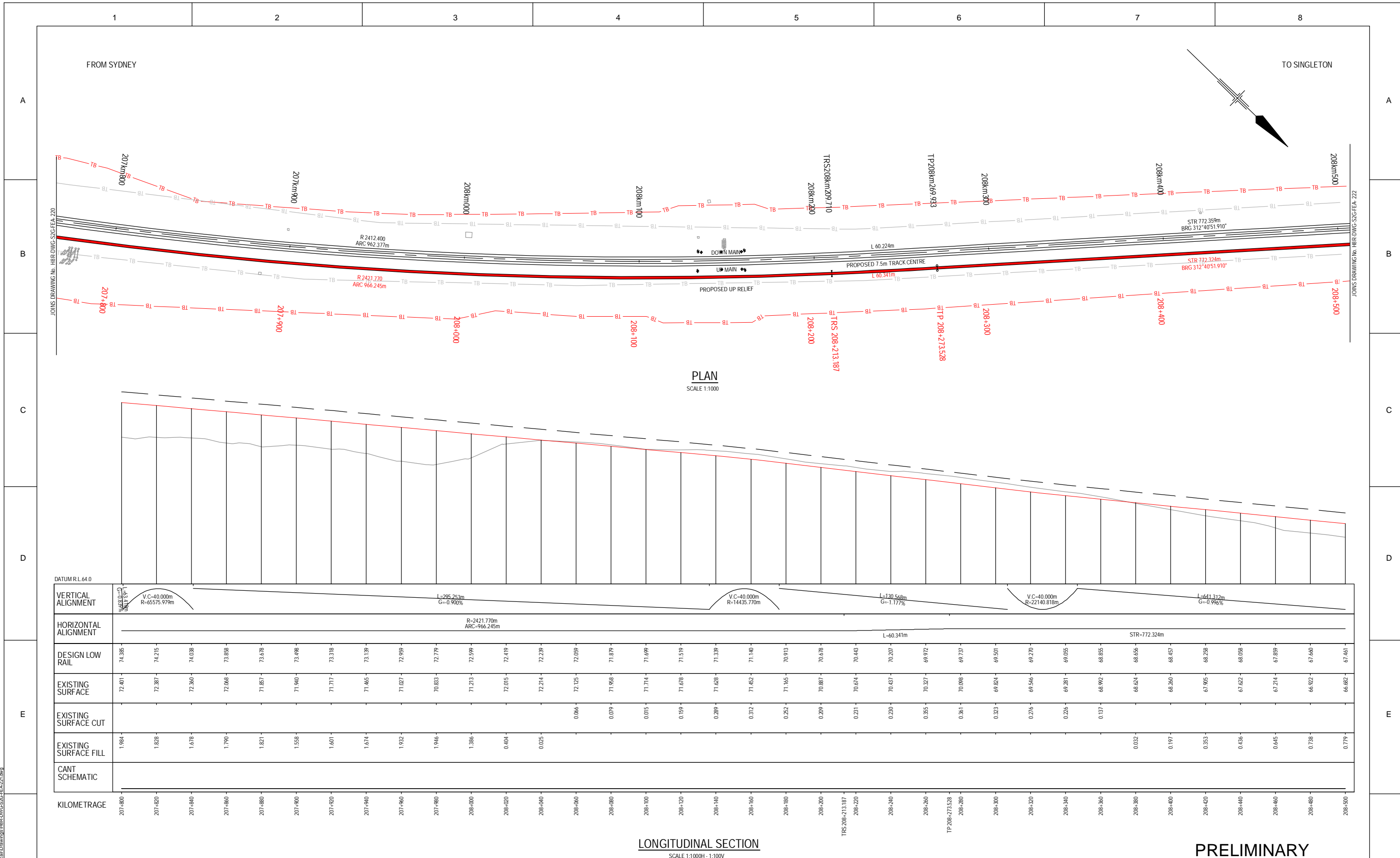
Scale (A1): 1:1000H - 1:100V

Sheet No. 18 of 44

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

PLOT DATE: 26 February 2010 14:14 PM PLOTTED BY: PT091
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Signed:		B 26.02.10		7.5m TRACK DESIGN REVIEW	
Approval Date		A 19.06.09		ISSUED FOR CLIENT REVIEW	
Rev	Date	Description	Drawn	Checked	Approved
			PT	TL*	GJW*
			PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

Address:
Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
P 61 2 4341 2798
W www.hunter8alliance.com.au

Drawn:
P.TOBIN

Designed:
V.ALEX / P.TOBIN

Drafting Check:
H.JENNINGS*

Design Check:
S.KING*

Approved

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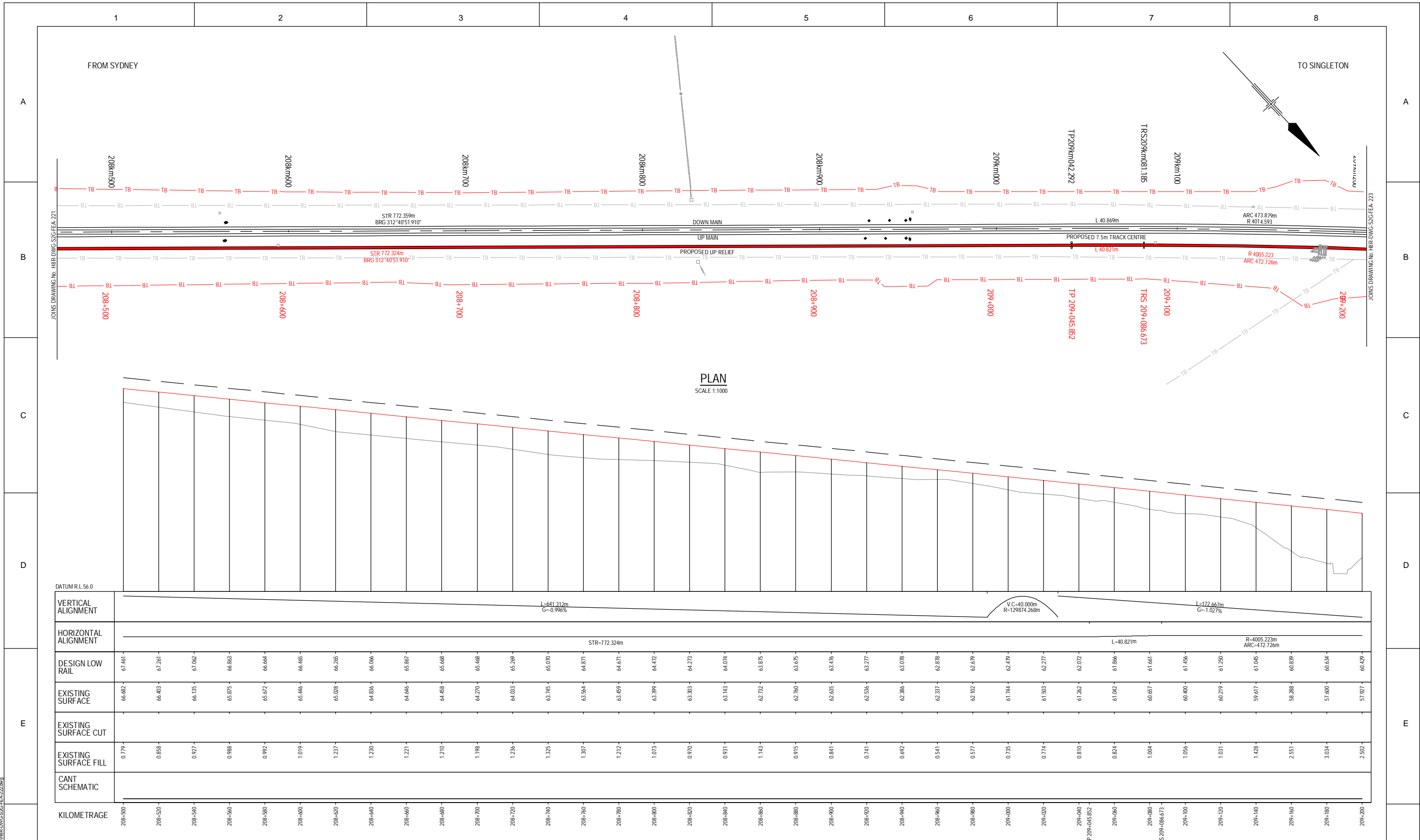
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H8R-DWG-S2G-FEA-221

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
21 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 08 February 2010 14:50 PM PLOTTED BY: PT091
GHD FILE PATH: G:\22\14471\CAD\Drawings\H8R-DWG-S2G-FEA-221.dwg



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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Approved By			
Signed:		B 26.02.10	7.5m TRACK DESIGN REVIEW
		A 19.06.09	ISSUED FOR CLIENT REVIEW
Approval Date	Rev	Date	Revision Description

Designing Company: GHD GHD Job Number: 22-14471	Address: Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia P 61 2 4941 2796 W www.hunter8alliance.com.au
Drawn: P.TOBIN	Designed: V.ALEX / P.TOBIN
Drafting Check: H.JENNINGS*	Design Check: S.KING*
Approved	Approved

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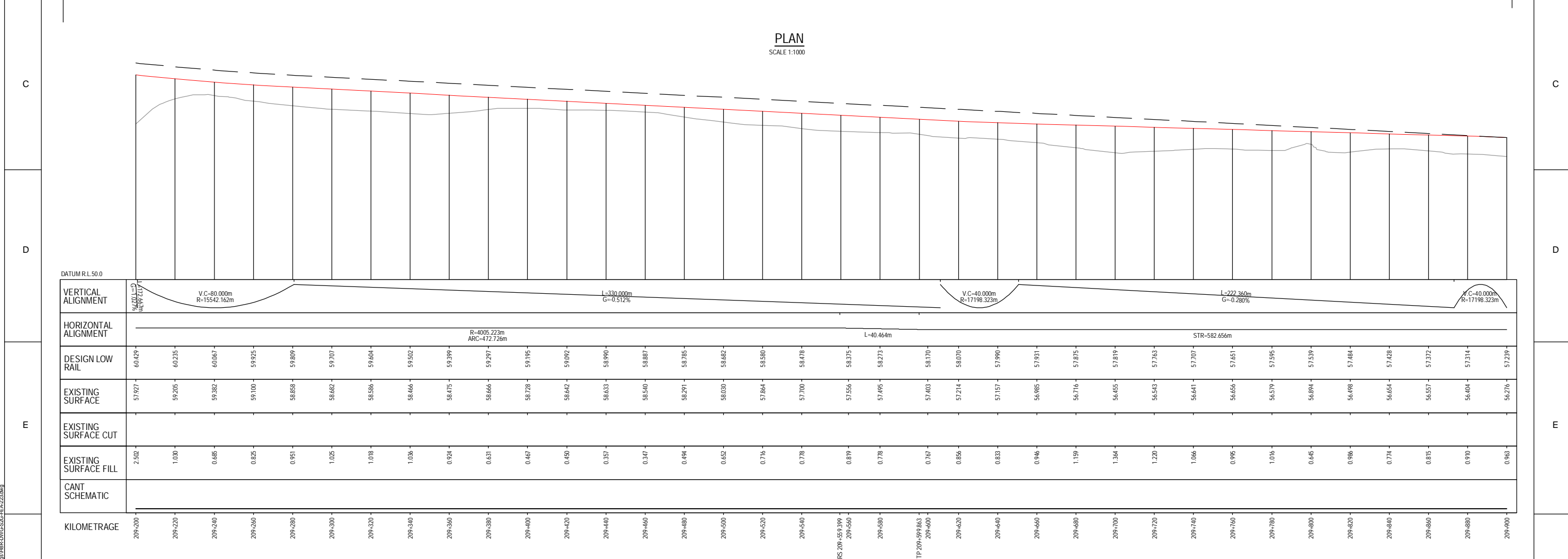
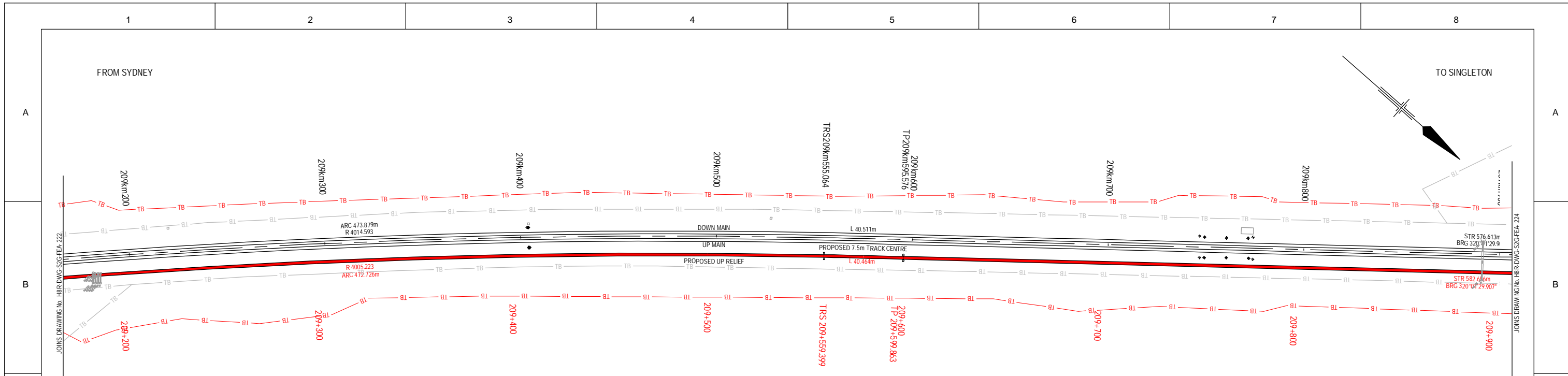
Hunter 8 ALLIANCE

H8R-DWG-S2G-FEA-222

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
22 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 26 February 2010 1:45 PM PLOTTED BY: PT091
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PRELIMINARY

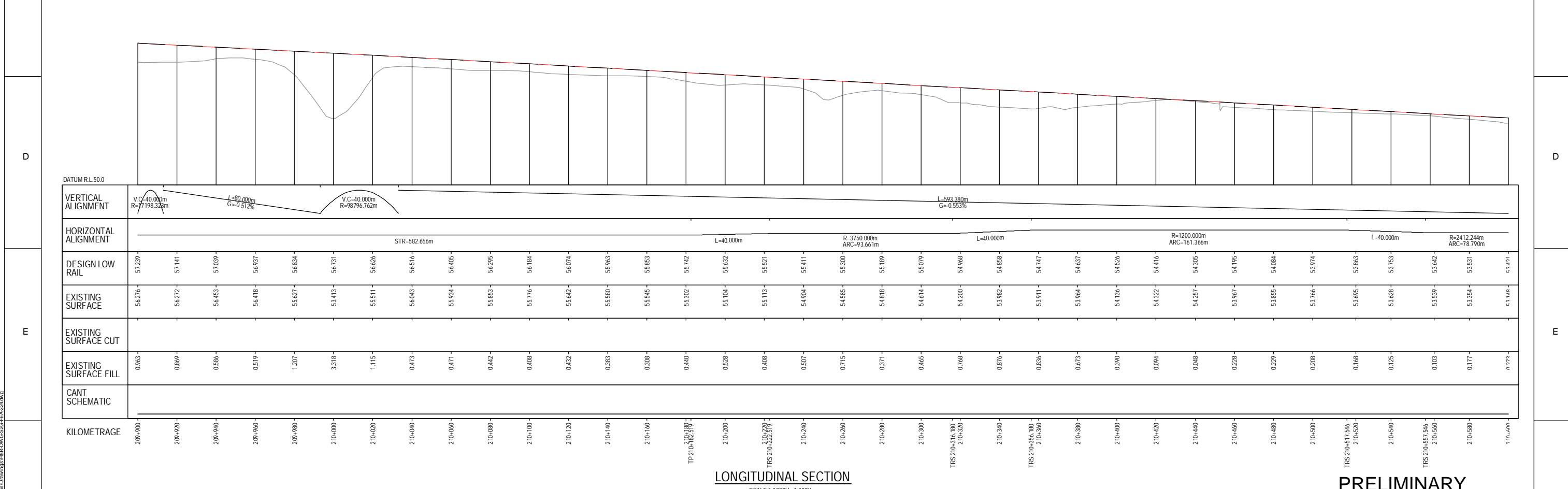
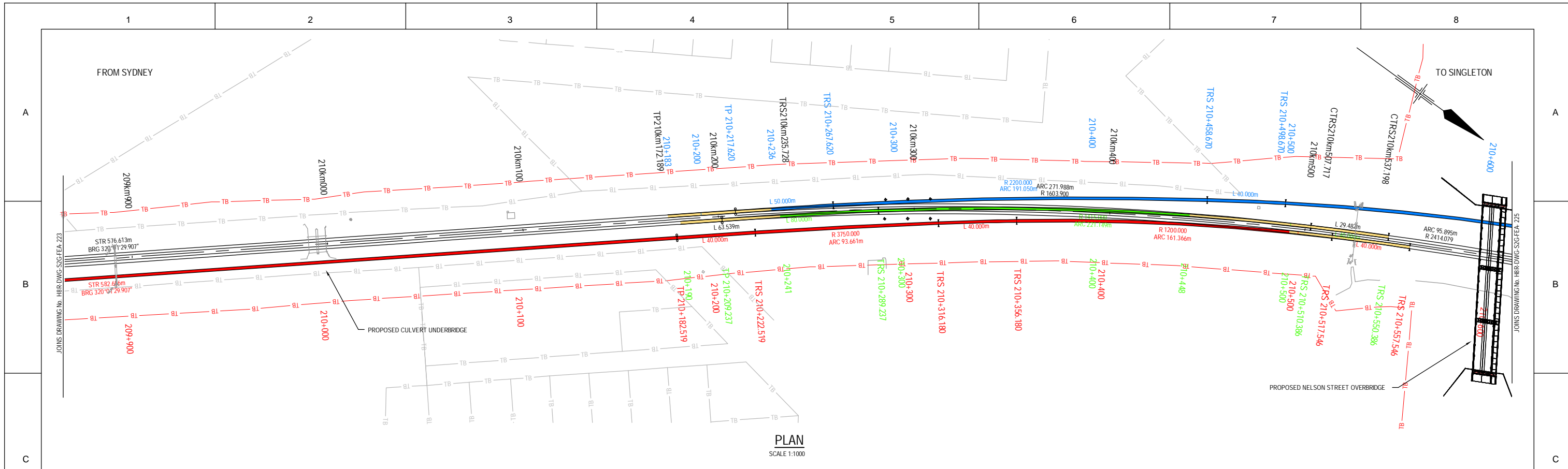
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Used on / Next higher assembly: _____		Approved Date: _____		Drawn: P.TOBIN		Designed: V.ALEX / P.TOBIN	
Alternate DMS number: _____		Approval Date: _____		Design Check: H.JENNINGS*		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.	
Rev: _____ Date: _____ Description: _____		Rev: _____ Date: _____ Description: _____		Drawn: _____ Checked: _____ Approved: _____		MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL	

H8R-DWG-S2G-FEA-223

Sheet No. **23 of 44**

Scale (A1): 1:1000H - 1:100V

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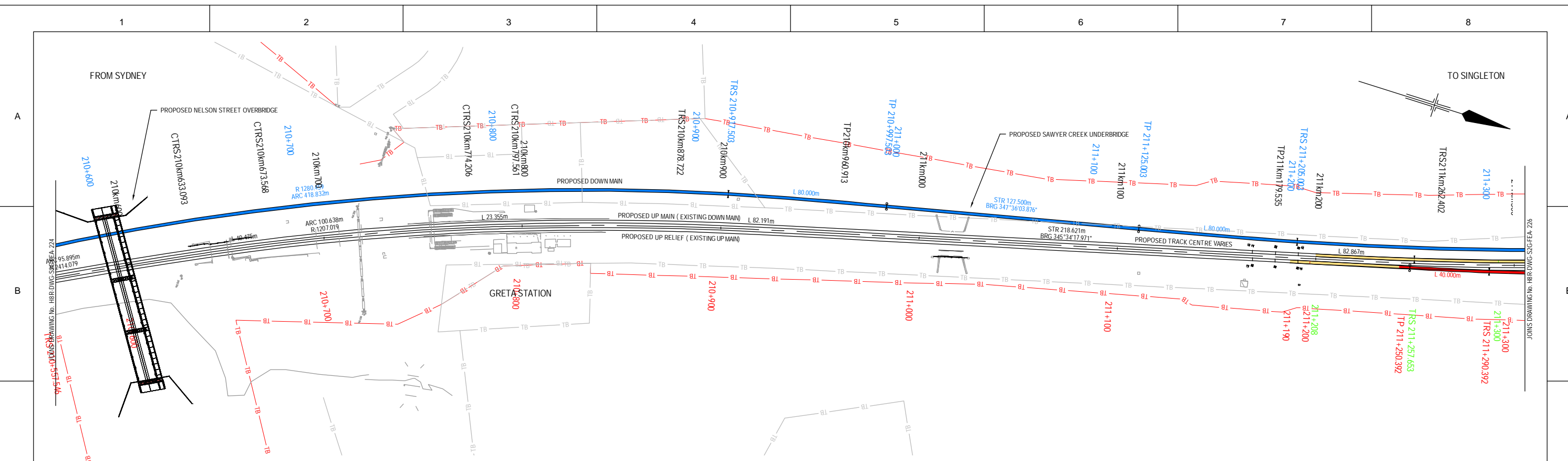


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

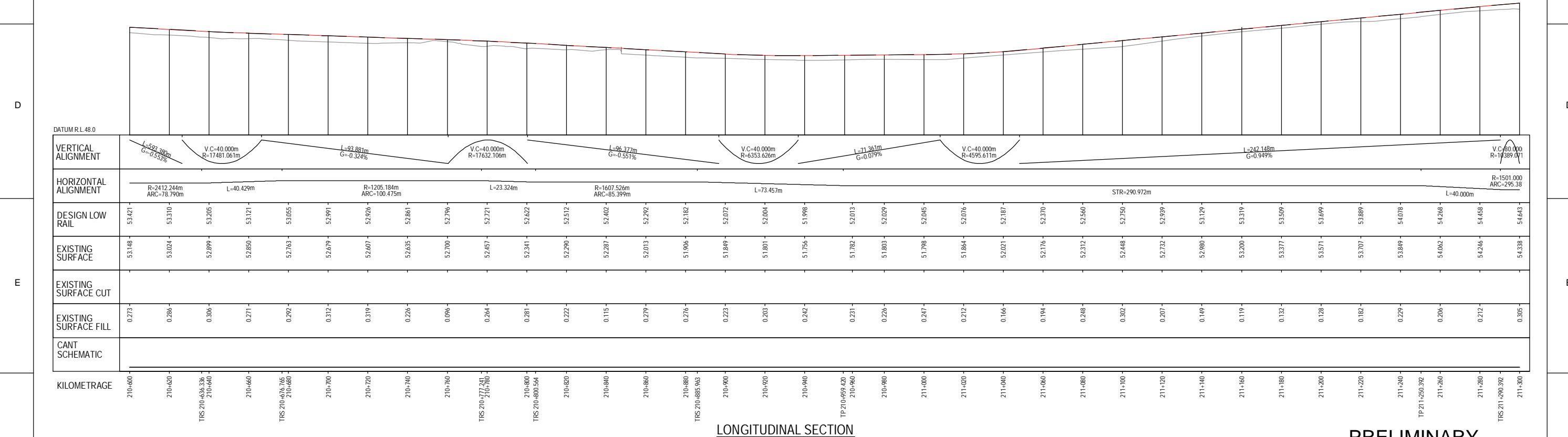
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		Approved By		GHD		Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia #41 2 4341 2796 www.hunteralliance.com.au					
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Approval Date		Rev		Date		Revision Description		Approved		Date	
		1		2		3		4		5	
		1		2		3		4		5	

PLOT DATE: 26 February 2010 14:58 PM PLOTTED BY: PT091
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PLAN
SCALE 1:1000

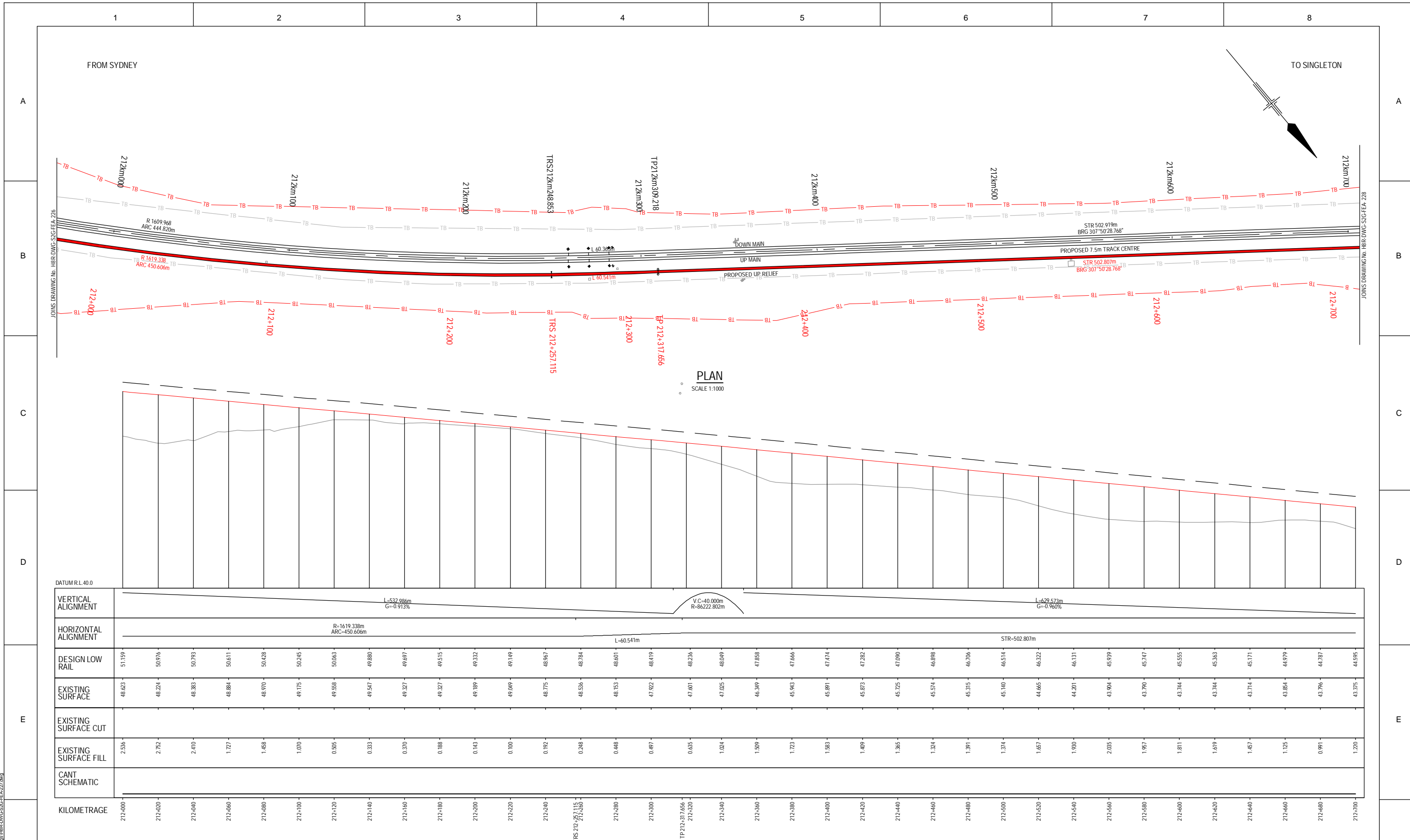


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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PLOT DATE: 26 February 2010 14:56 PM PLOTTED BY: PT091
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Approved By					
Signed:					
Approval Date					
Rev	Date	Description	Drawn	Checked	Apprv.
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:	GHD
GHD Job Number:	22-14471
Drawn:	P.TOBIN
Drafting Check:	H.JENNINGS*
Designed:	V.ALEX / P.TOBIN
Design Check:	S.KING*
Approved:	

Address: Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
61 2 4941 2796
W www.hunter8alliance.com.au

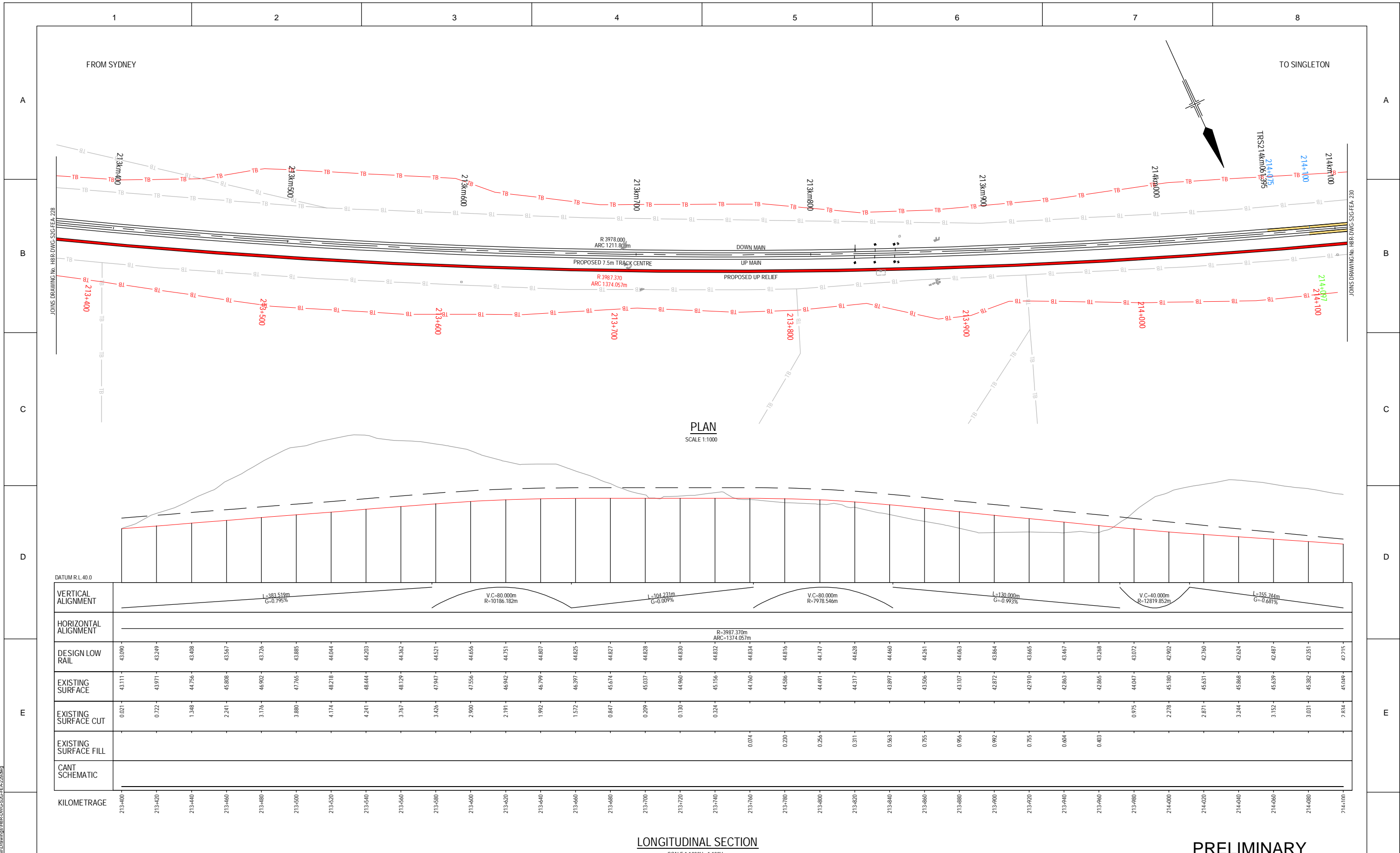
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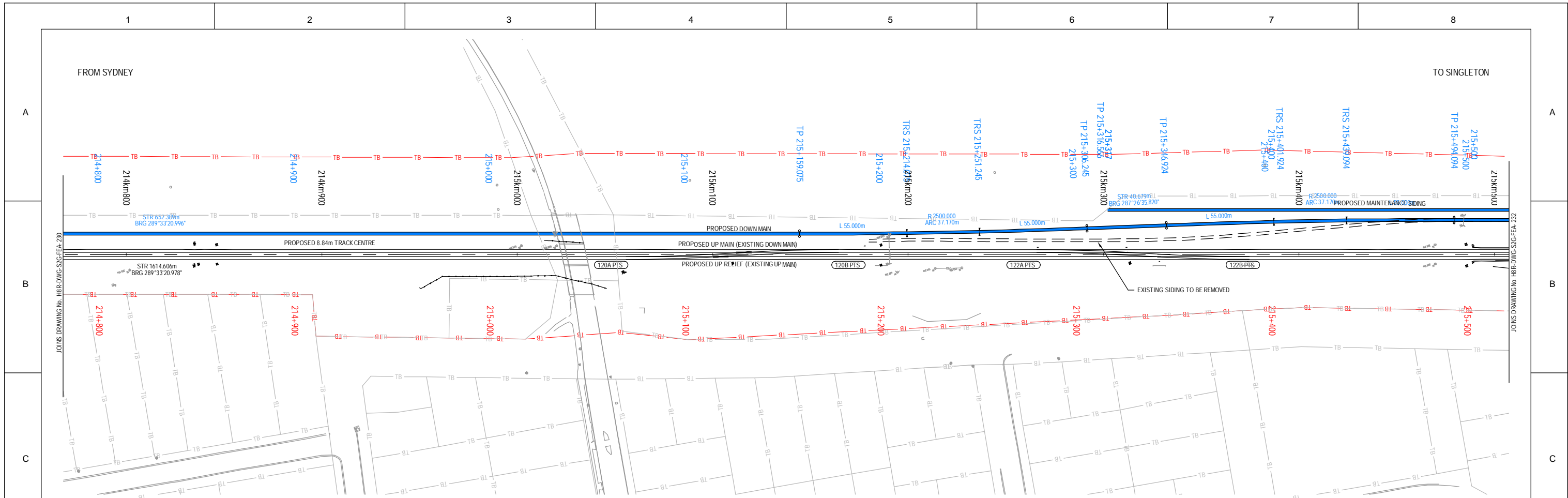
PRELIMINARY

H8R-DWG-S2G-FEA-227

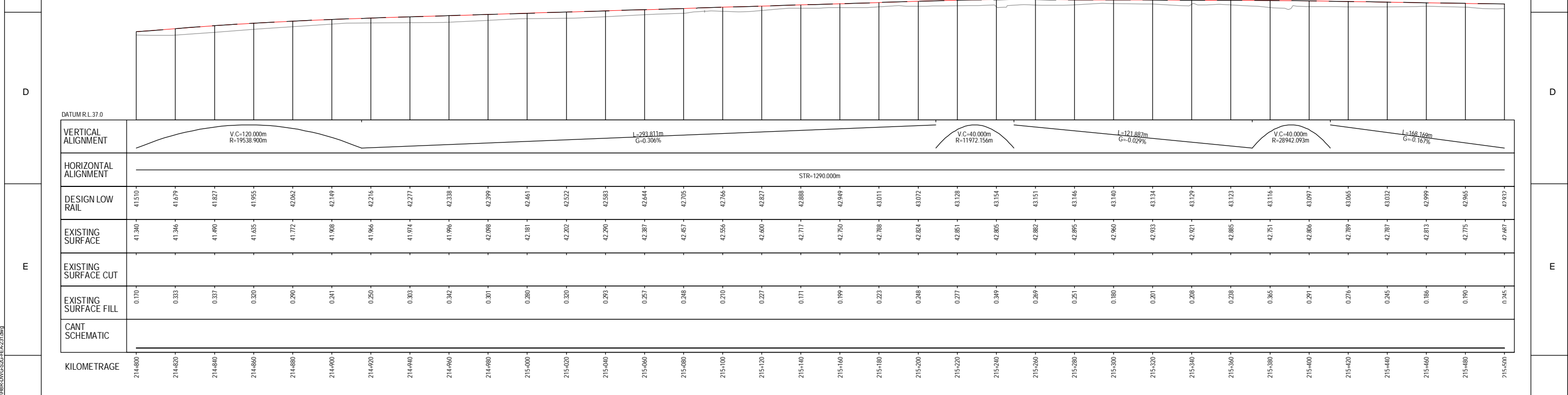
Sheet No. 27 of 44
Scale (A1): 1:1000H - 1:100V

PLOT DATE: 08 February 2010 14:56 PM PLOTTED BY: PT091
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PLAN
SCALE 1:1000

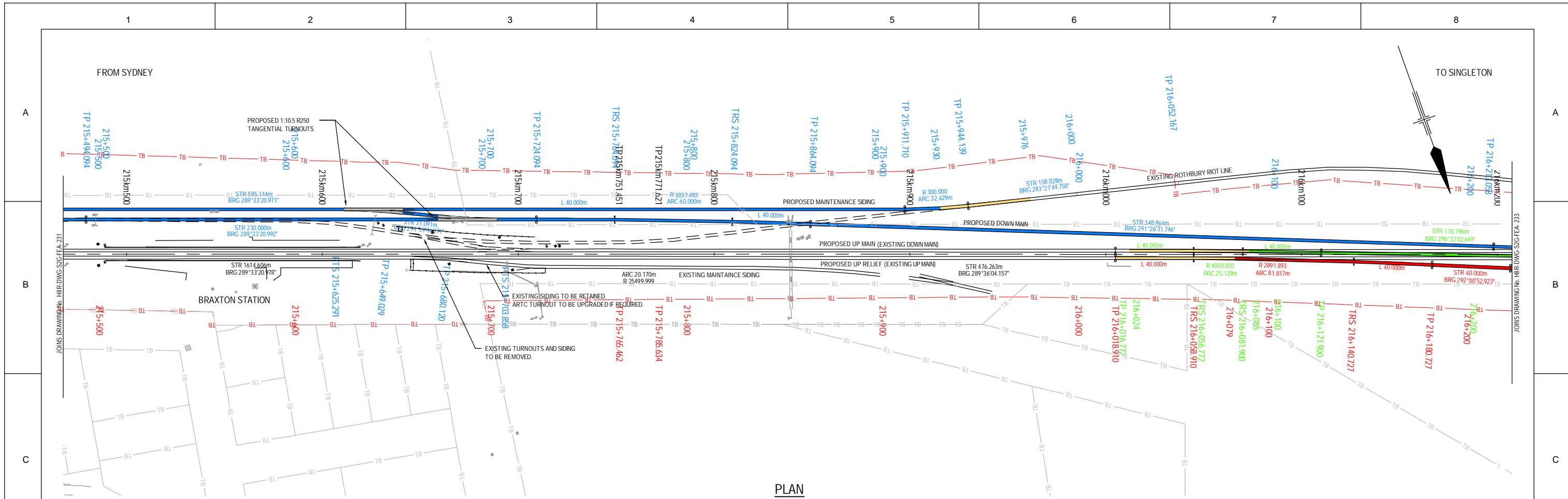


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

PRELIMINARY

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Used on / Next higher assembly:		Signed:		Drawn P.TOBIN		Designed V.ALEX / P.TOBIN				MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL		Scale (A1): 1:1000H - 1:100V																											
Alternate DMS number:		Approval Date		<table border="1"> <tr> <th>Rev</th> <th>Date</th> <th>Description</th> <th>Drawn</th> <th>Checked</th> <th>Apprv.</th> </tr> <tr> <td>B</td> <td>26.02.10</td> <td>7.5m TRACK DESIGN REVIEW</td> <td>PT</td> <td>TL*</td> <td>GJW*</td> </tr> <tr> <td>A</td> <td>19.06.09</td> <td>ISSUED FOR CLIENT REVIEW</td> <td>PT</td> <td>SK*</td> <td>GJW*</td> </tr> </table>		Rev	Date	Description	Drawn	Checked	Apprv.	B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*	A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*	<table border="1"> <tr> <th>Drawn</th> <th>Checked</th> <th>Apprv.</th> <th>Date</th> </tr> <tr> <td>P.TOBIN</td> <td>H.JENNINGS*</td> <td></td> <td></td> </tr> </table>		Drawn	Checked	Apprv.	Date	P.TOBIN	H.JENNINGS*			Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose. This Drawing must not be used for Construction unless signed as Approved.					
Rev	Date	Description	Drawn	Checked	Apprv.																																		
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*																																		
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*																																		
Drawn	Checked	Apprv.	Date																																				
P.TOBIN	H.JENNINGS*																																						

PLOT DATE: 26 February 2010 14:50 PM PLOTTED BY: PT091
 GHD FILE PATH: G:\22\14471\CAD\H8R\DWG\S2G-FEA-231.dwg



PLAN
SCALE 1:1000

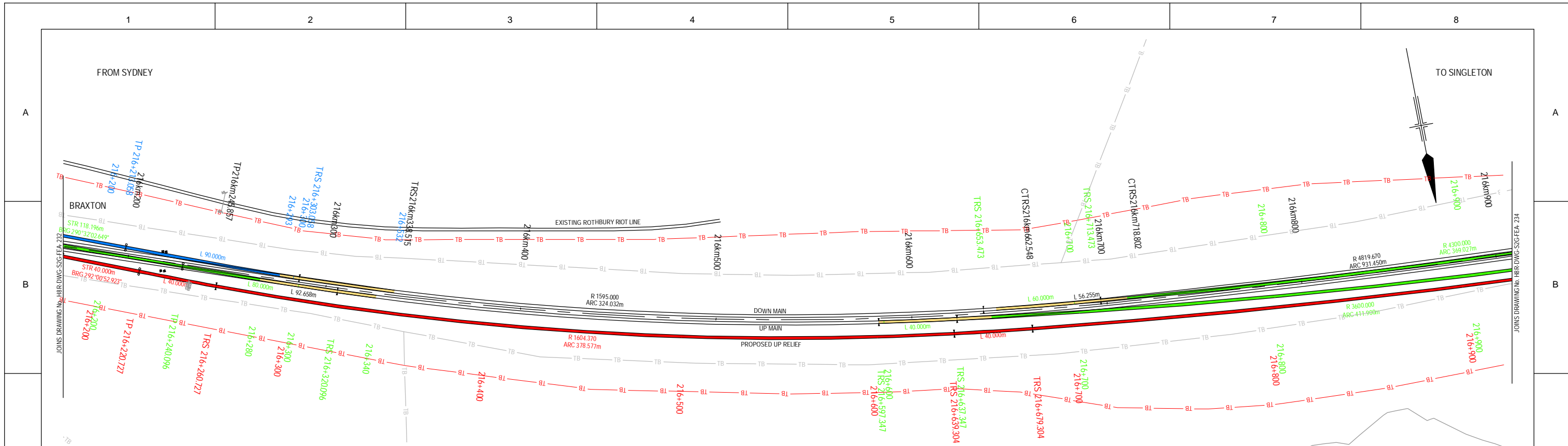
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	HORIZONTAL ALIGNMENT																																			
DESIGN LOW RAIL	42.932	42.899	42.865	42.832	42.799	42.766	42.810	42.851	42.893	42.934	42.976	43.019	43.065	43.109	43.155	43.203	43.252	43.303	43.355	43.408	43.462	43.517	43.573	43.630	43.688	43.747										
EXISTING SURFACE	42.887	42.831	42.776	42.722	42.669	42.617	42.566	42.516	42.467	42.419	42.373	42.328	42.285	42.243	42.203	42.164	42.127	42.092	42.059	42.028	41.999	41.972	41.947	41.924	41.903	41.884	41.867									
EXISTING SURFACE CUT	0.245	0.368	0.490	0.612	0.734	0.856	0.978	1.100	1.222	1.344	1.466	1.588	1.710	1.832	1.954	2.076	2.198	2.320	2.442	2.564	2.686	2.808	2.930	3.052	3.174	3.296										
EXISTING SURFACE FILL	0.245	0.368	0.490	0.612	0.734	0.856	0.978	1.100	1.222	1.344	1.466	1.588	1.710	1.832	1.954	2.076	2.198	2.320	2.442	2.564	2.686	2.808	2.930	3.052	3.174	3.296										
CANT SCHEMATIC																																				
KILOMETRAGE	215+500	215+520	215+540	215+560	215+580	215+600	215+620	215+640	215+660	215+680	215+700	215+720	215+740	215+760	215+780	215+800	215+820	215+840	215+860	215+880	215+900	215+920	215+940	215+960	215+980	216+000	216+020	216+040	216+060	216+080	216+100	216+120	216+140	216+160	216+180	216+200

LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

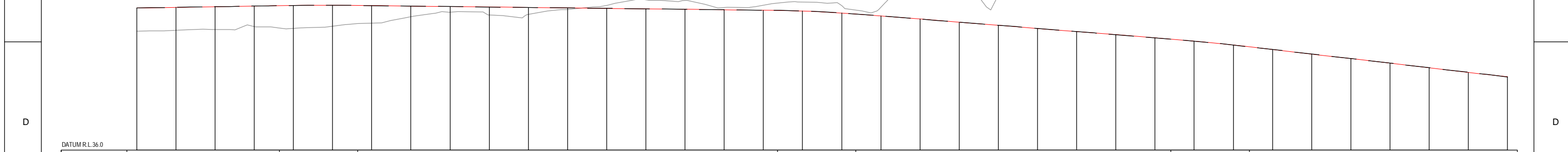
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Used on / Next higher assembly:		Signed:		Drawn P.TOBIN		Designed V.ALEX / P.TOBIN				H8R-DWG-S2G-FEA-232		MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL		Scale (A1): 1:1000H - 1:100V	
Approval Date		Rev		Date		Description		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose. This Drawing must not be used for Construction unless signed as Approved.		Approved H.JENNINGS* S.KING*		Approved P.TOBIN V.ALEX* G.J.W.*			

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PLAN
SCALE 1:1000



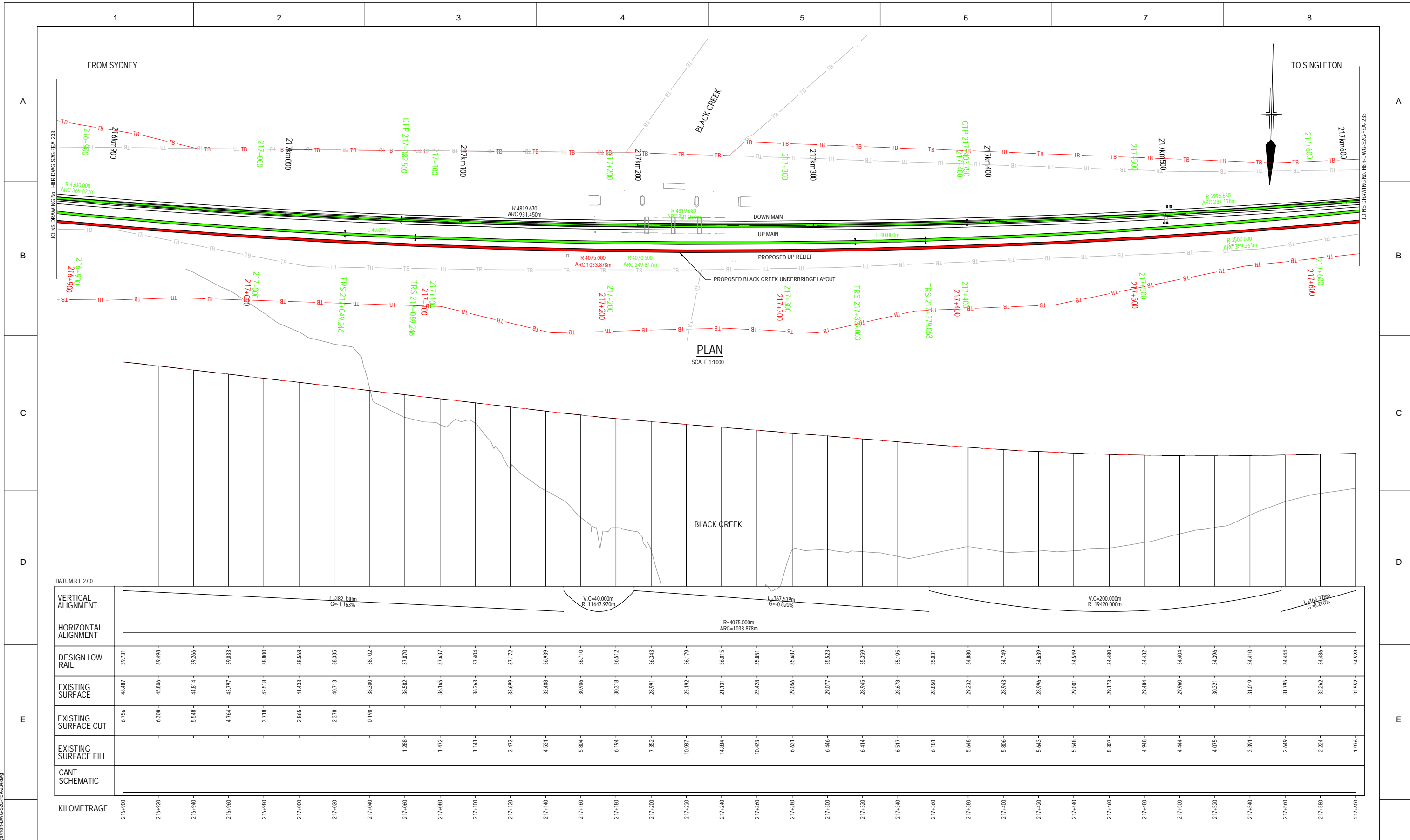
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	HORIZONTAL ALIGNMENT																																			
DESIGN LOW RAIL	14.23	14.27	14.30	14.33	14.37	14.39	14.41	14.43	14.45	14.47	14.49	14.51	14.53	14.55																						
EXISTING SURFACE	42.06	42.08	42.10	42.12	42.14	42.16	42.18	42.20	42.22	42.24	42.26	42.28	42.30	42.32																						
EXISTING SURFACE CUT																																				
EXISTING SURFACE FILL	1.81	1.71	1.61	1.51	1.41	1.31	1.21	1.11	1.01	0.91	0.81	0.71	0.61	0.51																						
CANT SCHEMATIC																																				
KILOMETRAGE	216+200	216+220	216+240	216+260	216+280	216+300	216+320	216+340	216+360	216+380	216+400	216+420	216+440	216+460	216+480	216+500	216+520	216+540	216+560	216+580	216+600	216+620	216+640	216+660	216+680	216+700	216+720	216+740	216+760	216+780	216+800	216+820	216+840	216+860	216+880	216+900

LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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Used on / Next higher assembly:		Signed:		Drawn: P.TOBIN		Designed: V.ALEX / P.TOBIN				MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL			
Alternate DMS number:		Approval Date		Drafting Check: H.JENNINGS* Design Check: S.KING*		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.							
		Rev		Date		Description		Approved: Date					
		B 26.02.10		7.5m TRACK DESIGN REVIEW		PT TL* GJM*		Approved: Date					
		A 19.06.09		ISSUED FOR CLIENT REVIEW		PT SK* GJM*							

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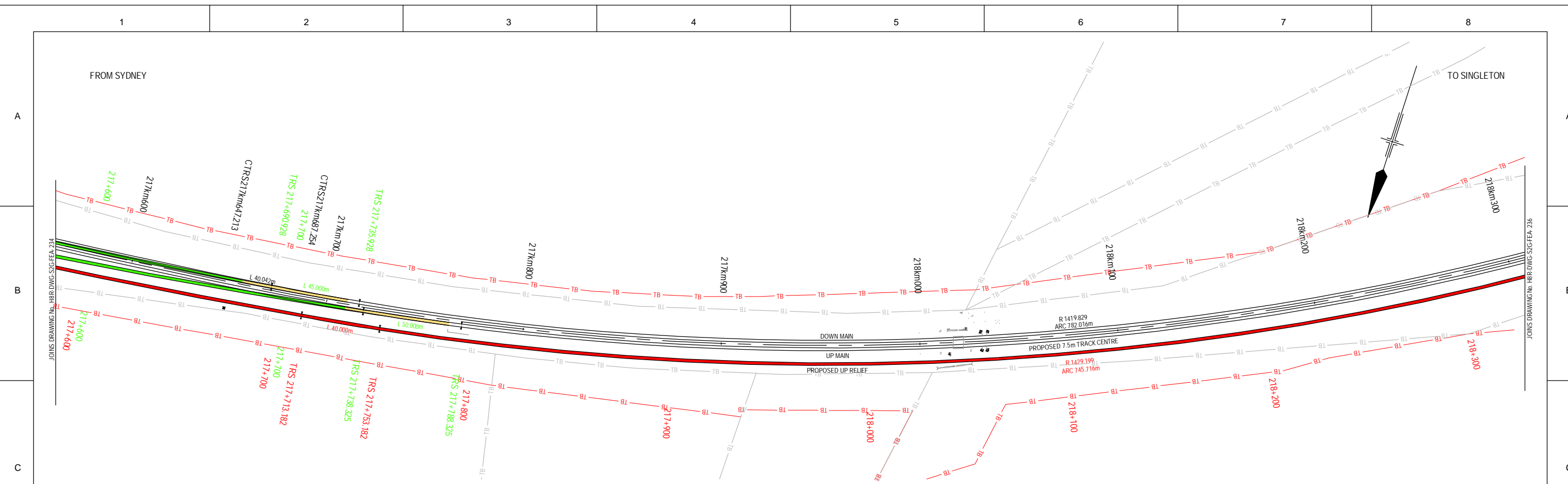
ARTC APPROVAL	Approved By	
Approved		
Signature		
Approval Date		
Rev	Date	Description
B	26.02.10	7.5m TRACK DESIGN REVIEW
A	19.06.09	ISSUED FOR CLIENT REVIEW

Designing Company: GHD
GHD Job Number: 22-14471
Drawn: P.TOBIN
Drafting Check: H.JENNINGS*
Designed: V.ALEX / P.TOBIN
Design Check: S.KING*
Approved: [Signature]
Date: [Date]

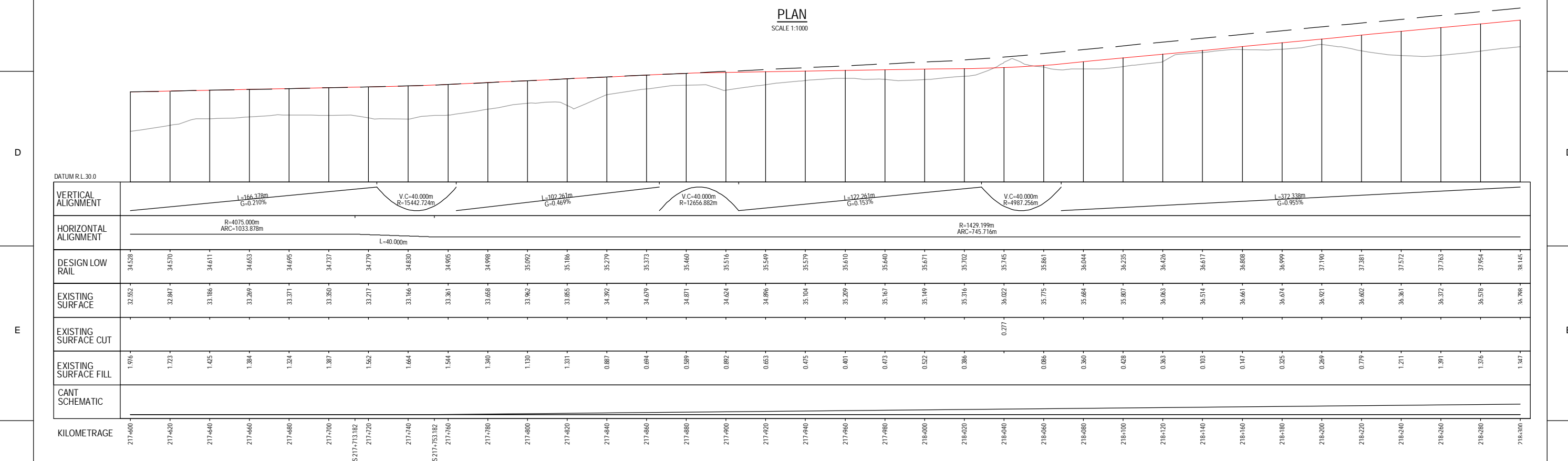
Address: Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
P 61 2 4941 2798
W www.hunter8alliance.com.au

H8R DWG NUMBER: **A/B**
H8R-DWG-S2G-FEA-234
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL
Sheet No. **34 of 44**
Scale (A1): 1:1000H - 1:100V

PLOT DATE: 26 February 2010 14:00 PM PLOTTED BY: PTOR
GHD FILE PATH: G:\22\14471\CAD\Drawings\H8R-DWG-S2G-FEA-234.dwg



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SCALE 1:1000

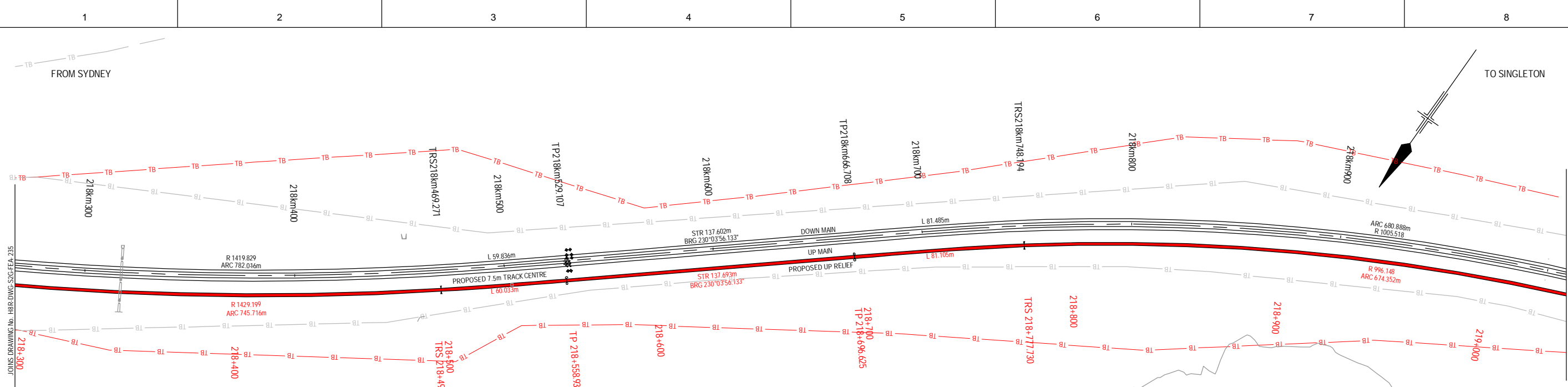


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

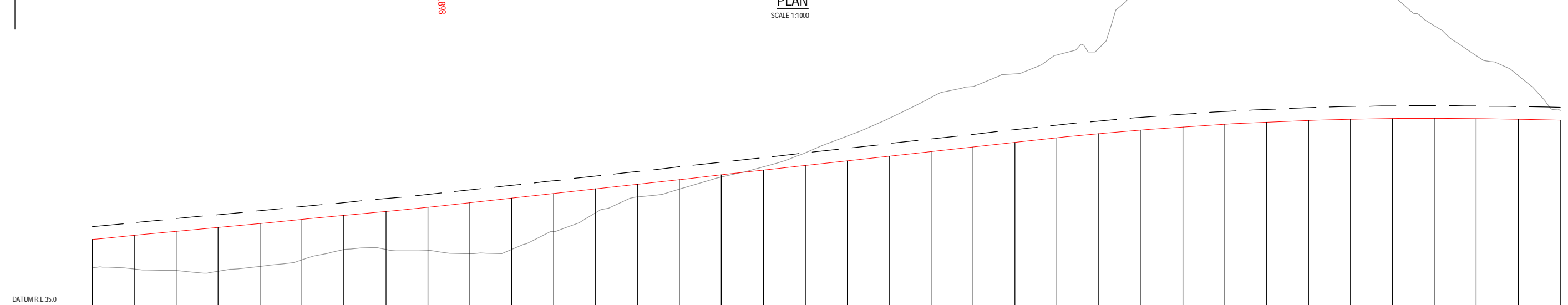
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Used on / Next higher assembly: _____ Alternate DMS number: _____		Approval Date: _____		Designated: V.ALEX / P.TOBIN Design Check: S.KING*		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.		Approved: _____ Date: _____		PT TL* GJW* PT SK* GJW*		Rev Date Description B 26.02.10 7.5m TRACK DESIGN REVIEW A 19.06.09 ISSUED FOR CLIENT REVIEW	

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PLAN
SCALE 1:1000



VERTICAL ALIGNMENT	L=372.338m G=-0.955%		V.C.=40.000m R=2606.611m		L=266.579m G=-1.108%		V.C.=220.000m R=17197.994m		L=178.940m G=-0.177%	
	HORIZONTAL ALIGNMENT									
DESIGN LOW RAIL	38.145	38.336	38.527	38.718	38.909	39.100	39.291	39.482	39.673	39.864
EXISTING SURFACE	36.798	36.737	36.659	36.624	36.854	37.167	37.640	37.664	37.614	37.470
EXISTING SURFACE CUT										
EXISTING SURFACE FILL	1.347	1.599	1.868	2.094	2.055	1.933	1.631	1.818	2.066	2.423
CANT SCHEMATIC	<div style="display: flex; justify-content: space-between;"> 25.00 mm CANT SUPER RAMP - 1 IN 2401.32 0.00 mm CANT 0.00 mm CANT SUPER RAMP - 1 IN 2027.64 40.00 mm CANT </div>									
KILOMETRAGE	218+300	218+320	218+340	218+360	218+380	218+400	218+420	218+440	218+460	218+480

LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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Signature										
Approval Date	B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*				
Rev	A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*				
Revision Description				Drawn	Checked	Approved	Date			

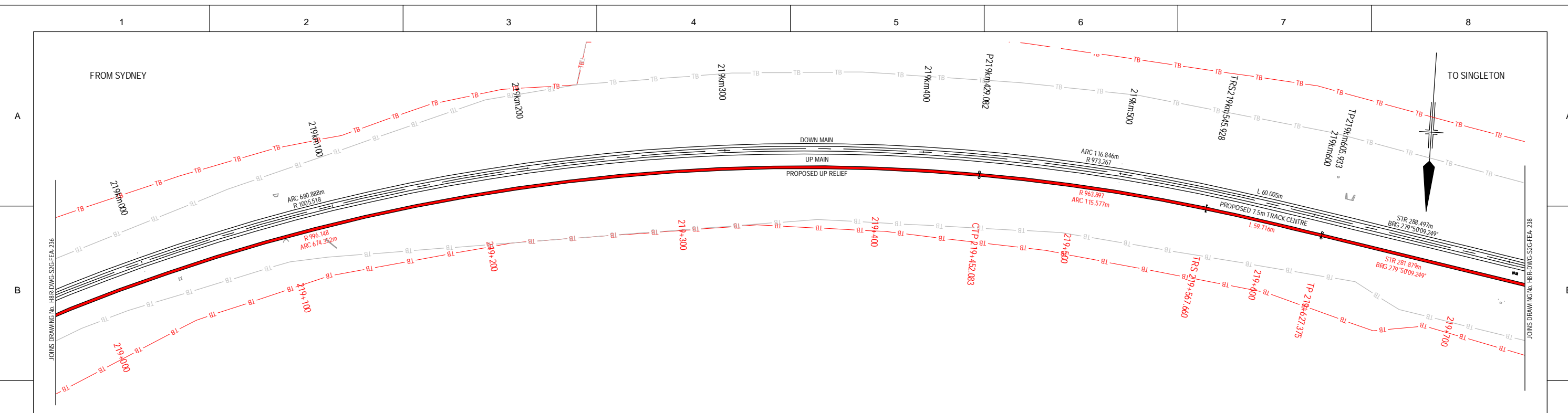
Designing Company: GHD
GHD Job Number: 22-14471
Drawn: P.TOBIN
Drilling Check: H.JENNINGS*
Designed: V.ALEX / P.TOBIN
Design Check: S.KING*
Approved

Address: Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
F 61 2 4941 2796
W www.hunter8alliance.com.au

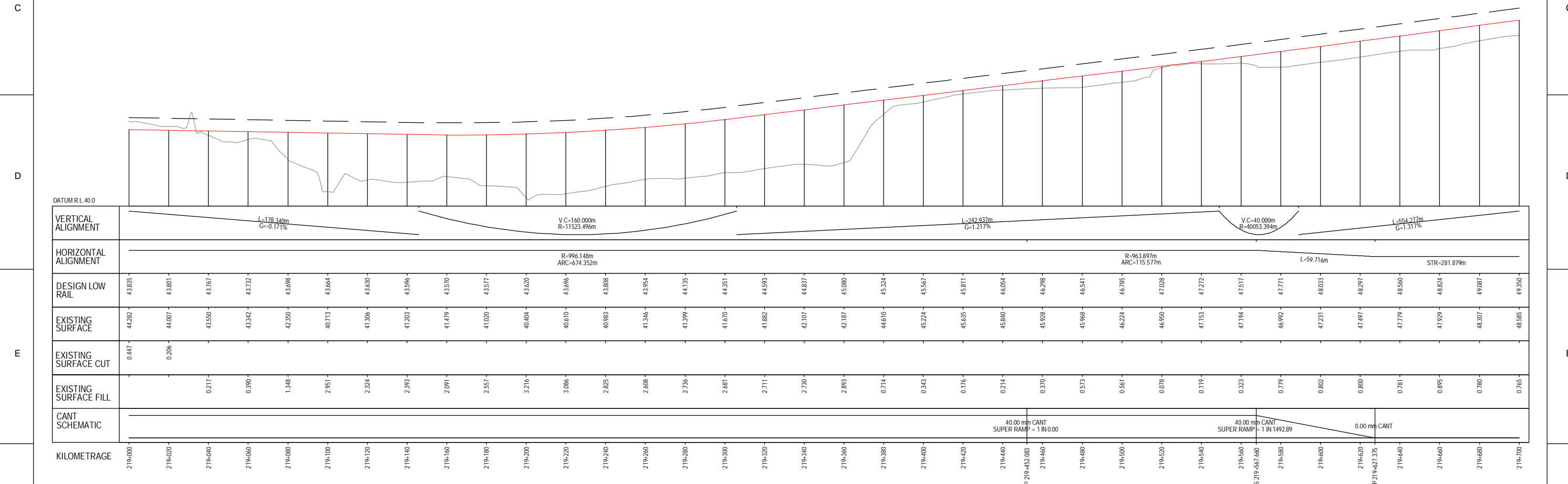


H8R-DWG-S2G-FEA-236
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL
Sheet No. 36 of 44
Scale (A1): 1:1000H - 1:100V

PLOT DATE: 28 February 2010 1:50 PM PLOTTED BY: PT091
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PLAN
SCALE 1:1000

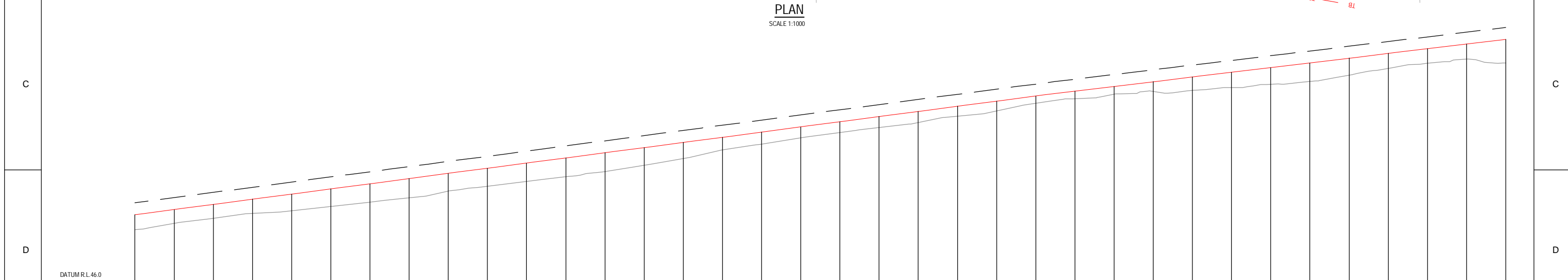
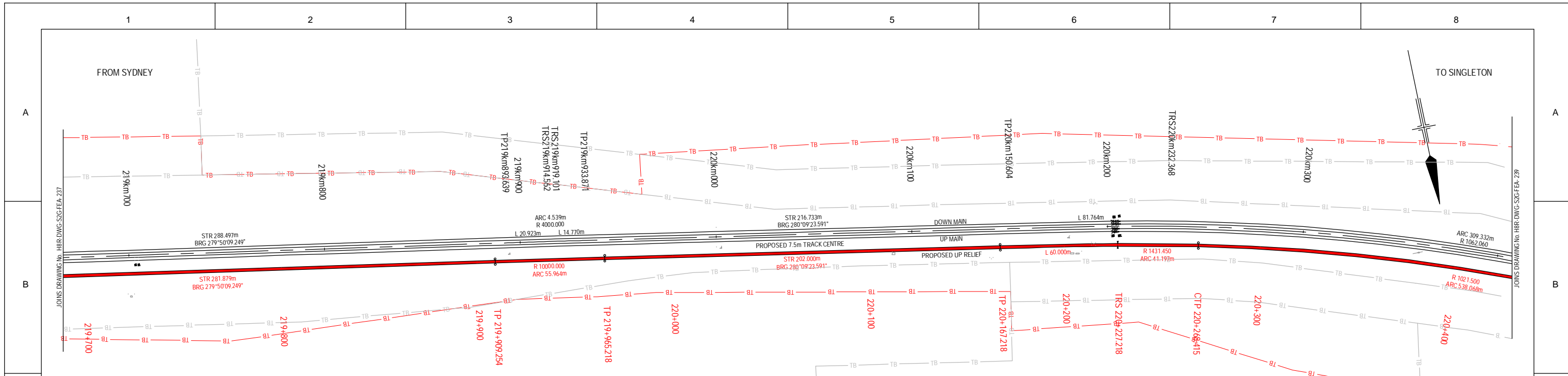


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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Used on / Next higher assembly:		Signed:		Drawn: P.TOBIN		Designed: V.ALEX / P.TOBIN				Sheet No. 37 of 44 Scale (A1): 1:1000H - 1:100V	
Alternate DMS number:		Approval Date		B 26.02.10 A 19.06.09		7.5m TRACK DESIGN REVIEW ISSUED FOR CLIENT REVIEW		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.		MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL	
1	2	3	4	5	6	7	8				

PLOT DATE: 26 February 2010 14:51 PM PLOTTED BY: PT091
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HORIZONTAL ALIGNMENT	STR-281.879m		R=10000.000m ARC=55.964m		STR-202.000m	
DESIGN LOW RAIL	49.350	49.614	49.877	50.141	50.404	50.668
EXISTING SURFACE	48.585	48.907	49.169	49.427	49.685	49.943
EXISTING SURFACE CUT						
EXISTING SURFACE FILL	0.765	0.707	0.700	0.710	0.719	0.725
CANT SCHEMATIC	0.00 mm CANT SUPER RAMP = 1 IN 2000.00					
KILOMETRAGE	219+700	219+720	219+740	219+760	219+780	219+800

LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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Signature					
Approval Date	B 26.02.10	A 19.06.09	7.5m TRACK DESIGN REVIEW	ISSUED FOR CLIENT REVIEW	
Rev	Date	Description	Drawn	Checked	Approved
			PT	TL*	GJW*
			PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

Address:
Level 3 GHD Tower, 24 Honeysuckle Drive
Newcastle NSW 2300 Australia
61 2 4941 2796
W www.hunter8alliance.com.au

Drawn:
P.TOBIN

Designed:
V.ALEX / P.TOBIN

Drafting Check:
H.JENNINGS*

Design Check:
S.KING*

Approved

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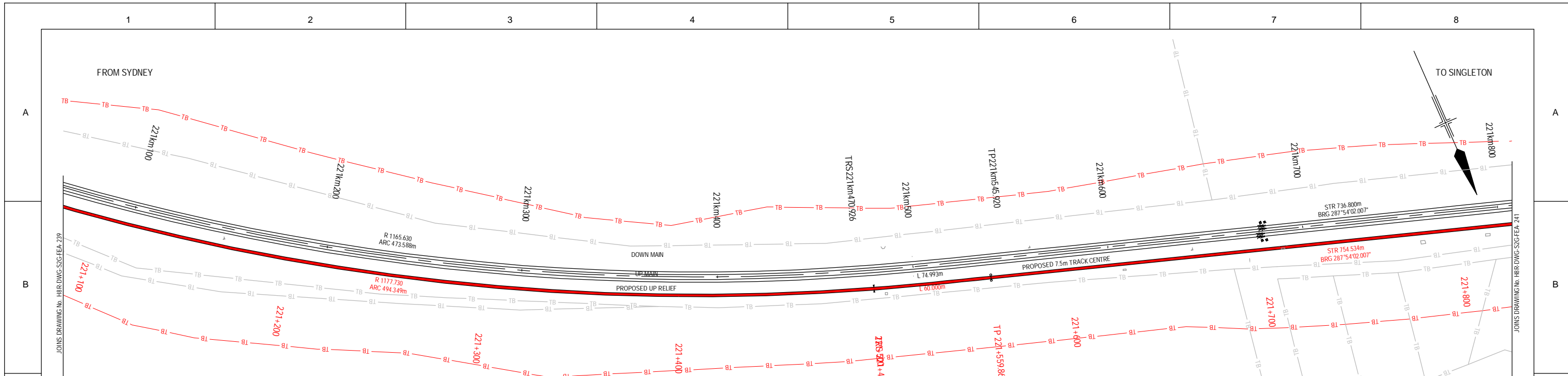
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

H8R DWG NUMBER **A/B**

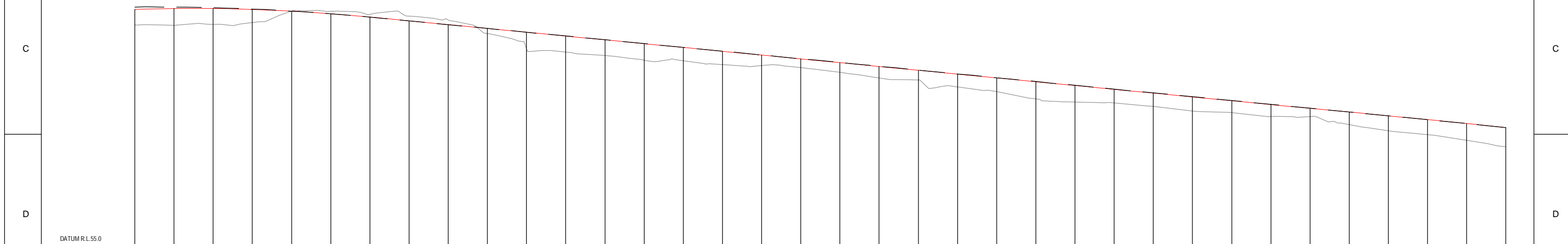
H8R-DWG-S2G-FEA-238

Sheet No.
38 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 26 February 2010 1:41 PM PLOTTED BY: PT091
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SCALE 1:1000



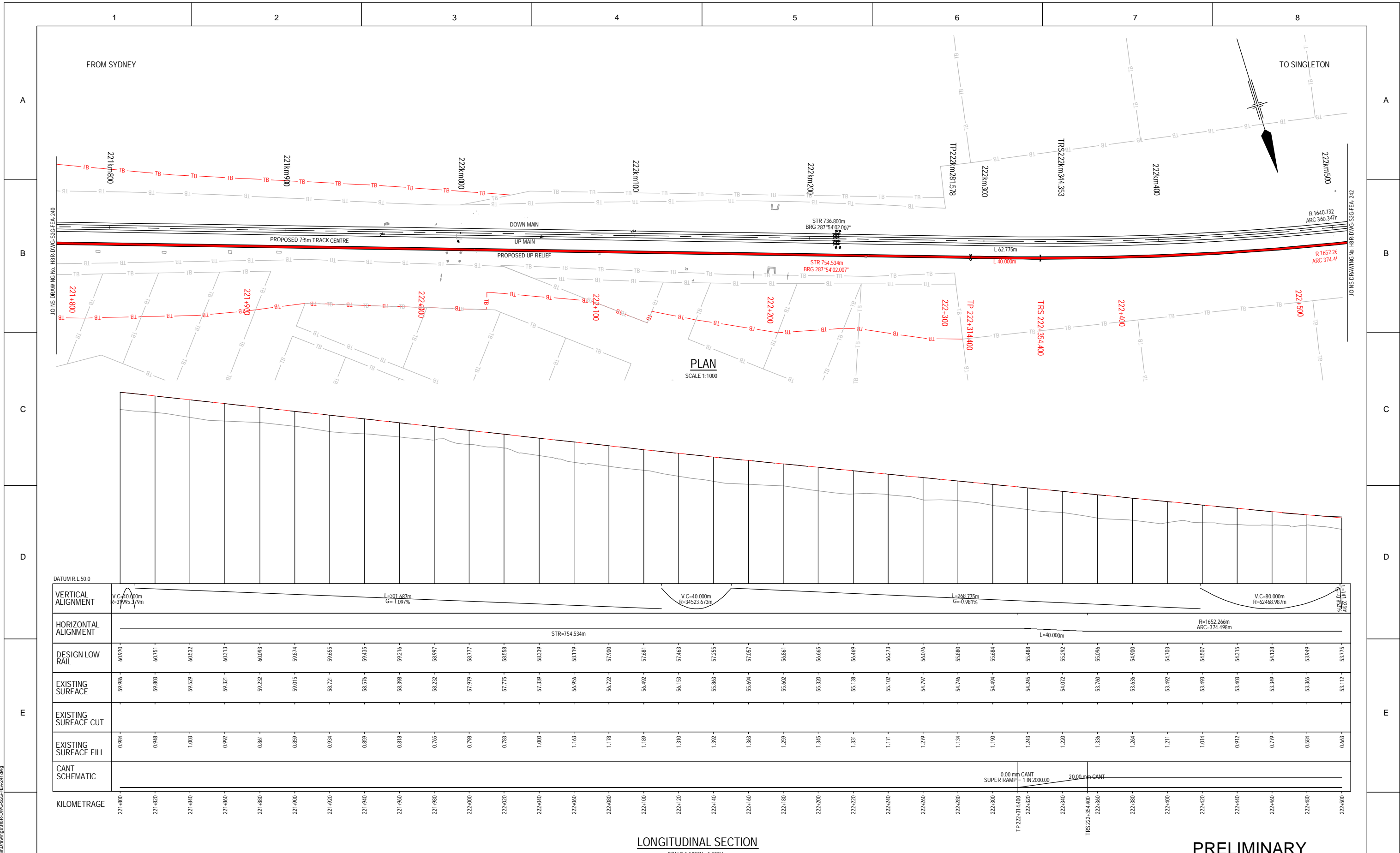
LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

KILOMETRAGE	VERTICAL ALIGNMENT		HORIZONTAL ALIGNMENT		DESIGN LOW RAIL	EXISTING SURFACE	EXISTING SURFACE CUT	EXISTING SURFACE FILL	CANT SCHEMATIC
	V.C.-220.000m R-9218.731m	L-519.813m G=-0.972%	R-1177.730m ARC-494.349m	L=60.000m					
221+100					6023.9	6621.2		0.811	
221+120					6070.6	6620.1		0.863	
221+140					6062.9	6626.9		0.796	
221+160					6107.9	6635.9		0.699	
221+180					6628.9	6694.9	0.010		
221+200					6796.9	6698.9	0.132		
221+220					6621.9	6677.9	0.155		
221+240					6628.9	6668.2	0.520		
221+260					6623.9	6648.1	0.490		
221+280					6309.9	6579.9	0.247		
221+300					6309.9	6499.9	0.158		
221+320					6569.9	6482.9	0.828		
221+340					6459.9	6495.9	0.803		
221+360					6526.9	6418.9	0.842		
221+380					6506.9	6381.9	0.670		
221+400					6487.9	6419.9	0.680		
221+420					6497.9	6414.9	0.556		
221+440					6483.9	6404.9	0.490		
221+460					6428.9	6378.9	0.490		
221+480					6409.9	6350.9	0.580		
221+500					6390.9	6341.9	0.487		
221+520					6370.9	6304.9	0.690		
221+540					6351.9	6280.9	0.700		
221+560					6337.9	6249.9	0.882		
221+580					6312.9	6227.9	0.850		
221+600					6298.9	6229.9	0.690		
221+620					6279.9	6205.9	0.670		
221+640					6254.9	6181.9	0.728		
221+660					6236.9	6172.9	0.617		
221+680					6219.9	6153.9	0.610		
221+700					6197.9	6151.9	0.430		
221+720					6170.9	6112.9	0.639		
221+740					6158.9	6080.9	0.765		
221+760					6137.9	6069.9	0.750		
221+780					6117.9	6032.9	0.856		
221+800					6097.9	5998.9	0.984		

PRELIMINARY

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Used on / Next higher assembly: _____		Approval Date: _____		Drawn: P.TOBIN Design Check: H.JENNINGS* Approved: _____		Designed: V.ALEX / P.TOBIN Design Check: S.KING* Approved: _____		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.	
Alternate DMS number: _____		Rev: B 26.02.10 7.5m TRACK DESIGN REVIEW A 19.06.09 ISSUED FOR CLIENT REVIEW		Drawn: PT TL* GJW* Checked: PT SK* GJW* Date: _____		MAITLAND TO MINIMBAH - THIRD TRACK TRACK ALIGNMENT HORIZONTAL AND VERTICAL		Sheet No. 40 of 44 Scale (A1): 1:1000H - 1:100V	

PLOT DATE: 26 February 2010 1:45 PM PLOTTED BY: PT091
 GHD FILE PATH: G:\221\4471\GAD00\Rail\Drawings\H8R-DWG-S2G-FEA-240.dwg



LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

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Signed:			
B	26.02.10	7.5m TRACK DESIGN REVIEW	
A	19.06.09	ISSUED FOR CLIENT REVIEW	
Rev	Date	Drawn	Checked
		PT	TL*
		PT	SK*
Approval Date		Approved	
		GJW*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

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Drawn:
P.TOBIN

Designed:
V.ALEX / P.TOBIN

Drafting Check:
H.JENNINGS*

Design Check:
S.KING*

Approved

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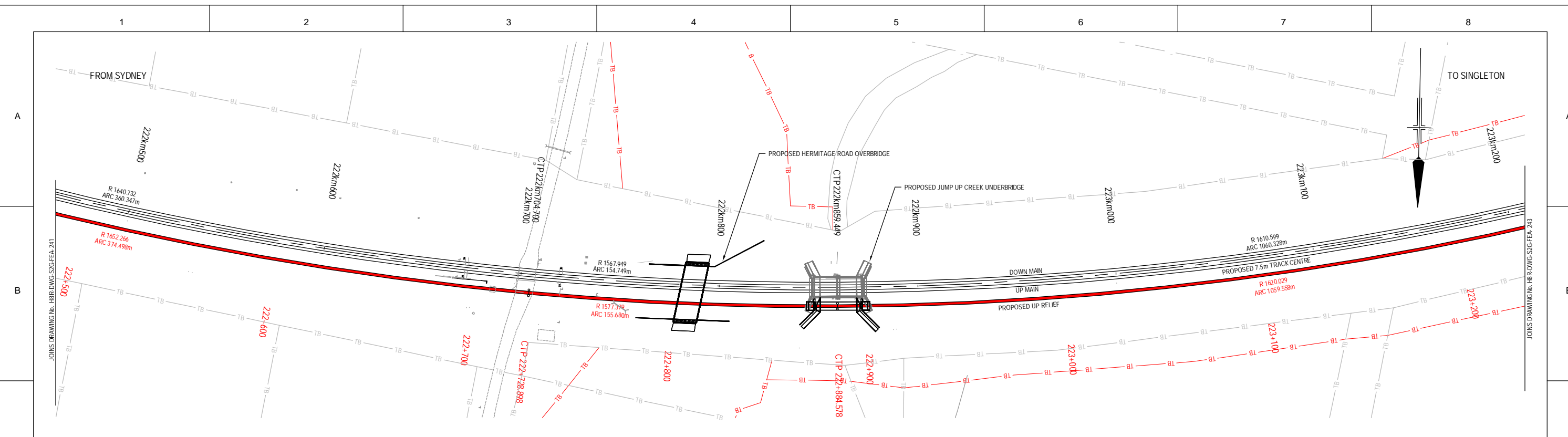
H8R DWG NUMBER **A/B**

H8R-DWG-S2G-FEA-241

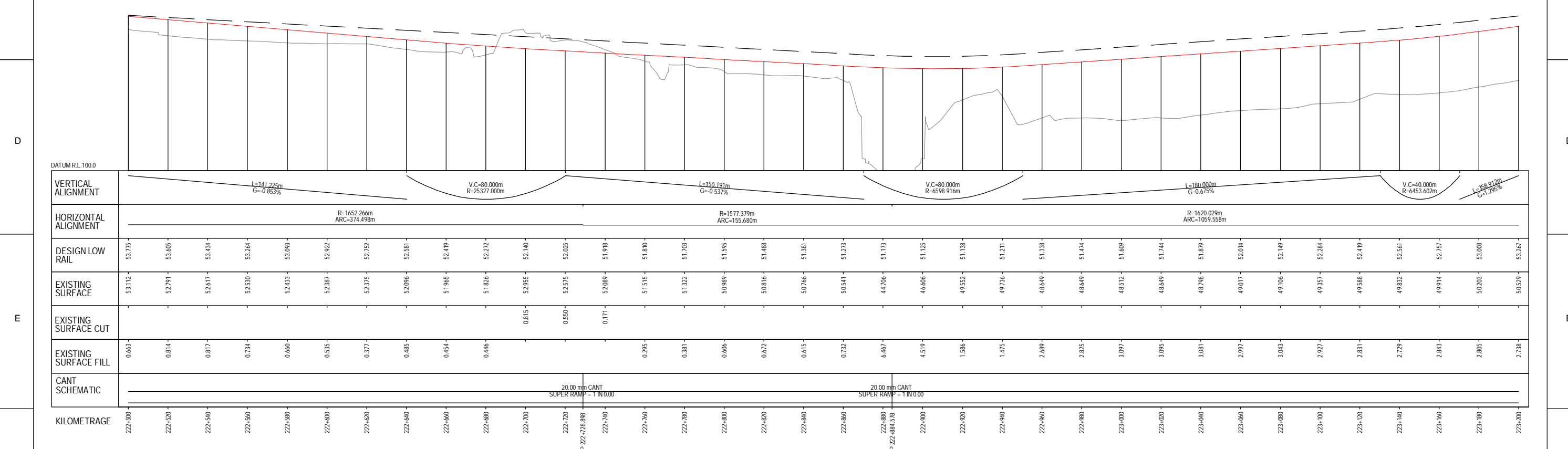
MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
41 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 26 February 2010 1:52 PM PLOTTED BY: PT091
GHD FILE PATH: G:\22\14471\GAD00\Rail\Drawings\H8R-DWG-S2G-FEA-241.dwg



PLAN
SCALE 1:1000

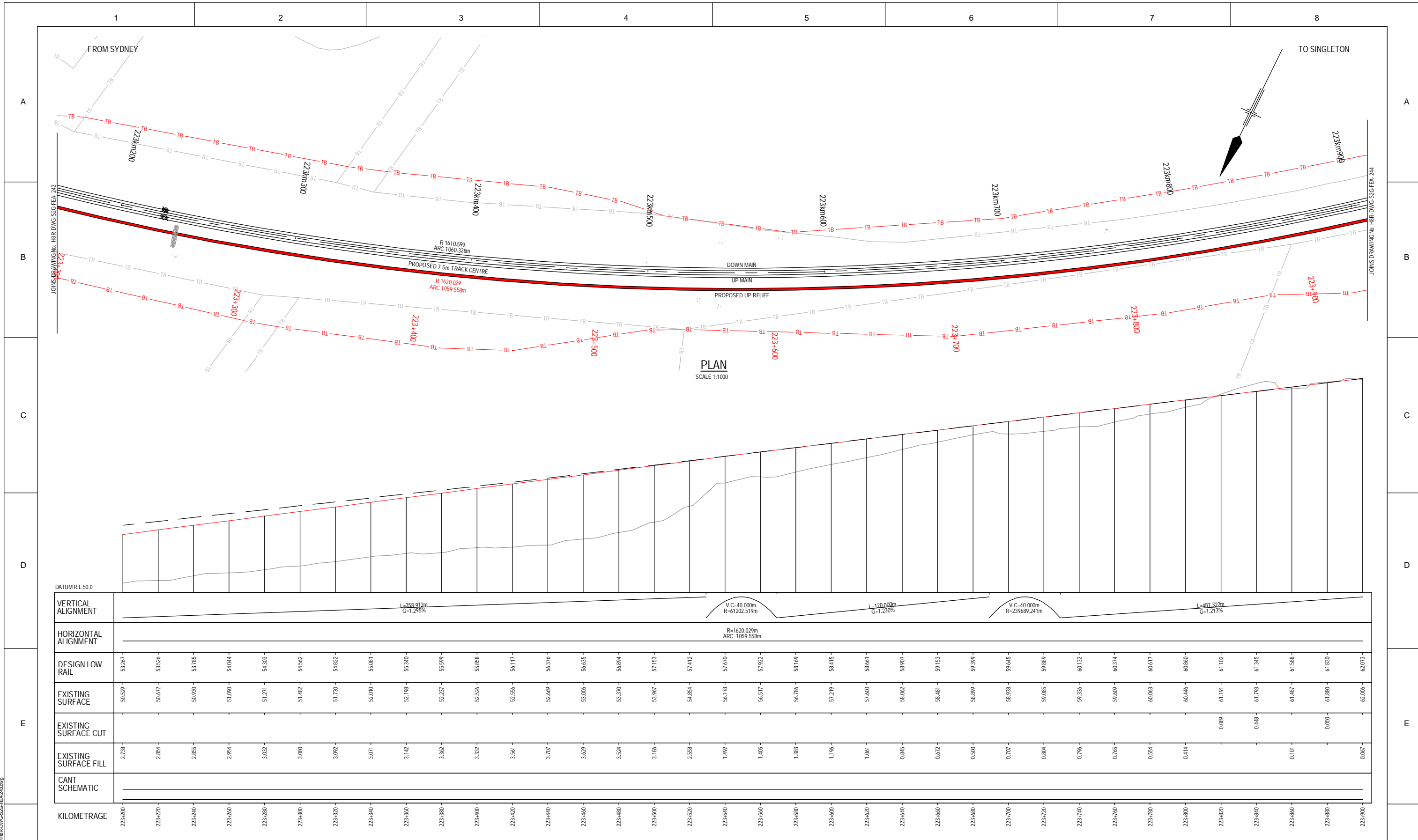


LONGITUDINAL SECTION
SCALE 1:1000H - 1:100V

PRELIMINARY

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Used on / Next higher assembly:		Signed:		Designed V.ALEX / P.TOBIN		Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.				Scale (A1): 1:1000H - 1:100V					
Approval Date		Rev		Date		Revision Description		Drawn		Checked		Approved		Date	
		B		26.02.10		7.5m TRACK DESIGN REVIEW		PT		TL*		GJW*			
		A		19.06.09		ISSUED FOR CLIENT REVIEW		PT		SK*		GJW*			

PLOT DATE: 28 February 2010 14:50 PM PLOTTED BY: PT091
 GHD FILE PATH: G:\22\14471\GADD\Rail\Drawings\H8R-DWG-S2G-FEA-242.dwg



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Rev	Date	Description	Drawn	Checked	Approved
B	26.02.10	7.5m TRACK DESIGN REVIEW	PT	TL*	GJW*
A	19.06.09	ISSUED FOR CLIENT REVIEW	PT	SK*	GJW*

Designing Company:
GHD
GHD Job Number:
22-14471

Drawn:
P.TOBIN

Designed:
V.ALEX / P.TOBIN

Design Check:
H.JENNINGS*

Approved:
S.KING*

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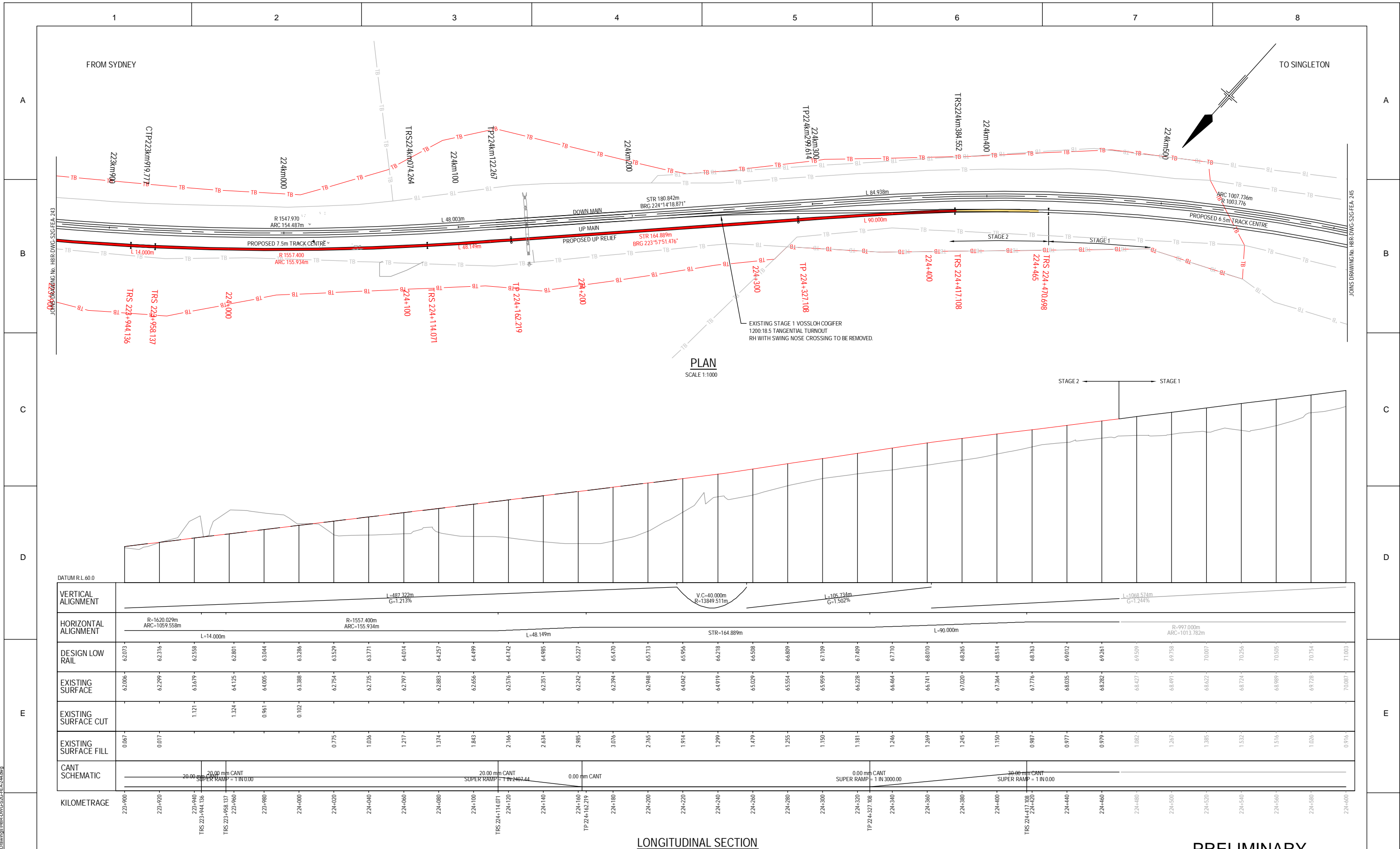
H8R DWG NUMBER **A/B**

H8R-DWG-S2G-FEA-243

MAITLAND TO MINIMBAH - THIRD TRACK
TRACK ALIGNMENT
HORIZONTAL AND VERTICAL

Sheet No.
43 of 44
Scale (A1):
1:1000H - 1:100V

PLOT DATE: 08 February 2010 1:45 PM PLOTTED BY: PT091
GHD FILE PATH: G:\22\14471\GAD00\H8R-DWG-S2G-FEA-243.dwg



LONGITUDINAL SECTION

SCALE 1:1000H - 1:100V

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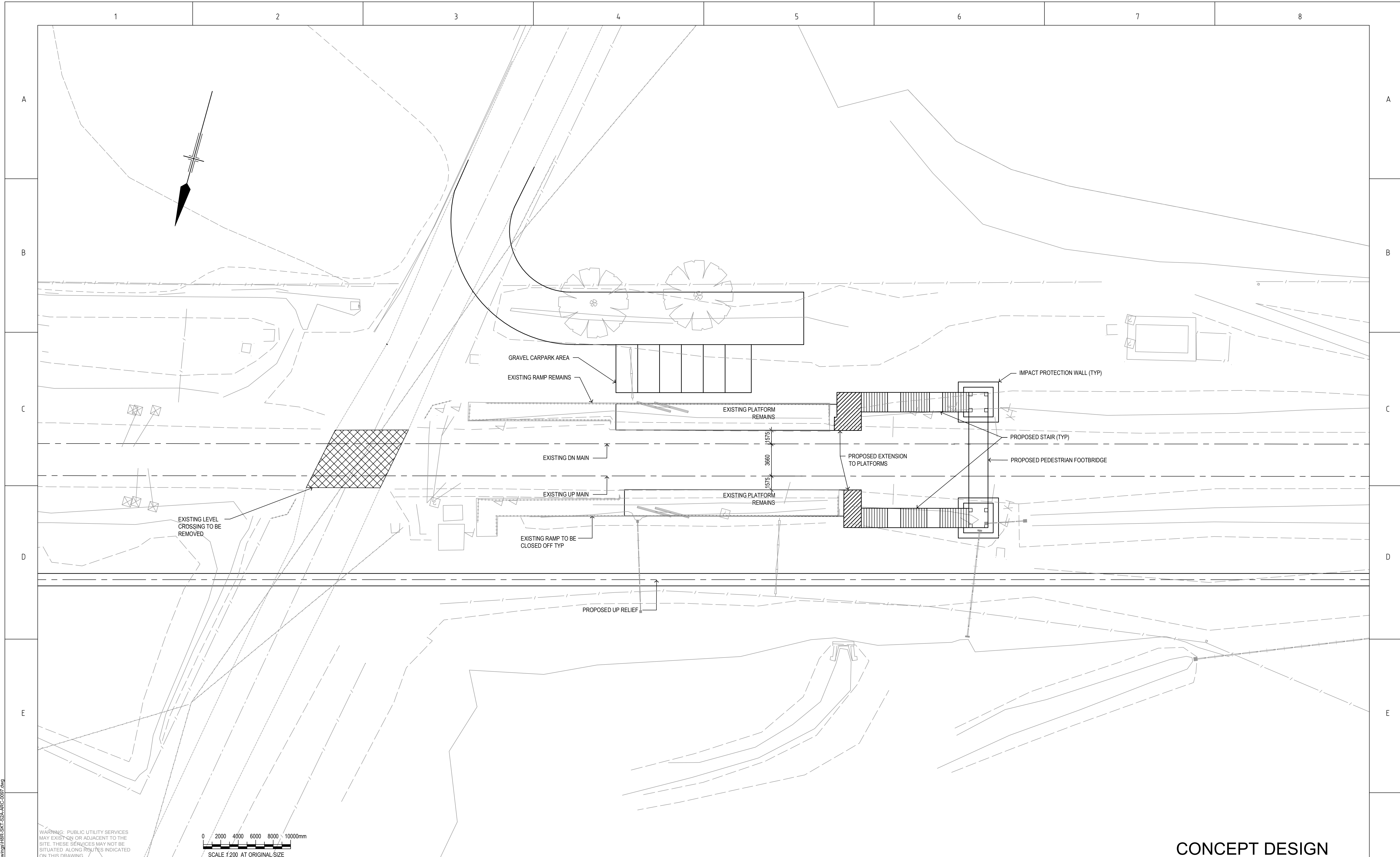
ARTC APPROVAL	Approved By	
Approved		
Signature		
Approval Date		
Rev	Date	Description
B	26.02.10	7.5m TRACK DESIGN REVIEW
A	19.06.09	ISSUED FOR CLIENT REVIEW

Designing Company:	GHD
GHD Job Number:	22-14471
Drawn:	P.TOBIN
Drilling Check:	H.JENNINGS*
Designed:	V.ALEX / P.TOBIN
Design Check:	S.KING*
Approved:	
Date:	

MAITLAND TO MINIMBAH - THIRD TRACK
 TRACK ALIGNMENT
 HORIZONTAL AND VERTICAL

Sheet No.
44 of 44
 Scale (A1):
 1:1000H - 1:100V

PLOT DATE: 28 February 2010 1:53 PM PLOTTED BY: PT081
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0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE


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Approval Date																				
Rev	Date	Revision Description																		
A	07.04.10	FOR EA SUBMISSION																		

Designing Company:	Address:	Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia F 61 2 4941 2799 W www.hunteralliance.com.au
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**MAITLAND TO MINIMBAH - THIRD TRACK
LOCHINVAR TRAIN STATION
CONCEPT PLAN**

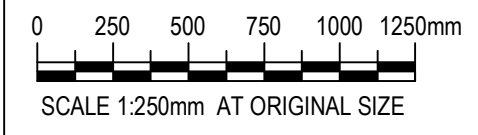
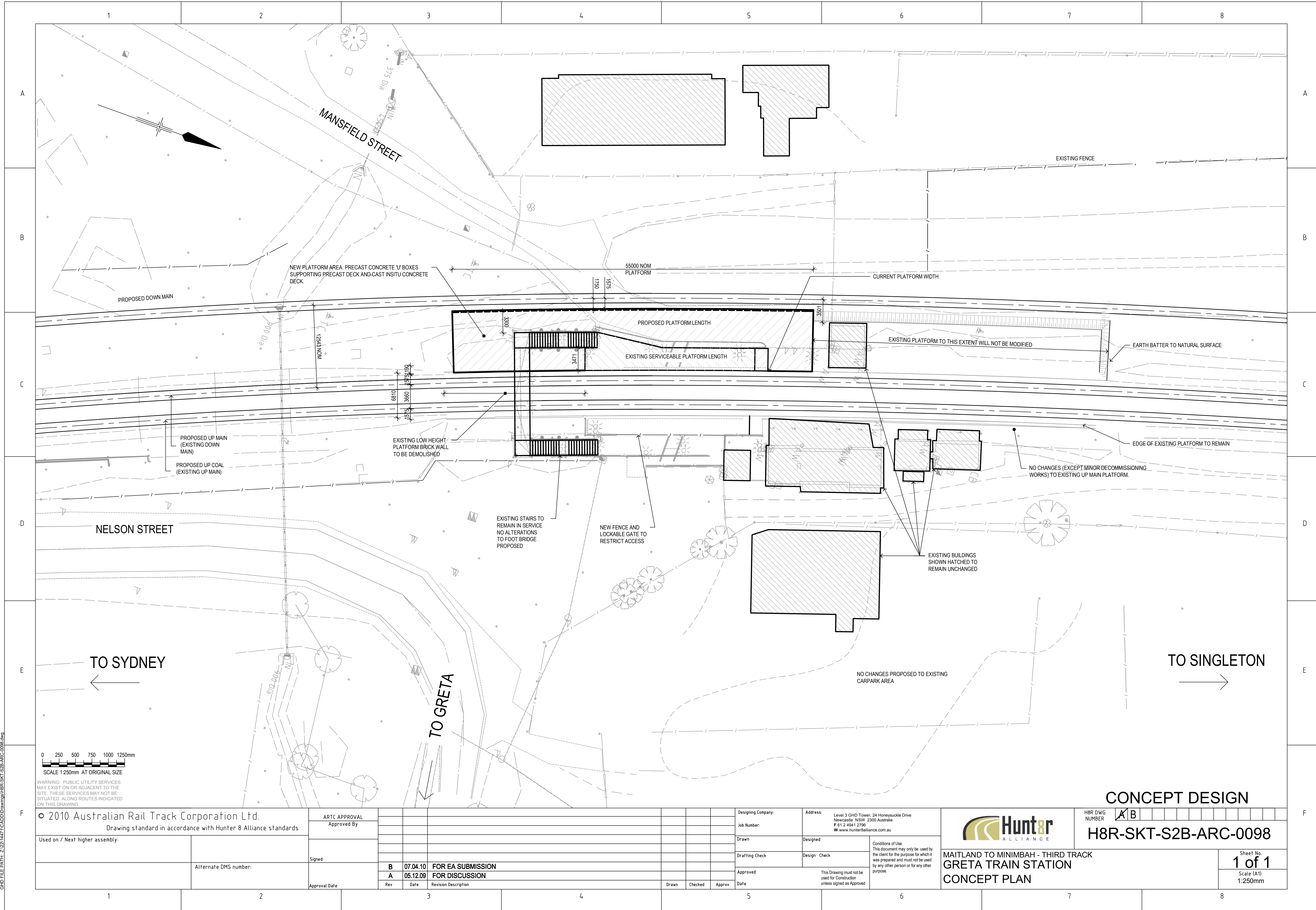
CONCEPT DESIGN

H8R DWG NUMBER **A**

H8R-SKT-S2A-ARC-0097

Sheet No.
1 of 1
Scale (A1):
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PLOT DATE: 07-Apr-2010 14:45:24
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Signed:

Approval Date

Rev	Date	Revision Description	Drawn	Checked	Apprv.	Date
B	07.04.10	FOR EA SUBMISSION				
A	05.12.09	FOR DISCUSSION				

Designing Company:
 Job Number:
 Drawn
 Drafting Check
 Approved
 Date

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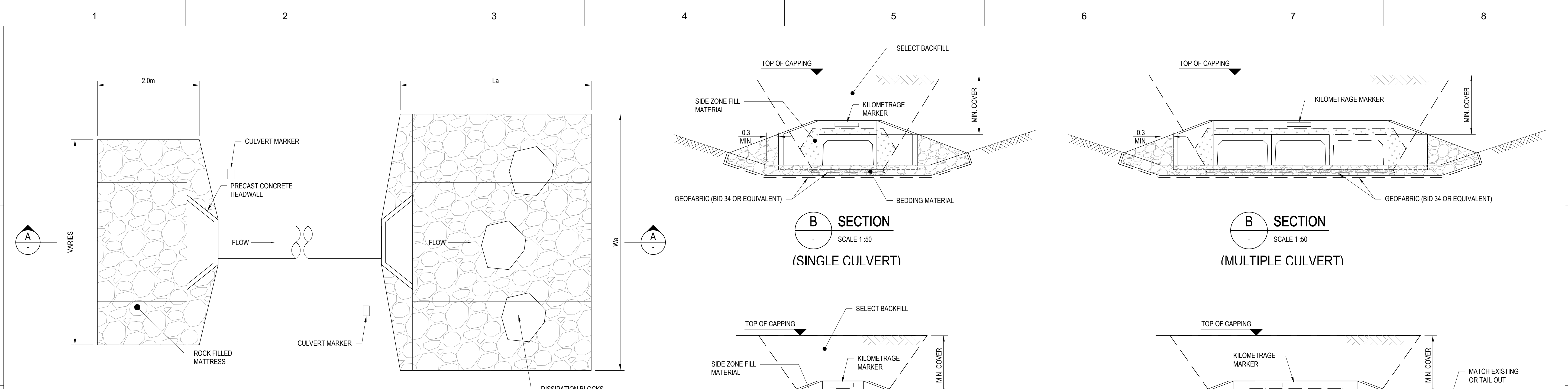


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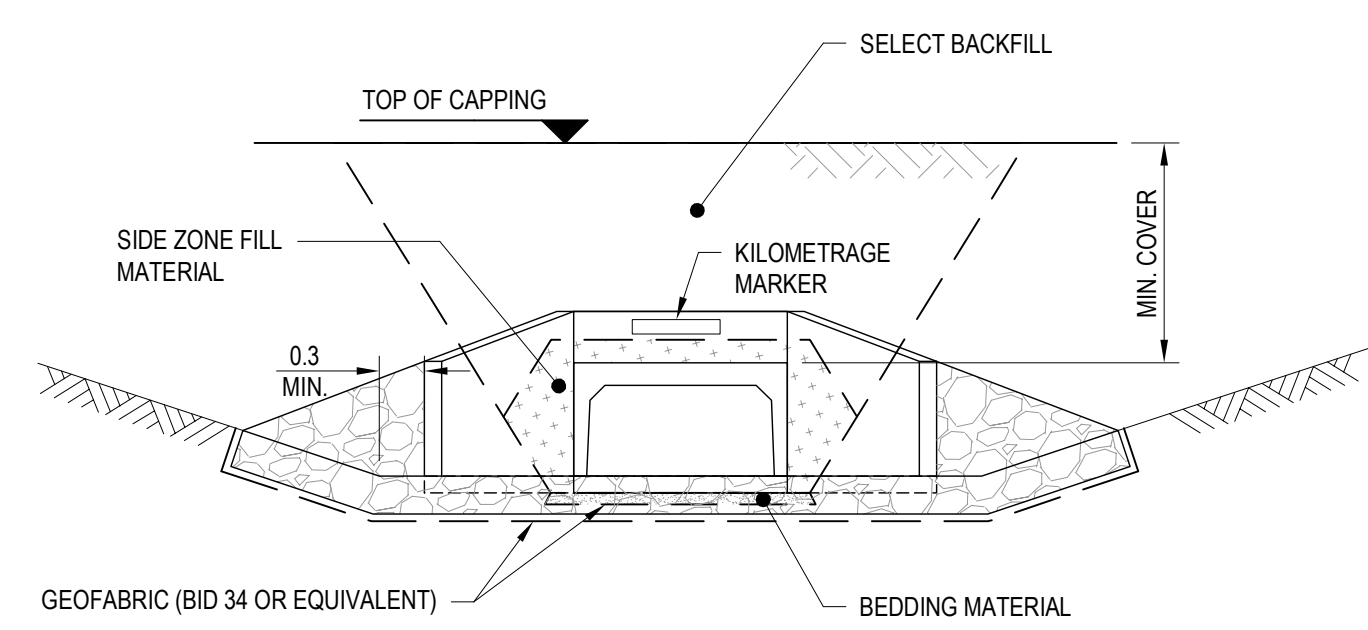
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MAITLAND TO MINIMBAH - THIRD TRACK
 GRETA TRAIN STATION
 CONCEPT PLAN

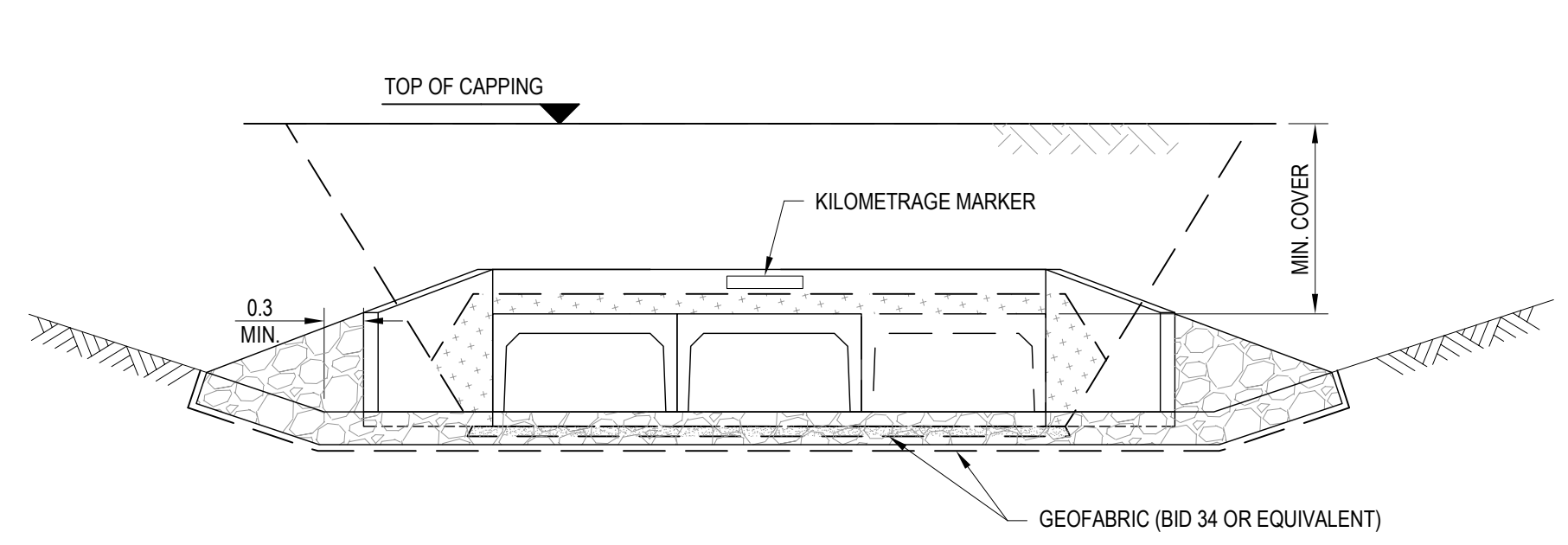
Sheet No.
1 of 1
 Scale (A1):
 1:250mm



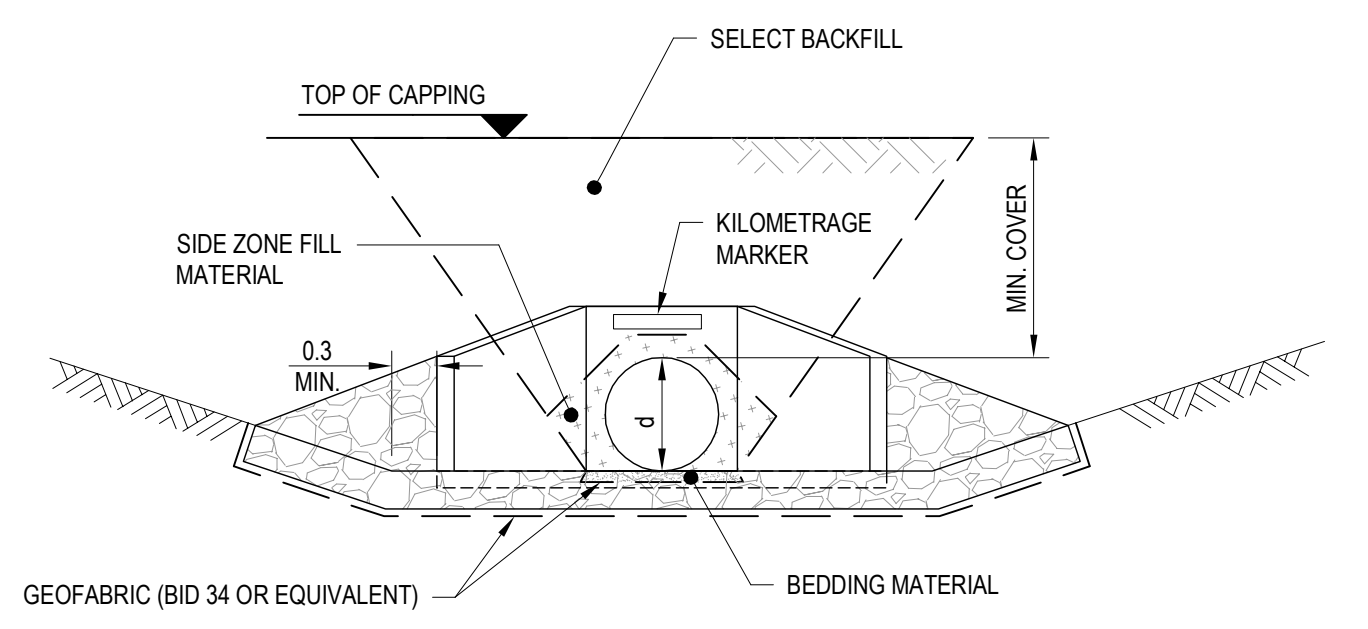
CULVERT PLAN
SCALE 1:50



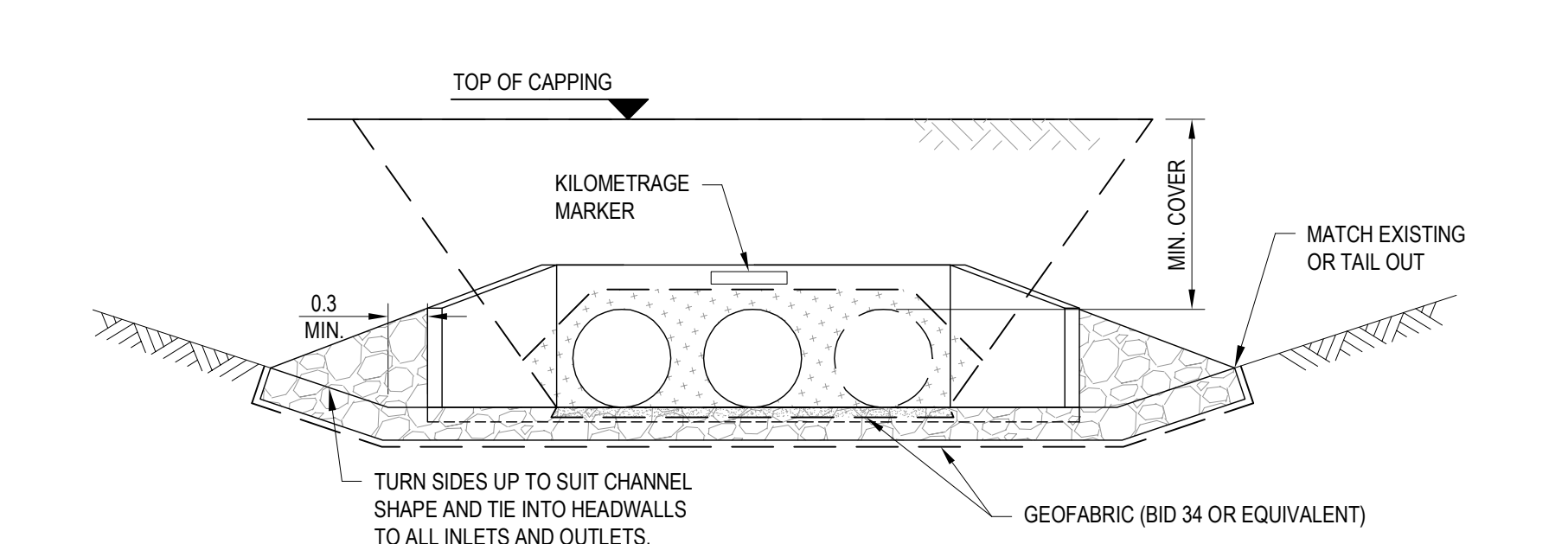
B SECTION
SCALE 1:50
(SINGLE CULVERT)



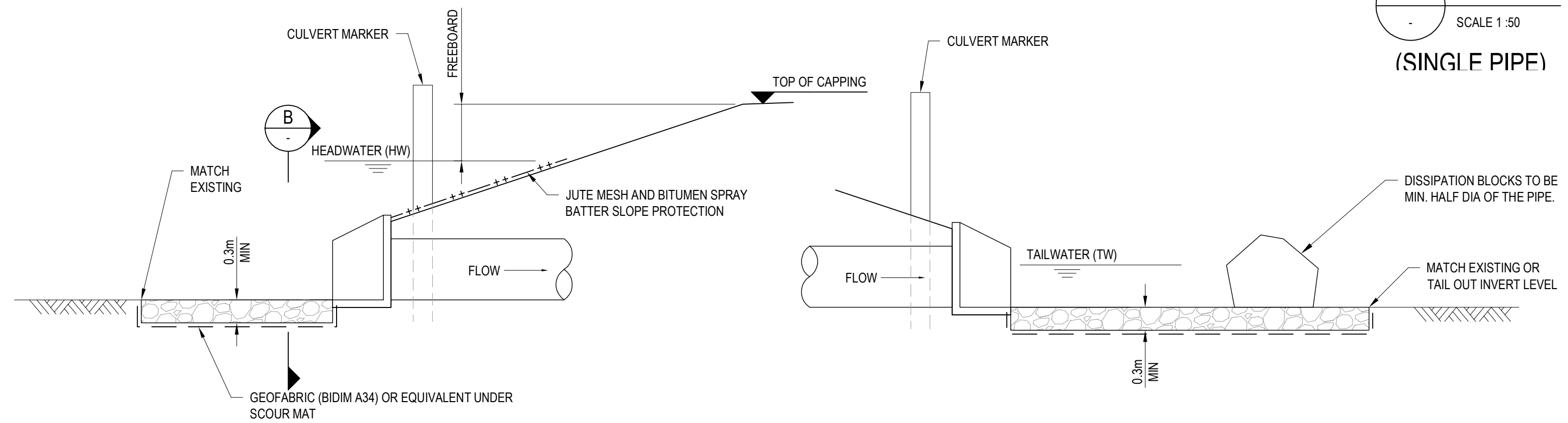
B SECTION
SCALE 1:50
(MULTIPLE CULVERT)



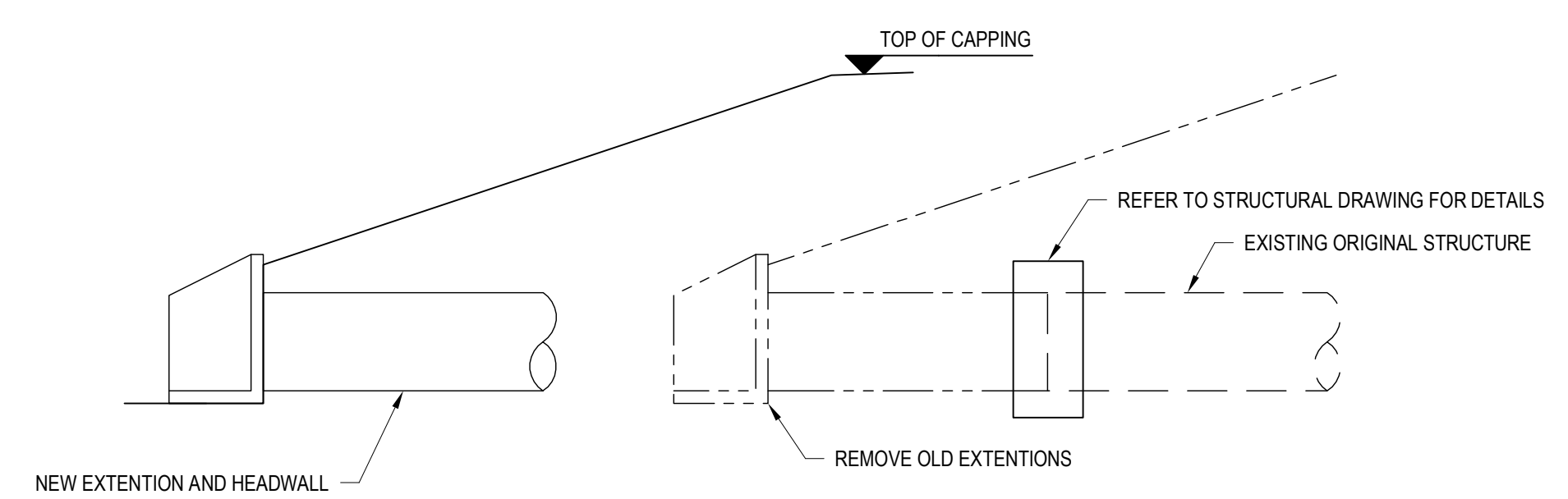
B SECTION
SCALE 1:50
(SINGLE PIPE)



B SECTION
SCALE 1:50
(MULTIPLE PIPE)



A SECTION
SCALE 1:50



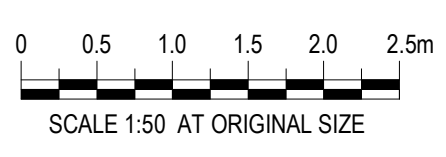
CULVERT EXTENSION DETAIL
SCALE 1:50

SCHEDULE WAT 0111.0	
REFERENCE DRAWINGS	
REFERENCE ITEM	DRAWING NUMBER
CESS DRAINS	H8R-DWG-S2G-WAT-0221

SCHEDULE WAT 0111.5				
STANDARD PIPE SIZES AVAILABLE				
STANDARD SIZES (mm)	CLASS 3		CLASS 4	
	INTERNAL Ø (mm)	AREA (m²)	INTERNAL Ø (mm)	AREA (m²)
450	457	0.164	445	0.156
600	596	0.279	596	0.279
750	750	0.442	750	0.442
900	914	0.656	902	0.639
1200	1199	1.129	1175	1.084
1500	1494	1.753	1462	1.679
1800	1791	2.519	1753	2.414
2100	2134	3.577	2096	3.450

SCHEDULE WAT 0111.6	
STANDARD BOX CULVERT SIZES	
STANDARD SIZES SPAN x H (mm)	AREA (m²)
600 x 450	0.27
900 x 600	0.54
1200 x 900	1.08
1200 x 1200	1.44
1500 x 1200	1.80
1500 x 1500	2.25
1800 x 1800	3.24
2100 x 1800	3.78
2100 x 2100	4.41

SCHEDULE WAT 0111.7				
ROCK MATTRESS DIMENSIONS				
PIPE SIZE	BOX CULVERT SIZE (W x H)	La (m)	Wa (m)	ROCK SIZE FOR ROCK FILLED MATTRESS (mm)
450	600 x 450	2.0	3.0	130
600	900 x 600	2.0	3.0	230
900	1200 x 900	2.0	3.0	360
1200	1200 x 1200	3.0	4.5	530
1500	1500 x 1200	3.0	4.5	740
	1500 x 1500	3.0	4.5	740
1800	1800 x 1800	4.0	6.0	740
2100	2100 x 1800	4.0	6.0	740
	2100 x 2100	4.0	6.0	740



- NOTES:**
- CULVERT EXTENSIONS ARE TO BE ON THE SAME LINE AND GRADE AS EXISTING CULVERTS WHERE PRACTICABLE.
 - PROFILE OF EACH INDIVIDUAL CULVERT IS SHOWN ON SCHEDULE 2.1.
 - NUMBER OF PIPES/CULVERTS TO BE INCREASED/DECREASED DEPENDING ON WATERWAY VOLUMES.

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Alternate DMS number:

ARTC APPROVAL	Approved By																			
Signed:																				
Approval Date																				
Rev	Date	Revision Description																		
B	18.12.09	50% REVIEW																		
A	10.08.09	15% REVIEW																		

Designing Company: GHD
GHD Job Number: 22-14630

Address: Level 3 GHD Tower, 24 Honeysuckle Drive
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E nrlmail@ghd.com W www.ghd.com

Drawn: M.WRIGHT
Designed: J.PAQUETTE
Drafting Check: Design Check

Approved: This Drawing must not be used for Construction unless signed as Approved.

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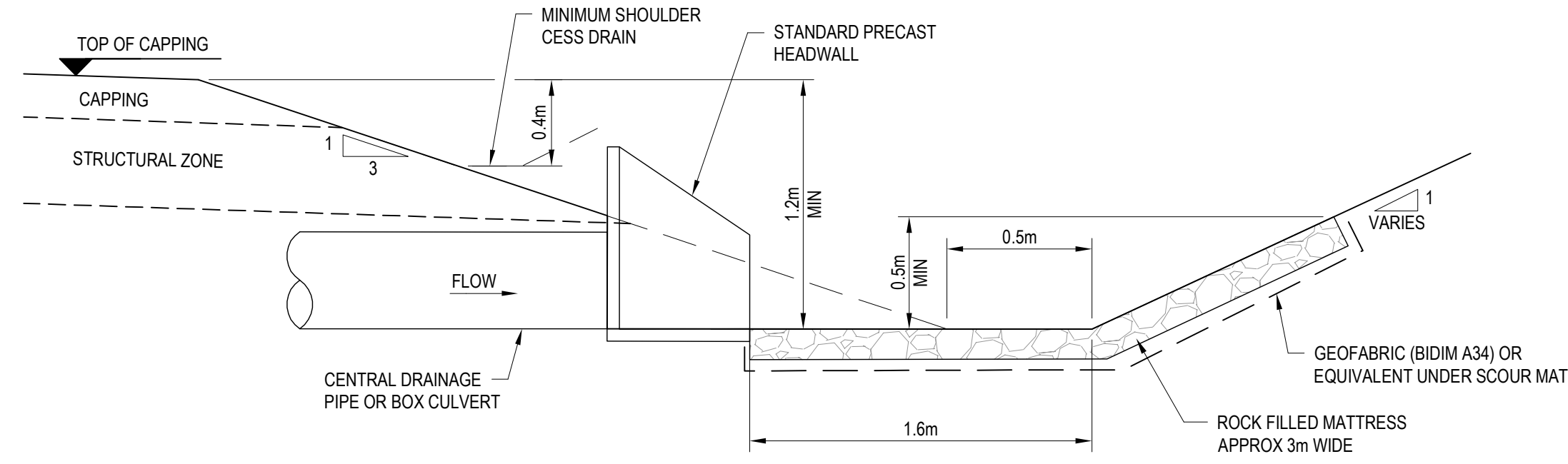
H8R DWG NUMBER **A/B**

H8R-DWG-S2G-WAT-0111

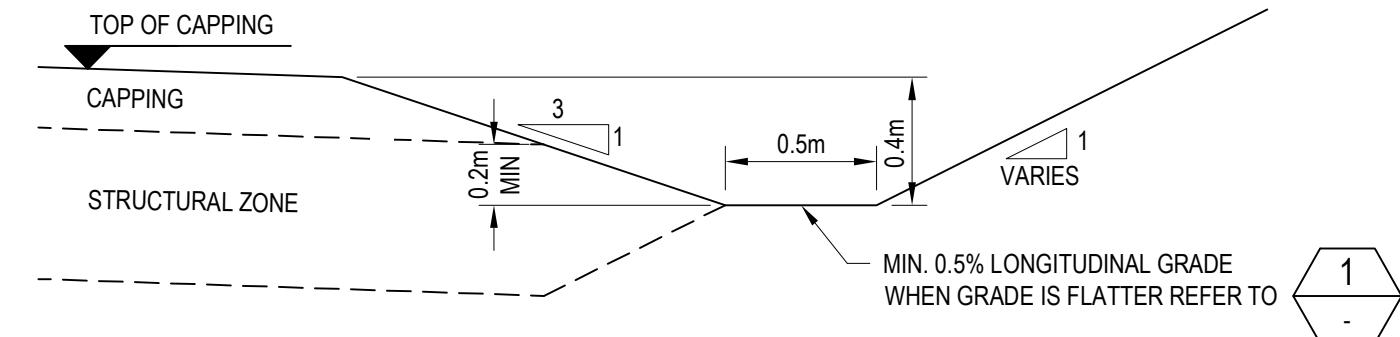
MAITLAND TO MINIMBAH - THIRD TRACK
STANDARD DRAWINGS - WATER
TYPICAL CULVERT - EXTENSION/REPLACEMENT

Sheet No. _____
Scale (A1): 1:50

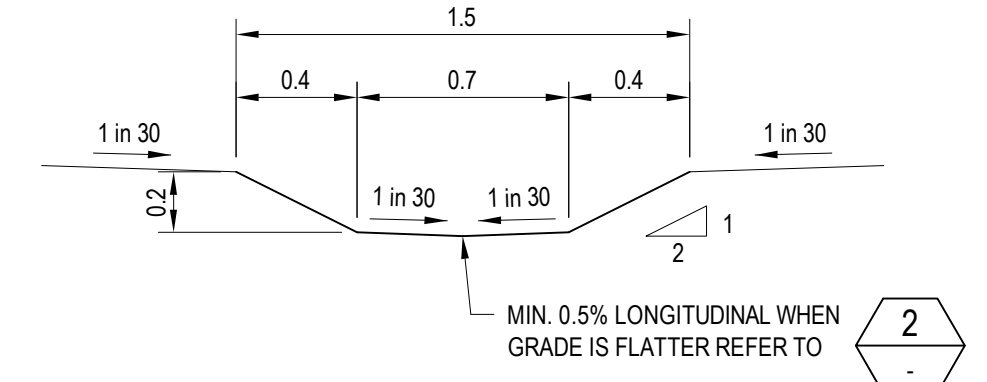
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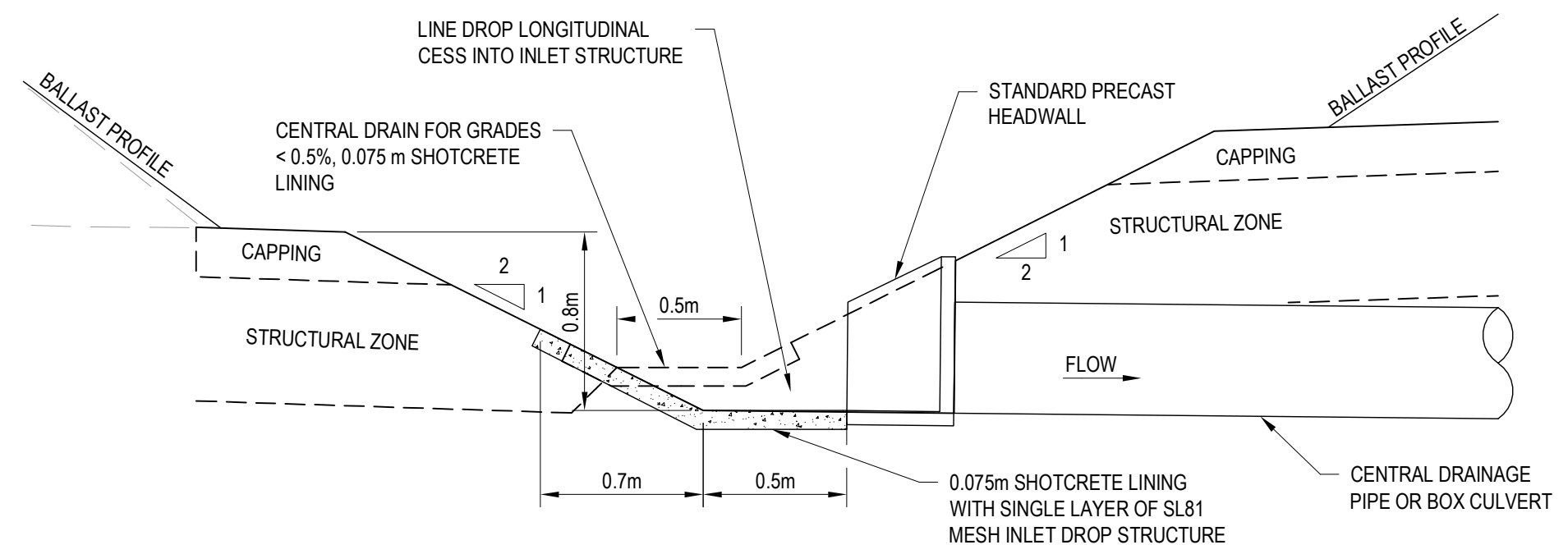
CESS DRAIN - PIPE OUTLET
SCALE 1:25



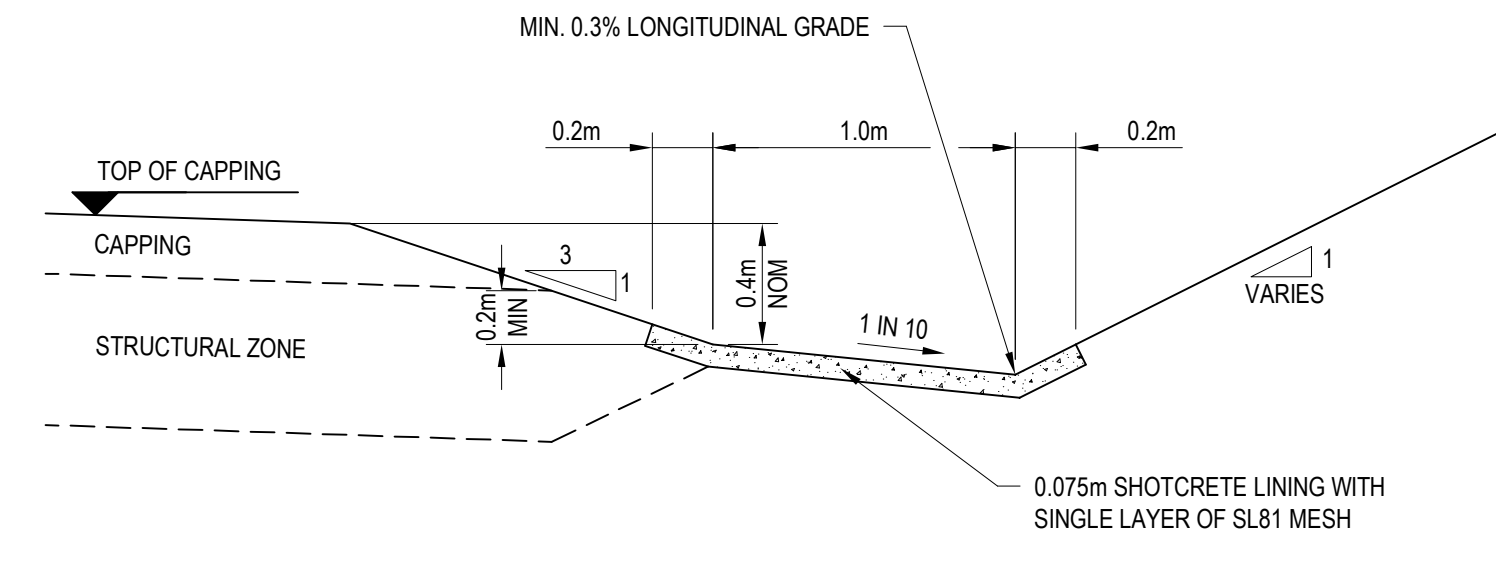
CESS DRAIN - MINIMUM SHOULDER
SCALE 1:25



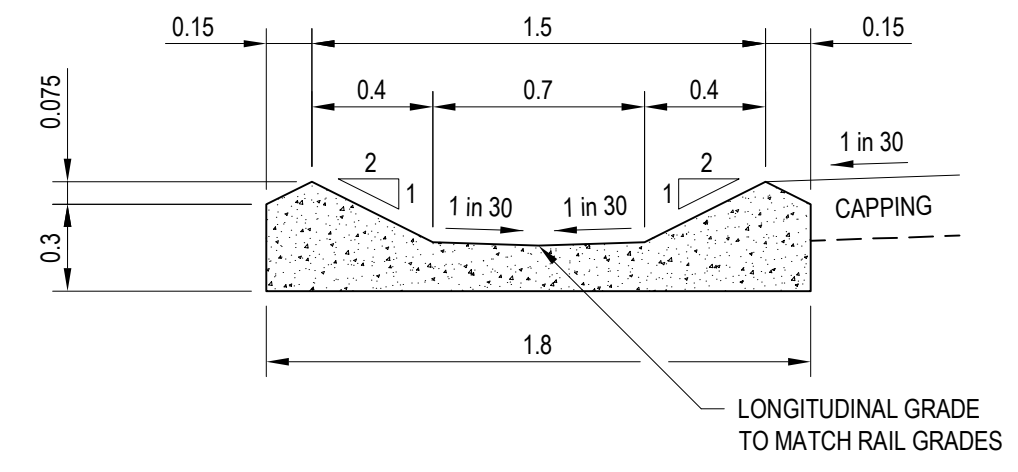
CENTRAL DRAIN
SCALE 1:25



**CENTRAL DRAIN PIPE INLET
MIN. 10.0m TRACK CENTRES**
SCALE 1:25

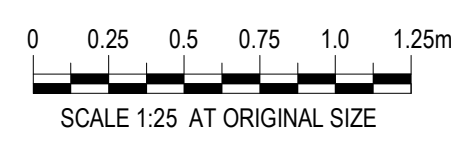


1 DETAIL
LINED CESS DRAIN - MINIMUM SHOULDER
SCALE 1:25



2 DETAIL
LINED CENTRAL DRAIN
SCALE 1:25

SCHEDULE WAT 0221.0	
REFERENCE DRAWINGS	
REFERENCE ITEM	DRAWING NUMBER
WATER STRING CODES 12d	H8R-DWG-S2G-GEN-231
TYPICAL SECTIONS	H8R-DWG-S2G-RLC-0111
PAVEMENTS	H8R-DWG-S2G-RLC-0121



NOTES:

1. ROCK FILLED MATTRESS TO BE MACAFERRI OR EQUIVALENT.
2. ROCK TO BE ANGULAR IGNEOUS AND PLACED TO MINIMISE VOIDS.
3. ROCK AND/OR SHOTCRETE LINING TO BE FLUSH WITH CULVERT INVERT.
4. WINGWALL, HEADWALL & APRON ARE DIAGRAMMATICALLY SHOWN ONLY.
5. INSITU CONCRETE TO BE MINIMUM N32 & PRECAST CONCRETE TYPICAL N40.

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ARTC APPROVAL	Approved By	
Signed:		
Approval Date		

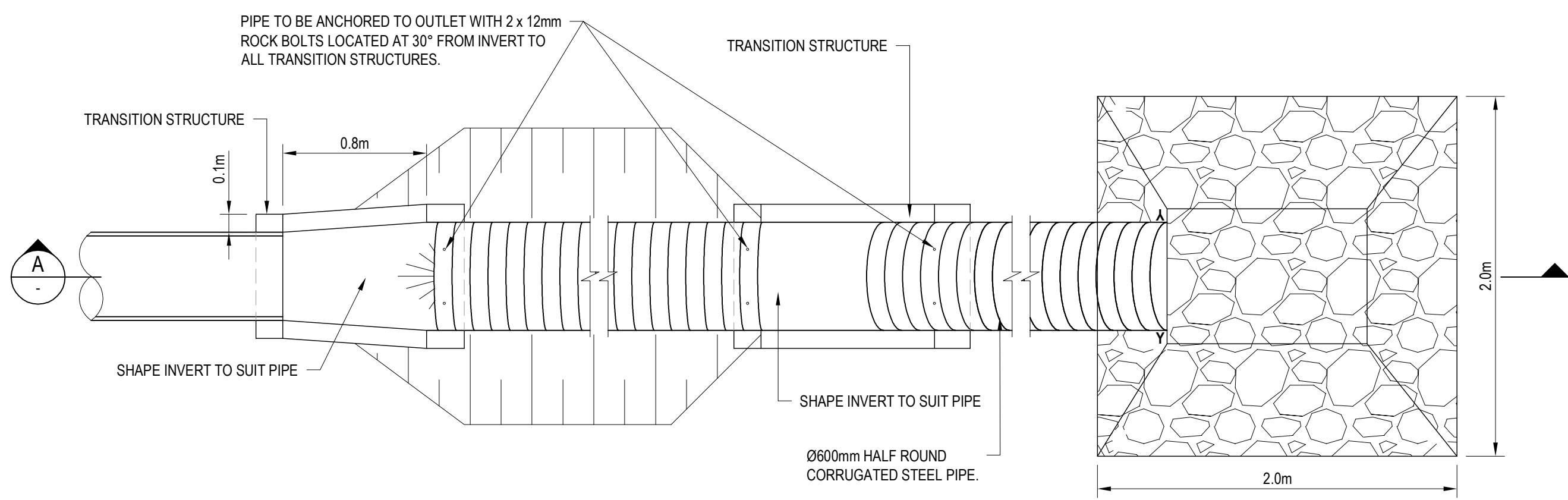
Rev	Date	Revision Description	Drawn	Checked	Approved
C	18.12.09	50% REVIEW CHANGES TO DRAIN DESIGNS	D.J.G.	M.J.P.*	M.K.P.*
B	09.10.09	50% REVIEW	D.J.G.	A.G.*	G.W.*
A	10.08.09	15% REVIEW	M.J.W	J.P.P.*	G.W.*

Designing Company:	GHD
GHD Job Number:	22-14630
Address:	Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com W www.ghd.com
Drawn	D.GRIFFIN
Designed	M.J.PIGGOTT
Drafting Check	
Design Check	
Approved	
Date	

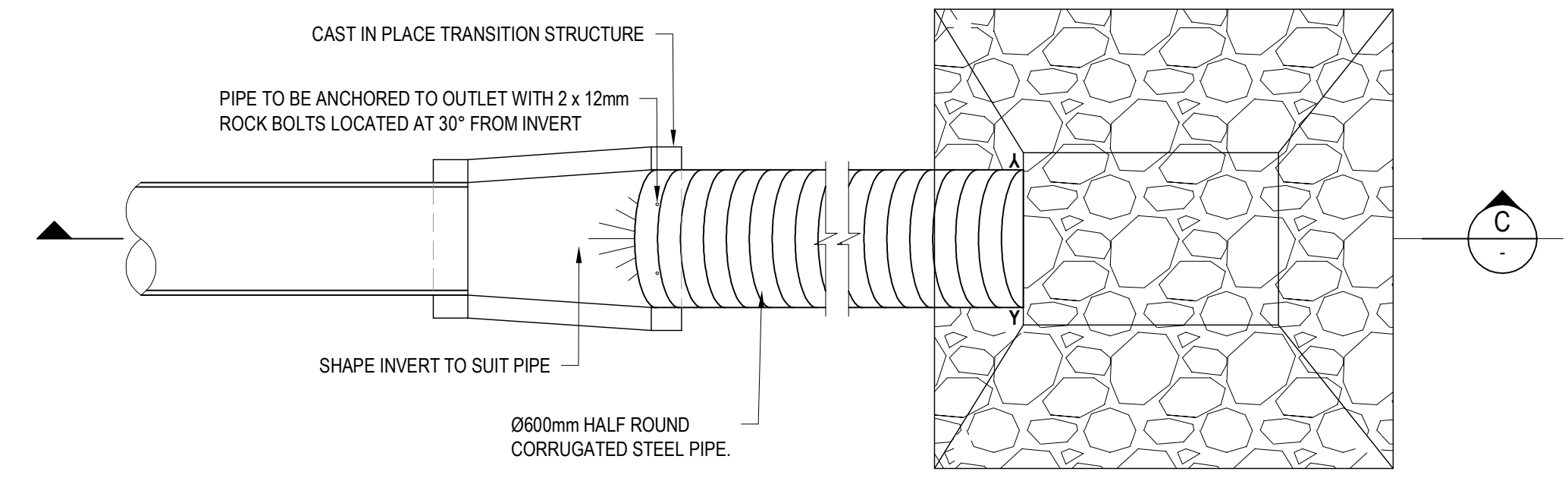
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H8R DWG NUMBER	A/B/C
H8R-DWG-S2G-WAT-0221	
MAITLAND TO MINIMBAH - THIRD TRACK STANDARD DRAWINGS - WATER CENTRAL AND CESS DRAINS	
Sheet No.	
Scale (A1):	1:25

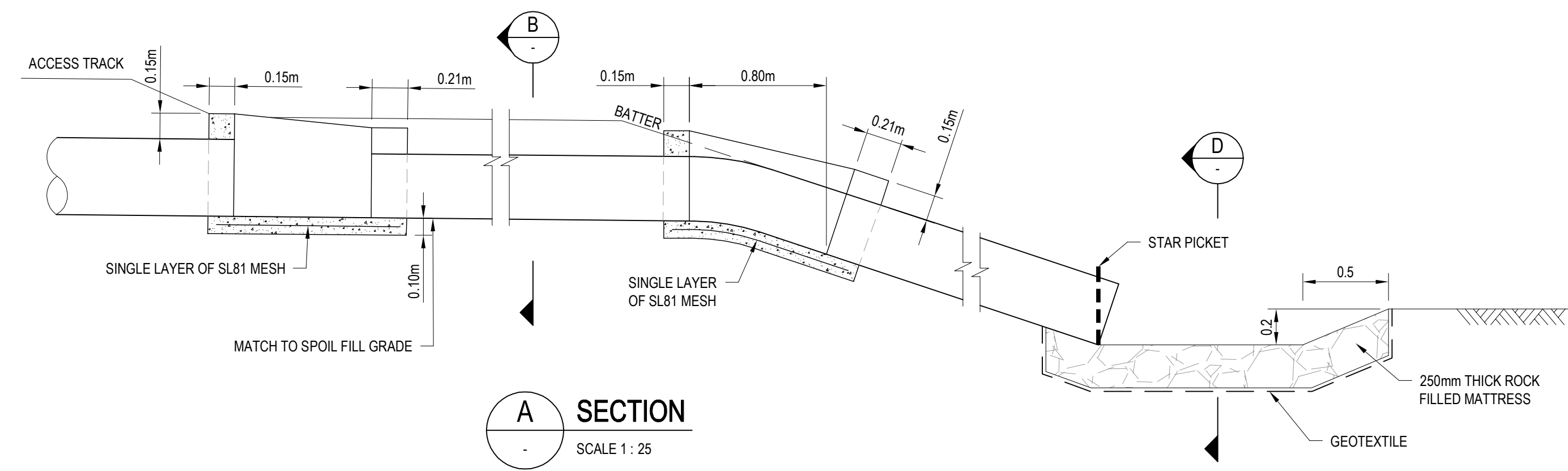
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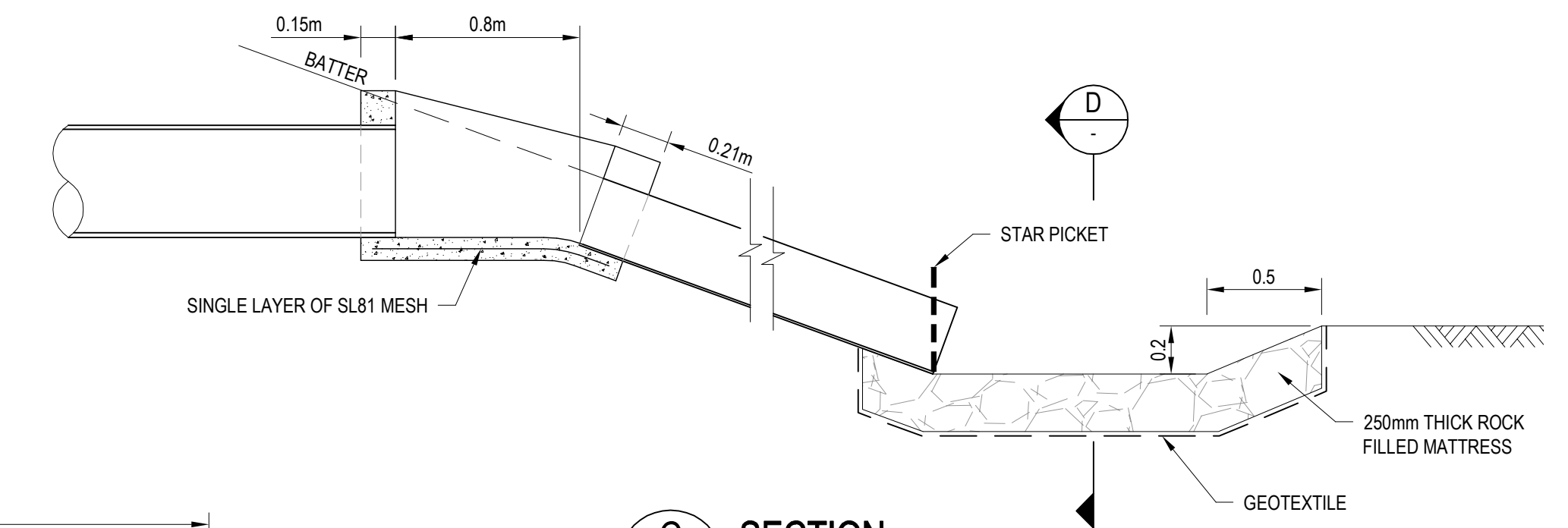
BATTER DRAIN FOR SIDE SPOIL FILLS
SCALE 1:25



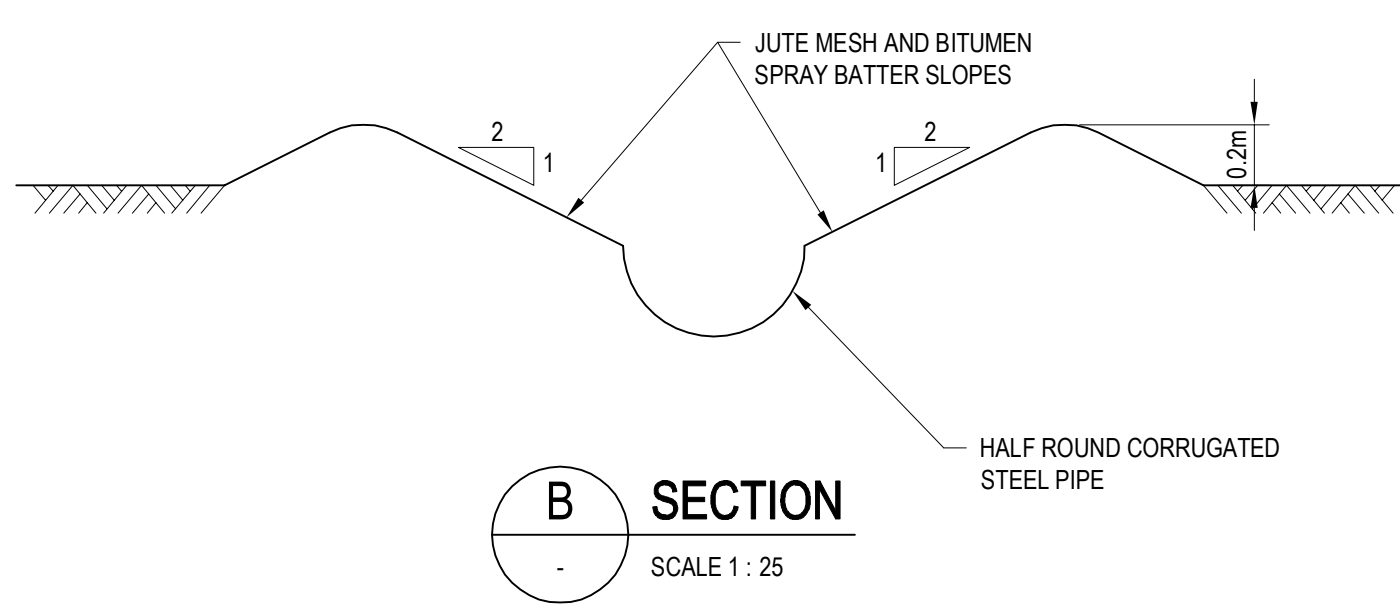
BATTER DRAIN FOR NORMAL FILLS
SCALE 1:25



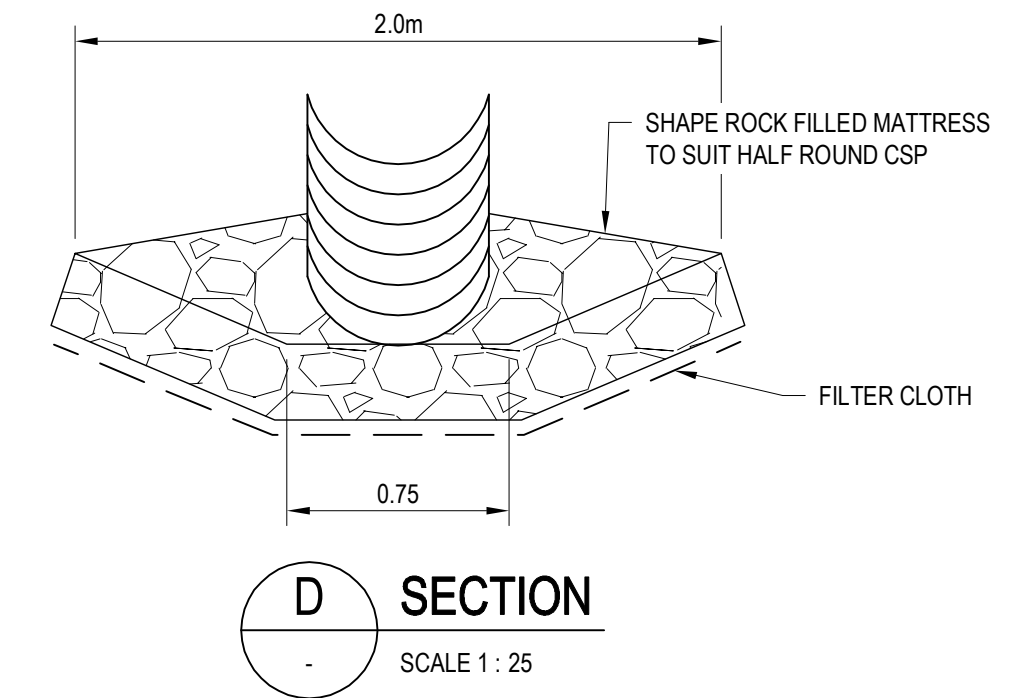
TYPICAL SECTION SIDE SPOIL BATTERS
SCALE 1:200



TYPICAL SECTION STANDARD BATTERS
SCALE 1:200



B SECTION
SCALE 1:25



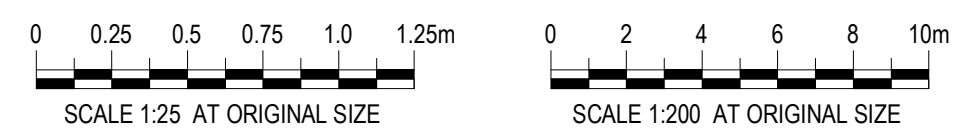
D SECTION
SCALE 1:25

C SECTION
SCALE 1:25

NOTES:

1. TOP LIP OF HALF ROUND CORRUGATED STEEL PIPE TO BE INSTALLED FLUSH WITH THE COMPACTED BATTER SURFACE.
2. HALF ROUND CORRUGATED STEEL PIPE TO BE SECURELY FASTENED WITH 4mm WIRE TO 1350mm STAR PICKETS AT 4.0m INTERVALS BOTH SIDES DOWN BATTER SLOPE FROM TRANSITION STRUCTURE AND TWO 1350mm STAR PICKETS AT LOWER END OF CSP.
3. 1350mm STAR PICKETS TO BE PROVIDED AT POINTS MARKED A (FOR FASTENING PURPOSES).
4. INSITU CONCRETE TO BE MINIMUM N32 & PRECAST CONCRETE TYPICALLY N40.
5. FOR 'g' VALUE REFER TO DRG No. H8R-DWG-S2G-RLC-0111.

SCHEDULE RLC 0111.0	
REFERENCE DRAWINGS	
REFERENCE ITEM	DRAWING NUMBER
OFFSETS & CLEARANCES	H8R-DWG-S2G-RLC-0101
PAVEMENT	H8R-DWG-S2G-RLC-0121
STORMWATER PIPE DRAINAGE	H8R-DWG-S2G-WAT-0141
CESS, TOP & TOE DRAINS	H8R-DWG-S2G-WAT-0221

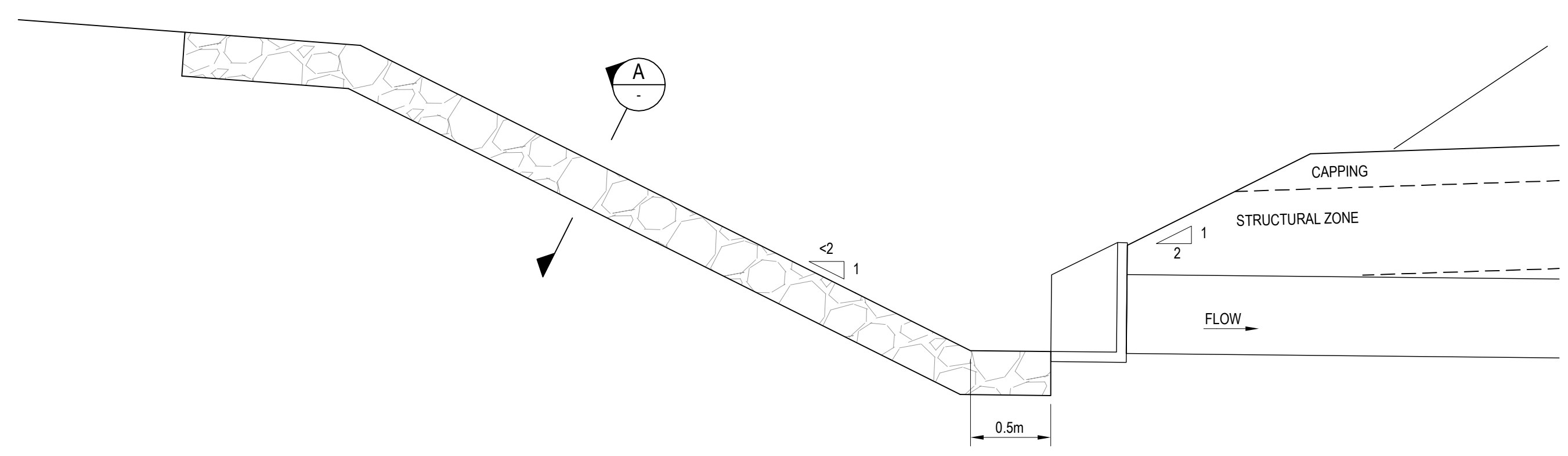


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Used on / Next higher assembly:		Signed:																		
Alternate DMS number:		Approval Date																		
		Rev	A	18.12.09	50% REVIEW															
		Date																		
		Revision Description																		
		Drawn	D.J.G.																	
		Checked	M.J.P.																	
		Approved	M.K.P.																	
		Date																		

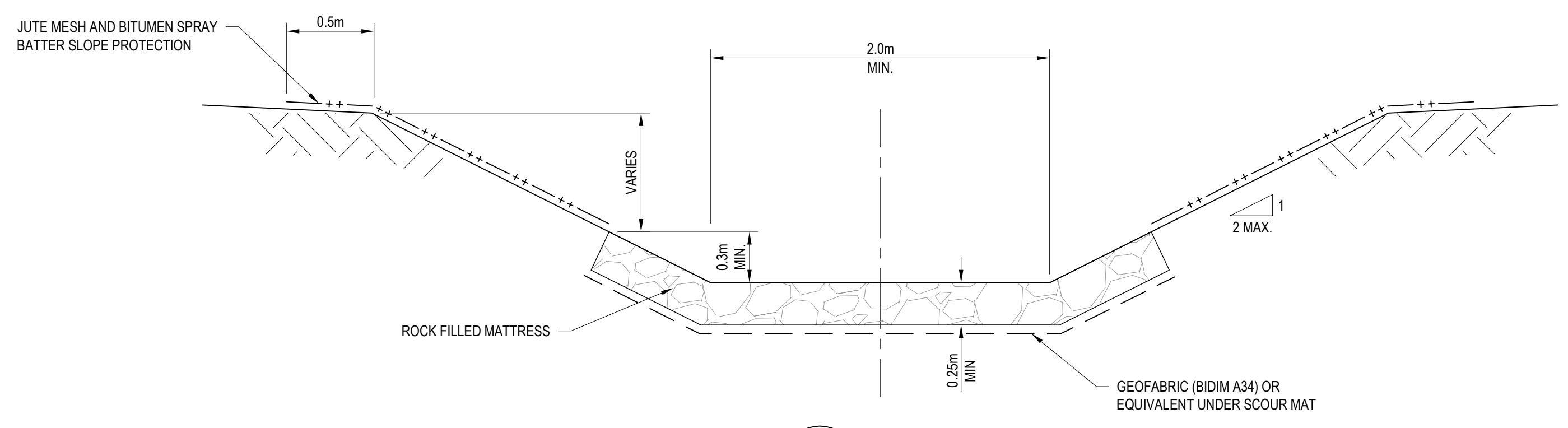
Designing Company: GHD GHD Job Number: 22-14630	Address: Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia T 61 2 4979 1900 F 61 2 4979 9988 E ntimail@ghd.com W www.ghd.com
Drawn D.GRIFFIN	Designed D.GREEN
Drafting Check	Design Check
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PRELIMINARY	
H8R DWG NUMBER	A
H8R-DWG-S2G-WAT-0242	
MAITLAND TO MINIMBAH - THIRD TRACK STANDARD DRAWINGS - WATER BATTER DRAINS	
Sheet No.	
Scale (A1): AS SHOWN	

PLOT DATE: 18 December 2009 4:17 PM PLOTTED BY: IMSMITH
GHD FILE PATH: G:\2011\1710\Drawings\Sub\H8R-DWG-S2G-WAT-0242.dwg

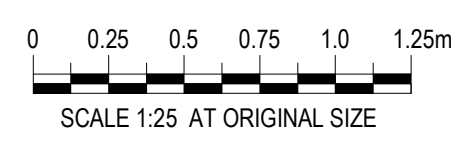


DROP STRUCTURE
SCALE 1:25



A SECTION
SCALE 1:25

SCHEDULE WAT 0221.0	
REFERENCE DRAWINGS	
REFERENCE ITEM	DRAWING NUMBER
WATER STRING CODES 12d	H8R-DWG-S2G-GEN-231
TYPICAL SECTIONS	H8R-DWG-S2G-RLC-0111
PAVEMENTS	H8R-DWG-S2G-RLC-0121



- NOTES:**
- ROCK IS TO BE ANGULAR IGNEOUS AND IS TO BE PLACED TO MINIMISED VOIDS.
 - BATTER PROTECTION IS TO BE MAINTAINED UNTIL ESTABLISHMENT OF VEGETATION.

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Signed:					
Approval Date					
Rev	Date	Revision Description	Drawn	Checked	Approved
A	18.12.09	50% REVIEW	D.J.G.	M.J.P*	M.K.P*

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Drawn D.GRIFFIN	Designed M.J.PIGGOTT	Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.	
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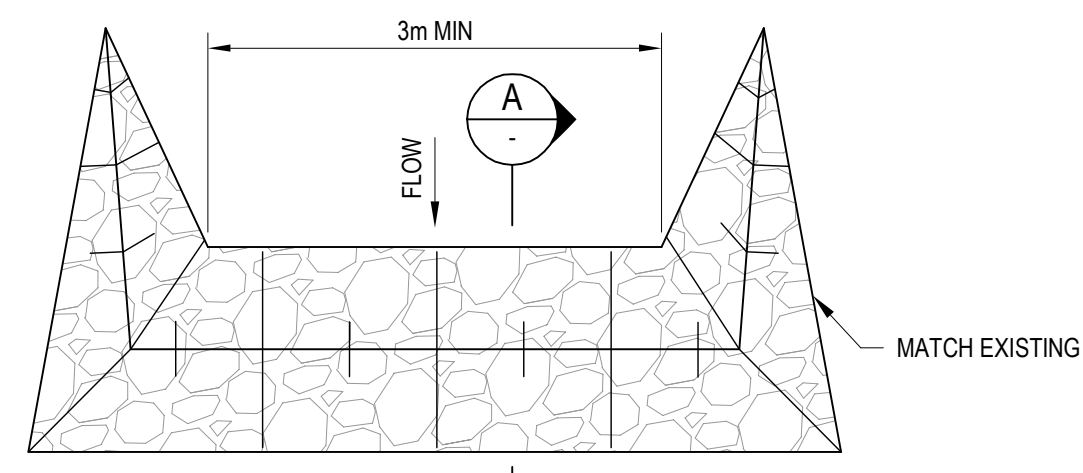


H8R DWG NUMBER **A**
H8R-DWG-S2G-WAT-0243

MAITLAND TO MINIMBAH - THIRD TRACK
STANDARD DRAWINGS - WATER
EMBANKMENT DROP STRUCTURE

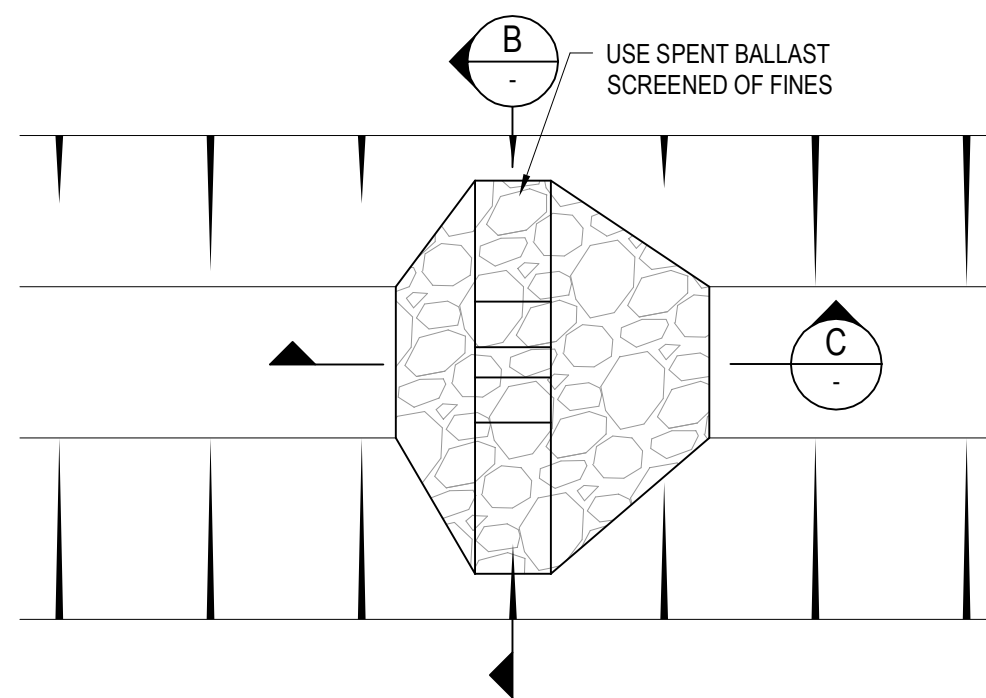
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Scale (A1):
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PLOT DATE: 18 December 2009 4:21 PM PLOTTED BY: IMSMITH
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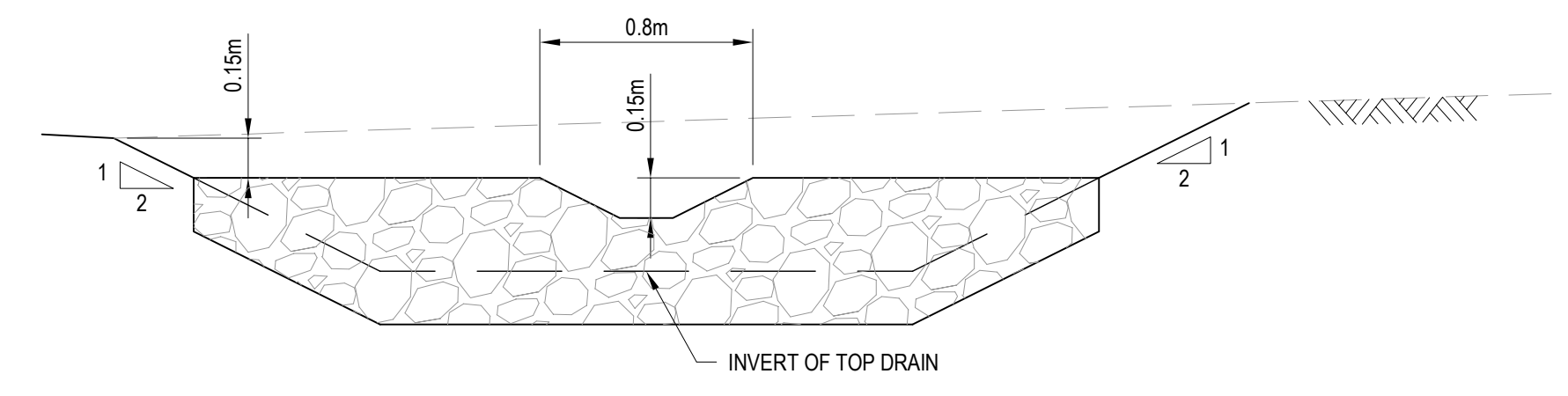


LEVEL SPREADER DETAIL
SCALE 1:50

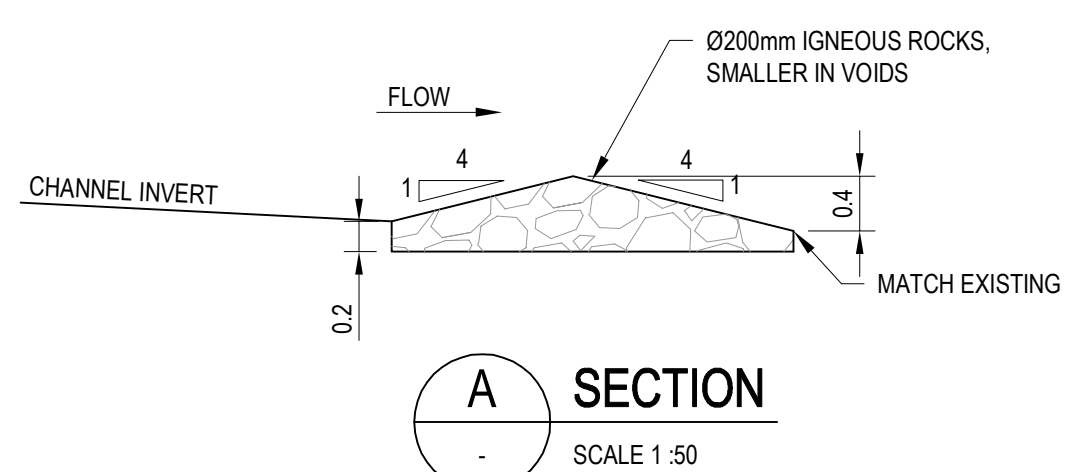
SCHEDULE WAT 0241.1 CHECK DAMS SPACING	
DRAIN GRADE (%)	SPACING (m)
3	25
4	20
5	20
6	15
7	15
8	15
9	15
10	15



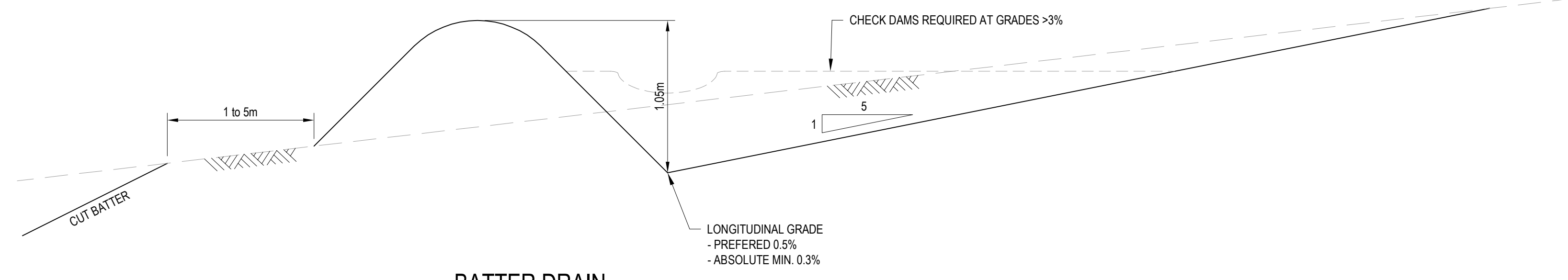
CHECK DAM DETAIL
SCALE 1:50



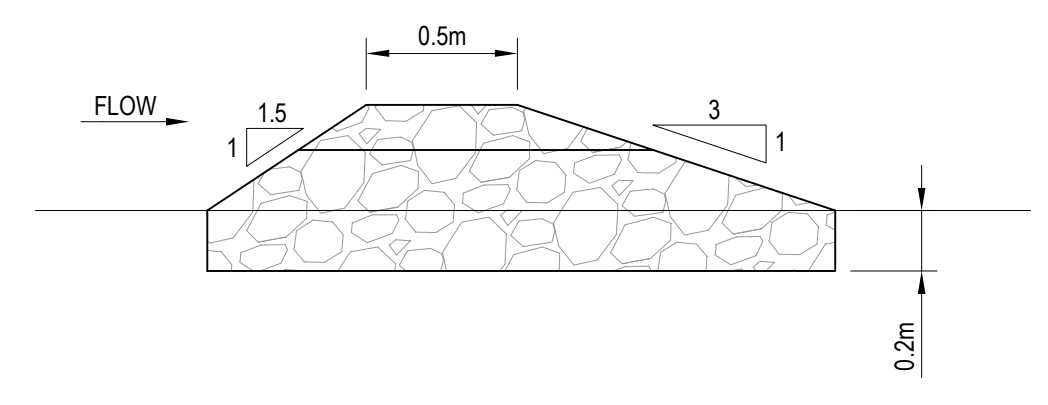
B SECTION
SCALE 1:25



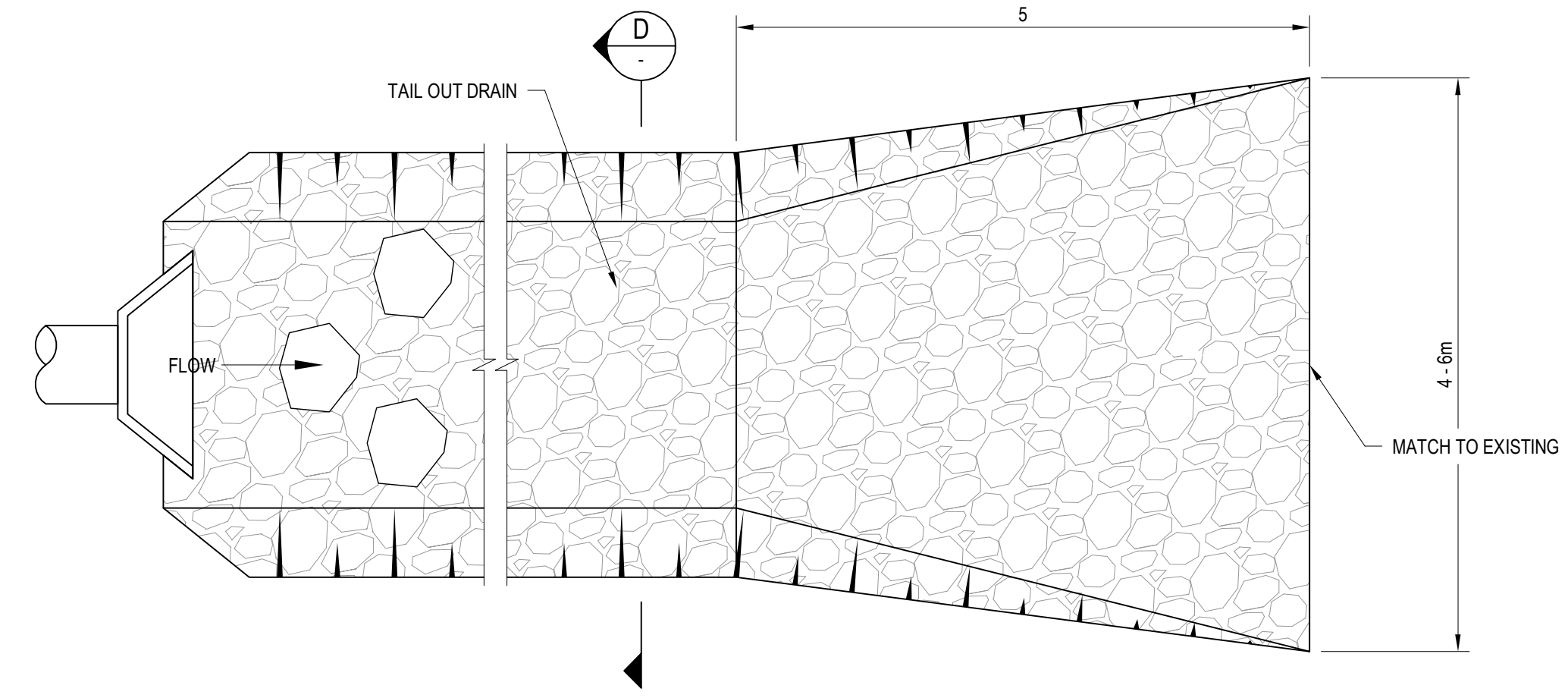
A SECTION
SCALE 1:50



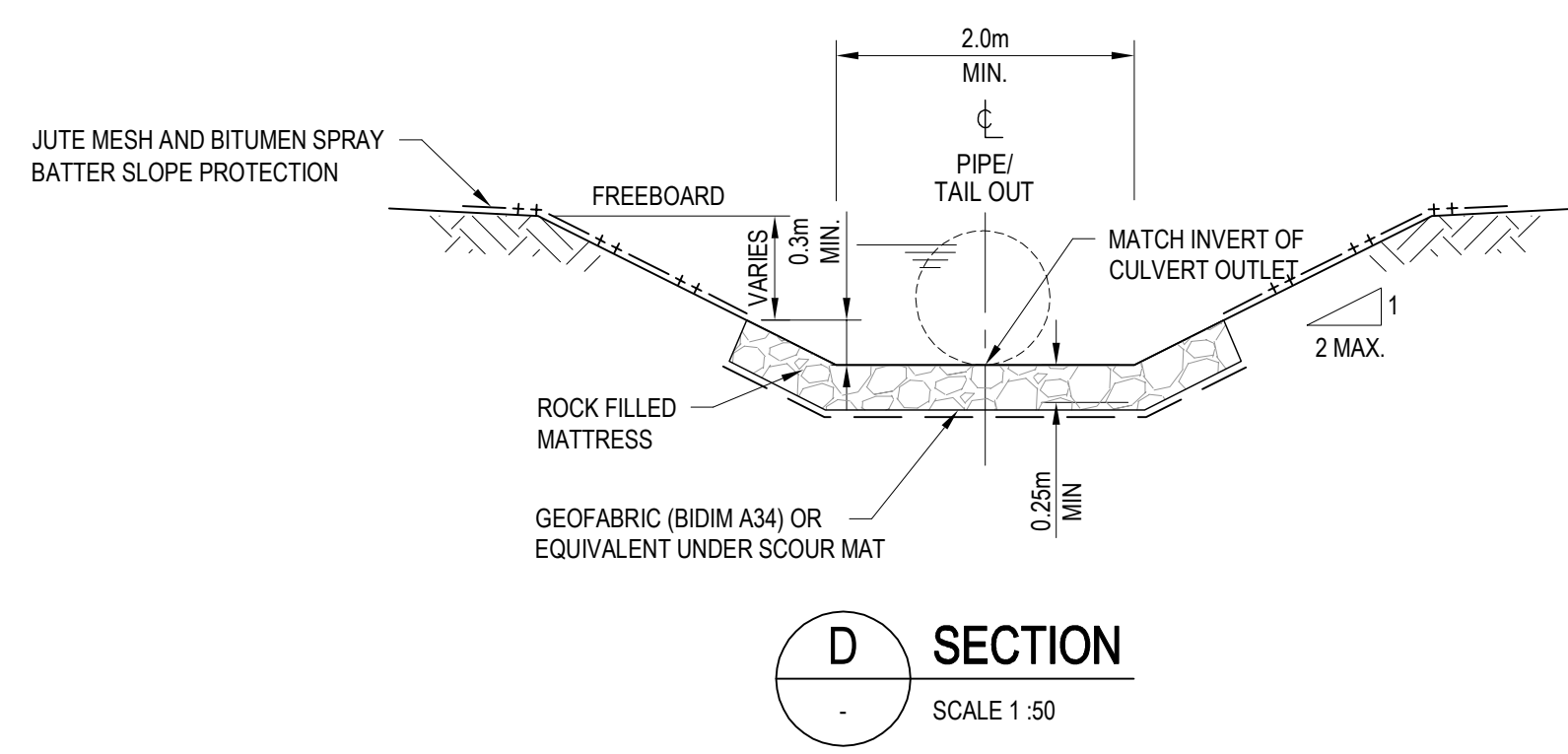
BATTER DRAIN
SCALE 1:25



C SECTION
SCALE 1:25



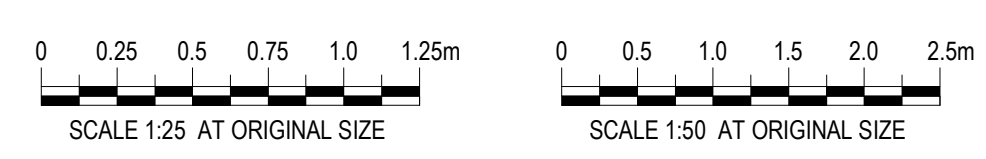
TAIL OUT DRAIN FLARED END DETAIL
SCALE 1:50



D SECTION
SCALE 1:50

SCHEDULE WAT 0241.2 CHANNEL LINING REQUIREMENTS	
0.5m BASE	
Q100 (m³/s)	SLOPE
< 0.2	10%
0.2 - 0.3	7%
0.3 - 0.4	6%
0.4 - 0.5	5%
0.5 - 0.6	4%
> 0.6	3%
2.0m BASE	
< 0.5	5%
0.5 - 1.0	4%
1.0 - 1.5	3%
4.0m BASE	
ALL	3%

SCHEDULE WAT 0241.0 REFERENCE DRAWINGS	
REFERENCE ITEM	DRAWING NUMBER
TYPICAL CULVERT - EXTENSION/REPLACEMENT	H8R-DWG-S2G-WAT-0111
CESS DRAINS	H8R-DWG-S2G-WAT-0221



NOTES:

- ALL PLACED ROCK TO BE ANGULAR AND IRREGULAR.
- ROCKS TO BE PLACED TO MAXIMISE INTERLOCKING AND MINIMISE VOIDS.
- INLET AND OUTLET WORKS ARE TO BE CONSTRUCTED IN A MANNER THAT DOES NOT REDUCE THE CAPACITY FOR FISH OR FAUNA PASSAGE.

PRILIMINARY

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ARTC APPROVAL Approved By					
Signed:					
Approval Date	A	18.12.09	50% REVIEW	D.J.G.	M.J.P*
Rev	Date	Revision Description	Drawn	Checked	Approv.

Designing Company: GHD GHD Job Number: 22-14630	Address: Level 3 GHD Tower, 24 Honeysuckle Drive Newcastle NSW 2300 Australia T 61 2 4979 9900 F 61 2 4979 9988 E ntlmail@ghd.com W www.ghd.com
Drawn D.GRIFFIN	Designed J.PAQUETTE
Drafting Check	Design Check
Approved Date	This Drawing must not be used for Construction unless signed as Approved.

Hunter ALLIANCE

H8R DWG NUMBER **A**

H8R-DWG-S2G-WAT-0241

MAITLAND TO MINIMBAH - THIRD TRACK
STANDARD DRAWINGS - WATER
PERMANENT SEDIMENT & EROSION CONTROL

Sheet No. _____
Scale (A1): 1: _____

PLOT DATE: 18 December 2009 4:16 PM PLOTTED BY: I.M.SMITH
GHD FILE PATH: G:\2011\14630\Drawings\Sub\H8R-DWG-S2G-WAT-0241.dwg