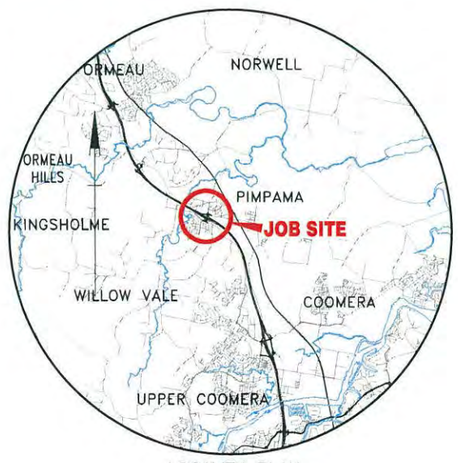

LOCALITY PLAN

DRAWING INDEX

Drawing Number	Revision	Series Number	Drawing Description
786484	A	DI-1	LOCALITY PLAN, KEY MAP AND DRAWING INDEX
786485	A	TC-1	TYPE CROSS SECTIONS
786486	A	EF_CL-1	EXISTING FEATURES AND SERVICES / CONTROL LINE SETOUT
786487	A	EF_CL-2	EXISTING FEATURES AND SERVICES / CONTROL LINE SETOUT
786488	A	CD-1	CONSTRUCTION AND PAVEMENT DETAILS SHEET 1
786489	A	DD-1	DRAINAGE DETAILS
786490	A	SL-1	SIGNS AND LINEMARKING SHEET 1
786491	A	SL-2	SIGNS AND LINEMARKING SHEET 2
786492	A	XS-1	ANNOTATED CROSS SECTIONS SHEET 1
786493	A	XS-2	ANNOTATED CROSS SECTIONS SHEET 2
786494	A	XS-3	ANNOTATED CROSS SECTIONS SHEET 3
786495	A	XS-4	ANNOTATED CROSS SECTIONS SHEET 4
786496	A	XS-5	ANNOTATED CROSS SECTIONS SHEET 5
786497	A	XS-6	ANNOTATED CROSS SECTIONS SHEET 6
786498	A	XS-7	ANNOTATED CROSS SECTIONS SHEET 7
786499	A	XS-8	ANNOTATED CROSS SECTIONS SHEET 8
786500	A	XS-9	ANNOTATED CROSS SECTIONS SHEET 9

DRAWING INDEX

Drawing Number	Revision	Series Number	Drawing Description
706969	B	IT-1	INTELLIGENT TRANSPORT SYSTEMS SHEET 1 OF 2
706970	B	IT-2	INTELLIGENT TRANSPORT SYSTEMS SHEET 2 OF 2
706975	A	TS-1	TRAFFIC SIGNAL INSTALLATION SHEET 1 OF 2
706974	A	TS-2	TRAFFIC SIGNAL INSTALLATION SHEET 2 OF 2

SCHEME SUBMITTED *(External Consultants or Internal Business Unit):*

This scheme has been prepared in accordance with the requirements of the brief/functional specifications.

SIGNED: TITLE: SENIOR ENGINEER (CIVIL)

Organisation: TMR DATE: 03/09/2018

SCHEME SCOPE AND FINANCIAL APPROVAL: *(Regional Director or Delegate):*

I hereby certify that this scheme complies with the intent of the scope and financial limits of the relevant project on QTRIP and the scheme is approved for release in accordance with that program.

SIGNED: TITLE: A/MANAGER (DEL.) DATE: 3/9/18

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES G:\NERD\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\01_DI-1.dwg

Associated Job Nos

Auxiliary Drg Nos ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST

PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)

CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP

LOCALITY PLAN, KEY MAP AND DRAWING INDEX

Drawn C.WOJCIK

Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)

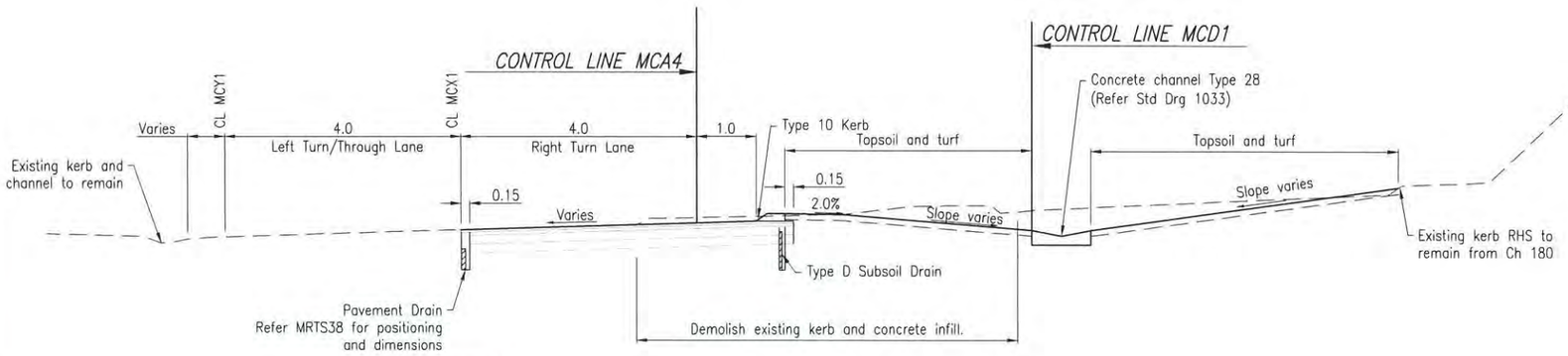
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18418	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786484 A
Series Number	DI-1 of 1

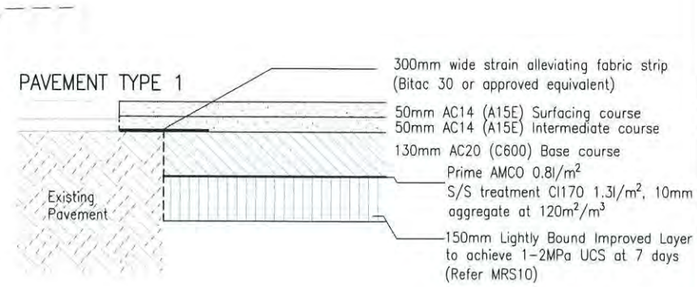
MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:30pm XREFS :- X_Survey_MR100720.dwg ; X_Aerial Images.dwg ; X_MAP.dwg ; X_DROA_Colour.dwg ; X_DCDB_MapInfo_180903.dwg

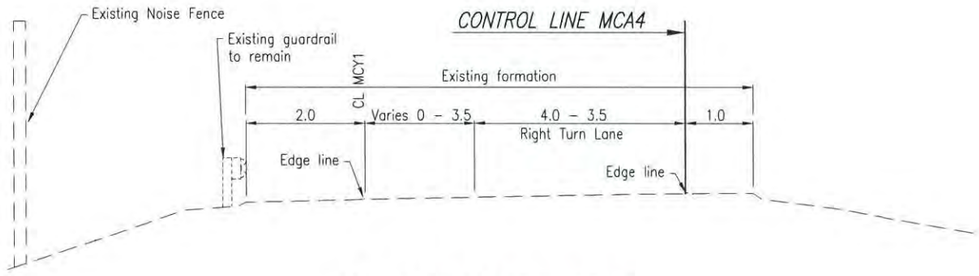


A: WIDENING

CHGE 170 – 284 MCA4

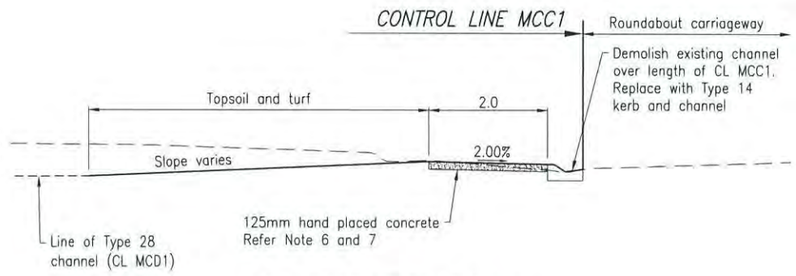


AADT = 4831(2014)
(Estimated as 6166 AADT in 2019 at 5% growth rate at opening)
Design Period = 15yrs
Design Traffic – DESA = 1.2×10^7
% Commercial Vehicles = 10.62%
Subgrade CBR = 8%



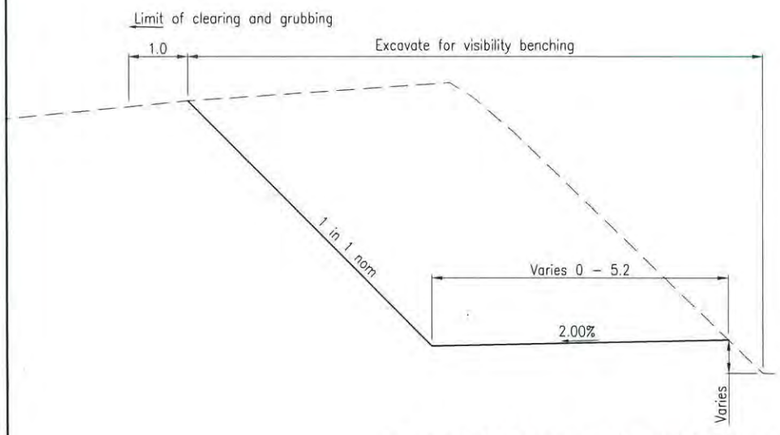
B: RAMP LANE WIDTHS

CHGE 121 – 170 MCA4



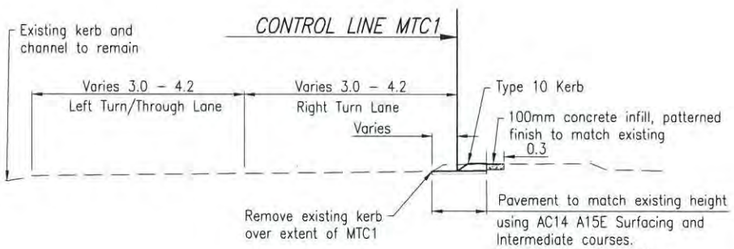
D: RECONSTRUCTION

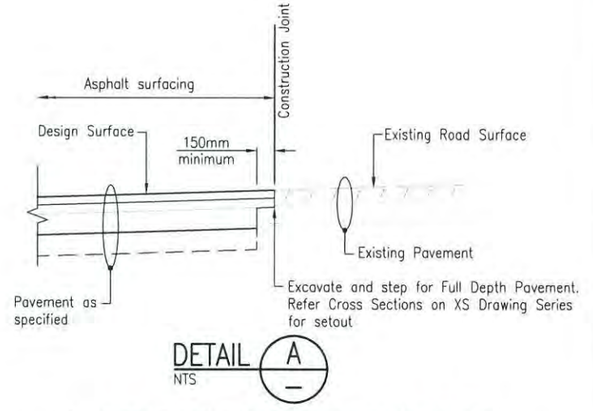
CONTROL LINE MCC1



C: EXCAVATION AND WIDENING

WESTBOUND APPROACH





TRANSVERSE AND LONGITUDINAL PAVEMENT JOINT

GENERAL
1. A1 denotes last two characters of the control line reference.

SEAL
2. Spray/spread rates are indicative only and are to be designed for the conditions at the time of placement and to the Contract Administrators approval.

PAVEMENT
3. Old to new pavement tie in transition shall be stepped in accordance with Detail A Transverse and longitudinal pavement joint on this drawing.
4. All pavement shall extend 150mm behind the kerb.

SUBGRADE TREATMENT
5. Subgrade treatment type shall be provisional

HAND PLACED CONCRETE PAVING
6. Concrete grade N32/10 minimum, with a layer of SL82 welded mesh placed centrally.
7. Refer MRTS03 for contraction and expansion joints.

PAVEMENT MARKING AND SIGNS
8. Refer Drg Series No. SL–1 to SL–2

PUBLIC UTILITY PLANT (PUP)
9. Refer Drg Series No. EF–1 to EF–2

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	Revisions/Descriptions	Certification	Date	Microfiled

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Last Modified :- Sep 03, 2018 – 10:10am XREFS :-

Associated Job Nos

Auxiliary Drg Nos: REFER DRG NO 786484

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 1.0 2.0m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

Drawn: C.WOJCIK
Designed: S.READ

EXIT 49 NORTH BOUND OFF RAMP TYPE CROSS SECTIONS SHEET 1 OF 1

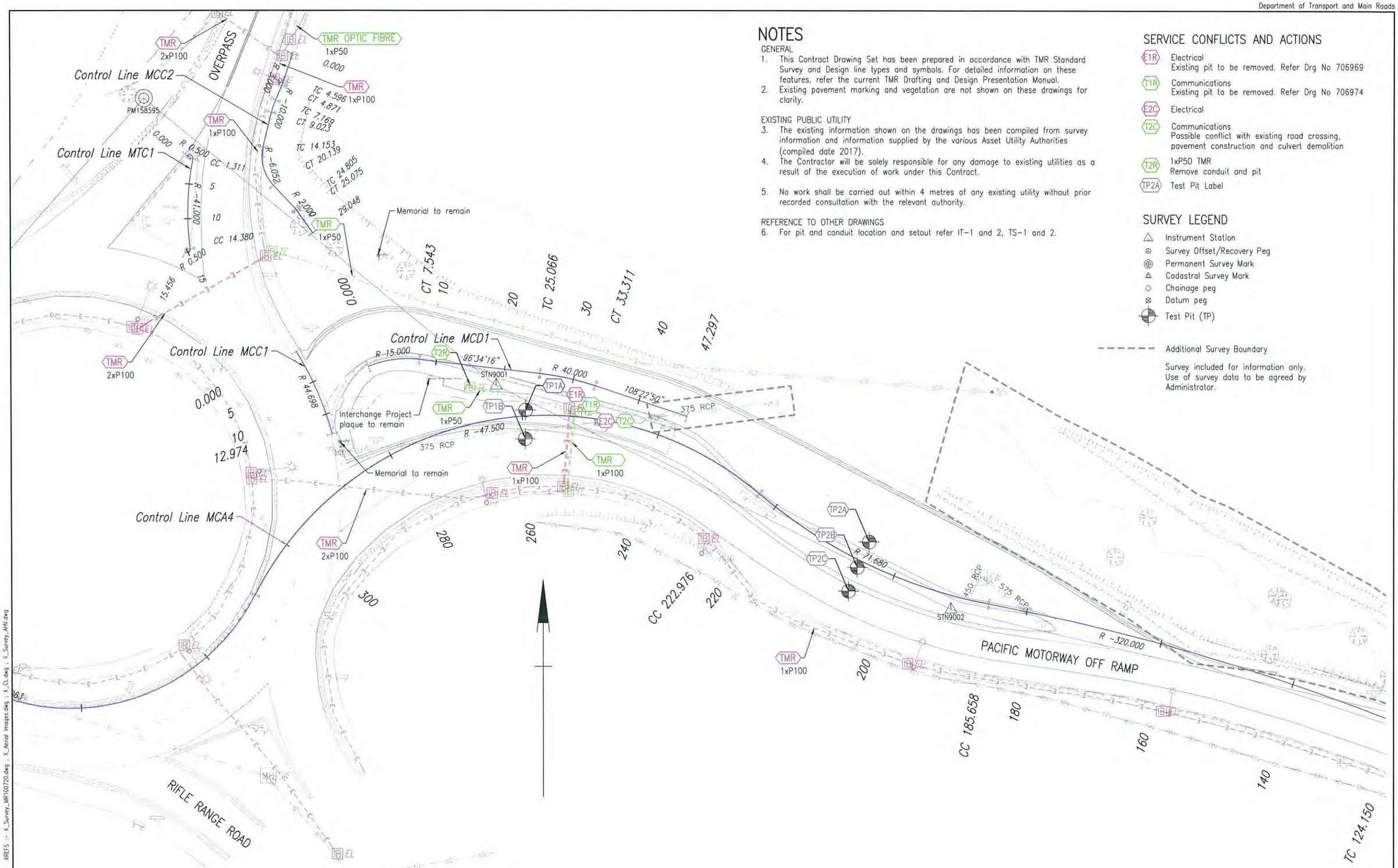
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18418	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN – 3476
Drawing No.	786485 A
Series Number	TC–1 of 1

MRR_Detail (02/14)



NOTES

GENERAL

1. This Contract Drawing Set has been prepared in accordance with TMR Standard Survey and Design line types and symbols. For detailed information on these features, refer the current TMR Drafting and Design Presentation Manual.
2. Existing pavement marking and vegetation are not shown on these drawings for clarity.

EXISTING PUBLIC UTILITY

3. The existing information shown on the drawings has been compiled from survey information and information supplied by the various Asset Utility Authorities (compiled date 2017).
4. The Contractor will be solely responsible for any damage to existing utilities as a result of the execution of work under this Contract.
5. No work shall be carried out within 4 metres of any existing utility without prior recorded consultation with the relevant authority.

REFERENCE TO OTHER DRAWINGS

6. For pit and conduit location and setout refer IT-1 and 2, TS-1 and 2.

SERVICE CONFLICTS AND ACTIONS

- E1R — Electrical: Existing pit to be removed. Refer Drg No 706969
- T1R — Communications: Existing pit to be removed. Refer Drg No 706974
- E2C — Electrical
- T2C — Communications: Possible conflict with existing road crossing, pavement construction and culvert demolition
- T2R — 1xP50 TMR: Remove conduit and pit
- TP2A — Test Pit Label

SURVEY LEGEND

- Instrument Station
- Survey Offset/Recovery Peg
- Permanent Survey Mark
- Cadastral Survey Mark
- Chainage peg
- Datum peg
- Test Pit (TP)
- Additional Survey Boundary

Survey included for information only. Use of survey data to be agreed by Administrator.

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES: G:\NERD\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\03_EF-CL-1.dwg

Associated Job Nos: ----

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST

PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)

CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from Start of Gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
EXISTING FEATURES AND SERVICES/CONTROL LINE SETOUT
SHEET 1 OF 2

Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18418	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786486 A
Series Number	EF-1 of 2
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 9:56am XREFS :- X_Survey_MR100720.dwg ; X_Aerial Images.dwg ; X_CL.dwg ; X_Survey_AHV.dwg

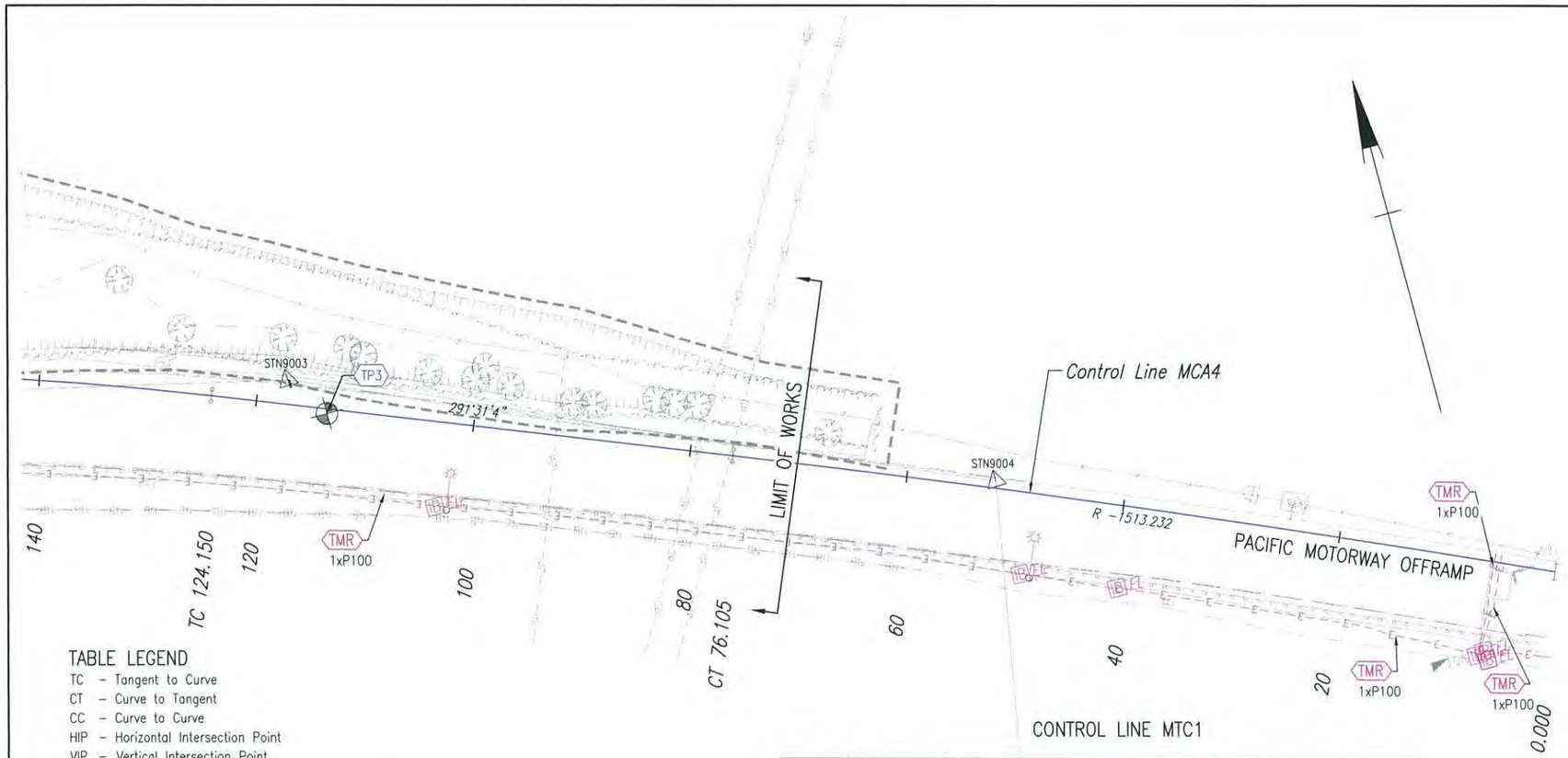

TABLE LEGEND

TC – Tangent to Curve
CT – Curve to Tangent
CC – Curve to Curve
HIP – Horizontal Intersection Point
VIP – Vertical Intersection Point

CONTROL LINE MCC2

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528469.118	6922593.458	29.433	198°54'56.57"	
TC	4.596	528467.628	6922589.110	29.233	198°54'56.57"	
IP 2	4.733	528467.583	6922588.981	29.227		R = 3.000
CT	4.871	528467.527	6922588.855	29.221	204°09'08.83"	
TC	7.169	528466.586	6922586.758	29.125	204°09'08.83"	
IP 3	8.096	528466.206	6922585.910	29.117		R = -10.000
CT	9.023	528465.989	6922585.006	29.048	193°31'46.94"	
TC	14.153	528464.788	6922580.018	28.835	193°31'46.94"	
IP 4	17.146	528464.025	6922576.845	28.689		R = -6.052
CT	20.139	528466.256	6922574.464	28.568	136°51'43.40"	
TC	24.805	528469.447	6922571.059	28.506	136°51'43.40"	
IP 5	24.940	528469.539	6922570.960	28.505		R = 2.000
CT	25.075	528469.618	6922570.850	28.503	144°35'52.34"	
IP 6	29.048	528471.919	6922567.612	28.440	144°35'52.34"	

CONTROL LINE MCD1

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528479.894	6922548.334	27.582	67°45'35.59"	
IP 2	3.771	528483.461	6922549.792	27.534		R = 15.000
CT	7.543	528487.288	6922549.351	27.486	96°34'16.37"	
TC	25.066	528504.697	6922547.346	26.999	96°34'16.37"	
IP 3	29.188	528508.806	6922546.872	26.867		R = 40.000
CT	33.311	528512.732	6922545.568	26.734	108°22'49.68"	
IP 4	47.297	528526.005	6922541.158	26.284	108°22'49.68"	

CONTROL LINE MTC1

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528453.763	6922578.711	28.822	40°47'23.15"	
IP 2	0.328	528454.014	6922579.002	28.812		R = 0.500
CC	0.655	528454.360	6922578.835	28.802	115°54'01.46"	
IP 3	0.983	528454.706	6922578.667	28.792		R = 0.500
CC	1.311	528454.633	6922578.289	28.782	191°00'39.77"	
IP 4	7.845	528453.374	6922571.820	28.583		R = -41.000
CC	14.380	528454.206	6922565.283	28.409	172°44'53.09"	
IP 5	14.649	528454.244	6922564.987	28.409		R = 0.500
CC	14.918	528454.001	6922564.813	28.408	234°24'15.68"	
IP 6	15.187	528453.758	6922564.639	28.408		R = 0.500
IP 7	15.456	528453.490	6922564.771	28.407	296°03'38.26"	

PERMANENT MARKS

NAME	COORDINATES		HEIGHT	COMBINED SCALE FACTOR	COMMENTS
	EASTING	NORTHING			
PM158595	528278.819	6922570.363	17.327	0.99960073	MINI MARK
PM130485	528447.558	6922587.004	28.983	0.99959902	STAR PICKET
PM191576	528654.858	6922327.303	19.284	0.99960069	MINI MARK
PM113167	528416.673	6922472.711	32.294	0.99959848	HILTI NAIL IN MANHOLE

ALIGNMENT MCC1

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528469.505	6922550.487	27.846	148°17'43.49"	
IP 2	6.487	528472.939	6922544.929	27.743		R = 44.698
IP 3	12.974	528474.638	6922538.620	27.670	164°55'35.37"	

CONTROL LINE MCA4

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528743.619	6922449.914	19.018	294°23'57.30"	
IP 2	38.053	528708.957	6922465.636	19.631		R = -1513.232
CT	76.105	528673.549	6922479.596	20.183	291°31'03.59"	
TC	124.150	528628.854	6922497.219	21.028	291°31'03.59"	
IP 3	154.904	528600.154	6922508.534	21.889		R = -320.000
CC	185.658	528569.822	6922514.158	23.164	280°30'16.57"	
IP 4	204.317	528551.050	6922517.639	24.156		R = 71.680
CC	222.976	528536.496	6922529.996	25.348	310°20'02.44"	
IP 5	265.773	528490.775	6922568.817	27.241		R = -47.500
CC	308.570	528463.463	6922515.417	27.354	207°05'17.72"	
IP 6	329.667	528451.891	6922492.792	27.177		R = 30.063
CC	350.764	528427.655	6922500.436	27.084	287°30'14.92"	
IP 7	371.861	528403.420	6922508.079	27.209		R = 30.063
IP 8	392.958	528406.921	6922533.249	27.397	7°55'12.13"	

PRIMARY INSTRUMENT STATIONS

NAME	COORDINATES		HEIGHT	COMBINED SCALE FACTOR	COMMENTS
	EASTING	NORTHING			
STN9000	528394.818	6922527.866	27.381	0.99959923	SCREW
STN9001	528498.422	6922545.612	27.529	0.99959928	SCREW
STN9002	528564.343	6922513.371	23.445	0.99959997	SCREW
STN9003	528635.971	6922496.778	20.777	0.99960044	SCREW
STN9004	528696.257	6922471.157	19.858	0.99960063	NAIL
STN9005	528686.524	6922416.121	15.753	0.99960127	NAIL

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	Revisions/Descriptions	Certification	Date	Microfiled	

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Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from Start of Gazettal 31.1km – 31.9km

EXIT 49 NORTH BOUND OFF RAMP
EXISTING FEATURES AND SERVICES/CONTROL LINE SETOUT
SHEET 2 OF 2

Drawn	ENGINEERING CERTIFICATION (RPEQ)				
C.WOJCIK	ENG. AREA	NAME		NO.	DATE
Designed	CIVIL	A. O'SHEA		18498	3/9/18
S.READ					

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786487 A
Series Number	EF-2 of 2
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 10:42am XREFS :- X_Survey_MR100720.dwg ; X_Aerial Images.dwg ; X_CL.dwg ; X_Survey_ARV.dwg

Chain wire fence to connect to existing fence panel.
Location of fence posts to be determined on site. Refer to Std Drg SD1602

Existing kerb and channel, guardrail and path to remain

OVERPASS

Excavate visibility bench to existing batter. Refer Cross Section Drg No 786500

Remove existing kerb over extent of MTC1

Modify extent of existing concrete lined drain to accommodate limit of excavation

Control Line MCC2

Type 10 kerb
Control Line MTC1

Remove existing concrete slabs and kerb and channel

Control Line MCD1
Type 28 channel

Existing kerb to remain

1050 dia access chamber

Construct Single Gully Field Inlet Type 1. Refer Std Drg 1309

Existing headwall and culvert to remain. Clean out culvert and remove silt, vegetation and rubbish from outlet.

Join smoothly to existing concrete slab and kerb and channel

Type 14 kerb and channel
Control Line MCC1

Type 28 channel

Remove existing concrete channel

Join smoothly to existing concrete slab and gully pit

Existing gully pit to remain

Construct Single Gully Field Inlet Type 1. Refer Std Drg 1309

Existing access chamber and gully pit to be demolished

Remove existing kerb between chge 142.000 and chge 179.000 CL MCA4

Existing kerb and channel to remain

Remove existing field inlet and gully

Remove existing kerb

Control Line MCA4

RIFLE RANGE ROAD

PACIFIC MOTORWAY OFF RAMP

283.889 CC 222.976 CC 185.658 138.387 TC 124.150

4.00 4.00 3.50 3.50 3.50 3.50

NOTES

1. For standard kerb, kerb and channel types refer Std. Drg. No.1033.
2. For Control Line Setout details refer Drg. Nos. 78686 and 786487.
3. For Signs and Linemarking details refer Drg. Nos. 786490 and 786491
4. For utility service conflicts refer Drg. Nos. 786486 and 786487
5. For extents of kerb and channels, Type 28 channel and kerb refer Typical Cross Section Drg. No. 786485
6. For Drainage, subsoil drains and pavement drain details refer Drg. No. 786489

LEGEND

Pavement Type 1
50mm AC14 (A15E) Surfacing course
50mm AC14 (A15E) Intermediate course
130mm AC20 (C600) Base course
Prime AMCO 0.8l/m^2
S/S treatment CI170 1.3l/m^2, 10mm aggregate at 120m^2/m^3
150mm Lightly Bound Improved Layer to achieve 1–2MPa UCS at 7days. (Refer MRS10)

Pavement Type 2
50mm AC14 (A15E) Surfacing course
50mm AC14 (A15E) Intermediate course

100mm Topsoil and Turf

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	Revisions/Descriptions	Certification	Date	Microfiled

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Associated Job Nos

Auxiliary Drg Nos ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP
CONSTRUCTION AND PAVEMENT DETAILS
SHEET 1 OF 1

Drawn C.WOJCIK
Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)

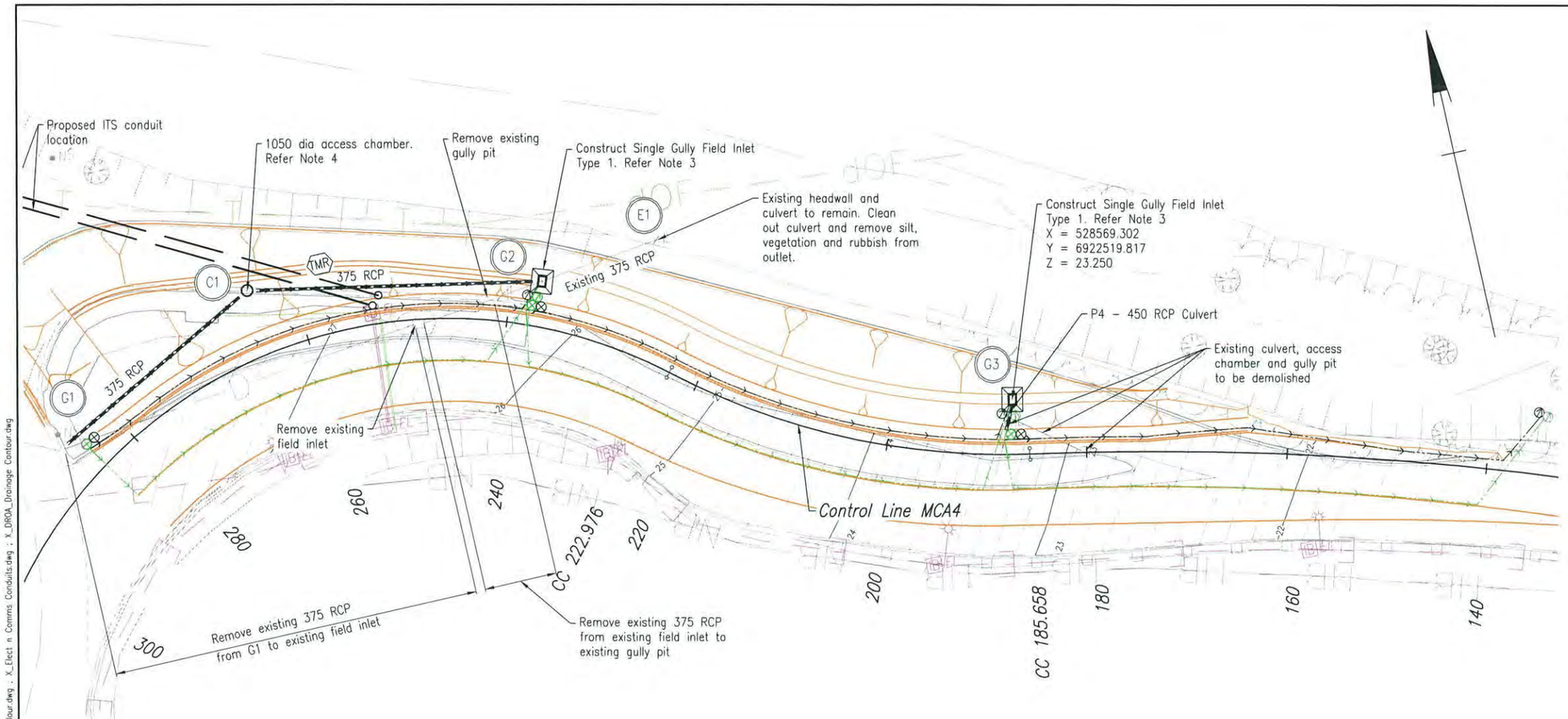
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		19418	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786488 A
Series Number	CD-1 of 1

MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 9:59am XREFS :- X_Aerial Images.dwg ; X_DROA.dwg ; X_DROA_Drainage.dwg ; X_PVT.dwg ; X_CL.dwg ; X_Survey_AHV.dwg ; X_Survey_MR100720.dwg

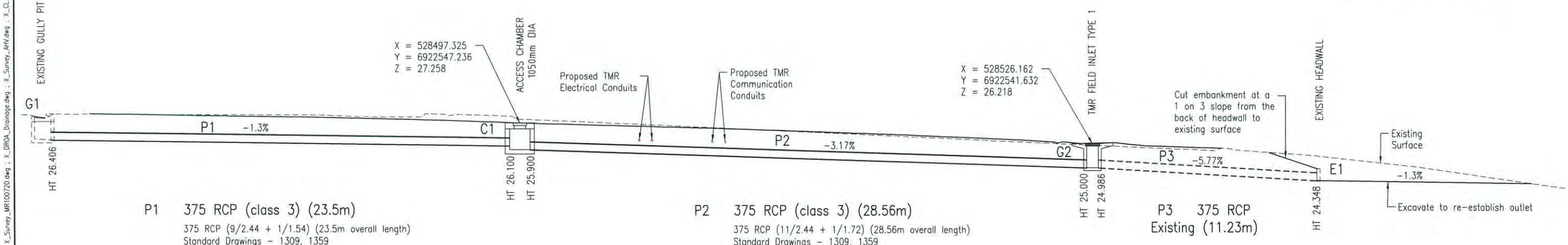


NOTES:

1. The pipe class does not allow for construction loading. The Class may need to be changed to suit construction processes and equipment.
2. Culvert Foundation Bedding Zone to be laid in accordance with Std. Drg. 1359. Haunch, Side and Overlay Zone material to be compacted lean mix concrete to the bottom of working platform for all culverts under the roadway.
3. For Field Inlet Type 1 details refer to Std. Drg. 1309.
4. For Access Chamber details refer to Std. Drgs. 1307, 1308 and 1441.
5. All culverts to have rubber ring joints.
6. For network Drainage Setout and Heights refer Drainage Long Sections
7. For subsoil drain outlet and cleanout details, refer to Std. Drg. 1116.
8. The design surface contours are shown.

DRAINAGE LEGEND

- ø375 RCP — Proposed Stormwater Drainage with culvert/pipe size and type
- cleanout — outlet — Subsoil Drain showing Cleanouts and Outlet
- cleanout — outlet — Pavement Drain showing Cleanouts and Outlet
- G1 — Structure Reference
- Access Chamber
- Field Inlet
- TMR — TMR New Electrical and Telecommunications Crossing



P1 375 RCP (class 3) (23.5m)
375 RCP (9/2.44 + 1/1.54) (23.5m overall length)
Standard Drawings – 1309, 1359

P2 375 RCP (class 3) (28.56m)
375 RCP (11/2.44 + 1/1.72) (28.56m overall length)
Standard Drawings – 1309, 1359

P3 375 RCP
Existing (11.23m)

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES: G:\NERD\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\05_DD-1.dwg

Associated Job Nos: ----

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP DRAINAGE DETAILS SHEET 1 OF 1

Drawn: C.WOJCIK
Designed: S.READ

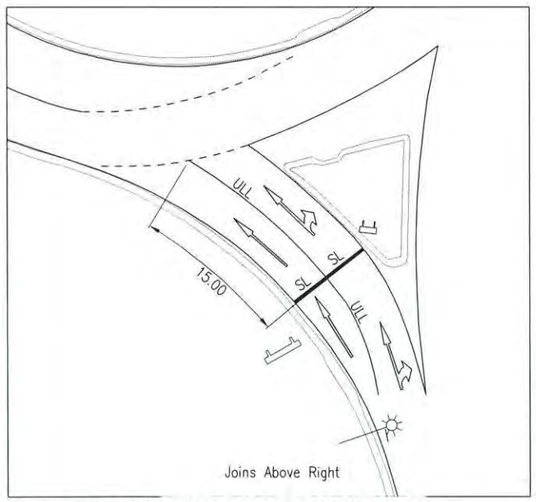
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18498	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786489 A
Series Number	DD-1 of 1

MRR_Detail (02/14)



M1 EXIT 49 EASTERN ROUNDABOUT

LEGEND

EL – Edge Line (100mm)
LL – Lane Line (100mm) (3+9m)
BLL – Special Purpose – Broken (100mm wide) (9+3m)
OM – Outline Marking (150mm wide)
SL – Stop Line (300mm wide, Thermoplastic)
GWL – Give Way Line (300mm wide Thermoplastic)
DBL – Double Barrier Line (80mm)
ULL – Unbroken Lane Line (100mm)
(T) – Thermoplastic

X–X–X Existing marking to be removed

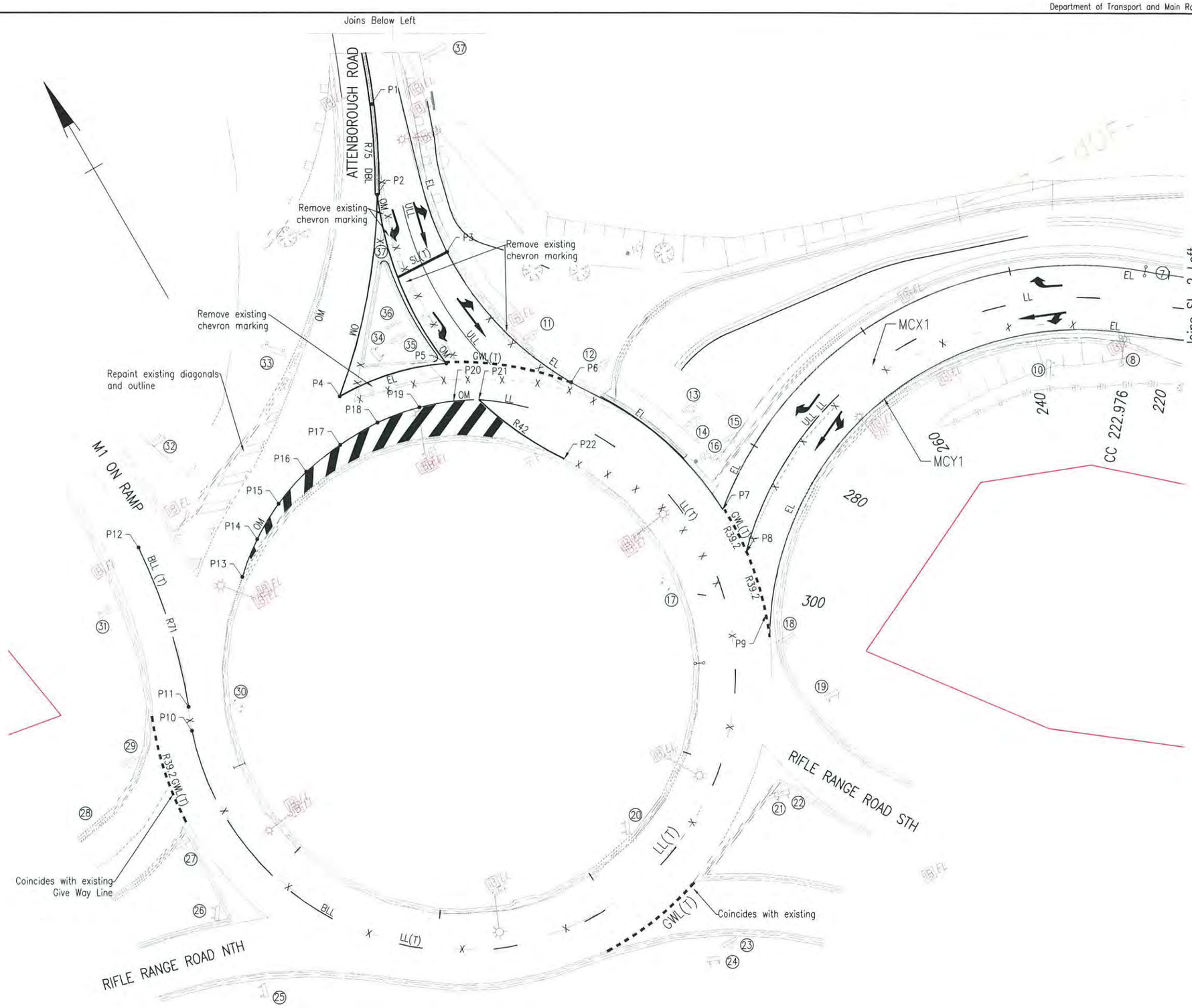
(X) Sign identifier – Refer Sign Tables Drg No 786491

Chevron and Diagonal dimensions:
B=1m, S=3m, W=150mm (refer MUTCD Pt2 Figure 5.6)

– Pavement Arrow

LINE MARKING COORDINATE TABLE

Point No.	Easting	Northing
P1	528462.879	6922596.600
P2	528457.795	6922586.400
P3	528461.821	6922575.836
P4	528441.044	6922566.931
P5	528454.734	6922563.811
P6	528467.128	6922553.926
P7	528475.687	6922530.562
P8	528475.482	6922524.446
P9	528473.811	6922516.461
P10	528403.911	6922540.023
P11	528405.034	6922542.805
P12	528409.614	6922563.233
P13	528419.076	6922553.480
P14	528423.081	6922556.648
P15	528427.643	6922559.144
P16	528432.659	6922560.875
P17	528437.996	6922561.648
P18	528443.516	6922561.715
P19	528449.054	6922560.738
P20	528453.182	6922559.254
P21	528456.043	6922557.811
P22	528461.601	6922546.047



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A	Issued For Construction				
	Revisions/Descriptions	Certification	Date	Microfiled	

CAD FILES | G:\NERD\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\SL-1.dwg

Associated Job Nos: ----

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from Start of Gazettal (M1) 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP
SIGNS AND LINEMARKING
LAYOUT 1 of 2

Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME		NO.	DATE
CIVIL	A. O'SHEA		18948	3/7/18

Queensland Government

Job No.	413159
Contract. No.	CN–3476
Drawing No.	786490 A
Series Number	SL–1 of 2

MRR_Detail (02/14)

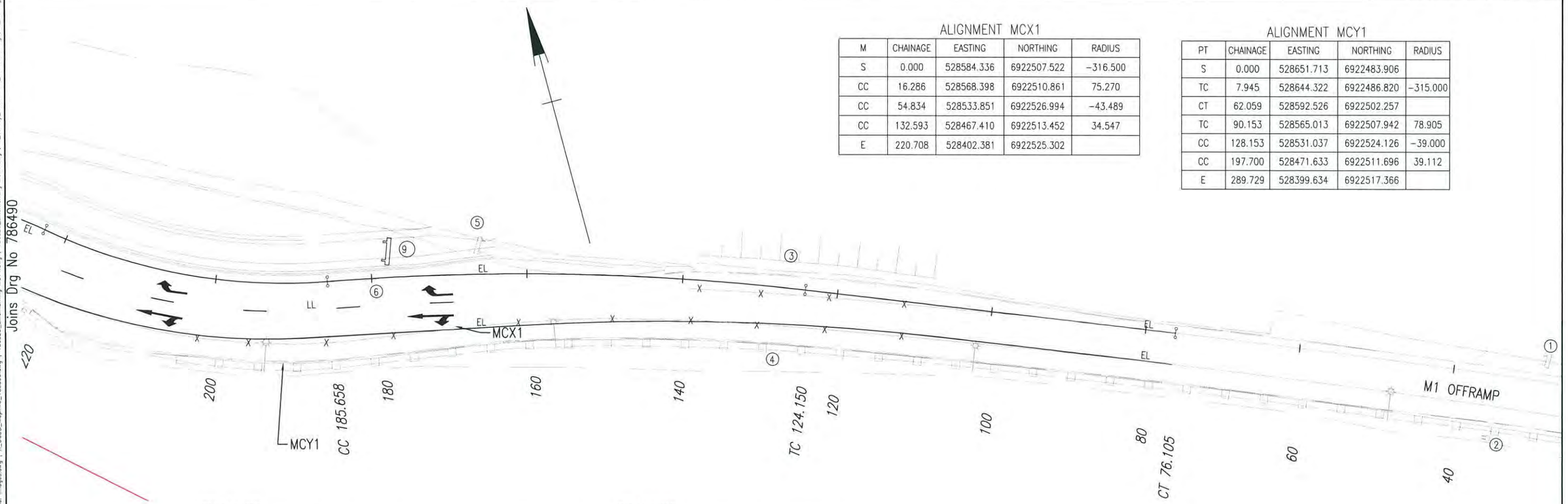
Last Modified :- Sep 03, 2018 – 1:51pm XREFS :- X_DLN_OPT 2.dwg ; X_DROA.dwg ; Prelim Survey MR101413_A.dwg ; 180823 VPath E49North SouthToWest Lane 1 Semi.dwg ; X_Aerial Images.dwg ; X_DCDB_MapInfo_180803.dwg ; 180823_Linemarking MCY1.dwg ; 180823_Linemarking MCX1.dwg ; X_Survey_MR100720_MODIFIED.dwg ; X_CL.dwg

ALIGNMENT MCX1

M	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528584.336	6922507.522	-316.500
CC	16.286	528568.398	6922510.861	75.270
CC	54.834	528533.851	6922526.994	-43.489
CC	132.593	528467.410	6922513.452	34.547
E	220.708	528402.381	6922525.302	

ALIGNMENT MCY1

PT	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528651.713	6922483.906	
TC	7.945	528644.322	6922486.820	-315.000
CT	62.059	528592.526	6922502.257	
TC	90.153	528565.013	6922507.942	78.905
CC	128.153	528531.037	6922524.126	-39.000
CC	197.700	528471.633	6922511.696	39.112
E	289.729	528399.634	6922517.366	



SIGN LIST

Sign No.	Description	Comments
1	Guide Sign (Exit 49)	To Remain
2	R4-1 Speed sign (80km/h)	To Remain
3	R4-1 Speed sign (60km/h)	Remove and Re-erect
4	R4-1 Speed sign (60km/h)	To remain
5	Guide sign (Wrong Way Go Back)	Remove
6	R2-Q02 (Through Traffic Keep Left)	Remove
7	Guide Sign (Information Sign)	Remove
8	On Light Pole - R2-9 (Left Lane Must Turn Left)	Remove
9	Guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new
	Guide sign R6-21 (End of Motorway)	Provide new
9R	New guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new sign
10	Guide sign (Wrong Way Go Back)	To Remain
11	R1-3 (Give Way at Roundabout)	To Remain
12	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
13	R1-3 (Give Way at Roundabout)	Remove
14	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
15	R1-3 (Give Way at Roundabout)	Remove and Re-erect
16	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
17	D4-1-1 (Hazard Marker L)	To Remain
18	R1-3 (Give Way at Roundabout)	To Remain
On back of 18	R2-4 (No Entry)	To Remain
	GE9-15 (Wrong Way)	To Remain
19	Guide sign (Rifle Range Rd South/Upper Coomera)	To Remain

SIGN LIST

Sign No.	Description	Comments
20	D4-2-3 (Hazard Marker)	To Remain
21	Street sign (Rifle Range Rd)	To Remain
	G5-14 Street sign (Pimpama Hall/Heritage Park/Pimpama State School)	To Remain
22	D4-1-1 (Hazard Marker L)	To Remain
23	R1-3 (Give Way at Roundabout)	To Remain
24	Information sign (Fire guide)	To Remain
25	Guide Sign (Rifle Range Rd-Nth / Willow Vale)	To Remain
	Tourist sign (The Golden Door Health Retreat)	To Remain
26	Tourist sign (Le Mans kart racing)	Remove
	Tourist sign (Stawberry Farm)	Remove
	Tourist sign (Gainsborough Greens Golf Course)	To Remain
	D4-1-1 (Hazard Marker L)	To Remain
27	R1-3 (Give Way at Roundabout)	To Remain
28	Guide sign (Pacific Mwy North / Rifle Range Rd South)	To Remain
29	R1-3 (Give Way at Roundabout)	To Remain
30	D4-1-1 (Hazard Marker L)	To Remain
	R2-2 (One Way L)	To Remain
31	Guide sign (Pacific MWY Nth / Brisbane)	To Remain
32	GE6-Q01 (Prohibited on Motorway)	To Remain
33	Guide sign (To Pacific MWY Sth / Jacobs Well, Gold Coast)	To Remain
34	D4-2-3 (Hazard Marker)	To Remain
	Tourist sign (Air Sea Rescue)	To Remain
35	R1-3 (Give Way at Roundabout)	To Remain
36	Tourist sign (Other Tourist Facilities)	To Remain
37	R2-3 (Keep Left)	Remove and Re-erect
38	Guide sign (Upper Coomera/Willow Vale, M1 Brisbane)	Provide new face

NOTES:

REFERENCE TO OTHER DRAWINGS
1. Complete Drawing list and numbers, refer DI drawing series.

SIGNS - FOOTINGS
2. The Contractor shall make enquires about existing drainage and public utility plant before undertaking any sign installation.
3. Signs shall be installed with a 3.0m minimum overhead clearance to aboveground power lines.
4. Where signs are in close proximity to underground utilities, the sign footing should be vaccum excavated (or similar approved method).
5. Position of the signs are shown approximately. The Contractor may change the position of the sign where deemed more appropriate with prior approval from the Administrator.
6. Single post signs positioned in grassed areas are to be installed in accordance with the Low Risk or Frangible Support detail on Std Drg 1368.
7. Unless footing details are provided, single post signs positioned in concrete or paved areas are to be installed in accordance with the Typical Sleeve Installation for 60.30D (50NB) Posts detail on Std Drg 1368.
8. Unless footing details are provided, multi post signs are to be installed in accordance with Std Drg 1363.

SIGNS - FACE AND POSTS
9. All new signs shall provide the make month and year on the rear face of each sign. The Contractor shall ensure these details are correct and provided before installation.
10. All signs to be installed using 50mm nominal bore posts unless otherwise directed in this Contract.
11. All relocated signs shall be on new posts. Where the relocated sign face is damaged prior to relocations, the Contractor must seek advice and approval to replace the damaged sign face prior to relocation.
12. Unless otherwise noted, sign faces shall be installed 2.0m min. clearance above the road shoulder and 1.0m clearance from the road shoulder/kerb or behind the face of guardrail. Where a sign is installed above or adjacent to footpath or verge, the sign face shall be installed 2.5m min. clearance above the final footpath or verge surface level.
13. Hazard signs D4-1-1A shall be installed with centre of the sign face installed approximately 1.7m from the road surface.
14. Sign faces shall be supplied in accordance with the requirements of MRS14 and MRTS14 Standard Specifications and Annexures.
15. Road edge guide posts shall be flexible metal type and installed on the hinge point where specified on drawings. Guide posts, which are not consistent with design are to be removed.

PAVEMENT MARKING
16. New pavement marking shall join smoothly to existing where required.
17. All pavement marking material shall be paint (type 3) unless otherwise noted in the Pavement Marking Legend.
18. All pavement markings not consistent with this design are to be removed by water blasting with minimal damage to the existing pavement surface.

	Revisions/Descriptions	Certification	Date	Microfiled
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A	Issued For Construction			

CAD FILES: G:\NERD\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\SL-1.dwg

Associated Job Nos: ----

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal (M1) 31.1km - 31.9km

EXIT 49 NORTHBOUND OFF RAMP
SIGNS AND LINEMARKING
SHEET 2 of 2

Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	NO.	DATE
CIVIL	A. O'SHEA	18418	3/9/18

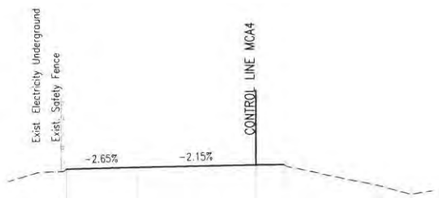
Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786491 A
Series Number	SL-2 of 2

MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:48pm XREFS :- X_DUIN_OPT 2.dwg ; X_DR0A.dwg ; Prelim Survey MR101413_A.dwg ; 180823 VPath E49North SouthToWest Lane 1 Sem.dwg ; X_Aerial Images.dwg ; X_DC0B_MapInfo_180803.dwg ; 180823_Linemarking MCY1.dwg ; 180823_Linemarking MCX1.dwg ; X_Survey_MR100720_MODIFIED.dwg ; X_CL.dwg

CONTROL LINE MCA4
X = 528669.926
Y = 6922481.025
Z = 20.243

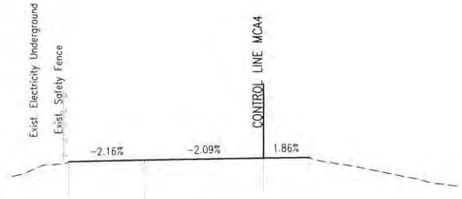


Datum 18.00

DESIGN HEIGHT			20.094	20.094	20.157		20.243	20.263	20.263
SUBGRADE HEIGHT									
EXISTING SURFACE		20.094	20.094		20.157		20.243	20.263	20.263
OFFSETS		-6.375	-6.375		-4.010		0.000	0.955	0.955

CHAINAGE 80.000

CONTROL LINE MCA4
X = 528651.320
Y = 6922488.361
Z = 20.553

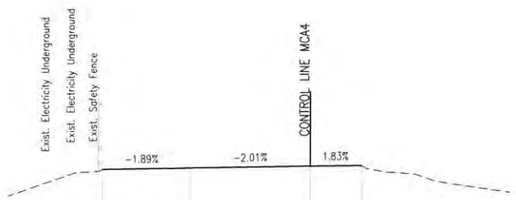


Datum 18.00

DESIGN HEIGHT			20.414	20.414	20.469		20.553	20.582	20.582
SUBGRADE HEIGHT									
EXISTING SURFACE		20.414	20.414		20.469		20.553	20.582	20.582
OFFSETS		-6.551	-6.551		-4.000		0.000	1.559	1.559

CHAINAGE 100.000

CONTROL LINE MCA4
X = 528632.714
Y = 6922495.697
Z = 20.931

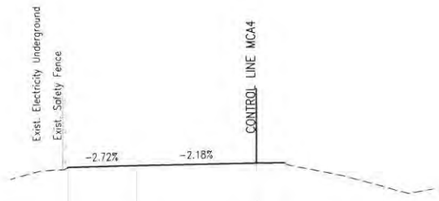


Datum 18.00

DESIGN HEIGHT			20.794	20.794	20.845	20.851	20.931	20.963	20.963
SUBGRADE HEIGHT									
EXISTING SURFACE		20.794	20.794		20.845	20.851	20.931	20.963	20.963
OFFSETS		-6.971	-6.971		-4.314	-4.000	0.000	1.749	1.749

CHAINAGE 120.000

CONTROL LINE MCA4
X = 528673.549
Y = 6922479.596
Z = 20.183

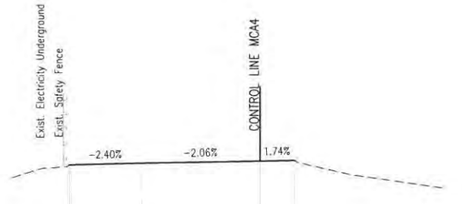


Datum 18.00

DESIGN HEIGHT			20.032	20.032	20.095		20.183	20.205	20.205
SUBGRADE HEIGHT									
EXISTING SURFACE		20.032	20.032		20.095		20.183	20.205	20.205
OFFSETS		-6.368	-6.368		-4.051		0.000	0.957	0.957

CHAINAGE 76.105

CONTROL LINE MCA4
X = 528660.623
Y = 6922484.693
Z = 20.392

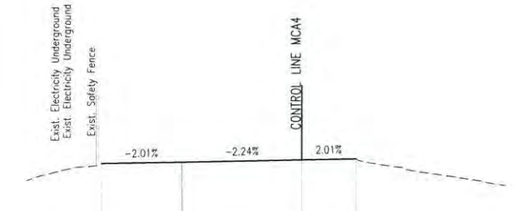


Datum 18.00

DESIGN HEIGHT			20.251	20.251	20.310		20.392	20.412	20.412
SUBGRADE HEIGHT									
EXISTING SURFACE		20.251	20.251		20.310		20.392	20.412	20.412
OFFSETS		-6.437	-6.437		-4.000		0.000	1.176	1.176

CHAINAGE 90.000

CONTROL LINE MCA4
X = 528642.017
Y = 6922492.029
Z = 20.737



Datum 18.00

DESIGN HEIGHT			20.593	20.593	20.647	20.648	20.737	20.774	20.774
SUBGRADE HEIGHT									
EXISTING SURFACE		20.593	20.593		20.647	20.648	20.737	20.774	20.774
OFFSETS		-6.720	-6.720		-4.026	-4.000	0.000	1.844	1.844

CHAINAGE 110.000

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES: G:\NERO\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\07_XS-1.dwg

Associated Job Nos:

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 1 OF 9 CL MCA4

Drawn: C.WOJCIK
Designed: S.READ

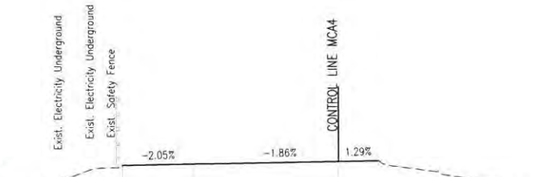
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18418	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786492 A
Series Number	XS-1 of 9
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:12pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

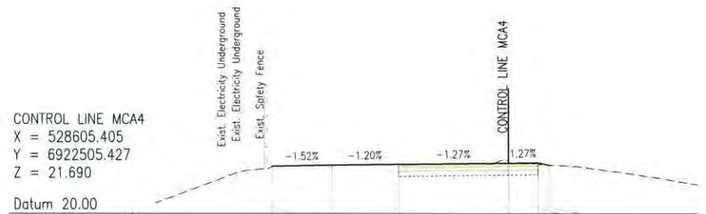


CONTROL LINE MCA4
X = 528623.392
Y = 6922499.315
Z = 21.173

Datum 18.00

DESIGN HEIGHT			21.032	21.032	21.082	21.101	21.173	21.191	21.191
SUBGRADE HEIGHT									
EXISTING SURFACE		21.032	21.032	21.082	21.101		21.173	21.191	21.191
OFFSETS		-7.263	-7.263	-4.861	-3.900		0.000	1.376	1.376

CHAINAGE 130.000



CONTROL LINE MCA4
X = 528605.405
Y = 6922505.427
Z = 21.690

Datum 20.00

DESIGN HEIGHT			21.585	21.585	21.616	21.643	21.690	21.702	21.702
SUBGRADE HEIGHT						21.643	21.310	21.322	21.322
EXISTING SURFACE		21.585	21.585	21.616	21.643		21.736	21.645	21.645
OFFSETS		-7.965	-7.965	-5.943	-3.689		0.000	1.000	1.000

CHAINAGE 149.000

CONTROL LINE MCA4
X = 528628.854
Y = 6922497.219
Z = 21.028

Datum 18.00

DESIGN HEIGHT			20.890	20.890	20.939	20.950	21.028	21.055	21.055
SUBGRADE HEIGHT									
EXISTING SURFACE		20.890	20.890	20.939	20.950		21.028	21.055	21.055
OFFSETS		-7.085	-7.085	-4.527	-3.965		0.000	1.610	1.610

CHAINAGE 124.150

CONTROL LINE MCA4
X = 528613.970
Y = 6922502.665
Z = 21.433

Datum 20.00

DESIGN HEIGHT			21.308	21.308	21.356	21.377	21.433	21.441	21.311
SUBGRADE HEIGHT						21.377	21.053	21.061	21.311
EXISTING SURFACE		21.308	21.308	21.356	21.377		21.434	21.370	21.311
OFFSETS		-7.588	-7.588	-5.431	-3.789		0.000	1.000	1.648

CHAINAGE 140.000

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES G:\NERD\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\07_XS-1.dwg

Associated Job Nos

Auxiliary Drg Nos ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales

0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 2 OF 9 CL MCA4

Drawn C.WOJCIK
Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18498	3/9/18

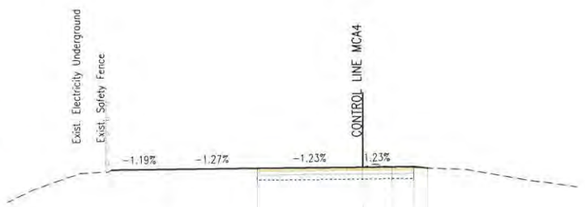
Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786493 A
Series Number	XS-2 of 9

MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:12pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

CONTROL LINE MCA4
X = 528594.836
Y = 6922508.474
Z = 22.080



Datum 20.00

DESIGN HEIGHT		21.976	21.976	21.998	22.036	22.080	22.092	22.101	22.049
SUBGRADE HEIGHT					22.036	21.700	21.712	21.721	22.049
EXISTING SURFACE		21.976	21.976	21.998	22.036	22.080	22.098	22.068	22.049
OFFSETS		-8.455	-8.455	-6.568	-3.567	0.000	1.000	1.733	2.190

CHAINAGE 160.000

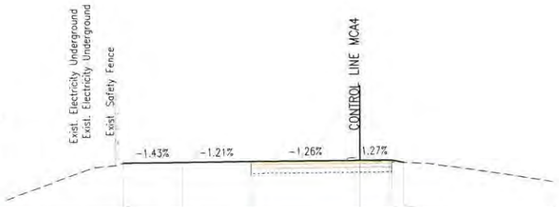
CONTROL LINE MCA4
X = 528585.142
Y = 6922510.928
Z = 22.506

Datum 20.00

DESIGN HEIGHT		22.352	22.352	22.386	22.446	22.506	22.523	22.530	22.655	22.655	22.635	22.526
SUBGRADE HEIGHT					22.446	22.126	22.143	22.150	22.153	22.159		
EXISTING SURFACE		22.352	22.352	22.386	22.446	22.468	22.482	22.488	22.491	22.495	22.551	22.526
OFFSETS		-9.246	-9.246	-7.000	-3.500	0.000	1.000	1.400	1.590	1.890	2.890	4.908

CHAINAGE 170.000

CONTROL LINE MCA4
X = 528604.448
Y = 6922505.719
Z = 21.719

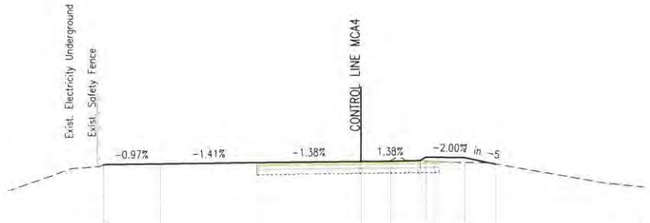


Datum 20.00

DESIGN HEIGHT		21.616	21.616	21.645	21.673	21.719	21.732	21.733	21.651
SUBGRADE HEIGHT					21.673	21.339	21.352	21.353	21.651
EXISTING SURFACE		21.616	21.616	21.645	21.673	21.722	21.674	21.671	21.651
OFFSETS		-7.997	-7.997	-6.000	-3.678	0.000	1.000	1.067	1.473

CHAINAGE 150.000

CONTROL LINE MCA4
X = 528590.967
Y = 6922509.492
Z = 22.241



Datum 20.00

DESIGN HEIGHT		22.128	22.128	22.147	22.193	22.241	22.255	22.269	22.394	22.394	22.374	22.163
SUBGRADE HEIGHT					22.193	21.861	21.875	21.889	21.892	21.896		
EXISTING SURFACE		22.128	22.128	22.147	22.193	22.232	22.273	22.260	22.252	22.239	22.214	22.163
OFFSETS		-8.711	-8.711	-6.777	-3.522	0.000	1.000	2.000	2.190	2.490	3.490	4.546

CHAINAGE 164.000

	Revisions/Descriptions	Certification	Date	Microfiled
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A	Issued For Construction			

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Associated Job Nos

Auxiliary Drg Nos ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 3 OF 9 CL MCA4

Drawn C.WOJCIK
Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18498	7/9/18

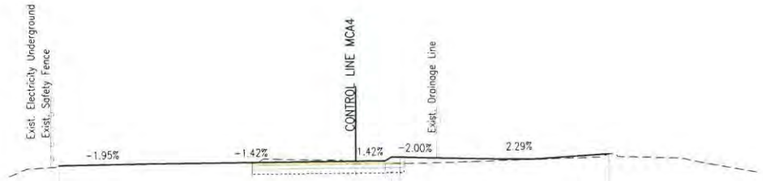
Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786494 A
Series Number	XS-3 of 9
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:13pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

CONTROL LINE MCA4
X = 528569.822
Y = 6922514.158
Z = 23.164

Datum 22.00

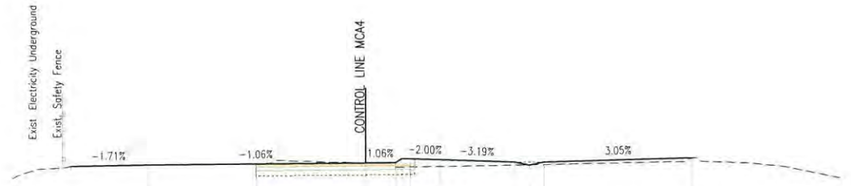


DESIGN HEIGHT	23.007	23.007	23.064	23.115	23.164	23.179	23.179	23.304	23.304	23.284	23.422	23.422		
SUBGRADE HEIGHT				23.115	22.784	22.799	22.799	22.801	22.806					
EXISTING SURFACE	23.007	23.007	23.064	23.115	23.074	23.083	23.083	23.086	23.089	23.110	23.422	23.422		
OFFSETS	-10.027	-10.027	-7.062	-3.500	0.000	1.000	1.000	1.190	1.490	2.490	8.536	8.536		

CHAINAGE 185.658

CONTROL LINE MCA4
X = 528556.075
Y = 6922518.161
Z = 23.906

Datum 22.00

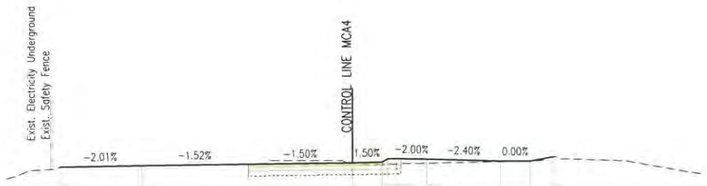


DESIGN HEIGHT	23.784	23.784	23.828	23.867	23.906	23.917	23.917	24.042	24.042	24.022	23.942	23.842	23.942	24.093	24.093
SUBGRADE HEIGHT				23.867	23.526	23.537	23.537	23.539	23.542						
EXISTING SURFACE	23.784	23.784	23.828	23.867	23.909	23.784	23.784	23.768	23.776	23.795	23.842	23.851	23.861	24.093	24.093
OFFSETS	-9.934	-9.934	-7.379	-3.693	0.000	1.000	1.000	1.190	1.490	2.490	5.000	5.500	6.000	10.967	10.967

CHAINAGE 200.000

CONTROL LINE MCA4
X = 528575.376
Y = 6922513.077
Z = 22.921

Datum 22.00

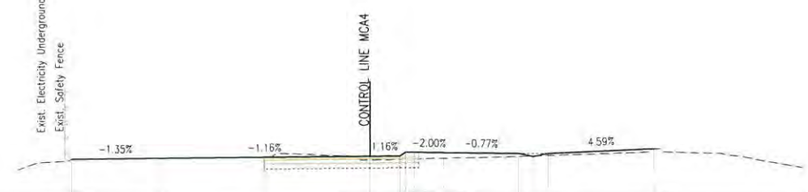


DESIGN HEIGHT	22.758	22.758	22.813	22.868	22.921	22.936	22.936	23.061	23.061	23.041	22.981	22.981	23.121	23.121
SUBGRADE HEIGHT				22.868	22.541	22.556	22.556	22.559	22.563					
EXISTING SURFACE	22.758	22.758	22.813	22.868	22.862	22.874	22.874	22.876	22.882	22.904	22.960	22.987	23.121	23.121
OFFSETS	-9.882	-9.882	-7.126	-3.500	0.000	1.000	1.000	1.190	1.490	2.490	4.990	5.990	6.758	6.758

CHAINAGE 180.000

CONTROL LINE MCA4
X = 528565.579
Y = 6922515.078
Z = 23.366

Datum 22.00



DESIGN HEIGHT	23.244	23.244	23.283	23.325	23.366	23.378	23.378	23.503	23.503	23.483	23.463	23.363	23.463	23.627	23.627
SUBGRADE HEIGHT				23.325	22.986	22.998	22.998	23.000	23.003						
EXISTING SURFACE	23.244	23.244	23.283	23.325	23.238	23.260	23.260	23.265	23.273	23.299	23.363	23.380	23.397	23.627	23.627
OFFSETS	-10.064	-10.064	-7.100	-3.555	0.000	1.000	1.000	1.190	1.490	2.490	5.000	5.500	6.000	9.562	9.562

CHAINAGE 190.000

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

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Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 4 OF 9 CL MCA4

Drawn C.WOJCIK
Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18498	3/9/18

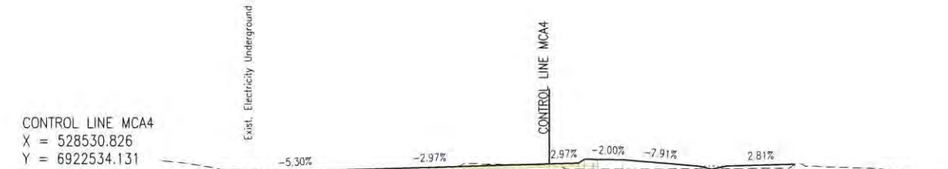
Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786495 A
Series Number	XS-4 of 9
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:13pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

DESIGN HEIGHT			24.972	24.972	25.036	25.096	25.155	25.171	25.171	25.296	25.296	25.276	25.054	24.954	25.054	25.090	25.090		
SUBGRADE HEIGHT						25.096	24.775	24.791	24.791	24.793	24.798								
EXISTING SURFACE			24.972	24.972	25.036	25.096	24.974	24.969	24.969	24.969	24.968	24.966	24.954	24.956	24.959	25.090	25.090		
OFFSETS			-10.085	-10.085	-7.923	-3.962	0.000	1.000	1.000	1.190	1.490	2.490	5.000	5.500	6.000	10.150	10.150		

CHAINAGE 220.000

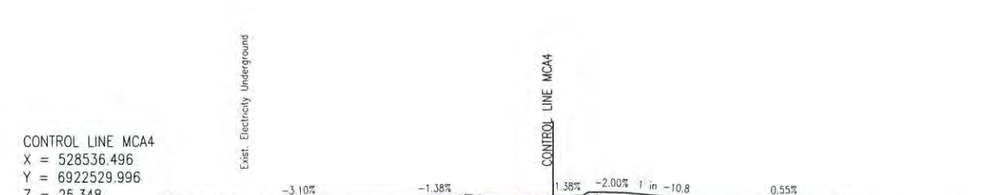


DESIGN HEIGHT		25.520	25.572		25.691		25.812	25.841	25.841	25.966	25.966	25.946		25.748	25.648	25.748		25.812	25.812
SUBGRADE HEIGHT					25.691		25.432	25.461	25.461	25.467	25.476								
EXISTING SURFACE		25.520	25.572		25.691		25.766	25.631	25.631	25.631	25.630	25.629		25.648	25.652	25.657		25.812	25.812
OFFSETS		-9.061	-8.062		-4.060		0.000	1.000	1.000	1.190	1.490	2.490		5.000	5.500	6.000		8.292	8.292

CHAINAGE 230.000

DESIGN HEIGHT			24.350	24.350	24.414	24.453	24.493	24.503	24.503	24.628	24.628	24.608	24.476	24.376	24.476	24.574	24.574		
SUBGRADE HEIGHT						24.453	24.113	24.123	24.123	24.125	24.128								
EXISTING SURFACE			24.350	24.350	24.414	24.453	24.498	24.381	24.381	24.352	24.354	24.358	24.376	24.381	24.386	24.574	24.574		
OFFSETS			-10.764	-10.764	-7.655	-3.830	0.000	1.000	1.000	1.190	1.490	2.490	5.000	5.500	6.000	11.159	11.159		

CHAINAGE 210.000



DESIGN HEIGHT		25.201	25.238		25.293		25.348	25.362	25.362	25.487	25.487	25.467		25.234	25.134	25.234		25.254	25.254
SUBGRADE HEIGHT					25.293		24.968	24.982	24.982	24.984	24.988								
EXISTING SURFACE		25.201	25.238		25.293		25.150	25.144	25.144	25.144	25.143	25.139		25.134	25.133	25.132		25.254	25.254
OFFSETS		-9.179	-8.000		-4.000		0.000	1.000	1.000	1.190	1.490	2.490		5.000	5.500	6.000		9.615	9.615

CHAINAGE 222.976

Last Modified :- Sep 03, 2018 - 1:13pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

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Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 5 OF 9 CL MCA4

Drawn C.WOJCIK
Designed S.READ

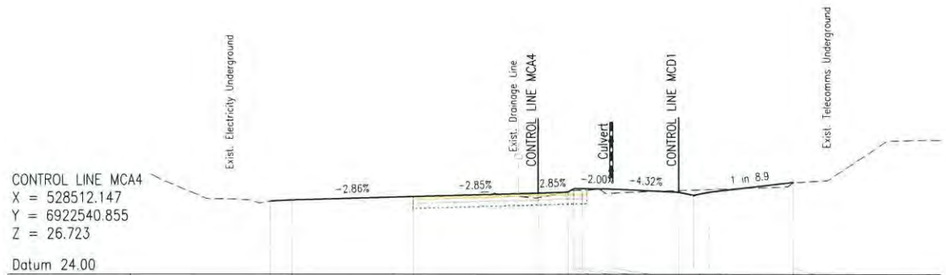
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		18998	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786496 A
Series Number	XS-5 of 9

MRR_Detail (02/14)



CONTROL LINE MCA4
X = 528512.147
Y = 6922540.855
Z = 26.723

Datum 24.00

DESIGN HEIGHT			26.445	26.487	26.603		26.723	26.752	26.752	26.877	26.877	26.857	26.760	26.660	26.760		27.080	27.080
SUBGRADE HEIGHT					26.603		26.343	26.372	26.372	26.377	26.386							
EXISTING SURFACE		26.445	26.487	26.603		26.572	26.783	26.783	26.813	26.819	26.717	26.808	26.826	26.843		27.080	27.080	
OFFSETS		-9.031	-8.280	-4.220		0.000	1.000	1.000	1.190	1.490	2.490	4.738	5.238	5.738		8.605	8.605	

CHAINAGE 250.000

CONTROL LINE MCA4
X = 528521.842
Y = 6922538.480
Z = 26.335

Datum 24.00

DESIGN HEIGHT			25.996	26.049	26.190		26.335	26.370	26.370	26.495	26.495	26.475	26.428	26.328	26.428		26.511	
SUBGRADE HEIGHT					26.190		25.955	25.990	25.990	25.997	26.007							
EXISTING SURFACE		25.996	26.049	26.190		26.344	26.350	26.350	26.351	26.352	26.247	26.269	26.281	26.294		26.511		
OFFSETS		-9.090	-8.163	-4.143		0.000	1.000	1.000	1.190	1.490	2.490	3.855	4.355	4.855		8.069		

CHAINAGE 240.000

CONTROL LINE MCA4
X = 528502.170
Y = 6922541.152
Z = 27.074

Datum 26.00

DESIGN HEIGHT			26.792	26.822	26.946		27.074	27.104	27.104	27.229	27.229	27.209	27.104	27.004	27.104		27.686	27.686
SUBGRADE HEIGHT					26.946		26.694	26.724	26.724	26.730	26.739							
EXISTING SURFACE		26.792	26.822	26.946		27.160	27.181	27.181	27.185	27.192	27.239	27.326	27.349	27.371		27.686	27.686	
OFFSETS		-8.912	-8.405	-4.288		0.000	1.000	1.000	1.190	1.490	2.490	6.560	7.060	7.560		11.539	11.539	

CHAINAGE 260.000

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A	Issued For Construction				
	Revisions/Descriptions	Certification	Date	Microfiled	

CAD FILES | G:\NERD\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\07_XS-1.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 10 20 30 40m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 6 OF 9 CL MCA4

Drawn C.WOJCIK
Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME		NO.	DATE
CIVIL	A. O'SHEA		18976	7/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786497 A
Series Number	XS-6 of 9
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 1:14pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

CONTROL LINE MCA4
X = 528484.935
Y = 6922536.483
Z = 27.495

Datum 26.00

DESIGN HEIGHT		27.177	27.216		27.354		27.495	27.527	27.527	27.652	27.652	27.632	
SUBGRADE HEIGHT					27.354		27.115	27.147	27.147	27.153	27.162		
EXISTING SURFACE		27.177	27.216		27.354		27.488	27.597	27.597	27.603	27.613	27.647	
OFFSETS		-9.112	-8.637		-4.378		0.000	1.000	1.000	1.190	1.490	2.490	

CHAINAGE 277.963

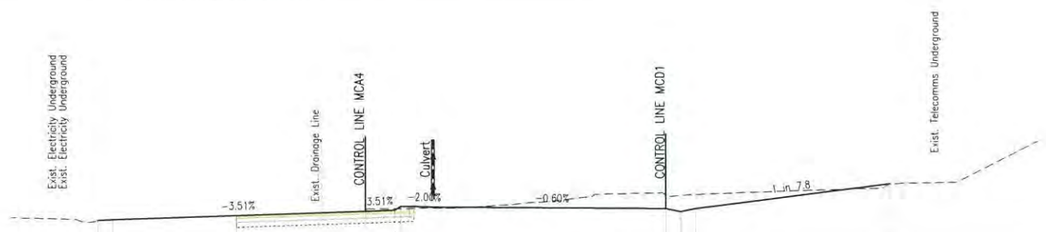
CONTROL LINE MCA4
X = 528479.784
Y = 6922533.560
Z = 27.572

Datum 26.00

DESIGN HEIGHT		27.267	27.324		27.451		27.572	27.621	27.621	27.746	27.746	27.726	
SUBGRADE HEIGHT					27.451		27.192	27.241	27.241	27.246	27.254		
EXISTING SURFACE		27.267	27.324		27.451		27.572	27.621	27.621	27.701	27.712	27.717	
OFFSETS		-9.277	-8.711		-4.396		0.000	1.760	1.760	1.950	2.250	3.250	

CHAINAGE 283.889

CONTROL LINE MCA4
X = 528492.351
Y = 6922539.358
Z = 27.354



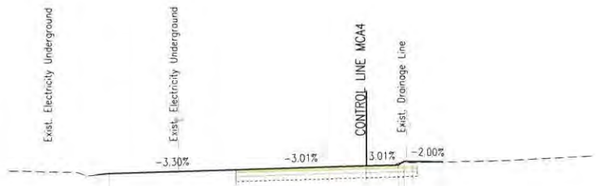
Datum 26.00

DESIGN HEIGHT		27.028	27.054		27.201		27.354	27.389	27.389	27.514	27.514	27.494	
SUBGRADE HEIGHT					27.201		26.974	27.009	27.009	27.015	27.026		
EXISTING SURFACE		27.028	27.054		27.201		27.421	27.437	27.437	27.438	27.441	27.451	
OFFSETS		-9.029	-8.535		-4.344		0.000	1.000	1.000	1.190	1.490	2.490	

DESIGN HEIGHT							27.447	27.347	27.447			28.289	28.289
SUBGRADE HEIGHT													
EXISTING SURFACE							27.906	27.881	27.924			28.289	28.289
OFFSETS							10.152	10.652	11.152			17.687	17.687

CHAINAGE 270.000

CONTROL LINE MCA4
X = 528483.124
Y = 6922535.551
Z = 27.523



Datum 26.00

DESIGN HEIGHT		27.213	27.250		27.391		27.523	27.556	27.556	27.681	27.681	27.661	
SUBGRADE HEIGHT					27.391		27.143	27.176	27.176	27.181	27.190		
EXISTING SURFACE		27.213	27.250		27.391		27.523	27.621	27.621	27.636	27.641	27.655	
OFFSETS		-9.069	-8.663		-4.385		0.000	1.088	1.088	1.278	1.578	2.578	

CHAINAGE 280.000

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERD\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\07_XS-1.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 10 20 30 40m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

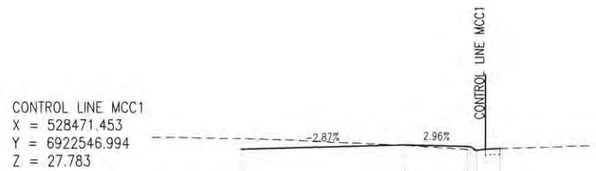
EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 7 OF 9 CL MCA4

Drawn	C.WOJCIK	ENGINEERING CERTIFICATION (RPEQ)			
Designed	S.READ	ENG. AREA	NAME	SIGNATURE	NO. / DATE
		CIVIL	A. O'SHEA		18498 3/9/18

Queensland Government

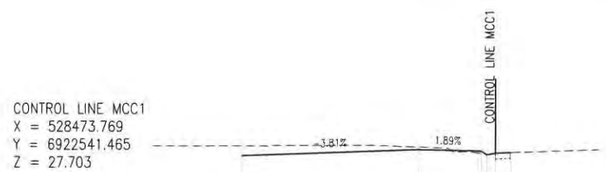
Job No.	413159
Contract. No.	CN-3476
Drawing No.	786498 A
Series Number	XS-7 of 9
	MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 – 1:15pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg



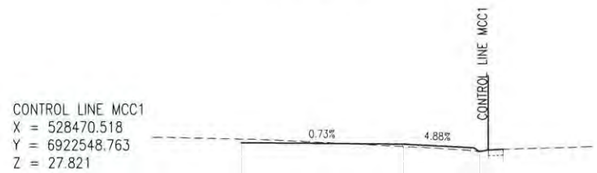
DESIGN HEIGHT	27.771	27.930	27.868	27.868	27.743	27.783	27.804
SUBGRADE HEIGHT						27.783	27.614
EXISTING SURFACE	28.123	27.901	27.772	27.763	27.750	27.783	27.804
OFFSETS	-8.204	-2.686	-0.600	-0.490	-0.300	0.000	0.500

CHAINAGE 4.000



DESIGN HEIGHT	27.600	27.826	27.788	27.788	27.663	27.703	27.734
SUBGRADE HEIGHT						27.703	27.544
EXISTING SURFACE	27.937	27.907	27.720	27.700	27.657	27.703	27.734
OFFSETS	-8.532	-2.600	-0.600	-0.490	-0.300	0.000	0.500

CHAINAGE 10.000

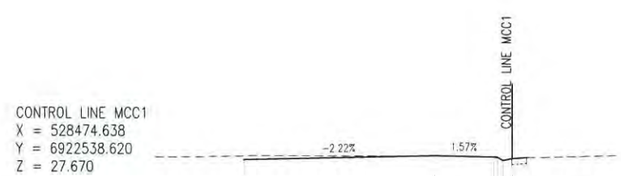


DESIGN HEIGHT	28.056	28.016	27.906	27.906	27.781	27.821	27.847
SUBGRADE HEIGHT						27.821	27.657
EXISTING SURFACE	28.174	27.939	27.807	27.795	27.785	27.821	27.847
OFFSETS	-8.307	-2.858	-0.600	-0.490	-0.300	0.000	0.500

CHAINAGE 2.000

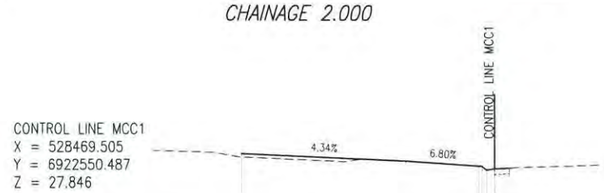
DESIGN HEIGHT	27.590	27.851	27.811	27.811	27.686	27.726	27.753
SUBGRADE HEIGHT						27.726	27.563
EXISTING SURFACE	28.138	27.869	27.716	27.703	27.677	27.726	27.753
OFFSETS	-8.316	-2.600	-0.600	-0.490	-0.300	0.000	0.500

CHAINAGE 8.000



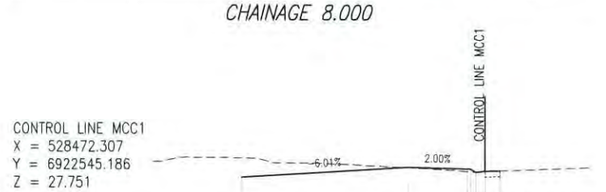
DESIGN HEIGHT	27.615	27.758	27.726	27.726	27.613	27.670	27.708
SUBGRADE HEIGHT						27.670	27.518
EXISTING SURFACE	27.731	27.758	27.726	27.683	27.613	27.670	27.708
OFFSETS	-9.056	-2.615	-0.615	-0.497	-0.307	0.000	0.500

CHAINAGE 12.974



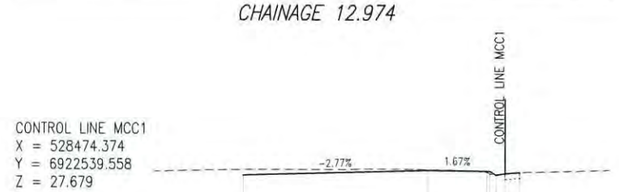
DESIGN HEIGHT	28.342	28.101	27.936	27.936	27.802	27.846	27.873
SUBGRADE HEIGHT						27.846	27.683
EXISTING SURFACE	28.224	28.101	27.936	27.882	27.802	27.846	27.873
OFFSETS	-8.517	-2.975	-0.544	-0.434	-0.271	0.000	0.500

CHAINAGE 0.000



DESIGN HEIGHT	27.539	27.876	27.836	27.836	27.711	27.751	27.771
SUBGRADE HEIGHT						27.751	27.581
EXISTING SURFACE	28.189	27.865	27.743	27.733	27.714	27.751	27.771
OFFSETS	-8.207	-2.600	-0.600	-0.490	-0.300	0.000	0.500

CHAINAGE 6.000



DESIGN HEIGHT	27.610	27.783	27.749	27.749	27.630	27.679	27.718
SUBGRADE HEIGHT						27.679	27.528
EXISTING SURFACE	27.800	27.809	27.720	27.659	27.637	27.679	27.718
OFFSETS	-8.857	-2.607	-0.607	-0.494	-0.304	0.000	0.500

CHAINAGE 12.000

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A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

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Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales
0 10 20 30 40m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 8 OF 9 CL MCC1

Drawn C.WOJCIK
Designed S.READ

ENGINEERING CERTIFICATION (RPEQ)

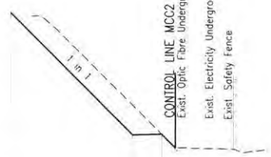
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA		19498	7/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786499 A
Series Number	XS-8 of 9

MRR_Detail (02/14)

Last Modified :- Sep 03, 2018 - 12:03pm XREFS :- X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg

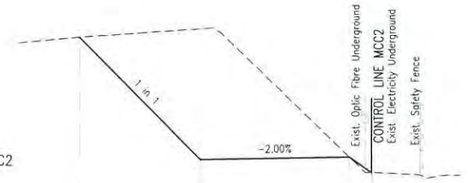


CONTROL LINE MCC2
X = 528467.474
Y = 6922588.737
Z = 29.216

Datum 28.00

DESIGN HEIGHT	33.728		29.644	29.663	29.216	
EXISTING SURFACE		30.640	29.663	29.216		
OFFSETS	-5.520	-1.435	-0.451	0.000		

CHAINAGE 5.000

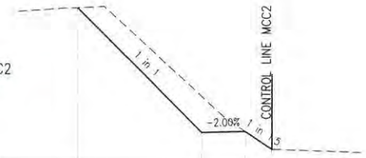


CONTROL LINE MCC2
X = 528464.649
Y = 6922579.184
Z = 28.793

Datum 26.00

DESIGN HEIGHT	33.307	29.216	29.316	28.793	
EXISTING SURFACE	33.307	33.601	29.316	28.793	
OFFSETS	-9.869	-5.778	-0.750	0.000	

CHAINAGE 15.000



CONTROL LINE MCC2
X = 528469.573
Y = 6922570.911
Z = 28.504

Datum 28.00

DESIGN HEIGHT	33.229	29.062	29.092	28.504	
EXISTING SURFACE	33.229	30.275	29.092	28.504	
OFFSETS	-6.551	-2.384	-0.900	0.000	

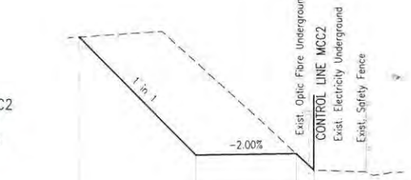
CHAINAGE 25.000

CONTROL LINE MCC2
X = 528468.048
Y = 6922590.338
Z = 29.289

Datum 28.00

DESIGN HEIGHT	32.188	29.689	29.689	29.289	
EXISTING SURFACE	32.188	29.698	29.689	29.289	
OFFSETS	-2.908	-0.409	-0.400	0.000	

CHAINAGE 3.299

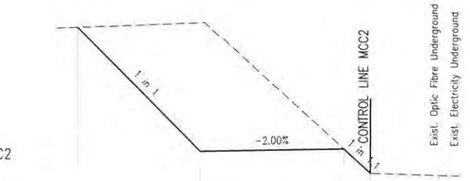


CONTROL LINE MCC2
X = 528465.760
Y = 6922584.056
Z = 29.008

Datum 28.00

DESIGN HEIGHT	33.442	29.490	29.558	29.008	
EXISTING SURFACE	33.442	32.614	29.558	29.008	
OFFSETS	-7.939	-3.987	-0.601	0.000	

CHAINAGE 10.000

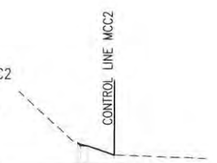


CONTROL LINE MCC2
X = 528466.163
Y = 6922574.567
Z = 28.571

Datum 26.00

DESIGN HEIGHT	33.424	29.288	29.385	28.571	
EXISTING SURFACE	33.424	33.594	29.385	28.571	
OFFSETS	-9.875	-5.739	-0.900	0.000	

CHAINAGE 20.000



CONTROL LINE MCC2
X = 528471.022
Y = 6922568.874
Z = 28.465

Datum 28.00

DESIGN HEIGHT	28.866	28.768	28.773	28.465	
EXISTING SURFACE	28.866	28.838	28.773	28.465	
OFFSETS	-1.229	-1.131	-0.900	0.000	

CHAINAGE 27.500

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A	Issued For Construction				
	Revisions/Descriptions	Certification	Date	Microfiled	

CAD FILES | G:\NERD\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\07_XS-1.dwg

Associated Job Nos:

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 10 20 30 40m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km - 31.9km

EXIT 49 NORTH BOUND OFF RAMP
ANNOTATED CROSS SECTIONS
SHEET 9 OF 9 CL MCC2

Drawn: C.WOJCIK
Designed: S.READ

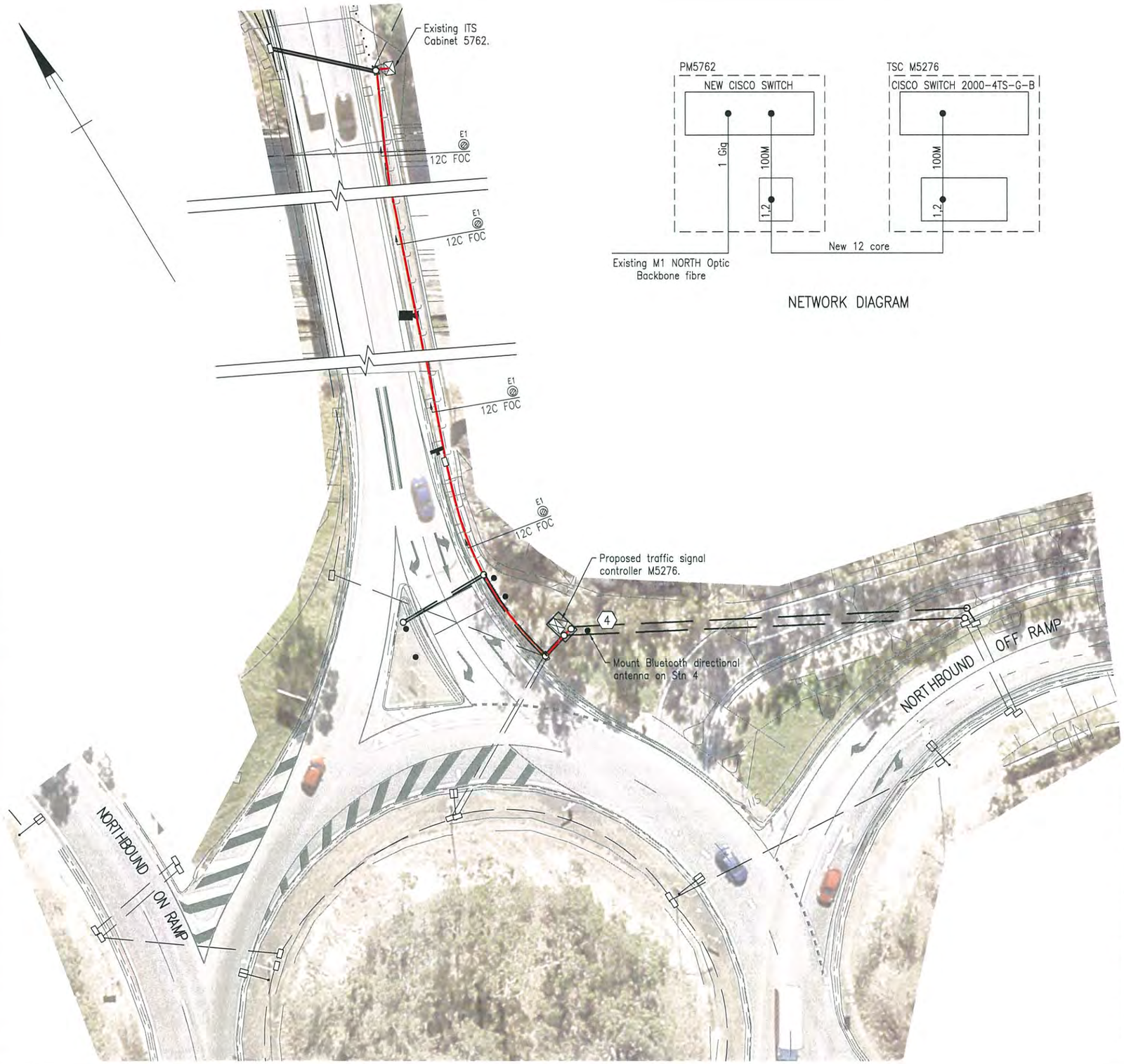
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	NO.	DATE
CIVIL	A. O'SHEA	18178	7/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786500 A
Series Number	XS-9 of 9
	MRR_Detail (02/14)

Last Modified: - Sep 03, 2018 - 12:03pm XREFS: - X_Cross Sections_MCA4_1.dwg ; X_Cross Sections_MCA4_2.dwg ; X_Cross Sections_MCA4_3.dwg ; X_Cross Sections_MCA4_4.dwg ; X_Cross Sections_MCA4_5.dwg ; X_Cross Sections_MCA4_6.dwg ; X_Cross Sections_MCA4_7.dwg ; X_Cross Sections_MCC2_1.dwg ; X_Cross Sections_MCC1_1.dwg



NETWORK DIAGRAM

NOTES:

1. Run 12 cores optic fibre cable (per cable standards in accordance with MRTS234) between existing ITS cabinet 5762 to new traffic signals cabinet M5276 in existing electrical conduit.
2. Present all 12 cores at Fobot and terminate active pairs only at both: PM5762 & M5276.
3. Recover existing Cisco switch from ITS cabinet PM5762 and install 2000-8TS-G-B.
4. Contact ITS&E team for port & switch configuration details.
5. General cabinet arrangement of the traffic signal controller M5762 to be as per SD1781, however with substitution of Telstra modem with Network Switch. Equipment to be located on shelf in controller; no top hat to be installed for M5762.
6. Install BLUETOOTH modem in the TSC M5276 with the directional antenna on the signal post at Station 4 pointing towards NB off-ramp & Rifle Range Road. Refer to Traffic Signal Installation dwg No.706974A for Station details.

CABLE SCHEDULE				
STATION/ PIT		CABLE TYPE	LENGTH (m)	REMARKS
FROM	TO			
5762	M5276	12C FOC	106	Install new cable
		TOTAL:	106	

LEGEND UNLESS OTHERWISE STATED

- NEW CONDUIT
- EXISTING CONDUIT
- 12C PROPOSED OPTIC FIBRE CABLE
- PROPOSED CABLE IN CONDUIT
- EXISTING TMR TRAFFIC SIGNAL/STREET LIGHTING PIT
- CIRCULAR PIT
- TRAFFIC SIGNAL CONTROLLER
- COMMUNICATIONS FIELD CABINET

BILL OF MATERIALS				
ITEM NO.	ITEM DESCRIPTION	BRAND/MODEL	M5276	PM5762
1	230V, DOUBLE SOCKET OUTLET PER SD1778		1	
2	4-WAY POWER RAIL		1	
3	FIELD PROCESSOR WITH POWER SUPPLY	TRANSMAX FP MINI-6	1	
4	ECLIPSE CONTROLLER		1	
5	ECLIPSE CONTROLLER CABLE		1	
6	LAYER 2 NETWORK SWITCH	CISCO-2000-4TS-G-B	1	
7	LAYER 2 NETWORK SWITCH	CISCO-2000-8TS-G-B		1
8	LAYER 2 NETWORK SWITCH POWER SUPPLY	PRW-IE-65W-AC-IEC	1	1
9	SFP	GLC-FE-100LX-RGD	1	1
10	SFP	GLC-LX-SM-RGD		2
11	CAT 5E CABLE 1.5m			1
12	FIBRE OPTIC PATCH LEADS 1MT SINGLE MODE	SCA-LC DUPLEX	2	2
13	FIBRE OPTIC BREAK OUT TERMINAL (FOBOT) DIN RAIL	AFC 6 PORT SCA	1	
14	FIBRE OPTIC BREAK OUT TERMINAL (FOBOT) RACK MOUNT	AFC 6 PORT SCA		2
15	PARANI	SD-1000	1	
16	NETWORK MODEM	NTC-6200-02	1	
17	BLUETOOTH DIRECTIONAL ANTENNA	SPDG11H22-SMA	1	

Revisions/Descriptions	Certification	Date	Microfiled
B Minor Changes	20873	30.08.18	
A Issued For Construction			MF10.16A

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (WEST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.83	0.53	7.42	12A/11Q

Through Chainage from 31.45km to 31.98km

INTELLIGENT TRANSPORT SYSTEMS
LAYOUT PLAN

Drawn: C.WOJCIK
Designed: M.VENKATARAMU

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
IT&T	T.KOOYMANS	Original signed	17460	19/8/2016

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	706969 B
Series Number	IT-1 of 1

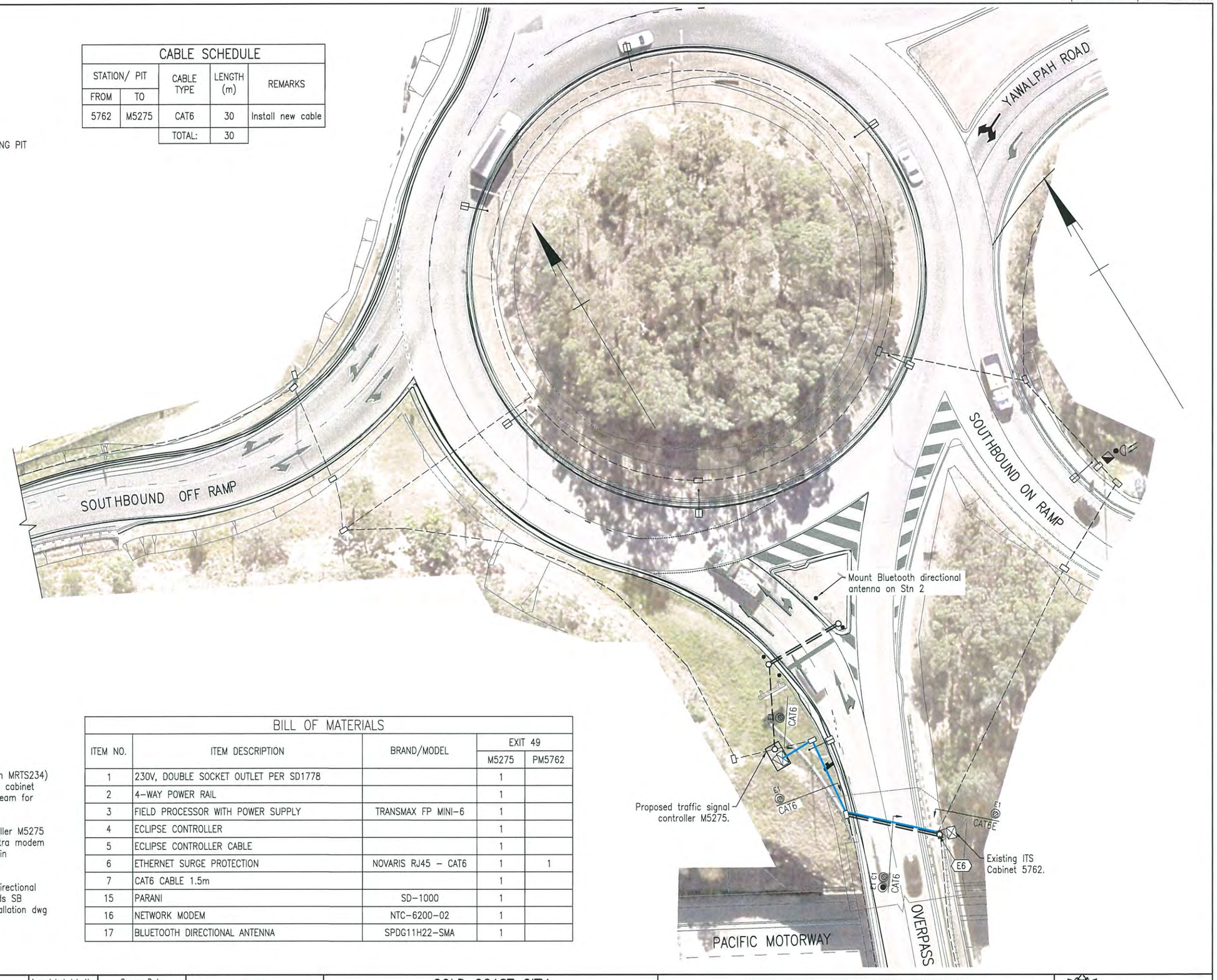
MRR_Detail (02/14)

Last Modified :- Aug 30, 2018 - 9:07am XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DROA.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg

LEGEND UNLESS OTHERWISE STATED

- EXISTING CONDUIT
- PROPOSED CAT 6 CABLE
- PROPOSED CABLE IN CONDUIT
- EXISTING CABLE IN CONDUIT
- EXISTING TMR TRAFFIC SIGNAL/STREET LIGHTING PIT
- CIRCULAR PIT
- TRAFFIC SIGNAL CONTROLLER
- COMMUNICATIONS FIELD CABINET

CABLE SCHEDULE				
STATION/ PIT		CABLE TYPE	LENGTH (m)	REMARKS
FROM	TO			
5762	M5275	CAT6	30	Install new cable
		TOTAL:	30	



NOTES:

1. Run CAT6 cable (per cable standards in accordance with MRTS234) between existing ITS cabinet 5762 to new traffic signals cabinet M5275 in new communications conduit. Contact ITS&E team for port details.
2. General cabinet arrangement of the traffic signal controller M5275 to be as per SD1780, however with substitution of Telstra modem with Network Switch. Equipment to be located on shelf in controller; no top hat to be installed for M5275.
3. Install BLUETOOTH modem in the TSC M5275 with the directional antenna on the signal post at Station 2 pointing towards SB on-ramp & Yawalpah Road. Refer to Traffic Signal Installation dwg No.706975A for Station details.

BILL OF MATERIALS				
ITEM NO.	ITEM DESCRIPTION	BRAND/MODEL	EXIT 49	
			M5275	PM5762
1	230V, DOUBLE SOCKET OUTLET PER SD1778		1	
2	4-WAY POWER RAIL		1	
3	FIELD PROCESSOR WITH POWER SUPPLY	TRANSMAX FP MINI-6	1	
4	ECLIPSE CONTROLLER		1	
5	ECLIPSE CONTROLLER CABLE		1	
6	ETHERNET SURGE PROTECTION	NOVARIS RJ45 - CAT6	1	1
7	CAT6 CABLE 1.5m		1	
15	PARANI	SD-1000	1	
16	NETWORK MODEM	NTC-6200-02	1	
17	BLUETOOTH DIRECTIONAL ANTENNA	SPDG11H22-SMA	1	

B	Minor Changes	20873	30.08.18	
A	Issued For Construction			MF10.16A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (EAST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.37	0.55	7.86	12A/11Q

Through Chainage from 30.99km to 31.54km

INTELLIGENT TRANSPORT SYSTEMS
LAYOUT PLAN

Drawn C.WOJCIK
Designed M.VENKATARAMU

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
IT&T	T.KOOYMANS	Original signed	17460	19/8/2016

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	706970 IB
Series Number	IT-1 of 1

MRR_Detail (02/14)

Last Modified :- Aug 30, 2018 - 9:06am XREFS :- X_OLIN_OPT2.dwg ; X_OLIN_OPT 2_V2.dwg ; X_DROA.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg

PHASE DIAGRAMS	1 ↑ A PHASE				T B PHASE			
SIGNAL GROUPS	1				1			
VEHICLE/PED	VG1				VG1			
LOGICAL INPUT	4				1,2,3			
CALL	X				PRES			
EXTEND	X							
INCREMENT								
SPECIAL CONDITIONS					SG1 RED if presence on detector 1, 2 or 3 canceled (after min RED time) by presence on detector 4 else Off after RED max time.			

LANTERN SCHEDULE

SIGNAL POST	HARDWARE	REQUIREMENT
1	G/M 2 Aspect LED Lantern	New Lantern
2	G/M 2 Aspect LED Lantern	New Lantern

G/M – Ground Mounted

LEGEND

***** UNLESS OTHERWISE STATED *****

- PROPOSED CONDUIT RUN
- EXISTING CONDUIT RUN
- RECTANGULAR PIT
- FOOTING LOCATION
- 3 DETECTOR LOOP
- 3 STATION POST/ID
- CIRCULAR PIT

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91. REFER TO TMR SD1436 FOR SYMBOL DETAILS

TRAFFIC SIGNAL CABLE SCHEDULE

	STATION/PIT FROM	STATION/PIT TO	CABLE TYPE	LENGTH (m)	REMARKS
RUN 1	⊠	1	19C	31	Install new cable
	1	2	19C	18	Install new cable
			TOTAL:	49	

LOOP DETECTOR FEEDER CABLE SCHEDULE

LOOP No.	LOOP TYPE	DISTANCE FROM STOP/HOLD LINE (m)	QUANTITY (m)	REMARKS
1	PRESENCE	As shown	230	Install New
2	PRESENCE	As shown	130	Install new
3	PRESENCE	As shown	130	Install new
4	PRESENCE	As shown	185	Install new
		TOTAL	675	

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CONNECTS
1	RED	A5	1	1
	YELLOW	A4	2	2
	NEUTRAL	A1,B1 C1,D1	NL	BK
	SPARE CORES TO EARTH			3–16
	CABLE SIZE			19C+E

CONTROLLER TYPE
TYCO ECLIPSE EC1–62–16

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	PRES	As shown
LOOP 2	P2	2	PRES	As shown
LOOP 3	P3	3	PRES	As shown
LOOP 4	P4	4	PRES	115m
		5		
		6		
		7		
		8		

PIT SCHEDULE

PIT NO.	TYPE	COMMENTS	COORDINATES EASTING	COORDINATES NORTHING
E1	Circular	Install new pit	528463.679	6922576.222
E1A	Circular	Install new pit	528468.019	6922565.371
E1B	Circular	Replace with new pit		
C1	Circular	Install new pit	528469.126	6922565.653
E2	Circular	Install new pit	528452.795	6922576.338
E3	No.7	Existing to remain		
E4	No.4	Existing to remain		
E5	No.4	Existing to remain		
C6	No.7	Existing to remove		
E6	No.7	Existing to remove		
E7	Circular	Install new pits	528509.158	6922543.010
C7	Circular	Install new pits	528509.945	6922543.869

CONDUIT SCHEDULE

PIT NO. FROM	PIT NO. TO	ELECTRICAL No	ELECTRICAL SIZE	SURFACE	LENGTH (m)	COMMENTS
E1	E1B	2	100	Concrete	14	Install new
E1	E2	2	100	Existing Road	14	Install new
E1A	E7	1	100	Earth	53	Install new
C1	C7	1	100	Earth	53	Install new
E1A	E1B	2	100	Earth	7	Install new
				TOTAL:	141	

FOOTING AND POST SCHEDULE

STATION No.	TYPE	COMMENTS	COORDINATES EASTING	COORDINATES NORTHING
1	4.1m Post	Install New	528464.536	6922572.754
2	4.1m Post	Install New	528451.968	6922572.127
4	4.1m Post	Install New	528470.700	6922564.423

SIGN SCHEDULE

POST	SIGN TYPE	REQUIREMENT
1A	Regulatory sign (R6–6A)	Install new sign on new post
2A	Regulatory sign (R6–6A)	Install new sign on new post
3	Warning sign (W3–3A)	Install new sign on new post

WARNING
SOME SERVICES ARE NOT SHOWN
ALL CONTRACTORS ARE RESPONSIBLE FOR AVOIDING CONFLICTS WITH SERVICES AND MUST CARRY OUT CHECKS WITH ALL SERVICE AUTHORITIES BEFORE COMMENCING WORKS.

NOTES:

1. The existing information shown on the plans has been supplied by the various services authorities.
2. Refer drawing number 706969 for fibre optic cable installation details.
3. Install traffic signal controller cabinet site M5276 on concrete base pad in accordance with TMR standard drawing 1423. Provide earth pit (not shown).
4. Multiple loops to be connected in parallel to a single loop feeder cable as shown.
5. Provide 25mm² 2C XLPE/PVC mains cable to new Controller M5276. Energex service fuse for mains cable to be 50A HRC.

Rev	Revisions/Descriptions	Drawn	Checked	Certification	Date	M'filed
A	Issued For Construction					

Associated Job Nos
Auxiliary Drg Nos

Survey Data: Datum GDA94; Horiz. Grid MGA94 Zone56; Height Origin AHD Derived; Survey Books MR100720

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms.dwg

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (WEST)

Reference Points through Chainage from 31.45km to 31.98km

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.83	0.53	7.42	12A/11Q

Drawn C.WOJCIK
Designed C.WOJCIK

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5276
UBD MAP 302 F20

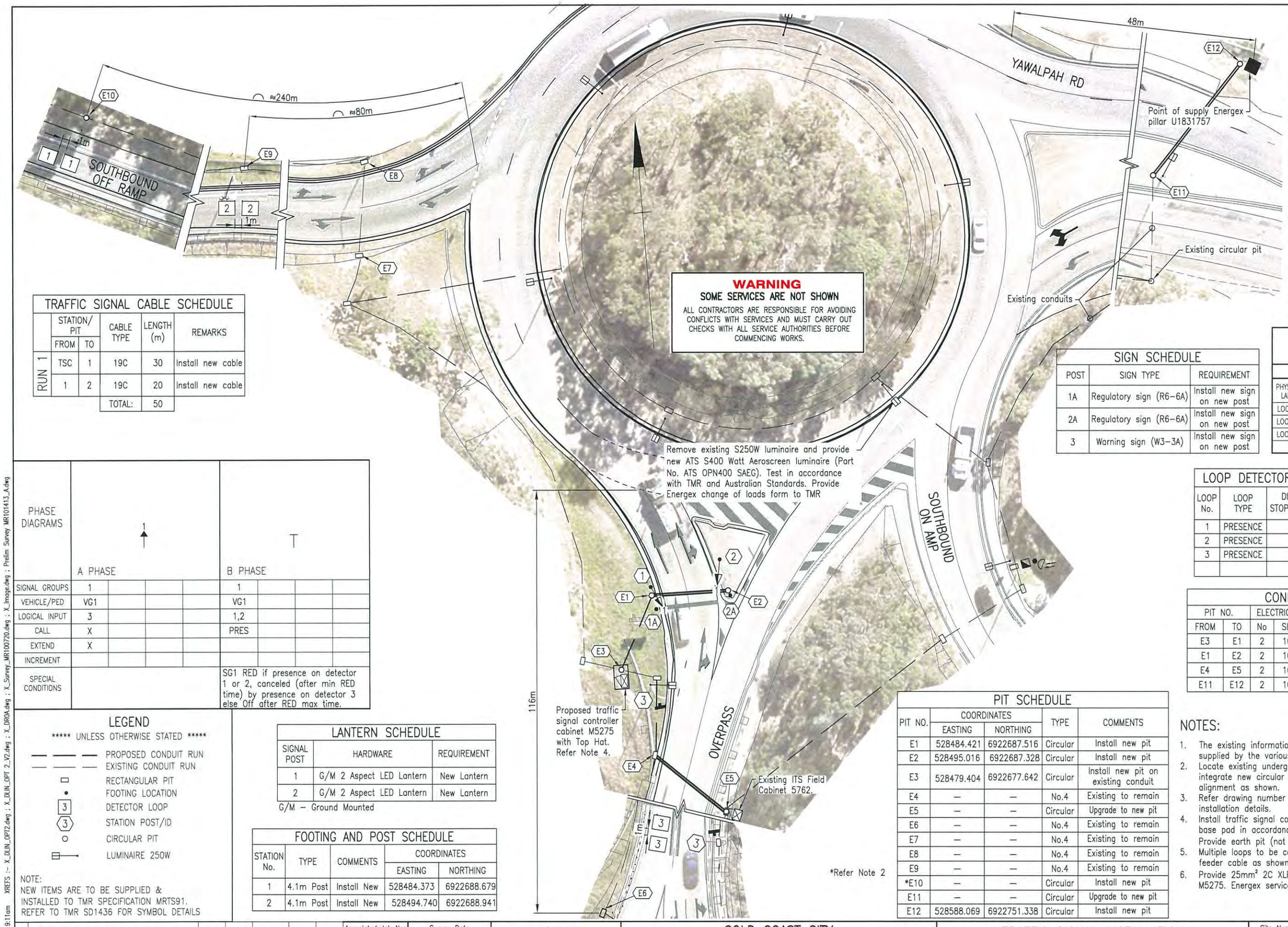
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	D.ROESNER		09350	30/8/2016

Queensland Government

Job No.	413159
Contract. No.	CN–3476
Drawing No.	706974 A
Series Number	TS–01 of 2
	MRT_Detail (02/14)

Last Modified :- Aug 30, 2018 - 9:10am XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DROA.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg



SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINIAL TERMINALS	RUN 1 CONNECTS	RUN 1 CORES USED
1	RED	A5	1	1	
	YELLOW	A4	2	2	
	NEUTRAL	A1,B1 C1,D1	NL	BK	
	SPARE CORES TO EARTH			3–16	
	CABLE SIZE			19C	

TRAFFIC SIGNAL CABLE SCHEDULE

	STATION/PIT FROM	STATION/PIT TO	CABLE TYPE	LENGTH (m)	REMARKS
RUN 1	TSC	1	19C	30	Install new cable
	1	2	19C	20	Install new cable
			TOTAL:	50	

SIGN SCHEDULE

POST	SIGN TYPE	REQUIREMENT
1A	Regulatory sign (R6–6A)	Install new sign on new post
2A	Regulatory sign (R6–6A)	Install new sign on new post
3	Warning sign (W3–3A)	Install new sign on new post

CONTROLLER TYPE
TYCO ECLIPSE EC1–62–16

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	PRES	As shown
LOOP 2	P2	2	PRES	80m
LOOP 3	P3	3	PRES	116m

LOOP DETECTOR FEEDER CABLE SCHEDULE

LOOP No.	LOOP TYPE	DISTANCE FROM STOP/HOLD LINE (m)	QUANTITY (m)	REMARKS
1	PRESENCE	As shown	330	Install New
2	PRESENCE	As shown	160	Install new
3	PRESENCE	As shown	135	Install new
		TOTAL	625	

CONDUIT SCHEDULE

PIT NO. FROM	PIT NO. TO	ELECTRICAL No	ELECTRICAL SIZE	SURFACE	LENGTH (m)	COMMENTS
E3	E1	2	100	Earth	12	Install new
E1	E2	2	100	Existing Road	12	Install new
E4	E5	2	100	Existing Road	15	Install new
E11	E12	2	100	Existing Road	21	Install new
				TOTAL:	60	

PHASE DIAGRAMS

	A PHASE	B PHASE
SIGNAL GROUPS	1	1
VEHICLE/PED	VG1	VG1
LOGICAL INPUT	3	1,2
CALL	X	PRES
EXTEND	X	
INCREMENT		
SPECIAL CONDITIONS		SG1 RED if presence on detector 1 or 2, canceled (after min RED time) by presence on detector 3 else Off after RED max time.

LEGEND

***** UNLESS OTHERWISE STATED *****

- PROPOSED CONDUIT RUN
- EXISTING CONDUIT RUN
- RECTANGULAR PIT
- FOOTING LOCATION
- 3 DETECTOR LOOP
- 3 STATION POST/ID
- CIRCULAR PIT
- LUMINAIRE 250W

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91. REFER TO TMR SD1436 FOR SYMBOL DETAILS

LANTERN SCHEDULE

SIGNAL POST	HARDWARE	REQUIREMENT
1	G/M 2 Aspect LED Lantern	New Lantern
2	G/M 2 Aspect LED Lantern	New Lantern

G/M – Ground Mounted

FOOTING AND POST SCHEDULE

STATION No.	TYPE	COMMENTS	COORDINATES EASTING	COORDINATES NORTHING
1	4.1m Post	Install New	528484.373	6922688.679
2	4.1m Post	Install New	528494.740	6922688.941

PIT SCHEDULE

PIT NO.	COORDINATES EASTING	COORDINATES NORTHING	TYPE	COMMENTS
E1	528484.421	6922687.516	Circular	Install new pit
E2	528495.016	6922687.328	Circular	Install new pit
E3	528479.404	6922677.642	Circular	Install new pit on existing conduit
E4	–	–	No.4	Existing to remain
E5	–	–	Circular	Upgrade to new pit
E6	–	–	No.4	Existing to remain
E7	–	–	No.4	Existing to remain
E8	–	–	No.4	Existing to remain
E9	–	–	No.4	Existing to remain
*E10	–	–	Circular	Install new pit
E11	–	–	Circular	Upgrade to new pit
E12	528588.069	6922751.338	Circular	Install new pit

NOTES:

1. The existing information shown on the plans has been supplied by the various services authorities.
2. Locate existing underground electrical conduit alignment and integrate new circular electrical pit into located conduit alignment as shown.
3. Refer drawing number 706970 for fibre optic cable installation details.
4. Install traffic signal controller cabinet site M5275 on concrete base pad in accordance with TMR standard drawing 1423. Provide earth pit (not shown).
5. Multiple loops to be connected in parallel to a single loop feeder cable as shown.
6. Provide 25mm² 2C XLPE/PVC mains cable to new Controller M5275. Energex service fuse for mains cable to be 50A HRC.

Rev	Revisions/Descriptions	Drawn	Checked	Certification	Date	M'filed
A	Issued For Construction					

Associated Job Nos
Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CAD FILES: G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms.dwg

Last Modified :- Aug 30, 2018 - 9:11am XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DROA.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (EAST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.37	0.55	7.86	12A/11Q

Through Chainage from 30.99km to 31.54km

Drawn: C.WOJCIK
Designed: C.WOJCIK

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5275
UBD MAP 302 F20

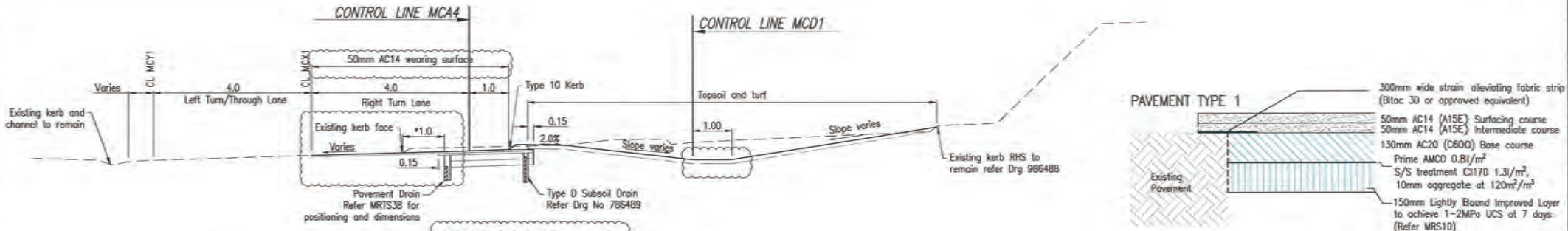
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	D.ROESNER		09350	30.08.2018

Queensland Government

Job No.	413159
Contract. No.	CN–3476
Drawing No.	706975 | A
Series Number	TS–1 of 1

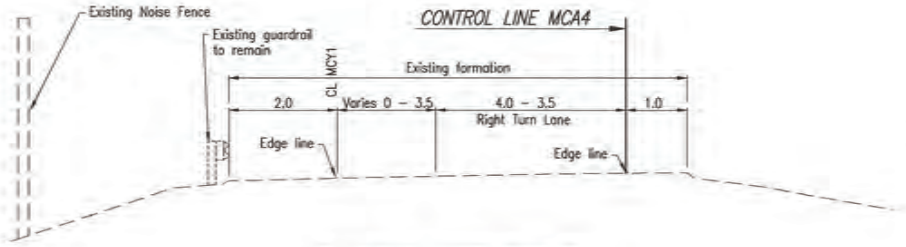
MRT_Detail (02/14)



A: WIDENING

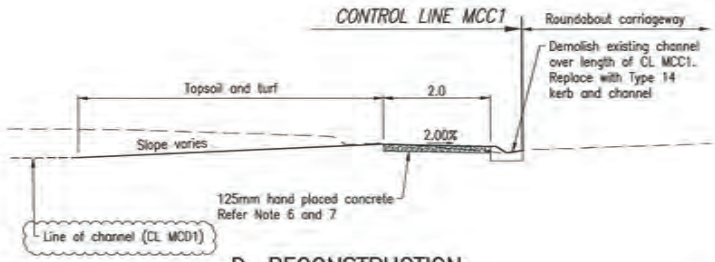
CHGE 145 – 277.25 MCA4

AADT = 4831(2014)
(Estimated as 6166 AADT in 2019 at 5% growth rate at opening)
Design Period = 15yrs
Design Traffic – DESA = 1.2 x 10^7
% Commercial Vehicles = 10.62%
Subgrade CBR = 8%



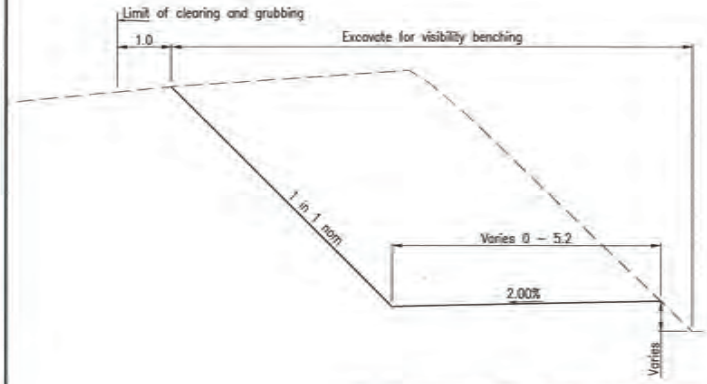
B: RAMP LANE WIDTHS

CHGE 98 – 169.5 MCA4



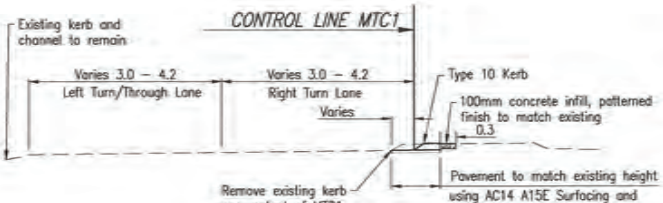
D: RECONSTRUCTION

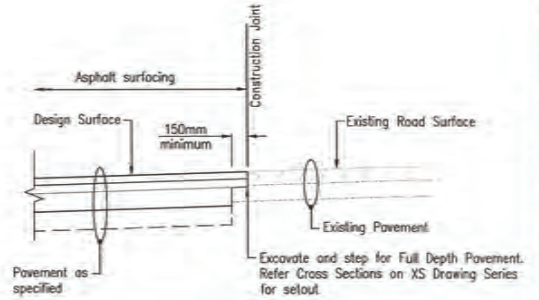
CONTROL LINE MCC1



C: EXCAVATION AND WIDENING

WESTBOUND APPROACH





DETAIL A
NTS

TRANSVERSE AND LONGITUDINAL PAVEMENT JOINT

GENERAL
1. A1 denotes last two characters of the control line reference.

SEAL
2. Spray/spread rates are indicative only and are to be designed for the conditions at the time of placement and to the Contract Administrators approval.

PAVEMENT
3. Old to new pavement tie in transition shall be stepped in accordance with Detail A Transverse and longitudinal pavement joint on this drawing.
4. All pavement shall extend 150mm behind the kerb.

SUBGRADE TREATMENT
5. Subgrade treatment type shall be provisional

HAND PLACED CONCRETE PAVING
6. Concrete grade N32/10 minimum, with a layer of SL82 welded mesh placed centrally.
7. Refer MRTS03 for contraction and expansion joints.

PAVEMENT MARKING AND SIGNS
8. Refer Drg Series No. SL-1 to SL-2

PUBLIC UTILITY PLANT (PUP)
9. Refer Drg Series No. EF-1 to EF-2

G				
F				
E				
D				
C				
B	Pavement joint position and extents. Omit Type 28 channel.	Acl	9/10/18	
A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfilm

CAD FILES | G:\NERD\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\02_90-1_B.dwg

Associated Job Nos
Auxiliary Drg Nos: REFER DRG NO 786484

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 1.0 2.0m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/110

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTH BOUND OFF RAMP
TYPE CROSS SECTIONS
SHEET 1 OF 1

Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)

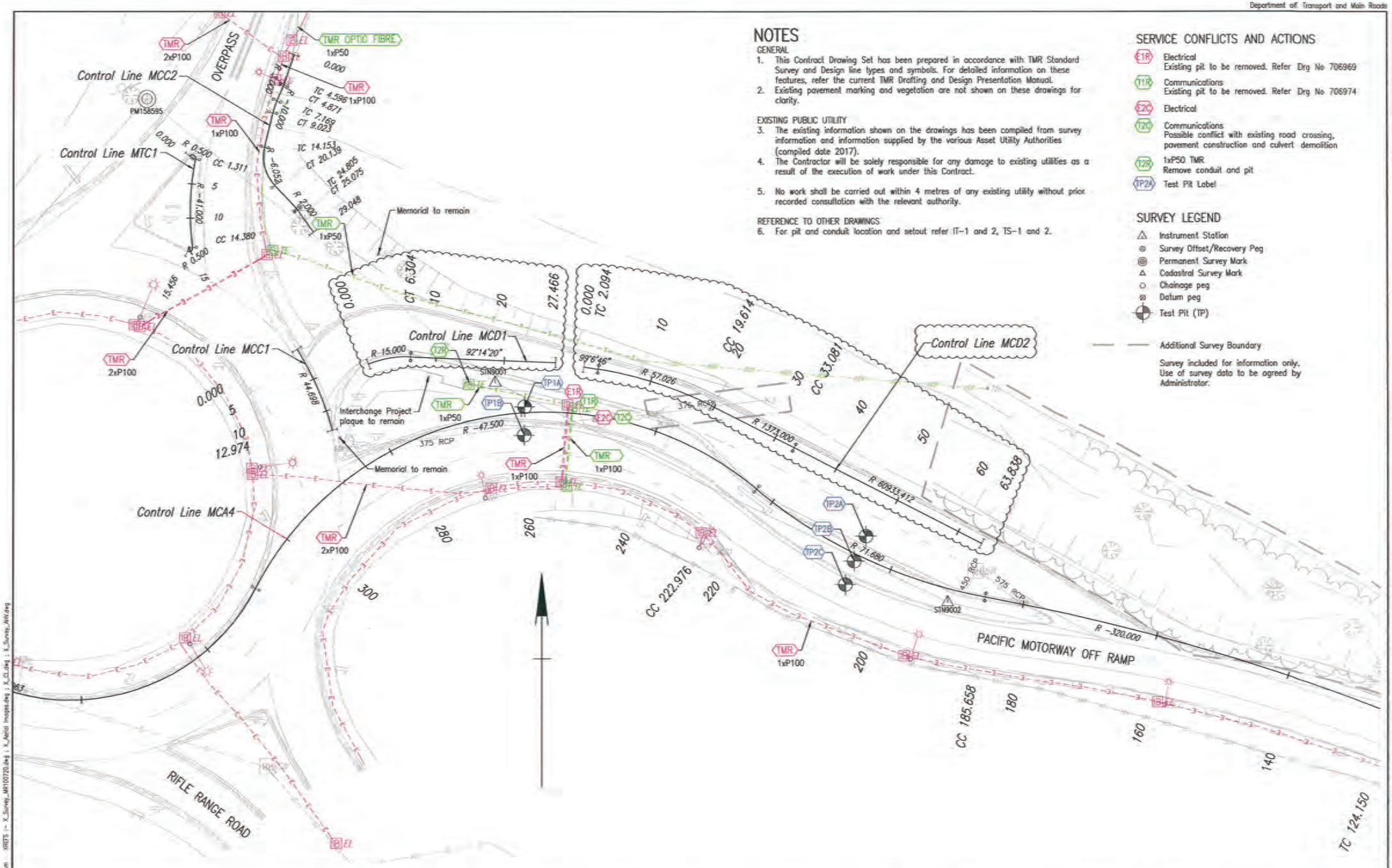
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA	Original signed	18498	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN – 3476
Drawing No.	786485 B
Series Number	TC–1 of 1

MRR_Detail (02/14)

Last Modified :- Oct 09, 2018 - 1:22pm XREFS :-



NOTES

GENERAL

1. This Contract Drawing Set has been prepared in accordance with TMR Standard Survey and Design line types and symbols. For detailed information on these features, refer the current TMR Drafting and Design Presentation Manual.
2. Existing pavement marking and vegetation are not shown on these drawings for clarity.

EXISTING PUBLIC UTILITY

3. The existing information shown on the drawings has been compiled from survey information and information supplied by the various Asset Utility Authorities (compiled date 2017).
4. The Contractor will be solely responsible for any damage to existing utilities as a result of the execution of work under this Contract.
5. No work shall be carried out within 4 metres of any existing utility without prior recorded consultation with the relevant authority.

REFERENCE TO OTHER DRAWINGS

6. For pit and conduit location and setout refer IT-1 and 2, TS-1 and 2.

SERVICE CONFLICTS AND ACTIONS

- E1R — Electrical: Existing pit to be removed. Refer Drg No 706969
- T1R — Communications: Existing pit to be removed. Refer Drg No 706974
- E2C — Electrical
- T2C — Communications: Possible conflict with existing road crossing, pavement construction and culvert demolition
- T2R — 1xP50 TMR: Remove conduit and pit
- TP2A — Test Pit Label

SURVEY LEGEND

- Instrument Station
- Survey Offset/Recovery Peg
- Permanent Survey Mark
- Cadastral Survey Mark
- Chainage peg
- Datum peg
- Test Pit (TP)
- Additional Survey Boundary

Survey included for information only. Use of survey data to be agreed by Administrator.

Rev	Revisions/Descriptions	Certification	Date	Microfiled
B	Realignment Of Table Drain Alignment MCD1 And MCD2			
A	Issued For Construction		9/10/18	

CAD FILES: G:\NERD\ROAD PROJECTS\12X\330_12A_413159 – Exit 49\Design\Acad\Current\03_EF-CL-1_B.dwg

Associated Job Nos:

Auxiliary Drg Nos: ----

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST

PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)

CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11O

Through Chainage from Start of Gazettal 31.1km – 31.9km

EXIT 49 NORTH BOUND OFF RAMP

EXISTING FEATURES AND SERVICES/CONTROL LINE SETOUT

SHEET 1 OF 2

Drawn: C.WOJCIK

Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA	ORIGINAL SIGNED	18498	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786486 B
Series Number	EF-1 of 2

MRR_Detail (02/14)

Last Modified :- Oct 09, 2018 - 2:08pm KRISTS :- X_Survey_MR100720.dwg ; X_Aerial Images.dwg ; X_CL.dwg ; X_Survey_AHD.dwg

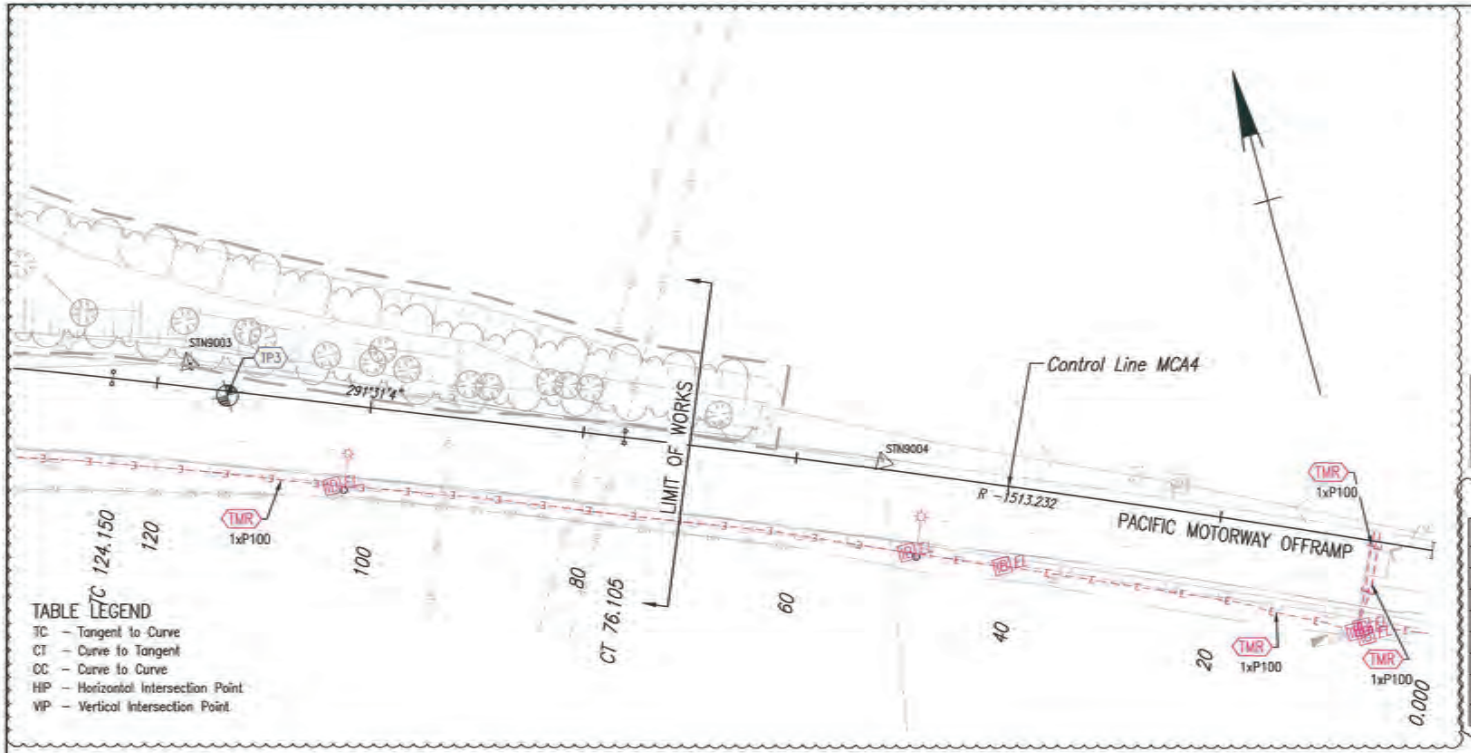


TABLE LEGEND
TC – Tangent to Curve
CT – Curve to Tangent
CC – Curve to Curve
HIP – Horizontal Intersection Point
VIP – Vertical Intersection Point

ALIGNMENT MCC1

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528469.505	6922550.487	27.846	148°17'43.49"	
IP 2	6.487	528472.939	6922544.929	27.743		R = 44.698
IP 3	12.974	528474.638	6922538.620	27.670	164°55'35.37"	

CONTROL LINE MCD2

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528511.330	6922547.918	26.861	99°06'45.70"	
TC	2.094	528513.398	6922547.586	26.787	99°06'45.70"	
IP 2	10.854	528522.116	6922546.188	26.477		R = 57.026
CC	19.614	528530.003	6922542.218	25.996	116°42'57.79"	
IP 3	26.348	528536.018	6922539.191	25.566		R = 1373.000
CC	33.081	528542.002	6922536.105	25.131	117°16'40.86"	
IP 4	48.460	528555.671	6922529.057	24.215		R = 60933.412
IP 5	63.838	528569.335	6922522.002	23.382	117°18'24.98"	

CONTROL LINE MCC2

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528469.118	6922593.458	29.433	198°54'56.57"	
TC	4.596	528467.628	6922589.110	29.233	198°54'56.57"	
IP 2	4.733	528467.583	6922588.981	29.227		R = 3.000
CT	4.871	528467.527	6922588.855	29.221	204°09'08.83"	
TC	7.169	528466.586	6922586.758	29.125	204°09'08.83"	
IP 3	8.096	528466.206	6922585.910	29.117		R = -10.000
CT	9.023	528465.989	6922585.006	29.048	193°31'46.94"	
TC	14.153	528464.788	6922580.018	28.835	193°31'46.94"	
IP 4	17.146	528464.025	6922576.845	28.689		R = -6.052
CT	20.139	528466.256	6922574.464	28.568	136°51'43.40"	
TC	24.805	528469.447	6922571.059	28.506	136°51'43.40"	
IP 5	24.940	528469.539	6922570.960	28.505		R = 2.000
CT	25.075	528469.618	6922570.850	28.503	144°35'52.34"	
IP 6	29.048	528471.919	6922567.612	28.440	144°35'52.34"	

CONTROL LINE MCD1

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528479.894	6922548.334	27.582	68°09'27.87"	
IP 2	3.152	528482.864	6922549.524	27.524		R = 15.000
CT	6.304	528486.061	6922549.399	27.466	92°14'19.84"	
IP 3	27.466	528507.206	6922548.572	26.998	92°14'19.84"	

CONTROL LINE MTC1

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528453.763	6922578.711	28.822	40°47'23.15"	
IP 2	0.328	528454.014	6922579.002	28.812		R = 0.500
CC	0.655	528454.360	6922578.835	28.802	115°54'01.46"	
IP 3	0.983	528454.706	6922578.667	28.792		R = 0.500
CC	1.311	528454.633	6922578.289	28.782	191°00'39.77"	
IP 4	7.845	528453.374	6922571.820	28.583		R = -41.000
CC	14.380	528454.206	6922565.283	28.409	172°44'53.09"	
IP 5	14.649	528454.244	6922564.987	28.409		R = 0.500
CC	14.918	528454.001	6922564.813	28.408	234°24'15.68"	
IP 6	15.187	528453.758	6922564.639	28.408		R = 0.500
IP 7	15.456	528453.490	6922564.771	28.407	296°03'38.26"	

PERMANENT MARKS

NAME	COORDINATES		HEIGHT	COMBINED SCALE FACTOR	COMMENTS
	EASTING	NORTHING			
PM158595	528278.819	6922570.363	17.327	0.99960073	MINI MARK
PM130485	528447.558	6922587.004	28.983	0.99959902	STAR PICKET
PM191576	528654.858	6922327.303	19.284	0.99960069	MINI MARK
PM113167	528416.673	6922472.711	32.294	0.99959848	HILTI NAIL IN MANHOLE

CONTROL LINE MCA4

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL
IP 1	0.000	528743.619	6922449.914	19.018	294°23'57.30"	
IP 2	38.053	528708.957	6922465.636	19.631		R = -1513.232
CT	76.105	528673.549	6922479.596	20.183	291°31'03.59"	
TC	124.150	528628.854	6922497.219	21.028	291°31'03.59"	
IP 3	154.904	528600.154	6922508.534	21.889		R = -320.000
CC	185.658	528569.822	6922514.158	23.164	280°30'16.57"	
IP 4	204.317	528551.050	6922517.639	24.156		R = 71.680
CC	222.976	528536.496	6922529.996	25.348	310°20'02.44"	
IP 5	265.773	528490.775	6922568.817	27.241		R = -47.500
CC	308.570	528463.463	6922515.417	27.354	207°05'17.72"	
IP 6	329.667	528451.891	6922492.792	27.177		R = 30.063
CC	350.764	528427.655	6922500.436	27.084	287°30'14.92"	
IP 7	371.861	528403.420	6922508.079	27.209		R = 30.063
IP 8	392.958	528406.921	6922533.249	27.397	7°55'12.13"	

PRIMARY INSTRUMENT STATIONS

NAME	COORDINATES		HEIGHT	COMBINED SCALE FACTOR	COMMENTS
	EASTING	NORTHING			
STN9000	528394.818	6922527.866	27.381	0.99959923	SCREW
STN9001	528498.422	6922545.612	27.529	0.99959928	SCREW
STN9002	528564.343	6922513.371	23.445	0.99959997	SCREW
STN9003	528635.971	6922496.778	20.777	0.99960044	SCREW
STN9004	528696.257	6922471.157	19.858	0.99960063	NAIL
STN9005	528686.524	6922416.121	15.753	0.99960127	NAIL

	Revisions/Descriptions	Certification	Date	Microfiled
G				
F				
E				
D				
C				
B	Update MCD1 Table, New Table For MCD2		9/10/18	
A	Issued For Construction			

Associated Job Nos: ——
Auxiliary Drg Nos: ——

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from Start of Gazettal 31.1km – 31.9km

EXIT 49 NORTH BOUND OFF RAMP
EXISTING FEATURES AND SERVICES/CONTROL LINE SETOUT
SHEET 2 OF 2

Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA	ORIGINAL SIGNED	18498	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786487 B
Series Number	EF-2 of 2

MRR_Detail (02/14)

CAD FILES: D:\MERR\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\03_ITF-CL-1_B.dwg

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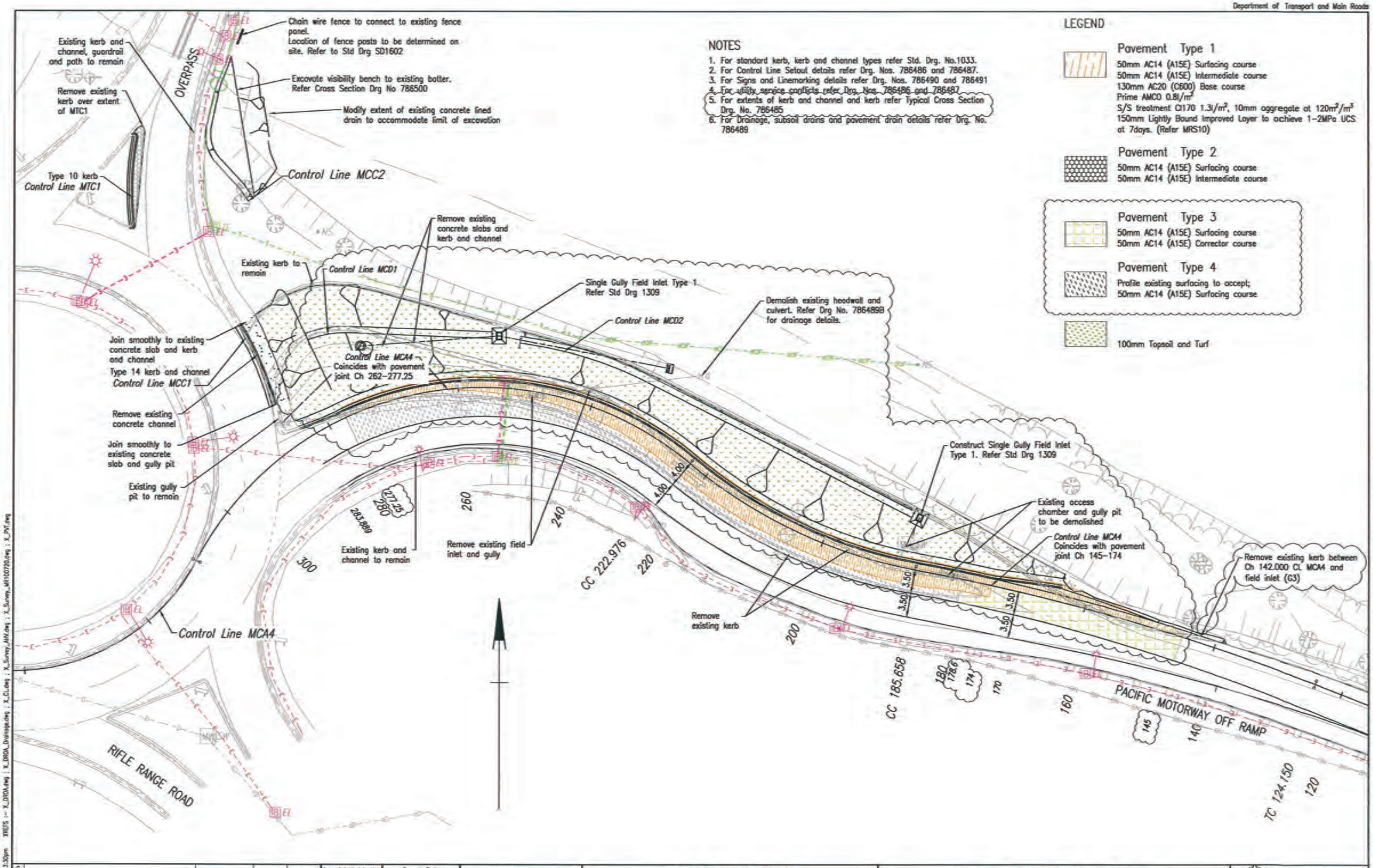

NOTES

1. For standard kerb, kerb and channel types refer Std. Drg. No.1033.
2. For Control Line Setout details refer Drg. Nos. 786486 and 786487.
3. For Signs and Linemarking details refer Drg. Nos. 786490 and 786491
4. For utility service conflicts refer Drg. Nos. 786486 and 786487
5. For extents of kerb and channel and kerb refer Typical Cross Section Drg. No. 786485
6. For Drainage, subsoil drains and pavement drain details refer Drg. No. 786489

LEGEND

Pavement Type 1
50mm AC14 (A15E) Surfacing course
50mm AC14 (A15E) Intermediate course
130mm AC20 (C600) Base course
Prime AMCO 0.8l/m²
S/S treatment C1170 1.3l/m², 10mm aggregate at 120m²/m³
150mm Lightly Bound Improved Layer to achieve 1–2MPa UCS at 7days. (Refer MRS10)

Pavement Type 2
50mm AC14 (A15E) Surfacing course
50mm AC14 (A15E) Intermediate course

Pavement Type 3
50mm AC14 (A15E) Surfacing course
50mm AC14 (A15E) Corrector course

Pavement Type 4
Profile existing surfacing to accept;
50mm AC14 (A15E) Surfacing course

100mm Topsoil and Turf

Rev	Revisions/Descriptions	Certification	Date	Microfiled
G				
F				
E				
D				
C				
B	Pavement Type 3 and 4 and extent of pavement types. Drainage line 1 reconfiguration.		9/6/18	
A	Issued For Construction			

CAD FILES: G:\NERD\ROAD PROJECTS\12M\230_12R_413159 – Exit 49\Design\Acad\Current\04_CD-1_B.dwg

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Associated Job Nos:
Auxiliary Drg Nos: ——

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP
CONSTRUCTION AND PAVEMENT DETAILS
SHEET 1 OF 1

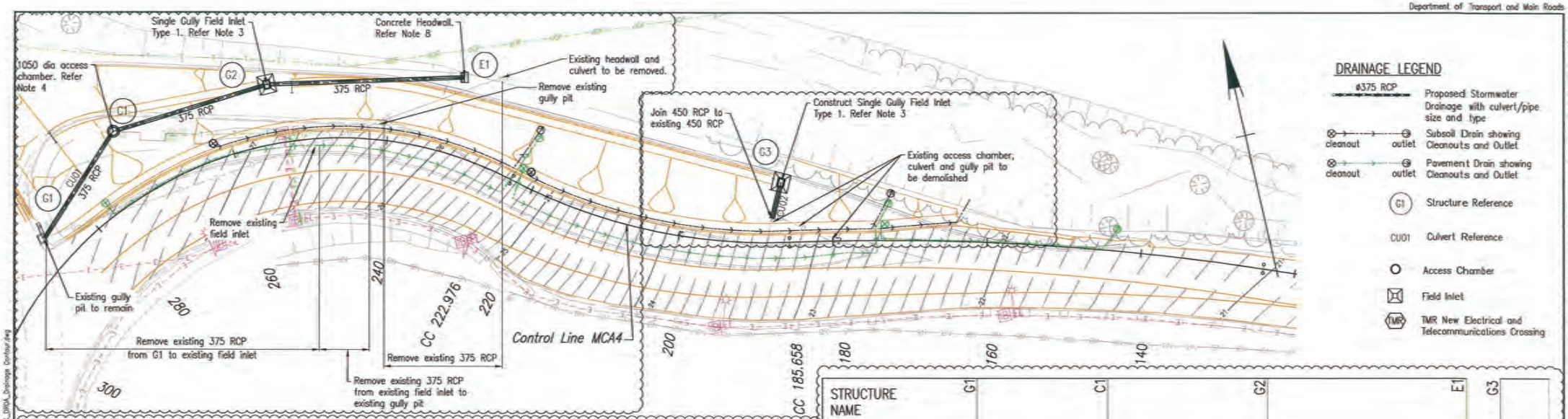
Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA	Original signed	18498	3/9/18

Queensland Government

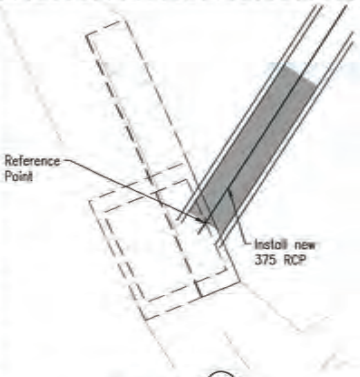
Job No.	413159
Contract. No.	CN-3476
Drawing No.	786488 B
Series Number	CD-1 of 1

MRR_Detail (02/14)

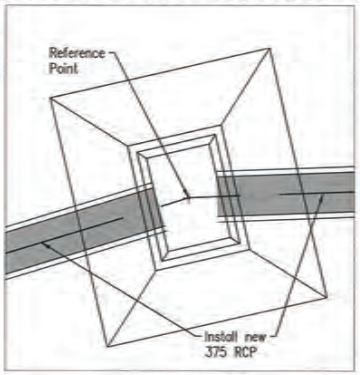


DRAINAGE LEGEND

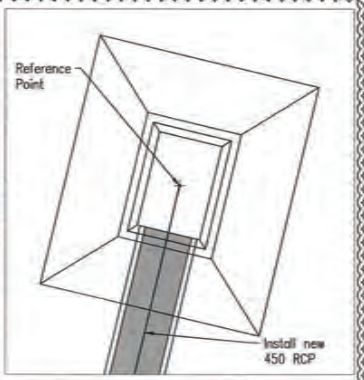
- ø375 RCP — Proposed Stormwater Drainage with culvert/pipe size and type
- cleanout → outlet — Subsoil Drain showing Cleanouts and Outlet
- cleanout → outlet — Pavement Drain showing Cleanouts and Outlet
- G1 — Structure Reference
- CU01 — Culvert Reference
- Access Chamber
- Field Inlet
- TMR — TMR New Electrical and Telecommunications Crossing



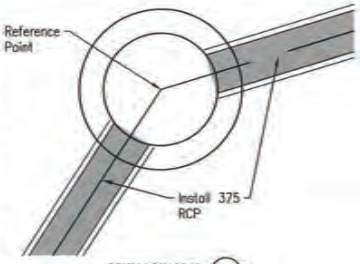
STRUCTURE (G1)
Existing Lip In Line Gully On Grade
Scale C



STRUCTURE (G2)
Field Inlet Type 1 (900 x 600) Chamber
Scale C



STRUCTURE (G3)
Field Inlet Type 1 (900 x 600) Chamber
Scale C

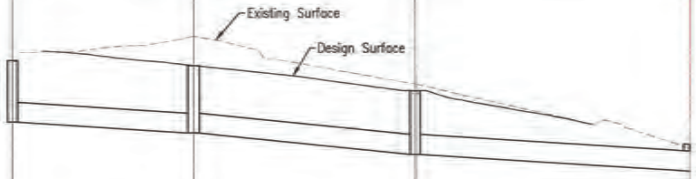


STRUCTURE (C1)
1050 dia Access Chamber
Scale C

NOTES:

1. The pipe class does not allow for construction loading. The Class may need to be changed to suit construction processes and equipment.
2. Culvert Foundation Bedding Zone to be laid in accordance with Std. Drg. 1359. Haunch, Side and Overlay Zone material to be compacted lean mix concrete to the bottom of working platform for all culverts under the roadway.
3. For Field Inlet Type 1 details refer to Std. Drg. 1309.
4. For Access Chamber details refer to Std. Drgs. 1307, 1308 and 1441.
5. All culverts to have rubber ring joints.
6. For network Drainage Setout and Heights refer Drainage Long Sections
7. For subsoil drain outlet and cleanout details, refer to Std. Drg. 1116.
8. For concrete headwall, apron and cut-off wall details, refer Std. Drg 1305
9. The design surface contours are shown for reference.

STRUCTURE NAME	G1	C1	G2	E1	G3	
STRUCTURE DESCRIPTION	EXISTING LIP IN LINE GULLY ON GRADE	ACCESS CHAMBER 1050mm DIA	FIELD INLET TYPE 1 (900x600) CHAMBER	CONCRETE HEADWALL	FIELD INLET TYPE 1 (900x600) CHAMBER	JOIN TO EXISTING 450 RCP
PIPE SIZE (mm)		375	375	375	450	
PIPE CLASS		RCP	RCP	RCP	RCP	
PIPE GRADE (%)		1.22%	1.94%	1.17%	1.41%	
PIPE SLOPE (1 in X)		81.94	51.58	85.39	70.99	
DATUM RL	23.0				18.0	
DEPTH TO INVERT	1.158	1.269 / 1.269	1.199 / 1.199	0.000	2.532	2.601
INVERT LEVEL OF DRAIN	26.406	26.200 / 26.200	25.800 / 25.800	25.500	20.850	20.783
DESIGN SURFACE LEVEL	27.564	27.469	26.999	25.920	23.382	23.383
SETOUT COORDINATES	E 528475.655 N 6922535.584	E 528487.679 N 6922547.430	E 528508.256 N 6922568.957	E 528533.425 N 6922544.184	E 528570.481 N 6922521.951	E 528568.363 N 6922517.856
CHAINAGE	0.000	16.880 / 16.880	20.633 / 37.513	25.618 / 63.130	0.000	4.788 / 4.788
LINE		CU01				CU02



Rev	Revisions/Descriptions	Certification	Date	Microfilm
C				
B	Realignment of network drainage, Drainage Long Section and Structure details		9/6/18	
A	Issued For Construction			

CAD FILES: C:\MERGROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Road\Current\05_DD-1_R.dwg

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Associated Job Nos		Survey Data	
		Datum	GDA
Auxiliary Drg Nos		Horiz. Grid	MGA94 Z56
		Height Origin	AHD
		Survey Books	MR100720

Scales
A 0 2 4 6 8 10m
B (Vert) 0 1.0 2.0m
C 0 0.5 1.0m
Dimensions shown in metres except where shown otherwise.

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP
DRAINAGE DETAILS
SHEET 1 OF 1

Drawn	Designed	Checked
C.MOJCIK	S.READ	

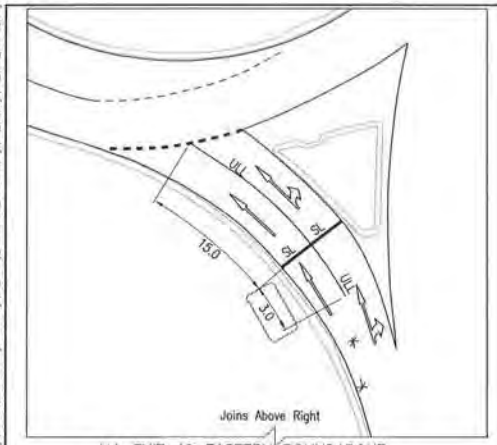
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA	ORIGINAL SIGNED	18498	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786489 B
Series Number	DD-1 of 1

MRR_Detail (02/14)



M1 EXIT 49 EASTERN ROUNDABOUT

LEGEND

EL – Edge Line (100mm)
LL – Lane Line (100mm) (3+9m)
BLL – Special Purpose – Broken (100mm wide) (9+3m)
OM – Outline Marking (150mm wide)
SL – Stop Line (300mm wide, Thermoplastic)
GWL – Give Way Line (300mm wide Thermoplastic)
DBL – Double Barrier Line (80mm)
ULL – Unbroken Lane Line (100mm)
(T) – Thermoplastic

X–X–X Existing marking to be removed

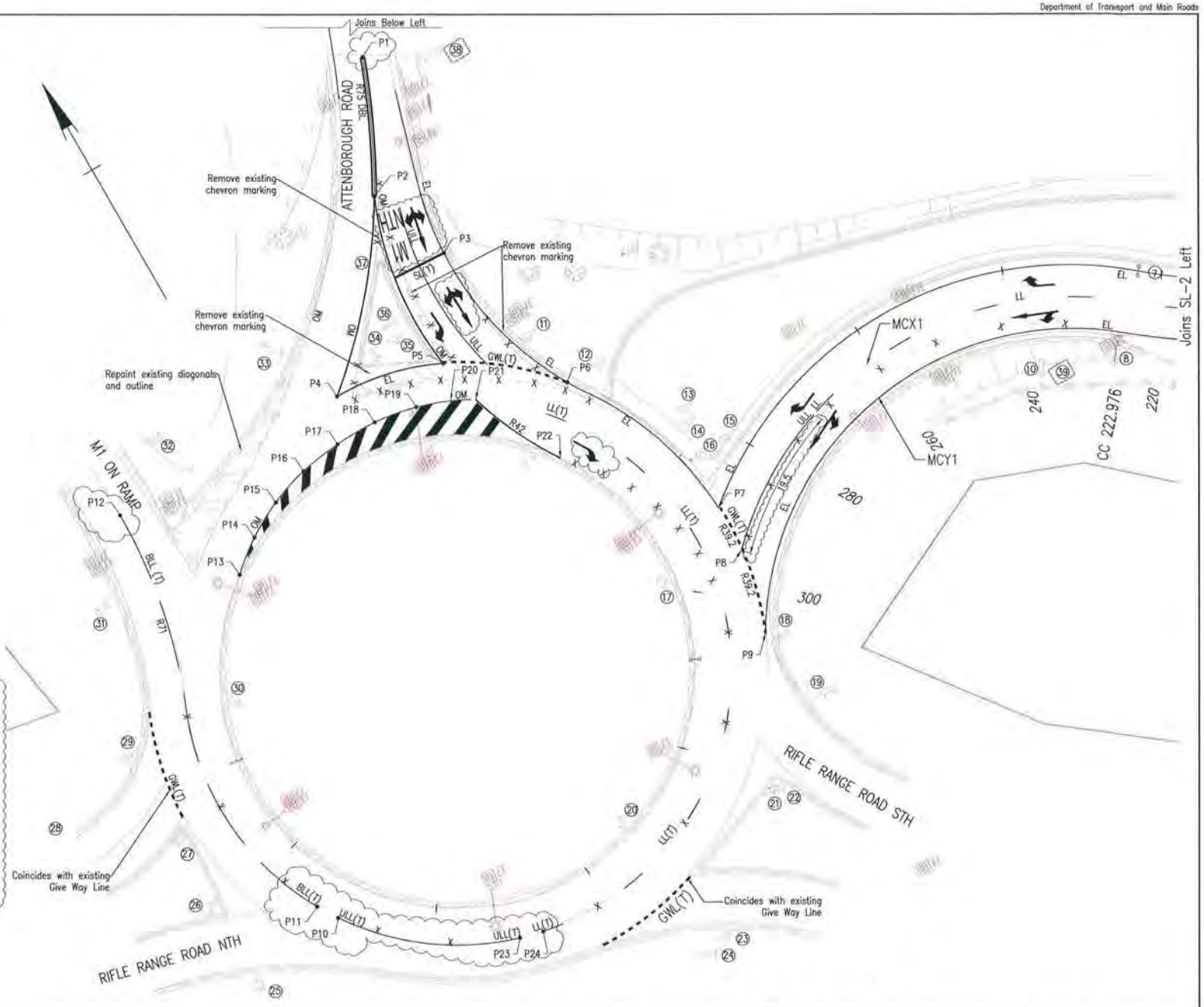
(X) Sign identifier – Refer Sign Tables Drg No 786491

Chevron and Diagonal dimensions:
B=1m, S=3m, W=150mm (refer MUTCD Pt2 Figure 5.6)

→ Pavement Arrow

LINE MARKING COORDINATE TABLE

Point No.	Easting	Northing
P1	528465.312	6922602.303
P2	528457.795	6922586.400
P3	528461.821	6922575.836
P4	528441.044	6922566.931
P5	528454.734	6922563.811
P6	528467.128	6922553.926
P7	528475.687	6922530.562
P8	528475.482	6922524.446
P9	528472.796	6922513.806
P10	528408.110	6922509.709
P11	528406.536	6922512.263
P12	528409.787	6922567.605
P13	528419.076	6922553.480
P14	528423.081	6922556.648
P15	528427.643	6922559.144
P16	528432.659	6922560.875
P17	528438.060	6922561.648
P18	528443.516	6922561.715
P19	528449.054	6922560.738
P20	528453.182	6922559.254
P21	528456.043	6922557.811
P22	528461.601	6922546.047
P23	528426.680	6922496.035
P24	528429.593	6922495.284



G				
F				
E				
D				
C				
B	Metered entry lanes; M1 NTH pavement marking, arrows and setout. Sign 38 location; Sign 39 inclusion. Linemarking coordinates table.		31/10/18	
A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfilm

CAD FILES: C:\NERD\ROAD PROJECTS\12A\230_12A_413159 – Exit 49\Design\Acad\Current\SL-1-B.dwg

Last Modified :- Oct 30, 2018 – 4:20pm KREFS :- R_0904.dwg ; Prelim Survey MR101413_A.dwg ; 180823 (Path 2)Northern Southbound Lane 1 Send.dwg ; R_Aerial Images.dwg ; R_0086_Manhole_180803.dwg ; 180823_Linemarking MCX1.dwg ; R_Survey_MR100720_MODIFIED.dwg ; R_SL.dwg ; R_DUN_OPT_28.dwg

Associated Job Nos	
Auxiliary Drg Nos	

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points				
Preceding RP	Dist. to start at job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from Start of Gazettal (M1) 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP
SIGNS AND LINEMARKING
SHEET 1 of 2

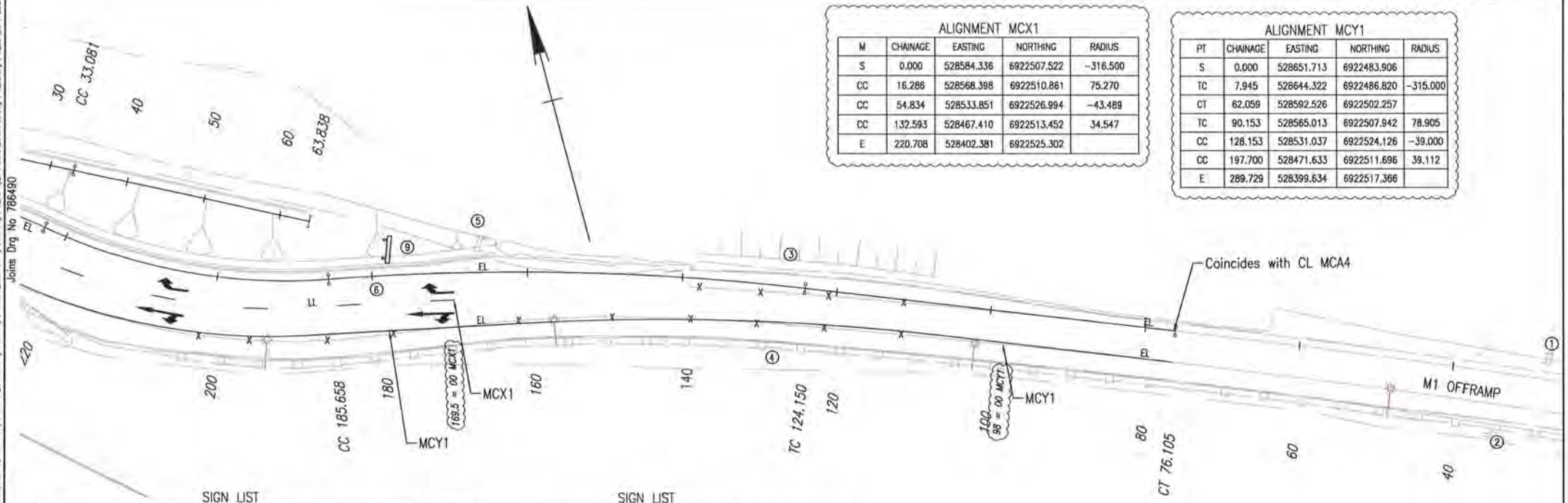
Drawn: C.WOJUN
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA	ORIGINAL SIGNED	18408	3/9/18

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786490 B
Series Number	SL-1 of 2

MRR_Detail (02/14)



ALIGNMENT MCX1

M	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528584.336	6922507.522	-316.500
CC	16.286	528568.398	6922510.861	75.270
CC	54.834	528533.851	6922526.994	-43.489
CC	132.593	528467.410	6922513.452	34.547
E	220.708	528402.381	6922525.302	

ALIGNMENT MCY1

PT	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528651.713	6922483.906	
TC	7.945	528644.322	6922486.820	-315.000
CT	62.059	528592.526	6922502.257	
TC	90.153	528565.013	6922507.942	78.905
CC	128.153	528531.037	6922524.126	-39.000
CC	197.700	528471.633	6922511.696	39.112
E	289.729	528399.634	6922517.366	

SIGN LIST

Sign No.	Description	Comments
1	Guide Sign (Exit 49)	To Remain
2	R4-1 Speed sign (80km/h)	To Remain
3	R4-1 Speed sign (60km/h)	Remove and Re-erect
4	R4-1 Speed sign (60km/h)	To remain
5	Guide sign (Wrong Way Go Back)	Remove
6	R2-Q02 (Through Traffic Keep Left)	Remove
7	Guide Sign (Information Sign)	Remove
8	On Light Pole - R2-9 (Left Lane Must Turn Left)	Remove
9	Guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new
	Guide sign R6-21 (End of Motorway)	Provide new
9R	New guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new sign
10	Guide sign (Wrong Way Go Back)	To Remain
11	R1-3 (Give Way at Roundabout)	To Remain
12	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
13	R1-3 (Give Way at Roundabout)	Remove
14	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
15	R1-3 (Give Way at Roundabout)	Remove and Re-erect
16	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
17	D4-1-1 (Hazard Marker L)	To Remain
18	R1-3 (Give Way at Roundabout)	To Remain
On back of 18	R2-4 (No Entry)	To Remain
	GE9-15 (Wrong Way)	To Remain
19	Guide sign (Rifle Range Rd South/Upper Coomera)	To Remain

SIGN LIST

Sign No.	Description	Comments
20	D4-2-3 (Hazard Marker)	To Remain
21	Street sign (Rifle Range Rd)	To Remain
	G5-14 Street sign (Pimpama Hall/Heritage Park/Pimpama State School)	To Remain
22	D4-1-1 (Hazard Marker L)	To Remain
23	R1-3 (Give Way at Roundabout)	To Remain
24	Information sign (Fire guide)	To Remain
25	Guide Sign (Rifle Range Rd-Nth / Willow Vale)	To Remain
	Tourist sign (The Golden Door Health Retreat)	To Remain
26	Tourist sign (Le Mans kart racing)	Remove
	Tourist sign (Strawberry Farm)	Remove
	Tourist sign (Gainsborough Greens Golf Course)	To Remain
	D4-1-1 (Hazard Marker L)	To Remain
27	R1-3 (Give Way at Roundabout)	To Remain
28	Guide sign (Pacific Mwy North / Rifle Range Rd South)	To Remain
29	R1-3 (Give Way at Roundabout)	To Remain
30	D4-1-1 (Hazard Marker L)	To Remain
	R2-2 (One Way L)	To Remain
31	Guide sign (Pacific MWY Nth / Brisbane)	To Remain
32	GE6-Q01 (Prohibited on Motorway)	To Remain
33	Guide sign (To Pacific MWY Sth / Jacobs Well, Gold Coast)	To Remain
34	D4-2-3 (Hazard Marker)	To Remain
	Tourist sign (Air Sea Rescue)	To Remain
35	R1-3 (Give Way at Roundabout)	To Remain
36	Tourist sign (Other Tourist Facilities)	To Remain
37	R2-3 (Keep Left)	Remove and Re-erect
38	Guide sign (Upper Coomera/Willow Vale, M1 Brisbane)	Provide new face
39	R6-21B END MOTORWAY	Provide sign face on back of Sign 10

NOTES:

REFERENCE TO OTHER DRAWINGS

1. Complete Drawing list and numbers, refer DI drawing series.

SIGNS - FOOTINGS

2. The Contractor shall make enquires about existing drainage and public utility plant before undertaking any sign installation.
3. Signs shall be installed with a 3.0m minimum overhead clearance to aboveground power lines.
4. Where signs are in close proximity to underground utilities, the sign footing should be vaccum excavated (or similar approved method).
5. Position of the signs are shown approximately. The Contractor may change the position of the sign where deemed more appropriate with prior approval from the Administrator.
6. Single post signs positioned in grassed areas are to be installed in accordance with the Low Risk or Frangible Support detail on Std Drg 1368.
7. Unless footing details are provided, single post signs positioned in concrete or paved areas are to be installed in accordance with the Typical Sleeve Installation for 60.300 (50NB) Posts detail on Std Drg 1368.
8. Unless footing details are provided, multi post signs are to be installed in accordance with Std Drg 1363.

SIGNS - FACE AND POSTS

9. All new signs shall provide the make month and year on the rear face of each sign. The Contractor shall ensure these details are correct and provided before installation.
10. All signs to be installed using 50mm nominal bore posts unless otherwise directed in this Contract.
11. All relocated signs shall be on new posts. Where the relocated sign face is damaged prior to relocations, the Contractor must seek advice and approval to replace the damaged sign face prior to relocation.
12. Unless otherwise noted, sign faces shall be installed 2.0m min. clearance above the road shoulder and 1.0m clearance from the road shoulder/kerb or behind the face of guardrail. Where a sign is installed above or adjacent to footpath or verge, the sign face shall be installed 2.5m min. clearance above the final footpath or verge surface level.
13. Hazard signs D4-1-1A shall be installed with centre of the sign face installed approximately 1.7m from the road surface.
14. Sign faces shall be supplied in accordance with the requirements of MRS14 and MRTS14 Standard Specifications and Annexures.
15. Road edge guide posts shall be flexible metal type and installed on the hinge point where specified on drawings. Guide posts, which are not consistent with design are to be removed.

PAVEMENT MARKING

16. New pavement marking shall join smoothly to existing where required.
17. All pavement marking material shall be paint (type 3) unless otherwise noted in the Pavement Marking Legend.
18. All pavement markings not consistent with this design are to be removed by water blasting with minimal damage to the existing pavement surface.

G			
F			
E			
D			
C			
B	Sign 38, Chainage equivalents MCX1 and MCY1	31/10/18	
A	Issued For Construction		
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERO\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Acad\Current\SL-1-B.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)

CTL CHGE 31100 - 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal (M1) 31.1km - 31.9km

EXIT 49 NORTHBOUND OFF RAMP
SIGNS AND LINEMARKING
SHEET 2 of 2

Drawn: C.WOJCIK
Designed: S.READ

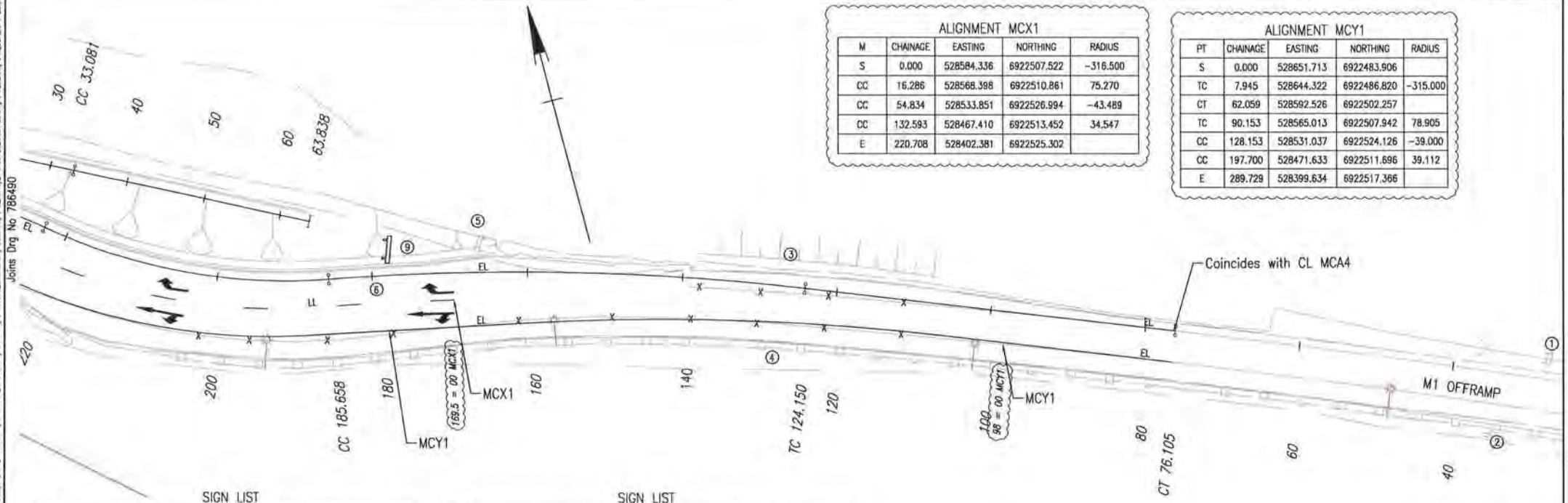
ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA			

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786491 B
Series Number	SL-2 of 2

MRR_Detail (02/14)

Last Modified :- Oct 05, 2018 - 2:47pm | XREFS :- X_DRGA.dwg ; Photo Survey MR101411_A.dwg ; 180823 Photo Existing Southbound Lane 1 Semi.dwg ; X_Aerial Images.dwg ; X_DEM_Model.dwg ; 180823_Linemarking MCY.dwg ; 180823_Linemarking MCX1.dwg ; X_Survey_MR100720_MODIFIED.dwg ; X_GL.dwg ; X_GLIN_OPT 28.dwg



ALIGNMENT MCX1

M	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528584.336	6922507.522	-316.500
CC	16.286	528568.398	6922510.861	75.270
CC	54.834	528533.851	6922526.994	-43.489
CC	132.593	528467.410	6922513.452	34.547
E	220.708	528402.381	6922525.302	

ALIGNMENT MCY1

PT	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528651.713	6922483.906	
TC	7.945	528644.322	6922486.820	-315.000
CT	62.059	528592.526	6922502.257	
TC	90.153	528565.013	6922507.942	78.905
CC	128.153	528531.037	6922524.126	-39.000
CC	197.700	528471.633	6922511.696	39.112
E	289.729	528399.634	6922517.366	

SIGN LIST

Sign No.	Description	Comments
1	Guide Sign (Exit 49)	To Remain
2	R4-1 Speed sign (80km/h)	To Remain
3	R4-1 Speed sign (60km/h)	Remove and Re-erect
4	R4-1 Speed sign (60km/h)	To remain
5	Guide sign (Wrong Way Go Back)	Remove
6	R2-Q02 (Through Traffic Keep Left)	Remove
7	Guide Sign (Information Sign)	Remove
8	On Light Pole – R2-9 (Left Lane Must Turn Left)	Remove
9	Guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new
	Guide sign R6-21 (End of Motorway)	Provide new
9R	New guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new sign
10	Guide sign (Wrong Way Go Back)	To Remain
11	R1-3 (Give Way at Roundabout)	To Remain
12	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
13	R1-3 (Give Way at Roundabout)	Remove
14	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
15	R1-3 (Give Way at Roundabout)	Remove and Re-erect
16	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
17	D4-1-1 (Hazard Marker L)	To Remain
18	R1-3 (Give Way at Roundabout)	To Remain
On back of 18	R2-4 (No Entry)	To Remain
	GE9-15 (Wrong Way)	To Remain
19	Guide sign (Rifle Range Rd South/Upper Coomera)	To Remain

SIGN LIST

Sign No.	Description	Comments
20	D4-2-3 (Hazard Marker)	To Remain
21	Street sign (Rifle Range Rd)	To Remain
	G5-14 Street sign (Pimpama Hall/Heritage Park/Pimpama State School)	To Remain
22	D4-1-1 (Hazard Marker L)	To Remain
23	R1-3 (Give Way at Roundabout)	To Remain
24	Information sign (Fire guide)	To Remain
25	Guide Sign (Rifle Range Rd-Nth / Willow Vale)	To Remain
	Tourist sign (The Golden Door Health Retreat)	To Remain
26	Tourist sign (Le Mans kart racing)	Remove
	Tourist sign (Stawberry Farm)	Remove
	Tourist sign (Coinsborough Greens Golf Course)	To Remain
	D4-1-1 (Hazard Marker L)	To Remain
27	R1-3 (Give Way at Roundabout)	To Remain
28	Guide sign (Pacific Mwy North / Rifle Range Rd South)	To Remain
29	R1-3 (Give Way at Roundabout)	To Remain
30	D4-1-1 (Hazard Marker L)	To Remain
	R2-2 (One Way L)	To Remain
31	Guide sign (Pacific MWY Nth / Brisbane)	To Remain
32	GE6-Q01 (Prohibited on Motorway)	To Remain
33	Guide sign (To Pacific MWY Sth / Jacobs Well, Gold Coast)	To Remain
34	D4-2-3 (Hazard Marker)	To Remain
	Tourist sign (Air Sea Rescue)	To Remain
35	R1-3 (Give Way at Roundabout)	To Remain
36	Tourist sign (Other Tourist Facilities)	To Remain
37	R2-3 (Keep Left)	Remove and Re-erect
38	Guide sign (Upper Coomera/Willow Vale, M1 Brisbane)	Provide new face
39	R6-21B END MOTORWAY	Provide sign face on back of Sign 10

NOTES:

REFERENCE TO OTHER DRAWINGS

1. Complete Drawing list and numbers, refer 01 drawing series.

SIGNS – FOOTINGS

2. The Contractor shall make enquires about existing drainage and public utility plant before undertaking any sign installation.
3. Signs shall be installed with a 3.0m minimum overhead clearance to aboveground power lines.
4. Where signs are in close proximity to underground utilities, the sign footing should be vaccum excavated (or similar approved method).
5. Position of the signs are shown approximately. The Contractor may change the position of the sign where deemed more appropriate with prior approval from the Administrator.
6. Single post signs positioned in grassed areas are to be installed in accordance with the Low Risk or Frangible Support detail on Std Drg 1368.
7. Unless footing details are provided, single post signs positioned in concrete or paved areas are to be installed in accordance with the Typical Sleeve Installation for 60.300 (50NB) Posts detail on Std Drg 1368.
8. Unless footing details are provided, multi post signs are to be installed in accordance with Std Drg 1363.

SIGNS – FACE AND POSTS

9. All new signs shall provide the make month and year on the rear face of each sign. The Contractor shall ensure these details are correct and provided before installation.
10. All signs to be installed using 50mm nominal bore posts unless otherwise directed in this Contract.
11. All relocated signs shall be on new posts. Where the relocated sign face is damaged prior to relocations, the Contractor must seek advice and approval to replace the damaged sign face prior to relocation.
12. Unless otherwise noted, sign faces shall be installed 2.0m min. clearance above the road shoulder and 1.0m clearance from the road shoulder/kerb or behind the face of guardrail. Where a sign is installed above or adjacent to footpath or verge, the sign face shall be installed 2.5m min. clearance above the final footpath or verge surface level.
13. Hazard signs D4-1-1A shall be installed with centre of the sign face installed approximately 1.7m from the road surface.
14. Sign faces shall be supplied in accordance with the requirements of MRS14 and MRTS14 Standard Specifications and Annexures.
15. Road edge guide posts shall be flexible metal type and installed on the hinge point where specified on drawings. Guide posts, which are not consistent with design are to be removed.

PAVEMENT MARKING

16. New pavement marking shall join smoothly to existing where required.
17. All pavement marking material shall be paint (type 3) unless otherwise noted in the Pavement Marking Legend.
18. All pavement markings not consistent with this design are to be removed by water blasting with minimal damage to the existing pavement surface.

G			
F			
E			
D			
C			
B	Sign 39, Chainage equivalents MCX1 and MCY1	31/10/18	
A	Issued For Construction		
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERO\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Xcad\Current\SL-1-B.dwg

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Associated Job Nos	
Auxiliary Drg Nos	

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST

PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)

CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal (M1) 31.1km – 31.9km

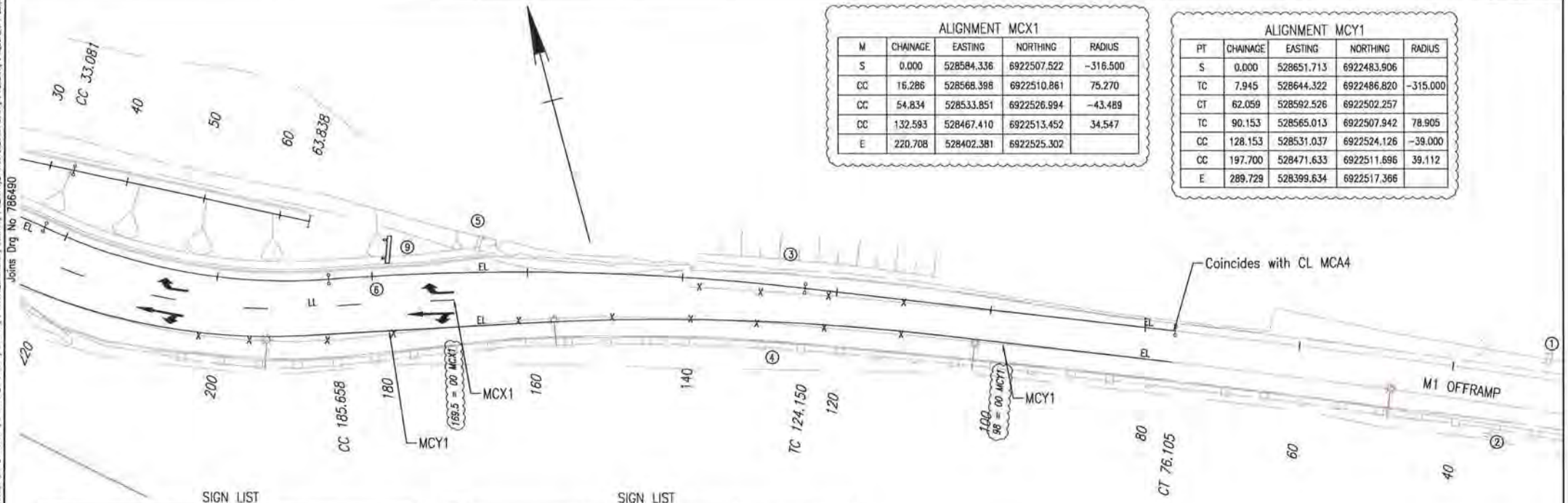
EXIT 49 NORTHBOUND OFF RAMP SIGNS AND LINEMARKING SHEET 2 of 2

Drawn	C.WOJCIK	ENGINEERING CERTIFICATION (RPEQ)			
		ENG. AREA	NAME	SIGNATURE	NO.	DATE
Designed	S.READ	CIVIL	A. O'SHEA			

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786491 B
Series Number	SL-2 of 2

MRR_Detail (02/14)



ALIGNMENT MCX1

M	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528584.336	6922507.522	-316.500
CC	16.286	528568.398	6922510.861	75.270
CC	54.834	528533.851	6922526.994	-43.489
CC	132.593	528467.410	6922513.452	34.547
E	220.708	528402.381	6922525.302	

ALIGNMENT MCY1

PT	CHAINAGE	EASTING	NORTHING	RADIUS
S	0.000	528651.713	6922483.906	
TC	7.945	528644.322	6922486.820	-315.000
CT	62.059	528592.526	6922502.257	
TC	90.153	528565.013	6922507.942	78.905
CC	128.153	528531.037	6922524.126	-39.000
CC	197.700	528471.633	6922511.696	39.112
E	289.729	528399.634	6922517.366	

SIGN LIST

Sign No.	Description	Comments
1	Guide Sign (Exit 49)	To Remain
2	R4-1 Speed sign (80km/h)	To Remain
3	R4-1 Speed sign (60km/h)	Remove and Re-erect
4	R4-1 Speed sign (60km/h)	To remain
5	Guide sign (Wrong Way Go Back)	Remove
6	R2-Q02 (Through Traffic Keep Left)	Remove
7	Guide Sign (Information Sign)	Remove
8	On Light Pole – R2-9 (Left Lane Must Turn Left)	Remove
9	Guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new
~~9R~~	~~Guide sign R6-21 (End of Motorway)~~	~~Provide new~~
9R	New guide sign (Upper Coomera/Willow Vale/Brisbane/Jacobs Well)	Provide new sign
10	Guide sign (Wrong Way Go Back)	To Remain
11	R1-3 (Give Way at Roundabout)	To Remain
12	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
13	R1-3 (Give Way at Roundabout)	Remove
14	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
15	R1-3 (Give Way at Roundabout)	Remove and Re-erect
16	R2-4 (No Entry)	Remove
	GE9-15 (Wrong Way)	Remove
17	D4-1-1 (Hazard Marker L)	To Remain
18	R1-3 (Give Way at Roundabout)	To Remain
On back of 18	R2-4 (No Entry)	To Remain
	GE9-15 (Wrong Way)	To Remain
19	Guide sign (Rifle Range Rd South/Upper Coomera)	To Remain

SIGN LIST

Sign No.	Description	Comments
20	D4-2-3 (Hazard Marker)	To Remain
21	Street sign (Rifle Range Rd)	To Remain
	G5-14 Street sign (Pimpama Hall/Heritage Park/Pimpama State School)	To Remain
22	D4-1-1 (Hazard Marker L)	To Remain
23	R1-3 (Give Way at Roundabout)	To Remain
24	Information sign (Fire guide)	To Remain
25	Guide Sign (Rifle Range Rd-Nth / Willow Vale)	To Remain
	Tourist sign (The Golden Door Health Retreat)	To Remain
26	Tourist sign (Le Mans kart racing)	Remove
	Tourist sign (Strawberry Farm)	Remove
	Tourist sign (Coinsborough Greens Golf Course)	To Remain
	D4-1-1 (Hazard Marker L)	To Remain
27	R1-3 (Give Way at Roundabout)	To Remain
28	Guide sign (Pacific Mwy North / Rifle Range Rd South)	To Remain
29	R1-3 (Give Way at Roundabout)	To Remain
30	D4-1-1 (Hazard Marker L)	To Remain
	R2-2 (One Way L)	To Remain
31	Guide sign (Pacific MWY Nth / Brisbane)	To Remain
32	GE6-Q01 (Prohibited on Motorway)	To Remain
33	Guide sign (To Pacific MWY Sth / Jacobs Well, Gold Coast)	To Remain
34	D4-2-3 (Hazard Marker)	To Remain
	Tourist sign (Air Sea Rescue)	To Remain
35	R1-3 (Give Way at Roundabout)	To Remain
36	Tourist sign (Other Tourist Facilities)	To Remain
37	R2-3 (Keep Left)	Remove and Re-erect
38	Guide sign (Upper Coomera/Willow Vale, M1 Brisbane)	Provide new face
39	R6-21B END MOTORWAY	Provide sign face on back of Sign 10

NOTES:

REFERENCE TO OTHER DRAWINGS
1. Complete Drawing list and numbers, refer DI drawing series.

SIGNS – FOOTINGS
2. The Contractor shall make enquires about existing drainage and public utility plant before undertaking any sign installation.
3. Signs shall be installed with a 3.0m minimum overhead clearance to aboveground power lines.
4. Where signs are in close proximity to underground utilities, the sign footing should be vaccum excavated (or similar approved method).
5. Position of the signs are shown approximately. The Contractor may change the position of the sign where deemed more appropriate with prior approval from the Administrator.
6. Single post signs positioned in grassed areas are to be installed in accordance with the Low Risk or Frangible Support detail on Std Drg 1368.
7. Unless footing details are provided, single post signs positioned in concrete or paved areas are to be installed in accordance with the Typical Sleeve Installation for 60.300 (50NB) Posts detail on Std Drg 1368.
8. Unless footing details are provided, multi post signs are to be installed in accordance with Std Drg 1363.

SIGNS – FACE AND POSTS
9. All new signs shall provide the make month and year on the rear face of each sign. The Contractor shall ensure these details are correct and provided before installation.
10. All signs to be installed using 50mm nominal bore posts unless otherwise directed in this Contract.
11. All relocated signs shall be on new posts. Where the relocated sign face is damaged prior to relocations, the Contractor must seek advice and approval to replace the damaged sign face prior to relocation.
12. Unless otherwise noted, sign faces shall be installed 2.0m min. clearance above the road shoulder and 1.0m clearance from the road shoulder/kerb or behind the face of guardrail. Where a sign is installed above or adjacent to footpath or verge, the sign face shall be installed 2.5m min. clearance above the final footpath or verge surface level.
13. Hazard signs D4-1-1A shall be installed with centre of the sign face installed approximately 1.7m from the road surface.
14. Sign faces shall be supplied in accordance with the requirements of MRS14 and MRTS14 Standard Specifications and Annexures.
15. Road edge guide posts shall be flexible metal type and installed on the hinge point where specified on drawings. Guide posts, which are not consistent with design are to be removed.

PAVEMENT MARKING
16. New pavement marking shall join smoothly to existing where required.
17. All pavement marking material shall be paint (type 3) unless otherwise noted in the Pavement Marking Legend.
18. All pavement markings not consistent with this design are to be removed by water blasting with minimal damage to the existing pavement surface.

Rev	Revisions/Descriptions	Certification	Date	Microfiled
B	Sign 39, Chainage equivalents MCX1 and MCY1		31/10/18	
A	Issued For Construction			

Associated Job Nos:

Auxiliary Drg Nos:

Survey Data	
Datum	GDA
Horiz. Grid	MGA94 Z56
Height Origin	AHD
Survey Books	MR100720

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
PACIFIC HIGHWAY (PACIFIC MOTORWAY 12A)
CTL CHGE 31100 – 31900

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.478	0.8	7.503	12A/11Q

Through Chainage from start of gazettal (M1) 31.1km – 31.9km

EXIT 49 NORTHBOUND OFF RAMP
SIGNS AND LINEMARKING
SHEET 2 of 2

Drawn: C.WOJCIK
Designed: S.READ

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	A. O'SHEA			

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	786491 B
Series Number	SL-2 of 2

MRR_Detail (02/14)

CAD FILES | G:\NERO\ROAD PROJECTS\12A\230_12A_413159 - Exit 49\Design\Xcad\Current\SL-1-B.dwg

Last Modified :- Oct 05, 2018 - 2:47pm XREFS :- X_DRGA.dwg ; Plotm Survey MR100141_A.dwg ; 180823 Work Estimate SouthBound Lane 1 Semi.dwg ; X_Aerial Images.dwg ; X_DEM_Mosaic_180903.dwg ; 180823_Linemarking MCY1.dwg ; 180823_Linemarking MCX1.dwg ; X_Survey_MR100720_MODIFIED.dwg ; X_GL.dwg ; X_GLN_OPT 28.dwg

Department of Transport and Main Roads

PHASE DIAGRAMS	A PHASE	B PHASE
SIGNAL GROUPS	1	1
VEHICLE/PED	VG1	VG1
LOGICAL INPUT	4	1,2,3
CALL	X	PRES
EXTEND	X	
INCREMENT		
SPECIAL CONDITIONS		SG1 RED if presence on detector 1, 2 or 3 canceled (after min RED time) by presence on detector 4 else Off after RED max time.

LANTERN SCHEDULE

SIGNAL POST	HARDWARE	REQUIREMENT
1	G/M 2 Aspect LED Lantern	New Lantern
2	G/M 2 Aspect LED Lantern	New Lantern

G/M – Ground Mounted

TRAFFIC SIGNAL CABLE SCHEDULE

	STATION/PIT FROM	STATION/PIT TO	CABLE TYPE	LENGTH (m)	REMARKS
RUN 1	⊠	1	19C	31	Install new cable
	1	2	19C	18	Install new cable
			TOTAL:	49	

LOOP DETECTOR FEEDER CABLE SCHEDULE

LOOP No.	LOOP TYPE	DISTANCE FROM STOP/HOLD LINE (m)	QUANTITY (m)	REMARKS
1	PRESENCE	As shown	272	Install New
2	PRESENCE	As shown	172	Install new
3	PRESENCE	As shown	172	Install new
4	PRESENCE	As shown	185	Install new
		TOTAL	801	

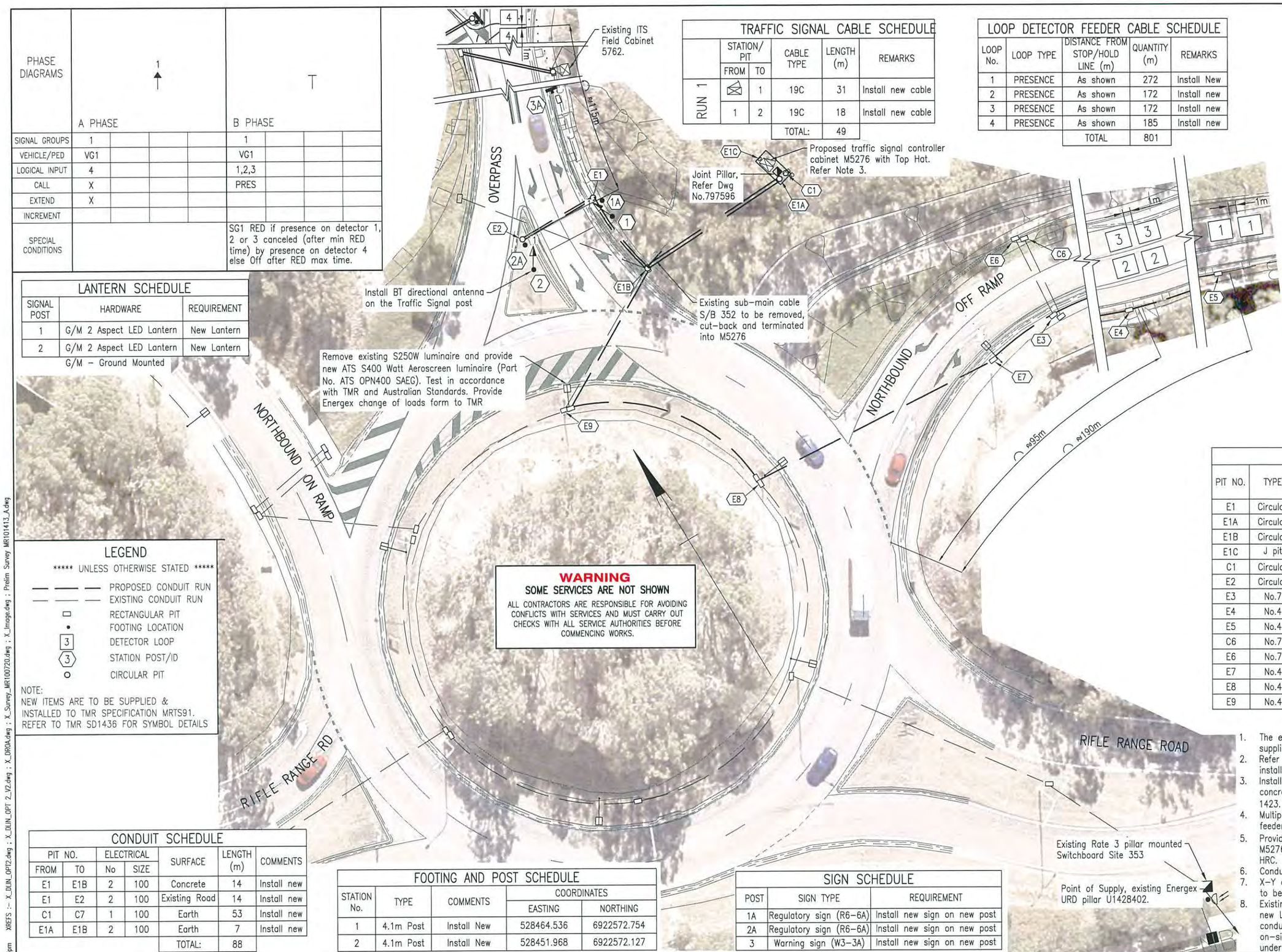
SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CORES USED
1	RED	A5	1	1
	YELLOW	A4	2	2
	NEUTRAL	A1,B1 C1,D1	NL	BK
	SPARE CORES TO EARTH			3–16
	CABLE SIZE			19C

CONNECTS: 1, 2

CONTROLLER TYPE
TYCO ECLIPSE EC1–62–16

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	PRES	As shown
LOOP 2	P2	2	PRES	As shown
LOOP 3	P3	3	PRES	As shown
LOOP 4	P4	4	PRES	115m
		5		
		6		
		7		



WARNING
SOME SERVICES ARE NOT SHOWN
ALL CONTRACTORS ARE RESPONSIBLE FOR AVOIDING CONFLICTS WITH SERVICES AND MUST CARRY OUT CHECKS WITH ALL SERVICE AUTHORITIES BEFORE COMMENCING WORKS.

LEGEND
***** UNLESS OTHERWISE STATED *****
- PROPOSED CONDUIT RUN
- EXISTING CONDUIT RUN
- RECTANGULAR PIT
- FOOTING LOCATION
- [3] DETECTOR LOOP
- ⟨3⟩ STATION POST/ID
- CIRCULAR PIT

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91. REFER TO TMR SD1436 FOR SYMBOL DETAILS

PIT SCHEDULE

PIT NO.	TYPE	COMMENTS	COORDINATES EASTING	COORDINATES NORTHING
E1	Circular	Install new pit	528463.679	6922576.222
E1A	Circular	Install new pit	528486.191	6922565.485
E1B	Circular	Replace with new pit		
E1C	J pit	Install new pit	528485.307	6922569.080
C1	Circular	Install new pit	528487.279	6922565.704
E2	Circular	Install new pit	528452.795	6922576.338
E3	No.7	Existing to remain		
E4	No.4	Existing to remain		
E5	No.4	Existing to remain		
C6	No.7	Existing to remove		
E6	No.7	Existing to remove		
E7	No.4	Existing to remain		
E8	No.4	Existing to remain		
E9	No.4	Existing to remain		

CONDUIT SCHEDULE

PIT NO. FROM	PIT NO. TO	ELECTRICAL No	ELECTRICAL SIZE	SURFACE	LENGTH (m)	COMMENTS
E1	E1B	2	100	Concrete	14	Install new
E1	E2	2	100	Existing Road	14	Install new
C1	C7	1	100	Earth	53	Install new
E1A	E1B	2	100	Earth	7	Install new
				TOTAL:	88	

FOOTING AND POST SCHEDULE

STATION No.	TYPE	COMMENTS	COORDINATES EASTING	COORDINATES NORTHING
1	4.1m Post	Install New	528464.536	6922572.754
2	4.1m Post	Install New	528451.968	6922572.127

SIGN SCHEDULE

POST	SIGN TYPE	REQUIREMENT
1A	Regulatory sign (R6–6A)	Install new sign on new post
2A	Regulatory sign (R6–6A)	Install new sign on new post
3	Warning sign (W3–3A)	Install new sign on new post

NOTES:
1. The existing information shown on the plans has been supplied by the various services authorities.
2. Refer drawing number 706969 for fibre optic cable installation details.
3. Install traffic signal controller cabinet site M5276 on concrete base pad in accordance with TMR standard drawing 1423. Provide earth pit (not shown).
4. Multiple loops to be connected in parallel to a single loop feeder cable as shown.
5. Provide 35mm² 2C XLPE/PVC mains cable to new Controller M5276. Energex service fuse for mains cable to be 50A HRC.
6. Conduit to be capped & sealed in pits E6 & C6.
7. X–Y coordinates provided are indicative only. Final location to be determent on–site in accordance with TMR standards.
8. Existing under–depth electrical conduit exist on–site. No new LV cable shall be installed in existing under–depth conduit. All existing under–depth conduits shall be labeled on–site with permanent engraved marked plates stating under–depth LV conduit.

Rev	Revisions/Descriptions	Certification	Date	Microfiled
B	Drawing Revised	09350	20.11.18	
A	Issued For Construction			

Associated Job Nos
Auxiliary Drg Nos

Survey Data: Datum GDA94; Horiz. Grid MGA94 Zone56; Height Origin AHD Derived; Survey Books MR100720

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (WEST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.83	0.53	7.42	12A/11Q

Through Chainage from 31.45km to 31.98km

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5276
UBD MAP 302 F20

Drawn C.WOJCIK
Designed C.WOJCIK

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	D.ROESNER	Original signed	09350	23/8/2018

Queensland Government

Job No.	413159
Contract. No.	CN–3476
Drawing No.	706974 | B
Series Number	TS–01 of 1

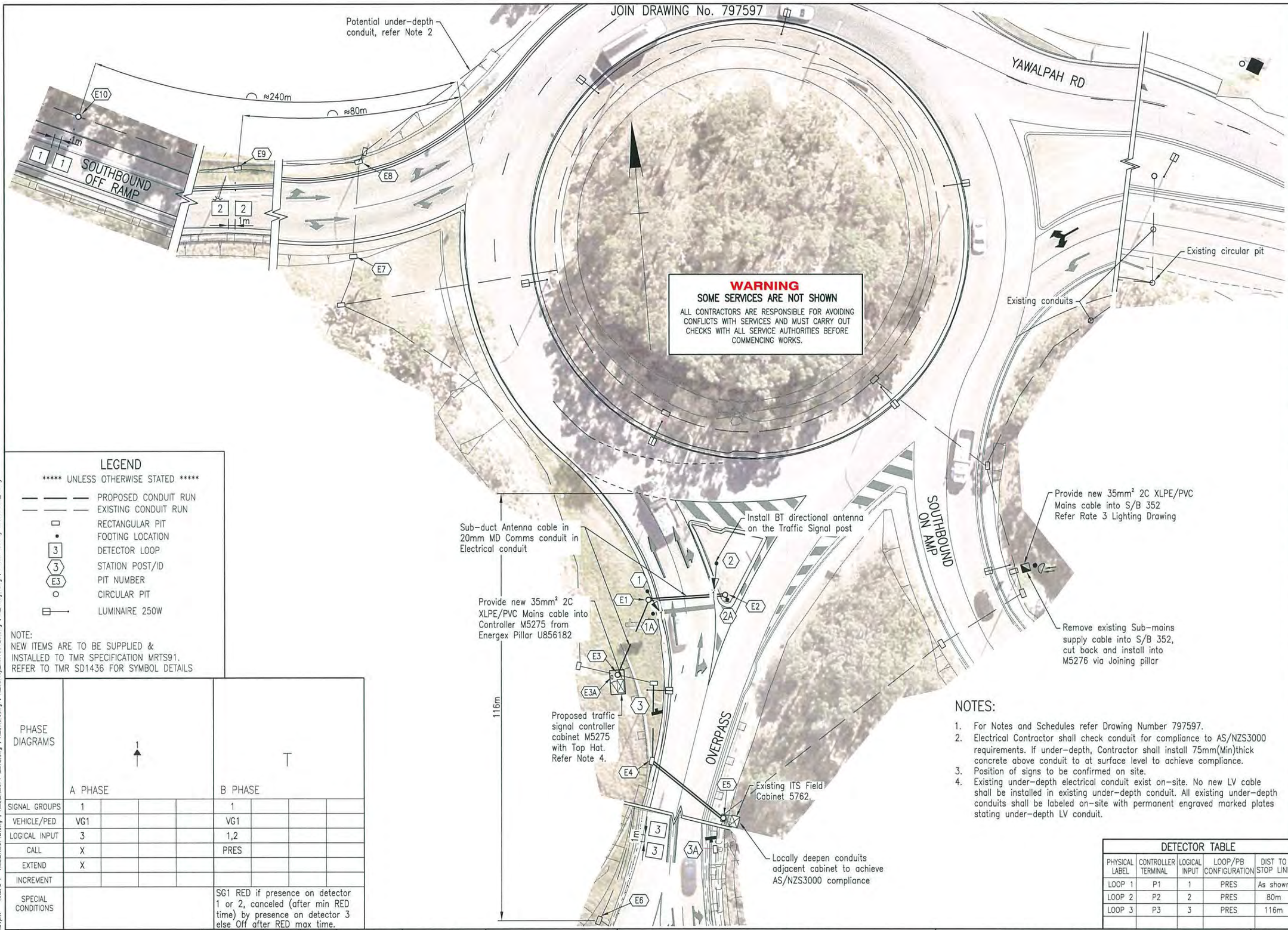
MRT_Detail (02/14)

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms_B_C.dwg

XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DR0A.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg

Last Modified :- Nov 20, 2018 – 5:06pm

Department of Transport and Main Roads



LEGEND

***** UNLESS OTHERWISE STATED *****

- PROPOSED CONDUIT RUN
- EXISTING CONDUIT RUN
- RECTANGULAR PIT
- FOOTING LOCATION
- 3 — DETECTOR LOOP
- 3 — STATION POST/ID
- E3 — PIT NUMBER
- CIRCULAR PIT
- LUMINAIRE 250W

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91.
REFER TO TMR SD1436 FOR SYMBOL DETAILS

PHASE DIAGRAMS	A PHASE (1)	B PHASE (T)
SIGNAL GROUPS	1	1
VEHICLE/PED	VG1	VG1
LOGICAL INPUT	3	1,2
CALL	X	PRES
EXTEND	X	
INCREMENT		
SPECIAL CONDITIONS		SG1 RED if presence on detector 1 or 2, canceled (after min RED time) by presence on detector 3 else Off after RED max time.

NOTES:

1. For Notes and Schedules refer Drawing Number 797597.
2. Electrical Contractor shall check conduit for compliance to AS/NZS3000 requirements. If under-depth, Contractor shall install 75mm(Min)thick concrete above conduit to at surface level to achieve compliance.
3. Position of signs to be confirmed on site.
4. Existing under-depth electrical conduit exist on-site. No new LV cable shall be installed in existing under-depth conduit. All existing under-depth conduits shall be labeled on-site with permanent engraved marked plates stating under-depth LV conduit.

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CONNECTS CORES USED
1	RED	A5	1	1
	YELLOW	A4	2	2
	NEUTRAL	A1,B1 C1,D1	NL	BK
	SPARE CORES TO EARTH			3–16
	CABLE SIZE			19C

CONTROLLER TYPE
TYCO ECLIPSE EC1–62–16

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	PRES	As shown
LOOP 2	P2	2	PRES	80m
LOOP 3	P3	3	PRES	116m

	Revisions/Descriptions	Certification	Date	Microfiled
B	Drawing Revised	09350	20.11.18	
A	Issued For Construction			

Associated Job Nos
Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (EAST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.37	0.55	7.86	12A/11Q

Through Chainage from 30.99km to 31.54km

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5275
UBD MAP 302 F20

Drawn C.WOJCIK
Designed C.WOJCIK

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	D.ROESNER	Original signed	09350	30.08.2018

Queensland Government

Job No.	413159
Contract. No.	CN–3476
Drawing No.	706975 | B
Series Number	TS–1 of 2
	MRT_Detail (02/14)

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms_B_C.dwg

Last Modified :- Nov 20, 2018 – 5:01pm XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DR0A.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg

LEGEND

***** UNLESS OTHERWISE STATED *****

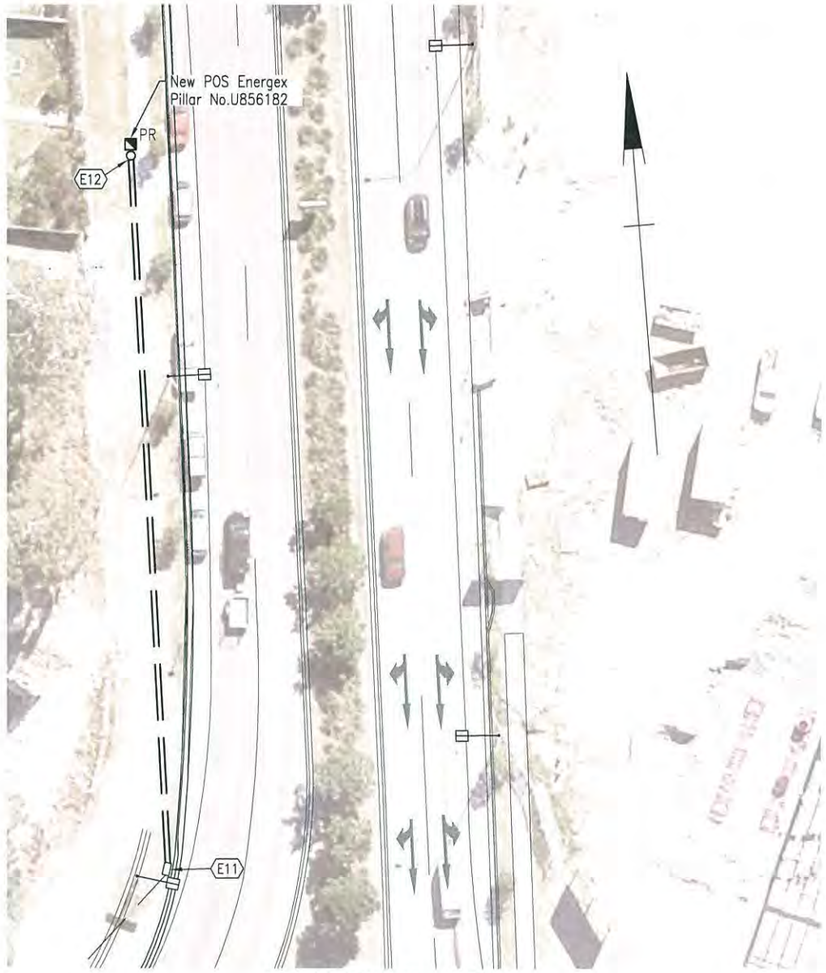
- PROPOSED CONDUIT RUN
- EXISTING CONDUIT RUN
- RECTANGULAR PIT
- E3 — PIT NUMBER
- FOOTING LOCATION
- LUMINAIRE 250W
- PR — SWITCHBOARD

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91.
REFER TO TMR SD1436 FOR SYMBOL DETAILS

WARNING

SOME SERVICES ARE NOT SHOWN

ALL CONTRACTORS ARE RESPONSIBLE FOR AVOIDING CONFLICTS WITH SERVICES AND MUST CARRY OUT CHECKS WITH ALL SERVICE AUTHORITIES BEFORE COMMENCING WORKS.



JOIN DRAWING No. 706975

SIGN SCHEDULE

POST	SIGN TYPE	REQUIREMENT
1A	Regulatory sign (R6-6A)	Install new sign on new post
2A	Regulatory sign (R6-6A)	Install new sign on new post
3*	Warning sign (W3-3A)	Install new sign on new post
3A*	Warning sign (W3-3A)	Install new sign on new post

*Position of signs to be confirmed on site"

LOOP DETECTOR FEEDER CABLE SCHEDULE

LOOP No.	LOOP TYPE	DISTANCE FROM STOP/HOLD LINE (m)	QUANTITY (m)	REMARKS
1	PRESENCE	As shown	330	Install New
2	PRESENCE	As shown	160	Install new
3	PRESENCE	As shown	135	Install new
		TOTAL	625	

CONDUIT SCHEDULE

PIT NO. FROM	PIT NO. TO	ELECTRICAL No	ELECTRICAL SIZE	SURFACE	LENGTH (m)	COMMENTS
E3	E1	2	100	Earth	12	Install new
E1	E2	2	100	Existing Road	12	Install new
E4	E5	2	100	Existing Road	15	Install new
E11	E12	2	80	Earth	65	Install new
				TOTAL:	104	

TRAFFIC SIGNAL CABLE SCHEDULE

	STATION/PIT FROM	STATION/PIT TO	CABLE TYPE	LENGTH (m)	REMARKS
RUN 1	TSC	1	19C	30	Install new cable
	1	2	19C	20	Install new cable
			TOTAL:	50	

LANTERN SCHEDULE

SIGNAL POST	HARDWARE	REQUIREMENT
1	G/M 2 Aspect LED Lantern	New Lantern
2	G/M 2 Aspect LED Lantern	New Lantern

G/M – Ground Mounted

FOOTING AND POST SCHEDULE

STATION No.	TYPE	COMMENTS	COORDINATES EASTING	COORDINATES NORTHING
1	4.1m Post	Install New	528484.373	6922688.679
2	4.1m Post	Install New	528494.740	6922688.941

PIT SCHEDULE

PIT NO.	COORDINATES EASTING	COORDINATES NORTHING	TYPE	COMMENTS
E1	528484.421	6922687.516	Circular	Install new pit
E2	528495.016	6922687.328	Circular	Install new pit
E3	528479.404	6922677.642	Circular	Install new pit on existing conduit
E3A	528478.600	6922677.381	J Pit	Install new pit
E4	–	–	No.4	Existing to remain
E5	–	–	Circular	Upgrade to new pit
E6	–	–	No.4	Existing to remain
E7	–	–	No.4	Existing to remain
E8	–	–	No.4	Existing to remain
E9	–	–	No.4	Existing to remain
*E10	–	–	Circular	Install new pit
E11	–	–	No.4	Existing to remain
E12	528504.647	6922851.153	Circular	Install new pit

*Refer Note 2

NOTES:

1. The existing information shown on the plans has been supplied by the various services authorities.
2. Locate existing underground electrical conduit alignment and integrate new circular electrical pit into located conduit alignment as shown.
3. Refer drawing number 706970 for fibre optic cable installation details.
4. Install traffic signal controller cabinet site M5275 on concrete base pad in accordance with TMR standard drawing 1423. Provide earth pit (not shown).
5. Multiple loops to be connected in parallel to a single loop feeder cable as shown.
6. Provide 35mm² 2C XLPE/PVC mains cable to new Controller M5275. Energex service fuse for mains cable to be 50A HRC.
7. X–Y coordinates provided are indicative only. Final location to be determent on–site in accordance with TMR standards.

A	Issued For Construction				
	Revisions/Descriptions	Certification	Date	Microfiled	

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (EAST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.37	0.55	7.86	12A/11Q

Through Chainage from 30.99km to 31.54km

TRAFFIC SIGNAL INSTALLATION
OPERATIONS AND ELECTRICAL
SCHEDULES

Site Number M5275
UBD MAP 302 F20

Drawn C.WOJCIK
Designed C.WOJCIK

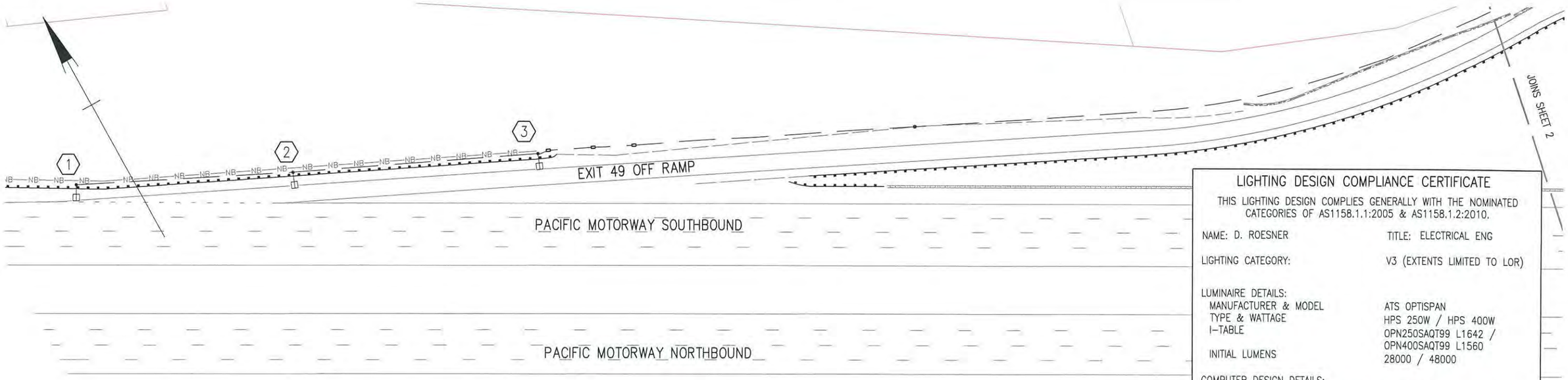
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	D.ROESNER		0	20.11.2018

Queensland Government

Job No.	413159
Contract. No.	CN–3476
Drawing No.	797597 A
Series Number	TS–2 of 2
	MRT_Detail (02/14)

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms_B_C.dwg



LIGHTING DESIGN COMPLIANCE CERTIFICATE

THIS LIGHTING DESIGN COMPLIES GENERALLY WITH THE NOMINATED CATEGORIES OF AS1158.1.1:2005 & AS1158.1.2:2010.

NAME: D. ROESNER — TITLE: ELECTRICAL ENG

LIGHTING CATEGORY: V3 (EXTENTS LIMITED TO LOR)

LUMINAIRE DETAILS:	
MANUFACTURER & MODEL	ATS OPTISPAN
TYPE & WATTAGE	HPS 250W / HPS 400W
I-TABLE	OPN250SAQT99 L1642 / OPN400SAQT99 L1560
INITIAL LUMENS	28000 / 48000

COMPUTER DESIGN DETAILS:	
AS1158.2.2005 COMPLIANT S/WARE	PERFECT LITE
SOURCE OF PROGRAM	TREVOR CASSWELL SOFTWARE
MAINTENANCE FACTOR	0.77
ROAD REFLECTION CHAR	CIE-R3

ALL LIGHTING CALCULATIONS ARE AVAILABLE UPON REQUEST.

FOR LIGHTING ARRANGEMENT, SPACINGS, MOUNTING HEIGHTS, OUTREACH DETAILS AND SIGNIFICANT ROAD FEATURES, REFER TO DRAWING.

LEGEND UNLESS OTHERWISE STATED

- EXISTING CULVERTS
- NB—NB—NB— EXISTING NOISE BARRIER
- EXISTING GUARDRAIL
- CONCRETE BARRIER
- EDGE OF PAVEMENT
- EXISTING CABLE/CONDUIT U/G ROUTE
- LV/SL POLE / JUNCTION BOX
- 400W HPS PROPOSED LUMINAIRE
- 250W HPS EXISTING LUMINAIRE
- 1 STATION NUMBER
- E3 PIT NUMBER
- RECTANGULAR PIT
- CIRCULAR PIT
- PR RATE 3 PILLAR MOUNTED SWITCHBOARD

EXISTING UTILITIES

- STORMWATER PIPE
- DBYD SEWER —dS—dS—

ELECTRICAL CONDUIT SCHEDULE

FROM PIT	TO PIT	ELECTRICAL No	ELECTRICAL SIZE (mm)	LENGTH (m)	USAGE	SURFACE	COMMENTS
E1	E2	2	80	65	Electrical	Earth	New conduit

FOOTING SCHEDULE

STATION No.	EASTING	NORTHING	FOOTING TYPE	COMMENTS
N/A ALL FOOTINGS ARE EXISTING				

ELECTRICAL PIT SCHEDULE

PIT NO.	COORDINATES EASTING	COORDINATES NORTHING	TYPE	REMARKS
E1	528504.048	6922840.140	Circular	PROPOSED
E2			Type 4	EXISTING

ROAD LIGHTING SCHEDULE

LOCATION	STN No.	SITE I.D. (POLE No)	POLE COMP I.D.	POLE EXISTING (m)	POLE RECOVER (m)	POLE ERECT (m)	POLE SDS No.	POLE ALIGN (m)	LUMINAIRE COMP I.D.	LUMINAIRE EXIST.	LUMINAIRE RECOVER LUMIN.	LUMINAIRE RECOVER CUST.	LUMINAIRE ERECT LUMIN.	LUMINAIRE ERECT CUST.	LUMINAIRE SDS No.	OUTREACH ARM EXIST (m)	OUTREACH ARM RECOVER (m)	OUTREACH ARM ERECT (m)	OUTREACH ARM SDS No.	MOUNT HEIGHT (m)	REMARKS
REFER DRAWING NUMBER 713929																					

MRD – TRANSPORT & MAIN ROADS DEPARTMENT, SBM – SLIP BASE MOUNTED, BPM – BASE PLATE MOUNTED, JUP – JOINT USE POLE, KB – KERB BACK

SERVICE LOCATIONS AND CONFLICTS

1. The existing services information shown on this plan is as supplied by Transport and Main Roads and various utility service authorities.
2. The information is not intended to provide the Contractor with complete or accurate information concerning the location and extent of utility services.
3. The Contractor is to make enquiries of the service authorities as to the location, depth and extent of utility services prior to commencement of any work on the site.
4. No work is to be carried out within 3 metres of any existing services, without prior recorded consultation with the relevant service authority.
5. The Contractor is to immediately advise the Principal and relevant service authority, when an existing underground utility service not previously identified, is found during construction. A hold time of two days is to be allowed for the service authority to witness and document.
6. The Contractor will be solely responsible for any damage incurred to existing utility services as a result of the execution of work under the Contract.

NOTES:

1. This drawing is based on "marked up" information provided by RoadTek and must be confirmed on-site.
2. X-Y coordinates provided are indicative only. Final location to be determent on-site in accordance with TMR standards.
3. Existing under-depth electrical conduit exist on-site. No new LV cable shall be installed in existing under-depth conduit. All existing under-depth conduits shall be labeled on-site with permanent engraved marked plates stating under-depth LV conduit.

SHEET 1 OF 5

ENERGEX PROJECT NUMBER: S2350210
PROJECT SUBURB: PIMPAMA

Rev	Revisions/Descriptions	Certification	Date	Microfiled
B	Minor Changes	09350	20.11.18	
A	Issued For Remedial Electrical Work			MF.A

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\Site 352 – M1 & Exit 49 Southbound on Ramp\Site 352 SLD M1 & Exit 49 Southbound dr_B.dwg

Associated Job Nos

Auxiliary Drg Nos: 713926-713929 797596

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 5 10 15 20m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
CTL CHGE 30.995km – 32.275km

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10A	0.39	1.28	7.145	12A/11A

Through Chainage from 30.995km – 32.275km

RATE 3 ROAD LIGHTING LAYOUT SHEET 1 OF 3

Drawn: L.NOKHOVA
Designed: D.ROESNER

ENGINEERING CERTIFICATION (RPEQ)

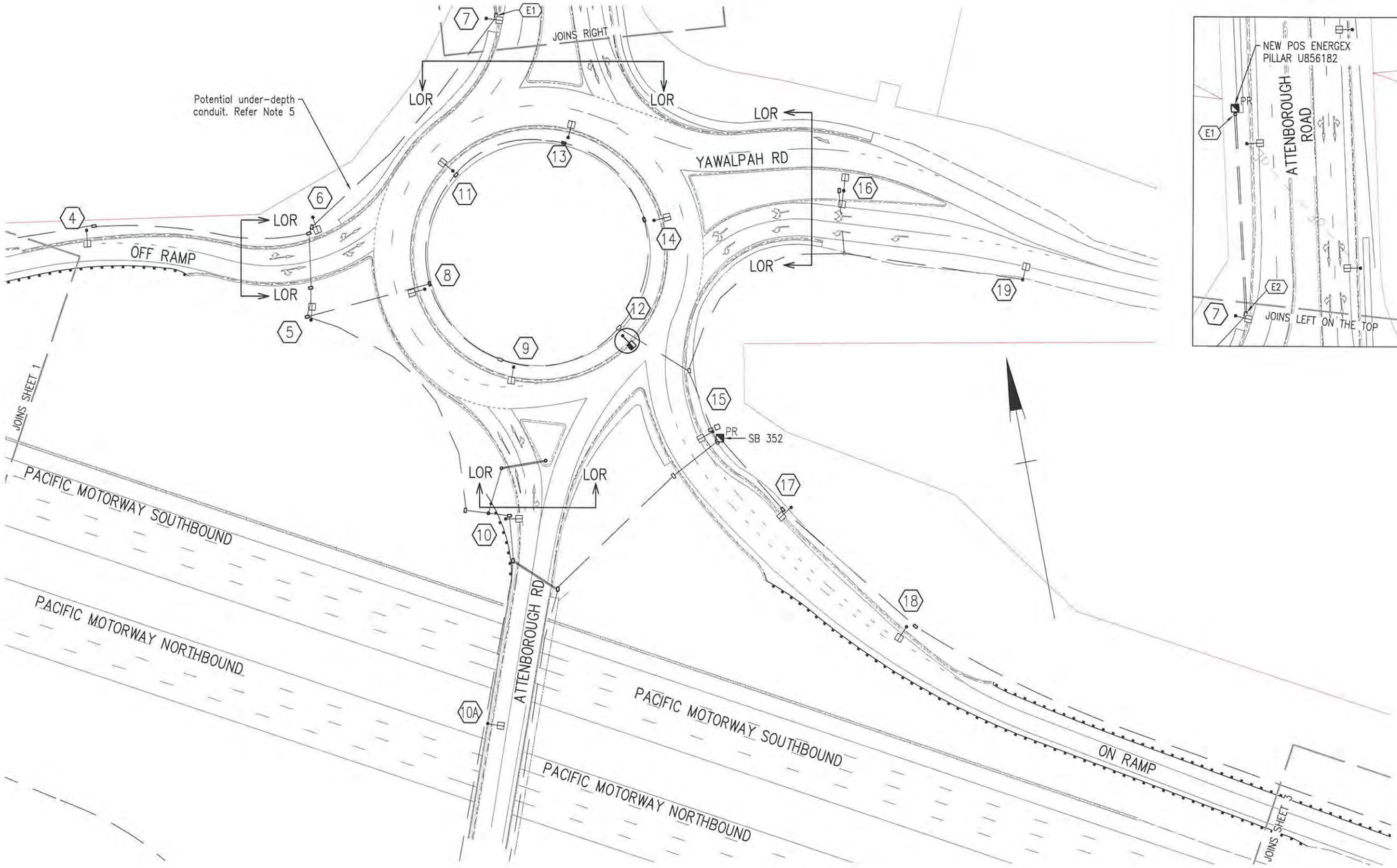
ENG. AREA	NAME	SIGNATURE	NO.	DATE
ELECTRICAL	D.ROESNER		09350	20.04.2017

Site Number: S352

Queensland Government

Job No.	D10/D001/418
Contract. No.	
Drawing No.	713925 B
Series Number	RL-1 of 5
	MRT_Detail (02/14)

Last Modified :- Nov 20, 2018 – 4:53pm XREFS :- X_Image.dwg ; X_Survey traced_2016.dwg ; Prelim Survey MR101413_A.dwg



SERVICE LOCATIONS AND CONFLICTS

1. The existing services information shown on this plan is as supplied by Transport and Main Roads and various utility service authorities.
2. The information is not intended to provide the Contractor with complete or accurate information concerning the location and extent of utility services.
3. The Contractor is to make enquiries of the service authorities as to the location, depth and extent of utility services prior to commencement of any work on the site.
4. No work is to be carried out within 3 metres of any existing services, without prior recorded consultation with the relevant service authority.
5. The Contractor is to immediately advise the Principal and relevant service authority, when an existing underground utility service not previously identified, is found during construction. A hold time of two days is to be allowed for the service authority to witness and document.
6. The Contractor will be solely responsible for any damage incurred to existing utility services as a result of the execution of work under the Contract.

NOTES:

1. For Symbol Legend and Services Conflict refer Sheet 1 of 3.
2. This drawing is based on "marked up" information provided by RoadTek and must be confirmed on-site.
3. Lighting Design completed to comply with AS/NZS 1158.1.1:2005 category V3 for the extents within LOR shown.
4. Existing under-depth electrical conduit exist on-site. No new LV cable shall be installed in existing under-depth conduit. All existing under-depth conduits shall be labeled on-site with permanent engraved marked plates stating under-depth LV conduit.
5. Electrical Contractor shall check conduit for compliance to AS/NZS3000 requirements. If under-depth, Contractor shall install 75mm(Min)thick concrete above conduit to at surface level to achieve compliance.

SHEET 2 OF 5

ENERGEX PROJECT NUMBER: S2350210
PROJECT SUBURB: PIMPAMA

B	Minor changes	09350	20.11.18	
A	Issued For Remedial Electrical Work			MF.A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERD\ROAD_PROJECTS\Elements\34\Site 352 - M1 & Exit 49 Southbound on Ramp\Site 352 SLD M1 & Exit 49 Southbound dr_B.dwg

Associated Job Nos:

Auxiliary Drg Nos: 713925, 713927-713929, 797596

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 5 10 15 20m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
CTL CHGE 30.995km – 32.275km

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10A	0.39	1.28	7.145	12A/11A

Through Chainage from 30.995km – 32.275km

RATE 3 ROAD LIGHTING LAYOUT
SHEET 2 OF 3

Site Number: S352

Drawn: L.NOKHOVA
Designed: D.ROESNER

ENGINEERING CERTIFICATION (RPEQ)

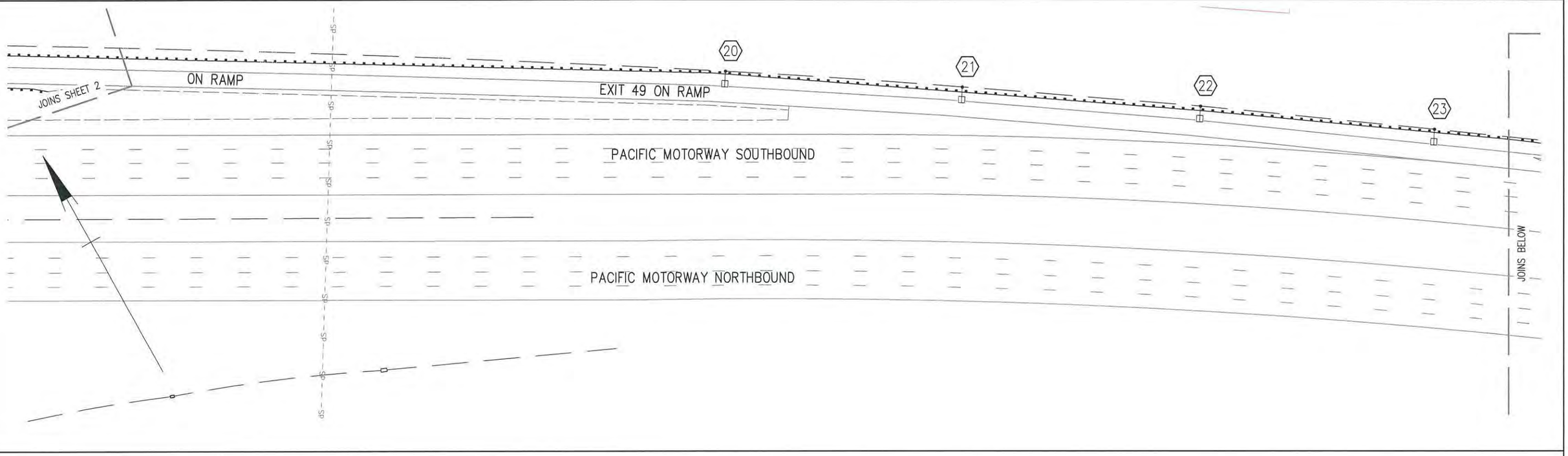
ENG. AREA	NAME	NO.	DATE
ELECTRICAL	D.ROESNER	09350	20.04.2017

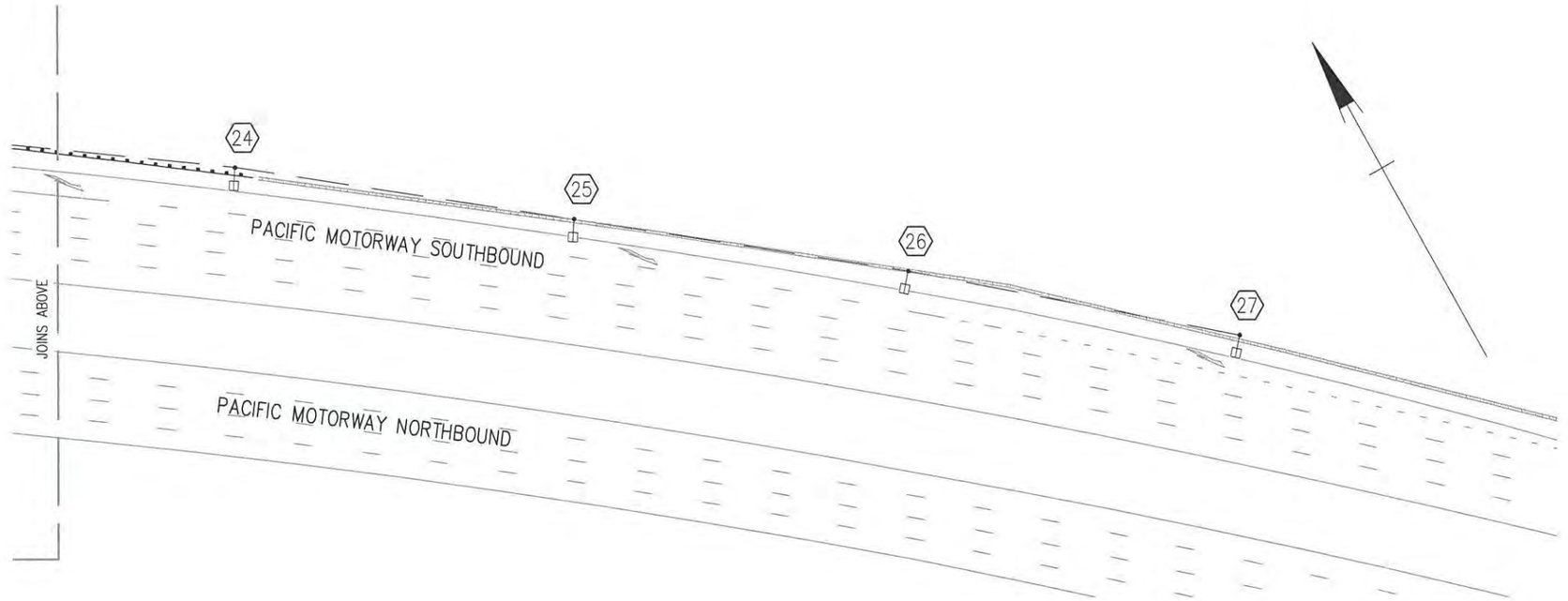
Queensland Government

Job No.	D10/D001/418
Contract. No.	
Drawing No.	713926 B
Series Number	RL-2 of 5

MRT_Detail (02/14)

Last Modified :- Nov 20, 2018 - 4:54pm XREFS :- X_Image.dwg ; X_Survey traced_2016.dwg ; Prelim Survey MR101413_A.dwg





SERVICE LOCATIONS AND CONFLICTS

1. The existing services information shown on this plan is as supplied by Transport and Main Roads and various utility service authorities.
2. The information is not intended to provide the Contractor with complete or accurate information concerning the location and extent of utility services.
3. The Contractor is to make enquiries of the service authorities as to the location, depth and extent of utility services prior to commencement of any work on the site.
4. No work is to be carried out within 3 metres of any existing services, without prior recorded consultation with the relevant service authority.
5. The Contractor is to immediately advise the Principal and relevant service authority, when an existing underground utility service not previously identified, is found during construction. A hold time of two days is to be allowed for the service authority to witness and document.
6. The Contractor will be solely responsible for any damage incurred to existing utility services as a result of the execution of work under the Contract.

NOTES:

1. For Symbol Legend refer Sheet 1 of 3
2. This drawing is based on "marked up" information provided by RoadTek and must be confirmed on-site.
3. Existing under-depth electrical conduit exist on-site. No new LV cable shall be installed in existing under-depth conduit. All existing under-depth conduits shall be labeled on-site with permanent engraved marked plates stating under-depth LV conduit.

SHEET 3 OF 5

ENERGEX PROJECT NUMBER: S2350210
PROJECT SUBURB: PIMPAMA

B	Minor changes	09350	20.11.18	
A	Issued For Remedial Electrical Work			MF.A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Site 352 – M1 & Exit 49 Southbound on Ramp\Site 352 SLD M1 & Exit 49 Southbound dr_B.dwg

Associated Job Nos

Auxiliary Drg Nos
713925,713926
713928,713929
797596

Survey Data
Datum
Horiz. Grid
Height Origin
Survey Books

Scales
0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
CTL CHGE 30.995km – 32.275km

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10A	0.39	1.28	7.145	12A/11A

Through Chainage from 30.995km – 32.275km

RATE 3 ROAD LIGHTING
LAYOUT
SHEET 3 OF 3

Site Number
S352

Drawn L.NOKHOVA
Designed D.ROESNER

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	NO.	DATE
ELECTRICAL	D.ROESNER	09350	20.04.2017

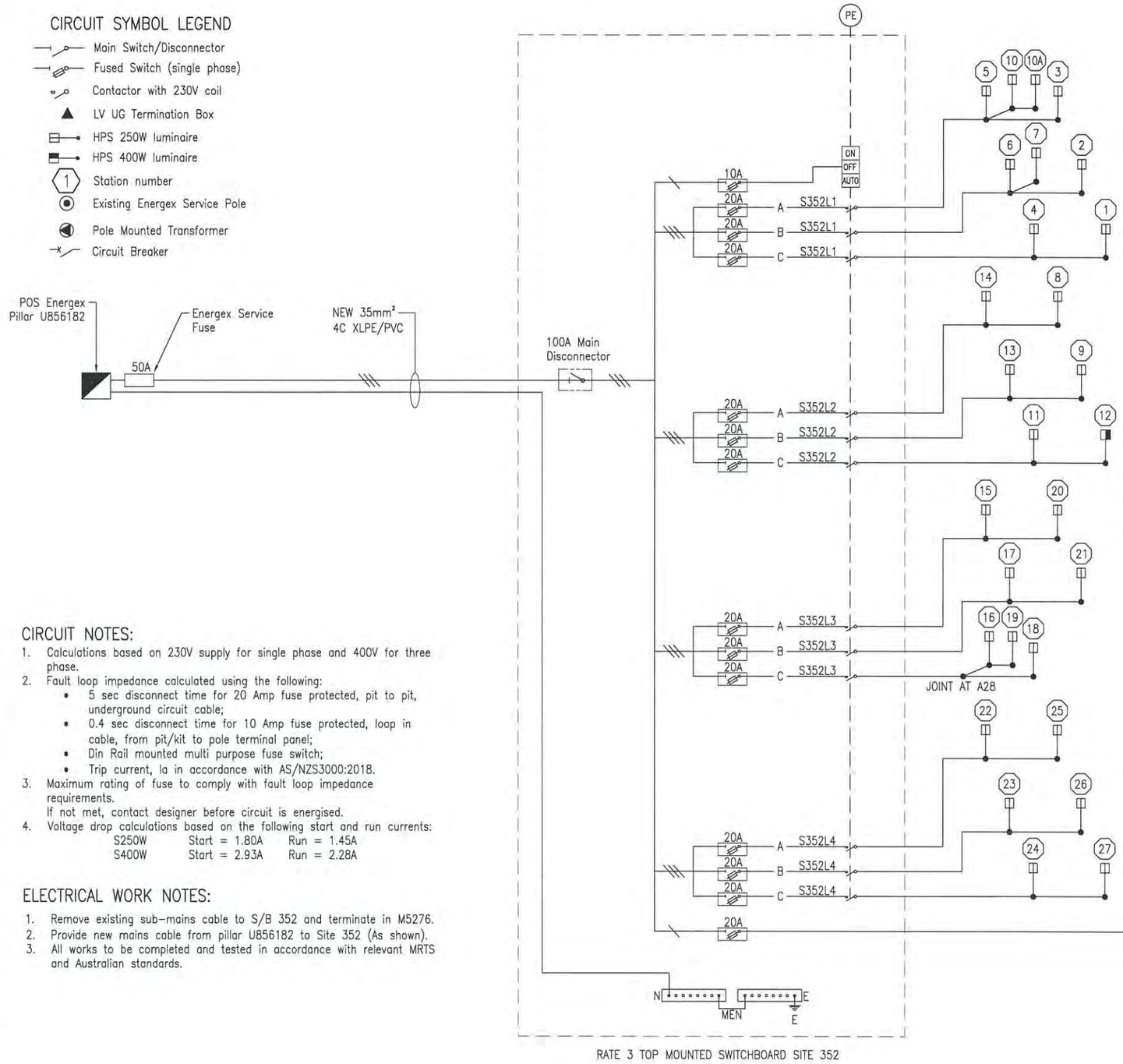
Queensland Government

Job No.	D10/D001/418
Contract. No.	
Drawing No.	713927 B
Series Number	RL-3 of 6
	MRT_Detail (02/14)

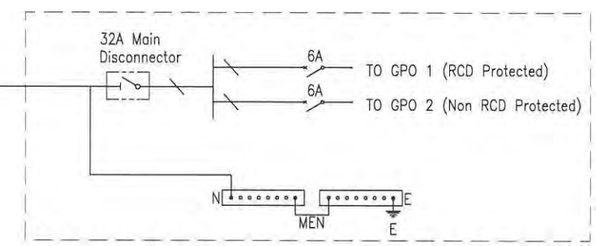
Last Modified :- Nov 20, 2018 – 4:55pm XREFS :- X_Image.dwg : X_Survey traced_2016.dwg : Prelim Survey MR101413_A.dwg

CIRCUIT SYMBOL LEGEND

- Main Switch/Disconnector
- Fused Switch (single phase)
- Contactor with 230V coil
- LV UG Termination Box
- HPS 250W luminaire
- HPS 400W luminaire
- (1) Station number
- Existing Energex Service Pole
- Pole Mounted Transformer
- Circuit Breaker



RATE 3 TOP MOUNTED SWITCHBOARD SITE 352



EXISTING FIELD CABINET 5761

NOTES:

1. These drawings are provided for modification to existing electrical cabling, switchgear and switchboards in regards to "end of life" maintenance. The existing lighting design and all existing luminaries, outreaches, poles etc are to remain "as is". Certification of these drawings are limited to electrical changes only.
2. This drawing is based on "marked up" information provided by RoadTek and must be confirmed on-site.

CIRCUIT NOTES:

1. Calculations based on 230V supply for single phase and 400V for three phase.
2. Fault loop impedance calculated using the following:
   - 5 sec disconnect time for 20 Amp fuse protected, pit to pit, underground circuit cable;
   - 0.4 sec disconnect time for 10 Amp fuse protected, loop in cable, from pit/kit to pole terminal panel;
   - Din Rail mounted multi purpose fuse switch;
   - Trip current, Ia in accordance with AS/NZS3000:2018.
3. Maximum rating of fuse to comply with fault loop impedance requirements.
   If not met, contact designer before circuit is energised.
4. Voltage drop calculations based on the following start and run currents:
   S250W Start = 1.80A Run = 1.45A
   S400W Start = 2.93A Run = 2.28A

ELECTRICAL WORK NOTES:

1. Remove existing sub-mains cable to S/B 352 and terminate in M5276.
2. Provide new mains cable from pillar U856182 to Site 352 (As shown).
3. All works to be completed and tested in accordance with relevant MRTS and Australian standards.

CIRCUIT SCHEDULE

LOCATION/ SWITCHBOARD	POWER SUPPLY NUMBER	PHASE	CIRCUIT NUMBER	LUMINAIRE STATION NUMBER	LOAD	START CURRENT (A)	RUN CURRENT (A)	FUSE RATING (A)	MINIMUM CONDUCTOR SIZE	REMARKS
PACIFIC MOTORWAY EXIT 49 (SWB352)	Pillar U856182	A	S352L1	3,5,10,10A	4x250W HPS	7.2	5.8	20	25mm² 4C XLPE/PVC	Existing
			S252L2	8,14	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
			S252L3	15,20	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
			S252L4	2,25	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
		B	S352L1	2,6,7	3x250W HPS	5.4	4.35	20	25mm² 4C XLPE/PVC	Existing
			S252L2	9,13	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
			S252L3	17,21	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
			S252L4	23,26	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
		C	S352L1	1,4	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing
			S252L2	11,12	1x250W,1x400W HPS	4.73	3.73	20	25mm² 4C XLPE/PVC	Existing
			S252L3	16,18,19	3x250W HPS	5.4	4.35	20	25mm² 4C XLPE/PVC	Existing
			S252L4	24,27	2x250W HPS	3.6	2.9	20	25mm² 4C XLPE/PVC	Existing

SHEET 4 OF 5

ENERGEX PROJECT NUMBER: S2350210
PROJECT SUBURB: PIMPAMA

B	Minor Changes	20.11.18	
A	Issued For Remedial Electrical Work		MF.A
	Revisions/Descriptions	Certification	Date / Microfiled

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Site 352 - M1 & Exit 49 Southbound on Ramp\Site 352 SLD M1 & Exit 49 Southbound dr_B.dwg

Associated Job Nos:

Auxiliary Drg Nos: 713925-713927 713929 797596

Survey Data: Datum | Horiz. Grid | Height Origin | Survey Books

Scales: NTS

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
CTL CHGE 30.995km - 32.275km

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10A	0.39	1.28	7.145	12A/11A

Through Chainage from 30.995km - 32.275km

RATE 3 ROAD LIGHTING SCHEMATIC

Site Number: S352

Drawn: L.NOKHOVA
Designed: D.ROESNER

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	NO.	DATE
ELECTRICAL	D.ROESNER	09350	20.04.2017

Queensland Government

Job No. D10/D001/418
Contract. No.
Drawing No. 713928 B
Series Number RL-4 of 5
MRT_Detail (02/14)

Last Modified :- Nov 20, 2018 - 4:55pm XREFS :- X_Image.dwg ; X_Survey traced_2016.dwg ; Prelim Survey MR101413_A.dwg

ROAD LIGHTING SCHEDULE

LOCATION	STN No.	SITE I.D. (POLE No)	POLE						LUMINAIRE							OUTREACH ARM				MOUNT HEIGHT (m)	REMARKS
			COMP I.D.	EXISTING (m)	RECOVER (m)	ERECT (m)	SDS No.	ALIGN (m)	COMP I.D.	EXIST.	RECOVER LUMIN.	RECOVER CUST.	ERECT LUMIN.	ERECT CUST.	SDS No.	EXIST (m)	RECOVER (m)	ERECT (m)	SDS No.		
EXIT 49 SOUTHBOUND INTERCHANGE	1	W468597	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	2	W468598	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	3	W468599	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	4	W468600	P01	10SBM			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	5	101547	P01	8.5BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	6	101546	P01	8.5BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	7	W468601	P01	8.5BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	8	101548	P01	10BPM			EX	EX	SL1	S250CM3					EX	4.5			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	9	101553	P01	10BPM			EX	EX	SL1	S250CM3					EX	4.5			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	10	101554	P01	8.5BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	10A	111316	P01	8.5BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	11	101549	P01	10BPM			EX	EX	SL1	S250CM3					EX	4.5			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	12	101552	P01	10BPM			EX	EX	SL1	S250CM3	S250CM3	MRD	S400CA	MRD	EX	4.5			EX	12	EXISTING POLE, OUTREACH AND NEW LUMINAIRE.
	13	101550	P01	10BPM			EX	EX	SL1	S250CM3					EX	4.5			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	14	101551	P01	10BPM			EX	EX	SL1	S250CM3					EX	4.5			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	15	101528	P01	10SBM			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	16	101599	P01	8.5SBM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	17	W468602	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	18	W468603	P01	10SBB			EX	EX	SL1	S250CM3					EX	3.0			EX	12	EXISTING POLE, OUTREACH AND LUMINAIRE.
	19	101600	P01	8.5SBM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	20	W468604	P01	8.5BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	21	W468605	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	22	W468606	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	23	W468607	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	24	W468608	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	25	W468609	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	26	W468610	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.
	27	W468611	P01	10BPM			EX	EX	SL1	S250CM3					EX	3.0			EX	10.5	EXISTING POLE, OUTREACH AND LUMINAIRE.

MRD – TRANSPORT & MAIN ROADS DEPARTMENT, SBM – SLIP BASE MOUNTED, BPM – BASE PLATE MOUNTED, JUP – JOINT USE POLE, KB – KERB BACK, EP – EDGE OF PAVEMENT, EL – EDGE LINE (WHITE)

UNDERGROUND CABLE SCHEDULE – SITE 352

LOCATION	STATIONS FROM – TO	VOLTS (V)	EX	REC	IN	CABLE SIZE/TYPE	TOTAL LENGTH (m)	REMARKS
CONSUMER MAINS U856182 TO S352	U856182 – S352	400			X	35MM² 4C XLPE/PVC	338	NEW CABLE
PACIFIC MWY EXIT 49 SWITCHBOARD 352	CIRCUIT 352L1							
	S352 – 5	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	5 – 3	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	5 – 10	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	5 – 10A	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 6	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	6 – 2	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	6 – 7	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 4	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	4 – 1	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	CIRCUIT 352L2							
	S352 – 14	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	14 – 8	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 13	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	13 – 9	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 11	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	11 – 12	400	X			25MM² 4C PVC/PVC		EXISTING CABLE

UNDERGROUND CABLE SCHEDULE – SITE 352

LOCATION	STATIONS FROM – TO	VOLTS (V)	EX	REC	IN	CABLE SIZE/TYPE	TOTAL LENGTH (m)	REMARKS
PACIFIC MWY EXIT 49 SWITCHBOARD 352	CIRCUIT 352L3							
	S352 – 15	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	15 – 20	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 17	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	17 – 21	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – A28	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	A28 – 16	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	16 – 19	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	A28 – 18	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	CIRCUIT 352L4							
	S352 – 22	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	22 – 24	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 23	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	23 – 26	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	S352 – 24	400	X			25MM² 4C PVC/PVC		EXISTING CABLE
	24 – 27	400	X			25MM² 4C PVC/PVC		EXISTING CABLE

NOTE

1. This drawing is based on "marked up" information provided by RoadTek and must be confirmed on–site.

SHEET 5 OF 5

ENERGEX PROJECT NUMBER: S2350210
PROJECT SUBURB: PIMPAMA

B	Minor changes	09350 20.11.18	
A	Issued For Remedial Electrical Work		MF.A
	Revisions/Descriptions	Certification	Date / Microfiled

CAD FILES: G:\NERD\ROAD PROJECTS\Elements\34\Site 352 – M1 & Exit 49 Southbound on Ramp\Site 352 SLD M1 & Exit 49 Southbound dr_B.dwg

Associated Job Nos:

Auxiliary Drg Nos: 713925–713928 797596

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: NTS

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
CTL CHGE 30.995km – 32.275km

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10A	0.39	1.28	7.145	12A/11A

Through Chainage from 30.995km – 32.275km

RATE 3 ROAD LIGHTING SCHEDULES

Site Number: S352

Drawn: L.NOKHOVA
Designed: D.ROESNER

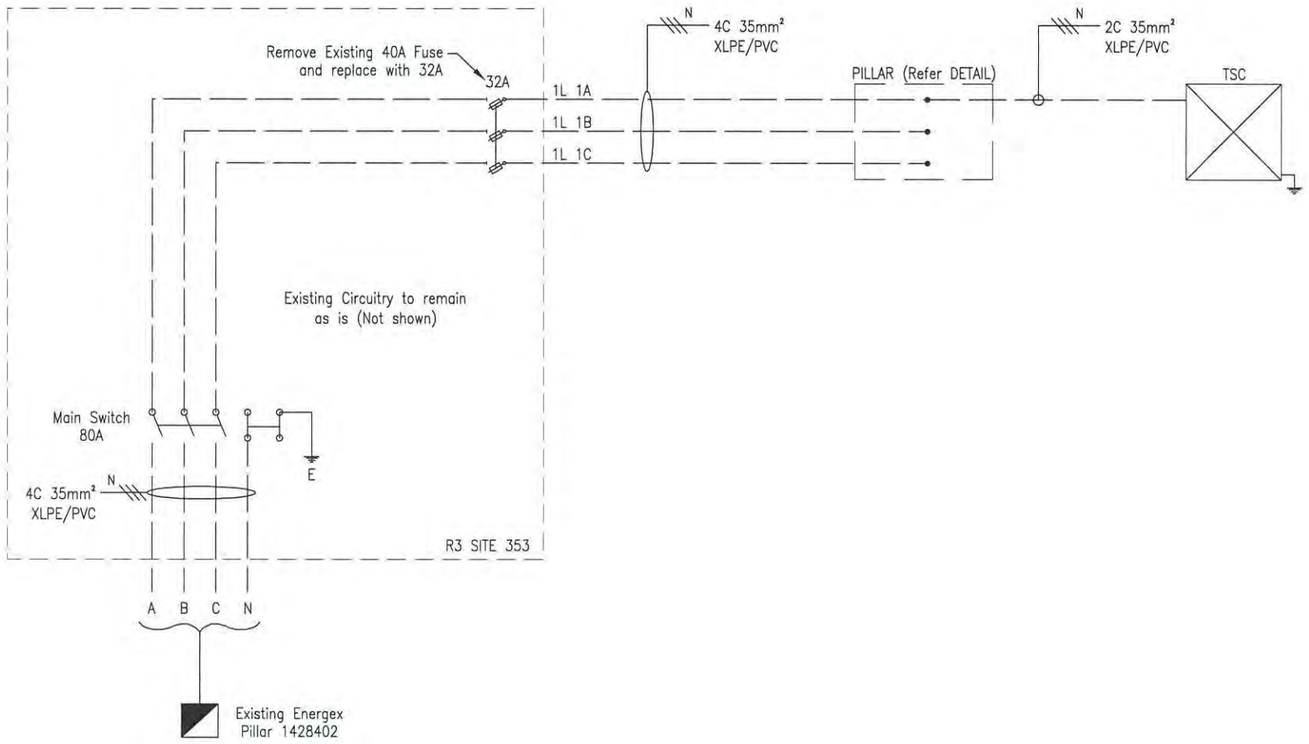
ENGINEERING CERTIFICATION (RPEQ)

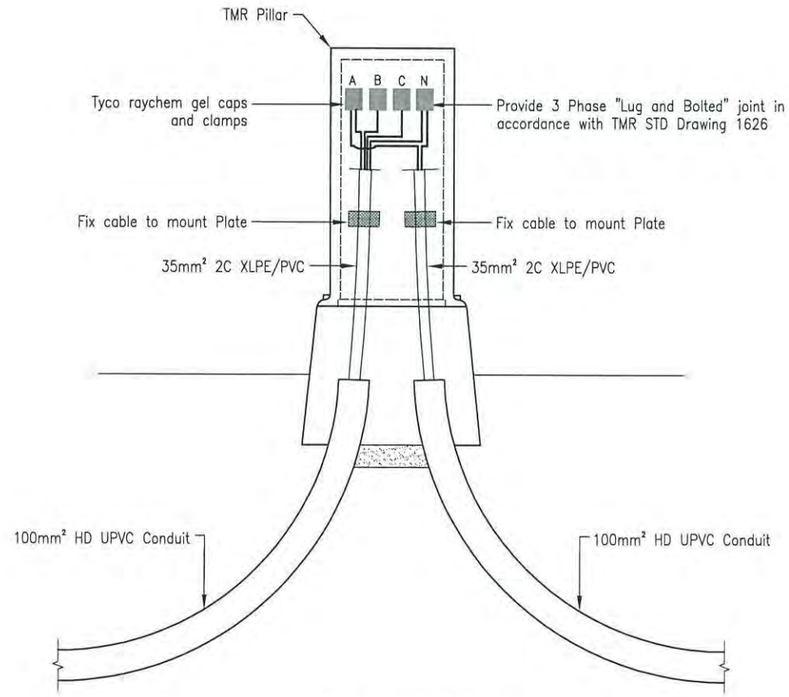
ENG. AREA	NAME	NO.	DATE
ELECTRICAL	D.ROESNER	09350	20.04.2017

Queensland Government

Job No.	D10/D001/418
Contract. No.	
Drawing No.	713929 B
Series Number	RL–5 of 5
	MRT_Detail (02/14)

Last Modified :– Nov 20, 2018 – 4:57pm XREFS :– X_Image.dwg ; X_Survey traced_2016.dwg ; Prelim Survey MR101413_A.dwg





TMR PILLAR DETAIL
NTS

CIRCUIT SYMBOL LEGEND

- Main Switch/Disconnector
- Fused Switch (single phase)
- Contactor with 230V coil
- LV UG Termination Box
- HPS 250W luminaire
- (1) Station number
- Existing Energex Service Pole
- Pole Mounted Transformer
- Circuit Breaker
- Earth

ELECTRICAL WORK NOTE

1. Existing Rate 3 Switchboard 353 is to remain existing except 40A Fuse is to be replaced with new 32A Fuse as shown and all new lagelling to clearly define all circuits.

A	Issued For Remedial Electrical Work			
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Site 352 – M1 & Exit 49 Southbound on Ramp\Site 352 SLD M1 & Exit 49 Southbound dr_B.dwg

Associated Job Nos:

Auxiliary Drg Nos: 713925–713929

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: NTS

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
CTL CHGE 30.995km – 32.275km

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10A	0.39	1.28	7.145	12A/11A

Through Chainage from 30.995km – 32.275km

RATE 3 ROAD LIGHTING SCHEMATIC

Site Number: S353

Drawn: L.NOKHOVA
Designed: D.ROESNER

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
ELECTRICAL	D.ROESNER		09350	20.11.2018

Queensland Government

Job No.	D10/D001/418
Contract. No.	
Drawing No.	797596 A
Series Number	RL–1 of 1

MRT_Detail (02/14)

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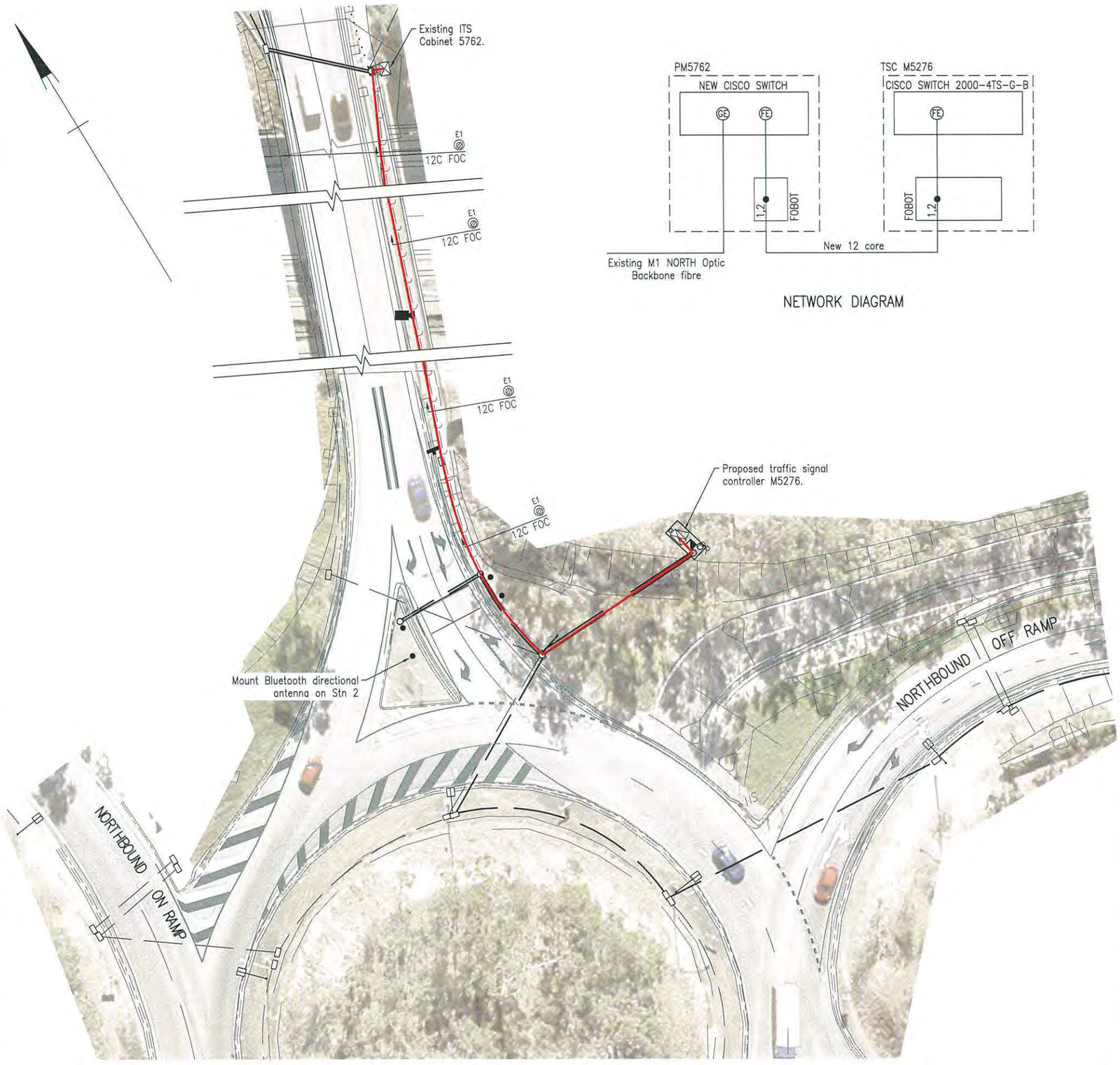


NETWORK DIAGRAM

NOTES:

1. Run 12 cores optic fibre cable (per cable standards in accordance with MRTS234) between existing ITS cabinet 5762 to new traffic signals cabinet M5276 in existing electrical conduit.
2. Present all 12 cores at Fobot and terminate active pairs only at both: PM5762 & M5276.
3. Recover existing Cisco switch from ITS cabinet PM5762 and install 2000-8TS-G-B.
4. Contact ITS&E team for port & switch configuration details.
5. General cabinet arrangement of the traffic signal controller M5762 to be as per SD1781, however with substitution of Telstra modem with Network Switch. Equipment to be located on shelf in controller; no top hat to be installed for M5762.
6. Install BLUETOOTH modem in the TSC M5276 with the directional antenna on the signal post at Station 4 pointing towards NB off-ramp & Rifle Range Road. Refer to Traffic Signal Installation dwg No.706974A for Station details.
7. Subduct electrical conduit to run the shielded co-axial cable between the antenna on traffic signal post at Stn 2 and the Controller M5275.

CABLE SCHEDULE

STATION/ PIT		CABLE TYPE	LENGTH (m)	REMARKS
FROM	TO			
5762	M5276	12C FOC	156	Install new cable
		TOTAL:	156	

LEGEND UNLESS OTHERWISE STATED

- NEW CONDUIT
- EXISTING CONDUIT
- 12C PROPOSED OPTIC FIBRE CABLE
- PROPOSED CABLE IN CONDUIT
- EXISTING TMR TRAFFIC SIGNAL/STREET LIGHTING PIT
- CIRCULAR PIT
- TRAFFIC SIGNAL CONTROLLER
- COMMUNICATIONS FIELD CABINET

BILL OF MATERIALS

ITEM NO.	ITEM DESCRIPTION	BRAND/MODEL	M5276	PM5762
1	230V, DOUBLE SOCKET OUTLET PER SD1778		1	
2	4-WAY POWER RAIL		1	
3	FIELD PROCESSOR WITH POWER SUPPLY	TRANSMAX FP MINI-6	1	
4	ECLIPSE CONTROLLER		1	
5	ECLIPSE CONTROLLER CABLE		1	
6	LAYER 2 NETWORK SWITCH	CISCO-2000-4TS-G-B	1	
7	LAYER 2 NETWORK SWITCH	CISCO-2000-8TS-G-B		1
8	LAYER 2 NETWORK SWITCH POWER SUPPLY	PRW-IE-65W-AC-IEC	1	1
9	SFP	GLC-FE-100LX-RGD	1	1
10	SFP	GLC-LX-SM-RGD		2
11	CAT 5E CABLE 1.5m			1
12	FIBRE OPTIC PATCH LEADS 1.5MT SINGLE MODE	SCA-LC DUPLEX	2	2
13	FIBRE OPTIC BREAK OUT TERMINAL (FOBOT) DIN RAIL	AFC 6 PORT SCA	1	
14	FIBRE OPTIC BREAK OUT TERMINAL (FOBOT) RACK MOUNT	AFC 6 PORT SCA		2
15	PARANI	SD-1000	1	
16	NETWORK MODEM	NTC-6200-02	1	
17	BLUETOOTH DIRECTIONAL ANTENNA	SPDG11H22-SMA	1	

D	Minor changes	20873	21.11.18	
C	As per cloud	M.Venkataramu 20873	04.10.18	
B	Minor Changes	M.Venkataramu 20873	29.08.18	
A	Issued For Construction			MF10.16A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES | G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms_B_C.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum | Horiz. Grid | Height Origin | Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (WEST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.83	0.53	7.42	12A/11Q

Through Chainage from 31.45km to 31.98km

INTELLIGENT TRANSPORT SYSTEMS
LAYOUT PLAN

Drawn: C.WOJCIK
Designed: M.VENKATARAMU

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
IT&T	T.KOOYMANS	Original signed	17460	19/8/2016

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	706969 ID
Series Number	IT-1 of 1

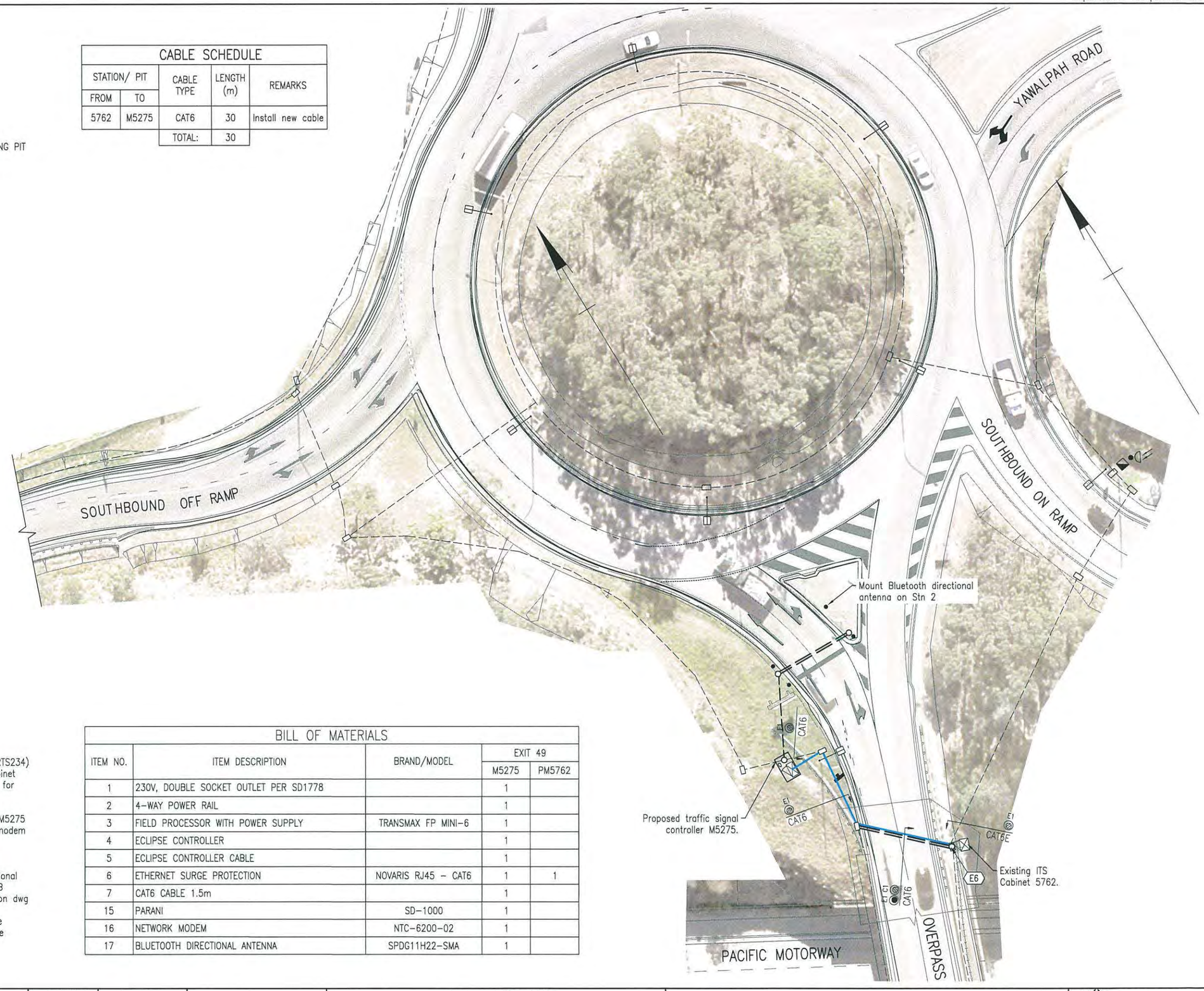
MRR_Detail (02/14)

Last Modified :- Nov 21, 2018 - 8:38am XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DROA.dwg ; X_Survey_MR100720.dwg ; X_Image.dwg ; Prelim Survey MR101413_A.dwg

LEGEND UNLESS OTHERWISE STATED

- EXISTING CONDUIT
- PROPOSED CAT 6 CABLE
- PROPOSED CABLE IN CONDUIT
- EXISTING CABLE IN CONDUIT
- EXISTING TMR TRAFFIC SIGNAL/STREET LIGHTING PIT
- CIRCULAR PIT
- TRAFFIC SIGNAL CONTROLLER
- COMMUNICATIONS FIELD CABINET

CABLE SCHEDULE				
STATION/ PIT		CABLE TYPE	LENGTH (m)	REMARKS
FROM	TO			
5762	M5275	CAT6	30	Install new cable
		TOTAL:	30	



NOTES:

1. Run CAT6 cable (per cable standards in accordance with MRTS234) between existing ITS cabinet 5762 to new traffic signals cabinet M5275 in new communications conduit. Contact ITS&E team for port details.
2. General cabinet arrangement of the traffic signal controller M5275 to be as per SD1780, however with substitution of Telstra modem with Network Switch. Equipment to be located on shelf in controller; no top hat to be installed for M5275.
3. Install BLUETOOTH modem in the TSC M5275 with the directional antenna on the signal post at Station 2 pointing towards SB on-ramp & Yawalpah Road. Refer to Traffic Signal Installation dwg No.706975A for Station details.
4. Subduct electrical conduit to run the shielded co-axial cable between the antenna on traffic signal post at Stn 2 and the Controller M5276.

BILL OF MATERIALS				
ITEM NO.	ITEM DESCRIPTION	BRAND/MODEL	EXIT 49	
			M5275	PM5762
1	230V, DOUBLE SOCKET OUTLET PER SD1778		1	
2	4-WAY POWER RAIL		1	
3	FIELD PROCESSOR WITH POWER SUPPLY	TRANSMAX FP MINI-6	1	
4	ECLIPSE CONTROLLER		1	
5	ECLIPSE CONTROLLER CABLE		1	
6	ETHERNET SURGE PROTECTION	NOVARIS RJ45 - CAT6	1	1
7	CAT6 CABLE 1.5m		1	
15	PARANI	SD-1000	1	
16	NETWORK MODEM	NTC-6200-02	1	
17	BLUETOOTH DIRECTIONAL ANTENNA	SPDG11H22-SMA	1	

C	Note 4 added	0873	21.11.18	
B	Minor Changes	0873	30.08.18	
A	Issued For Construction			MF10.16A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\Pacific Motorway Off Ramp Signals\Exit 49\Final\M5275_M5276_TS_Comms_B_C.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
PACIFIC MOTORWAY
EXIT 49 INTERCHANGE (EAST)

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
12A/10R	0.37	0.55	7.86	12A/11Q

Through Chainage from 30.99km to 31.54km

INTELLIGENT TRANSPORT SYSTEMS
LAYOUT PLAN

Drawn C.WOJCIK
Designed M.VENKATARAMU

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
IT&T	T.KOOYMANS	Original signed	17460	19/8/2016

Queensland Government

Job No.	413159
Contract. No.	CN-3476
Drawing No.	706970 IC
Series Number	IT-1 of 1

MRR_Detail (02/14)

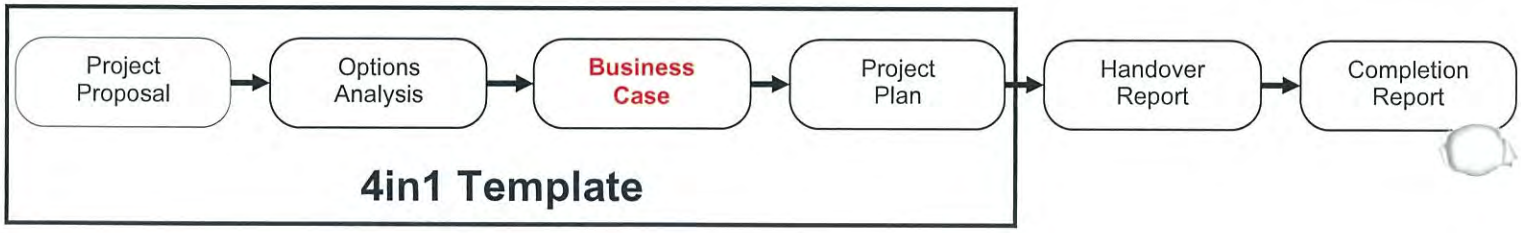
Last Modified :- Nov 21, 2018 - 8:37am XREFS :- X_DUN_OPT2.dwg ; X_DUN_OPT 2_V2.dwg ; X_DROA.dwg ; X_Survey_MR160720.dwg ; X_Image.dwg ; Prelim Survey MR1101413_A.dwg

Business Case

M1 Pacific Motorway

Exit 49 – Interchange Upgrade

230/12A/900



Project Summary

Region/Unit	South Coast Region
Location	Nerang
Program	QTRIP
Project Number	230/12A/900
Project Description	M1 Pacific Motorway – Exit 49 Interchange Upgrade

Document Control

Prepared by:	Wayne Brennan
Title:	Principal Engineer
Branch:	Project Delivery and Operation
Division:	Project Planning and Corridor Management
Location:	36-38 Cotton Street, Nerang
Version no:	0.2
Version date:	February 2017
Status:	Final
DMS ref. no:	450/01258
File/Doc no:	230/12A/900

Version history

Version no.	Date	Changed by	Nature of amendment
0.1	Nov 2016	N J Guest	Initial draft.
0.2	Feb 2017	N J Guest	Final

Template Version 2.0 (07/08/2013)

Endorsement and Approval

Customer

I agree to the project proceeding as proposed in this document.

Name ~~Paul Noonan~~ Les Dunn

Position A/Regional Director (South Coast Region)

Signature Part Refuse Sch.4 Part 4 s.6 Personal information Date 7/3/17

Comments Please advise on possible delivery dates.

Sponsor

I agree to the project proceeding as proposed in this document.

Name Gary Swanson

Position A/Manager, Project Planning & Corridor Management

Signature Part Refuse Sch.4 Part 4 s.6 Personal information Date 3/3/17

Comments

The following officers have **endorsed** this document:

Name Shane McNamee

Position Principal Engineer (Civil), Project Planning and Corridor Management

Signature Part Refuse Sch.4 Part 4 s.6 Personal information Date 27/2/17

Add further names as required

Project manager:

I recommend the project proceeds as proposed in this document.

Name Wayne Brennan

Position Principal Engineer, Project Planning and Corridor Management

Signature Part Refuse Sch.4 Part 4 s.6 Personal information Date 27/02/17

Table of Contents

1 Executive Summary

1.1. Current Situation

This **Business Case** study focuses on the upgrade of the northbound off-ramp at Exit 49 on the M1 Pacific Motorway at Pimpama.

Congestion and queuing on the northbound off-ramp at this interchange presents a serious safety issue as vehicles are regularly backed-up out onto the motorway with motorists often queuing along the motorway shoulder to avoid the through traffic.

The northbound off-ramp at Exit 49 is controlled by a roundabout which directs traffic to adjacent residential developments and across the motorway.

The roundabout becomes heavily congested particularly during peak periods due to increasing traffic flow demands. This results in significant queuing and unacceptable delays on the off-ramp.

The off-ramp at this interchange does not meet current design standards associated with the existing and future traffic demands.

The root cause of the problems associated with the poor performance of this interchange include;

- Continuing residential development in the Pimpama area, close to and adjacent to the M1.
- Congestion and delays at the existing roundabouts, particularly in peak periods.
- Inadequate length of the northbound off-ramp.
- Uneven flows entering the roundabouts causing delays on minor legs.

Part way along the off-ramp is an access to an information centre/layby area which also exits onto the roundabout to the north of the off-ramp exit. Motorists are by-passing queued traffic on the off-ramp by accessing the information/layby area lane and entering the roundabout ahead of the queued traffic. This is causing more delays to the queued traffic on the off-ramp and is initiating some hostility between motorists.

1.2. Preferred Option

The Recommended Preferred Option for the upgrade of the northbound off-ramp and to alleviate congestion at the roundabout is **Option 1: Duplication of the Off-ramp Lanes.**

The Scope of Works includes:

- Duplication of the ramp lanes, to provide additional capacity on the off-ramp.
- Closing of the information/layby area – to eliminate the associated traffic issues and driver frustration.

The Traffic modelling undertaken indicates that Option 1 will operate satisfactorily up to 2021 with moderate improvements to the northbound off-ramp in the AM peak period. Average delays are predicted to reduce from 150 seconds to 40 seconds and queues on the off-ramp reduced from 40 vehicles to 10 in the AM peak.

This option is considered to be a low cost interim upgrade which will provide improved safety performance on the off-ramp.

1.3. Estimated Project Cost

The **estimated project cost** for the upgrade of the northbound off-ramp is **$1.20M** (2017).

The out-turned project cost (2017-2018) is **$1.23M**

1.4. Key Benefits Realised

The key benefits realised by the project include:

- Improved safety by reducing traffic incidents, and driver frustration.
- Improved operational functionality by reducing congestion/travel times/pollution.
- Improved network functionally by improving connections to cross network links.
- Elimination queuing on the motorway.
- Reduced whole of life costs with better asset preservation.

1.5. Recommendation

It is recommended that Preferred Option identified in this Business Case proceed to the Development Phase (Preliminary and Detailed Design).

Additional Recommendation. from Alan Stone District Director.

- To improve the forecast 2021 performance, project scope is to include roundabout approach metering of the western roundabout on the eastern approach.
- The project budget is to be increased to $1.5m for the above increased scope.

Part Refuse Sch.4 Part 4 s.6 Personal information 14/3

Approved Les Dunn
A/ Regional Director

2 Purpose of this Document

The purpose of this **Business Case** is to finalise scope definition of and concept estimate for the selected option, evaluate benefits and obtain the customer's commitment to funding and agreement to the project's inclusion in the organisation's program.

This Business Case focuses on the upgrade of the northbound off-ramp at Exit 49 on the M1 Pacific Motorway at Pimpama.

3 Definitions

Terms, abbreviations and acronyms	Meaning
Customer	Decision maker 'owning' the new asset
Sponsor	Head of the delivery group
TMR	Department of Transport and Main Roads
QTRIP	Queensland Transport and Roads Investment Program
OnQ	TMR Project Management Methodology

4 Governance

The project will be/is being managed in accordance with the project management policy of April 2012 and the principles on the OnQ website under governance. Governance arrangements for the project are set out below.

The proposed governance model for the project delivery will include TMR representatives who will have defined roles and responsibilities that will be further developed during the project lifecycle.

TMR will remain the Project Manager/Owner/Sponsor for procuring preconstruction consultancies and construction contractor/s.

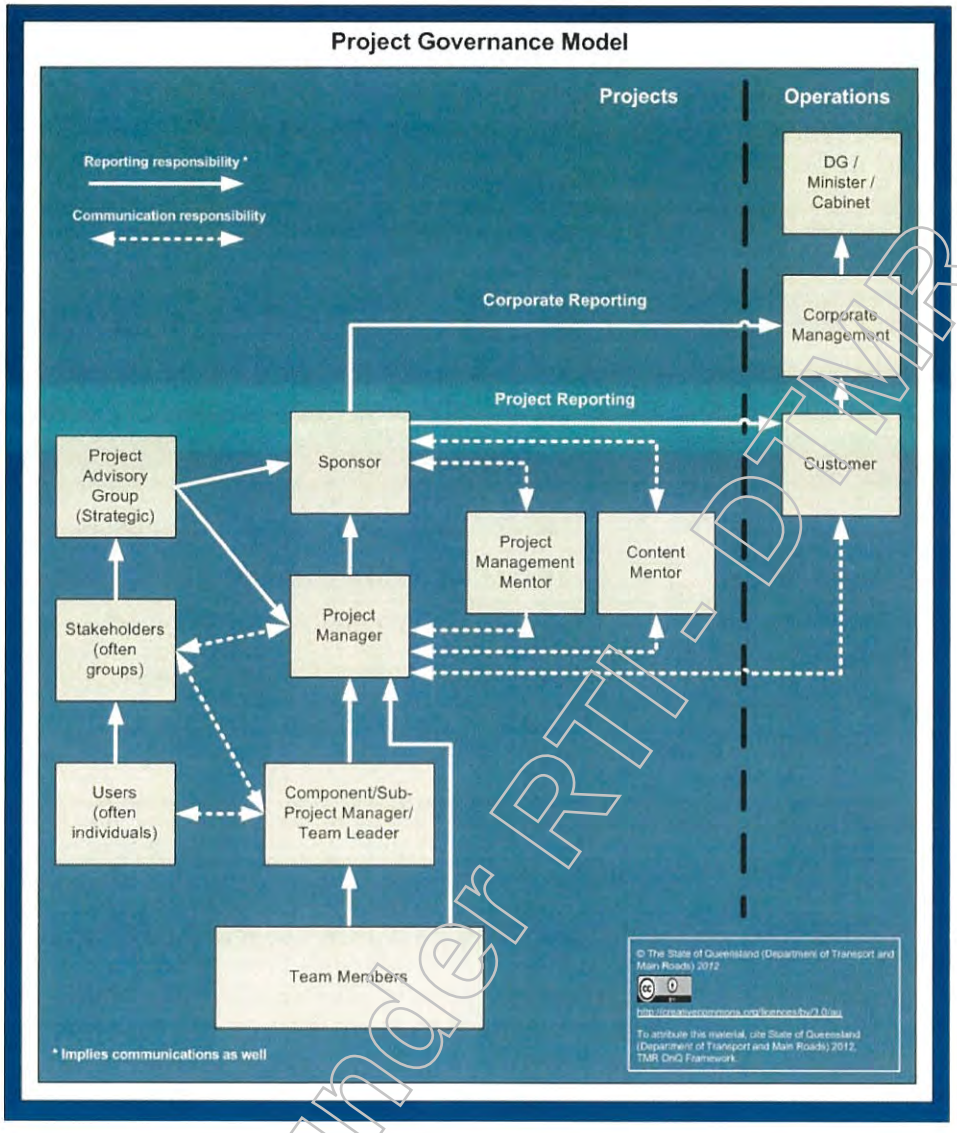
4.1. Key Roles

The key project management roles are:

Project Customer	Paul Noonan, Regional Director (South Coast Region)
Project Sponsor	Gary Swanson, A/Manager, Project Planning & Corridor Management
Project Director	Shane McNamee, Principal Engineer, PP&CM
Project Manager	Wayne Brennan, Principal Engineer, PP&CM

4.2. Project Organisation Structure

This Project is to be completed by the Program Delivery and Operations division of the South Coast Region, which is part of the Transport and Main Roads Infrastructure Management and Delivery division.



4.3. Whole of Government Requirements/Strategic Focus

Sydney to Brisbane Corridor Strategy

The M1 Pacific Motorway is part of the Sydney to Brisbane national coastal corridor. The corridor strategy recognises that the M1 between Eight Mile Plains (Gateway Motorway) and Tugun currently is congested and interaction between passenger and HV is reducing efficiency for freight operations as well as causing negative impacts on local communities and transit times.

The strategy identified increasing interchange capacity and addressing congestion on the Pacific Motorway, as short-term strategic priorities.

This project directly delivers on the short-term strategic priority by providing increased capacity to address congestion at this interchange and safety related issues on the Pacific Motorway.

Queensland State Infrastructure Plan

The Queensland Government State Infrastructure Plan (SIP) (March 2016) provides a coordinated and integrated approach to; infrastructure planning, prioritisation, funding and delivery. It sets out policies and initiatives to support economic growth, productivity enhancement and job creation.

The M1 corridor is recognised by the Queensland Government as critical infrastructure essential for supporting development in SEQ and for Queensland as a whole.

Draft Brisbane to Gold Coast Transport Investment Strategy

The proposed strategy for upgrading this corridor is outlined in Queensland Government's draft Brisbane to Gold Coast Transport Investment Strategy.

This draft strategy outlines multi-modal approaches for addressing key corridor priorities over the next 10 years. The draft investment strategy identifies the following upgrade 10-year priorities;

- Increasing the capacity of interchanges to reduce queuing at off-ramps.
- Upgrading the intersections at key interchanges to improve travel times; and
- Implementation of Managed Motorways to improve motorway operations and incident management to reduce recovery time and risk of secondary incidents.

The upgrade of the Exit 49 interchange at Pimpama is one of a number of interchange upgrades required to address capacity and safety issues on the M1 corridor between Brisbane (Eight Mile Plains) and Tugun.

4.4. Departmental Corporate/Strategic Requirements

This project aligns with the Departments Strategic Plan – *Roads Connecting Queenslanders*, by meeting the challenge to contribute to Queensland's welfare and responding to the needs of community, industry and government, and contributing to an integrated transport system.

4.5. Portfolio Management Requirements

This project is planned to be part of the Queensland Transport and Roads Investment Program (QTRIP), which is a portfolio under the policy Planning and Investment Division.

Part of the Portfolio management is to achieve specific strategic business objectives starting with strategic planning as the first step. This includes the sanctioned process (current departmental policy) of the provision of an approved OnQ project proposal ("first step") to get the project onto QTRIP four years out and then an approved OnQ Business Case two years out for the QTRIP.

4.6. Program Management Requirements

This programming project is included in and managed under the Transport Strategy Planning Program (TSPP).

4.7. Business and Program Benefits of the Project

The purpose of this project is to enable this interchange to safely and efficiently cater for the future traffic demands.

The strategic benefits for this project include;

- Improved safety by reducing traffic incidents, and driver frustration.
- Improved operational functionality by reducing congestion/travel times/pollution.
- Improved network functionally by improving connections to cross network links.
- Elimination queuing on the motorway.
- Reduced whole of life costs with better asset preservation.

4.8. Approvals

This project is to be developed under the OnQ process and will follow the appropriate approval procedures as set out by this process.

4.9. Reviews and Reporting

This project is to be developed under the OnQ process and all reviews and reporting shall be in accordance with the appropriate procedures and proforma documents.

4.10. Project Management Method

The OnQ project management methodology is to be used for this project.

4.11. Technical Standards and Processes

All relevant Departmental technical standards will be followed. These include (but are not limited to):

- TMR Road Planning and Design Manual.
- TMR Road Drainage Manual.
- Austroads Guidelines.
- TMR Project Cost Estimating Manual.
- TRUM Guidelines.
- TMR Pavement Design Manual.
- Manual of Uniform Traffic Control Devices.
- TMR Preconstruction Processes Manual.

5 Project Definition

5.1. Location

This **Business Case** focuses on the upgrade of the northbound off-ramp at Exit 49 on the M1 Pacific Motorway at Pimpama.

The location of the interchange is shown in Figure 1 below.

Figue 1: Locality Plan

5.2. Background

Congestion and queuing on the northbound off-ramp at this interchange present serious safety issues as vehicles are backed-up out onto the motorway in peak traffic periods, with motorists often queuing along the motorway shoulder to avoid the through traffic.

The northbound off-ramp at this interchange does not meet current design standards associated with the existing and future traffic demands.

Land use for properties abutting the M1 Pacific Motorway in the Pimpama area is undergoing a major transition from predominantly rural use to residential development.

Congestion levels and delay costs are projected to worsen significantly to 2031, with Queensland set to experience the second highest level of population and employment growth in Australia after WA.

5.3. Current Situation

5.3.1. Off-Ramp Queuing

The northbound off-ramp at Exit 49 is controlled by a roundabout which directs traffic to adjacent residential developments and across the motorway.

The roundabout becomes heavily congested particularly during peak periods due to increasing traffic flow demands. This results in significant queuing and unacceptable delays on the off-ramp.

Observations of the current interchange operations show that significant queuing occurs on the northbound directions during the AM and PM peaks.

The queuing extends past the start of the off-ramps which results in slow moving or stationary vehicles being located in the shoulder or through lane of the Pacific Motorway. This creates a serious safety issue for through traffic on the motorway in this 110km/h area. (Refer to the photo below).

The existing length of the off-ramp is only 340m from the gore area and does not have sufficient storage length to contain the peak hour traffic.

5.3.2. Information Lane Informal Detour

Part way along the off-ramp is an access to an information centre/layby area which also exits onto the roundabout to the north of the off-ramp exit. Motorists are by-passing queued traffic on the off-ramp by accessing the information/layby area lane and entering the roundabout ahead of the queued traffic (refer to photo below).

This is causing further delays to the queued traffic on the off-ramp and is initiating some hostility between motorists.

5.4. Traffic Modelling Results

A base year 2016 Aimsun Microsimulation Traffic Model has been developed by Metis for the M1 Pacific Motorway and Exit 49. The model was calibrated and validated based on existing traffic count data from intersection surveys. Future year 2021 road network and traffic demands were developed to assess future traffic performance within the modelling area. In addition, one network option (Option 1) was tested for the northbound off-ramp and was found to reduce queues and delays.

A copy of the Aimsun Traffic Modelling Report is attached in **Appendix C.**

The Aimsun modelling indicates that the existing off-ramp is at capacity in 2016, and predicted Average Delays at the interchange in 2021 without improvement to be in region of 150 seconds.

5.5. Crash History

An examination of the available road crash data for this general locality over the last five years shows that there has not been any crashes on the northbound off-ramp. The majority of crashes appear to be single or double vehicle crashes on the motorway in the vicinity of the off-ramp.

5.6. Environmental Studies

5.6.1. Environmental Scoping Study

Environmental studies have not been undertaken at the Business Case Stage.

It is recommended that Environmental Scoping Study be carried out at the Preliminary Design stage of the project

5.6.2. Cultural Heritage Risk Assessment

A Cultural Heritage Risk Assessment of the project site has not been undertaken at the Business Case Stage.

It is recommended that a CHRA be carried out at the Preliminary Design stage.

5.7. Public Utility Plant

A DBYD request has revealed that there are no PUP assets on the northbound off-ramp. Telstra cables have been identified in the vicinity of the project. An allowance for the relocation/protection of the cables has been included in the cost estimate.

5.8. Related Projects/Proposals/Planning Studies

5.8.1. Intra Regional Transport Corridor (IRTC)

Planning of the corridor for the IRTC has been completed, along with concept planning of the carriageway configuration and intersections / interchange layouts.

The IRTC connects to Yawalpah Road which feeds directly to the motorway via Exit 49.

It is anticipated that the circulating traffic at Exit 49 interchange would reduce with the introduction of the IRTC.

5.8.2. Road Corridor Development Planning

An ultimate planning option for Exit 49 has been developed which shows the collapsing of the roundabouts at the interchange to traffic signals and the duplication of the overpass bridge. The northbound off-ramp is shown to deviate to join into Rifle Range Road.

A copy of the Road Corridor Development staging plans are in the White Books – Ground Floor, TMR Regional Office, 36-38 Cotton Street, Nerang.

5.8.3. Managed Motorway Planning Study

A Managed Motorway Planning Study (GHD July 2015) for the M1 has been undertaken to provide the Department with a plan for the operation of the M1 Pacific Motorway from the Gateway Motorway to Nerang as a managed motorway.

The managed motorway model under consideration for the M1 Pacific Motorway adopts the concept of controlling access onto the network and managing the operations and flow of traffic on the road network by using modern technologies and procedures. Managed motorway uses technologies to tackle flow breakdown, bottlenecks and congestion to improve motorway efficiency, reliability and safety.

The combination of ramp signalling, incident management, vehicle detection systems, variable speed control, and driver information systems all combine to provide the maximum efficient use of the road network.

Further concept planning is underway to determine the requirements and cost for the implementation of the recommended treatments at this interchange.

5.9. Proposed Project

This project focuses on the upgrade of the northbound off-ramp at Exit 49 on the M1 Pacific Motorway at Pimpama. This interchange services predominantly residential developments, and congestion on the northbound off-ramp is having a detrimental effect on the safe and efficient operation of the M1.

The root cause of the problems associated with the poor performance of this interchange include;

- Continuing residential development in the Pimpama area, close to and adjacent to the M1.
- Congestion and delays at the existing roundabouts, particularly in peak periods.
- Inadequate length of the northbound off-ramp.
- Uneven flows entering the roundabouts causing delays on minor legs.

5.10. Objectives and Benefits

5.10.1. Primary Objectives

Primary Objectives of the Project include;

- Improved safety for the motorway off-ramp traffic movements at this interchange by reducing queuing on the northbound off-ramp.
- Reduced delays at the interchange by increasing the capacity of the interchange.

5.10.2. Secondary Objectives

Secondary Objectives of the Project include;

- Retention of the interchange functionality by providing safe and efficient operations for interchange directional cross flow traffic.
- Retention of and improvement to the network functionality by not precluding the Managed Motorways discipline, particularly for 2031 traffic demands.
- Integration with the City of Gold Coast planning directions for these locations.
- Maintain existing active transport provisions.

5.11. Delivery Strategy

South Coast District will manage this project. The project is to be delivered primarily in-house with traffic analysis and modelling conducted by consultants.

The concept planning project is funded over the 2016/2017 financial years.

5.12. Project Performance Measurement/Success Criteria/KPIs

The management of this project shall be judged to have been successful based on the following criteria;

- On time and within budget.
- Achieving particular milestones.
- Customer / stakeholder satisfaction.

These criteria are likely to change as the project progresses.

5.13. Product Performance Measurement/Success Criteria/KPIs

The performance of this project shall be judged against the project objectives and benefits as defined in clause 5.10 above.

6 Project Scope

6.1. In Scope

The scope of the project includes;

- Traffic modelling of the off-ramp performance to determine the most appropriate preferred option for the upgrade of this off-ramp, and present a timeline for the implementation which provides the best value for money.
- Development of viable option for the upgrade of the off-ramp and interchange.

6.2. Out of Scope

Out of scope for this project includes;

- Field investigations.
- Community consultation.
- Improvement works outside the sanctioned scope of works (unless approved).

6.3. Constraints

The following constraints have been identified for this project;

- Required funding is not available for subsequent phases of this project (i.e. Implementation and Finalisation phases).
- The improvement works will be undertaken in a high traffic volume area and the works will need to the completed under traffic. A high level of analysis with the staging of the ultimate option will be needed in order to deliver value for money.

6.4. Assumptions

Assumption made during the preparation of this Business Case include;

- Predicted traffic volumes and % increase used in the traffic studies and the strategic models reflect the existing and future traffic flows.
- Congestion at this interchange will continue to worsen.
- Residential development in the Pimpama area will continue at its current rate.
- Funding will continue to be available for subsequent phases of this project.
- Resources will be available to complete subsequent phases.
- Stakeholders will continue to support the project.

6.5. Urgency

Queuing of vehicles back onto the Pacific Motorway on Exit 49 (northbound) in the AM peak period presents a serious safety issue in this 110km/h speed restriction zone.

Congestion and delays at this interchange is expected to increase with the continuing residential development in the area.

Planning for the upgrade of this interchange is necessary to prepare for the existing and future demands, and provide for a safe and efficient interchange.

7 Stakeholder Impacts

Public consultation on this project has not been undertaken to date. However, some initial consideration of stakeholder and their potential concerns is provided in the following sections.

7.1. Internal

Stakeholder	Impact/Interest in the project
Regional Director, South Coast Region	• Most appropriate solution to serve the district local community. • Most appropriate use of funds. • Most efficient and effective solution for transport industry, travelling public and other road users.
Manager (Project Planning and Corridor Management)	• Most appropriate and cost-effective solution within budgetary constraints meeting district road network requirements. • Improve safety. • Clarify future road planning and requirements for preservation.

7.2. External

Stakeholder	Impact/Interest in the project
City of Gold Coast	• Local plan and area road network.

8 Options Development

8.1. Options Investigated

At this stage of the project only one option has been investigated as a viable option for the upgrade of the northbound off-ramp and to improve congestion at the roundabout.

Option 1: Duplication of the Off-ramp Lanes includes;

- Duplication of the ramp lanes to provide additional capacity on the off-ramp.
- Closing of the information/layby area – to eliminate the associated traffic issues and driver frustration.

This option is considered to be a low cost interim upgrade which will provide improved performance on the off-ramp.

8.2. Recommended Preferred Option

The Recommended Preferred Option for the upgrade of the northbound off-ramp and to alleviate congestion at the roundabout is **Option 1: Duplication of the Off-ramp Lanes**

The Traffic modelling undertaken indicates that Option 1 will operate satisfactorily up to 2021 with significant improvements to the northbound off-ramp in the AM peak period. Average delays are predicted to reduce from 150 seconds to 40 seconds and queues on the off-ramp reduced from 40 vehicles to 10 in the AM peak.

A copy of the **Preferred Option Layout Plan** is attached in **Appendix A.**

8.3. Key Benefits Realised

- Improved safety by reducing traffic incidents, and driver frustration.
- Improved operational functionality by reducing congestion/travel times/pollution.
- Improved network functionally by improving connections to cross network links.
- Elimination of queuing on the motorway.
- Reduced whole of life costs with better asset preservation.

9 Project Cost and Quantifiable Benefits

9.1. Project Cost – Preferred Option

A Concept Cost estimation of the Preferred Option has been undertaken in accordance with the TMR Project Cost Estimating Manual.

A copy of the construction cost estimate is attached in **Appendix B**.

The project estimated cost includes the Departmental Costs for all of the subsequent Phases of the project (i.e. Concept, Development, Implementation (incl. construction costs), and Finalisation). The estimate also includes an allowance for contingency.

Appropriate risk contingency and escalation values have been added to the estimate.

The date of the last stage estimate is; **2017.**

This estimate is a category (1 to 6): **2.**

The method of contingency estimation was: **In accordance with the PCEM.**

The final figure given is a: **Risk Adjusted Comparative Cost Estimate.**

The confidence level in this estimate is: **Medium.**

Project Phase	Total ($)
Concept (Business Case)	$88,500
Development (Preliminary & Detailed Design)	$129,500
Implementation (Construction and Contract Supervision)	$714,300
Finalisation	$10,000
Base Estimate	**$942,300**
Contingency	$254,520
Total Project Cost	**$1,196,820**
Escalation Amount (to 2018/19)	$33,250
Out-turn Cost	**$1,230,070**

10 Project Management Plan

10.1. Scope

Scope will be managed initially by proceeding through the concept and development phases to enumerate the scope defined in **Section 6** above.

Once scope is finalised, any changes will be identified, costed and their implications for time and quality determined, using the OnQ site> tools> proforma> project change request and change log, or other required/existing organisational process. Any changes to estimated cost will be handled through the cost variation process in sub-section 3 below on cost.

10.2. Time

Progress of the project will be managed against the milestones listed below:

Milestone	Date
Approval to commence Business case	November 2016
Commence Business Case	November 2016
Submission of Business Case for approval	February 2017
Approval to proceed to Development stage	March 2017
Completion of Development stage	June 2017

Progress will be reviewed and reported monthly, initially against the above milestones, and at later stages, against the P6 schedule.

Extensions of time (EOTs) will be recorded in a change log for major contracts.

For projects that are mandated in RPM, TMR's Reporting and Performance Management system, the project manager will enter commentary on any time or financial variances, preferably as they occur, but by the sixth working day of the month at the latest.

10.3. Cost

10.3.1. Budget to Development Phase

The estimated cost to complete the Development Phase (Preliminary and Detailed Design) for this project is detailed in the table below.

Activity	Total ($)
Project Management	$10,000
Preliminary and Detailed Design	$95,000
Traffic Modelling (provisional if ordered)	$7,500
Geotechnical investigations	$7,000
Survey	$10,000
Total Phase Cost	$129,500

Project management includes departmental project management of the Concept Phase (Business Case) of the project which may include management of external consultants.

Preliminary and Detailed Design involves the preparation of the final construction drawings and cost estimate. This task could be undertaken internally or by an external consultant.

Traffic modelling involves a provisional amount for additional traffic modelling if required.

Environmental studies would include the preparation of an Environmental Scoping Report (ESR) (internal) and Cultural Heritage Risk Assessment. Depending of the findings of the ESR, the preparation of an Environmental Assessment Report (EAR) which may include a traffic noise assessment. The preparation of the EAR would generally be prepared by an external consultant.

Survey would include a full topographical survey of the project extents.

Stakeholder Consultation would be undertaken internally by the Department.

Tender Documentation involves the preparation of the final documentation for the tendering of the works.

10.3.2. Budget Management

The total project budget, formerly called allocations, will be obtained/managed through TMR's State-wide Program Investment Delivery Application (SPIDA). Variations to the project total budget will be initiated and approved using the program submission form, formerly known as the M3131.

Approval to spend money on the project will be obtained in TMR's Financial Approval Process (FAP) system using the 'Financial approval for purchase of materials and services' form, formerly known as the M739.

Staff and contractor staff working in-house will use CATS timesheets, and apportion their times to appropriate cost codes determined by the project manager.

Expenditure will be recorded in SAP. General Ledger (GL) codes will be assigned to all expenditure, and detailed estimate items aggregated to a suitable level into either SAP WBS elements or internal orders. The structure of these needs to be determined by the project manager at the start of the job. The total of these estimated items becomes the project management budget for each cost code/internal order, which SAP expenditure will be monitored against.

SAP line items will be reviewed monthly, if necessary, to ensure no items have been charged to the wrong cost code, and that any such items are corrected.

Expenditure forecasts will be done in ProjMan.

Expenditure will be reviewed and the forecast cost to complete will be estimated monthly.

Variations to project internal budget items will be identified by the project manager/team and submissions requesting financial approval will be approved as per the limit of each officer's financial delegation, with due consideration being given to the impact on total project budget.

Variations that need to be funded from contingencies will be identified by the project manager/team and the funds released by the program manager or the 'major project owner' for projects where the Major Projects Contingency and Savings Management Policy applies.

For projects that are mandated in RPM, TMR's Reporting and Performance Management system, the project manager will enter commentary on any time or financial variances, preferably as they occur, but by the sixth working day of the month at the latest.

10.4. Quality

The quality requirements of the end product will be addressed during the concept phase process of considering options and developing the business case. This process is designed to balance aspirations for project scope, completion date, cost and quality, all of which impact upon each other. Design standards and surface finish requirements will be considered in balancing these aspects of the project. Once these matters are settled and the project proceeds to implementation, then the quality standards will be incorporated into the contract brief and specification annexures.

10.5. Environment, Cultural Heritage and Native Title

Environment and cultural heritage will be managed in accordance with the Environmental Processes Manual as per the TMR EMS under the Operations tab on InsideTMR.

10.6. Safety

A 'Zero Harm' policy exists within TMR which aspires to achieve an incident and injury-free work environment where every person comes to work and goes home again safely. This covers all activities, from the office based concept development, data collection and site investigations through to operations.

Safety in Design criteria will be considered during the Business Case phase of the project and implemented in the final detailed design.

To achieve the best Safety in Design outcome, workshop shall be conducted during the subsequent phases of this project i.e. Development Implementation, and Finalisation, where safety will be discussed at all forums and meetings.

10.7. Functionality

Decisions on issues that could either reduce or increase functionality will be referred to the customer.

Where substantial improvements in functionality become possible through performing additional work at an additional cost, the Customer shall be informed of the appropriate cost option.

10.8. Human Resources

The skills and resources needed to deliver the Business Case study included:-

- Project Director – leads the delivery team to achieve objectives of project.
- Project Manager – drive technical aspects and ensure timely delivery of project.
- Consultant – preparation of Options Analysis, Business Case documentation, traffic modelling, risk management, cost estimates.
- Design/Draft Lead – design and drafting of options, concept estimates.

Human Resource skills, roles and responsibilities for subsequent phases of the project will be developed using the OnQ Responsibility Assignment Matrix (RAM).

10.9. Communications

No public or industry group consultation will be undertaken at this stage of the project.

Key stakeholders will be consulted using the RPCG.

10.10. Risk

A Project Risk Register has been prepared identifying the risks to the concept phase and the overall or high level risks which may impact on later phases of the project. These risks will be fully defined during preparation of the Business Case.

A copy of the Project Risk Register is attached in **Appendix D.**

Project risks have been identified in each category and the Likelihood and Consequence of the risk assessed. Mitigation strategies have been developed and the Likelihood and Consequence after mitigation have been reassessed, which then classifies the final Risk Rating for each risk identified.

The table below identifies the major risks or uncertainties likely to be encountered in this phase as well as the remaining phases of the project.

Risk details	Comment on likelihood, consequence and treatment
Overall Project Key Risks	
Availability of Funding	Almost certain/project does not proceed
Constructability under traffic	Likely/further delays, congestion and frustration
Increased congestion due to adjacent residential development	Almost certain/adverse publicity, complaints
Current Phase Risks	
Funding to complete next phase	Likely/Project delayed
Availability of resources for next phase	Possible

This list will be further developed by:

- Taking these risks into the risk register in the corporate risk log.
- Expanding as the project scope and impacts are fully developed.
- Referring back to the corporate risk prompt list.
- Conducting (a) risk workshop(s).
- Conducting (a) value management workshop(s).
- Monitoring, reviewing and updating the risk register on a monthly/quarterly basis.

10.11. Procurement

The major consultancies/contracts/service providers required are listed below together with the proposed procurement method:

Consultancy/Contract/Service Required	Expected $ value	Procurement method
Traffic Modelling (Provisional)	$7,500	External Consultant
Development Phase	$97,500	Internal / External Consultant
Geotechnical investigations	$7,500	External Consultant
Survey	$7,000	External Consultant

Procurement will be in accordance with the State Purchasing Policy and will be carried out in accordance with departmental procurement procedures including the Manual – Consultants for Engineering Projects Whole of Government Engineering Consultant Scheme.

All purchase orders will be processed in SAP and approval limits will be monitored in ProjMan.

Requisitions for goods/services and purchase orders will be created in SAP.

Accounts will be processed and paid through SAP.

10.12. Integration

This project management plan has been prepared taking into account the requirements of all knowledge areas, and so provides the means of integrating them, ensuring they can be progressed individually and as a seamless part of the whole project with cohesive inter-relationships.

Management against this plan using the issues register on the OnQ site under tools> proforma will provide ongoing integration that will be supported by the regular project meetings and reporting outlined in this plan.

10.13. Phase Transitions/Handover/Completion

This **Business Case** report shall facilitate as a handover document for the completion of the project in the Concept Phase.

All data and information documented in this report is stored in the following TMR computer directory;

G:\NERD\ROAD PROJECTS\12A\230_12A_900\Exit 49\1 Concept\Concept Reports\3 Business Case

10.14. Design Development

Design considerations will be progressively documented in the Design Development Report M4212. As-constructed plans will be prepared progressively during the implementation phase.

10.15. Project Learnings

Learnings on the project will be progressively entered into the learnings register from the OnQ website.

Project team members will add to this progressively throughout the project, and it will be an agenda item at monthly team meetings. This will provide a source of information for preparation of the completion report at the end of the project.

11 Summary and Recommendations

11.1. Summary

This **Business Case** study focuses on the upgrade of the northbound off-ramp at Exit 49 on the M1 Pacific Motorway at Pimpama.

Congestion and queuing on the northbound off-ramp at this interchange present serious safety issues as vehicles are regularly backed-up out onto the motorway, with motorists often queuing along the motorway shoulder to avoid the through traffic.

The northbound off-ramp at Exit 49 is controlled by a roundabout which directs traffic to adjacent residential developments and across the motorway.

The roundabout becomes heavily congested particularly during peak periods due to increasing traffic flow demands. This results in significant queuing and unacceptable delays on the off-ramp.

The off-ramp at this interchange do not meet current design standards associated with the existing and future traffic demands.

The root cause of the problems associated with the poor performance of this interchange include;

- Continuing residential development in the Pimpama area, close to and adjacent to the M1.
- Congestion and delays at the existing roundabouts, particularly in peak periods.
- Inadequate length of the northbound off-ramp.
- Uneven flows entering the roundabouts causing delays on minor legs.

Part way along the off-ramp is an access to an information centre/layby area which also exits onto the roundabout to the north of the off-ramp exit. Motorists are by-passing queued traffic on the off-ramp by accessing the information/layby area lane and entering the roundabout ahead of the queued traffic. This is causing more delays to the queued traffic on the off-ramp and is initiating some hostility between motorists.

11.2. Preferred Option

The Recommended Preferred Option for the upgrade of the northbound off-ramp and to alleviate congestion at the roundabout is **Option 1: Duplication of the Off-ramp Lanes.**

The Scope of Works includes:

- Duplication of the ramp lanes, to provide additional capacity on the off-ramp.
- Closing of the information/layby area – to eliminate the associated traffic issues and driver frustration.

The Traffic modelling undertaken indicates that Option 1 will operate satisfactorily up to 2021 with significant improvements to the northbound off-ramp in the AM peak period. Average delays are predicted to reduce from 150 seconds to 40 seconds and queues on the off-ramp reduced from 40 vehicles to 10 in the AM peak.

This option is considered to be a low cost interim upgrade which will provide improved performance on the off-ramp.

11.3. Estimated Project Cost

The **estimated project cost** for the upgrade of the northbound off-ramp is **$1.20M** (2017).

The out-turned project cost (2017-2018) is **$1.23M**

11.4. Key Benefits Realised

The key benefits realised by the project include:

- Improved safety by reducing traffic incidents, and driver frustration.
- Improved operational functionality by reducing congestion/travel times/pollution.
- Improved network functionally by improving connections to cross network links.
- Elimination queuing on the motorway.
- Reduced whole of life costs with better asset preservation.

11.5. Recommendation

It is recommended that Preferred Option identified in this Business Case proceed to the Development Phase (Preliminary and Detailed Design).

12 Considerations for Development Phase

12.1. Topographical Survey

The Business Case planning has been carried out using aerial imagery 2016, ALS data, and As Constructed drawings.

A full topographical survey of the project extents may need to be undertaken during the Development phase of the project.

The survey is required to check;

- Adverse crossfall at the roundabout entry.
- Check aquaplaning along the road
- Drainage design

12.2. Services Location

Potholing of the PUP assets may need to be undertaken if deemed to be of concern to the project.

12.3. Environmental Studies

An Environmental Scoping Report and Cultural Heritage Risk Assessment may need to be undertaken.

12.4. Geotechnical Investigations

Geotechnical investigations will be required where there is pavement widening.

12.5. Pavement Design

The pavement design was indicative only taken from the As Constructed drawings.

A full pavement design will be required using the results of the geotechnical investigations.

13 Annexures

Appendix A: Preferred Option Layout Plans

Appendix B: Project Cost Estimate

Appendix C: Traffic Analysis Report

Appendix D: Risk Management Record

APPENDIX A

PREFERRED OPTION LAYOUT PLANS

LEGEND

- Concrete path
- Turf
- Pavement Type 1
- Asphalt overlay 50mm
- Concrete infill
- Scarify existing surface and revegetate

Comments:
Prepared based on sketch supplied by PP&CM A/Manager 23/06/2016.
Concept Developed for discussion only.
Concept based on ALS data and aerial imagery.

Pacific Highway (Pacific Motorway)
Exit 49 North Bound Exit Ramp Concept
Proposed Works

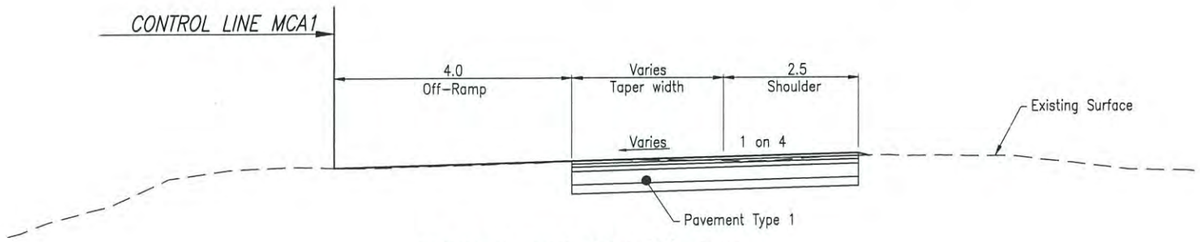
A 0 5 10m

Brawing No. SK004 (A)
Drawn: S. NESMASHIN
Design: S. READ
Engineer: Y. WONG

Queensland Government

PACIFIC MOTORWAY EXIT 49 | North Bound Off-Ramp

Last Modified :- Feb 17, 2017 - 1:09pm



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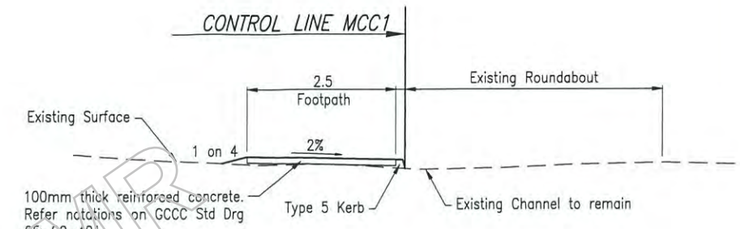
C.L. CHGE 84–122 MCA1



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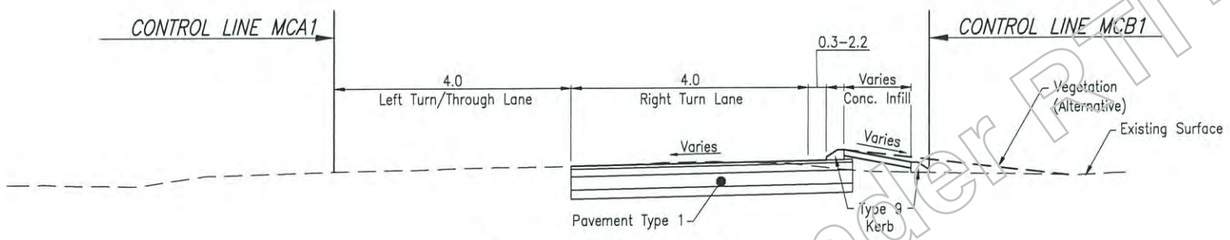
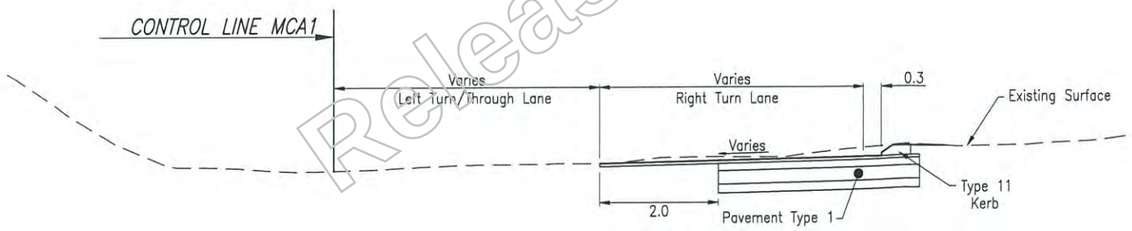
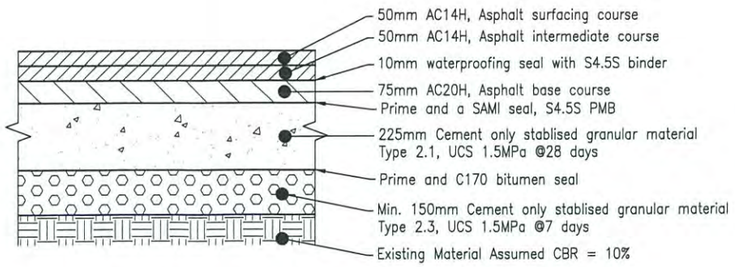
C.L. CHGE 0–10.317 MCC1



TYPICAL SECTION 'B' RHS
C.L. CHGE 122–213 MCA1



TYPICAL SECTION 'C' RHS
C.L. CHGE 213–232 MCA1



INDICATIVE PAVEMENT TYPE 1
Subject to design verification and site investigation/information

Comments:
Prepared based on sketch supplied by PP&CM A/Manager 23/06/2016.
Concept Developed for discussion only.
Concept based on ALS data and aerial imagery.

Pacific Highway (Pacific Motorway)
Exit 49 North Bound Exit Ramp Concept
Typical Sections and Details

Not to Scale

Drawing No. SK003 (A)
Drawn: S. READ
Design: S. READ
Engineer: Y. WONG

PACIFIC MOTORWAY EXIT 49 | North Bound Off-Ramp

Queensland Government

C:\AutoCAD~1\20\Nerang\230_12A_900\Design\BC Exit 49\Acad\Sketches\SK003_Exit 49_BC.dwg

APPENDIX B

PROJECT COST ESTIMATE

Project Cost Estimate (Summary)

QUEENSLAND GOVERNMENT

Project Details:

Project Number:	230/12A/900		
Road:	M1 Pacific Motorway		
Project Description	Exit 49 Northbound Off-Ramp Upgrade		
Project Location:	Pimpama	Length (km) :	250m

Region	SCR	Office	Nerang	Local Authority	Gold Coast City Council
Estimate Stage	Business Case			Date	March 2017

Activity Group	Previous Years	2015/16	2016/17	2017/18	2018/19	Total ($000)
Concept Phase						
Concept Planning			88,500			88,500
					Concept Phase Sub Total	**$88,500**
Development Phase						
Development Phase				129,500		129,500
					Development Phase Sub Total	**$129,500**
Implementation Phase						
Contract Administration				53,000		53,000
Principal arranged insurance & WHS - PLSL				25,000		25,000
Construction (including PUP reloctations)				636,300		636,300
					Implementation Phase Sub Total	**$714,300**
Finalisation Phase						
Project Management				10,000		10,000
					Finalisation Phase Sub Total	**$10,000**
					Base Estimate	**$942,300**
Risk and Contingency						
Risk & Contingency	-			254,520		254,520
	-					
					Risk and Contingency Sub Total	**$254,520**
PROJECT ESTIMATE (IN CURRENT $S)					**Estimate Base Date**	**1/02/16**	**$1,196,820**

Outturn Cost Calculation

	Previous Years	2015/16	2016/17	2017/18	2018/19	TOTAL
Total Project Cost	-	-	88,500	1,108,320	-	1,196,820
Escalation % pa #	0%	0%	0%	3%	5%	
Escalation Amount	0	-	-	33,250	-	33,250
Out-turn Cost ($OT)	0	0	88,500	1,141,570	0	$1,230,070
PROJECT ESTIMATE (IN OUT-TURN $S)				**Estimated Practical Completion Date**	**1/10/2018**	**$1,230,070**

- For advice on Escalation refer QTRIP Development Guidelines and/or Project Cost Estimating Manual

Project Cost Estimate (Summary)

Project Details:

Project Number:	230/12A/900
Road:	M1 Pacific Motorway
Project Description	Exit 49 Northbound Off-Ramp Upgrade
Project Location:	Pimpama
Length (km) :	250m

QUEENSLAND GOVERNMENT

Region	SCR	Office	Nerang	Local Authority	Gold Coast City Council
Estimate Stage	Business Case	Outturn Cost	$ 1,230,070	Date	March 2017

Project Cost Estimate Certification

Project Cost Estimate

I certify that I have prepared this estimate in accordance with the Project Cost Estimating Manual based on the project information contained in the project scope statement, plans, documents and program of work included in this submission. I further certify that this is a P50 risk adjusted estimate

Estimator's Name: Pam Price

Signature: Part Refuse Sch.4 Part 4 s.6 Personal information

Date: 07.02.17

Peer Review

I certify that I have conducted a peer review for this estimate in accordance with the Project Cost Estimating Manual. Points of difference have been resolved and adjustments incorporated in the cost estimate as appropriate.

Reviewer's Name: Neil Guest

Signature: Part Refuse Sch.4 Part 4 s.6 Personal information

Date: 27.2.17

Recommendation

I am satisfied that this P50 estimate has been prepared in accordance with the Project Cost Estimating Manual and meets the requirements of approved project proposal, business case or project plan, as relevant.

Any issues raised in the peer review have been resolved as per the Estimate Review Checklist.

I recommend that this estimate be approved.

Project Manager's Name: Wayne Brennan

Signature: Part Refuse Sch.4 Part 4 s.6 Personal information

Date: 27/02/17

Concurrence Project Review

I have reviewed the project in accordance with the Project Cost Estimating Manual and I am satisfied that the scope has been sufficiently defined and the estimate is reasonable for this stage of the project.

Reviewer's Name:

Signature:

Date:

I am satisfied that this project cost estimate has been prepared in accordance with the processes outlined in the current Project Cost Estimating Manual and that any issues raised in the concurrence review (if one was required) have been resolved as per the Estimate Review Checklist.

Estimate Approval

Regional/District Director/ Program Manager/ Customer/ Sponsor – (Circle as appropriate)

Approver's Name: Garv Swanson

Signature:

Date: 3/3/17

Queensland Government

Project Number : Exit 49 Off Ramp Widening
Project Boundary : GOLD COAST CITY COUNCIL
Asset Name : PACIFIC HIGHWAY (PACIFIC MOTORWAY)
Location : Pimpama

Stage : 1 - Business case

Stage : 1 - Business case

Work Package : 1 - Civil_BC

Item Number	Description	Unit of Measure	Quantity	Unit Rate ($)	Amount ($)
MRS02 Apr 16					
	PROVISION FOR TRAFFIC				
1201.01	Provision for traffic	lump sum			$150,000.00
MRS03 Oct 16					
	DRAINAGE REMOVAL/DEMOLITION				
2103.01	Removal or demolition of culverts, excluding end structures	lump sum			$3,000.00
2104.01	Removal or demolition of concrete kerb including kerb crossings	m			$5,155.00
2106.01	Removal or demolition of concrete kerb and channel including kerb crossings	m			$480.00
2107.01	Removal or demolition of concrete slabs	m2			$5,824.00
2108.01	Removal or demolition of gullies	each			$2,500.00
	SUPPLY AND INSTALLATION OF CULVERTS				
2241.01	Supply and installation of concrete pipe culvert components, Class [2], [375] mm diameter	m			$25,500.00
	PAVEMENT DRAINAGE				
2401.01	Concrete kerb, [Type 5]	m			$520.00
2401.02	Concrete kerb, [Type 9]	m			$6,367.50
2401.03	Concrete kerb, [Type 11]	m			$2,090.00
2413.01	Concrete gullies, [Field Inlet Type 1]	each			$4,000.00
	SUBSURFACE DRAINAGE				
2502.01	Subsoil drains, Type D	m			$5,490.00
2503.01	Subsoil drain outlet connection, [100] mm diameter, [D]	each			$620.00
2504.01	Subsoil drain clean-out, [100] mm diameter, [D]	each			$620.00
	PROTECTIVE TREATMENTS				
2631.01	Hand placed concrete paving, [125mm Footpath] mm thick	m2			$8,532.00
2631.02	Hand placed concrete paving, [100mm Median Infill] mm thick	m2			$16,000.00
2642.01	Grouted rock pitching	m2			$2,400.00
MRS04 Oct 14					
	EARTHWORKS, PREPARATION				
3101.01	Clearing and grubbing	m2			$1,327.20
3103.01P	Stripping of topsoil (Provisional Quantity as directed)	m3			$1,625.00
3104.01	Ground surface treatment under embankment, standard	m2			$1,000.00
	EARTHWORKS, EXCAVATION				
3201.01	Road excavation, all materials	m3			$15,440.00
3205.01	Excavation for diversion channels, all materials	m3			$1,600.00
	EARTHWORKS, EMBANKMENT				
3301.01	Road embankment	m3			$4,300.00
	EARTHWORKS, SUBGRADE				
3401.01P	Testing of existing material below subgrade level in cuttings (Provisional Quantity if ordered)	per set			$1,000.00
3404.01P	Subgrade in cuttings, subgrade treatment Type C, replace with unbound pavement material (Provisional Quantity if ordered)	m3			$23,800.00

Queensland Government

Project Number : Exit 49 Off Ramp Widening
Project Boundary : GOLD COAST CITY COUNCIL
Asset Name : PACIFIC HIGHWAY (PACIFIC MOTORWAY)
Location : Pimpama

NOTE: Estimate must be considered absolutely as the property of Transport and Main Roads until the acceptance of a tender, and must under no circumstances be divulged.

Stage : 1 - Business case
Work Package : 1 - Civil_BC

Item Number	Description	Unit of Measure	Quantity	Unit Rate ($)	Amount ($)
MRS08 Oct 14					
	PLANT-MIXED STABILISED PAVEMENTS				
4301.01	Plant-mixed stabilised pavement	m3			$43,350.00
4321.01	Supply of stabilising agent	tonne			$4,706.80
4331.01	Water curing [location]	m2			$4,080.00
MRS11 Jan 17					
	SPRAYED BITUMINOUS SURFACING (EXCLUDING EMULSION)				
5101.01	Prime, grade [AMCO], spray rate [1.0], [including] supply of binder, [location]	litre			$3,400.00
5141.01	Sprayed bituminous surfacing, [including] supply of binder, [including] supply of additives, [including] supply of cover aggregates, [Interlayer AC14/AC20], refer to Clause 2 of Annexure MRTS11.1	m2			$12,240.00
5141.02	Sprayed bituminous surfacing, [including] supply of binder, [including] supply of additives, [including] supply of cover aggregates, [Interlayer CMBCI170], refer to Clause 2 of Annexure MRTS11.1	m2			$12,240.00
MRS14 Oct 16					
	REMOVAL, DEMOLITION AND RE-ERECTION				
6101.01	Demolition of road furniture, as listed in Clause 3 of Annexure MRTS14.1	lump sum			$4,000.00
6104.01	Removal and re-erection of road furniture, as listed in Clause 4 of Annexure MRTS14.1	lump sum			$3,000.00
MRS16 Oct 14					
	GROUND PREPARATION WORKS - TOPSOIL				
3829.01P	Supply of imported topsoil (Provisional Quantity, if ordered)	m3			$1,900.00
3830.01	Install topsoil [100mm]	m2	Part Refuse Sch.4 Part 4 s.7(1)(b)		$864.00
	VEGETATION WORKS - TURFING				
3847.01	Turf [description]	m2			$1,440.00
	ESTABLISHMENT AND MONITORING OPERATIONS				
3891.01	Establishment Period	lump sum			$5,000.00
3892.01P	Establishment Period Watering (Provisional Quantity, as directed)	kilolitre			$450.00
MRS245 Jan 16					
6440.01	TELECOMMUNICATIONS NETWORK	lump sum			$71,000.00
MRS28 Apr 16					
	CONTRACTOR'S SITE FACILITIES AND CAMP				
1101.01	Contractor's site facilities	lump sum			$10,000.00
MRS30 Jan 16					
	HEAVY DUTY DENSE GRADED ASPHALT				
4162.01	Heavy duty dense graded asphalt in base course, AC [20] H mix	tonne			$32,000.00
4163.01	Heavy duty dense graded asphalt in intermediate course, AC [14] H mix	tonne			$22,680.00
4164.01	Heavy duty dense graded asphalt in surfacing course, AC [14] H mix	tonne			$30,740.00
	PREPARATION OF THE EXISTING SURFACE				
5401.01	Preparation of the existing surface	m2			$2,040.00
5403.01P	Strain alleviating membrane fabric strips (Provisional Quantity)	m			$3,240.00
5404.01P	Tack coat, residual bitumen (Provisional Quantity)	litre			$1,700.00

Queensland Government

Project Number : Exit 49 Off Ramp Widening
Project Boundary : GOLD COAST CITY COUNCIL
Asset Name : PACIFIC HIGHWAY (PACIFIC MOTORWAY)
Location : Pimpama

NOTE: Estimate must be considered absolutely as the property of Transport and Main Roads until the acceptance of a tender, and must under no circumstances be divulged.

Stage : 1 - Business case

Work Package : 1 - Civil_BC

Item Number	Description	Unit of Measure	Quantity	Unit Rate ($)	Amount ($)
MRS45 Jan 17					
	LINE MARKING				
6301.01	Spotting only for longitudinal lines	m			$469.00
6316.01	Lane line, broken, 100 mm wide, [3] mm line length, [9] mm gap length, colour [white], material [material]	m			$164.00
6318.01	Lane line, continuous, 100 mm wide, colour [white], material [material]	m			$52.00
6319.01	Edge line, 150 mm wide, colour [white], material [material]	m			$210.60
6331.01	Transverse lines (stop lines, holding lines, markings at Stop and Give Way signs, pedestrian crosswalk lines, arrows,shapes, symbols and numerals), colour [white], material [material]	m2			$150.00
	RAISED PAVEMENT MARKERS				
6351.01	Retroreflective raised pavement markers	each			$336.00
6355.01	Removal of existing raised pavement markers, by [method of removal]	each			$156.00
MRS51 Oct 16					
	ENVIRONMENTAL MANAGEMENT				
1331.01	Develop Environmental Management Plan (Construction)	lump sum			$3,000.00
1332.01	Implement Environmental Management Plan (Construction)	lump sum			$5,000.00
MRS94 Jan 16					
6710.01P	ROAD LIGHTING (Provisional Item if ordered) (3 additional installations)	lump sum			$67,500.00

Part Refuse Sch.4 Part 4 s.7(1)(b)

Work Package Total : $636,299.10

Work Package : A - Principals Cost

Item Number	Description	Unit of Measure	Quantity	Unit Rate ($)	Amount ($)
MRP001 May 11					
11000.01	PROJECT STAGE MANAGEMENT (ALL STAGES)	lump sum			$50,000.00
MRP004 May 11					
14000.01	BUSINESS CASE	lump sum			$15,000.00
MRP005 May 11					
	Environmental and cultural				
15020.01	Environmental Impact Study	lump sum			$5,000.00
15040.01	Cultural heritage	lump sum			$3,500.00
MRP006 May 11					
	Public Utility Plant				
16010.01	Public Utility Plant identification	lump sum			$10,000.00
16020.01	Public Utility Plant conflict management	lump sum			$5,000.00
MRP007 May 11					
17000.01	DESIGN PLANNING (PRELIMINARY AND DETAIL) (Civil)	lump sum			$60,000.00

Queensland Government

Project Number : Exit 49 Off Ramp Widening
Project Boundary : GOLD COAST CITY COUNCIL
Asset Name : PACIFIC HIGHWAY (PACIFIC MOTORWAY)
Location : Pimpama

NOTE: Estimate must be considered absolutely as the property of Transport and Main Roads until the acceptance of a tender, and must under no circumstances be divulged.

Work Package : A - Principals Cost

Item Number	Description	Unit of Measure	Quantity	Unit Rate ($)	Amount ($)
MRP008 May 11					
	DESIGN INVESTIGATION REPORTS				
18020.01	Geotechnical investigation analysis and report (non-pavement)	lump sum			$7,000.00
18070.01	Traffic counting and analysis and reports	lump sum			$7,500.00
18080.01	Engineering survey	lump sum			$10,000.00
18090.01	Constructability review	lump sum			$5,000.00
MRP009 May 11					
19000.01	ENGAGE AND MANAGE DESIGN SERVICES (Electrical)	lump sum			$40,000.00
MRP011 May 11					
21000.01	PROCUREMENT	lump sum			$3,000.00
MRP013 May 11					
23000.01	CONTRACT ADMINISTRATION	lump sum			$50,000.00
MRP014 May 11					
24000.01	PRINCIPAL'S OBLIGATIONS	lump sum			$25,000.00
MRP015 May 11					
25000.01	FINALISATION	lump sum			$10,000.00
MISCELLANEOUS					
9001.01	CONTINGENCY	lump sum			$254,520.00

Work Package Total : $560,520.00
Stage Total : $1,196,819.10

APPENDIX C

TRAFFIC ANALYSIS REPORT

Technical Note 01

Project:	Pacific Motorway M1 Exit 49	**Reference:**	MC1609-TN01-v10
Prepared for:	Department of Transport and Main Roads		
Subject:	Aimsun Traffic Modelling		
Date:	02 February 2017		

1. Introduction

A base year 2016 Aimsun Microsimulation Traffic Model was developed for the Pacific Motorway M1 Exit 49 using the following steps:

- obtain aerial photography of the study area;
- code existing road network using information from the aerial photography;
- extract traffic count data from intersection survey at turning level;
- conduct model calibration (vehicle demands adjustment) using observed traffic count data; and
- carry out trip assignment by assigning the estimated 2016 traffic demand to the road network.

The above steps are illustrated in Figure 1.

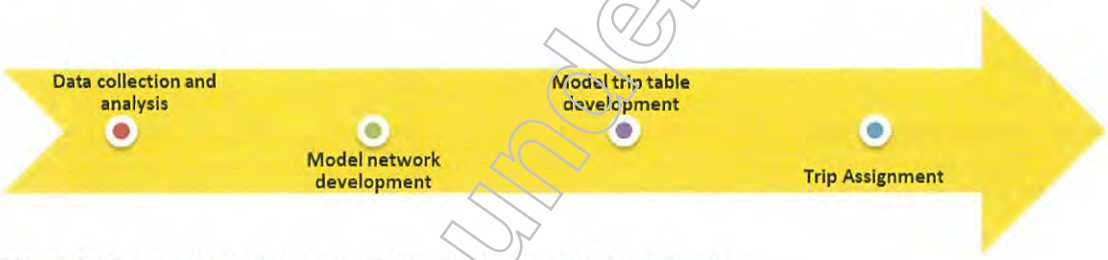


Figure 1 Aimsun Microsimulation Traffic Model Development Process

1.1 Network Build

1.1.1 Extent

Figure 2 displays the extent of the Aimsun microsimulation traffic model developed for the study. The model contains the north-south interchange intersections for the Pacific Motorway at the Exit 49.

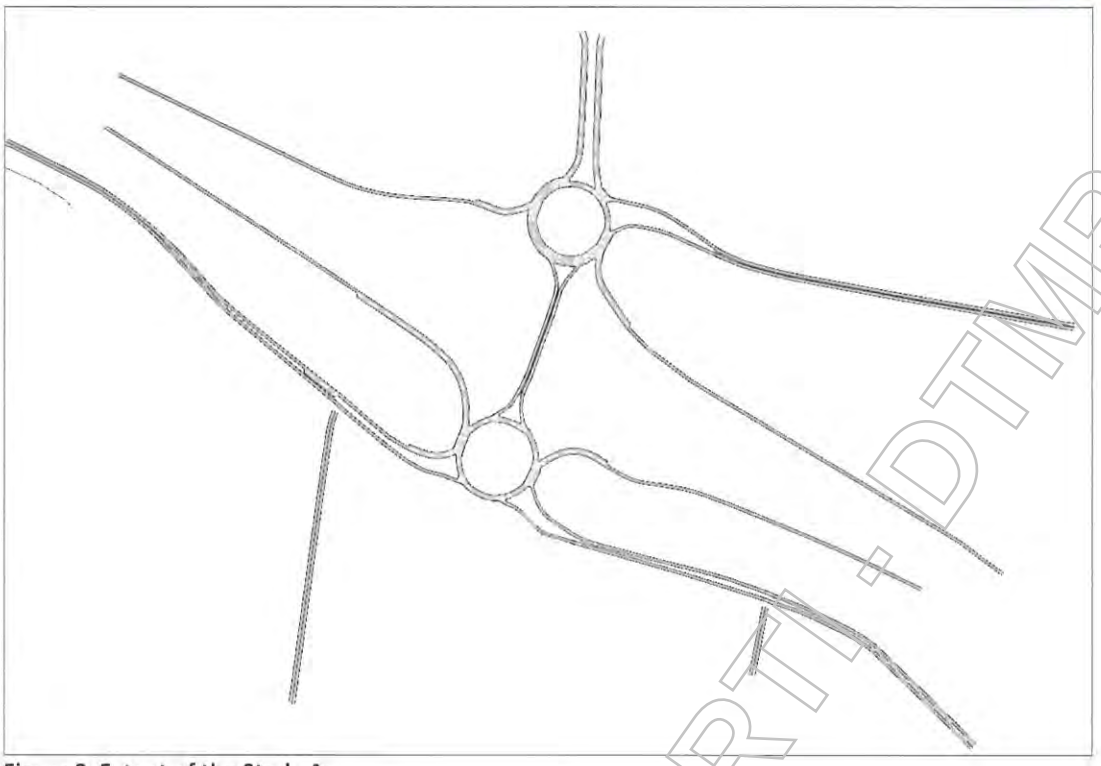


Figure 2 Extent of the Study Area

1.1.2 Version

At time of model development, Aimsun version 8.1.3 (R40087) was used to develop the model as this version has been updated with functionalities that enhance modelling operations. No additional plug-ins or add-ons were used.

1.2 Model Demand Matrices

The Aimsun model has been set up to simulate two time periods:

- AM peak period 0730 to 0930
- PM peak period 1430 to 1730

1.2.1 Origin-Destination Matrices Development

A trip matrix (also referred to as a trip table) is normally in a table format that displays the number of trips going from each origin (table row) to each destination (table column) for a given time period. Trip tables were developed for the two peak periods respectively, with separate trip tables for the two different vehicle classes, i.e. private vehicles and heavy vehicles.

1.2.2 Demand Profile

The demand profile for the peak periods was determined from the traffic count in 15-minute intervals to represent the variation in the traffic flow throughout the simulation period. The observed volumes from traffic counts were converted to percentages to control the amount of vehicles released at each interval in the Aimsun model.

For the purpose of this study, a profile was calculated for each zone to represent the variation based on different surrounding land uses and road users. A separate profile was created for private and heavy vehicles. Figure 3 and Figure 4 show the overall profile distribution in the AM and PM peaks.

The hourly distribution was calculated in the following periods:

- AM Peak – two (2) hours between 0730 and 0930
- PM Peak – three (3) hours between 1430 and 1730

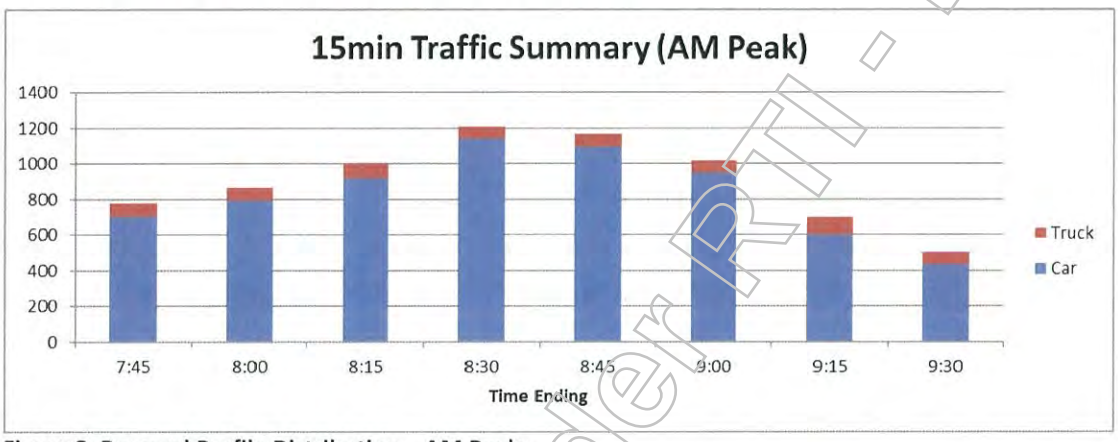


Figure 3 Demand Profile Distribution – AM Peaks

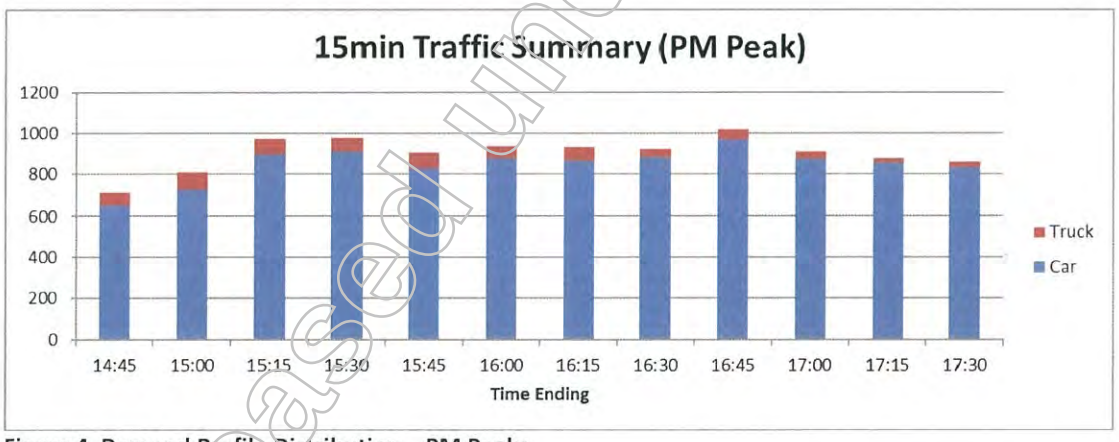


Figure 4 Demand Profile Distribution – PM Peaks

2. Model Calibration and Validation

2.1 Network Calibration

The purpose of calibrating a microsimulation traffic model is to verify that the modelling is a suitably robust representation of the traffic flows on the actual road network. During the calibration process, a few network changes were made to provide a better reflection of the existing traffic conditions.

2.2 Turn Calibration

The GEH statistic is used to quantify the extent of calibration. It is an empirical formula used to compare and gauge the acceptability of variations between two data sets. The GEH statistic was used as a reference to measure the general accuracy of the model and is given by the following equation:

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

where,

- M is the traffic volume estimated by the model (or new count); and
- C is the observed traffic volume (or old count).

The accepted GEH based calibration criteria, as defined by RMS Traffic Modelling Guidelines is shown in Table 1.

Table 1 Calibration Criteria (Ideal)

GEH Value	Proportion
GEH ≤ 5	≥ 85%
5 < GEH < 10	≤ 15%
GEH ≥ 10	0%

Turn calibration was carried out by comparing the outputs from the modelling to existing count data at various locations. The turn calibration is used to ensure the OD trip table was estimated robustly to produce the expected demands to the network.

Table 2 summarises the results for turn calibration for the peak hour in the AM and PM periods. The table shows all GEH values for turn performance are within 5, which indicate the model is calibrated satisfactorily at the zone demand level. The detailed turn calibration results for the AM and PM peaks are provided in Appendix A for further reference.

Table 2 Turn Calibration Summary: Observed vs Modelled Flow and Associated GEH Values

Modelled Time Period	Period	Total Counts	GEH Less than 5	GEN Between 5 and 10	GEH More than 10
AM Peak	0800 to 0900	26	26	0	0
PM Peak	1600 to 1700	26	26	0	0

2.3 Model Validation

Following calibration of a traffic model, further evaluation of the calibrated model's performance is then conducted using an independently observed set of data not used in the calibration process. This second evaluation process is called the model validation and is an additional step to ensure that the calibrated model is robust.

2.3.1 Base Year 2016 Modelled Queues

The demand matrices were factored to 2016 conditions to validate the queuing performance of the Aimsun microsimulation model. Note the intersection turning movement counts were undertaken in June 2014 and the site observations were conducted between September and November 2016.

A typical growth of 1.5% per annum was applied to the demand matrices. In addition, a growth of 150% was applied to the zone linking Attenborough Road as a result of significant growth in residential developments along Attenborough Rd. Figure 5 and Figure 6 show the typical queues in the AM and PM peak conditions.

Figure 5 Modelled Queues for 2016 AM Peak

Figure 6 shows the 2016 base modelled queues in the PM peak.

Figure 6 Modelled Queues for 2016 PM Peak

3. Future Model and Options

Future year 2021 road network and traffic demand were developed to assess the future traffic performance within the modelled area following the calibration and validation of the base year model.

The future year 2021 base network is identical to the base year 2016 within the study area. In addition, one network option is proposed and tested for the westbound off-ramp, namely Option 1, which is shown in Figure 7.

Figure 7 Option 1 Concept Sketch

The development of the future year traffic demand matrices is based on the cordon matrices extracted from the VLC's Zenith Strategic Transport Model (STM). The cordon matrices have same number of zones as the Aimsun microsimulation model.

The 2016 traffic demand matrices were factored using growth rates estimated from the Zenith STM to generate the 2021 traffic demands matrices. A summary of the matrix totals are shown in Table 3. The growth in vehicle trips between 2016 and 2021 is approximately 18% in both AM and PM peak periods.

Table 3 Future Year Matrix Totals (vehicles)

Year	AM Peak (two-hour total)	PM Peak (three-hour total)
2016	4,688	8,375
2021	5,512	9,915

3.1 Models Performance

Table 4 displays the forecast network performance of the AM peak base year 2016 and future year 2021 models. The average travel speed is forecast to drop significantly, from 38.0 kph in 2016 to 21.9 kph in 2021. This indicates the interchange is operating with over-capacity, with extensive queues forecast on Rifle Range Road. Figure 8 shows the queues forecast in the AM peak 2021 base model.

Table 4 AM Peak Models Performance

Scenario	Vehicle-Hours Travelled	Vehicle-Kilometres Travelled	Average Travel Speed (kph)	Vehicles Waiting to Enter the Network
2016 Base	128.9	4,894.1	38.0	0
2021 Base	262.2	5,728.7	21.9	0
2016 Option 1	127.5	4,893.5	38.4	0
2021 Option 1	243.5	5,728.9	23.5	0

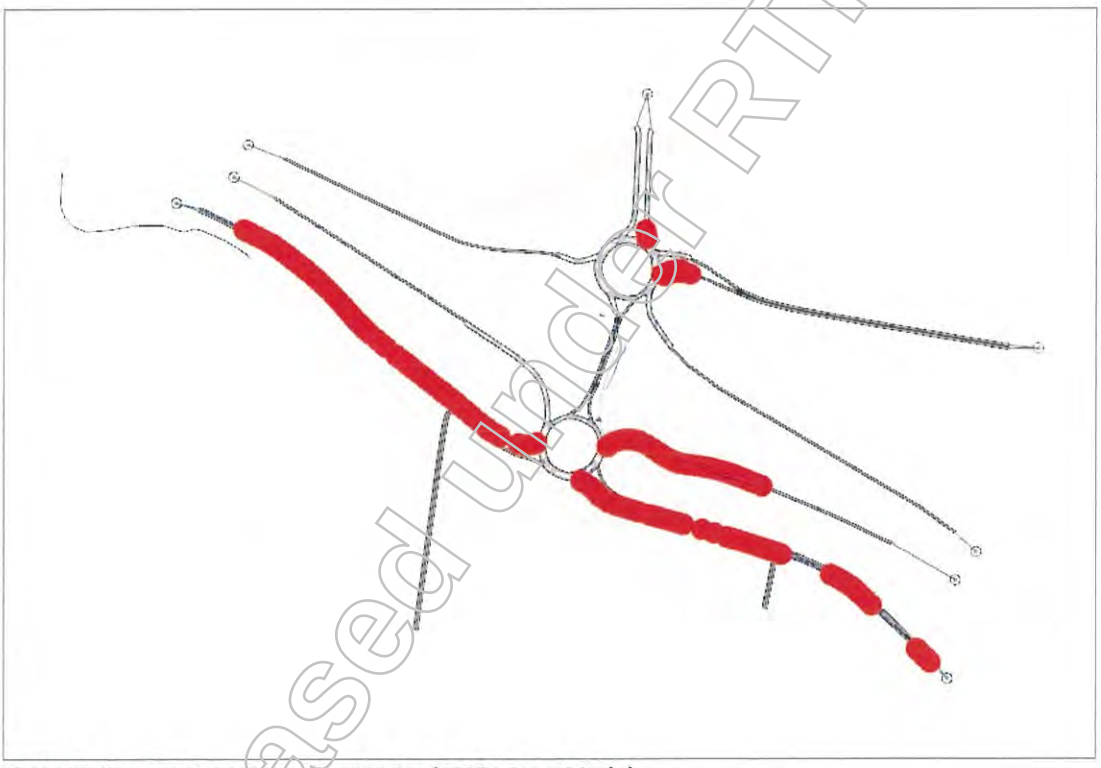


Figure 8 Queues Forecast in the AM Peak 2021 Base Model

Table 5 demonstrates the forecast network performance of the PM peak base year 2016 and future year 2021 models. Similar to the performance in the AM peak, the average travel speed is forecast to drop significantly, from 39.8 kph in 2016 to 23.1 kph in 2021. This indicates the interchange is operating over-capacity. The table also indicates large amount of vehicles unable to access the network due to extensive queues forecast on the Pacific Motorway northbound off-ramp. Without increasing the capacity at the interchange, the queues are forecast to extend back to the motorway and affected the motorway traffic. Figure 9 shows the queues forecast in the PM peak in 2021 base model.

Table 5 PM Peak Models Performance

Scenario	Vehicle-Hours Travelled	Vehicle-Kilometres Travelled	Average Travel Speed (kph)	Vehicles Waiting to Enter the Network
2016 Base	211.9	8,429.5	39.8	0
2021 Base	410.3	9,490.9	23.1	401
2016 Option 1	191.3	8,432.3	44.1	0
2021 Option 1	456.7	9,827.3	21.5	56

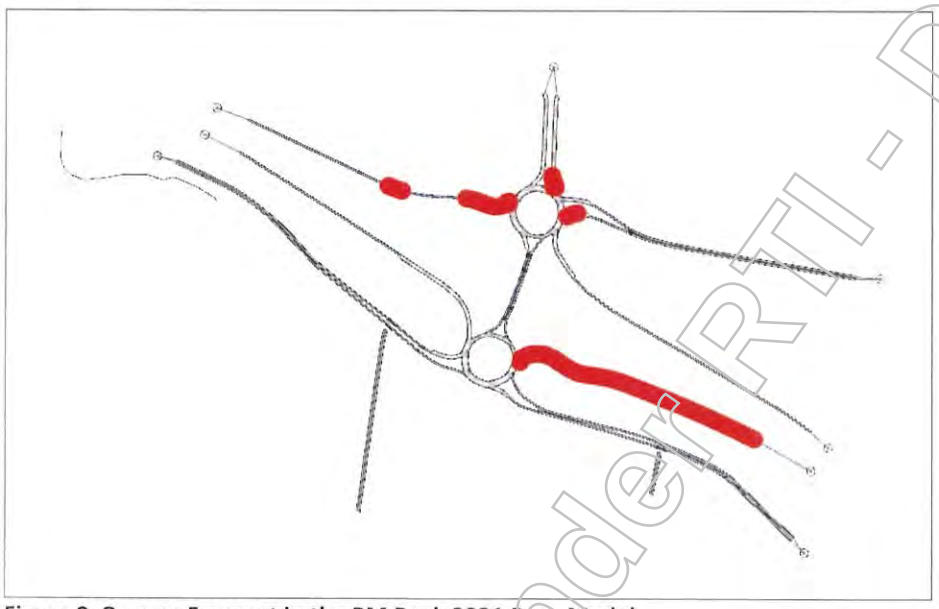


Figure 9 Queues Forecast in the PM Peak 2021 Base Model

Table 4 and Table 5 above show the proposed Option 1 is forecast to improve the traffic performance within the study area. The model forecasts to relieve the extensive queuing issue on the Pacific Motorway northbound off-ramp in the PM peak period. It is noted in the 2021 PM peak period the average travel speed in Option 1 is slower than Base Case (21.5 kph vs. 23.1 kph). This is because there are more vehicles in the Option 1 network, where more vehicles are forecast to enter the interchange from the northbound off-ramp, hence causing extra traffic delays.

3.2 M1 Exit 49 Northbound Off-Ramp Performance

Table 6 summarises the forecast AM traffic performance on the M1 Exit 49 northbound off-ramp. The table indicates the existing northbound off-ramp will be out of capacity by 2021, with an average delays of over 150 seconds.

The proposed Option 1 is forecast to reinstate the traffic performance in 2021 to the same conditions as current year. This indicates the additional storage will provide significant improvements to the northbound off-ramp in the AM peak.

Table 6 M1 Exit 49 Northbound Off-Ramp Performance (AM Peak)

Scenario	Forecast Traffic Volume (vehicles per hour)	Maximum Queues (vehicles)	Average Delays (seconds)	Number of Stops
2016 Base	421	10	42.1	0.94
2021 Base	531	40	150.8	2.41
2016 Option 1	421	5	28.2	0.70
2021 Option 1	549	10	40.7	1.01

Table 7 provides the forecast PM traffic performance on the M1 Exit 49 northbound off-ramp. The table indicate the existing northbound off-ramp is at capacity in 2016, with long queues extending to the motorway. The average delays is forecast to double by 2021, which implies the ramp will be heavily congested.

The model forecasts the proposed Option 1 will operate satisfactory in 2016, but additional upgrades would be required to provide more capacity on the ramp to ensure the traffic perform well in 2021.

Table 7 M1 Exit 49 Northbound Off-Ramp Performance (PM Peak)

Scenario	Forecast Traffic Volume (vehicles per hour)	Maximum Queues (vehicles)	Average Delays (seconds)	Number of Stops
2016 Base	700	24	86.3	1.86
2021 Base	727	49	277.6	4.19
2016 Option 1	702	10	45.8	0.98
2021 Option 1	936	52	225.8	2.83

Appendix A

Intersection	Approach	Turn	AM			PM		
			Observed	Modelled	GEH	Observed	Modelled	GEH
Attenborough Road / Yawalpah Road / Ramps (Northern Interchange)	North	Through	227	228	0.1	193	192	0.1
		On-ramp	194	194	0.0	204	181	1.6
		Left	54	54	0.0	52	50	0.1
	East	Right	54	54	0.0	29	26	0.6
		Left	297	298	0.1	177	175	0.2
		On-ramp	117	117	0.0	114	110	0.4
	South	On-ramp	443	446	0.1	185	184	0.1
		Right	237	240	0.2	168	169	0.1
		Through	302	305	0.2	242	244	0.1
	West	Right	184	186	0.2	456	453	0.1
		On-ramp	0	0	0.0	0	0	0.0
		Through	114	114	0.0	203	194	0.7
		Left	30	30	0.0	39	34	0.9
Attenborough Road / Rifle Range Road / Ramps (Southern Interchange)	North	On-ramp	297	300	0.2	177	180	0.2
		Right	98	99	0.1	132	135	0.3
		Left	310	313	0.2	503	505	0.1
	Off-ramp	Right	336	338	0.1	279	281	0.1
		On-ramp	0	0	0.0	0	0	0.0
		Through	75	75	0.0	109	107	0.2
		Left	14	14	0.0	21	21	0.0
	East	Right	380	381	0.1	190	192	0.1
		On-ramp	207	207	0.0	94	91	0.3
		Through	52	52	0.0	75	74	0.1
	West	Through	90	90	0.0	60	60	0.0
		Left	271	272	0.1	122	125	0.3
		On-ramp	142	142	0.0	74	69	0.6

APPENDIX D

RISK MANAGEMENT RECORD

Project Planning & Corridor Management Risk Log

Queensland Government

M1 PACIFIC MOTORWAY
EXIT 49 (Northbound Exit)
INTERCHANGE UPGRADE

Risk log owner	**Wayne Brennan**
Risk Management Reference Group member	Project Planning & Corridor Management
Risk log contact (if different to the RMRG member)	
Date last updated	Feb-17

Document purpose
The TMR Risk Log is a central repository for the Risk Register, Fraud Risk Register, Opportunity Register and Work Health and Safety Register. The risk log also contains an (optional) Issue Register and a Lessons Learned Log. This suite of tools provides a structured and integrated means of recording and managing risk.

Template version number	Version 3.0
Template enquiries/feedback	Email - Risk Advisory Team Mailbox
Risk management information	*inside* TMR --> Home --> Policies and procedures --> Risk management
Risk Advisory Team	Shaun Scanlan, Sharrel Mani, Michael Baker
WHS Risk Contact	Regional Safety Advisor

Project Planning & Corridor Management

Risk Register

Reference Number	TMR Objectives: Election commitments	TMR Objectives: Financial implications	TMR Objectives: Customer at centre of all we do	TMR Objectives: Fit-for-purpose transport network	TMR Objectives: Partnering with Govt, Industry, Community	TMR Objectives: Living One TMR - enabling people	Service Area (SDS): Transport system investment planning and programming	Service Area (SDS): Transport infrastructure management and delivery	Service Area (SDS): Transport safety, regulation and customer service	Service Area (SDS): Passenger transport services	Description	Impacts	Stakeholders	Risk Owner	Current Rating: Likelihood	Current Rating: Consequence	Current Rating: Rating	Treatment: Treatment Option	Treatment: Treatment	Treatment: Treatment Owner	Treatment: Treatment Due Date	Treatment: Treatment Status	Residual/ Retained Rating: Likelihood	Residual/ Retained Rating: Consequence	Residual/ Retained Rating: Rating	Net Financial Impact ($): Best Case	Net Financial Impact ($): Most Likely Case	Net Financial Impact ($): Worst Case	Risk review date	BRIEF justification (if applicable) for: - Behind Schedule/ Stalled status - Change to Treatment Due Date	Comments
1		X					X	X			Funding priority changes, Availability of funding	* Project may not proceed. * Interchange become further congested, which has a detremental affect on the motorway operations. * Safety issues conpromised.	TMR	TMR	Possible	Major	High	Changing the consequence	Ensure correct protocol and procedures are follwed. Prepare robust Business Case to justify expenditure				Possible	Minor	Medium								
2	X	X						X			Accelerated project leads to project errors/increase in cost	* Project budget exceeded, * Project delayed, * Appropriate option not realised.	TMR, CGC	TMR	Unlikely	Moderate	Medium	Changing the consequence	Ensure correct protocol and procedures are follwed. Prepare robust Business Case to justify expenditure				Unlikely	Minor	Low								
																			Undertake stakeholder consultation early on in the project timeline												
																			Undertake peer reviews at all stages of the project												
3	X										Politically unacceptable option	* Project delayed, * Congestion at interchange becomes unacceptable, * Congestion impacts on motorway, * Safety issues compromised.	TMR CGC		Unlikely	Moderate	Medium	Changing the consequence	Undertake stakeholder consultation early on in the project timeline			On Track	Unlikely	Minor	Low								
																			Ensure political stakeholder are kept informed of the project and its progress												
4			X	X				X			Owner/Community objects to the project	* Property accesses impacted, * Project delayed, * Congestion at interchange becomes unacceptable, * Congestion impacts on motorway.	TMR		Possible	Moderate	High	Changing the likelihood & consequence	Ensure early consultation with affected land owners / stakeholders				Unlikely	Minor	Low								

Project Planning & Corridor Management

Risk Register

		TMR Objectives					Service Area (SDS)							Current Rating			Treatment				Residual/ Retained Rating			Net Financial Impact ($)					
Reference Number	Election commitments	Financial implications	Customer at centre of all we do	Fit-for-purpose transport network	Partnering with Govt, Industry, Community	Living One TMR - enabling people	Transport system investment planning and programming	Transport infrastructure management and delivery	Transport safety, regulation and customer service	Passenger transport services	Description	Impacts	Stakeholders	Risk Owner	Likelihood	Consequence	Rating	Treatment Option	Treatment	Treatment Owner	Treatment Due Date	Treatment Status	Likelihood	Consequence	Rating	Best Case	Most Likely Case	Worst Case	Risk review date	BRIEF justification (if applicable) for: - Behind Schedule/ Stalled status - Change to Treatment Due Date	Comments
5		X			X			X			Development constrains future upgrade options	* Restricts / limits available options, * Increase in project costs	TMR, Property Developer		Possible	Moderate	High	Changing the likelihood & consequence	Prepare robust Business Case				Unlikely	Minor	Low							
																			Identify land requirements at early stage of the project												
																			Undertake close evaluation of Development Applications in the area												
8		X			X			X			Environmental / Cultural heritage issues	* Delays to project * Costly mitigation requirements	TMR, Indigenous Community		Unlikely	Moderate	Medium	Changing the consequence	Undertake appropriate studies to identify environmental and cultural heritage issues.				Unlikely	Minor	Low							
																			Consult with indigenous communities throughout the project												

Project Planning & Corridor Management

Risk Register

			TMR Objectives				Service Area (SDS)																										
													Current Rating						Treatment					Residual/ Retained Rating			Net Financial Impact ($)							
Reference Number	Election commitments	Financial implications	Customer at centre of all we do	Fit-for-purpose transport network	Partnering with Govt, Industry, Community	Living One TMR - enabling people	Transport system investment planning and programming	Transport infrastructure management and delivery	Transport safety, regulation and customer service	Passenger transport services	Description	Impacts	Stakeholders	Risk Owner	Likelihood	Consequence	Rating	Treatment Option	Treatment	Treatment Owner	Treatment Due Date	Treatment Status	Likelihood	Consequence	Rating	Best Case	Most Likely Case	Worst Case	Risk review date	BRIEF justification (if applicable) for: - Behind Schedule/ Stalled status - Change to Treatment Due Date	Comments
9		X						X	X		Constructability / Traffic Management	* Increase in project costs, * Increased congestion, * Increased driver frustration, * Long construction period, * Safety issues.	TMR, Business owners, Road users.		Likely	Major	High	Changing the consequence	Undertake robust review of contractor's Traffic Management Plan				Likely	Moderate	High						
10		X						X			Public Utility Plant issues	* Increase in project cost, * Delays to project	TMR, Service authorities		Possible	Moderate	High	Changing the consequence	Undertake robust site investigations (incl. potholing) of PUP, Identify PUP impacts early in the project Carry out design to avoid PUP (where possible) Liaise / negotiate with the service autorities early on in the project				Possible	Minor	Medium						
11		X		X				X	X		Inappropriate option adopted as preferred option	* Delays regarding rework, * Increased departmental costs * Value for money not realised	TMR		Possible	Moderate	High	Changing the likelihood & consequence	Prepare robust Option Analysis and Business Case Ensure appropriate reviews of options is undertaken				Unlikely	Minor	Low						

Technical Note 01

Project: Pacific Motorway M1 Exit 49 **Reference:** MC1609-TN01-v10

Prepared for: Department of Transport and Main Roads

Subject: Aimsun Traffic Modelling

Date: 02 February 2017

1. Introduction

A base year 2016 Aimsun Microsimulation Traffic Model was developed for the Pacific Motorway M1 Exit 49 using the following steps:

- obtain aerial photography of the study area;
- code existing road network using information from the aerial photography;
- extract traffic count data from intersection survey at turning level;
- conduct model calibration (vehicle demands adjustment) using observed traffic count data; and
- carry out trip assignment by assigning the estimated 2016 traffic demand to the road network.

The above steps are illustrated in Figure 1.

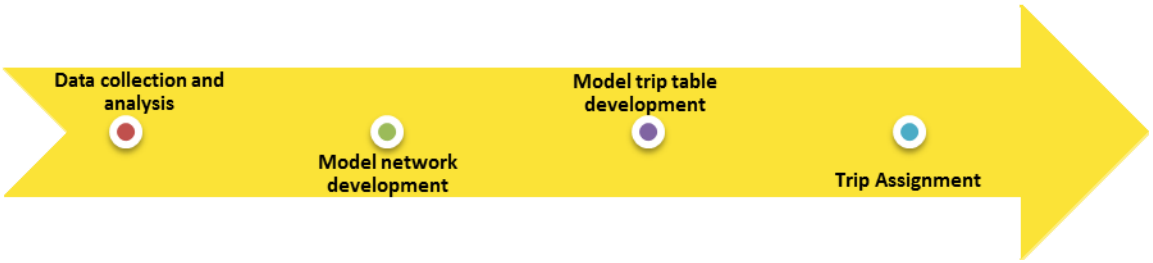


Figure 1 Aimsun Microsimulation Traffic Model Development Process

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1.1.1 Extent

Figure 2 displays the extent of the Aimsun microsimulation traffic model developed for the study. The model contains the north-south interchange intersections for the Pacific Motorway at the Exit 49.

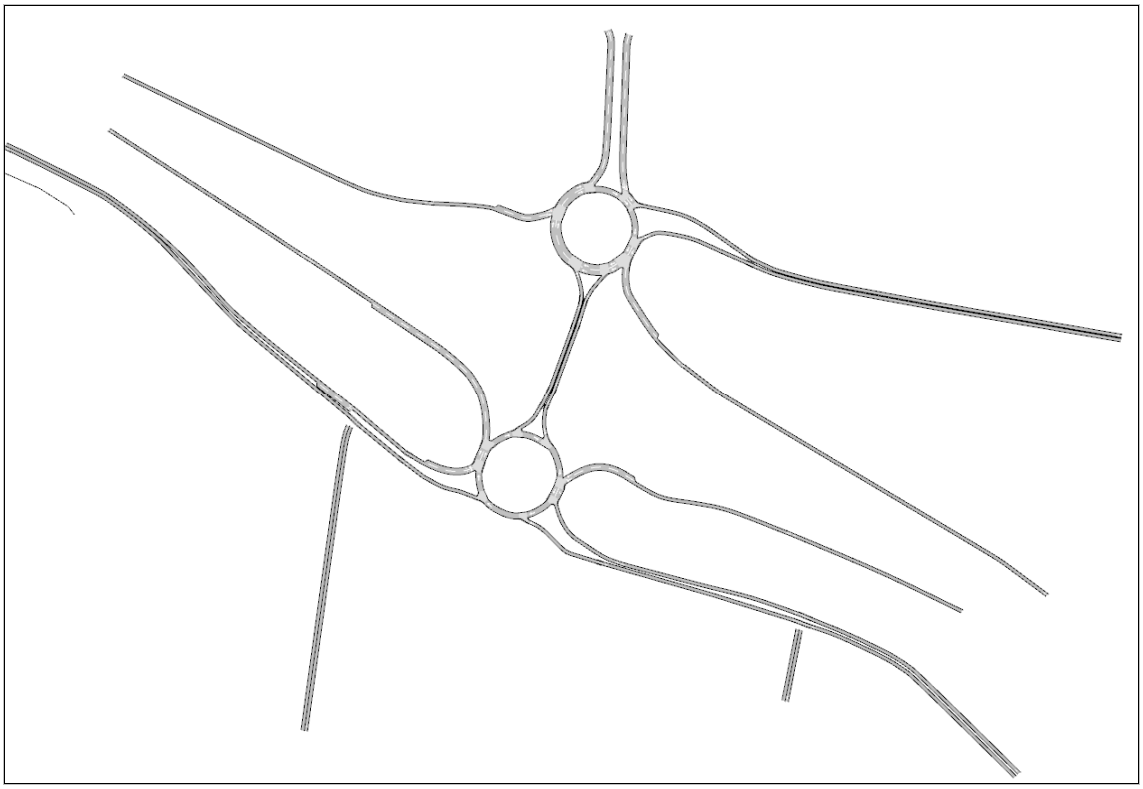

Figure 2 Extent of the Study Area

1.1.2 Version

At time of model development, Aimsun version 8.1.3 (R40087) was used to develop the model as this version has been updated with functionalities that enhance modelling operations. No additional plug-ins or add-ons were used.

1.2 Model Demand Matrices

The Aimsun model has been set up to simulate two time periods:

- AM peak period 0730 to 0930
- PM peak period 1430 to 1730

1.2.1 Origin-Destination Matrices Development

A trip matrix (also referred to as a trip table) is normally in a table format that displays the number of trips going from each origin (table row) to each destination (table column) for a given time period. Trip tables were developed for the two peak periods respectively, with separate trip tables for the two different vehicle classes, i.e. private vehicles and heavy vehicles.

1.2.2 Demand Profile

The demand profile for the peak periods was determined from the traffic count in 15-minute intervals to represent the variation in the traffic flow throughout the simulation period. The observed volumes from traffic counts were converted to percentages to control the amount of vehicles released at each interval in the Aimsun model.

For the purpose of this study, a profile was calculated for each zone to represent the variation based on different surrounding land uses and road users. A separate profile was created for private and heavy vehicles. Figure 3 and Figure 4 show the overall profile distribution in the AM and PM peaks.

The hourly distribution was calculated in the following periods:

- AM Peak – two (2) hours between 0730 and 0930
- PM Peak – three (3) hours between 1430 and 1730

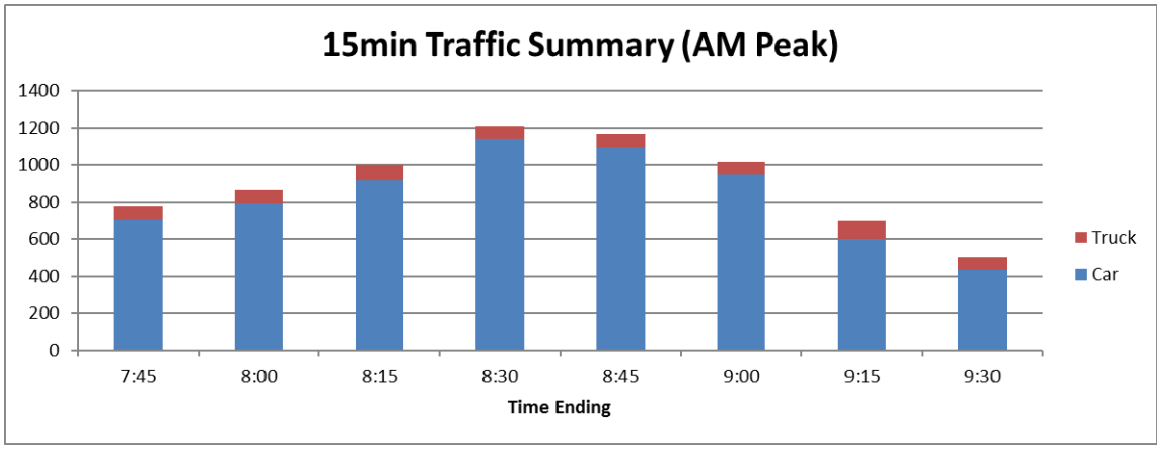

Figure 3 Demand Profile Distribution – AM Peaks

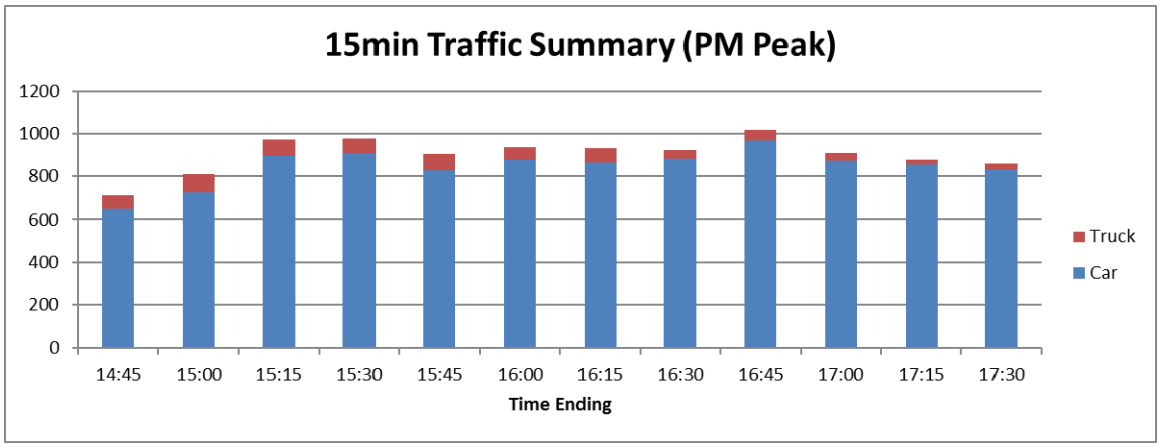

Figure 4 Demand Profile Distribution – PM Peaks

2. Model Calibration and Validation

2.1 Network Calibration

The purpose of calibrating a microsimulation traffic model is to verify that the modelling is a suitably robust representation of the traffic flows on the actual road network. During the calibration process, a few network changes were made to provide a better reflection of the existing traffic conditions.

2.2 Turn Calibration

The GEH statistic is used to quantify the extent of calibration. It is an empirical formula used to compare and gauge the acceptability of variations between two data sets. The GEH statistic was used as a reference to measure the general accuracy of the model and is given by the following equation:

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

where,

- M is the traffic volume estimated by the model (or new count); and
- C is the observed traffic volume (or old count).

The accepted GEH based calibration criteria, as defined by RMS Traffic Modelling Guidelines is shown in Table 1.

Table 1 Calibration Criteria (Ideal)

GEH Value	Proportion
GEH ≤ 5	≥ 85%
5 < GEH < 10	≤ 15%
GEH ≥ 10	0%

Turn calibration was carried out by comparing the outputs from the modelling to existing count data at various locations. The turn calibration is used to ensure the OD trip table was estimated robustly to produce the expected demands to the network.

Table 2 summarises the results for turn calibration for the peak hour in the AM and PM periods. The table shows all GEH values for turn performance are within 5, which indicate the model is calibrated satisfactorily at the zone demand level. The detailed turn calibration results for the AM and PM peaks are provided in Appendix A for further reference.

Table 2 Turn Calibration Summary: Observed vs Modelled Flow and Associated GEH Values

Modelled Time Period	Period	Total Counts	GEH Less than 5	GEN Between 5 and 10	GEH More than 10
AM Peak	0800 to 0900	26	26	0	0
PM Peak	1600 to 1700	26	26	0	0

2.3 Model Validation

Following calibration of a traffic model, further evaluation of the calibrated model's performance is then conducted using an independently observed set of data not used in the calibration process. This second evaluation process is called the model validation and is an additional step to ensure that the calibrated model is robust.

2.3.1 Base Year 2016 Modelled Queues

The demand matrices were factored to 2016 conditions to validate the queuing performance of the Aimsun microsimulation model. Note the intersection turning movement counts were undertaken in June 2014 and the site observations were conducted between September and November 2016.

A typical growth of 1.5% per annum was applied to the demand matrices. In addition, a growth of 150% was applied to the zone linking Attenborough Road as a result of significant growth in residential developments along Attenborough Rd. Figure 5 and Figure 6 show the typical queues in the AM and PM peak conditions.

Figure 5 Modelled Queues for 2016 AM Peak

Figure 6 shows the 2016 base modelled queues in the PM peak.

Figure 6 Modelled Queues for 2016 PM Peak

3. Future Model and Options

Future year 2021 road network and traffic demand were developed to assess the future traffic performance within the modelled area following the calibration and validation of the base year model.

The future year 2021 base network is identical to the base year 2016 within the study area. In addition, one network option is proposed and tested for the westbound off-ramp, namely Option 1, which is shown in Figure 7.

Figure 7 Option 1 Concept Sketch

The development of the future year traffic demand matrices is based on the cordon matrices extracted from the VLC's Zenith Strategic Transport Model (STM). The cordon matrices have same number of zones as the Aimsun microsimulation model.

The 2016 traffic demand matrices were factored using growth rates estimated from the Zenith STM to generate the 2021 traffic demands matrices. A summary of the matrix totals are shown in Table 3. The growth in vehicle trips between 2016 and 2021 is approximately 18% in both AM and PM peak periods.

Table 3 Future Year Matrix Totals (vehicles)

Year	AM Peak (two-hour total)	PM Peak (three-hour total)
2016	4,688	8,375
2021	5,512	9,915

3.1 Models Performance

Table 4 displays the forecast network performance of the AM peak base year 2016 and future year 2021 models. The average travel speed is forecast to drop significantly, from 38.0 kph in 2016 to 21.9 kph in 2021. This indicates the interchange is operating with over-capacity, with extensive queues forecast on Rifle Range Road. Figure 8 shows the queues forecast in the AM peak 2021 base model.

Table 4 AM Peak Models Performance

Scenario	Vehicle-Hours Travelled	Vehicle-Kilometres Travelled	Average Travel Speed (kph)	Vehicles Waiting to Enter the Network
2016 Base	128.9	4,894.1	38.0	0
2021 Base	262.2	5,728.7	21.9	0
2016 Option 1	127.5	4,893.5	38.4	0
2021 Option 1	243.5	5,728.9	23.5	0

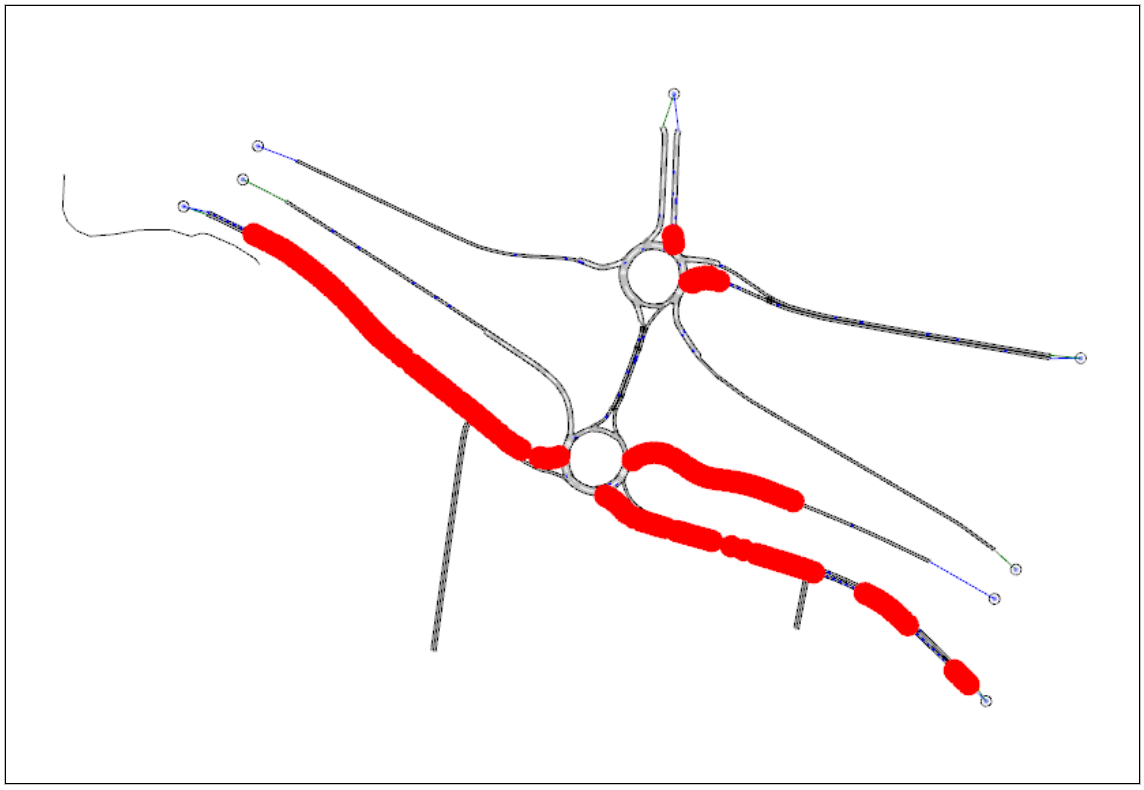

Figure 8 Queues Forecast in the AM Peak 2021 Base Model

Table 5 demonstrates the forecast network performance of the PM peak base year 2016 and future year 2021 models. Similar to the performance in the AM peak, the average travel speed is forecast to drop significantly, from 39.8 kph in 2016 to 23.1 kph in 2021. This indicates the interchange is operating over-capacity. The table also indicates large amount of vehicles unable to access the network due to extensive queues forecast on the Pacific Motorway northbound off-ramp. Without increasing the capacity at the interchange, the queues are forecast to extend back to the motorway and affected the motorway traffic. Figure 9 shows the queues forecast in the PM peak in 2021 base model.

Table 5 PM Peak Models Performance

Scenario	Vehicle-Hours Travelled	Vehicle-Kilometres Travelled	Average Travel Speed (kph)	Vehicles Waiting to Enter the Network
2016 Base	211.9	8,429.5	39.8	0
2021 Base	410.3	9,490.9	23.1	401
2016 Option 1	191.3	8,432.3	44.1	0
2021 Option 1	456.7	9,827.3	21.5	56

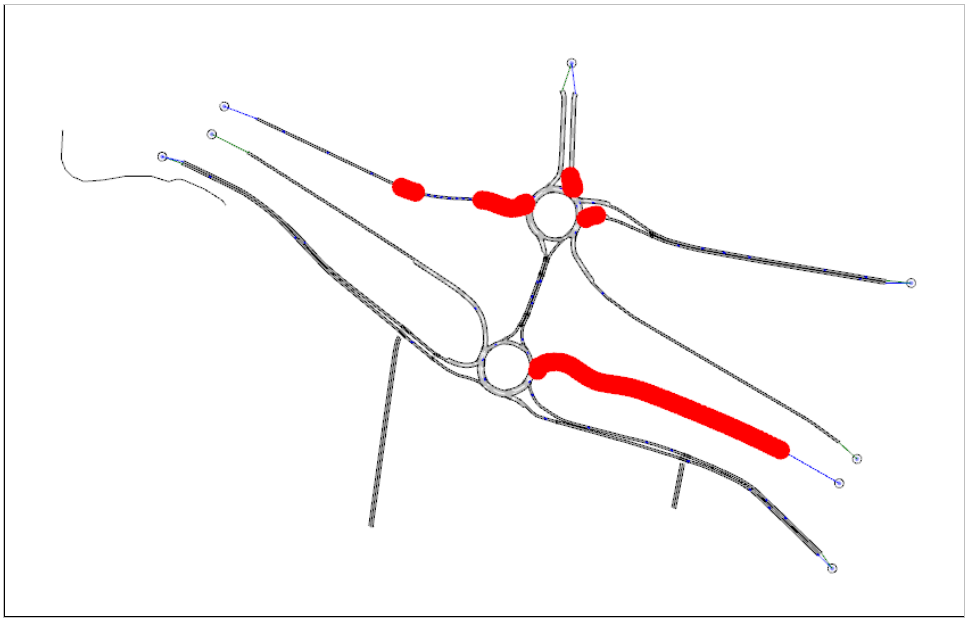

Figure 9 Queues Forecast in the PM Peak 2021 Base Model

Table 4 and Table 5 above show the proposed Option 1 is forecast to improve the traffic performance within the study area. The model forecasts to relieve the extensive queuing issue on the Pacific Motorway northbound off-ramp in the PM peak period. It is noted in the 2021 PM peak period the average travel speed in Option 1 is slower than Base Case (21.5 kph vs. 23.1 kph). This is because there are more vehicles in the Option 1 network, where more vehicles are forecast to enter the interchange from the northbound off-ramp, hence causing extra traffic delays.

3.2 M1 Exit 49 Northbound Off-Ramp Performance

Table 6 summarises the forecast AM traffic performance on the M1 Exit 49 northbound off-ramp. The table indicates the existing northbound off-ramp will be out of capacity by 2021, with an average delays of over 150 seconds.

The proposed Option 1 is forecast to reinstate the traffic performance in 2021 to the same conditions as current year. This indicates the additional storage will provide significant improvements to the northbound off-ramp in the AM peak.

Table 6 M1 Exit 49 Northbound Off-Ramp Performance (AM Peak)

Scenario	Forecast Traffic Volume (vehicles per hour)	Maximum Queues (vehicles)	Average Delays (seconds)	Number of Stops
2016 Base	421	10	42.1	0.94
2021 Base	531	40	150.8	2.41
2016 Option 1	421	5	28.2	0.70
2021 Option 1	549	10	40.7	1.01

Table 7 provides the forecast PM traffic performance on the M1 Exit 49 northbound off-ramp. The table indicate the existing northbound off-ramp is at capacity in 2016, with long queues extending to the motorway. The average delays is forecast to double by 2021, which implies the ramp will be heavily congested.

The model forecasts the proposed Option 1 will operate satisfactory in 2016, but additional upgrades would be required to provide more capacity on the ramp to ensure the traffic perform well in 2021.

Table 7 M1 Exit 49 Northbound Off-Ramp Performance (PM Peak)

Scenario	Forecast Traffic Volume (vehicles per hour)	Maximum Queues (vehicles)	Average Delays (seconds)	Number of Stops
2016 Base	700	24	86.3	1.86
2021 Base	727	49	277.6	4.19
2016 Option 1	702	10	45.8	0.98
2021 Option 1	936	52	225.8	2.83

Appendix A

Intersection	Approach	Turn	AM			PM		
			Observed	Modelled	GEH	Observed	Modelled	GEH
Attenborough Road / Yawalpah Road / Ramps (Northern Interchange)	North	Through	227	228	0.1	193	192	0.1
		On-ramp	194	194	0.0	204	181	1.6
		Left	54	54	0.0	52	50	0.1
	East	Right	54	54	0.0	29	26	0.6
		Left	297	298	0.1	177	175	0.2
		On-ramp	117	117	0.0	114	110	0.4
	South	On-ramp	443	446	0.1	185	184	0.1
		Right	237	240	0.2	168	169	0.1
		Through	302	305	0.2	242	244	0.1
	West	Right	184	186	0.2	456	453	0.1
		On-ramp	0	0	0.0	0	0	0.0
		Through	114	114	0.0	203	194	0.7
		Left	30	30	0.0	39	34	0.9
Attenborough Road / Rifle Range Road / Ramps (Southern Interchange)	North	On-ramp	297	300	0.2	177	180	0.2
		Right	98	99	0.1	132	135	0.3
		Left	310	313	0.2	503	505	0.1
	Off-ramp	Right	336	338	0.1	279	281	0.1
		On-ramp	0	0	0.0	0	0	0.0
		Through	75	75	0.0	109	107	0.2
		Left	14	14	0.0	21	21	0.0
	East	Right	380	381	0.1	190	192	0.1
		On-ramp	207	207	0.0	94	91	0.3
		Through	52	52	0.0	75	74	0.1
	West	Through	90	90	0.0	60	60	0.0
		Left	271	272	0.1	122	125	0.3
		On-ramp	142	142	0.0	74	69	0.6

Technical Note 01

Project:	Pacific Motorway M1 Exit 49	**Reference:**	MC1609-TN01-v11
Prepared for:	Department of Transport and Main Roads		
Subject:	Aimsun Traffic Modelling		
Date:	18 April 2017		

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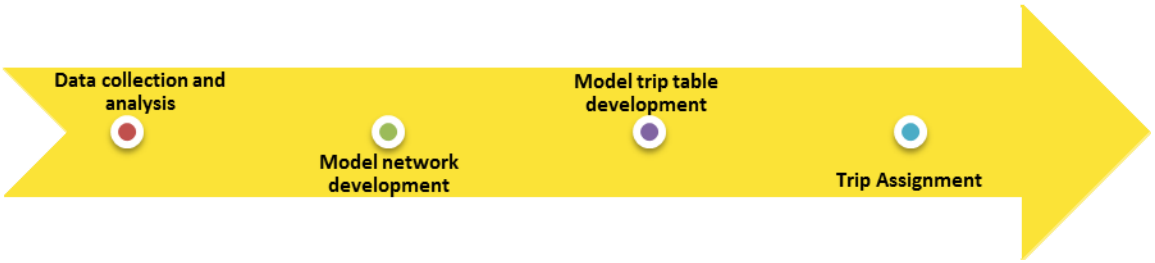

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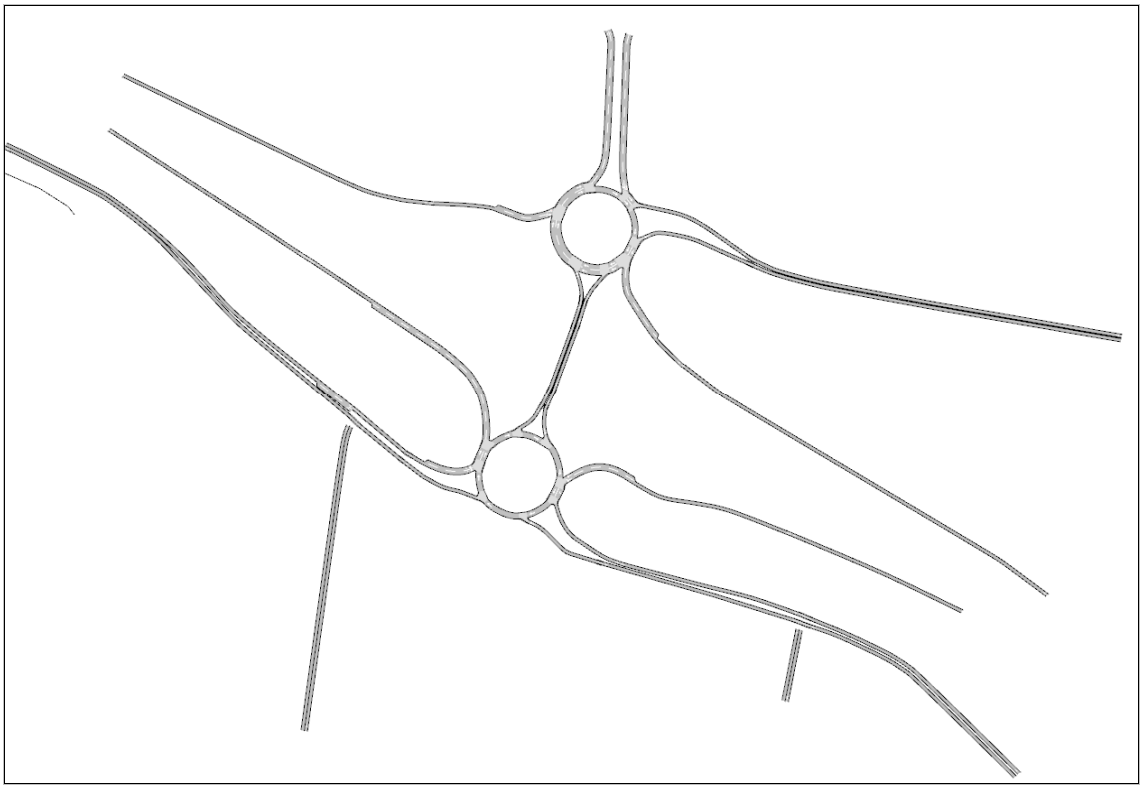

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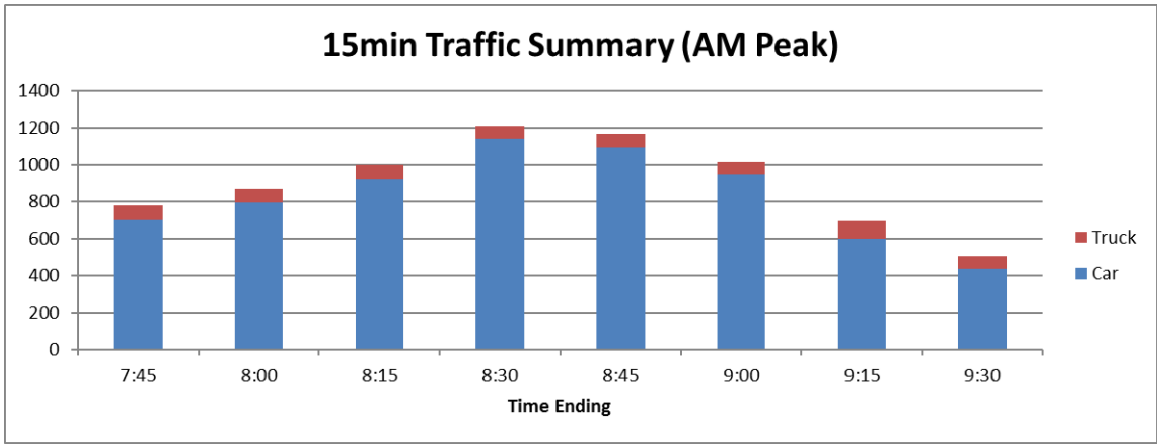
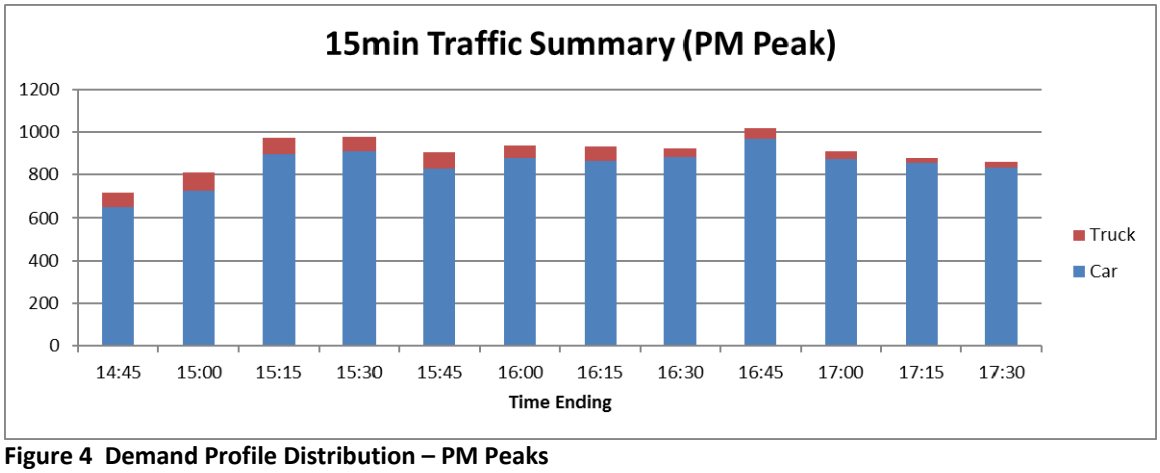


Figure 3 Demand Profile Distribution – AM Peaks



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2.3.1 Base Year 2016 Modelled Queues

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Table 4 displays the forecast network performance of the AM peak base year 2016 and future year 2021 models. The average travel speed is forecast to drop significantly, from 38.0 kph in 2016 to 21.9 kph in 2021. This indicates the interchange is operating with over-capacity, with extensive queues forecast on Rifle Range Road. Figure 8 shows the queues forecast in the AM peak 2021 base model.

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Scenario	Vehicle-Hours Travelled	Vehicle-Kilometres Travelled	Average Travel Speed (kph)	Vehicles Waiting to Enter the Network
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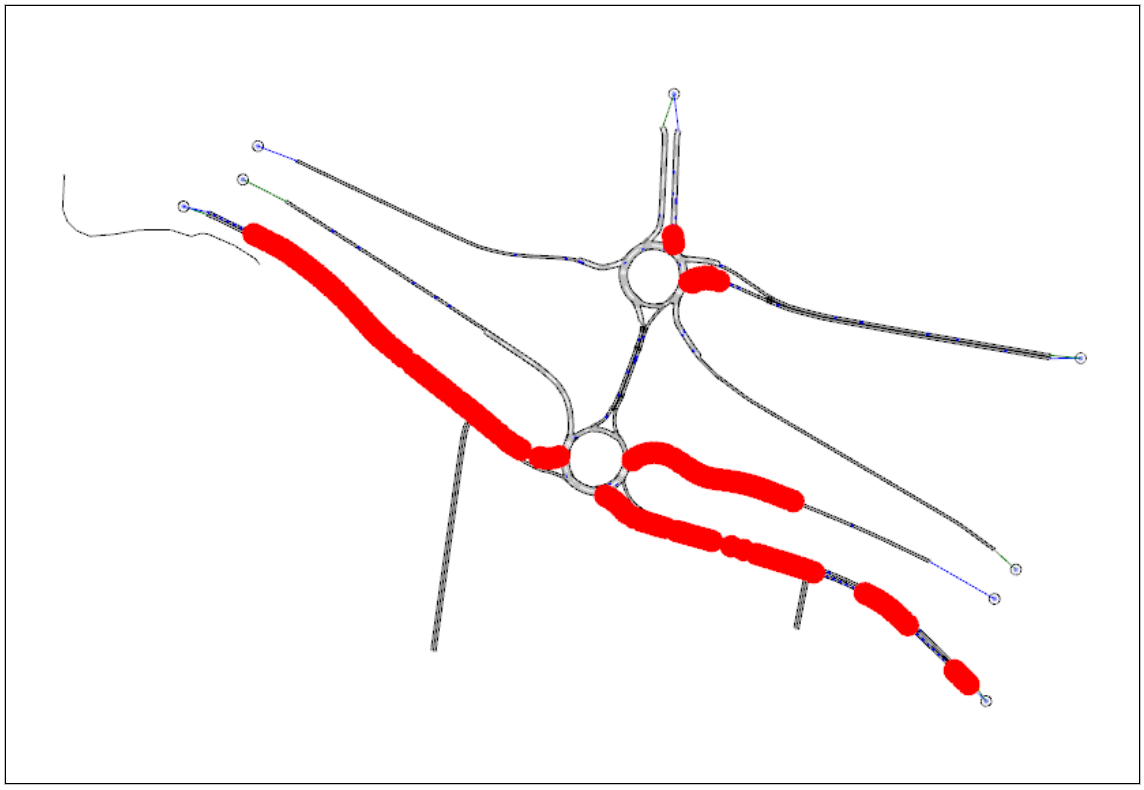

Figure 8 Queues Forecast in the AM Peak 2021 Base Model

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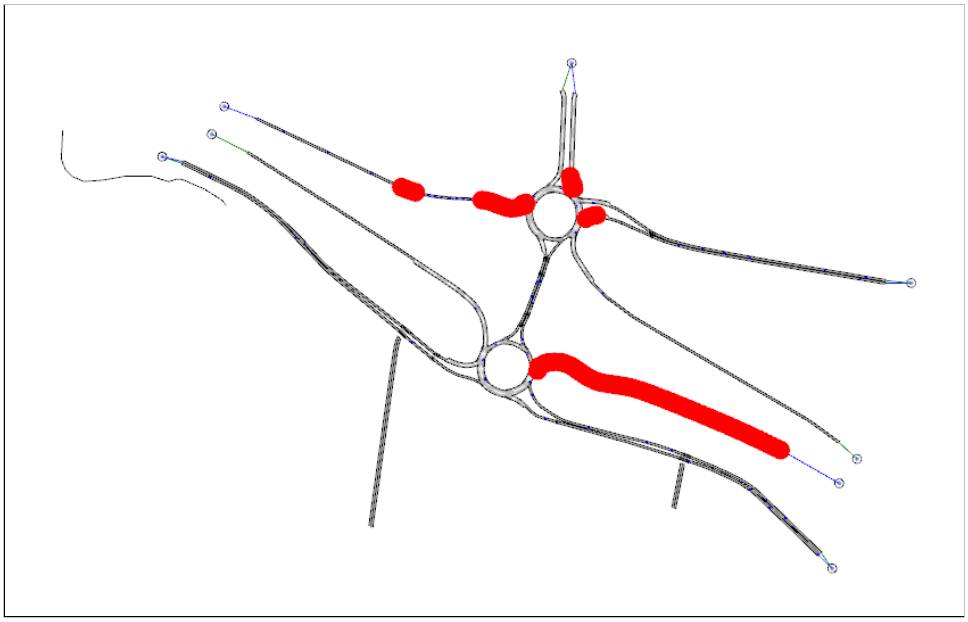

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2021 Base	727	49	277.6	4.19
2016 Option 1	702	10	45.8	0.98
2021 Option 1	936	52	225.8	2.83

3.3 Additional Testings

Two additional tests were undertaken based on the Option 1 above. These testings aim to improve the off-ramp condition with metering signals on the overpass. When the queues on the off-ramp reach the detector location, it will trigger a red phase on the overpass. The choice of 15 and 20 seconds is to ensure that queues on the northbound and southbound carriageways of the overpass will not exceed its capacity.

Figure 10 shows the location of the metering coded on the northbound on-ramp for Option 1A.

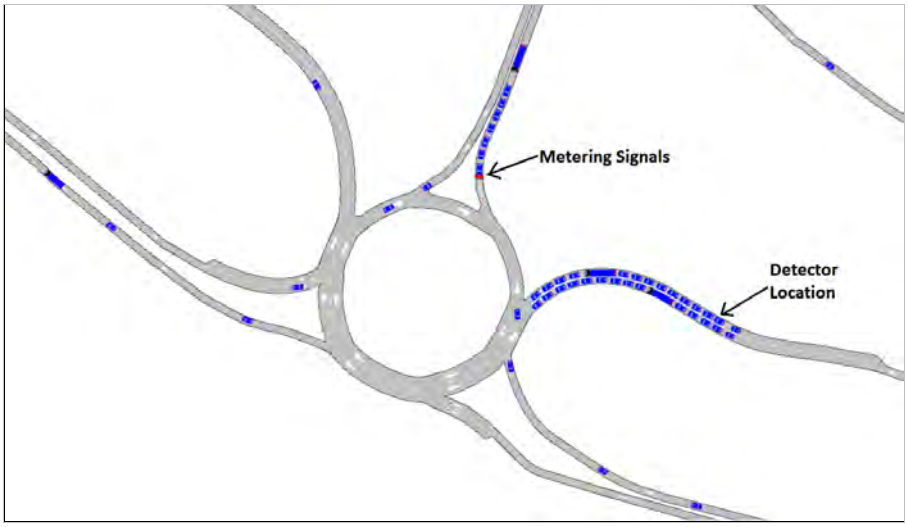

Figure 10 Option 1A Metering Location

Figure 11 shows ramp metering on both northbound and southbound on-ramps for Option 1B.

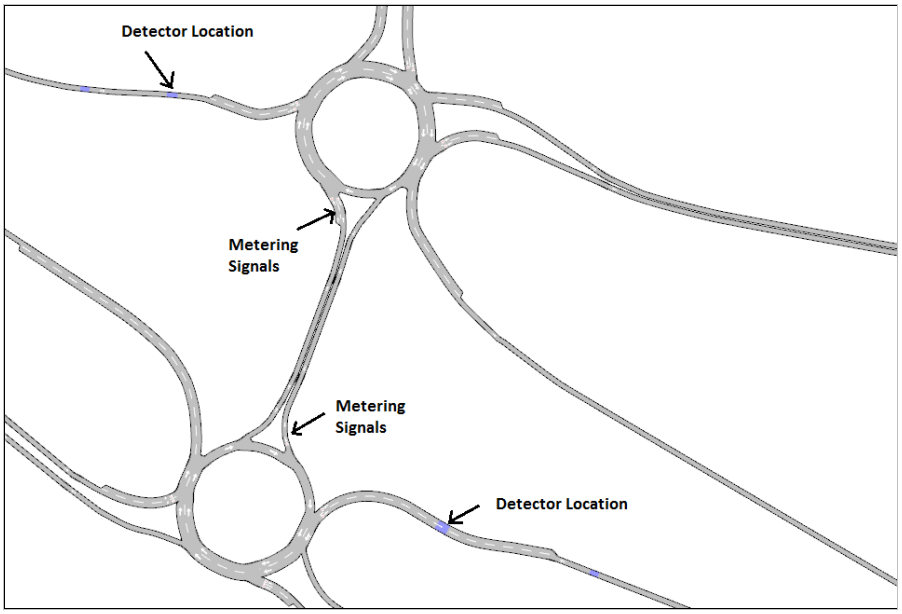

Figure 11 Option 1B Metering Locations

Table 8 summarises the Option 1A PM peak performance of the northbound off-ramp with metering signal on the overpass. The metering signal stops the traffic flow to provide gaps for the queuing vehicles on the off-ramp. The detector to trigger the signals is proposed to locate approximately 70m away from the stopline. The results in this option indicate a significant improvement with the metering signals while the queues on the overpass are still within capacity.

Table 8 Northbound Off-ramp PM Peak Models Performance (Option 1A)

Scenario	Forecast Traffic Volume (vehicles per hour)	Maximum Queues (vehicles)	Average Delays (seconds)	Number of Stops
2016 Metering	712	8	36.8	0.89
2021 Metering	934	10	41.3	1.04

Table 9 summarises the Option 1B PM peak performance of the southbound off-ramp with metering signal on the overpass. The metering signal stops the traffic flow to provide gaps for the queuing vehicles on the off-ramp. The detector to trigger the signals is proposed to locate approximately 90m away from the stopline. The results in this option indicate similar performance to Option 1A, with approximately 1 stop per vehicle on the off-ramp with the metering signals.

Table 9 Southbound Off-ramp PM Peak Models Performance (Option 1B)

Scenario	Forecast Traffic Volume (vehicles per hour)	Maximum Queues (vehicles)	Average Delays (seconds)	Number of Stops
2016 Metering	538	8	46.7	1.01
2021 Metering	629	11	59.0	1.15

Appendix A

Intersection	Approach	Turn	AM			PM		
			Observed	Modelled	GEH	Observed	Modelled	GEH
Attenborough Road / Yawalpah Road / Ramps (Northern Interchange)	North	Through	227	228	0.1	193	192	0.1
		On-ramp	194	194	0.0	204	181	1.6
		Left	54	54	0.0	52	50	0.1
	East	Right	54	54	0.0	29	26	0.6
		Left	297	298	0.1	177	175	0.2
		On-ramp	117	117	0.0	114	110	0.4
	South	On-ramp	443	446	0.1	185	184	0.1
		Right	237	240	0.2	168	169	0.1
		Through	302	305	0.2	242	244	0.1
	West	Right	184	186	0.2	456	453	0.1
		On-ramp	0	0	0.0	0	0	0.0
		Through	114	114	0.0	203	194	0.7
		Left	30	30	0.0	39	34	0.9
Attenborough Road / Rifle Range Road / Ramps (Southern Interchange)	North	On-ramp	297	300	0.2	177	180	0.2
		Right	98	99	0.1	132	135	0.3
		Left	310	313	0.2	503	505	0.1
	Off-ramp	Right	336	338	0.1	279	281	0.1
		On-ramp	0	0	0.0	0	0	0.0
		Through	75	75	0.0	109	107	0.2
		Left	14	14	0.0	21	21	0.0
	East	Right	380	381	0.1	190	192	0.1
		On-ramp	207	207	0.0	94	91	0.3
		Through	52	52	0.0	75	74	0.1
	West	Through	90	90	0.0	60	60	0.0
		Left	271	272	0.1	122	125	0.3
		On-ramp	142	142	0.0	74	69	0.6