MIRVAC PACIFIC
GAINSBOROUGH GREENS
STAGES 5.4 & 5.5

mirvac

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15-184-61	SAFETY IN DESIGN

PLAN
SCALE 1:1500

GENERAL NOTES

1. ALL WORK SHALL BE JOINED NEATLY TO EXISTING CONSTRUCTION.
2. WHERE REFERENCE IS MADE ON THESE DRAWINGS TO A KERB LINE, IT SHALL BE TAKEN TO MEAN THE KERB INVERT LINE.
3. LEVELS FOR KERB AND CHANNEL CONSTRUCTION ARE SHOWN AT LIP OF CHANNEL UNLESS SHOWN OTHERWISE.
4. RADIUS TO KERB INVERT LINE AT TURNOUTS OF ROADS SHALL BE 10.00m UNLESS OTHERWISE SHOWN.
5. LIP LEVELS ARE AT QUARTER POINTS AT TURNOUTS AND AT EQUAL POINTS WHERE INDICATED (=) UNLESS NOTED OTHERWISE.
6. KERBS AND KERB AND CHANNEL, SHALL BE CONSTRUCTED IN ACCORDANCE WITH G.C.C.C. STD. DWG. NUMBERS 05-02-101 & 05-02-102.
7. IF MACHINE MADE KERB AND CHANNEL IS USED, EXTRA FINES AND 20mm SLUMP IS REQUIRED.
8. PROVIDE PRAM RAMPS TO ALL INTERSECTIONS IN ACCORDANCE WITH G.C.C.C. STD. DWG. No. 05-02-202 AND ALIGN TO DIRECT THE USER ACROSS THE ROADWAY BY THE MOST DIRECT ROUTE.
9. GULLY CONNECTIONS AND STORM WATER PIPES SHALL BE 375mm DIAMETER CLASS '2' R.C. PIPES UNLESS SHOWN OTHERWISE.
10. THE CONTRACTOR SHALL INITIALLY EXCAVATE THE PAVEMENT BOX TO 225mm BELOW THE FINISHED PAVEMENT LEVEL SHOWN ON THE DRAWINGS HE SHALL THEN NOTIFY THE ENGINEER WHO WILL FIX THE PAVEMENT THICKNESS TO BE CONSTRUCTED FOLLOWING THE RESULTS OF SUBGRADE TESTING.
11. NOTWITHSTANDING THE LIMITS OF CUTTING AND FILLING SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE ENGINEER AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE ENGINEER DURING CONSTRUCTION.
12. TWO KERB ADAPTORS SHALL BE PROVIDED TO EACH LOT UNLESS INDICATED OTHERWISE. KERB ADAPTORS ARE TO BE LOCATED SO THAT ITS CENTRE LINE IS 300MM FROM THE PROJECTION OF THE SIDE BOUNDARY AT THE KERB LINE.
13. ALL ALLOTMENTS SHALL GRADE AT A MINIMUM SLOPE OF 1 IN 150 TOWARDS THE KERB & CHANNEL UNO.
14. ALL CONCRETE FOOTPATHS TO BE MINIMUM 100mm THICK IN ACCORDANCE WITH GCCC. STD. DRG. No. 05-02-201
15. KERB RAMPS TO BE PROVIDED AT ALL INTERSECTIONS IN LINE WITH THE POSITION OF THE CONCRETE FOOTPATH. TACTILE INDICATORS REQUIRED ON KERB RAMPS CONNECTING TO PATHWAYS.
16. ANY SPRINGS ENCOUNTERED DURING CONSTRUCTION ARE TO BE IDENTIFIED TO THE SUPERINTENDENT AND CONNECTED TO THE PIPED STORMWATER DRAINAGE NETWORKS VIA MITRE DRAINS, REFER G.C.C.C. STD. DWG. No. 05-02-104 AS DIRECTED ON SITE.

R.P. DESCRIPTION
GAINSBOROUGH GREENS
PRECINCT 7.2,
YAWALPAH ROAD, PIMPAMA
LOT 2 ON SP246472,
LOT 3 ON SP246472 AND
LOT 4 ON SP246472

DATUM A.H.D.
PM166862
RL 3.982
E 74232.390, N 7742.950
YAWALPAH RD - OPPOSITE
GAWTHERN DR

LOCALITY PLAN
UBD MAP 326 GRID M7
SCALE NTS

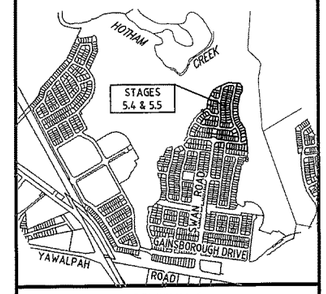
PRECINT 5
STAGES 5.4 & 5.5

SCALE
15 0 15 30 45 60 75 90 105 120 135 150m
1 : 1,500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE DESIGN
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
SOUTH BRISBANE
QUEENSLAND 4101
PHONE 07 3017 1900
FAX 07 3017 1911
EMAIL kng@knpl.com.ou
ABN 35 112 053 611

Approved Director - ~~RPEQ 1988~~ RPEQ 12805 9.2.16

Drawing title
GENERAL
LOCALITY PLAN,
DRAWING INDEX AND NOTES

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	01 of 61

	Drawing No	Revision
A1	15-184-01	A

REFER KN DWG 15-184-03

SETOUT PLAN
SCALE 1:500

LEGEND

STAGE BOUNDARY

PROPOSED ROAD CENTRELINE

NOTE: REFER KN DRAWINGS 15-184-04 FOR SETOUT TABLES

SCALE
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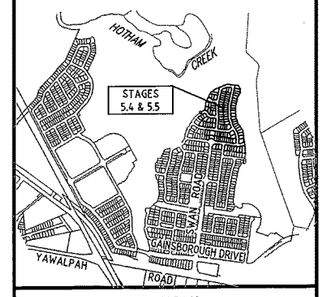
1:500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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ABN 35 112 053 611

Approved ~~Director - RPEQ 1988~~
RAL RPEQ 12005 9.2.16

Drawing Title

GENERAL
SETOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	02 of 61

	Drawing No	Revision
A1	15-184-02	A

LEGEND

STAGE BOUNDARY

PROPOSED ROAD CENTRELINE

NOTE: REFER KN DRAWINGS 15-184-04 FOR SETOUT TABLES

SETOUT PLAN
SCALE 1:500

REFER KN DWG 15-184-02

SCALE
10 5 0 10 20 30 40 50m
1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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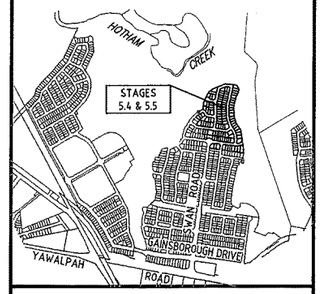
NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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Approved ~~Director - RPEQ 1988~~ 9.2.16

Drawing Title

GENERAL
SETOUT PLAN
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	03 of 61

	Drawing No	Revision
A1	15-184-03	A

NINGALOO STREET - CENTRELINE

Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	960.000	74017.067	78280.959	39°23'24.32"			
					-67.18	14.653	12°29'50.65"
IP2	967.327	74021.735	78286.644				
CC	974.653	74025.062	78293.204	26°53'33.67"			
					17.25	6.81	22°37'08.87"
IP3	978.058	74026.623	78296.281				
CC	981.463	74029.247	78298.521	49°30'42.53"			
					-11.75	14.014	68°19'59.93"
IP4	988.470	74035.312	78303.699				
CC	995.477	74032.739	78311.248	341°10'42.60"			
					13.25	1.059	4°34'45.88"
IP5	996.006	74032.568	78311.75				
CC	996.536	74032.438	78312.263	345°45'28.48"			
					13.25	7.26	31°23'38.73"
IP6	1000.166	74031.522	78315.872				
CT	1003.796	74032.62	78319.431	17°09'07.21"			
					37.5	10.569	16°08'53.51"
TC	1037.767	74042.638	78351.89	17°09'07.21"			
IP7	1043.051	74044.207	78356.973				
CT	1048.335	74047.128	78361.42	33°18'00.73"			
					14.25	7.326	29°27'24.39"
TC	1077.431	74063.102	78385.738	33°18'00.73"			
IP8	1081.094	74065.158	78388.869				
CC	1084.757	74068.489	78390.584	62°45'25.12"			
					-11.75	13.553	66°05'08.48"
IP9	1091.533	74075.284	78394.082				
CC	1098.310	74074.84	78401.712	356°40'16.64"			
					13.75	9.243	38°30'51.24"
IP10	1102.931	74074.561	78406.508				
CT	1107.553	74077.329	78410.434	35°11'07.88"			
					40	7.331	10°30'01.42"
TC	1121.485	74085.357	78421.82	35°11'07.88"			
IP11	1125.150	74087.475	78424.824				
CT	1128.815	74090.105	78427.392	45°41'09.31"			
					38.25	7.029	10°31'44.84"
TC	1142.794	74100.108	78437.158	45°41'09.31"			
IP12	1146.309	74102.63	78439.62				
CT	1149.824	74105.559	78441.58	56°12'54.14"			
					40	3.7	5°18'00.40"
TC	1173.784	74125.473	78454.904	56°12'54.14"			
IP13	1175.634	74127.012	78455.934				
CT	1177.484	74128.639	78456.817	61°30'54.55"			
					14.25	22.384	90°00'00.00"
TC	1192.577	74141.905	78464.015	61°30'54.55"			
IP14	1203.769	74154.43	78470.811				
CT	1214.961	74161.226	78458.286	151°30'54.55"			
					-28.25	26.421	53°35'13.50"
TC	1222.615	74164.876	78451.558	151°30'54.55"			
IP15	1235.826	74171.68	78439.019				
CT	1249.036	74185.81	78437.051	97°55'41.05"			
					-15	2.573	9°49'37.05"
TC	1274.415	74210.946	78433.551	97°55'41.05"			
IP16	1275.702	74212.224	78433.373				
CT	1276.988	74213.512	78433.416	88°06'04.00"			
IP17	1289.998	74226.515	78433.847	88°06'04.00"			

LIVINGSTONE CIRCUIT - CENTRELINE

Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	0.000	74266.156	78271.386	187°55'41.05"			
					-10	15.708	90°00'00.00"
TC	387.300	74212.735	77887.788	187°55'41.05"			
IP2	395.154	74211.356	77877.883				
CT	403.008	74221.261	77876.504	97°55'41.05"			
					-10	15.708	89°59'60.00"
TC	450.200	74268.002	77869.995	97°55'41.05"			
IP3	458.054	74277.906	77868.615				
CT	465.908	74279.286	77878.52	7°55'41.05"			
					200	13.999	4°00'37.95"
TC	599.341	74297.69	78010.677	7°55'41.05"			
IP4	606.341	74298.656	78017.613				
CT	613.341	74300.105	78024.464	11°56'19.00"			
					108.25	26.795	14°10'57.43"
TC	700.380	74318.11	78109.621	11°56'19.00"			
IP5	713.778	74320.896	78122.796				
CC	727.176	74326.825	78134.888	26°07'16.43"			
					-50	15.877	18°11'35.38"
IP6	735.114	74330.349	78142.075				
CT	743.052	74331.453	78150.005	7°55'41.05"			
					-13.5	21.206	90°00'00.00"
TC	760.767	74333.897	78167.55	7°55'41.05"			
IP7	771.370	74335.759	78180.921				
CT	781.973	74322.388	78182.783	277°55'41.05"			
IP8	849.888	74255.121	78192.151	277°55'41.05"			

YATALA STREET - CENTRELINE

Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	0.000	74188.53	78282.196	97°55'41.05"			
TC	150.827	74337.916	78261.392	97°55'41.05"			
					-11.6	11.516	56°52'56.16"
IP2	156.585	74344.139	78260.526				
IP3	162.343	74348.264	78265.264	41°02'44.89"			

LITCHFIELD LANE - CENTERLINE

Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	0.000	74348.264	78265.264	131°02'44.89"			
TC	5.594	74352.483	78261.591	131°02'44.89"			
					-10	7.235	41°27'22.64"
IP2	9.212	74355.337	78259.106				
CC	12.829	74359.122	78259.133	89°35'22.25"			
					-65	15.857	13°58'38.14"
IP3	20.758	74367.089	78259.19				
CT	28.686	74374.807	78261.17	75°36'44.11"			
IP4	47.312	74392.849	78265.798	75°36'44.11"			

WHITSUNDAY CIRCUIT - CENTRELINE

Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	0.000	74348.264	78265.264	41°02'44.89"			
					-11.6	5.94	29°20'29.75"
IP2	2.970	74350.259	78267.555				
CC	5.940	74350.875	78270.528	11°42'15.14"			
					-108.25	87.038	46°04'06.14"
IP3	49.459	74360.211	78315.597				
CT	92.978	74334.232	78353.59	325°38'09.00"			
					68.25	20.08	16°51'25.00"
TC	110.980	74324.071	78368.449	325°38'09.00"			
IP4	121.019	74318.363	78376.797				
CT	131.059	74315.321	78386.442	342°29'34.00"			
					108.25	29.489	15°36'30.00"
TC	155.940	74307.836	78410.169	342°29'34.00"			
IP5	170.684	74303.373	78424.318				
CT	185.429	74302.882	78439.147	358°06'04.00"			
					108.25	27.406	14°30'20.00"
TC	228.426	74301.457	78482.12	358°06'04.00"			
IP6	242.129	74301	78495.889				
CT	255.831	74304.007	78509.333	12°36'24.00"			
					-14.25	23.963	96°21'00.00"
TC	352.129	74325.025	78603.31	12°36'24.00"			
IP7	364.111	74328.5	78618.849				
CT	376.092	74312.671	78620.585	276°15'24.00"			
					-58.25	28.314	27°51'00.00"
TC	386.767	74302.06	78621.748	276°15'24.00"			
IP8	400.924	74287.704	78623.322				
CT	415.081	74274.275	78618.007	248°24'24.00"			
					-14.25	13.878	55°48'00.00"
TC	436.270	74254.572	78610.209	248°24'24.00"			
IP9	443.209	74247.557	78607.432				
CT	450.148	74245.91	78600.069	192°36'24.00"			
					-160	40.507	14°30'20.00"
TC	529.166	74228.664	78522.956	192°36'24.00"			
IP10	549.420	74224.22	78503.085				
CT	569.673	74224.894	78482.733	178°06'04.00"			
					60	10.291	9°49'37.05"
TC	634.052	74227.028	78418.391	178°06'04.00"			
IP11	639.197	74227.199	78413.235				
CT	644.342	74226.487	78408.127	187°55'41.05"			
IP12	697.805	74219.113	78355.175	187°55'41.05"			

FORTESCUE STREET - CENTRELINE

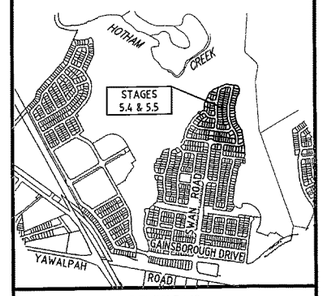
Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	0.000	74073.658	78395.853	123°18'00.73"			
TC	35.948	74103.704	78376.117	123°18'00.73"			
					-50	22.141	25°22'19.68"
IP2	47.019	74113.111	78369.937				
CT	58.089	74124.258	78368.385	97°55'41.05"			
					-38.25	28.234	42°17'32.05"
TC	218.923	74283.555	78346.201	97°55'41.05"			
IP3	233.040	74298.208	78344.16				
CT	247.157	74310.421	78352.511	55°38'09.00"			
IP4	267.421	74327.148	78363.95	55°38'09.00"			

MUNGO CLOSE - CENTRELINE

Pt	Chainage	Easting	Northing	Bearing	Rad/Spiral	A.Length	D.Angle
IP1	0.000	74229.322	78525.899	277°55'41.05"			
TC	29.979	74199.63	78530.034	277°55'41.05"			
					69.45	22.696	18°43'25.87"
IP2	41.327	74188.289	78531.613				
CT	52.674	74178.056	78536.749	296°39'06.92"			
IP3	62.674	74169.119	78541.235	296°39'06.92"			

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
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Client

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Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

LEVEL 2 - 71 GREY STREET
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QUEENSLAND 4101
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FAX 07 3017 1911
EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved ~~Checker - RPEQ1988~~
RPEQ 12805 9.2.16

Drawing Title

GENERAL
SETOUT TABLES

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	04 of 61

	Drawing No	Revision
A1	15-184-04	A

REFER KN DWG 15-184-06

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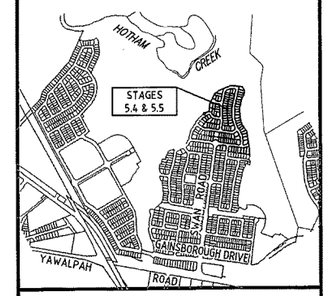
KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

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Approved Director RPEQ 1988 RAEQ12505 9.2.16

Drawing Title

GENERAL
LAYOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

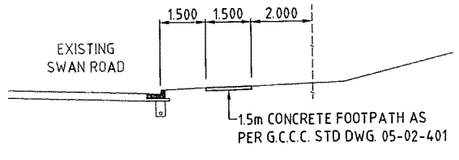
Scale	Sheet
AS SHOWN	05 of 61

Drawing No	Revision
15-184-05	A

A1

LEGEND

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- BARRIER KERB & CHANNEL - B1
- PRDPDSED STORMWATER DRAINAGE
- CDNCRETE SLEEPER RETAINING WALL
- ROCK BOULDER RETAINING WALL
- S — SEWER MAIN
- W — WATER MAIN
- 36.0 — DESIGN SURFACE CONTOURS
- (5A) STORMWATER MANHDLE NUMBER
- G101 STDRMWATER GULLY NUMBER
- DRIVEWAY POSITION
- 100Φ RODFWATER CDNNECTION TO GULLY PIT/MH
- 100Φ RDOFWATER CDNNECTION TD KERB ADAPTOR
- SUBSURFACE DRAIN CLEANING POINT
- KERB AOAPTOR LOCATION



1.5m FOOTPATH
(SWAN ROAD CROSS SECTION)
SCALE 1:100

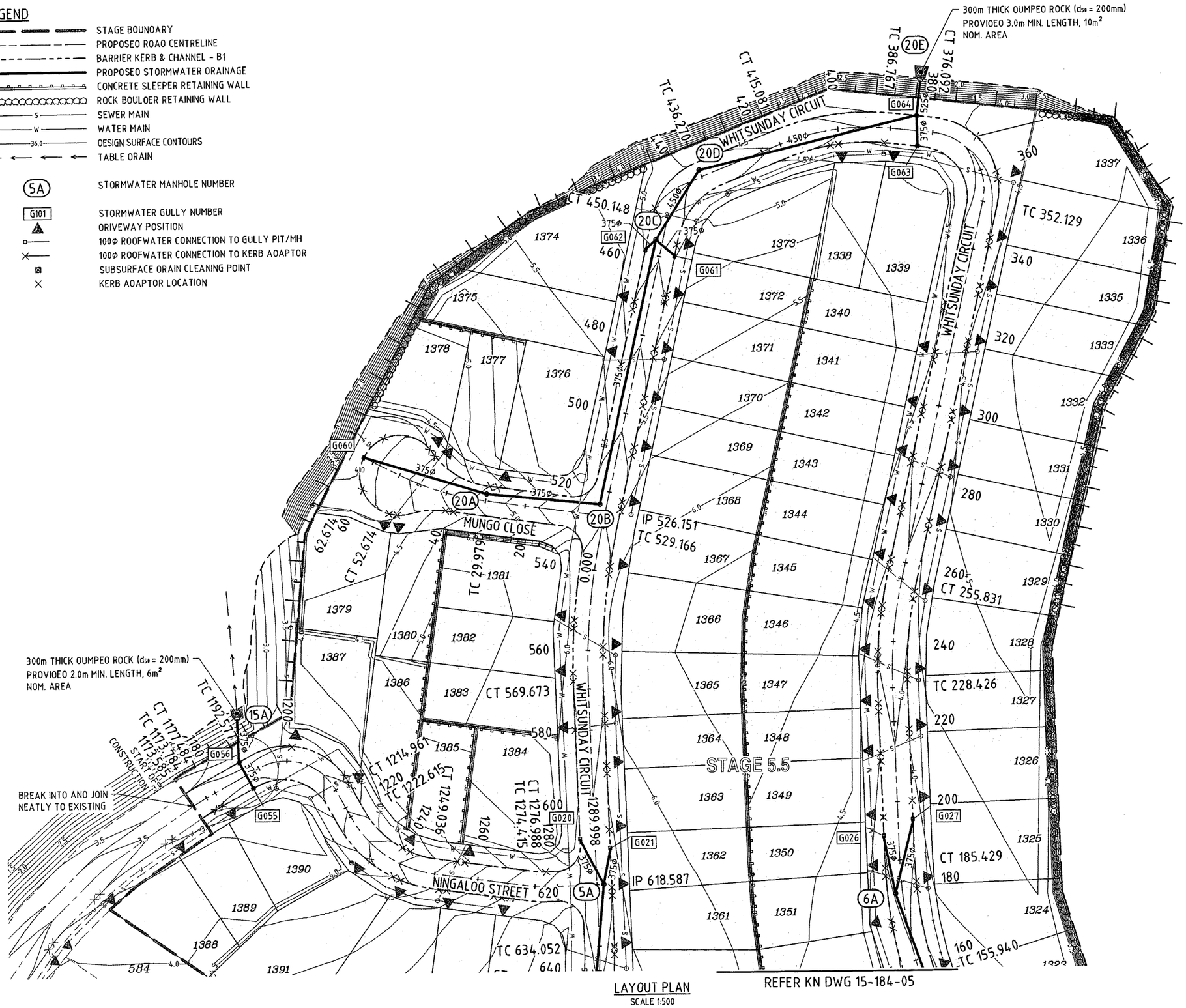
LAYOUT PLAN
SCALE 1:500

SCALE 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
1 : 100 (A1 UNREDUCED)

SCALE 10 5 0 10 20 30 40 50m
1 : 500 (A1 UNREDUCED)

LEGEND

- STAGE BOUNOARY
- PROPOSEO ROAO CENTRELINE
- BARRIER KERB & CHANNEL - B1
- PROPOSEO STORMWATER ORAINAGE
- CONCRETE SLEEPER RETAINING WALL
- ROCK BOULOER RETAINING WALL
- SEWER MAIN
- WATER MAIN
- OESIGN SURFACE CONTOURS
- TABLE ORAIN
- 5A — STORMWATER MANHOLE NUMBER
- G101 — STORMWATER GULLY NUMBER
- ORIVEWAY POSITION
- 100Φ ROOFWATER CONNECTION TO GULLY PIT/MH
- 100Φ ROOFWATER CONNECTION TO KERB AOAPTOR
- SUBSURFACE ORAIN CLEANING POINT
- KERB AOAPTOR LOCATION



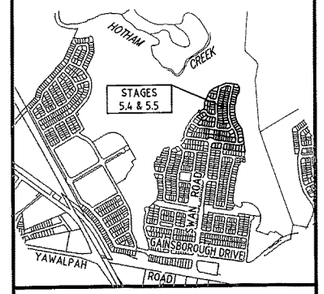
LAYOUT PLAN
SCALE 1:500

SCALE
1 : 500 (A1 UNREOUCEO)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
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Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Oesigner - RPEQ 19288
9.2.16

Drawing Title
GENERAL
LAYOUT PLAN
SHEET 2

Drawn	Designed	Checked	Oate
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	06 of 61

	Drawing No	Revision
A1	15-184-06	A

REFER KN DWG 15-184-08

CONTOUR PLAN

SCALE 1:500

LEGEND

— — —	STAGE BOUNDARY
— - —	PROPOSED ROAD CENTRELINE
- - - -	BARRIER KERB AND CHANNEL - B1
——37.0——	DESIGN SURFACE CONTOURS (0.25m)
- - -36.0- - -	EXISTING SURFACE CONTOURS (0.50m)
- - - -	BATTER LINE
(dark shading)	EXTENT OF CUT
(light shading)	EXTENT OF FILL

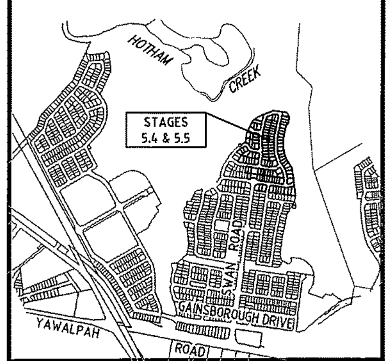
SCALE 10 5 0 10 20 30 40 50m

1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director ~~RPEQ 1988~~
RPEQ12805 9.2.16

Drawing Title

EARTHWORKS
CONTOUR PLAN
SHEET 1

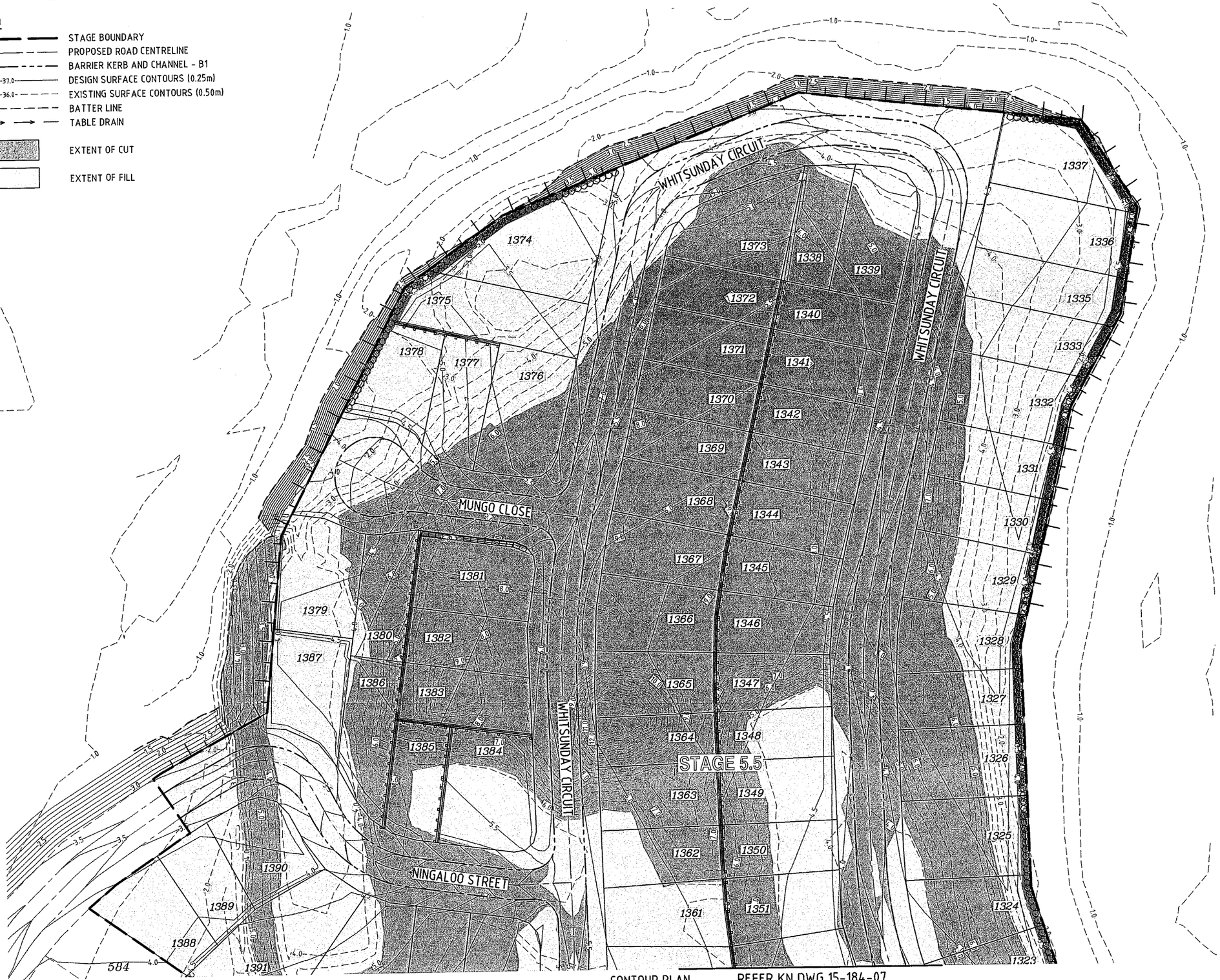
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	07 of 61

	Drawing No	Revision
A1	15-184-07	A

LEGEND

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL - B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- TABLE DRAIN
- EXTENT OF CUT
- EXTENT OF FILL



CONTOUR PLAN
SCALE 1:500

REFER KN DWG 15-184-07

SCALE
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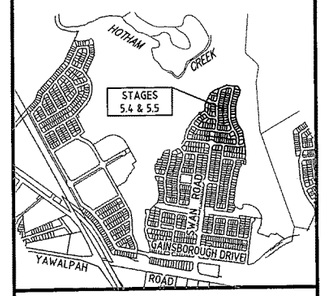
1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Drawing Title

EARTHWORKS
CONTOUR PLAN
SHEET 2

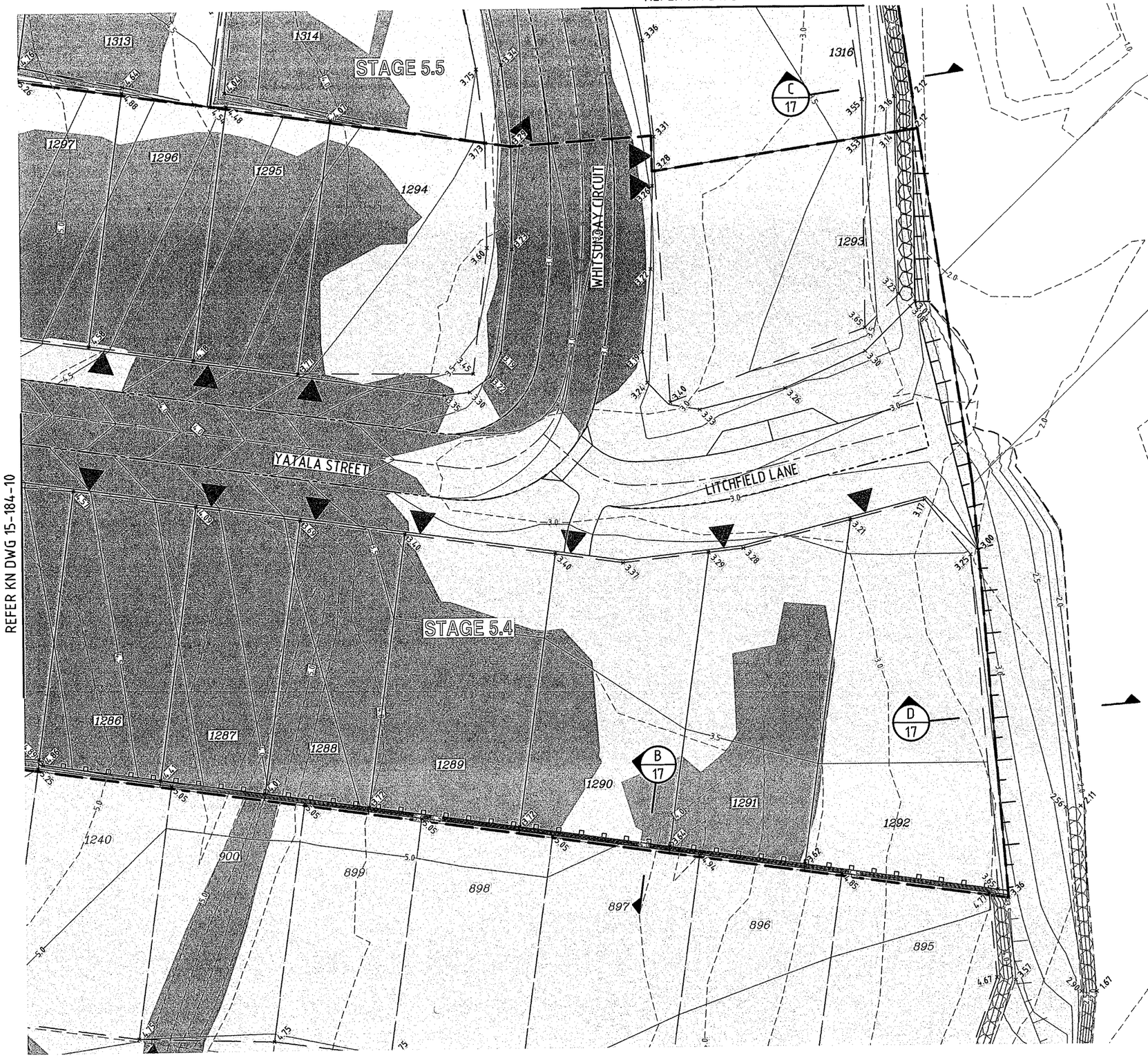
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	08 of 61

	Drawing No	Revision
A1	15-184-08	A

REFER KN DWG 15-184-11

REFER KN DWG 15-184-10



LEGEND

- STAGE BOUNDARY
- PRDPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTDURS (0.50m)
- BATTER LINE
- RDCK BOULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- DRIVEWAY POSTIONS
- EXTENT OF CUT
- EXTENT OF FILL

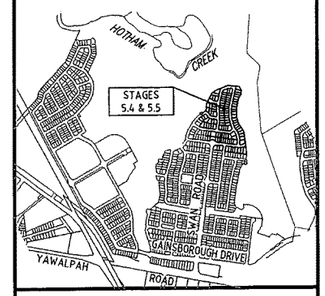
SPOT LEVELS PLAN
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



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No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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RAL RPEQ 11805 9.2.16

Drawing Title

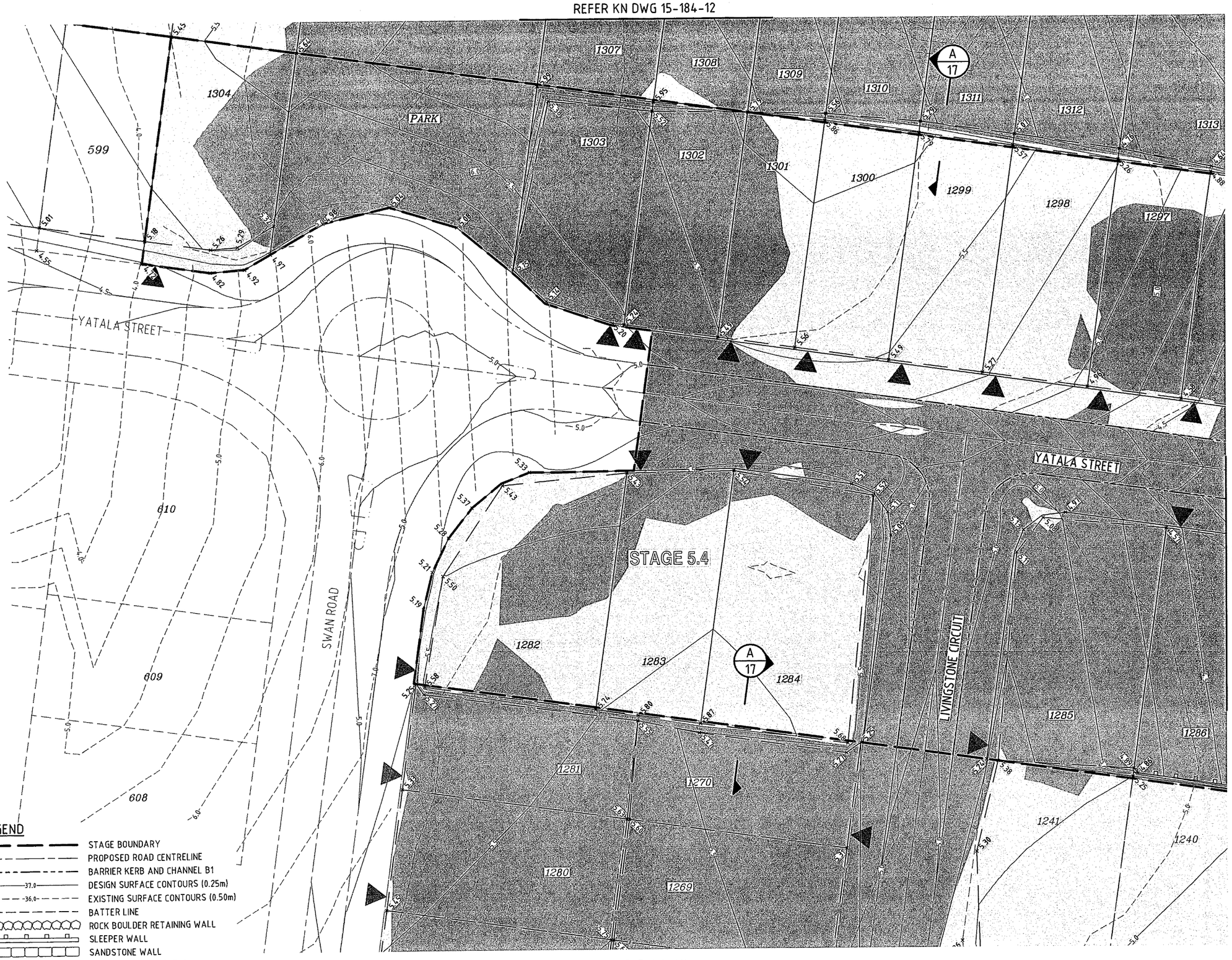
EARTHWORKS
SPOT LEVELS PLAN
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	09 of 61

	Drawing No	Revision
A1	15-184-09	A

REFER KN DWG 15-184-12



REFER KN DWG 15-184-09

LEGEND

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- ROCK BOULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- DRIVEWAY POSTIONS
- EXTENT OF CUT
- EXTENT OF FILL

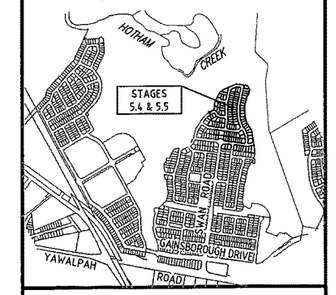
SPOT LEVELS PLAN
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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Approved ~~Director - RPEQ 1958~~ RMcL RPEQ12505 9.2.16

Drawing Title
EARTHWORKS
SPOT LEVELS PLAN
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	10 of 61

	Drawing No	Revision
A1	15-184-10	A

REFER KN DWG 15-184-13

REFER KN DWG 15-184-12

REFER KN DWG 15-184-09

LEGEND

- STAGE BOUNDARY
- PROPDSED RDAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTDURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- ROCK BDULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- ORIVEWAY PDSTIONS
- EXTENT DF CUT
- EXTENT DF FILL

1360 1352 1323 1322 1359 1353 1321 1357 1356 1355 1354 1320 1319 1318 1317 1316 1315 1314 1313 1312 1311 1310 1300 1299 1298 1297 1296 1295

WHITSUNDAY CIRCUIT

FORTESCUE STREET

STAGE 5.5

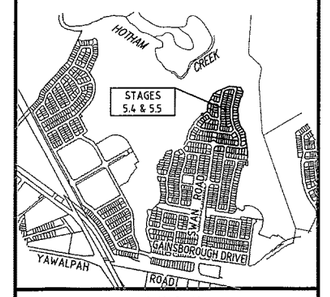
SPOT LEVELS PLAN
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Drawing Title

EARTHWORKS
SPOT LEVELS PLAN
SHEET 3

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	11 of 61

	Drawing No	Revision
A1	15-184-11	A

REFER KN DWG 15-184-14

NINGALOO STREET

STAGE 5.5

WHITSUNDAY CIRCUIT

FORTESCUE STREET

PARK

PARK

REFER KN DWG 15-184-11

REFER KN DWG 15-184-10

LEGEND

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- ROCK BOULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- DRIVEWAY POSTIONS
- EXTENT OF CUT
- EXTENT OF FILL

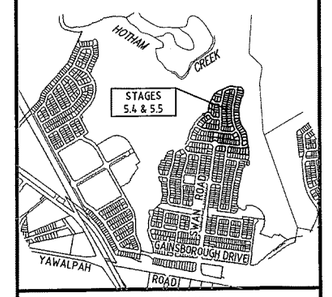
SPOT LEVELS PLAN
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director - RPEQ 1988
9.2.16

Drawing Title

EARTHWORKS
SPOT LEVELS PLAN
SHEET 4

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

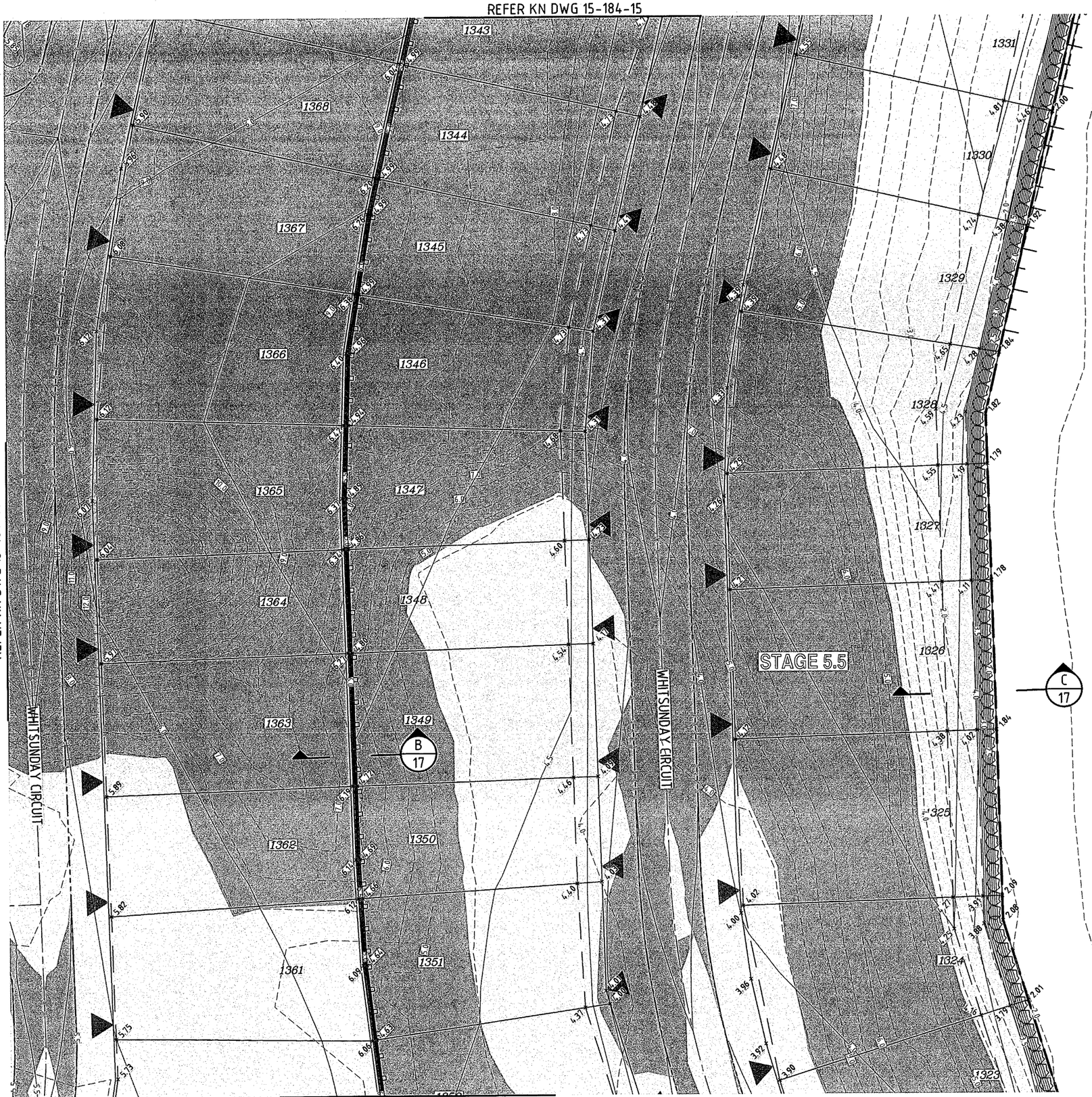
Scale	Sheet
AS SHOWN	12 of 61

A1	Drawing No	Revision
	15-184-12	A

REFER KN DWG 15-184-15

REFER KN DWG 15-184-14

REFER KN DWG 15-184-11



LEGEND

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- ROCK BOULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- DRIVEWAY POSTIONS
- EXTENT OF CUT
- EXTENT OF FILL

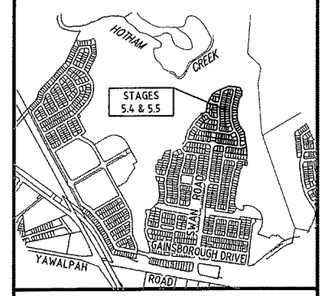
SPOT LEVELS PLAN
SCALE 1:1250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

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RPEQ12505 9.2.16

Drawing Title

EARTHWORKS
SPOT LEVELS PLAN
SHEET 5

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

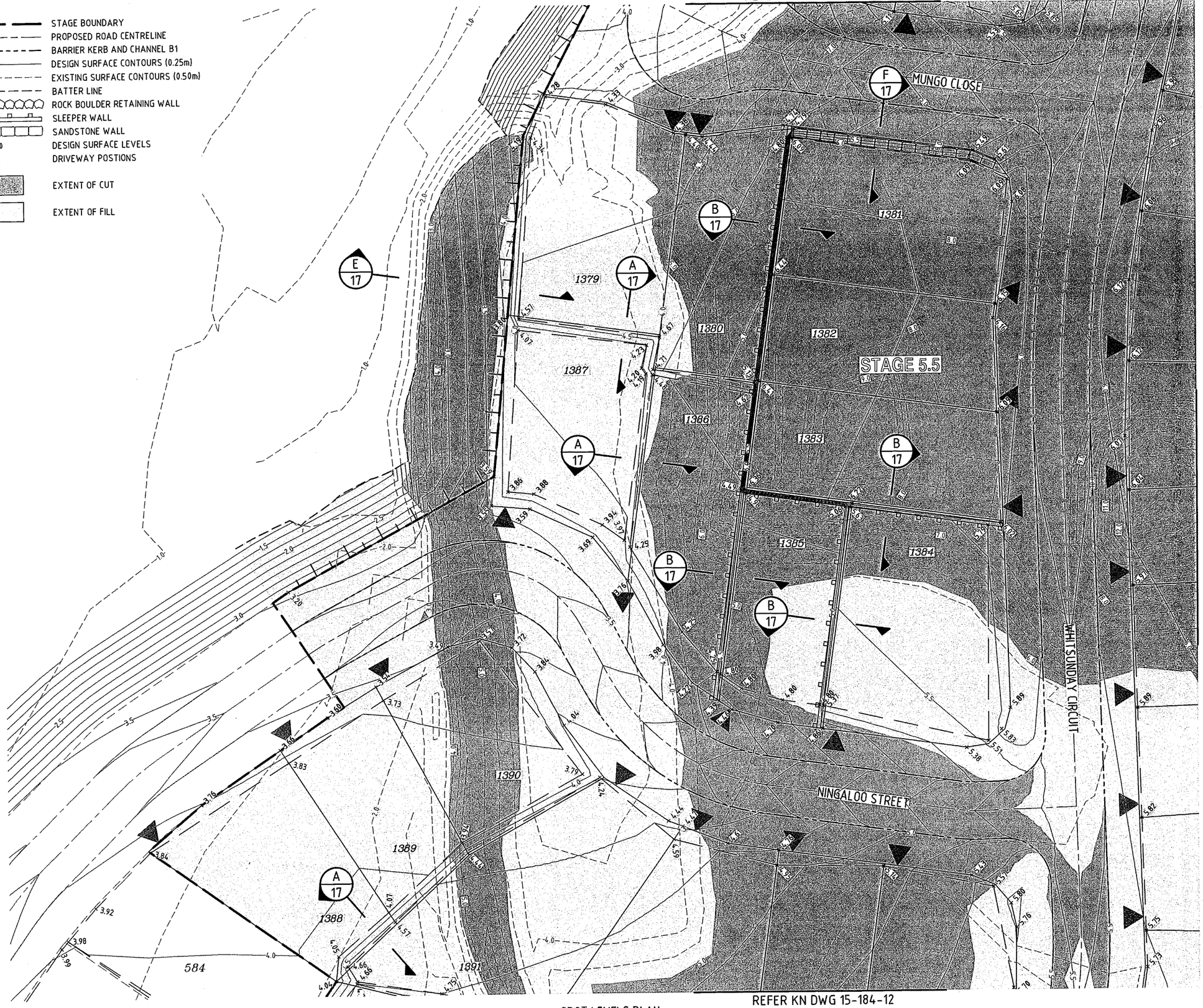
Scale	Sheet
AS SHOWN	13 of 61

	Drawing No	Revision
A1	15-184-13	A

REFER KN DWG 15-184-16

LEGEND

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- ROCK BOULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- DRIVEWAY POSTIONS
- EXTENT OF CUT
- EXTENT OF FILL



REFER KN DWG 15-184-13

REFER KN DWG 15-184-12

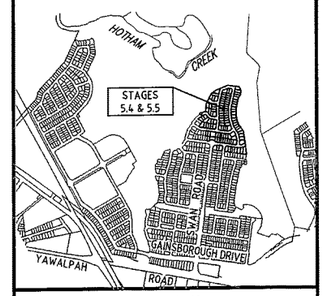
SPOT LEVELS PLAN
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS urban environment consultants
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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved Director RPEQ 12805 9.2.16

Drawing Title

EARTHWORKS
SPOT LEVELS PLAN
SHEET 6

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	14 of 61

A1	Drawing No 15-184-14	Revision A

SPOT LEVELS PLAN
SCALE 1:250

LEGEND

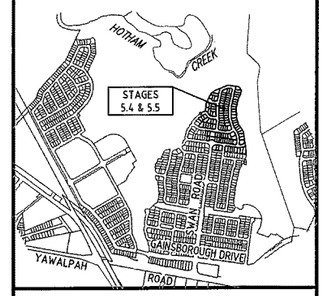
- STAGE BOUNDARY
- PROPOSED RDAD CENTRELINE
- BARRIER KERB AND CHANNEL B1
- 37.0 DESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- RDCK BDULDER RETAINING WALL
- SLEEPER WALL
- SANDSTONE WALL
- × 3.60 DESIGN SURFACE LEVELS
- DRIVEWAY PDSTIONS
- EXTENT DF CUT
- EXTENT OF FILL

SCALE
5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS URBAN ENVIRONMENT CONSULTANTS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
SOUTH BRISBANE
QUEENSLAND 4101
PHONE 07 3017 1900
FAX 07 3017 1911
EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved ~~Director - RPEQ 1988~~ RPEQ 9.2.16

Drawing Title

EARTHWORKS
SPOT LEVELS PLAN
SHEET 7

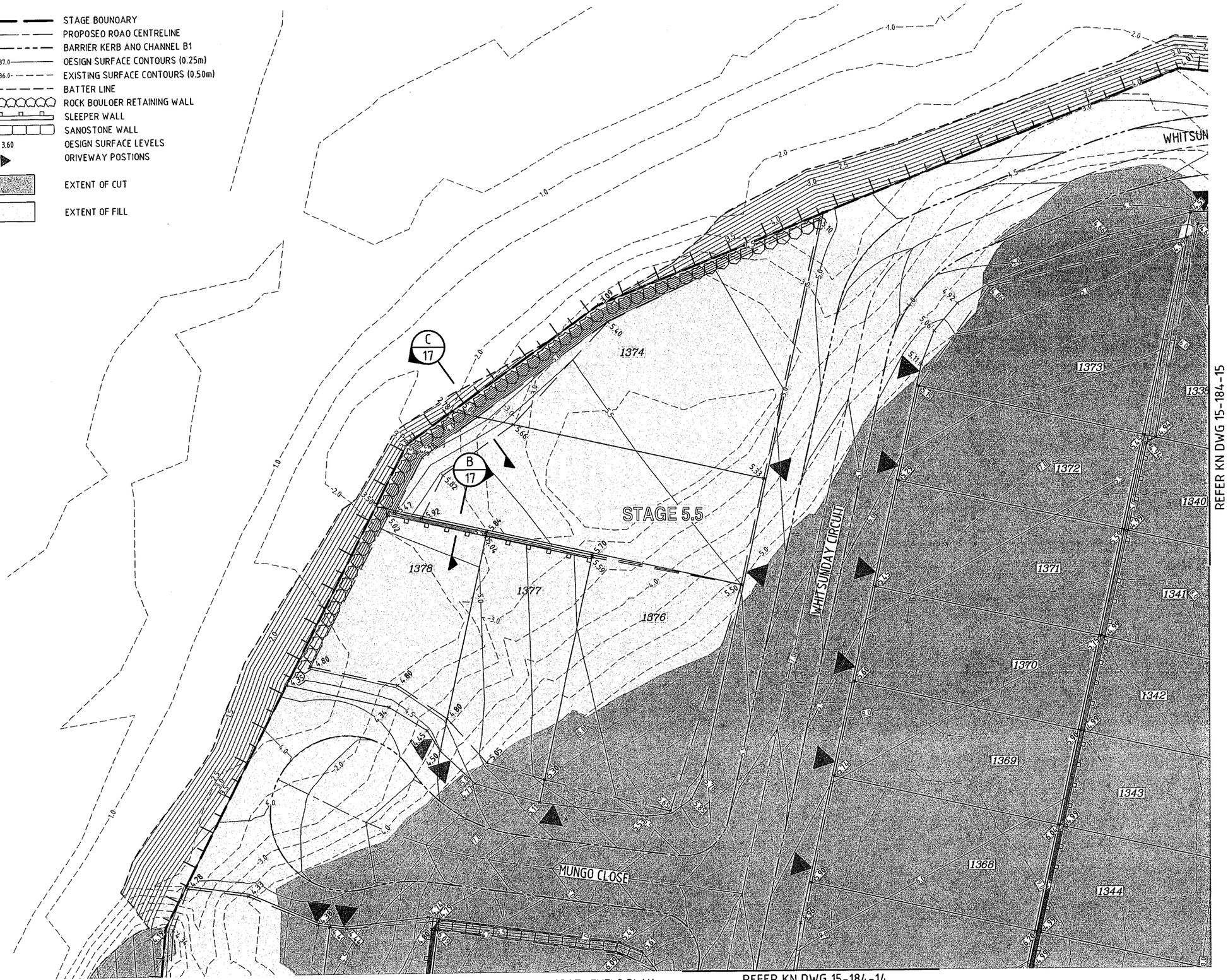
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	15 of 61

	Drawing No	Revision
A1	15-184-15	A

LEGEND

- STAGE BOUNOARY
- PROPOSEO ROAO CENTRELINE
- BARRIER KERB ANO CHANNEL B1
- 37.0 OESIGN SURFACE CONTOURS (0.25m)
- 36.0 EXISTING SURFACE CONTOURS (0.50m)
- BATTER LINE
- ROCK BOULOER RETAINING WALL
- SLEEPER WALL
- SANOSTONE WALL
- × 3.60 OESIGN SURFACE LEVELS
- ORIVEWAY POSTIONS
- EXTENT OF CUT
- EXTENT OF FILL



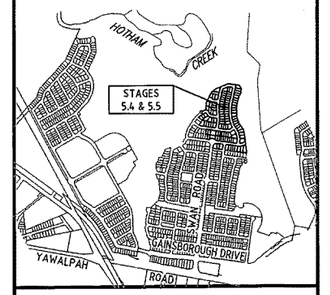
SPOT LEVELS PLAN
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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ABN 35 112 053 611

Approved ~~Bigelow RPEQ 1988~~ RPEQ 12915 9-2-16

Drawing Title

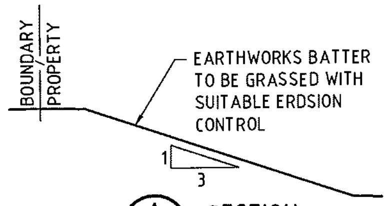
EARTHWORKS
SPOT LEVELS PLAN
SHEET 8

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

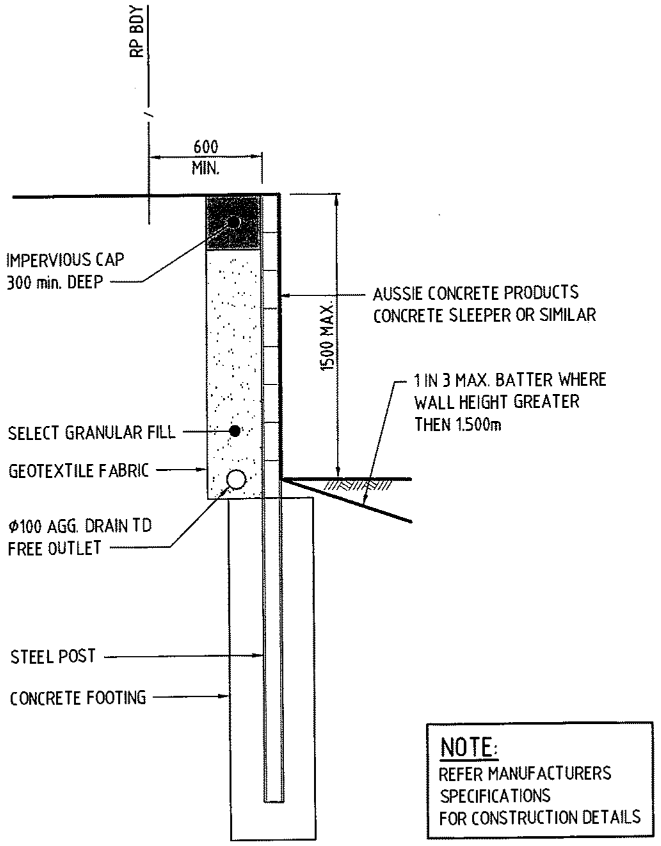
Scale	Sheet
AS SHOWN	16 of 61

	Drawing No	Revision
A1	15-184-16	A

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

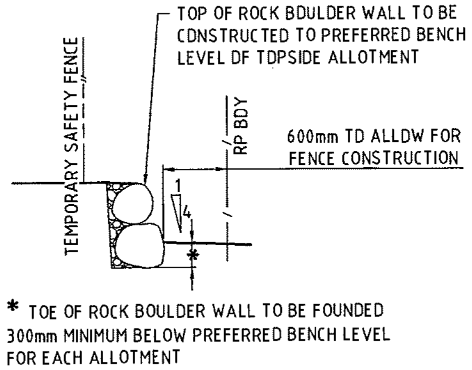


A 10-16 SECTION
SCALE NTS



NOTE:
REFER MANUFACTURERS SPECIFICATIONS FOR CONSTRUCTION DETAILS

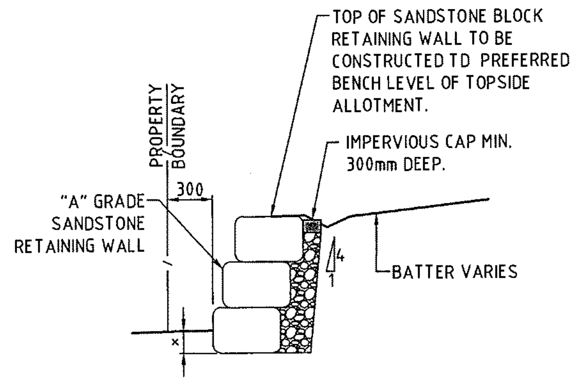
B 09,11,13-16 SECTION
SCALE NTS



* TOE OF ROCK BOULDER WALL TO BE FOUNDED 300mm MINIMUM BELOW PREFERRED BENCH LEVEL FOR EACH ALLOTMENT

TYPICAL ROCK BOULDER RETAINING WALL DETAIL

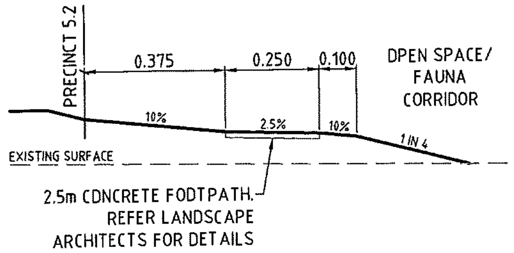
C 9,11,13,15,16 SECTION
SCALE NTS



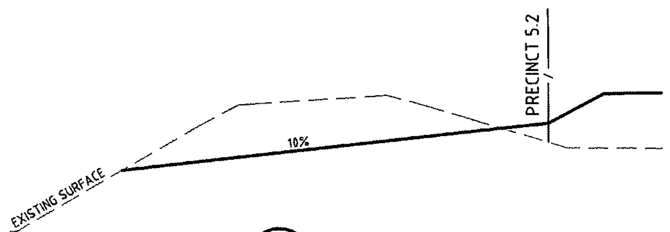
x TOE OF SANDSTONE BLOCK RETAINING WALL TO BE FOUNDED A MINIMUM 300mm BELOW PREFERRED BENCH LEVEL FOR EACH ALLOTMENT.

NOTE: FOR RETAINING WALL DESIGN, REFER TO KNIGHT CONSULTING DWGS.

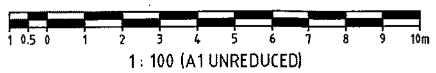
F 14 SECTION
SCALE NTS



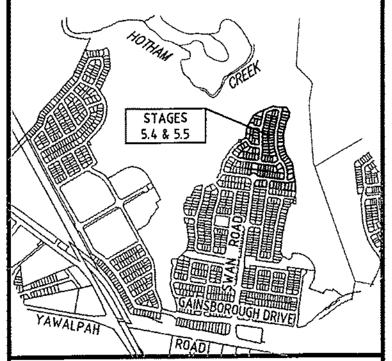
D 09 SECTION
SCALE 1:100



E 14 SECTION
SCALE 1:100

SCALE


KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD
CONSULTING ENGINEERS

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ABN 35 112 053 611

Approved ~~Director RPEQ 4986~~
RM L RPEQ12865 9.2.16

Drawing Title

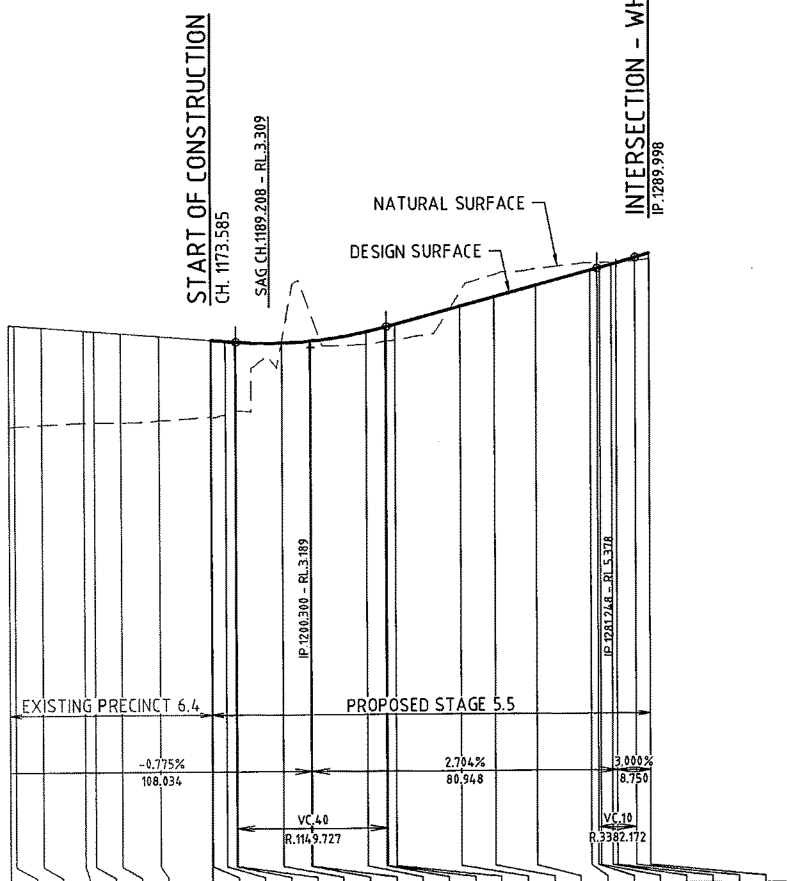
EARTHWORKS
SECTIONS AND DETAILS

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 17 of 61
A1	Drawing No: 15-184-17		Revision: A

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NOMINAL PAVEMENT DETAILS

RESIDENTIAL ACCESS STREET
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)



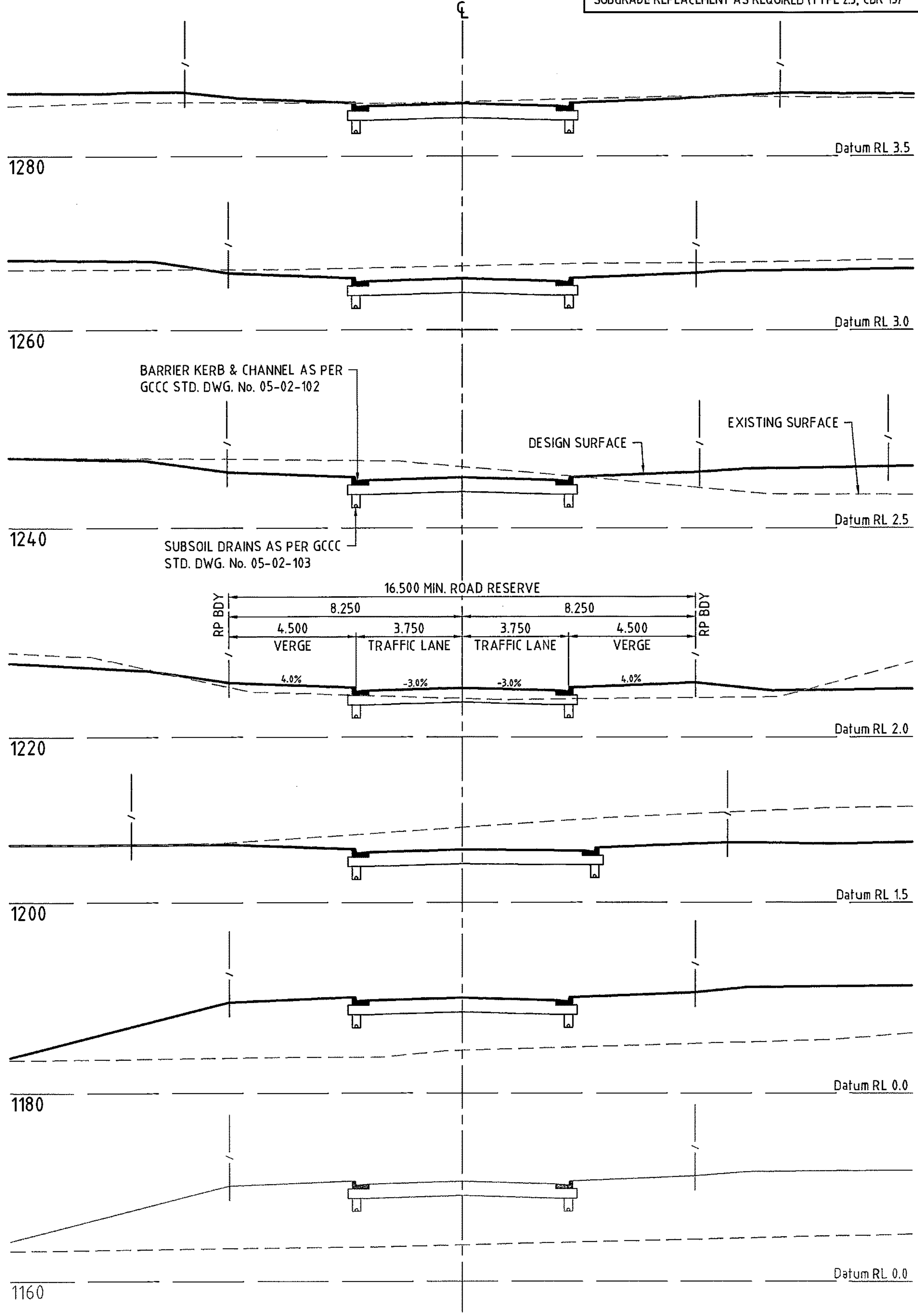
VOLUMES									
CUT	0	0	0	159	33	25	167	81	0
FILL	1107	982	861	280	72	111	1	2	0

PEGGED CHAINAGE	DESIGN SURFACE	CUT/FILL DEPTH	NATURAL SURFACE	LIP OF KERB LHS	LIP OF KERB RHS
1120.000	3.811	2.692	1.119	3.712	3.712
1121.485	3.800	2.672	1.127	3.701	3.701
1128.815	3.743	2.569	1.174	3.644	3.644
1140.000	3.656	2.430	1.226	3.557	3.557
1142.794	3.635	2.402	1.232	3.536	3.536
1149.824	3.580	2.352	1.228	3.481	3.481
1160.000	3.501	2.229	1.272	3.402	3.402
1173.585	3.396	2.023	1.373	3.297	3.297
1173.784	3.394	2.033	1.361	3.295	3.295
1177.484	3.366	1.933	1.433	3.267	3.267
1180.000	3.346	1.845	1.502	3.247	3.247
1180.300	3.344	1.834	1.510	3.245	3.245
1192.577	3.314	-0.080	3.394	3.215	REFER INTERSECTION DETAILS DWG 15-184-30
1200.000	3.360	-0.777	4.137	3.261	
1200.300	3.363	-0.691	4.054	3.264	
1214.961	3.598	0.327	3.271	3.499	
1220.000	3.722	0.372	3.349	3.623	3.623
1220.300	3.730	0.378	3.352	3.631	3.631
1222.615	3.792	0.414	3.379	3.693	3.693
1240.000	4.263	-0.376	4.638	4.164	4.164
1249.036	4.507	-0.589	5.096	4.408	4.408
1260.000	4.803	-0.434	5.237	4.704	4.704
1274.415	5.193	-0.196	5.389	5.094	5.094
1276.248	5.243	-0.151	5.394	5.144	5.144
1276.988	5.263	-0.132	5.395	5.164	5.164
1280.000	5.346	-0.050	5.396	5.247	5.247
1281.248	5.382	-0.015	5.397	REFER INTERSECTION DETAILS DWG 15-184-30	REFER INTERSECTION DETAILS DWG 15-184-30
1286.248	5.528	0.082	5.446		
1289.998	5.641	0.151	5.489		

Horiz Curve Data: R.40 7.331; R.38.25 7.029; R.40 3.700; R.14.25 22.384; R.-28.25 26.421; R.-15 2.573

NINGALOO STREET - LONGITUDINAL SECTION

SCALE - 1:1000 (H)
1:100 (V)

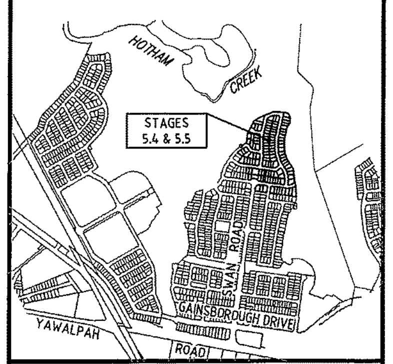


NINGALOO STREET - CROSS SECTIONS

SCALE 1:100

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants: BURCHILLS ENGINEERING SOLUTIONS; LANDPARTNERS built environment consultants; VEE; DesignFlow

Client: mirvac

Project: GAINSBOROUGH GREENS PRECINCT 5 STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
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EMAIL kng@knpl.com.au
ABN 35 112 053 611

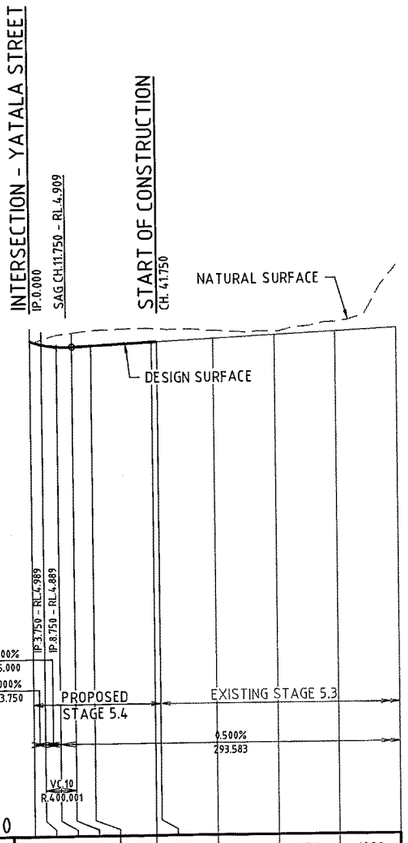
Approved ~~Director~~ - ~~RPEQ 1988~~ RPEQ12905 9-2-16

Drawing Title: ROADWORKS LONG. AND CROSS SECTIONS NINGALOO STREET

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 18 of 61
A1	Drawing No: 15-184-18		Revision: A

NOMINAL PAVEMENT DETAILS

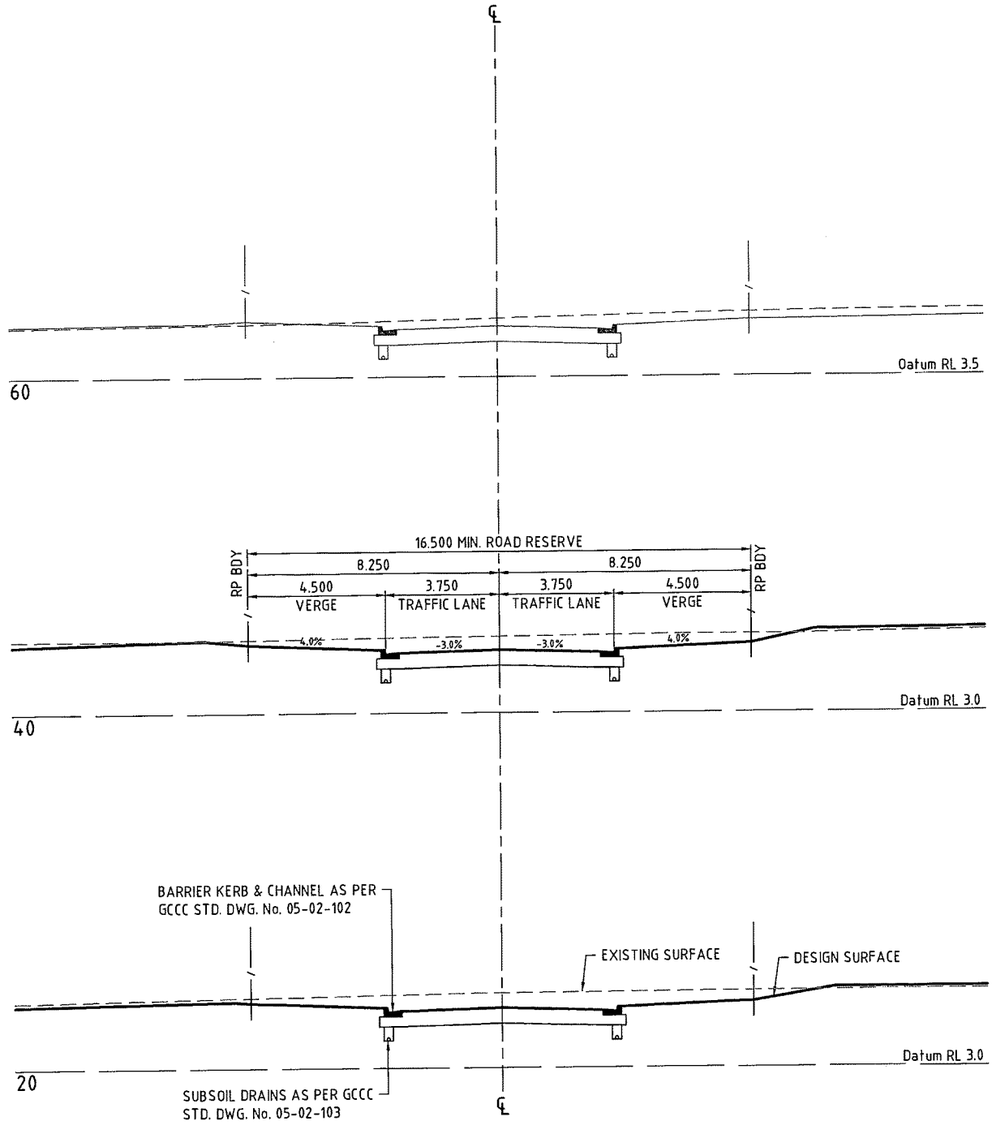
RESIDENTIAL COLLECTOR STREET
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)



VOLUMES	CUT	1157			2102	1841	1176	936	1020
	FILL	0			0	0	0	0	0
LIP OF KERB LHS	REFER INTERSECTION DETAILS DWG 15-184-30		4.815	4.846	4.946	4.955	5.046	5.246	5.346
LIP OF KERB RHS			4.802	4.846	4.946	4.955	5.046	5.246	5.346
NATURAL SURFACE	5.155	5.152	5.298	5.362	5.433	5.486	5.478	5.401	5.362	5.658	7.458
CUT/FILL DEPTH	-0.053	-0.163	-0.378	-0.448	-0.488	-0.440	-0.424	-0.256	-0.117	-0.313	-2.013
DESIGN SURFACE	5.102	4.989	4.920	4.914	4.945	5.045	5.054	5.145	5.245	5.345	5.445
PEGGED CHAINAGE	0.000	3.750	8.750	13.750	20.000	40.000	41.750	60.000	80.000	100.000	120.000

Horiz Curve Data

LIVINGSTONE CIRCUIT - LONGITUDINAL SECTION
SCALE - 1:1000 (H)
1:100 (V)

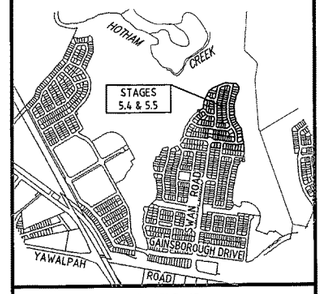


LIVINGSTONE CIRCUIT - CROSS SECTIONS
SCALE 1:100

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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ABN 35 112 053 611

Approved Director ~~RPEQ 1988~~
RPEQ 12505 9-2-16

Drawing Title
ROADWORKS
LONG. AND CROSS SECTIONS
LIVINGSTONE CIRCUIT

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	19 of 61

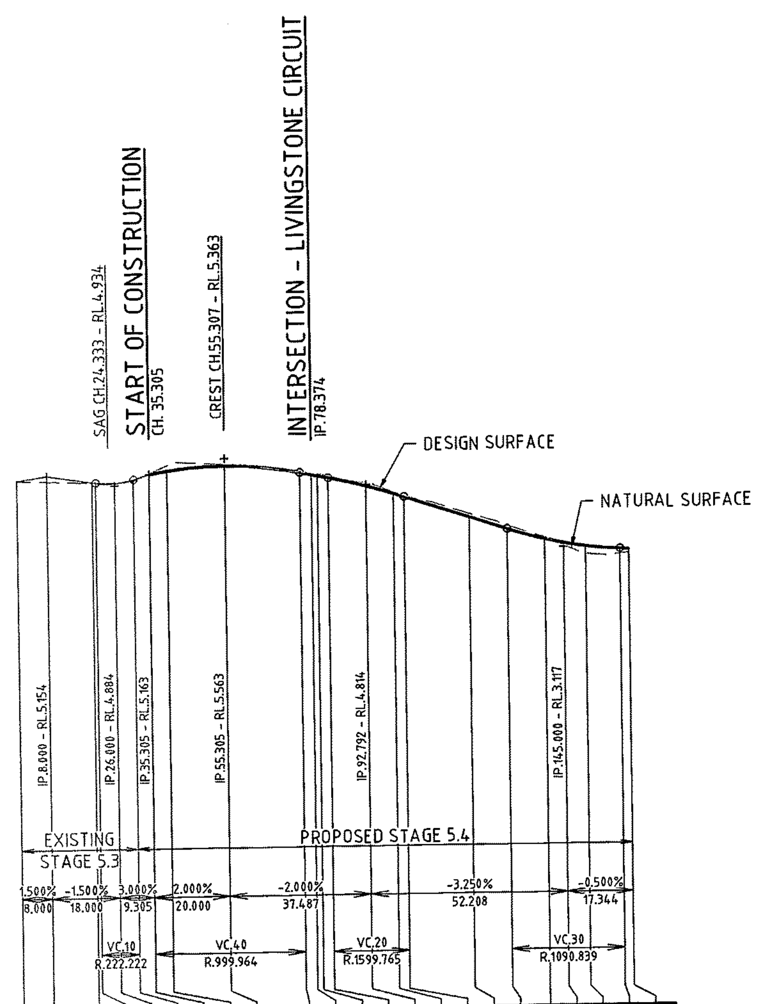
Drawing No	Revision
15-184-19	A

A1

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NOMINAL PAVEMENT DETAILS

RESIDENTIAL COLLECTOR STREET
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)



STAGE NUMBER: EXISTING STAGE 5.3 | PROPOSED STAGE 5.4

Vertical Geometry Grade / Vertical Geometry Length (m): 1.500% / 8.000; -1.500% / 18.000; 3.000% / 9.305; 2.000% / 20.000; -2.000% / 37.487; -3.250% / 52.208; -0.500% / 17.344

Vertical Curve Length (m) / Vertical Curve Radius (m): VC.10 / R.222.222; VC.40 / R.999.964; VC.20 / R.1599.765; VC.30 / R.1090.839

DATUM R.L.-9.000

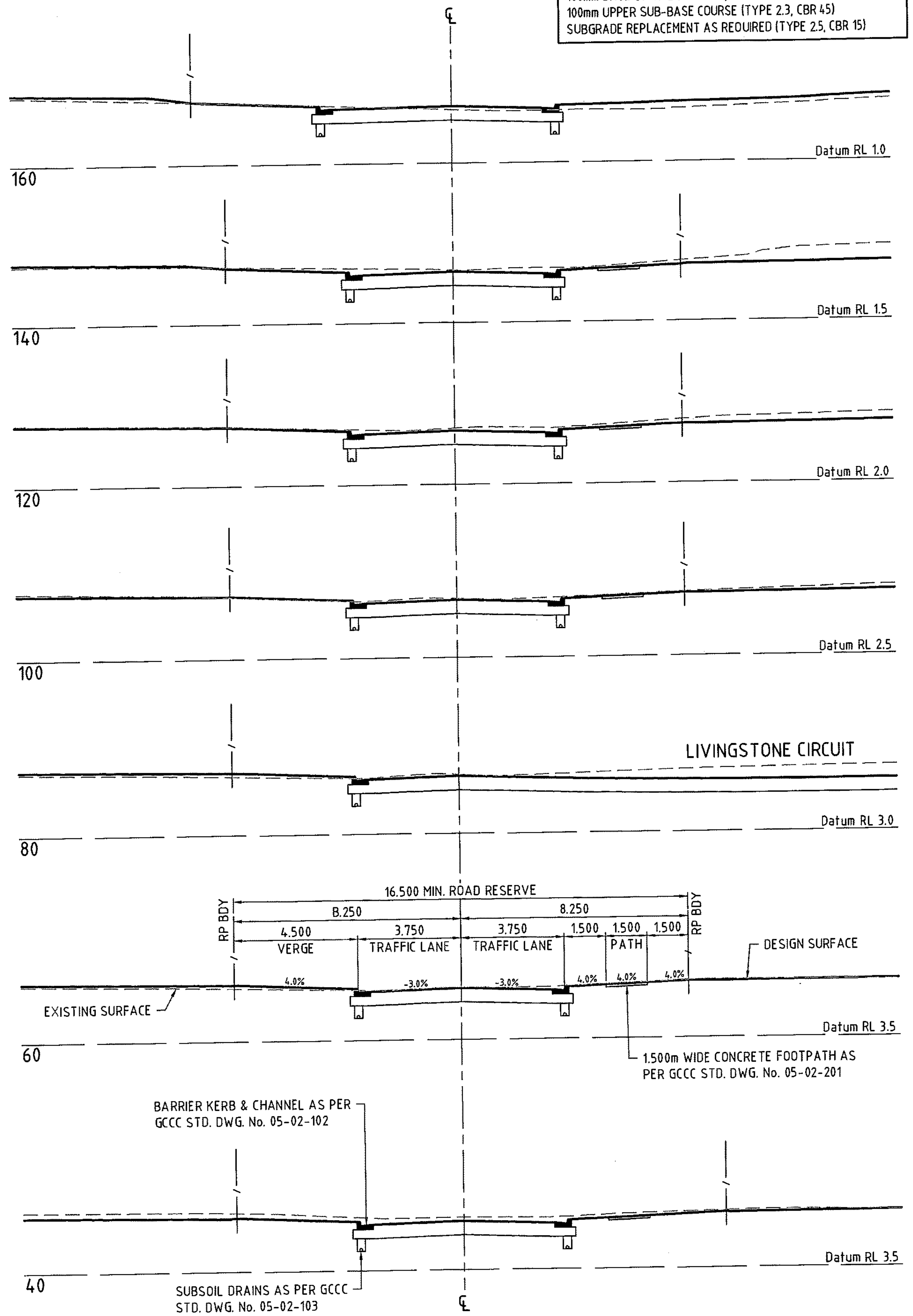
VOLUMES										
CUT	0	98	33	7	17	22	43	11	
FILL	0	2	2	10	4	1	0	21	

PEGGED CHAINAGE	DESIGN SURFACE	CUT/FILL DEPTH	NATURAL SURFACE	LIP OF KERB LHS	LIP OF KERB RHS
0.000	5.034	-1.737	6.771	EXISTING INTERSECTION	EXISTING INTERSECTION
8.000	5.154	-2.444	7.598		
20.000	4.974	-3.753	8.727		
21.000	4.959	-3.855	8.814		
26.000	4.940	-4.307	9.247		4.841
31.000	5.034	0.033	5.001	4.935	4.935
35.305	5.163	-0.024	5.187	5.064	5.064
40.000	5.246	-0.146	5.392	5.147	5.147
55.305	5.363	-0.047	5.410	5.264	5.264
60.000	5.352	-0.033	5.385	5.253	5.253
75.305	5.163	-0.018	5.181	5.064	REFER INTERSECTION DETAILS DWG 15-184-30
78.374	5.102	-0.053	5.155	5.003	
80.000	5.069	-0.056	5.125	4.970	
82.792	5.013	-0.061	5.075	4.914	
92.792	4.782	-0.076	4.858	4.683	4.683
100.000	4.577	-0.049	4.626	4.478	4.478
102.792	4.488	-0.038	4.527	4.389	4.389
120.000	3.929	-0.091	4.021	3.830	3.830
130.000	3.604	-0.101	3.705	3.505	3.505
140.000	3.325	-0.053	3.378	3.226	3.226
145.000	3.220	0.072	3.148	3.121	3.121
150.827	3.126	0.208	2.918	3.028	3.027
160.000	3.042	0.123	2.919	2.970	2.943
162.343	3.030	0.088	2.942	REFER INTERSECTION DETAILS DWG 15-184-30	REFER INTERSECTION DETAILS DWG 15-184-30

Horiz Curve Data: R.-11.6 / 11.516

YATALA STREET - LONGITUDINAL SECTION

SCALE - 1:1000 (H)
1:100 (V)



YATALA STREET - CROSS SECTIONS

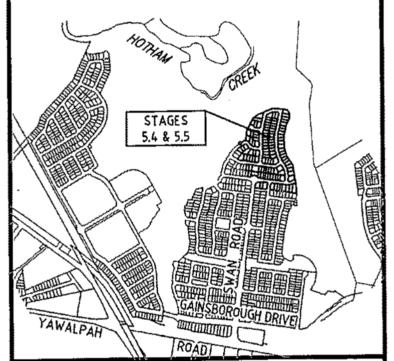
SCALE 1:100

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants: BURCHILLS ENGINEERING SOLUTIONS, LANDPARTNERS built environment consultants, vee, DesignFlow

Client: mirvac

Project: GAINSBOROUGH GREENS PRECINCT 5 STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved ~~Director~~ RPEQ 1988 — RPEQ 12805 9.2.16

Drawing Title: ROADWORKS LONG. AND CROSS SECTIONS YATALA STREET

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

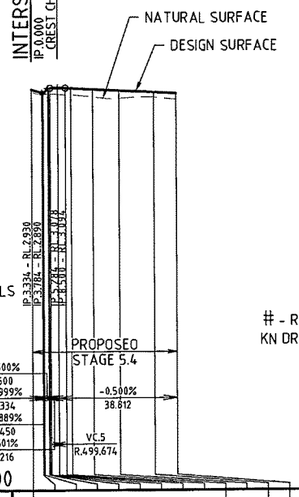
Scale	Sheet
AS SHOWN	20 of 61

	Drawing No	Revision
A1	15-184-20	A

NOMINAL PAVEMENT DETAILS

ACCESS LANE
N40 CONCRETE 180mm THICK
SL92 FABRIC 50 COVER
150mm CBR 45% SUBBASE.

INTERSECTION - YATALA STREET/WHITSUNDAY CIRCUIT
IP 0.000
CREST CH.8.502 - RL.3.087



- REFER INTERSECTION DETAILS
KN DRAWING 15-184-30

- REFER INTERSECTION DETAILS
KN DRAWING 15-184-29/30

STAGE NUMBER

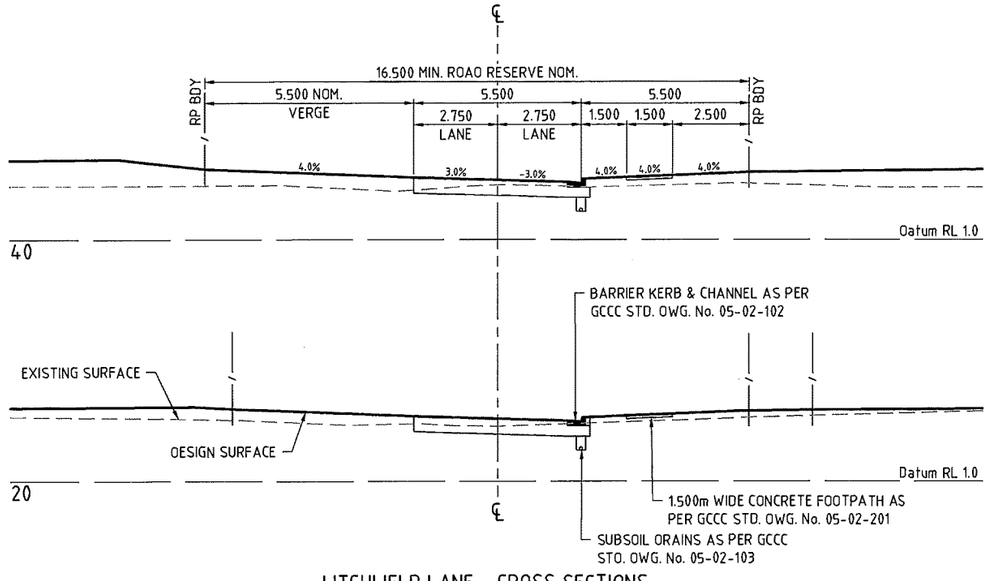
Vertical Geometry Grade	12.500%	-2.999%	-8.889%
Vertical Geometry Length (m)	1.500	3.334	0.450
Vertical Curve Length (m)			VC.5
Vertical Curve Radius (m)			R.499.674

DATUM R.L.-10.000

VOLUMES	CUT	0										0	0	
	FILL	29										94	56	
LIP OF KERB LHS		#			3.077	3.082	3.089	3.123	3.144	3.154	3.119	3.150	3.019	#
LIP OF KERB RHS					3.077	3.076	3.073	3.052	3.024	3.003	2.967	2.924	2.867	
NATURAL SURFACE		2.942	2.861	2.850	2.867	2.870	2.875	2.878	2.862	2.855	2.790	2.742	2.774	2.697
CUT/FILL DEPTH		0.088	0.069	0.040	0.211	0.209	0.206	0.210	0.220	0.217	0.246	0.251	0.162	0.202
DESIGN SURFACE		3.030	2.930	2.890	3.078	3.079	3.081	3.087	3.081	3.072	3.036	2.993	2.936	2.900
PEGGED CHAINAGE		0.000	3.334	3.784	5.284	5.594	6.000	8.500	11.000	12.829	20.000	28.686	40.000	47.312

Horiz Curve Data — R.-10 / 7.235 — R.-65 / 15.857

LITCHFIELD LANE - LONGITUDINAL SECTION
SCALE - 1:1000 (H)
1:100 (V)

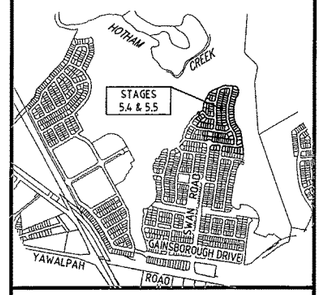


LITCHLIELD LANE - CROSS SECTIONS
SCALE 1:100

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants
BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client
mirvac

Project
GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
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PHONE 07 3017 1900
FAX 07 3017 1911
EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved ~~Director - RPEQ 1988~~ RAL RPEQ 12505 9.2.16

Drawing Title
ROADWORKS
LONG. AND CROSS SECTIONS
LITCHFIELD LANE

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

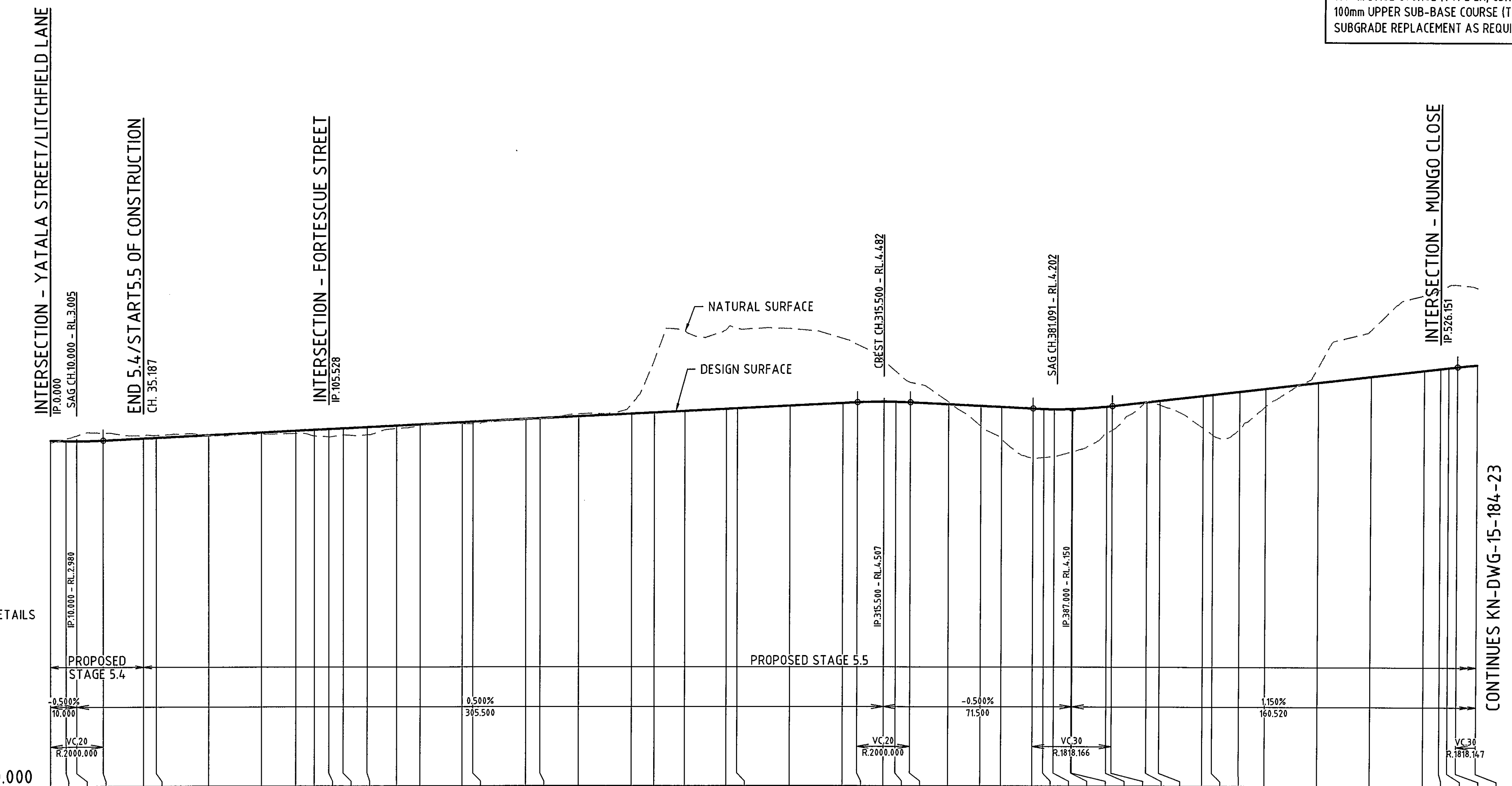
Scale	Sheet
AS SHOWN	21 of 61

	Drawing No	Revision
A1	15-184-21	A

NOMINAL PAVEMENT DETAILS

RESIDENTIAL COLLECTOR STREET - CH 0.000 - 115.500
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)

RESIDENTIAL ACCESS STREET - CH 115.500 - 697.805
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)



- REFER INTERSECTION DETAILS
KN DRAWING 15-184-29/30

STAGE NUMBER
Vertical Geometry Grade
Vertical Geometry Length (m)
Vertical Curve Length (m)
Vertical Curve Radius (m)

DATUM R.L.-10.000

VOLUMES

Interval	CUT	FILL
1	58	1
2	55	1
3	33	7
4	6	25
5	1	34
6	0	59
7	1	45
8	7	22
9	15	18
10	17	6
11	91	4
12	698	0
13	938	0
14	962	0
15	873	0
16	572	0
17	189	3
18	2	207
19	0	578
20	0	559
21	37	265
22	12	348
23	1	456
24	66	143
25	350	8
26	750	0
27	588	0

PEGGED CHAINAGE	LIP OF KERB LHS	LIP OF KERB RHS	NATURAL SURFACE	CUT/FILL DEPTH	DESIGN SURFACE
0.000	2.957	2.931	2.942	0.088	3.030
5.940	2.923	2.910	3.092	-0.083	3.009
10.000	2.906	2.906	3.201	-0.196	3.005
20.000	2.931	2.931	3.314	-0.284	3.030
35.187	3.007	3.007	3.226	-0.120	3.106
40.000	3.031	3.031	3.220	-0.090	3.130
60.000	3.131	3.131	3.217	0.013	3.230
80.000	3.231	3.231	3.266	0.064	3.330
92.978	3.296	3.296	3.284	0.110	3.395
100.000	#	3.331	3.192	0.238	3.430
105.528	#	3.359	3.162	0.295	3.458
110.980	#	3.386	3.233	0.252	3.485
120.000	3.431	3.431	3.236	0.294	3.530
131.059	3.486	3.486	3.480	0.105	3.585
140.000	3.531	3.531	3.577	0.053	3.630
155.940	3.611	3.611	3.650	0.060	3.710
160.000	3.631	3.631	3.655	0.075	3.730
180.000	3.731	3.731	3.826	0.004	3.830
185.429	3.758	3.758	3.849	0.008	3.857
200.000	3.831	3.831	4.013	-0.083	3.930
220.000	3.931	3.931	4.401	-0.371	4.030
228.426	3.973	3.973	6.060	-1.988	4.072
240.000	4.031	4.031	7.126	-2.996	4.130
255.831	4.110	4.110	7.196	-2.987	4.209
260.000	4.131	4.131	7.237	-3.007	4.230
280.000	4.231	4.231	7.225	-2.895	4.330
300.000	4.331	4.331	6.858	-2.428	4.430
305.500	4.358	4.358	6.630	-2.173	4.457
315.500	4.383	4.383	6.005	-1.523	4.482
320.000	4.378	4.378	5.615	-1.138	4.477
325.500	4.358	4.358	5.206	-0.748	4.457
340.000	4.286	4.286	4.469	-0.084	4.385
352.129	4.225	4.225	3.556	0.768	4.324
360.000	4.189	4.186	3.064	1.221	4.285
372.000	4.136	4.126	2.365	1.860	4.225
376.092	4.117	4.110	2.380	1.829	4.209
380.000	4.104	4.104	2.431	1.771	4.203
386.767	4.112	4.112	2.598	1.613	4.211
387.000	4.113	4.113	2.604	1.608	4.212
400.000	4.202	4.202	3.299	1.001	4.301
402.000	4.224	4.224	3.399	0.924	4.323
415.081	4.374	4.374	4.492	-0.019	4.473
420.000	4.431	4.431	4.370	0.160	4.530
436.270	4.625	4.618	3.498	1.218	4.717
440.000	4.664	4.661	3.228	1.531	4.760
450.148	4.770	4.777	3.453	1.423	4.876
460.000	4.891	4.891	4.324	0.666	4.990
480.000	5.121	5.121	5.821	-0.602	5.220
500.000	5.351	5.351	7.211	-1.762	5.450
520.000	5.581	4.140	8.505	-2.826	5.680
526.151	5.651	4.109	8.743	-2.993	5.750
529.166	5.686	4.094	8.873	-3.088	5.785
532.520	5.724	4.085	8.901	-3.078	5.823
540.000	5.795	5.795	8.783	-2.889	5.894

Horiz Curve Data: R.-11.6 5.940 | R.-108.25 87.038 | R.68.25 20.080 | R.108.25 29.489 | R.108.25 27.406 | R.-14.25 23.963 | R.-58.25 28.314 | R.-14.25 13.878 | R.-160 40.507

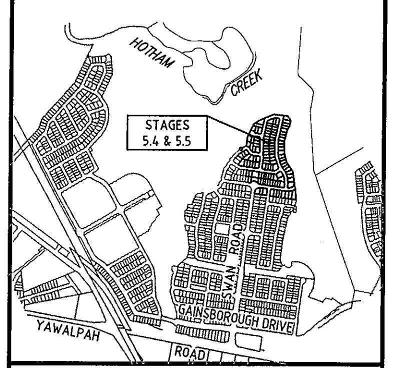
WHITSUNDAY CIRCUIT - LONGITUDINAL SECTION

SCALE - 1:1000 (H)
1:100 (V)

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants
BURCHILLS
LANDPARTNERS
VEE
DesignFlow

Client
mirvac

Project
GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD
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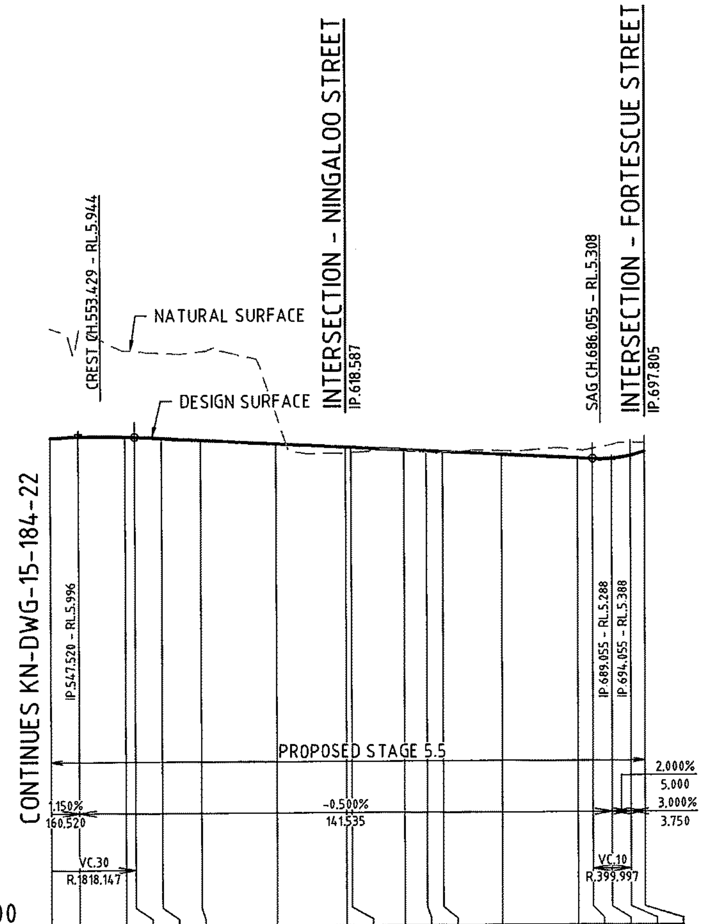
ABN 35 112 053 611

Approved Creator - RPEQ 1788
RPEQ 12905 9-2-16

Drawing Title
ROADWORKS
LONGITUDINAL SECTION
WHITSUNDAY CIRCUIT - SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale: AS SHOWN
Sheet: 22 of 61
A1 | Drawing No: 15-184-22 | Revision: A



\# - REFER INTERSECTION DETAILS KN DRAWING 15-184-29/30

STAGE NUMBER

Vertical Geometry Grade
Vertical Geometry Length (m)

Vertical Curve Length (m)
Vertical Curve Radius (m)

DATUM R.L.-7.000

VOLUMES CUT		849		918			744	11		5		19		59	34			
VOLUMES FILL		0		0			2	44		18		12		0	0			
LIP OF KERB LHS	5.795	5.835	5.833	5.822	5.786	5.735	5.635	5.542	5.535	5.464	5.435	5.413	5.335	5.235	5.201	#		
LIP OF KERB RHS	5.795	5.835	5.833	5.822	5.786	5.735	5.635	3.744	3.737	5.464	5.435	5.413	5.335	5.235	5.201	3.247	3.217	3.195
NATURAL SURFACE	8.783	8.604	8.202	8.187	8.139	8.167	6.524	5.489	5.497	5.577	5.491	5.497	5.534	5.552	5.585	5.673	5.737	5.737
CUT/FILL DEPTH	-2.889	-2.670	-2.270	-2.266	-2.254	-2.333	-0.790	0.152	0.136	-0.014	0.043	0.015	-0.100	-0.218	-0.272	-0.354	-0.348	-0.236
DESIGN SURFACE	5.894	5.934	5.932	5.921	5.885	5.834	5.734	5.641	5.634	5.563	5.534	5.512	5.434	5.334	5.313	5.320	5.388	5.501
PEGGED CHAINAGE	540.000	547.520	560.000	562.520	569.673	580.000	600.000	618.587	620.000	634.052	640.000	644.342	660.000	680.000	684.055	689.055	694.055	697.805

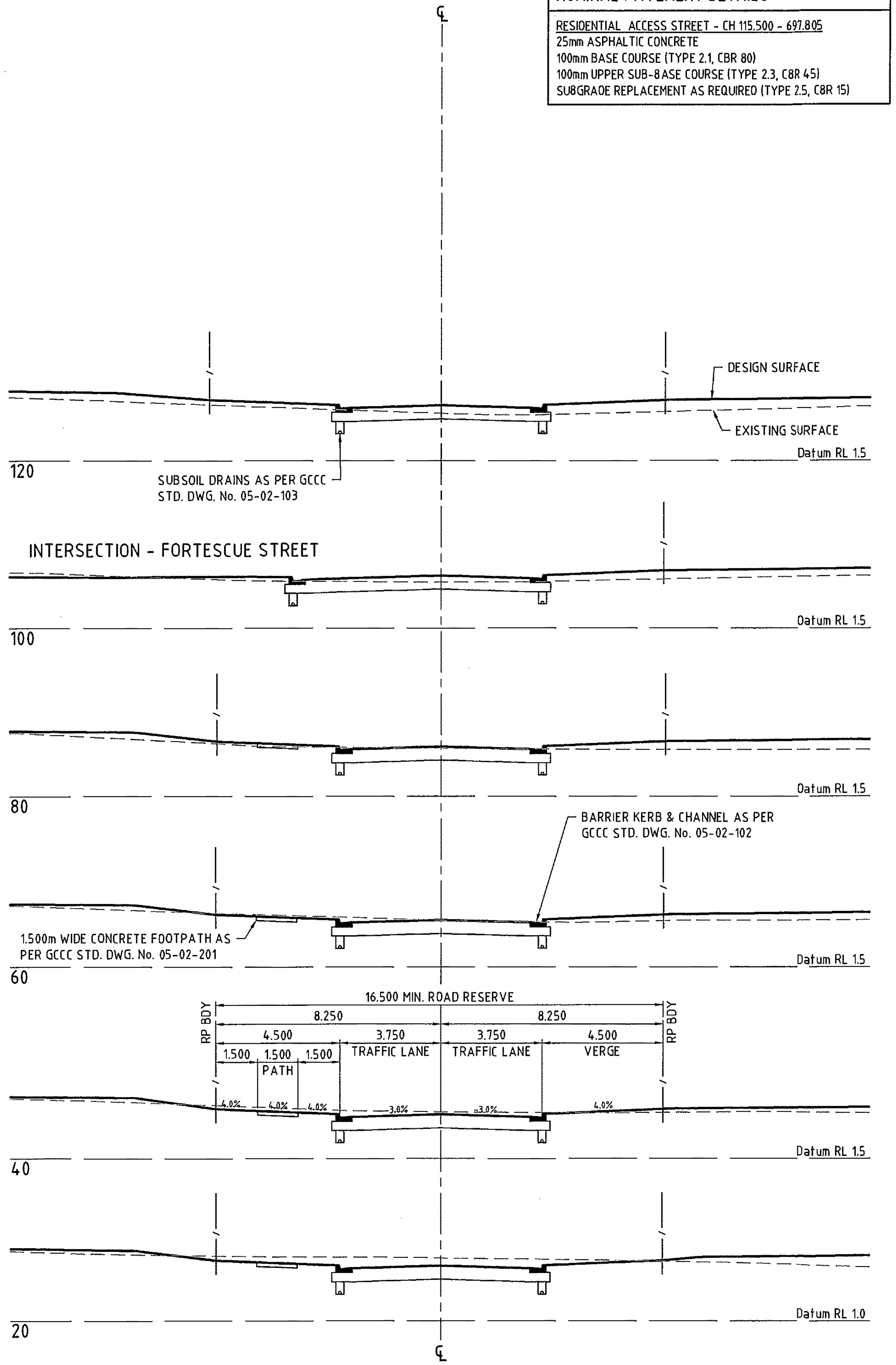
Horiz Curve Data: R.-160 / 40.507; R.60 / 10.291

WHITSUNDAY CIRCUIT - LONGITUDINAL SECTION

SCALE - 1:1000 (H)
1:100 (V)

NOMINAL PAVEMENT DETAILS

RESIOENTIAL ACCESS STREET - CH 115.500 - 697.805
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-8ASE COURSE (TYPE 2.3, C8R 45)
SU8GRAOE REPLACEMENT AS REQUIREO (TYPE 2.5, C8R 15)



WHITSUNDAY CIRCUIT - CROSS SECTIONS

SCALE 1:100

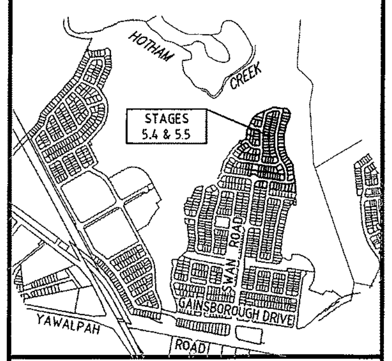
SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS · LANDPARTNERS built environment consultants · vee · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
SOUTH BRISBANE
QUEENSLAND 4101
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FAX 07 3017 1911
EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved ~~Director RPEQ 1988~~ RM RPEQ 12905 9.2.16

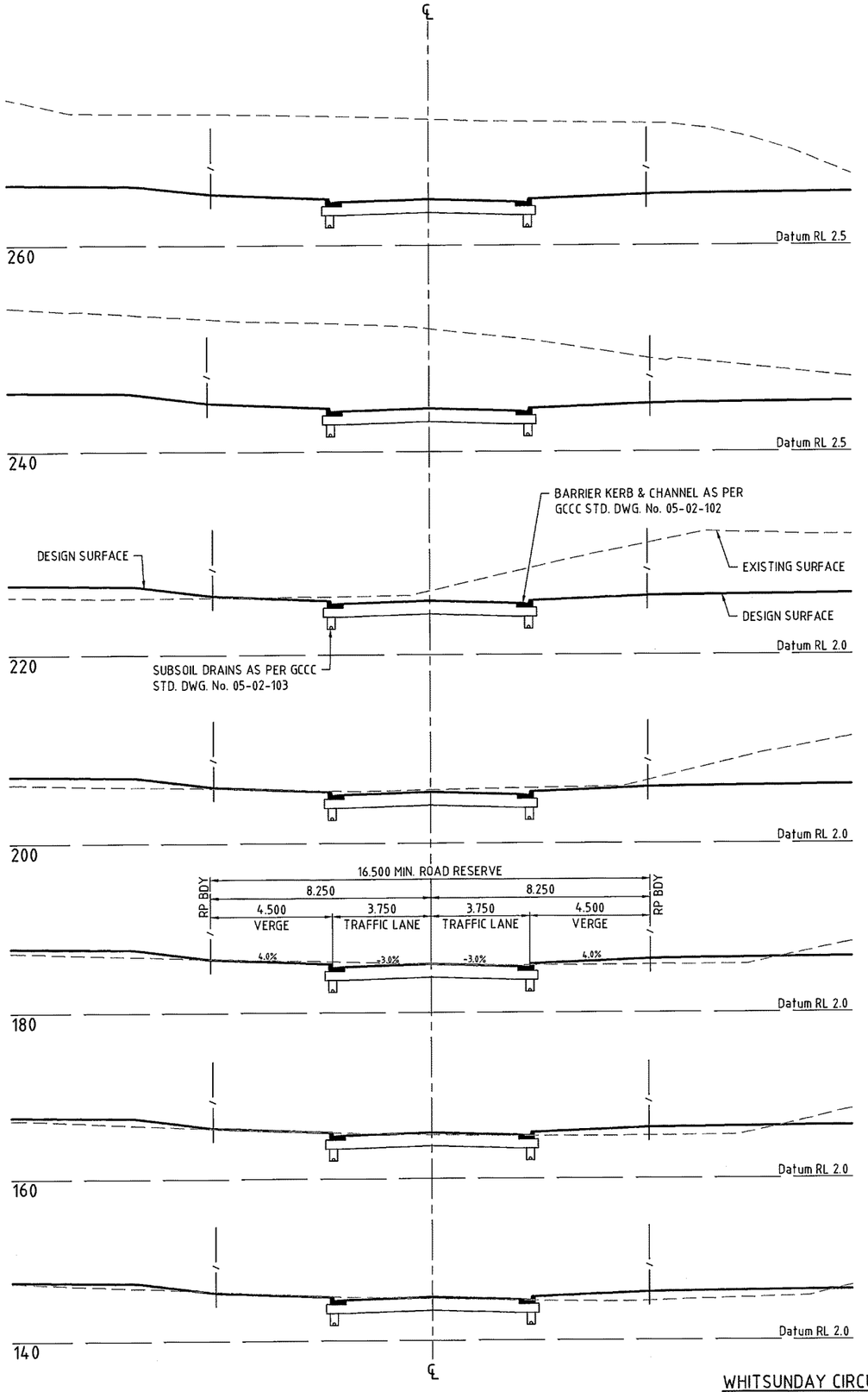
Drawing Title

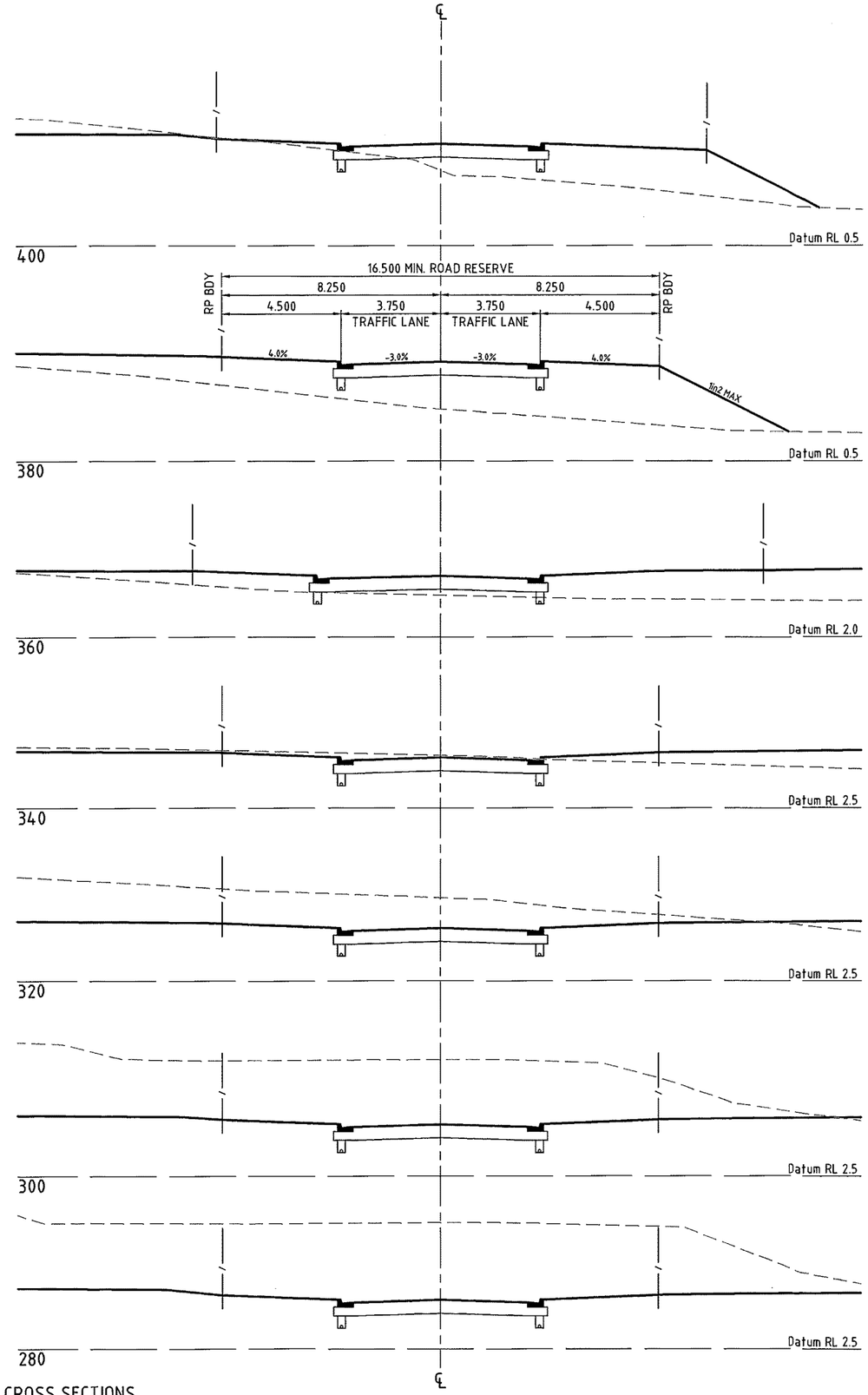
ROADWORKS
LONG. AND CROSS SECTIONS
WHITSUNDAY CIRCUIT - SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	23 of 61

	Drawing No	Revision
A1	15-184-23	A



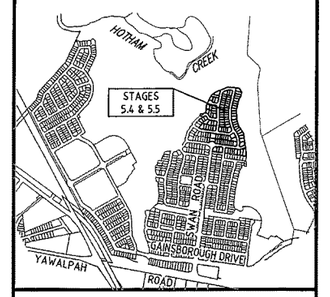


WHITSUNDAY CIRCUIT - CROSS SECTIONS
SCALE 1:100

SCALE
1 0.5 0 1 2 3 4 5 6 7 8 9 10m
1 : 100 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
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Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director - RPEQ 12805 9.2.16

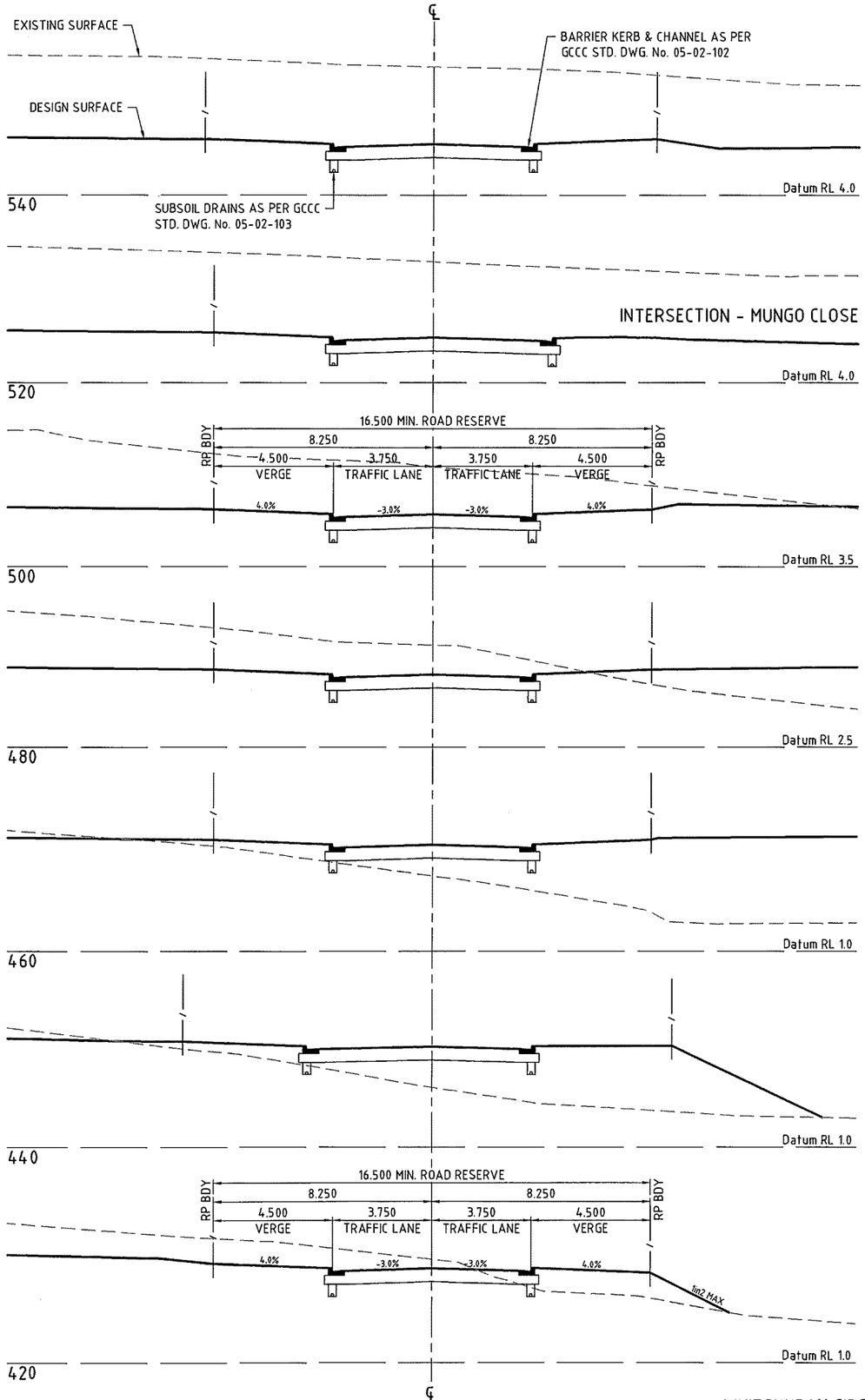
Drawing Title

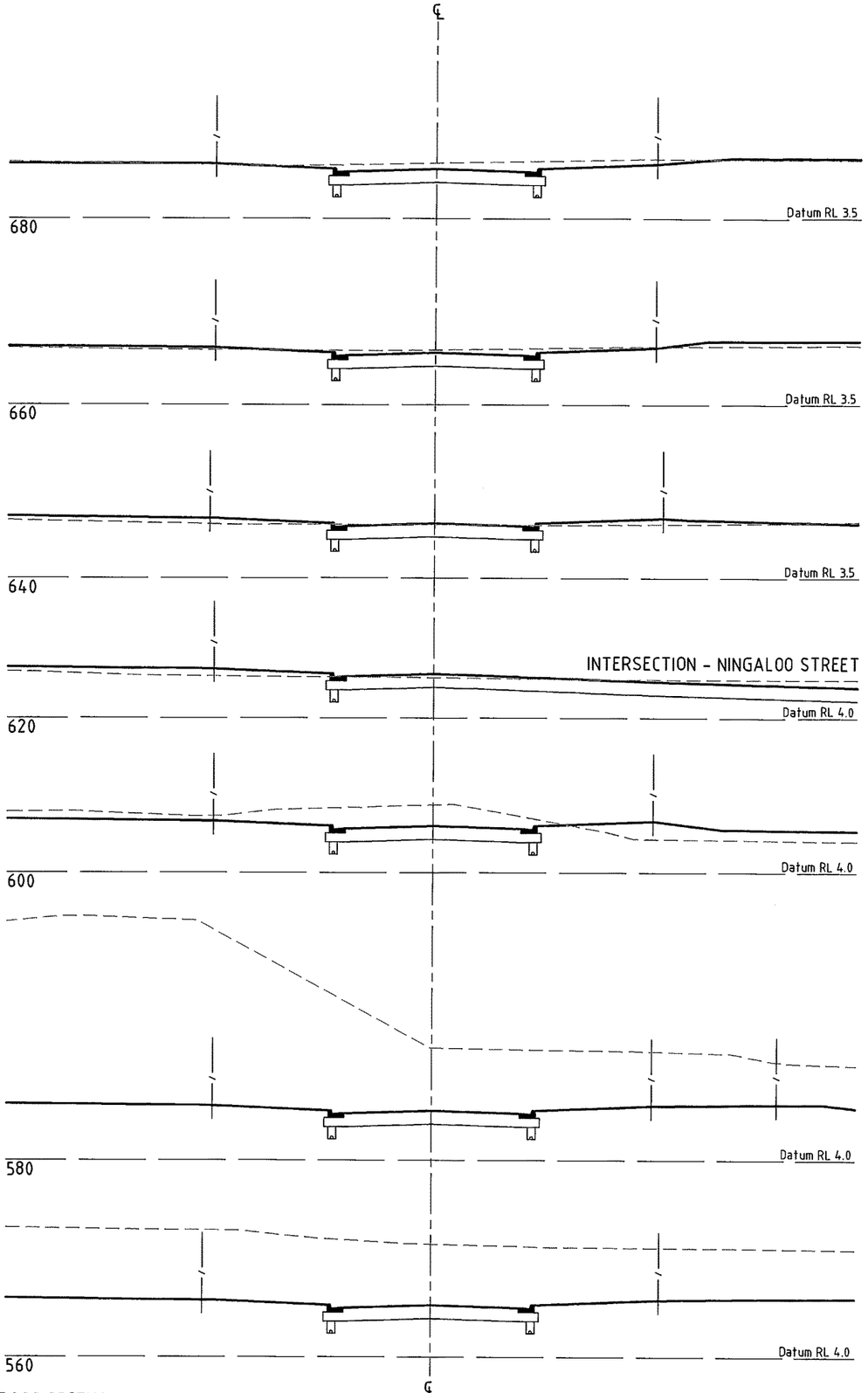
ROADWORKS
CROSS SECTIONS
WHITSUNDAY CIRCUIT - SHEET 3

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	24 of 61

	Drawing No	Revision
A1	15-184-24	A



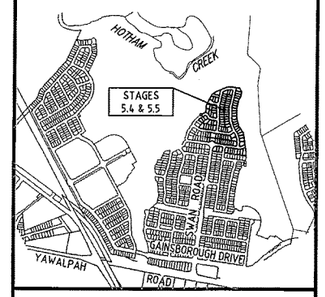


WHITSUNDAY CIRCUIT - CROSS SECTIONS
SCALE 1:100

SCALE 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
1 : 100 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved Director - RPEQ 19585
9.2.16

Drawing Title

ROADWORKS
CROSS SECTIONS
WHITSUNDAY CIRCUIT - SHEET 4

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

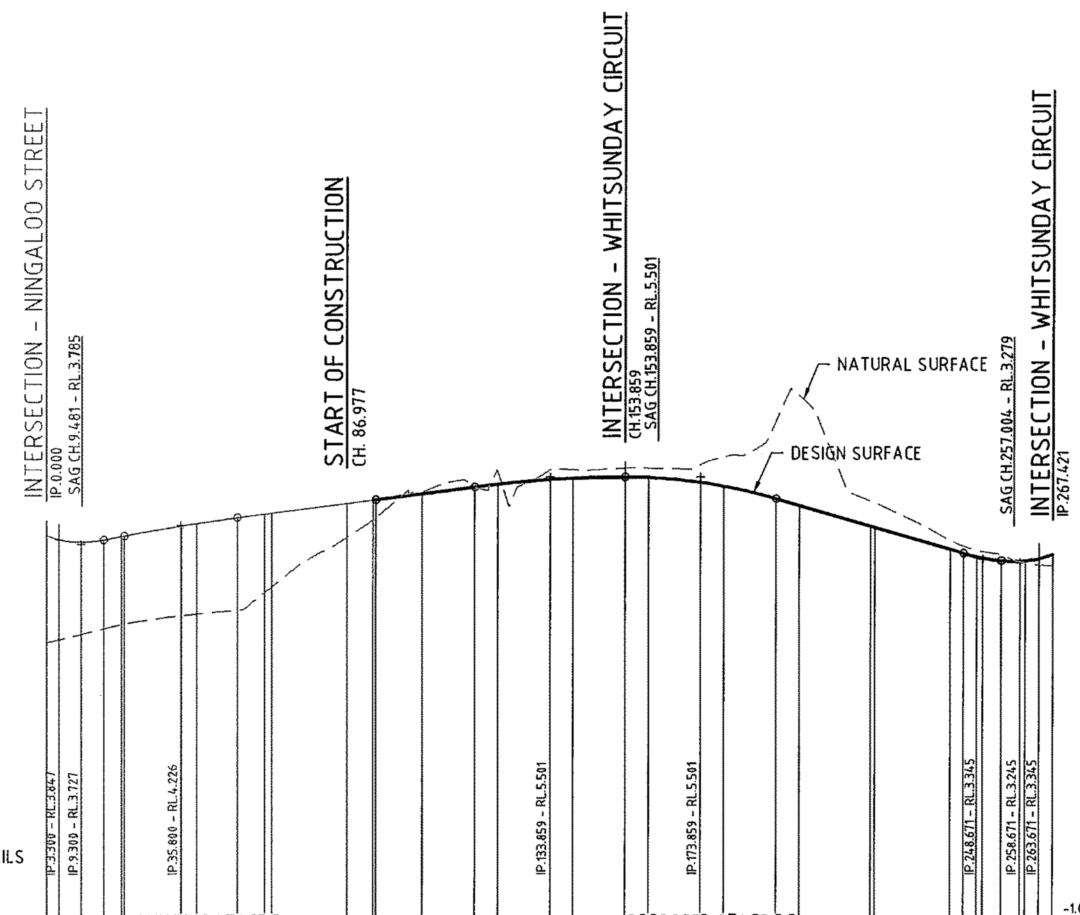
Scale	Sheet
AS SHOWN	25 of 61

	Drawing No	Revision
A1	15-184-25	A

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NOMINAL PAVEMENT DETAILS

RESIDENTIAL ACCESS STREET
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)



\# - REFER INTERSECTION DETAILS
KN DRAWING 15-184-29/30

STAGE NUMBER: EXISTING STAGE 3 | PROPOSED STAGE 5.5

Vertical Geometry Grade / Vertical Geometry Length (m): -2.000% / 6.000; -3.000% / 3.300; 1.883% / 26.500; 1.300% / 51.903; 1.300% / 46.156; 0.000% / 40.000; -2.881% / 74.812; -1.000% / 10.000; 2.000% / 5.000; 3.000% / 3.750

Vertical Curve Length (m) / Vertical Curve Radius (m): VC.12 / R.309.038; VC.30 / R.5144.968; VC.40 / R.3076.581; VC.40 / R.1388.228; VC.10 / R.531.527; VC.10 / R.333.333

DATUM R.L.-11.000

VOLUMES															
CUT	0	0	0	0	6	36	34	40	118	527	499	164	54	0
FILL	23	765	776	471	128	13	22	0	0	0	0	0	0	0

PEGGED CHAINAGE	DESIGN SURFACE	CUT/FILL DEPTH	NATURAL SURFACE	LIP OF KERB LHS	LIP OF KERB RHS
0.000	3.946	2.818	1.128	REFER EXISTING INTERSECTION DETAILS	REFER EXISTING INTERSECTION DETAILS
3.300	3.847	2.639	1.208		
9.300	3.785	2.430	1.355		
15.300	3.840	2.339	1.501		
20.000	3.928	2.318	1.611	3.829	
20.800	3.944	2.317	1.626	3.845	
35.800	4.204	2.365	1.839	4.105	4.105
35.948	4.206	2.366	1.840	4.107	4.107
40.000	4.269	2.387	1.882	4.170	4.170
50.800	4.421	2.433	1.988	4.322	4.322
58.089	4.516	2.062	2.454	4.417	4.417
60.000	4.541	1.937	2.604	4.442	4.442
80.000	4.801	0.893	3.908	4.702	4.702
86.977	4.891	0.524	4.368	4.792	4.792
87.703	4.901	0.484	4.417	4.802	4.802
100.000	5.061	-0.046	5.107	4.962	4.962
113.859	5.241	-0.019	5.260	5.142	5.142
120.000	5.314	-0.321	5.635	5.215	5.215
133.859	5.436	-0.254	5.690	5.337	5.337
140.000	5.470	-0.232	5.702	5.371	5.371
153.859	5.501	-0.236	5.737	#	5.402
160.000	5.487	-0.249	5.737		5.388
173.859	5.357	-0.466	5.822	5.258	5.258
180.000	5.255	-0.769	6.024	5.156	5.156
193.859	4.925	-2.055	6.980	4.826	4.826
200.000	4.748	-2.895	7.643	4.649	4.649
218.923	4.202	-0.662	4.864	4.103	4.103
220.000	4.171	-0.649	4.820	4.072	4.072
240.000	3.595	-0.244	3.839	3.496	3.496
243.671	3.489	-0.192	3.681	3.390	3.390
247.157	3.400	-0.171	3.571	3.301	3.301
248.671	3.369	-0.168	3.537	3.270	3.270
253.671	3.295	-0.157	3.452	3.185	3.196
258.671	3.283	0.015	3.268	REFER INTERSECTION DETAILS DWG 15-184-29/30	REFER INTERSECTION DETAILS DWG 15-184-29/30
260.000	3.292	0.055	3.237		
263.671	3.345	0.163	3.182		
267.421	3.457	0.295	3.162		

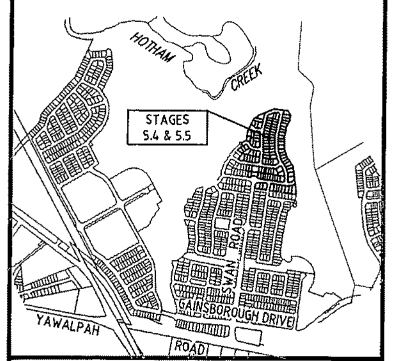
Horiz Curve Data: R.-50 / 22.141; R.-38.25 / 28.234

FORTESCUE STREET - LONGITUDINAL SECTION

SCALE - 1:1000 (H)
1:100 (V)

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants
BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS built environment consultants
VEE DESIGN
DesignFlow

Client
mirvac

Project
GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD
CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
SOUTH BRISBANE
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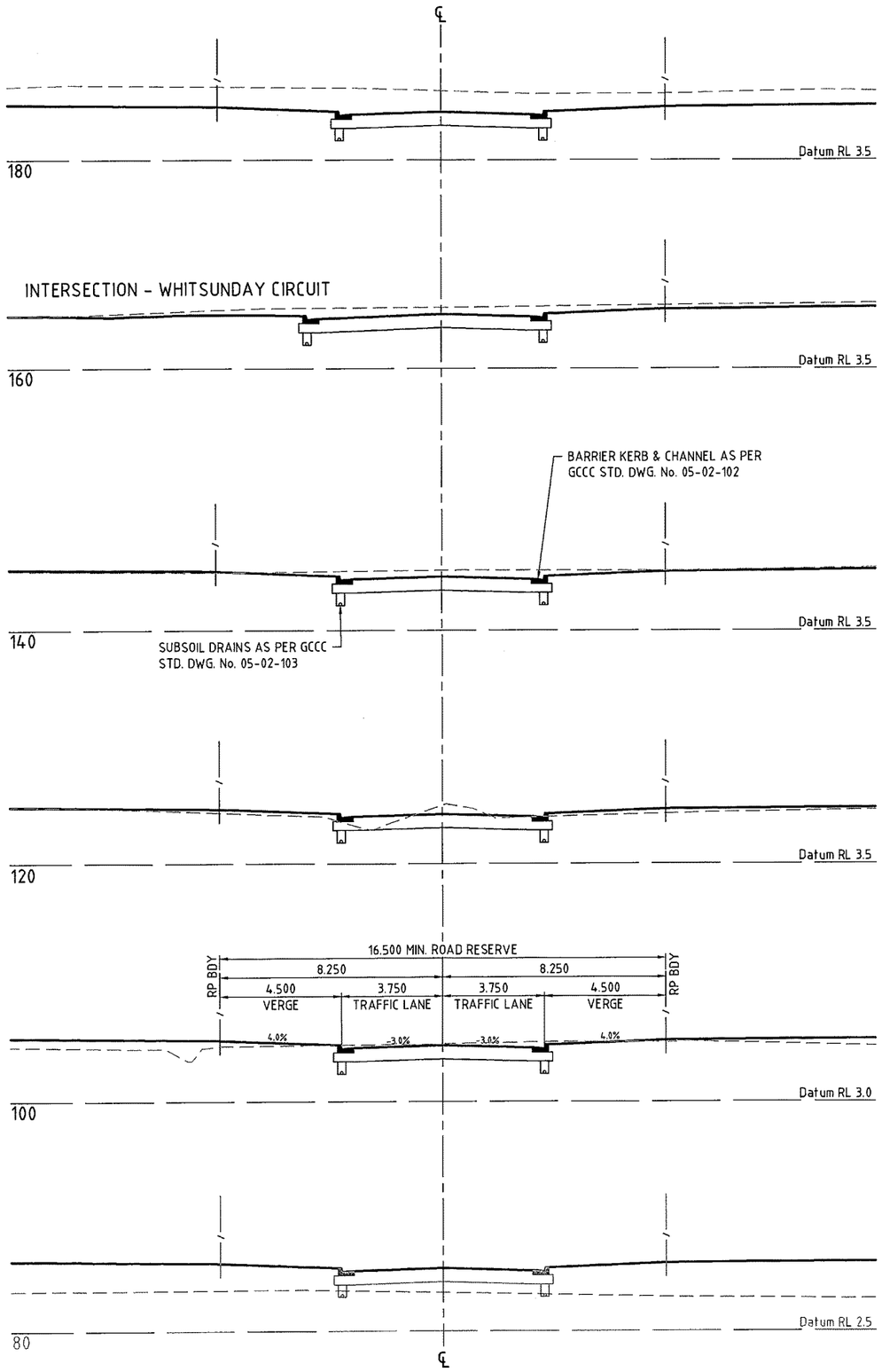
PHONE 07 3017 1900
FAX 07 3017 1911
EMAIL kng@knpl.com.au
ABN 35 112 053 611

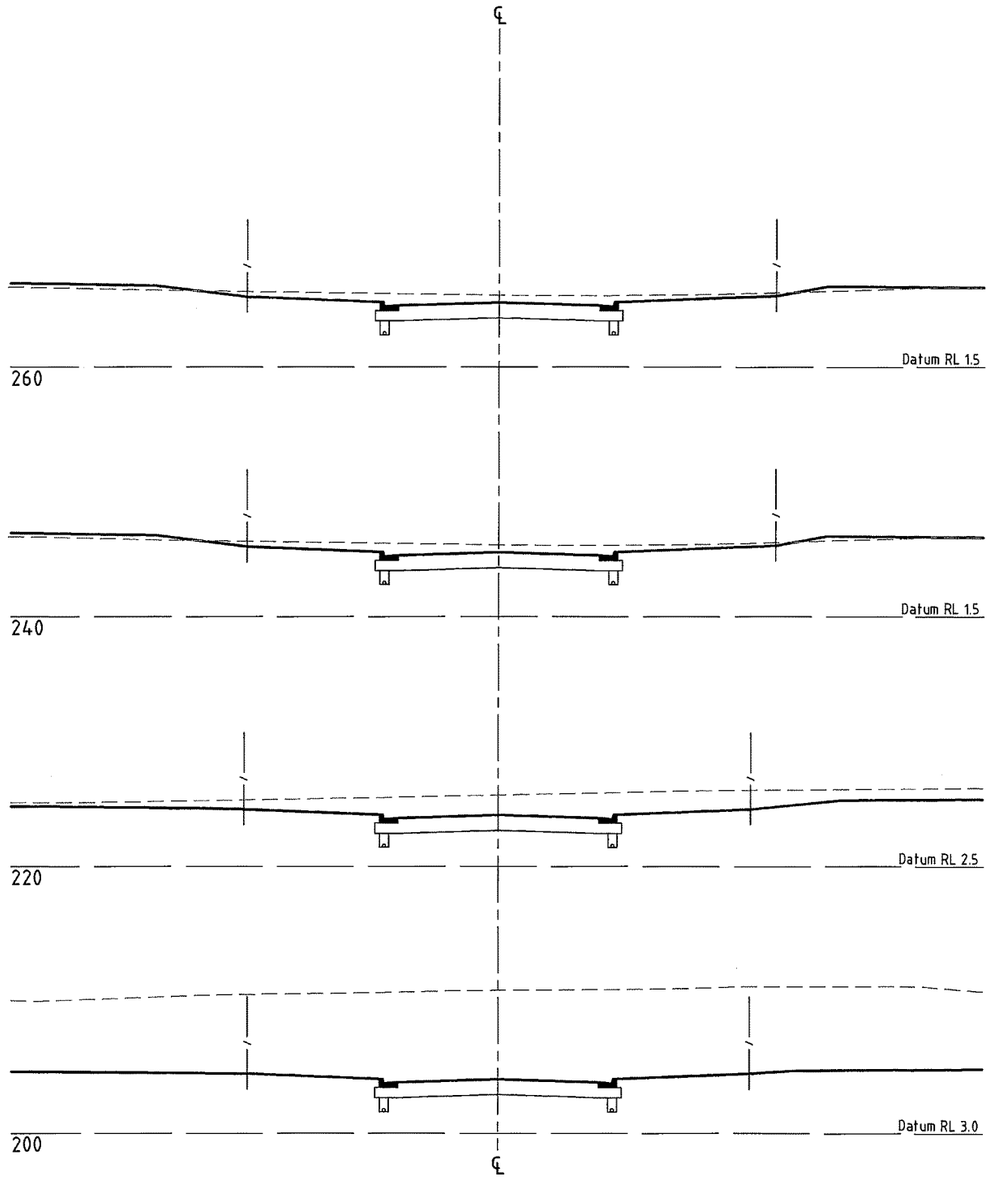
Approved ~~Director RPEQ 1988~~ RPEQ12505 9.2.16

Drawing Title
ROADWORKS
LONGITUDINAL SECTION
FORTESCUE STREET

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale: AS SHOWN | Sheet: 26 of 61
A1 | Drawing No: 15-184-26 | Revision: A



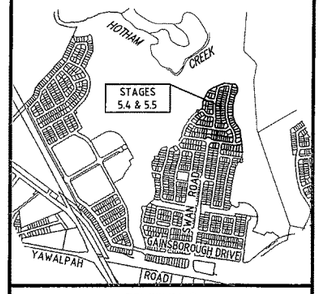


FORTESCUE STREET - CROSS SECTION
SCALE 1:100

SCALE 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
1 : 100 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
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Client

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Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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ABN 35 112 053 611

Approved Director ~~RPEQ 1988~~ RPEQ 12505 9-2-16

Drawing Title

ROADWORKS
CROSS SECTIONS
FORTESCUE STREET

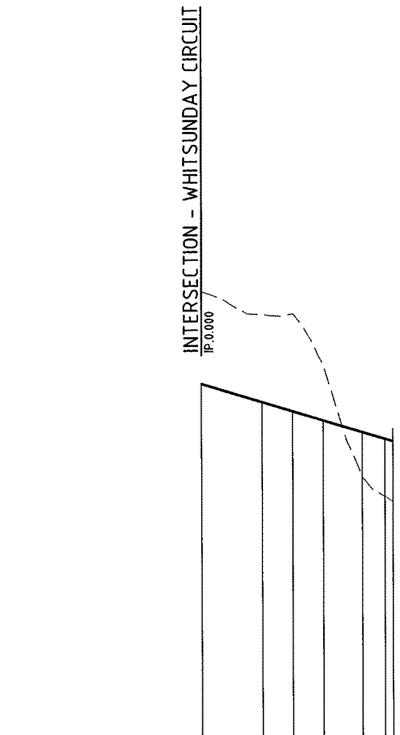
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	27 of 61

	Drawing No	Revision
A1	15-184-27	A

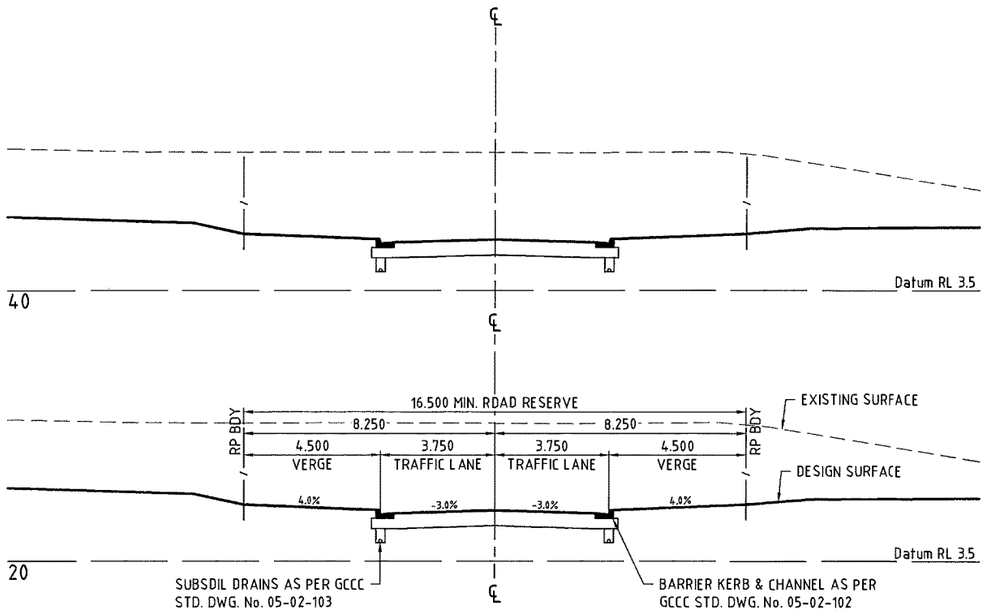
NOMINAL PAVEMENT DETAILS

RESIDENTIAL ACCESS STREET
25mm ASPHALTIC CONCRETE
100mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)



Stage Number			PROPOSED STAGE 5.5					
Vertical Geometry Grade Vertical Geometry Length (m)			-3.000% 62.674					
Vertical Curve Length (m) Vertical Curve Radius (m)								
DATUM R.L.-11.000								
VOLUMES	CUT	467	468	0				
	FILL	0	0	0				
LIP OF KERB LHS	REFER INTERSECTION DETAILS DWG 15-184-30							
LIP OF KERB RHS								
NATURAL SURFACE	8.743	7.984	8.010	6.333	2.720	2.080	1.905	
CUT/FILL DEPTH	-2.992	-2.833	-3.160	-1.782	1.450	1.871	1.965	
DESIGN SURFACE	5.750	5.150	4.851	4.550	4.170	3.950	3.870	
PEGGED CHAINAGE	0.000	20.000	29.979	40.000	52.674	60.000	62.674	
Horiz Curve Data				R.69.45 22.696				

MUNGO CLOSE - LONGITUDINAL SECTION
SCALE - 1:1000 (H)
1:100 (V)

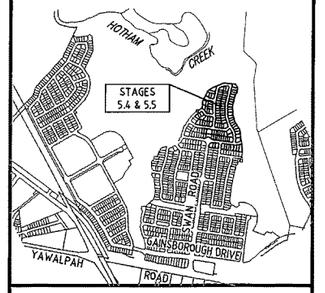


MUNGO CLOSE - CROSS SECTIONS
SCALE 1:100

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants
BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
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Project
GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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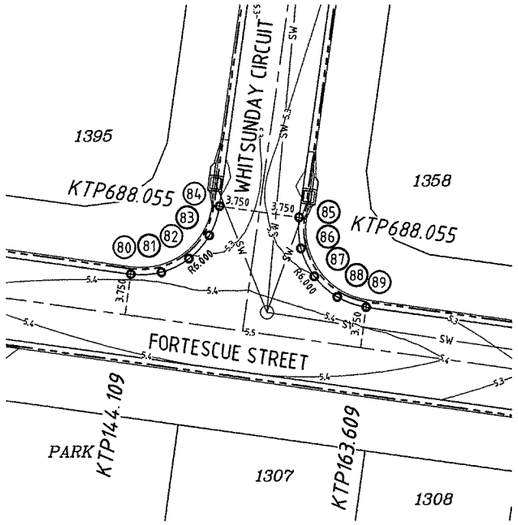
ABN 35 112 053 611

Approved Director ~~RPEQ 1988~~ RPEQ 12905 9.2.16

Drawing Title
ROADWORKS
LONG. AND CROSS SECTIONS
MUNGO CLOSE

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 28 of 61
A1	Drawing No: 15-184-28		Revision: A



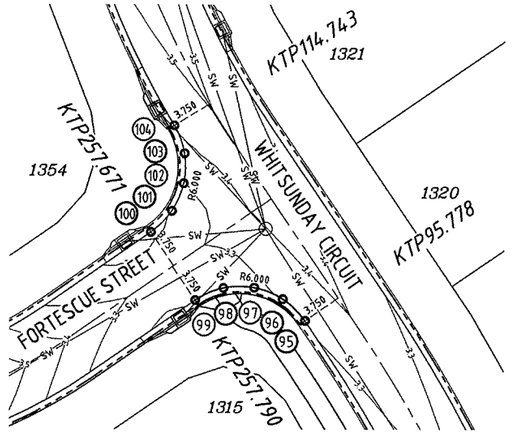
INTERSECTION DETAIL
FORTESCUE STREET & WHITSUNDAY CIRCUIT
SCALE 1:250

SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
80	74209.911	78359.789	5.386
81	74212.424	78359.934	5.374
82	74214.689	78361.031	5.313
83	74216.363	78362.910	5.247
84	74217.189	78365.287	5.214
85	74223.726	78364.377	5.247
86	74223.872	78361.865	5.268
87	74224.968	78359.599	5.303
88	74226.848	78357.926	5.333
89	74229.225	78357.099	5.335

SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
95	74329.928	78354.039	3.310
96	74328.129	78355.799	3.307
97	74325.794	78356.737	3.274
98	74323.277	78356.710	3.235
99	74320.963	78355.722	3.213
100	74317.335	78361.237	3.180
101	74319.046	78362.961	3.214
102	74319.998	78365.197	3.293
103	74320.056	78367.625	3.372
104	74319.211	78369.903	3.405



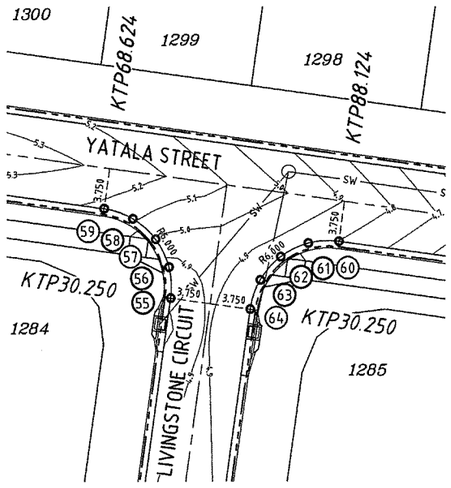
INTERSECTION DETAIL
WHITSUNDAY CIRCUIT & FORTESCUE STREET
SCALE 1:250

LEGEND

- ROAD CENTRELINE
- KERB AND CHANNEL (TYPE B1)
- SW — STORMWATER DRAINAGE
- 36.0 — FINISHED SURFACE CONTOURS
- 3.000 — OFFSET TO KERB FACE

GENERAL NOTES

1. SETOUT POINTS ARE GIVEN AT KERB LIP LEVELS.
2. KERB LIP LEVELS ARE GIVEN AT QUARTER POINTS, TP'S AND EQUAL PARTS U.N.O.
3. KERB RADII AND OFFSETS ARE GIVEN TO THE KERB FACE.
4. EXTRA DETAIL FOR SETTING OUT IS AVAILABE ON CAD FILE.



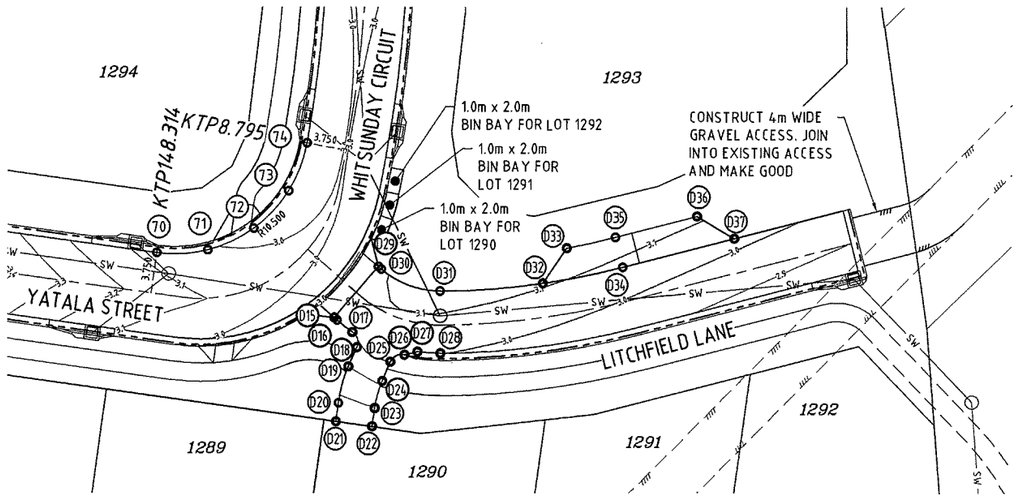
INTERSECTION DETAIL
LIVINGSTONE CIRCUIT & YATALA STREET
SCALE 1:250

SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
55	74261.542	78262.184	4.815
56	74261.397	78264.697	4.868
57	74260.300	78266.962	4.987
58	74258.421	78268.635	5.111
59	74256.044	78269.462	5.176
60	74275.357	78266.773	4.799
61	74272.845	78266.627	4.840
62	74270.580	78265.531	4.845
63	74268.906	78263.651	4.831
64	74268.079	78261.274	4.815

SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
70	74335.881	78265.008	3.064
71	74340.042	78265.229	3.009
72	74343.819	78266.987	2.971
73	74346.665	78270.030	2.934
74	74348.169	78273.915	2.906



INTERSECTION DETAIL
YATALA STREET & LITCHFIELD LANE
KERB WIDENING AND DRIVEWAY SETOUT
SCALE 1:250

SETOUT TABLE

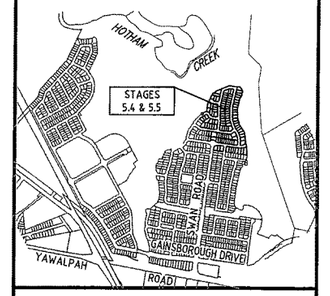
PT No.	EASTING	NORTHING	LEVEL
D15	74350.444	78259.721	3.077
D16	74350.677	78259.517	3.076
D17	74351.949	78258.543	3.067
D18	74352.311	78257.316	3.126
D19	74351.637	78255.757	3.198
D20	74350.804	78252.783	3.329
D21	74350.597	78251.297	3.392
D22	74353.569	78250.883	3.380
D23	74353.775	78252.369	3.303
D24	74354.391	78254.567	3.185
D25	74355.065	78256.126	3.098
D26	74356.206	78256.704	3.026
D27	74357.254	78256.965	3.025
D28	74359.138	78256.833	3.003
D29	74354.055	78263.869	3.077
D30	74354.289	78263.665	3.082
D31	74359.102	78261.883	3.154
D32	74367.547	78262.520	3.110
D33	74369.512	78265.376	3.172
D34	74374.124	78263.834	3.075
D35	74373.503	78266.255	3.150
D36	74380.199	78267.973	3.116
D37	74383.242	78266.173	3.028

SCALE
5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
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EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved ~~Director~~ RPEQ 1988
RM L RPEQ 12605 9.2.16

Drawing Title
ROADWORKS
INTERSECTION DETAILS
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	29 of 61

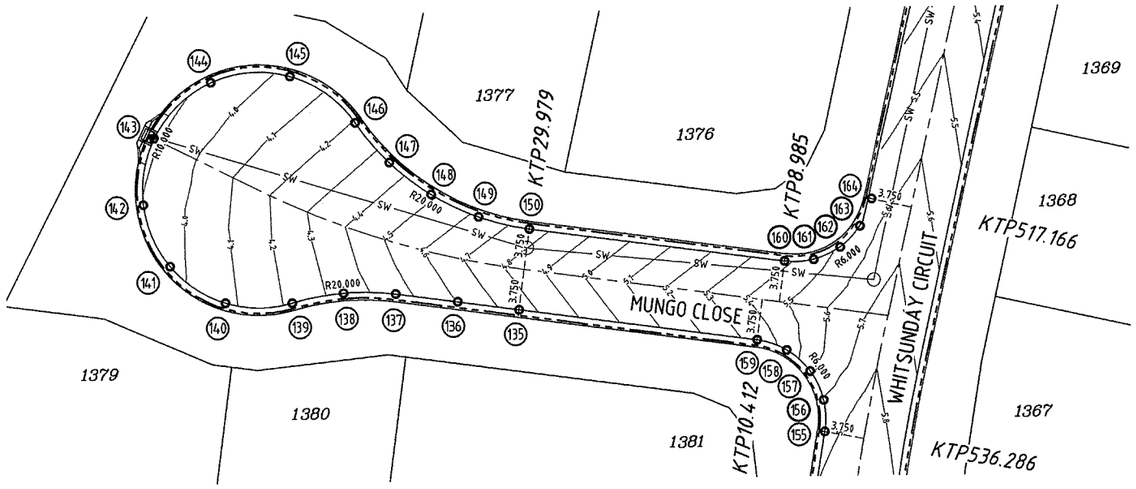
	Drawing No	Revision
A1	15-184-29	A

GENERAL NOTES

1. SETOUT POINTS ARE GIVEN AT KERB LIP LEVELS.
2. KERB LIP LEVELS ARE GIVEN AT QUARTER POINTS, TP'S AND EQUAL PARTS U.N.O.
3. KERB RADII AND OFFSETS ARE GIVEN TO THE KERB FACE.
4. EXTRA DETAIL FOR SETTING OUT IS AVAILABE ON CAD FILE.

LEGEND

- ROAD CENTRELINE
- KERB AND CHANNEL (TYPE B1)
- SW — STORMWATER DRAINAGE
- 36.0 — FINISHED SURFACE CONTOURS
- 3.000 — OFFSET TO KERB FACE



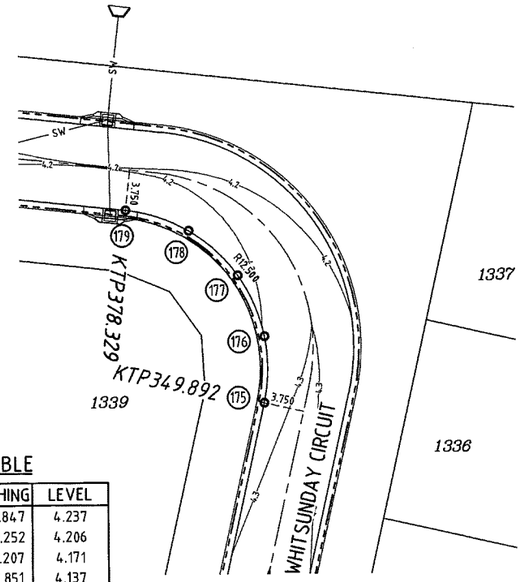
SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
135	74199.174	78526.766	4.752
136	74194.156	78527.464	4.603
137	74189.137	78528.163	4.459
138	74184.880	78528.308	4.340
139	74180.685	78527.568	4.221
140	74175.235	78527.625	4.075
141	74170.705	78530.653	3.969
142	74168.568	78535.667	3.904
143	74169.521	78541.033	3.884
144	74174.234	78545.501	3.919
145	74180.716	78545.921	4.027
146	74185.967	78542.099	4.206
147	74188.718	78538.829	4.346
148	74192.091	78536.201	4.485
149	74195.935	78534.331	4.621
150	74200.084	78533.303	4.752

INTERSECTIDN DETAIL
MUNGO CLOSE & WHITSUNDAY CIRCUIT
SCALE 1:250

SETOUT TABLE

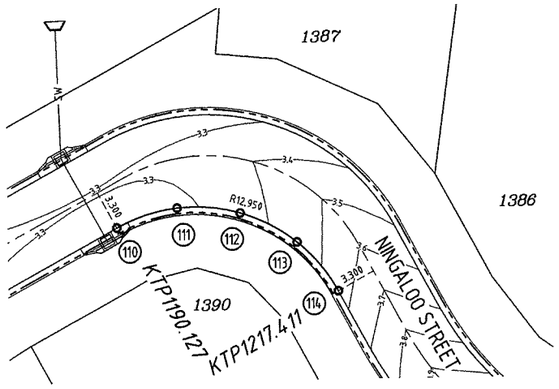
PT No.	EASTING	NORTHING	LEVEL
155	74224.016	78516.552	5.764
156	74223.950	78519.126	5.705
157	74222.882	78521.470	5.578
158	74220.983	78523.209	5.439
159	74218.554	78524.067	5.339
160	74220.878	78530.407	5.382
161	74223.263	78530.521	5.452
162	74225.443	78531.494	5.517
163	74227.119	78533.194	5.556
164	74228.063	78535.387	5.548



SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
175	74321.316	78601.847	4.237
176	74321.369	78607.252	4.206
177	74319.212	78612.207	4.171
178	74315.220	78615.851	4.137
179	74310.088	78617.548	4.105

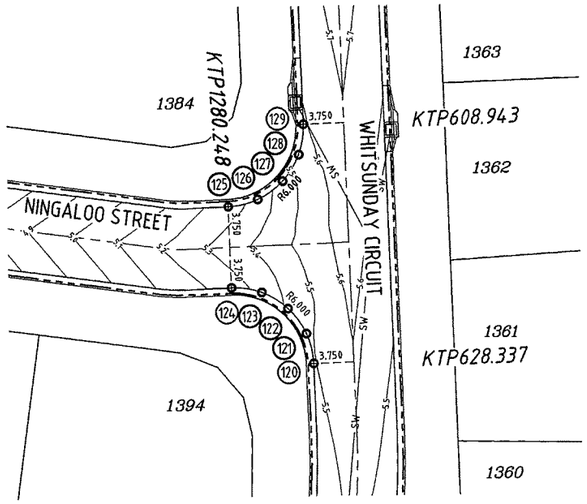
ROAD BEND DETAIL
WHITSUNDAY CIRCUIT
SCALE 1:250



SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
110	74141.325	78459.946	3.211
111	74146.319	78461.495	3.270
112	74151.525	78461.015	3.358
113	74156.152	78458.579	3.446
114	74159.494	78454.559	3.556

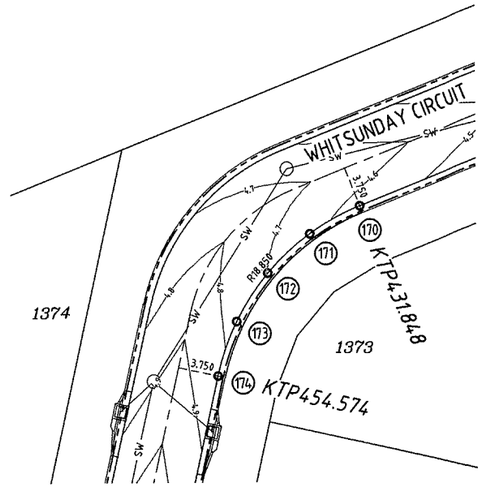
INTERSECTIDN DETAIL
NINGALOO STREET & WHITSUNDAY CIRCUIT
SCALE 1:250



SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
120	74223.540	78423.993	5.493
121	74222.968	78426.443	5.479
122	74221.501	78428.489	5.415
123	74219.363	78429.817	5.331
124	74216.880	78430.226	5.254
125	74216.661	78436.822	5.254
126	74219.112	78437.394	5.340
127	74221.157	78438.861	5.451
128	74222.485	78440.999	5.549
129	74222.894	78443.482	5.590

INTERSECTION DETAIL
NINGALOO STREET & WHITSUNDAY CIRCUIT
SCALE 1:250



SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
170	74259.899	78608.768	4.567
171	74255.781	78606.526	4.628
172	74252.325	78603.357	4.697
173	74249.736	78599.448	4.767
174	74248.165	78595.030	4.828

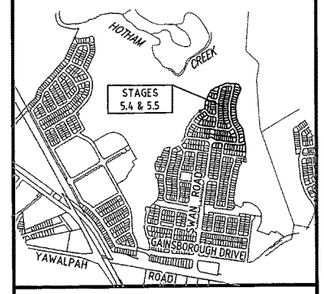
ROAD BEND DETAIL
WHITSUNDAY CIRCUIT
SCALE 1:250

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
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Project

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Approved Director - RPEQ 11988
RCT 9.2.16

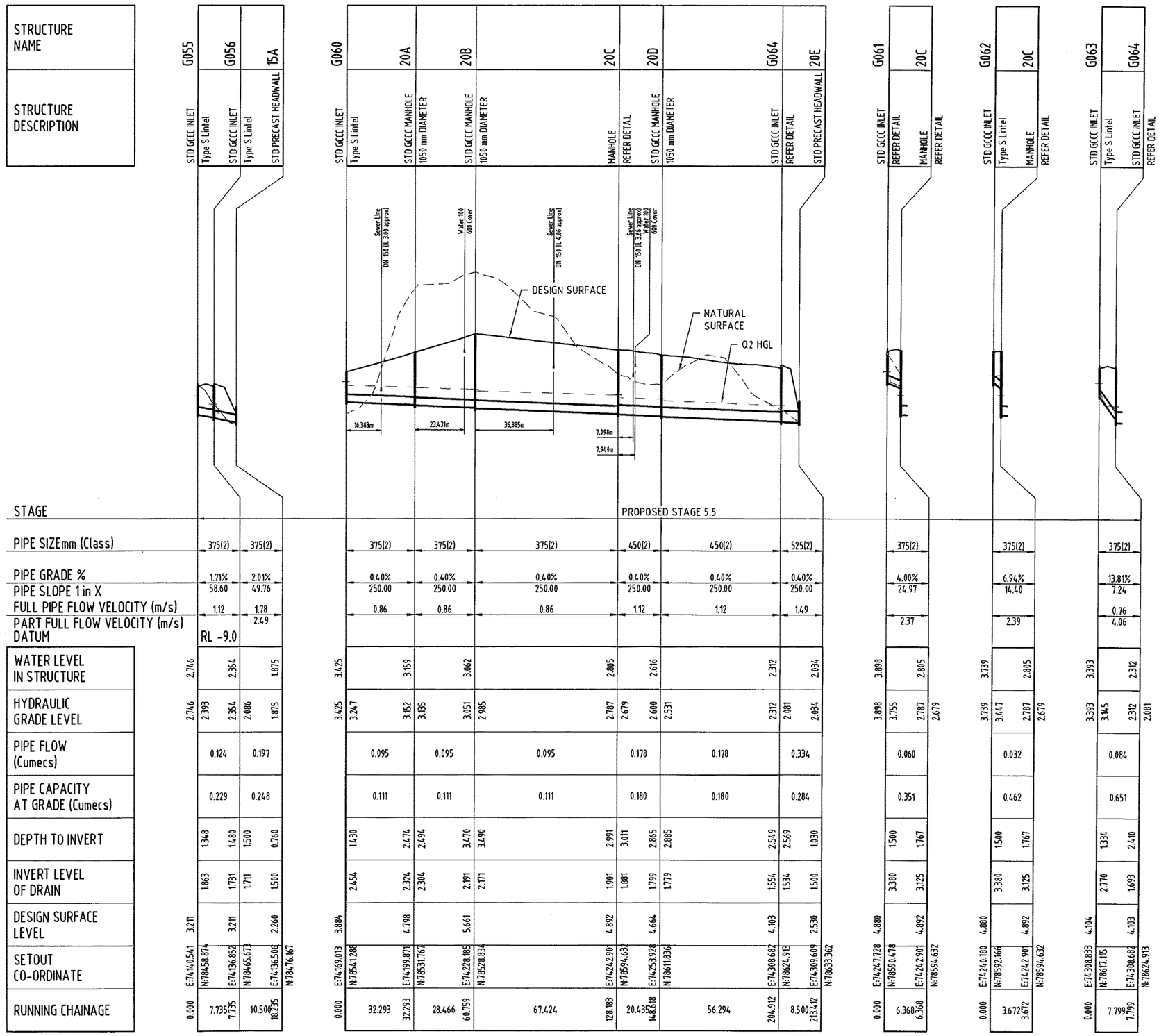
Drawing Title
ROADWORKS
INTERSECTION DETAILS
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	30 of 61

Drawing No	Revision
15-184-30	A

A1



STRUCTURE NAME	G055	G056	15A	G060	20A	20B	20C	20D	G064	20E	G061	20C	G062	20C	G063	G064
STRUCTURE DESCRIPTION	STD GCCC INLET	Type S Lintel	STD PRECAST HEADWALL	STD GCCC INLET	Type S Lintel	STD GCCC MANHOLE 1050 mm DIAMETER	STD GCCC MANHOLE 1050 mm DIAMETER	MANHOLE REFER DETAIL	STD GCCC MANHOLE 1050 mm DIAMETER	STD GCCC INLET REFER DETAIL	STD PRECAST HEADWALL	STD GCCC INLET REFER DETAIL	MANHOLE REFER DETAIL	STD GCCC INLET Type S Lintel	MANHOLE REFER DETAIL	STD GCCC INLET Type S Lintel	STD GCCC INLET REFER DETAIL
STAGE	PROPOSED STAGE 5.5																
PIPE SIZEmm (Class)	375(2)	375(2)		375(2)	375(2)	375(2)	450(2)	450(2)	525(2)		375(2)		375(2)		375(2)		
PIPE GRADE %	1.71%	2.01%		0.40%	0.40%	0.40%	0.40%	0.40%	0.40%		4.00%		6.94%		13.81%		
PIPE SLOPE 1 in X	58.60	49.76		250.00	250.00	250.00	250.00	250.00	250.00		24.97		14.40		7.24		
FULL PIPE FLOW VELOCITY (m/s)	1.12	1.78		0.86	0.86	0.86	1.12	1.12	1.49		2.37		2.39		4.06		
PART FULL FLOW VELOCITY (m/s)		2.49															
DATUM	RL -9.0																
WATER LEVEL IN STRUCTURE	2.746	2.354	1.875	3.425	3.159	3.062	2.805	2.616	2.312	2.034	3.898	2.805	3.739	2.805	3.393	2.312	
HYDRAULIC GRADE LEVEL	2.746 2.393	2.354	2.086	1.875	3.425 3.247	3.152	3.135	3.051	2.985	2.787	2.679	2.600	2.531	2.312	2.081	2.034	3.898 3.755	2.787	2.679	3.739 3.447	2.787	2.679	3.393 3.145	2.312	2.081
PIPE FLOW (Cumecs)	0.124	0.197		0.095	0.095	0.095	0.178	0.178	0.334		0.060		0.032		0.084		
PIPE CAPACITY AT GRADE (Cumecs)	0.229	0.248		0.111	0.111	0.111	0.180	0.180	0.284		0.351		0.462		0.651		
DEPTH TO INVERT	1.348	1.480	1.500	0.760	1.430	2.474	2.494	3.470	3.490	2.991	3.011	2.865	2.885	2.549	2.569	1.030	1.500	1.767	1.500	1.767	1.334	2.410
INVERT LEVEL OF DRAIN	1.863	1.731	1.711	1.500	2.454	2.324	2.304	2.191	2.171	1.901	1.881	1.799	1.779	1.554	1.534	1.500	3.380	3.125	3.380	3.125	2.770	1.693
DESIGN SURFACE LEVEL	3.211	3.211		2.260	3.884	4.798	5.661	4.892	4.664	4.103		2.530	4.880	4.892	4.880	4.892	4.104	4.103	
SETOUT CO-ORDINATE	E:714040.541 N:784458.874	E:714136.852 N:784465.673	E:714136.506 N:784476.167	E:714169.013 N:784541.288	E:714199.871 N:784531.767	E:714228.185 N:784528.834	E:714242.901 N:784594.632	E:714253.928 N:786111.836	E:714308.682 N:786624.913	E:714309.609 N:786633.362	E:714247.728 N:786590.478	E:714242.901 N:786594.632	E:714246.180 N:786592.166	E:714242.901 N:786594.632	E:714308.833 N:786617.115	E:714308.682 N:786624.913	
RUNNING CHAINAGE	0.000 7.735 7.735	10.500 18.235		0.000 32.293 32.293	28.466 60.759	67.424 128.183	20.435 148.618	56.294 204.912	8.500 213.412		0.000 6.368 6.368		0.000 3.672 3.672		0.000 7.799 7.799		
LINE	1			2							3		4		5		

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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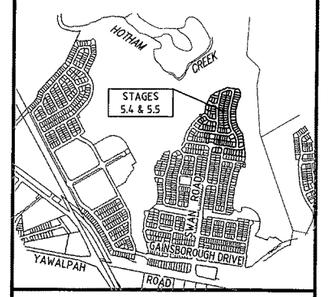
KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS URBAN DEVELOPMENT CONSULTANTS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

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Approved Director ~~RPEQ 7788~~ RPEQ 11695 92.6

Drawing Title

STORMWATER
LONGITUDINAL SECTIONS
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	36 of 61

Drawing No	Revision
A1 15-184-36	A

DO NOT SCALE THIS DRAWING
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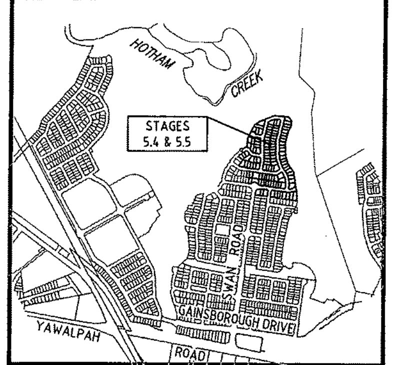
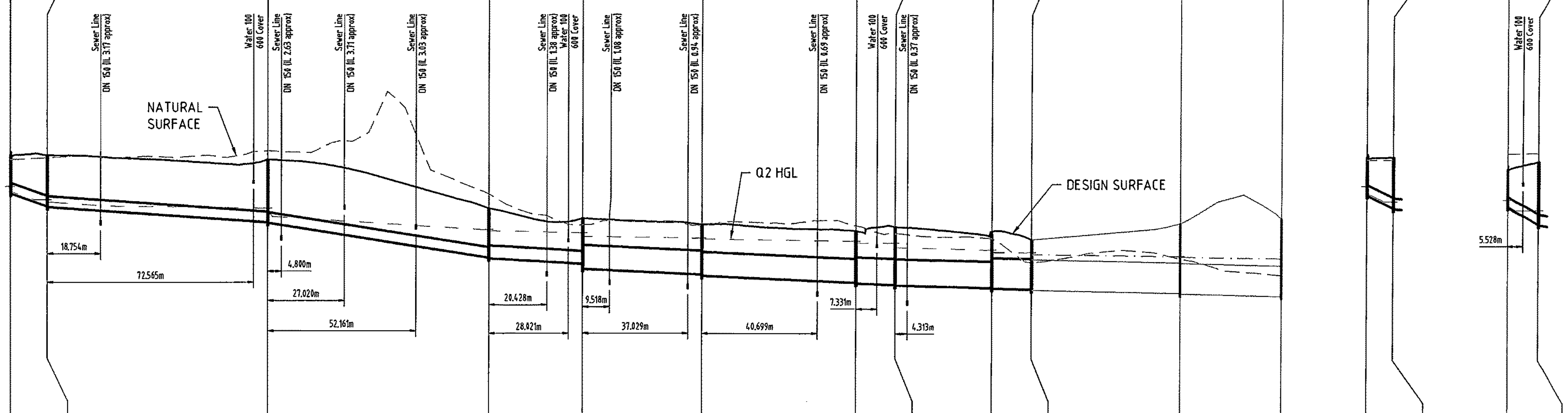
KEY PLAN





LINE 6

STRUCTURE NAME	STRUCTURE DESCRIPTION	WATER LEVEL IN STRUCTURE	HYDRAULIC GRADE LEVEL	DEPTH TO INVERT	INVERT LEVEL OF DRAIN	DESIGN SURFACE LEVEL	SETOUT CO-ORDINATE	RUNNING CHAINAGE
G020	STD GCCC INLET REFER DETAIL	4.504	4.504 / 4.333	1.342	4.257	5.599	E:74222.267 N:78445.257	0.000
5A	MANHOLE REFER DETAIL	4.045	4.045 / 3.962	1.780 / 1.800	3.808 / 3.788	5.588	E:74228.264 N:78433.905	12.839
5B	MANHOLE REFER DETAIL	3.749	3.745 / 3.608	2.191 / 2.211	3.253 / 3.233	5.444	E:74221.088 N:78356.667	90.410
5C	STD GCCC MANHOLE 1050 mm DIAMETER	3.003	2.985 / 2.961	1.729 / 1.749	2.014 / 1.994	3.743	E:74297.977 N:78345.145	168.158
5D	MANHOLE REFER DETAIL	2.886	2.886 / 2.763	1.589 / 1.766	1.807 / 1.630	3.396	E:74326.691 N:78361.517	201.212
5E	STD GCCC MANHOLE 1200 mm DIAMETER	2.720	2.708 / 2.674	1.757 / 1.801	1.430 / 1.386	3.187	E:74349.517 N:78326.400	243.096
5F	MANHOLE REFER DETAIL	2.611	2.602 / 2.543	1.812 / 1.832	1.142 / 1.122	2.954	E:74352.992 N:78272.220	297.387
5G	MANHOLE REFER DETAIL	2.538	2.522 / 2.377	2.027 / 2.047	1.067 / 1.047	3.094	E:74359.116 N:78259.883	311.160
G036	STD GCCC INLET REFER DETAIL	2.312	2.297 / 2.230	1.854 / 1.874	0.979 / 0.959	2.833	E:74393.106 N:78262.904	345.284
5H	STD GCCC MANHOLE 1500 mm DIAMETER	2.229	2.214 / 2.156	1.734 / 1.754	0.931 / 0.911	2.665	E:74402.786 N:78252.911	359.197
5J	STD GCCC MANHOLE 1500 mm DIAMETER	2.104	2.095 / 2.073	2.448 / 2.468	0.806 / 0.786	3.254	E:74407.024 N:78200.711	411.569
5K	MANHOLE REFER DETAIL	2.032	2.032	2.704	0.715	3.419	E:74407.969 N:78165.147	447.146

Pipe (from – to)	STAGE	PIPE SIZEmm (Class)	PIPE GRADE %	PIPE SLOPE 1 in X	FULL PIPE FLOW VELOCITY (m/s)	PART FULL FLOW VELOCITY (m/s)	PIPE FLOW (Cumecs)	PIPE CAPACITY AT GRADE (Cumecs)	Length (chainage)
G020 – 5A	PROPOSED STAGE 5.5	375(2)	3.50%	28.57		1.83	0.029	0.328	12.839
5A – 5B	PROPOSED STAGE 5.5	375(2)	0.69%	144.98	0.58	1.28	0.064	0.145	77.571
5B – 5C	PROPOSED STAGE 5.5	375(2)	1.57%	63.76	1.23	2.09	0.136	0.219	77.748
5C – 5D	PROPOSED STAGE 5.5	450(2)	0.56%	177.52	0.85		0.136	0.214	33.054
5D – 5E	PROPOSED STAGE 5.5	825(2)	0.48%	209.42	0.98		0.543	1.034	41.884
5E – 5F	PROPOSED STAGE 5.4	825(2)	0.45%	222.93	0.98		0.543	1.002	54.291
5F – 5G	PROPOSED STAGE 5.4	900(2)	0.40%	250.00	1.13		0.741	1.196	13.773
5G – G036	PROPOSED STAGE 5.4	900(2)	0.20%	500.00	1.39		0.917	0.846	34.124
G036 – 5H	PROPOSED STAGE 5.4	1050(2)	0.20%	500.00	1.09		0.969	1.271	13.913
5H – 5J	EXISTING STAGE 5.3	1050(2)	0.20%	500.00	1.09		0.969	1.271	52.372
5J – 5K	EXISTING STAGE 5.3	1050(2)	0.20%	500.00	1.09		0.969	1.271	35.577

DATUM RL -10.0

LINE 7 (PROPOSED STAGE 5.5)

STRUCTURE NAME	STRUCTURE DESCRIPTION	WATER LEVEL IN STRUCTURE	HYDRAULIC GRADE LEVEL	DEPTH TO INVERT	INVERT LEVEL OF DRAIN	DESIGN SURFACE LEVEL	SETOUT CO-ORDINATE	RUNNING CHAINAGE
G021	STD GCCC INLET Type S Lintel	4.583	4.583 / 4.337	1.328	4.259	5.587	E:74230.083 N:78442.958	0.000
5A	MANHOLE REFER DETAIL	4.045	4.045 / 3.962	1.780	3.808	5.588	E:74228.264 N:78433.905	9.234

Pipe G021 – 5A: PIPE SIZE 375(2); PIPE GRADE 4.88%; PIPE SLOPE 1 in 20.47; PART FULL FLOW VELOCITY 2.20; PIPE FLOW 0.036; PIPE CAPACITY AT GRADE 0.387; length 9.234

LINE 8 (PROPOSED STAGE 5.5)

STRUCTURE NAME	STRUCTURE DESCRIPTION	WATER LEVEL IN STRUCTURE	HYDRAULIC GRADE LEVEL	DEPTH TO INVERT	INVERT LEVEL OF DRAIN	DESIGN SURFACE LEVEL	SETOUT CO-ORDINATE	RUNNING CHAINAGE
G022	STD GCCC INLET REFER DETAIL	4.112	4.112 / 3.912	1.334	3.852	5.186	E:74216.875 N:78367.143	0.000
5B	MANHOLE REFER DETAIL	3.749	3.745 / 3.608	2.191	3.253	5.444	E:74221.088 N:78356.667	11.291

Pipe G022 – 5B: PIPE SIZE 375(2); PIPE GRADE 5.30%; PIPE SLOPE 1 in 18.86; FULL PIPE FLOW VELOCITY 0.21; PART FULL FLOW VELOCITY 1.98; PIPE FLOW 0.023; PIPE CAPACITY AT GRADE 0.403; length 11.291

SCALE A 1:1000 (Horiz.)
B 1:100 (Vert.)
(A1 UNREDUCED)

REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants: BURCHILLS, LANDPARTNERS, VEE, DesignFlow

Client: mirvac

Project: GAINSBOROUGH GREENS PRECINCT 5 STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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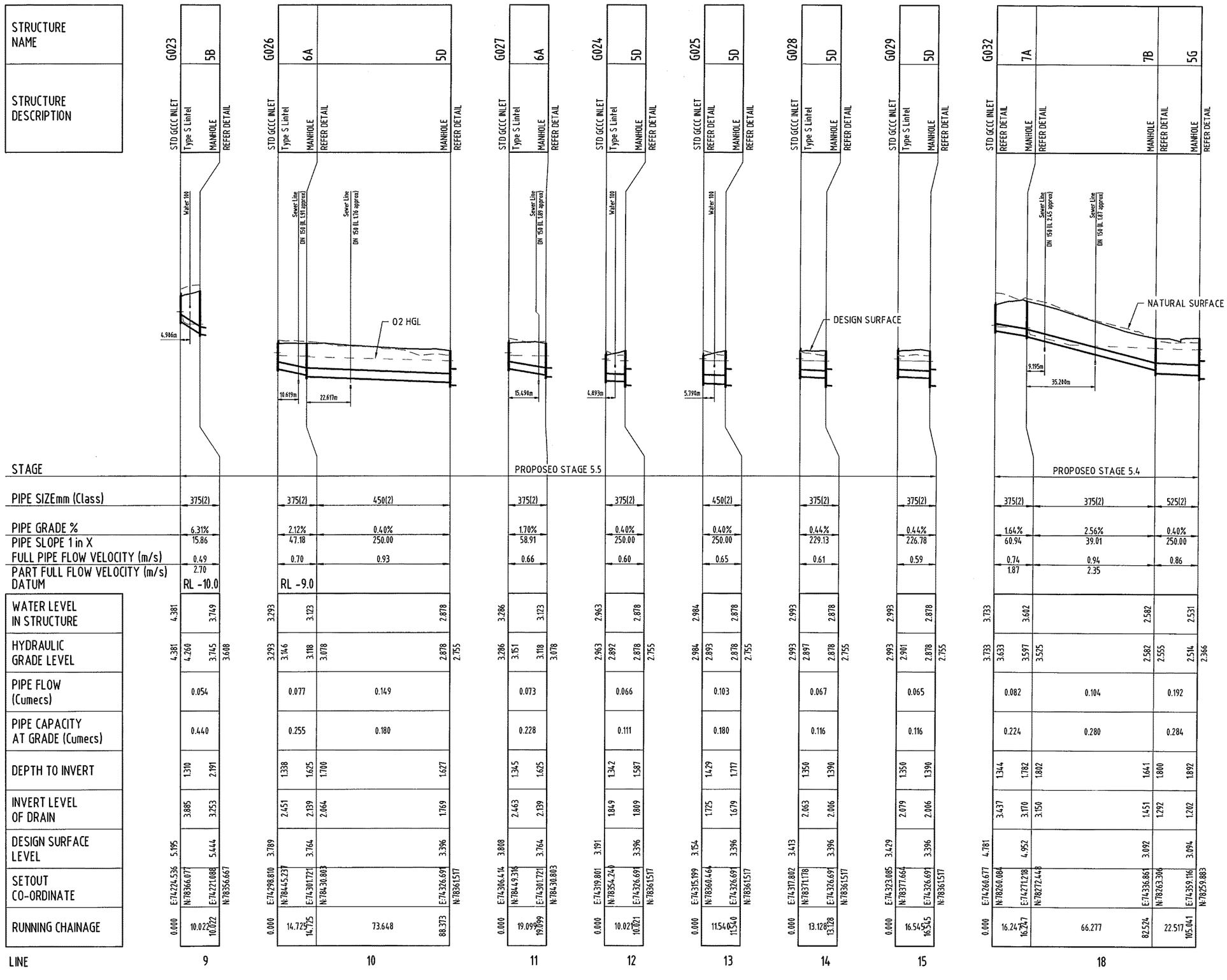
Approved Director RPEQ 1988 — RM... RPEQ 12805 9.2.16

Drawing Title: STORMWATER LONGITUDINAL SECTIONS SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet	Drawing No	Revision
AS SHOWN (A1)	37 of 61	15-184-37	A



DO NOT SCALE THIS DRAWING
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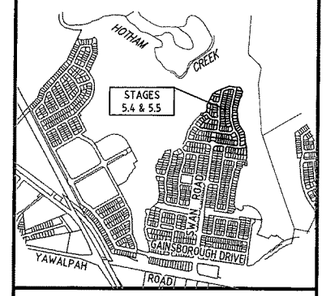
KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Drawing Title

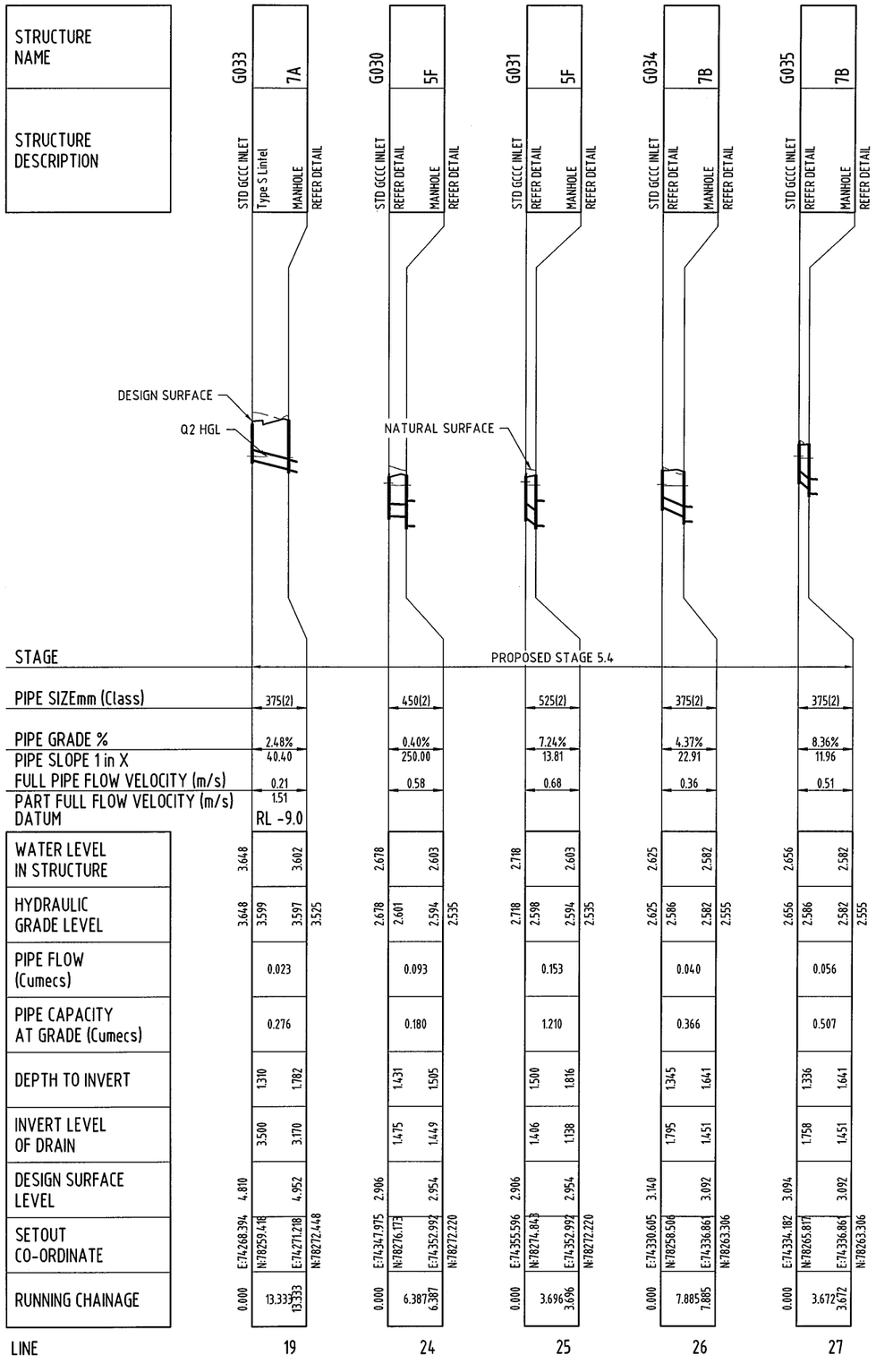
STORMWATER
LONGITUDINAL SECTIONS
SHEET 3

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	38 of 61

Drawing No	Revision
15-184-38	A

A1



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B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

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DO NOT SCALE THIS DRAWING
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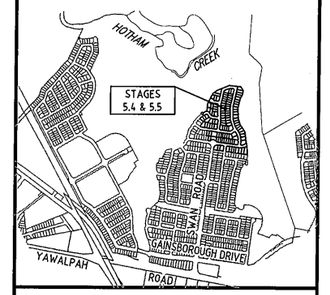

REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved ~~Director~~ RPEQ 1988
RMcL RPEQ 12605 9.2.16

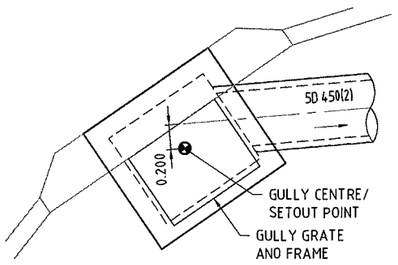
Drawing Title

STORMWATER
LONGITUDINAL SECTIONS
SHEET 4

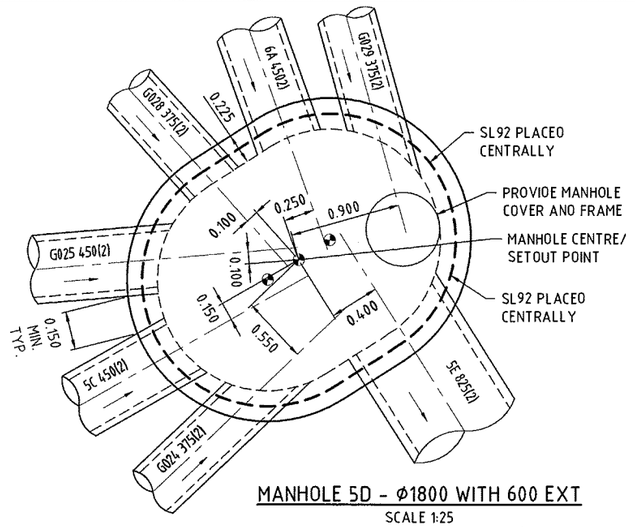
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	39 of 61

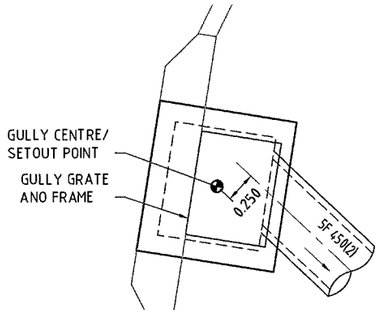
A1	Drawing No	Revision
	15-184-39	A



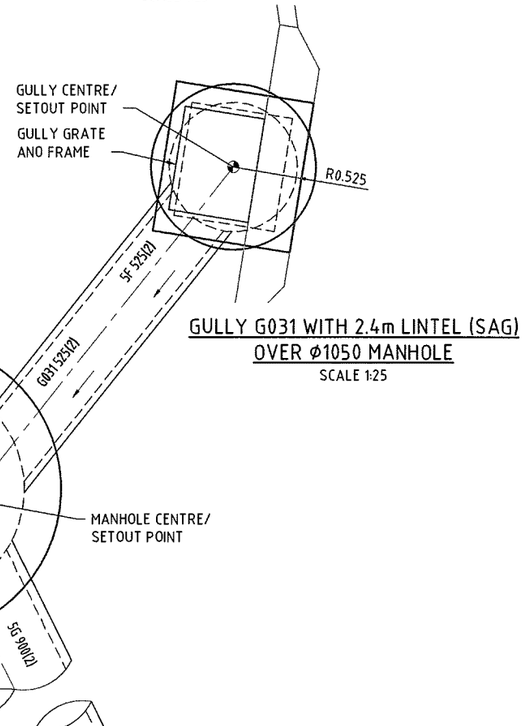
GULLY G025 WITH 2.4m LINTEL
SCALE 1:25



MANHOLE 5D - ø1800 WITH 600 EXT
SCALE 1:25

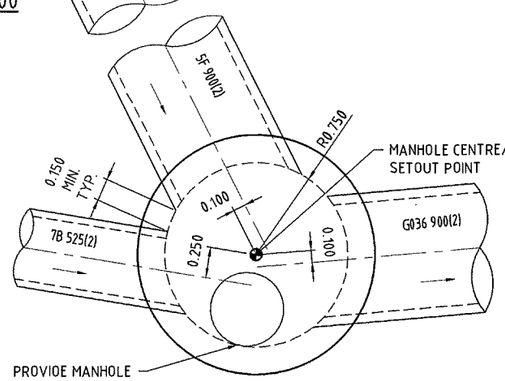


GULLY G030 WITH 2.4m LINTEL
SCALE 1:25

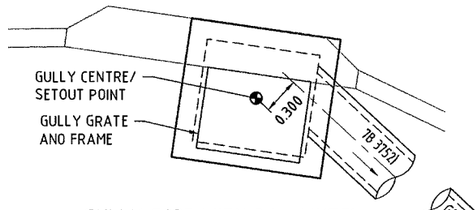


GULLY G031 WITH 2.4m LINTEL (SAG)
OVER ø1050 MANHOLE
SCALE 1:25

MANHOLE 5F - ø1800
SCALE 1:25



MANHOLE 5G - ø1500
SCALE 1:25



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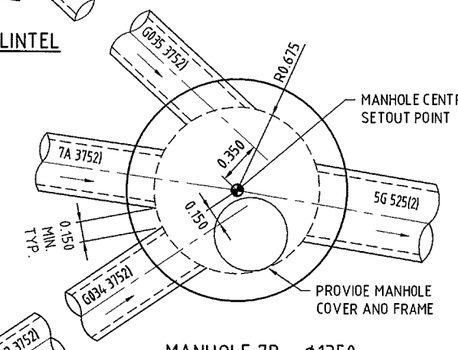
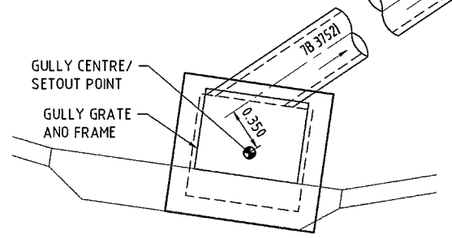
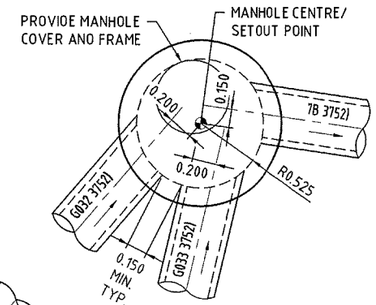


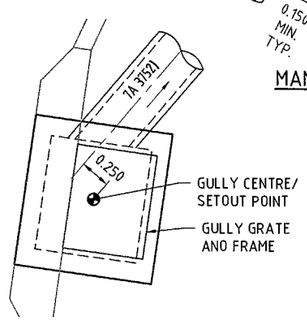
MANHOLE 7B - ø1350
SCALE 1:25



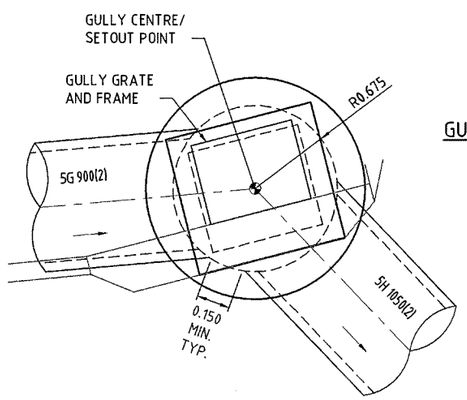
GULLY G034 WITH 2.4m LINTEL
SCALE 1:25



MANHOLE 7A - ø1050
SCALE 1:25



GULLY G032 WITH 2.4m LINTEL
SCALE 1:25



GULLY G036 WITH 2.4m LINTEL (SAG)
OVER ø1350 MANHOLE
SCALE 1:25

SCALE 0.5 0 0.5 1.0 1.5 2.0 2.5m
1 : 25 (A1 UNREDUCED)

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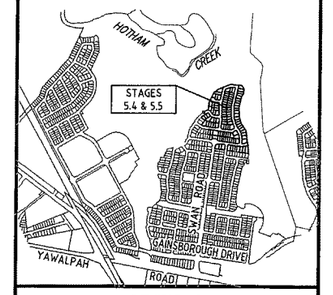
NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
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mirvac

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PRECINCT 5
STAGE 5.4 & 5.5

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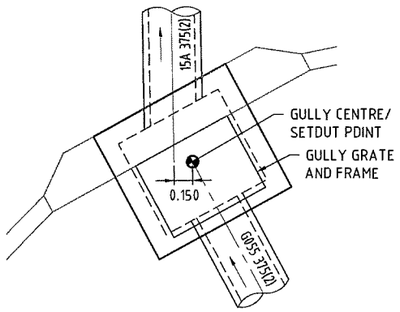
Approved Director - RPEQ 1988
RPEQ 12855 9.2.16

Drawing Title
STORMWATER
MANHOLE DETAILS
SHEET 1

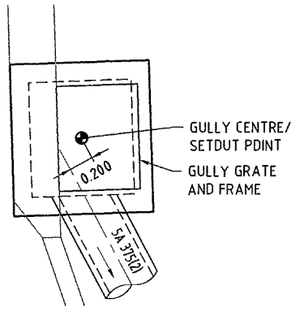
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	40 of 61

	Drawing No	Revision
A1	15-184-40	A



GULLY G056 WITH 2.4m LINTEL
SCALE 1:25



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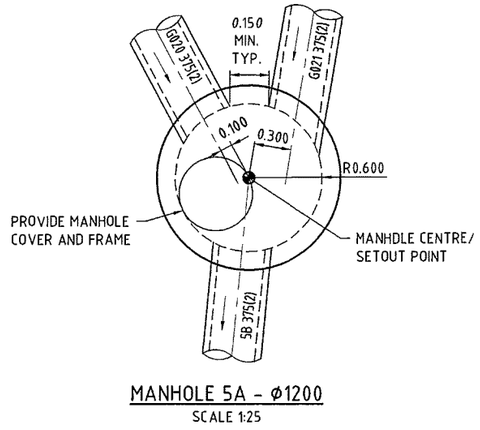
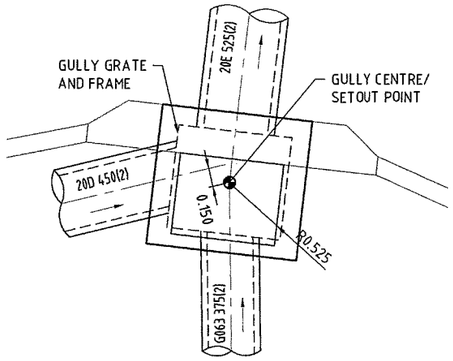
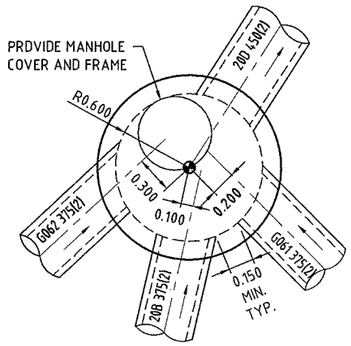


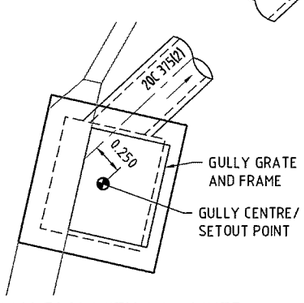
MANHOLE 5A - ø1200
SCALE 1:25



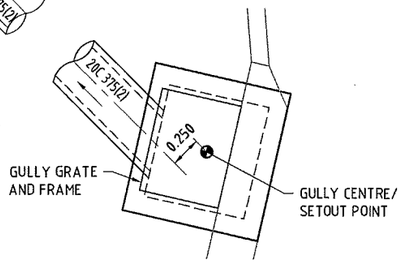
GULLY G064 WITH 2.4m LINTEL (SAG)
OVER ø1050 MANHOLE
SCALE 1:25



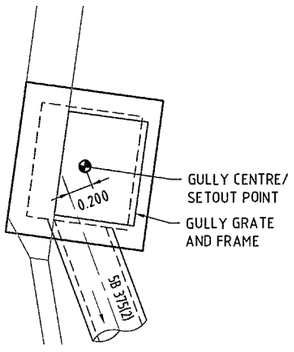
MANHOLE 20C - ø1200
SCALE 1:25



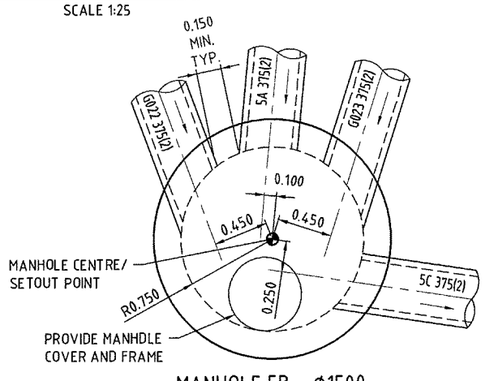
GULLY G062 WITH 2.4m LINTEL
SCALE 1:25



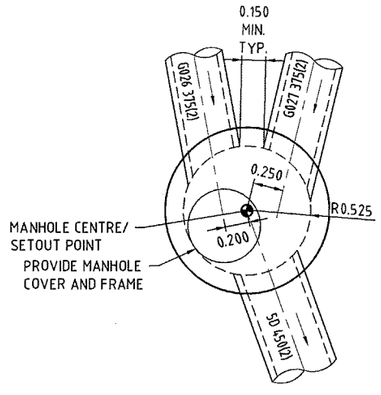
GULLY G061 WITH 2.4m LINTEL
SCALE 1:25



GULLY G022 WITH 2.4m LINTEL
SCALE 1:25



MANHOLE 5B - ø1500
SCALE 1:25



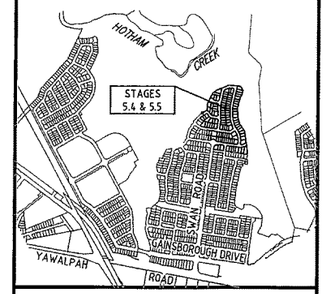
MANHOLE 6A - ø1050
SCALE 1:25

SCALE
0.5 0 0.5 1.0 1.5 2.0 2.5m
1 : 25 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

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mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director ~~RREQ 1988~~ RREQ 12SCT 9.2.16

Drawing Title
STORMWATER
MANHOLE DETAILS
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
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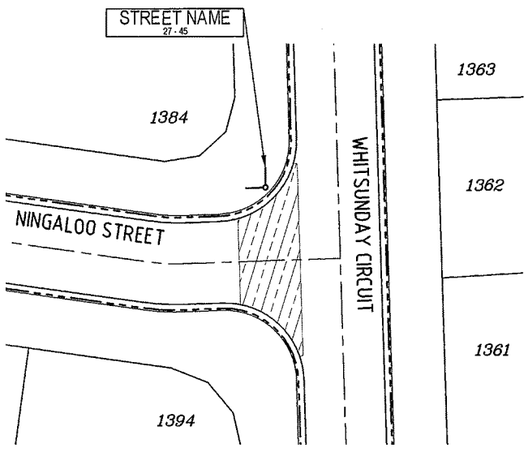
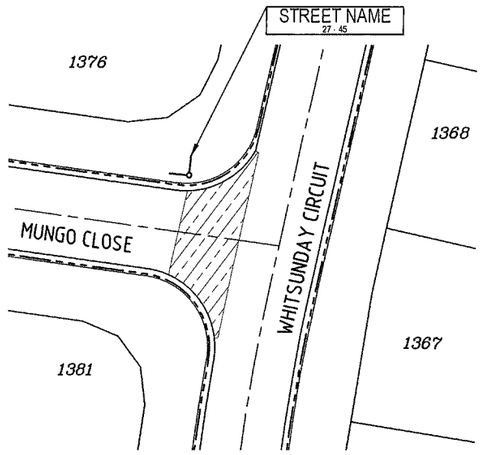
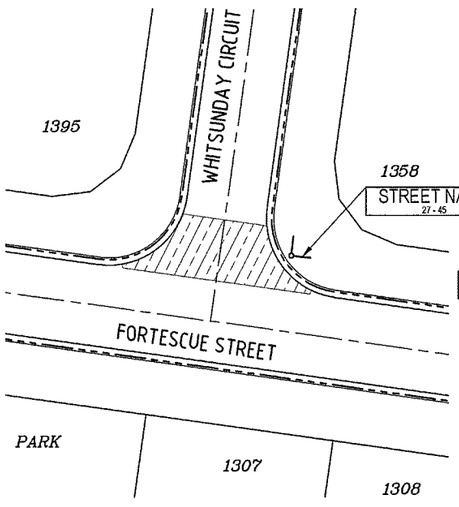
	Drawing No	Revision
A1	15-184-41	A



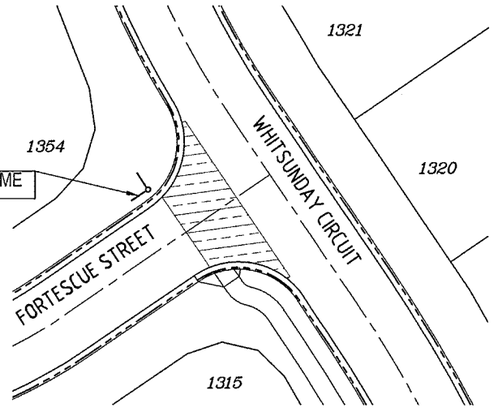
SIGNS AND LINEMARKING
NINGALOO STREET & WHITSUNDAY CIRCUIT
SCALE 1:250



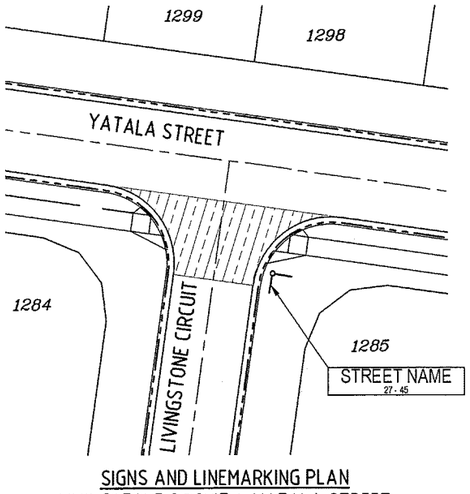
SIGNS AND LINEMARKING
MUNGO CLOSE & WHITSUNDAY CIRCUIT
SCALE 1:250



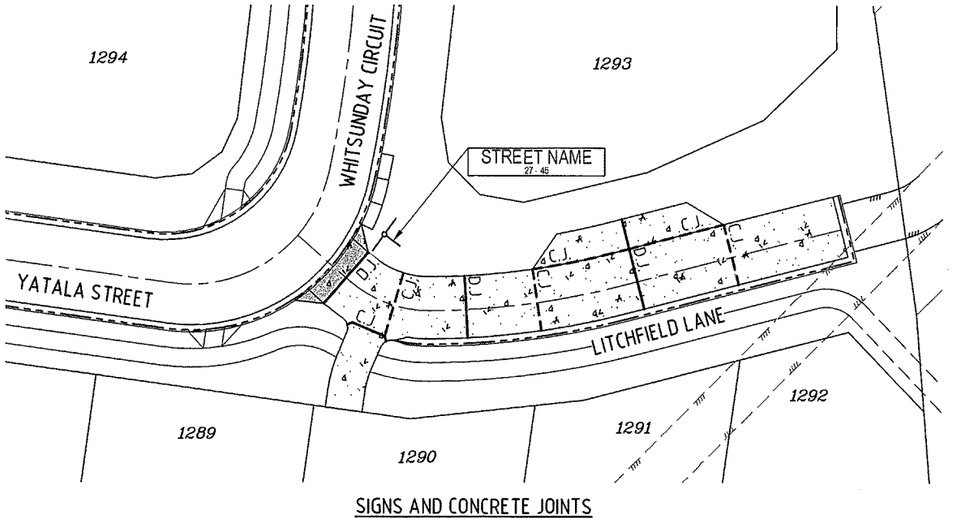
SIGNS AND LINEMARKING
FORTESCUE STREET & WHITSUNDAY CIRCUIT
SCALE 1:250



SIGNS AND LINEMARKING
WHITSUNDAY CIRCUIT & FORTESCUE STREET
SCALE 1:250



SIGNS AND LINEMARKING PLAN
LIVINGSTONE CIRCUIT & YATALA STREET
SCALE 1:250



SIGNS AND CONCRETE JOINTS
YATALA STREET, WHITSUNDAY CIRCUIT AND LITCHFIELD LANE
SCALE 1:250

SIGN NOTES

1. ALL SIGNS TO BE INSTALLED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES - CURRENT EDITION
2. THE LOCATION OF EXISTING SIGNS ARE INDICATED ON PLAN.
3. THE LOCATIONS OF PROPOSED SIGNS ARE INDICATED ON PLAN.

   ALL SIGNS TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES TO EDGE OF SIGN FACE:

NO KERB	- 600mm BEHIND GUIDEPOSTS
BARRIER KERB	- 300mm FROM FACE OF KERB
MOUNTABLE KERB	- 500mm FROM FACE OF KERB.

4. CHECK FOR ALL IN GROUND SERVICES PRIOR TO PLACING SIGN SUPPORTS.
5. SIGN SUPPORT CONSTRUCTION TO BE IN ACCORDANCE WITH MAIN ROADS STANDARD DRAWING 1368 FOR SIGN SUPPORTS AND FOR MULTIPLE SUPPORT. REUSE EXISTING SIGN SUPPORTS WHERE POSSIBLE.
6. EXACT LOCATION OF ALL SIGNS IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO INSTALLATION.

PAVEMENT MARKING NOTES

ALL PAVEMENT MARKING TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES - CURRENT EDITION.

OUTLINE MARKINGS, OFFSET 75mm MINIMUM FROM THE KERB FACE SHALL BE PROVIDED AROUND ALL RAISED ISLANDS AND MEDIANS.

WHITE REFLECTIVE PAINT SHALL BE USED FOR ALL LANE AND EDGE LINES, CHEVRONS AND OUTLINE MARKINGS.

WHITE REFLECTIVE THERMOPLASTIC MATERIAL SHALL BE USED FOR ALL CONTINUITY, TURNING, HOLDING, GIVE WAY, STOP, CROSSWALK MARKINGS AND TURN ARROWS.

ALL EXISTING PAVEMENT MARKINGS THAT SHALL BE MADE OBSOLETE BY THESE WORKS SHALL BE REMOVED FROM THE ROAD SURFACE BY APPROVED METHOD.

LEGEND

- RDAD CENTRELINE
- KERB AND CHANNEL (TYPE B1)
- 36.0 FINISHED SURFACE CONTOURS
- C.J. CUT JOINT
- D.J. DOWEL JOINT

LANE CONCRETE (EXPOSED)

N40 CONCRETE (f'cf=4.0MPa)
135mm THICK SL82 FABRIC
40 COVER OVER 25mm SAND BEDDING
200mm CBR 45 SUBBASE.

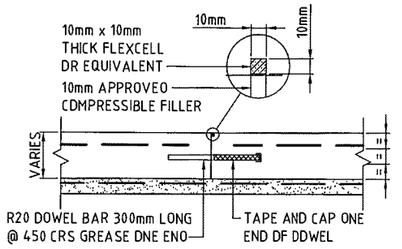
CONCRETE CROSSOVER

DRIVEWAY AND CROSSOVER
N40 CONCRETE (f'cf=4.0MPa)
180mm THICK SL92 FABRIC
40 COVER OVER 25mm SAND BEDDING
100mm CBR 45 SUBBASE.
AS PER IPWEAQ DWG SEQ R-051

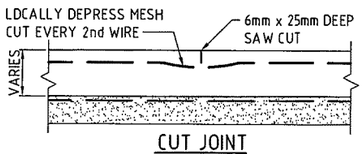
EXPOSED AGGREGATE TREATMENT

REFER LANDSCAPE DRAWINGS FOR AGGREGATE TYPE

EXPOSED AGGREGATE REINFORCED THRESHOLD
N40 CONCRETE - 180mm THICK SL82 FABRIC
40 COVER OVER 200mm CBR 45% SUBBASE.



DOWEL JOINT
DENOTED 'DJ' ON PLAN
SCALE NTS



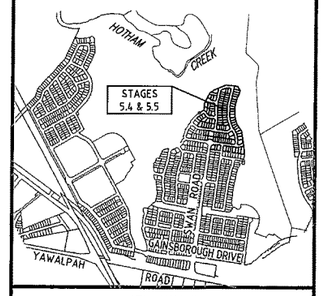
CUT JOINT
DENOTED 'CJ' ON PLAN
SCALE NTS

SCALE
5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
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Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD
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Approved ~~Director~~ RPEQ 1988
RPEQ 12805 9-2-16

Drawing Title
ROADWORKS
SIGNS AND LINEMARKING PLAN

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
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	Drawing No	Revision
A1	15-184-31	A

LEGEND

PROPOSED CATCHMENT BOUNDARY

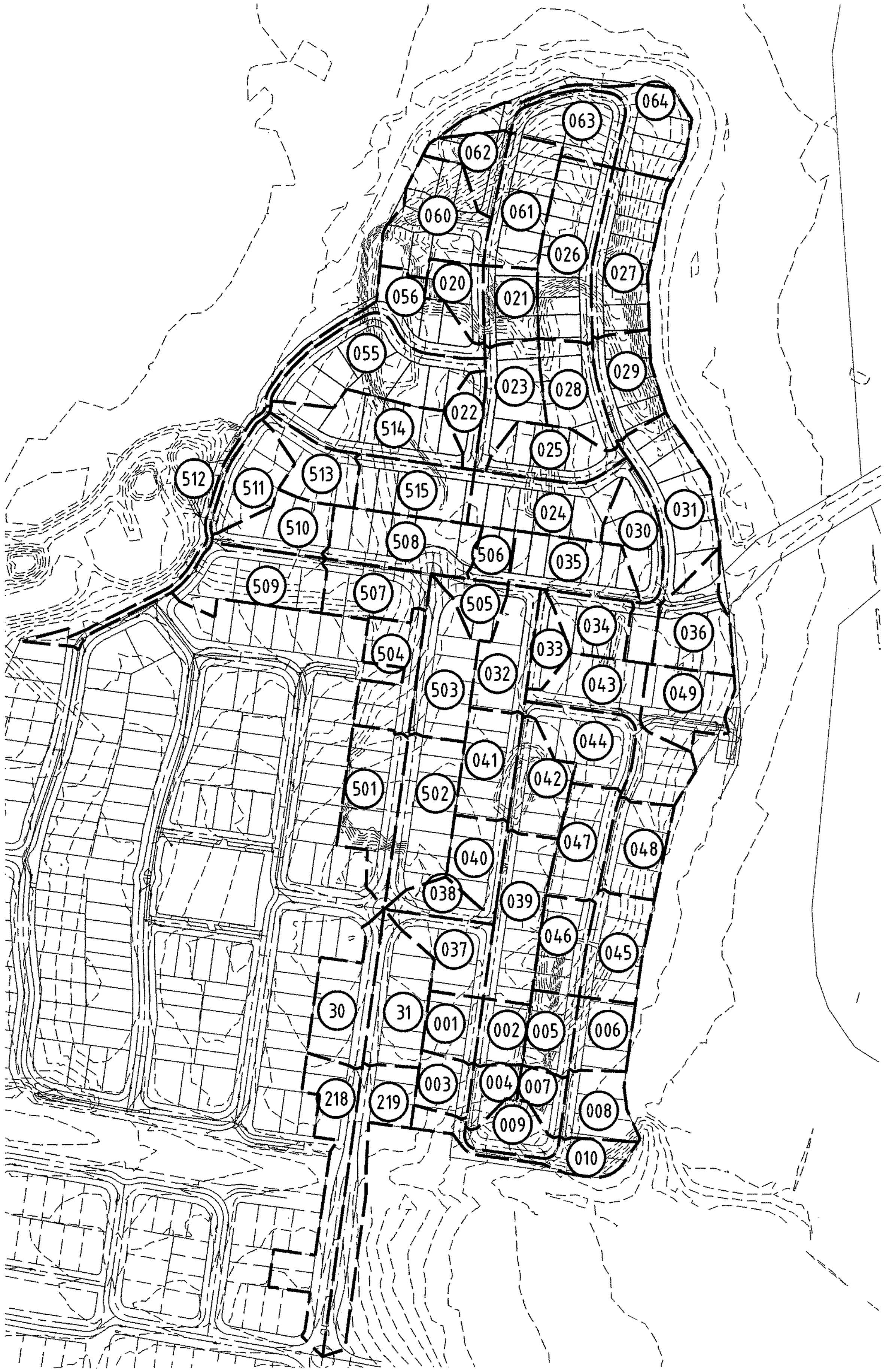
(55) CATCHMENT NUMBER

KERB AND CHANNEL

SW PROPOSED STORMWATER DRAINAGE

36.0 FINISHED SURFACE CONTOURS

36.0 NATURAL SURFACE CONTOURS



CATCHMENT PLAN

SCALE 1:2000

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
30	0.324
31	0.372
218	0.479
219	0.400
501	0.394
502	0.431
503	0.373
504	0.280
505	0.137
506	0.101
507	0.265
508	0.398
509	0.384
510	0.242
511	0.247
512	0.116
513	0.229
514	0.437
515	0.311

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
001	0.170
002	0.152
003	0.149
004	0.117
005	0.188
006	0.202
007	0.112
008	0.224
009	0.175
010	0.212

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
020	0.161
021	0.203
022	0.122
023	0.281
024	0.410
025	0.280
026	0.487
027	0.458
028	0.277
029	0.272
030	0.242
031	0.546
032	0.290
033	0.121
034	0.209
035	0.326
036	0.325
037	0.266
038	0.132
039	0.406
040	0.216
041	0.293
042	0.263
043	0.459
044	0.313
045	0.302
046	0.231
047	0.287
048	0.269
049	0.295

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
055	0.565
056	0.306

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
060	0.434
061	0.357
062	0.177
063	0.297
064	0.385

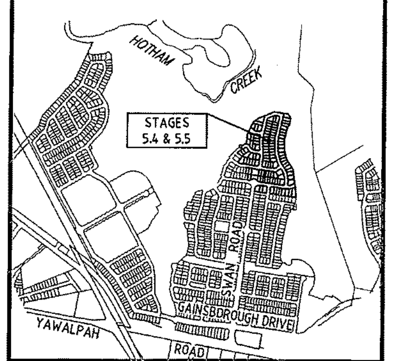
SCALE 20 10 0 20 40 60 80 100 120 140 160 180 200m

1 : 2,000 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS

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Client

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Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director ~~RPEQ 1988~~ RPEQ12EC5 9.2.16

Drawing Title

STORMWATER
CATCHMENT PLAN

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale: AS SHOWN

Sheet: 32 of 61

A1 Drawing No: 15-184-32 Revision: A

LOCATION					TIME		SUB-CATCHMENT RUNOFF						INLET DESIGN						
DESIGN ARI (yrs)	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	LAND USE	SLOPE OF CATCHMENT (%)	tc SUB-CATCHMENT TIME OF CONC. (min)	I RAINFALL INTENSITY (mm/h)	C10 10yr RUNOFF CO-EFFICIENT	C CO-EFFICIENT OF RUNOFF	A SUB-CATCHMENT AREA (ha)	C×A EQUIVALENT AREA (ha)	ΣCA SUM OF (C × A) (ha)	Q SUB-CATCHMENT DISCHARGE (l/s)	FLOW IN K&C (INC. BYPASS) (l/s)	ROAD GRADE AT INLET (%)	MINOR FLOW ROAD CAPACITY (l/s)	INLET TYPE	Qg FLOW INTO INLET (l/s)	Qb BYPASS FLOW (l/s)	BYPASS STRUCTURE No.
2 100	G055	G055 to G056	055			15.00 15.00	110 245		0.72 0.96	0.565 0.565	0.407 0.542	0.407 0.542	124 369 FLOW WIDTH/DEPTH 1.853 Vd m	124	0.00	230	12S0.104	124	0	G056
2 100	G056	G056 to 15A	055;056			15.00 15.00	110 245		0.72 0.96	0.306 0.306	0.220 0.294	0.220 0.294	67 200 FLOW WIDTH/DEPTH 0.924 Vd m	73	0.00	230	12S0.104	73	0	
2 100	G060	G060 to 20A	060			15.00 15.00	110 245		0.72 0.96	0.434 0.434	0.312 0.417	0.312 0.417	95 284 FLOW WIDTH/DEPTH 1.343 Vd m	95	0.00	230	12S0.104	95	0	
2 100	20A	20A to 20B	060														16			
2 100	20B	20B to 20C	060														16			
2 100	G061	G061 to 20C	061			15.00 15.00	110 245		0.72 0.96	0.357 0.357	0.257 0.343	0.257 0.343	79 233 FLOW WIDTH/DEPTH 2.160 Vd m DOWNSTREAM 1.067m	79	1.15	168	5	60	19	G063
2 100	G062	G062 to 20C	062			15.00 15.00	110 245		0.72 0.96	0.177 0.177	0.127 0.170	0.127 0.170	39 116 FLOW WIDTH/DEPTH 1.550 Vd m DOWNSTREAM 0.570m	39	1.15	168	5	32	7	G064
2 100	20C	20C to 20D	060;061;062														16			
2 100	20D	20D to G064	060;061;062														16			
2 100	G063	G063 to G064	063			15.00 15.00	110 245		0.72 0.96	0.297 0.297	0.214 0.285	0.214 0.285	65 194 FLOW WIDTH/DEPTH 1.133 Vd m	84	0.00	230	12S0.104	84	0	G064
2 100	G064	G064 to 20E	060;061;062;063;064			15.00 15.00	110 245		0.72 0.96	0.385 0.385	0.277 0.370	0.277 0.370	85 252 FLOW WIDTH/DEPTH 1.286 Vd m	92	0.00	230	12S0.104	92	0	
2 100	G020	G020 to 5A	020			15.00 15.00	110 245		0.72 0.96	0.161 0.161	0.116 0.155	0.116 0.155	35 105 FLOW WIDTH/DEPTH 1.797 Vd m DOWNSTREAM 0.683m	35	0.50	111	5	29	6	G056
2 100	G021	G021 to 5A	021			15.00 15.00	110 245		0.72 0.96	0.203 0.203	0.146 0.195	0.146 0.195	45 133 FLOW WIDTH/DEPTH 2.020 Vd m DOWNSTREAM 0.883m	45	0.50	111	5	36	9	G023
2 100	5A	5A to 5B	020;021														16			
2 100	G022	G022 to 5B	022			15.00 15.00	110 245		0.72 0.96	0.122 0.122	0.088 0.117	0.088 0.117	27 80 FLOW WIDTH/DEPTH 1.587 Vd m DOWNSTREAM 0.510m	27	0.50	111	5	23	4	G514
2 100	G023	G023 to 5B	023			15.00 15.00	110 245		0.72 0.96	0.281 0.281	0.202 0.270	0.202 0.270	62 184 FLOW WIDTH/DEPTH 2.480 Vd m DOWNSTREAM 1.257m	71	0.50	111	5	54	17	G025
2 100	5B	5B to 5C	020;021;022;023														16			
2 100	5C	5C to 5D	020;021;022;023														16			
2 100	G026	G026 to 6A	026			15.00 15.00	110 245		0.72 0.96	0.487 0.487	0.351 0.468	0.351 0.468	107 318 FLOW WIDTH/DEPTH 2.963 Vd m DOWNSTREAM 1.670m	107	0.50	111	5	77	30	G028

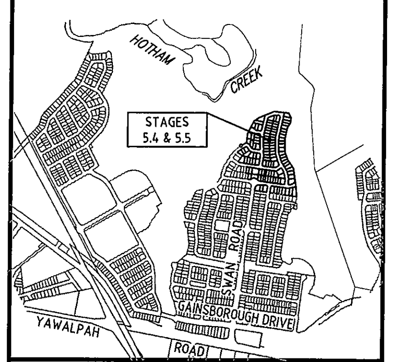
	DRAIN DESIGN												
STRUCTURE No.	tc CRITICAL TIME OF CONC. (min)	I RAINFALL INTENSITY (mm/h)	ΣCA TOTAL (C × A) (ha)	Qt MAJOR TOTAL FLOW (l/s)	Qm MAJOR SURFACE FLOW CAPACITY (l/s)	Qs MAJOR SURFACE FLOW (l/s)	Qp PIPE FLOW (l/s)	L REACH LENGTH (m)	S PIPE GRADE (%)	PIPE / BOX DIMENSIONS (CLASS) (mm)	V FLOW VELOCITY FULL (PIPE GRADE VELOCITY) (m/s)	T TIME OF FLOW IN REACH (min)	STRUCTURE CHART No.
G055	15.00 15.00	110 245	0.407 0.542	369			124 (Pipe flow= Grate flow)	7.735	1.71	375(2)	1.12 (2.07)	0.12	
G056	15.12 15.12	110 244	0.627 0.836	567			197 (Pipe flow= Sum upstr atten flows)	10.500	2.01	375(2)	1.78 (2.25)	0.10	
G060	15.00 15.00	110 245	0.312 0.417	284			95 (Pipe flow= Grate flow)	32.293	0.40	375(2)	0.86 (1.00)	0.54	
20A	15.54 15.54	108 241	0.312 0.417	279			95 (Pipe flow= Sum upstr atten flows)	28.466	0.40	375(2)	0.86 (1.00)	0.47	
20B	16.01 16.01	107 238	0.312 0.417	276			95 (Pipe flow= Sum upstr atten flows)	67.424	0.40	375(2)	0.86 (1.00)	1.12	
G061	15.00 15.00	110 245	0.257 0.343	233			60 (Pipe flow= Grate flow)	6.368	4.00	375(2)	0.54 (3.17)	0.11	
G062	15.00 15.00	110 245	0.127 0.170	116			32 (Pipe flow= Grate flow)	3.672	6.94	375(2)	0.29 (4.18)	0.06	
20C	17.13 17.13	103 230	0.696 0.930	594			178 (Pipe flow= Sum upstr atten flows)	20.435	0.40	450(2)	1.12 (1.13)	0.30	
20D	17.43 17.43	102 228	0.696 0.930	589			178 (Pipe flow= Sum upstr atten flows)	56.294	0.40	450(2)	1.12 (1.13)	0.84	
G063	15.00 15.00	110 245	0.214 0.285	194			84 (Pipe flow= Grate flow)	7.799	13.81	375(2)	0.76 (5.90)	0.13	
G064	18.27 18.27	100 223	1.187 1.585	982			334 (Pipe flow= Sum upstr atten flows)	8.500	0.40	525(2)	1.49 (1.27)	0.10	
G020	15.00 15.00	110 245	0.116 0.155	105			29 (Pipe flow= Grate flow)	12.839	3.50	375(2)	0.26 (2.97)	0.21	
G021	15.00 15.00	110 245	0.146 0.195	133			36 (Pipe flow= Grate flow)	9.234	4.88	375(2)	0.33 (3.51)	0.15	
5A	15.21 15.21	109 243	0.262 0.350	236			64 (Pipe flow= Sum upstr atten flows)	77.571	0.69	375(2)	0.58 (1.32)	1.29	
G022	15.00 15.00	110 245	0.088 0.117	80			23 (Pipe flow= Grate flow)	11.291	5.30	375(2)	0.21 (3.65)	0.19	
G023	15.00 15.00	110 245	0.202 0.270	184			54 (Pipe flow= Grate flow)	10.022	6.31	375(2)	0.49 (3.98)	0.17	
5B	16.50 16.50	105 234	0.552 0.737	479			136 (Pipe flow= Sum upstr atten flows)	77.748	1.57	375(2)	1.23 (1.99)	1.05	
5C	17.55 17.55	102 227	0.552 0.737	465			136 (Pipe flow= Sum upstr atten flows)	33.054	0.56	450(2)	0.85 (1.34)	0.55	
G026	15.00 15.00	110 245	0.351 0.468	318			77 (Pipe flow= Grate flow)	14.725	2.12	375(2)	0.70 (2.31)	0.25	

		HEADLOSSES						PART FULL				DESIGN LEVELS						
STRUCTURE No.	STRUCTURE RATIOS FOR 'K' VALUE CALCULATIONS	V²/2g VELOCITY HEAD (m)	Ku U/S HEADLOSS COEFFICENT	hu U/S PIPE STRUCT. HEADLOSS (m)	Kl LAT. HEADLOSS CO-EFFICIENT	hl LAT. PIPE STRUCT. HEADLOSS (m)	Kw W.S.E CO-EFFICIENT	hw CHANGE IN W.S.E (m)	Sf PIPE FRICTION SLOPE (%)	hf PIPE FRICTION HEADLOSS (L × Sf) (m)	DEPTH (m)	Vp VELOCITY (m/s)	OBVERT LEVELS (m)	DRAIN SECTION H.G.L (m)	UPSTREAM H.G.L (m)	LAT. H.G.L (m)	W.S.E. (m)	SURFACE OR K&C INVERT LEVEL (m)
G055	Qg 0.124 Qo 0.124 Do 375 CHRT 32: Vo2/2gDo 0.17 H/Do 0.41 Kg side flow 5.52 end flow 4.44	0.064	5.52	0.353			5.52	0.353	0.50	0.039			2.238 2.106	2.393 2.354	2.746		2.746	3.211
G056	Qg 0.073 Qo 0.197 Do 375 CHART 34 Angle 26 Case 3 S/Do 2.5 Du/Do 1.00 Qg/Qo 0.37 K 1.36 S/Do 1.72 cor 0.30 Ku 1.66 Kw 1.66	0.161	1.66	0.268			1.66	0.268	1.26	0.133	0.252	2.49	2.086 1.875	2.086 1.875	2.354		2.354	3.211
G060	Qg 0.095 Qo 0.095 Do 375 CHRT 32: Vo2/2gDo 0.10 H/Do 1.12 Kg side flow 4.73 end flow 3.74	0.038	4.73	0.178			4.73	0.178	0.29	0.095			2.829 2.699	3.247 3.152	3.425		3.425	3.884
20A	Qo 0.095 Do 375 CHART 50 Du/Do1.00 alpha 11 K'w 0.18 Vu 0.86 WSE 0.02 Ku 0.46 Kw 0.64	0.038	0.46	0.017			0.64	0.024	0.29	0.084			2.679 2.566	3.135 3.051	3.152		3.159	4.798
20B	Qo 0.095 Do 375 CHART 50 Du/Do1.00 alpha 83 K'w 0.30 Vu 0.86 WSE 0.08 Ku 1.75 Kw 2.05	0.038	1.75	0.066			2.05	0.077	0.29	0.198			2.546 2.276	2.985 2.787	3.051		3.062	5.661
G061	Qg 0.060 Qo 0.060 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.65 end flow 6.94	0.015	9.65	0.143			9.65	0.143	0.12	0.007	0.105	2.37	3.755 3.500	3.755 3.230	3.898		3.898	4.880
G062	Qg 0.032 Qo 0.032 Do 375 CHRT 32: Vo2/2gDo 0.01 H/Do 0.00 Kg side flow 10.53 end flow 7.40 Part full downstream pipe	0.004	1.00	0.292	Upstream HGL 3.739 below outlet pipe obv 3.755 Set Kp to 1		1.00	0.292	0.03	0.001	0.067	2.39	3.755 3.500	3.447 3.192	3.739		3.739	4.880
20C	Qo 0.178 Do 450 Flow G061 made eqv grate flow Flow G062 made eqv grate flow Angle 20 Chart 36 S/Do 2.5 chartdeg Du/Do 0.83 K0 1.37 K0.5 1.80 Qu/Qo 0.51 Cg 0.98 K 1.79 S/Do 2.5 K0 1.37 K0.5 1.80 K 1.79 S/Do 2.0 K0 1.59 K0.5 2.00 K 1.99	0.064	1.68	0.108	Interp val for S/Do 2.05 Kw 1.97 CHART 35 S/Do 2.5 K0 1.25 K0.5 1.65 K 1.64 S/Do 2.0 K0 1.45 K0.5 1.69 K 1.68 Interp val for S/Do 2.05 Ku 1.68 K vals above for stepped pipes as grate flow		1.97	0.126	0.39	0.079			2.331 2.249	2.679 2.600	2.787		2.805	4.892
20D	Qo 0.178 Do 450 CHART 50 Du/Do1.00 alpha 44 K'w 0.25 Vu 1.12 WSE 0.09 Ku 1.09 Kw 1.34	0.064	1.09	0.069			1.34	0.085	0.39	0.219			2.229 2.004	2.531 2.312	2.600		2.616	4.664
G063	Qg 0.084 Qo 0.084 Do 375 CHRT 32: Vo2/2gDo 0.08 H/Do 0.00 Kg side flow 8.42 end flow 6.35	0.029	8.42	0.248			8.42	0.248	0.23	0.018	0.091	4.06	3.145 2.068	3.145 2.312	3.393		3.393	4.104
G064	Qg 0.084 Qo 0.334 Do 525 Routine 2.2 CHART 48 Du/Do 0.71 Qu/Qo 0.23 K 1.86 d/Do 2.0 chrt Qg/Qo 0.25 Kg 0.26 d/Do 1.5 chrt Qg/Qo 0.25 Kg 0.32 d/Do 1.02 Interp value Kg 0.38 Ku=Kw= 2.24 Combined pipes in line case Join Pipes:	0.113	2.04	0.231	20D and G063 Vel1 0.691 Vel2 1.095 Eq Dia 572 Angle 227 Flow 0.250 CHART 33 Angle 0 S/Do 2.5 Du/Do 1.09 Qg/Qo 0.25 K 0.95 S/Do 1.30 cor 0.34 Ku 1.29 Kw 1.29 Interpolated Ku= 2.04 Kw= 2.04		2.04	0.231	0.55	0.047			2.068 2.034	2.081 2.034	2.312		2.312	4.103
G020	Qg 0.029 Qo 0.029 Do 375 CHRT 32: Vo2/2gDo 0.01 H/Do 0.00 Kg side flow 10.60 end flow 7.43 Part full downstream pipe	0.003	1.00	0.171	Upstream HGL 4.504 below outlet pipe obv 4.632 Set Kp to 1		1.00	0.171	0.03	0.004	0.075	1.83	4.632 4.183	4.333 4.045	4.504		4.504	5.599
G021	Qg 0.036 Qo 0.036 Do 375 CHRT 32: Vo2/2gDo 0.01 H/Do 0.00 Kg side flow 10.42 end flow 7.34 Part full downstream pipe	0.006	1.00	0.246	Upstream HGL 4.583 below outlet pipe obv 4.634 Set Kp to 1		1.00	0.246	0.04	0.004	0.078	2.20	4.634 4.183	4.337 4.045	4.583		4.583	5.587
5A	Qo 0.064 Do 375 Routine 2.15 Join Pipes: G020 and G021 Vel1 0.260 Vel2 0.323 Eq Dia 527 Angle 168 Flow 0.064 CHART 50 Du/Do1.41 alpha 12	0.017	1.00	0.083	K'w 0.19 Vu 0.30 WSE 0.02 Ku 1.02 Kw 1.07 Part full downstream pipe Upstream HGL 4.045 below outlet pipe obv 4.163 Set Kp to 1		1.00	0.083	0.14	0.105	0.174	1.28	4.163 3.628	3.962 3.745	4.045		4.045	5.588
G022	Qg 0.023 Qo 0.023 Do 375 CHRT 32: Vo2/2gDo 0.01 H/Do 0.00 Kg side flow 10.70 end flow 7.48 Part full downstream pipe	0.002	1.00	0.200	Upstream HGL 4.112 below outlet pipe obv 4.227 Set Kp to 1		1.00	0.200	0.02	0.002	0.061	1.98	4.227 3.628	3.912 3.745	4.112		4.112	5.186
G023	Qg 0.054 Qo 0.054 Do 375 CHRT 32: Vo2/2gDo 0.03 H/Do 0.00 Kg side flow 9.87 end flow 7.05	0.012	9.87	0.121			9.87	0.121	0.10	0.010	0.089	2.70	4.260 3.628	4.260 3.745	4.381		4.381	5.195
5B	Qo 0.136 Do 375 Routine 3.2 Join Pipes: G023 and 5A Vel1 0.467 Vel2 0.562 Eq Dia 528 Angle 272 Flow 0.114 Routine 2.15 Join Pipes:	0.077	1.78	0.137	Eqv G023 & 5A and G022 Vel1 0.519 Vel2 0.199 Eq Dia 647 Angle 266 Flow 0.136 CHART 50 Du/Do1.62 alpha 86 K'w 0.30 Vu 0.47 WSE 0.14 Ku 1.78 Kw 1.82		1.82	0.141	0.60	0.465	0.213	2.09	3.608 2.389	3.608 2.985	3.745		3.749	5.444
5C	Qo 0.136 Do 450 CHART 50 Du/Do0.83 alpha 39 K'w 0.24 Vu 1.23 WSE 0.04 Ku 0.65 Kw 1.15	0.037	0.65	0.024			1.15	0.042	0.23	0.075			2.444 2.257	2.961 2.886	2.985		3.003	3.743
G026	Qg 0.077 Qo 0.077 Do 375 CHRT 32: Vo2/2gDo 0.07 H/Do 0.88 Kg side flow 5.82 end flow 4.43	0.025	5.82	0.146			5.82	0.146	0.19	0.028			2.826 2.514	3.154 3.126	3.300		3.300	3.789

CALCULATIONS TABLE

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS · LANDPARTNERS · VEE · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved ~~Director RPEQ 1988~~ RPEQ12505 9.2.16

Drawing Title

STORMWATER
CALCULATION TABLE
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	33 of 61

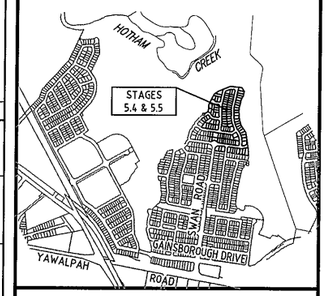
	Drawing No	Revision
A1	15-184-33	A

LOCATION					TIME			SUB-CATCHMENT RUNOFF					INLET DESIGN							DRAIN DESIGN										HEADLOSSES								PART FULL			DESIGN LEVELS						
						tc	I	C10	C	A	CxA	+CA	Q					Qg	Qb		tc	I	+CA	Qt	Qm	Qs	Qp	L	S		V	T				V2/2g	Ku	hu	Kt	hl	Kw	hw	Sf	hf		Vp							
DESIGN ARI	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	LAND USE	SLOPE OF CATCHMENT	SUB-CATCHMENT TIME OF CONC.	RAINFALL INTENSITY	10yr RUNOFF CO-EFFICIENT	CO-EFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT AREA	SUM OF (C x A)	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD GRADE AT INLET	MINOR FLOW ROAD CAPACITY	INLET TYPE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE No.	CRITICAL TIME OF CONC.	RAINFALL INTENSITY	TOTAL (C x A)	MAJOR TOTAL FLOW	MAJOR SURFACE FLOW CAPACITY	MAJOR SURFACE FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS (CLASS)	FLOW VELOCITY FULL (PIPE GRADE VELOCITY)	TIME OF FLOW IN REACH	STRUCTURE CHART No.	STRUCTURE RATIOS FOR 'K' VALUE CALCULATIONS	VELOCITY HEAD	U/S HEADLOSS COEFFICIENT	U/S PIPE STRUCT. HEADLOSS	LAT. HEADLOSS CO-EFFICIENT	LAT. PIPE STRUCT. HEADLOSS	W.S.E. CO-EFFICIENT	CHANGE IN W.S.E	PIPE FRICTION SLOPE	PIPE FRICTION HEADLOSS (L x Sf)	DEPTH	VELOCITY	OBVERT LEVELS	DRAIN SECTION H.G.L	UPSTREAM H.G.L	LAT. H.G.L	W.S.E.	SURFACE OR K&C INVERT LEVEL	STRUCTURE No.
yrs					%	min	mm/h			ha	ha	ha	l/s	l/s	%	l/s		l/s	l/s		min	mm/h	ha	l/s	l/s	l/s	l/s	m	%	mm	m/s	min			m				m		m		m	m	m/s	m	m	m	m	m	m	
2 100	G027	G027 to 6A	027			15.00 15.00	110 245		0.72 0.96	0.458 0.458	0.330 0.440	0.330 0.440	101 299	101 FLOW	0.50 WIDTH/DEPTH 2.893	111 DOWNSTREAM 1.613m	5	73	28	G029	15.00 15.00	110 245	0.330 0.440	299			73 (Pipe flow=	19.099 Grate flow)	1.70	375(2)	0.66 (2.07)	0.32		Qg 0.073 Qo 0.073 Do 375 CHRT 32: Vo2/2gDo 0.06 H/Do 0.86 Kg side flow 6.01 end flow 4.55	0.022	6.01	0.134			6.01	0.134	0.17	0.033			2.838 2.514	3.159 3.126	3.293		3.293	3.888	G027
2 100	6A	6A to 5D	026,027														16				15.32 15.32	109 242	0.681 0.908	610			149 (Pipe flows=	73.648 Sum upstr	0.40 eatten flows)	450(2)	0.93 (1.13)	1.23		Qo 0.149 Do 450 Routine 2.15 Join Pipes: G026 and G027 Vel1 0.691 Vel2 0.655	0.044	0.90	0.040	Eq Dia 520 CHART 50 K'w 0.21 Ku 0.90	Angle 201 Du/Do1 Vu 0.67 Kw 1.01	1.01 8 alpha 2 WSE 0.04	0.045 Flow 0.149	0.27	0.200			2.514 2.219	3.086 2.886	3.126		3.131	3.764	6A
2 100	G024	G024 to 5D	024			15.00 15.00	110 245		0.72 0.96	0.410 0.410	0.295 0.394	0.295 0.394	90 268	90 FLOW	0.50 WIDTH/DEPTH 2.753	111 DOWNSTREAM 1.497m	5	66	24	G030	15.00 15.00	110 245	0.295 0.394	268			66 (Pipe flows=	10.021 Grate flow)	0.40	375(2)	0.60 (1.00)	0.17		Qg 0.066 Qo 0.066 Do 375 CHRT 32: Vo2/2gDo 0.05 H/Do 1.80 Kg side flow 3.82 end flow 3.17	0.018	3.82	0.070			3.82	0.070	0.14	0.014			2.224 2.184	2.900 2.886	2.970		2.970	3.191	G024
2 100	G025	G025 to 5D	025			15.00 15.00	110 245		0.72 0.96	0.280 0.280	0.202 0.269	0.202 0.269	62 183	103 FLOW	0.00 WIDTH/DEPTH 1.495	230	1250.104	103	0	G024	15.00 15.00	110 245	0.202 0.269	183			103 (Pipe flows=	11.540 Grate flow)	0.40	450(2)	0.65 (1.13)	0.19		Qg 0.103 Qo 0.103 Do 450 CHRT 32: Vo2/2gDo 0.05 H/Do 1.61 Kg side flow 4.16 end flow 3.36	0.022	4.16	0.090			4.16	0.090	0.13	0.015			2.175 2.129	2.901 2.886	2.991		2.991	3.154	G025
2 100	G028	G028 to 5D	028			15.00 15.00	110 245		0.72 0.96	0.277 0.277	0.199 0.266	0.199 0.266	61 181	91 FLOW	0.50 WIDTH/DEPTH 2.767	111 DOWNSTREAM 1.497m	5	67	24	G025	15.00 15.00	110 245	0.199 0.266	181			67 (Pipe flows=	13.128 Grate flow)	0.44	375(2)	0.61 (1.05)	0.22		Qg 0.067 Qo 0.067 Do 375 CHRT 32: Vo2/2gDo 0.05 H/Do 1.24 Kg side flow 4.97 end flow 3.84	0.019	4.97	0.094			4.97	0.094	0.15	0.019			2.438 2.381	2.905 2.886	2.999		2.999	3.413	G028
2 100	G029	G029 to 5D	029			15.00 15.00	110 245		0.72 0.96	0.272 0.272	0.196 0.261	0.196 0.261	60 178	88 FLOW	0.50 WIDTH/DEPTH 2.727	111 DOWNSTREAM 1.467m	5	65	23	G031	15.00 15.00	110 245	0.196 0.261	178			65 (Pipe flows=	16.545 Grate flow)	0.44	375(2)	0.59 (1.05)	0.28		Qg 0.065 Qo 0.065 Do 375 CHRT 32: Vo2/2gDo 0.05 H/Do 1.21 Kg side flow 5.11 end flow 3.93	0.018	5.11	0.098			5.11	0.090	0.14	0.023			2.454 2.381	2.909 2.886	2.999		2.999	3.429	G029
2 100	5D	5D to 5E	028 to 025,028,029														16				18.10 18.10	100 224	2.125 2.835	1764			543 (Pipe flows=	41.884 Sum upstr	0.48 eatten flows)	825(2)	0.98 (1.87)	0.70		Qo 0.543 Do 825	0.049	2.50	0.123			2.50	0.123	0.13	0.055			2.468 2.268	2.763 2.708	2.886		2.886	3.396	5D
2 100	5E	5E to 5F	020 to 025,028,029														16				18.80 18.80	99 220	2.125 2.835	1733			543 (Pipe flows=	54.291 Sum upstr	0.45 eatten flows)	825(2)	0.98 (1.82)	0.90		Qo 0.543 Do 825 CHART 50 Du/Do1.00 alpha 29 K'w 0.23 Vu 1.82 WSE 0.85 Ku 0.71 Kw 0.95	0.049	0.71	0.034			0.95	0.046	0.13	0.072			2.224 1.980	2.674 2.602	2.708		2.720	3.187	5E
2 100	G037	G037 to 9A	037			15.00 15.00	110 245		0.72 0.96	0.266 0.266	0.192 0.255	0.192 0.255	59 174	59 FLOW	0.00 WIDTH/DEPTH 0.647	230	1250.104	59	0	G038	15.00 15.00	110 245	0.192 0.255	174			59 (Pipe flows=	16.248 Grate flow)	1.25	375(2)	0.53 (1.78)	0.27		Qg 0.059 Qo 0.059 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.78 end flow 6.96 Part full downstream pipe	0.014	1.00	0.093	Upstream HGL 4.633 pipe obv 4.759 Set Kp to 1		1.00 below outlet	0.093	0.11	0.018	0.141	1.55	4.759 4.555	4.540 4.522	4.633		4.633	5.734	G037
2 100	G038	G038 to 9A	038			15.00 15.00	110 245		0.72 0.96	0.132 0.132	0.095 0.127	0.095 0.127	29 86	29 FLOW	0.50 WIDTH/DEPTH 1.643	111 DOWNSTREAM 0.603m	5	24	5	G040	15.00 15.00	110 245	0.095 0.127	86			24 (Pipe flows=	13.333 Grate flow)	2.07	375(2)	0.22 (2.28)	0.22		Qg 0.024 Qo 0.024 Do 375 CHRT 32: Vo2/2gDo 0.01 H/Do 0.00 Kg side flow 10.68 end flow 7.47 Part full downstream pipe	0.002	1.00	0.104	Upstream HGL 4.638 pipe obv 4.831 Set Kp to 1		1.00 below outlet	0.104	0.02	0.003	0.078	1.43	4.831 4.555	4.534 4.522	4.638		4.638	5.766	G038
2 100	9A	9A to 9B	037,038														16				15.27 15.27	109 243	0.287 0.382	258			82 (Pipe flows=	70.880 Sum upstr	0.48 eatten flows)	375(2)	0.74 (1.10)	1.18		Qo 0.082 Do 375 Routine 2.15 Join Pipes: G037 and G038 Vel1 0.529 Vel2 0.215 Eq Dia 488 Angle 245 Flow 0.082 CHART 50 Du/Do1.30 alpha 65	0.028	1.00	0.033	K'w 0.28 Ku 1.59 Part full Upstream pipe obv Set Kp to	Vu 0.44 downstream HGL 4.522 4.535 1	1.00 WSE 0.05 Kw 1.69 below outlet	0.033	0.22	0.156	0.226	1.18	4.535 4.195	4.489 4.333	4.522		4.522	5.962	9A
2 100	G032	G032 to 7A	032			15.00 15.00	110 245		0.72 0.96	0.290 0.290	0.209 0.278	0.209 0.278	64 189	82 FLOW	0.00 WIDTH/DEPTH 1.095	230	1250.104	82	0	G033	15.00 15.00	110 245	0.209 0.278	189			82 (Pipe flows=	16.247 Grate flow)	1.64	375(2)	0.74 (2.03)	0.27		Qg 0.082 Qo 0.082 Do 375 CHRT 32: Vo2/2gDo 0.07 H/Do 0.00 Kg side flow 8.53 end flow 6.41 Part full downstream pipe	0.028	1.00	0.100	Upstream HGL 3.733 pipe obv 3.812 Set Kp to 1		1.00 below outlet	0.100	0.22	0.036	0.157	1.87	3.812 3.545	3.633 3.597	3.733		3.733	4.781	G032
2 100	G033	G033 to 7A	033			15.00 15.00	110 245		0.72 0.96	0.121 0.121	0.087 0.116	0.087 0.116	27 79	27 FLOW	0.50 WIDTH/DEPTH 1.587	111 DOWNSTREAM 0.510m	5	23	4	G034	15.00 15.00	110 245	0.087 0.116	79			23 (Pipe flows=	13.333 Grate flow)	2.48	375(2)	0.21 (2.50)	0.22		Qg 0.023 Qo 0.023 Do 375 CHRT 32: Vo2/2gDo 0.01 H/Do 0.00 Kg side flow 10.70 end flow 7.48 Part full downstream pipe	0.002	1.00	0.049	Upstream HGL 3.648 pipe obv 3.875 Set Kp to 1		1.00 below outlet	0.049	0.02	0.002	0.073	1.51	3.875 3.545	3.599 3.597	3.648		3.648	4.810	G033
2 100	7A	7A to 7B	032,033														16				15.27 15.27	109 243	0.296 0.394	266			104 (Pipe flows=	66.277 Sum upstr	2.35 eatten flows)	375(2)	0.94 (2.43)	1.10		Qo 0.104 Do 375 Routine 2.15 Join Pipes: G032 and G033 Vel1 0.736 Vel2 0.206	0.045	1.59	0.072	Eq Dia 462 CHART 50 K'w 0.28 Ku 1.59	Angle 105 Flow 0.104 Du/Do1.33 alpha 65 Vu 0.62 WSE 0.08 Kw 1.71	1.71	0.077	0.35	0.234	0.162	2.28	3.525 1.965	3.525 2.590	3.597		3.602	4.952	7A
2 100	G039	G039 to 9B	039			15.00 15.00	110 245		0.72 0.96	0.406 0.406	0.292 0.390	0.292 0.390	89 265	89 FLOW	0.50 WIDTH/DEPTH 2.744	111 DOWNSTREAM 1.467m	5	66	23	G042	15.00 15.00	110 245	0.292 0.390	265			66 (Pipe flows=	10.027 Grate flow)	4.04	375(2)	0.60 (3.19)	0.17		Qg 0.066 Qo 0.066 Do 375 CHRT 32: Vo2/2gDo 0.05 H/Do 0.00 Kg side flow 9.36 end flow 6.78	0.018	9.36	0.172			9.36	0.172	0.14	0.014	0.110	2.44	4.655 4.250	4.655 4.333	4.827		4.827	5.611	G039
2 100	G040	G040 to 9B	040			15.00 15.00	110 245		0.72 0.96	0.216 0.216	0.156 0.207	0.156 0.207	48 141	53 FLOW	0.50 WIDTH/DEPTH 2.177	111 DOWNSTREAM 0.990m	5	42	11	G041	15.00 15.00	110 245	0.156 0.207	141			42 (Pipe flows=	6.368 Grate flow)	5.63	375(2)	0.38 (3.76)	0.11		Qg 0.042 Qo 0.042 Do 375 CHRT 32: Vo2/2gDo 0.02 H/Do 0.00 Kg side flow 10.27 end flow 7.27 Part full downstream pipe	0.007	1.00	0.147	Upstream HGL 4.484 pipe obv 4.608 Set Kp to 1		1.00 below outlet	0.147	0.06	0.004	0.081	2.41	4.608 4.250	4.337 4.333	4.484		4.484	5.577	G040
2 100	9B	9B to 9C	037,038,039,040														16				16.45 16.45	105 234	0.735 0.979	636			182 (Pipe flows=	76.500 Sum upstr	0.48 eatten flows)	450(2)	1.15 (1.24)	1.11		Qo 0.182 Do 450 Routine 3.1 Join Pipes: G039 and 9A Vel1 0.578 Vel2 0.117 Eq Dia 526 Angle 174 Flow 0.142 Routine 2.1 Combined pipes in line case Join Pipes:	0.067	1.13	0.076	Eqv G039 & 9A and G040 Vel1 0.655 Vel2 0.363 Eq Dia 617 Angle 188 Flow 0.182 CHART 50 Du/Do1.39 alpha 0 K'w 0.05 Vu 0.59 WSE 0.07 Ku 0.96 Kw 0.97 Interpolated Ku= 1.13 Kw= 1.13			1.13	0.076	0.41	0.313			4.250 3.885	4.257 3.944	4.333		4.333	5.608	9B
2 100	G045	G045 to 10A	045			15.00 15.00	110 245		0.72 0.96	0.302 0.302	0.217 0.290	0.217 0.290	66 197	66 FLOW	0.50 WIDTH/DEPTH 2.403	111 DOWNSTREAM 1.177m	5	51	15	G048	15.00 15.00	110 245	0.217 0.290	197			51 (Pipe flows=	5.430 Grate flow)	4.05	375(2)	0.46 (3.19)	0.09		Qg 0.051 Qo 0.051 Do 375 CHRT 32: Vo2/2gDo 0.03 H/Do 0.00 Kg side flow 9.99 end flow 7.12 Part full downstream pipe	0.011	1.00	0.264	Upstream HGL 4.061 pipe obv 4.075 Set Kp to 1		1.00 below outlet	0.264	0.08	0.005	0.097	2.28	4.075 3.855	3.797 3.577	4.061		4.061	4.954	G045
2 100	G046	G046 to 10A	046			15.00 15.00	110 245		0.72 0.96	0.231 0.231	0.166 0.222	0.166 0.222	51 151	51 FLOW	0.50 WIDTH/DEPTH 2.144	111 DOWNSTREAM 0.990m	5	40	11	G047	15.00 15.00	110 245	0.166 0.222	151			40 (Pipe flows=	14.863 Grate flow)	0.82	375(2)	0.36 (1.44)	0.25		Qg 0.044 Qo 0.040 Do 375 CHRT 32: Vo2/2gDo 0.02 H/Do 0.00 Kg side flow 10.34 end flow 7.30 Part full downstream pipe	0.007	1.00	0.074	Upstream HGL 3.805 pipe obv 3.977 Set Kp to 1		1.00 below outlet	0.074	0.05	0.008	0.129	1.20	3.977 3.855	3.731 3.609	3.805		3.805	4.998	G046
2 100	10A	10A to 10B	045,046														16				15.25 15.25	109 243	0.383 0.512	346			90 (Pipe flows=	45.254 Sum upstr	1.06 eatten flows)	450(2)	0.57 (1.84)	0.75		Qo 0.090 Do 450 Flow G045 made eqv grate flow Flow G046 made eqv grate flow CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.74 end flow 6.98 K vals above for stepped pipes as grate flow	0.017	1.00	0.037	Part full Upstream pipe obv Set Kp to	downstream pipe HGL 3.270 3.398 1	1.00 below outlet	0.037	0.10	0.045	0.171	1.62	3.398 2.920	3.233 3.188	3.270		3.270	4.975	10A

CALCULATIONS TABLE

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS URBAN ENVIRONMENT CONSULTANTS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Drawing Title

STORMWATER
CALCULATION TABLE
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	34 of 61

	Drawing No	Revision
A1	15-184-34	A

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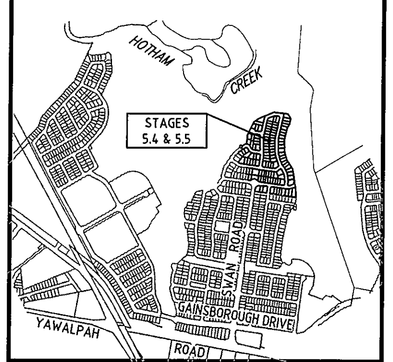
LOCATION: DESIGN ARI (yrs)	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	LAND USE	TIME: SLOPE OF CATCHMENT (%)	tc SUB-CATCHMENT TIME OF CONC. (min)	I RAINFALL INTENSITY (mm/h)	SUB-CATCHMENT RUNOFF: C10 10yr RUNOFF CO-EFFICIENT	C CO-EFFICIENT OF RUNOFF	A SUB-CATCHMENT AREA (ha)	CxA EQUIVALENT AREA (ha)	+CA SUM OF (C x A) (ha)	Q SUB-CATCHMENT DISCHARGE (l/s)	INLET DESIGN: FLOW IN K&C (INC. BYPASS) (l/s)	ROAD GRADE AT INLET (%)	MINOR FLOW ROAD CAPACITY (l/s)	INLET TYPE	Qg FLOW INTO INLET (l/s)	Qb BYPASS FLOW (l/s)	BYPASS STRUCTURE No.
2 100	10B	10B to 10C	045;046														16			
2 100	G030	G030 to 5F	030			15.00 15.00	110 245		0.72 0.96	0.242 0.242	0.174 0.232	0.174 0.232	53 158 FLOW WIDTH/DEPTH 1.305 Wd m	93	0.00	230	12S0.104	93	0	G031
2 100	G031	G031 to 5F	031			15.00 15.00	110 245		0.72 0.96	0.546 0.546	0.393 0.524	0.393 0.524	120 357 FLOW WIDTH/DEPTH 2.302 Wd m	153	0.00	230	12S0.104	153	0	G036
2 100	5F	5F to 5G	020 to 025;028;029;0 30;031														16			
2 100	G034	G034 to 7B	034			15.00 15.00	110 245		0.72 0.96	0.209 0.209	0.150 0.201	0.150 0.201	46 137 FLOW WIDTH/DEPTH 1.577 Wd m DOWNSTREAM 0.633m	50	1.75	207	5	40	10	G031
2 100	G035	G035 to 7B	035			15.00 15.00	110 245		0.72 0.96	0.326 0.326	0.235 0.313	0.235 0.313	72 213 FLOW WIDTH/DEPTH 1.880 Wd m DOWNSTREAM 0.857m	72	1.75	207	5	56	16	G030
2 100	7B	7B to 5G	032;033;034;035														16			
2 100	5G	5G to G036	020 to 025;028;029;0 30;031;032;033;034;0 35														16			
2 100	G036	G036 to 5H	020 to 025;028;029;0 30;031;032;033;034;0 35;0.36			15.00 15.00	110 245		0.72 0.96	0.325 0.325	0.234 0.312	0.234 0.312	72 212 FLOW WIDTH/DEPTH 0.905 Wd m	72	0.50	230	12S0.104	72	0	
2 100	5H	5H to 5J	020 to 025;028;029;0 30;031;032;033;034;0 35;0.36														16			
2 100	5J	5J to 5K	020 to 025;028;029;0 30;031;032;033;034;0 35;0.36														16			
2 100	G041	G041 to 9C	041			15.00 15.00	110 245		0.72 0.96	0.293 0.293	0.211 0.281	0.211 0.281	64 191 FLOW WIDTH/DEPTH 2.543 Wd m DOWNSTREAM 1.293m	75	0.50	111	5	57	18	G032
2 100	G042	G042 to 9C	042			15.00 15.00	110 245		0.72 0.96	0.263 0.263	0.189 0.252	0.189 0.252	58 172 FLOW WIDTH/DEPTH 2.630 Wd m DOWNSTREAM 1.367m	81	0.50	111	5	61	20	G044
2 100	9C	9C to 9D	037;038;039;040;041; 042														16			
2 100	9D	9D to 9E	037;038;039;040;041; 042														16			
2 100	G047	G047 to 10C	047			15.00 15.00	110 245		0.72 0.96	0.287 0.287	0.207 0.276	0.207 0.276	63 188 FLOW WIDTH/DEPTH 2.527 Wd m DOWNSTREAM 1.293m	74	0.50	111	5	56	18	G044
2 100	G048	G048 to 10C	048			15.00 15.00	110 245		0.72 0.96	0.269 0.269	0.194 0.258	0.194 0.258	59 176 FLOW WIDTH/DEPTH 2.527 Wd m DOWNSTREAM 1.293m	74	0.50	111	5	56	18	G043

STRUCTURE No.	DRAIN DESIGN: tc CRITICAL TIME OF CONC. (min)	I RAINFALL INTENSITY (mm/h)	+CA TOTAL (C x A) (ha)	Qt MAJOR TOTAL FLOW (l/s)	Qm MAJOR SURFACE FLOW CAPACITY (l/s)	Qs MAJOR SURFACE FLOW (l/s)	Qp PIPE FLOW (l/s)	L REACH LENGTH (m)	S PIPE GRADE (%)	PIPE / BOX DIMENSIONS (CLASS) (mm)	V FLOW VELOCITY FULL (PIPE GRADE VELOCITY) (m/s)	T TIME OF FLOW IN REACH (min)	STRUCTURE CHART No.	HEADLOSSES: STRUCTURE RATIOS FOR 'K' VALUE CALCULATIONS
10B	16.00 16.00	107 238	0.383 0.512	338			90 (Pipe flow= Sum upstr atten flows)	23.413	0.40	450(2)	0.57 (1.13)	0.39		Qo 0.090 Do 450 CHART 50 Du/Do1.00 alpha 5 K'w 0.16 Vu 0.57 WSE 0.01 Ku 0.38 Kw 0.54
G030	15.00 15.00	110 245	0.174 0.232	158			93 (Pipe flow= Grate flow)	6.387	5.21	450(2)	0.58 (4.09)	0.11		Qg 0.093 Qo 0.093 Do 450 CHRT 32: Vo2/2gDo 0.04 H/Do 1.52 Kg side flow 4.48 end flow 3.52
G031	15.00 15.00	110 245	0.393 0.524	357			153 (Pipe flow= Grate flow)	3.696	7.14	525(2)	0.68 (5.37)	0.06		Qg 0.153 Qo 0.153 Do 525 CHRT 32: Vo2/2gDo 0.04 H/Do 1.25 Kg side flow 5.05 end flow 3.88
5F	19.70 19.70	96 214	2.692 3.591	2135			741 (Pipe flow= Sum upstr atten flows)	13.773	0.40	900(2)	1.13 (1.82)	0.20		Qo 0.741 Do 900 Routine 3.1 Join Pipes: G030 and 5E Vel1 0.510 Vel2 0.985 Eq Dia 916 Angle 195 Flow 0.608 Routine 2.24 Join Pipes:
G034	15.00 15.00	110 245	0.150 0.201	137			40 (Pipe flow= Grate flow)	7.885	4.37	375(2)	0.36 (3.31)	0.13		Qg 0.040 Qo 0.040 Do 375 CHRT 32: Vo2/2gDo 0.02 H/Do 1.13 Kg side flow 5.80 end flow 4.30
G035	15.00 15.00	110 245	0.235 0.313	213			56 (Pipe flow= Grate flow)	3.672	8.36	375(2)	0.51 (4.59)	0.06		Qg 0.056 Qo 0.056 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 1.23 Kg side flow 5.22 end flow 3.98
7B	16.37 16.37	105 235	0.681 0.908	593			192 (Pipe flow= Sum upstr atten flows)	22.517	0.40	525(2)	0.86 (1.27)	0.38		Qo 0.192 Do 525 Routine 3.2 Join Pipes: G035 and 7A Vel1 0.484 Vel2 0.907 Eq Dia 507 Angle 191 Flow 0.154 Routine 2.21 Combined pipes in line case Join Pipes:
5G	19.90 19.90	96 213	3.373 4.499	2662			917 (Pipe flow= Sum upstr atten flows)	34.124	0.20	900(2)	1.39 (1.29)	0.41		Qo 0.917 Do 900 Routine 2.24 Join Pipes: 5F and 7B Vel1 1.165 Vel2 0.810
G036	20.31 20.31	95 211	3.607 4.811	2820			969 (Pipe flow= Sum upstr atten flows)	13.913	0.20	1050(2)	1.09 (1.42)	0.21		
5H	20.52 20.52	94 210	3.607 4.811	2806			969 (Pipe flow= Sum upstr atten flows)	52.372	0.20	1050(2)	1.09 (1.42)	0.80		Qo 0.969 Do 1050 CHART 50 Du/Do1.00 alpha 39 K'w 0.24 Vu 1.12 WSE 0.07 Ku 0.96 Kw 1.22
5J	21.32 21.32	92 206	3.607 4.811	2753			969 (Pipe flow= Sum upstr atten flows)	35.577	0.20	1050(2)	1.09 (1.42)	0.54		Qo 0.969 Do 1050 CHART 50 Du/Do1.00 alpha 3 K'w 0.14 Vu 1.12 WSE 0.03 Ku 0.35 Kw 0.50
G041	15.00 15.00	110 245	0.211 0.281	191			57 (Pipe flow= Grate flow)	6.369	5.68	375(2)	0.52 (3.78)	0.11		Qg 0.057 Qo 0.057 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.74 end flow 6.98
G042	15.00 15.00	110 245	0.189 0.252	172			61 (Pipe flow= Grate flow)	5.430	7.08	375(2)	0.55 (4.22)	0.09		Qg 0.061 Qo 0.061 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.61 end flow 6.91
9C	17.56 17.56	102 227	1.135 1.512	953			287 (Pipe flow= Sum upstr atten flows)	10.235	2.11	525(2)	1.28 (2.92)	0.13		Qo 0.287 Do 525 Routine 3.1 Join Pipes: G042 and 9B Vel1 0.512 Vel2 1.114 Eq Dia 554 Angle 138 Flow 0.234 Routine 2.13 Equiv defln 50 CHART 49 High vel lat Eqv G042 & 9B Dhv 554 Qhv 0.234 Dhv/Dlv 1.5 Dhv/Do 1.06 Qhv/Qo 0.82 H 2.39 Low vel latrl G041 Dlv 375 Qlv 0.053 Dlv/Do 0.71 Qlv/Qo 0.18 L 0.16 H-L 2.23 No grate flow: H-L-0.2 = 2.03
9D	17.69 17.69	102 226	1.135 1.512	949			287 (Pipe flow= Sum upstr atten flows)	62.200	0.91	525(2)	1.28 (1.92)	0.81		Qo 0.287 Do 525 CHART 50 Du/Do1.00 alpha 54 K'w 0.26 Vu 1.32 WSE 0.14 Ku 1.34 Kw 1.62 Part full downstream pipe
G047	15.00 15.00	110 245	0.207 0.276	188			56 (Pipe flow= Grate flow)	6.406	12.03	375(2)	0.51 (5.50)	0.11		Qg 0.056 Qo 0.056 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.79 end flow 7.01
G048	15.00 15.00	110 245	0.194 0.258	176			56 (Pipe flow= Grate flow)	6.973	11.65	375(2)	0.51 (5.42)	0.12		Qg 0.056 Qo 0.056 Do 375 CHRT 32: Vo2/2gDo 0.04 H/Do 0.00 Kg side flow 9.79 end flow 7.01

STRUCTURE No.	V2/2g VELOCITY HEAD (m)	Ku U/S HEADLOSS COEFFICENT	hu U/S PIPE STRUCT. HEADLOSS (m)	Kl LAT. HEADLOSS CO-EFFICIENT	hl LAT. PIPE STRUCT. HEADLOSS (m)	Kw W.S.E CO-EFFICIENT	hw CHANGE IN W.S.E (m)	Sf PIPE FRICTION SLOPE (%)	hf PIPE FRICTION HEADLOSS (L x Sf) (m)	PART FULL: DEPTH (m)	Vp VELOCITY (m/s)	DESIGN LEVELS: OBVERT LEVELS (m)	DRAIN SECTION H.G.L (m)	UPSTREAM H.G.L (m)	LAT. H.G.L (m)	W.S.E. (m)	SURFACE OR K&C INVERT LEVEL (m)	STRUCTURE No.
10B	0.017	0.38	0.007			0.54	0.009	0.10	0.023			2.900 2.806	3.181 3.158	3.188		3.190	4.749	10B
G030	0.017	4.48	0.077			4.48	0.077	0.11	0.007			1.925 1.592	2.609 2.602	2.686		2.686	2.906	G030
G031	0.024	5.05	0.119			5.05	0.119	0.12	0.004			1.940 1.676	2.606 2.602	2.725		2.725	2.906	G031
5F	0.065	0.91	0.059	Eqv G030 & 5E and G031 Vel1 0.9[illegible]2 Vel2 0.[illegible]17 Eq Dia 1[illegible]43 Angle 205 Flow 0.741 CHART 50 Du/Do1.[illegible]6 alpha 25 K'w 0.22 Vu 0.87 WSE 0.07 Ku 0.91 Kw 1.04		1.04	0.068	0.15	0.021			2.037 1.982	2.543 2.522	2.602		2.611	2.954	5F
G034	0.007	5.80	0.038			5.80	0.038	0.05	0.004			2.170 1.826	2.594 2.590	2.632		2.632	3.140	G034
G035	0.013	5.22	0.069			5.22	0.069	0.10	0.004			2.133 1.826	2.594 2.590	2.663		2.663	3.094	G035
7B	0.038	0.72	0.027	Eqv G035 & 7A and G034 Vel1 0.7[illegible]1 Vel2 0.3[illegible]6 Eq Dia 6[illegible]0 Angle 1[illegible]9 Flow 0.[illegible]92 CHART 50 Du/Do1.[illegible]4 alpha 0 K'w 0.05 Vu 0.68 WSE 0.03 Ku 0.72 Kw 0.75 Interpolated Ku= 0.72 Kw= 0.72		0.72	0.027	0.18	0.041			1.965 1.875	2.563 2.522	2.590		2.590	3.092	7B
5G	0.098	1.47	0.145	Eq Dia 1[illegible]31 Angle [illegible]38 Flow 0.917 CHART 50 Du/Do1.[illegible]5 alpha 5[illegible] K'w 0.27 Vu 1.10 WSE 0.16 Ku 1.47 Kw 1.64		1.64	0.161	0.23	0.080			1.962 1.894	2.377 2.297	2.522		2.538	3.094	5G
G036	0.061	1.10	0.067			1.35	0.082	0.12	0.016			2.025 1.997	2.230 2.214	2.297		2.312	2.833	G036
5H	0.061	0.96	0.058			1.22	0.073	0.12	0.061			1.977 1.872	2.156 2.095	2.214		2.229	2.665	5H
5J	0.061	0.35	0.022			0.50	0.031	0.12	0.041			1.852 1.781	2.073 2.032	2.095		2.104	3.254	5J
G041	0.014	9.74	0.134			9.74	0.134	0.11	0.007	0.094	2.65	4.227 3.865	4.227 3.944	4.361		4.361	5.194	G041
G042	0.015	9.61	0.148			9.61	0.148	0.12	0.007	0.092	2.92	4.249 3.865	4.249 3.944	4.397		4.397	5.204	G042
9C	0.084	1.00	0.200	Ku=Kw= 2.03 Combined pipes in line case Join Pipes: Eqv G042 & 9B and G041 Vel1 0.9[illegible]9 Vel2 0.[illegible]79 Eq Dia 6[illegible]4 Angle [illegible]50 Flow 0.287 CHART 50 Du/Do1.[illegible]3 alpha 0 K'w 0.05 Vu 0.88 WSE 0.07 Ku 0.84 Kw 0.86 Interpolated Ku= 1.37 Kw= 1.38 Part full downstream pipe Upstream HGL 3.944 below outlet pipe obv 3.949 Set Kp to 1		1.00	0.200	0.41	0.042	0.248	2.82	3.949 3.733	3.744 3.702	3.944		3.944	5.216	9C
9D	0.084	1.00	0.171	Upstream HGL 3.702 below outlet pipe obv 3.713 Set Kp to 1		1.00	0.171	0.41	0.253	0.319	2.06	3.713 3.145	3.531 3.278	3.702		3.702	4.979	9D
G047	0.013	9.79	0.130			9.79	0.130	0.10	0.007	0.077	3.43	3.641 2.870	3.641 3.158	3.771		3.771	4.599	G047
G048	0.013	9.79	0.130			9.79	0.130	0.10	0.007	0.078	3.40	3.683 2.870	3.683 3.158	3.813		3.813	4.618	G048

CALCULATIONS TABLE

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS
LANDPARTNERS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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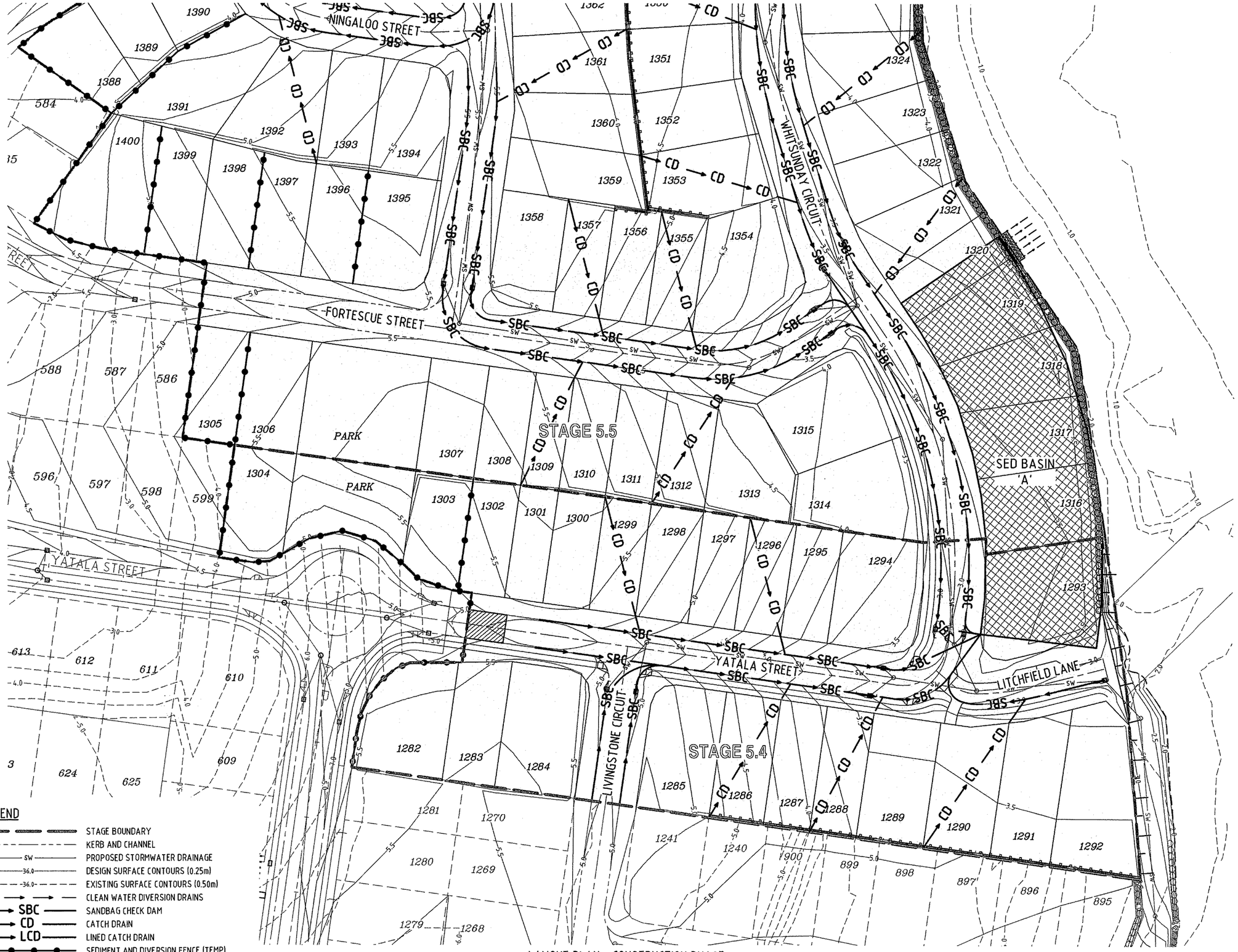
Drawing title

STORMWATER
CALCULATION TABLE
SHEET 3

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 35 of 61
A1	Drawing No: 15-184-35		Revision: A

REFER KN DWG 15-184-43



LEGEND

- STAGE BOUNDARY
- KERB AND CHANNEL
- SW — PROPOSED STORMWATER DRAINAGE
- 36.0 — DESIGN SURFACE CONTOURS (0.25m)
- 36.0 — EXISTING SURFACE CONTOURS (0.50m)
- CLEAN WATER DIVERSION DRAINS
- SBC — SANDBAG CHECK DAM
- CD — CATCH DRAIN
- LCD — LINED CATCH DRAIN
- SEDIMENT AND DIVERSION FENCE (TEMP)
- SEDIMENT BASIN
- TRUCK SHAKE DOWN FACILITY - LOCATION TO BE CONFIRMED ON SITE

LAYOUT PLAN - CONSTRUCTION PHASE

SCALE 1:500

SCALE 10 5 0 10 20 30 40 50m

1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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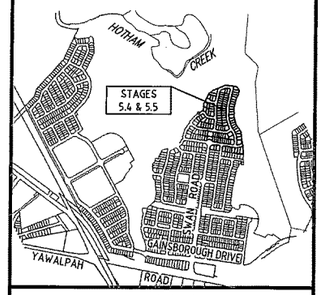
NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS LAND DEVELOPMENT CONSULTANTS
vee
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director - RPEQ 1988
RMcL RPEQ 12EC5 92.16

Drawing Title

EROSION AND SEDIMENT CONTROL
LAYOUT PLAN
CONSTRUCTION PHASE - SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	42 of 61

	Drawing No	Revision
A1	15-184-42	A

LEGEND

- STAGE BOUNDARY
- KERB AND CHANNEL
- SW — PROPOSED STORMWATER DRAINAGE
- 36.0 — DESIGN SURFACE CONTOURS (0.25m)
- 36.0 — EXISTING SURFACE CONTOURS (0.50m)
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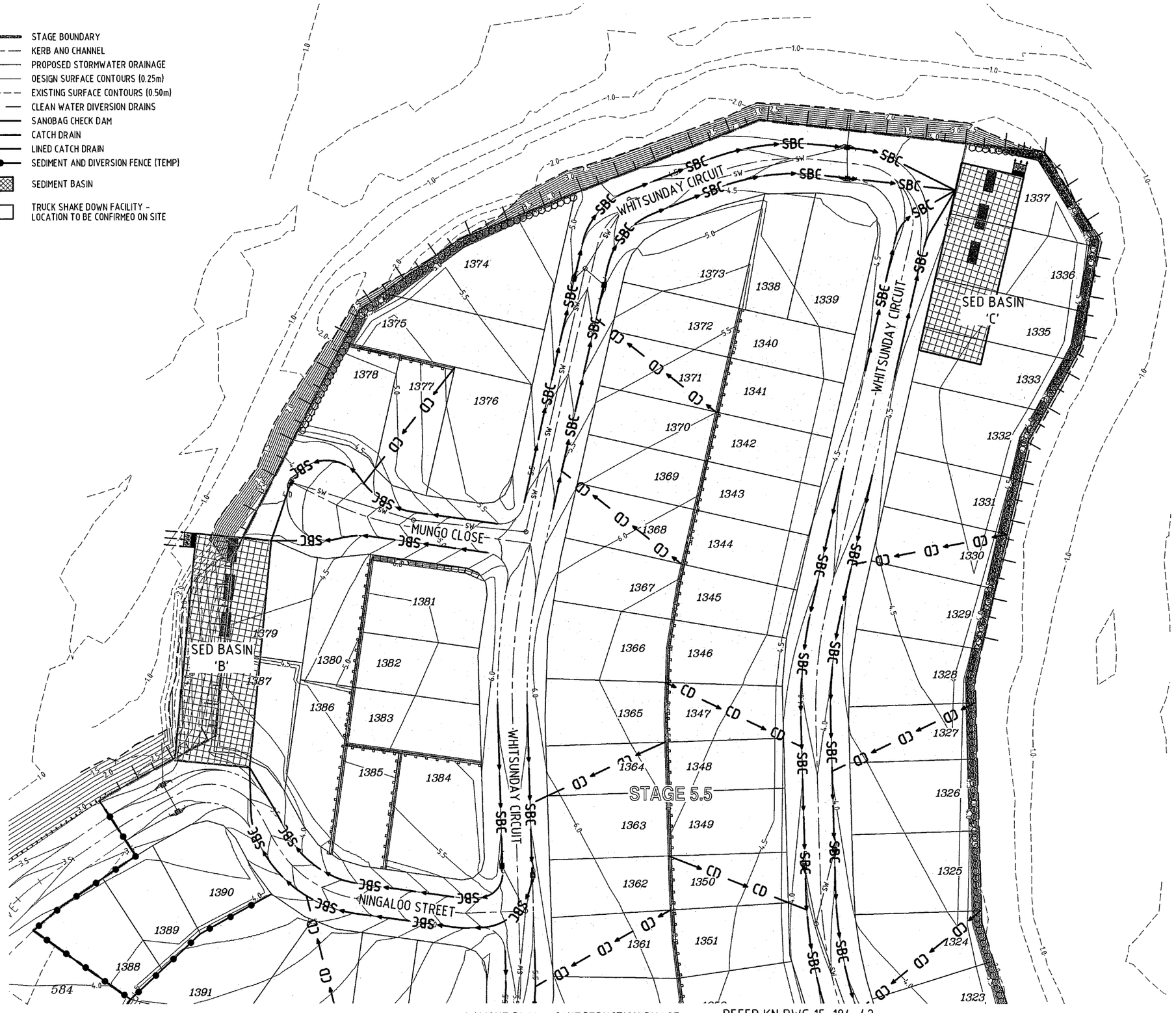
- SEDIMENT BASIN
- TRUCK SHAKE DOWN FACILITY – LOCATION TO BE CONFIRMED ON SITE



LAYOUT PLAN – CONTSTRUCTION PHASE
SCALE 1:500

REFER KN DWG 15-184-42

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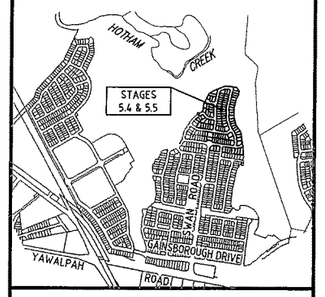

REVISIONS

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GAINSBOROUGH GREENS
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RMK RPEQ 9-2-16

Drawing Title
EROSION AND SEDIMENT CONTROL
LAYOUT PLAN
CONSTRUCTION PHASE - SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	43 of 61

	Drawing No	Revision
A1	15-184-43	A

REFER KN DWG 15-184-45

LEGEND

- STAGE BOUNDARY
- KERB AND CHANNEL
- SW — PROPOSED STORMWATER DRAINAGE
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- CLEAN WATER DIVERSION DRAINS
- SEDIMENT AND DIVERSION FENCE (TEMP)
- SILT WEIR
- GULLY BAGS
- TURF STRIP

NOTE

1. 600mm WIDE TURFING STRIP WITH FINGERS @ 5m CRS TO BE PLACED BEHIND ALL KERB AND CHANNEL.

LAYOUT PLAN - POST CONSTRUCTION PHASE

SCALE 1:500

SCALE 10 5 0 10 20 30 40 50m

1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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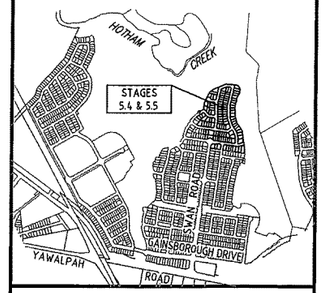
KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Drawing Title

EROSION AND SEDIMENT CONTROL
LAYOUT PLAN
POST CONST. PHASE - SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	44 of 61

A1	Drawing No	Revision
	15-184-44	A

LEGEND

- STAGE BOUNDARY
- KERB AND CHANNEL
- SW — PROPOSED STORMWATER DRAINAGE
- 36.0 — DESIGN SURFACE CONTOURS (0.25m)
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- SILT WEIR
- GULLY BAGS
- TURF STRIP

NOTE

1. 600mm WIDE TURFING STRIP WITH FINGERS @ 5m CRS TO BE PLACED BEHIND ALL KERB AND CHANNEL.

LAYOUT PLAN - POST CONSTRUCTION PHASE

SCALE 1:500

REFER KN DWG 15-184-44

SCALE 1 : 500 (A1 UNREDUCED)

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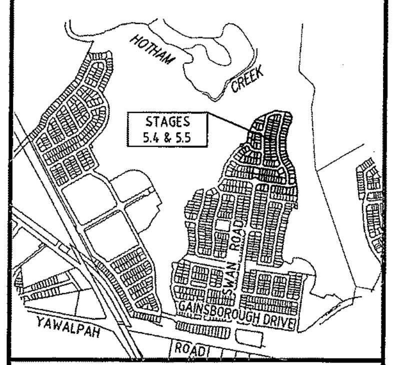
NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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PRECINCT 5
STAGE 5.4 & 5.5

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Drawing Title

EROSION AND SEDIMENT CONTROL
LAYOUT PLAN
POST CONST. PHASE - SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
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	Drawing No	Revision
A1	15-184-45	A

EROSION AND SEDIMENT CONTROL PROGRAM

1. THIS PROGRAM ANO ASSOCIATED PLANS SHDULO BE READ IN CONJUNCTIDN WITH THE SITE MANAGEMENT SPECIFICATION INCORPORATEO IN THE CONTRACT DOCUMENTS. THE PRDVISIDNS DF THE SPECIFICATIDN ARE TD BE STRICTLY ADHERED TD.
2. THE BASIC OBJECTIVES DF THE EROSION AND SEDIMENT CNTRDL ARE:
   - I. IDENTIFY CRITICAL AREAS AND PROVIDE APPROPRIATE ATTENTION TD THOSE AREAS.
   - II. PLAN SITE LAYOUTS SO THAT ACCESS TO ALL REQUIRED DRAINAGE ERDSION AND SEDIMENT CONTROL MEASURE IS MAINTAINED.
   - III. LIMIT EXPOSURE TIME BY PROGRAMMING TO MINIMISE THE AREA OF LAND EXPOSED TO PDTENTIALLY ADVERSE WEATHER CONDITIONS AT ANY ONE TIME. I.E. PROGRESSIVELY CLEAR ANO REVEGETATE.
   - IV. PROVIDE CONTROL MEASURES INCLUDING TEMPORARY ANO PERMANENT DRAINAGE, ERDSIDN ANO SEDIMENT CONTROLS.
3. THE EROSION AND SEOIMENT CONTROL SHALL CDMPLY WITH BEST PRACTICE FOR ERDSIDN AND SEDIMENT CONTROL, THE POLLUTIDN CONTRDL MANUAL FDR URBAN STORMWATER MANAGEMENT, THE OUEENSLAND URBAN ORAINAGE MANUAL, AND THE SOIL EROSION AND SEDIMENT CONTROL - ENGINEERING GUIDELINES FOR OUEENSLAND (CURRENT EDITIONS).
4. CONSTRUCTION SEOUENCE THE CONSTRUCTION SEOUENCE WILL GENERALLY BE:
   - I. OBTAIN ALL NECESSARY PERMITS AND APPROVALS BEFORE SITE ESTABLISHMENTS.
   - II. HOLD A PRE-CDNSTRUCTION CONFERENCE.
   - III. STABILISE ALL CDNSTRUCTION ACCESS ROUTES ANO ENTRY/EXIT PDINTS.
   - IV. ESTABLISH SEDIMENT CONTROL STRUCTURES AND TEMPDRARY DRAINAGE CONTROL MEASURES AS NECESSARY.
   - V. CARRY OUT BULK EARTHWORKS.
   - VI. MAINTAIN AND REPAIR DRAINAGE, EROSION AND SEOIMENT CONTROL MEASURES.
   - VII. REMOVE SEOIMENT CONTROL MEASURES WHEN THE SITE IS STABILISEO. I.E. >70% GRDUND COVER
   - VIII. THE CONTRACTOR SHALL PREPARE A SUPPLEMENTARY EROSION AND SEDIMENT CONTROL PLAN TO SUIT HIS/HER CDNSTRUCTION METHOODLDGY, AND SUBMIT THIS PLAN FOR APPROVAL TD THE SUPERINTENDENT. IT SHDULD BE NDTED THAT ANY SIGNIFICANT VARIATIDN TO THIS PLAN MAY REQUIRE RESUBMISSIDN TO COUNCIL FOR APPROVAL. THE CLIENT SHALL NDT BE RESPONSIBLE FOR ANY SUCH ASSOCIATED DELAY.
5. ALL ESC OEVICES ARE TO BE INSPECTED WEEKLY, PRIOR TO EXPECTED AND AFTER RAINFALL ANY OAMAGE IS TO BE REPAIRED AS REQUIRED TO MAINTAIN THEIR EFFICACY.
6. ALL TEMPORARY EROSION AND SEDIMENT CONTROL (ESC) MEASURE TO BE MAINTAINED AND FULLY OPERATIONAL DURING THE MAINTENANCE PERIOD AND ARE TO BE REMOVED AFTER THE SATISFACTDRY CDMPLETIDN OF AN OFF-MAINTENANCE INSPECTIDN BY CDUNCIL AND PRIDR TO FORMAL ACCEPTANCE "OFF MAINTENANCE" BY COUNCIL.
7. PRIOR TO THE CDMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR IS TO PROVIDE A OETAILED PROGRAM TD THE SUPERINTENOENT SHOWING THE TIMING FOR ALL WDRKS ASSOCIATEO WITH THE PROJECT, NOMINATING, IN PARTICULAR, THE PROGRAM FOR INSTALLATION OF SOIL ANO EROSION CONTROL SYSTEMS.
8. EARTHWORKS SHALL BE CARRIED OUT IN SUCH A MANNER THAT THE SITE IS MAINTAINED IN A WELL DRAINED CONDITION, AREAS OF LOOSE SOIL ARE MINIMISED AND CONCENTRATIONS OF STORMWATER ARE MINIMISED. BULK EARTHWORKS WILL BE CARRIED OUT OVER THE ENTIRE SITE IN DNE STAGE.
9. A SHAKE DOWN AS DETAILED DN THE PLAN COMPRISING FREE DRAINAGE GRAVEL SHALL BE LOCATED ADJACENT TO THE POINT OF ACCESS WHERE VEHICLES CAN BE WASHED OOWN PRIOR TO EXIT TO THE STREET SYSTEM IF REQUIREO. THE WASH OOWN AREA SHALL BE KEPT FREE OF MUD.
10. FOR OETAILS OF ENTRY/EXIT SEDIMENT PAD REFER TO BEST PRACTICE EROSION & SEDIMENT CONTROL BOOK 1, PAGE 2.48, FIGURE 2.6.
11. SUPPLEMENTARY EROSION AND SEDIMENT CONTROL OEVICES MAY BE REDUIRED AT THE DISCRETION OF THE SUPERINTENDENT.
12. SEOIMENTATION FENCES TO BE PLACED AS SHDWN. FOR DETAILS OF SEDIMENT FENCE REFER BEST PRACTICE EROSIDN & SEDIMENT CONTROL BDOK 1, PAGE 2.50, FIGURE 2.8.
13. WHERE SEOIMENT FENCES ARE SHOWN TO BE CDNSTRUCTED IN AREAS OF SIGNIFICANT EARTHWORKS, ERECTION OF THE FENCE MAY BE DEFERRED UNTIL COMPLETION OF THE BULK EARTHWORKS, SUBJECT TO ABSENCE OF RAIN.

TREES

1. ENSURE COMPLIANCE WITH THE REQUIREMENTS OF AS4970 - TREES DN CONSTRUCTIDN SITES. THIS MAY REQUIRE CONSULTATION ANO GUIOANCE FROM A CLASS V CERTIFIEO ARBORIST AS TREES DUTSIOE THE IMMEOIATE WDRK AREA MAY BE AFFECTED.

EROSION AND SEDIMENT CONTROL NOTES

1. NO DISTURBED AREA IS TO REMAIN DENUDED LONGER THAN 60 DAYS.
2. ALL EROSION AND SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TD OR AS THE FIRST STEP IN CLEARING AND GRUBBING OR ANY OTHER EARTHWORKS OR TRENCHING.
3. ALL STORMWATER, SEWER LINE ANO SERVICES TRENCHES NOT IN STREETS ARE TO BE MULCHED AND SEEDEO WITHIN 15 OAYS AFTER BACKFILL, NO MDRE THAN 150 METRES ARE TO BE OPEN AT ANY ONE TIME.
4. ALL TEMPDRARY EARTH BANKS, DIVERSIONS AND SEDIMENT DAM EMBANKMENTS ARE TO BE MACHINE-COMPACTED, SEEDED AND MULCHEO FDR TEMPDRARY VEGETATIVE COVER WITHIN 10 OAYS AFTER GRADING. STRAW OR HAY MULCH IS REQUIRED.
5. ALL FILL EMBANKMENTS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE ENO OF EACH DAYS OPERATION.
6. ALL CUT AND FILL BATTERS ARE TO BE SEEDED AND MULCHED WITHIN 10 OAYS OF COMPLETIDN OF GRADING.
7. ADDITIONAL SILT AND EROSION CONTROLS MAY BE REQUIRED AS ORDERED ON SITE BY THE SUPERVISING ENGINEER.
8. ALL CONTROLS ARE TO BE INSPECTED AFTER EACH STDRM EVENT AND MAINTAINEO AS REQUIRED. CONTROLS ARE TO BE MAINTAINED UNTIL THE DISTURBEO AREAS ARE PERMANENTLY STABILIZED DR UNTIL NO LONGER REDUIRED.

PHASE 1 - CLEARING AND BULK EARTHWORKS

CDNSTRUCT AND MAINTAIN SILT FENCES, STRAW BALE TRAPS, ALLDTMENT ORAINAGE BANKS, CATCH DRAINS AND HYDRDMULCHING WHICH CONTROL SEDIMENT AND EROSION DURING CLEARING AND BULK EARTHWORKS.

PHASE 2 - TRENCH EXCAVATION

CONSTRUCT AND MAINTAIN SILT FENCES, STRAW BALE TRAPS, ALLOTMENT ORAINAGE BANKS AND CATCH DRAINS WHICH CONTROL SEDIMENTATION AND EROSION OURING TRENCHING WORK.

PHASE 3 - PAVEMENT CONSTRUCTION

CDNSTRUCT AND MAINTAIN SILT FENCES, STRAW BALE TRAPS, ALLDTMENT DRAINAGE BANKS, GULLY INLET PROTECTION, AND PIPE INLET/OUTLET PRDTECTION WHICH CONTROL SEDIMENTATIDN AND ERDSION DURING PAVEMENT CONSTRUCTIDN. SAND BAGGING TO BE PLACED ACRDSS PAVEMENT TO CONTRDL RUNDFF IN PAVEMENT BOXING AS OIRECTED DN SITE.

PHASE 4 - MAINTENANCE PERIOD

CONSTRUCT AND MAINTAIN CONTROLS ANO VEGETATIVE TREATMENTS WHICH CONTROL SEOIMENTATION ANO EROSION PRIOR TO THE ESTABLISHMENT OF GRASS COVER.
PROVIDE 600mm WIDE GRASS FILTER STRIPS BEHIND KERB ANO CHANNEL.

NOTE: TURF TREATMENT IN CERTAIN AREAS BY LANDSCAPER. REFER TO LANDSCAPE DRAWING.

NOTE

ALL VEHICLES EXITING FROM THE SITE ARE TD BE CLEANED ANO TREATED TO PREVENT MATERIAL BEING TRACKEO OR DEPOSITED ONTO PUBLIC ROADS.
IF MATERIAL IS ACCIDENTLY DEPOSITED ONTO PUBLIC ROAOS IT SHALL BE REMOVED WITHOUT DELAY. IF THE SHAKEOOWN DEVICE PROVES TO BE INEFFECTIVE THE CONTRACTOR IS TO USE OTHERS MEANS TO PREVENT MATERIAL BEING OEPOSITED ONTO PUBLIC ROADS.

TOPSOIL

1. STRIP AND STDCKPILE AVAILABLE TOPSOIL (ASSUMED AVERAGE DEPTH 150mm) FROM ALL DISTURBED AREAS PRIOR TD BULK EARTHWORKS. GRADE EVENLY BETWEEN ALLOTMENT FINISHED SURFACE LEVELS AND ENSURE LOTS ARE FREE DRAINING.
2. MINIMUM SLOPE ACROSS ALLOTMENTS TD BE 1%.
3. ALL FDDTPATHS, BATTERS, AND EARTHWORKS AFFECTED ALLDTMENTS ARE TO BE TOPSOILED TO A MINIMUM DEPTH OF 150mm (LIGHTLY COMPACTED) AND TURFEO WHERE SPECIFIED.

SEDIMENT FENCES

1. SEDIMENT FENCES TO BE PLACEO AS SHOWN. SEDIMENT FENCED TO BE REPAIREO ANO EXCESSIVE SEDIMENT DEPOSITS SHALL BE REMOVED ONCE CAPACITY FALLS BELOW 75%.
2. FOR OETAILS OF SEDIMENT FENCE REFER BEST PRACTICE EROSION & SEDIMENT CONTROL BOOK 1, PAGE 2.50, FIGURE 2.8.
3. SEDIMENT FENCES TO BE REPAIREO AS REDUIRED AND EXCESSIVE SEDIMENT DEPOSITS SHDULD BE REMOVED.
4. INSTALL KERB INLETS WITH GRAVEL RANGING FRDM 50mm TO 75mm IN SIZE SHALL BE INSTALLED AT ALL COMPLETED INLETS. REFER IPWEAD STANDARD DRAWING D-0041. THESE SHALL BE MAINTAINEO IN A CLEAN CONDITION. IN THE EVENT OF HEAVY RAIN THEY SHALL BE REMOVEO TO MINIMISE THE POTENTIAL FDR FLOODING.
5. CHECKS OF SILT CONTROL DEVICES ARE TO BE MADE WEEKLY, OR AFTER ANY SIGNIFICANT STORM EVENT TO ENSURE INTEGRITY ANO PERFDRMANCE.

TURFING

1. PROVIDE TURFING TO ENTIRE WIDTH DF ALL SWALES, FDDTPATHS, AND 1 IN 4 CUT ANO FILL BATTERS.
2. FOOTPATH BATTERS ARE TO BE STABILISED WITH TOPSOIL (ANO TURFED) AS SOON AS PRACTICAL AFTER THE BATTERS HAVE BEEN COMPLETED.

DURING CONSTRUCTION SEQUENCE:

1. TOPSOIL STOCKPILES SHALL BE LESS THAN 1m DEEP AND UNCDMPACTED. A SEDIMENTATIDN FENCE SHALL BE CDNSTRUCTED DN THE D/S SIDE, OR THE STOCKPILE STABILISED WITH VEGETATION, MULCH, OR A SOIL STABILISER.
2. SEDIMENTATION FENCES TD BE PLACED AS SHDWN.
3. REGULARLY INSPECT BANKS ANO REPAIR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD.
4. REMOVE SEOIMENT TO AVOID PONDING FROM CATCH DRAINS.
5. REMOVE EXCESSIVE SEDIMENT FROM UPSTREAM OF CHECK DAM.
6. ROAO RESERVE TO BE USED AS HAUL ROAD.
7. A CATCH DRAIN DR DIVERSIDN BANK IS TO BE PROVIDED ON THE TDP SIDE DF ALL CUTS, WITH DISCHARGE EITHER TO UNDISTURBED GRASS LANOS OR TD THE CROSS ROAO DRAINAGE.
8. SUPPLEMENTARY EROSION AND SEDIMENT CDNTROL DEVISED MAY BE REQUIRED AT THE DISCRETION DF THE ENGINEER.
9. WATER OUALITY SAMPLES MUST BE TAKEN AND ANALYSED PRIOR TO THE RELEASE OF ANY WATER FROM THE SEDIMENT POND. WATER QUALITY MUST SATISFY THE FOLLOWING CRITERIA: TSS<50MG/L PH BETWEEN 6.5 AND 8.5.
10. ALL WATER OUALITY OATA INCLUDING DATES OF RAINFALL, TESTING AND WATER RELEASE MUST BE MAINTAINED IN AN ON-SITE REGISTER. THIS REGISTER IS TD BE MAINTAINED FDR THE DURATIDN OF THE APPROVEO WDRKS ANO BE AVAILABLE ON SITE FOR INSPECTIDN BY COUNCIL OFFICERS ON REQUEST.
11. EXPOSED AREAS ON LDTS ARE TD BE SEEDED AND MULCHEO (E.G. HYDROMULCHED). MULCH SHALL BE APPLIED AT A MINIMUM RATE DF 2.5T/HA. ALTERNATIVELY THEY SHALL BE ORILL-SEEDED AND IRRIGATED SO AS TD ENSURE >70% GROUND COVER WITHIN 14 OAYS FROM NOVEMBER TO APRIL, OR 30 OAYS FROM MAY TO OCTOBER.

FOLLOWING CONSTRUCTION:

1. SEDIMENTATIDN FENCES TO BE MAINTAINED UNTIL TURFING IS COMPLETED.
2. SEDIMENT BASINS TD BE CHECKED AFTER EVERY SIGNIFICANT STORM AND DESILTED ONCE THE SETTLEMENT LIMIT HAS BEEN REACHED.

DO NOT SCALE THIS DRAWING
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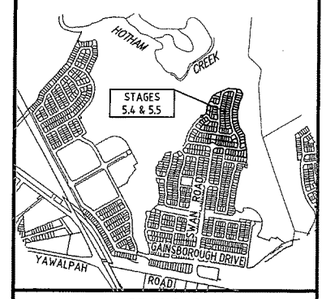
KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director - ~~RPEQ 1988~~
RAL RPEQ 12505 9.2.16

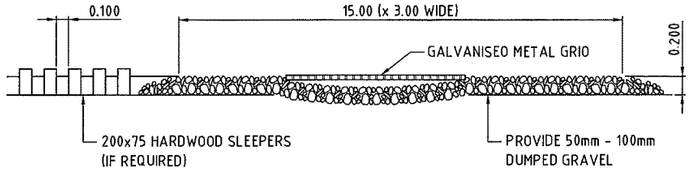
Drawing Title

EROSION AND SEDIMENT CONTROL NOTES

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	46 of 61

	Drawing No	Revision
A1	15-184-46	A



SITE ACCESS POINT SHAKEDOWN FACILITY
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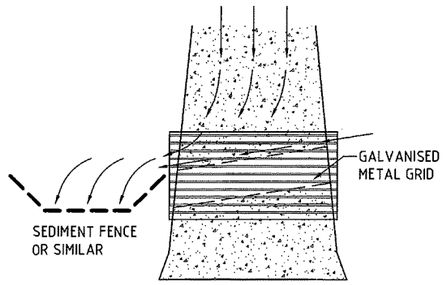

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ENTRY/EXIT PAD
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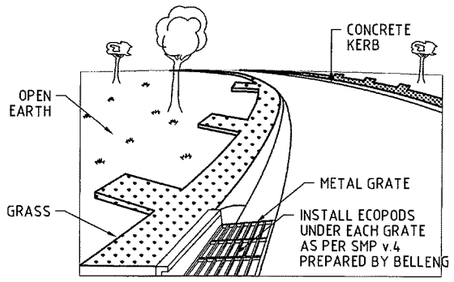
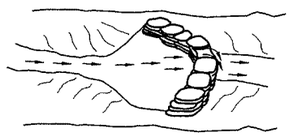
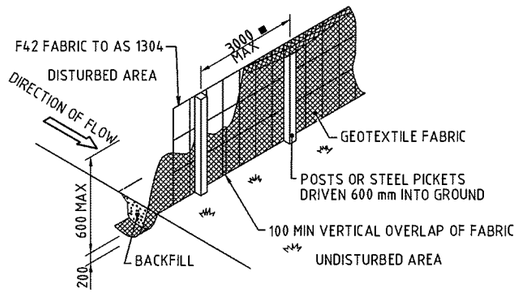


TURF STRIP DETAIL
N.T.S.



SANDBAG CHECK DAM
N.T.S.



SEDIMENT FENCE
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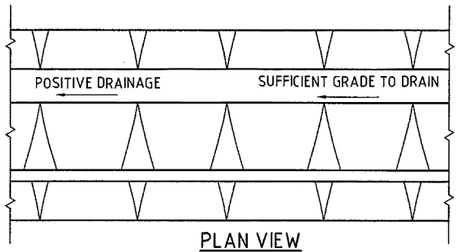
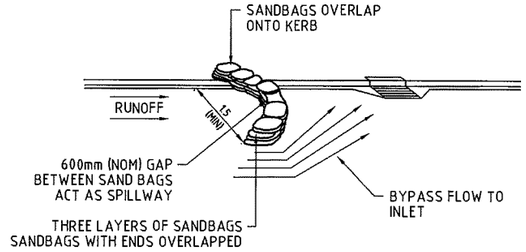
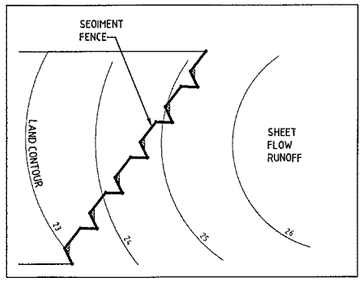
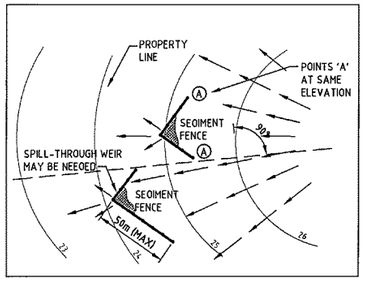


PLAN VIEW
N.T.S.

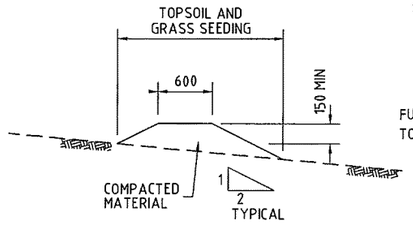


ON GRADE GULLY INLET
N.T.S.

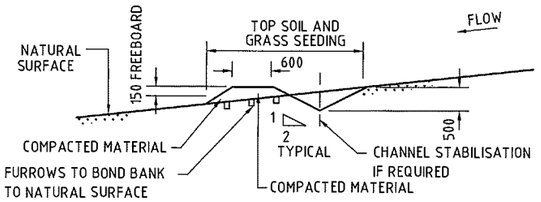




SILT FENCE DETAILS
N.T.S.



DIVERSION DRAINAGE BANK
N.T.S.

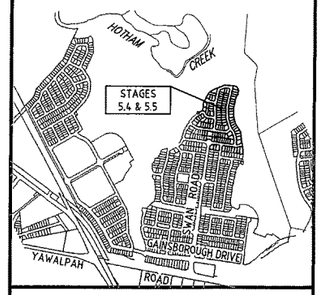


PLACE FILTER FABRIC ACROSS DRAIN AT 30m MAXIMUM INTERVALS AND AT OUTLET OF DRAIN, OR AS REQUIRED TO CONTROL SEDIMENT MOVEMENT ALONG DRAIN.

CATCHMENT DRAIN
N.T.S.

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS URBAN MASTERPLANNING EXPERTISE
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD
CONSULTING ENGINEERS

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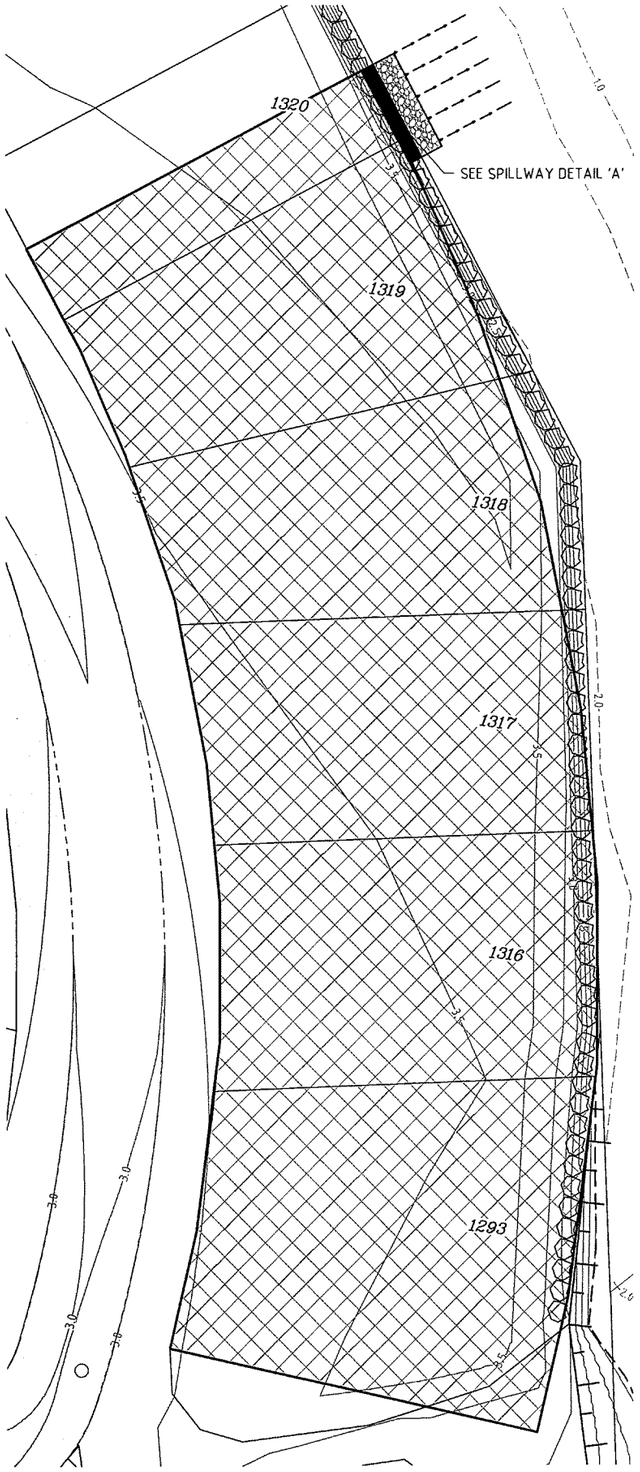
ABN 35 112 053 611

Approved ~~Director~~ RPEQ 1988
RMcL RPEQ12805 9.2.16

Drawing title

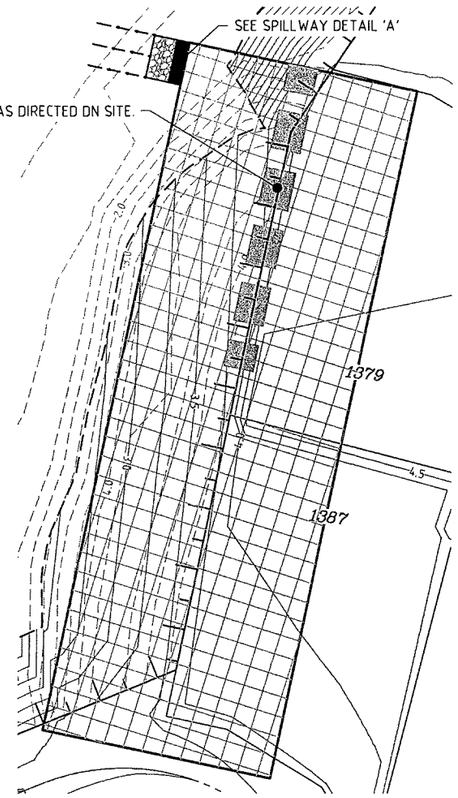
EROSION AND SEDIMENT CONTROL DETAILS

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 47 of 61
A1	Drawing No: 15-184-47		Revision: A



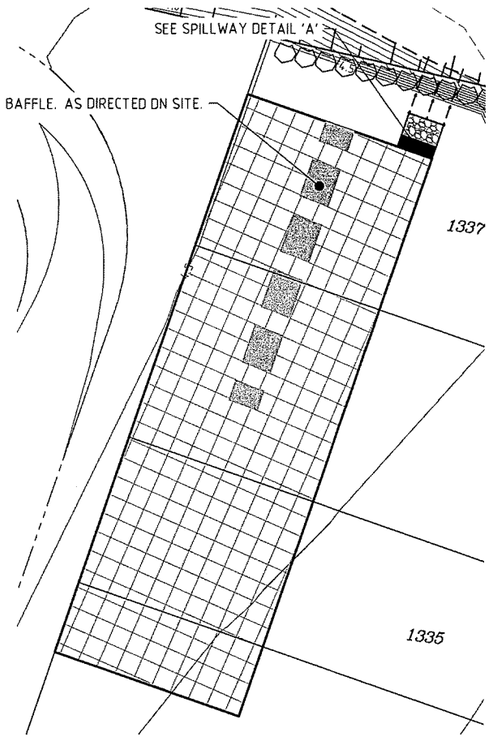
TEMPORARY SEDIMENT BASIN 'A'

SCALE 1 : 250



TEMPORARY SEDIMENT BASIN 'B'

SCALE 1 : 250



TEMPORARY SEDIMENT BASIN 'C'

SCALE 1 : 250

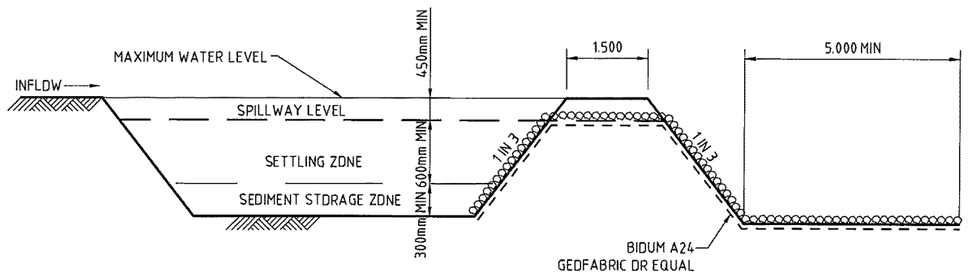
Job No 15-184
Client: Mirvac
Project: Gainsborough Greens 5.4/5.5

KN GROUP PTY LTD

GAINSBOROUGH GREENS STAGE 5.4/5.5

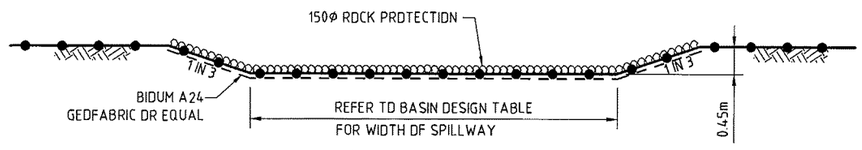
Basin Design	**Temp** Basin A	**Temp** Basin B	**Temp** Basin C	
R(y%5day)	48.8	48.8	48.8 mm	Table B5 (85th%)
Soil Type Clay	Clay	Clay	Clay	
Cv	0.8	0.8	0.8	Table B7 (Clay)
Effective catchment area (A)	4.38	1.70	1.17 Ha	
Vs (volume of settling zone)	1708.0	663.7	456.8 m3	Vs = 10.R(y%5day) Cv A
settling depth	0.6	0.6	0.6 m	
Area of basin	2846.7	1106.1	761.3 m2	
Base width	30.8	19.2	15.9 m	
Base length	92.4	57.6	47.8 m	
settling zone Volume check	1708.0	663.7	456.8 m3	= required volume therefore ok Volume matches ultimate volume for ulitimate bio-basin
Spillway Design				
Less than 3month operation	Q10	Q10	Q10	
3-12month operation	Q20	Q20	Q20	
greater than 12 months	Q100	Q100	Q100	
Intensity for a 20 year, 6 min event	217.0	217.0	217.0 mm/hr	(GCCC)
C10 value	0.88	0.88	0.88	Factor by 1.05 for C20
Effective catchment area (a)	4.4	1.7	1.2 Ha	
Q (flow rate)	2.4	0.9	0.7 m3/s	flow to design for
(n)	0.025	0.025	0.025	(velocity check for rock rip rap)
width of spillway	8.5	3.5	3.0 m	
yc = 2/3H depth of flow over spillway	0.20	0.18	0.17 m	(Maximum 0.45m, IECA 2008, Page B.35)
gradient of spill way "wings"	2.0	2.0	2.0 :1	
area spillway (using gradient 2:1)	1.78	0.71	0.56	area (cross section) of spillway
perimeter	9.4	4.3	3.7 m	wetted perimeter
Slipway outlet slope (S)	0.25	0.10	0.25	
(R)	0.19	0.16	0.15 m	(area/wetted perimeter)
Velocity (V)	6.6	3.8	5.6 m/s	V=R^(2/3) * S^(1/2) / n
Check against design flow (Q)	11.7	2.7	3.1 m3/s	QK
Bottom velocity (V)	4.6	2.7	3.9 m/s	
Weir Flow Calculation (H)	0.3	0.275	0.25 m	Maximum Depth above weir
Check on against design flow rate (Q)	2.5	1.0	0.7 m3/s	OK refer Table A21 IECA

Summary	Basin A	Basin B	Basin C	
Depth of weir	0.45	0.45	0.45 m	
settling depth	0.60	0.60	0.60 m	
storage depth	0.3	0.3	0.3 m	
Total depth	1.35	1.35	1.35 m	
Base width	30.8	19.2	15.9 m	
Base Length	92.4	57.6	47.8 m	
Spillway width	8.5	3.5	3.0 m	
Weir Rock Diameter Size	500	200	500 mm	Sized using QUDM figure 8.13



TYPICAL BASIN DETAIL

N.T.S.



SPILLWAY DETAIL A

N.T.S.

LEGEND

CATCHDRAIN (TEMPORARY)

TEMPORARY SEDIMENT BASIN

ROCK SPILLWAY

SCALE

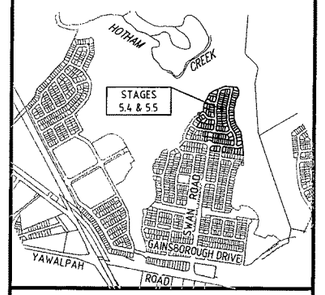
5 0 5 10 15 20 25m

1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS · LANDPARTNERS · VEE · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD
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Approved Director - RPEQ 1988
RCT RPEQ 12005 9.2.16

Drawing Title

EROSION AND SEDIMENT CONTROL
BASIN NOTES AND DETAILS

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 48 of 61
A1	Drawing No: 15-184-48		Revision: A

REFER KN DWG 15-184-50

REDUNDANT SEWER LINE TO BE REMOVED AND PROPOSED SEWER LINES 47 & 49 CONSTRUCTED IN ACCORDANCE WITH SEQ SEWER CODE.

FORTESCUE STREET

YATALA STREET

LITCHFIELD LANE

LIVINGSTONE CIRCUIT

WHITSUNDAY CIRCUIT

STAGE 5.5

STAGE 5.4

PARK

PARK

(IF REQ.)

LEGEND

- CONSTRUCTION BOUNDARY
- PROPOSED SEWER MAIN
- EXISTING SEWER MAIN
- STORMWATER MAIN
- WATER MAIN
- SEWER TRUNK MAIN
- DRIVEWAY POSITION INDICATED
- BATTER LINE
- KERB AND CHANNEL
- FINISHED SURFACE CONTOURS
- DEFINES LIVE CONNECTION UNDER GOLD COAST WATER SUPERVISION AT DEVELOPER'S EXPENSE
- CONTROL POINT
- FLOW ARROW

SEWER MANHOLE LEGEND

- MH 1/26 MANHOLE
- MS 1/26 MAINTENANCE SHAFT
- E E/26 END OF LINE
- B51 BEND

SEWER RETICULATION - LAYOUT PLAN

SCALE 1:500

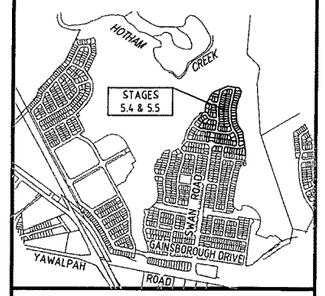
SCALE 10 5 0 10 20 30 40 50m

1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

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PRECINCT 5
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Approved Director - RPEQ 1988 RPEQ12505 92.16

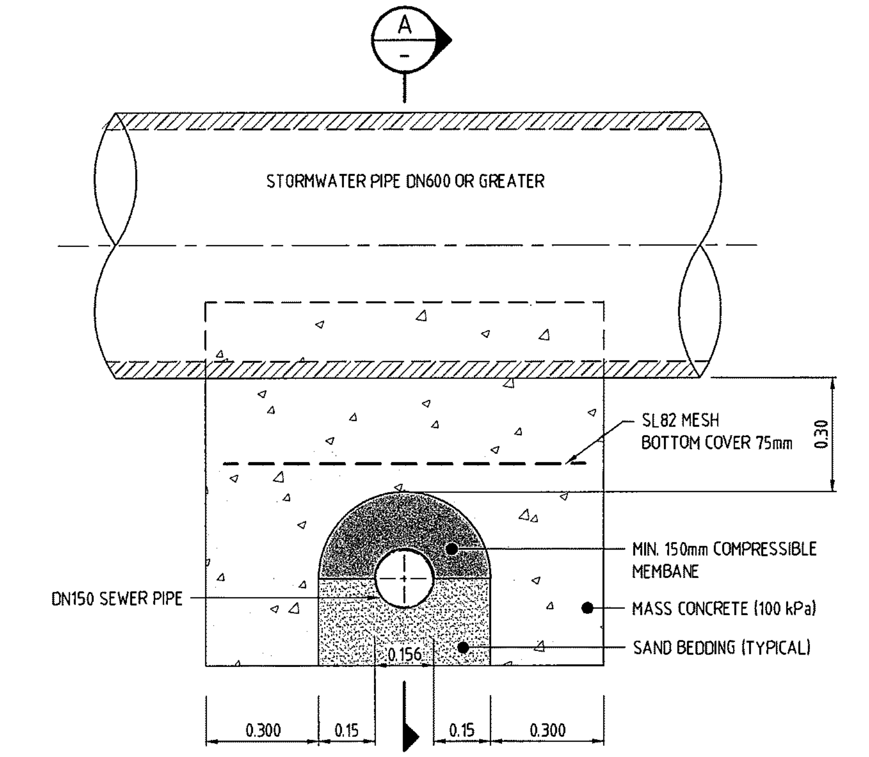
Drawing Title

SEWERAGE RETICULATION
LAYOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

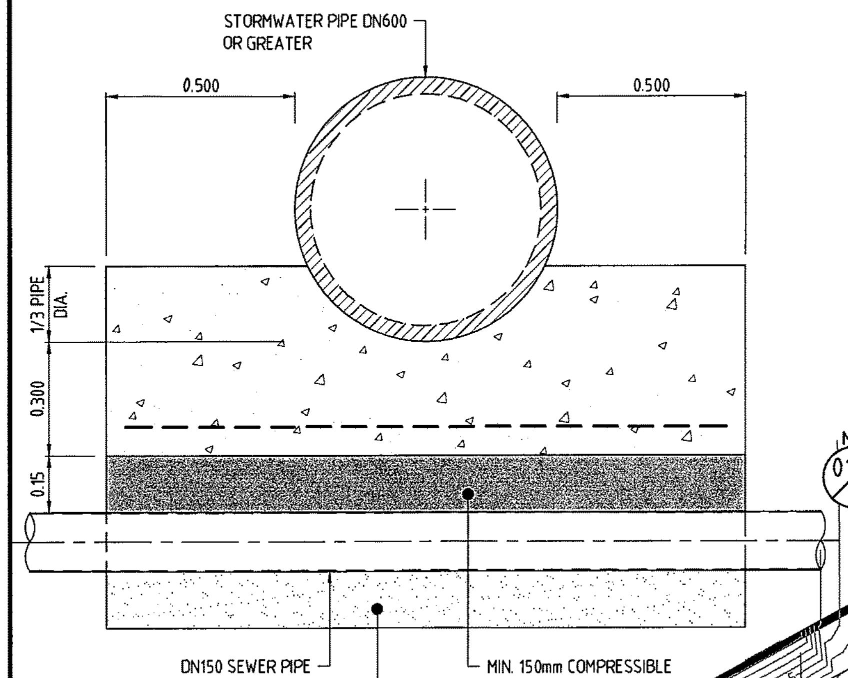
Scale	Sheet
AS SHOWN	49 of 61

	Drawing No	Revision
A1	15-184-49	A



TYPICAL BRIDGING DETAIL

SCALE 1:10



A – SECTION

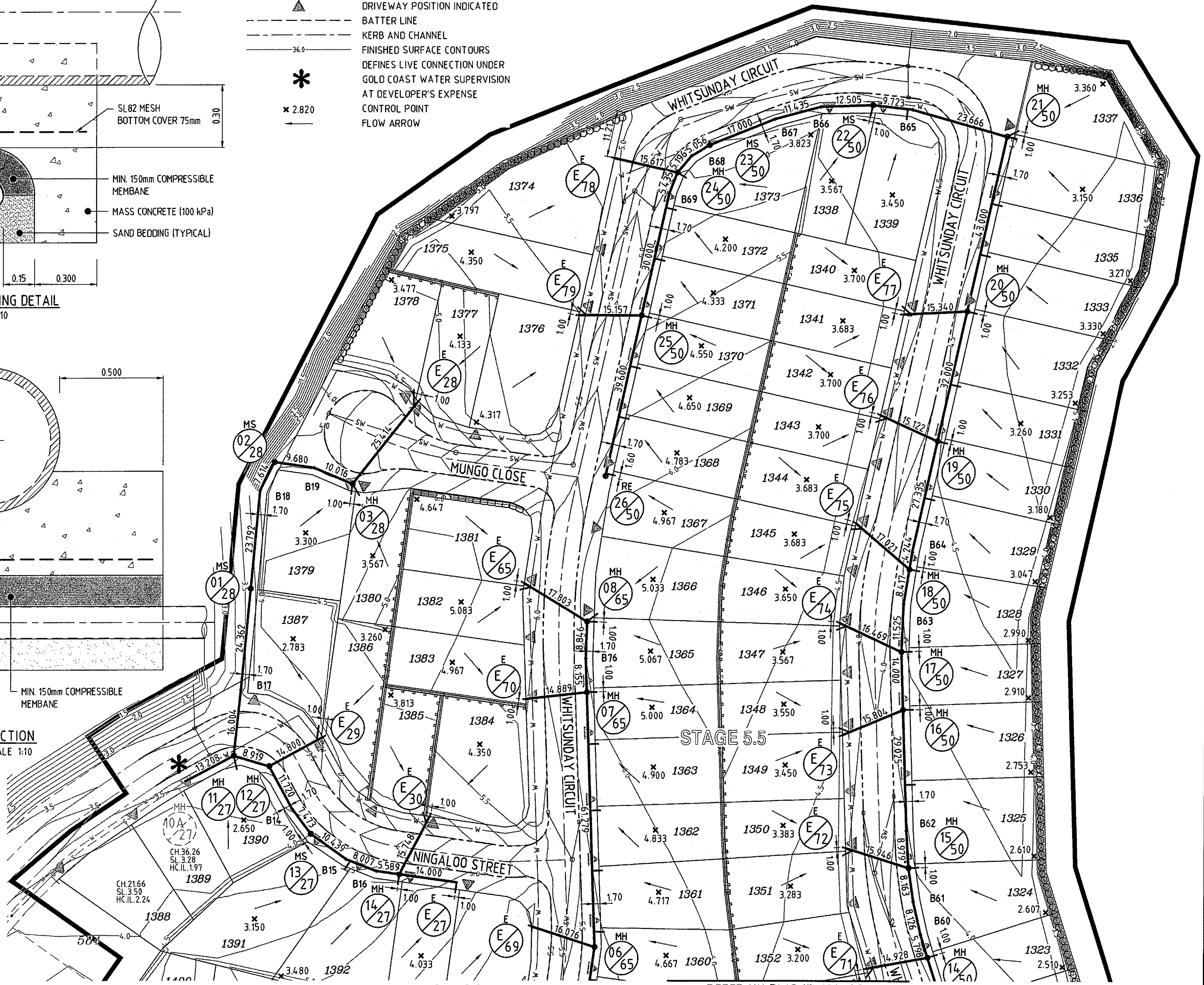
SCALE 1:10

LEGEND

	CONSTRUCTION BOUNDARY
	PROPOSED SEWER MAIN
TS	PROPOSED TRUNK SEWER MAIN
S	EXISTING SEWER MAIN
SW	STORMWATER MAIN
W	WATER MAIN
TS	SEWER TRUNK MAIN
	DRIVEWAY POSITION INDICATED
	BATTER LINE
	KERB AND CHANNEL
36.0	FINISHED SURFACE CONTOURS
	DEFINES LIVE CONNECTION UNDER
*	GOLD COAST WATER SUPERVISION AT DEVELOPER'S EXPENSE
× 2.820	CONTROL POINT
	FLOW ARROW

SEWER MANHOLE LEGEND

MH 1/26	MANHOLE
MS 1/26	MAINTENANCE SHAFT
RE E/26	RODDING END
E E/26	END OF LINE
B51	BEND



SEWER RETICULATION - LAYOUT PLAN

SCALE 1:500

REFER KN DWG 15-184-49

SCALE 1 : 10 (A1 UNREDUCED)

SCALE 1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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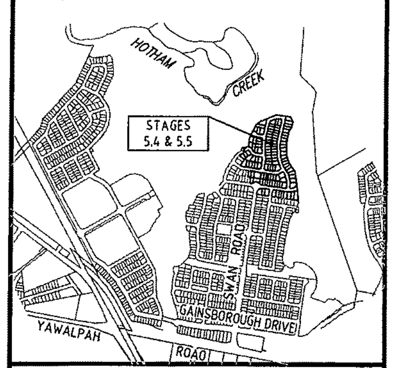
NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS · LANDPARTNERS · VEE · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director - RPEQ 1988

RPEQ 12855 9.2.16

Drawing Title

SEWERAGE RETICULATION
LAYOUT PLAN
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	50 of 61

	Drawing No	Revision
A1	15-184-50	A

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SDUTH EAST QUEENSLAND SEWERAGE CODE AND LOGAN WATER SPECIFICATIONS AND STANDARDS.
2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDAROS.
3. THE CONSTRUCTION DF THE SEWERAGE WORK SHOWN DN THIS DRAWING SHALL BE SUPERVISED BY AN ENGINEER WHD HAS R.P.E.Q. REGISTRATIDN. SEWERAGE WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TD CDNNECT INTO THE SEO SERVICE PROVIDER SEWERAGE SYSTEM.
4. ALL WDRK ASSDCIATED WITH LIVE SEWERS OR MAINTENANCE HOLES SHALL BE CARRIED OUT BY LDGAN WATER AT THE DEVELOPERS COST.
5. ALL PIPES ANO MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE "ACCEPTED PRODUCTS AND MATERIALS" LIST.
6. EACH ALLDTMENT SHALL BE SERVED BY A DN100 PVC PROPERTY CONNECTION. FOR ALLOTMENTS OTHER THAN SINGLE RESIDENTIAL, A DN150 PVC PROPERTY CONNECTION SHALL BE PROVIDED.
7. PROPERTY CONNECTIONS SHALL BE LOCATED WITHIN THE PROPERTY AS SHOWN IN THE DRAWINGS.
8. PROPERTY CONNECTION BRANCHES SHALL EXTEND INTD THE PROPERTY A MINIMUM OF 300mm AND A MAXIMUM OF 750mm. LOGAN WATER REQUIRE MINIMUM EXTENSION OF 500mm INTO PROPERTY.
9. WHERE PIPES ARE LAID IN FILL, THE FILLING SHALL BE CARRIED OUT IN LAYERS NOT EXCEEDING 300mm (LOOSE) IN DEPTH AND SHALL BE COMPACTED UNTIL THE COMPACTION IS NOT LESS THAN 95% OF THE MATERIALS MAXIMUM COMPACTIDN WHEN TESTED IN ACCORDANCE WITH A.S. 1289 (MODIFIED COMPACTION). TESTING SHALL BE CARRIED OUT AFTER EACH ALTERNATE LAYER. IN ALL SUCH CASES APPROVAL OF CONSTRUCTED SEWERS WILL NOT BE ISSUED BY THE SEO SERVICE PRDVIDER UNLESS CERTIFICATES ARE PRODUCED CERTIFYING THAT THE REQUIRED COMPACTIDN HAS BEEN ACHIEVED.
10. WHERE SEWERS HAVE A GRADE OF 1 in 20 OR STEEPER, BULKHEADS ANO TRENCH STOPS SHALL BE CDNSTRUCTED IN ACCDRDANCE WITH TABLE 8.1 OF THE SEQ WS&S D&C CODE.
11. THE CONTRACTOR SHALL VERIFY THE LOCATIDN AND DEPTH DF EXISTING SERVICES WITH RELEVANT AUTHORITIES BEFORE COMMENCING WORKS.
12. SEWERS SHALL BE DISUSED/ABANDDNED IN ACCDRDANCE WITH PROCEDURES SET OUT IN THE SEQ SEWER CODE.
13. BENCHMARK LEVELS TO AHD. REFER COVER SHEET KN DWG 14-181-01.
14. EXISTING ALLOTMENTS REQUIRING A PROPERTY CONNECTION FROM EXISTING SEWERS SHALL BE PROVIDED BY LDGAN WATER AT THE DEVELOPERS COST.
15. CONTRACTOR SHALL VERIFY FINISHED SURFACE LEVELS DN SITE BEFORE CONSTRUCTION OF SEWERS AND HOUSE CONNECTION BRANCHES.
16. FINISHED SURFACE LEVELS SHOWN ON THE LDNGITUDINAL SECTIONS ARE INDICATIVE ONLY. MANHOLE COVERS TO BE CONSTRUCTED AS PER STD OG NO SEQ-SEW-1308-1.
17. VACUUM TESTING OF ALL SEWER MANHOLES AND PIPELINES ARE REQUIRED TO THE SEQ D&C SEWERAGE CDDE - LDGAN WATER SPECIFICATIONS.
18. PRIOR TO COMMENCING WORKS/CDNSTRUCTIDN TD LIVE SEWERS, KN GROUP PTY LTD IS TO BE NOTIFIED OF PROPOSED TIMING TO ALLOW NDTIFICATIDN TD LDGAN WATER REPRESENTATIVES.
19. MANHDLES TO CONFORM TO STD DWG SEQ-SEW-1307-1.
20. BENDS TO CONFORM TO SEQ SEW-1314-3.
21. RODDING ENDS TO CONFORM TO SEQ-SEW-1314-1.
22. ALL DICL SEWER PIPE TO BE CALCIUM ALUMINATE LINED TD AS1281.
23. PRDPERTY CDNNECTION BRANCHES SHALL BE CONSTRUCTED AS PER STD DWG SEO-SEW-1104-1, SEQ-SEW-1105-1 AND SEQ-SEW-1303-1.
24. FOR HOUSE CONNECTIDN INSPECTION TEE LDCATIDN MARKER ARRANGEMENT REFER SEO-SEW-1104-1.
25. THE CONTRACTOR SHALL LAYOUT THE WATER RETICULATION MAINS ADJACENT TO SEWERAGE MAINTENANCE SHAFTS TO ENSURE THAT LOADINGS FROM THRUST BLDCKS ARE LDCATED WITH A MINIMUM OF 1m SEPARATION TO A MAINTENANCE SHAFT RISER.
26. THE CONTRACTOR WILL PROVIDE A MINIMUM OF TWO ADDITIONAL DENSITY TEST RESULTS PER 20m (OR PART THERE OF) IN ALL LOCATIONS WHERE THE WATER MAIN PLAN LAYDUT IS CONVEX ANO HAS THRUST BLOCKS SUPPORTED ON SEWERAGE TRENCH BACKFILL.
27. REFER TO KN DWG 11-121-SK1 FOR DETAILS OF SEWER HOUSE CONNECTIONS.

2B. SEWER MANHOLES ARE TO BE OFFSET AS PER KN DWG 11-151-SK1 WHERE WATER AND SEWER ARE IN THE SAME VERGE.

VEGETATION PROTECTION

A. TREES LOCATED ALDNG THE FDDTPATH SHOULD BE, WHERE POSSIBLE TRANSPLANTED PRIOR TO CONSTRUCTION, OR REPLACED IF DESTROYED.

B. WHEN WORKING WITHIN 4m DF TREES, RUBBER DR HAROWOOO GIRDLES SHALL BE CONSTRUCTED WITH 1.8m BATTENS CLDSELY SPACED AND ARRANGEMENT VERTICALLY FROM GROUND LEVEL. GIROLES MUST BE STRAPPED TO TREES PRIOR TD CDNSTRUCTIDN AND REMAIN UNTIL COMPLETION.

C. TREE ROOTS SHOULO BE TUNNELLED UNDER, RATHER THAN SEVERED. IF ROOTS ARE SEVERED THE DAMAGED AREA SHALL BE TREATED WITH A SUITABLE FUNGICIDE. CDNTACT RELEVANT COUNCIL ARBORIST FOR FURTHER AOVICE.

O. ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPRDVED ARBORIST.

SOIL

A. TOPSOIL AND SUBSOIL SHALL BE STDCKPILED SEPARATELY.

B. CARE SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STDRMWATER SYSTEM. THIS MAY INVOLVE PLACING APPROPRIATE SEDIMENT CONTROLS ARDUND STDCKPILES.

REHABILITATION

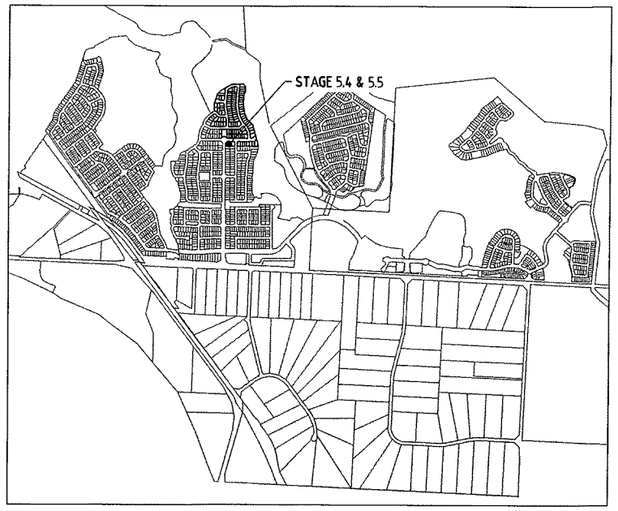
A. PREDISTURBANCE SDIL PRDFILES AND COMPACTION LEVELS SHALL BE REINSTATED.

B. PREDISTURBANCE VEGETATION PATTERNS SHOULD BE RESTORED.

SAFETY

A. THE DESIGN AND CDNSTRUCTIDN DF THE WORKS SHALL COMPLY WITH ALL QUEENSLAND LEGISLATION.

ALL ENVIRDNMENT PRDTECTIDN MEASURES SHDULD BE IMPLEMENTED PRIOR TO ANY CONSTRUCTION WDRK, INCLUDING CLEARING, COMMENCING.



LOCALITY PLAN
SCALE NTS

NAME OF ESTATE		GAINSBOROUGH GREENS STAGE 5.4
SUBDIVIDER		MIRVAC
APPLICATION No.		-
SP DELEGATE APPROVAL DATE		-
DRAWING PLAN No.		-
No. OF ALLOTMENTS		24
AREA IN Ha.		1.67B
LENGTH	150mm	306.127m
DF SEWERS	225mm	-

NAME OF ESTATE		GAINSBOROUGH GREENS STAGE 5.5
SUBDIVIDER		MIRVAC
APPLICATION No.		-
SP DELEGATE APPROVAL DATE		-
DRAWING PLAN No.		-
No. OF ALLOTMENTS		96
AREA IN Ha.		6.48B
LENGTH	150mm	1290.874m
OF SEWERS	225mm	-

STAGE 5.4 - LIVE SEWER WORKS TABLE

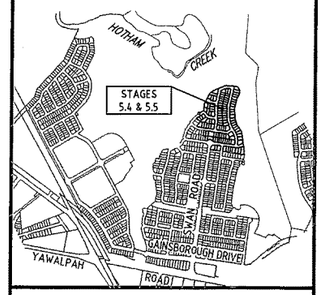
No.	DESCRIPTION	DIA. SEWER	MH No.	MH/MS TYPE	COVER TYPE	LOT No.	F.S.L.	E.S.L.	I.L.	DEPTH TO INVERT
1(A)	CONTRACTOR TO BREAK INTO (UNDER GOLD COAST WATER SUPERVISION) EXISTING MANHOLE 05/41 AND CONSTRUCT A 150 mm STUB (TEMPDRARILY END CAP) PRIOR TO START OF CONSTRUCTION.	150	05/41	MS	(B)	1282	5.053	5.044	2.630	2.423
1(B)	0.5m FROM STUB END CAP, CDNTRACTDR TD LAY NEW LINE 41. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY GOLD COAST WATER.									
1(C)	CONTRACTOR TO REMOVE (UNDER GOLD COAST WATER SUPERVISION) TEMPORARY END CAPS ON STUB & LINE 41 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL 'ON MAINTENANCE' INSPECTION.									
2(A)	CONTRACTOR TO BREAK INTO (UNDER GOLD COAST WATER SUPERVISION) EXISTING MANHDLE 06/50 AND CONSTRUCT A 150 mm STUB (TEMPDRARILY END CAP) PRIOR TO START OF CONSTRUCTION.	150	06/50	MS	(B)	1292	2.823	1.917	0.036	2.787
2(B)	0.5m FROM STUB END CAP, CONTRACTOR TO LAY NEW LINE 50. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY GOLD COAST WATER.									
2(C)	CONTRACTOR TO REMOVE (UNDER GOLD COAST WATER SUPERVISION) TEMPORARY END CAPS ON STUB & LINE 50 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL 'ON MAINTENANCE' INSPECTIDN.									

STAGE 5.5 - LIVE SEWER WORKS TABLE

No.	DESCRIPTION	DIA. SEWER	MH No.	MH/MS TYPE	COVER TYPE	LOT No.	F.S.L.	E.S.L.	I.L.	DEPTH TO INVERT
3(A)	CONTRACTOR TO BREAK INTO (UNDER GOLD COAST WATER SUPERVISION) EXISTING MANHOLE 10/50 AND CONSTRUCT A 150 mm STUB (TEMPORARILY END CAP) PRIOR TO START OF CONSTRUCTION.	150	10/50	MS	(B)	1316	3.293	3.218	0.697	2.596
3(B)	0.5m FROM STUB END CAP, CONTRACTOR TO LAY NEW LINE 50. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY GOLD COAST WATER.									
3(C)	CONTRACTOR TD REMOVE (UNDER GDLD CDAST WATER SUPERVISION) TEMPORARY END CAPS ON STUB & LINE 50 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL 'ON MAINTENANCE' INSPECTION.									
4(A)	CONTRACTOR TO BREAK INTO (UNDER GOLD COAST WATER SUPERVISION) EXISTING MANHOLE 02/47 AND CONSTRUCT A 150 mm STUB (TEMPORARILY END CAP) PRIOR TD START OF CONSTRUCTION.	150	02/47	P	(8)	586	4.991	4.14B	2.330	2.661
8(B)	0.5m FROM STUB END CAP, CONTRACTOR TO LAY NEW LINE 47. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY GOLD COAST WATER.									
8(C)	CONTRACTOR TO REMOVE (UNDER GOLD COAST WATER SUPERVISION) TEMPORARY END CAPS ON STUB & LINE 47 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL 'ON MAINTENANCE' INSPECTION.									
5(A)	CONTRACTOR TO BREAK INTO (UNDER GOLD COAST WATER SUPERVISION) EXISTING MANHOLE 10A/27 AND CONSTRUCT A 150 mm STUB (TEMPORARILY END CAP) PRIOR TD START OF CONSTRUCTIDN.	150	10A/27	MS	(D)	1390	3.453	1.718	1.690	1.763
5(B)	0.5m FROM STUB END CAP, CONTRACTOR TO LAY NEW LINE 27. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY GOLD COAST WATER.									
5(C)	CONTRACTOR TO REMOVE (UNDER GOLD COAST WATER SUPERVISION) TEMPORARY END CAPS ON STUB & LINE 27 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL 'ON MAINTENANCE' INSPECTION.									

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client
mirvac

Project
GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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Approved Director - RPEQ 1988
RPEQ12805 92-16

Drawing Title
SEWERAGE RETICULATION NOTES

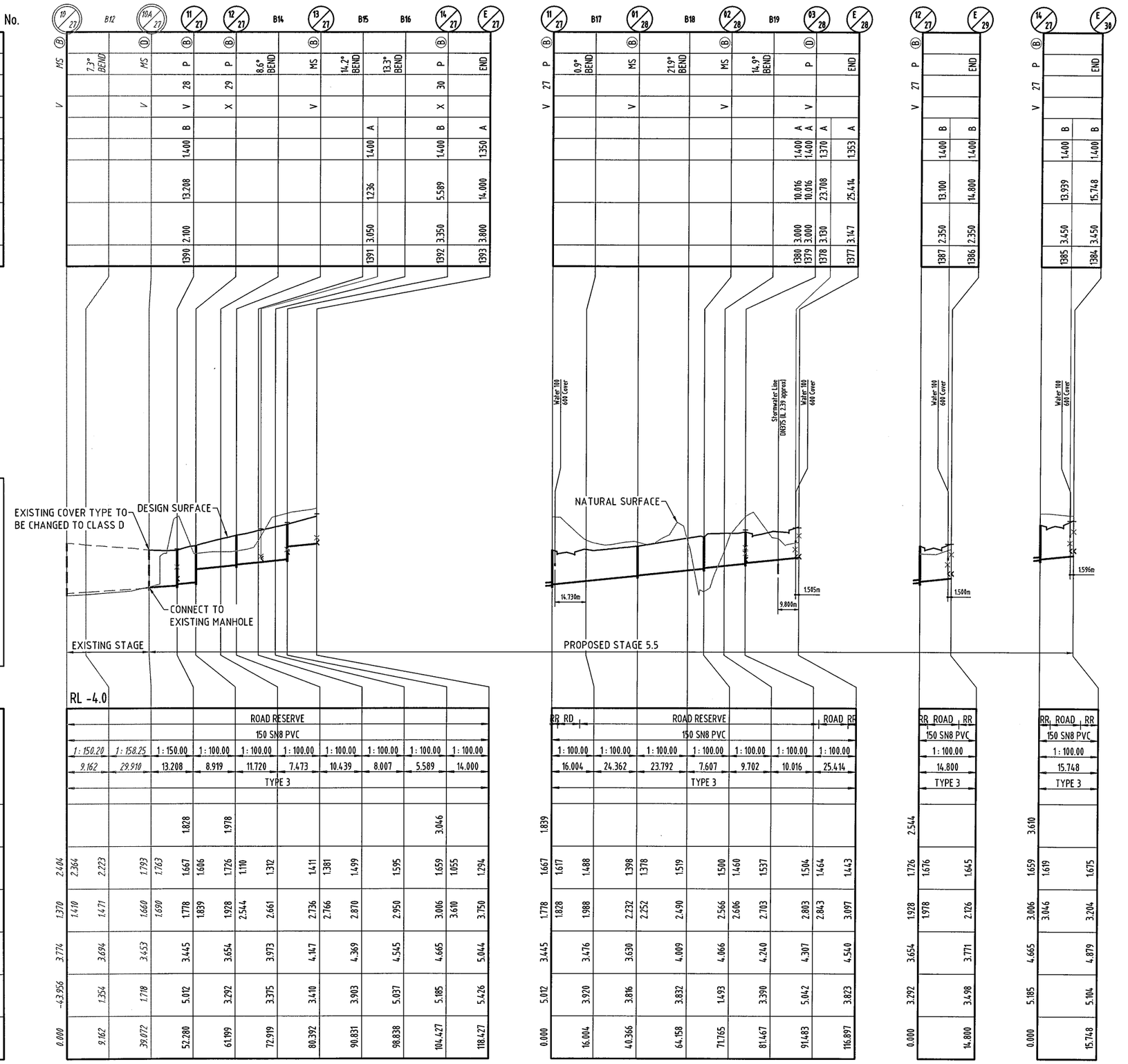
Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	51 of 61

	Drawing No	Revision
A1	15-184-51	A

MAINTENANCE HOLE/SHAFT No.	10/27	B12	10A/27	11/27	12/27	B14	13/27	B15	B16	14/27	E/27	11/27	B17	01/28	B18	02/28	B19	03/28	E/28	12/27	E/29	14/27	E/30
MH/MS COVER TYPE	Ⓑ		Ⓓ	Ⓑ	Ⓑ		Ⓑ			Ⓑ		Ⓑ		Ⓑ		Ⓑ		Ⓓ		Ⓑ		Ⓑ	
MH/MS TYPE	MS	7.3° BEND	MS	P	P	8.6° BEND	MS	14.2° BEND	13.3° BEND	P	END	P	0.9° BEND	MS	21.9° BEND	MS	14.9° BEND	P	END	P	END	P	END
BRANCH LINE No.				28	29					30		27								27		27	
BRANCH DROP TYPE	V		V	V	X		V			X		V		V		V		V		V		V	
HC TYPE				B					A	B	A							A	A	B	B	B	B
HC DEPTH				1.400					1.400	1.400	1.350							1.400	1.400	1.400	1.400	1.400	1.400
HC CH. TO DS MH/MS				13.208					1.236	5.589	14.000							10.016	10.016	13.100	14.800	13.939	15.748
HC INVERT LEVEL				2.100					3.050	3.350	3.800							3.000	3.000	2.350	2.350	3.450	3.450
HC LOT No.				1390					1391	1392	1393							1380	1379	1387	1386	1385	1384

LOCATION																							
PIPE DIAMETER																							
GRADE	1:150.20	1:158.25	1:150.00	1:100.00	1:100.00	1:100.00	1:100.00	1:100.00	1:100.00	1:100.00		1:100.00	1:100.00	1:100.00	1:100.00	1:100.00	1:100.00	1:100.00		1:100.00		1:100.00	
LENGTH	9.162	29.910	13.208	8.919	11.720	7.473	10.439	8.007	5.589	14.000		16.004	24.362	23.792	7.607	9.702	10.016	25.414		14.800		15.748	
EMBEDMENT TYPE					TYPE 3										TYPE 3					TYPE 3		TYPE 3	
JUNCTION INVERT LEVEL				1.828	1.978					3.046		1.839								2.544		3.610	
DEPTH OF INVERT BELOW FSL	2.404	2.364	2.223	1.793	1.763	1.667	1.606	1.726	1.110	1.312	1.411	1.381	1.499	1.595	1.659	1.055	1.294	1.667	1.617	1.488	1.398	1.378	1.519
INVERT LEVEL (IL)	1.370	1.410	1.471	1.660	1.690	1.778	1.839	1.928	2.544	2.661	2.736	2.766	2.870	2.950	3.006	3.610	3.750	1.778	1.828	1.988	2.232	2.252	2.490
FINISHED SURFACE LEVEL (FSL) *	3.774		3.694	3.453		3.445		3.654		3.973	4.147		4.369	4.545	4.665		5.044	3.445		3.476	3.630		4.009
EXISTING SURFACE LEVEL (ESL)	-43.956		1.354	1.718		5.012		3.292		3.375	3.410		3.903	5.037	5.185		5.426	5.012		3.920	3.816		3.832
CHAINAGE (CH)	0.000	9.162	39.072		52.280	61.199	72.919	80.392	90.831	98.838	104.427	118.427	0.000	16.004	40.366	64.158	71.765	81.467	91.483	116.897	0.000	14.800	0.000	15.748



NOTES:

1. PROPERTY CONNECTION TYPES REFER SEQ D&C CODE STD. DWGs No. SEQ-SEW-1104 & SEQ-SEW-1105.
2. MAINTENANCE STRUCTURE TYPES AND DROPS REFER SEQ D&C CODE STD DWG SEQ-SEW-1300 SET.
3. MAINTENANCE STRUCTURE COVER TYPES REFER SEQ D&C CODE STD DWG SEQ-SEW-1308 SET.

LEGEND:

MAINTENANCE HOLE TYPES
- A = CONCRETE 1.000ø
- B = CONCRETE 1.200ø
- C = CONCRETE 1.500ø
- P = TYPE 'P3' PRE-CAST CONCRETE
- MS = TYPE 'MS' MAINTENANCE SHAFT
- RE = RODDING END
- @ = 150ø HCB FOR DUPLEX LOTS

Ⓑ = CLASS B NON-TRAFFICABLE
Ⓓ = CLASS D TRAFFICABLE

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSION H' TABLE AS PER STD. DWG. No. SEQ-SEW-1308-1

\# DENOTES BRIDGING STRUCTURE BETWEEN STORMWATER AND SEWER MAIN. REFER KNG DWG No. 15-184-50 FOR DETAIL.

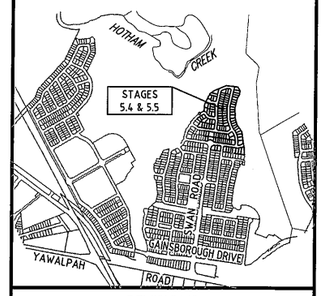
SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS · LANDPARTNERS · VEE · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

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EMAIL kng@knpl.com.au

ABN 35 112 053 611

Approved ~~Director~~ - RPEQ 1988 9.2.16

Drawing Title

SEWERAGE RETICULATION
LONGITUDINAL SECTION
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	52 of 61

	Drawing No	Revision
A1	15-184-52	A

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

MAINTENANCE HOLE/SHAFT No.

Line 41

	04/41	05/41	06/41	07/41	E/41
MH/MS COVER TYPE	B	B	B	B	
MH/MS TYPE	A	MS	P	P	END
BRANCH LINE No.	45	41 / 46	46B		
BRANCH DROP TYPE	V	V	V	V	
HC TYPE			B	B	B
HC DEPTH			1.400	1.400	1.400
HC CH. TO DS MH/MS			22.294	16.700	15.202
HC INVERT LEVEL			4.150	4.100	4.100
HC LOT No.			1283	1284	1299

Line 46B

	06/41		E/46B
MH/MS COVER TYPE	B		
MH/MS TYPE	P		END
BRANCH LINE No.	41		
BRANCH DROP TYPE	W		
HC TYPE		B	B
HC DEPTH		1.400	1.400
HC CH. TO DS MH/MS		14.674	16.579
HC INVERT LEVEL		4.150	4.150
HC LOT No.		1301	1300

Line 47

	01/47	02/47	03/47		04/47		E/47
MH/MS COVER TYPE	B	B	B		B		
MH/MS TYPE	A	P	P		P		END
BRANCH LINE No.	48	49	49A				
BRANCH DROP TYPE	V	V	W		V		
HC TYPE			B	B	B	B	B
HC DEPTH			1.400	1.400	1.400	1.400	1.400
HC CH. TO DS MH/MS			14.356	14.356	16.658	15.795	17.844
HC INVERT LEVEL			3.850	3.850	4.050	4.150	4.150
HC LOT No.			1305	PARK	1306	1396	1395

Line 49

	02/47		E/49
MH/MS COVER TYPE	B		
MH/MS TYPE	P		END
BRANCH LINE No.	47		
BRANCH DROP TYPE	X		
HC TYPE		B	B
HC DEPTH		1.400	1.400
HC CH. TO DS MH/MS		13.107	14.808
HC INVERT LEVEL		3.650	3.650
HC LOT No.		1399	1398

Line 49A

	03/47	E/49A
MH/MS COVER TYPE	B	
MH/MS TYPE	P	END
BRANCH LINE No.	47	
BRANCH DROP TYPE	W	
HC TYPE		B
HC DEPTH		1.400
HC CH. TO DS MH/MS		14.823
HC INVERT LEVEL		3.850
HC LOT No.		1397

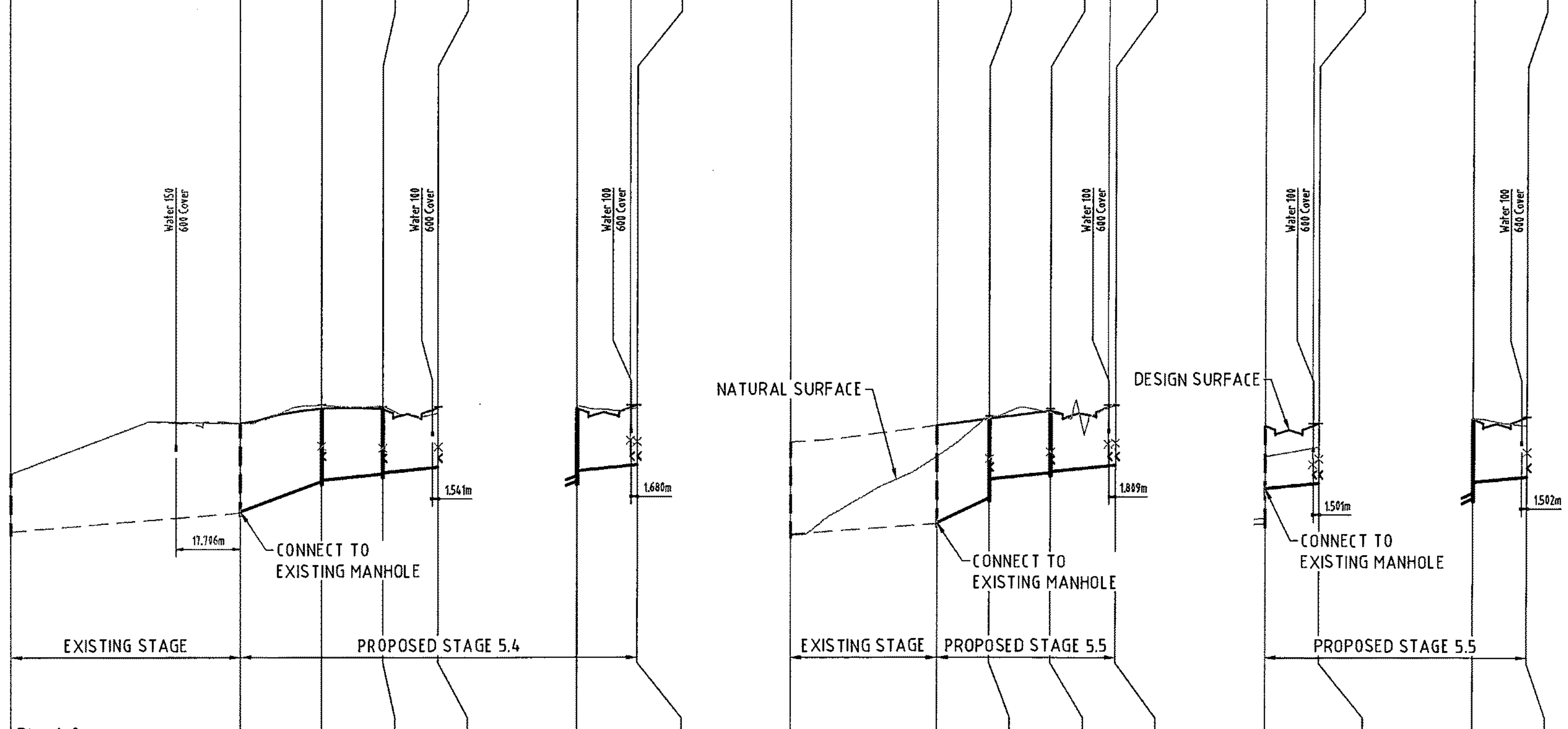
LEGEND:

MAINTENANCE HOLE TYPES
- A = CONCRETE 1.000ø
- B = CDNCRETE 1.200ø
- C = CONCRETE 1.500ø
- P = TYPE 'P3' PRE-CAST CONCRETE
- MS = TYPE 'MS' MAINTENANCE SHAFT
- RE = ROODING ENO
- @ = 150ø HCB FOR DUPLEX LOTS

- (B) = CLASS B NON-TRAFFICABLE
- (D) = CLASS O TRAFFICABLE

NOTES:

1. PROPERTY CONNECTION TYPES REFER SEO D&C COOE STD. OWGs No. SED-SEW-1104 & SED-SEW-1105.
2. MAINTENANCE STRUCTURE TYPES AND OR0PS REFER SED D&C CODE STD DWG SEO-SEW-1300 SET.
3. MAINTENANCE STRUCTURE COVER TYPES REFER SED D&C COOE STD OWG SEO-SEW-1308 SET.



DATUM

RL -4.0

Line 41

LOCATION	ROAD	ROAD RESERVE		ROAD, RR
PIPE DIAMETER	150 SN8 PVC			
GRADE	1 : 123.79	1 : 26.76	1 : 100.00	1 : 100.00
LENGTH	63.131	22.294	16.700	15.202
EMBEDMENT TYPE	TYPE 3			

	04/41	05/41	06/41	07/41	E/41
JUNCTION INVERT LEVEL		3.490 / 3.320	3.750		
DEPTH OF INVERT BELOW FSL	2.530 / 1.578	2.453 / 2.423	1.986 / 1.956	1.781 / 1.741	1.621
INVERT LEVEL (IL)	2.060 / 2.090	2.600 / 2.630	3.463 / 3.493	3.660 / 3.700	3.852
FINISHED SURFACE LEVEL (FSL) *	3.668	5.053	5.449	5.441	5.473
EXISTING SURFACE LEVEL (ESL)	75.732	5.044	5.537	5.525	5.319
CHAINAGE (CH)	0.000	63.131	85.425	102.125	117.327

LINE 41

Line 46B

LOCATION	RR, RDAD, RR
PIPE DIAMETER	150 SN8 PVC
GRADE	1 : 100.00
LENGTH	16.579
EMBEDMENT TYPE	TYPE 3

	06/41	E/46B
JUNCTION INVERT LEVEL	3.493	
DEPTH OF INVERT BELOW FSL	1.986 / 1.699	1.632
INVERT LEVEL (IL)	3.463 / 3.750	3.916
FINISHED SURFACE LEVEL (FSL) *	5.449	5.548
EXISTING SURFACE LEVEL (ESL)	5.537	5.464
CHAINAGE (CH)	0.000	16.579

LINE 46B

Line 47

LOCATION	RDAD RESERVE			ROAD, RR
PIPE DIAMETER	150 SN8 PVC			
GRADE	1 : 138.83	1 : 21.00	1 : 100.00	1 : 100.00
LENGTH	40.262	14.356	16.658	17.844
EMBEDMENT TYPE	TYPE 3			

	01/47	02/47	03/47	04/47	E/47
JUNCTION INVERT LEVEL		3.272	3.456		
DEPTH OF INVERT BELOW FSL	2.524 / 2.524	2.681 / 2.661	2.163 / 1.650	1.699 / 1.659	1.653
INVERT LEVEL (IL)	2.020 / 2.020	2.310 / 2.330	3.014 / 3.527	3.694 / 3.734	3.912
FINISHED SURFACE LEVEL (FSL) *	4.544	4.991	5.177	5.393	5.565
EXISTING SURFACE LEVEL (ESL)	45.175	4.148	5.184	5.353	5.603
CHAINAGE (CH)	0.000	40.262	54.618	71.276	89.120

LINE 47

Line 49

LOCATION	RR, ROAD, RR
PIPE DIAMETER	150 SN8 PVC
GRADE	1 : 100.00
LENGTH	14.808
EMBEDMENT TYPE	TYPE 3

	02/47	E/49
JUNCTION INVERT LEVEL	2.330	
DEPTH OF INVERT BELOW FSL	2.681 / 1.719	1.632
INVERT LEVEL (IL)	2.310 / 3.272	3.420
FINISHED SURFACE LEVEL (FSL) *	4.991	5.052
EXISTING SURFACE LEVEL (ESL)	4.148	4.398
CHAINAGE (CH)	0.000	14.808

LINE 49

Line 49A

LOCATION	RR, RD, RR
PIPE DIAMETER	150 SN8 PVC
GRADE	1 : 100.00
LENGTH	14.823
EMBEDMENT TYPE	TYPE 3

	03/47	E/49A
JUNCTION INVERT LEVEL	3.527	
DEPTH OF INVERT BELOW FSL	2.163 / 1.721	1.631
INVERT LEVEL (IL)	3.014 / 3.456	3.604
FINISHED SURFACE LEVEL (FSL) *	5.177	5.235
EXISTING SURFACE LEVEL (ESL)	5.184	4.974
CHAINAGE (CH)	0.000	14.823

LINE 49A

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSIDN H' TABLE AS PER STD. OWG. No. SEO-SEW-1308-1

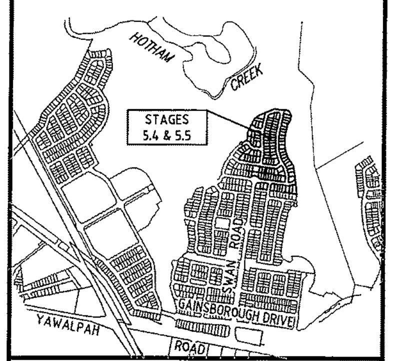
# DENOTES BRIDGING STRUCTURE BETWEEN STORMWATER ANO SEWER MAIN. REFER KNG DWG No. 15-184-50 FOR DETAIL.

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants: BURCHILLS ENGINEERING SOLUTIONS; LANDPARTNERS built environment consultants; VEE; DesignFlow

Client: mirvac

Project: GAINSBOROUGH GREENS PRECINCT 5 STAGE 5.4 & 5.5

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ABN 35 112 053 611

Approved ~~Director RPEQ 1988~~ RMcL RPEQ 12805 9.2.16

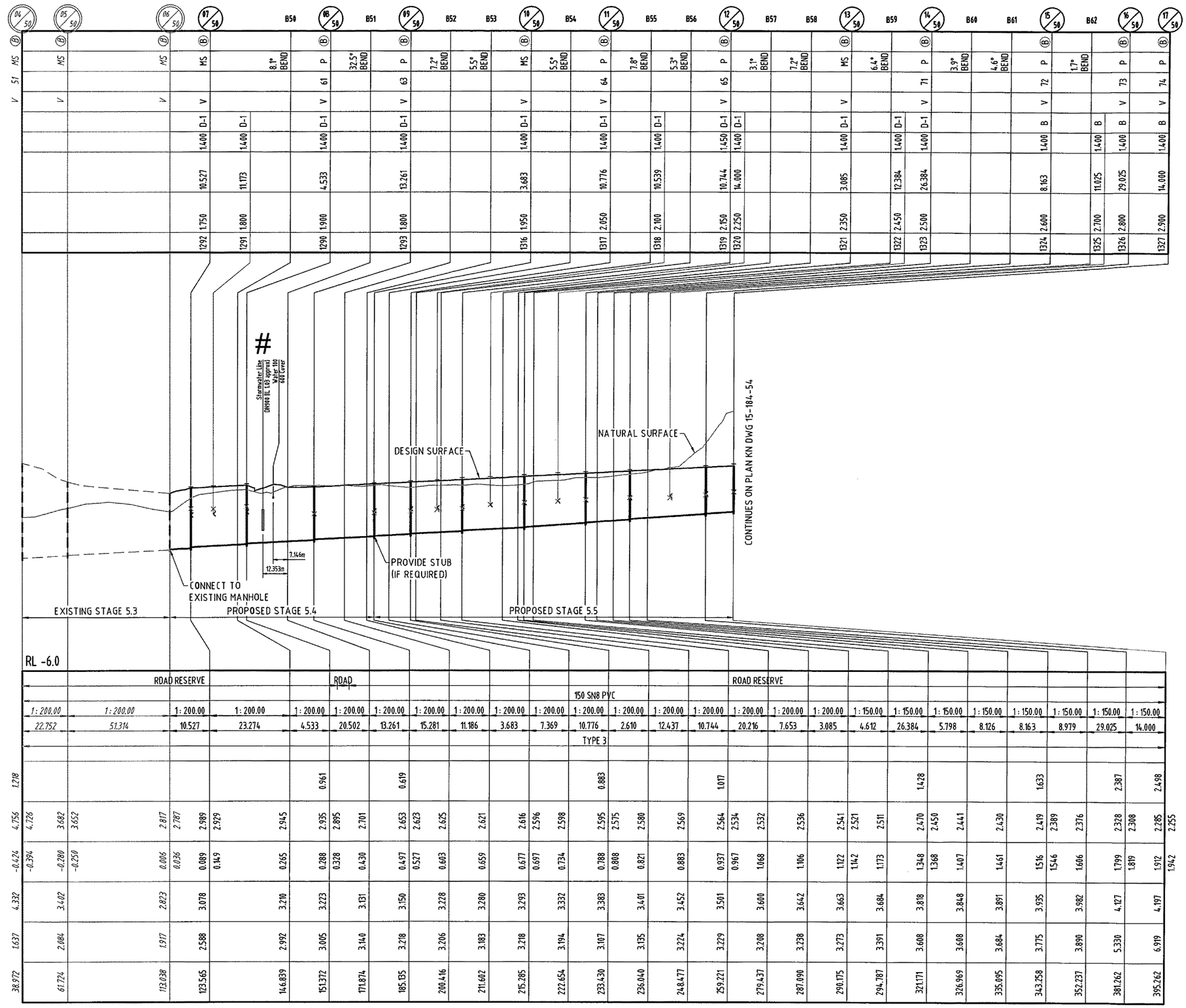
Drawing Title: SEWERAGE RETICULATION LONGITUDINAL SECTION SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet	Drawing No	Revision
AS SHOWN	53 of 61	A1 15-184-53	A

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

MAINTENANCE HOLE/SHAFT No.	04/50	05/50	06/50	07/50	B50	08/50	B51	09/50	B52	B53	10/50	B54	11/50	B55	B56	12/50	B57	B58	13/50	B59	14/50	B60	B61	15/50	B62	16/50	17/50
MH/MS COVER TYPE	Ⓑ	Ⓑ	Ⓑ	Ⓑ		Ⓑ		Ⓑ			Ⓑ		Ⓑ			Ⓑ			Ⓑ		Ⓑ			Ⓑ		Ⓑ	Ⓑ
MH/MS TYPE	MS	MS	MS	MS	8.1° BEND	P	32.5° BEND	P	7.2° BEND	5.5° BEND	MS	5.5° BEND	P	7.8° BEND	5.3° BEND	P	3.1° BEND	7.2° BEND	MS	6.4° BEND	P	3.9° BEND	4.6° BEND	P	1.7° BEND	P	P
BRANCH LINE No.	S1					61		63					64			65					71			72		73	74
BRANCH DROP TYPE	V	V	V	V		V		V			V		V			V			V		V			V		V	V
HC TYPE				D-1	D-1	D-1		D-1			D-1		D-1			D-1	D-1		D-1		D-1	D-1		B		B	B
HC DEPTH				1.400	1.400	1.400		1.400			1.400		1.400	1.400		1.450	1.400		1.400		1.400	1.400		1.400		1.400	1.400
HC CH. TO DS MH/MS				10.527	11.173	4.533		13.261			3.683		10.776	10.539		10.744	14.000		3.085		12.384	26.384		8.163		11.025	29.025	14.000
HC INVERT LEVEL				1.750	1.800	1.900		1.800			1.950		2.050	2.100		2.150	2.250		2.350		2.450	2.500		2.600		2.700	2.800	2.900
HC LOT No.				1292	1291	1290		1293			1316		1317	1318		1319	1320		1321		1322	1323		1324		1325	1326	1327



DATUM																											
LOCATION			1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:200.00	1:150.00	1:150.00	1:150.00	1:150.00	1:150.00	1:150.00	1:150.00	1:150.00
PIPE DIAMETER			22.752	51.314	10.527	23.274	4.533	20.502	13.261	15.281	11.186	3.683	7.369	10.776	2.610	12.437	10.744	20.216	7.653	3.085	4.612	26.384	5.798	8.126	8.163	8.979	29.025	14.000
GRADE																											
LENGTH																											
EMBEDMENT TYPE																											
JUNCTION INVERT LEVEL	1.218						0.961		0.619					0.883			1.017					1.428			1.633		2.387	2.498
DEPTH OF INVERT BELOW FSL	4.756	4.726	3.682	3.652	2.817	2.787	2.989	2.929	2.945	2.935	2.895	2.701	2.653	2.623	2.625	2.621	2.616	2.596	2.598	2.595	2.575	2.580	2.569	2.564	2.534	2.532	2.536	2.541	2.521	2.511	2.470	2.450	2.441	2.430	2.419	2.389	2.376	2.328	2.308	2.285	2.255
INVERT LEVEL (IL)	-0.424	-0.394	-0.280	-0.250	0.006	0.036	0.089	0.149	0.265	0.288	0.328	0.430	0.497	0.527	0.603	0.659	0.677	0.697	0.734	0.788	0.808	0.821	0.883	0.937	0.967	1.068	1.106	1.122	1.142	1.173	1.348	1.368	1.407	1.461	1.516	1.546	1.606	1.799	1.819	1.912	1.942
FINISHED SURFACE LEVEL (FSL) *	4.332		3.402		2.823		3.078		3.210	3.223		3.131	3.150		3.228	3.280	3.293		3.332	3.383		3.401	3.452	3.501		3.600	3.642	3.663		3.684	3.818		3.848	3.891	3.935		3.982	4.127		4.197	
EXISTING SURFACE LEVEL (ESL)	1.637		2.084		1.917		2.588		2.992	3.005		3.140	3.218		3.206	3.183	3.218		3.194	3.107		3.135	3.224	3.229		3.208	3.238	3.273		3.391	3.608		3.608	3.684	3.775		3.890	5.330		6.919	
CHAINAGE (CH)	38.972		61.724		113.038		123.565		146.839	151.372		171.874	185.135		200.416	211.602	215.285		222.654	233.430		236.040	248.477	259.221		279.437	287.090	290.175		294.787	321.171		326.969	335.095	343.258		352.237	381.262		395.262	
LINE																																										

50

LEGEND:

MAINTENANCE HOLE TYPES
- A = CONCRETE 1.000ϕ
- B = CONCRETE 1.200ϕ
- C = CONCRETE 1.500ϕ
- P = TYPE 'P3' PRE-CAST CONCRETE
- MS = TYPE 'MS' MAINTENANCE SHAFT
- RE = RODDING END
- @ = 150ϕ HCB FOR DUPLEX LOTS

Ⓑ = CLASS B NON-TRAFFICABLE
Ⓓ = CLASS D TRAFFICABLE

NOTES:

1. PROPERTY CONNECTION TYPES REFER SEQ D&C CODE STD. DWGs No. SEQ-SEW-1104 & SEQ-SEW-1105.
2. MAINTENANCE STRUCTURE TYPES ANO OROPS REFER SEQ D&C COOE STD DWG SEQ-SEW-1300 SET.
3. MAINTENANCE STRUCTURE COVER TYPES REFER SED D&C COOE STD DWG SEQ-SEW-1308 SET.

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSION H' TABLE AS PER STD. DWG. No. SEQ-SEW-1308-1

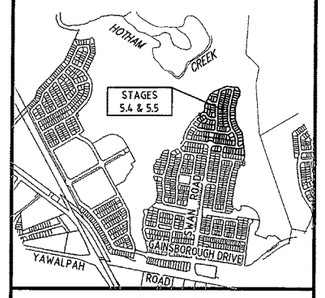
\# DENOTES BRIDGING STRUCTURE BETWEEN STORMWATER AND SEWER MAIN. REFER KNG OWG No. 15-184-50 FOR DETAIL.

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS · LANDPARTNERS · vee · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

LEVEL 2 - 71 GREY STREET
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ABN 35 112 053 611

Approved Director RPEQ 1988
RM.L RPEQ 12905 9.2.16

Drawing Title

SEWERAGE RETICULATION
LONGITUDINAL SECTION
SHEET 3

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	54 of 61

A1	Drawing No	Revision
	15-184-54	A

MAINTENANCE HOLE/SHAFT No.	17/50	B63	18/50	B64	19/50	20/50	21/50	B65	22/50	B66	B67	23/50	B68	24/50	B69	25/50	26/50
MH/MS COVER TYPE	Ⓑ		Ⓑ		Ⓑ	Ⓑ	Ⓑ		Ⓑ			Ⓑ		Ⓑ		Ⓑ	
MH/MS TYPE	P	6.8° BEND	P	3.5° BEND	P	P	P	9.5° BEND	P	13.4° BEND	6.4° BEND	MS	18.6° BEND	P	8.6° BEND	P	RODDING END
BRANCH LINE No.	74		75		76	77								78		79	
BRANCH DROP TYPE	V		V		V	V	V		V			V		V		W	
HC TYPE	B		B	B	B	B	B	B	A					A	A	A	
HC DEPTH	1.400		1.400	1.400	1.400	1.400	1.400	1.400	1.298					1.400	1.400	1.400	
HC CH. TO DS MH/MS	14.000		8.417	13.335	27.335	32.000	14.000	43.000	1.240					5.196	3.500	16.000	
HC INVERT LEVEL	2.900		3.000	3.100	3.150	3.300	3.250	3.150	3.100	3.102				3.650	3.750	3.900	
HC LOT No.	1327		1328	1329	1330	1332	1333	1335	1336	1337	1339			1373	1372	1371	

MAINTENANCE HOLE/SHAFT No.	08/50	B74	01/61	02/61	03/61	E 61	02/61	E 62	09/50	E 63
MH/MS COVER TYPE	Ⓑ		Ⓑ	Ⓑ	Ⓑ		Ⓑ		Ⓑ	
MH/MS TYPE	P	14.2° BEND	MS	P	P	END	P	END	P	END
BRANCH LINE No.	50			62			61		50	
BRANCH DROP TYPE	X		V	W	V		V		V	
HC TYPE			B	B-1	D-1	B	B	B	B	B
HC DEPTH			1.400	1.400	1.400	1.400	1.400	1.400	1.400	1.400
HC CH. TO DS MH/MS			8.834	43.000	27.155	14.804	13.569	14.991	14.868	
HC INVERT LEVEL			2.000	2.700	3.550	3.550	2.800	2.800	1.800	
HC LOT No.			1289	1286	1285	1298	1295	1296	1294	

CONTINUES ON PLAN KN DWG 15-184-53

NATURAL SURFACE

DESIGN SURFACE

Water 180 Ø63 Cover

Stormwater Line DN375 (IL 2.31 approx)

Water 180 Ø63 Cover

Stormwater Line DN375 (IL 2.25 approx)

Water 180 Ø63 Cover

Stormwater Line DN825 (IL 1.26 approx)

Water 180 Ø63 Cover

#

4.064m

1.540m

6.502m

1.519m

6.584m

1.501m

7.495m

PROPOSED STAGE 5.5

PROPOSED STAGE 5.4

RL -4.0

	ROAD RESERVE						ROAD		ROAD RESERVE								
	150 SN8 PVC																
	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 100.00	1 : 100.00	1 : 87.03	
	11.525	8.417	4.244	27.335	32.000	43.000	23.672	9.723	12.505	11.435	17.000	5.056	5.196	5.435	30.000	39.600	
	TYPE 3																
2.498		2.603		2.758	2.879								3.590		3.974		
2.285	2.255	2.236	2.216	2.157	2.137	2.060	2.040	1.611	1.571	1.278	1.224	1.194	1.218	1.291	1.373	1.343	1.382	1.464	1.434	1.453	1.498	1.055	1.055
1.912	1.942	2.019	2.075	2.095	2.124	2.306	2.326	2.539	2.559	2.846	2.886	3.044	3.108	3.138	3.222	3.298	3.411	3.441	3.475	3.510	3.540	3.594	3.894	4.337	4.792
4.197	4.259	4.311	4.327	4.463	4.599	4.457	4.322	4.332	4.440	4.589	4.784	4.857	4.974	5.047	5.392	5.847	
6.319	6.290	6.168	6.559	7.096	5.456	3.256	3.114	3.625	4.521	4.968	4.770	4.529	4.532	4.791	6.537	8.820	
395.262	406.787	415.204	419.448	446.783	478.783	521.783	545.455	555.178	567.683	579.118	596.118	601.174	606.370	611.805	641.805	681.405	
LINE	50																

	ROAD RESERVE						ROAD	RR	RR	ROAD	RR	RR	RD	RR			
	150 SN8 PVC								150 SN8 PVC			150 SN8 PVC					
	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00				1 : 100.00			1 : 100.00					
	9.454	8.834	43.000	27.155	14.804				14.991			14.868					
	TYPE 3								TYPE 3			TYPE 3					
0.328			1.673						2.030			0.527					
2.935	2.262	2.240	2.163	2.143	2.460	2.023	2.603	2.563	2.491	2.460	2.380	2.316	2.653	2.531	2.458		
0.288	0.961	1.055	1.143	1.163	1.593	2.030	2.301	2.341	2.489	1.593	1.673	1.823	0.497	0.619	0.767		
3.223	3.295	3.306	4.053	4.904	4.980	4.053	4.199	3.150	3.225								
3.005	3.133	3.076	4.183	4.939	4.940	4.183	4.210	3.218	3.428								
0.000	9.454	18.288	61.288	88.443	103.247	0.000	14.991	0.000	14.868								
	61						62		63								

LEGEND:

MAINTENANCE HOLE TYPES
- A = CONCRETE 1.000ø
- B = CONCRETE 1.200ø
- C = CONCRETE 1.500ø
- P = TYPE 'P3' PRE-CAST CONCRETE
- MS = TYPE 'MS' MAINTENANCE SHAFT
- RE = RODDING END
- @ = 150ø HCB FOR DUPLEX LOTS

Ⓑ = CLASS B NON-TRAFFICABLE
Ⓓ = CLASS D TRAFFICABLE

NOTES:
1. PROPERTY CONNECTION TYPES REFER SEQ D&C CODE STD. DWGs No. SEQ-SEW-1104 & SEQ-SEW-1105.
2. MAINTENANCE STRUCTURE TYPES AND DROPS REFER SEQ D&C CODE STD DWG SEQ-SEW-1300 SET.
3. MAINTENANCE STRUCTURE COVER TYPES REFER SEQ D&C CODE STD DWG SEQ-SEW-1308 SET.

DATUM

LOCATION PIPE DIAMETER GRADE LENGTH EMBEDMENT TYPE	
JUNCTION INVERT LEVEL	
DEPTH OF INVERT BELOW FSL	
INVERT LEVEL (IL)	
FINISHED SURFACE LEVEL (FSL) *	
EXISTING SURFACE LEVEL (ESL)	
CHAINAGE (CH)	

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSION H' TABLE AS PER STD. DWG. No. SEQ-SEW-1308-1

# DENOTES BRIDGING STRUCTURE BETWEEN STORMWATER AND SEWER MAIN. REFER KNG DWG No. 15-184-50 FOR DETAIL.

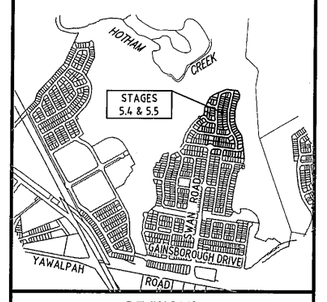
SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

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FAX 07 3017 1911
EMAIL kng@knpl.com.au

ABN 35 112 053 611

Approved Director ~~RPEQ1988~~ RPEQ12805 9.2.16

Drawing Title

SEWERAGE RETICULATION
LONGITUDINAL SECTION
SHEET 4

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	55 of 61

Drawing No	Revision
A1	15-184-55	A

MAINTENANCE HOLE/SHAFT No.	11/50	12/50	B75	01/65	02/65	03/65	04/65	04A/65	05/65	06/65	07/65	B76	08/65	E/65
MH/MS COVER TYPE	Ⓑ	Ⓑ		Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ		Ⓑ	
MH/MS TYPE	P	P	9.2° BEND	P	P	P	P	MS	P	P	P	3.7° BEND	P	END
BRANCH LINE No.	50	50		66		67	68		69		70			
BRANCH DROP TYPE	V	V		X	V	V	V	V	V	W	V		V	
HC TYPE					B	B	D-1	D-1	D-1	D-1	B		B	B
HC DEPTH	1.400	1.400		1.400	1.400	1.400	1.400	1.400	1.400	1.400	1.400		1.400	1.400
HC CH. TO DS MH/MS	13.306				24.047	24.342	25.000	18.274	16.226	57.800	61.279		8.846	15.022
HC INVERT LEVEL	2.050				2.700	3.350	3.500	3.850	4.100	4.250	4.300		4.350	4.400
HC LOT No.	1314				1313	1311	1310	1309	1308	1307	1359		1360	1361

MAINTENANCE HOLE/SHAFT No.	E/64	01/65	E/66	03/65	E/67	04/65	E/68	06/65	E/69
MH/MS COVER TYPE	Ⓑ	Ⓑ		Ⓑ		Ⓑ		Ⓑ	
MH/MS TYPE	END	P	END	P	END	P	END	P	END
BRANCH LINE No.		65		65		65		65	
BRANCH DROP TYPE		V		X		X		V	
HC TYPE	B	B		B	B	B	B	B	B
HC DEPTH	1.400	1.400		1.400	1.400	1.400	1.400	1.500	1.500
HC CH. TO DS MH/MS	15.022	14.939		14.849	16.776	14.849	16.776	16.076	
HC INVERT LEVEL	2.050	2.100		3.400	3.400	4.050	4.050	4.250	
HC LOT No.	1395	1354		1355	1356	1357	1358	1394	

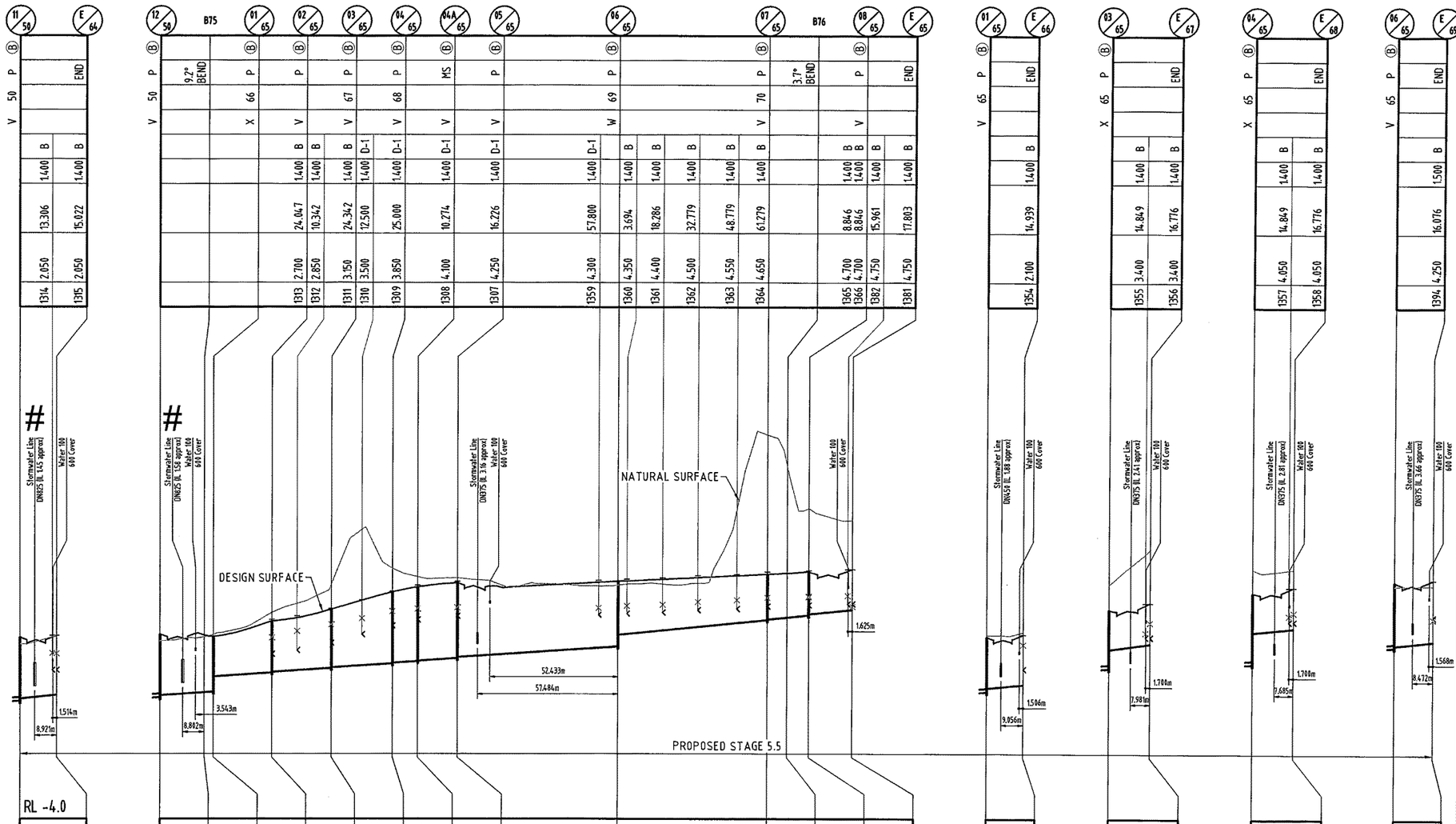
LEGEND:

MAINTENANCE HOLE TYPES
- A = CONCRETE 1.000ø
- B = CONCRETE 1.200ø
- C = CONCRETE 1.500ø
- P = TYPE 'P3' PRE-CAST CONCRETE
- MS = TYPE 'MS' MAINTENANCE SHAFT
- RE = RODDING END
- @ = 150ø HCB FOR DUPLEX LOTS

Ⓑ = CLASS B NON-TRAFFICABLE
Ⓓ = CLASS D TRAFFICABLE

NOTES:

1. PROPERTY CONNECTION TYPES REFER SEQ D&C CODE STD. DWGs No. SEQ-SEW-1104 & SEQ-SEW-1105.
2. MAINTENANCE STRUCTURE TYPES AND DROPS REFER SEQ D&C CODE STD DWG SEQ-SEW-1300 SET.
3. MAINTENANCE STRUCTURE COVER TYPES REFER SED D&C CODE STD DWG SEQ-SEW-1308 SET.



DATUM	RL -4.0	RR	RDAD	RR	RR	RD			ROAD RESERVE				ROAD	ROAD RESERVE			ROAD	RR
LOCATION																		
PIPE DIAMETER		150 SN8 PVC											150 SN8 PVC					
GRADE		1 : 100.00			1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 150.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	
LENGTH		15.022			18.198	3.727	24.047	24.342	25.000	10.274	16.226	65.733	61.279	8.155	8.846	17.803		
EMBEDMENT TYPE		TYPE 3										TYPE 3						
JUNCTION INVERT LEVEL	0.808				0.967		1.322		2.911	3.616		3.092	4.240					
DEPTH OF INVERT BELOW FSL	2.595	2.500		2.421	2.564	2.484	2.329	2.247	1.632	2.103	2.073	2.390	2.370	2.906	3.025	3.005	3.068	3.028	2.653	2.181	1.861	1.841	1.800	1.711	1.731	1.643
INVERT LEVEL (IL)	0.788	0.883		1.033	0.937	1.017	1.138	1.163	1.778	1.939	1.969	2.131	2.151	2.318	2.338	2.406	2.426	2.534	2.574	3.012	3.484	4.097	4.117	4.199	4.287	4.327	4.505
FINISHED SURFACE LEVEL (FSL) *	3.383			3.454	3.501	3.467	3.410	4.042	4.521	5.224	5.431	5.602	5.665	5.958	5.999	6.058	6.148										
EXISTING SURFACE LEVEL (ESL)	3.107	3.455			3.229	3.398	3.487	4.388	5.542	6.188	5.847	5.801	5.504	11.624	10.325	8.631	8.153										
CHAINAGE (CH)	0.000	15.022			0.000	18.198	21.925	45.972	70.314	95.314	105.588	121.814	187.547	248.826	256.981	265.827	283.630										
LINE		64								65										66				67		68		69

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSION H' TABLE AS PER STD. DWG. No. SEQ-SEW-1308-1

\# DENOTES BRIDGING STRUCTURE BETWEEN STORMWATER AND SEWER MAIN. REFER KNG DWG No. 15-184-50 FOR DETAIL.

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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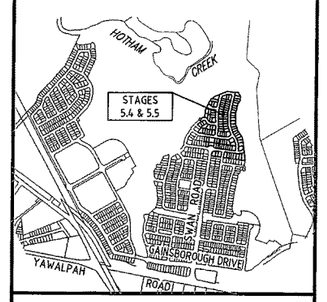
KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VDC
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mirvac

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GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved Director - RPEQ 1988
RPEQ 12805 9.2.16

Drawing Title
SEWERAGE RETICULATION
LONGITUDINAL SECTION
SHEET 5

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 56 of 61
A1	Drawing No: 15-184-56		Revision: A

MAINTENANCE HOLE/SHAFT No.	70	71	72	73	74	75	76	77	78	79
MH/MS COVER TYPE	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ
MH/MS TYPE	P	P	P	P	P	P	P	P	P	P
BRANCH LINE No.	END	END	END	END	END	END	END	END	END	END
BRANCH DROP TYPE	65	50	50	50	50	50	50	50	50	50
HC TYPE	V	V	V	W	W	W	W	W	V	V
HC DEPTH	A	B B	B B	B A	B B	B B	B B	B A	A A	A A
HC CH. TO DS MH/MS	1.400 14.842	1.400 13.214	1.400 14.147	1.400 13.989	1.400 14.658	1.400 15.100	1.400 13.385	1.400 13.578	1.354 15.617	1.342 13.416
HC INVERT LEVEL	4.600	2.500 2.500	2.650 2.650	2.750 2.750	2.900 2.900	3.000 3.000	3.150 3.150	3.250 3.250	3.796	4.158 4.116
HC LOT No.	1383	1353 1352	1351 1350	1348 1349	1347 1346	1345 1344	1343 1342	1340 1341	1374	1375 1376

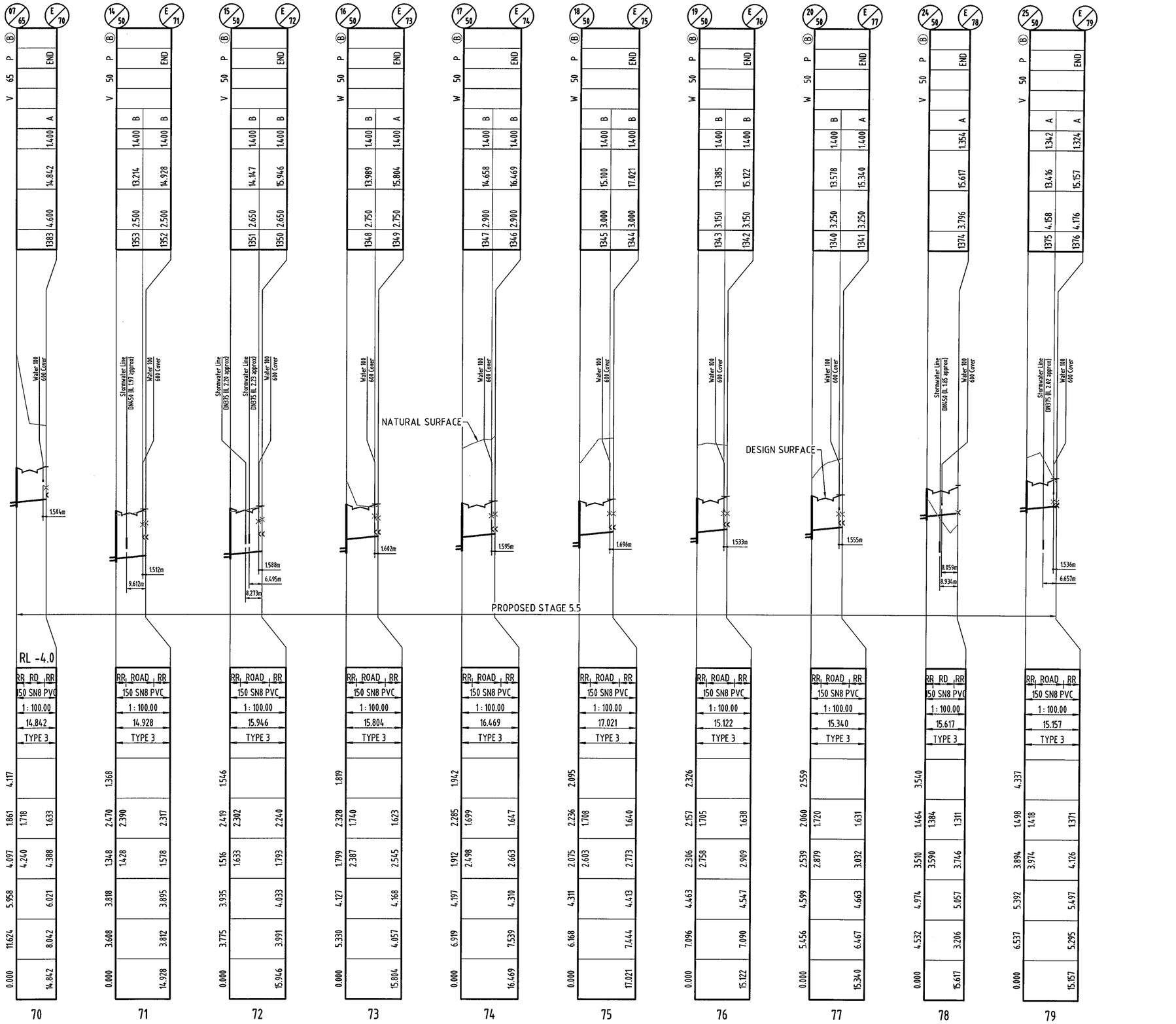
LEGEND:

MAINTENANCE HOLE TYPES
- A = CONCRETE 1.000ø
- B = CONCRETE 1.200ø
- C = CONCRETE 1.500ø
- P = TYPE 'P3' PRE-CAST CONCRETE
- MS = TYPE 'MS' MAINTENANCE SHAFT
- RE = RODDING END
- @ = 150ø HCB FOR DUPLEX LOTS

Ⓑ = CLASS B NON-TRAFFICABLE
Ⓓ = CLASS D TRAFFICABLE

NOTES:

1. PROPERTY CONNECTION TYPES REFER SEQ D&C CODE STD. DWGs No. SEQ-SEW-1104 & SEQ-SEW-1105.
2. MAINTENANCE STRUCTURE TYPES AND DROPS REFER SEQ D&C CODE STD DWG SEQ-SEW-1300 SET.
3. MAINTENANCE STRUCTURE COVER TYPES REFER SEQ D&C CODE STD DWG SEQ-SEW-1308 SET.



DATUM	70	71	72	73	74	75	76	77	78	79
LOCATION	RL -4.0	RR ROAD RR	RR ROAD RR	RR ROAD RR	RR ROAD RR	RR ROAD RR	RR ROAD RR	RR ROAD RR	RR RD RR	RR ROAD RR
PIPE DIAMETER	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC	150 SN8 PVC
GRADE	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00	1 : 100.00
LENGTH	14.842	14.928	15.946	15.804	16.469	17.021	15.122	15.340	15.617	15.157
EMBEDMENT TYPE	TYPE 3	TYPE 3	TYPE 3	TYPE 3	TYPE 3	TYPE 3	TYPE 3	TYPE 3	TYPE 3	TYPE 3
JUNCTION INVERT LEVEL	4.117	1.368	1.546	1.819	1.942	2.095	2.326	2.559	3.540	4.337
DEPTH OF INVERT BELOW FSL	1.861 1.718 1.633	2.470 2.390 2.317	2.419 2.302 2.240	2.328 1.740 1.623	2.285 1.699 1.647	2.236 1.708 1.640	2.157 1.705 1.638	2.060 1.720 1.631	1.464 1.384 1.311	1.498 1.418 1.371
INVERT LEVEL (IL)	4.097 4.240 4.388	1.348 1.428 1.578	1.516 1.633 1.793	1.799 2.387 2.545	1.912 2.498 2.663	2.075 2.603 2.773	2.306 2.758 2.909	2.539 2.879 3.032	3.510 3.590 3.746	3.894 3.974 4.126
FINISHED SURFACE LEVEL (FSL) *	5.958 6.021	3.818 3.895	3.935 4.033	4.127 4.168	4.197 4.310	4.311 4.413	4.463 4.547	4.599 4.663	4.974 5.057	5.392 5.497
EXISTING SURFACE LEVEL (ESL)	11.624 8.042	3.608 3.812	3.775 3.991	5.330 4.057	6.919 7.539	6.168 7.444	7.096 7.090	5.456 6.467	4.532 3.206	6.537 5.295
CHAINAGE (CH)	0.000 14.842	0.000 14.928	0.000 15.946	0.000 15.804	0.000 16.469	0.000 17.021	0.000 15.122	0.000 15.340	0.000 15.617	0.000 15.157
LINE	70	71	72	73	74	75	76	77	78	79

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSION H' TABLE AS PER STD. DWG. No. SEQ-SEW-1308-1

\# DENOTES BRIDGING STRUCTURE BETWEEN STORMWATER AND SEWER MAIN. REFER KNG DWG No. 15-184-50 FOR DETAIL.

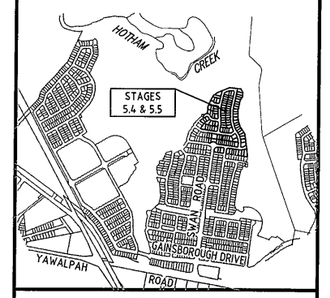
SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS · LANDPARTNERS URBAN ENVIRONMENT CONSULTANTS · VEE · DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS

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ABN 35 112 053 611

Approved Director ~~RPEQ 1988~~ RPEQ 12005 9.2.16

Drawing Title

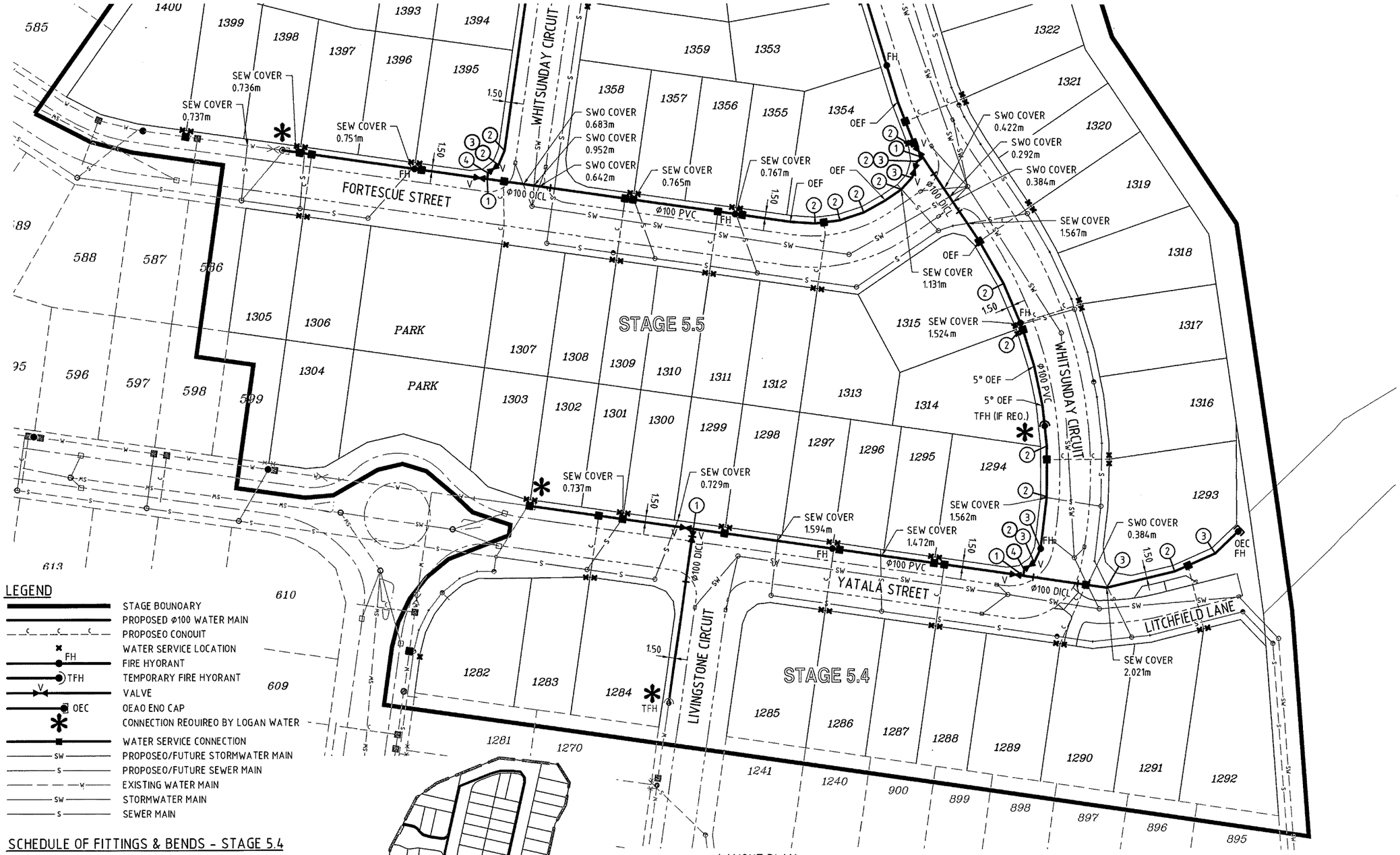
SEWERAGE RETICULATION
LONGITUDINAL SECTION
SHEET 6

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	57 of 61

	Drawing No	Revision
A1	15-184-57	A

REFER KN DWG 15-184-58



LEGEND

- STAGE BOUNDARY
- PROPOSED Ø100 WATER MAIN
- PROPOSED CONDUIT
- WATER SERVICE LOCATION
- FIRE HYDRANT
- TEMPORARY FIRE HYDRANT
- VALVE
- OEAD END CAP
- CONNECTION REQUIRED BY LOGAN WATER
- WATER SERVICE CONNECTION
- PROPOSED/FUTURE STORMWATER MAIN
- PROPOSED/FUTURE SEWER MAIN
- EXISTING WATER MAIN
- STORMWATER MAIN
- SEWER MAIN

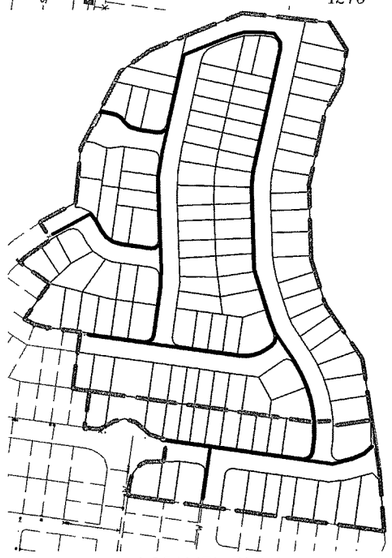
SCHEDULE OF FITTINGS & BENDS - STAGE 5.4

1	Ø100 x Ø100 x Ø100 TEE	2 REQUIRED
2	Ø100 uPVC 11.25° BEND	4 REQUIRED
3	Ø100 uPVC 22.50° BEND	4 REQUIRED
4	Ø100 uPVC 45.00° BEND	1 REQUIRED

SCHEDULE OF FITTINGS & BENDS - STAGE 5.5

1	Ø100 x Ø100 x Ø100 TEE	4 REQUIRED
2	Ø100 uPVC 11.25° BEND	25 REQUIRED
3	Ø100 uPVC 22.50° BEND	14 REQUIRED
4	Ø100 uPVC 45.00° BEND	7 REQUIRED

LAYOUT PLAN
SCALE 1:500



LOCALITY PLAN
SCALE NTS

LIVE WATER CONNECTION TABLE

STAGE	LOCATION	DIAMETER
5-4	YATALA STREET ADJACENT TO LOT 1302	Ø100
5-4	LIVINSTONE CIRCUIT ADJACENT LOT 1284	Ø100
5-5	WHITSUNDAY CIRCUIT ADJACENT LOT 1314	Ø100
5-5	FORTESCUE STREET ADJACENT LOT 1398	Ø100
5-5	NINGALOO STREET ADJACENT LOT 1389	Ø100

SCHEDULE OF PIPES AND FITTINGS - STAGE 5.4

PIPE SIZE	LENGTH(m)	VALVE	FIRE HYDRANT	TEMP FIRE HYDRANT	11¼° BEND	22½° BEND	45° BEND	90° BEND
Ø100 PVC	237.490	4	3	1	4	4	1	-
Ø100 DICL	22.000	-	-	-	-	-	-	-

SCHEDULE OF PIPES AND FITTINGS - STAGE 5.5

PIPE SIZE	LENGTH(m)	VALVE	FIRE HYDRANT	TEMP FIRE HYDRANT	11¼° BEND	22½° BEND	45° BEND	90° BEND
Ø100 PVC	919.983	8	14	1	25	14	7	-
Ø100 DICL	60.500	-	-	-	-	-	-	-

NOTE - 1. "DUCTILE IRON" PIPEWORK UNDER ROAD CARRIAGEWAYS DENOTES DICL CLASS PN35

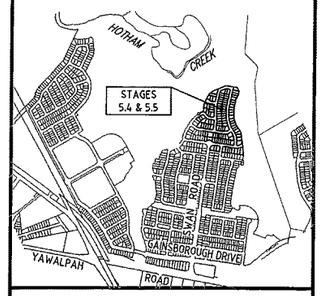
NOTE
ALL LIVE CONNECTIONS TO EXISTING MAINS TO BE UNDERTAKEN BY GOLD COAST WATER AT DEVELOPERS COST

SCALE 10 5 0 10 20 30 40 50m
1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

Client

mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
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Approved Director - RPEQ 1988
RCT RPEQ18805 9.2.16

Drawing Title
WATER RETICULATION
LAYOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

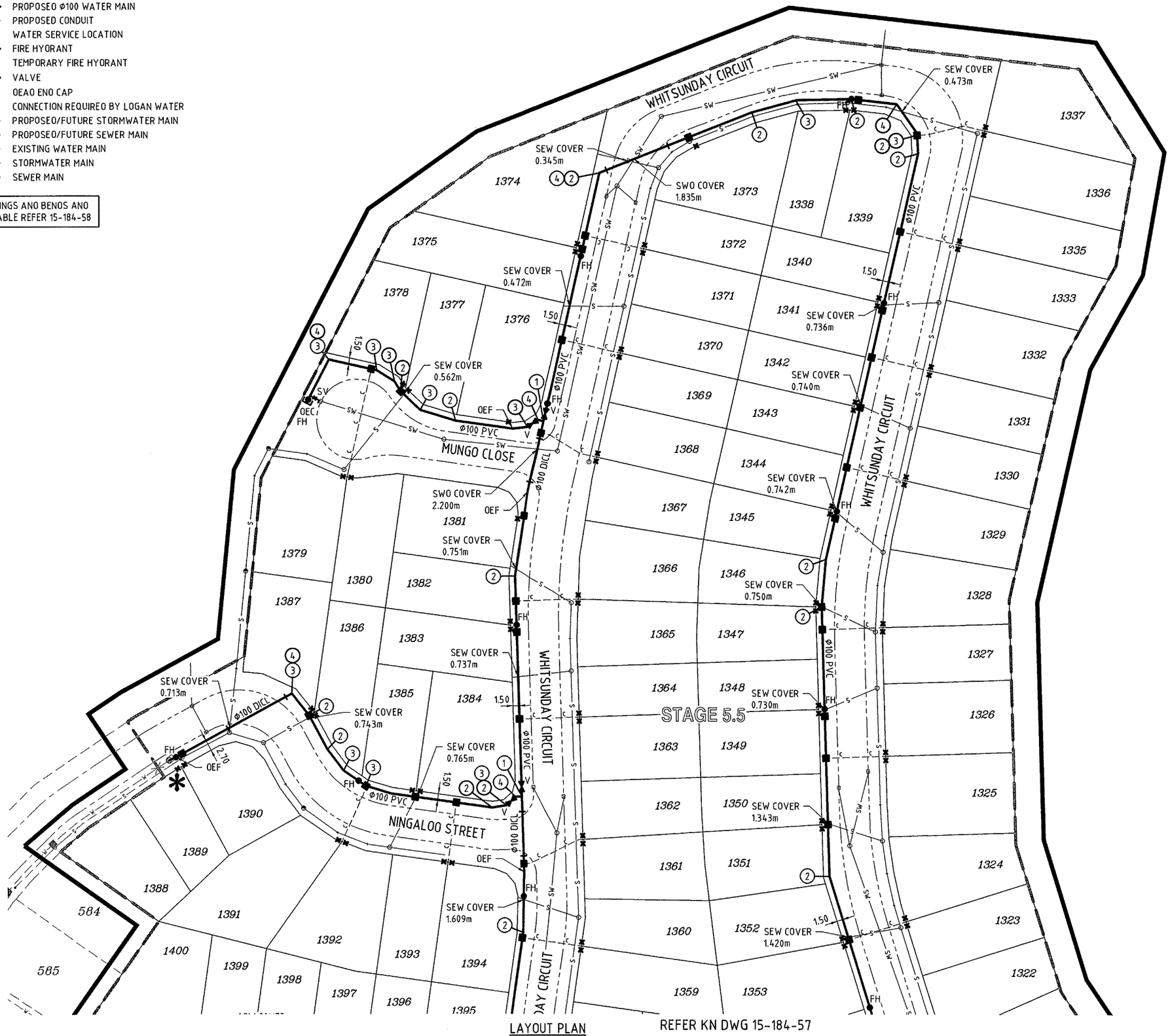
Scale	Sheet
AS SHOWN	58 of 61

	Drawing No	Revision
A1	15-184-58	A

LEGEND

- STAGE BOUNDARY
- PROPOSED Ø100 WATER MAIN
- PROPOSED CONDUIT
- WATER SERVICE LOCATION
- FH — FIRE HYDRANT
- TFH — TEMPORARY FIRE HYDRANT
- V — VALVE
- OEC — DEAD END CAP
- CONNECTION REQUIRED BY LOGAN WATER
- SW — PROPOSED/FUTURE STORMWATER MAIN
- S — PROPOSED/FUTURE SEWER MAIN
- W — EXISTING WATER MAIN
- SW — STORMWATER MAIN
- S — SEWER MAIN

FOR SCHEDULE OF FITTINGS AND BENDS AND PIPES AND FITTINGS TABLE REFER 15-184-58



LAYOUT PLAN
SCALE 1:500

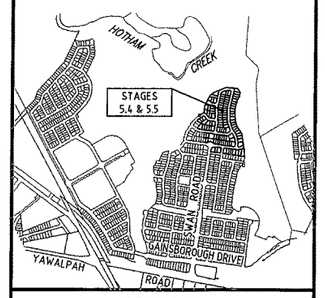
REFER KN DWG 15-184-57

SCALE 10 5 0 10 20 30 40 50m
1 : 500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS URBAN ENVIRONMENT CONSULTANTS
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DesignFlow CIVIL ENGINEERING

Client

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Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

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Approved ~~Director - RPEQ 1988~~
RMcL RPEQ12805 92.16

Drawing Title
WATER RETICULATION
LAYOUT PLAN
SHEET 2

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	59 of 61

	Drawing No	Revision
A1	15-184-59	A

GENERAL NOTES

1. ALL WDRK AND MATERIALS SHALL BE IN ACCDRDANCE WITH CURRENT SEQ WS&S CODE SPECIFICATIONS AND STANDARDS.
2. UNLESS SPECIFIED DTHERWISE ALL MATERIALS ANO WORK SHALL CDMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
3. ADOPT LIP OF KERB OR SHOULDER OF ROAD AS PERMANENT LEVEL.
4. CDVER OVER MAINS FROM PERMANENT LEVEL TO BE AS SHDWN IN STANDARD DRAWING No. SEO-WAT-1200-2.
5. MINIMUM EMBEDMENT SHALL BE IN ACCORDANCE WITH STANDARD DRAWING Nos. SEQ-WAT-1200-2 TO SEO-WAT-1203-1.
6. THRUST BLDCKS SHALL BE IN ACCORDANCE WITH AND PRESSURE TESTED TO 1200kPa AS PER STANDARD DRAWING No. SEO-WAT-1205-1 AND SEQ-WAT-1206-1.
7. CONDUITS TO BE INSTALLED IN ACCDRDANCE WITH THE STANDARD DRAWING No. SEQ-WAT-1107-2.
8. A WATER METER IS TD BE INSTALLED AT THE RESIDENT'S COST, BY GDLD COAST WATER.
9. ALL MATERIALS USED IN THE WDRKS SHALL BE AS FOLLOWS:
   - ALL DUCTILE IRDN FITTINGS SHALL BE MANUFACTURED TD AS/NZS 22B0 WITH SDCKET ENDS (UNLESS NDTED) AND DESIGNED FOR USE WITH PVC OR DI PIPES AS APPLICABLE. ALL DI PIPES SHALL BE CEMENT LINED TO AS/NZS 2280.
   - DICL USED IN ROAD CROSSINGS WILL BE PN35 AS PER WATER AUTHORITY STANDARDS.
   - PRESSURE PIPES USED FDR WATER SUPPLY SHALL BE RRJ PIPES AND SHALL BE EITHER PVC CLASS PN16 (UNLESS NOTED OTHERWISE) MINIMUM AND MANUFACTURED TD (PVC AS/NZS 1477), (PVC-M AS/NZS 4765) (PVC-0 AS/NZS 4441) DR DICL PN 20, 35 DR FLANGED CLASS TD AS/NZS 22B0).
   - DUCTILE IRDN SLUICE AND SCOUR VALVES SHALL BE PN16 RESILIENT SEATED WITH DOUBLE "O" RING STEM SEALS MANUFACTURED TO AS 2638.
   - ALL VALVES, FITTINGS AND PIPE FITTINGS TD BE COATED INTERNALLY AND EXTERNALLY WITH FACTORY APPLIED THERMAL POLYMERIC CORRDSIDN PRDTECTIDN TO AS 4158.
   - ALL NUTS, BDLTS AND WASHERS, SHALL BE STAINLESS STEEL GRADE 316 CLASS 50, WITH AN ANTI-SEIZE APPLIED DURING ASSEMBLY.
   - ALL DUCTILE IRDN FLANGES ARE TO COMPLY WITH AS/NZS 2280 AND SHALL BE RAISED FACE TO AS 4087.
10. ALL CONCRETE FDDTPATHS TD BE CLEAR OF WATER MAINS (WHERE APPLICABLE)
11. TEST/CHLDRINATION POINTS TO B INSTALLED IN ACCORDANCE WITH STANDARD DRAWING No. SEO-WAT-1410-1.
12. MARKERS SHALL BE INSTALLED FDR ALL SERVICE CRDSSINGS, HYDRANTS AND VALVES IN ACCDRDANCE WITH STANDARD DRAWING Nos. SEO-WAT-1107-1, SEO-WAT-1300-1 AND SEO-WAT-1300-2.
13. THE CDNSTRUCTIDN OF THE WATER RETICULATION WORK SHOWN ON THIS DRAWING MUST BE SUPERVISED BY AND ENGINEER WHD HAS R.P.E.O. REGISTRATION. WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TD CDNNECT TO THE RETICULATION SYSTEM.
14. WATER MAIN SHALL BE LAID AT 1.425m ALIGNMENT FROM PROPERTY BOUNDARY UNLESS NDTES DTHERWISE.
15. WHERE PERMANENT HYDRANTS ARE NDT INSTALLED AT END DF MAINS DF EACH STAGE, AT TEMPDRARY HYDRANT WILL BE INSTALLED INSTEAD.
16. NO WORK SHALL BE BACKFILLED UNTIL PERMISSION IS GRANTED BY THE SUPERINTENDENT OR GDLD CDAST WATER.
17. NOT ALL SERVICES HAVE NECESSARILY BEEN SHOWN. THE LOCATION OF SERVICES ON THESE PLANS ARE APPROXIMATE ONLY. NO RESPONSIBILITY IS TAKEN FDR THE ACCURACY DF COMPLETENESS OF THIS INFORMATIDN NO WORK IS TO BE UNDERTAKEN WITHOUT CONSULTING THE RELEVANT SERVICE AUTHORITY PRIOR TD CDMMENCEMENT OF THE WORK. DEPTH OF SERVICES AT POSSIBLE CONFLICT POINTS ARE TO BE CONFIRMED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION. ABDVE GRDUND SERVICES AS SHDWN ON THE ORGS HAVE BEEN LOCATED BY FIELD SURVEY. ALL UNDERGRDUNO SERVICES HAVE BEEN PLOTTED FROM THE RELEVANT AUTHDRITY'S RECDRDS.
18. ALL EXISTING FEATURES (eg. DRIVEWAYS, GARDENS, PATHS etc.) ARE TO BE REINSTATED WHERE DISTURBED BY THE WORKS. ALLOW FOR SUPPORT OF POWER POLES/STAYS, FENCES etc. ADJACENT TO TRENCHES.
19. WHERE BEND FITTINGS ARE NOT SHOWN, MAKE CHANGES IN DIRECTIDN USING PIPE JDINT DEFLECTIONS. MAKE EQUAL NUMBER AND SIZE DF PIPE DEFLECTIDNS EACH SIDE DF CHAINAGE SHDWN (MAX. DEFLECTION 3° PER JDINT). IL SHDWN ON LONG SECTIONS IS AT INTERSECTIONS PDINT (IP). JDINT DEFLECTIDNS MAY ALSO BE REQUIRED AT FITTINGS TO MEET ALIGNMENT AND LEVELS AS SPECIFIED.

PIPES, FITTINGS AND VALVES

1. ALL DUCTILE IRDN FITTINGS SHALL BE MANUFACTURED TD AS/NZS 22B0 WITH SDCKET ENDS (UNLESS NDTED) AND DESIGNED FDR USE WITH PVC DR DI PIPES AS APPLICABLE. ALL DI PIPES SHALL BE CEMENT LINED TD AS/NZS 22B0.
2. DICL USED IN ROAD CROSSINGS WILL BE PN35 AS PER WATER AUTHORITY STANDARDS.
3. PRESSURE PIPES USED FOR WATER SUPPLY SHALL BE RRJ PIPES AND SHALL BE EITHER PVC CLASS PN16 (UNLESS NDTED DTHERWISE) MINIMUM AND MANUFACTURED TO (PVC AS/NZS 1477), (PVC-M AS/NZS 4765) (PVC-0 AS/NZS 4441) DR DICL PN 20, 35 DR FLANGED CLASS TO AS/NZS 22B0).
4. DUCTILE IRON SLUICE AND SCDUR VALVES SHALL BE PN16 RESILIENT SEATED WITH DOUBLE "O" RING STEM SEALS MANUFACTURED TO AS 2638.
5. ALL VALVES, FITTINGS AND PIPE FITTINGS TO BE COATED INTERNALLY AND EXTERNALLY WITH FACTDRY APPLIED THERMAL PDLYMERIC CDRROSION PROTECTION TD AS 4158.
6. ALL NUTS, BOLTS AND WASHERS, SHALL BE STAINLESS STEEL GRADE 316 CLASS 50, WITH AN ANTI-SEIZE APPLIED DURING ASSEMBLY.
7. ALL DUCTILE IRON FLANGES ARE TO COMPLY WITH AS/NZS 22B0 AND SHALL BE RAISED FACE TD AS 40B7.

VEGETATION PROTECTION (WHERE APPLICABLE)

A. TREES LDCATED ALDNG THE FDDTPATH SHALL BE, TRANSPLANTED PRIDR TO CONSTRUCTION, OR REPLACED IF DESTRDYED.
B. WHEN WDRKING WITHIN 4m DF TREES, RUBBER DR HARDWDDD GIRDLES SHALL BE CONSTRUCTED WITH 1.8m BATTENS CLOSELY SPACED AND ARRANGED VERTICALLY FRDM GRDUND LEVEL. GIRDLES SHALL BE STRAPPED TO TREES PRIOR TO CONSTRUCTION AND REMAIN UNTIL COMPLETION.
C. TREE RODTS SHALL BE TUNNELLED UNDER, RATHER THAN SEVERED. IF ROOTS ARE SEVERED THE DAMAGED AREA SHALL BE TREATED WITH A SUITABLE FUNGICIDE. CONTACT RELEVANT CDUNCIL ARBDRIST FDR FURTHER ADVICE.
D. ANY TREE LDPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPRDVED ARBDRIST.

SOIL (WHERE APPLICABLE)

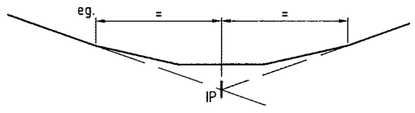
A. TOPSOIL AND SUBSDIL SHDULD BE STDCKPILED SEPARATELY.
B. CARE SHOULD BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STDRMWATER SYSTEM. THIS MAY INVDLVE PLACING APPROPRIATE SEDIMENT CONTROL AROUND STOCKPILES.

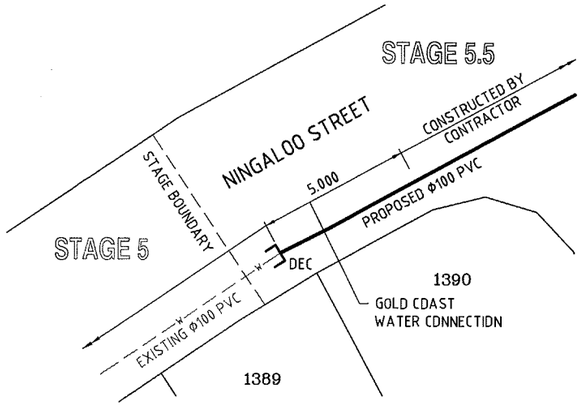
CREEK CROSSINGS (WHERE APPLICABLE)

A. SILTATION CONTROL MEASURES SHALL BE PLACED DDWNSTREAM DF ANY EXCAVATIDN WORK.
B. APPROPRIATE SEDIMENT CDNTROLS SHALL BE USED TO PREVENT SEDIMENT FRDM ENTERING THE CREEK.
C. ND SOIL SHDULD BE STDCKPILED WITHIN 5m OF CREEK.

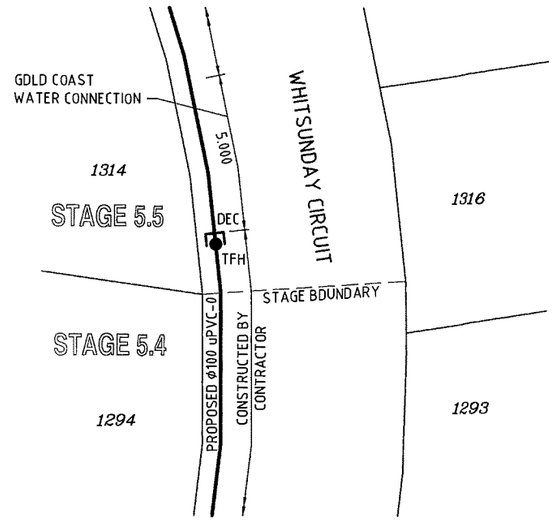
REHABILITATION (WHERE APPLICABLE)

A. PREDISTURBANCE SOIL PROFILES ANO COMPACTION LEVELS SHALL BE REINSTATEO.
B. PREDISTURBANCE VEGETATIDN PATTERNS SHALL BE RESTDRED.

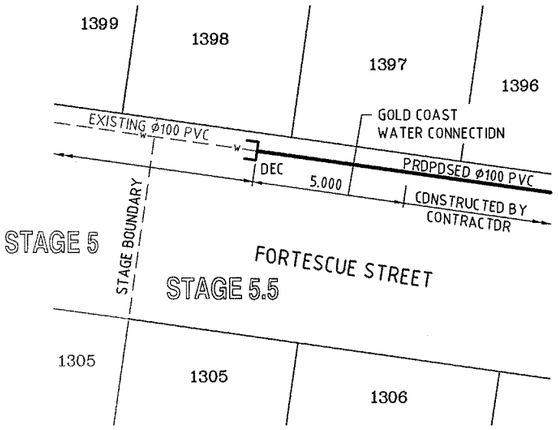




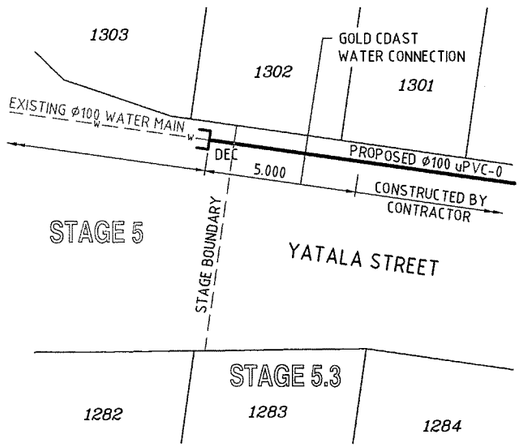
LIVE CONNECTION - NINGALOO STREET
OPPOSITE LOT 1389
SCALE 1:250



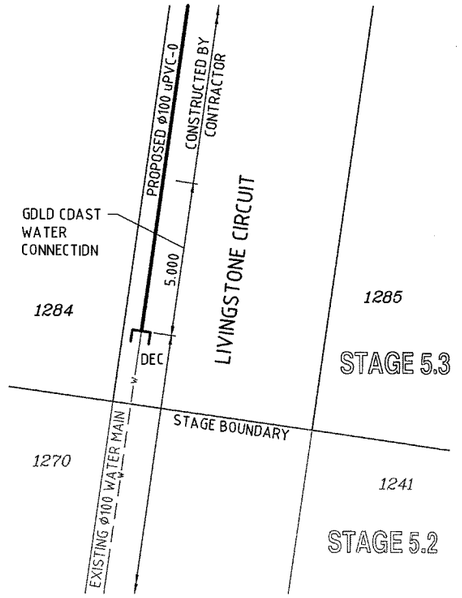
LIVE CONNECTION - WHITSUNDAY CIRCUIT
ADJACENT LOT 1314
SCALE 1:250



LIVE CONNECTION - FORTESCUE STREET
ADJACENT LOT 1398
SCALE 1:250



LIVE CONNECTION - YATALA STREET
ADJACENT LOT 1302
SCALE 1:250



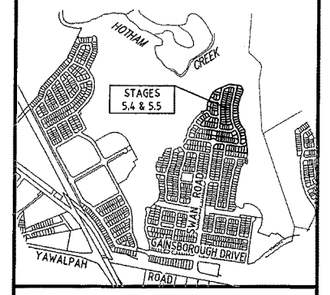
LIVE CONNECTION - LIVINGSTONE CIRCUIT
ADJACENT LOT 1284
SCALE 1:250

SCALE
5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
VEE
DesignFlow

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mirvac

Project

GAINSBOROUGH GREENS
PRECINCT 5
STAGE 5.4 & 5.5

KN GROUP PTY LTD CONSULTING ENGINEERS
LEVEL 2 - 71 GREY STREET
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EMAIL kng@knpl.com.au
ABN 35 112 053 611

Approved Director - RPEQ 7988
9.2.16

Drawing Title

WATER RETICULATION
LIVE CONNECTION DETAILS
AND NOTES

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15

Scale	Sheet
AS SHOWN	60 of 61

	Drawing No	Revision
A1	15-184-60	A

Client: MIRVAC
Project: GAINSBOROUGH GREENS PRECINCT S STAGE S.4-5.5
Prepared By: Josh Strogusz Date: 29th January 2016
Reviewed By: Robert Mander Date: 29th January 2016

Safety in Design Analysis

- Complete Safety in Design Analysis by populating the table where applicable with all of the relevant safety issues for the project. For example:

☒Positioning of new services adjacent to existing live services ☒Construction adjacent to existing road carriageways ☒Pedestrians ☒Civil Construction Workers ☒Maintenance Workers ☒Work Place Health and Safety Constraints ☐Unusual material handling ☒Falls from heights ☒Underground Services (existing) ☒Electrical Service Installation ☒Gas Service Installation ☒Communication Installation ☐Traffic Signal Installation ☒Landscape Workers ☒Line marking Workers ☒Excavation – open cut trenching - Trench excavation depths ☒Tunnel Boring ☒Confined Spaces ☒Lifting of loads ☒Unloading of materials and storage ☐Storage of hazardous materials ☒Geotechnical investigation – works ☒Bulk Earthworks	☒Slope Stability ☒Dust Control ☒Erosion and Sediment Control/Management ☒Sediment Basin Construction ☒Wetland/Dam Construction ☒Working under traffic Project Specific Design Elements:
☐List all relevant safety studies	

The following table summarises the safety in design issues considered.

Section of Works	Identify any Potential Incident or Hazard	Consequence	Likelihood	Risk Rating	Risk Control Measures	Consequence	Likelihood	Residual Risk Rating (after design applied)	Risk Manager
Earthworks Material Investigation	Geotechnical Investigation	C	3	S	SWMS required by Contractor	D	3	M	Contractor
Road/Earthworks Works	Pedestrians Injury	D	3	M	TMP to be provided by Contractor to exclude pedestrians from work site	E	3	L	Contractor
	Civil Construction Workers – Injury	A	4	H	TMP and SWMS required for all activities	C	2	S	Contractor
	Maintenance Workers	A	4	H	TMP and SWMS required for all activities	C	3	S	Contractor
	Underground Services (Existing)	A	3	H	OBYO information to be sort prior to design. Existing to be located by survey if applicable to design. All existing services to be located and depths confirmed prior to commencement. SWMS to be provided by Contractor	C	2	S	Designer/ Contractor
Working adjacent to existing Infrastructure	Conflict between construction equipment / personnel and live infrastructure in particular Power lines	B	4	S	All existing services highlighted in the documentation. Contractor to complete DBYD search before commencing works. SWMS to be provided by Contractor	C	4	M	Designer/ Contractor
Service trench/ pipe installation	Location of all trenches to provide clearance to all other services and all structures or battered embankments	A	4	H	Mains located with safe working clearance to existing pressure mains, structures and battered embankments	C	4	M	Designer
	Trench depth	A	4	M	Depth of trenches minimized for both safety and cost efficiency	C	4	M	Designer
Works within Confined Spaces	Construction of stormwater, sewer, water and wetland structures	A	4	M	Contractor to ensure works undertaken in a manner complying with safe work method statements	D	5	L	Contractor
Silt and Erosion Control	Public access to water retaining temporary sediment basins	A	5	S	Protection measures – that is fencing of all water retaining structures with side slopes greater than 1 in 5 as described in International Erosion Control Association (Australasian) Table B9	C	4	M	Designer/ Contractor

RISK ASSESSMENT AND CONTROL

Risk Assessment			
Select **one** category from each of the columns below that best represents the likely outcome if the potential hazard actually did occur. For each consequence consider the **most likely outcome** and **not** the 'absolute worst' case.			
Consequence		**Likelihood**	
A	Death – major environmental damage	1	Certain
B	Permanent Disability – severe environmental damage	2	Probable
C	Lost Time Injury – moderate environmental damage	3	Possible
D	Medical Treatment Injury – minor environmental damage	4	Unlikely
E	First Aid Treatment	5	Very Unlikely

RISK RATING

H: High Risk **S: Significant Risk**

M: Moderate Risk **L: Low Risk**

Read the Risk Rating from the matrix below:

Risk Assessment Matrix	A	B	C	D	E
1	H	H	H	S	S
2	H	H	S	S	M
3	H	H	S	M	L
4	H	S	M	L	L
S	S	S	M	L	L

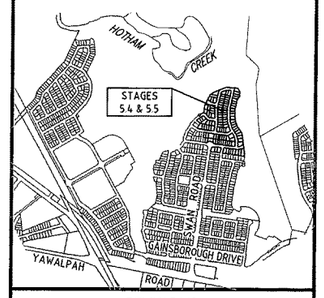
Certain - means an event or situation that is happening more or less all the time, including continuous situations
Permanent Disability – means a disability, such as loss of a limb or eyesight, loss of hearing, chronic skin disorder, chronic back disorder, emphysema, and the like

Probable – means an event or situation that occurs or is likely to occur about ten times or more per year
Possible – means an event or situation that occurs or is likely to occur about once per year
Unlikely – means an event or situation that occurs or is likely to occur less frequently than once every ten years

Issued 29th January 2016 Rev - A

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

KEY PLAN



REVISIONS

No	Description	Date	By
A	FOR REVIEW	FEB 16	RCT

Associated Consultants

BURCHILLS ENGINEERING SOLUTIONS
LANDPARTNERS
vee
DesignFlow

Client

mirvac

Project

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Drawing Title
SAFETY IN DESIGN

Drawn	Designed	Checked	Date
RCT	JAS	GBG	SEPT '15
Scale: AS SHOWN			Sheet: 61 of 61
A1	Drawing No: 15-184-61		Revision: A