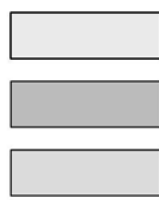


**GENERAL LEGEND**

Existing	Proposed	Description
		Central line and chainage mark
		Cadastral boundary
		Kerb and channel
		Kerb only
		Footpath
		Concrete barrier
		Guardrail - W Beam
		Retaining wall
		Galvanised welded mesh fence
		Tram Track
		Awning
		Dwelling
		Concrete Block/ACO



Proposed Work Extent

Proposed 2.5m Concrete Shared Path

Proposed Driveway

**DRAINAGE LEGEND**

Existing	Proposed	Description
		Drainage pipe
		Access chamber
		Gully pit
		ACO Drain
		ACO Pit
		Private Property Stormwater Connections
		Drainage structure label
		Abandoned/Demolished Drainage Pipe
		Abandoned/Demolished Access Chamber

**SERVICE LEGEND - LONGITUDINAL SECTIONS**

Existing	Proposed	Description
		Electricity aboveground
		Electricity underground
		Telecomms underground
		Telecomms Optical Fibre underground
		Gas Lines underground
		Sewer main underground
		Water main underground

**GENERAL DRAINAGE NOTES**

- All interfaces between existing and proposed pipes and culverts to be joined and matched smoothly.
- All pipes are to be rubber ring jointed.
- Construction of drainage elements are to be in accordance with MRTS03 and relevant standard drawings.
- RCP support shall be in accordance with the 'Drainage Pipe Trench Installation Detail' included on Series No. DD-GD-01, TMR standard drawing 1359 and MRTS03.
- All locations, orientation and levels shall be verified on site before commencing any works.
- Natural surface levels as shown on the drawings are indicative only.
- Any permits or approvals required for construction of permanent or temporary shall be obtained by the Contractor prior to the start of construction.
- Where drainage is to be constructed outside of proposed full depth pavement, proposed pipes shall be backfilled to existing finish surface level in accordance with BSD-2042, BSD-2043, MRTS03, MRTS04, MRTS05 and MRTS30.
- Temporary bracing, propping etc. to drainage pipes, culverts and structures may be required during construction. Structures shall be maintained in a stable position and no part shall be overstressed during construction.
- Precast and proprietary products are to be installed as per TMR specifications, drawings and manufacturers requirements.
- For pavement and subsoil drains refer Series No. PD-01 to PD-07.
- All access chambers to be constructed within roadways shall have bolt down covers.
- Where existing culverts are to be removed from service but not demolished the ends shall be plugged in accordance with MRTS03.
- For services legend refer Series No. PU-NL-01.
- For ITS legend refer Series No. IT-NL-01.

**PRIVATE PROPERTY STORMWATER CONNECTIONS**

- All existing private property stormwater connections are to be identified during the drainage investigation and modified as part of the works to suit new verge and road levels.
- Where possible existing private property stormwater connections are to be modified such that they outlet to existing and proposed gully pits in accordance with Brisbane City Council Standard Drawing BSD-8114 and BSD-8051.
- Connections to the proposed kerb and channel are to be constructed in accordance with Brisbane City Council Standard Drawing BSD-8114.
- Connections to the proposed trench (drainage) systems are to be constructed in accordance with Brisbane City Council Standard Drawing BSD-8114 with trench drainage connections to manufacturers requirements.

**SERVICES**

- Where services are impacted by the construction of the proposed drainage design, the Contractor shall comply with all the requirements of third party authorities in accordance with PSSS01.
- For details of site PUP refer to the Combined Services and Pothole Layout Drawings.

**STRUCTURE MODIFICATION**

- Modification of existing access chambers are to include the removal of the existing cover, frame, collar, chamber walls (where chamber cannot meet depth requirements) and roof slab and replaced in accordance with TMR standard drawings SD1307, SD1308 or BCC standard drawings BSD-8021 and BSD-8023 where appropriate. The Principal Contractor shall submit to the Administrator the proposed standard drawing treatment to be applied for approval.
- Modification of existing gully pits are to include the removal of the existing intel, gate, frame, walls (where required) and replaced in accordance with TMR standard drawings SD1311 and SD1312 or BCC standard drawings BSD-8051 and BSD-8052 where appropriate. The Principal Contractor shall submit to the Administrator the proposed standard applied for approval.
- Following the removal of elements of existing drainage structure they are to be inspected by the Designer to confirm the original structure is in a suitable condition for modification.
- Details of proposed structural modifications are to be confirmed with the Administrator and included following the completion of the drainage survey, condition assessment and mapping (PSSS02).
- If existing structures display structural damage, defect or degradation the Administrator is to be immediately notified, prior to performing any works.

**DRAINAGE INVESTIGATION AND DESIGN CONFIRMATION**

- For details of the required survey, condition assessments and mapping activities to be completed by the Principal Contractor, refer to MRTS03.1 and PSSS02.
- For details and requirements of the design confirmation activities to be undertaken by the Administrator and the Designer refer to MRTS03.1 and PSSS02.
- The location and depth of all services in proximity to the proposed drainage design must be ground proved/confirmed (potholes) prior to construction of any drainage network in accordance with PSSS01. Minimum clearances to PUP shall be in accordance with the dimensions identified in the 'Minimum clearances between design drainage and existing PUP' table below. Site determined clearances between design drainage and existing PUP shall be assessed using the ground proving data by the Principal Contractor in accordance with PSSS01. Where a clearances does not meet the minimum requirements, it shall be provided to the Administrator for assessment.

**MINIMUM CLEARANCES BETWEEN DESIGN DRAINAGE AND EXISTING PUP**

Public Utility Authority (PUA)	Asset	Horizontal Clearance to Drainage Pipe (m)	Horizontal Clearance to Drainage Structure (m)	Vertical Clearance to Drainage Pipe (m)
APA	MP Gas	0.3	0.3	0.15
	LV Electrical	0.3	0.15	0.15
BCC/TMR	Communications	0.3	0.15	0.15
	LV and HV Electrical	0.5	0.5	0.15
Energex	Poles	0.5	0.5	-
	Communications	0.3	0.3	0.15
QUU	Water (<DN200)	0.3	0.15	0.3
	Water (>DN200)	0.6	0.3	0.3
	Sewer (<DN200)	0.3	0.3	0.3
	Sewer (>DN200)	0.6	0.3	0.3

**WARNING AND DISCLAIMER  
BEWARE OF UNDERGROUND SERVICES**

The information provided in these drawings relating to the positions of underground services is intended to be only a guide to existing and proposed service locations. Aurecon does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, whilst the best endeavours have been made to identify services through liaison with service authorities and site investigation, services may exist of which Aurecon is unaware. The information provided should therefore not be solely relied upon and exact positions of services should be verified by hand excavation. Furthermore, Aurecon disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services. All works carried out that may potentially impact or other service authorities plant must comply with any restrictions imposed by that authority. It is recommended that appropriate contact and confirmation of all necessary works be obtained before commencement of any excavation.

**WARNING AND DISCLAIMER  
ASBESTOS CONTAINING MATERIALS IDENTIFIED WITHIN SITE EXTENTS**

Asbestos containing materials have been identified in a number of existing underground services throughout the site. The information provided in these drawings relating to the identification of asbestos is intended to be only a guide. Aurecon does not warrant or represent that the identification of asbestos containing materials shown on the drawings are accurate. Furthermore, whilst the best endeavours have been made to identify asbestos containing materials through liaison with service authorities and site investigation, some may exist of which Aurecon is unaware. The information provided should therefore not be solely relied upon and exact positions of asbestos containing materials should be verified on site using appropriate techniques. Furthermore, Aurecon disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services. The Principal Contractor shall follow all relevant codes of practice when working around or with asbestos containing materials and must comply with the requirements outlined with MRTS95 - Management and Removal of Asbestos.

Last Modified: Oct 08, 2021 - 4:04pm REFS: Y-504050-0000-GEN-DWG-INT-001

Revisions/Descriptions	Certification	Date	Microfilm
D Notes Updated	A.Sami	08/10/21	
C Notes Updated	A.Sami	01/10/21	
B Note Updated / Services Layers Added	A.Sami	17/09/21	
A Issued For Construction			

Associated Job Nos	Survey Data	Scopes
	Datum: GDA94	
Auxiliary Drg Nos	Horiz. Grid: BCSG02	
	Height Origin: AHD Derived	
	Survey Books: MR102029 MR101327	Dimensions shown in meters except where shown otherwise

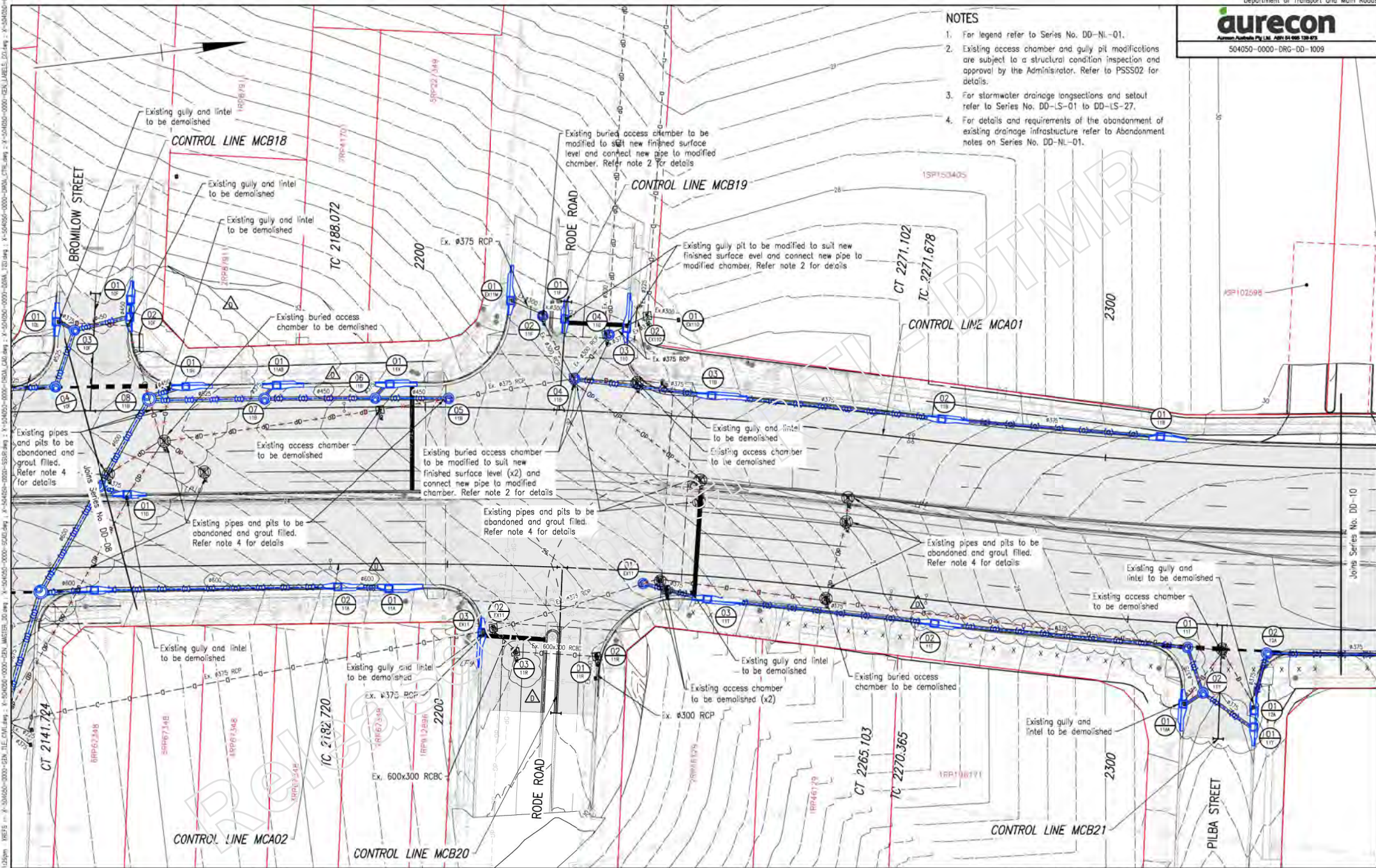
BRISBANE CITY GYMPIE ARTERIAL ROAD CTL CHGE SADLER STREET TO HAMILTON ROAD				
Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
U14/1	0.69	2.41	1.49	U14/6
Through Chainage from INT U14/019				

NORTHERN TRANSITWAY DRAINAGE NOTES AND LEGEND		ENGINEERING CERTIFICATION (RPEC)	
Drawn	ENG. AREA	NAME	SIGNATURE
NR	Civil	NR	AS (504050-0000-REG-U-0008)
Designed			
NR			

Queensland Government	
Job No.	728940
Contract No.	CN-12205
Drawing No.	832627 1D
Series Number	DD-NL-01 of 01
	MRR Detail (02/14)

**NOTES**

1. For legend refer to Series No. DD-NL-01.
2. Existing access chamber and gully pit modifications are subject to a structural condition inspection and approval by the Administrator. Refer to PSS02 for details.
3. For stormwater drainage longsections and setout refer to Series No. DD-LS-01 to DD-LS-27.
4. For details and requirements of the abandonment of existing drainage infrastructure refer to Abandonment notes on Series No. DD-NL-01.



Associated Job Nos	Survey Data	Scales
	Datum: GDA94	0 2 4 6 8 10m
Auxiliary Org Nos	Horiz. Grid: BCSG02	
	Height Origin: AHD Derived	
	Survey Books: MR102029, MR101327	Dimensions shown in meters except where shown otherwise

BRISBANE CITY				
GYMPIE ARTERIAL ROAD				
CTL CHGE SADLER STREET TO HAMILTON ROAD				
Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
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Through Change from 'NT U14/019				

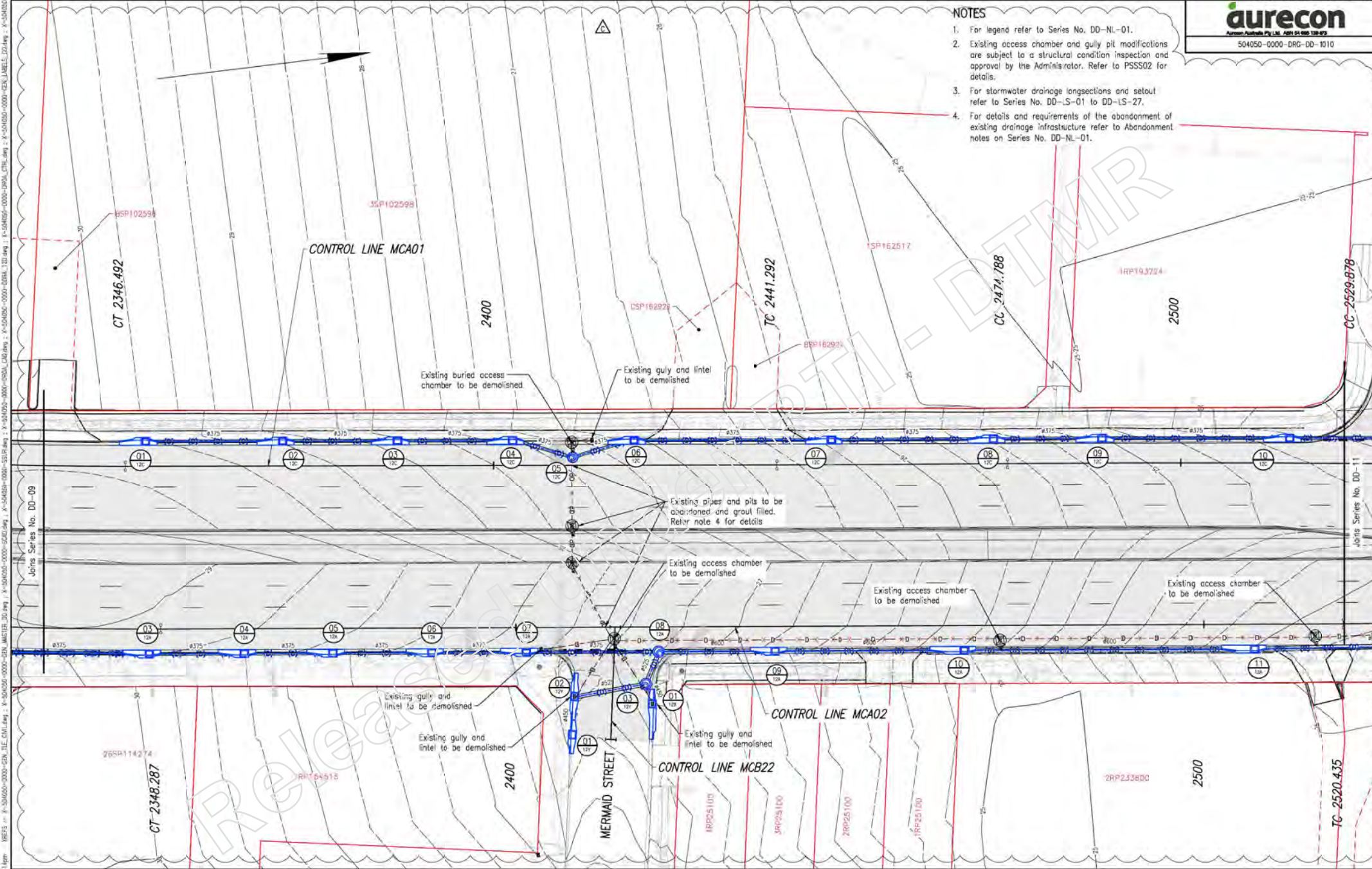
NORTHERN TRANSITWAY DRAINAGE LAYOUT SHEET 9				
Drawn	ENG. AREA	NAME	ENGINEERING CERTIFICATION (RPEQ)	NO. DATE
NR	Civil		A.S (504050-0000-REG-U-0008)	14427 19/02/23
Designed				
NR				

**Queensland Government**

Job No. 728940  
Contract No. CN-12205  
Drawing No. 832636 1D  
Series Number DC-09 of 13  
MRB Date: 02/21/23

**NOTES**

1. For legend refer to Series No. DD-NL-01.
2. Existing access chamber and gully pit modifications are subject to a structural condition inspection and approval by the Administrator. Refer to PSSS02 for details.
3. For stormwater drainage longsections and setout refer to Series No. DD-LS-01 to DD-LS-27.
4. For details and requirements of the abandonment of existing drainage infrastructure refer to Abandonment notes on Series No. DD-NL-01.



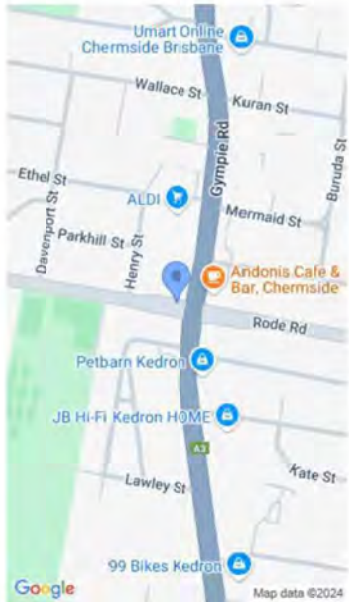
Design Update (RF1-199 & 249)	A.Sami 14427	11/10/22
Catchment Four Updated	A.Sami 14427	04/03/22
Issued For Construction		
Revisions/Descriptions	Certification	Date
		Microfilm

Associated Job Nos	Survey Data	Scales
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Auxiliary Org Nos	Horiz. Grid: BCSG02	
	Height Origin: AHD Derived	
	Survey Books: MR102029, MR101327	Dimensions shown in meters except where shown otherwise

<b>BRISBANE CITY</b>				
<b>GYMPIE ARTERIAL ROAD</b>				
<b>CTL CHGE SADLIER STREET TO HAMILTON ROAD</b>				
Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
U14/1	0.69	2.41	1.49	U14/6
Through Chance from INT U14/019				

<b>NORTHERN TRANSITWAY DRAINAGE LAYOUT SHEET 10</b>	
Drawn	ENGINEERING CERTIFICATION (RPCO)
NR	NAME: A.S (504050-0000-REG-U-0008)
Designed	SIGNATURE: A.S (504050-0000-REG-U-0008)
NR	NO. DATE: 14427 19/02/21

Job No.	728940
Contract No.	CN-12205
Drawing No.	832637 1C
Series Number	DC-10 of 13
	MRR Detail (02/214)



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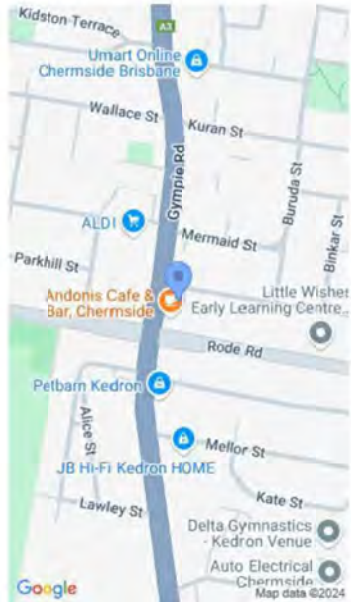
Tags: Drainage, Earthworks, Safety, HAZARD  
Section 5 Northbound

Description: TAB 02 to 01/11A Pole grab x 1  
Ex x 1 Lab x 5 Trucks x 2

Comments:



Jul 5, 2023  
10:40 PM UTC +10:00  
TAB 02 to 01/11A  
Pole g...  
Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 05 July 2023, 10:41:18 pm

Tags: Drainage,Earthworks,Safety,HAZARD

Section 5 Northbound

Description: TAB 02 to 01/11A drainage works

Comments:



Jul 5, 2023  
10:41 PM UTC +10:00  
TAB 02 to 01/11A draina...  
Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 07 July 2023, 2:17:24 am

Tags: Drainage, Concrete Section 5 Northbound

Description: 01/11B prepour base inspection

Comments:



Jul 7, 2023  
2:17 AM UTC +10:00  
01/11B prepour base ins...  
Ranbury  
21024 - Northern Transi...



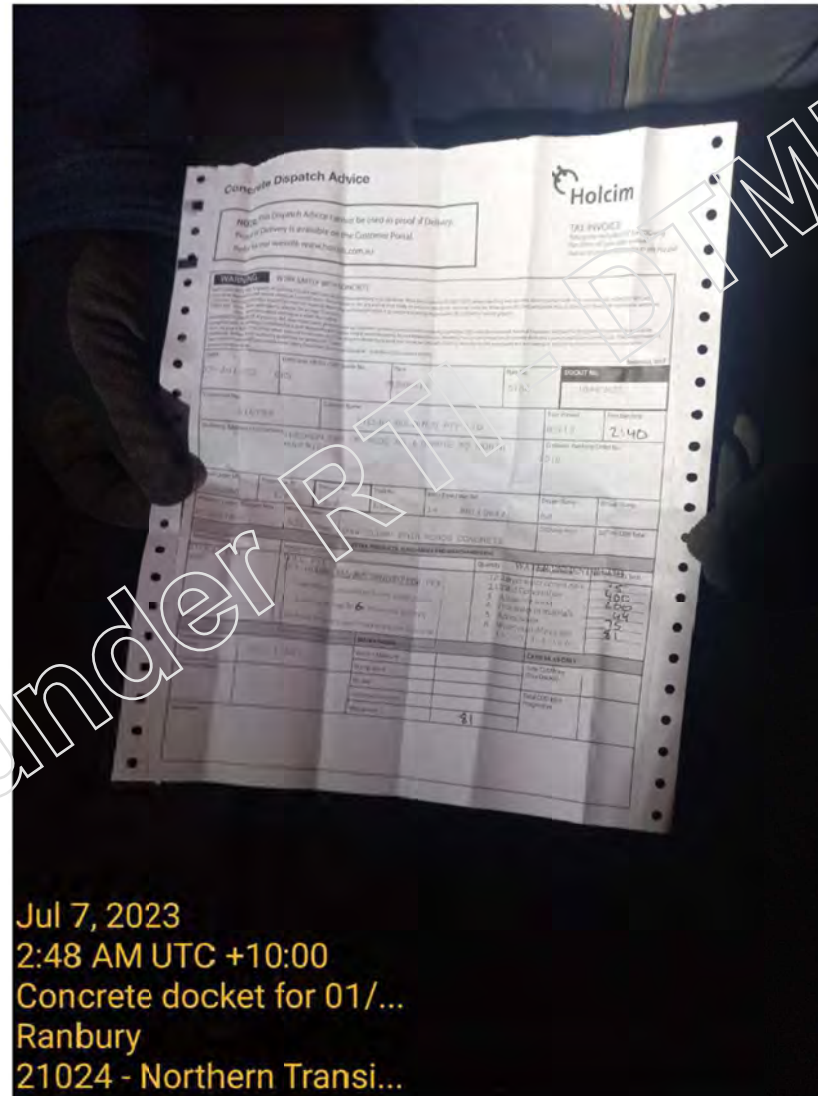
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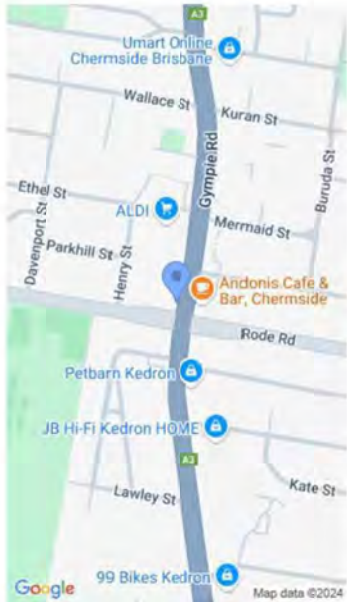
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 Northbound

Description: Concrete docket for 01/11B  
 slump test 70

Comments:

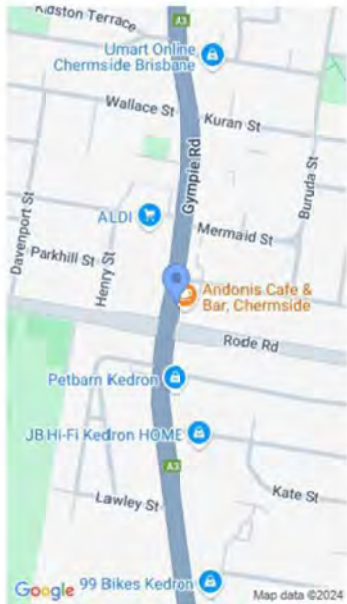


Jul 7, 2023  
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 Concrete docket for 01/...  
 Ranbury  
 21024 - Northern Transi...



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Description: 01/11B form up walls  
Comments:

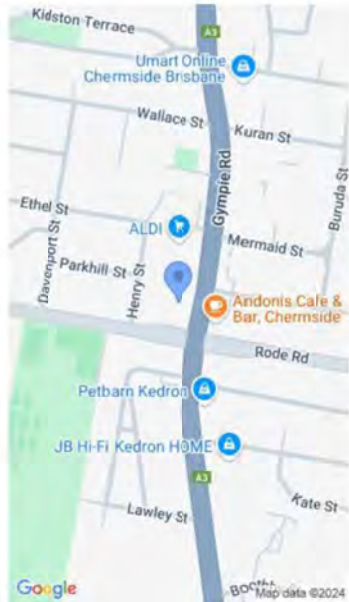




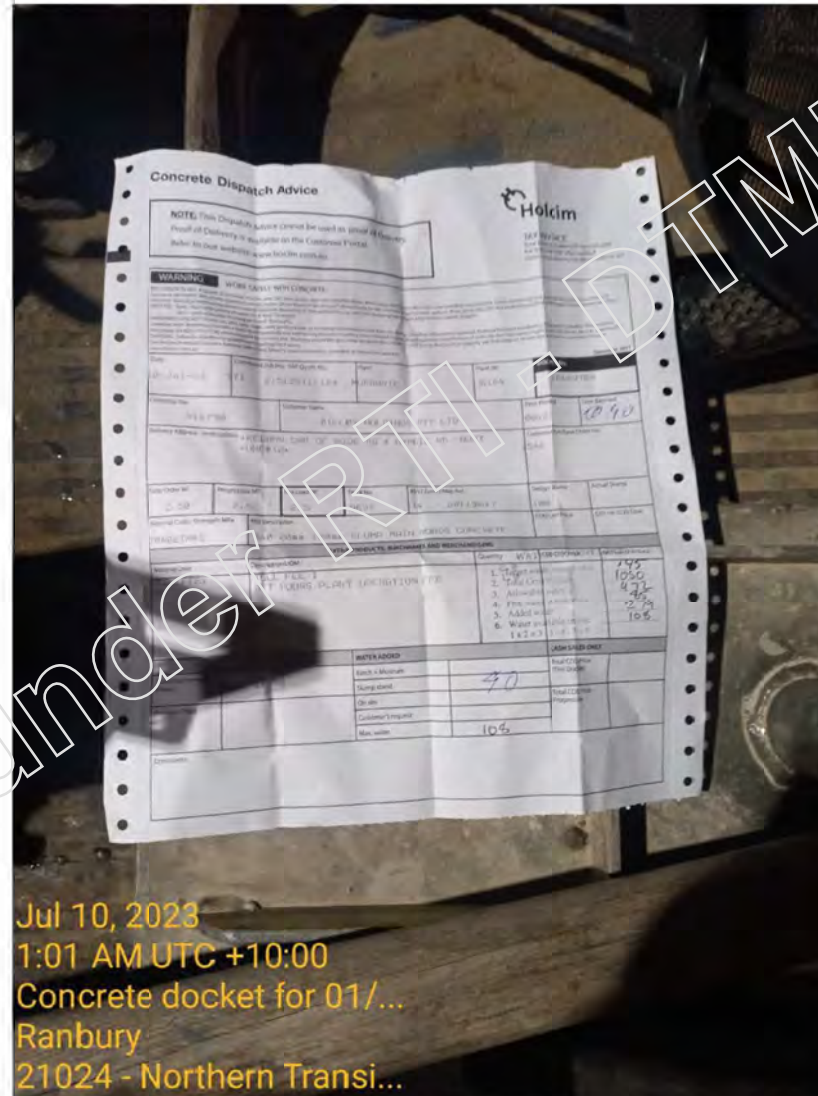
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Northbound  
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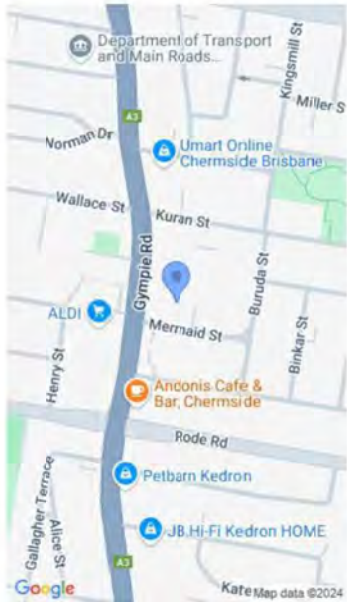


Jul 10, 2023  
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01/11B prepour inspecti...  
Ranbury  
21024 - Northern Transl...



Captured by: NR  
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 Northbound  
 Description: Concrete docket for 01/11B  
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 Comments:





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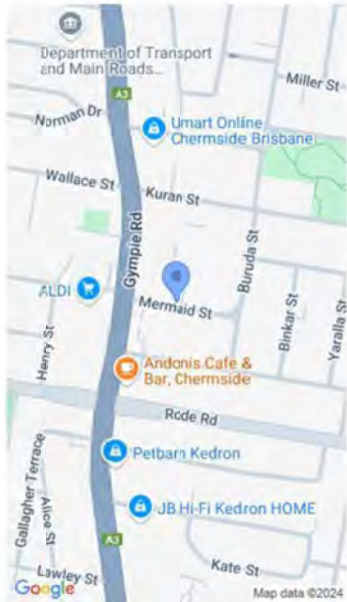
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Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: 01/11Y pre pour inspection

Comments:





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Tags: Drainage, Concrete Section 5 Local Road, Southbound  
Description: Concrete placement 01/11Y  
Comments:



Jul 20, 2023  
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Concrete placement 01/1...  
Ranbury  
21024 - Northern Transi...



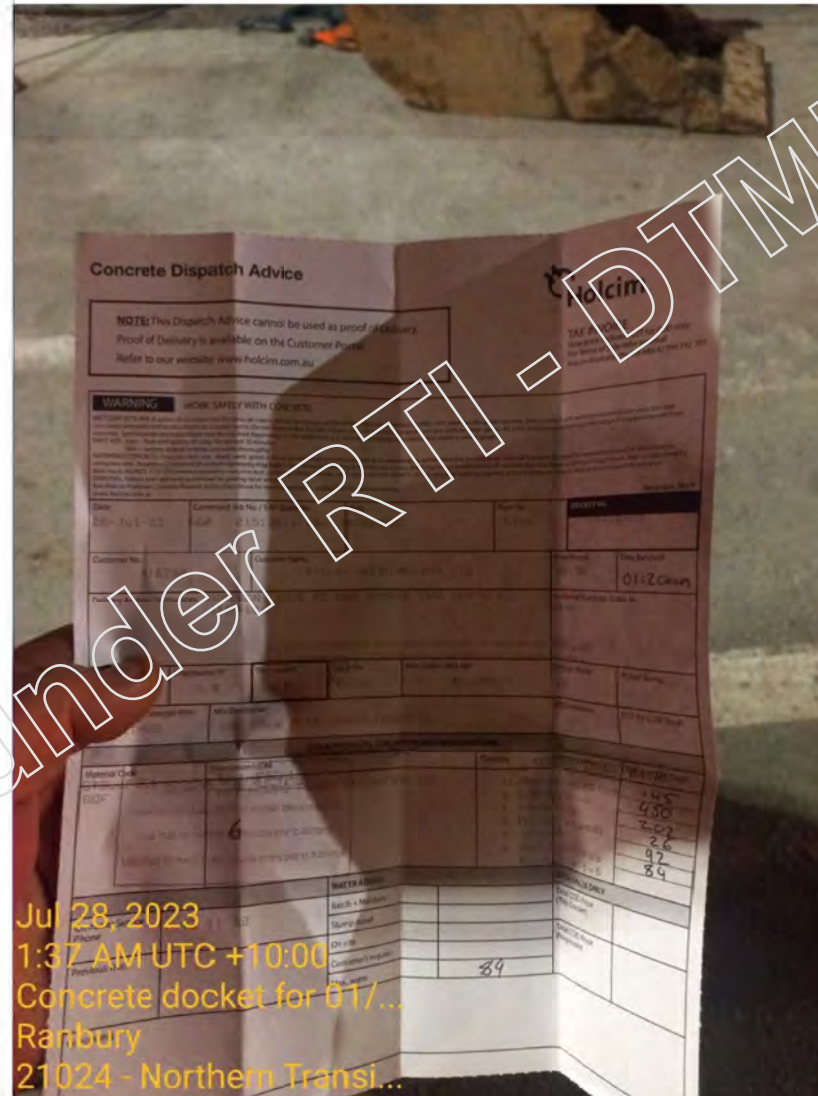
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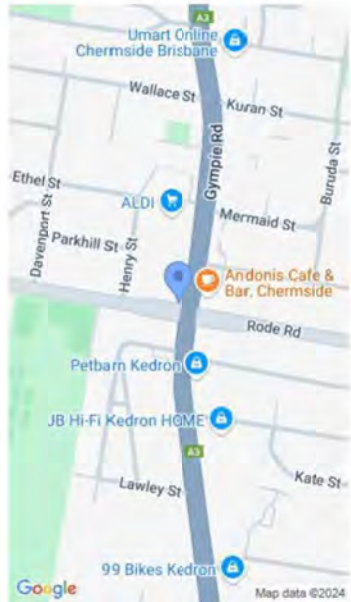
Tags: Drainage, Concrete Section 4, Section 5 Northbound

Description: Concrete docket for 02/11B and 01/11AB

Comments:



Jul 28, 2023  
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 Ranbury  
 21024 - Northern Transi...



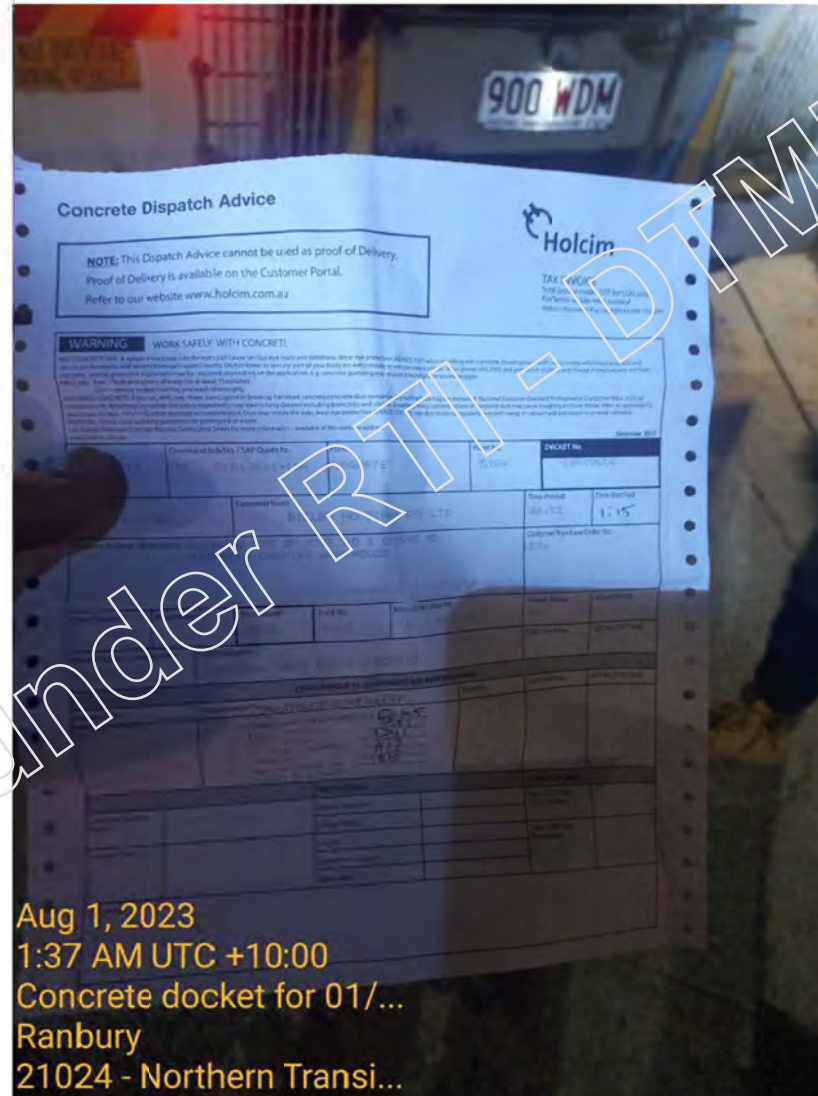
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Captured on: 01 August 2023, 1:37:30 am

Tags: Drainage, Concrete Section 4, Section 5 Southbound, Northbound, Median

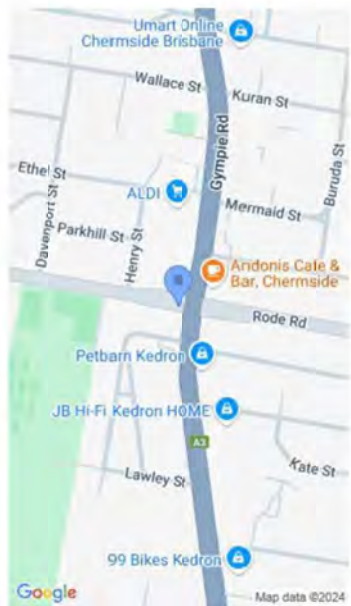
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Comments:

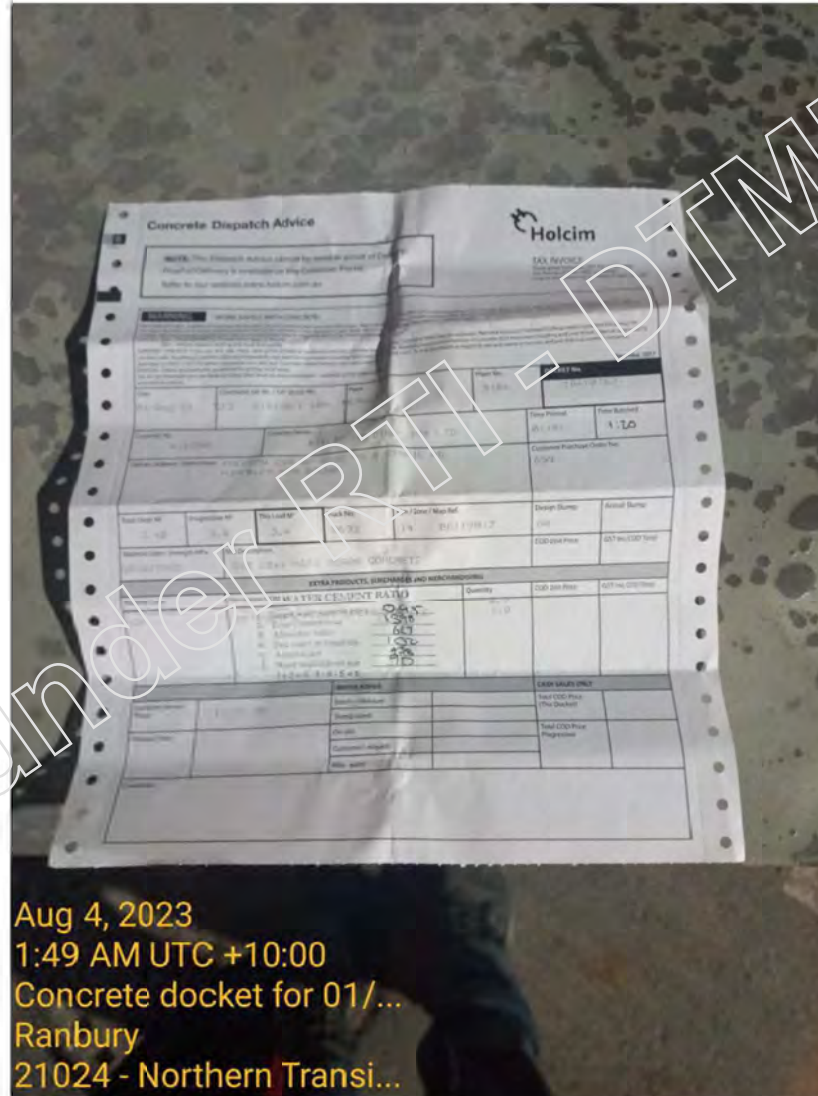


Aug 1, 2023  
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 Ranbury  
 21024 - Northern Transi...

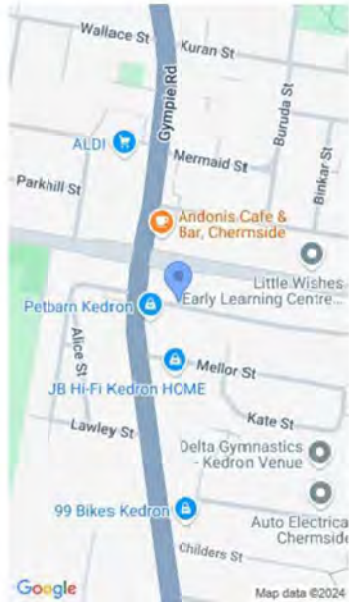
Released under RTI-DTMR



Captured by:   
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 Northbound, Southbound, Local  
 Road, Intersection  
 Description: Concrete docket for 01/11X  
 and 03/11T  
 Comments:



Aug 4, 2023  
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 Ranbury  
 21024 - Northern Transi...



Captured by: NR

Captured on: 21 August 2023, 2:37:08 pm

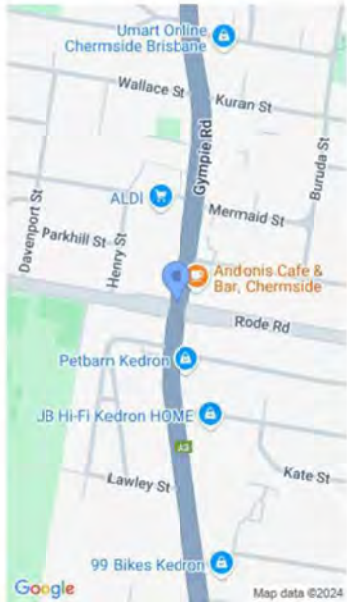
Tags: Drainage Section 5 Local Road, Northbound, Intersection

Description: 01/11B lintel landing

Comments:



Aug 21, 2023  
2:37 PM UTC +10:00  
01/11B lintel landing  
Ranbury  
21024 - Northern Transi...



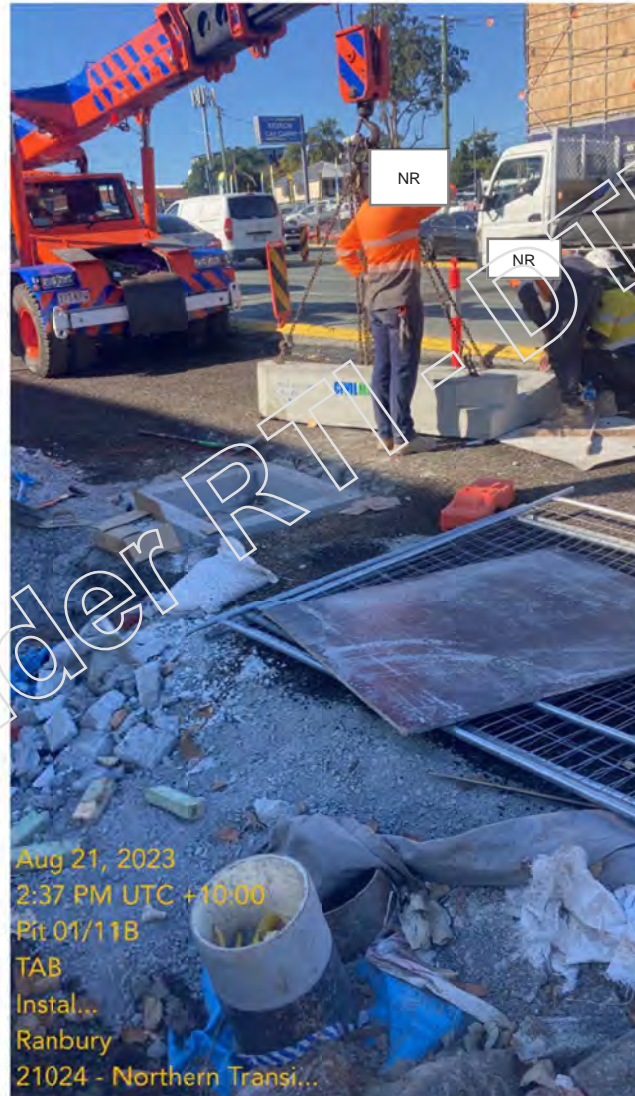
Captured by:

Captured on: 21 August 2023, 2:37:57 pm

Tags: Drainage Section 5 Northbound, Local Road, Footpath

Description: Pit 01/11B TAB Install lintel

Comments:



No GPS information available

Captured by:

Captured on: 22 August 2023, 12:32:54 am

Tags: Concrete, Drainage Section 5 Northbound

Description: Section 5 Northbound, Concrete pour for Pit extension 01/11B 1st concrete truck batched out of time. Batched at 11.55, onsite test for 1am, sent back

Comments:



No GPS information available

Captured by:

Captured on: 22 August 2023, 12:32:54 am

Tags: Concrete, Drainage Section 5 Northbound

Description: Section 5 Northbound, Concrete pour for Pit extension 01/11B 1st concrete truck batched out of time. Batched at 11.55, onsite test for 1am, sent back

Comments:



No GPS information available

Captured by:

Captured on: 22 August 2023, 2:17:34 am

Tags: Concrete, Drainage, Rework Section 5 Northbound

Description: Section 5 Northbound, Concrete pour for Pit extension 01/11B

Comments:



No GPS information available

Captured by:

Captured on: 22 August 2023, 2:17:34 am

Tags: Concrete, Drainage, Rework Section 5 Northbound

Description: Section 5 Northbound, Concrete pour for Pit extension 01/11B

Comments:





Captured by:

Captured on: 22 August 2023, 8:47:11 am

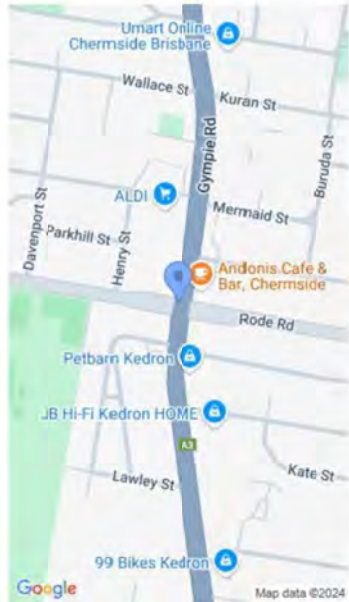
Tags: Drainage, Concrete, Defect, Rework  
Section 5 Northbound

Description: 01/11B pit rectification

Comments:



Aug 22, 2023  
8:47:11 AM UTC +10:00  
01/11B pit rectificatio...  
Ranbury  
21024 - Northern Transi...



Captured by: NR

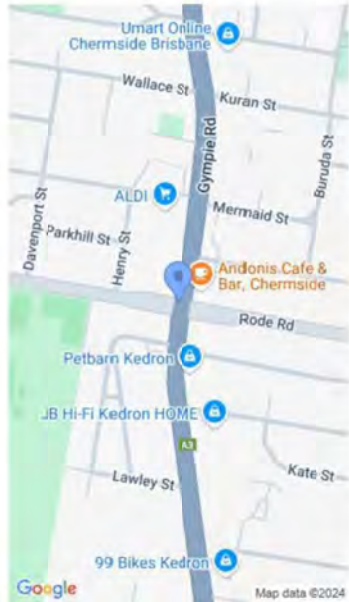
Captured on: 22 August 2023, 8:54:06 am

Tags: Drainage, Defect Section 5  
Northbound, Local Road

Description: Bielbys Pits / lintels 01/11B, 02/11B where re set by TAB yesterday correctly, but night shift has gone and out mortar around the outside of the lintels again

Comments:





Captured by:

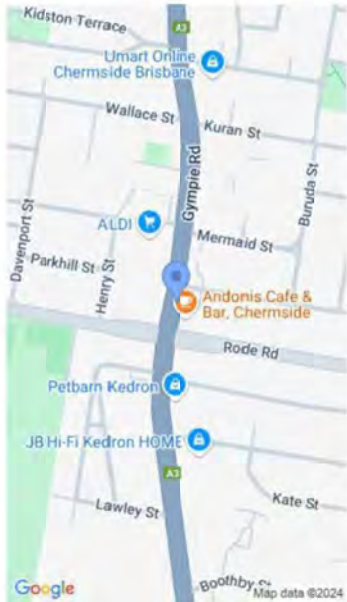
Captured on: 22 August 2023, 8:54:35 am

Tags: Drainage, Defect, Rework Section 5 Northbound, Local Road

Description: Bielbys Pits / lintels 01/11B, 02/11B where re set by TAB yesterday correctly, but night shift has gone and out mortar around the outside of the lintels again

Comments:





Captured by: NR

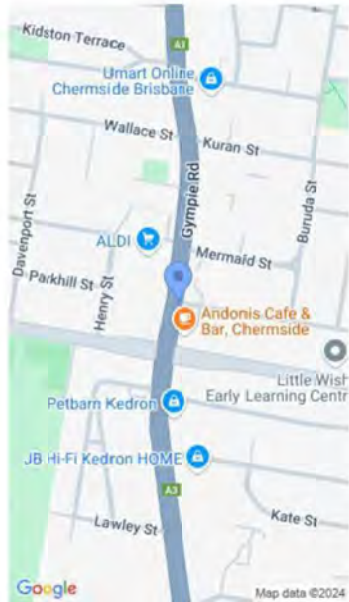
Captured on: 23 August 2023, 9:46:54 am

Tags: Drainage, Earthworks Section 5 Local Road, Southbound

Description: Carmans drainage at 01/11T

Comments:





Captured by:

NR

Captured on: 23 August 2023, 3:25:29 pm

Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: 01/11T prepour inspection

Comments:



Aug 23, 2023  
3:25 PM UTC +10:00  
01/11T prepour inspecti...  
Ranbury  
21024 - Northern Transi...



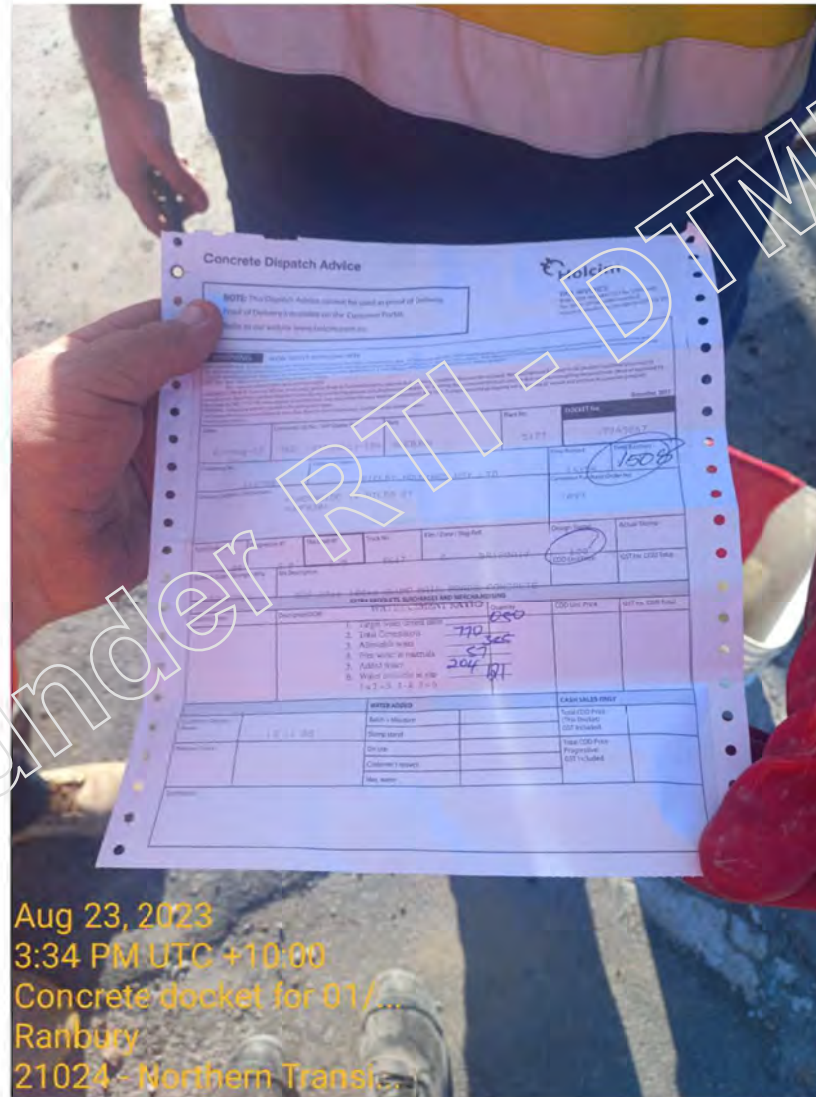
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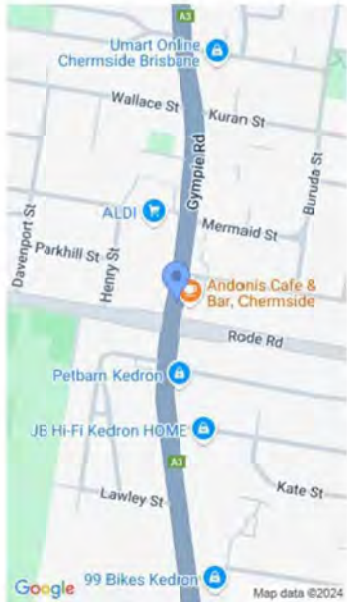
Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: Concrete docket for 01/11T, 5ltrs of water added before testing

Comments:



Aug 23, 2023  
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 Concrete docket for 01/...  
 Ranbury  
 21024 - Northern Transi...



Captured by:

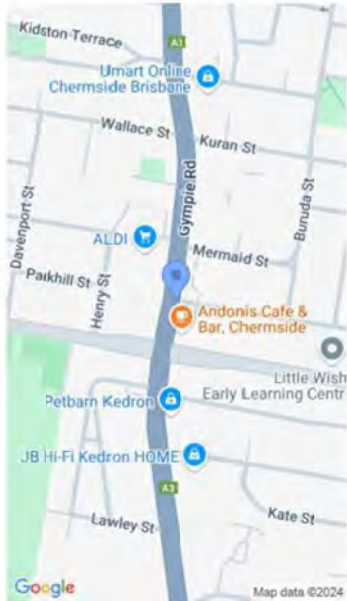
Captured on: 24 August 2023, 9:38:53 am

Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: Carmans drainage works at Q1/11T

Comments:





Captured by:

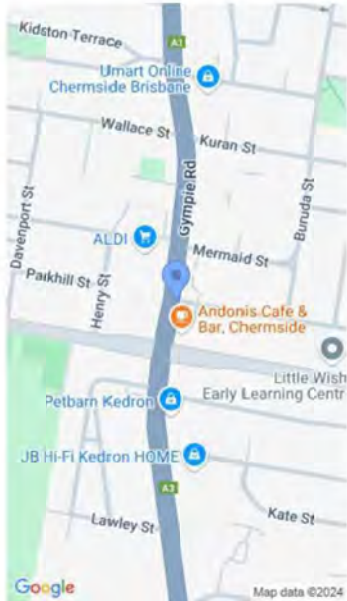
Captured on: 24 August 2023, 1:55:08 pm

Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: Carmans drainage at 01/11T not ready for pour today

Comments:





Captured by: NR

Captured on: 24 August 2023, 1:55:16 pm

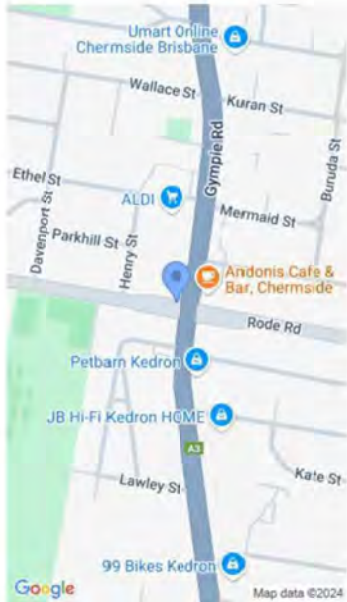
Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: Carmans drainage at 01/11T not ready for pour today

Comments:



Released under RTI - DTP



Captured by:

Captured on: 25 August 2023, 10:23:09 am

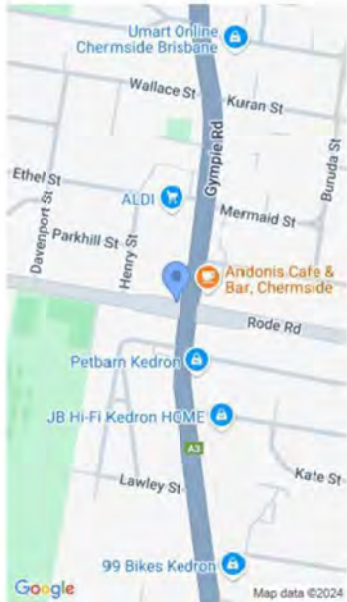
Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: 01/11T prepour inspection

Comments:



Aug 25, 2023  
10:23 AM UTC +10:00  
01/11T prepour inspecti...  
Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 25 August 2023, 10:23:16 am

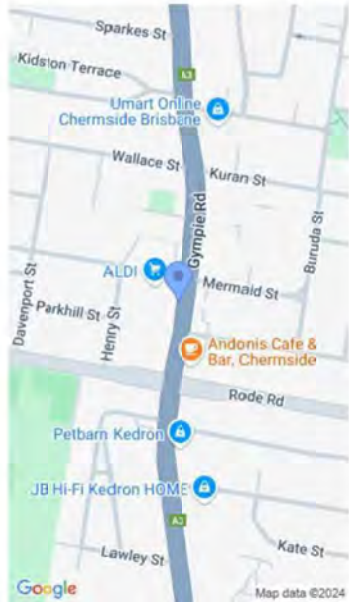
Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: 01/11T prepour inspection

Comments:

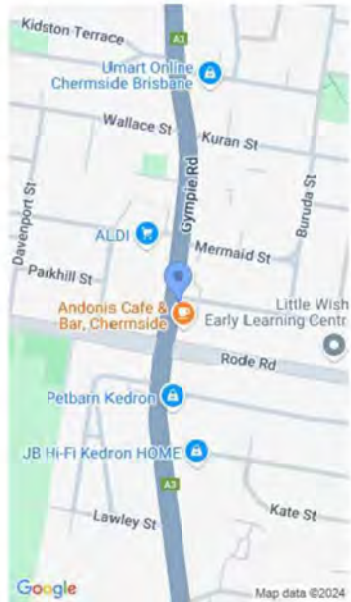


Aug 25, 2023  
10:23 AM UTC +10:00  
01/11T prepour inspecti...  
Ranbury  
21024 - Northern Transi...



**Captured by:** NR  
**Captured on:** 25 August 2023, 12:01:05 pm  
**Tags:** Concrete, Drainage Section 5 Local Road, Southbound  
**Description:** Concrete docket for 01/11T  
**Comments:**





Captured by:

Captured on: 25 August 2023, 12:23:05 pm

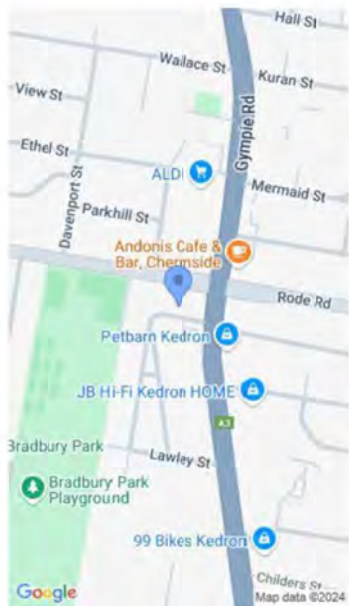
Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11T concrete placement

Comments:



Aug 25, 2023  
12:23 PM UTC +10:00  
01/11T concrete placeme...  
Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 28 August 2023, 10:19:06 am

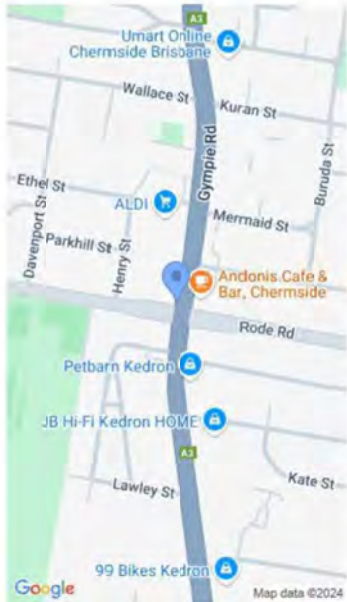
Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: 01/11T strip formwork

Comments:



Aug 28, 2023  
10:19 AM UTC +10:00  
01/11T strip formwork  
Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 28 August 2023, 2:53:49 pm

Tags: Drainage, Earthworks Section 5 Local Road, Southbound

Description: WDA/Bielby 01/11T strip wall, box out 03/11Y

Comments:



Aug 28, 2023  
2:53 PM UTC +10:00  
WDA/Bielby 01/11T stri...  
Ranbury  
21024 - Northern Transi...



Captured by: NR

Captured on: 28 August 2023, 2:53:57 pm

Tags: Drainage, Earthworks Section 5 Local Road, Southbound

Description: WDA/Bielby 01/11T strip wall, box out 03/11Y

Comments:



Aug 28, 2023  
2:53 PM UTC +10:00  
WDA/Bielby 01/11T strip wall  
Ranbury  
21024 - Northern Transitway



Captured by: NR

Captured on: 28 August 2023, 2:54:11 pm

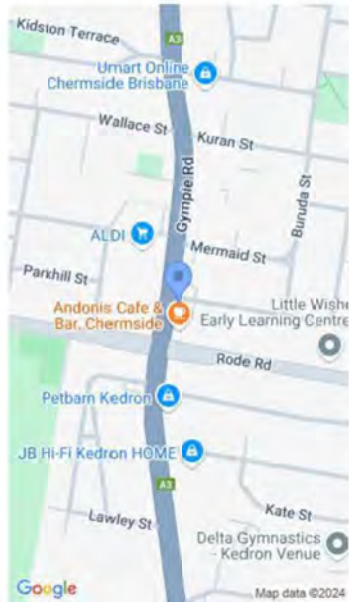
Tags: Drainage, Earthworks Section 5 Local Road, Southbound

Description: WDA/Bielby 01/11T strip wall, box out 03/11Y

Comments:



Aug 28, 2023  
2:54 PM UTC +10:00  
WDA/Bielby 01/11T stri...  
Ranbury  
21024 - Northern Transi...



Captured by:

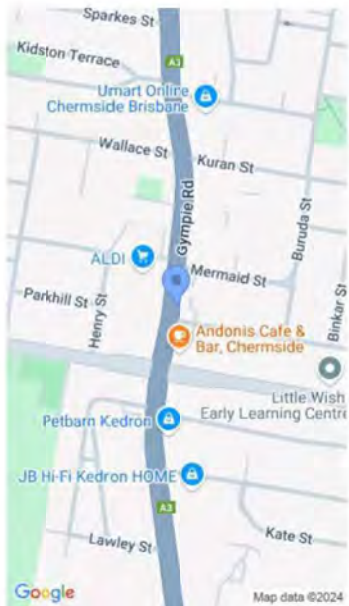
Captured on: 30 August 2023, 10:01:20 am

Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: WDA/Bielby place aspro to 01/11T Lab x 6 Ex x 2 Little tipper x 1

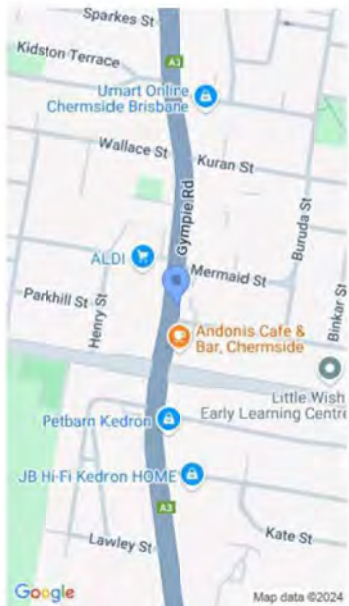
Comments:





Captured by:   
 Captured on: 30 August 2023, 10:03:11 am  
 Tags: Drainage, Concrete Section 5 Local Road, Southbound  
 Description: WDA/Bielby place aspro to Q1/11T Lab x 6 Ex x 2 Little tipper x 1  
 Comments:





Captured by:

Captured on: 30 August 2023, 10:03:13 am

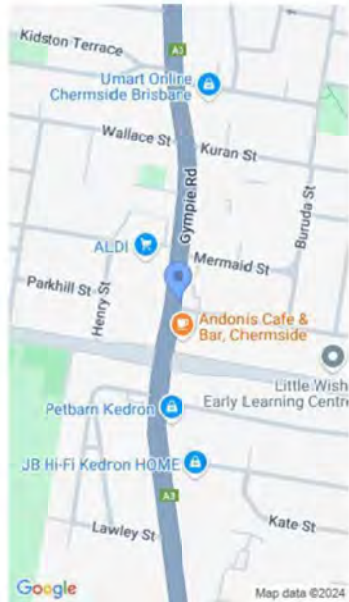
Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: WDA/Bielby place aspro to Q1/11T Lab x 6 Ex x 2 Little tipper x 1

Comments:



Aug 30, 2023  
10:03 AM UTC +10:00  
WDA/Bielby place aspro ...  
Ranbury  
21024 - Northern Transi...



Captured by:   
Captured on: 30 August 2023, 10:08:20 am  
Tags: Drainage, Concrete Section 5 Local Road, Southbound  
Description: 01/11AA  
Comments:





Captured by:

NR

Captured on: 30 August 2023, 1:36:25 pm

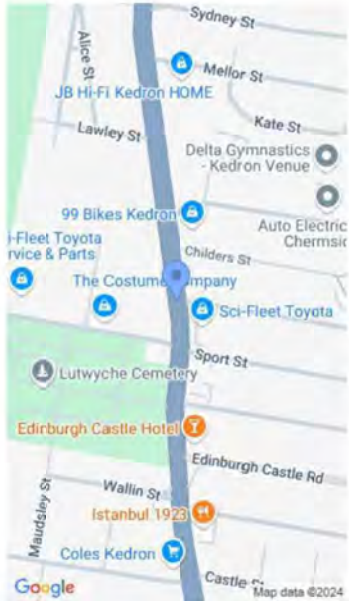
Tags: Drainage,Pavement,Earthworks  
Section 5 Local Road,Southbound

Description: Geofab on 10mm before 2.3  
placement at 01/11T

Comments:



Aug 30, 2023  
1:36 PM UTC +10:00  
Geofab on 10mm before 2...  
Ranbury  
21024 - Northern Transi...



Captured by:

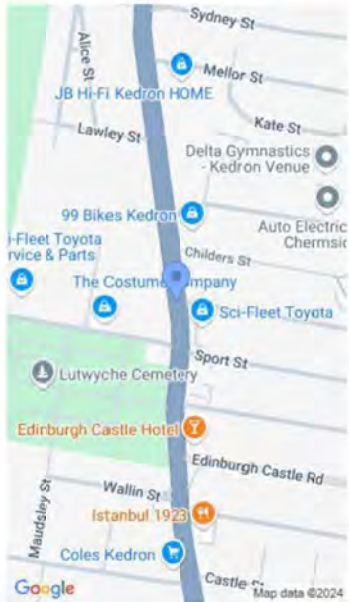
Captured on: 30 August 2023, 3:44:24 pm

Tags: Drainage Section 5 Southbound, Local Road, Intersection

Description: Pilba st WAD Pits 01/11AA - 02/11Y Blinder in base of pits

Comments:





Captured by:

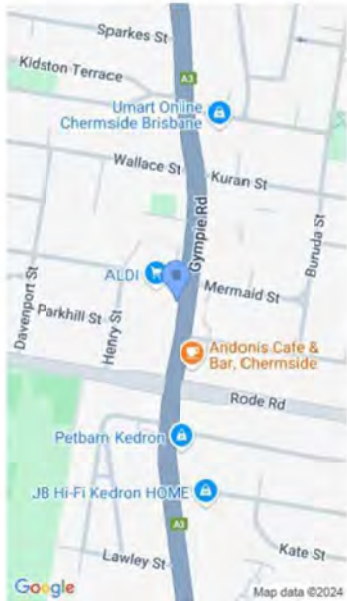
Captured on: 30 August 2023, 3:44:29 pm

Tags: Drainage Section 5 Southbound, Local Road, Intersection, Footpath

Description: Pilba st WAD Pits 01/11AA - 02/11Y Blinder in base of pits

Comments:





Captured by:

Captured on: 31 August 2023, 9:57:39 am

**Tags:**

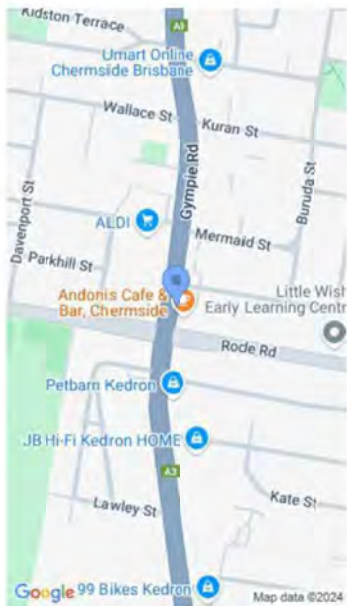
Concrete, Earthworks, Drainage, Pedestrian Management, Traffic Management Section 5 Local Road, Southbound

**Description:** FRC building pit walls 01/11AA and 02/11Y 4 x lab

**Comments:**



Aug 31, 2023  
9:57 AM UTC +10:00  
FRC building pit walls ...  
Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 01 September 2023, 9:12:23 am

Tags: Drainage, Concrete Section 5 Local Road, Southbound

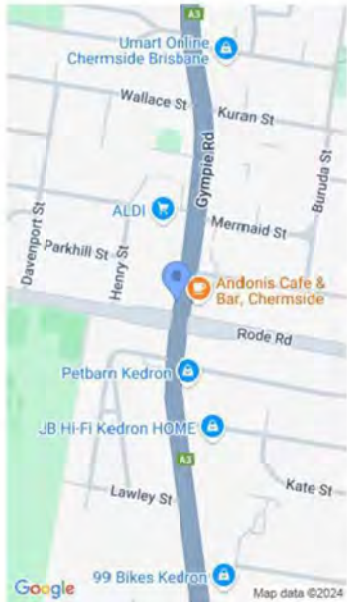
Description: FRC forming up 01/11AA and 01/11Y FRC x 3

Comments:



Sep 1 2023  
9:12 AM UTC +10:00  
FRC forming up 01/11AA ...  
Ranbury  
21024 - Northern Transi...

Released under RTI - DTMR



Captured by:

Captured on: 01 September 2023, 9:13:41 am

Tags: Drainage, Concrete Section 5 Local Road, Southbound

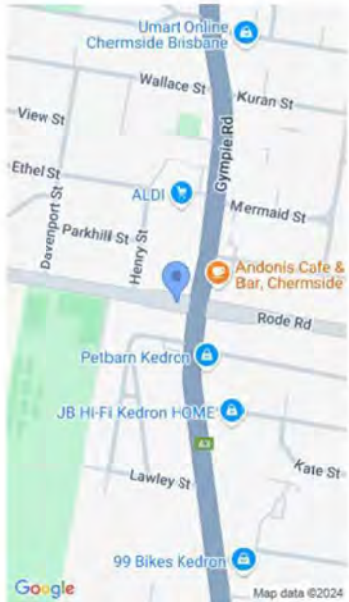
Description: FRC forming up 01/11AA and 01/11Y FRC x 3

Comments:



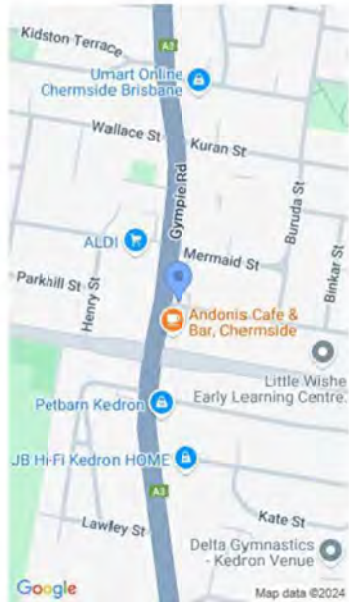
Sep 1, 2023  
9:13:41 AM UTC +10:00  
FRC forming up 01/11AA ...  
Ranbury  
21024 - Northern Transi...

Released under RTI - DTMR



Captured by:   
Captured on: 04 September 2023, 9:08:03 am  
Tags: Drainage Section 5 Local Road, Southbound  
Description: 01/11Y 2 x bielby  
Comments:





Captured by:

Captured on: 05 September 2023, 8:38:50 am

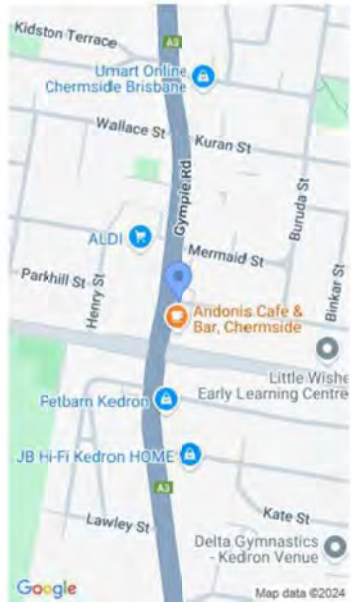
Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y

Comments:



Released under RTI - DTMR



Captured by:   
Captured on: 05 September 2023, 8:45:18 am  
Tags: Concrete, Drainage Section 5 Local Road, Southbound  
Description: 01/11AA  
Comments:

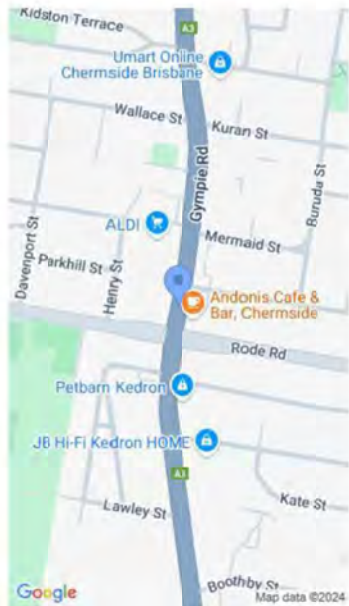


05 Sep 2023  
8:45 AM UTC +1000  
01/11AA  
Ranbury  
21024 - Northern Transi



Captured by:   
Captured on: 06 September 2023, 9:47:46 am  
Tags: Drainage Section 5 Local Road, Southbound  
Description: 01/11A  
Comments:





Captured by:

Captured on: 06 September 2023, 11:29:58 am

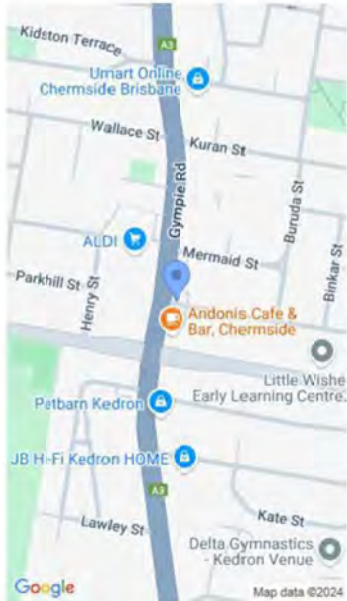
Tags: Concrete, Drainage, Earthworks  
Section 5 Local Road, Southbound

Description: FRC x 4 forming wall on  
01/11Aa

Comments:



Sep 6, 2023  
11:29 AM UTC +10:00  
FRC x 4 forming wall on...  
Ranbury  
21024 - Northern Transi...



Captured by:

NR

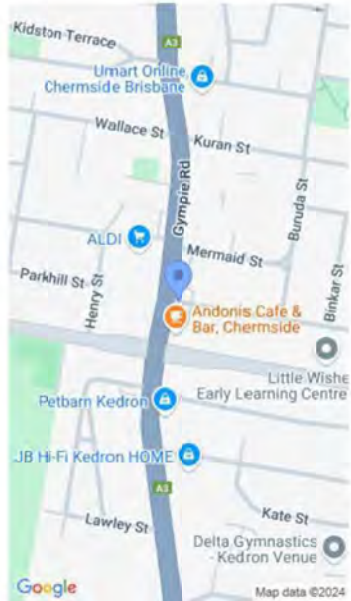
Captured on: 07 September 2023, 8:57:03 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y wall pour

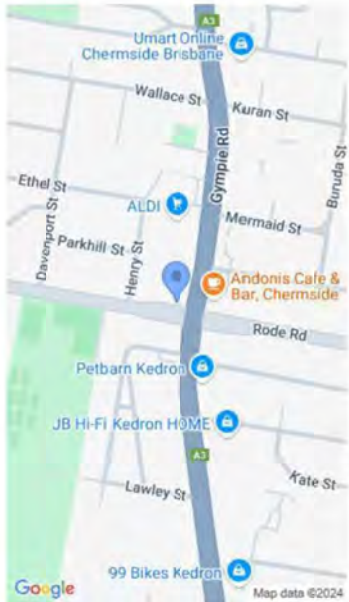
Comments:





Captured by:   
Captured on: 07 September 2023, 8:57:39 am  
Tags: Concrete, Drainage Section 5 Local Road, Southbound  
Description: 01/11A wall pour  
Comments:





Captured by:

Captured on: 07 September 2023, 12:19:01 pm

Tags: Drainage Section 5 Local Road, Southbound

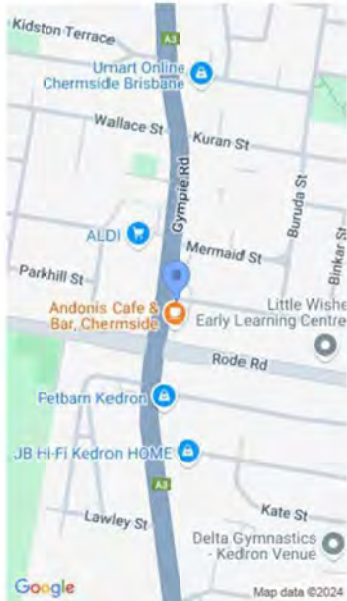
Description: Pour Pit Walls 01/11AA Pilba st Pour cancelled due base was poured smaller than the walls, up to 65mm clearance

Comments:



07/09/2023  
12:19 PM UTC +10:00

Ranbury  
21024 - Northern Transi...



Captured by:

Captured on: 07 September 2023, 12:21:03 pm

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: Pour Pit Walls 01/11AA Pilba st  
Pour cancelled due base was poured smaller than the walls, up to 65mm clearance

Comments:





Captured by:

Captured on: 07 September 2023, 12:21:15 pm

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: Pour Pit Walls 01/11AA Pilba st  
Pour cancelled due base was poured smaller than the walls, up to 65mm clearance

Comments:



Sep 7, 2023  
12:21 PM UTC +10:00  
Ranbury  
21024 - Northern Transi



Captured by:

Captured on: 07 September 2023, 12:21:20 pm

Tags: Concrete, Drainage Section 5 Local Road, Southbound

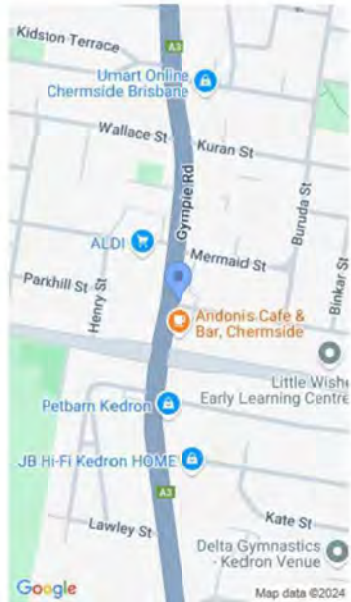
Description: Pour Pit Walls 01/11AA Pilba st  
Pour cancelled due base was poured smaller than the walls, up to 65mm clearance

Comments:



Sep 7, 2023  
12:21 PM UTC +10:00

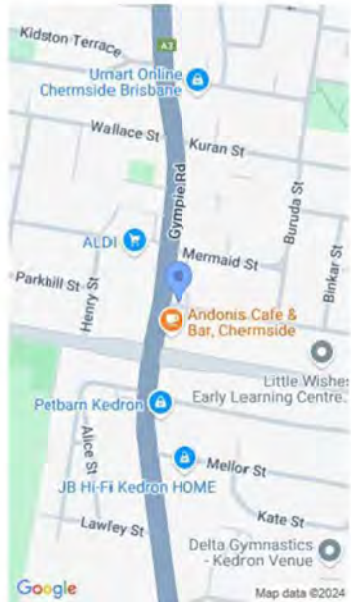
Ranbury  
21024 - Northern Transi



Captured by:   
Captured on: 08 September 2023, 9:14:50 am  
Tags: Concrete, Drainage Section 5 Local Road, Southbound  
Description: Pour Pit Walls 01/11Y at Pilba st  
Comments:



Released under RTI - DTMR



Captured by:

Captured on: 11 September 2023, 9:13:09 am

Tags: Concrete, Demolition, Drainage Section  
5 Local Road, Southbound

Description: Remove base pit 01/11AA

Comments:



Sep 11, 2023  
9:13 AM UTC +10:00  
Remove base pit 01/11AA  
Ranbury  
21024 - Northern Transitway

No GPS information available

Captured by:

Captured on: 11 September 2023, 10:59:15 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y walls strip form work

Comments:



No GPS information available

Captured by:

Captured on: 11 September 2023, 10:59:15 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y walls strip form work

Comments:



No GPS information available

Captured by:

Captured on: 11 September 2023, 10:59:15 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y walls strip form work

Comments:



No GPS information available

Captured by:

Captured on: 11 September 2023, 10:59:15 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y walls strip form work

Comments:



No GPS information available

Captured by:

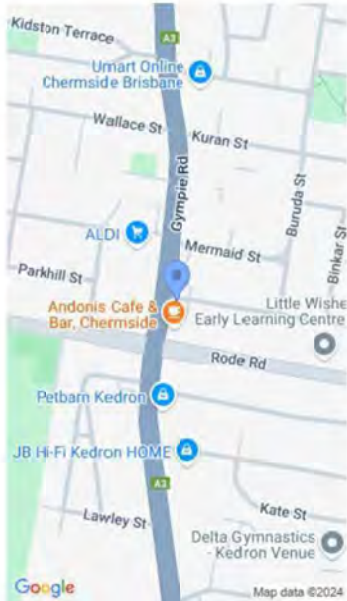
Captured on: 11 September 2023, 10:59:15 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11Y walls strip form work

Comments:





Captured by:

Captured on: 13 September 2023, 11:02:46 am

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: 01/11AA Pilba st Pre pour, water to be removed from base prior to pour

Comments:



No GPS information available

Captured by:

Captured on: 13 September 2023, 12:50:02 pm

Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: FRC forming up 01/11AA for pour

Comments:



No GPS information available

Captured by:

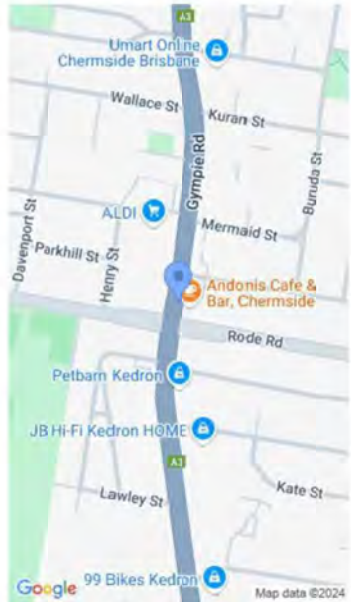
Captured on: 13 September 2023, 12:49:57 pm

Tags: Drainage, Concrete Section 5 Local Road, Southbound

Description: FRC forming up 01/11AA for pour

Comments:





Captured by: NR

Captured on: 13 September 2023, 2:05:51 pm  
 Tags: Concrete, Drainage Section 4, Section 5  
 Local Road, Southbound  
 Description: Concrete docket for 01/11Aa,  
 02/11G, 03/11G  
 Comments:

Dispatch Advice

Concrete docket for 01/11Aa project of project is available on the Customer Portal. [www.holcim.com.au](http://www.holcim.com.au)

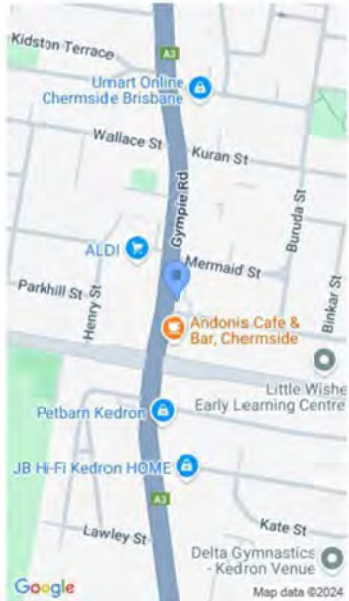
SAFELY WITH CONCRETE

Concrete docket for 01/11Aa project of project is available on the Customer Portal. [www.holcim.com.au](http://www.holcim.com.au)

Customer No. / SAF Quote No.	Plant	Plant No.	DOCKET No.	
257 21513611-16A	BRISBANE CITY	5164	16807570	
Customer Name	Time Placed	Time Batched		
BIELBY HOLDINGS PTY LTD	13:26	13:44		
Address	Customer Purchase Order No.			
10/11Aa 01/11G, 03/11G	2080			
Progression M	Final Local M	Plant / Map Ref	Design Slump	Actual Slump
1.7	6674	11 BR20A17	88	
Concrete Description	COO Unit Price	GST Inc COO Total		
SLUMP MAIN ROADS CONCRETE				
COO Unit Price	GST Inc COO Total			
WATER ADDED	CASH SALES ONLY			
	Total COO Price (This Docket)			
	Total COO Price (Progression)			

Sep 13, 2023  
 2:05 PM UTC +10:00  
 Concrete docket for 01/...  
 Ranbury  
 21024 - Northern Transi...

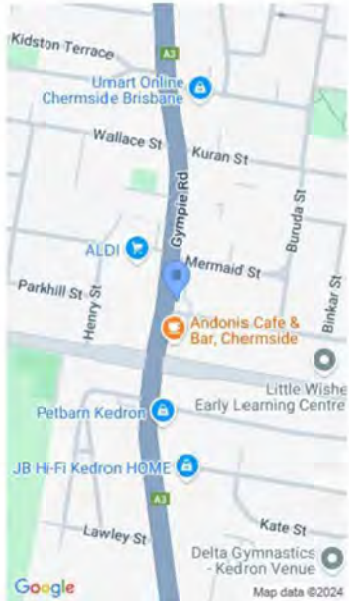
Released under RTI-DTMR



Captured by:   
Captured on: 14 September 2023, 8:01:58 am  
Tags: Drainage, Concrete Section 5 Local Road, Southbound  
Description: Pilba st works, walls for pit 01/11AA  
Comments:



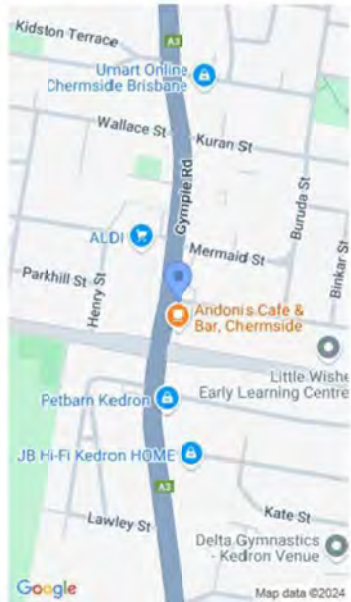
Sep 24 2023  
6:01 AM UTC +10:00  
XERO  
Vac Truck  
Ranbury  
21024 - Northern Transi...



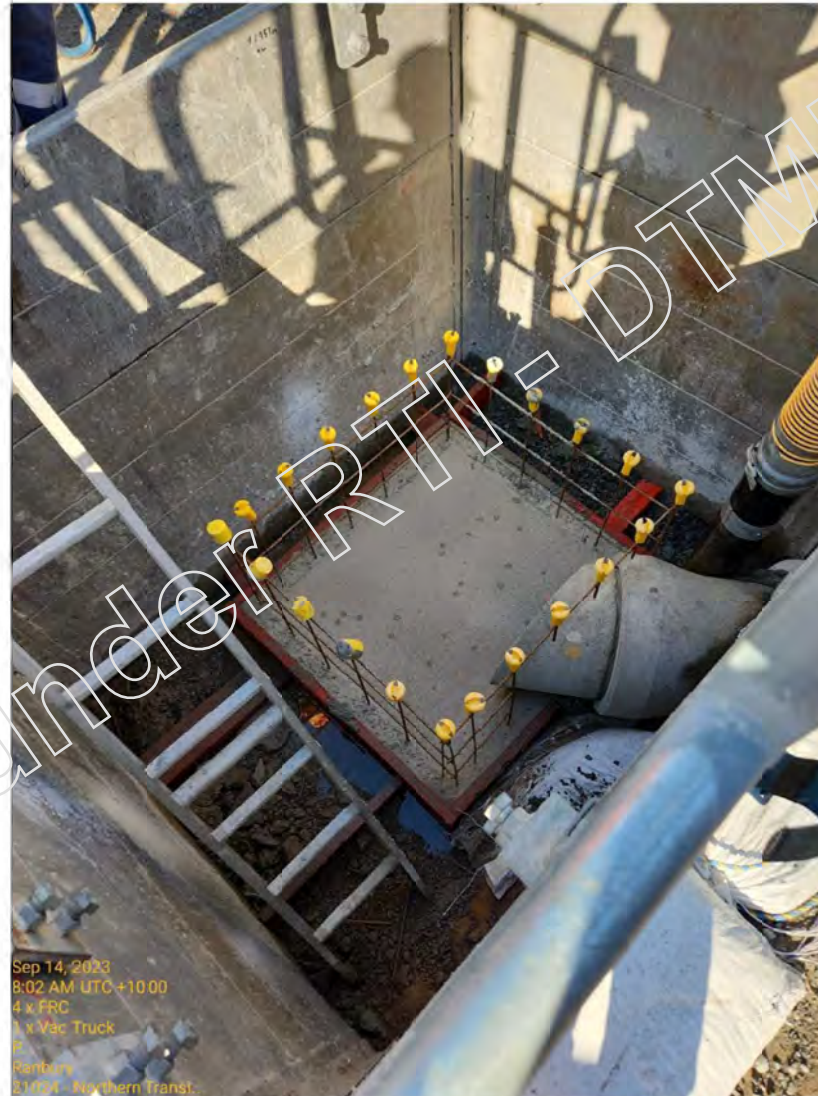
Captured by:   
Captured on: 14 September 2023, 8:02:25 am  
Tags: Drainage, Concrete Section 5 Local Road, Southbound  
Description: Pilba st works, walls for pit 01/11AA  
Comments:



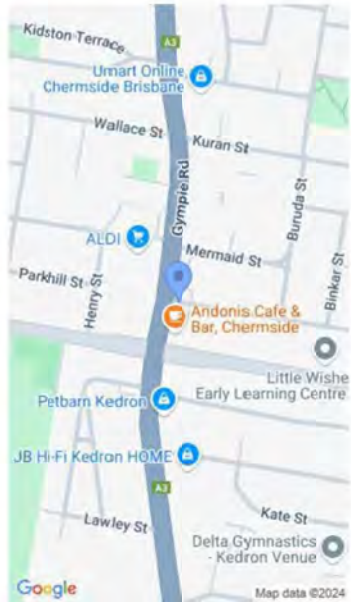
02 AM UTC +10:00  
Var Truck  
Ranbury  
21024 - Northern Transi...



Captured by:   
Captured on: 14 September 2023, 8:02:57 am  
Tags: Drainage, Concrete Section 5 Local Road, Southbound  
Description: Pilba st works, walls for pit 01/11AA  
Comments:

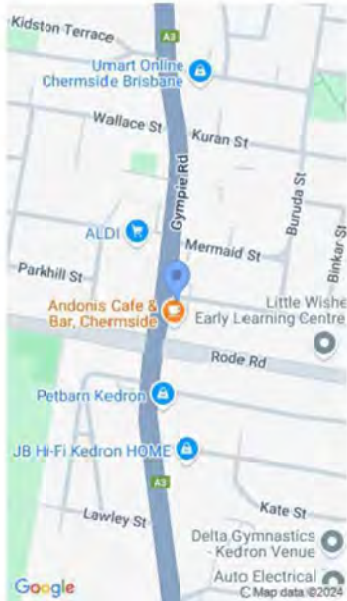


Sep 14, 2023  
8:02 AM UTC +10:00  
4 x FRC  
1 x Vac Truck  
Ranbury  
21024 - Northern Trans.



Captured by:   
Captured on: 14 September 2023, 8:06:38 am  
Tags: Drainage Section 5 Local Road, Southbound  
Description: 01/11A  
Comments:

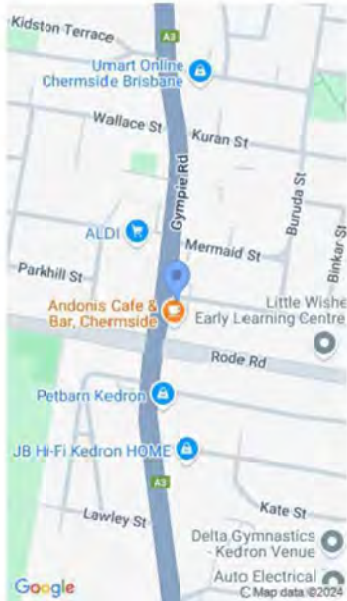




Captured by:   
Captured on: 15 September 2023, 9:39:21 am  
Tags: Concrete, Drainage Section 5  
Southbound, Local Road  
Description: Pre pour 01/11AA  
Comments:



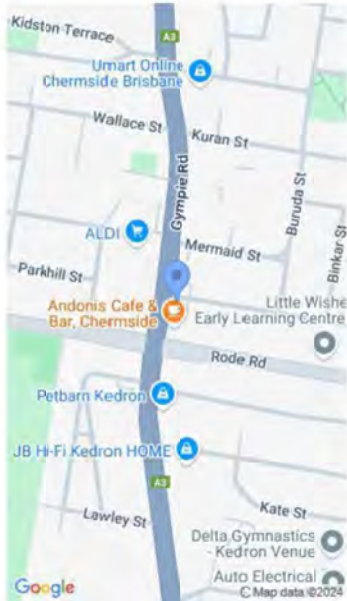
Sep 15, 2023  
9:39 AM UTC +10:00  
Pre pour 01/11AA  
Ranbury  
21024 - Northern Transi



Captured by:   
Captured on: 15 September 2023, 9:39:25 am  
Tags: Concrete, Drainage Section 5  
Southbound, Local Road  
Description: Pre pour 01/11AA  
Comments:



Sep 15, 2023  
9:39 AM UTC +10:00  
Pre pour 01/11AA  
Ranbury  
21024 - Northern Transi...

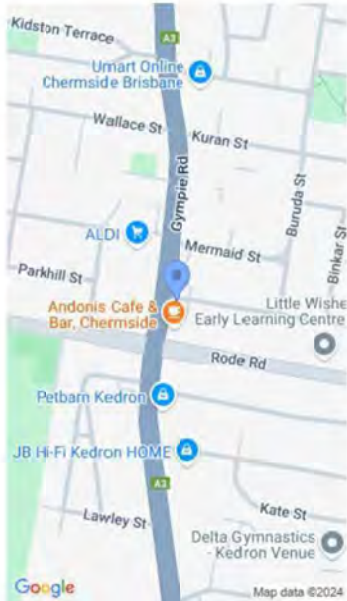


Captured by:   
Captured on: 15 September 2023, 9:39:30 am  
Tags: Concrete, Drainage Section 5  
Southbound, Local Road  
Description: Pre pour 01/11AA  
Comments:



Sep 15, 2023  
9:39 AM UTC +10:00  
Pre pour 01/11AA  
Ranbury  
21024 - Northern Transi...

Released under RTI - DTMR



Captured by:   
Captured on: 15 September 2023, 9:39:39 am  
Tags: Concrete, Drainage Section 5  
Southbound, Local Road  
Description: Pre pour 01/11AA  
Comments:



No GPS information available

Captured by:

Captured on: 15 September 2023, 12:28:02 pm

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: Pilba st works, walls for pit 01/11AA

Comments:



No GPS information available

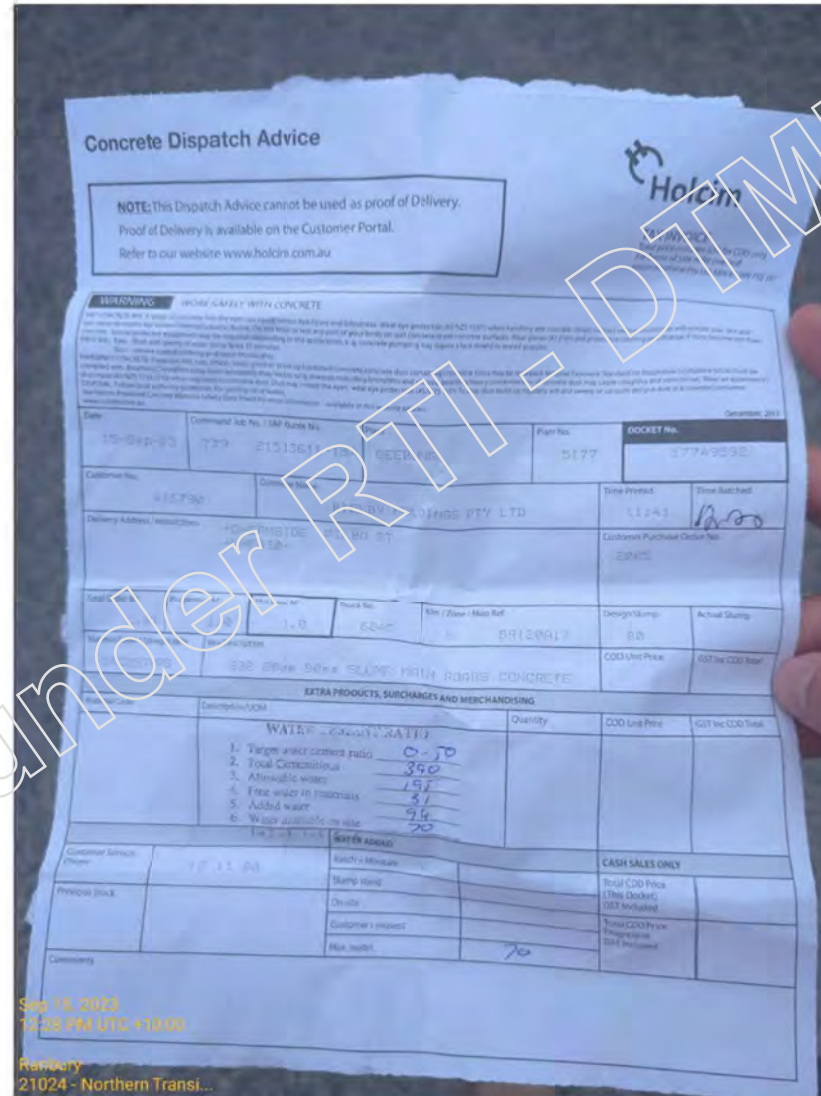
Captured by: NR

Captured on: 15 September 2023, 12:28:02 pm

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: Pilba st works, walls for pit 01/11AA

Comments:



No GPS information available

Captured by:

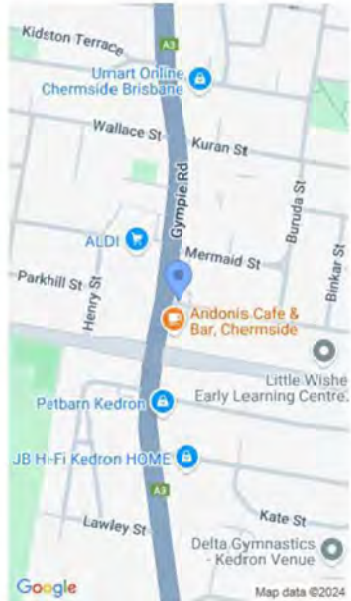
Captured on: 15 September 2023, 12:33:42 pm

Tags: Concrete, Drainage Section 5 Local Road, Southbound

Description: Pilba st works, walls for pit 01/11AA 90mm slump

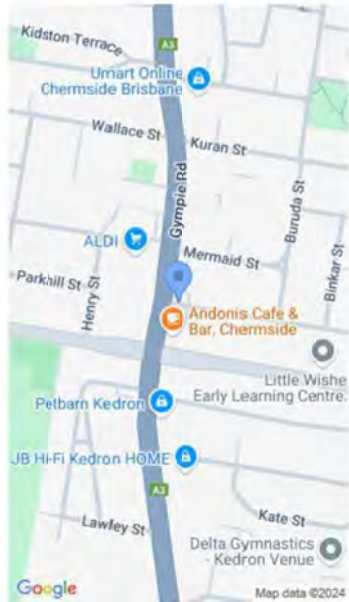
Comments:





Captured by:   
Captured on: 19 September 2023, 8:48:54 am  
Tags: Drainage Section 5 Local Road, Southbound  
Description: Pit 01/11AA  
Comments:





Captured by:

Captured on: 06 October 2023, 9:08:08 am

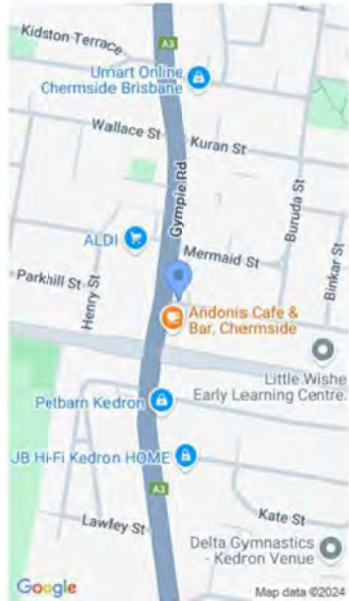
Tags: Drainage,Kerb and Subsoils Section 5  
Southbound,Local Road

Description: Pit 01/11Y Install lintel

Comments:



Released under RRM - DMR



Oct 6, 2023  
9:08 AM UTC +10:00  
Pit 01/11Y  
Install lintel...  
Ranbury  
21024 - Northern Transi...

Captured by: NR

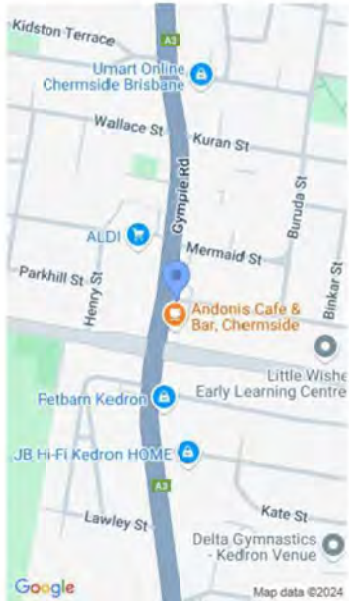
Captured on: 06 October 2023, 9:08:27 am

Tags: Drainage,Kerb and Subsoils Section 5  
Southbound,Local Road

Description: Pit 01/11Y Install lintel

Comments:

Released under RMI



Captured by:

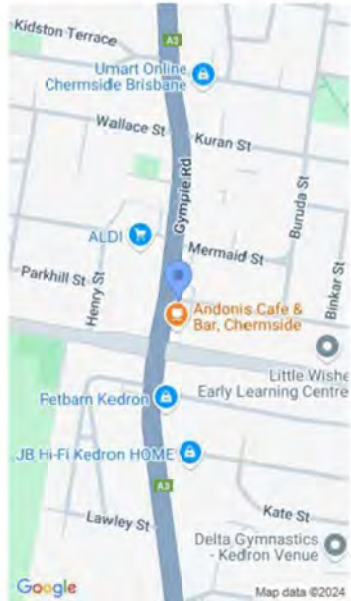
Captured on: 13 October 2023, 11:18:40 am

Tags: Drainage Section 5 Southbound, Local Road

Description: Pilba st 01/11AA lintel install  
Backfill and open up Pilba st

Comments:

Released under RII - DTMR



Oct 13, 2023  
11:19 AM UTC +10:00  
Pilba st  
01/11AA lintel  
Ranbury  
21024 - Northern Transi

Captured by:

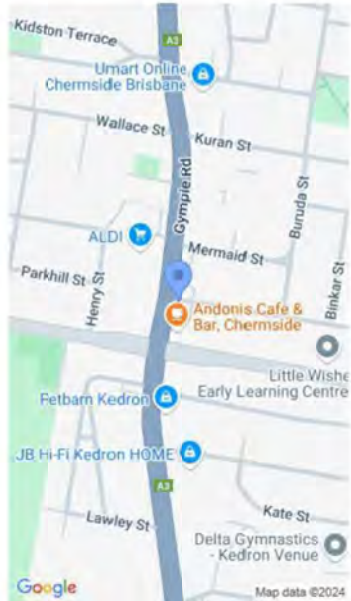
Captured on: 13 October 2023, 11:19:08 am

Tags: Drainage Section 5 Southbound, Local Road

Description: Pilba st 01/11AA lintel install  
Backfill and open up Pilba st

Comments:

Released under RTI - DTPMR



Captured by:

Captured on: 13 October 2023, 11:19:24 am

Tags: Drainage Section 5 Southbound, Local Road

Description: Pilba st 01/11AA lintel install  
Backfill and open up Pilba st

Comments:

Released under RTI/OTI/DMR



Captured by:

Captured on: 30 April 2024, 7:20:39 am

Tags: Drainage Section 5 Northbound

Description: Pit south of Aldi driveway  
01/11B still has false floor installed, Luke  
Neil contacted

Comments:



# Northern Transitway

Hydraulic Analysis and Design (DD06)

Department of Transport and Main Roads

Reference: 504050

Revision: 0

2019-12-18

Released under RTI - DTMR

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to life*

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### Appendix A

Mean intensity data

### Appendix B

63% AEP flow width sketches

### Appendix C

10% AEP flow width sketches

### Appendix D

1% AEP flow width sketches

# 1 Introduction

## 1.1 Purpose

Aurecon have been commissioned by the Department of Transport and Main Roads (TMR) to prepare the Preliminary and Detailed Design for the Gympie Arterial Road Transitway project, between Sadlier Street, Kedron and Hamilton Road, Chermerside.

This report presents the review and assessment of the Detailed Design stormwater drainage issues and conditions for the proposed design. Figure 1-1 below outlines the locality map.



Figure 1-1 - Gympie Road Project Locality Plan

## 1.2 Project background

The Detailed Design of Northern Transitway follows on from the Preliminary Design completed in March 2019 and Business Case approved in March 2015 by TMR. The Transitway consist of an integrated suite of treatments including:

- Dynamic bus lane in each direction along the existing road shoulder and parking lane
- Retaining three existing traffic lanes in each direction, reconfigured to accommodate the bus lanes within the existing road footprint
- Upgrades to side roads and intersections within sections directly impacted by the proposed bus lanes

All the above works will be delivered under the Transport Infrastructure Contract (TIC) suite.

## 1.3 Project scope

The key components of the Detailed Design for the Gympie Road corridor upgrade are converting the existing shoulder/parking lanes into bus lanes in both the northbound and southbound directions, thus increasing public transport connectivity and improving journey times for buses during normal traffic conditions. The bus lanes will operate only during the am (6:00 – 9:00AM) and pm (3:00 – 6:30PM) peak periods. Outside of these hours the bus lanes will operate as parking.

The scope of the project along Gympie Road is to avoid impacts on property adjacent to the road corridor, limit impacts on utility services and maintain the existing outside shoulder kerb lines, whilst developing bus lanes and maintaining three (3) general purpose lanes both northbound and southbound.

In summary the scope of works for the Northern Transitway Project is outlined below:

- no property impacts
- minimise impacts on PUP
- bus lanes between Sadlier Street, Kedron and Hamilton Road, Chermside
- changes to unsignalised intersections of local streets with Gympie Road to left-in, left-out access only
- on-street car parking removal along Gympie Road for the length of the Transitway
- adjustments to verge areas and driveway crossings.

The width of both the existing general-purpose traffic lanes and median traffic islands will be reduced to accommodate the new bus lanes within the existing outside kerb lines. The conversion of existing parking lanes and the road shoulder to bus lanes and the reconfiguration of existing intersections mean that the existing verge, driveways, road drainage, street lighting, traffic signals, and bus stops are required to be upgraded utilising EDD and DE where appropriate and approved.

Active transport modes will be accommodated for in the design through the provision of a 2.5m wide shared path on both sides of Gympie Road.

## 1.4 Project objectives

The inclusion of bus lanes on Gympie Road between Sadlier Street and Hamilton Road are to:

- deliver a low cost, value for money improvements to public transport
- improve active transport connectivity along the corridor
- to achieve the desired benefits, the design has been developed based on the Business Case design and investigative work undertaken during the detailed design phase to ensure a value-for-money and appropriate engineering design solution is delivered

## 1.5 Scope of Report

This report has been compiled to outline the hydraulic analysis and design development during the Detailed Design Stage for Northern Transitway on Gympie Road between Sadlier Street to Hamilton Road.

## 2 Project requirements

### 2.1 General

The section outlines the project drainage requirements for the Northern Transitway project.

### 2.2 Design objective

The primary design objectives for the stormwater drainage for the northern transitway project are:

- To mitigate the surface flooding impacts associated with correcting the crossfall on the outer lanes of Gympie Road
- Where economically viable, to improve the existing spread of surface flows into traffic lanes

### 2.3 Applicable standards

The applicable standards used for the drainage design are listed below:

- Department of Transport and Main Roads QLD, Manual – Road Drainage (July 2015)
- Department of Transport and Main Roads QLD, Standard Drawings
- Austroads Guide to Road Design – Part 5, 5A & 5B
- Queensland Urban Drainage Manual (August 2017)
- AS 3500.3 National Plumbing and Drainage Code – Part 5: Stormwater Drainage
- Australian Rainfall and Runoff Guidelines 2019

### 2.4 Design criteria

#### 2.4.1 General criteria

General drainage design criteria:

- Pipe Grade Limits shall be in accordance with Austroads Guide to Road Design – Part 5A
- Pipe Velocity Limits shall be in accordance with Austroads Guide to Road Design – Part 5A
- All drainage infrastructure shall be designed to cater for applicable wheel loads in accordance with Austroads Guide to Road Design – Part 5A
- Road gully grates and access chamber tops to be Class D in trafficable areas, and Class C elsewhere
- Road gully grates shall be bicycle safe
- Access chamber tops shall be positioned to avoid wheel paths
- Minimum pipe size shall be nominal diameter 375mm
- Flow limits for traverse flow in minor storm, in accordance with QUDM (2017) Table 7.4.3

#### 2.4.2 Minor storm criteria - 63% AEP (ARI 1-years)

- For pedestrians at bus stops, kerb ramps and pedestrian crossing locations the maximum flow width shall be no more than 0.45m.
- For road corridor flows, a maximum depth velocity ratio ( $d \cdot V$ ) value of:
  - 0.3m<sup>2</sup>/s (at pedestrian crossings)

#### 2.4.3 Minor storm criteria - 10% AEP (ARI 10-years)

- Flow widths on the road surface shall meet the following criteria:
  - For through traffic lanes, two lanes or more in the same direction, the maximum flow width shall be:
    - the maximum allowable width of spread leaves the inside and any lane-locked lanes clear plus 2.5m clear width in the remaining lane; that is, water is kept out of the wheel paths of lanes 2.5m clear in the median lane where water is directed towards the median

- the maximum allowable width of spread leaves the inside and any lane-locked lanes clear plus 2.5m clear width in the remaining lane
- for one lane, a minimum clear width of 3.5m is to remain in the lane
- at medians, the allowable spread of water leaves 2.5m clear width in the traffic lane next to the median
- at intersections without left slip lanes, the allowable width of spread adjacent to the kerb is 1.0m

#### 2.4.4 Major storm criteria - 1% AEP (ARI 50-years)

- Where floor levels of adjacent buildings are above road level
  - Total flow contained within road reserve. Peak water levels at least 300 mm below floor level of adjacent buildings (i.e. freeboard of at least 300 mm).
- Vehicle Safety
  - Maximum energy level of 300mm above roadway surface for areas subject to transverse flow.
- Property immunity requirements (major storm event, 2% AEP (ARI 50-years)):
  - Where floor levels of adjacent buildings are less than 350mm above top of kerb
    - Water depth to be limited to 50mm above top of kerb, where fall on footpath towards kerb is greater than 100mm
    - Water depth to be limited to top of kerb in conjunction with a footpath profile that prevents flow from the roadway entering onto the adjacent property, where fall on footpath towards kerb is less than 100mm
- For road corridor flows, a maximum depth velocity ratio ( $d^*V$ ) value of:
  - 0.4 m<sup>2</sup>/s (no obvious danger)
  - 0.6 m<sup>2</sup>/s shall apply (obvious danger)
  - Obvious danger is interpreted as areas where pedestrians are directed to or most likely to cross water paths (such as marked crossings and corners of intersections).

## 3 Existing conditions

### 3.1 General

The Northern Transitway project area passes through two greater waterway catchments. The southern portion of the site from Sadler Street to Rode Road, sits within the Kedron Brook catchment area, while a smaller northern portion from Rode Road to Hamilton Road is within the Nundah-Downfall Creek catchment. Both catchments fall from west to east, resulting in significantly larger external sub-catchments contributing to road flows on the Northbound carriageway. The section covers the existing condition of Gympie Arterial Road.

### 3.2 Existing network

The existing drainage networks that was assumed for the Northern Transitway Project consists of a patchwork of data from a number of existing data sources as is summarised in the section below. The assumed network can be found on the Detailed Design Drawings.

#### 3.2.1 Sources of information

##### Survey

Detail survey was provided by the Department of Transport and Main Roads, for the purpose of Detail Design. The survey contained reasonably comprehensive information on surface drainage asset that were obvious at the existing surface level. This included access chamber lids, gully pits, headwalls, pipe inverts, and pipe diameter information where the pipe was accessible to the surveyors at the time of the data collection.

##### Service proving

Service proving was undertaken for some drainage assets during the detail design phase. This included additional pipe invert surveys, boreholes, camera probe inside of existing pipes, and ground penetrating radar.

##### GIS data

GIS information for stormwater assets was obtained from the Brisbane City Council 'Brisbane Data Store'. This data contained information on existing property drainage, side road drainage, and cross drainage that informed the design.

##### Dial Before You Dig (DBYD)

DBYD data was used to determine the presence of underground drainage assets within the project area in the first instance.

##### Archive drawings

Archive drawings were obtained from the Department of Transport and Main Roads. These drawings identified several existing legacy drainage assets in the project area.

##### Site visits

Site visits were undertaken to oversee the camera probe and service proving activities.

#### 3.2.2 Limitations

No detailed survey of all existing drainage infrastructure, as undertaken during the detailed design phase. Drainage networks and flow paths have been assumed for the purposes of the detailed design.

#### 3.2.3 Construction verification

It has been included within the construction contract for site verification of the drainage network as a miscellaneous item. This proposed to confirm the drainage network prior to construction of drainage elements.

### 3.3 Local catchment data

#### 3.3.1 Sources of information

The existing local drainage catchments assumed for the Northern Transitway Project consists of a patchwork of data from a number of existing data sources as is summarised in the section below.

##### Detailed ground survey

Detail survey was provided by the Department of Transport and Main Roads, for the purpose of Detail Design. The survey contained a ground feature survey for the project extent.

##### LiDAR Derived Contour Data

LiDAR derived grid DEM data was obtained from Open Data QLD via the web portal. This information was used in part to delineate external sub-catchment contributing flow to the road drainage network.

#### 3.3.2 Local catchment delineation

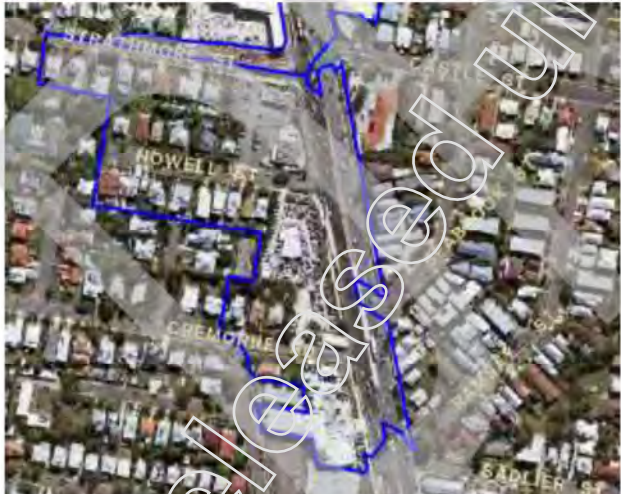
A number of catchments have been delineated for the extent of the projects. These catchments are defined by their outfall locations to the greater drainage network. The greater drainage catchments are maintained by coordinating the geometric design with the overland flow paths and geometric crest locations.

The construction of the new shared path represents a reasonable change of imperviousness to the road corridor. In most locations there is an existing 1.5m wide footpath on both sides of the road corridor. This will change to a 2.5m wide concrete path, resulting in an additional 4600m<sup>2</sup> of impervious area that was previously mostly grass or low planting. This represents an approximate change of imperviousness along the corridor from 93% impervious to 98% impervious. It is not expected the change in imperviousness will significantly affect the flow widths in the road corridor to the extent that additional drainage assets would be required.

#### 3.3.3 Catchments details

Table 3-1 summarises each catchment including catchment size.

Table 3-1 - Catchment details

Figure	Catchment Details
	<p><b>Catchment 1 – Sadlier to Strathmore</b></p> <ul style="list-style-type: none"> <li>■ Commercial and residential sub catchments</li> <li>■ Total Area 5.04ha</li> </ul>

Figure

Catchment Details



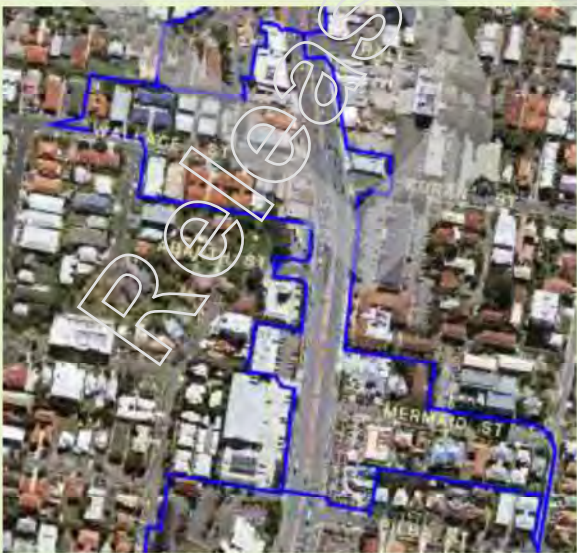
Catchment 2 – Strathmore to Kitchener

- Residential and cemetery sub catchments
- Total Area 7.23ha



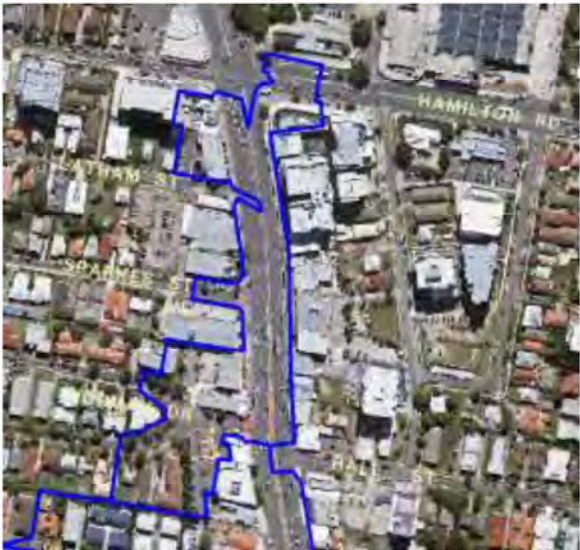
Catchment 3 – Kitchener to Pilba

- Commercial sub catchments
- Total Area 13.20ha



Catchment 4 – Pilba to Hall

- Commercial and high-density residential sub catchments
- Total Area 5.71ha

Figure	Catchment Details
	<p><b>Catchment 5 – Hall to Hamilton</b></p> <ul style="list-style-type: none"> <li>■ Commercial and high-density residential sub catchments</li> <li>■ Total Area 2.80ha</li> </ul>

### 3.4 Regional catchments

It is noted that a number of regional catchments surcharge from existing underground cross drainage networks and flow into and across Gympie Arterial Road, through the project area.

These have not been modelled as a part of the project.

### 3.5 Hydrology


#### 3.5.1 Rainfall data


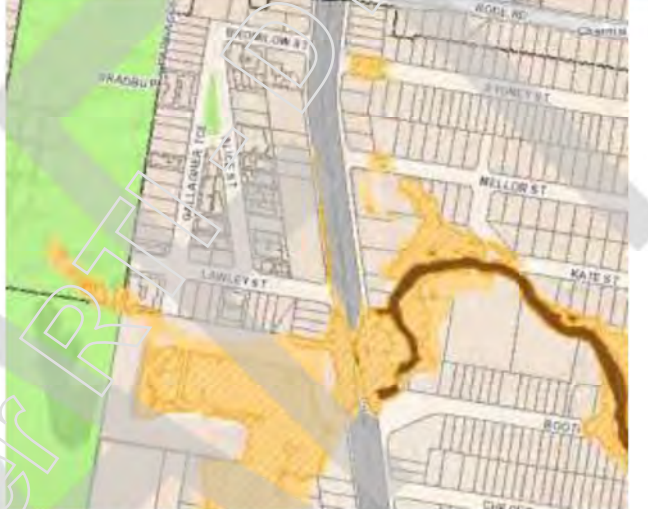

Rainfall data was obtained from the Bureau of Meteorology for the applicable design storm events. This data is summarised in Appendix A.

### 3.6 Overland flow paths

Several sections of Gympie Road are known to be at risk of significant flooding during severe storm events, both from local flows and cross road flows at geometric sags. The following locations are identified by BCC as being at risk of flooding.

Table 3-2 - Existing overland flow paths



Details	Figure
<ul style="list-style-type: none"> <li>■ Gympie Road, near Sadlier St. <ul style="list-style-type: none"> <li>– Medium and Low impact flooding</li> <li>– Across both northbound and southbound carriageways</li> </ul> </li> </ul>	

Details	Figure
<ul style="list-style-type: none"> <li>■ Gympie Road, at corner of Wallin St               <ul style="list-style-type: none"> <li>– Medium and Low impact flooding</li> <li>– Northbound carriageway</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>■ Gympie Road, between Boothby St and Lawley St               <ul style="list-style-type: none"> <li>– High, Medium, and Low impact flooding</li> <li>– Across both northbound and southbound carriageways</li> </ul> </li> <li>■ Gympie Road, between Lawley and Bromilow St               <ul style="list-style-type: none"> <li>– Medium and Low impact flooding</li> <li>– Northbound carriageway</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>■ Gympie Road, at Abarth St               <ul style="list-style-type: none"> <li>– Medium and Low impact flooding</li> <li>– Across both northbound and southbound carriageways</li> </ul> </li> </ul>	

### 3.7 Existing performance

There are two existing locations where absent or inadequate drainage infrastructure results in unacceptable cross carriageway flows from median turn lanes across several through lanes. These are summarised in the table below.

Table 3-3 – Existing locations with drainage performance issues

Details	Figure
<ul style="list-style-type: none"> <li>■ South of Rode Rd, right turn from Gympie Rd into Rode Rd</li> <li>■ Flows collect against the median kerb before flowing across 3 through lanes on the northbound carriageway</li> <li>■ There are no existing gully pits in the median</li> <li>■ Flows across carriageway are 86L/s in a 63% AEP (1-year ARI) event</li> </ul>	
<ul style="list-style-type: none"> <li>■ South of Kitchener St, right turn from Gympie Rd into Sport St</li> <li>■ Flows collect against the median kerb before flowing across 4 through lanes on northbound carriageway</li> <li>■ There is one existing gully pit with insufficient capture capacity to cater for the catchment</li> <li>■ Flows across carriageway are 56L/s in a 63% AEP (1-year ARI)</li> </ul>	

The existing drainage infrastructure was found to be significantly undersized to achieve compliant surface flooding conditions for the existing road geometry and sub-catchments. Most drainage pipes are 300mm internal diameter and immediately are non-compliant with TMR requirements (<375mm internal diameter), regardless of their insufficient flow capacity for the contributing catchments.

There are numerous buried existing drainage structures throughout the project areas. These structures were identified in archived plans from the 1960s to 1970s. Most buried gullies and manholes were verified with ground penetrating radar and camera probe investigations on site. Some structures are still in use and have storm water flows passing through them, while others appear to be abandoned. The structures were at some time accessible to from the surface but have since been covered over. In addition to the buried pits, there are also a number of buried legacy drainage structures, particularly at known overland flow locations. These are relatively large structures integrated into the existing cross drainage networks and will be elaborated on later in this report.

## 4 Hydraulic design

### 4.1 Summary

The crossfall grade corrections required in the outer lanes of Gympie Road to accommodate the bus lanes, results in a reduction of cross-sectional area for conveyance of road surface water flows. Unmitigated, this would result in a greater spread of flood waters into through lanes and in places an increased risk of flooding to adjacent private properties.

To mitigate the impact of the geometric changes to the road, additional gully pits have been incorporated to capture and convey surface flows to new and existing underground drainage networks. In multiple locations, the existing downstream drainage networks that the road drainage outlets to are undersized to cater for the design storm flows from the road corridor and contributing sub-catchments. In these cases, additional gully pits and new drainage pipes will only serve to help with flood mitigation during regular storm events and will not improve the situation for the design storm and less rare, more severe storm events. Significant upgrades to the existing regional drainage systems outside of the project area would be required to provide a fully compliant drainage solution.

Drainage analysis has been undertaken to assess the proposed design against the existing case. This work focused on the following:

- Identifying locations where upgrades to the existing drainage system would be required to mitigate impacts back to an existing condition;
- Identifying locations where flows posed an unacceptable risk to pedestrians;
- Specifying additional drainage infrastructure where doing so would improve surface flooding sufficiently to justify the cost of the works;
- Documenting proposed drainage infrastructure to a level that would allow accurate pricing of capital works.

Hydraulic modelling was undertaken on the proposed drainage network and undertaken using the 12d dynamic function.

### 4.2 Interfaces

#### 4.2.1 Geometrics

The drainage design has coordinated multiple elements of the geometric design. These include, but are not limited to:

- Kerb ramp locations
- Bus stop locations
- Road longitudinal, cross section, and horizontal geometry
- Overland flow path geometry

#### 4.2.2 Existing and proposed utilities

The drainage design has attempted, where possible and economically viable, to avoid all existing utilities. Where it has not been possible to avoid utilities, they have been identified to be relocated around the drainage assets in the PUP design.

#### 4.2.3 Structures

Existing structures have been avoided where known, and economically viable to avoid. Where new structures are required, such as the proposed retaining walls, they have been coordinated with the drainage design to avoid clashes.

Some new drainage outfalls are at existing drainage structures. Where the structure is standard and common, such as existing manholes or gullies, they have been specified to be replaced as deemed necessary. Where the structure is significant in nature, such as the large underground chambers and culverts at Boothby St, it will be necessary for the constructor to confirm the size, state, condition, and viability of the connections at the time of construction. Adequate information was not available during the detailed design to specify the connection details.

## 4.3 Design considerations

### 4.3.1 Safety in design

Safety in design has influenced multiple drainage design decisions, some of which are summarised below:

- Connections to large custom existing drainage assets has been minimised to reduce confined space operations in potentially hazardous environments
- The depth of proposed drainage assets has been reduced as far as practically possible, to reduce the depth of excavations required

### 4.3.2 Maintenance

Ease of maintenance has been considered during the design process. The following actions were adopted to minimise maintenance requirements:

- Where possible, access chambers have been located away from high traffic areas
- Pipes have been graded, where possible, to achieve self-cleansing velocities and minimise blockage or build-up of sediment
- Assets in the median have been minimised as far as the flow performance criteria will allow, to reduce requirements for median lane closures during maintenance activities

### 4.3.3 Economic

The main objective of the drainage design was to mitigate the impacts of the geometric changes in the first instance, and to meet the requirements of the TMR Drainage Design standards if economically viable. The design does not seek to resolve existing surface flooding issues where the impact to existing utilities and associated cost to achieve this would have been considered significant. Significant gains could have been made to the performance of the drainage network and mitigation of surface flows, but this would have required significant new road cross drainage. Significant cross drainage was considered undesirable due to the high cost of construction and impacts to traffic during construction.

### 4.3.4 Road user comfort

Road user comfort has been considered in the development of the design. The following actions were taken to improve road user comfort:

- Access chamber covers are located outside of wheel paths where possible
- 'Lip-in-line' road gullies are adopted as the preferred inlet in the design over 'Kerb-in-line' gullies, to minimise regular trafficking by vehicles
- Gullies are provided where possible, at the upstream of all bus stops and kerb ramps, to minimise the flows of water through pedestrian paths
- Dish gullies have been avoided in driveways for ease of access by driveway users

## 4.4 Design summary

### 4.4.1 Catchment 1 - Sadlier Street to Strathmore Street

#### Road Drainage

The northbound and southbound carriageway drainage remains separate for this section.

The northbound drainage outlets to a large underground regional drainage network immediately south of Sadlier Street. The works between the southern end of the project and Cremorne Street are minor and require only one new gully pit and outlet pipe to the existing drainage network, and the replacement of two existing gully pits to match new kerb alignments in Cremorne Street. Between Cremorne Street and Strathmore Street, a significant amount of new drainage infrastructure has been specified. This area is subject to large external catchment flows from Strathmore Street and Howell Street. As there is no existing local drainage network in either street, all flows pass into the road drainage network in Gympie Road, which is undersized to cater for the catchment flows.

The additional gullies improve surface flooding at the top of the catchment in the design storm but quickly begin to surcharge at the bottom of the catchment as the existing drainage network flow capacity is exceeded.

The southbound drainage outlets at two locations. The top of the catchment outlets to an existing surcharge gully in Seabrook Street, and the catchment outlets to the existing regional drainage network in Sadlier Street. Very little new drainage infrastructure is required in the southbound, as the external catchments are negligible. Two new gullies have been specified at the top of the catchment to replace an existing gully and reduce flood widths at the flatter section of the kerb near the top of the catchment.

### **Overland flow paths**

There are no significant overland flow paths through the civil works areas in this section, however the downstream outlets will be within a flood risk zone and are expected to be drowned in the minor storm event.

## **4.4.2 Catchment 2 - Strathmore Street to Kitchener Road**

### **Road Drainage**

Catchment 2 outlets to the existing drainage network passing under Gympie Road at Wallin St. The outlet location on the northbound carriageway has been identified as being at risk of surface flooding. The northbound and southbound drainage networks remain independent down to the outlet location, with the only cross drainage being the existing buried bridge structure immediately north of Wallin St.

The northbound drainage network from Strathmore to Wallin requires only minor works. The existing gullies are required to be replaced to match the new kerb alignment, and flood widths are reasonable due to the relatively new 'Coles' shopping centre development draining directly to the existing underground trunk drainage system and thus not contributing to the road flows. The northbound carriageway drainage from Wallin Street to Kitchener Road required additional drainage infrastructure to be specified to mitigate the impacts of the geometric changes. This section of road is subject to relatively large external catchment flows from Lutwyche Cemetery. Generous longitudinal grades help to reduce pipe sizes and flooded widths on the road surface. Approximately 230m of new pipe was required, along with 10 new gully pits, in order to mitigate impacts.

The southbound drainage in this catchment outlets the majority of flows to the existing cross drainage at Wallin Street, by way of a new access chamber of the existing line. A small portion of the catchment outlets to the same drainage network, by way of an existing branch drain in Edinburgh Castle Road. The existing drainage infrastructure between Castle Street and Oliver Street consists of two closely spaced gullies just south of Oliver Street, on Gympie Road. The outlet pipe from the existing gullies is only 225mm diameter and insufficient for the catchment flows. The gullies are specified to be replaced with a single long lintel gully with a larger outlet pipe. Two additional gullies are specified closer to Castle Street towards the top of the catchment to manage flow widths, and associated pipework included to connect to the existing drainage pipes at the corner of Oliver Street and Gympie Road. Pipe sizes are limited to 300mm diameter as this is the size of the existing downstream pipe network.

Southbound carriageway drainage between Oliver Street and Edinburgh Castle Road consists of four new gullies to manage the flows at the sag and approaches, as well as two new access chambers. Between Edinburgh Street and Nundah Street two additional gullies have been specified, along with a new access chamber. The gullies reduce the flooded width and the access chamber is required in place of an existing gully that was unable to be retained.

Median drainage for this section consists of one new gully at the southern end of the extended right turn land from Gympie Road to Sport Street. The new gully collects the majority of the catchment flows, mitigating any impacts from the works. Additional gullies could be added to collect almost all catchment flows and improve the existing cross road flow issues at the location.

### **Overland flow paths**

There are no significant overland flow paths over Gympie Road in this catchment. Minor existing flood risks are identified at Wallin Street and Edinburgh Castle Road indicating that the outlets for the drainage network are likely to be drowned during the design storm.

### 4.4.3 Catchment 3 - Kitchener Road to Pilba Street

#### Road Drainage

Catchment 3 is the largest catchment in the project area and also represents the majority of flooding issues for the project. The catchment is highly developed and has a significantly undersized existing drainage network in Gympie Road. The catchment outlets to the small creek on the eastern side of southbound carriageway. The northbound carriageway drainage connects to the southbound drainage networks via multiple existing cross drainage pipes and one new cross drainage pipe.

The northbound carriageway between Kitchener Road and the existing cross drainage pipe at Childers Street includes five new gullies and 120m of new pipe. The pipe size is limited to 300mm diameter by the existing cross drainage that it outlets to. The gullies at the top of the sub catchment are effective in reducing the flooded width, however due to the existing cross pipe being undersized, the final road gully surcharges in the design storm allowing water to flow to the north.

The northbound carriageway between the cross drainage at Childers Street and the main existing catchment cross pipe north of Boothby Street is subject to reasonably significant surface flooding. The existing network is undersized and the addition of additional gullies provides little improvement. The road cross section at this location adopts a channel kerb in place of the existing barrier kerb. This is to maintain the flow capacity of the existing overland flow path across Gympie Road. This benefits the flooded width encroachment into the through lanes, but significantly floods the path on the northbound carriageway in the design storm.

The northbound carriageway drainage network between the existing cross pipe north of Boothby Street and a splitter chamber at Lawley Street receives the largest flows in the project area. This network has a significant number of gully pits and a new 750mm diameter cross pipe across both carriageways. The new cross pipe was deemed necessary to mitigate flooding created by excessive bypass flows in the north of the catchment. While the cross pipe goes a long way to reduce surface flooding, the impacts remain unmitigated.

At the top end of the drainage network for section, there is a secondary outlet provided for the upstream drainage network to the north. This is to relieve the undersized upstream cross pipe.

The northbound carriageway drainage network from Lawley to Bromilow Street represents a significant amount of new drainage infrastructure. The proposed infrastructure is beneficial in the 63% AEP (1-year ARI) event but is insufficient to mitigate the design storm flows. This section is subject to significant highly developed external catchments with negligible existing drainage infrastructure. Significant gully pits have been incorporated to capture road flows, however the gullies surcharge in the design storm due to the excessive approach flows and surface flooding is worsened in terms of flood encroachment into the through lanes. Significant additional drainage infrastructure would be required to mitigate the impacts and was deemed cost prohibitive at this stage.

The northern most network in this catchment between Bromilow Street and Pilba Street performs better than the rest, with improvements in the total width of flooding and elimination of footpath flooding. There is however a wider spread of flood waters into the through lanes south of Rode Road due to the significant reduction in road cross section flow capacity.

On the southbound carriageway, there is no new drainage infrastructure south of Kedron Street. Between Kedron Street and Boothby Street, there is negligible new drainage infrastructure with only a few gullies replaced to match the new kerb alignment. Between Boothby Street and Lawley Street, a new 750/900mm diameter drainage pipe runs along the southbound carriageway to outlet at the existing creek to the east. This new outlet will require modification of the existing rock gabion in the creek and the installation of a new headwall at the outlet.

Between Lawley Street and Mellor Street, a small amount of pit and pipe drainage has been specified to manage road flows. Trench drain has also been specified in places to drain properties and verge where the footpath is unable to drain to the road.

Between Mellor Street and Sydney Street, no new drainage is required.

Between Sydney Street and Rode Road, additional gullies and pipes are specified to mitigate flow width issues.

Between Rode Road and Pilba Street, a small amount of existing drainage had been added to manage flow width issues.

#### Overland flow paths

A large overland flow path exists at Boothby Street. The road geometry has been designed in this location to ensure there is no change in the way external flows will traverse the road.

#### 4.4.4 Catchment 4 - Pilba Street to Hall Street

##### Road Drainage

The northbound and southbound drainage networks outlet to the existing cross drainage at Abarth Street. The northbound carriageway drainage from Pilba Street to Abarth Street requires new longitudinal drainage to mitigate surface flows. Surface flows are largely mitigated with the addition of the new drainage. The northbound carriageway drainage from Abarth to Hall Street requires minimal road drainage, but a significant amount of trench drain is required in the verge to manage the flows from the verge and adjacent properties.

The southbound carriageway drainage requires minimal road drainage, however additional trench drainage is required to manage the flows from adjacent properties and the verge area. This trench drainage requires road drainage be added to collect the trench drainage flows and convey it to a discharge location.

##### Overland flow paths

There is a significant overland flow path in this catchment at Abarth Street. The road geometry has been designed to ensure the overland flow path is not compromised.

#### 4.4.5 Catchment 5 - Hall Street to Hamilton Road

##### Road Drainage

This catchment outlets all flows to the existing drainage system in Hamilton Road.

The northbound carriageway drainage requires a significant amount of trench drain to manage verge and property flows.

The southbound carriageway also requires a significant amount of trench drain to manage verge and property flows, as well as a moderate amount of road drainage to convey the trench drain flows and mitigate flood widths in the kerbside lanes.

##### Overland flow paths

There is no known overland flow path through this catchment.

# 5 Design compliance

The section below outlines the compliance of the proposed design. Where a non-compliance has been noted it has been captured in a Design Exception Report. Refer to the Design Domain Report for details.

## 5.1 Roadway flow widths (10% AEP)

The following tables display the flow width compliance along the northbound carriageway, southbound carriageway and medians for a minor storm event, 10% AEP (ARI 10-years). The existing flow widths have been modelled and compared to the proposed flow widths and displayed alongside at corresponding chainages. Refer to Appendix B, C and D for the 63%, 10% and 1% AEP flow width sketches.

The assessment of the flow widths was completed in accordance with TMRs Road Drainage Manual. Generally, the proposed model does not significantly differ from the existing model, however, there are some sections on the northern carriageway which are different. These differences include:

- At Chge 935, the existing flow width does not allow for any through lanes whereas the proposed model allows for two through lanes.
- From Chge 1810 to Chge 1870 the existing flow widths only allow for a range of 1-3 through lanes, however, the proposed model allows for 3 through lanes for the entirety of the section.
- At Chge 1314, the existing flow width blocks all the through lanes and slowly thins to one lane at Chge 1335. The proposed model mitigates this problem by containing the spread of water to the bus lane.
- From CH2060 to Bromilow Street, the flow currently spills across the road and into the existing spread from the median resulting in no through lanes. The proposed model mitigates this issue by containing the spread of the water within the proposed bus lane in most locations

Table 5-1 MCA01 flow width compliance summary

Chge Start (MCA01)	Chge Finish (MCA01)	Compliant? (Y/N)	Bus lane clear? (Y/N)	No# Lanes clear Proposed	No# Lanes clear Existing
NR					

Chge Start (MCA01)	Chge Finish (MCA01)	Compliant? (Y/N)	Bus lane clear? (Y/N)	No# Lanes clear Proposed	No# Lanes clear Existing
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NR

Chge Start (MCA01)	Chge Finish (MCA01)	Compliant? (Y/N)	Bus lane clear? (Y/N)	No# Lanes clear Proposed	No# Lanes clear Existing
Rode Road					
2241	2273	Yes	Yes	3	3
2277	2311	No	No	3	3
2311	2361	Yes	Yes	3	3
2361	2421	No	No	3	3

NR

Table 5-2 MCA02 flow width compliance summary

Chge Start (MCA02)	Chge Finish (MCA02)	Compliant? (Y/N)	Bus lane clear? (Y/N)	No# Lanes clear Proposed	No# Lanes clear Existing
NR					

Chge Start (MCA02)	Chge Finish (MCA02)	Compliant? (Y/N)	Bus lane clear? (Y/N)	No# Lanes clear Proposed	No# Lanes clear Existing
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NR

Chge Start (MCA02)	Chge Finish (MCA02)	Compliant? (Y/N)	Bus lane clear? (Y/N)	No# Lanes clear Proposed	No# Lanes clear Existing
NR					
Rode Road		No	-	-	3
2232	2299	No	No	3	3
2299	2302	No	No	2	3
Pilba Street		No	-	-	3
2324	2328	Yes	Yes	3	3
2333	2361	Yes	Yes	3	3
2361	2371	No-minor	No-minor	3	3
2373	2376	Yes	Yes	3	3
2376	2406	No	No	3	3
NR					

Table 5-3 Median flow width Compliance

Chge Start (MCA0)	Chge Finish (MCA0)	Compliant? (Y/N)	Through lanes obstructed (Y/N)	Existing through lanes clear
NR				

## 5.2 Kerb ramp flow widths and corridor flow

The below tables show the compliance of each kerb ramp along the proposed Northern Transitway design during major and minor storm events. TMR's Road Drainage Manual was used to establish appropriate criteria for assessing compliance. For major storm events (ARI 50-years), a maximum water depth-velocity relationship was used to determine compliance. As highlighted in the table above, all but seven of the kerb ramps complied under the 0.4m<sup>2</sup>/s (obvious danger) limit. With only the Sydney Street north kerb ramps failing the 0.6m<sup>2</sup>/s (no obvious danger) limit given the existing grade on approach and exit to the kerb ramp.

Both the ARI 10-years and ARI 1-year minor storm events were used in assessing kerb ramp compliance. The ARI 1-year event was evaluated using two criteria; a depth velocity limit of 0.3 m<sup>2</sup>/s and a maximum spread width of 0.5m at pedestrian crossings. The former achieved full compliance and the latter was predominantly fully or partially compliant (partial compliance is achieved when there exists a region of the kerb ramp that complies and is large enough for pedestrian access). Of the 23 non-compliances, 9 were either improved or unchanged with respect to the existing conditions. 26 of the 41 full or partial compliances of the proposed design demonstrated an improvement over the existing conditions.

For the ARI 10-years event, a spread width of 0.45m immediately upstream at pedestrian crossings was the sole criteria used. Of the 74 kerb ramps assessed, 37 were deemed non-compliant and 37 were deemed fully or partially compliant. However, 22 of the 37 non-compliance regions improved upon or were no different to the existing drainage conditions. In no situation was there a non-compliant kerb which had previously complied.

Table 5-4 - Kerb ramp flow widths and corridor flow

Kerb Ramp Location	Major Storm (Q50) Compliance	Minor Storm (Q1) Compliance		Minor Storm (Q10) Compliance
	depth*Vavg [Xm <sup>2</sup> /s]	Spread <0.5m	depth*Vavg [Xm <sup>2</sup> /s]	Spread <0.45m

NR				
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Kerb Ramp Location	Major Storm (Q50) Compliance	Minor Storm (Q1) Compliance		Minor Storm (Q10) Compliance
	depth*Vavg [Xm^2/s]	Spread <0.5m	depth*Vavg [Xm^2/s]	Spread <0.45m

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Pilba South	0<=X<=0.3	YES	0<=X<=0.3	PARTLY COMPLIANT
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Kerb Ramp Location	Major Storm (Q50) Compliance	Minor Storm (Q1) Compliance		Minor Storm (Q10) Compliance
	depth*Vavg [Xm^2/s]	Spread <0.5m	depth*Vavg [Xm^2/s]	Spread <0.45m
Pilba North	0<=X<=0.3	YES	0<=X<=0.3	PARTLY COMPLIANT

NR
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### 5.3 Bus stop flow widths

The compliance of the bus stops along both north and southbound carriageways of the Northern Transitway are indicated in the table above. TMR's Road Drainage manual stipulates that bus stops must maintain a spread width of 0.45m during an ARI 10-years storm event. Of the 8 stops situated within the design region 4 were deemed non-compliant under the proposed design, with the other 4 varying in degrees of partial compliancy.

Table 5-5 – Bus stop flow widths

Bus Stop Location	Minor Storm (Q10) Compliance (Spread <0.45m)	
	Proposed	Existing (better/Same/Worse)
NR		

Bus Stop Location	Minor Storm (Q10) Compliance (Spread <0.45m)	
	Proposed	Existing (better/Same/Worse)
NR		

## 5.4 Property immunity requirements

The flow depth ranges along the kerb of the northbound carriageway are shown below.

Table 5-6 – Northbound carriageway flow depth ranges

Chainage Start	Chainage Finish	Length [m]	Depth of Flow (Xm)	Compliant
NR				

Chainage Start	Chainage Finish	Length [m]	Depth of Flow (Xm)	Compliant
NR				

Total Compliant Length [m]	Total Non-Compliant Length [m]
NR	

The flow depths along the approaches of each street on the northbound side are shown below.

Table 5-7 – Northbound streets flow depth ranges

Location	Depth of Flow (Xm)	Compliant
NR		

The flow depth ranges along the kerb of the southbound carriageway are shown below.

Table 5-8 – Southbound carriageway flow depth ranges

Chainage Start	Chainage Finish	Length [m]	Depth of Flow (Xm)	Compliant
NR				
2235	2305	70	0.15<=0.2 Orange	Yes
2326	2406	80	0<= 0.15 green	Yes
NR				

The flow depths along the approaches of each street on the southbound side are shown below.

Table 5-9 – Southbound streets flow depth ranges

Location	Depth of Flow (Xm)	Compliant
NR		

Location	Depth of Flow (Xm)	Compliant
NR		
Pilba Street North	0.15<=0.2 Orange	Yes
Pilba Street South	0.15<=0.2 Orange	Yes
NR		

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# Appendices

Appendix A  
Mean intensity data

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Mean Intensity Data

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Duration	Duration in min	Annual Exceedance Probability (AEP)						
		63%	50%	20%	10%	5%	2%	1%
1 min	1	158.00	179.00	244.00	287.50	330.00	385.00	427.00
2 min	2	131.00	149.00	204.00	243.00	281.00	332.00	371.00
3 min	3	123.00	140.00	191.00	227.00	262.00	309.00	344.50
4 min	4	118.00	133.00	182.00	215.50	248.00	291.50	324.50
5 min	5	113.00	127.50	174.00	205.50	236.00	277.00	307.50
10 min	10	92.75	105.00	143.00	168.00	192.00	224.00	248.00
15 min	15	78.65	89.00	121.00	142.00	163.00	190.00	210.00
20 min	20	68.40	77.40	105.00	124.00	142.00	165.50	183.00
25 min	25	60.60	68.70	93.60	110.00	126.50	147.50	164.00
30 min	30	54.60	61.85	84.40	99.50	114.00	133.50	148.00
45 min	45	42.50	48.10	65.80	77.90	89.70	105.00	117.00
1 hour	60	35.15	39.80	54.60	64.70	74.70	88.05	98.35
1.5 hour	90	26.60	30.15	41.45	49.30	57.15	67.70	76.00
2 hour	120	21.75	24.65	34.00	40.55	47.05	56.00	63.00
3 hour	180	16.40	18.60	25.70	30.75	35.85	42.85	48.35
4.5 hour	270	12.40	14.05	19.50	23.45	27.40	32.90	37.35
6 hour	360	10.20	11.60	16.15	19.45	22.75	27.40	31.15
9 hour	540	7.79	8.87	12.45	15.05	17.70	21.40	24.35
12 hour	720	6.46	7.38	10.40	12.50	14.85	18.00	20.60
18 hour	1080	4.97	5.71	8.13	9.39	11.75	14.30	16.40
24 hour	1440	4.12	4.75	6.83	8.35	9.89	12.15	13.95
30 hour	1800	3.57	4.12	5.96	7.31	8.71	10.65	12.30
36 hour	2160	3.15	3.66	5.33	6.55	7.82	9.62	11.05
48 hour	2880	2.59	3.01	4.43	5.48	6.55	8.10	9.37
72 hour	4320	1.93	2.26	3.36	4.16	5.01	6.22	7.22
96 hour	5760	1.54	1.81	2.70	3.36	4.04	5.04	5.86
120 hour	7200	1.29	1.51	2.24	2.79	3.36	4.19	4.89
144 hour	8640	1.11	1.29	1.91	2.37	2.86	3.55	4.15
168 hour	10080	0.96	1.12	1.65	2.04	2.46	3.05	3.57

Mean Intensity Data

Standard Deviation Quality Check

Duration	Duration in min	63%	50%	20%	10%	5%	2%	1%
1 min	1	0.00	0.00	0.00	0.50	0.00	0.00	0.00
2 min	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 min	3	0.00	0.00	0.00	0.00	0.00	0.00	0.50
4 min	4	0.00	0.00	0.00	0.50	0.00	0.50	0.50
5 min	5	0.00	0.50	0.00	0.50	0.00	0.00	0.50
10 min	10	0.15	0.00	0.00	0.00	0.00	0.00	0.00
15 min	15	0.15	0.10	0.00	0.00	0.00	0.00	0.00
20 min	20	0.10	0.10	0.00	0.00	0.00	0.50	0.00
25 min	25	0.10	0.10	0.10	0.00	0.50	0.50	0.00
30 min	30	0.10	0.05	0.10	0.10	0.00	0.50	0.00
45 min	45	0.10	0.10	0.10	0.10	0.10	0.00	0.00
1 hour	60	0.05	0.10	0.10	0.10	0.10	0.15	0.15
1.5 hour	90	0.10	0.05	0.15	0.10	0.15	0.20	0.20
2 hour	120	0.05	0.05	0.10	0.15	0.15	0.20	0.20
3 hour	180	0.10	0.10	0.10	0.15	0.15	0.25	0.25
4.5 hour	270	0.10	0.05	0.10	0.15	0.20	0.20	0.25
6 hour	360	0.10	0.10	0.15	0.15	0.15	0.20	0.25
9 hour	540	0.07	0.08	0.15	0.15	0.20	0.20	0.25
12 hour	720	0.06	0.08	0.10	0.10	0.15	0.20	0.20
18 hour	1080	0.06	0.06	0.10	0.12	0.15	0.20	0.20
24 hour	1440	0.05	0.06	0.09	0.11	0.11	0.15	0.15
30 hour	1800	0.04	0.06	0.08	0.10	0.12	0.15	0.20
36 hour	2160	0.04	0.05	0.08	0.09	0.11	0.13	0.15
48 hour	2880	0.04	0.04	0.06	0.07	0.09	0.11	0.13
72 hour	4320	0.03	0.03	0.04	0.06	0.06	0.08	0.09
96 hour	5760	0.02	0.03	0.03	0.04	0.05	0.06	0.07
120 hour	7200	0.02	0.02	0.03	0.03	0.04	0.05	0.06
144 hour	8640	0.02	0.02	0.03	0.03	0.04	0.04	0.05
168 hour	10080	0.01	0.01	0.02	0.03	0.03	0.04	0.04

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## IFD Design Rainfall Intensity (mm/h)

Issued: 8-Aug-19

Location Label:

Requested Latitude -27.491 Longitude 153.07

Nearest gri Latitude 27.4875 (S) Longitude 153.0625 (E)

Duration	Duration in	Annual Exceedance Probability (AEP)							
		63.20%	50%	20%	10%	5%	2%	1%	
1 min	1	158	179	244	287	330	385	427	
2 min	2	131	149	204	243	281	332	371	
3 min	3	123	140	191	227	262	309	344	
4 min	4	118	133	182	215	248	291	324	
5 min	5	113	127	174	205	236	277	307	
10 min	10	92.6	105	143	168	192	224	248	
15 min	15	78.5	88.9	121	142	163	190	210	
20 min	20	68.3	77.3	105	124	142	165	183	
25 min	25	60.5	68.6	93.5	110	126	147	164	
30 min	30	54.5	61.8	84.3	99.4	114	133	148	
45 min	45	42.4	48	65.7	77.8	89.6	105	117	
1 hour	60	35.1	39.7	54.5	64.6	74.6	87.9	98.2	
1.5 hour	90	26.5	30.1	41.3	49.2	57	67.5	75.8	
2 hour	120	21.7	24.6	33.9	40.4	46.9	55.8	62.8	
3 hour	180	16.3	18.5	25.6	30.6	35.7	42.6	48.1	
4.5 hour	270	12.3	14	19.4	23.3	27.2	32.7	37.1	
6 hour	360	10.1	11.5	16	19.3	22.6	27.2	30.9	
9 hour	540	7.72	8.79	12.3	14.9	17.5	21.2	24.1	
12 hour	720	6.39	7.3	10.3	12.5	14.7	17.8	20.4	
18 hour	1080	4.91	5.64	8.03	9.77	11.6	14.1	16.2	
24 hour	1440	4.07	4.69	6.74	8.24	9.78	12	13.8	
30 hour	1800	3.52	4.06	5.88	7.21	8.59	10.5	12.1	
36 hour	2160	3.11	3.61	5.25	6.46	7.71	9.49	10.9	
48 hour	2880	2.55	2.97	4.37	5.4	6.46	7.99	9.24	
72 hour	4320	1.9	2.22	3.31	4.1	4.94	6.14	7.13	
96 hour	5760	1.52	1.78	2.66	3.31	3.99	4.97	5.79	
120 hour	7200	1.27	1.49	2.21	2.75	3.32	4.14	4.83	
144 hour	8640	1.09	1.27	1.88	2.34	2.82	3.51	4.1	
168 hour	10080	0.952	1.11	1.62	2.01	2.43	3.01	3.52	

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IFD Design Rainfall Intensity (mm/h)

Issued: 8-Aug-19

Location Label:

Requested Latitude -27.494 Longitude 153.085

Nearest gri Latitude 27.4875 (S) Longitude 153.0875 (E)

Duration	Duration in	Annual Exceedance Probability (AEP)							
		63.20%	50%	20%	10%	5%	2%	1%	
1 min	1	158	179	244	288	330	385	427	
2 min	2	131	149	204	243	281	332	371	
3 min	3	123	140	191	227	262	309	345	
4 min	4	118	133	182	216	248	292	325	
5 min	5	113	128	174	206	236	277	308	
10 min	10	92.9	105	143	168	192	224	248	
15 min	15	78.8	89.1	121	142	163	190	210	
20 min	20	68.5	77.5	105	124	142	166	183	
25 min	25	60.7	68.8	93.7	110	127	148	164	
30 min	30	54.7	61.9	84.5	99.6	114	134	148	
45 min	45	42.6	48.2	65.9	78	89.8	105	117	
1 hour	60	35.2	39.9	54.7	64.8	74.8	88.2	98.5	
1.5 hour	90	26.7	30.2	41.6	49.4	57.3	67.9	76.2	
2 hour	120	21.8	24.7	34.1	40.7	47.2	56.2	63.2	
3 hour	180	16.5	18.7	25.8	30.9	36	43.1	48.6	
4.5 hour	270	12.5	14.1	19.6	23.6	27.6	33.1	37.6	
6 hour	360	10.3	11.7	16.3	19.6	22.9	27.6	31.4	
9 hour	540	7.86	8.95	12.6	15.2	17.9	21.6	24.6	
12 hour	720	6.52	7.45	10.5	12.7	15	18.2	20.8	
18 hour	1080	5.03	5.77	8.23	10	11.9	14.5	16.6	
24 hour	1440	4.17	4.81	6.92	8.46	10	12.3	14.1	
30 hour	1800	3.61	4.17	6.04	7.41	8.82	10.8	12.5	
36 hour	2160	3.19	3.7	5.4	6.64	7.92	9.75	11.2	
48 hour	2880	2.62	3.05	4.45	5.55	6.64	8.21	9.49	
72 hour	4320	1.95	2.29	3.4	4.22	5.07	6.3	7.31	
96 hour	5760	1.56	1.83	2.73	3.4	4.09	5.1	5.93	
120 hour	7200	1.3	1.53	2.27	2.82	3.4	4.24	4.95	
144 hour	8640	1.12	1.3	1.93	2.4	2.89	3.59	4.2	
168 hour	10080	0.977	1.13	1.67	2.06	2.49	3.08	3.61	

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## IFD Design Rainfall Intensity (mm/h)

Issued: 8-Aug-19

Location Label:

Requested Latitude -27.498 Longitude 153.052

Nearest gri Latitude 27.4875 (S) Longitude 153.0625 (E)

Duration	Duration in	Annual Exceedance Probability (AEP)						
		63.20%	50%	20%	10%	5%	2%	1%
1 min	1	158	179	244	287	330	385	427
2 min	2	131	149	204	243	281	332	371
3 min	3	123	140	191	227	262	309	344
4 min	4	118	133	182	215	248	291	324
5 min	5	113	127	174	205	236	277	307
10 min	10	92.6	105	143	168	192	224	248
15 min	15	78.5	88.9	121	142	163	190	210
20 min	20	68.3	77.3	105	124	142	165	183
25 min	25	60.5	68.6	93.5	110	126	147	164
30 min	30	54.5	61.8	84.3	99.4	114	133	148
45 min	45	42.4	48	65.7	77.8	89.6	105	117
1 hour	60	35.1	39.7	54.5	64.6	74.6	87.9	98.2
1.5 hour	90	26.5	30.1	41.3	49.2	57	67.5	75.8
2 hour	120	21.7	24.6	33.9	40.4	46.9	55.8	62.8
3 hour	180	16.3	18.5	25.6	30.6	35.7	42.6	48.1
4.5 hour	270	12.3	14	19.4	23.3	27.2	32.7	37.1
6 hour	360	10.1	11.5	16	19.3	22.6	27.2	30.9
9 hour	540	7.72	8.79	12.3	14.9	17.5	21.2	24.1
12 hour	720	6.39	7.3	10.3	12.5	14.7	17.8	20.4
18 hour	1080	4.91	5.64	8.03	9.77	11.6	14.1	16.2
24 hour	1440	4.07	4.69	6.74	8.24	9.78	12	13.8
30 hour	1800	3.52	4.06	5.88	7.21	8.59	10.5	12.1
36 hour	2160	3.11	3.61	5.25	6.46	7.71	9.49	10.9
48 hour	2880	2.55	2.97	4.37	5.4	6.46	7.99	9.24
72 hour	4320	1.9	2.22	3.31	4.1	4.94	6.14	7.13
96 hour	5760	1.52	1.78	2.66	3.31	3.99	4.97	5.79
120 hour	7200	1.27	1.49	2.21	2.75	3.32	4.14	4.83
144 hour	8640	1.09	1.27	1.88	2.34	2.82	3.51	4.1
168 hour	10080	0.952	1.11	1.62	2.01	2.43	3.01	3.52

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## IFD Design Rainfall Intensity (mm/h)

Issued: 8-Aug-19

Location Label:

Requested Latitude -27.498 Longitude 153.099

Nearest gri Latitude 27.4875 (S) Longitude 153.0875 (E)

Duration	Duration in	Annual Exceedance Probability (AEP)							
		63.20%	50%	20%	10%	5%	2%	1%	
1 min	1	158	179	244	288	330	385	427	
2 min	2	131	149	204	243	281	332	371	
3 min	3	123	140	191	227	262	309	345	
4 min	4	118	133	182	216	248	292	325	
5 min	5	113	128	174	206	236	277	308	
10 min	10	92.9	105	143	168	192	224	248	
15 min	15	78.8	89.1	121	142	163	190	210	
20 min	20	68.5	77.5	105	124	142	166	183	
25 min	25	60.7	68.8	93.7	110	127	148	164	
30 min	30	54.7	61.9	84.5	99.6	114	134	148	
45 min	45	42.6	48.2	65.9	78	89.8	105	117	
1 hour	60	35.2	39.9	54.7	64.8	74.8	88.2	98.5	
1.5 hour	90	26.7	30.2	41.6	49.4	57.3	67.9	76.2	
2 hour	120	21.8	24.7	34.1	40.7	47.2	56.2	63.2	
3 hour	180	16.5	18.7	25.8	30.9	36	43.1	48.6	
4.5 hour	270	12.5	14.1	19.6	23.6	27.6	33.1	37.6	
6 hour	360	10.3	11.7	16.3	19.6	22.9	27.6	31.4	
9 hour	540	7.86	8.95	12.6	15.2	17.9	21.6	24.6	
12 hour	720	6.52	7.45	10.5	12.7	15	18.2	20.8	
18 hour	1080	5.03	5.77	8.23	10	11.9	14.5	16.6	
24 hour	1440	4.17	4.81	6.92	8.46	10	12.3	14.1	
30 hour	1800	3.61	4.17	6.04	7.41	8.82	10.8	12.5	
36 hour	2160	3.19	3.7	5.4	6.64	7.92	9.75	11.2	
48 hour	2880	2.62	3.05	4.45	5.55	6.64	8.21	9.49	
72 hour	4320	1.95	2.29	3.4	4.22	5.07	6.3	7.31	
96 hour	5760	1.56	1.83	2.73	3.4	4.09	5.1	5.93	
120 hour	7200	1.3	1.53	2.27	2.82	3.4	4.24	4.95	
144 hour	8640	1.12	1.3	1.93	2.4	2.89	3.59	4.2	
168 hour	10080	0.977	1.13	1.67	2.06	2.49	3.08	3.61	

# Appendix B

## 63% AEP flow width sketches

Release 30/06/2014  
Order RTI - DTMR  
DRAFT

Released under RTI - DTMR

NR



NORTHERN TRANSITWAY  
FLOW WIDTH LAYOUT 63% AEP  
SHEET 1

50462000-SC1-LD-1021

17/12/2019

REV:003



Released under RTI - DTMR

NR

15/06/2019 10:21:15

**aurecon**  
Water Services Division

17/12/2019 REP:003

15/06/2019 10:21:15

NORTHERN TRANSITWAY  
 FLOW WIDTHS 69% AEP  
 SHEET 2

0 5 10 15 20m

Released under RTI - DTMR

NR



NORTHERN TRANSITWAY  
FLOW WIDTHS 69% AEP  
SHEET 3



REV 003

17/12/2019

504820000-000-000-000

15.12.2019 10:27:15

Released under RTI - DTMR

15.12.2019 10:22:22

**aurecon**  
Aurecon Limited, 120 St Albans Road, St Albans, Western Australia 6107

REV 003

17/12/2019

504850000-000-001-01-004

NORTHERN TRANSITWAY  
FLOW WIDTHS 69% AEP  
SHEET 4

0 5 10 15 20m





Released under RTI - DTMR

NR

NORTHERN TRANSITWAY  
FLOW WIDTHS 69% AEP  
SHEET 6



17/12/2019  
150480-000-SCTLD-1206  
REV:003

15.12.2019.10.23.34



Appendix C  
10% AEP flow width sketches

DR  
Release  
Order RTI - DTMR

Released under RTI - DTMR

NR



REP:003

17/12/2019

504620000-SCTLD-120

NORTHERN TRANSITWAY  
FLOW WIDTHS 10% AEP  
SHEET 1





Released under RTI - DTMR



REV: 003

17/12/2019

504820000-000-SCTLD-1022

NORTHERN TRANSITWAY  
FLOW WIDTHS 10% AEP  
SHEET 3



Released under RTI - DTMR

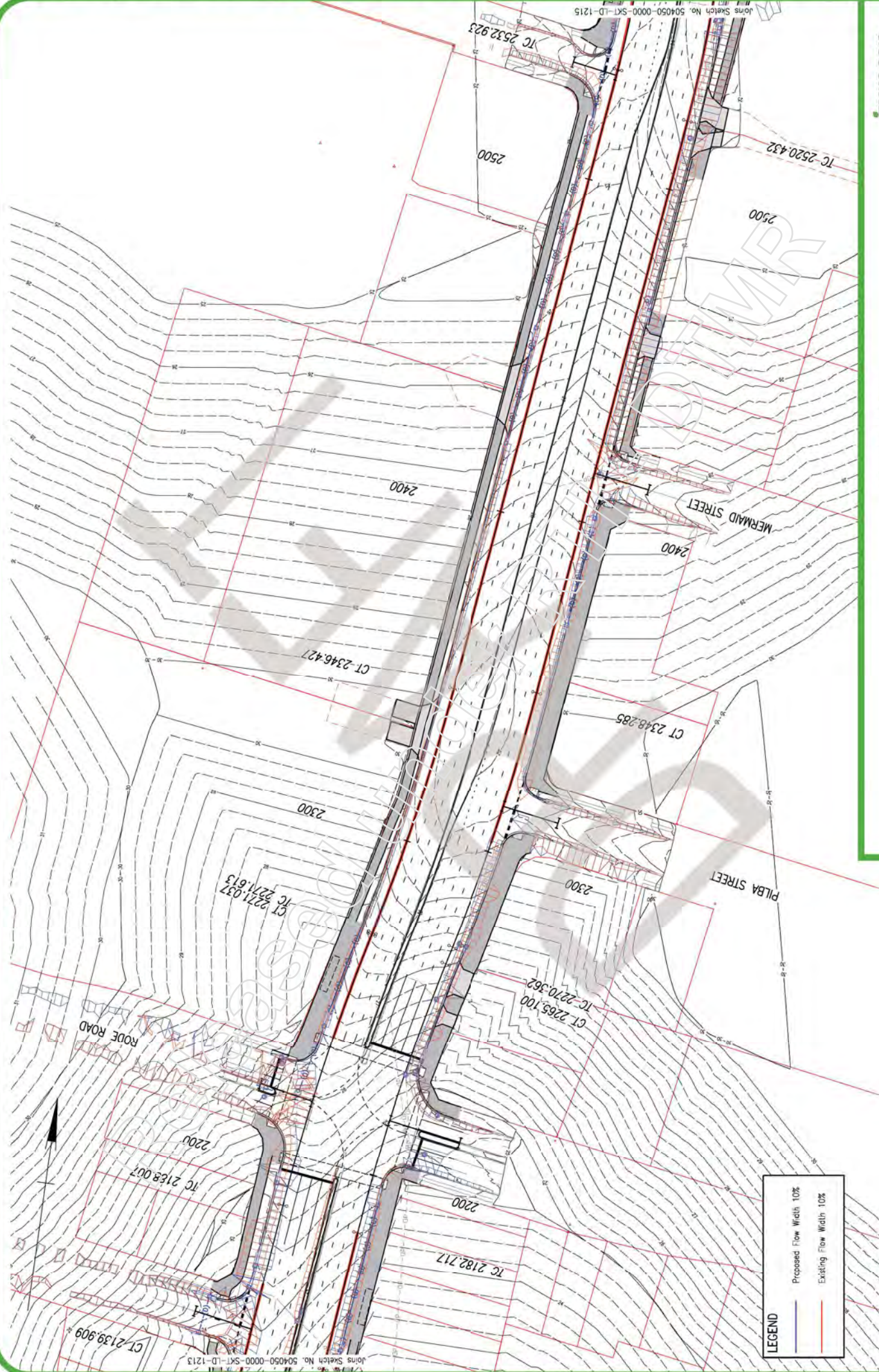
NR

NORTHERN TRANSITWAY  
FLOW WIDTHS 10% AEP  
SHEET 4



17/12/2019 REV 003  
504850000-000-000-000-000-000-000

18.12.2019 10:28:23



**LEGEND**

- Proposed Flow Width 10%
- Existing Flow Width 10%

NORTHERN TRANSITWAY  
FLOW WIDTHS 10% AEP  
SHEET 5



Released under RTI - DTMR

NR



NORTHERN TRANSITWAY  
FLOW WIDTHS 10% AEP  
SHEET 6

50480-000-SCTLD-1215

17/12/2019

REV:003



19.12.2019 10:27:3



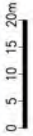
# Appendix D

## 1% AEP flow width sketches

Release 30/06/2014  
Order RTI - DTMR  
**DRAFT**

Released under RTI - DTMR

NR



NORTHERN TRANSITWAY  
FLOW WIDTH LAYOUT 1% AEP  
SHEET 1

50482000-SCTLD-1613

17/12/2019

REV:003





Released under RTI - DTMR

NR

NORTHERN TRANSITWAY  
FLOW WIDTHS 1% AEP  
SHEET 3



50482000-000-SCTL-D-1616  
17/12/2019  
REV:003

Released under RTI - DTMR

NR

NORTHERN TRANSITWAY  
FLOW WIDTHS 1% AEP  
SHEET 4



17/12/2019 REV 003  
504820000-000-000-000-000-000-000

18.12.2019 10:38:02



Released under RTI - DTMR

NR

NORTHERN TRANSITWAY  
FLOW WIDTHS 1% AEP  
SHEET 6



REV: 003

17/12/2019

504820000-SCITLD-1618

15.12.2019 10:20:23



**Document prepared by**

**Aurecon Australasia Pty Ltd**

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**aurecon**

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to life*

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Swaziland, Tanzania, Thailand, Uganda,  
United Arab Emirates, Vietnam, Zambia.

**From:** [Redacted]  
**To:** [NTW DocControl](#)  
**Subject:** FW: CN-12205 - Notification of Contract Award  
**Date:** Monday, 22 March 2021 3:29:19 PM  
**Attachments:** Ranbury-Logo-Resized-for-email\_c621aa7e-e52c-44e7-bf88-efc51a9604a4.jpg  
LOA.pdf  
LOA attachments.pdf  
FIA Ltr.pdf

---

[Redacted]

General Manager - Roads & Civil, QLD



Project delivery and advisory services

**TRANSPORT | PROPERTY & BUILDING | RESOURCES & UTILITIES**

**HAVE YOUR SAY.** Ranbury are asking our clients to let us know how we are doing. Have your say by clicking [here](#).

**M** [Redacted] | **E** [Redacted] | **T** 07 3211 2300

Level 18, 270 Adelaide Street Brisbane QLD 4000 | GPO Box 914 Brisbane QLD 4001  
[ranbury.com.au](#) | [LinkedIn](#) | [Townsville](#) | [Mackay](#) | [Brisbane](#) | [Sydney](#) | [Melbourne](#)

---

**From:** Caleb J Brown <Caleb.J.Brown@tmr.qld.gov.au>  
**Sent:** Thursday, 18 March 2021 4:37 PM  
**To:** [Redacted]  
**Cc:** CN12205\_NTW <CN12205\_NTW@tmr.qld.gov.au>  
**Subject:** FW: CN-12205 - Notification of Contract Award

Hi [Redacted]

Thanks again for your time this afternoon,

As discussed the contract to for CN-12205 was awarded to Bielby on Tuesday 16 March 2021 (refer below and attached). Also, I have received several email/questions from Bielby looking to progress things, which I will forward individually to make record keeping and correspondence easier to manage.

Please let me know the project inbox created by Ranbury so I can cc it in on the forwarded emails.

If there is anything further you require from me please don't hesitate to ask. Thanks

**Caleb Brown** BEng (Civil) CPEng RPEQ  
Civil Engineer (Contractor) | Metropolitan Region  
**Program Delivery and Operations Branch** | Infrastructure Management and Delivery Division | Department of Transport and Main Roads

---

Floor 15 | 313 Adelaide Street | Brisbane Qld 4000  
GPO Box 70 | Spring Hill Qld 4004

P: (07) 3066 9124 | M:   
[caleb.j.brown@tmr.qld.gov.au](mailto:caleb.j.brown@tmr.qld.gov.au)  
[www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

---

**From:** Tender Contracts <[Tender\\_Contracts@tmr.qld.gov.au](mailto:Tender_Contracts@tmr.qld.gov.au)>  
**Sent:** Tuesday, 16 March 2021 10:43 AM  
**To:**   
**Cc:** Caleb J Brown <[Caleb.J.Brown@tmr.qld.gov.au](mailto:Caleb.J.Brown@tmr.qld.gov.au)>; Tender Contracts <[Tender\\_Contracts@tmr.qld.gov.au](mailto:Tender_Contracts@tmr.qld.gov.au)>  
**Subject:** CN-12205 - Notification of Contract Award

Congratulations

Please find attached a scanned version of the Letter of Acceptance which will be sent to you by Express Post today.

Under the contract, securities are due within 10 business days of the LOA.

You will also receive documentation relating to the submission and sighting of specific information in accordance with the General Conditions of Contract ie: insurances, securities, plans as outlined in the form C7872 - Requirements to be Executed by the Contractor. Please satisfy these requirements within the time limits specified.

Please ensure you complete the Performance Reports on a monthly basis, preferably during site meetings. Please liaise with the Administrator regarding the Performance Report template to be completed.

A draft version of the e-Contract will also be available to you on the QBuild eTender website shortly.

Regards

**Arwen Lea**  
Advisor (Tenders) | Prequalification and Contracts Unit  
**Program Management and Delivery** | Department of Transport and Main Roads  
Floor 18 | Brisbane City - 313 Adelaide Street | Brisbane City Qld 4000  
GPO Box 1549 | Brisbane City Qld 4000  
P: (07) 3066-5466 | F: (07) 3066-5466  
E: [arwen.z.lea@tmr.qld.gov.au](mailto:arwen.z.lea@tmr.qld.gov.au)  
W: [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

\*\*\*\*\*  
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Opinions contained in this email do not necessarily reflect the opinions of the Department of Transport and Main Roads, or endorsed organisations utilising the same infrastructure.

\*\*\*\*\*

Released under RTI - DTMR



16 March 2021

NR

Managing Director  
Bielby Holdings Pty Ltd  
PO Box 1553  
Milton Qld 4064

Dear NR

**Contract Number: CN-12205**  
**Northern Transitway – Gympie Road (Kedron to Chermside)**  
**Project No. 728940**

**LETTER OF ACCEPTANCE**

I am pleased to advise that the State of Queensland acting through the Department of Transport and Main Roads hereby accepts your schedule of rates conforming tender dated 14 December 2020 for the above works for the contract sum of \$50,698,378.18 (GST inclusive).

In accordance with the Conditions of Tendering, you are now bound by the Conditions of Contract. Your attention is drawn to Form C7872 - Requirements to be Executed by the Contractor, which is enclosed under a separate letter. Would you please satisfy these requirements within the time limits specified.

The Principal will be represented by the nominated delegates, as outlined in the General Conditions of Contract Annexure under Item 4 of the Contract. All correspondence to the Principal should be addressed accordingly.

Yours sincerely

NR

Alan Uhlmann

**Delegate of the Principal**

Department of Transport and Main Roads  
Program Management & Delivery  
Floor 18 | 313 Adelaide Street | Brisbane | Qld | 4000  
GPO Box 1549 | Brisbane | Qld | 4001

Our Ref: CN-12205  
Enquiries: Arwen Lea  
Telephone +61 7 3066 5466  
Website [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

ABN 39 407 690 291



16 March 2021

Managing Director  
Bielby Holdings Pty Ltd  
PO Box 1553  
Milton Qld 4064

Dear

**Contract Number: CN-12205**  
**Northern Transitway – Gympie Road (Kedron to Chermside)**  
**Project No. 728940**

An unexecuted version of the e-Contract is now available for you to peruse on the QBuild eTender website.

Also attached are three copies of the Formal Instrument of Agreement for the above Contract for your signature and return.

In accordance with Clause 6.2 of the General Conditions of Contract, you are requested to execute all copies of the Formal Instrument of Agreement and to return the contract documents to the address stated below within 10 business days of the Letter of Acceptance.

Please ensure all three copies are properly executed in accordance with the Corporations Act 2001. Section 127 of this Act is attached for your information.

On return of the correctly executed documents, they will be incorporated into the final e-Contract document and uploaded to the QBuild eTender system for your records.

Yours sincerely,

Allan Uhlmann  
**Executive Director (Program Management and Delivery)**

Department of Transport and Main Roads  
Program Management & Delivery  
Floor 18 | 313 Adelaide Street | Brisbane | Qld | 4000  
GPO Box 1549 | Brisbane | Qld | 4001

Our Ref: CN-12205  
Enquiries: Arwen Lea  
Telephone 3066 5466  
Website [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

ABN 39 407 690 291

**Corporations Act 2001**

**127 Execution of documents (including deeds) by the company itself**

- (1) A company may execute a document without using a common seal if the document is signed by:
- (a) two directors of the company; or
  - (b) a director and a company secretary of the company; or
  - (c) for a proprietary company that has a sole director who is also the sole company secretary—that director
- Note: If a company executes a document in this way, people will be able to rely on the assumptions in subsection 129(5) for dealings in relation to the company.
- (2) A company with a common seal may execute a document if the seal is fixed to the document and the fixing of the seal is witnessed by:
- (a) 2 directors of the company; or
  - (b) a director and a company secretary of the company; or
  - (c) for a proprietary company that has a sole director who is also the sole company secretary—that director.
- Note: If a company executes a document in this way, people will be able to rely on the assumptions in subsection 129(6) for dealings in relation to the company.
- (3) A company may execute a document as a deed if the document is expressed to be executed as a deed and is executed in accordance with subsection (1) or (2).
- (4) This section does not limit the ways in which a company may execute a document (including a deed).

**From:** [Caleb J Brown](#)  
**To:**   
**Cc:** [NTW.DocControl](#); [CN12205\\_NTW](#)  
**Subject:** Executed Formal Instrument of Agreement (CN-12205)  
**Date:** Friday, 16 April 2021 3:49:52 PM  
**Attachments:** 20210412\_CN-12205\_Forma Instrument of Agreement\_Executed.pdf

---

Hi

For your records please find attached the executed Formal Instrument of Agreement document for CN-12205. Thanks

**Caleb Brown** BEng (Civil) CPEng RPEQ  
Civil Engineer (Contractor) | Metropolitan Region  
**Program Delivery and Operations Branch** | Infrastructure Management and Delivery Division | Department of Transport and Main Roads

---

Floor 15 | 313 Adelaide Street | Brisbane Qld 4000

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[www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

\*\*\*\*\*

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\*\*\*\*\*



12 April 2021

Caleb Brown  
Metropolitan District  
Department of Transport and Main Roads  
PO Box 70  
Spring Hill Qld 4000

Dear Caleb,

**Contract Number: CN-12205**  
**Northern Transitway – Gympie Road (Kedron to Chermside)**  
**Project No. 728940**

Please find enclosed one copy of the executed Formal Instrument of Agreement for your retention. The full electronic version of the contract is available on the QBuild eTender website.

Should you have any difficulties in accessing this information, please advise us and we can forward to you an electronic copy.

Yours sincerely,

NR

Narelle Spano  
**For Manager (Prequalification and Contracts)**

Department of Transport and Main Roads  
Program Management & Delivery  
Floor 18 | 313 Adelaide Street | Brisbane | Qld | 4000  
GPO Box 1549 | Brisbane | Qld | 4001

ABN 39 407 690 291

Our Ref: CN-12205  
Enquiries: Arwen Lea  
Telephone +61 7 3066 5466  
Website [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

# Formal Instrument of Agreement

Contract Number: **CN-12205**

## Contract between

[Contractor Details]

Name and Address of Contractor <b>Bielby Holdings Pty Ltd PO BOX 1553, MILTON QLD 4064</b>	ACN 052 188 600
Contractor's Representative [Name] NR <b>MANAGING DIRECTOR</b>	
Contractor's Representative Contact Details Email: NR	Phone: NR

Referred to in the Agreement as 'the Contractor'

and

Name of Principal <b>The State of Queensland acting through the Department of Transport and Main Roads</b>
---

'the Principal'

The Contractor agrees to perform the work under the Contract in accordance with the requirements contained in the documents listed in the completed Form C7871, *Contract Document List* signed and dated:

16 March 2021

The Contractor agrees with the Principal and the Principal agrees with the Contractor that they will comply with all conditions and matters as set out or reasonably inferred in the Contract.

## Execution by the Contractor

*Signed, sealed and delivered for and on behalf of*

Name of Authorised Party (1) for the Contractor NR	Position <b>MANAGING DIRECTOR</b>
Name of Authorised Party (2) for the Contractor NR	Position <b>EXEC. DIRECTOR</b>

Signature (1) NR	Date <b>23/03/21</b>
---------------------	-------------------------

Signature (2) NR	Date <b>6.4.21</b>
---------------------	-----------------------

who certifies his/hers/their authorisation to execute this Deed in the presence of

Witness Signature NR	Date <b>06.04.2021</b>
-------------------------	---------------------------

The Company Seal  
(where applicable)

**Execution by the Principal**

*Signed, sealed and delivered for and on behalf of the STATE OF QUEENSLAND acting through the DEPARTMENT OF TRANSPORT AND MAIN ROADS by*

Name	Position
Dale Cunningham	Manager (Prequalification and Contracts)

Signature	NR	Date	9/4/2021
-----------	----	------	----------

as Delegate of the Director-General of the Department of Transport and Main Roads  
in the presence of

Witness Signature/	Date
NR	9/4/2021

# Requirements to be Executed by the Contractor



Queensland Government

C7872

Contract Number

CN-12205

Date of Letter of  
Acceptance (LOA)

16 March 2021

When Required	What	Clause † Reference	Amount	Forward to ‡	Details
Before commencing work.	Evidence of Insurance of Employees	Cl. 20 & 21 GCoC	-	A	
Before commencing work.	Prestart Conference	Cl. 4.2 GCoC	-	A	Contact the Administrator to arrange a Prestart conference.
Within 10 Business Days of LOA.	Primary Security	Cl. 5.4 GCoC	\$506,983.78	P1	An Insurance Bond on the attached form is acceptable.
Within 10 Business Days of LOA.	Subcontractor Payment Security	Cl. 5.4 GCoC	\$506,983.78	P1	An Insurance Bond on the attached form is acceptable.
Provided at Contractor's discretion as per Clause 5.3.	Retention Security	Cl. 5.3 GCoC	\$2,027,935.13	P1	An Insurance Bond on the attached form is acceptable. Alternatively, Retention Monies will be withheld from each Payment Claim until required amount is retained.
Please check Item 35A of Annexure A to GCoC.	Contract Plan	Cl. 33.3 GCoC	-	A	
<p><b>Contract Plan</b> which includes the following plans:</p> <ul style="list-style-type: none"> <li>i. Construction Program</li> <li>ii. Quality Plan</li> <li>iii. Environmental Management Plan</li> <li>iv. Work Health and Safety Management Plan</li> <li>v. Traffic Management Plan (where required)</li> <li>vi. Community Liaison Plan (where required)</li> <li>vii. Severe Weather Management Plan (where required)</li> </ul>					

When Required	What	Clause † Reference	Amount	Forward to ‡	Details
Within 10 Business Days of LOA.	Training Requirements	Cl. 29.3 GCoC	-	-	
Within 10 Business Days after receipt from the Principal.	Formal Instrument of Agreement (FIA)	Cl. 6.2 GCoC		P1	The Principal will forward 3 hard copies of the FIA within 20 Business Days after the LOA for execution. Contract documents will be provided electronically.

† GCoC = General Conditions of Contract

‡ Forwarding Addresses:

**P1**  
 Program Officer (Contracts)  
 Prequalification & Contracts Unit  
 Program Management & Delivery  
 Department of Transport & Main  
 Roads  
**GPO Box 1549**  
**Brisbane QLD 4001**

**A**  
 Administrator  
 c/- Department of Transport &  
 Main Roads  
 Email: [bthiele@ranbury.com.au](mailto:bthiele@ranbury.com.au)

**Authorisation**

Name /Position  Allan Uhlmann <b>Executive Director (Program Management and Delivery)</b>	Signature  <div style="border: 1px solid black; width: 100px; height: 40px; margin: 0 auto; text-align: center;">NR</div>	Date  <div style="border: 1px solid black; width: 100px; height: 40px; margin: 0 auto; text-align: center;">16 March 2021</div>
--	---	---

# Unconditional Insurance Bond for Subcontractor Payment Security



Queensland Government

C7845

<b>Contract Number:</b>	<b>CN-12205</b>
-------------------------	-----------------

3. Should the Insurance Company be notified in writing, purporting to be signed by or on behalf of the Principal, that the Principal desires payment to be made of the whole or any part or parts of the Maximum Sum and this Undertaking is produced for sighting to the Insurance Company, it is unconditionally and irrevocably agreed that the Insurance Company will make the payment or payments to the Principal immediately and without reference to the Contractor or to any other person and notwithstanding any notice given by the Contractor not to pay same. The authority of the person signing the demand need not be proved.
4. The Insurance Company's liability under this Undertaking may be terminated at any time upon payment to the Principal (without the Insurance Company being required to do so) of the Maximum Sum, less any amount or amounts the Insurance Company may previously have paid under this Undertaking, or such lesser sum as may be specified by the Principal, and thereupon the liability of the Insurance Company hereunder shall immediately cease and determine.
5. This Undertaking and the Insurance Company's liability under it --
  - a. is not contingent upon, or discharged or impaired by reason of, any other right or obligation appearing in or arising under any other document
  - b. shall not be discharged or impaired by reason of any variation (with or without the knowledge or consent of the Insurance Company) to any of the provisions of the Contract, the work under the Contract, the Works or any acts or things to be executed, performed or done under the Contract, or by reason of any breach or breaches of the Contract by the Contractor or the Principal.
6. The benefit of this Undertaking is not assignable by the Principal.
7. This Undertaking shall be governed by the laws of the State of Queensland.

Dated at 

Place

 this 

Day

 day of 

Month

Year

**Executed as a Deed on the date first appearing above**

Signed, sealed and delivered for and on behalf of:		
Name and branch of insurance company	ACN	<b>The company seal (where applicable)</b>
by its duly authorised attorney		
Attorney's name	Date executed	
Attorney's position	Attorney's signature	
pursuant to a power of attorney dated	Date of power of attorney	and the attorney hereby declares that he/she has not received notice of revocation of the power of attorney
in the presence of		
Name of witness	Signature of witness	Date witnessed
<p>The Department of Transport and Main Roads collects personal information on this form so that you may execute the deed. The information on this form is accessible by authorised departmental officers and external personnel who are engaged to administer the Contract who will not disclose your personal details to a third party without your consent unless required to do so by law.</p>		

**From:** [NR] (Ranbury Management Group)  
**To:** [NR] (Ranbury Management Group); Caleb Brown (Department of Transport and Main Roads); [NR] (Bielby)  
**Cc:** [NR] (Ranbury Management Group); [NR] (Ranbury Management Group); [NR] (Bielby); [NR] (Bielby); TMR Doc Control (Department of Transport and Main Roads)  
**Subject:** Possession of Site - Northern Transitway (Kedron to Chermshire)  
**Date:** Tuesday, 3 August 2021 2:55:01 PM  
**Attachments:** 21024 - -003 (Possession of Site).pdf  
**Importance:** High

---

## General Advice

**Reference No.:** CN12205-RMG-GA-00111.00  
**Project Title:** Northern Transitway (Kedron to Chermshire)

---

**Date:** 03 August 2021, 02:55:59 PM +10:00 **Response required by:**

**To:** [NR] Bielby  
[NR] Ranbury Management Group  
Caleb Brown, Department of Transport and Main Roads

**CC:** [NR] Bielby  
[NR] Bielby  
[NR] Bielby  
TMR Doc Control, Department of Transport and Main Roads  
[NR] Ranbury Management Group  
[NR] Ranbury Management Group  
[NR] Ranbury Management Group

**From:** [NR] Ranbury Management Group

**Subject:** Possession of Site - Northern Transitway (Kedron to Chermshire)

---

[NR]

On behalf of [NR], please find the following correspondence in relation to Possession of Site on the Northern Transitway (Kedron to Chermshire).

Kind Regards  
[NR]  
Contract Administrator's Representative  
CN-12205  
Northern Transitway (Kedron to Chermshire)  
M [NR] | T [NR]

---

**Discipline:** \_\_\_\_\_ **Area:** \_\_\_\_\_ **Location:** \_\_\_\_\_  
**Originator's Reference No.:** \_\_\_\_\_

----- Original Message -----

General Advice

Reference No.: CN12205-BIELBY-GA-00092.00  
Project Title: Northern Transitway (Kedron to Chermside)

Date: 02 August 2021, 09:00:44 AM +10:00 Response required by:

To: [NR] Ranbury Management Group  
[NR] Ranbury Management Group  
Caleb Brown, Department of Transport and Main Roads

CC: TMR Doc Control, Department of Transport and Main Roads

[NR] Ranbury Management Group  
[NR] Bielby  
[NR] Bielby  
[NR] Bielby  
[NR] Bielby

From: [NR] Bielby

Subject: CN12205 - H114 | GEC-0011 | Submission of CVA & NVMP - Rev E

[NR]

Please find attached correspondence and submission around NVMP and CVA Rev E.

Thanks,

Discipline: Area: Location:  
Originator's Reference No.:

21024-003

3 August 2021

Bielby Holdings Pty Ltd  
PO Box 1553  
MILTON QLD 4604

Dear

**CN-12205 NORTHERN TRANSITWAY (KEDRON TO CHERMSIDE)  
POSSESSION OF SITE**

The Administrator refers to Contractor's general correspondence in relation to Revision E of the Vibration Assessment and Noise and Vibration Management Plan, reference H114 | GEC-0011 | Submission of CVA & NVMP - Rev E, dated 2 August 2021.

Pursuant to Clause 27.1 of the General Conditions of Contract, the Contactor is granted possession of site across the entire project limits, as defined in the contract drawings.

Furthermore, pursuant to Clause 33.3 of the General Conditions of Contract, the following Contract Plans have been approved, as listed below.

- Quality Plan
- Environmental Management Plan (inclusive Noise and Vibration Management Plan)
- Work Health and Safety Management Plan
- Traffic Management Plan
- Community Liaison Plan
- Severe Weather Management Plan

The Contractor is reminded of their obligation to maintain, review, update and implement the Contract Plans for the duration of the project, pursuant to Clause 33.3 of General Conditions of Contract. The contractor is further reminded that the granting of possession of site does not relieve the contractor from their obligations regarding network access permits for PUP service providers, specifically with respect to Queensland Urban Utilities.

Should you require any further information or clarification regarding this letter please contact the undersigned.

Regards,

Contract Administrator  
CN-12205 NTW (Kedron to Chermside)

**BRISBANE**

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BRISBANE QLD 4000  
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F (+61 7) 3211 2913

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NORTH SYDNEY NSW 2060

T (+61 2) 8039 4500

**MELBOURNE**

Level 3, 3 Bowen Crescent  
MELBOURNE VIC 3000

T (+61 3) 8672 5626

**From:** [Caleb J Brown](#)  
**To:**   
**Cc:** [John Kakourakis](#)  
**Subject:** Northern Transitway - Possession of Site  
**Date:** Sunday, 15 August 2021 1:47:00 PM

---

Hope you are well,

Just a quick one to advise that Possession of Site has been issued to Bielby Holdings for Northern Transitway project on 3 August 2021.

Please note:

- Project location is Gympie Road (U14) from Sadlier Street, Kedron (Ch: 0.69km) to Hamilton Road, Chermside (Ch: 3.10km).
- Please ensure that the principal contractor is contacted in advance should there be any need for BCC to undertake maintenance / emergency works or enter the site.
  - Email - [NT.Admin@bielby.com.au](mailto:NT.Admin@bielby.com.au)
  - Ph - 1800 328 972

**Caleb Brown** BEng (Civil) CPEng RPEQ  
Civil Engineer (Contractor) | Metropolitan Region  
**Program Delivery and Operations Branch** | Infrastructure Management and Delivery Division | Department of Transport and Main Roads

---

Floor 15 | 313 Adelaide Street | Brisbane Qld 4000

GPO Box 70 | Spring Hill Qld 4004

P: (07) 3066 9124 | M:

[caleb.j.brown@tmr.qld.gov.au](mailto:caleb.j.brown@tmr.qld.gov.au)

[www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

## **Transport Infrastructure Contract**

### **Tender Documents for Contract Number CN-12205**

#### **Part 4 -- General Conditions of Contract**

Released under RTI - DTMR

**General Conditions of Contract – C7830.TIC**

**Transport Infrastructure Contract**

**November 2019**



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## 1 Construction of Contract

- a) The law governing the Contract, its interpretation, any agreement to arbitrate and the conduct of any arbitration or litigation, is the law of the State of Queensland.
- b) Unless otherwise provided, prices are in Australian currency and payments shall be made in Australian currency at the place stated in Item 1A.
- c) Where provisions in the General Conditions of Contract are expressed to be alternatives and the Contract fails to state which alternative applies, the first alternative shall apply.
- d) Any provision of the Contract which purports to, or has the effect of, limiting or excluding a liability of the Principal shall be construed as limiting or excluding that liability only to the extent permitted by law.

## 2 Defined terms and interpretation

### 2.1 Defined terms

In the Contract, except where the context otherwise requires, the following words and expressions shall have the meanings given to them below.

Term	Definition
Accession	for the purposes of Clause 14.7, has the meaning given in the PPSA
Administrator	means the entity or individual specified in Item 5A of Annexure A, with the role as defined in the General Conditions of Contract
Administrator's Representative	means the individual stated in Item 5A as the Administrator's Representative or other person from time to time, appointed in writing by the Administrator, to be the Administrator's Representative and notified as such in writing to the Contractor and the Principal by the Administrator
Annexure	means an annexure to these General Conditions of Contract
Authority	means any Commonwealth, State or local government department, body or instrumentality or any other authority or body (statutory or otherwise) which has jurisdiction or authority over the Site, the execution of the Work Under the Contract, the use of the Works or with respect to any Public Utility Plant
Bound Contracted Service Provider	for the purposes of Clause 8.10, has the meaning given in the <i>Information Privacy Act 2009</i> (Qld)
Business Day	has the meaning given in the <i>Payments Act</i>
Certificate of Practical Completion	means a Certificate of Practical Completion issued by the Administrator under Clause 42.5
Claim	includes any claim, demand, action, proceeding or suit which the Contractor may make or bring against the Principal or any of its agents or employees or any Claim which the Principal may have against the Contractor relating to the construction of the Contract or as to any fact, matter or thing arising out of or in connection with the Contract or the Work Under the Contract including any claim, demand, action, proceeding or suit seeking the payment of money, an adjustment to the Contract Sum, an extension of the Date for Practical Completion or any costs, expenses, loss or damages on any ground whatsoever including pursuant to the Contract, on a quantum meruit basis, for unjust enrichment, in tort and insofar as is permitted by law pursuant to any other principle of law

Term	Definition
Claim of Charge	means any claim which: a) purports to be a claim of charge under the <i>Payments Act</i> b) is made by any person who purports to be a Subcontractor, and c) purports to be in connection with the performance by that person of any of the Work Under the Contract
Commercial Framework	is attached as Annexure B to the General Conditions of Contract
Community Liaison Plan	means any plan the Contractor is required to provide pursuant to Clause 15.6
Compliance Notice	for the purposes of Clause 8.10, has the meaning given in the <i>Information Privacy Act 2009</i> (Qld)
Constructional Plant	means appliances and things used in the execution of the Work Under the Contract, but not forming part of the Works
Construction Program	for the purposes of Clause 33.4, means a statement in writing showing the dates by which, or the times within which, the various stages or parts of the Work Under the Contract are to be executed or completed
Construction Project	for the purposes of Clause 15.3, has the meaning given in the WHS Act and WHS Regulation
Construction Work	for the purposes of Clause 15.4, has the meaning given in the WHS Act and WHS Regulation
Contract	means the agreement between the Principal and the Contractor and comprising the documents set out or referred to in the completed Form C7871
Contract Leadership Team or CLT	means the CLT established in accordance with Clause 4.1
Contractor	means the person stated in item 6A, who is bound to execute the Work Under the Contract
Contractor's Representative	means the person nominated under Clause 29.2.1
Contract Plan	has the meaning in Clause 33.3.1
Contract Sum	means the amount set out in, or determined in accordance with, Annexure B (Commercial Framework)
Corporation	has the meaning given in the Corporations Law
Corporations Law	means the <i>Corporations Act 2001</i> (Cth)
Current Program	has the meaning given in Clause 33.4.4
Date for Practical Completion	means: a) where Item 2A or Item 37A provides a Date for Practical Completion, that Date b) where Item 2A or Item 37A provides a period of time for Practical Completion, the last day of the period but if any extension of time for Practical Completion is granted by the Administrator or allowed in any arbitration or litigation, it means the date resulting therefrom
Date of Acceptance of Tender	means the date of the Letter of Acceptance issued by the Principal

Term	Definition
Date of Practical Completion	means: a) the date certified by the Administrator in a Certificate of Practical Completion issued pursuant to Clause 42.5, to be the date upon which Practical Completion was reached, or b) where another date is determined in any arbitration or litigation as the date upon which Practical Completion was reached, that other date
Day	means calendar day
Daywork	means work which the Administrator directs to be carried out as Daywork under Clause 41
Daywork Rates	means the rates set out in the Schedule of Daywork Rates
Defects Liability Period	means the Defects Liability Period or Periods referred to in Clause 37 and any extended Defects Liability Period or Periods in accordance with Clause 37
Disclosure Statement	for the purposes of Clause 48 or 49, means a statement provided by each proposed Dispute Resolution Board Member (DRB) or Issues Resolution Advisor (IRA) (as applicable), including a resume of experience together with a declaration: a) describing all past, present, anticipated and planned future relationships, including indirect relationships through the nominated DRB Members' or IRA's (as applicable) primary or full-time employer, to the project and with all parties involved in the Contract, including Subcontractors, design professionals and consultants, and b) close professional or personal relationships with all key members of all parties to the project shall be included
Dispute Resolution Board (DRB)	means the board established by Clause 48
Document	for the purposes of Clause 8.10, has the meaning given in the <i>Information Privacy Act 2009 (Qld)</i>
Drawings	means the Standard Drawings and the Project Specific Drawings
DRB Agreement	is the agreement between the parties and the DRB Members based on the template which is available on the Principal's website
DRB Members	are the members selected for the DRB pursuant to Clauses 48.5 and 48.6
Environmental Management Plan	means the plan the Contractor is required to provide pursuant to Clause 15.7.2
EP Act	means the <i>Environmental Protection Act 1994 (Qld)</i>
Excepted Risks	has the meaning given in Clause 16.4
Final Certificate	means the Final Certificate issued by the Administrator under Clause 42.8
Form	means the applicable form available on the Principal's website, or as provided as part of tendering and award documents, as amended from time to time
Formal Instrument of Agreement	means the Formal Instrument of Agreement generally in the form of Form C7805 to be executed by the parties pursuant to Clause 6.2
GST	means the goods and services tax imposed under the GST Legislation. A reference to an amount of GST is reference to the GST liability in respect of the supply in question

Term	Definition
GST Legislation	means the <i>A New Tax System (Goods and Services Tax) Act 1999</i> , associated legislation and regulation and any additional or substituted legislation and regulation providing for a value added tax, consumption tax, retail tax or other goods and services tax
Indicative Conformance	As per MRTS50 Clause 10.1.2
Information Commissioner	for the purposes of Clause 8.10, has the meaning given in the <i>Information Privacy Act 2009 (Qld)</i>
IRA Agreement	is the agreement between the parties and the IRA based on the template which is available on the Principal's website
Issues Resolution Advisor (IRA)	means the person appointed under Clause 49
Item	means an item in Annexure A
Latent Condition	is a physical condition on the Site or its surroundings, including artificial things but excluding weather conditions, which differs materially and substantially: <ul style="list-style-type: none"> <li>a) from the physical conditions specified in the Reliance Information at a specific location at the Site, or</li> <li>b) from the physical conditions which should reasonably have been anticipated by a competent and experienced Contractor at the time of the Contractor's Tender if such a Contractor had: <ul style="list-style-type: none"> <li>i. examined all information made available in writing by the Principal to the Contractor for the purpose of tendering,</li> <li>ii. examined all information relevant to the risks, contingencies and other circumstances having an effect on the Tender and obtainable by the making of reasonable enquiries, and</li> <li>iii. inspected and investigated the Site and its surroundings</li> </ul> </li> </ul> but Latent Conditions do not include any conditions described in Item 3A.
Legislative Requirement	means: <ul style="list-style-type: none"> <li>a) Acts, ordinances, regulations, by-laws, orders, awards and proclamations of the jurisdiction where Work Under the Contract or the particular part thereof is being carried out, and</li> <li>b) certificates, licences, consents, permits, approvals and requirements of organisations having jurisdiction in connection with the carrying out of Work Under the Contract</li> </ul>
Letter of Acceptance	means a letter of acceptance issued by the Principal to the Contractor accepting the Contractor's Tender in respect of the Works
Management and Control	for the purposes of Clause 15.3, has the meaning given in the WHS Act and WHS Regulation
NGER Legislation	means the <i>National Greenhouse and Energy Reporting Act 2007 (Cth)</i>
Nominated Subcontractor	means: <ul style="list-style-type: none"> <li>a) a subcontractor to whom the Contractor is directed by the Administrator to subcontract Nominated Subcontract Work, or</li> <li>b) a subcontractor named in Item 15C</li> </ul>
Nominated Subcontract Work	means the work or supply of items specified in Item 15B
Notice of Claim of Charge	means a notice which purports to be a notice of claim of charge pursuant to the <i>Payments Act</i> and which is given by a person who purports to be a Subcontractor

Term	Definition
Notices to Tenderers	means notices to Tenderers issued by the Principal to clarify, revise, amend or modify any aspect of the Tender Documents before the time for submission of Tenders in respect of the Work Under the Contract
Notifiable Incident	for the purposes of Clause 15.3, has the meaning given in the WHS Act and WHS Regulation, and also includes any incident which is notifiable under the WHS Legislation
Other Contract Documents	means the documents included or referred to in the part of this Contract titled 'Other Documents'
Payments Act	means the <i>Building Industry Fairness (Security of Payment) Act 2017 (Qld)</i> and any relevant regulations and includes any amendments to that Act and those regulations
Perfect (or Perfection or Perfected)	for the purposes of Clause 14.7, has the meaning given in the PPSA
Performance Assessment Conferences	has the meaning given in Clause 4.4
Personal Information	has the meaning given to it in the <i>Information Privacy Act 2009 (Qld)</i>
Personal Property	for the purposes of Clause 14.7, has the meaning given in the PPSA
PPSA	means the <i>Personal Property Securities Act 2009 (Cth)</i>
Practical Completion	<p>is that stage in the execution of the Work Under the Contract when:</p> <ol style="list-style-type: none"> <li>a) the Works are complete except for minor omissions and minor defects: <ol style="list-style-type: none"> <li>i. which do not prevent the Works from being reasonably capable of being used for their intended purpose, and</li> <li>ii. which the Administrator determines the Contractor has reasonable grounds for not promptly rectifying</li> <li>iii. rectification of which will not prejudice the convenient use of the Works</li> </ol> </li> <li>b) those tests which are required by the Contract to be carried out and passed before the Works reach Practical Completion have been carried out and passed</li> <li>c) documents and other information required under the Contract which, in the opinion of the Administrator, are essential for the use, operation and maintenance of the Works have been supplied</li> <li>d) all certificates required by the Contract and all approvals, consents and permissions from all Authorities have been provided to the Administrator and</li> <li>e) the Contractor has done everything which it is required to do as a condition precedent to Practical Completion</li> </ol>
Primary Security	means the security provided under Clause 5.2 and any further security provided under Clause 5.3 or as directed under Clause 5.8 and, in each case, includes any moneys resulting from the conversion into money of any part of that security which did not originally consist of money
Principal	means the Principal stated in Item 4A
Principal Arranged Insurance Program (PAIP)	means the Contract Works and general and products liability insurance policies effected and maintained by the Principal

<b>Term</b>	<b>Definition</b>
Principal Contractor	for the purposes of Clause 15.3 and Clause 15.4, has the meaning given in the WHS Act
Principal's Delegate	means the person or position delegated by the Principal with the authority to enter into the Contract. The Principal's Delegate shall be nominated in Item 4C.
Principal's Representative	means the person or position delegated by the Principal's Delegate and shall represent the interests of the Principal when required under the Contract. The Principal's Representative shall have a good knowledge and understanding of the requirements of the Works. The Principal's Representative shall be nominated in Item 4E.
Principal Supplied Material	means the materials to be provided by the Principal as listed in any Principal supplied Item list (Form C7827) included or referred to in the Contract
Privacy Complaint	for the purposes of Clause 8.10, has the meaning given in the <i>Information Privacy Act 2009</i> (Qld)
Privacy Principles	for the purposes of Clause 8.10, has the meaning given in the <i>Information Privacy Act 2009</i> (Qld)
Project Specific Drawings	means: a) the drawings attached or referred to in the Contract. b) any modification of such drawings notified to the Contractor by the Administrator, and c) such other drawings as may from time to time be supplied to the Contractor by the Administrator, or the use of which has been permitted by the Administrator, for the purposes of the Contract but do not include the Standard Drawings.
Project Specific Specifications	means: a) the specifications attached or referred to in the Contract b) any modification of such specifications notified to the Contractor by the Administrator, and c) such other specifications as may from time to time be supplied to the Contractor by the Administrator, or the use of which has been permitted by the Administrator, for the purposes of the Contract but do not include the Standard Specifications
Provisional Sum	includes monetary sum, contingency sum and prime cost item, but does not include any amounts in a Schedule of Rates for items described or marked 'provisional', 'provisional quantity' or 'if ordered, provisional quantity' (or similar) or any amounts for numbered items in a Schedule of Rates which include the suffix 'F' or 'PS'
Public Utility Plant	means any railway, monorail, tramway, viaduct, aqueduct, conduit, water channel, pipeline (water, stormwater, gas, sewerage or otherwise), fixed mechanical conveyor, tower, pole, cable (electrical, fibre optic, telecommunications or otherwise), electrical installation or telecommunications plant that is: a) on, in, over, under or adjacent to the Site, or b) affected by the Work Under the Contract but does not include Constructional Plant
Purchase Money Security Interest	for the purposes of Clause 14.7 has the meaning given in the PPSA
Quality Plan	means the plan the Contractor is required to provide pursuant to Clause 30.3
Quality System	has the meaning given in Clause 30.2

<b>Term</b>	<b>Definition</b>
Relationship and Collaboration Principles	has the meaning given in Clause 3.2.1
Reliance Information	means those documents and other information specified in Item 13B
Resolution Institute	is the merger of the Institute of Arbitrators and Mediators Australia (iAMA) and Leaders Engaged in Alternative Dispute Resolutions (LEADR) and a reference to Resolution Institute is a reference to the Chairperson of the Queensland Chapter of Resolution Institute
Retention Moneys	means the retention moneys withheld by the Principal under Clause 42.3
Retention Security	means the security provided under Clause 5.3 and any further security provided as directed under Clause 5.7 and in each case includes any moneys resulting from the conversion into money of any part of that security which did not originally consist of money
Schedule of Deviations	means the Schedule of Deviations (Form C7807), if any, developed jointly and agreed by the Principal and the Contractor during post-Tender negotiations and enclosed within the Letter of Acceptance
Schedule of Prices	has the meaning given in Annexure B (Commercial Framework)
Schedule of Rates	has the meaning given in Annexure B (Commercial Framework)
Schedules of Daywork Rates	means the various completed schedules named 'Daywork Rates – Personnel' and 'Daywork Rates – Plant and Equipment'
Security Interest	for the purposes of Clause 14.7, has the meaning given in the PPSA
Selected Subcontractor	means a subcontractor identified in the Contractor's Tender from a list of one or more subcontractors provided by the Principal in the Tender Documents for Selected Subcontract Work
Selected Subcontract Work	means the work or supply of Items specified in Item 15D
Separable Portion	means a portion of the Work Under the Contract described in Item 37A as a Separable Portion or which the Administrator has determined pursuant to Clause 35.4 shall be a Separable Portion
Site	means the lands and other places described in Item 7A and any other lands and places made available to the Contractor by the Principal for the purpose of the Contract
Site Conferences	has the meaning given in Clause 4.3
Site Information	means any document, information, data, report, material, core or sample, whatever its form, regarding the Site or its surroundings or regarding the subsurface conditions (including topographical, geological and hydrological conditions) or subsurface services at the Site or its surroundings, but does not include the Reliance Information
Specifications	means the Standard Specifications and the Project Specific Specifications
Standard Drawings	means the Principal's standard drawings attached or referred to in the Contract, as amended or updated from time to time by the Principal
Standard Specifications	means the Principal's standard specifications attached or referred to in the Contract, as amended or updated from time to time by the Principal

<b>Term</b>	<b>Definition</b>
Subcontractor	means any Contractor, consultant or supplier (including their personnel), engaged by or on behalf of the Contractor with respect to the Work Under the Contract and includes the Contractor's Designers and any supplier or hirer of materials, plant or equipment
Subcontractor Payment Security	means the security provided under Item 11A and any further security provided as directed under Clause 5 and in each case includes any moneys resulting from the conversion into money of any part of that security which did not originally consist of money
Subsidiary	has the meaning given in the Corporations Law
Supply	for the purposes of Clause 42.11, has the meaning given in the GST Legislation
Temporary Works	means works used in the execution of the Work Under the Contract, but not forming part of the Works
Traffic Management Plan	means any plan the Contractor is required to provide pursuant to Clause 15.5.2
Warranty Items	has the meaning in Clause 30.10
WHS Act	means the <i>Work Health and Safety Act 2011</i> (Qld) as amended from time to time
WHS Legislation	means the <i>WHS Act</i> , the <i>Work Health and Safety Regulation 2011</i> (Qld), the <i>Electrical Safety Act 2002</i> (Qld), the <i>Electrical Safety Regulation 2013</i> (Qld), the <i>Safety in Recreational Water Activities Act 2011</i> , the <i>Mining and Quarrying Safety and Health Act 1999</i> (Qld), the <i>Mining and Quarrying Safety and Health Regulation 2017</i> (Qld) and any other general law of the State or Commonwealth in respect of workplace health and safety and any State or Commonwealth Act, Regulation, Code of Practice or ministerial notice in respect of work health and safety, as amended from time to time
WHS Regulation	means the <i>Work Health and Safety Regulation 2011</i> (Qld), or any other applicable regulation made under the WHS Legislation, as amended from time to time
Work Health and Safety Management Plan	means any plan the Contractor is required to provide pursuant to Clause 15.3.4
Working Days and Working Hours	have the meaning given in Clause 32
Workplace	for the purposes of Clause 15.3 means the Site
Works	means the whole of the work to be executed in accordance with the Contract, including variations provided for by the Contract, which by the Contract is to be handed over to the Principal
Work Under the Contract	means the work which the Contractor is or may be required to execute under the Contract and includes variations, remedial work, Constructional Plant and Temporary Works

In addition to the defined terms set out in Clause 2.1, some terms, specific to a clause, are defined in that clause.

## 2.2 Interpretation

- a) Reference to:
  - i. one gender includes the others
  - ii. the singular includes the plural and the plural includes the singular
  - iii. a person includes a body corporate
  - iv. a party includes the party's executors, Administrators, successors and permitted assigns
  - v. a Legislative Requirement includes:
    - a) that Legislative Requirement as amended or re-enacted from time to time, and
    - b) a Legislative Requirement enacted in replacement of that legislative requirement
  - vi. money is to Australian dollars unless otherwise stated.
- b) Measurements of physical quantities shall be in legal units of measurement of Australia within the meaning of the *National Measurement Act 1960*.
- c) Communications between the Principal, the Administrator and the Contractor shall be in the English language.
- d) 'Including' and similar expressions are not words of limitation.
- e) Where a word or expression is given a particular meaning, other parts of speech and grammatical forms of that word or expression have a corresponding meaning.
- f) Headings are for convenience only and do not form part of the Contract or affect its interpretation.
- g) A provision of the Contract shall not be construed to the disadvantage of a party merely because that party was responsible for the preparation of the Contract or the inclusion of the provision in the Contract.
- h) If an act must be done on a specified Day which is not a Business Day, it shall be done instead on the next Business Day, except as otherwise expressly contemplated by this Contract.
- i) No comment, review, representation, vetting, inspection, testing or approval by the Principal or the Administrator in respect of the Contractor's obligations under this Contract will lessen or otherwise affect the Contractor's obligations under this Contract.
- j) The Contractor acknowledges that:
  - i. an absolute discretion in the Principal or the Administrator under the Contract is not required to be exercised for the benefit of the Contractor
  - ii. neither the Principal nor the Administrator is bound to exercise any such absolute discretion in any particular manner or having regard to any particular consideration notwithstanding that such considerations might be stated in the Contract
  - iii. no provision of the Contract conferring such an absolute discretion gives the Contractor any rights (including any right to make any Claim arising out of the exercise or failure to exercise the discretion), and

- iv. the exercise or failure to exercise such an absolute discretion is not capable of being the subject of a dispute or difference for the purpose of Clause 47 and is not otherwise subject to review.
- k) Whenever the Principal or Administrator is required to act reasonably, what is reasonable under the circumstances is to be judged having regard to the terms of this Contract.
- l) All indemnities and warranties given by the Contractor in this Contract survive the termination or otherwise merging of this Contract.
- m) Without limiting Clause 2.2(l), the provisions of this Contract which, by their nature, are intended to survive the termination, cancellation, completion or expiration of this Contract shall continue as valid and enforceable obligations of the parties notwithstanding any such termination, cancellation, completing or expiration.
- n) Unless otherwise expressed as a sole remedy, the rights and remedies provided in this Contract are in addition to other rights and remedies given by law independently of this Contract.
- o) Unless otherwise expressly set out in this Contract, and to the extent permitted by law, all implied terms (whether implied by statute or operation of law) are excluded from this Contract.
- p) The word 'immediately' means to act promptly, with expedition, within a reasonable time and without unnecessary delay.

### **3 Nature of Contract**

#### **3.1 Performance and description**

- a) The Contractor shall execute and complete the Work Under the Contract.
- b) The Principal shall pay the Contractor the Contract Sum in accordance with the Contract. The Contract Sum shall be set out in, or determined in accordance with, the relevant part of the Commercial Framework, as specified in Item 8A.

#### **3.2 Commitment to relationship and collaboration**

##### **3.2.1 Relationship and Collaboration Principles**

- a) The parties acknowledge that a good working relationship between the Principal, the Administrator and the Contractor is a significant factor that contributes towards the successful completion of a project. The Contractor, the Principal and the Administrator jointly commit to establishing and maintaining a project team built on relationships and they agree to observe the following principles (Relationship and Collaboration Principles):
  - i. act as stated in this Contract and in the spirit of mutual trust, openness, respect and cooperation
  - ii. at all times deal with each other fairly, honestly and reasonably
  - iii. communicate and expeditiously reconcile any matter that may affect the proper execution and timely completion of the Work Under the Contract, and
  - iv. be dedicated to achieving 'best for project' outcomes.

- b) The parties agree and acknowledge that the Relationship and Collaboration Principles do not apply where the Contract expressly provides that the Principal or the Administrator may act in its absolute or sole discretion.

### **3.2.2 Relationship and collaboration workshop**

As specified in Item 8B, the Administrator will convene, within two months of the Date of Acceptance of Tender, a relationship management workshop to facilitate the understanding of, and commitment to, the Relationship Principles. This workshop is to be attended by representatives of the Contractor, the Principal, the Administrator (the Team) and the CLT (if any).

All costs associated with the relationship and collaboration workshop shall be borne by the Contractor.

### **3.2.3 Relationship management and collaboration protocol**

At the workshop held under Clause 3.2.2, the Team and the CLT (if any) shall develop and agree a relationship management and collaboration protocol to be signed by all participants of the workshop that:

- a) includes a relationship charter or mission
- b) sets the relationship and collaboration goals and objectives, core values and guiding principles
- c) includes a mechanism for determining a rating of the parties' achievement of the agreed objectives (including by reference to Performance Assessment Conferences required under Clause 4.4)
- d) includes a mechanism for the resolution of personality-related issues
- e) documents the lines of communication, levels of responsibility and reporting systems
- f) includes an issues resolution matrix that includes an action plan for addressing factors that may prevent them from meeting the relationship objectives, and
- g) specifies the times for the workshops and meetings referred to in Clause 3.2.4.

### **3.2.4 Monitoring the relationship**

Unless the parties agree otherwise, the Team shall meet at least monthly to review the Team's performance against the Relationship and Collaboration Principles and the relationship management and collaboration protocol (if any).

## **4 Contract Leadership Team and conferences**

### **4.1 Contract Leadership Team**

This Clause 4.1 only applies if 'Yes' is selected in Item 9A.

#### **4.1.1 Representation and tenure**

- a) A Contract Leadership Team (CLT) shall be established prior to the commencement of the Work Under the Contract.
- b) The CLT will consist of two senior representatives from the Principal and two senior representatives from the Contractor (CLT Members).
- c) A party may replace its CLT Member(s) at any time by giving notice in writing to the other party at least 24 hours prior to the change in representation.

- d) Unless otherwise agreed by the Principal and the Contractor, the CLT will remain established until 10 Business Days after the date of the Final Certificate.

#### **4.1.2 Duties and accountabilities for the Contract Leadership Team**

- a) The CLT shall, unless otherwise agreed by the parties in writing:
  - i. provide overall guidance and leadership with respect to the Work Under the Contract and to provide a forum for regular and formal interaction between senior executives of the Principal and the Contractor
  - ii. set policy and give philosophical and strategic direction for the Work Under the Contract within the boundaries set out in the Contract, including by establishment of a relationship charter (Relationship Charter)
  - iii. provide leadership and set a visible example of senior management's commitment to the Relationship Charter and the Relationship Management Protocol
  - iv. provide guidance to the Contractor in its development and implementation of a transparent governance framework across the Work Under the Contract
  - v. provide leadership and guidance to the Contractor in ensuring timely, accurate and comprehensive reports are given to the Principal
  - vi. oversee the Contractor in initiating or approving the commitment of resources to the Work Under the Contract and provide corporate support as necessary
  - vii. provide leadership in the implementation of a culture necessary to achieve any key performance indicators and ensure they are created and sustained
  - viii. provide encouragement to the Contractor to implement directions from the Principal or the Administrator
  - ix. monitor the performance of the Contract and implement appropriate measures to correct undesirable trends
  - x. issue decisions as required by the Contract (if any)
  - xi. attempt to resolve any differences or issues that are referred to it under Clause 47.3, and
  - xii. any other duties agreed between the parties from time to time.
- b) The parties acknowledge and agree that, except as expressly provided for in the Contract:
  - i. the CLT will have no legal responsibility.
  - ii. no comment, direction, review, representation, vetting, inspection, testing or approval by the CLT or members of the CLT will be binding on a party or be construed as a direction from the Principal or the Administrator to do or not to do something, and
  - iii. nothing that occurs at a meeting of the CLT will relieve either party, or alter or affect their liabilities or responsibilities under this Contract, including a requirement for the Contractor to provide formal notification to the Principal or the Administrator under any other provision of this Contract.
- c) Prior to each meeting of the CLT, the Administrator and the Contractor's Representative shall provide a joint report on the following matters for the consideration of the CLT:

- i. the progress of the Works
- ii. delays to the Works, including planned mitigation
- iii. the adequacy of resourcing levels, and
- iv. all issues and disputes which have arisen and have not yet been resolved.

#### **4.1.3 Meetings**

- a) Unless the parties agree otherwise, the CLT will meet at least once every month until Practical Completion.
- b) At least one CLT Member from each party shall be present to enable the CLT to hold a meeting or make a decision. Attendance may be by telephone or video link.
- c) The CLT will arrange for a secretary (CLT Secretary) to record minutes of all resolutions of the CLT and all actions arising out of each CLT meeting. A copy of the minutes will be forwarded by the CLT Secretary to each CLT Member as soon as practicable but not later than five Business Days after each CLT meeting.
- d) Decisions of the CLT must be unanimous.

#### **4.2 Prestart conference**

- a) Prior to the commencement of Work Under the Contract, the Contractor shall contact the Administrator in order to arrange a conference (prestart conference).
- b) The prestart conference shall:
  - i. be attended by representatives of the Contractor, the Principal, the Administrator and the CLT (if any)
  - ii. establish lines of communication and clarify all relevant responsibilities and delegations
  - iii. discuss arrangements for submission and review of the Construction Program, Quality Plan, Environmental Management, Work Health and Safety Management Plan, Traffic Management Plan (where required), Severe Weather Management Plan (where required), Community Liaison Plan (where required) and the Indigenous Economic Opportunities Plan (where required)
  - iv. discuss arrangements for project records, including access by the Administrator, submission of test results and other reports, and disposition of records upon completion of the Contract
  - v. discuss setting out of the Works, Site accommodation, camp and delivery of materials and plant to the Site
  - vi. determine arrangements for Site inspections and Site Conferences
  - vii. define arrangements for management of:
    - a) payment Claims
    - b) variations, and
    - c) non-conformances

- viii. discuss arrangements for all administrative requirements, including the date for a relationship workshop (if required under Clause 3.2.2) and information and documents which the Contractor is obliged to submit to the Administrator
  - ix. deal with any other matters nominated by the Contractor or the Administrator, and
  - x. deal with requirements for a post-construction review.
- c) The Administrator shall, within five Business Days of the Prestart Conference, issue to the Contractor a copy of the minutes. Within two Business Days of receipt of the copy of the minutes, the Contractor shall notify the Administrator in writing of any Item from the minutes which, in its opinion, has not been correctly recorded. Within a further two Business Days, the Administrator shall arrange to amend the minutes where necessary and will return two copies to the Contractor for confirmation of the minutes. The Contractor shall confirm the minutes by returning a signed copy to the Administrator within two Business Days of receipt. The CLT (if any) may review and provide guidance to the parties in relation to the content of those minutes.

#### **4.3 Site Conferences**

- a) The Contractor shall arrange for conferences to be held at the Site (Site Conferences) to:
- i. review progress of the Work Under the Contract
  - ii. review the Contract Plan documents and issues relating to progress of the Work Under the Contract
  - iii. review non-conformances and dispositions, and
  - iv. discuss any matters of concern related to the project with a view to their resolution as far as possible.
- b) Site Conferences shall be held until Practical Completion at the intervals stated in Item 10A or at such other intervals as are otherwise mutually agreed between the Principal, the Contractor and the Administrator (such interval not exceed a period of one month).
- c) Site Conferences shall be attended by the Contractor, the Principal and the Administrator, and/or their senior representatives. Subject to the prior approval of the Administrator, which may be given or withheld in its absolute discretion, other persons may attend all or part of any Site Conference, but:
- i. at no time more than four persons from either the Contractor or the Administrator, and
  - ii. members of the CLT (if any) may attend any Site Conference without the approval of the Administrator, which may be given or withheld in its absolute discretion.
- d) The Administrator will chair each Site Conference and will arrange for the recording of minutes. The Administrator shall, within five Business Days of each Site Conference, issue to the Contractor, a copy of the minutes. Within two Business Days of receipt of the copy of the minutes, the Contractor shall notify the Administrator in writing of any Item from the minutes which, in its opinion, has not been correctly recorded. Minutes of a Site Conference will be confirmed at the next Site Conference. The CLT (if any) may provide guidance to the parties in relation to the content of those minutes.

#### **4.4 Contract Performance Assessment**

- a) The Administrator shall score on the Contractor's performance as set out in the Form C7901 on a monthly basis and hand over to the Contractor for any comments. The Contractor shall take all reasonable steps to provide additional comments in a timely manner.
- b) Upon reaching Practical Completion and issuance of Final Certificate, the Administrator and the Contractor shall prepare detailed performance reports using Form C7902. The same Form C7902 shall be used for performance assessment at reaching milestones in the Contract or as directed by the Principal.
- c) If required, a separate meeting may be arranged to discuss the Administrator's performance report or this topic can be accommodated as part of monthly Site Conferences. If a separate meeting is arranged then it should be attended by the Administrator and the Contractor and/or their senior representatives. Subject to the prior approval of the Administrator, which may be given or withheld in its absolute discretion, other persons may attend all or part of any performance assessment meeting, but members of the CLT (if any) may attend without the approval of the Administrator.
- d) The Administrator shall take all reasonable steps in a timely manner to obtain the signature of the Contractor on the Form C7901 or C7902 and submit to the department's project manager or the Principal's Representative for comments and submission to the Prequalification and Contracts Unit.
- e) The department's project manager or Principal's Representative, within reasonable time, shall include any comments and send a signed copy (portable document format or PDF) via electronic mail to:  
  
Department of Transport and Main Roads, Program Management & Delivery  
Attention: Prequalification and Contracts Unit  
Email address: [contractorprequal@tmr.qld.gov.au](mailto:contractorprequal@tmr.qld.gov.au)
- f) If the Administrator and department's project manager roles are shared by a same person, then the performance reports shall be reviewed by the Manager (Delivery) or Principal's Representative and any additional comments to be added prior to submission to the Prequalification and Contracts Unit.
- g) The department's prequalification committee members or its nominees may attend any performance meetings including Site Conferences to discuss the contract performance without prior invitation and if necessary moderate the scorings on behalf of the Principal.

### **5 Security and Retention Moneys**

#### **5.1 Purpose**

- a) The Primary Security, Retention Moneys, Retention Security, and any additional security are, subject to the provisions of Clause 5, for the purpose of (in order of priority):
  - i. ensuring the due and proper performance of the Contract by the Contractor (including the satisfaction of any debts due from the Contractor to the Principal and any Claims which the Principal may have against the Contractor), and
  - ii. satisfying Claims of Charge as provided in Clause 5.7.

- b) The Subcontractor Payment Security is, subject to the provisions of Clause 5, for the purpose of (in order of priority):
  - i. satisfying Claims of Charge as provided in Clause 5.7, and
  - ii. ensuring the due and proper performance of the Contract by the Contractor (including the satisfaction of any debts due from the Contractor to the Principal and any Claims which the Principal may have against the Contractor).

## **5.2 Provision of security**

Within 10 Business Days of the Date of Acceptance of Tender, the Contractor shall lodge with the Principal security in accordance with Item 11A.

## **5.3 Substitution of security for Retention Moneys**

- a) The Contractor may, at any time with the prior written consent of the Principal (which the Principal may give or withhold), lodge with the Administrator Retention Security in substitution for Retention Moneys (or the Principal's right to deduct Retention Moneys) as discussed under Clause 42.3.
- b) If the Contractor provides such security, the Principal shall, to the extent of that security:
  - i. not deduct Retention Moneys under Clause 42.3, and
  - ii. release any Retention Moneys previously deducted under Clause 42.3 immediately upon the provision of such security.

## **5.4 Form of security**

- a) The Primary Security, the Retention Security and the Subcontractor Payment Security shall, in each case, be any of the following:
  - i. an unconditional irrevocable bank guarantee from a bank as defined under s36 of the *Acts Interpretation Act 1954* in the forms included in the Tender Documents (Forms C7840, C7841, C7842, C7855) that:
    - a) complies with the requirements of Part 2, Division 6 of the *Financial and Performance Management Standard 2009 (Qld)*, and
    - b) is approved by the Principal in its absolute discretion
  - ii. an unconditional irrevocable insurance bond from an insurance company, in the forms included in the Tender Documents (Forms C7843, C7844, C7845, C7856), that:
    - a) complies with the requirements of Part 2, Division 6 of the *Financial and Performance Management Standards 2009 (Qld)*, and
    - b) is approved by the Principal in its absolute discretion
  - iii. if the security provider has stopped being an approved security provider, the Contractor shall, immediately upon request by the Principal, substitute that bank guarantee or insurance bond submitted to the Principal.
- b) The costs of and incidental to providing any security (including all stamp duty and other taxes payable in respect of the security) shall be borne by the Contractor.

### **5.5 Conversion of security**

- a) The Principal may convert into money at any time, such part of the Primary Security, the Retention Security and/or any additional security provided pursuant to Clause 42 that does not consist of money, whether or not it is entitled to exercise a right under the Contract in respect of the security.
- b) The Principal shall not be liable in any way for any loss occasioned by the conversion of any security into money whether that conversion is done pursuant to this Clause 5.5 or any other clause.

### **5.6 Recourse to security and Retention Moneys**

- a) The Principal may have recourse to the Primary Security, the Retention Security and/or the Retention Moneys if:
  - i. the Principal has become entitled to exercise a right under the Contract in respect of any such security and/or Retention Moneys, and/or
  - ii. the Principal has received a Notice of Claim of Charge.
- b) The Principal may have recourse to the Subcontractor Payment Security if:
  - i. the Principal has received a Notice of Claim of Charge, and/or
  - ii. the Principal has otherwise become entitled to exercise a right under the Contract in respect of that security (and notwithstanding any other provision of the Contract, the Principal shall not be so entitled until three months after the date of issue of the Final Certificate, and, even then, the Principal shall only be so entitled if it has exercised its powers under Clause 5.7(a)(ii) in respect of any Notices of Claim of Charge which it has received).
- c) Nothing in any other part of Clause 5 shall limit the Principal's rights under Clause 5.5 or oblige the Principal to have recourse to any security and/or Retention Moneys where the Principal has received a Notice of Claim of Charge.

### **5.7 Notice of Claim of Charge received**

- a) Where the Principal has received a Notice of Claim of Charge, the moneys mentioned in Clauses 5.7(b)(i) to (b)(vi):
  - i. shall, for the purposes of Section 109(1) of the *Payments Act*, be deemed to be moneys payable to the Contractor by the Principal under the Contract, and
  - ii. may, in respect of any Notice of Claim of Charge, be retained by the Principal in accordance with Section 126(2) of the *Payments Act* or be used by the Principal to make a payment into court under Section 126(4) of the *Payments Act*.
- b) The moneys mentioned in Clause 5.7(a) are:
  - i. such part of the Subcontractor Payment Security as consists of cash
  - ii. the moneys resulting from the conversion into money of any part of the Subcontractor Payment Security that did not consist of money
  - iii. such part of the Primary Security as consists of cash (but only the balance remaining after the Principal has exercised all of its rights against such moneys)

- iv. the moneys resulting from the conversion into money of any part of the Primary Security that did not consist of money (but only the balance remaining after the Principal has exercised all of its rights against such moneys)
  - v. the balance of the Retention Moneys after the Principal has exercised all of its rights against such moneys, and
  - vi. the moneys resulting from the conversion into money of any part of the Retention Security that did not consist of money (but only the balance thereof remaining after the Principal has exercised all of its rights against such moneys).
- c) If any part of the Primary Security, the Retention Security, the Subcontractor Payment Security, the moneys resulting from the conversion into money of any of those securities or the Retention Moneys is retained by the Principal or paid into court as provided in Clause 5.7(a)(ii), the Contractor shall within 10 Business Days of being directed to do so by the Principal, lodge further security for an amount equal to the amount retained or paid into court. If the Contractor fails to provide such further security within the stated time, the Principal may deduct from any moneys otherwise due to the Contractor, an amount equal to the amount of the further security required by this Clause 5.7 and such deduction shall become part of the Primary Security, the Retention Security or the Subcontractor Payment Security (as the case requires).

**5.8 Reduction of security and Retention Moneys**

- a) Upon the issue of the Certificate of Practical Completion, the Principal's entitlement to:
- i. the Primary Security
  - ii. the Retention Moneys, and
  - iii. the Retention Security
- shall be reduced to the percentage stated in Item 11B.
- b) Subject to Clause 5.8(a), if, in the opinion of the Administrator, it is reasonable to further reduce the Principal's entitlement to the Primary Security, the Retention Security and/or the Retention Moneys, that entitlement shall be reduced to the amount which the Administrator determines to be reasonable.
- c) The Principal shall, within 10 Business Days of the Administrator making such a determination, release the Primary Security, the Retention Security and/or the Retention Moneys (as the case requires) in excess of the entitlement determined by the Administrator.

**5.9 Release of security**

- a) If the Contractor has provided additional security pursuant to Clause 42.4, the Principal shall, at the request of the Contractor, release that additional security within 10 Business Days of the incorporation into the Works of the unfixed plant or materials in respect of which the additional security was provided.
- b) On achieving Practical Completion, any additional securities requested by the Principal from the Contractor at award stage, shall be released by the Principal within 10 Business Days of being notified by the Administrator to release such securities.

- c) Where the Final Certificate shows that there is no balance owing by the Contractor to the Principal, the Principal shall, subject to the provisions of Clause 5:
  - i. within 10 Business Days of the issue of the Final Certificate, release to the Contractor any Primary Security, Retention Security or Retention Moneys then held by the Principal, and
  - ii. within four months after the issue of the Final Certificate, release to the Contractor any Subcontractor Payment Security then held by the Principal.

**5.10 Interest on security and Retention Moneys**

- a) The Principal shall own any interest earned on:
  - i. any Primary Security, Retention Security, Subcontractor Payment Security and/or additional security provided under Clause 42.4, which is converted into money, and
  - ii. any Retention Moneys.
- b) The Principal does not hold any such security, converted moneys or Retention Moneys upon any trust for the Contractor or any other party.

**5.11 Deed of guarantee, undertaking and substitution**

Where:

- a) the Contractor is a Corporation that is related to, or is a Subsidiary of, another Corporation, and
- b) the Principal has included in the Tender Documents a Form of deed of guarantee, undertaking and substitution

the Contractor shall, if requested by the Principal in writing, lodge with the Principal within 10 Business Days after that request having been made a deed of guarantee, undertaking and substitution in the form of Form C7848 duly executed by the Contractor and that other Corporation for the performance of the obligations and the discharge of the liabilities of the Contractor under or arising out of the Contract.

**6 Evidence of Contract**

**6.1 Contract in absence of Formal Instrument of Agreement**

Unless and until a Formal Instrument of Agreement is executed by the parties, the Letter of Acceptance, including documents or parts of documents referred to in, or attached to, the Letter of Acceptance, shall evidence the Contract.

**6.2 Formal Instrument of Agreement**

- a) If Item 12A specifies that a Formal Instrument of Agreement is required, the Principal shall prepare in triplicate a Formal Instrument of Agreement and shall, within 20 Business Days after the Date of Acceptance of Tender, forward it to the Contractor with a request that it be executed.
- b) Within 10 Business Days after being requested in writing by the Principal so to do, the Contractor shall execute all three copies of the Formal Instrument of Agreement in the manner directed in writing by the Principal and return them to the Principal.

- c) Within 10 Business Days after receipt from the Contractor of the three copies of the Formal Instrument of Agreement duly executed by the Contractor, the Principal shall execute all three copies and forward one copy to the Contractor.
- d) The Administrator may extend the periods under Clause 6.2 by notice in writing to the parties.
- e) The Principal shall bear the cost of any stamp duty payable on the Contract.
- f) Notwithstanding any other provision of the Contract, and without prejudice to any other right or remedy which the Principal may have, if the Contractor has failed to comply with this Clause 6.2, the Principal may withhold payment until the Contractor complies with this Clause 6.2.

### **6.3 Collusive arrangements**

The Contractor warrants and represents to the Principal that:

- a) it had no knowledge of the Tender Price of any other Tenderer for the Work Under the Contract at the time of submission of its Tender;
- b) except as disclosed in its Tender, it has not entered into any Contract, arrangement or understanding to pay or allow to be paid any money directly or indirectly to a trade or industry association (above the published standard membership fee) or to or on behalf of any other Tenderer in relation to its Tender or this Contract, nor paid or allowed to be paid any money on that account
- c) except by prior agreement with the Principal, it has not paid or allowed to be paid or entered into any Contract, arrangement or understanding to pay or allow to be paid any money directly or indirectly to or on behalf of any other Tenderer nor received any money or allowance from or on behalf of any other Tenderer in relation to its Tender or this Contract, nor will it pay or allow or receive any money, and
- d) if, without the Principal's prior agreement, it receives or has received any money or allowance from any other Tenderer in relation to its Tender, the other Tenderer's Tender or this Contract, then without prejudice to any other right or remedy of the Principal, such money or allowance shall be deemed to be held by the Contractor on trust for the Principal and shall be paid to the Principal within five Business Days.

## **7 Service of notices**

### **7.1 Notice requirements**

- a) Subject to Clause 7.1(b), a notice, request, consent, approval, direction or other communication (notice) under or for the purposes of the Contract shall be:
  - i. in writing, in English and addressed to the receiving party, and
  - ii. either:
    - a. sent by registered post to or left at the address specified in Item 4B, 5B or 6B (as the case may be)
    - b. handed to the other party and/or the Administrator (as the case may be)
    - c. sent by email to the email address specified in Item 4D, 4F, 5C or 6D (as the case may be), or
    - d. sent via a proprietary document management system which the parties have agreed in writing may be used for the purpose of giving a notice under the Contract.

- b) Service of a notice under Clauses 44.2, 44.4, 44.7, 44.9 or 47.1 shall only be valid if effected in accordance with Clause 7.1(a)(ii)(a) or 7.1(a)(ii)(b).

## **7.2 Time of receipt**

A notice is deemed to have been received:

- a) if sent by registered post, on the third Business Day (or the 10<sup>th</sup> Business Day if posted to or from a place outside Australia) after posting
- b) if delivered personally, upon delivery
- c) if sent by email:
  - i. on a Business Day, on dispatch of the transmission, or
  - ii. on a Day other than a Business Day, on the next Business Dayunless the sender's server indicates a malfunction or error in transmission or the recipient within four hours of sending notifies the sender of an incomplete transmission, or
- d) if sent via any proprietary document management system which the parties have agreed may be used for the purpose of giving a notice under the Contract, upon notification from that system to the recipient of the notice having been delivered on the proprietary document management system.

## **7.3 Notice details**

A party may specify another address or email address for the purposes of this Clause 7, by notice to the other party.

## **7.4 Service of payment Claims**

- a) Service of payment Claims under the *Payments Act* by the Contractor on the Principal shall be made by forwarding or serving such Claims on the same Day to both the Administrator and the Principal.
- b) The Contractor shall ensure that within 24 hours after any notice under the *Payments Act* (other than a payment Claim or payment schedule) is given or received by the Contractor or any Subcontractor, a copy of that notice is given to both the Principal and the Administrator.

## **8 Contract documents**

### **8.1 Order of precedence of documents**

- a) The Contract is comprised of the documents listed in the Formal Instrument of Agreement (or the Letter of Acceptance, unless and until a Formal Instrument of Agreement is executed by the parties).
- b) Unless otherwise expressly stated in the Formal Instrument of Agreement or the Letter of Acceptance (as the case may be) or in a version of Form C7871 attached to the Formal Instrument of Agreement or Letter of Acceptance, the following order of precedence shall apply where there is any ambiguity, discrepancy or inconsistency between the documents comprising the Contract, with the higher in the list having a higher priority:
  - i. Formal Instrument of Agreement

- ii. Letter of Acceptance, including any post-Tender correspondences and the Schedule of Deviations (if applicable) listed or referred to in the Letter of Acceptance
- iii. notices to Tenderers
- iv. Special Conditions of Contract (Annexure D to these General Conditions of Contract) if any
- v. these General Conditions of Contract, including:
  - a) Annexure A (Contract Details)
  - b) Annexure B (Commercial Framework)
  - c) Annexure C (Certification Functions of the Administrator), and
  - d) Clause Bank (C7836)
- vi. Project Specific Specifications including MRTS Annexures
- vii. Project Specific Drawings
- viii. Standard Specifications
- ix. Standard Drawings
- x. Conditions of Tendering and Conditions of Tendering Annexure
- xi. Completed Tender Form and Tender Schedules
- xii. Other Contract Documents.

### **8.2 Discrepancies**

- a) The several documents forming the Contract are to be taken as mutually explanatory of one another. If either party discovers any ambiguity or discrepancy in any document prepared for the purpose of executing the Work Under the Contract, that party shall notify the Administrator in writing of the ambiguity or discrepancy as soon as possible but not later than five Business Days of first becoming aware of the ambiguity or discrepancy. In the event of any such ambiguity or discrepancy, the Administrator shall within five Business Days of receiving such advice or discovering the discrepancy, direct the Contractor as to the interpretation to be followed by the Contractor in carrying out the work.
- b) If the direction from the Administrator under Clause 8.2(a) causes the Contractor to incur more or less cost than the Contractor could reasonably have anticipated at the time of tendering, the difference shall be valued under Clause 40.5.

### **8.3 Dimensions**

Where any discrepancy exists between figured and scaled dimensions, the figured dimensions shall prevail.

### **8.4 Supply of documents and information by Principal**

- a) The Principal shall supply to the Contractor the number of copies stated in Item 13A of the Drawings, Specifications and Other Documents required by the Contract to be supplied to the Contractor by the Principal. Documents supplied to the Contractor by the Principal shall remain the property of the Principal and shall be returned by the Contractor to the Principal on demand in writing. The documents shall not, without the prior written approval of the Principal,

be used, copied or reproduced for any purpose other than the execution of the Work Under the Contract.

- b) The Contractor warrants that it has and it shall be deemed to have:
- i. examined carefully and to have acquired actual knowledge of the contents of the Contract documents, the Principal's Requirements (if applicable), the Tender Documents and any other information made available in writing by the Principal or any other person on the Principal's behalf to the Contractor for the purpose of preparing and submitting the Contractor's Tender
  - ii. examined all information relevant to the risks, contingencies and other circumstances which could affect the Contractor's Tender and which was obtainable by the making of detailed enquiries
  - iii. informed itself of the nature of the work and materials necessary for the execution of the Work Under the Contract and the means of access to and facilities at the Site and transport facilities for deliveries to or from the Site
  - iv. informed itself as to the availability and cost of labour including the costs of complying with obligations imposed by any agreement between the relevant building industry unions and employers relating to the execution of construction and building work similar to the Work Under the Contract
  - v. satisfied itself as to the correctness and sufficiency of the Contract Sum and that the Contract Sum covers the cost of complying with all its obligations under the Contract and of all matters and things necessary for the due and proper performance and completion of the Work Under the Contract
  - vi. informed itself of all requirements of the Authorities in relation to the Work Under the Contract generally, and without limiting the generality of the foregoing, in relation to measures necessary to protect the environment from any adverse effect or damage arising from execution of the Work Under the Contract
  - vii. obtained all appropriate professional and technical advice on all matters and circumstances with respect to the matters referred to in Clause 8.4(b)(i) to (vi) prior to submitting its Tender for the Work Under the Contract, and
  - viii. entered into this Contract based on its own investigations, interpretations, deductions, information and determinations and the Contractor acknowledges that it is aware that the Principal has entered into the Contract relying upon this acknowledgment and warranty.
- c) Failure by the Contractor to do all or any of the things it is deemed to have done under Clause 8.4(b) will not relieve the Contractor of any of its obligations or liabilities under the Contract, including its obligation to perform and complete the Work Under the Contract in accordance with the Contract.

#### **8.5 Supply of documents by Contractor**

- a) If the Contract requires the Contractor to supply documents, the Contractor shall supply the number of copies stated in Item 13C.
- b) If the Contractor submits documents to the Administrator, then:

- i. the Administrator shall not be bound to check the documents for errors, omissions or compliance with the requirements of the Contract
  - ii. notwithstanding the provisions of Clauses 3.2.1 or 23, the Administrator's approval or direction as to suitability shall not relieve the Contractor from responsibility for the Contractor's errors or omissions or compliance with the requirements of the Contract
  - iii. if the Contract provides that the Contractor must obtain the Administrator's direction whether documents are suitable or are not suitable then within the time stated in Item 13D after receipt of the documents, the Administrator shall notify the Contractor that the documents are suitable or are not suitable
  - iv. if the Administrator notifies the Contractor that the documents are not suitable, the Administrator shall give reasons why the documents are not suitable and the Contractor shall submit new or amended documents for the Administrator's direction under this Clause 8.5 within five Business Days after receipt of the Administrator's notice
  - v. the Administrator shall not reject documents which are in accordance with the requirements of the Contract.
- c) Copies of documents supplied by the Contractor shall be the property of the Principal but shall not be used or copied otherwise than for the use, maintenance or alteration of the Works.

## **8.6 Design by Contractor**

### **8.6.1 Definitions**

- a) This Clause 8.6 only applies where Item 14A specifies the Contractor is required to design a Defined Part or where the Contractor has proposed an Alternative Tender that the Principal has accepted at the time of tendering and the Alternative Tender involved Contractor-supplied design.
- b) The parties agree that the Principal or the Administrator (as the case may be) may act in its absolute discretion when exercising any of its rights under Clause 8.6.
- c) Unless the context requires otherwise, in this Clause 8.6 and any other part of the Contract relating to work to be designed by the Contractor:
  - i. 'Contractor's Construction Drawings' means the drawings prepared by, or on behalf of, the Contractor which are necessary for the construction and/or installation of the Defined Part.
  - ii. 'Contractor's Construction Specifications' means the specifications prepared by, or on behalf of, the Contractor which are necessary for the construction and/or installation of the Defined Part.
  - iii. 'Contractor's Design' means the design for the Defined Part which has been accepted pursuant to Clause 8.6.9(c)(i) or is deemed to have been accepted pursuant to Clause 8.6.11 and includes:
    - a) the Contractor's Construction Drawings, the Contractor's Construction Specifications and all other Drawings, Specifications, manuals, designs (including systems designs) and other information, calculations, samples, models, patterns and the like, and
    - b) any new software and any customised, modified or extended parts of any existing software (including associated data and documentation)

required for the construction and/or installation of the Works or which the Contract requires the Contractor to create or cause to be created or to provide (in all forms, including electronic) and which has become the Contractor's Design in accordance with Clause 8.6.8.

- iv. 'Contractor's Designer' means the consultants and/or employees stated in the Contractor's Tender or any replacement Designer approved by the Administrator under Clause 8.6.4, being the Designers engaged by the Contractor for the purpose of preparing the Contractor's Design and providing required Certificates.
- v. 'Defined Part' means that part of the Work Under the Contract specified in Item 14B which is to be designed and constructed by the Contractor, including all necessary interfaces with the remainder of the Work Under the Contract.
- vi. 'Designer's Certificate' means a certificate in the form of Form C7859.
- vii. 'Designer's Deed of Covenant' means the deed between the Principal, the Contractor and the Contractor's Designer referred to in Clause 8.6.4, in the form of Form C7854.
- viii. 'Principal's Requirements' means the written summary or outline of the Principal's requirements for the Defined Part described in the documents stated in Item 14C or in any relevant design provided by the Principal.

#### **8.6.2 Contractor's warranties**

The Contractor warrants that:

- a) it shall at all times be suitably qualified and experienced, and shall exercise due skill, care and diligence in the execution and completion of the design of the Defined Part
- b) the design of the Defined Part will be carried out and completed in accordance with the requirements of the Contract, and:
  - i. such design will satisfy the Principal's Requirements and be fit and adequate for the purposes stated in, or that can be reasonably implied from the Contract, and suitable and adequate for the Site, and
  - ii. construction in accordance with such design will comply with the standards and other requirements specified by this Contract
- c) it will construct the Defined Part in accordance with the Contractor's Design:
  - i. in a proper and workmanlike manner
  - ii. using material of the nature described in the Contract which is of merchantable quality fit and adequate for its intended purpose, or failing any specific description, then using material of the best quality available which is of merchantable quality and fit and adequate for its intended purpose
- d) the Defined Part will, when constructed:
  - i. satisfy the Principal's Requirements and be fit and adequate for the purposes stated in, or that can be reasonably implied from, the Contract and be suitable and adequate for the Site, and

- ii. comply with all the requirements of the Contract, including all Legislative Requirements and the requirements of all Authorities, and
- e) it will apply for, and obtain (or cause to be applied for and obtained) and will maintain, all certificates, licenses, consents, permits and other approvals of any Authority necessary for:
  - i. the execution of the Defined Part, and
  - ii. the occupation and use of the Defined Part.

#### **8.6.3 Contractor's liabilities, obligations and warranties unaffected**

The warranties in Clause 8.6.2 shall remain unaffected, notwithstanding:

- a) any design work in respect of the Defined Part may have been carried out by, or on behalf of, the Principal
- b) any comment upon, response to, review or acceptance of, giving or withholding of permission to use, approval to proceed with, direction or query in relation to or request to vary any Contractor's Construction Drawing or Contractor's Construction Specification or any part of the quality assurance system (in so far as it relates to the Defined Part), by the Principal, the Administrator or any agent, employee or consultant of the Principal
- c) any acceptance of a Drawing or Specification pursuant to Clause 8.6.9(c)(i) or deemed acceptance pursuant to Clause 8.6.11
- d) any variation directed or approved by the Principal in accordance with Clause 40, or
- e) the provision of any warranty under Clause 30.10

#### **8.6.4 The Contractor's Designer and Designer's Deed of Covenant**

- a) The Contractor shall engage the Contractor's Designer to assist the Contractor to carry out and complete the Contractor's Design and to assist the Contractor to discharge its other obligations under Clause 8.6. The Contractor shall not terminate the engagement of the Contractor's Designer without the prior written consent of the Administrator.
- b) Before commencing any Work Under the Contract in respect of the Defined Part, the Contractor shall ensure that the Contractor's Designer takes out a professional indemnity insurance policy:
  - i. for a total aggregate of not less than the sum stated in Item 14D covering, among other things, Claims by the Principal, its employees and agents and third parties against the Contractor or the Contractor's Designer or by any other person arising out of or incidental to any negligent act, error or omission by the Contractor or the Contractor's Designer in connection with the professional activities and duties of the Contractor or the Contractor's Designer, and
  - ii. which is maintained until the Final Certificate is issued under Clause 42.8 and, after that, time for the period stated in Item 14E.
- c) The Contractor shall, if requested by the Principal, within five Business Days of the later of:
  - i. the Date of Acceptance of Tender, or
  - ii. the date the Contractor's Designer is engaged by the Contractor

complete and execute, and procure the Contractor's Designer to complete and execute, a Designer's Deed of Covenant and deliver it to the Administrator.

- d) If having been requested by the Contractor to execute a Designer's Deed of Covenant, the Contractor's Designer fails to do so in the required Form and within the time period prescribed by this Clause 8.6.4, the Contractor shall, provided it has obtained the prior written approval of the Administrator, terminate the engagement of the Contractor's Designer and the Contractor shall nominate a further Designer for the approval of the Administrator. If the Administrator approves the replacement Designer, the provisions of this Clause 8.6.4 shall apply with respect to that Designer.

### **8.6.5 The Contractor's Design**

The Contractor shall ensure the Design of the Defined Part is carried out and completed in accordance with the Contract and such that the Contractor's Design, the Contractor's Construction Drawings, the Contractor's Construction Specifications and the Defined Part:

- a) are in accordance with the Principal's Requirements
- b) are consistent with the Contractor's Tender for the Defined Part (except to the extent that the Contractor's Tender is inconsistent with the Principal's Requirements or the Other Contract Documents or provides for standards of finish, workmanship or materials of a lesser standard than that required by the Principal's Requirements or the Other Contract Documents, in which case the Contractor's Design shall be in accordance with the Principal's Requirements and the Other Contract Documents), and
- c) are sufficient to enable the Contractor to construct and complete the Defined Part.

### **8.6.6 Submission of Contractor's Construction Drawings, Specifications and certificate**

The Contractor shall, in accordance with the documentation program required under Clause 8.6.13, submit to the Administrator:

- a) five copies of the Drawings and Specifications for the Defined Part or as otherwise specified in Item 13C, and
- b) with the copies of the Drawings and Specifications for the Defined Part submitted under Clause 8.6.6(a), five copies of a Designer's Certificate from the Contractor's Designer (signed by a Principal of the Contractor's Designer).

### **8.6.7 No obligations to review or check Drawings and Specifications**

- a) Neither the Principal nor the Administrator is required to review or check any Drawings or Specifications submitted by the Contractor under Clause 8.6.6 or 8.6.10(a) or any reasons or supporting information submitted by the Contractor under Clause 8.6.10(b):
  - i. for errors, omissions or compliance with the Contract (including the Principal's Requirements), or
  - ii. for any other purpose whatsoever.
- b) The Contractor acknowledges that in considering and responding to any Drawings or Specifications submitted by the Contractor (if any such consideration occurs or response is given), the Principal and the Administrator will be relying upon:
  - i. the advice, skill and judgment of the Contractor and the Contractor's Designer

- ii. the Designer's Certificate provided under Clauses 8.6.6 and 8.6.10(a)
  - iii. any reasons and supporting information given by the Contractor under Clause 8.6.10(b), and
  - iv. the warranties given by the Contractor under the Contract.
- c) No review of, comments upon, rejection of, or failure to review or comment upon, or reject, any Drawings or Specifications submitted by the Contractor or any other direction by the Principal or Administrator about such Drawings or Specifications forming part of the Contractor's Design will:
- i. relieve the Contractor from, or alter or affect, the Contractor's liabilities or responsibilities whether under the Contract or otherwise according to law, or
  - ii. prejudice the Principal's rights against the Contractor whether under the Contract or otherwise according to law.

#### **8.6.8 Permission to use required before construction**

The Contractor shall not commence construction of any part of the Defined Part unless and until Drawings and Specifications for that part of the Defined Part have been submitted under Clause 8.6.6 or 8.6.10(a) and either:

- a) the Administrator has accepted the Contractor may use those Drawings and Specifications for the construction of the Defined Part in accordance with Clause 8.6.9(c)(i), or
- b) the Administrator is deemed to have accepted those Drawings or Specifications may be used by the Contractor for the construction of the Defined Part as provided in Clause 8.6.11.

#### **8.6.9 Giving and withholding permission to use**

Within 10 Business Days after the submission by the Contractor to the Administrator of:

- a) Drawings and Specifications and the accompanying Designer's Certificate in accordance with Clause 8.6.6
- b) resubmitted Drawings and Specifications and the accompanying Designer's Certificate in accordance with Clause 8.6.10(a), or
- c) reasons and supporting information in accordance with Clause 8.6.10(b) concerning Drawings and Specifications for which the Administrator has previously withheld permission to use

as the case may be, the Administrator may either:

- i. give the Contractor notice in writing that it accepts use of the relevant Drawings and Specifications by the Contractor for the construction of the Defined Part, or
- ii. advise the Contractor in writing that it does not accept such Drawings or Specifications and give the Contractor brief reasons for withholding permission.

#### **8.6.10 Where permission to use is withheld**

If the Administrator advises the Contractor under Clause 8.6.9(c)(ii) that it does not accept the Drawing or Specification, the Contractor shall either:

- a) amend the Drawing or Specification and resubmit it to the Administrator together with an accompanying Designer's Certificate in accordance with Clause 8.6.6, or

- b) submit written reasons and supporting information to the Administrator stating why use of the Drawing or Specification should be accepted.

#### **8.6.11 Deemed permission to use**

If within 10 Business Days after submission by the Contractor to the Administrator of:

- a) a Drawing or Specification and the accompanying Designer's Certificate in accordance with Clause 8.6.6
- b) a resubmitted Drawing or Specification and the accompanying Designer's Certificate in accordance with Clause 8.6.10(a), or
- c) reasons and supporting information in accordance with Clause 8.6.10(b) concerning a Drawing or Specification for which the Administrator has previously withheld permission to use

as the case may be, the Administrator has not responded to the Contractor as provided in Clause 8.6.9(c)(i) or 8.6.9(c)(ii), then upon the expiration of the relevant 10 Business Day period, the Administrator shall be deemed to have accepted the use of the relevant Drawing or Specification by the Contractor for the construction of the Defined Part to the extent that the document complies with the requirements of the Contract.

#### **8.6.12 Documents become part of the Contractor's Design**

A Drawing or Specification submitted under Clause 8.6.6 or resubmitted in accordance with Clause 8.6.10(a) shall become part of the Contractor's Design:

- a) when the Administrator has accepted that Drawing or Specification may be used by the Contractor for the construction of the Defined Part pursuant to Clause 8.6.9(c)(i), or
- b) where such acceptance is deemed to have occurred pursuant to Clause 8.6.11.

#### **8.6.13 Documentation program**

- a) The Contractor shall, as part of the program which it is obliged to provide pursuant to Clause 33, submit a documentation program to the Administrator setting out the order in which and times by which Drawings and Specifications for the construction of the Defined Part are to be completed and submitted to the Administrator.
- b) The Contractor shall ensure that the documentation program provides for, and makes due allowance for, those Drawings and Specifications to be prepared and supplied to the Administrator within the time required by and at a rate consistent with the maintenance of progress of the Defined Part in accordance with the Current Program (provided that no more than a reasonable number of Drawings or Specifications are to be submitted to the Administrator on any one Day).

#### **8.6.14 No departure from Contractor's Design**

- a) The Contractor shall carry out and complete the Defined Part strictly in accordance with the Contractor's Design.
- b) The Contractor shall not depart from, or change, the Contractor's Design unless the departure or change (including a departure or change required by a variation directed by the Administrator under Clause 40.1):

- i. is not inconsistent with the Principal's Requirements or any other Contract requirements, and
  - ii. will not materially affect the design and construction of the Defined Part.
- c) Where there is any departure or change to the Contractor's Design pursuant to Clause 8.6.14(b), the Contractor shall prepare Drawings and Specifications in relation to the departure or change in accordance with Clause 8.6.5 and submit them, together with relevant Designer's Certificates, in accordance with Clause 8.6.6 and the Administrator shall be deemed to have accepted those Drawings and Specifications in accordance with Clause 8.6.11.
- d) If any departure or change to the Contractor's Design is inconsistent with the Principal's Requirements or any other Contract requirements or will materially affect the Defined Part, the Contractor shall resubmit Drawings and Specifications in relation to the departure or change in accordance with Clause 8.6.6 and Clauses 8.6.5 to 8.6.12 shall apply in respect of those resubmitted Drawings and Specifications.
- e) No acceptance or deemed acceptance by the Administrator in connection with a departure from or change to a Contractor's Design as contemplated by this Clause 8.6.14 shall:
  - i. constitute, or be treated as, a variation direction by the Administrator under Clause 40.1
  - ii. entitle the Contractor to any additional payment or any extension of the Date of Practical Completion, or
  - iii. affect the warranties or obligations of the Contractor under Clause 8.6.2.

#### **8.6.15 Copyright in design**

- a) The Contractor warrants that:
  - i. it and/or the Contractor's Designer owns the copyright in all of the Drawings and Specifications prepared by them for the purposes of the construction of the Defined Part, and
  - ii. it has the right and the Authority to grant the licence mentioned in Clause 8.6.15(b).
- b) The Contractor hereby grants to the Principal an irrevocable royalty-free licence to use the documents mentioned in Clause 8.6.15(a)(i) for the Work Under the Contract, for any subsequent operation, maintenance, repairs, additions or alterations of or to the Defined Part and for any other purpose including other non-related projects. This licence will survive the breach, repudiation, rescission, frustration, cancellation, termination, completion or any other discharge of the Contract and any takeover of the whole or any part of the Work Under the Contract.
- c) Where the Principal uses any of the documents mentioned in Clause 8.6.15(a)(i) other than for the purposes of this Contract or in connection with the Work Under the Contract, it does so at its own risk.

#### **8.6.16 Conditions precedent to issue of Certificate of Practical Completion**

The Contractor shall, as a condition precedent to the issue of the Certificate of Practical Completion, hand over the following to the Administrator:

- a) three sets of as-constructed Contractor's Construction Drawings and Contractor's Construction Specifications in a Form and containing such details as may be required by the Administrator, and
- b) a Designer's Certificate certifying that the as-constructed Contractor's Construction Drawings and Contractor's Construction Specifications comply with the requirements of the Contract and the Contractor's Design.

#### **8.6.17 Ambiguities and discrepancies in the Contractor's Design**

Clause 8.2(b) shall apply to a Defined Part only where the ambiguity or discrepancy is in the Principal's Requirements. Where the ambiguity or discrepancy is:

- a) in the Contractor's Design or any Drawing or Specification produced by the Contractor in respect of a Defined Part (including in or between any of the Contractor's Construction Drawings or the Contractor's Construction Specifications), or
- b) between the Contractor's Design or any Drawing or Specification produced by the Contractor in respect of a Defined Part (including any Contractor's Construction Drawings or the Contractor's Construction Specifications) and the Principal's Requirements

such ambiguity or discrepancy shall be at the Contractor's risk and the direction shall not entitle the Contractor to any extra payment or an extension of time.

#### **8.7 Workshop drawings**

The Contractor shall prepare all fabrication, erection and construction drawings (workshop drawings), required to supplement any information supplied by the Principal and these shall be submitted to the Administrator for a direction as to their suitability, in accordance with Clause 8.5, where specified, at the time specified or, if not specified, 15 Business Days before any work shown in such workshop drawings is commenced.

#### **8.8 Availability of documents**

- a) While Work Under the Contract is being performed, one complete set of Drawings, Specifications and other written information supplied by the Principal, the Administrator and the Contractor shall be kept by the Contractor at the Site or other location approved in writing by the Principal and shall be available at all times for reference by the Principal, the Administrator and any persons nominated in writing by either of them.
- b) During the manufacture or assembly of any significant part of the Work Under the Contract away from the part of the Site where the Works are to be constructed, a set of the Drawings and written information relevant to that part of the work shall be kept by the Contractor at the place of manufacture or assembly and shall be available for reference by the Principal, the Administrator and any person nominated in writing by either of them.

#### **8.9 Confidential information**

- a) Drawings, Specifications and other information, samples, models, patterns and the like, supplied by either the Contractor or the Principal and marked or otherwise identified as confidential, shall be regarded as confidential and shall not be disclosed to a third party except with the prior agreement of the other party to the Contract.

- b) If required in writing by a party, the other party shall enter into a separate agreement not to disclose to anyone else any confidential matter even after the issue of the Final Certificate pursuant to Clause 42.8 or the earlier termination of the Contract.

**8.10 Information Privacy Act 2009**

- a) The Contractor acknowledges that the Contractor is a Bound Contracted Service Provider and the Information Commissioner's (as defined under the Act) functions include conducting reviews into Personal Information handling practices of Bound Contracted Service Providers and conducting compliance audits to assess Bound Contracted Service Providers' compliance with the privacy principles.
- b) The Contractor shall promptly advise the Principal of any:
  - i. enforcement of the Contractor's obligations under the *Information Privacy Act 2009* (Qld) in connection with the Contract, including enforcement through Compliance Notices given to the Contractor, and
  - ii. Privacy Complaints in connection with the Contractor's discharge of its obligations under the Contract, including any Privacy Complaints to which the Contractor is a respondent.
- c) The Contractor shall take any actions reasonably required by the Principal in connection with the matters referred to in Clause 8.10(b), including steps to comply with any Compliance Notice.
- d) The Contractor shall keep the Principal informed about actions of the Information Commissioner in connection with the Contract of which the Contractor becomes aware.
- e) The Contractor shall immediately notify the Principal if the Contractor becomes aware that disclosure of Personal Information held in relation to this Contract is, or may be, required or authorised by law.
- f) Where:
  - i. an individual makes an application to the Principal for access to, or amendment of, a Document containing the individual's Personal Information, whether the application is made under the *Information Privacy Act 2009* (Qld) or otherwise, or
  - ii. a Privacy Complaint is made to the Principal, including any Privacy Complaints to which the Principal is a respondent, the Contractor shall, as soon as possible following the Principal's request, but no later than two Business Days after such request from the Principal:
    - i. submit to the Principal any Document specified by the Principal
    - ii. amend or notate any Document specified by the Principal
    - iii. provide information to the Principal concerning the Contractor's discharge of its obligations under this Clause 8.10, and
    - iv. take other reasonable actions required by the Principal.
- g) The Principal may request the Contractor to comply with privacy and security measures under the *Information Privacy Act 2009* (Qld) and the *Right to Information Act 2009* (Qld). Such request will be in writing.

- h) In relation to this Clause 8.10, the Administrator shall act as an agent of the Principal.
- i) Following the issuing of the Certificate of Practical Completion and prior to the issue of the Final Certificate, the Contractor shall forward any Personal Information on members of the community held by the Contractor to the Principal. Following confirmation of receipt by the Principal, the Contractor shall destroy all such information in the Contractor's possession.
- j) This Clause 8.10 survives termination or expiry of the Contract.

#### **8.11 Media releases**

The Contractor shall not issue any information, publication, document or article for publication concerning the project in any media without prior approval of the Principal. The Contractor shall refer to the Principal any enquiries concerning the project from any media.

### **9 Assignment and subcontracting**

#### **9.1 Assignment**

- a) Neither party shall, without the prior written approval of the other, and except on such reasonable terms and conditions as are determined in writing by the other, assign the Contract or any payment or any other right or benefit or interest thereunder.
- b) The Contractor shall not without the written approval of the Administrator allow a Subcontractor to assign a subcontract or any payment or any other right, benefit or interest under a subcontract.

#### **9.2 Subcontracting**

##### **9.2.1 Prior consent required**

The Contractor shall not:

- a) subcontract the whole of the Work Under the Contract
- b) subcontract or allow a Subcontractor to subcontract any Work Under the Contract, if:
  - i. the value of the Work Under the Contract to be subcontracted exceeds the amount specified in Item 15A, or
  - ii. the Work Under the Contract to be subcontracted is subject to the requirements in Clause 9.3 in relation to registered suppliers

without the written approval of the Administrator, which may be given or withheld in the Administrator's absolute discretion.

##### **9.2.2 Details of proposed Subcontractors**

- a) In seeking approval to subcontract any part of the Work Under the Contract, the Contractor shall provide to the Administrator:
  - i. particulars in writing of the work to be subcontracted and the name and the address of the proposed Subcontractor, and
  - ii. any other information which the Administrator reasonably requests, including the proposed subcontract documents (without prices).

- b) Within 10 Business Days of receiving the information required to be provided by the Contractor pursuant to Clause 9.2.2(a), the Administrator shall consider the request for approval and advise the Contractor of its approval or provide reasons why approval is not given.
- c) In considering a request for approval to subcontract under this Clause 9.2.2, the Administrator may consider the proposed Subcontractor's:
  - i. management capability in quality, work health and safety and environmental management, and
  - ii. technical experience and capability.
- d) The Administrator's approval to subcontract under this Clause 9.2.2 may be conditional upon the subcontract, including:
  - i. provision that the Subcontractor shall not assign or subcontract without the consent in writing of the Contractor, and
  - ii. provisions which may be reasonably necessary to enable the Contractor to fulfil the Contractor's obligations to the Principal.

### **9.3 Registered suppliers**

- a) Without limiting the Contractor's obligations under Clause 9.2, the Contractor shall only use registered suppliers in respect of the Work Under the Contract which is covered by the Department's relevant registration categories.
- b) The registered suppliers and registration categories may be amended at any time and from time to time by the Principal and are available at the Principal's website.
- c) Where a registered supplier is removed from the register after the Administrator has granted approval of that Subcontractor, the Contractor shall continue to fulfil that registered supplier's obligations under the Contract.
- d) The Contractor shall ensure that any special conditions imposed on the Registered Suppliers as part of registration be complied.

### **9.4 Contractor's responsibility**

The existence of a subcontract (with or without the approval of the Administrator) does not relieve the Contractor from any liability or obligation under the Contract. Except where the Contract otherwise provides, the Contractor is liable to the Principal for the acts and omissions of Subcontractors and employees and agents of Subcontractors as if they were acts or omissions of the Contractor.

## **10 Selected and Nominated Subcontractors**

### **10.1 Selected Subcontract**

The Contractor shall subcontract the Selected Subcontract Work to a Selected Subcontractor. If the Tender Documents specify the terms and conditions upon which the subcontract is to be entered into, the subcontract shall include those terms and conditions.

### **10.2 Nominated Subcontract**

- a) At such time as is necessary to avoid delay to the Contractor, the Contractor shall subcontract the Nominated Subcontract Work to a Nominated Subcontractor.

- b) If the Contract provides that the Principal may assign to the Contractor the benefit of a prior Contract made between the Principal and a Nominated Subcontractor, the Contractor shall, when directed by the Administrator, accept the assignment of that prior Contract. If the Contract provides that the Principal may novate to the Contractor a prior Contract made between the Principal and a Nominated Subcontractor in respect of Nominated Subcontract Work, the Contractor shall, when directed by the Administrator, execute a deed of novation of that prior Contract in the Form included in the Tender Documents (Form C7849) and unless the Contract otherwise provides, the Contractor shall give the Principal credit for payment made by the Principal to the Nominated Subcontractor in respect of the Nominated Subcontract Work.
- c) The Contractor shall ensure that the provisions of the subcontract with a Nominated Subcontractor provides:
  - i. that in respect of the Nominated Subcontract Work, the Nominated Subcontractor will undertake the Contractor obligations and liabilities to enable the Contractor to discharge the Contractor's obligations and liabilities to the Principal under the terms of the Contract
  - ii. that the Nominated Subcontractor will indemnify the Contractor against loss resulting from any failure by the Nominated Subcontractor to perform such obligations or fulfil such liabilities
  - iii. that the Nominated Subcontractor will indemnify the Contractor against loss resulting from any negligence by the Nominated Subcontractor and the Nominated Subcontractor's servants and agents and against any misuse by them of any Constructional Plant or Temporary Works provided by the Contractor for the purposes of the Contract
  - iv. that the Nominated Subcontractor will lodge security in a Form provided by Clause 5.4 and that security and Retention Moneys shall be calculated on the same scale and on the same basis respectively as apply in the Contract, and
  - v. rights and obligations equivalent to those in Clause 44.

### **10.3 Provisions applying generally to Selected and Nominated Subcontract Work**

- a) The Contractor shall be fully responsible to the Principal for the Selected or Nominated Subcontract Work, including design, suitability, quality and workmanship.
- b) Except as specified in this Clause 10, and subject to any reasonable objection made by the Contractor pursuant to this Clause 10:
  - i. the Principal shall have no liability to a Selected or Nominated Subcontractor arising from the subcontract between the Contractor and the Selected or Nominated Subcontractor, and
  - ii. the Principal shall not be liable to the Contractor for any act, default or omission or breach of Contract by a Selected or Nominated Subcontractor, arising from the subcontract between the Contractor and the Selected or Nominated Subcontractor.

### **10.4 Direct payment of Nominated Subcontractor**

- a) In respect of Nominated Subcontract Work performed by a Nominated Subcontractor, the Principal shall make payment directly to the Nominated Subcontractor. Except where the

Contractor has accepted an assignment of the benefit of a prior Contract made between the Principal and a Nominated Subcontractor:

- i. such payment shall be made on behalf of the Contractor, and
  - ii. if the Contractor reasonably requests the Principal in writing not to make a payment to the Nominated Subcontractor, the Principal shall withhold payment, but under no circumstances, including bankruptcy or winding up of the Contractor, shall payment be made to the Contractor.
- b) The Principal as stakeholder shall hold Retention Moneys and security provided by a Nominated Subcontractor and shall disburse or apply the Retention Moneys or security as jointly requested by the Contractor and the Nominated Subcontractor or in accordance with the decision of an arbitrator or Court.

#### **10.5 Termination of Nominated Subcontractor**

- a) The Contractor shall not unreasonably terminate a subcontract for Nominated Subcontract Work and as early as possible the Contractor shall notify the Administrator of the Contractor's intention to terminate and the reasons.
- b) If a Nominated Subcontractor repudiates or abandons a subcontract or the Nominated Subcontractor is terminated, the Contractor shall within one Business Day notify the Administrator in writing and within three Business Days the Administrator shall nominate an alternative Nominated Subcontractor to complete the subcontract work.
- c) The Contractor shall not be obliged to enter into a subcontract with an alternative Nominated Subcontractor referred to in Clause 10.5(b) against whom the Contractor raises reasonable objection.
- d) The Contractor shall, as soon as practicable, enter into a subcontract with the alternative Nominated Subcontractor referred to in Clause 10.5(b) and notify the Administrator accordingly.
- e) If compliance with such a direction causes the Contractor to incur more or less cost than otherwise would have been incurred had the Contractor not been given the direction, the difference shall be valued under Clause 40.5, except where a Provisional Sum for the Nominated Subcontract Work has been included in the Contract, in which case the provisions of Clause 11 shall apply.

#### **11 Provisional Sums**

- a) A Provisional Sum included in the Contract shall not itself be payable by the Principal, but where at the direction of the Administrator, the work or Item to which the Provisional Sum relates is performed by:
  - i. the Contractor, the work or Item shall be valued under Clause 40.5 of the General Conditions of Contract
  - ii. a Subcontractor, the Principal shall pay the Contractor the amount payable by the Contractor to the Subcontractor for the work or Item, disregarding any damages payable by the Contractor to the Subcontractor or vice versa, plus the amount or percentage thereon for profit and attendance stated in Item 15E or, where not so stated, as stated

elsewhere in the Contract and (unless incorporated within the amounts payable under this paragraph) GST, and

- iii. a Nominated Subcontractor pursuant to a prior Contract made between the Principal and a Nominated Subcontractor, the benefit of which has been assigned to the Contractor, the Principal shall pay the Contractor the amount stated in Item 15F or the percentage for profit and attendance stated in Item 15F of the amount payable by the Principal to the Nominated Subcontractor for the work or Item or, where no amount or percentage is stated, as stated elsewhere in the Contract, disregarding any damages payable by the Principal to the Nominated Subcontractor or vice versa and (unless incorporated within the amounts payable under this paragraph) GST.
- b) The amount payable to a Subcontractor for materials or goods is to be taken to be the nett cost to the Contractor (disregarding any deduction of cash discount for prompt payment).

## **12 Site conditions**

### **12.1 Contractor investigations**

- a) The Principal does not warrant or make any representation with respect to:
  - i. the completeness, accuracy, adequacy or content of any Site Information provided to the Contractor by, or on behalf of, the Principal
  - ii. the completeness or adequacy of any Reliance Information, or
  - iii. any interpretations, deductions, opinions or conclusions set out in any such Site Information or Reliance Information.
- b) The Contractor warrants that it has, and shall be deemed to have, visited and examined the Site and its surroundings and done everything a competent and experienced Contractor would have done to inform itself fully as to the physical conditions or obstructions upon and below the surface of the Site, and the local conditions, including climatic and hydrologic conditions at, near or relevant to the Site, or any other condition or characteristic of the Site affecting or which may affect its performance of the Contract and obtained all necessary information as to risks, contingencies and other circumstances which could have an effect on the performance and cost of executing the Work Under the Contract.
- c) Any Site Information provided to the Contractor by, or on behalf of, the Principal is provided for information only.
- d) Subject to Clause 12.2:
  - i. the Principal shall not be liable to the Contractor for any Claim arising out of, or in relation to, Site Information provided to the Contractor by, or on behalf of, the Principal
  - ii. the Contractor shall not be relieved of any of its obligations or liabilities, if the Contractor encounters conditions, including subsurface conditions and subsurface services, which differ from the conditions shown in or indicated by any Site Information provided to the Contractor by or on behalf of the Principal, and
  - iii. the Contractor accepts all risk arising out of its use of or reliance upon any Site Information provided to the Contractor by or on behalf of the Principal.

## **12.2 Notification**

- a) If during the execution of the Work Under the Contract, the Contractor becomes aware of a Latent Condition, the Contractor shall within one Business Day and, where possible, before the Latent Condition is disturbed, give written notice to the Administrator of that Latent Condition endorsed 'Contractor's Notice Under Clause 12.2'.
- b) Following notification under Clause 12.2 a) and unless not required by the Administrator, the Contractor shall provide to the Administrator a statement in writing, specifying:
  - i. the Latent Condition encountered and in what respects it differs materially
  - ii. the additional work and additional resources which the Contractor estimates to be necessary to deal with the Latent Condition
  - iii. the time the Contractor anticipates will be required to deal with the Latent Condition and the expected delay in achieving Practical Completion
  - iv. the Contractor's estimate of the cost of the measures necessary to deal with the Latent Condition, and
  - v. other details reasonably required by the Administrator.
- c) The written statement provided under Clause 12.2 b) shall be provided by the Contractor within a reasonable timeframe after the Latent Condition was first notified under Clause 12.2 a).

## **12.3 Extension of time and cost**

Delay caused by a Latent Condition may justify an extension of time under Clause 35.5. If a Latent Condition causes the Contractor to:

- a) carry out additional work
- b) use additional Constructional Plant, or
- c) incur extra cost (including any disruption costs)

which a competent and experienced Contractor could not reasonably have anticipated at the time of tendering, a valuation shall be made under Clause 40.5.

## **12.4 Reduced Valuation**

Where the Contractor has not provided the notification required under Clause 12.2, the Administrator may reduce the value of the Contractor's claim to the extent that there is a more cost-effective treatment to mitigate the Latent Condition which was not identified by the Contractor and could have been identified by the Principal and directed by the Administrator had the required notification been provided.

## **13 Patents, copyright and other intellectual property rights**

- a) The Principal warrants that unless otherwise provided in the Contract:
  - i. design
  - ii. materials
  - iii. documents, and

- iv. methods of working specified in the Contract or provided or directed by the Principal or the Administrator will not infringe any patent, registered design, trademark or name, copyright or other protected right.
- b) The Contractor warrants that any other design, materials, documents and methods of working provided by the Contractor will not infringe any patent, registered design, trademark or name, copyright or other protected right and the Contractor shall indemnify the Principal against any design, materials, documents or methods of working provided by the Contractor infringing any patent, registered design, trademark or name, copyright or other protected right.

## **14 Statutory requirements**

### **14.1 Complying with Legislative Requirements**

- a) The Contractor shall satisfy all Legislative Requirements.
- b) The Contractor shall give the notices and pay any fees or charges necessary to comply with all Legislative Requirements.
- c) If a change in a Legislative Requirement is at variance with a provision of the Contract, as soon as the Contractor discovers the variance, the Contractor shall notify the Administrator in writing specifying the difference.

### **14.2 Changes in Legislative Requirements**

If a change in a Legislative Requirement after the 10<sup>th</sup> Business Day prior to the closing of Tenders:

- a) necessitates a change in the Works or the Temporary Works or the Contractor's method of working, or
- b) is an increase or decrease in or is a new fee or charge in relation to the Works or Temporary Works,

and causes the Contractor to incur more or less cost than could reasonably have been anticipated by a competent and experienced Contractor at the time the Contractor submitted its Tender, the difference shall be valued under Clause 40.5.

### **14.3 Licences, registrations, permits, approvals and certificates**

- a) The Contractor shall obtain and hold, and ensure that its Subcontractors, agents and employees obtain and hold, all of the licences, registrations, permits, approvals and certificates that they are required under all Legislative Requirements in order to carry out the Work Under the Contract and in respect of the use and occupation of the Works.
- b) The Contractor shall give the Principal copies of documents issued to the Contractor by any Authority in respect of the Work Under the Contract and, in particular, any approvals of work.

### **14.4 Industrial matters**

- a) The Contractor shall comply with, and ensure that its Subcontractors comply with, the provisions of the industrial awards and agreements that from time to time are applicable to the performance of the Work Under the Contract. Without limiting the generality of the foregoing, the Contractor shall ensure that its Subcontractors enter into an agreement to comply with the provisions of the said industrial awards and agreements prior to their employment on the Site.

- b) The Contractor warrants that the labour rates and conditions upon which the Contract Sum has been calculated are based on the provisions of the applicable industrial awards and/or agreements.
- c) The Contractor is not entitled to make any Claim in connection with its compliance with this Clause 14.4 or any increase in labour costs.

#### **14.5 Specific Legislative Requirements**

Without limiting Clause 14.1, the Contractor shall comply with the requirements set out in this Clause 14.5.

##### **14.5.1 The Building Code**

If specified in Item 16A, the Code for the Tendering and Performance of Building Works 2016 (the Building Code) applies to this Contract. The Building Code can be viewed at the Australian Government website <https://www.abcc.gov.au/building-code/building-code-2016>

##### **14.5.2 Haulage of plant and materials**

- a) The Contractor shall ensure that vehicles carrying plant and material over state-controlled roads and local government-controlled roads shall comply with the vehicle weight limit requirements set out in the *Transport Operations (Road Use Management) Act 1995 (Qld)*, and with any other vehicle weight limit requirements imposed by duly constituted authorities on whose roads such vehicles operate.
- b) The Contractor shall, prior to commencement of work on the Site, submit evidence to the Administrator that the approvals of the relevant Authorities have been obtained for the haulage of plant and materials over surface streets along nominated routes.
- c) The Contractor shall be responsible for the rectification of any damage to surface streets attributable to the Work Under the Contract. If the Contractor fails to rectify the damage, the Administrator may, after giving reasonable notice, arrange for the necessary rectification work to be carried out and the cost incurred shall be a debt due from the Contractor to the Principal.
- d) Access for Constructional Plant to and from surface streets on or off the Site shall be subject to any restrictions stated in Item 17A.
- e) Failure of the Contractor to comply with the requirements of this Clause 14.5.2 will be a substantial breach of Contract for the purposes of Clause 44.2.

##### **14.5.3 Portable Long Service Leave Levy**

Where applicable:

- a) The Principal shall be responsible for the notification of any building and construction work required to be performed under this Contract in accordance with Section 67 of the *Building and Construction Industry (Portable Long Service Leave) Act 1991 (Qld)*, and
- b) The Principal shall be responsible for the payment of any levies due in accordance with Section 66 of the *Building and Construction Industry (Portable Long Service Leave) Act 1991 (Qld)*.

#### **14.5.4 National Greenhouse and Energy Reporting Act**

- a) A party will provide the other party with all information and documentation reasonably requested by the other party in respect of greenhouse gas emissions and energy production and consumption referable to any activities that comprise Work Under the Contract which is reasonably necessary to enable compliance by the other party with its obligations under the *National Greenhouse and Energy Reporting Act 2007* (Cth) (NGER Legislation) in relation to any Work Under the Contract.
- b) The Contractor acknowledges that it is not entitled to any additional payment from the Principal for complying with any obligations the Contractor may have under the NGER Legislation.

#### **14.5.5 Work health and safety accreditation**

If applicable, as indicated in Item 11A of the Conditions of Tendering Annexure (or in the case of a TIC-Sole Invitation, if requested by the Principal):

- a) the Contractor shall be accredited under the Australian Government Building and Construction WHS Accreditation Scheme (the Scheme) established by the *Fair Work (Building Industry) Act 2012* (Cth) (FWBI Act) while building work (as defined in Section 5 of the FWBI Act) is carried out, and shall maintain accreditation under the Scheme while the Works are being carried out and for the duration of the Contract, and
- b) The Contractor shall comply with all conditions of the Scheme accreditation.

#### **14.6 The Queensland Code**

##### **14.6.1 Definitions**

If applicable, in addition to terms defined in this document, terms used in this Clause 14.6 have the same meaning as is attributed to them in the Queensland Government's *Queensland Code of Practice for the Building and Construction Industry* (the Queensland Code). The *Queensland Code of Practice for the Building and Construction Industry* (the Queensland Code) is available at <https://www.oir.qld.gov.au/industrial-relations/building-and-construction-code-practice-2000>.

##### **14.6.2 Primary obligation**

- a) The Contractor shall comply with, and meet any obligations imposed by, the Queensland Code.
- b) The Contractor shall notify the Australian Building and Construction Commission (or nominee) and the Principal of any alleged breaches of the Queensland Code and of voluntary remedial action taken within 24 hours of becoming aware of the alleged breach.
- c) Where the Contractor is authorised to engage a Subcontractor and it does so, the Contractor shall ensure that any secondary Contract imposes on the Subcontractor equivalent obligations to those in this Clause 14.6, including that the Subcontractor shall comply with, and meet any obligations imposed by, the Queensland Code.
- d) The Contractor shall not appoint or engage another party in relation to the Work Under the Contract where that appointment or engagement would breach a sanction imposed on the other party in relation to the Queensland Code.

#### 14.6.3 Access and information

- a) The Contractor shall maintain adequate records of compliance with the Queensland Code by it, its Subcontractors and related entities.
- b) The Contractor shall allow, and take reasonable steps to facilitate, Queensland Government authorised personnel (including personnel of the ABCC) to:
  - i. enter and have access to Sites and premises controlled by the Contractor, including any Site at which the Work Under the Contract is being carried out
  - ii. inspect any work, material, machinery, appliance, article or facility
  - iii. access information and documents
  - iv. inspect and copy any record relevant to the Work Under the Contract
  - v. have access to personnel, and
  - vi. interview any person.
- c) As is necessary for the authorised personnel to monitor and investigate compliance with the Queensland Code by the Contractor, its Subcontractors and related entities.
- d) The Contractor, and its related entities, shall agree to, and comply with, a request from Queensland Government authorised personnel (including personnel of the ABCC) for the production of specified documents by a certain date, whether in person, by post or electronic means.

#### 14.6.4 Sanctions

- a) The Contractor warrants that at the time of entering into this Contract, neither it, nor any of its related entities, are subject to a sanction in connection with the Queensland Code that would have precluded it from tendering for work to which the Queensland Code applies.
- b) If the Contractor does not comply with, or fails to meet any obligation imposed by, the Queensland Code, a sanction may be imposed against it in connection with the Queensland Code.
- c) Where a sanction is imposed:
  - i. it is without prejudice to any rights that would otherwise accrue to the parties
  - ii. the State of Queensland (through its agencies, Ministers and the ABCC) is entitled to:
    - a) record and disclose details of non-compliance with the Queensland Code and the sanction, and
    - b) take them into account in the evaluation of future expressions of interest or Tender responses that may be lodged by the Contractor, or its related entities, in respect of work to which the Queensland Code applies.

#### 14.6.5 Compliance

- a) The cost of ensuring the Contractor's compliance with the Queensland Code shall be borne by the Contractor. The Contractor is not entitled to make a Claim for reimbursement or an extension of time from the Principal or the State of Queensland for such costs.

- b) Compliance with the Queensland Code does not relieve the Contractor from responsibility to perform the Work Under the Contract and any other obligation under the Contract, or from liability for any defect in the Works or from any other legal liability, whether or not arising from its compliance with the Queensland Code.
- c) Where a change in the Contract or the Work Under the Contract is proposed, and that change would, or would be likely to, affect compliance with the Queensland Code, the Contractor shall immediately notify the Principal (or nominee) of the change, or likely change and specify:
  - i. the circumstances of the proposed change
  - ii. the extent to which compliance with the Queensland Code will, or is likely to be, affected by the change, and
  - iii. what steps the Contractor proposes to take to mitigate any adverse impact of the change.and the Principal will direct the Contractor as to the course it must adopt within five Business Days of receiving notice.

#### **14.7 Personal Property Securities Act**

##### **14.7.1 Confidentiality under the Act**

If this Contract contains a Security Interest, then each party agrees for the purposes of s275(6) of the *Personal Property Securities Act 2009* (Cth) (the PPSA) that it will not disclose information of the type referred to in Section 275(1) of the PPSA where a request is made under s275(1) of the PPSA in relation to this Contract or any part of it, except in circumstances where the party is compelled by law (other than s275(1) of the PPSA) to make that disclosure.

##### **14.7.2 Security Interests under the Act**

If the Principal determines that any clause of this Contract, or a transaction contemplated by this Contract or in connection with the performance of the Work Under the Contract constitutes, or is likely to give rise to a Security Interest in respect of which the Principal is the security holder, then:

- a) the Contractor agrees to promptly provide all assistance and cooperation requested by the Principal that the Principal determines is reasonably required to:
  - i. register and maintain the registration of its Security Interest on the personal property securities register within any applicable time limits relevant to the effectiveness of the Security Interest
  - ii. ensure that the Principal's Security Interest is enforceable against third parties, Perfected or otherwise effective
  - iii. ensure that the Security Interest has the appropriate priority required by the Principal (including where applicable as a Purchase Money Security Interest)
  - iv. ensure that any Security Interest granted temporary Perfection under the PPSA is Perfected by registration or other appropriate means prior to any applicable expiry of that temporary Perfection, and
  - v. enable the Principal to register financing statements or financing change statements under the PPSA with respect to any such Security Interest

- b) the Contractor waives the right to receive notice of a verification statement in relation to the registration of that Security Interest
- c) the Contractor shall not register or permit to be registered any other Security Interest in respect of the Personal Property that comprises the collateral in respect of that Security Interest other than one that has been consented to or granted by the Principal
- d) the Contractor shall not cause or allow any of the Contractor's Personal Property to become an Accession to the Principal's Personal Property or cause or allow the Principal's Personal Property to become an Accession to the Contractor's Personal Property without the prior consent of the Principal, and
- e) immediately notify the Principal if any other person Claims or attempts to enforce a Security Interest:
  - i. in the Principal's Personal Property, or
  - ii. in the Contractor's Personal Property to the extent that that purported enforcement affects or has the potential to affect the Contractor's ability to carry out the Works in accordance with the terms of the Contract.

#### **14.8 The Queensland Charter for Local Content**

The Contractor is advised that the Queensland Charter for Local Content (the Charter) applies when the project meets one of the following requirements:

- a) Queensland Government contribution is \$5.5 million and above (including GST) for south-east Queensland and \$2.75 million and above (including GST) for regional Queensland
- b) Queensland Government grants greater than \$2.75 million (inclusive of GST), and
- c) Large infrastructure projects where funding of over \$20 million is provided by the Commonwealth through the Queensland Government

There is an obligation on the Contractor to comply with the principles of the Queensland Charter and:

- i. within 28 Days of the Letter of Acceptance, the Contractor shall prepare and submit a statement of intent, indicating how the principles of the Charter shall be addressed, and
- ii. upon reaching Practical Completion or the last of the Practical Completion if there is more than one separable portion, the Contractor shall complete and submit a Queensland Charter for Local Content – Project Outcome report (template available from <https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Infrastructure-Contract/Transport-Infrastructure-Contract/TIC-Construct-Only>) to [qclc@dcd.qld.gov.au](mailto:qclc@dcd.qld.gov.au) and also submit a copy to the Principal via [localcontentreports@tmr.qld.gov.au](mailto:localcontentreports@tmr.qld.gov.au).

No additional payment will be made for compliance requirements in accordance with the Queensland Charter.

For more information, please refer to:

[www.statedevelopment.qld.gov.au/resources/charter-for-local-content.html](http://www.statedevelopment.qld.gov.au/resources/charter-for-local-content.html)

## **15 Protection of people and property**

### **15.1 Contractor's obligations**

Nothing in Clause 15 shall in any way limit or exclude any of the Contractor's obligations or liabilities under the Contract.

### **15.2 Protection of people and property**

- a) Insofar as compliance with the requirements of the Contract permits, the Contractor shall:
  - i. provide all things and take all measures necessary to protect people and property
  - ii. avoid unnecessary interference with the passage of people and vehicles, and
  - iii. prevent nuisance and unreasonable noise and disturbance.
- b) Without limiting the generality of the Contractor's obligations, they include the provision of barricades, guards, fencing, temporary roads, footpaths, warning signs, lighting, traffic flagging, safety helmets and clothing, removal of obstructions and protection of services.
- c) If the Contractor or the employees or agents of the Contractor damage property, including Public Utilities Plant and services and/or property on or adjacent to the Site, the Contractor shall promptly make good the damage and pay any compensation which the law requires the Contractor to pay.
- d) If the Contractor fails to comply with an obligation under Clause 15 the Principal may, in addition to any other remedy, perform the obligation on the Contractor's behalf and the cost incurred by the Principal shall be a debt due from the Contractor to the Principal.

### **15.3 Work health and safety**

#### **15.3.1 General**

This Clause 15.3 survives the termination or expiry of the Contract.

#### **15.3.2 Appointment of Principal Contractor**

- a) The Contractor is engaged by the Principal as the Principal Contractor for the Construction Project and the Contractor accepts that engagement.
- b) The Contractor is authorised to have Management and Control of the Workplace and to discharge its obligations as Principal Contractor under Chapter 6 of the WHS Regulation.
- c) The Contractor's engagement as Principal Contractor will continue until completion of the Works, unless earlier revoked by the Principal.
- d) The Contractor shall comply with (and ensure that its employees, agents, Subcontractors and representatives also comply with) all WHS Legislation and with the Principal's work health and safety policies to the extent that such policies require a higher standard than what the Contractor is otherwise required to comply with.
- e) The Contractor shall provide the Principal with copies of all notices and correspondence of whatsoever nature concerning the WHS Legislation within 24 hours of the dispatch and/or receipt by the Contractor of any such notice or correspondence.
- f) The Contractor shall, to the extent permitted by law, indemnify and keep indemnified the Principal and its officers, employees and agents against any action, Claim, demand, expense,

loss, cost (including legal costs), penalty, fine or other liability (including in tort) arising from or in connection with:

- i. any injury, accident or safety related incident on or adjacent to the Site, and
  - ii. the enforcement of, or any breach by the Contractor of, its obligations under this Clause 15.3.
- g) The Contractor shall consult, cooperate and coordinate with the Administrator in accordance with WHS Legislation.

#### **15.3.3 Notifiable Incidents**

The Contractor shall:

- a) ensure that the relevant regulator is notified immediately after becoming aware of a Notifiable Incident, arising out of or in connection with the conduct of the business or undertaking of the Contractor
- b) notify the Administrator of every Notifiable Incident in relation to or in connection with the Site immediately on becoming aware but not more than 12 hours after the occurrence
- c) keep the Administrator informed of the status of any safety or health-related incidents that have occurred in relation to or in connection with the Site
- d) do all that is necessary to assist the Administrator with any investigations into any safety or health related incident in relation to or in connection with the Site, including requiring, to the extent possible, the Contractor's agents and Subcontractors to assist the Administrator
- e) as soon as possible but no later than 12 hours of receiving a request from the Administrator to do so, provide the Administrator with a copy of any notification to the regulator for work health and safety of a safety or health-related incident.

#### **15.3.4 Work Health and Safety Management Plan**

- a) The Contractor shall prepare and submit, as part of the Contract Plan, its Work Health and Safety Management Plan (WHS Management Plan) to the Administrator in accordance with Clause 33.3.
- b) The Contractor shall not commence the Works until the Administrator has advised that the Contractor's WHS Management Plan is suitable pursuant to Clause 33.3.1 or 33.3.2 (as applicable).
- c) The Contractor's WHS Management Plan shall comply with all applicable WHS Legislation.
- d) The Contractor is not entitled to make any Claim in connection with any direction as to suitability, review, approval of, or modification to the WHS Management Plan as directed by the Administrator.

#### **15.3.5 Safety audits**

- a) The Administrator may audit the implementation of the WHS Management Plan (or any other plan required to be developed by the Contractor under the WHS Legislation) at any time. During any audit the Contractor shall provide the Administrator with all documents, access and assistance necessary for its completion.

- b) The Contractor shall suspend the Work Under the Contract (or the relevant portion) until the Contractor has addressed the safety issues identified during the audit and, in the meantime, continue to comply with all duties and obligations under WHS Legislation and the Contract.
- c) If the Contractor fails to rectify a non-conformance that has been identified on three separate occasions in the auditing process, the Principal may give notice to the Contractor of a substantial breach of the Contract under Clauses 44.2 and 44.3.

#### **15.4 Health and safety duties**

##### **15.4.1 General duty**

The parties shall discharge all applicable duties under the WHS Act and (without limiting those duties) shall ensure, so far as is reasonably practicable, the health and safety of all persons associated with the Works, the Workplace, fixtures, fittings, plant and structures associated with any of them, and that persons are not exposed to risks to health and safety in relation to or connection with the Contract, the Works or the Workplace.

##### **15.4.2 Principal's obligations**

The Principal will:

- a) comply with its obligations under the WHS Act
- b) as soon as reasonably possible, give the Contractor any information the Principal has in relation to hazards and risks at or in the vicinity of the Workplace where any Construction Work is to be carried out
- c) provide the Contractor with copies of any Drawings and Specifications created for the Principal by its designer of any Works to be constructed under this Contract, and
- d) consult, cooperate and coordinate with the Contractor in relation to any health or safety matters arising out of or in connection with the Workplace, the Works or the Contract.

##### **15.4.3 Contractor's obligations**

The Contractor shall discharge its duties and comply with all relevant obligations under the WHS Act, including the following:

- a) the duties of a Principal Contractor
- b) the duties of a person conducting a business or undertaking
- c) the duties in relation to health and safety matters in relation to or connected with the Management and Control of the Workplace
- d) the duty to ensure all risks to health and safety are eliminated, minimised or managed, and
- e) any other duties, obligations, standards and requirements under the WHS Act which may be or become applicable in relation to or in connection with the Contract or the Works.

##### **15.4.4 Additional Contractor obligations**

Without limiting the obligations in Clauses 15.4.1 and 15.4.3, the Contractor shall ensure the Contractor, and its officers, employees, agents and Subcontractors:

- a) are familiar with and comply with all their obligations and exercise due diligence in discharging all their duties under the WHS Act

- b) as a minimum comply with the Principal's reasonable policies, procedures and directions in relation to health and safety
- c) are suitable and competent, and shall retain evidence of that verification, and provide that evidence to the Principal promptly upon written or verbal request, and
- d) where the Contractor provides or commissions any design for the Works, the Contractor shall:
  - i. ensure that it and any designer discharge all duties as required under Part 6.2 of the WHS Regulation
  - ii. obtain a design safety report from any designer in accordance with the WHS Regulation and provide a copy to the Principal's Representative, and
  - iii. ensure it obtains full details of all hazards and risks from any designer and incorporates corresponding methods of controlling these in the WHS Management Plan.

#### **15.4.5 Primary responsibility**

- a) As between the Principal and the Contractor, where a duty is held by both parties, and without limiting the Principal's rights under the Contract, the Contractor has the primary responsibility for ensuring that duty is discharged and any investigations are undertaken.
- b) If the Contractor cannot discharge its work health and safety duties and obligations under the WHS Act or the Contract to the standard imposed by the WHS Act or the Contract, the Contractor shall:
  - i. ensure work health and safety is preserved including, if necessary, stopping the relevant part of the Work Under the Contract
  - ii. immediately notify the Principal and consult, cooperate and coordinate with the Principal to ensure any duties are discharged or issues resolved to the standard required, and
  - iii. if the Contractor in its capacity as Principal Contractor or otherwise in relation to the Contract, the Workplace or the Works, creates, sends or receives any document, notice or report under the WHS Act, forward a copy to the Principal.

#### **15.4.6 Communication, consultation and coordination**

- a) The Contractor shall, before commencing the Works and then on an ongoing basis, consult, cooperate and coordinate with:
  - i. the Principal
  - ii. all other duty holders in relation to any duty held by the Contractor
  - iii. workers (whether or not directly employed by the Contractor) who are or are likely to be directly affected, and
  - iv. relevant suppliers, Contractors and other third parties,in relation to any health or safety matters arising out of or in connection with the Workplace, the Works or the Contract.
- b) Without limiting the above obligations, the Contractor shall as a minimum comply with the Principal's reasonable policies and procedures in relation to communication, consultation and coordination.

#### **15.4.7 No separate payment for compliance with work health and safety requirements**

The Contractor is not entitled to make any Claim in connection with complying with the WHS Act, WHS Regulation or the work health and safety requirements under this Contract. The Contractor acknowledges it has allowed for the cost of compliance in the Contract Sum.

#### **15.5 Traffic management**

##### **15.5.1 General**

- a) Without limiting Clause 15.1, the Contractor shall be responsible for the safe and orderly passage of all traffic on or within the road reserve including all vehicular and pedestrian traffic through and around the Site at all times from the date of possession of the Site to the Date of Practical Completion.
- b) For the purposes of Clause 15.5, 'the Manual' means the department's *Manual of Uniform Traffic Control Devices* as amended from time to time and available at the Principal's website.
- c) If specified in Item 18A, the Contractor shall prepare, implement and maintain a Traffic Management Plan for the Work Under the Contract and the provisions of Clause 15.5.2 shall apply.

##### **15.5.2 Traffic Management Plan**

- a) The Contractor shall prepare and submit, as part of the Contract Plan, its Traffic Management Plan to the Administrator, in accordance with Clause 33.3.
- b) The Traffic Management Plan shall be consistent with the Manual, the Standard Specifications and any Traffic Management Plan outline submitted with the Contractor's Tender (except to the extent that any Traffic Management Plan outline is inconsistent with the Manual, the Standard Specifications or any of the Other Documents comprising the Contract, then the Traffic Management Plan shall be in accordance with the Manual, the Standard Specifications and the Other Documents comprising the Contract).
- c) The Traffic Management Plan shall include procedures to comply with any minimum traffic restrictions stated in Clause 15.5.3 and shall be accompanied by a duly completed Form M994.
- d) The Traffic Management Plan shall include details of all proposed road closures, detours, staged construction, necessary signing, the relevant Authorities whose approval is required to be obtained and all other relevant information.
- e) The Contractor shall implement, monitor and update its Traffic Management Plan during the Contract and shall, within five Business Days of its amendment, submit a copy of the Traffic Management Plan to the Administrator.

##### **15.5.3 Restrictions to traffic**

Unless otherwise agreed in writing with the Administrator, the Contractor shall comply with any restrictions to the passage of vehicular traffic through the Site set out in the Standard Specifications.

## **15.6 Community liaison**

### **15.6.1 General**

If specified in Item 19A, the Contractor shall prepare, implement and maintain a Community Liaison Plan for the Work Under the Contract and Clause 15.6.2 applies.

### **15.6.2 Community Liaison Plan**

- a) The Contractor shall prepare and submit, as part of the Contract Plan its Community Liaison Plan to the Administrator in accordance with Clause 33.3.
- b) The Community Liaison Plan shall be formatted under at least the following headings:
  - i. Overview
  - ii. Objectives
  - iii. Target audiences
  - iv. Potential issues and opportunities
  - v. Strategy
  - vi. Tactics
  - vii. Evaluation, and
  - viii. Timeframes.
- c) The Community Liaison Plan shall include procedures and timetables to:
  - i. make contact with any local businesses, schools, hospitals, community groups and residents adjacent to the Site and/or affected by the Work Under the Contract and the office of the relevant local government, to establish an effective communication network to be maintained during construction
  - ii. anticipate the impacts of construction on the above groups and the broader community, and be proactive (subject to the requirements of Clause 15.6.4) in keeping all parties informed via direct contact, through newsletters, leaflets, advertisements in newspapers, radio and other appropriate means, particularly in regard to changed traffic arrangements during construction and local access issues
  - iii. maintain a complaints register and respond to all registered complaints within 48 hours
  - iv. prepare regular fact sheets for the information of visitors and the public
  - v. develop procedures for the management of emergency situations and ensure that staff are trained in the appropriate response necessary to deal with such emergency situations, and
  - vi. implement the following minimum reporting requirements:
    - a) immediately report any emergency issue and a copy of any public inquiry
    - b) on a weekly basis report on:
      - i. key activities achieved from previous week
      - ii. key activities planned for coming week

- iii. summary of responses to complaints and inquiries, and
- iv. summary of outstanding responses
- c) on a monthly basis report on:
  - i. anticipated issues for coming month
  - ii. proposed actions in response to issues, and
- d) on a quarterly basis report on key actions and achievements.

#### **15.6.3 Meetings and reporting**

- a) An initial meeting with members of the local community that will be affected by the Work Under the Contract shall be convened by the Contractor within 20 Business Days after the Date of Acceptance of Tender at which the Contractor shall undertake a brief presentation of the work to be undertaken under the Contract and the expected issues.
- b) The Contractor shall report to the Administrator at weekly meetings to be held between the Contractor's Community Liaison Officer, the Administrator and a representative of the Principal.

#### **15.6.4 Restrictions and prior permissions**

- a) All newsletters, leaflets and other public statements shall be submitted for approval to the Administrator prior to publication.
- b) The Contractor shall:
  - i. not have direct contact or liaise with members of the press, and
  - ii. assist in formulating responses to questions raised by the press as required from the Contractor's Community Liaison Officer.

### **15.7 Environmental management**

#### **15.7.1 General**

The Contractor shall, at all times during the course of the Contract, comply with the requirements of the *Environmental Protection Act 1994* (Qld) (EP Act). The Contractor shall implement and maintain measures to preserve and protect the natural environment on and adjacent to the Site.

#### **15.7.2 Environmental Management Plan**

- a) The Contractor shall prepare and submit, as part of the Contract Plan, its Environmental Management Plan to the Administrator in accordance with Clause 33.3 and a time-based schedule for its implementation.
- b) The Environmental Management Plan shall be consistent with the EP Act, the Standard Specifications and any Environmental Management Plan outline submitted with the Contractor's Tender (except that if any Environmental Management Plan outline is inconsistent with the EP Act, the Standard Specifications or any of the Other Documents comprising the Contract, then the Environmental Management Plan shall be in accordance with the EP Act, the Standard Specifications and the Other Documents comprising the Contract).

- c) The Contractor shall:
  - i. implement the Environmental Management Plan in accordance with the schedule included in the Environmental Management Plan, and
  - ii. monitor, update and control its Environmental Management Plan while carrying out Work Under the Contract.
- d) Nothing contained in Clause 15.7 shall in any way limit or exclude any of the Contractor's obligations or liabilities under the Contract.

## **16 Care of the work and reinstatement of damage**

### **16.1 Care of the Work Under the Contract**

- a) From and including the earlier of the date of commencement of Works under the Contract and the date on which the Contractor is given possession of the Site to 4.00 pm on the Date of Practical Completion of the Works, the Contractor shall be responsible for the care of the Work Under the Contract.
- b) Without limiting the generality of the Contractor's obligations, the Contractor shall be responsible for the care of unfixed items the value of which has been included in a payment certificate under Clause 42.1, things entrusted to the Contractor by the Principal for the purpose of carrying out the Work Under the Contract, things brought on the Site by the Contractor or any Subcontractor for that purpose, the Works, the Temporary Works and Constructional Plant, and the Contractor shall provide the storage and protection necessary to preserve these items and things, and the Works, the Temporary Works and Constructional Plant.
- c) After 4.00 pm on the Date of Practical Completion the Contractor shall remain responsible for the care of outstanding work and items to be removed from the Site by the Contractor and shall be liable for damage occasioned by the Contractor in the course of completing outstanding work or complying with obligations under Clauses 30.9, 31.1 and 37.

### **16.2 Weather protection**

#### **16.2.1 General obligations**

- a) Without affecting the Contractor's obligations under Clause 16.1, the Contractor shall:
  - i. take all reasonable precautions to protect the Work Under the Contract against the effects of inclement weather, including by ensuring that:
    - a) the Work Under the Contract is carried out and designed so as to obviate ponding of rain water on or within the Site
    - b) all excavations are adequately drained or, if practicable, protected to minimise water entry and where a suitable outlet cannot be constructed to excavations, taking such other measures as are necessary to remove water from the excavation
    - c) all excavations are backfilled as soon as practicable after the work for which the excavation was made is completed
    - d) it takes all reasonable steps to prevent otherwise suitable materials from becoming unsuitable as a result of moisture entry during construction, and

- e) that at the completion of each Day's operations, and at such other times when rainfall is imminent, the surface of relevant areas of the Site are graded so as to provide adequate falls transversely and, where practicable, longitudinally to permit shedding of surface water without ponding or scouring and ensuring the graded area is rolled to provide a smooth dense surface in this regard, and
- ii. reinstate any part of the Work Under the Contract affected by inclement weather in a timely manner after the event.
- b) Nothing in Clause 16.2 shall in any way limit or exclude the Contractor's obligations or liabilities under the Contract.

#### **16.2.2 Severe weather management plan**

- a) If specified in Item 20A, the Contractor shall prepare, implement and maintain a Severe Weather Management Plan (SWMP).
- b) The Contractor shall prepare and submit its SWMP to the Administrator in accordance with Clause 33.3.
- c) The SWMP shall:
  - i. comply with and fully satisfy the requirements of the Principal's Engineering Policy EP146
  - ii. include a time-based schedule for its implementation
  - iii. as a minimum, detail what measures will be undertaken by the Contractor to mitigate or minimise the impact of damage to the following elements (as applicable to the Work Under the Contract) as a result of inclement weather:
    - a) pavement
    - b) earthworks formation and batters (cuttings and embankments)
    - c) culvert construction
    - d) drainage
    - e) environmental protection and
    - f) major excavations
  - iv. include the following components:
    - a) severe weather identification (means and methods)
    - b) risk evaluation (procedures)
    - c) weather treatments (short-, mid- and long-term)
    - d) rectification and recovery (means and methods), and
    - e) contact personnel.
- d) The Contractor shall monitor, update and control its SWMP while carrying out Work Under the Contract.

#### **16.3 Reinstatement**

- a) If loss or damage (except loss or damage which is a direct consequence, without fault or omission on the part of the Contractor, of an Excepted Risk) occurs to anything while the

Contractor is responsible for its care, the Contractor shall promptly make good the loss or damage and any costs incurred by the Contractor in making good the loss or damage shall be borne by the Contractor.

- b) Where loss or damage occurs as a direct consequence, without fault or omission on the part of the Contractor, of an Excepted Risk, the Contractor shall, if and to the extent directed by the Administrator, rectify that loss or damage, which shall be deemed to be a variation under Clause 40. In the case of loss or damage being caused by a combination of Excepted Risks and other risks, any such direction and consequential valuation made under Clause 40.5 shall take into account the proportional responsibility of the Contractor and the Principal.

#### **16.4 Excepted Risks**

The Excepted Risks are:

- a) any negligent act or omission of the Principal, the Administrator or the employees, consultants or agents of the Principal
- b) any risk specifically excepted in the Contract
- c) war, invasion, act of foreign enemies, act of terrorism, hostilities, (whether war be declared or not), civil war, rebellion, revolution, insurrection or military or usurped power, martial law or confiscation by order of any government or public Authority
- d) ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel not caused by the Contractor or the Contractor's employees or agents
- e) use or occupation by the Principal or the employees or agents of the Principal or other Contractors to the Principal (not being employed by the Contractor) or a Nominated Subcontractor engaged by the Principal (pursuant to a prior Contract the benefit of which has been assigned to the Contractor pursuant to the Contract) of any part of the Works or the Temporary Works, or
- f) defects in the design of the Work Under the Contract other than a design provided by the Contractor.

### **17 Damage to persons and property other than the Works**

#### **17.1 Indemnity by Contractor**

- a) The Contractor shall indemnify the Principal against:
- i. loss of or damage to property of the Principal, including existing property in, or upon, which the Work Under the Contract is being carried out, and
  - ii. Claims by any person (including Claims by owners or occupiers of areas adjacent to the Site) against the Principal in respect of personal injury or death or loss of or damage to any property arising out of or as a consequence of the carrying out by the Contractor of the Work Under the Contract, but the Contractor's liability to indemnify the Principal shall be reduced proportionally to the extent that the act or omission of the Principal or employees or agents of the Principal may have contributed to the loss, damage, death or injury.

- b) Clause 17.1(a) shall not apply to:
- i. the extent that the liability of the Contractor is limited by another provision of the Contract
  - ii. exclude any other right of the Principal to be indemnified by the Contractor
  - iii. things for the care of which the Contractor is responsible under Clause 16.1, and
  - iv. Claims in respect of the right of the Principal to construct the Work Under the Contract on the Site.

**17.2 Indemnity by the Principal**

The Principal shall indemnify the Contractor in respect of Claims referred to in Clause 17.1(b)(iv).

**18 Insurance of the Works**

The alternative applying for Insurance of the Works for this Contract is given in item 21A.

**Alternative 1 – Principal arranged insurance**

- a) On or before the Date of Acceptance of Tender, the Principal shall effect a policy of insurance in relation to the Work Under the Contract in the terms of the Principal Arranged Insurance Program as set out at the website <https://docs.ilta.com.au/tm/contractors/> maintained by the Principal's insurance broker. The Principal shall maintain the policy while ever the Contractor has an interest in it and the Principal shall pay all premiums.
- b) The policy will include the Principal, the Contractor and Subcontractors as insured parties.
- c) The Contractor is responsible for the payment of deductibles under the policy to the extent that the Claim under the policy is not a direct consequence, without fault or omission on the part of the Contractor, of an Excepted Risk defined in Clause 16.4.

**Alternative 2 – Contractor arranged insurance**

- a) Before the Contractor commences work, the Contractor shall take out an insurance policy covering all the things referred to in Clause 16.1 against loss or damage resulting from any cause whatsoever until the Contractor ceases to be responsible for their care.
- b) Without limiting the generality of the obligation to insure, the policy shall cover the Contractor's liabilities under Clause 16.3 and things in storage off Site and in transit to the Site.
- c) The insurance cover may exclude:
  - i. the cost of making good fair wear and tear or gradual deterioration, but shall not exclude the loss or damage resulting therefrom
  - ii. the cost of making good faulty design, workmanship and materials, but shall not exclude the loss or damage resulting therefrom
  - iii. consequential loss of any kind, but shall not exclude loss of or damage to the Works
  - iv. damages for delay in completing or for the failure to complete the Works
  - v. loss or damage resulting from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel resulting from any cause
  - vi. loss or damage resulting from the Excepted Risks in Clause 16.4(b) and (c).

- d) The insurance cover shall be for an amount not less than the sum of:
  - i. the Contract Sum
  - ii. the amount stated in Item 21B to provide for costs of demolition and removal of debris
  - iii. the amount stated in Item 21C to cover fees of consultants
  - iv. the value stated in Item 21D of any materials or things to be supplied by the Principal for the purposes of the Work Under the Contract, and
  - v. the additional amount or percentage stated in Item 21E of the total of the items referred to in Clause 18(d)(i) to (iv).
- e) The insurance policy shall be in the joint names of the Principal and the Contractor, and shall cover the Principal, the Contractor and all Subcontractors for their respective rights, interests and liabilities and, unless otherwise specified elsewhere in the Contract, shall be effected with an insurer and in terms both approved in writing by the Principal, which may be given or withheld in its absolute discretion. The policy shall be maintained until the Contractor ceases to be responsible under Clause 16.1 for the care of anything.

## **19 Public liability insurance**

The alternative applying for public liability insurance for this Contract is given in Item 22A.

### **Alternative 1**

- a) On or before the Date of Acceptance of Tender, the Principal shall effect in relation to the Work Under the Contract a policy of insurance in the terms of the Principal Arranged Insurance Program (PAIP) as set out at the website <https://docs.ilta.com.au/tmrcontractors/> maintained by the Principal's insurance broker. The Principal shall maintain the policy while ever the Contractor has an interest in it and the Principal shall pay all premiums.
- b) The policy will include the Principal, the Contractor and Subcontractors as insured parties.
- c) The Contractor is responsible for the payment of deductibles under the policy to the extent that the Claim under the policy is not a direct consequence, without fault or omission on the part of the Contractor, of an Excepted Risk defined in Clause 16.4.

### **Alternative 2**

- a) Before the Contractor commences work, the Contractor shall take out a public liability policy of insurance in the joint names of the Principal and the Contractor, which covers the Principal, the Contractor, the Administrator and all Subcontractors for their respective rights and interests and covers their liabilities to third parties. The policy shall also cover the Contractor's liability to the Principal and Principal's liability to the Contractor for loss of or damage to property (other than property required to be insured by Clause 18) and the death of or injury to any person (other than liability which is required by law to be insured under a workers compensation policy of insurance).
- b) The public liability policy of insurance shall be for an amount in respect of any one occurrence not less than the sum stated in Item 22B and, unless otherwise specified elsewhere in the Contract, shall be effected with an insurer and in terms both approved in writing by the Principal, which may be given or withheld in its absolute discretion. The policy shall be maintained until the Final Certificate is issued under Clause 42.8.

## **20 Insurance of employees**

- a) Before the Contractor commences work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed.
- b) Where permitted by law, the insurance shall be extended to indemnify the Principal for the Principal's statutory liability to persons employed by the Contractor.
- c) The Contractor shall ensure that every Subcontractor is similarly insured.

## **21 Inspection and provisions of insurance policies**

### **21.1 Proof of insurance**

- a) Before the Contractor commences work and whenever requested in writing by the other party, a party liable to effect or maintain insurance shall produce evidence to the satisfaction and approval of the other party of the insurance effected and maintained.
- b) The effecting of insurance shall not limit the liabilities or obligations of a party under other provisions of the Contract.
- c) The Contractor shall be deemed to have examined, assessed and understood the Principal's insurance policies at the Date of Acceptance of Tender.

### **21.2 Failure to produce proof of insurance**

If, after being requested in writing by the other party so to do, a party fails to produce evidence of compliance with insurance obligations under Clauses 18, 19 or 20 to the satisfaction and approval of the other party, the other party may effect and maintain the insurance and pay the premiums. The amount paid shall be a debt due from the party in default to the other party. Where the defaulting party is the Contractor, the Principal may refuse payment until evidence of compliance with insurance obligations under Clauses 18, 19 or 20 is produced by the Contractor to the satisfaction and approval of the Principal. The rights given by Clause 21.2 are in addition to any other right.

### **21.3 Notices from or to the insurer**

The party effecting insurance under Clause 18 or 19 shall ensure that each policy of insurance contains provisions acceptable to the other party that will:

- a) require the insurer, whenever the insurer gives the Principal, the Contractor or a Subcontractor a notice of cancellation or other notice concerning the policy at the same time to inform the other party in writing that the notice has been given.
- b) provide that a notice of Claim given to the insurer by the Principal, the Administrator, the Contractor or a Subcontractor shall be accepted by the insurer as a notice of Claim given by the Principal, the Administrator, the Contractor and the Subcontractor and that a failure by one insured to discharge its obligations of disclosure and good faith or to observe the terms of the policy will not prejudice the cover of the other insureds, and
- c) require the insurer, whenever the party fails to renew the policy or to pay a premium, to give notice in writing thereof forthwith to the Principal and the Contractor and prior to the insurer giving any notice of cancellation.

#### **21.4 Notices of potential Claims**

- a) The Contractor shall, as soon as practicable, inform the Principal in writing of any occurrence that may give rise to a Claim under a policy of insurance required by Clause 18 or 19 and shall keep the Principal informed of subsequent developments concerning the Claim. The Contractor shall ensure that Subcontractors in respect of their operations similarly inform the Principal.
- b) Where the occurrence may give rise to a Claim or potential Claim under a policy of insurance effected under the PAIP regardless of whether the likely value of such Claim or potential Claim is less than the applicable deductible, the Contractor shall, despite any clause to the contrary, comply in all respects with the procedures for notifying a Claim as set out at the website <https://docs.ilta.com.au/tmrcontractors/> maintained by the Principal's insurance broker. Failure to do so may result in indemnity not being granted under the PAIP.
- c) Where a policy of insurance required by the Contract has been effected by the Principal, the Principal shall similarly inform the Contractor.
- d) The Contractor shall comply with the terms of the policies of insurance effected under Clauses 18, 19 or 20 (including the notification requirements under those policies).

#### **21.5 Settlement of Claims**

- a) Upon settlement of a Claim under the insurance specified by Clause 18:
  - i. to the extent that the Work Under the Contract needing reinstatement has been the subject of a payment or allowance by the Principal to the Contractor, if the Contractor has not completed reinstatement of that work, moneys received shall, if requested by either party, be paid into a bank agreed upon by the parties in an account in the joint names of the Contractor and the Principal. As the Contractor proceeds to reinstate the loss or damage, the Administrator shall certify against the joint account for the cost of reinstatement, and
  - ii. to the extent that the work to be reinstated has not been the subject of a payment or allowance by the Principal to the Contractor, the Contractor shall be entitled immediately to receive from moneys received, the amount of money so paid in relation to any loss suffered by the Contractor relating to that Work Under the Contract (including the supply of goods and materials on Site whether or not incorporated into the Works).
- b) Settlement of Claims under the PAIP will be dealt with in accordance with the procedures set out at the website <https://docs.ilta.com.au/tmrcontractors/> maintained by the Principal's insurance broker.

#### **21.6 Cross liability**

Any insurance required to be effected by the Contractor in joint names in accordance with the Contract shall include a cross-liability clause in which the insurer agrees to waive all rights of subrogation or action against any of the persons comprising the insured and for the purpose of which the insurer accepts the term 'insured' as applying to each of the persons comprising the insured as if a separate policy of insurance had been issued to each of them (subject always to the overall sum insured not being increased thereby).

### **21.7 Excess/deductible**

The Contractor shall bear or pay any excess or deductible which is applicable to any Claim made under any of the policies of insurance effected under Clauses 18, 19 or 20 except to the extent the Claim is with respect to loss or damage which is the direct consequence, without fault or omission on the part of the Contractor, of an Excepted Risk defined in Clause 16.4.

## **22 Inspectors**

The Administrator shall forthwith notify the Contractor in writing of the name of any inspector appointed by the Principal or the Administrator, including any appointed inspector's delegated function under the contract (if any). This may include separate designated geographical areas performing the same delegated functions.

## **23 Administrator**

### **23.1 Administrator**

- a) The Principal shall ensure that at all times there is an Administrator. The Administrator will be responsible for the overall administration of this Contract.
- b) The Principal shall ensure that in the exercise of the functions of the Administrator under the Contract listed in Annexure C, the Administrator:
  - i. acts fairly, reasonably, and honestly
  - ii. acts within the time prescribed under the Contract or where no time is prescribed, within a reasonable time, and
  - iii. arrives at a reasonable measure or value of work, quantities or time.
- c) In the exercise of all other functions of the Administrator under the Contract, the Administrator acts as the agent of the Principal (not as an independent certifier).
- d) If pursuant to a provision of the Contract enabling the Administrator to give directions, the Administrator gives a direction, the Contractor shall comply with the direction.
- e) In this Clause 23 'direction' includes agreement, approval, Authorisation, certificate, decision, demand, determination, explanation, instruction, notice, order, permission, rejection, request or requirement.
- f) Except where the Contract otherwise provides, a direction may be given orally, but the Administrator shall as soon as practicable confirm it in writing.
- g) If the Contractor in writing requests the Administrator to confirm an oral direction, the Contractor shall not be bound to comply with the direction until the Administrator confirms it in writing.

## **24 Administrator's Representative**

- a) The Administrator may from time to time appoint individuals to exercise any functions of the Administrator under the Contract but not more than one Administrator's Representative shall be delegated the same function at the same time. The appointment of an Administrator's Representative shall not prevent the Administrator from exercising any function.

- b) The Administrator shall forthwith notify the Contractor in writing of:
  - i. the appointment and the name of any Administrator's Representative and the functions delegated to the Administrator's Representative
  - ii. the termination of the appointment of an Administrator's Representative.
- c) If the Contractor makes a reasonable objection to the appointment of a representative, the Administrator shall terminate the appointment.

## **25 Contractor's Representative**

- a) The Contractor shall personally superintend the execution of the Work Under the Contract or, at all times during which any activities relating to the execution of the Work Under the Contract are taking place, have a competent representative present on the Site and, if required by the Administrator, at other places at which activities relating to the execution of the Work Under the Contract are taking place.
- b) The person nominated by the Contractor in accordance with Clause 29.2.1 shall be the Contractor's Representative.
- c) The Contractor shall forthwith notify the Administrator in writing of the name of the representative and of any subsequent changes. Any direction defined in Clause 23 shall:
  - i. if it relates to the execution of work on the Site and is given to the Representative on the Site, or
  - ii. if it relates to the execution of work at any other place and is given to the Representative at the other placebe deemed to have been given to the Contractor.
- d) Matters within the knowledge of a representative of the Contractor shall be deemed to be within the knowledge of the Contractor.
- e) If the Administrator makes a reasonable objection to the appointment of a Representative, the Contractor shall terminate the appointment and appoint another Representative.

## **26 Control of Contractor's employees and Subcontractors**

The Administrator may direct the Contractor to have removed from the Site or from any activity connected with the Work Under the Contract, within such time as the Administrator directs, any person employed in connection with the Work Under the Contract who, in the opinion of the Administrator, is guilty of misconduct or is incompetent or negligent. The person shall not thereafter be employed on the Site or on activities connected with the Work Under the Contract without the prior written approval of the Administrator.

## **27 Site**

### **27.1 Possession of Site**

- a) The Principal shall on, or before, the expiration of the time stated in Item 24A, give the Contractor possession of the Site or sufficient of the Site to enable the Contractor to commence work, provided, however, that the Principal is not obliged to give possession of the Site if:

- i. the Contractor has not supplied to the Administrator proof of the implementation of the requirements stated in Item 24B.
  - ii. the Contractor has not complied with the requirements of Clause 5.2, 21.1 or 33.3.
- b) If the Principal has not given the Contractor possession of the whole Site, the Principal shall, from time to time, give the Contractor possession of such further parts of the Site as may be necessary to enable the Contractor to execute the Work Under the Contract in accordance with the requirements of the Contract. The Principal shall advise the Contractor in writing of the date upon which the Site or any part thereof will be available.
  - c) Possession of the Site shall confer on the Contractor a right to only such use and control as is necessary to enable the Contractor to execute the Work Under the Contract.
  - d) Except to the extent otherwise agreed in writing by the parties, the Contractor acknowledges and accepts that the public use of the Site must be fully maintained during the performance of the Work Under the Contract.

## **27.2 Access for the Principal and others**

### **27.2.1 General**

- a) The Principal and the Principal's employees and agents may, at any time after reasonable notice to the Contractor, have access to any part of the Site for any purpose.
- b) The Contractor shall permit the execution of work on the Site by persons engaged by the Principal and shall cooperate with them and coordinate the Contractor's work with their work.
- c) If requested by the Contractor, the Principal shall provide to the Contractor the names of the persons so engaged.
- d) The Contractor shall, at all reasonable times, give the Principal, the Administrator and inspectors appointed under Clause 22, and other persons authorised in writing by the Principal or by the Administrator, access to the Work Under the Contract at any place where the work is being carried out or materials are being prepared or stored.
- e) The Principal shall ensure that the Contractor is not unreasonably impeded in the execution of the Contractor's work by any persons referred to in Clause 27.2.1(d) while exercising the right of access given by Clause 27.2.1(d).
- f) The Contractor shall have no right to any Claim in connection with work or performance of other activities carried out pursuant to this Clause 27.2.1.

### **27.2.2 Adjoining work**

- a) The Contractor acknowledges that:
  - i. when it commences the Work Under the Contract, prior Contractors may not have completed their Works and may be doing so at the same time as the Contractor is executing the Work Under the Contract, and
  - ii. Contractors may be executing work on other Contracts which may interface with the Work Under the Contract.
- b) The Contractor agrees that it will be responsible for coordination of its work with that of other Contractors so as not to disrupt, impede or adversely affect those other Contractors in the

execution of their work and the Contractor shall indemnify the Principal for any liability the Principal may incur to other Contractors as a result of the Contractor's failure to comply with this Clause 27.2.2.

- c) Notwithstanding any other provision of this Contract, the Contractor shall not be entitled to make any Claim against the Principal because of an act or omission of a separate Contractor unless the Contractor has fully complied with Clause 27.2.2.

### 27.2.3 Adjoining private land

- a) In performing the Work Under the Contract, the Contractor shall not enter or permit any Constructional Plant to enter private land adjoining the Site without first obtaining the written approval of the land occupier and the land owner (where these are not the same person). The Contractor shall submit a copy of this written approval to the Administrator upon request.
- b) Notwithstanding the granting of such approval of entry, the Contractor shall comply with the following conditions relating to private land adjoining the Site:
  - i. privacy of the land owner/occupier shall be paramount
  - ii. the land owner/occupier shall be notified in advance when entry onto private land is required for any purpose
  - iii. vehicles shall be driven at a maximum speed of 20 kilometres per hour when in close proximity to any dwellings, and
  - iv. where a permanent access structure to private land is to be constructed under this Contract, the Contractor shall maintain access for others across the Site at all times.
- c) The Contractor shall, by the action of the entering on to the private land, be deemed to have indemnified the Principal against any Claims which may arise from or in connection with such entry or subsequent operations on the land.
- d) Upon completion of work on private land, the Contractor shall forward to the Administrator a statement signed by the land owner/occupier to the effect that the land owner and occupier are satisfied that any damage to the land which may have arisen from or in connection with the Contractor's operations has been adequately repaired or otherwise compensated by the Contractor. All costs associated with work on private land shall be borne by the Contractor.
- e) The Contractor shall develop and maintain a schedule of planned dates for temporary access and occupation of private land adjoining the Site. This schedule, and any subsequent updates, shall be reflected in any Construction Program submitted to the Principal.
- f) The schedule of planned dates for temporary access and occupation of private land adjoining the Site shall be presented to and reviewed with the Administrator and the Principal during the Site Conferences.
- g) The Contractor's obligations with respect to the safe performance of the Work Under the Contract shall apply to the Contractor's activities on the adjoining private land during the period of temporary access and occupation.

#### **27.2.4 Notice of entry**

- a) For purposes of this Clause 27.2.4, the term 'notice of entry' means the Notice of Entry Form (Department of Transport and Main Roads Form M727 CFD), a copy of which is available on the Principal's website.
- b) In the event that the Contractor fails to obtain written approval from the land occupier and land owner in accordance with Clause 27.2.3, then the Contractor shall issue a written notification to the Administrator specifying:
  - i. the details of the land and the land occupier and land owner (as the case may be)
  - ii. any potential adverse impacts on the performance of the Work Under the Contract, and
  - iii. the alternative measures it proposes to take to mitigate the failure to obtain written approval from the land occupier or land owner (as the case may be) or confirming that no alternative measures have been identified and requesting the Principal issue a Notice of Entry to the land occupier and land owner in relation to the Contractor's proposed temporary access and occupation of a private land adjoining the Site.
- c) The Contractor shall submit a written request to the Administrator under this Clause 27.2.4 for the Principal to issue a Notice of Entry at least 15 Business Days prior to the date the Contractor proposes to temporarily access and occupy private land adjoining the Site. The written notification shall include all necessary information and supporting documentation that address:
  - i. the purpose of entry
  - ii. details of proposed use of the land
  - iii. the estimated commencement date
  - iv. the period of occupation
  - v. proposed safety measures for temporary access and occupation, and
  - vi. any other proposed measures to guarantee the privacy of the land occupier.
- d) The Contractor shall provide any other additional information or documentation that may be requested by the Administrator in considering the Contractor's request to issue a notice of entry.
- e) The Contractor acknowledges and agrees that:
  - i. the Principal may give or refuse to give a notice of entry in its absolute discretion, and
  - ii. the issuance or non-issuance of a notice of entry by the Principal to any land occupier or land owner of private land adjoining the Site shall not relieve the Contractor of any obligations under the Contract, including the obligation to execute the Work Under the Contract by the Date for Practical Completion.

#### **27.3 Delivery of materials to and work on Site before possession**

Until possession of the Site or part of the Site is given to the Contractor under Clause 27.1, the Contractor shall not deliver materials to or perform work on the Site or part of the Site, as the case may be, unless approval in writing is given by the Administrator.

#### **27.4 Use of Site by Contractor**

Unless the Contract otherwise provides, or the Administrator gives prior written approval, the Contractor shall not use the Site or allow it to be used for:

- a) camping
- b) residential purposes, or
- c) any purpose not connected with the Work Under the Contract.

#### **27.5 Finding of minerals, fossils and relics**

- a) Valuable minerals, fossils, articles or objects of antiquity or of anthropological or archaeological interest, treasure trove, coins and articles of value found on the Site shall as between the parties be and remain the property of the Principal. Immediately upon the discovery of these things, the Contractor shall take precautions to prevent their loss or removal or damage and shall notify the Administrator of the discovery.
- b) If compliance with obligations under Clause 27.5 causes the Contractor to incur more or less cost than the Contractor could reasonably have anticipated at the time of tendering, the difference shall be valued under Clause 40.5.

#### **27.6 Lane rentals and lane closures**

- a) Where any Work Under the Contract necessitates lane or shoulder closures, other than those at the locations and times specifically described in the Contract, the Contractor shall pay to the Principal the lane rental charges listed in Item 25A, for every hour or part thereof that the lane or shoulder remains closed.
- b) Notwithstanding the application of lane rental charges by the Principal, the Contractor shall make every endeavour to ensure that traffic lanes and shoulders remain open to the safe passage of traffic at the posted speed at all times in accordance with the provisions of the Contract.

#### **27.7 Public Utility Plant**

##### **27.7.1 Responsibilities**

- a) As from the Date of Acceptance of Tender, the Contractor shall:
  - i. be responsible for arranging and coordinating all Work Under the Contract associated with the replacement or relocation of Public Utility Plant
  - ii. ensure that the specific relocation and/or replacement requirements of each responsible Authority are met
  - iii. establish and maintain, up to the Date of Practical Completion, reference markers identifying the type, size, alignment and depth of Public Utility Plant and emergency contact telephone number of the responsible Authority, and
  - iv. execute all other work items associated with affected Public Utility Plants as described and detailed in the Project Specific Specifications, Standard Specifications and Drawings as part of the Contractor's scope of Works.

- b) If the Contractor incurs costs in respect of the coordination of the relocation and/or replacement of Public Utility Plant in excess of the costs that a competent and experienced Contractor could have been reasonably anticipated at the time of tendering:
  - i. a valuation of the costs incurred by the Contractor shall be made under Clause 40.5, and
  - ii. notwithstanding the provisions in Clause 40.5 such valuation shall not include the cost of the Contractor's supervision or overheads.

**27.7.2 Public Utility Plant identified during the Contract**

- a) Where Public Utility Plant, additional to that stated in the Contractor's Tender, is identified during the Contract, the following procedure shall apply:
  - i. the Contractor shall within one Business Day advise the Administrator and the responsible Authority of the newly identified Public Utility Plant
  - ii. the Contractor shall request and obtain from the responsible Authority an estimate of cost to relocate the Public Utility Plant and a program for completion of the relocation
  - iii. the Principal will arrange for payment to the responsible Authority for the necessary relocation, and
  - iv. the Contractor shall revise its program of work to accommodate the program of the responsible Authority and shall coordinate completion of the relocation by the responsible Authority.
- b) If the Contractor's compliance with the procedure set out in Clause 27.7.2(a) causes the Contractor to more or less cost than a competent and experienced Contractor could have reasonably anticipated at the time of tendering, a valuation shall be made under Clause 40.5.
- c) Delay caused by the Contractor's compliance with the procedure set out in Clause 27.7.2(a) may justify an extension of time under Clause 35.5.

**27.7.3 Damage and repair**

- a) The Contractor shall immediately notify the Administrator of any damage to any Public Utility Plant.
- b) The Contractor shall be responsible for any damage to any Public Utility Plant caused by the Work Under the Contract, in which case the Contractor shall:
  - i. make good any such damage at its own cost
  - ii. make arrangements directly with the responsible Authority for any repairs which may be necessary to Public Utility Plant damaged by the Work Under the Contract, and
  - iii. have no Claim against the Principal for the damage to the Public Utility Plant or any associated delay to the completion of the Works.
- c) The Contractor shall be responsible for any damage caused to the Work Under the Contract by any fault that develops in any Public Utility Plant during the term of the Contract.

**27.7.4 Disruption to public**

The Contractor shall take all reasonable steps to minimise disruption to individual land owners and/or occupiers in disconnecting, relocating and reconnecting public utilities, including by:

- a) consulting with all affected land owners and/or occupiers to arrange for a mutually acceptable time for the carrying out of such Works, at least five Business Days before the anticipated event, and
- b) identifying and consulting with any land owner and/or occupier with special requirements regarding continuity of supply of any public utility and taking all measures necessary to satisfy such requirements.

#### **27.7.5 Contractor's negotiations**

All negotiations between the Contractor and the responsible Authority shall be confirmed in writing by the Contractor and copies of all such correspondence to and from the responsible Authority shall be promptly forwarded to the Administrator by the Contractor.

#### **27.7.6 Contractor's obligations**

Nothing contained in Clause 27.7 shall in any way limit or exclude any of the Contractor's obligations or liabilities under the Contract.

### **27.8 Advertising on Site**

#### **27.8.1 Project signs**

- a) Within 20 Business Days after the Date of Acceptance of Tender, the Contractor shall supply and erect the number of project signs stated in Item 26A. The signs shall be of a size and/or type as stated in Item 26B, contain the words and graphics as shown on the Drawings or as directed by the Administrator and be located as directed by the Administrator.
- b) Unless directed otherwise by the Administrator, the Contractor shall remove the project signs within 10 Business Days of the Date of Practical Completion and transport them to the location stated in Item 26C.

#### **27.8.2 Contractor's advertising**

- a) If the Contractor wishes to erect a sign describing the names of the project and the Contractor, the Contractor shall submit details of the sign (size, wording, graphics and location) to the Administrator for consideration. The size of any such sign shall not be greater than 3 m x 2 m.
- b) Any such sign approved by the Administrator shall be removed from the Site within 10 Business Days after the Date of Practical Completion or at such other time as directed by the Administrator.
- c) All expenses incurred in the provision, erection, relocation (if necessary) and removal of such signs shall be borne by the Contractor.

#### **27.8.3 Other advertising**

Except as permitted under Clauses 27.8.1 and 27.8.2, no other advertising shall be permitted on the Site, other than the names of the manufacturer and/or owner painted on items of Constructional Plant.

### **27.9 Temporary filling of waterways**

- a) Unless otherwise stated in Item 27A, the Contractor shall not construct any temporary filling of any waterway during the carrying out of the Work Under the Contract.
- b) Where Item 27A permits temporary filling of a waterway, the Contractor shall:

- i. immediately after work has been completed in the area, restore any disturbance (not associated with the Works) of the banks of any waterway to a condition equivalent to that at the date the Contractor was granted possession of the Site, and
- ii. prior to the Date of Practical Completion, remove from the waterway all materials used in the construction of any Temporary Works.

### **27.10 Cleaning up**

The Contractor shall keep each Site and the work clean and tidy. The Contractor shall regularly remove rubbish and surplus material.

## **28 Setting out the Works**

### **28.1 Setting out**

- a) The Principal has provided the survey marks listed in Item 28A. The accuracy of survey marks listed in Item 28A is set out in Item 28B.
- b) Setting out of all control lines and associated survey lines shown on the Drawings or necessary for the setting out of the Work Under the Contract is the responsibility of the Contractor. Any existing survey lines on the Site or existing survey marks not listed in Item 28A shall not be relied upon by the Contractor. Where the Contractor establishes additional survey marks, full details of such marks shall be submitted to the Administrator.

### **28.2 Care of survey marks**

- a) The Contractor shall keep in their true positions all survey marks specified in the Contract or as supplied by the Administrator.
- b) If a survey mark is disturbed or obliterated, the Contractor shall within one Business Day notify the Administrator and, unless the Administrator otherwise directs, the Contractor shall reinstate the survey mark.
- c) If the disturbance or obliteration is caused by a person referred to in Clause 27.2, other than the Contractor, the cost incurred by the Contractor in reinstating the survey mark shall be valued under Clause 40.5.

### **28.3 Relocation of survey marks**

If the Contractor wishes to relocate an existing survey mark, the Administrator shall be notified in writing at least five Business Days prior to such intended relocation. The notice shall include a description of the proposed method for coordinating and levelling the new survey mark. If another Authority's survey mark is involved, the Contractor shall also obtain written approval from the other Authority and submit a copy of such approval to the Administrator.

### **28.4 Identification markers**

The Contractor shall place identification markers at least at every 500 metres along each control line and adjacent to each tangent point. Such markers shall show the chainage and any other relevant information and the lettering shall be at least 50 mm high.

### **28.5 Errors in setting out**

- a) If the Contractor discovers an error in the position, level, dimensions or alignment of any Work Under the Contract, the Contractor shall within one Business Day notify the

Administrator and, unless the Administrator otherwise directs, the Contractor shall rectify the error.

- b) If the error has been caused by incorrect survey marks supplied by the Administrator, the cost incurred by the Contractor in rectifying the error shall be valued under Clause 40.5.

#### **28.6 Survey mark defined**

'Survey mark' in Clause 28 means a survey peg, bench mark, reference mark, signal, alignment, level mark or any other mark for the purpose of setting out, checking or measuring Work Under the Contract.

### **29 Materials, labour and Constructional Plant**

#### **29.1 Provision of materials, labour and Constructional Plant**

Except to the extent that the Contract specifies Principal Supplied Material, the Contractor shall supply everything necessary for the proper performance of the Contractor's obligations and discharge of the Contractor's liabilities under the Contract.

#### **29.2 Contractor's staff**

##### **29.2.1 General**

- a) The Contractor shall employ:
  - i. appropriately qualified, trained and experienced personnel to perform the Work Under the Contract. If labour hire is required, the Contractor shall only engage with labour hire providers licensed under the *Labour Hire Licensing Act* (Qld).
  - ii. appropriately qualified, trained and experienced personnel to fill the positions stated in Item 29A and if no such positions are stated, the Contractor shall employ an adequate number of appropriately qualified, trained and experienced staff as determined by the Administrator to be necessary to carry out the requirements of the Contract.
- b) The personnel nominated by the Contractor to fill the positions stated in Item 29A shall be able to read, write and converse fluently in the English language.
- c) If the Principal reasonably considers at any time that personnel employed by the Contractor to perform the Work Under the Contract (including the Contractor's key personnel under Clause 29.2.2) do not satisfy the requirements of Clause 29.2.1(a), it may, acting reasonably, request the Contractor remove such personnel and replace them with a suitably qualified replacement.

##### **29.2.2 Key personnel**

- a) Those personnel specified in Item 29B shall be the Contractor's key personnel for the Contract.
- b) The Contractor shall maintain its key personnel in the roles specified in Item 29B on the Work Under the Contract and shall not replace them unless the Administrator approves a substitute.
- c) Any vacancy of key personnel shall be promptly filled by the Contractor with a person of at least equivalent ability, experience and expertise and who is approved by the Administrator. The Administrator shall notify Prequalification and Contracts Unit (PCU) of any changes to

Contractor's key personnel prior to approving the change and record them in the monthly contract performance reporting.

- d) When a key personnel is replaced in accordance with this Clause 29.2.2, the Contractor shall ensure that there is a proper 'handover' which will require the person and his replacement working together for at least 10 Business Days.
- e) A failure by the Contractor to comply with the requirements of this Clause 29.2.2 shall constitute a substantial breach for the purposes of Clause 44.2.

### **29.3 Training requirements**

- a) The *Queensland Government Building and Construction Training Policy* (the Training Policy) applies to Queensland Government building projects with a Contract Sum of \$500,000 or greater (including GST) and civil construction projects with a Contract Sum of \$3 million or greater (including GST) as identified in Item 30A.
- b) For purposes of this Clause 29.3:
  - i. 'apprentice' and 'trainee' shall be a person who enters into a training Contract that has been executed in the formation of an apprenticeship or traineeship as provided for in the *Further Education and Training Act 2014*
  - ii. 'compliance plan' means the plan developed by the Contractor demonstrating how the Contractor will comply with its obligations under this clause and the Training Policy
  - iii. 'DESBT' means Department of Employment, Small Business and Training
  - iv. 'eligible project' means the work under this Contract if the Training Policy applies in accordance with Clause 29.3(a)
  - v. 'new entrant' shall be an apprentice or trainee who has not been continuously employed by the employer, detailed on the training Contract, for more than three months full-time, or 12 months casual or part-time, or a combination of both, immediately prior to the commencement date of the training Contract; this person shall remain a new entrant under the Training Policy until the person completes the apprenticeship or traineeship
  - vi. 'Practical Completion report' means the report prepared by the Contractor at project completion demonstrating its compliance with the requirements of Clause 29.3
  - vii. 'Training Policy' means the *Queensland Government Building and Construction Training Policy*, published by the Department of Employment, Small Business and Training and located at [www.training.qld.gov.au/trainingpolicy](http://www.training.qld.gov.au/trainingpolicy), as amended from time to time
  - viii. 'TPAS' means the *Training Policy Administration System* – it is an electronic reporting system to report compliance with the Training Policy and is available on the website at <https://tpa.csq.org.au> and
  - ix. 'upskill workers' means upskilling existing workers in training that is delivered by registered training organisations which leads to nationally-recognised building or civil construction qualifications and upskilling existing workers in industry-recognised training, but does not include Site induction, toolbox talks or Site meetings.
- c) The Contractor, in its execution of the Work Under the Contract, shall:

- i. employ on the Site, either directly or indirectly through Subcontractors, apprentices and trainees, or
- ii. employ on the Site, either directly or indirectly through Subcontractors, apprentices and trainees and upskill workers employed on the Site

for eligible projects up to \$100 million in Contract Sum, the deemed hours for the training policy will be determined by the Contract Sum multiplied by 0.03 percent for civil construction projects.

- d) In complying with this clause, not less than 60% of the required number of deemed hours shall be performed by new entrants.
- e) The number of attributable deemed hours to upskill a worker shall be limited to the hours necessary to adequately present the educational material, in a classroom delivery mode, for the worker to achieve an identified competency or qualification.
- f) On eligible projects over \$100 million, there are additional requirements that have to be fulfilled relating to development and implementation of a skills development plan, training delivery linked to occupational outcomes and a training coordinator appointed to ensure implementation of the skills development plan.
- g) The Contractor shall:
  - i. within 10 Working Days of the Date of Acceptance of Tender, submit to DESBT through TPAS, a completed Compliance Plan, and
  - ii. within 15 Working Days of the Date of Practical Completion, submit a Practical Completion report through TPAS.
- h) The Contractor acknowledges that failure to comply in part or in whole with this Clause 29.3 will be a substantive factor that will be taken into account in the award of future Contracts by the Principal.

#### **29.4 Removal of materials and Constructional Plant**

From time to time, the Administrator may, by written notice to the Contractor, direct the Contractor not to remove from the Site Constructional Plant or materials. Thereafter, the Contractor shall not remove the materials or the Constructional Plant without the prior written approval of the Administrator.

#### **29.5 Manufacture and supply of materials**

The Administrator may direct the Contractor to supply particulars of:

- a) the mode and place of manufacture
- b) the source of supply
- c) the performance capacities, and
- d) other information,

in respect of any materials, machinery or equipment to be supplied by the Contractor under, or used in connection with, the Contract.

**29.6 Use of proprietary, trade or brand names**

The description in the Contract of any materials, plant, equipment, work or other items by a proprietary, trade or brand name, supplier's or manufacturer's name, model number or other specific means does not in any way relieve, limit or exclude any of the Contractor's obligations or liabilities under the Contract with respect to the materials, plant, equipment, work or any other items (including obligations and liabilities under any warranties, performance guarantees or defects liability provisions of the Contract).

**29.7 Material supplied by the Principal**

- a) The Principal shall supply the Principal Supplied Material.
- b) The Contractor's Construction Program shall show the date(s) on which any Principal Supplied Material is required, together with the quantity of such Material. The Contractor shall provide the Administrator with at least 15 Business Days prior written notice of the exact date of the Principal Supplied Material is required and the quantity required on that date.
- c) The Contractor shall:
  - i. transport the Principal Supplied Material from the location stated in the Principal Supplied Material list to the Site
  - ii. assume the risk in Principal Supplied Material
  - iii. appropriately store and care for the Principal Supplied Material at all times so that it is not contaminated and does not deteriorate
  - iv. take all necessary measures to reduce potential harm to the environment which might arise from the transport and storage of Principal Supplied Material
  - v. comply with any relevant requirements in the Contract and all Legislative Requirements, Australian Standards and/or manufacturer's instructions in relation to the proper handling and care of any Principal Supplied Material
  - vi. pay all costs associated with the inspection, storage, transportation and care of the Principal Supplied Material
  - vii. allow the Principal reasonable access to and use of the Principal Supplied Material to the extent reasonably necessary for the conduct of the Principal's operations at the Site, including any inspection, maintenance and repair the Principal may wish to carry out in relation to the Principal Supplied Material
  - viii. use and store the Principal Supplied Material in accordance with industry best practice and so as not to invalidate the terms of any warranty in respect of the Principal Supplied Material.
- d) Upon the receipt of any Principal Supplied Material, the Contractor shall within three Business Days inspect the material and ensure that the specified quantity has been delivered and that the material is in a condition which complies with the relevant Specifications. Within one Business Day upon inspection, notify the Administrator of any damage to, or loss of, the Principal Supplied Material.

- e) If, within five Business Days of receipt of the Principal Supplied Material, the Administrator has not received written notification of any deficiencies, then it shall be deemed that the specified quantity of Principal Supplied Material has been delivered to the Contractor in a condition which complies with the relevant Specifications.
- f) Any Principal Supplied Material which, after delivery to the Contractor, is lost, destroyed, contaminated or altered in any way such that the material no longer complies with the relevant Specifications, shall be within three Business Days or as agreed with the Administrator replaced by the Contractor with material which complies with the relevant Specifications. The Contractor shall notify the Administrator in writing of any lost, destroyed, contaminated or altered material within five Business Days of the Contractor becoming aware of such events.
- g) Any Principal Supplied Material which is excess to the reasonable requirements of the Contract shall be returned to the point of return nominated in the Principal Supplied Material list. Any empty containers shall also be returned to the nominated location.
- h) Nothing in this Clause 29.7 shall in any way limit or exclude in any way the Contractor's obligations or liabilities under Clause 16.

### **30 Materials and work**

#### **30.1 Quality of materials and work**

The Contractor shall use the materials and standards of workmanship required by the Contract. In the absence of any requirement to the contrary, the Contractor shall use suitable new materials.

#### **30.2 Quality assurance**

- a) The Contractor shall:
  - i. plan, establish, implement and maintain a quality system which conforms to the requirements of this Contract (Quality System) as per Item 31A of the Annexure A
  - ii. provide the Administrator with access to the Quality System of the Contractor and each of the Subcontractors to enable monitoring and quality auditing.
- b) Failure by the Contractor to either establish, implement or maintain a Quality System in accordance with this Clause 30.2 shall constitute a substantial breach for the purposes of the operation of Clause 44.2.
- c) The Contractor shall provide all quality records to the Administrator prior to the issue of the Final Certificate. Such records shall be provided in electronic form and/or paper form as determined by the Administrator.

#### **30.3 Quality Plan**

- a) The Contractor shall prepare and submit, as part of the Contract Plan, a Quality Plan to the Administrator in accordance with Clause 33.3.
- b) The Quality Plan shall be consistent with the Standard Specifications and any Quality Plan outline submitted with the Contractor's Tender (except to the extent that if any Quality Plan outline is inconsistent with the Standard Specifications or any of the Other Documents comprising the Contract, then the Quality Plan shall be in accordance with the Standard Specifications and the Other Documents comprising the Contract).

- c) The Contractor shall implement and maintain the Quality Plan while carrying out the Work Under the Contract.
- d) The Contractor shall submit inspection and test procedures to the Administrator, for a direction as to their suitability in accordance with Clause 8.5, not later than five Business Days prior to the commencement of the applicable work.

**30.4 Suspension of Works by the Administrator due to serious non-conformance**

If, in the opinion of the Administrator, any process, procedure, test method, calculation, analysis and/or report has resulted or will result in a serious non-conformance, then the Administrator may, in its absolute discretion, in accordance with Clause 34, direct the Contractor in writing, to suspend the whole or part of the Work Under the Contract and the Contractor shall immediately carry out any corrective and/or remedial action.

**30.5 Contractor's obligations unaffected**

The Quality System (including the Quality Plan):

- a) shall be used only as an aid to achieving compliance with the Contract and to document such compliance, and
- b) will not relieve the Contractor of any responsibilities or obligations in respect of the Work Under the Contract and the Contractor will remain solely responsible despite:
  - i. the obligation of the Contractor to implement and maintain a Quality System in accordance with this Contract, or
  - ii. any comment or direction upon, review or acceptance of, approval to proceed with, or request to vary any part of the quality assurance system by the Administrator.

**30.6 Defective materials or work**

- a) If the Administrator discovers material or work provided by the Contractor which is not in accordance with the Contract, the Administrator may direct the Contractor to:
  - i. remove the material from the Site
  - ii. demolish the work
  - iii. reconstruct, replace or correct the material or work, or
  - iv. not to deliver the material or work to the Site.
- b) The Administrator may direct the times within which the Contractor shall commence and complete the removal, demolition, reconstruction, replacement or correction.
- c) If the Contractor fails to comply with a direction issued by the Administrator pursuant to Clause 30.6 within the time specified by the Administrator in the direction and provided the Administrator has given the Contractor notice in writing that after the expiry of five Business Days from the date on which the Contractor receives the notice the Principal intends to have the work carried out by other persons, the Principal may have the work of removal, demolition, replacement or correction carried out by other persons and the cost incurred by the Principal in having the work so carried out shall be a debt due from the Contractor to the Principal.

### **30.7 Variations due to defective materials or work**

Instead of a direction under Clause 30.6, the Administrator may direct a variation pursuant to Clause 40. The variation shall be valued under Clause 40.5 and:

- a) if the variation causes an increase or decrease in the value to the Principal of the Works, regard shall also be had to the increase or decrease, and
- b) if the variation results in the Contractor incurring more or less cost than would reasonably have been incurred had the Contractor been given a direction under Clause 30.6, regard shall also be had to the difference.

### **30.8 Acceptance of defective material or work**

Instead of a direction under Clause 30.6 or 30.7, the Administrator may notify the Contractor that the Principal elects to accept the material or work notwithstanding that it is not in accordance with the Contract. In that event the resulting decrease in the value of the Works to the Principal, and any other loss suffered by the Principal, shall be valued in accordance with the applicable provisions of the Specification dealing with such valuations, and in the absence of such provisions, at a relevant value as determined by the Administrator.

### **30.9 Generally**

- a) The Administrator shall give either a direction under Clause 30.6 or 30.7 or a notice under Clause 30.8 as soon as practicable after the Administrator becomes aware that material or work is not in accordance with the Contract. The Administrator may give the direction or notice at any time before the issue of the Final Certificate under Clause 42.8.
- b) Except to the extent that to do so would be inconsistent with a direction under Clause 30.7 or a notice under Clause 30.8, and notwithstanding that the Administrator has not given a direction under Clause 30.6, the Contractor shall promptly remove, demolish, reconstruct, replace or correct material or work that is not in accordance with the Contract.
- c) A progress payment, or a test or a failure by the Administrator or anyone else, to disapprove any material or work shall not prejudice the power of the Administrator to subsequently give a direction under Clauses 30.6 or 30.7 or a notice under Clause 30.8.
- d) Nothing in Clause 30 shall prejudice any other right which the Principal may have against the Contractor arising out of the failure of the Contractor to provide material or work in accordance with the Contract.
- e) The Administrator shall not be obliged to give a direction under Clause 30.7 or a notice under Clause 30.8 to assist the Contractor.

### **30.10 Suppliers' and manufacturers' warranties**

- a) The Contractor shall:
  - i. in respect of each Item specified in Item 32A (Warranty Item), procure and deliver to the Principal, prior to the end of the Defects Liability Period, a completed and executed warranty in the form of Form C7858 from the supplier or manufacturer of the materials or goods
  - ii. in respect of any other goods or materials incorporated into the Works, assign to the Principal the benefit of any warranty which applies after the end of the

Defects Liability Period.

- b) The provision of an executed warranty pursuant to Clause 30.10 shall not:
  - i. affect the warranties given by the Contractor under the Contract
  - ii. relieve, limit or exclude any of the Contractor's liabilities or obligations under the Contract
  - iii. modify, limit or exclude any of the Principal's rights or remedies against the Contractor whether under the Contract or otherwise.

### **31 Examination and testing**

#### **31.1 Administrator may order tests**

- a) In Clause 31, 'test' includes examination and measurement, and may include laboratory or field based tests.
- b) At any time prior to the issue of the Final Certificate, the Administrator may direct that any material or Work Under the Contract be tested. The Contractor shall provide such assistance and samples and make accessible such parts of the Work Under the Contract as may be required by the Administrator. On completion of the tests, the Contractor shall make good the Work Under the Contract so that it fully complies with the Contract.

#### **31.2 Covering up of work**

The Administrator may direct that any part of the Work Under the Contract shall not be covered up or made inaccessible without the Administrator's prior approval.

#### **31.3 Who conducts tests**

Tests shall be conducted as provided in the Contract or by the Administrator or a person (which may include the Contractor) nominated by the Administrator.

#### **31.4 Notice of tests**

Before conducting a test under the Contract, the party conducting the test, being the Administrator or the Contractor, shall give reasonable notice in writing to the other of the time, date and place of the test. If the other does not then attend, the test may nevertheless proceed.

#### **31.5 Procedure if tests delayed**

Without prejudice to any other right, if the Contractor or the Administrator delays in conducting a test, the other, after giving reasonable notice in writing of intention to do so, may conduct the test.

#### **31.6 Results of tests**

Results of tests shall be promptly made available by each party to the other and to the Administrator.

#### **31.7 Costs of testing**

- a) Costs of, and incidental to, testing shall be valued under Clause 40.5 and shall be borne by the Principal or paid by the Principal to the Contractor unless:
  - i. the Contract provides that the Contractor shall bear the costs or the test is one which the Contractor was required to conduct other than pursuant to a direction under Clause 31.1
  - ii. the test shows that the material or work is not in accordance with the Contract

- iii. the test is in respect of Work Under the Contract covered up or made inaccessible without the Administrator's prior approval where such was required
  - iv. the test is consequent upon a failure of the Contractor to comply with a requirement of the Contract.
- b) Where such costs are not to be borne by the Principal, they shall be borne by the Contractor or paid by the Contractor to the Principal.

### **31.8 Access for testing**

If, during the Defects Liability Period:

- a) the Principal or the Administrator asserts that material or work is not in accordance with the Contract, and
- b) the Contractor requests permission to test the material or work,

the Principal shall not unreasonably refuse the Contractor access to test the material or work.

## **32 Working Hours**

### **32.1 General**

- a) The Working Hours and Working Days shall be as stated in Item 33A and, if not so stated, as notified by the Contractor to the Administrator prior to commencement of work on Site and shall not be varied without the prior approval of the Administrator, except when in the interests of safety of the Work Under the Contract or to protect life or property, the Contractor finds it necessary to carry out work outside the Working Hours or on other than the Working Days stated in the Contract. In such cases, the Contractor shall notify the Administrator in writing of the circumstances as early as possible.
- b) Notwithstanding Item 33A, the following days are not Working Days. No Work Under the Contract is permitted during these times without the prior written approval of the Administrator:
  - i. all gazetted Queensland public holidays
  - ii. local public holidays within the local government area in which the Site is located
  - iii. the Day before Good Friday
  - iv. the Days after the last Working Day prior to Christmas Day until New Year's Day inclusive
  - v. any other Days listed in Item 33B.
- c) The Contractor shall make due allowance for days that are not Working Days in its Construction Program and shall not be entitled to any Claim in respect of restrictions on carrying out the Work Under the Contract on these Days.

## **33 Progress and programming and planning of the Works**

### **33.1 Rate of progress**

- a) The Contractor shall proceed with the Work Under the Contract with due expedition and without delay.

- b) The Contractor shall not suspend the progress of the whole or any part of the Work Under the Contract except where the suspension is under Clause 44.9 or is directed or approved by the Administrator under Clause 34.
- c) Without limiting the Contractor's obligations under Clause 29.7, the Contractor shall give the Administrator reasonable advance notice of when the Contractor requires any information, materials, documents or instructions from the Administrator or the Principal.
- d) The Principal and the Administrator shall not be obliged to furnish any information, materials, documents or instructions earlier than the Principal or the Administrator, as the case may be, should reasonably have anticipated at the Date of Acceptance of Tender.
- e) The Administrator may direct in what order, and at what time, the various stages or parts of the Work Under the Contract shall be performed. If the Contractor can reasonably comply with the direction, the Contractor shall do so. If the Contractor cannot reasonably comply, the Contractor shall notify the Administrator in writing, giving reasons. No direction by the Administrator shall constitute, or be regarded as, a direction under this Clause 33.1(e) unless the direction is in writing and expressly states that it is a direction under this Clause 33.1(e).
- f) If the Contractor considers that compliance with the direction will cause the Contractor to incur more or less cost than otherwise would have been incurred had the Contractor not been given the direction, the Contractor shall within 10 Business Days of the receipt of the direction notify the Administrator that it considers the direction is a variation to the Work Under the Contract and details of why the Contractor considers it to be a variation. If the Administrator considers that the direction is a variation to the Work Under the Contract, it will within 10 Business Days of receiving the Contractor's notice confirm this in writing, in which event it will be valued under Clause 40.5.
- g) Unless the Contractor has given notice strictly in compliance with Clause 33.1(f), the Contractor shall be barred from making any Claim against the Principal in respect of the work the subject of the direction.

### **33.2 Contractor's reports**

#### **33.2.1 Daily reports**

- a) If specified in Item 34A, the Contractor shall provide to the Administrator daily reports.
- b) The daily report shall be an accurate written record of all Site activities and events. Daily reports shall include:
  - i. a workforce report listing staff and labour personnel and the Current Program activities on which labour was used
  - ii. a subcontract report listing subcontract staff and labour personnel and the Current Program activities on which labour was used
  - iii. a plant and equipment report listing all Constructional Plant and equipment utilised, the Current Program activities on which the Constructional Plant and equipment was used, and a listing of all idle Constructional Plant and equipment and reasons for it being idle
  - iv. deliveries and quantities of materials delivered
  - v. significant and unusual events.

- c) Daily reports shall be submitted to the Administrator by 11.00 am on the following Business Day.

### **33.2.2 Weekly report**

- a) If specified in Item 34A, the Contractor shall provide to the Administrator weekly reports.
- b) The weekly report shall be a brief written summary of the daily reports, plus any details of safety matters, industrial matters, weather conditions and lost time.
- c) Weekly reports shall be submitted to the Administrator by 12 pm on Tuesday of the week following the period to which the report refers.

### **33.3 Contract Plan**

#### **33.3.1 General**

- a) The Contractor shall, within the time stated in Item 35A, prepare and submit a plan, which documents all of the systems, procedures and plans required to be implemented by the Contractor under the Contract (Contract Plan), to the Administrator for a direction as to its suitability in accordance with Clause 8.5.
- b) The Contract Plan shall include the following plans, each of which shall comply with the relevant requirements in the Contract:
  - i. Construction Program
  - ii. Quality Plan
  - iii. Environmental Management Plan
  - iv. Work Health and Safety Management Plan
  - v. Traffic Management Plan (where required)
  - vi. Community Liaison Plan (where required)
  - vii. Severe Weather Management Plan (where required)
- c) The Contractor shall establish, review, maintain, update and implement the Contract Plan.
- d) If the Contractor fails to comply strictly with the provisions of this Clause 33.3.1:
  - i. such failure will be a substantial breach of Contract for the purposes of Clause 44.2
  - ii. the Principal may, pursuant to Clause 27.1, refuse to give access to the Site until the Contractor has strictly complied with this Clause 33.3.1.

#### **33.3.2 Interim plans**

- a) The Administrator may in its absolute discretion, as a condition of granting the Contractor access to the Site prior to a direction from the Administrator that the Contract Plan is suitable, require the Contractor to submit interim versions of the following plans to the Administrator for a direction as to suitability in accordance with Clause 8.5:
  - i. Environmental Management Plan
  - ii. Work Health and Safety Management Plan
  - iii. Traffic Management Plan (where required)

- iv. Community Liaison Plan (where required)
  - v. Severe Weather Management Plan (where required).
- b) The interim plans to be submitted by the Contractor under Clause 33.3.2(a) shall:
- i. be submitted 10 Business Days before the Contractor proposes to commence work on the Site
  - ii. comply with the requirements set out in the Contract or the relevant Standard Specifications as appropriate
  - iii. contain sufficient particulars to demonstrate the Contractor's commitment to its obligations and the management of the environmental, safety, traffic and community liaison issues for the first two months of the term of the Contract.

### **33.3.3 Updating Contract Plans**

If requested by the Administrator, which may be made at any time, and from time to time in its absolute discretion, or where an issue or deficiency arises in respect of any part of the Contract Plan, the Contractor shall submit an updated version of the relevant part of the Contract Plan to the Administrator for a direction as to its suitability in accordance with Clause 8.5.

### **33.3.4 Permission and compliance**

- a) The Contractor shall implement, and at all times comply with, all plans and procedures that form part of the Contract Plan.
- b) Compliance with the Contract Plan does not relieve the Contractor from its general obligation to comply with this Contract and all Legislative Requirements.
- c) Any direction as to the suitability or comment from the Administrator in respect of the Contract Plan does not relieve the Contractor of its responsibilities under this Contract or under the Contract Plan.

### **33.3.5 Audit of Contract Plan**

The Principal may carry out audits of the Contract Plan and its implementation at any time and from time to time. During any audit, the Contractor shall provide the Principal and its Representatives with all documentation, access and assistance necessary for the audit. The Contractor is not entitled to any additional payment for providing any assistance during any audit of the Contract Plan.

## **33.4 Construction Program**

### **33.4.1 General Program matters**

- a) The Contractor shall:
  - i. prepare, implement and maintain a Construction Program in accordance with this Clause 33.4
  - ii. within the time stated in Item 36A, prepare and submit its Construction Program to the Administrator for a direction as to its suitability in accordance with Clause 8.5
  - iii. be fully responsible for maintaining the progress of all Work Under the Contract in accordance with its Construction Program, including works carried out by the Contractor and by its Subcontractors.

- b) The Contractor shall not, without reasonable cause, depart from:
  - i. a Construction Program included in the Contract, or
  - ii. a Construction Program furnished to the Administrator.
- c) The content of, or furnishing of a Construction Program, or of a further Construction Program, shall not affect the rights and obligations under Clause 33.1, nor relieve the Contractor of any obligations under the Contract, including the obligation to not, without reasonable cause, depart from an earlier Construction Program.
- d) The Construction Program shall:
  - i. take one of the following forms as stated in Item 36B:
    - a) a critical path network, in accordance with Clause 33.4.2, or
    - b) a bar chart in accordance with the requirements of Clause 33.4.3
  - ii. be consistent with the program which was submitted with the Contractor's Tender
  - iii. show the Contractor's bona fide planned work activities and sequences for bringing the Work Under the Contract to Practical Completion by the Date for Practical Completion, and
  - iv. not affect the time for performance by the Principal or the Administrator of any of their obligations or oblige either of them to do anything earlier than is necessary to enable the Contractor to bring the Work Under the Contract to Practical Completion on the Date for Practical Completion.
- e) The Contractor may implement and revise, as necessary, its Construction Program while carrying out Work Under the Contract.

#### **33.4.2 Critical path network program**

- a) Any critical path network program required to be prepared by the Contractor under the Contract shall be prepared on a computerised project management system approved by the Administrator. The Contractor's software shall be capable of exporting data in an electronic format which can be readily loaded into the Administrator's project management software nominated in Item 36C.
- b) The critical path network program shall include:
  - i. all significant key dates and milestones, including dates by which the Principal is required to supply information or materials, or is required to have done anything
  - ii. an appropriate number of activities, not less than the number stated in Item 36D
  - iii. activity durations of not longer than 15 Working Days
  - iv. activities identified by whole numbers, with sufficient gaps in the logical sequence to allow later insertion of additional activities should that be required
  - v. the total float for each activity
  - vi. a separate detailed activity listing showing coding, estimated durations and full logic links between activities

- vii. one start activity (award of the Contract) and one end activity (Practical Completion), or if there are Separable Portions, one end activity for each Separable Portion
  - viii. one or more continuous paths of zero float from the start activity to the end activity or end activities
  - ix. all external constraints, including constraints on Working Days, Working Hours and traffic lane access
  - x. any resource and/or logic restraints (non-zero lags shall only be shown where an engineering or resource requirement can be demonstrated)
  - xi. at least two calendars, one for calendar days and one for Working Days
  - xii. activity weightings expressed as a percentage of the total cost of the Work Under the Contract
  - xiii. projected progress of the Work Under the Contract, capable of being presented graphically
  - xiv. the estimated value of work programmed in each month throughout the Contract.
- c) The Contractor shall provide the necessary input such that its computerised project management system is capable of providing reports showing personnel, plant and machinery resources for each activity in man hours, machine hours or by crews. The format and content of the report(s) shall be as agreed with the Administrator.

#### **33.4.3 Bar chart program**

- a) A bar chart program shall be prepared in the Form of a bar chart, which shall comply with the requirements of Clause 33.4.2(b)(i), (ii), (iii), (v), (vii), (viii) and (xi).
- b) Notwithstanding the provisions of this Clause 33.4.3, the Contractor may elect to provide a Construction Program in the Form of a critical path network in accordance with Clause 33.4.2.

#### **33.4.4 Current Program**

- a) Once the Administrator gives a direction that a Construction Program is suitable, the Construction Program shall be designated the Current Program. No changes shall be made to the Current Program without the Administrator's prior written agreement.
- b) Until such time as the Administrator gives direction that a Construction Program is suitable, the Administrator may have regard, as necessary, to the program submitted with the Contractor's Tender.
- c) Where a critical path network program is specified, with each program submitted under Clause 33.4, any revised program submitted under Clause 33.4.7 and any rolling program submitted under Clause 33.4.9, the Contractor shall submit appropriate information in the electronic format stated in Clause 33.4.2.

#### **33.4.5 Contractor's liabilities and obligations not relieved**

No direction as to use of nor any other comment or direction by the Administrator regarding the suitability of or any change to any Construction Program submitted under Clause 33.4, any revised program submitted under Clause 33.4.7 or any rolling program submitted under Clause 33.4.9 shall:

- a) relieve, limit or exclude any of the Contractor's liabilities or obligations under the Contract, including its obligation to ensure the Work Under the Contract reaches Practical Completion by the Date for Practical Completion and its responsibility for all planning, scheduling, sequences, methods and techniques necessary for the due performance of its obligations under the Contract
- b) constitute a direction to accelerate, disrupt, prolong or vary any, or all, of the Contractor's activities or the Work Under the Contract or any part of the Work Under the Contract
- c) constitute a direction under Clause 33.1(e)
- d) constitute the granting of an extension of time or a determination in relation to any application of an extension of time to the Date for Practical Completion, or
- e) affect the time for performance by the Principal or the Administrator of any of their obligations or oblige either of them to do anything earlier than is necessary to enable the Contractor to bring the Work Under the Contract to Practical Completion by the Date for Practical Completion.

#### **33.4.6 Current Program not part of Contract**

- a) Under no circumstances does a direction by the Administrator regarding the suitability of, or any change to, any Construction Program submitted under Clause 33.4, nor any revised program submitted under Clause 33.4.7, or any rolling program submitted under Clause 33.4.9, confer any ownership whatsoever regarding any Construction Program, to the Principal.
- b) The Current Program may be used by the Administrator to monitor the progress of the Work Under the Contract and assess Claims for extension of time.

#### **33.4.7 Contractor's revisions of Current Program**

- a) If the actual progress of the Work Under the Contract varies significantly from that shown in the Current Program, the Contractor shall submit a revised program which shall (where possible) indicate how the Contractor proposes to accelerate the work in order to meet the Date for Practical Completion. A revised program shall comply with the provisions of Clause 33.4
- b) Once the Administrator gives a direction that a revised program is suitable, that program shall be the Current Program.

#### **33.4.8 Review of Current Program**

At each Site Conference held in accordance with Clause 4.3, the Contractor shall provide to the Administrator a printed report which reviews the Current Program and highlights any significant impacts on the project for the period up to the next Site Conference.

#### **33.4.9 Short-term rolling program**

Where a critical path network program is specified, the Contractor shall each month prepare and submit to the Administrator a detailed short-term rolling program for the Work Under the Contract (the rolling program). The rolling program shall:

- a) be drawn on a horizontal time scale
- b) show all activities scheduled for the next two months

- c) be stated at a date within five Business Days of the date of submission
- d) be in sufficient detail to monitor the day-to-day progress of the Work Under the Contract
- e) be accompanied by an updated projection of the estimated value of work programmed in each month for the remainder of the Contract.

#### **33.4.10 Data for preparation of factual network**

The Contractor shall maintain adequate records of its progress in a format agreed with the Administrator. The records may be examined by the Administrator at any time and, if the records are agreed to be accurate, signed by both the Contractor and the Administrator as a true record of the Contractor's performance.

#### **33.5 Acceleration**

- a) Where the Contractor is entitled to an extension of time to the Date for Practical Completion under Clause 35.5, the Administrator may, instead of granting a reasonable extension of time under Clause 35.5, direct the Contractor in writing to accelerate the performance of the Work Under the Contract so as to overcome the whole or part of the delay which gave rise to the entitlement to an extension of time and the Contractor shall comply with that direction.
- b) If the Administrator directs the Contractor under this Clause 33.5 to accelerate the performance of the Work Under the Contract so as to overcome the whole of the delay in question, the Contractor shall no longer be entitled to any extension of time for that delay.
- c) If the Administrator directs the Contractor under this Clause 33.5 to accelerate the performance of the Work Under the Contract so as to overcome part only of the delay in question, the Contractor shall no longer be entitled to any extension of time for that part of the delay, but the Administrator shall grant a reasonable extension of time under Clause 35.5 for the balance of the delay.
- d) No direction by the Administrator shall constitute, or be regarded as, a direction under this Clause 33.5 unless it is in writing and expressly states that it is a direction under Clause 33.5.
- e) If compliance with a direction to accelerate given under Clause 33.5 causes the Contractor to incur more or less cost than otherwise would have been incurred had the Contractor not been given the direction, the difference shall be valued under Clause 40.5.
- f) The Principal may prior to giving a direction under this Clause 33.5, provide a written notice of a proposed variation and in that case:
  - i. the Contractor shall advise the Administrator whether the proposed variation can be effected and if the variation can be effected, the Contractor shall:
    - a) advise the Administrator of the effect which the Contractor anticipates that the variation will have on the Construction Program and time for Practical Completion
    - b) provide an estimate of the cost (including delay costs, if any) of the proposed variation
  - ii. if the Contractor incurs additional costs in complying with the requirements of Clause 33.5(f), a valuation shall be made under Clause 40.5.

## **34 Suspension of the Works**

### **34.1 Suspension by Administrator**

If the Administrator considers in its absolute discretion that the suspension of the whole or part of the Work Under the Contract is necessary:

- a) because of an act or omission of:
  - i. the Principal, the Administrator or an employee, consultant or agent of the Principal
  - ii. the Contractor, a Subcontractor or an employee or agent of either
- b) for the protection or safety of any person or property
- c) to comply with an order of a Court,

the Administrator shall direct the Contractor to suspend the progress of the whole or part of the Work Under the Contract for such time as the Administrator thinks fit.

### **34.2 Suspension by Contractor**

If the Contractor wishes to suspend the whole or part of the Work Under the Contract, otherwise than under Clause 44.9, the Contractor shall obtain the prior written approval of the Administrator. The Administrator may approve of the suspension and may impose conditions of approval or reject the suspension in the Principal's absolute discretion.

### **34.3 Recommencement of work**

- a) As soon as the Administrator becomes aware that the reason for any suspension no longer exists, the Administrator shall direct the Contractor to recommence work on the whole or on the relevant part of the Work Under the Contract.
- b) If work is suspended pursuant to Clause 34.2 or 44.9, the Contractor may recommence work at any time after reasonable advance notice to the Administrator.

### **34.4 Cost of suspension**

Any cost incurred by the Contractor by reason of a suspension under Clause 34.1 or Clause 34.2 shall be borne by the Contractor, but if the suspension is due to an act or omission of the Principal, the Administrator or an employee, consultant or agent of the Principal, and the suspension causes the Contractor to incur more or less cost than otherwise would have been incurred but for the suspension, the difference shall be valued under Clause 40.5.

### **34.5 Effect of suspension**

Suspension shall not affect the Date for Practical Completion, but the cause of suspension may be a ground for extension of time under Clause 35.5.

## **35 Times for commencement and Practical Completion**

### **35.1 Time for commencement of work on the Site**

- a) The Contractor shall give the Administrator five Business Days' notice of the date upon which the Contractor proposes to commence work on the Site.
- b) The Administrator may reduce the period of notice required.

- c) The Contractor shall commence work on the Site within 10 Business Days after the Principal has given the Contractor possession of sufficient of the Site to enable the Contractor to commence work.
- d) The Administrator may extend the time for commencement of work on the Site.

**35.2 Date/time for Practical Completion**

- a) The Contractor shall execute the Work Under the Contract to Practical Completion by the Date for Practical Completion.
- b) Upon the Date of Practical Completion, the Contractor shall give possession of the Site and the Works to the Principal.
- c) The Contractor may, if it chooses, accelerate progress at its own cost and reach Practical Completion before the Date for Practical Completion, but if it does choose to accelerate, then:
  - i. neither the Principal, the Administrator, nor any other person for whom the Principal is responsible, will be obliged to do or refrain from doing anything to enable the Contractor to reach Practical Completion before the Date for Practical Completion
  - ii. the time for performance of the Principal's and the Administrator's obligations shall not be affected by the Contractor's decision to accelerate.

**35.3 Separable Portions**

- a) The interpretations of:
  - i. Date for Practical Completion
  - ii. Date of Practical Completion
  - iii. Practical Completion,and Clauses 5.8, 16, 35, 37, 38, 42.3 and 42.5 shall apply separately to each Separable Portion as identified in item 37A and references therein to the Works and to Work Under the Contract shall mean so much of the Works and the Work Under the Contract as is comprised in the relevant Separable Portion.
- b) If the Contract does not make provision for the amount of security, Retention Moneys, liquidated damages or bonus applicable to a Separable Portion, the respective amounts applicable shall be such proportion of the security, Retention Moneys, liquidated damages or bonus applicable to the whole of the Work Under the Contract as the value of the Separable Portion bears to the value of the whole of the Work Under the Contract.

**35.4 Use of partly completed Works**

- a) If a part of the Works has reached a stage equivalent to that of Practical Completion, but another part of the Works has not reached such a stage and the parties cannot agree upon the creation of Separable Portions, the Administrator may, in its absolute discretion, determine that the respective parts shall be Separable Portions.
- b) In using the Separable Portion that has reached Practical Completion, the Principal shall not hinder the Contractor in the performance of the Work Under the Contract.

### **35.5 Extension of time for Practical Completion**

- a) Within 10 Business Days of it becoming evident to the Contractor that anything, including an act or omission of the Principal, the Administrator or the Principal's employees, consultants, other Contractors or agents, may delay the Work Under the Contract, the Contractor shall notify the Administrator in writing with details of the possible delay and the cause. The notice shall be endorsed 'Contractor's Notice of Possible Delay Under Clause 35.5'.
- b) Within 10 Business Days of it becoming evident to the Principal that anything which the Principal is obliged to do or provide under the Contract may be delayed, the Principal shall give notice to the Administrator who shall within a further three Business Days notify the Contractor in writing of the extent of the likely delay.
- c) If the Contractor is, or will be delayed in, reaching Practical Completion by a cause described in Clause 35.5(d) and within 20 Business Days after the commencement of that cause the Contractor gives the Administrator a written Claim for an extension of time for Practical Completion endorsed 'Contractor's Extension of Time Claim Under Clause 35.5' and setting out the facts on which the Claim is based supported by a compliant Current Program submitted in accordance with the requirements of Clause 33.4, the Contractor shall be entitled to an extension of time for Practical Completion.
- d) The causes are:
  - i. events occurring on or before the Date for Practical Completion which are beyond the reasonable control of the Contractor, including:
    - a) industrial conditions
    - b) inclement weather,but not including a delay, breach, act or omission by any Subcontractor or any of the Contractor's employees
  - ii. any of the following events whether occurring before, on or after the Date for Practical Completion:
    - a) delays caused by:
      - i. the Principal
      - ii. the Administrator
      - iii. the Principal's employees, consultants, other Contractors or agents
    - b) actual quantities of work in the Schedule of Rates being greater than the quantities determined by reference to the upper limit of accuracy stated in Item 44C (otherwise than by reason of a variation directed under Clause 40)
    - c) Latent Conditions
    - d) variations directed under Clause 40
    - e) repudiation or abandonment by a Nominated Subcontractor
    - f) changes in a Legislative Requirement (which occurs after the Date of Acceptance of Tender and could not have been anticipated by an experienced and competent Contractor)

- g) directions by any Authority, but not where the direction arose from the failure of the Contractor to comply with a legislative requirement
  - h) delays by any Authority not caused by the Contractor
  - i) delays arising as a result of the Contractor's compliance with Clause 27.7.2
  - j) Claims referred to in Clause 17.1(b)(iv)
  - k) any breach of the Contract by the Principal
  - l) any other cause which is expressly stated in the Contract to be a cause for extension of time for Practical Completion.
- e) Where more than one event causes overlapping delays and the cause of at least one of those events, but not all of them, is not a cause referred to in Clause 35.5(d), then to the extent that the delays overlap, the Contractor shall not be entitled to an extension of time for Practical Completion.
- f) In determining whether the Contractor is, or will be, delayed in reaching Practical Completion regard shall not be had to:
- i. whether the Contractor can reach Practical Completion by the Date for Practical Completion without an extension of time
  - ii. whether the Contractor can, by committing extra resources or incurring extra expenditure, make up the time lost.
- g) With any Claim for an extension of time for Practical Completion, or as soon as practicable thereafter but not more than 20 Business Days, the Contractor shall give the Administrator written notice of the number of days' extension claimed.
- h) The Contractor shall not be entitled to an extension of time for any delay in respect of which the Contractor has failed to comply strictly with the requirements of Clause 35.5(c).
- i) If the Contractor is entitled to an extension of time for Practical Completion the Administrator shall, within 20 Business Days after receipt of the notice of the number of days' extension claimed, grant a reasonable extension of time. If within the 20 Business Days, the Administrator does not grant the full extension of time claimed, the Administrator shall, before the expiration of the 20 Business Days, give the Contractor notice in writing of the reason.
- j) In determining a reasonable extension of time for an event causing delay, the Administrator shall have regard to whether the Contractor has taken all reasonable steps to preclude the occurrence of the cause and minimise the consequences of the delay.
- k) Notwithstanding that the Contractor is not entitled to, or has not claimed an extension of time, the Administrator may, in its absolute discretion and without being under any obligation to do so, at any time and from time to time before the issue of the Final Certificate, by notice in writing to the Contractor, extend the time for Practical Completion for any reason.
- l) Neither a delay caused by any one or more of the causes mentioned in Clauses 35.5(d)(ii)(a), 35.5(d)(ii)(d) or 35.5(d)(ii)(k), nor a failure by the Administrator to grant an extension of time or a reasonable extension of time under this Clause 35.5, or to do so within the time stated in this Clause 35.5, nor the giving of a direction to accelerate under Clause 35.5, shall:

- i. set the Date for Practical Completion at large, or
- ii. render Clause 35.6 unenforceable,

and the legal principle known as the 'prevention principle' shall not apply where there has been such a delay or failure, but nothing in this Clause 35.5(l) shall prejudice any right of the Contractor to damages for breach of Contract.

### **35.6 Liquidated damages for delay in reaching Practical Completion**

- a) If the Contractor fails to reach Practical Completion by the Date for Practical Completion, the Contractor shall be indebted to the Principal for liquidated damages at the rate stated in Item 38A for every Day after the Date for Practical Completion to, and including, the Date of Practical Completion or the date that the Contract is terminated under Clause 44, whichever occurs first.
- b) If after the Contractor has paid, or the Principal has deducted liquidated damages, the time for Practical Completion is extended, the Principal shall forthwith repay to the Contractor any liquidated damages paid or deducted in respect of the period up to and including the new Date for Practical Completion.

### **36 Delay costs**

- a) Where the Contractor has been granted an extension of time under Clause 35.5 for any delay caused by any of the events referred to in Clause 35.5(d)(ii)(a), the Principal shall pay to the Contractor such extra costs as are necessarily incurred by the Contractor by reason of the delay. The amount payable (if any) shall include the percentage margin for onsite and/or offsite overheads stated in Item 40A, as the case may be but shall not include profit or loss of profit.
- b) Nothing in Clause 36 shall:
  - i. oblige the Principal to pay extra costs for delay which have already been included in the value of a variation or any other payment under the Contract, or
  - ii. limit the Principal's liability for damages for breach of the Contract.

### **37 Defects liability**

- a) The Defects Liability Period stated in Item 37A or 39A shall commence on the Date of Practical Completion. Where no period is stated in Item 37A or 39A, the Defects Liability Period shall be 90 days.
- b) As soon as possible after the Date of Practical Completion, the Contractor shall rectify any defects or omissions in the Work Under the Contract existing at Practical Completion.
- c) At any time prior to 10 Business Days after the expiration of the Defects Liability Period, the Administrator may direct the Contractor to rectify any omission or defect in the Work Under the Contract existing at the Date of Practical Completion or which becomes apparent prior to the expiration of the Defects Liability Period. The direction shall identify the omission or defect and state a date by which the Contractor shall complete the work of rectification and may state a date by which the work of rectification shall commence. The direction may provide that in respect of the work of rectification there shall be a separate Defects Liability Period of a stated duration not exceeding the period stated in Item 37A or

39A. The separate Defects Liability Period shall commence on the date the Contractor completes the work of rectification. Clause 37 shall apply in respect of the work of rectification and the Defects Liability Period for that work of rectification work.

- d) If the work of rectification is not commenced or completed by the stated dates, the Principal may have the work of rectification carried out at the Contractor's expense, but without prejudice to any other rights that the Principal may have against the Contractor with respect to such omission or defect and the cost of the work of rectification incurred by the Principal shall be a debt due from the Contractor.
- e) If it is necessary for the Contractor to carry out work of rectification, the Contractor shall do so at times and in a manner which cause as little inconvenience to the occupants or users of the Works as is reasonably possible.

### **38 Cleaning up**

- a) The Contractor shall keep the Site and the work clean and tidy. The Contractor shall regularly remove rubbish and surplus material.
- b) Within 10 Business Days after the Date of Practical Completion, the Contractor shall remove Temporary Works and Constructional Plant.
- c) The Administrator may extend the time for removal of Temporary Works or Constructional Plant necessary to enable the Contractor to perform remaining obligations.
- d) Notwithstanding the provisions of Clause 44, if the Contractor fails to comply with any obligation imposed on the Contractor by Clause 38, the Administrator may, after the Administrator has given reasonable notice in writing to the Contractor, have the work of cleaning and tidying up carried out by other persons and the reasonable cost incurred by the Principal in having the work so carried out may be recovered by the Principal as a debt due from the Contractor to the Principal. The rights given by this Clause 38(d) are in addition to any other right.

### **39 Urgent protection**

- a) If urgent action is necessary to protect the Work Under the Contract, other property or people and the Contractor fails to take the action, the Principal may, in its absolute discretion, take the necessary action. If the action was action which the Contractor should have taken at the Contractor's cost, the cost incurred by the Principal shall be a debt due from the Contractor.
- b) If time permits, the Administrator shall give the Contractor prior written notice of the Principal's intention to take action under Clause 39.

### **40 Variations**

#### **40.1 Authority to vary the work**

- a) The Administrator may, in its absolute discretion, direct the Contractor to:
  - i. increase, decrease or omit any part of the Work Under the Contract
  - ii. change the character or quality of any material or work
  - iii. change the levels, lines, positions or dimensions of any part of the Work Under the Contract

- iv. execute additional work and/or
- v. demolish or remove material or work no longer required by the Principal.
- b) The Contractor shall not vary the Work Under the Contract, except as directed by the Administrator or approved in writing by the Administrator under Clause 40.
- c) The Contractor is bound only to execute a variation which is within the general scope of the Contract.
- d) The Contractor shall not be bound to execute a variation directed after Practical Completion unless the variation is in respect of rectification work referred to in Clause 37.
- e) Despite any provision of this Contract to the contrary no variation shall invalidate or amount to a repudiation of this Contract.
- f) For the avoidance of doubt, the Principal shall be entitled to have any omitted work carried out by other contractors.

**40.2 Contractor's obligations concerning proposed variations**

- a) Upon receipt of a notice in writing from the Administrator advising the Contractor of a proposed variation under Clause 40, the Contractor shall advise the Administrator whether the proposed variation can be effected. If the variation can be effected, the Contractor shall within a reasonable timeframe but not more than 5 Business Days:
  - i. advise the Administrator of the effect which the Contractor anticipates that the variation will have on the Construction Program and time for Practical Completion, and
  - ii. provide a realistic estimate of the cost (including delay costs, if any) of the proposed variation.
  - iii. provide supporting document to substantiate the estimated cost and time impacts including an updated Current Program clearly showing the time impacts of the proposed variations, supplier quotations, measurements and any other relevant evidence of costs
- b) If the Contractor incurs additional costs in complying with the requirements of Clause 40.2, a valuation shall be made under Clause 40.5.

**40.3 Direction to proceed with proposed variations**

- a) The Contractor and the Administrator shall make reasonable endeavours to agree on the cost and time impacts before the Administrator gives a direction to proceed with the variation
- b) If the Administrator and the Contractor fail to agree upon the price for a variation, the variation directed or approved by the Administrator under Clause 40.1 shall be valued under Clause 40.5 a) ii to iv.
- c) The Administrator shall give a direction to the Contractor on whether to proceed with the variation within 5 Business Days of providing a realistic estimate of the cost. The direction shall include details of the agreed cost and time impacts, or failing agreement, the Administrator's valuation and assessment of the time impacts.
- d) The Contractor shall proceed with the variation as directed even if agreement on the time and cost impacts has not been reached or the Contractor does not agree with the Administrator's valuation or assessment.

- e) If the Contractor does not agree with the Administrator's valuation or assessment, the Contractor may issue a Notice of Dispute under Clause 47.1 while continuing to proceed with the directed variation.

**40.4 Variations for the convenience of the Contractor**

- a) If the Contractor requests the Administrator to approve a variation for the convenience of the Contractor, the Administrator may, in its absolute discretion, do so in writing. The approval may be conditional.
- b) Unless the Administrator otherwise directs in the notice approving the variation, the Contractor shall not be entitled to:
  - i. an extension of time for Practical Completion, or
  - ii. extra payment,in respect of the variation or anything arising out of the variation which would not have arisen had the variation not been approved.
- c) The Administrator shall not be obliged to approve a variation for the convenience of the Contractor.

**40.5 Valuation**

- a) Where the Contract provides that a valuation shall be made under Clause 40.5, the Principal shall pay or allow the Contractor or the Contractor shall pay or allow the Principal as the case may require, an amount ascertained by the Administrator as follows:
  - i. prior agreement between the Contractor and the Administrator
  - ii. if Clause 40.5(a)(i) does not apply and the Contract prescribes specific rates or prices to be applied in determining the value, those rates or prices shall be used
  - iii. if Clause 40.5(a)(i) or 40.5(a)(ii) do not apply, the rates or prices in a Schedule of Prices or Schedule of Rates shall be used to the extent that it is reasonable to use them
  - iv. to the extent that neither Clause 40.5(a)(i) to 40.5(a)(iii) applies, reasonable rates or prices which are exclusive of GST shall be used in any valuation made by the Administrator.
- b) Notwithstanding Clause 40.5(a), the following principles apply to the valuation of variations:
  - i. in determining the deduction to be made for work which is taken out of the Contract, the deducted amount shall comprise the direct job costs, overheads and profit associated with the deducted component of the work, the amount of overheads to be deducted may be adjusted in favour of the Contractor if the Contractor can demonstrate that notwithstanding the deduction of the work, it has still incurred some or all of the overheads. In the case of a Schedule of Rates, Clause 3.6 of the Commercial Framework shall be taken into consideration with the limit of accuracy. In all cases, the Contractor shall not be entitled to any profit if the whole Item of work has been deducted.

The percentages used for assessing the overheads and profit deductions shall be ascertained as follows:

- 1 by agreement between the Contractor and the Administrator

- 2 failing agreement under Clause 40.5(b)(i)(1) the percentages for profit, onsite overheads and offsite overheads stated in Item 40A may be used in determining the reasonable amount of such profit and overheads to be allowed or disallowed, as the case may be, in the cost of a variation or value of reduced quantities treated as a variation
  - ii. if the valuation is of an increase or decrease in a fee or charge or is a new fee or charge by an Authority under Clause 14.2(b), the value shall be the actual increase or decrease or the actual amount of the new fee or charge without regard to overheads or profit
  - iii. if the valuation relates to extra costs incurred by the Contractor for disruption, the valuation of the extra costs shall include the percentage margin for onsite and/or offsite overheads stated in Item 40A, as the case may be, but shall not include profit or loss of profit
  - iv. if Clause 11 applies, the percentage referred to in Clause 11 shall be used for valuing the Contractor's profit and attendance
  - v. Daywork shall be valued in accordance with Clause 41
  - vi. in respect of Clauses 40.5(b)(i) to (v), the percentages for profit, onsite overheads and/or offsite overheads stated in Item 40A, as the case may be, may be utilised in determining the reasonable amount of such profit and overheads to be allowed or disallowed, as the case may be, in the cost of a variation
  - vii. where applicable, the amount of GST in respect of the relevant supply or part being valued shall be added in accordance with Clause 42.11.
- c) When under Clause 40.3, the Administrator directs the Contractor to support a variation with measurements and other evidence of cost, the Administrator shall allow the Contractor the reasonable cost of preparing the measurements or other evidence of cost that has been incurred over and above the reasonable overhead cost.

#### **41 Daywork**

- a) The Administrator may, in its absolute discretion, direct that quantities greater than those determined by reference to the upper limit of accuracy referred to in Item 44C or variations directed by the Administrator under Clause 40.1 shall be carried out as Daywork. The Contractor shall thereafter each day record particulars of all resources used by the Contractor for the execution of the Daywork and each day furnish to the Administrator the particulars and copies of time sheets, wages sheets, invoices, receipts and Other Documents evidencing the cost of the Daywork. The Administrator may direct the manner in which matters are to be recorded.
- b) In determining the value of Daywork regard shall be had to the rates and prices in the Daywork Schedules contained in the Tender. To the extent that the Daywork Schedules do not apply:
  - i. the amount of wages and allowances paid or payable by the Contractor at the rates obtaining on the Site at the time as established by the Contractor to the satisfaction of the Administrator or at such other rates as may be approved by the Administrator in its absolute discretion

- ii. the amount paid or payable by the Contractor in accordance with any statute or award applicable to day labour additional to the wages paid or payable under Clause 41(b)(i)
  - iii. the amount of hire charges in respect of Constructional Plant approved by the Administrator for use on the work in accordance with such hiring rates and conditions as may be agreed between the Administrator and the Contractor or, in the absence of agreement, in accordance with such rates and conditions as may be determined by the Administrator in its absolute discretion
  - iv. the amounts paid for services, subcontracts and professional fees
  - v. the actual cost to the Contractor of all materials supplied and required for the work
  - vi. the charge stated in Item 40A or, if no charge is stated, a charge agreed between the Administrator and the Contractor to cover offsite overheads, administrative costs, establishment costs, attendance and profit, or, in the absence of agreement, a reasonable charge determined by the Administrator.
- c) Amounts payable for Daywork shall not be subject to adjustment for rise and fall in costs notwithstanding that the Contract may provide for adjustment for rise and fall in costs.

## **42 Certificates and payments**

### **42.1 Payment Claims, certificates, calculations and time for payment**

#### **42.1.1 Payment Claims**

- a) At the times for payment Claims stated in Item 41A, upon issue of a Certificate of Practical Completion and within the time prescribed by Clause 42.7, the Contractor may deliver to the Administrator a payment Claim. For the avoidance of doubt, a reference date under the *Payments Act* shall not arise during the period following the end of the month in which Practical Completion is reached until the time for making the Final Payment Claim under Clause 42.7
- b) As a condition precedent to the Contractor's entitlement to deliver a payment Claim, the payment Claim shall:
  - i. be supported by evidence of the amount due to the Contractor, including a breakdown of the value of Work Under the Contract executed:
    - a) since the commencement of the Contract
    - b) since the previous payment Claim was made
  - ii. include evidence of conformance of the Work Under the Contract, including that:
    - a) the Work Under the Contract has been completed in accordance with the provisions of the Contract in respect to quantity, quality and any other relevant requirements
    - b) the Work Under the Contract has been inspected and tested in accordance with the requirements of the Contract
    - c) inspection and test results has been analysed to demonstrate compliance with the Contract
    - d) a conformance report has been submitted to the Administrator on completion of the relevant work and prior to substantial progress on subsequent work

- iii. enclose a copy of a completed Form C7901 or Form C7902 to evidence compliance to the provisions of Clause 4.4, as if a Form C7901 or C7902 has not been completed pursuant to Clause 4.4, evidence that the Contractor has taken all reasonable steps to comply with Clause 4.4
  - iv. enclose evidence of compliance with Clause 33.2 (if applicable), Clause 33.3 and Clause 33.4
  - v. provide a completed statutory declaration in accordance with Clause 43.
- c) A payment Claim shall include the value of work carried out by the Contractor in the performance of the Contract to that time together with all amounts then due to the Contractor arising out of or in connection with the Contract or for any alleged breach of the Contract. Each component of the Claim shall be assessed to determine if GST applies in accordance with Clause 42.11.
- d) If the time for any payment Claim under Clause 42.1.1(a) falls on a day which is not a Business Day, the Contractor shall submit the Claim on the next Business Day.

#### **42.1.2 Payment certificate**

- a) Within 10 Business Days after receipt of a payment Claim, the Administrator shall issue to the Principal and to the Contractor a payment certificate setting out:
- i. the amount of the payment which, in the opinion of the Administrator, is to be made by the Principal to the Contractor or by the Contractor to the Principal
  - ii. the calculations employed to arrive at the amount and, if the amount is more or less than the amount claimed by the Contractor, the reasons for the difference.
- b) The Administrator may allow in any payment certificate issued pursuant to this Clause 42.1 or any Final Certificate issued pursuant to Clause 42.8 or a Certificate issued pursuant to Clause 44.6, amounts paid under the Contract and amounts otherwise due from the Principal to the Contractor and/or due from the Contractor to the Principal arising out of or in connection with the Contract, including any amount due or to be credited under any provision of the Contract, but the Administrator shall not be required to include in any such certificate and the Principal shall not be obliged to pay for any work for which evidence of conformance has not been provided to the Administrator.
- c) In instances where Indicative Conformance applies, where the relevant evidence of conformance has not been submitted due only to the normal delays involved in processing, testing, analysis and reporting, the Contractor may include that completed work for which evidence of conformance will be submitted in the following month. In this case, the Contractor shall submit with its payment Claim, a statement which lists the relevant completed work and certifies that evidence of conformance will be presented to the Administrator no later than the end of the calendar month following the month of the relevant payment Claim.
- d) If the Contractor fails to deliver a payment Claim under Clause 42.1, the Administrator may, nevertheless, issue a payment certificate.
- e) Within two Business Days of the issue of the payment certificate by the Administrator, the Contractor shall issue to the Principal or the Principal shall issue to the Contractor, as the

case may be, a tax invoice complying with the GST Legislation in respect of the relevant Supply.

#### **42.1.3 Payment**

- a) Subject to the provisions of the Contract, within 20 Business Days after receipt by the Administrator of a payment Claim in accordance with Clause 42.1.1, provided that the requirements of Clause 42.1.2(e) have been met, the Principal shall pay to the Contractor or the Contractor shall pay to the Principal, as the case may be, an amount not less than the amount shown in the payment certificate as due to the Contractor or to the Principal as the case may be or if no payment certificate has been issued, the Principal shall pay the amount of the Contractor's Claim.
- b) A payment made pursuant to this Clause 42.1.3 shall not prejudice the right of either party to dispute under Clause 47 whether the amount so paid is the amount properly due and payable and on determination (whether under Clause 47 or as otherwise agreed) of the amount so properly due and payable, the Principal or Contractor, as the case may be, shall be liable to pay the difference between the amount of such payment and the amount so properly due and payable.
- c) Payment of moneys shall not be evidence of the value of work or an admission of liability or evidence that work has been executed satisfactorily but shall be a payment on account only, except as provided by Clause 42.8.
- d) Upon payment to the Contractor of the amount which includes the value of the Item, the Item shall be the property of the Principal free of any lien or charge.
- e) Except as provided in the Contract, the Principal shall not be obliged to pay for any Item of unfixed plant and materials which is not incorporated in the Works.
- f) If any work for which payment has been made is found not to be in accordance with the Contract, the Administrator may take this into account in valuing any future certificate.

#### **42.2 Correction of payment certificates**

- a) At any time and from time to time, the Administrator may by a further certificate correct any error which has been discovered in any previous certificate other than a Certificate of Practical Completion or Final Certificate.
- b) Any correction must also correct the amount of GST in accordance with the GST Legislation.

#### **42.3 Retention Moneys**

The Principal may deduct Retention Moneys from moneys otherwise due to the Contractor as stated in Item 41B.

#### **42.4 Unfixed materials, plant and equipment**

The alternative applying for unfixed plant and materials is given in Item 41C.

##### **Alternative 1**

- a) Notwithstanding Clause 42.1, the Contractor may not claim payment for, and the Principal is not obliged to pay for, any unfixed materials, plant or equipment that have not been incorporated in the Works unless:

- i. the materials, plant or equipment:
  - a) have been manufactured solely for the purpose of incorporation in the Works and have not been manufactured before the date required by the Contract, and
  - b) are of the type stated in Item 41D(a), and
  - c) are properly stored either on the Site or at a suitable location off site (as determined by the Administrator), clearly marked the property of the Department of Transport and Main Roads and adequately protected and insured, and
  - d) have been paid for in full by the Contractor and are the unencumbered property of the Contractor and proof of such payment and ownership is provided to the satisfaction of the Administrator, and
  - e) the Contractor provides additional security in one of the forms provided by Clause 5.4 in an amount equal to the payment claimed for the materials, plant or equipment.
- b) If pursuant to a payment certificate issued under Clause 42.1, the Principal pays the Contractor an amount which includes the value of any unfixed materials, plant or equipment that have not been incorporated in the Works, the materials, plant or equipment will become the property of the Principal, free of any lien, charge or any other encumbrance, at the time the payment is made.

#### **Alternative 2**

The Contractor shall not be entitled to payment for materials, plant or equipment not incorporated in the Works.

#### **42.5 Certificate of Practical Completion**

- a) The Contractor shall give the Administrator at least 10 Business Days' notice of the date upon which the Contractor anticipates that Practical Completion will be reached.
- b) When the Contractor is of the opinion that Practical Completion has been reached, the Contractor shall, in writing, request the Administrator to issue a Certificate of Practical Completion. Within 10 Business Days of the receipt of the request, the Administrator shall give to the Contractor and to the Principal a Certificate of Practical Completion certifying the Date of Practical Completion or give the Contractor in writing the reasons for not issuing the Certificate.
- c) When the Administrator is of the opinion that Practical Completion has been reached, the Administrator may issue a Certificate of Practical Completion whether or not the Contractor has made a request for its issue.
- d) Within two months of Practical Completion, the Contractor shall hand over to the Administrator copies of all investigation reports undertaken by the Contractor or its agents, in connection with the Contract.

#### **42.6 Effect of certificates**

The issue of a payment certificate or a Certificate of Practical Completion shall not constitute approval of any work or other matter, nor shall it prejudice any Claim by the Principal or the Contractor.

#### **42.7 Contractor's final payment Claim**

- a) Within 20 Business Days after the expiration of the Defects Liability Period, or where there is more than one, the last to expire, the Contractor shall lodge with the Administrator a final payment Claim and endorse it 'final payment Claim'.
- b) The Contractor shall include in that Claim all moneys which the Contractor considers to be due from the Principal under or arising out of the Contract or any alleged breach thereof.
- c) After the expiration of the period for lodging a final payment Claim, any Claim which the Contractor could have made against the Principal and has not been made shall be barred.

#### **42.8 Final Certificate**

- a) Within 10 Business Days after receipt of the Contractor's final payment Claim or, where the Contractor fails to lodge such Claim, the expiration of the period specified in Clause 42.7 for the lodgement of the final payment Claim by the Contractor, the Administrator shall issue to the Contractor and to the Principal a final payment certificate endorsed 'Final Certificate', but the Administrator shall not be obliged to issue the Final Certificate until the Contractor has fulfilled all of its obligations under the Contract. In the final payment certificate, the Administrator shall certify the amount which in the Administrator's opinion is finally due from the Principal to the Contractor or from the Contractor to the Principal under or arising out of the Contract or any alleged breach thereof.
- b) Unless either party, either before the Final Certificate has been issued or not later than 10 Business Days after the issue thereof, serves a notice of dispute under Clause 47, the Final Certificate shall be evidence in any proceedings of whatsoever nature and whether under the Contract or otherwise between the parties arising out of the Contract, that the Works have been completed in accordance with the terms of the Contract and that any necessary effect has been given to all the terms of the Contract which require additions or deductions to be made to the Contract Sum, except in the case of:
  - i. fraud, dishonesty or fraudulent concealment relating to the Works or any part thereof or to any matter dealt with in the said Certificate
  - ii. any defect (including omission) in the Works or any part thereof which was not apparent at the end of the Defects Liability Period or which would not have been disclosed upon reasonable inspection at the time of the issue of the Final Certificate, or
  - iii. any accidental or erroneous inclusion or exclusion of any work, plant, materials or figures in any computation or any arithmetical error in any computation.

#### **42.9 Interest on overdue payments**

If any moneys due to either party remain unpaid after the date upon which or the expiration of the period within which they should have been paid then interest shall be payable thereon from, but excluding the date upon which or the expiration of the period within which they should have been paid to, and including, the date upon which the moneys are paid. The rate of interest shall be the rate stated in Item 41E. Interest shall be compounded at six monthly intervals.

#### **42.10 Set offs by the Principal**

- a) Without limiting the Principal's rights under any other provision of the Contract and notwithstanding the provisions of Clauses 42.1 and 42.8 or the issue of any certificate by the

Administrator under those Clauses, the Principal may deduct from any moneys due to the Contractor any debt due from the Contractor to the Principal and any Claim which the Principal may have against the Contractor:

- i. whether or not the debt or Claim arises by way of damages, debt, restitution or otherwise, and
  - ii. whether or not the factual basis giving rise to the debt or Claim arises out of this Contract, any other Contract or is independent of any Contract.
- b) If the moneys payable to the Contractor are insufficient to discharge the debt or Claim, the Principal may have recourse to:
- i. Retention Moneys, and
  - ii. if Retention Moneys are insufficient, security provided under Clause 5.2, and
  - iii. subject to Clause 5.1, if the Primary Security provided under Clause 5.2 is insufficient to the Subcontractor Payment Security provided under Clause 5.2.
- c) Nothing in this Clause 42.10 shall affect the right of the Principal to recover from the Contractor the whole of the debt or Claim or any balance that remains owing. This Clause 42.10 shall survive the termination of the Contract.

#### **42.11 Goods and Services Tax**

##### **42.11.1 Interpretation**

Where applicable, terms used in this Clause 42.11 have the meaning given in the GST Legislation.

##### **42.11.2 Consideration is Goods and Services Tax exclusive**

- a) Unless otherwise stated, any consideration to be paid or provided under this Contract does not include an amount on account of GST.
- b) The Contractor shall be responsible (in the first instance) for determining if GST applies in accordance with the GST Legislation.
- c) The parties agree to exchange such information as is reasonably necessary to enable each party to accurately assess its rights and obligations under the GST Legislation.

##### **42.11.3 Gross up of consideration**

To the extent that a party (Supplier) makes a Supply under or in connection with this Contract on which GST is imposed (not being a Supply the consideration for which is specifically described in this Contract as GST inclusive):

- a) the consideration payable or to be provided for that Supply under this Contract, but for the application of this clause (GST exclusive consideration) is increased by, and the recipient of the Supply (Recipient) shall also pay to the Supplier, an amount equal to the GST payable on the Supply (GST amount)
- b) subject to Clause 42.11.3(c) the GST amount shall be paid to the Supplier by the Recipient without set off, deduction or requirement for demand, at the same time as the GST exclusive consideration is payable or to be paid, and

- c) the Recipient need not pay the GST amount in respect of a taxable Supply made under or in connection with this Contract until the Supplier has given the Recipient a tax invoice in respect of that taxable Supply.

#### **42.11.4 Reimbursements and indemnity payments**

If either party is entitled under this Contract to be reimbursed or indemnified by the other party for a cost or expense incurred in connection with this Contract, the reimbursement or indemnity amount will be reduced by the amount of any input tax credit that can be claimed by the party entitled to be reimbursed or indemnified, or by its Representative member (as the case may be).

#### **42.11.5 Adjustments**

If, as a result of:

- a) an adjustment event
- b) any amendment to the GST Legislation
- c) the issue of a ruling or advice by the Commissioner of Taxation in relation to this Contract or a Supply made under or in connection with this Contract, or
- d) a decision of any tribunal or Court in relation to this Contract or a supply made under or in connection with this Contract,

the GST amount differs from the amount of GST paid or payable by the Supplier to the Commissioner of Taxation in respect of a Supply under this Contract, then:

- e) the Supplier shall issue an adjustment note to the Recipient that complies with the requirements of the GST Legislation within five Business Days of the relevant event occurring or, otherwise, as soon as it becomes aware of the relevant event, and
- f) any difference shall be paid by or refunded to the Recipient (as the case may be) within 10 Business Days of the adjustment note being issued by the Supplier.

### **43 Payment of workers and Subcontractors**

- a) Upon entry into a subcontract the Contractor shall, in respect of that subcontract, establish a payment recording system for that Subcontractor set out in a format approved by the Principal.
- b) The recording system shall record all details of transactions with a Subcontractor including, at least, details of Claims for payment, payments made, retention and securities held in cash or unconditional undertakings or any other form.
- c) The record of payment system shall be:
  - i. kept by the Contractor until the Final Certificate is issued by the Administrator
  - ii. provided to the Administrator for inspection and copying upon reasonable notice in writing.
- d) The Contractor shall deliver to the Administrator with each payment Claim, a statutory declaration, in the form of Form C7850, sworn by the Contractor, or where the Contractor is a Corporation, by a Representative of the Contractor who is in a position to know the facts attested to, stating that all Subcontractors have been paid all that is due and payable to such Subcontractors up to the date of submission by the Contractor of a payment Claim in respect of the Work Under the Contract and that all its employees who at any time have been engaged on Work Under the Contract by the Contractor have been paid all moneys due and

payable to them up to the date of submission by the Contractor of a payment Claim, in respect of their employment on the Work Under the Contract. The Administrator may also request reasonable supporting documentary evidence of those matters.

- e) Before the payment of any money to the Contractor by the Principal, the Administrator may also require the Contractor to deliver to the Administrator a statutory declaration, in the form of Form C7851, by any Subcontractor, or where the Subcontractor is a Corporation, by a representative of the Subcontractor who is in a position to know the facts attested to, stating that all Subcontractors of the Subcontractor have been paid all that is due and payable to them up to the date of submission by the Contractor of a payment Claim in respect of the Work Under the Contract and that all employees who have been engaged by the Subcontractor have been paid all moneys due and payable to them up to the date of submission by the Contractor of a payment Claim in respect of their engagement on the Work Under the Contract. The Administrator may also request reasonable supporting documentary evidence of those matters.
- f) If the Contractor provides to the Administrator satisfactory proof of the maximum amount due and payable to workers and Subcontractors by the Contractor, the Principal shall not be entitled to withhold any amount in excess of the maximum amount.
- g) At the written request of the Contractor and out of moneys payable to the Contractor, the Principal may, on behalf of the Contractor, make payments directly to any worker or Subcontractor.
- h) If any worker or Subcontractor obtains a court order in respect of moneys referred to in Clause 43 and produces to the Principal the court order and a statutory declaration that it remains unpaid, the Principal may pay the amount of the order, and costs included in the order, to the worker or Subcontractor and the amount paid shall be a debt due from the Contractor to the Principal.
- i) After the making of a sequestration order or a winding up order in respect of the Contractor, the Principal shall not make any payment to a worker or Subcontractor without the concurrence of the official receiver or trustee of the estate of the bankrupt or the liquidator as the case may be.

**43A Payments Act**

- a) For the purposes of the *Payments Act*, the Administrator is authorised to receive payment Claims and issue payment schedules on behalf of the Principal.
- b) If a Claim is a payment Claim under the *Payments Act*, the corresponding payment certificate will be deemed to be a payment schedule for the purposes of the *Payments Act*.
- c) If an adjudicator makes a decision under the *Payments Act* with respect to a payment Claim which differs from the payment certificate in respect of that payment Claim, the Administrator shall promptly issue an amended payment certificate to adopt the decision of the adjudicator. Either party may dispute the amended payment certificate.
- d) The Contractor shall ensure that within one Business Day after any notice (other than a payment Claim or payment schedule) under the *Payments Act* is given or received by the Contractor or any Subcontractor, a copy of that notice is given to both the Administrator and the Principal.

#### **43B Subcontractors' Charges**

- a) Notwithstanding any other provision of this Contract, the Contractor shall:
  - i. immediately give the Principal notice if the Contractor has been required to supply information to a Subcontractor under Section 119 of the *Payments Act*, together with a copy of the information provided, and
  - ii. immediately notify the Principal if it becomes aware that a Subcontractor has claimed or intends to Claim a statutory Charge under Section 122 of the *Payments Act*.
- b) The Contractor shall indemnify the Principal against any Claims against, or costs, losses or damages (including lawyers' fees and expenses on a solicitor/client basis) suffered or incurred by the Principal arising out of, or in any way in, connection with:
  - i. a Notice of Claim of Charge being served on the Principal under Section 122 of the *Payments Act*, and
  - ii. a failure by the Contractor to comply with its obligations under Clause 43B(a).
- c) If the Principal makes a payment into court or to a Subcontractor or other person as a result of receiving a Notice of Claim of Charge under the *Payments Act*, for the purposes of calculating the Contract Sum finally payable by the Principal to the Contractor, that payment will be treated as though it was a payment made by the Principal to the Contractor.

#### **44 Default or insolvency**

##### **44.1 Preservation of other rights**

If a party breaches or repudiates the Contract, nothing in this Clause 44 shall prejudice the right of the other party to recover damages or exercise any other right.

##### **44.2 Default by the Contractor**

- a) If the Contractor commits a substantial breach of Contract, and the Principal considers that damages may not be an adequate remedy, the Principal may, in its absolute discretion, give the Contractor a written notice to show cause.
- b) Substantial breaches include:
  - i. failing to lodge security in breach of Clause 5.2
  - ii. failing to lodge a deed of guarantee, undertaking and substitution, in breach of Clause 5.11
  - iii. failing to comply with requirements of Clause 8.6
  - iv. failing to comply in any respect with Clause 9.2
  - v. failing to comply with the requirements of Clause 14.5.2
  - vi. failing to rectify a non-conformance identified on three separate occasions in the safety auditing process under Clause 15.3
  - vii. failing to provide evidence of insurance, in breach of Clause 21.1
  - viii. failing to comply with a direction of the Administrator under Clause 30.6 in breach of Clause 23

- ix. repeatedly failing to ensure the Contractor or the Contractor's Representative is present on the Site in accordance with Clause 25
- x. failing to comply with the requirements of Clause 29.2.2
- xi. failing to use the materials or standards of workmanship required by the Contract in breach of Clause 30.1
- xii. failing to either establish, implement or maintain a Quality System in accordance with Clause 30.2
- xiii. suspension of work in breach of Clause 33.1
- xiv. failing to proceed with due expedition and without delay in breach of Clause 33.1
- xv. failing to comply with the provisions of Clause 33.3.1
- xvi. failing to deliver a statutory declaration or supporting documentary evidence in breach of Clause 43
- xvii. providing a statutory declaration pursuant to Clause 43 which is false, misleading or deceptive in any respect, and/or
- xviii. any other breach identified by the Principal as a 'substantial breach'.

#### **44.3 Requirements of a notice by the Principal to show cause**

A notice under Clause 44.2 shall:

- a) state that it is a notice under Clause 44 of the General Conditions of Contract
- b) specify the alleged substantial breach;
- c) require the Contractor to show cause, in writing, why the Principal should not exercise a right referred to in Clause 44.4
- d) specify the time and date by which the Contractor must show cause (which time shall not be less than five clear Business Days after the notice is given to the Contractor), and
- e) specify the place at which cause must be shown.

#### **44.4 Rights of the Principal**

- a) If the Contractor commits a substantial breach of Contract regardless of whether or not the Principal has served a notice under Clause 44.2, the Principal may, in its absolute discretion, by notice in writing to the Contractor:
  - i. take out of the hands of the Contractor the whole or part of the work remaining to be completed, or
  - ii. terminate the Contract.
- b) If the Contractor commits a substantial breach of Contract regardless of whether or not the Principal has served a notice under Clause 44.2, the Principal may, in its absolute discretion, suspend payments to the Contractor until:
  - i. the date upon which the Principal takes action under Clause 44.4(a)(i) or (ii).

- c) If the Principal exercises the right under Clause 44.4(a)(i), the Contractor shall not be entitled to any further payment in respect of the work taken out of the hands of the Contractor unless a payment becomes due to the Contractor under Clause 44.6.

**44.5 Procedure when the Principal takes over work**

- a) If the Principal takes work out of the hands of the Contractor under Clause 44.4(a)(i), the Principal shall complete that work and the Principal may, without payment of compensation, take possession of such of the Constructional Plant and other things on or in the vicinity of the Site as are owned by the Contractor and are reasonably required by the Principal to facilitate completion of the work.
- b) If the Principal takes possession of Constructional Plant or other things, the Principal shall maintain the Constructional Plant and, subject to Clause 44.6, on completion of the work, the Principal shall return to the Contractor the Constructional Plant and any things taken under this Clause 44.5 which are surplus.

**44.6 Adjustment on completion of the work taken out of the hands of the Contractor**

- a) When work taken out of the hands of the Contractor under Clause 44.4(a)(i) is completed, the Administrator shall ascertain the cost incurred by the Principal in completing the work and shall issue a certificate to the Principal and the Contractor certifying the amount of that cost.
- b) If the cost incurred by the Principal is greater than the amount which would have been paid to the Contractor if the work had been completed by the Contractor, the difference shall be a debt due from the Contractor to the Principal. If the cost incurred by the Principal is less than the amount that would have been paid to the Contractor if the work had been completed by the Contractor, the difference shall be a debt due to the Contractor from the Principal. The Principal shall keep records of the cost in a similar manner to that prescribed in Clause 41.
- c) If the Contractor is indebted to the Principal, the Principal may, in its absolute discretion, retain Constructional Plant or other things taken under Clause 44.5 until the debt is satisfied. If after reasonable notice, the Contractor fails to pay the debt, the Principal may sell the Constructional Plant or other things and apply the proceeds to the satisfaction of the debt and the costs of sale. Any excess shall be paid to the Contractor.

**44.7 Default of the Principal**

- a) If the Principal commits a substantial breach of Contract and the Contractor considers that damages may not be an adequate remedy, the Contractor may give the Principal a written notice to show cause.
- b) Substantial breaches include:
  - i. failing to make a payment in breach of Clause 42.1
  - ii. failure by the Administrator to either issue a Certificate of Practical Completion or give the Contractor, in writing, the reasons for not issuing the Certificate within 10 Business Days of receipt of a request by the Contractor to issue the Certificate in breach of Clause 42.5
  - iii. failing to produce evidence of insurance in breach of Clause 21.1, and/or
  - iv. failing to give the Contractor possession of sufficient of the Site, in breach of Clause 27.1, but only if the failure continues for longer than the period stated in Item 42A.

#### **44.8 Requirements of a notice by the Contractor to show cause**

A notice under Clause 44.7 shall:

- a) state that it is a notice under Clause 44 of the General Conditions of Contract
- b) specify the alleged substantial breach
- c) require the Principal to show cause in writing why the Contractor should not exercise a right referred to in Clause 44.9
- d) specify the time and date by which the Principal must show cause (which shall not be less than five clear Business Days after the notice is given to the Principal), and
- e) specify the place at which cause must be shown.

#### **44.9 Rights of the Contractor**

- a) If by the time specified in a notice under Clause 44.7, the Principal fails to show reasonable cause why the Contractor should not exercise a right referred to in Clause 44.9, the Contractor may, by notice in writing to the Principal, suspend the whole or any part of the Work Under the Contract.
- b) The Contractor shall lift the suspension if the Principal remedies the breach, but if within 20 Business Days after the date of suspension under Clause 44.9, the Principal fails to remedy the breach or, if the breach is not capable of remedy, fails to make other arrangements to the reasonable satisfaction of the Contractor, the Contractor may, by notice in writing to the Principal, terminate the Contract.
- c) The Contractor shall be entitled to recover from the Principal any damages incurred by the Contractor by reason of the suspension.

#### **44.10 Rights of the parties on termination**

If the Contract is terminated under Clause 44.4(a)(ii) or Clause 44.9, the rights and liabilities of the parties shall be the same as they would have been at common law had the defaulting party repudiated the Contract and the other party elected to treat the Contract as at an end and recover damages.

#### **44.11 Insolvency**

- a) If:
  - i. a party informs the other party in writing or creditors generally that the party is insolvent or is financially unable to proceed with the Contract
  - ii. execution is levied against a party by a creditor
  - iii. a party is an individual person or a partnership including an individual person and that person:
    - a) commits an act of bankruptcy
    - b) has a bankruptcy petition presented against the person or presents own petition
    - c) is made bankrupt
    - d) makes a proposal for a scheme of arrangement or a composition, or

- e) has a deed of assignment or deed of arrangement made, accepts a composition, is required to present a debtor's petition, or has a sequestration order made, under Part X of the *Bankruptcy Act 1966* (Cth), or
- iv. in relation to a party being a Corporation:
  - a) notice is given of a meeting of creditors with a view to the Corporation entering a deed of company arrangement
  - b) the party enters a deed of company arrangement with creditors
  - c) a controller or Administrator is appointed
  - d) an application is made to a court for the winding up of the party and not stayed within 10 Business Days
  - e) a winding up order is made in respect of the party
  - f) it resolves by special resolution that it be wound up voluntarily (other than for a members' voluntary winding-up)
  - g) a mortgagee of any property of the party takes possession of that property, or
  - h) a receiver or a receiver and manager is appointed in respect of any property or undertaking of the party,

then, where the other party is:

- v. the Principal — the Principal may, in its absolute discretion, without giving a notice to show cause, exercise the right under Clause 44.4(a)(i) or Clause 44.4(a)(ii), or
  - vi. the Contractor — the Contractor may, without giving a notice to show cause, exercise the right under Clause 44.9.
- b) The rights given by this Clause 44.11 are in addition to any other rights and may be exercised notwithstanding that there has been no breach of Contract.

#### **45 Termination by frustration**

If, under the law governing the Contract, the Contract is frustrated, the Principal shall pay the Contractor:

- a) for work executed prior to the date of frustration, the amount which would have been payable if the Contract had not been frustrated and the Contractor had delivered a payment Claim on the date of frustration
- b) the cost of materials reasonably ordered by the Contractor for the Work Under the Contract, which the Contractor is liable to accept, but only if the materials become the property of the Principal upon payment
- c) costs reasonably incurred by the Contractor in the expectation of completing the whole of the Work Under the Contract and not included in any payment by the Principal
- d) all retention moneys and security
- e) the reasonable cost of removal of Constructional Plant, and

- f) the reasonable cost of return to their place of recruitment of the Contractor's employees engaged in the Work Under the Contract at the date of frustration.

#### **46 Time for notification of Claims and disputing Administrator's directions**

##### **46.1 Contractor's prescribed notice**

- a) In respect of any Claim by the Contractor, arising out of, a breach of the Contract, the Contractor shall provide a prescribed notice to the Administrator within 20 Business Days after the first day upon which the Contractor could reasonably have been aware of the breach.
- b) The Contractor shall provide the Administrator with a prescribed notice:
  - i. in respect of or arising out of any direction or approval by the Administrator (including a direction or approval which the Administrator did not expressly acknowledge to be a variation under Clause 40, but which the Contractor claims is a variation under that Clause 40)
  - ii. under any provision of the Contract (including Clauses 34.4, 36 and 40.5)
  - iii. in respect of, or arising out of, the subject matter of the Contract
  - iv. in tort or under any statute
  - v. upon a quantum meruit or for restitution based on unjust enrichment, or
  - vi. for additional payment or compensation on any other legal or equitable basis,

within 20 Business Days after the first day upon which the Contractor could reasonably have been aware of the act, omission, direction, approval or other event, fact, matter or circumstance on which the Claim is, or will be, based.

If the Contractor fails to provide the prescribed notice required under Clauses 46.1 a) or b) within 20 Business Days, the Principal's liability may be reduced to the extent that the Principal or Administrator have been denied an opportunity to mitigate the liability.

- c) A 'prescribed notice' is a notice in writing which shall be endorsed 'Prescribed Notice Under Clause 46.1' and includes particulars of all of the following:
  - i. the breach, act, omission, direction, approval or circumstances on which the Claim is, or will be, based
  - ii. the provision of the Contract or other basis for the Claim or proposed Claim, and
  - iii. the quantum or likely quantum of the Claim.
- d) This Clause 46.1 shall not have any application to:
  - i. any Claim for payment to the Contractor of an amount or amounts forming part of the original Contract Sum
  - ii. any Claim for payment for a variation directed by the Administrator in writing and expressly acknowledged by the Administrator to be a variation under Clause 40
  - iii. any Claim for payment for a valuation made pursuant to Clause 12.3, or
  - iv. any Claim for an extension of time for Practical Completion.

- e) Nothing in this Clause 46.1 shall limit the operation or effect of any other notice provision, time-bar provision, condition precedent or limitation or exclusion clause in the Contract, nor waive the effect of any failure by the Contractor to comply with any such provision or requirement.

#### **46.2 Time for disputing Administrator's directions**

- a) Where the Administrator has given:
  - i. a certificate or valuation under the Contract, or
  - ii. a determination with respect to a Claim by the Contractor, including a Claim:
    - a) for breach of the Contract by the Principal
    - b) of the type referred to in Clause 46.1(b)(i) to (vi)
    - c) for payment for a variation directed or approved under Clause 40, and
    - d) for an extension of time to the Date for Practical Completion

the Administrator may also give a notice under Clause 46.2 with respect to the certificate, valuation or determination.
- b) The notice under Clause 46.2(a) may be given at the same time or after that the certificate, valuation or determination is given but must:
  - i. be in writing and endorsed 'Administrator's Notice under Clause 46.2'
  - ii. be given to the Principal and the Contractor
  - iii. identify the certificate, valuation or determination to which it relates, and
  - iv. state that the certificate, valuation or determination will be final and binding upon the parties and not subject to dispute unless either party, within 20 Business Days after receiving the Administrator's notice, gives a notice of dispute in accordance with Clause 47.1 disputing the certificate, valuation or determination.
- c) If neither the Principal nor the Contractor gives a notice of dispute in accordance with Clause 47.1 within 20 Business Days after receipt of a Administrator's notice under this Clause 46.2, then the certificate, valuation or determination to which the Administrator's notice relates shall be final and binding upon the parties and not subject to dispute notwithstanding Clause 47.
- d) Nothing in this Clause 46.2, nor the giving of a Administrator's notice under this Clause 46.2, shall limit the operation or effect of Clause 46.1 or any other notice provision, time-bar provision, condition precedent or limitation or exclusion clause in the Contract, nor waive the effect of any failure by the Contractor to comply with Clause 46.1 or with such other provision or requirement.

### **47 Dispute resolution**

#### **47.1 Notice of dispute**

- a) If a dispute between the Contractor and the Principal arises out of, or in connection with, the Contract, including a dispute concerning a direction given by the Administrator, then either party shall deliver by hand or send by registered post to the other party and to the

Administrator a notice of dispute in writing adequately identifying and providing details of the dispute (notice of dispute).

- b) Notwithstanding the existence of a dispute, the Principal and the Contractor shall continue to perform the Contract, and subject to Clause 44, the Contractor shall continue with the Work Under the Contract and the Principal and the Contractor shall continue to comply with Clause 42.1.
- c) A Claim in tort, under statute or for restitution based on unjust enrichment or for rectification or frustration, may be included in an arbitration.

#### **47.2 Meeting of representatives**

Within five Business Days after the service of a notice of dispute, the Administrator and Contractor's Representative shall confer at least once to attempt to resolve the dispute.

#### **47.3 Further steps required before proceedings**

The alternative applying for dispute resolution is given in Item 43A.

#### **Alternative 1A – issues resolution advisor (when required) (refer to 47.3.1 to 47.3.4)**

##### **47.3.1 Issues resolution advisor**

Under this alternative, the Issues Resolution Advisor (IRA) shall be engaged when required only after notice of dispute is issued and to resolve specific and discrete disputes.

If the Administrator and Contractor's Representative fail to resolve the dispute within 10 Business Days after the service of a notice of dispute, the party may, by notice in writing to the other party, request that an IRA be engaged under Clause 49 and the dispute referred to the IRA.

##### **47.3.2 Meeting of chief executive officers**

If the IRA has not made a binding recommendation under Clause 49.9:

- a) the chief executive officers of the parties, or
- b) nominees of the chief executive officers who have not been directly involved in the management of the Contract and have the Authority to agree to a resolution of the dispute,

shall confer at least once to attempt to resolve the dispute. If a Contract Leadership Team has been established as nominated in Item 9A of Annexure A, the Contract Leadership Team may fulfil the obligations of the chief executive officers of the parties under this clause.

##### **47.3.3 Referral of dispute**

Either party may, by notice in writing delivered by hand or sent by registered post to the other party, refer such dispute to arbitration or litigation if:

- a) the dispute has not been resolved within 10 Business Days after the referral of the dispute to the chief executive officers of the parties under Clause 47.3.2, or
- b) a party convenes a meeting under either Clause 47.2, or 47.3.2 and the other party fails to attend that meeting provided that 10 Business Days after the referral of the dispute to the chief executive officers have passed.

#### **47.3.4 Privileged meetings**

All aspects of any meetings held pursuant to Clause 47.2, 47.3.8 or 47.3.9 (or any other conferences between the parties for the purposes of resolving the dispute), except the fact of occurrence, shall be privileged.

#### ***Alternative 1B – issues resolution advisor full contract duration (refer to 47.3.5 to 47.3.8)***

#### **47.3.5 Issues resolution advisor**

Under this alternative, the Issues Resolution Advisor (IRA) shall be engaged upon commencement of the Contract.

If the Administrator and Contractor's Representative fail to resolve the dispute within 10 Business Days after the service of a notice of dispute, the party may, by notice in writing to the other party, refer such dispute to the issues resolution advisor (IRA) appointed under Clause 49.

#### **47.3.6 Meeting of chief executive officers**

If the IRA has not made a binding recommendation under Clause 49.9:

- a) the chief executive officers of the parties, or
- b) nominees of the chief executive officers who have not been directly involved in the management of the Contract and have the Authority to agree to a resolution of the dispute,

shall confer at least once to attempt to resolve the dispute. If a Contract Leadership Team has been established as nominated in Item 9A of Annexure A, the Contract Leadership Team may fulfil the obligations of the chief executive officers of the parties under this clause.

#### **47.3.7 Referral of dispute**

Either party may, by notice in writing delivered by hand or sent by registered post to the other party, refer such dispute to arbitration or litigation if:

- a) the dispute has not been resolved within 10 Business Days after the referral of the dispute to the chief executive officers of the parties under Clause 47.3.5, or
- b) a party convenes a meeting under either Clause 47.2, 47.3.5 or 47.3.6 and the other party fails to attend that meeting provided that 10 Business Days after the referral of the dispute to the chief executive officers have passed.

#### **47.3.8 Privileged meetings**

All aspects of any meetings held pursuant to Clause 47.2, 47.3.5 or 47.3.6 (or any other conferences between the parties for the purposes of resolving the dispute), except the fact of occurrence, shall be privileged.

#### ***Alternative 2 – dispute resolution board (refer to 47.3.9 to 47.3.12)***

#### **47.3.9 Dispute resolution board**

If the Administrator and Contractor's Representative fail to resolve the dispute within 10 Business Days after the service of a notice of dispute, the party may, by notice in writing to the other party, refer such dispute to the dispute resolution board (DRB) constituted under Clause 48.

#### **47.3.10 Meeting of chief executive officers**

If the DRB has not made a binding recommendation under Clause 48.10:

- a) the chief executive officers of the parties, or
- b) nominees of the chief executive officers, who have not been directly involved in the management of the Contract and have the Authority to agree to a resolution of the dispute,

shall confer at least once to attempt to resolve the dispute. If a Contract Leadership Team has been established as nominated in Item 9a of Annexure A, in the alternative, the Contract Leadership Team may fulfil the obligations of the chief executive officers of the parties under this clause.

#### **47.3.11 Referral of dispute**

Either party may, by notice in writing delivered by hand or sent by registered post to the other party, refer such dispute to arbitration or litigation if:

- a) the dispute has not been resolved within 10 Business Days after the referral of the dispute to the chief executive officers of the parties under Clause 47.3.9, or
- b) a party convenes a meeting under either Clause 47.2, 47.3.9 or 47.3.10 and the other party fails to attend that meeting provided that 10 Business Days after the referral of the dispute to the chief executive officers have passed.

#### **47.3.12 Privileged meetings**

All aspects of any meetings held pursuant to Clause 47.2, 47.3.9 or 47.3.10 (or any other conferences between the parties for the purposes of resolving the dispute), except the fact of occurrence, shall be privileged.

### **47.4 Arbitration**

- a) Arbitration shall be effected by a single arbitrator who shall be nominated by the Chairperson for the time being of the Queensland Chapter of the Resolution Institute. Such arbitration shall be held in Queensland.
- b) Unless the parties agree in writing, any person agreed upon by the parties to resolve the dispute pursuant to Clause 47.3 shall not be appointed as an arbitrator, nor may that person be called as a witness by either party in any proceedings.
- c) Notwithstanding Clause 42.9, the arbitrator may award whatever interest the arbitrator considers reasonable.
- d) If one party has overpaid the other, whether pursuant to an Administrator's certificate or not and whether under a mistake of law or fact, the arbitrator may order repayment together with interest.

### **47.5 Summary or urgent relief**

Nothing herein shall prejudice the right of a party to institute proceedings to enforce payment due under Clause 42 or to seek urgent injunctive or declaratory relief in respect of a dispute under Clause 47 or any matter arising under the Contract.

## **48 Dispute Resolution Board**

### **48.1 Dispute Resolution Board**

This Clause 48 only applies if 'Alternative 2' is selected in Item 43A as the alternative applying for dispute resolution pursuant to Clause 47.

#### **48.2 Establishment and tenure of the Dispute Resolution Board**

- a) Within 10 Business Days after the appointment of the DRB Members in accordance with Clauses 48.5 and 48.6, the Principal and the Contractor shall procure the execution of the DRB Agreement.
- b) The DRB will be established as of the date all the parties to the DRB Agreement execute the DRB Agreement and will continue until the later of:
  - i. 10 Business Days after the date of the Final Certificate under Clause 42.8, or
  - ii. resolution of a dispute the subject of a notice of dispute under Clause 42.8,

subject to the earlier termination of the Contract by either party or termination of the DRB Agreement by the Principal and the Contractor.

#### **48.3 Membership of the Dispute Resolution Board**

The DRB Members will be:

- a) one DRB Member nominated by the Principal
- b) one DRB Member nominated by the Contractor, and
- c) a third DRB Member appointed in accordance with Clause 48.6.

#### **48.4 Dispute Resolution Board Members' criteria and Disclosure Statements**

- a) Unless otherwise agreed in writing by the Principal and the Contractor, all DRB Members shall be experienced in works similar to the Works, interpretation of Contract documents and resolution of construction disputes.
- b) DRB Members shall be neutral, act impartially and be free of any conflict of interest. For the purposes of this Clause 48.4, the term 'DRB Member' also includes that DRB Member's current primary full-time employer and 'involved' means having a contractual relationship with either party to the Contract or any other entity, such as a Subcontractor, design professional or consultant, having a role in relation to the Works.
- c) A person is prohibited from being a DRB Member if the person or DRB Member:
  - i. has an ownership interest in any entity involved in the Contract or a financial interest in the Work Under the Contract, except for payment for services on the DRB
  - ii. was previously employed by, or had financial ties to, any party involved in the Work Under the Contract within a period of two years prior to award of the Contract, except for fee-based consulting services on other projects
  - iii. has had a professional or personal relationship with any key member of any entity involved in the Work Under the Contract which, in the opinion of either party, could suggest partiality, or
  - iv. has had prior involvement in the Work Under the Contract of a nature which, in the opinion of either party, could suggest partiality.
- d) DRB Members shall be replaced if the person:
  - i. is employed or engaged by any entity involved directly in the Work Under the Contract unless the written approval of both parties is given, or

- ii. discusses during the term of the Contract being employed or engaged by any entity involved in the Work Under the Contract after the Work Under the Contract is completed.

**48.5 Nomination and approval of first two Dispute Resolution Board Members**

- a) The Principal and Contractor shall each nominate a proposed DRB Member and give the nominee's name and Disclosure Statement to the other party within five Business Days after the Date of Acceptance of Tender.
- b) If the nominee is not rejected within seven Business Days after the Date of Acceptance of the Contractor's Tender the nominee is approved.
- c) If a nominee is rejected, the nominating party shall request the Chairperson for the time being of Resolution Institute to nominate a person for appointment to the DRB. The party for whom Resolution Institute nominated the person shall procure and give to the other party a Disclosure Statement for the nominee. The person nominated by Resolution Institute is appointed to the DRB if the person satisfies the criteria in Clause 48.4 and the person's Disclosure Statement has been given to the party other than the party for whom Resolution Institute nominated him or her.

**48.6 Nomination and approval of third Dispute Resolution Board Member**

- a) Within five Business Days after the appointment of the first two DRB Member, the parties shall request the first two DRB Members to nominate a third DRB Member by giving to the Principal and the Contractor the third nominee's name and Disclosure Statement.
- b) If the Principal or the Contractor do not notify the other party and the appointed DRB Members within five Business Days of receiving the name and Disclosure Statement of why the person nominated does not satisfy the criteria in Clause 48.4 the person nominated is deemed to be appointed a DRB Member.
- c) If the first two appointed DRB Members cannot agree on the third DRB Member, or either or both of the Principal or Contractor reject the nominee of the DRB Members, the first DRB Member appointed by the Principal under Clause 48.5 shall request Resolution Institute to nominate a person for appointment to the DRB. The DRB Members shall procure and give to the parties a Disclosure Statement for the nominee. If that person satisfies the criteria in Clause 48.4 and the person's Disclosure Statement has been given to the parties the person nominated by Resolution Institute is deemed to be appointed a DRB Member.

**48.7 Replacement**

If a DRB Member becomes incapable of performing its functions on the DRB or does not continue to satisfy all of the criteria in Clause 48.4, or engages in any prohibited activity the party on whose behalf the DRB Member was appointed, or if the DRB Member was nominated by the DRB Members under Clause 48.6, the remaining DRB Members shall nominate a replacement DRB Member in accordance with the Contract acceptable to the remaining DRB Members and the parties. The parties shall request the remaining DRB Members to procure the execution of a further DRB Agreement by the new DRB Member and remaining DRB Members.

#### **48.8 Meeting**

- a) Each party shall execute, and shall ensure that the DRB Member nominated by the party or by Resolution Institute on the party's behalf, executes the DRB Agreement at the first DRB meeting.
- b) The first DRB meeting shall be held at the place nominated by the Principal. During the first meeting, the DRB shall confirm the Principles of Process in Part 2 to the DRB Agreement for the conduct of its routine Site visits and its meetings on disputes. The conduct of the business of the DRB shall be based on the provisions of the Contract but procedures must be adaptable to changing the situations and, if requested by the Principal and the Contractor, the DRB shall initiate new procedures or modified procedures.
- c) The DRB will visit the Site and meet with representatives of the parties at periodic intervals and at other times requested by the parties.
- d) Each meeting with representatives of the parties shall consist of an informal discussion followed by a field observation of the progress of the Work Under the Contract. The discussion and field observation shall be attended by representatives of the Principal and the Contractor.

#### **48.9 Review of Disputes**

If a dispute is referred to the DRB under Clause 47.3, the DRB shall consider that dispute in accordance with the Principles of Process included in the DRB Agreement, and provide its written recommendation to the parties. A recommendation shall be in writing, shall contain reasons for the recommendation and, where it is not a unanimous recommendation, shall include the recommendations of the majority and the minority of the DRB Members.

#### **48.10 Recommendations**

- a) For the purposes of this Clause 48.10 and Clauses 48.9 and 48.11, a recommendation includes a recommendation of at least two of the DRB Members.
- b) A recommendation of the DRB is binding on both parties only if:
  - i. it is a recommendation in relation to a Claim for the payment of an amount of \$500,000 or less unless agreed otherwise by the parties, or
  - ii. it is a recommendation in any other case and within 10 Business Days of receiving the DRB's recommendation, or such longer time as is specified by the DRB in providing its recommendation, either the Principal or the Contractor fail to provide written notice to the other and to the DRB of the rejection of the recommendation.

#### **48.11 Admissibility**

If the DRB's recommendation is not binding on both parties, the DRB recommendation and any recommendation of a single DRB Member may be admitted to establish:

- a) that the DRB considered the dispute
- b) the qualification of the DRB Members, and
- c) the DRB recommendation that resulted from the process

to the extent permitted by law in any subsequent dispute resolution proceedings or forum.

#### **48.12 Payment**

- a) The fees and expenses of all three DRB Members shall be shared equally by the Principal and the Contractor.
- b) The Contractor shall pay the invoices of the DRB Members after approval by the Principal and include in payment Claims under Clause 42.1, fifty percent of all invoices paid in accordance with this Clause 48.12(b).
- c) The Contractor is not entitled to any payment for the participation of anyone on its behalf or for whom it is responsible, including any Subcontractor or designer in the DRB process.

#### **49 Issue Resolution Advisor**

##### **49.1 Issues Resolution Advisor**

This Clause 49 only applies if 'Alternative 1A or 1B' is selected in Item 43A as the alternative applying for dispute resolution pursuant to Clause 47.

##### **49.2 Establishment and tenure of the Issues Resolution Advisor**

- a) Within 10 Business Days after the appointment of the IRA in accordance with Clause 49.5, the Principal and the Contractor shall procure the execution of the IRA Agreement.
- b) The IRA will be established as of the date all the parties to the IRA Agreement execute the IRA Agreement. Where Alternative 1A of Item 43A applies, the appointment of the IRA will continue until 10 Business Days after the dispute has been resolved and the outcome formally agreed by the parties. Where Alternative 1B of Annexure A applies the appointment of the IRA will continue until 10 Business Days after the date of the Final Certificate under Clause 42.8. In either case, the establishment of the IRA is subject to the earlier termination of the Contract by either party, or termination of the IRA Agreement by the Principal and the Contractor.
- c) It is expected that all issues will be resolved by the Date of Practical Completion.

##### **49.3 Selection of Issues Resolution Advisor**

The IRA will be a person appointed in accordance with Clause 49.5.

##### **49.4 Issues Resolution Advisor criteria and Disclosure Statements**

- a) Unless otherwise agreed in writing by the Principal and the Contractor, the IRA shall be experienced in works similar to the Works, interpretation of Contract documents and resolution of construction disputes.
- b) The IRA shall have expertise relevant to the nature of the dispute, or alternatively engage appropriate specialist advisors.
- c) The IRA shall be neutral, act impartially and be free of any conflict of interest. For the purposes of this Clause 49.4, the term 'IRA' also includes the IRA's current primary full-time employer, and 'involved' means having a contractual relationship with either party to the Contract, or any other entity, such as a Subcontractor, design professional or consultant having a role in relation to the Works.
- d) A person is prohibited from being an IRA if the person or IRA:

- i. has an ownership interest in any entity involved in the Contract, or a financial interest in the Work Under the Contract except for payment for services on the IRA
  - ii. was previously employed by, or had financial ties to, any party involved in the Work Under the Contract within a period of two years prior to award of the Contract, except for fee-based consulting services on other projects
  - iii. has had a professional or personal relationship with any key member of any entity involved in the Work Under the Contract which, in the opinion of either party, could suggest partiality, or
  - iv. has had prior involvement in the Work Under the Contract of a nature which, in the opinion of either party, could suggest partiality.
- e) The IRA shall be replaced if the person:
- i. is employed or engaged by any entity involved in the Work Under the Contract unless the written approval of both parties is given, or
  - ii. discusses during the term of the Contract being employed or engaged by any entity involved in the Work Under the Contract after the Work Under the Contract is completed.

#### **49.5 Nomination and approval of Issues Resolution Advisor**

- a) The Principal shall nominate a minimum of three proposed IRAs and give the nominees' names and Disclosure Statement to the Contractor within five Business Days after a party requests the engagement of an IRA under Alternative 1A of Item 43A or five Business Days after the Date of Acceptance of Tender under Alternative 1B of Item 34A. The Contractor shall pick a person as the IRA from the list of nominees, within five Business Days of receiving the name and Disclosure Statement.
- b) The IRA chosen shall be from TMR Contract Administration Services panel.

#### **49.6 Replacement**

If the IRA becomes incapable of performing its functions or does not continue to satisfy all of the criteria in Clause 49.4, or engages in any prohibited activity the party on whose behalf the IRA was appointed, or if the IRA was nominated under Clause 49.5, the Principal shall nominate a replacement IRA in accordance with the Contract acceptable to the Contractor. The parties shall request to procure the execution of a further IRA Agreement by the new IRA.

#### **49.7 Meeting**

- a) Clauses 49.7 c) to e) are applicable to the engagement of the IRA under Alternative 1B of Item 43A.
- b) Each party shall execute, and shall ensure that the IRA nominated or by Resolution Institute on the parties' behalf, executes the IRA Agreement at the first IRA meeting.
- c) The first IRA meeting shall be held at the place nominated by the Principal. During the first meeting, the IRA shall confirm the principles of process in the IRA Agreement for the conduct of its routine Site visits and its meetings on disputes. The conduct of the business of the IRA shall be based on the provisions of the Contract but procedures must be adaptable to changing the situations and, if requested by the Principal and the Contractor, the IRA shall initiate new procedures or modified procedures.

- d) The IRA will visit the Site and meet with representatives of the parties at periodic intervals and at other times requested by the parties. Unless noted otherwise, the IRA shall attend all monthly Site meetings.
- e) Each meeting with representatives of the parties shall consist of an informal discussion followed by a field observation of the progress of the Work Under the Contract. The discussion and field observation shall be attended by representatives of the Principal and the Contractor.
- f) All communications in relation to IRA matters outside of meetings shall be copied to all parties to ensure the Principal, Contractor and IRA remain fully informed.
- g) The IRA will be provided with:
  - i. a copy of the signed Contract documentation, and
  - ii. copies of the following documents:
    - a) monthly reports
    - b) minutes of meetings, and
    - c) any Other Documents needed by the IRA to perform the role.

#### **49.8 Review of disputes**

If a dispute is referred to the IRA under Clause 47.3, the IRA shall consider that Dispute in accordance with the Principles of Process included in the IRA Agreement, and provide its written recommendation to the parties. A recommendation shall be in writing and contain reasons for the recommendation.

#### **49.9 Recommendations**

A recommendation of the IRA is binding on both parties only if:

- a) it is a recommendation in relation to a Claim for the payment of an amount of \$100,000 or less unless agreed otherwise by the parties, or
- b) it is a recommendation in any other case and within 10 Business Days of receiving the IRA's recommendation, or such longer time as is specified by the IRA in providing its recommendation, either the Principal or the Contractor fail to provide written notice to the other and to the IRA of rejection of the recommendation.

#### **49.10 Admissibility**

If the IRA's recommendation is not binding on both parties, the IRA recommendation may be admitted to establish:

- a) that the IRA considered the Dispute
- b) the qualification of the IRA, and
- c) the IRA recommendation that resulted from the process

to the extent permitted by law in any subsequent dispute resolution proceedings or forum.

#### **49.11 Payment**

- a) The fees and expenses of the IRA shall be shared equally by the Principal and the Contractor.

- b) The Contractor shall pay the invoices of the IRA after approval by the Principal and include in payment Claims under Clause 42.1, 50 percent of all invoices paid in accordance with this Clause 49.11(b).
- c) The Contractor is not entitled to any payment for the participation of anyone on its behalf or for whom it is responsible, including any Subcontractor or designer in the IRA process.

## **50 General**

### **50.1 Warranties by joint venturers**

Where the Contractor is two or more legal entities, the Contract shall be binding upon them jointly and severally and:

- a) each joint venture warrants to the Principal:
  - i. the joint venturers have entered into a valid and binding Joint Venture agreement, a copy of which has been provided to the Principal before the Date of Acceptance of Tender
  - ii. it will fully comply with the terms of the Joint Venture agreement
  - iii. it will give prompt notice to the Principal of any intention to amend or vary the Joint Venture agreement and will seek approval from the Principal for the proposed amendment or variation, and
  - iv. it will give prompt notice to the Principal of any dispute between the joint venturers, of which formal notice has been given by one to the other.
- b) Any review or approval of the Joint Venture agreement by the Principal shall not constitute a representation by the Principal that the agreement is suitable, workable or consistent with the terms of the Contract and shall not relieve the Contractor from the performance of, or compliance with, any term of this Contract.

### **50.2 Waiver of conditions**

Except as provided at law or in equity or elsewhere in the Contract, none of the terms of the Contract shall be varied, waived, discharged or released, except with the prior consent in writing of the Principal in each instance.

## **99 Additional clauses**

### **99.1 Clause Bank (C7836)**

Additional (if applicable) project-specific clauses to these General Conditions of Contract are specified in the Clause Bank (C7836), provided in Part 5 Additional Contract Requirements.

# Annexure A (Contract Details) (Construct Only Contract) to the General Conditions of Contract



Queensland Government

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<b>Contract Number:</b>	<b>CN-12205</b>
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This Annexure shall be issued as part of the Tender Documents and is to be attached to the General Conditions of Contract and shall be read as part of the Contract. Clause numbers refer to clauses in the General Conditions of Contract.

Item	Issue	Contract details	
<b>1</b>	<b>Place for payments</b>		
1A	Payments under the Contract shall be made at Clause 1	<a href="mailto:Metropolitan.Finance@tmr.qld.gov.au">Metropolitan.Finance@tmr.qld.gov.au</a> Department of Transport and Main Roads Metropolitan Region PO Box 70 Spring 4004	
<b>2</b>	<b>Practical Completion</b>		
2A	The Date for Practical Completion Clauses 2.1, 35.2	650 680 calendar days Where a period of time is provided, the commencement date shall be deemed to be the Date of Acceptance of Tender.	
<b>3</b>	<b>Latent Conditions</b>		
3A	Exclusions to Latent Conditions Clause 2.1	Nil.	
<b>4</b>	<b>The Principal</b>		
4A	Name of the Principal Clause 2.1	The State of Queensland acting through the C/- Regional Department of Transport and Main Roads.	
4B	Address of the Principal	C/- Regional Director (Metropolitan), Level 6, 313 Adelaide Street, Brisbane, QLD 4000	
4C	Principal's Delegate Clause 2.1	Adam Williams (Program Director – Infrastructure Delivery Services)	
4D	Email address and telephone number of the Principal's Delegate	Email:	<a href="mailto:Metropolitan.Projects@tmr.qld.gov.au">Metropolitan.Projects@tmr.qld.gov.au</a>
		Telephone:	
4E	Principal's Representative Clause 2.1	John Ryan – Deputy Regional Director (Metropolitan)	
4F	Email address and telephone number of the Principal's Representative	Email:	<a href="mailto:Metropolitan.Projects@tmr.qld.gov.au">Metropolitan.Projects@tmr.qld.gov.au</a>
		Telephone:	
<b>5</b>	<b>The Administrator</b>		
5A	Name of the Administrator and the Administrator's Representative Clause 2.1	Administrator:	TBC at Prestart Meeting
		Administrator's Representative:	TBC at Prestart Meeting
5B	Email address or Address and telephone number of the Administrator	Email/Address:	TBC at Prestart Meeting
		Telephone:	TBC at Prestart Meeting

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Item	Issue	Contract details	
5C	Email address and telephone number of the Administrator's Representative	Email:	TBC at Prestart Meeting
		Telephone:	TBC at Prestart Meeting
<b>6</b>	<b>The Contractor</b>		
6A	Name of the Contractor Clause 2.1	Refer to Formal Instrument of Agreement.	
6B	Address of the Contractor	Refer to Formal Instrument of Agreement.	
6C	Name of the Contractor's representative	Refer to Formal Instrument of Agreement.	
6D	Email address and telephone number of the Contractor's representative	Refer to Formal Instrument of Agreement.	
<b>7</b>	<b>Site description</b>		
7A	Description of the Site Clause 2.1	Gympie Arterial Road (U14) Reserve from South of Sadlier Street to North of Hamilton Road including Local Authority Road Reserve for extent of works to all intersections and side roads.	
<b>8</b>	<b>Nature of the Contract</b>		
8A	Alternative that applies Refer to relevant Clause in Annexure B (Commercial Framework) to the General Conditions of Contract	Alternative 1 – Schedule of Rates	<input checked="" type="checkbox"/>
		Alternative 2 – lump sum	<input type="checkbox"/>
		Alternative 3 – part Schedule of Rates and part lump sum	<input type="checkbox"/>
8B	Relationship management workshop required Clause 3.2.2	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>9</b>	<b>Contract Leadership Team</b>		
9A	Contract Leadership Team to be established Clause 4.1	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>10</b>	<b>Site Conferences</b>		
10A	Intervals between Site Conferences Clause 4.3	Every month.	

# Annexure A (Contract Details) (Construct Only Contract) to the General Conditions of Contract



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Item	Issue	Contract details
<b>11</b>	<b>Security</b>	
11A	Amount of security Clause 5.2	<p>The Contractor must provide:</p> <p>a) security (Primary Security) in an amount equal to 1% of the Contract Sum, and</p> <p>b) any of the following, and:</p> <p>i. further security (Subcontractor Payment Security) in an amount calculated in accordance with the following:</p> <p>A. where the Contract Sum is not greater than \$1,000,000, the amount shall be 3% of the Contract Sum</p> <p>B. where the Contract Sum is greater than or equal to \$1,000,000, but not greater than \$20,000,000, the amount shall be 2% of the Contract Sum or \$30,000 — whichever is the greater</p> <p>C. where the Contract Sum is greater than or equal to \$20,000,000, the amount shall be 1% of the Contract Sum or \$400,000 — whichever is the greater</p> <p>ii. a statutory declaration in the Form included in the Tender Documents (Form C7847), declaring that no Subcontractors are to be engaged under the Contract.</p> <p>c) Retention Security equal to 4% of the Contract Sum in substitution of Retention Moneys (if applicable).</p> <p>d) Additional security (if applicable) required under the Contract, such as security for unfixed plant or materials (refer Item 41D).</p>
11B	The percentage to which the Principal's entitlement to Retention Moneys and/or Retention Security is reduced Clause 5.8	<p>Primary Security: No reduction</p> <p>Retention Moneys and/or Retention Security: 20%</p>
<b>12</b>	<b>Formal Instrument of Agreement</b>	
12A	Formal Instrument of Agreement required Clause 6.2	Yes <input checked="" type="checkbox"/>
<b>13</b>	<b>Documents</b>	
13A	The number of copies to be supplied by the Principal Clause 8.4	One (1) electronic
13B	Reliance Information Clause 2.1	Nil.
13C	The number of copies to be supplied by the Contractor Clauses 8.5 and 8.6	One (1) Electronic

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Item	Issue	Contract details	
13D	The time for the Administrator to give a direction as to the suitability and return the Contractor's copies Clause 8.5	10 Business Days.	
<b>14</b>	<b>Design by the Contractor</b>		
14A	Contractor is required to design a Defined Part Clause 8.6.1	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
14B	Defined Part Clause 8.6.1	Nil.	
14C	Principal's requirements Clause 8.6.1	N/A	
14D	Amount of professional indemnity insurance policy Clause 8.6.4(b)(i)	N/A	
14E	Period after Final Certificate to maintain professional indemnity insurance policy Clause 8.6.4(b)(ii)	N/A	
<b>15</b>	<b>Subcontracting and Provisional Sums</b>		
15A	Threshold for value of work to be subcontracted Clause 9.2.1(b)(i)	\$100,000	
15B	Nominated Subcontract Work Clauses 2, 10	N/A	
15C	Nominated Subcontractor Clauses 2, 10	N/A	
15D	Selected Subcontract Work Clauses 2, 10	N/A	
15E	The percentage for profit and attendance — work performed by a Subcontractor Clause 11	Refer to Tender Schedule M10.	
15F	The amount or percentage for profit and attendance — work performed by a Nominated Subcontractor Clause 11	Refer to Tender Schedule M10.	
<b>16</b>	<b>The Building Code 2016</b>		
16A	The Building Code will apply to this Contract Clause 14.5.1 (This applies if the project is federally funded)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>17</b>	<b>Haulage of plant and materials</b>		

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Item	Issue	Contract details	
17A	Restrictions to access for Constructional Plant Clause 14.5.2	All haulage routes on local council roads are to be identified and sent to the Contract Administrator for approval.	
<b>18</b>	<b>Traffic management</b>		
18A	A Traffic Management Plan is required Clause 15.5.1	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>19</b>	<b>Community liaison</b>		
19A	A Community Liaison Plan is required Clause 15.6.1	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>20</b>	<b>Severe weather management</b>		
20A	A Severe Weather Management Plan is required Clause 16.2.2	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>21</b>	<b>Insurance of the Works</b>		
21A	The alternative applying Clause 18	Alternative 1.	
21B	The assessment for insurance purposes of the costs of demolition and removal of debris Clause 18(d)(ii)	Nil.	
21C	The assessment for insurance purposes of consultant's fees Clause 18(d)(iii)	Nil.	
21D	The value of materials to be supplied by the Principal Clause 18(d)(iv)	N/A	
21E	The additional amount or percentage Clause 18(d)(v)	Nil.	
<b>22</b>	<b>Public liability insurance</b>		
22A	The alternative applying Clause 19	Alternative 1.	
22B	The amount of public liability insurance shall not be less than Clause 19	N/A	
<b>23</b>	<b>Office accommodation for the Administrator</b>		
23A	The requirements of providing office accommodation for the Administrator is no longer specified in the General Conditions of Contract. The Contractor shall meet the requirements as stated in MRTS28 and Annexure MRTS28.1	The Contractor shall provide a separate office accommodation in accordance with the requirements outlined in MRTS28 and MRTS28.1 and for exclusive use of the administrator during work under the Contract.	

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Item	Issue		Contract details		
<b>24</b>	<b>Site possession</b>				
24A	Time for giving possession of the Site Clause 27.1		Within 25 Business Days from the Date of Acceptance of Tender.		
24B	Possession of Site Clause 27.1		Prior to being given possession of the Site by the Principal, the Contractor must provide: a) security in accordance with Clause 5.2 b) proof of insurances in accordance with Clause 21.1 c) Contract Plan deemed suitable in accordance with Clause 33.3, and d) Contract Plan deemed suitable for construction by the Administrator.		
<b>25</b>	<b>Lane rental charges (Clause 27.6)</b>				
25A	Location	Time	Hourly charge		Shoulder closer
			Lane closure		
			One lane	Two lanes	
	Gympie Arterial Rd	As per MRTS 02_1	\$2,000	\$4,000	
BCC Roads	As per MRTS 02_1	\$1,000	\$2,000		
<b>26</b>	<b>Advertising on Site</b>				
26A	The number of project signs to be supplied and erected by the Contractor Clause 27.8.1		Four (4)		
26B	The size and/or type of project signs Clause 27.8.1		Refer to MRTS14.1 for details.		
26C	The location to which project signs are to be delivered at the completion of the Contract Clause 27.8.1		Signs to be removed and disposed of 90 days after practical completion.		

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Item	Issue	Contract details			
<b>27A</b>	<b>Filling of waterways</b>				
27A	Areas where waterways can be filled for construction purposes, including restrictions and conditions, to be applied Clause 27.9	Nil.			
<b>28</b>	<b>Survey marks</b>				
28A	Survey marks provided by the Principal Clause 28.1	Station	Easting	Northing	Height
		Refer to: • Contract Drawings Series No's: CL-01 to CL-14			
28B	Accuracy of survey marks Clause 28.1	If nothing stated, $\pm 10$ mm in all three dimensions.			
<b>29</b>	<b>Contractor's staff</b>				
29A	<b>Position</b>			<b>Percentage of time onsite</b>	
	Contractor's Representative (if no person is nominated by the Contractor then the Project Manager shall be the Contractor's Representative)	Yes <input checked="" type="checkbox"/>			
	Project Manager:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100%	
	Project Engineer:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100%	
	PUP Co-ordination Manager:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100%	
	Contractor's Quality Representative:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100%	
	Environmental Representative:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	40%	
	Landscape Representative:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	20%	
	Community Liaison Officer:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100%	
	Surveyor:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	As required to comply with MRS56 M1 schedule items	
	Works Supervisor:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100%	
Works Supervisor (Electrical and ITS)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	100% (duration of Electrical and ITS)		
Safety Officer:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	To meet requirements of the WHS Act (2011)		
29B	Key personnel Clause 29.2.2	Those personnel identified in the requested P-Schedules at best Tender stage.			

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29C	Specific staffing requirements	<p><u>Project Manager</u> Degree-qualified engineer with a minimum of 15 years' experience with of a similar nature to those in the contract. The Project Manager shall be available at all times during working hours.</p> <p><u>Project Engineer</u> The Project Engineer shall have a minimum of 10 years' experience in engineering works of a similar nature to those in the Contract. The Project Engineer shall be a degree qualified civil engineer with qualification accepted by the institution of Engineers Australia. The Project Engineer shall be available at all times during working hours.</p> <p><u>PUP Co-ordination Manager:</u> The PUP Co-ordination Manager shall have a minimum of 10 years' experience working with and managing Public Utility Plant (PUP) authorities and assets. The PUP Co-ordination Manager shall be available at all times during working hours.</p> <p><u>Contractors Quality Representative</u> Qualified civil engineer or civil technical officer with minimum 10 years' experience on similar projects. Contractor's Quality Representative shall be available on site at all times during working hours.</p> <p><u>Environmental Representative</u> It is not expected that an Environmental Representative will be required on site full time. However, the Environmental Representative will be expected to be available as required by the Contractor to resolve issues that may arise. The Environmental representative shall be present for all vegetation clearing operations. The Environmental Representative shall be on site at least two days per week and shall be on site within 24 hours from being given notice by the Administrator.</p> <p><u>Surveyor</u> The Surveyor shall have a minimum of 10 years' relevant experience in similar works. The Surveyor shall have a minimum of a 3-year degree in surveying from a recognised institution or qualifications and experience that in the opinion of the Principal and equivalent. Where the Contractor's Surveying work has a legislative requirement (e.g. property boundary</p>
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Item	Issue	Contract details	
		<p>determination), an appropriate qualified Surveyor who has the necessary registration with the Surveyors' Board of Queensland shall be used.</p> <p><u>Works Supervisor</u> The Work Supervisors shall have a minimum of 15 years' relevant experience in the similar role. The Work Supervisors shall have relevant experience in road works, including earthworks, drainage, pavement and sealing operations.</p> <p><u>Community Liaison Officer (CLO)</u> The contractor's community liaison officer shall have a minimum 10 years' relevant experience in a similar role. The CLO must be skilled, dedicated and experienced in public consultation on major road construction projects in Queensland and be available at all times during work hours.</p> <p><u>Dual Roles</u> The requirements above are the minimum requirements. Key personnel fulfilling dual roles is not permitted under the Contract.</p> <p>Notes:</p> <p>a) Unless noted otherwise, Project Engineers shall be a degree-qualified engineer with qualifications accepted by the Institution of Engineers Australia.</p> <p>b) The Surveyor shall meet the competency requirements for each relevant sub-category type as prescribed in Clause 2.4.3 of the <i>TMR Surveying Standards</i>, Part 1, February 2016, or For those who do not meet the requirements as per the <i>TMR Surveying Standards</i>, the department's Engineering and Technology will assess their qualification and experience and approve them on a case-by-case basis. To undertake this type of assessment, the Contractor shall make contact with the Director Geospatial Technologies: <a href="mailto:TMR_Spatial_Enquiry@tmr.qld.gov.au">TMR_Spatial_Enquiry@tmr.qld.gov.au</a></p> <p>c) Professional Engineering Services: Certain activities to be carried out as part of the delivery of this Contract may be 'professional engineering services' as defined in the <i>Professional Engineers Act 2002</i> (the Act). Where such services are carried out, the Contractor shall ensure that the personnel providing these services meet the requirements of the Act.</p> <p>d) If the Mining and Quarrying Safety and Health Act 1999 applies, the Site Senior executive to be appointed under the Act should be provided for here. Also include Special Conditions as Item 99.</p>	
<b>30</b>	<b>Training requirements</b>		
30A	Is the Queensland Government's Training Policy applicable? Clause 29.3	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

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Item	Issue	Contract details		
<b>31</b>	<b>Quality System</b>			
31A	Quality System required Clause 30.2	Mandatory		
<b>32</b>	<b>Warranty Items</b>			
32A	Warranty Items Clause 30.10	ITS, road lighting, traffic signals and associated electrical equipment as required in MRTS201. All other items that include a manufacturer's or supplier's warranty, must be detailed in Construction Handover Documentation.		
<b>33</b>	<b>Working times</b>			
33A	Working Days and Working Hours Clause 32.1	Work times shall be 7:00am to 5:00pm, Monday to Saturday.		
33B	Other days considered to be not Working Days during which work is not permitted under the Contract Clause 32.1	All public holidays as shown at the following website: <a href="https://www.qld.gov.au/recreation/travel/holidays/public">https://www.qld.gov.au/recreation/travel/holidays/public</a> Including the Royal Queensland Show holiday for the Brisbane area		
<b>34</b>	<b>Contractor reports</b>			
34A	Contractor reports Clause 33.2.1	Daily Reports:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
		Weekly Reports:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>35</b>	<b>Contract Plan</b>			
35A	Time for submission of the Contract Plan Clause 33.3.1	Within 15 Business Days after the Date of Acceptance of Tender.		
<b>36</b>	<b>Construction Program</b>			
36A	Time for submission of Construction Program Clause 33.4.1	Within 15 Business Days after the Date of Acceptance of Tender.		
36B	Format of the Construction Program Clause 33.4.1	Critical path network	<input checked="" type="checkbox"/>	
		Bar chart	<input type="checkbox"/>	
36C	Format for electronic program data Clause 33.4.2	The Contractor's software shall be Oracle Primavera P6, presented in .xml format or any software acceptable to the Principal.		
36D	Minimum number of activities in Construction Program Clause 33.4.2	300		

# Annexure A (Contract Details) (Construct Only Contract) to the General Conditions of Contract



Queensland Government

C7831.TIC.CO

<b>Contract Number:</b>	<b>CN-12205</b>
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Item	Issue	Contract details	
<b>37</b>	<b>Separable Portions</b>		
37A	Separable Portions Clause 35.3	Separable Portion number:	
		Description of Separable Portion:	
		Date for Practical Completion* (Clause 2.1):	
		Liquidated Damages per Day (Clause 35.6):	
		Defects Liability Period (Clause 37):	
		*Where a period of time is provided in respect of the Date for Practical Completion, the commencement date shall be deemed to be the Date of Acceptance of Tender.	
		Separable Portion number:	
		Description of Separable Portion:	
		Date for Practical Completion* (Clause 2.1):	
		Liquidated Damages per Day (Clause 35.6):	
		Defects Liability Period (Clause 37):	
		*Where a period of time is provided in respect of the Date for Practical Completion, the commencement date shall be deemed to be the Date of Acceptance of Tender.	
<b>38</b>	<b>Liquidated damages</b>		
38A	Liquidated Damages per Day Clause 35.6	\$8,000 per day	
<b>39</b>	<b>Defects Liability</b>		
39A	The Defects Liability Period Clause 37	365 days	
<b>40</b>	<b>Profit and overheads</b>		
40A	Percentage for profit, onsite overheads and offsite overheads Clauses 36(a), 40.5(b)(iii), 40.5(b)(vi) and 41(b)(vi)	Refer to Tender Schedule M10.	

# Annexure A (Contract Details) (Construct Only Contract) to the General Conditions of Contract



Queensland Government

C7831.TIC.CO

Contract Number: CN-12205

Item	Issue	Contract details
<b>41</b>	<b>Certificates and payments</b>	
41A	Time for lodgement of payment Claims Clause 42.1.1	a) During the carrying out of the Work Under the Contract on the last business day of each month b) Once upon the issue of the certificate of Practical Completion, and c) Once upon the issue of the Final Certificate.
41B	Retention Moneys Clause 42.3	The Principal may deduct 10% of the value of work included in a payment certificate until the aggregate amount withheld equals 4% of the Contract Sum. Retention Moneys may be substituted for Retention Security as per Clause 5.3.
41C	Unfixed plant or materials – the alternative applying Clause 42.4	Alternative 1.
41D (a)	Unfixed plant or materials – the materials which apply Clause 42.4	Drainage pipes as applicable under MRS03 as may be agreed from time to time in writing.
41D (b)	Additional security	As approved by Contract Administrator.
41E	The rate of interest on overdue payments Clause 42.9	The Office of State Revenue Unpaid Tax Interest Rate as at the first day after the date on which payment was due to be made.
<b>42</b>	<b>Site delay</b>	
42A	The delay in giving possession of the Site which shall be a substantial breach Clause 44.7(b)(iv)	10% of the duration of the period from the Date of Acceptance of Tender to the Date for Practical Completion, following satisfactory provision of all requirements in Item 24B of this Annexure A.
<b>43</b>	<b>Dispute resolution</b>	
43A	Dispute resolution – the alternative applying Clause 47.3	Alternative 1A
<b>44</b>	<b>Commercial Framework (if Alternative 1, 2 or 3 is specified in Item 8A)</b>	
44A	For a part Schedule of Rates and part lump sum Contract the lump sum part shall consist of Clauses 3.1, 3.2 and 4.1 of Annexure B (Commercial Framework)	Refer to the pricing schedule.
44B	The amount of the Contract Sum for the purposes of Clauses 14.8, 18 and 29.3 of the General Conditions of Contract and Item 11A of the Annexure A. Clause 3.3 of Annexure B (Commercial Framework)	Refer to the total amount (including GST) set out in Tender Schedule M1 or M2 (being the anticipated total Contract Sum as at the Date of Acceptance of Tender).

**Annexure A (Contract Details)  
(Construct Only Contract) to the  
General Conditions of Contract**



Queensland Government

C7831.TIC.CO

<b>Contract Number:</b>	<b>CN-12205</b>
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Item	Issue	Contract details
44C	Limits of accuracy applying to quantities in the Schedule of Rates Clause 3.6 of Annexure B (Commercial Framework) and Clause 35.5(d)(ii)(b)	For a Work Item whose Item number has a 'P' suffix, limits of accuracy are as specified in MRS01 <i>Introduction to Specifications</i> . For a Work Item with an Item number between 32001 and 32602, the limits of accuracy shall be plus 20% or minus 20%. For all other Work Items, the limits of accuracy shall be plus 10% or minus 10% unless noted otherwise in the MRS Annexures.
99	Special Conditions relating to the application of the Mining and Quarrying Safety and Health Act 1999	This Item 99 is to be used where any quarrying activities which may be caught by the Mining and Quarrying Safety and Health Act 1999 are undertaken. It is not required if the quarrying pit is directly adjoining the road area under construction.
99A	Application of Special Conditions in addition to existing WHS obligations	Nothing in this Item 99 shall in any way limit or exclude any of the Contractor's obligations or liabilities under the Contract, including the application of Clause 15 of the Contract.

Released under

**Annexure A (Contract Details)  
(Construct Only Contract) to the  
General Conditions of Contract**



C7831.TIC.CO

<b>Contract Number:</b>	<b>CN-12205</b>
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Item	Issue	Contract details
99B	Appointment of Contractor as Operator	<p>a) From the date specified in Item 24A, the Principal relinquishes, and the Contractor assumes, control of the Quarry Site for all purposes.</p> <p>b) The Contractor acknowledges and agrees that from the date specified in Item 24A the Contractor will be the Operator for the purposes of the <i>MQSH Act</i>.</p> <p>c) The Contractor shall appoint a Site Senior Executive for the Quarry Site.</p> <p>d) The Quarrying Activities shall not be carried out unless:</p> <ul style="list-style-type: none"> <li>i. a Site Senior Executive has been, and remains, properly appointed; and</li> <li>ii. the Contractor has ensured that the Site Senior Executive has developed and implemented an appropriate Safety and Health Management System is in place for the Quarrying Activities.</li> </ul> <p>e) The Contractor is authorised by the Principal to have Management and Control of the Quarry Site and to discharge its obligations as Operator under Part 3 of the <i>MQSH Act</i>.</p> <p>f) The Contractor shall discharge its duties and comply with all relevant obligations under the <i>MQSH Act</i>, including the duties of an Operator.</p>
99C	Discharge of duties under <i>MQSH Act</i>	<p>Without limiting the obligations in Clause 15 of the Contract or this Item 99:</p> <p>a) the Contractor shall ensure the Contractor, and its officers, employees, agents and Subcontractors are familiar with and comply with all their obligations and exercise due diligence in discharging all their duties under the <i>MQSH Act</i>;</p> <p>b) if the Contractor cannot discharge its duties under the <i>MQSH Act</i>, the Contractor shall comply with Clause 15.4.5(b) of the Contract as though the words "WHS Act" were omitted and replaced with the words "MQSH Act".</p>

**Annexure A (Contract Details)**  
**(Construct Only Contract) to the**  
**General Conditions of Contract**



C7831.TIC.CO

<b>Contract Number:</b>	<b>CN-12205</b>
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Item	Issue	Contract details
99D	Definitions for this Special Condition	<p>In this Item 99:</p> <ul style="list-style-type: none"> <li>• <i>MQSH Act</i> means the <i>Mining and Quarrying Safety and Health Act 1999 (Qld)</i> as amended from time to time;</li> <li>• <i>Operator</i> has the meaning provided in the <i>MQSH Act</i>;</li> <li>• <i>Quarrying Activities</i> means the operations to produce road building material within the meaning provided by the <i>MQSH Act</i>;</li> <li>• <i>Quarry Site</i> means the part of the Site which is a quarry within the meaning provided by the <i>MQSH Act</i>;</li> <li>• <i>Safety and Health Management System</i> has the meaning provided in the <i>MQSH Act</i>;</li> <li>• <i>Site Senior Executive</i> has the meaning provided in the <i>MQSH Act</i>.</li> </ul>

Released under RIPA

Conditions of Contract – C7832.TIC

**Transport Infrastructure Contract  
Annexure B (Commercial Framework) to the General  
Conditions of Contract**

July 2019

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Released under RTI - DTMR

## 1 Overview and defined terms

1.1 Item 8A of Annexure A specifies one of the following as the basis for calculating the Contract Sum:

- a) Alternative 1 – Schedule of Rates
- b) Alternative 2 – lump sum, or
- c) Alternative 3 – part Schedule of Rates and part lump sum.

1.2 In this Contract, the following definitions apply:

- a) **Contract Sum** has the meaning given in Clauses 3.2 and 4.2 (as applicable) of this Commercial Framework and which, for the avoidance of doubt, includes any GST payable in respect of the relevant supply to which the payment relates.
- b) **Schedule of Rates** means any schedule (other than a Schedule of Prices) included in the Contract which, in respect of any section or Item of work to be carried out, shows the rate or respective rates of payment for the execution of that work and which may also include lump sums, Provisional Sums, other sums, quantities and prices. The rates of payment should not include an amount of GST in respect of the work.
- c) **Schedule of Prices** means a schedule (other than a Schedule of Rates) which provides an itemised breakdown of the work under the Contract and which is priced by the Contractor in its Tender, with the sum of the prices and the amount of GST totalling the Contract Sum and a Schedule of Prices may also include an itemised table of work related tasks for which the Contractor is required to provide a unit rate in its Tender.

## 2 General

2.1 The Contract Sum is not subject to adjustment, except as expressly provided for under the Contract.

## 3 Schedule of Rates (Alternative 1 and Alternative 3)

3.1 This Clause 3 of the Commercial Framework applies:

- a) if Alternative 1 applies in Item 8A of Annexure A, and
- b) if Alternative 3 applies in Item 8A of Annexure A, but only in respect of that part of the work under the Contract which is not the work under the Contract to be paid on a lump sum basis, as specified in Item 44A of Annexure A.

3.2 The Contract Sum is the sum ascertained by:

- a) multiplying the measured quantity of each Item of work completed (measured in accordance with the Specifications) by the rate included in the Schedule of Rates
- b) adjusting that sum by any additions or deductions made pursuant to the Contract
- c) adding any GST in respect of the relevant supply, and
- d) if Alternative 3 applies in Item 8A of Annexure A, adding the lump sum (including GST) applicable to the part of the work specified in Item 44A of Annexure A that is to be paid on a lump sum basis.

- 3.3 For the purposes of Clauses 18, 14.8 and 29.3 (if applicable) of the General Conditions of Contract and Item 11A of Annexure A, the Contract Sum is the amount specified in Item 44B of Annexure A.
- 3.4 Quantities in a Schedule of Rates are estimated quantities only and the Principal does not warrant, guarantee or make any representation with respect to the completeness, accuracy or adequacy of the Items and quantities in a Schedule of Rates.
- 3.5 A direction shall not be required to be given by the Administrator by reason of the actual quantity of an Item required to perform the Contract being greater or less than the quantity shown in the Schedule of Rates.
- 3.6 Where otherwise than by reason of a direction of the Administrator to vary the work under the Contract, the actual quantity of an Item required to perform the Contract is greater or less than the quantity shown in the Schedule of Rates, the tendered rate shall apply to the greater or lesser quantities within the limits of accuracy Item 44C of Annexure A, and quantities outside the limits shall be valued under Clause 40.5 of the General Conditions of Contract as if they were varied work directed by the Administrator as a variation. However total payment for a reduced quantity of work will not exceed the amount calculated by multiplying the quantity of work, at the lower limit of accuracy, by the tendered rate.
- 3.7 If, in the opinion of the Administrator, a Schedule of Rates omits an Item which should have been included and the value of that Item exceeds \$2,000, the provisions of Clause 8.2 of the General Conditions of Contract shall apply.
- 3.8 If no rate or price is shown in a Schedule of Rates for an Item, the rate or price for that Item shall be deemed to have been included elsewhere in the Schedule of Rates.
- 3.9 The quantity of work under the Contract completed shall be measured in accordance with the standard method of measurement specified in Clause 2 of Specification (Measurement).
- MRS01 *Introduction to Specifications*, as amended or updated from time to time by the Principal.
- 3.10 Where the unit of measurement for an Item in the Schedule of Rates is stated as 'lump sum', the Contractor may include part of the relevant amount in a Claim for payment under Clause 42.1 of the General Conditions of Contract. Valuations of such Items will be made based on the Administrator's assessment of the percentage of completed and conforming work under the Contract or, where an appropriate formula is included in the Specifications associated with the particular work under the Contract, in accordance with that formula.

#### **4 Lump sum (Alternative 2 and Alternative 3)**

- 4.1 This Clause 4 of the Commercial Framework applies:
- a) If Alternative 2 applies in Item 8A of Annexure A, and
  - b) If Alternative 3 applies in Item 8A of Annexure A, but only in respect of that part of the work under the Contract to be paid on a lump sum basis, as specified in Item 44A of Annexure A.
- 4.2 The Contract Sum is the lump sum (including GST) specified in Tender Schedule M2 (Schedule of Prices), adjusted by any additions or deductions made pursuant to the Contract.

- 4.3 A Schedule of Prices may be used for the purposes of valuation of variations pursuant to Clause 40.5 of the General Conditions of Contract and for the valuation of Claims for payment under Clause 42.1 of the General Conditions of Contract.
- 4.4 The Principal does not warrant, guarantee or make any representation with respect to the completeness, accuracy or adequacy of the sections and Items in a Schedule of Prices and the Principal shall have no liability for any Claim to the Contractor arising out of or in connection with any errors in or omissions from the Schedule of Prices.
- 4.5 The Contractor may include part of Items contained in the Schedule of Prices in a Claim for payment under Clause 42.1 of the General Conditions of Contract. Valuations of such Items will be made based on the Administrator's assessment of the value of conforming work under the Contract completed or, where an appropriate formula is included in the Specification associated with the particular work under the Contract, in accordance with that formula.

## 5 Rise and fall

### 5.1 Overview

- a) For payments made to the Contractor for work under the Contract completed prior to the Date for Practical Completion, rise and fall adjustments will be applied in accordance with Clauses 5.2 and 5.3 of this Commercial Framework.
- b) No cost adjustment shall be made under this Clause 5 of the Commercial Framework for work under the Contract carried out after the Date for Practical Completion.

### 5.2 Bitumen

- a) The Contract Sum shall be subject to adjustment for variations in the cost of bitumen supplied by the Contractor in accordance with the following formula:

$$D = (C - B) \times A \text{ where -}$$

A = the quantity of bitumen supplied by the Contractor derived from:

- the calculation of residual bitumen at 15 degrees Celsius where the product is sprayed bituminous surfacing or a tack coat
- the approved design binder content where the product is asphalt (excluding Reclaimed Asphalt Pavement)
- the approved residual binder content where the product is a bituminous slurry surfacing
- where the binder is modified bitumen, the quantity shall be the quantity of manufactured polymer modified binder and
- the approved residual binder content where the product is foamed bitumen pavement.

B = the price of Class 170 bitumen on the 15<sup>th</sup> day of the month prior to the Time for Lodgement of Tenders.

C = the price of Class 170 bitumen on the 15<sup>th</sup> day of the month during which the work is performed.

D = the applicable cost adjustment for the relevant Claim for payment submitted under Clause 42 of the General Conditions of Contract.

- b) The price of Class 170 bitumen shall be the average general market price of Class 170 bitumen of all Queensland manufacturers.

### 5.3 Other adjustments

- a) Where the original Date for Practical Completion specified in the Tender Documents is greater than 730 days after the Date of Acceptance of Tender, in addition to adjustments under Clause 5.2, payments to the Contractor shall be subject to a cost adjustment to reflect variations in the cost of labour and materials in accordance with the following formula:

$$H = (0.85 \times (G - F) \times E) / F$$

where:

E = the value of the monthly payment certificate subject to rise and fall less:

- any variations or payments made under a Provisional Sum Item, that were based on actual cost or current prices and for which rise and fall payments do not apply
- any Daywork assessed using plant for which the Daywork rates were established during the Contract, and
- the assessed value of bitumen used in sprayed seals and asphalt for which a cost adjustment is payable under Clause 5.2.

F = the value of the Index for the quarter prior to the month in which the Contractor's Tender was lodged.

G = the value of the Index for the quarter prior to the month during which the work under the Contract is performed.

H = the applicable cost adjustment.

- b) For the purposes of this Clause 5.3 of the Commercial Framework, the 'Index' is the index of road and bridge construction (Australia) in Table 17 of catalogue 6427.0 (Producer Price Indexes, Australia) published quarterly by the Australian Bureau of Statistics.
- c) If at any time the index is discontinued or modified, the Administrator shall request the Australian Bureau of Statistics to nominate the index or Authority which in its opinion is the most practical for the purposes of measuring any variation in costs during the performance of the Contract. The index or Authority nominated by the Australian Bureau of Statistics shall be adopted for the purposes of making the calculation under this Clause. If the Australian Bureau of Statistics fails to nominate an index or Authority which is practical for the purpose of measuring any variation in costs, then the amount of the cost adjustment shall be the amount determined by the Administrator acting reasonably.

# Annexure C (Certification Functions of the Administrator) to the General Conditions of Contract



Queensland Government

C7833

<b>Contract Number:</b>	<b>CN-12205</b>
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Clause	Clause headings	Description of certification functions
21.5	Settlement of Claims	Certify against the joint account for the cost of reinstatement following an insurance claim.
33.5	Acceleration	Clause 33.5(a): determining whether to issue a direction for the Contractor to accelerate the performance of the work instead of granting an extension of time.
35.3	Separable Portions	If the Contract does not make provision for the amount of security applicable to a Separable Portion, the Administrator shall certify the value of the work under the Contract as the value of the Separable Portion bears to the value of the whole of the work under the Contract.
35.5	Extension of Time for Practical Completion	Within 20 Business Days after receipt of a claim for an extension of time, grant a reasonable extension of time.
40.5	Valuation	Where the Contract provides that a valuation be made under this Clause, the Administrator shall determine the appropriate value.
41	Daywork	Value the Daywork in accordance with Clause 41.
42.1	Payment Claims, Certificates, Calculations and Time for Payment	<p>Within 10 Business Days of receipt of a payment claim issue to the Principal and the Contractor a payment certificate stating the amount of payment which is to be made by the Principal to the Contractor or by the Contractor to the Principal.</p> <p>Shall set out in the payment certificate the calculations used to arrive at the amount and reasons for any difference in the amount.</p> <p>May issue a payment certificate even if the Contractor fails to make a payment claim.</p>
42.5	Certificate of Practical Completion	<p>Issue to the Contractor and Principal a Certificate of Practical Completion certifying the Date of Practical Completion within 10 Business Days of receipt of a written request for a Certificate of Practical Completion or give the Contractor in writing the reasons for not issuing the Certificate.</p> <p>The Administrator may issue a Certificate of Practical Completion when of the opinion that Practical Completion has been reached, whether or not the Contractor requests it be issued.</p>
42.8	Final Certificate	Issue to the Contractor and Principal a final payment certificate endorsed 'Final Certificate' within 10 Business Days of the later of the receipt of the Contractor's Final Payment Claim (or the expiration of time for its lodgement) and the Contractor having completed making good of defects.
44.6	Adjustment on Completion of the Work Taken Out of the Hand of the Contractor	Ascertain the costs incurred by the Principal in completing the work taken out of the Contractor's hands under clause 44.4(a) and issue a certificate certifying the amount of that cost.



C7836

Contract Number: CN-12205

**Checklist of applicable clauses**

Further to Clause 99 of the General Conditions of Contract, the following additional clauses, if selected, shall apply under the Contract as if they were included in the General Conditions of Contract.

Number	Clauses	Yes	No
1	Independent Verifier	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Use of explosives	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Software licences	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Bonus for early completion	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Work on and adjacent to railways	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	<i>Queensland Building and Construction Commission Act 1991 (Qld)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	NOT USED		
8	Mandatory Milestones	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Supply of digital Information disclaimer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Not used		
11	Traffic management	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12	Care of the work and reinstatement of damage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13	Training – Indigenous component	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14	Physical security of ITS infrastructure facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15	Training Policy – Additional requirements for Contract Sum >\$100 million	<input type="checkbox"/>	<input checked="" type="checkbox"/>
99	Additional Clauses	<input checked="" type="checkbox"/>	

**Part A – Project-specific conditions**

**6 Queensland Building and Construction Commission Act 1991 (Qld)**

**6.1 Amount of security under the QBCC Act**

- (a) The parties acknowledge that their rights and obligations under the Contract are subject to the provisions of the *Queensland Building and Construction Commission Act 1991 (Qld)* (QBCC Act) to the extent they apply, and where there is any inconsistency between the Contract and the QBCC Act, the QBCC Act prevails to the extent necessary to avoid the inconsistencies.
- (b) The parties acknowledge that (unless the parties expressly agree otherwise) under the QBCC Act to the extent that it applies, Section 67K(2) of the QBCC Act makes this Contract subject to a condition that at any time before Practical Completion the total of all security held by the Principal under the Contract (other than those referred to in Section 67K(3) of the QBCC Act) is not to exceed 5% of the Contract Sum which under the QBCC Act includes adjustments for variations).
- (c) The parties acknowledge that under the QBCC Act, by initialling the Contract in the space provided below, the parties have expressly agreed that the Contract is not subject to the conditions imposed by the above sections and explained above.



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<b>Contract Number:</b>	<b>CN-12205</b>
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Parties to Initial

Principal's initials .....

Contractor's initials .....

- d) Despite the terms of Clause 5.6 of the General Conditions of Contract, the parties acknowledge that the Principal must comply with the requirements of Section 67J of the QBCC Act in relation to having recourse to security.

**6.2 Certificates and payments**

- (i) Clause 42.1 of the General Conditions of Contract is amended by deleting Clause 42.1.2(a) and replacing it with the following:

*'a) Within 10 Business Days after receipt of a payment Claim, the Administrator shall issue to the Principal and to the Contractor a payment certificate setting out:*

- i. the amount of the payment which, in the opinion of the Administrator, is to be made by the Principal to the Contractor or by the Contractor to the Principal and*
- ii. the calculations employed to arrive at the amount and, if the amount is more or less than the amount claimed by the Contractor, the reasons for the difference '*

- (ii) Clause 42.1 of the General Conditions of Contract is amended by deleting Clause 42.1.3(a) and replacing it with the following:

*'(a) Subject to the provisions of the Contract, within 15 Business Days after receipt by the Administrator of a payment Claim in accordance with Clause 42.1.1, provided that the requirements of Clause 42.1.2(e) have been met, the Principal shall pay to the Contractor or the Contractor shall pay to the Principal, as the case may be, an amount not less than the amount shown in the payment certificate as due to the Contractor or to the Principal as the case may be, or if no payment certificate has been issued, the Principal shall pay the amount of the Contractor's Claim.'*

- (iii) Despite anything in the General Conditions of Contract to the contrary, for the purpose of Clause 42 of the General Conditions of Contract only, the term 'Business Day' shall have the meaning given to that term under the *Acts Interpretation Act 1901* (Cth).

**6.3 Interest on overdue payments**

- a) Clause 42.9 is amended by deleting the final two sentences and replacing with:  
*'The rate of interest shall be calculated pursuant to Section 67P(3)(a) of the QBCC Act.'*
- b) Item 41E shall not apply to this Contract.

**6.4 Non-conforming building products**

- a) In this clause, the terms 'person in the chain of responsibility', 'building product', 'Minister', 'non-conforming building product' and 'required information' each have the respective meanings given to those terms in the QBCC Act.
- b) The Contractor acknowledges that, to the extent that the Contractor is a person in the chain of responsibility, it has obligations under Part 6AA of the QBCC Act in relation to non-conforming building products and:
  - i. warrants that no building products incorporated into the Works are non-conforming building products or the subject of a warning statement issued by the Minister



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- ii. must ensure that it, and its subcontractors, provide all required information for a building product incorporated into the Works to the Administrator upon installation of the building product into the Works
  - iii. must provide the Administrator with copies of all notices (including warning statements) issued and received in relation to the Works pursuant to the QBCC Act within 48 hours of dispatch or receipt by the Contractor of the relevant notice
  - iv. agrees to provide all required information and any other information relevant to a building product to the Principal and the Administrator within the timeframes requested by the Principal or the Administrator, and
  - v. indemnifies and shall keep indemnified the Principal against all loss, costs, liabilities, claims, damages or expense caused or contributed to any breach of its obligations under this Clause 6.4, or by any failure of the Contractor to comply with its obligations under the QBCC Act in relation to building products.
- c) If the Contractor installs a building product without the required information, the Principal will be entitled to do either of the following in its sole and absolute discretion:
- i. request the required information from the Contractor, in which case the Contractor will provide the required information as soon as reasonably practicable, or
  - ii. direct the Contractor to remove the building product from the Works and replaced with a building product that is not non-conforming pursuant to Clause 37 of the General Conditions of Contract.
- d) The Contractor shall, as a precondition to achieving Practical Completion, provide to the Principal and the Administrator a signed statutory declaration confirming that all required information has been obtained and provided to the Principal and the Administrator and that no non-conforming building products have been installed or incorporated into the Works.
- e) The Contractor shall indemnify and shall keep indemnified the Principal against any cost, loss, expense, liability, claim, or damage suffered or incurred by the Principal due to a building product incorporated into the Works being recalled or identified as a non-conforming building product.
- f) For the avoidance of doubt, the indemnities contained in this Clause 6.4 survive the termination, cancellation, completion, expiration or otherwise merging of this Contract.

**9 Supply of digital information disclaimer**

For the convenience of Tenderers/Contractors the Principal has provided Digital Information namely, the 12D Design Strings and/or the Digital Terrain Model (DTM).

Under the conditions of providing this data, the Principal acknowledges to the Tenderers/Contractors the following terms and conditions:

- (a) This Digital Information is only provided for the Tenderer's/Contractor's internal consideration and use.
- (b) This Digital Information may not be a true, accurate, current or certified representation of the corresponding hard copy document.
- (c) The hard copy documents take precedence over any corresponding Digital Information.
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**Part B – Road specific conditions**

**11 Traffic management**

**11.1 Notification of traffic changes**

The Contractor shall:

- (a) Give the Administrator a minimum of 10 Business Days' written notice of changes in traffic movements necessary for the performance of work under the Contract.
- (b) Be responsible for obtaining approval from the relevant Authority for road closures or traffic changes which affect it.

**11.2 Public notification**

- (a) The Contractor shall ensure it disseminates information to the community regarding the nature and impact of the work under the Contract, including by:
  - i. publicly advertising changes to normal traffic movements and of any possible disruptions, and
  - ii. providing the community with as much notice as possible of changes or disruptions (but it shall not be less than 48 hours).
- (b) The Contractor shall obtain the agreement of the Administrator as to the extent and nature of all publicity prior to implementation. The Principal reserves the right to take control of and/or to incorporate publicity proposals by the Contractor into any project publicity arranged directly by the Principal.



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**12 Care of the work and reinstatement of damage**

**12.1 Amendments to the General Conditions of Contract**

- (a) Clause 16 of the General Conditions of Contract is amended by inserting the words 'except to the extent specified in Clause 12.4(c) of the Clause Bank' at the beginning of paragraph (a) of Clause 16.3.
- (b) Clause 44.2 of the General Conditions of Contract is amended by including the following new paragraph (xviv):

*'(xviv) failing to comply with Clause 12.2 of the Clause Bank.'*

**12.2 Vehicles with excess axle loads within the Site**

- (a) The Contractor shall:
  - i. only use or operate vehicles with excess axle loads for constructing sections of embankment and provided such vehicles are loaded within the Site only
  - ii. not use or operate vehicles with excess axle loads along or across any existing pavement or over any concrete structure without the prior approval of the Administrator in writing
  - iii. exercise caution in relation to the use or operation of vehicles with excess axle loads over drainage or other structures
  - iv. not use or operate vehicles with excess axle loads on sections of road under construction once trimming of the subgrade is complete, and
  - v. make good any damage which, in the opinion of the Administrator, has resulted from the operation of vehicles with excess axle loads.
- (b) Nothing in this Clause 12.2 shall in any way limit or exclude the Contractor's obligations or liabilities under the Contract.

**12.3 Protection of bituminous surfaces**

The Contractor shall not carry out any of the following activities on any bituminous surface, including asphalt, or on any other surface on which bitumen is to be placed:

- (a) the refuelling of plant
- (b) the use of plant or equipment which leaks fuel or oil
- (c) the mixing of cutter or flux oils with bitumen, or
- (d) any other activity which may result in the spillage of any solvent.

**12.4 Maintenance of existing and completed Works**

- (a) From the Date of Acceptance of Tender up to the Date of Practical Completion, the Contractor shall carry out the following maintenance activities:
  - i. maintain existing and new Site vegetation and plantings, including grassed areas by, without limitation, watering, weeding, mulching, spraying and fertilising
  - ii. mow any grassed areas within the Site within five Business Days of the height of such grass exceeding 200 mm and trim any trees or shrubs likely to cause a safety problem for road users
  - iii. ensure that all culverts, channels, table drains, catch drains and other waterways and subsoil drains within the Site are kept clear of any obstructions



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- iv. maintain the existing pavement within the Site to no lesser standard than that existing at the time possession of the Site was granted to the Contractor and ensure its safety for all road users
  - v. maintain the completed pavement that is part of the Works
  - vi. maintain existing and new route, ramp and intersection lighting within the Site, and
  - vii. maintain pavement markings within the Site.
- (b) Where specific maintenance activities are specified elsewhere under the Contract, the provisions of those specific requirements shall take precedence over the maintenance activities described in Clause 12.4(a) of the Clause Bank.
- (c) The Contractor shall not be responsible for repairs to road infrastructure required because of collateral road crash damage or vandalism.
- (d) Notwithstanding the provisions of Clause 44 of the General Conditions of Contract, if the Contractor fails to comply with any obligation imposed on the Contractor by this Clause 12.4, the Administrator may, after the Administrator has given reasonable notice in writing to the Contractor, have the maintenance work carried out by other persons and the reasonable cost incurred by the Principal in having the work so carried out may be recovered by the Principal as a debt due from the Contractor to the Principal. The rights given by this Special Condition 12.4(d) are in addition to and without prejudice to any other right or remedy.

**14 Physical security of ITS infrastructure facilities**

Where the Contractor is required to install, maintain or otherwise access Intelligent Transportation System (ITS) and road lighting facility cabinets, including, but not limited to, traffic signal controller cabinets, ITS communications cabinets, electrical switchboards, dynamic signs or other control devices, the Contractor shall ensure that the facilities are physically secure.

Where the Principal has provided keys to the Contractor for use in accessing the facilities, the Contractor shall return the keys when required or at the completion of the Contract. Where keys have been lost or the Contractor fails to return the keys, the Principal may deduct the cost of the keys from the Contract.

Deductions shall be for the total replacement costs of the keys, including labour and materials. Where the keys and locks are electronic, the replacement costs shall include the reprogramming of the keys and locks.

**99 Additional Clauses**

**Clause 99.1 Compliance with the Queensland Procurement Policy (QPP)**

Local Business Participation.

The Principal expects the Contractor to support local businesses by sourcing equipment, materials and services from suppliers based locally to the Project. The Contractor shall give, and shall ensure that its subcontractors give, local subcontractors, vendors and suppliers a full, fair and reasonable opportunity to supply labour, services, materials, plant, machinery, equipment and other items for the Works. "Local" is defined by the Queensland Procurement Policy (QPP).

In addition to the reporting requirements stipulated in Clause 14.8 (ii) of the General Conditions of Contract, the Contractor shall compile and submit a report monthly, to the Principal via email address [localcontentreports@tmr.qld.gov.au](mailto:localcontentreports@tmr.qld.gov.au) with a copy to the Administrator, using the Project Outcome Reporting template (template available at <https://www.tmr.qld.gov.au/business-industry/Technical->



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[standards-publications/Infrastructure-Contract/Transport-Infrastructure-Contract/TIC-Construct-Only](#)).

This monthly report shall contain data relevant to the work completed up to and including the month (cumulative) to which the Contractor's progress claim relates, identifying businesses meeting the local requirements of the QPP.

**Clause 99.3 The Ethical Supplier Threshold and Ethical Supplier Mandate**

- a) In this clause 99.3,
  - a. Ethical Supplier Mandate means the Queensland Government policy titled 'Ethical Supplier Mandate' or any policy that replaces that policy;
  - b. Ethical Supplier Threshold means the Ethical Supplier Threshold in paragraph 2.3 of the Queensland Procurement Policy;
  - c. Government Department or Instrumentality means any governmental regulator, including Work Health Safety Queensland, the Queensland Building and Construction Commission, the Fair Work Commission and the Australian Building and Construction Commission; and
  - d. QPP Compliance Unit means the Queensland Procurement Policy (QPP) Compliance Unit, Office of the Chief Advisor -- Procurement, Department of Housing and Public Works.
- b) The Contractor shall comply with the Ethical Supplier Threshold.
- c) The Principal may obtain information about the Contractor relevant to the Contractor's compliance with clause 99.3(b) that may be held by the QPP Compliance Unit or any Government Department or Instrumentality and take the information into account in assessing the offer.
- d) The Contractor acknowledges that a failure to comply with the Principal's policies that apply to the work under the proposed contract or the Contractor's obligations under the proposed contract may result in the imposition of a demerit or sanction under the Ethical Supplier Mandate, in addition to any other remedies available to the Principal under this Contract.
- e) Failing to comply with the requirements of this clause 99.3(b) is a substantial breach of Contract for the purpose of Clause 44.2(a) and (b)(xviii) of the General Conditions of Contract.

**Technical Specification**

**Transport and Main Roads Specifications  
MRTS03 Drainage, Retaining Structures and Protective  
Treatments**

**January 2019**

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## 1 Introduction

This Technical Specification applies to the provision of drainage structures, retaining structures, and protective treatments in roadworks.

The requirements for reinforced soil retaining structures are specified in MRTS06 *Reinforced Soil Structures*.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

## 2 Definition of terms

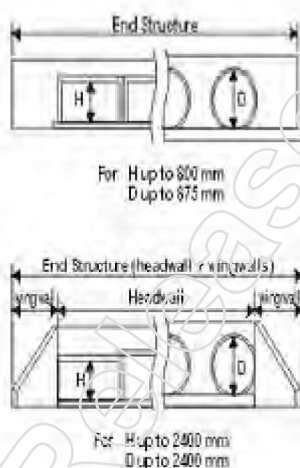
The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*. Additional terms used in this Technical Specification shall be as defined in Table 2.

**Table 2 – Definition of terms**

Term	Definition
Gabion	A steel-wire mesh cage which is filled with rock particles and used to construct a retaining structure.
Mattress	A steel-wire mesh cage which is filled with rock particles and used to line a drainage channel.
Spillthrough	That portion of an embankment constructed adjacent to and under a bridge abutment.

End structures for culverts are defined by the terms detailed in Figure 2.

**Figure 2 – Culvert end structure terms**



### 3 References

Tables 3(a) and 3(b), below, list documents referenced in this Technical Specification.

**Table 3(a) – Referenced documents**

Reference	Title
AS 1379	<i>Specification and supply of concrete</i>
AS 1762	<i>Helical lock-seam corrugated steel pipes – Design and Documentation</i>
AS 1830	<i>Grey cast iron</i>
AS 2338	<i>Preferred dimensions of wrought metal products</i>
AS 2423	<i>Coated steel-wire fencing products for terrestrial, aquatic and general use</i>
AS 2439.1	<i>Perforated plastics drainage and effluent pipe and fittings – Perforated drainage pipe and associated fittings</i>
AS 3678	<i>Structural steel – hot-rolled plates, floor plates and slabs</i>
AS 3679.1	<i>Structural steel – hot-rolled bars and sections</i>
AS 3600	<i>Concrete structures</i>
AS 3700	<i>Masonry structures</i>
AS 3750.9	<i>Paints for steel structures – Organic zinc – rich primer</i>
AS 3996	<i>Access covers and grates</i>
AS 5100	<i>Bridge design – scope and general principles</i>
AS/NZS 1254:2010	<i>PVC-U pipes and fittings for stormwater and surface water applications</i>
AS/NZS 2041.4:2010	<i>Buried corrugated metal structures – Helically formed sinusoidal pipes</i>
AS/NZS 2041:1998	<i>Buried corrugated metal structures</i>
AS/NZS 4455.1	<i>Masonry units, pavers, flags and segmental retaining wall units – Masonry units</i>
AS/NZS 4671	<i>Steel reinforcing materials</i>
AS/NZS 4680	<i>Hot-dipped galvanised (zinc) coatings on fabricated ferrous articles</i>
MRTS01	<i>Introduction to Technical Specifications</i>
MRTS04	<i>General Earthworks</i>
MRTS05	<i>Unbound Pavements</i>
MRTS06	<i>Reinforced Soil Structures</i>
MRTS24	<i>Manufacture of Precast Concrete Culverts</i>
MRTS25	<i>Manufacture of Precast Concrete Pipes</i>
MRTS26	<i>Manufacture of Fibre Reinforced Concrete Drainage Pipes</i>
MRTS27	<i>Geotextiles (Separation and Filtration)</i>
MRTS30	<i>Asphalt Pavements</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS70	<i>Concrete</i>

Reference	Title
MRTS71	<i>Reinforcing Steel</i>
MRTS72	<i>Manufacture of Precast Concrete Elements</i>
MRTS77	<i>Bridge Deck</i>
MRTS78	<i>Fabrication of Structural Steelwork</i>
-	<i>TMR Surveying Standards</i>

**Table 3(b) – Referenced departmental Standard Drawings**

Standard Drawing Number	Title
1033	<i>Kerb and channel — Kerbs, channels and ramped vehicular crossing</i>
1116	<i>Subsoil drains - Outlets and cleanouts</i>
1174	<i>R C Box Culverts – Installation of Precast Units and Construction Headwalls – Height = 375 to 600</i>
1303	<i>R C Box Culverts &amp; Slab Link Box Culverts - Construction of Headwalls and Wingwalls – Height &gt; 600</i>
1304	<i>Pipe Culverts – Wingwalls, Headwall and Apron for Pipe Diameter 750 to 2400 – Drawing 1 of 2 to 2 of 2</i>
1305	<i>Pipe Culverts - Headwall and Apron for Pipe Diameter 375 to 675</i>
1307	<i>Access Chamber - Details 1050 to 2100 Dia.</i>
1308	<i>Access Chamber - Roof Slabs 1050 to 2100 Dia.</i>
1313	<i>Concrete Gully - Precast Lintex Details</i>
1316	<i>R C Box Culverts &amp; Slab Link Box Culverts - Installation of Precast Units – Height &gt; 600</i>
1317	<i>R C Box Culverts &amp; Slab Link Box Culverts - Construction of Bases with Nibs and Aprons (all sizes)</i>
1318	<i>R C Box Culverts &amp; Slab Link Box Culverts - Construction of Bases with Recesses and Aprons (all sizes)</i>
1320	<i>R C Box Culverts &amp; Slab Link Box Culverts - Crown Unit Holding Down Anchors</i>
1321	<i>Concrete Gully - Precast Concrete Side Inlet Gully with Precast Shaft</i>
1322	<i>Concrete Gully - Precast Concrete Side Inlet Gully with Cast In Situ Pit</i>
1443	<i>Concrete Gully - Roadway Type Precast Inlet Units on Grade</i>
1444	<i>Concrete Gully - Roadway Type Precast Inlet Units in Sag</i>
2232	<i>Abutment Protection – Type 1 - Rock Spillthrough - Up to 1700 Clearance</i>
2233	<i>Abutment Protection – Type 1 - Rock Spillthrough – Greater Than 1700 Clearance</i>
2234	<i>Abutment Protection – Type 2 - Reinforced Concrete Over Spillthrough - Up to 1700 Clearance</i>
2235	<i>Abutment Protection – Type 2 - Reinforced Concrete Over Spillthrough - Greater Than 1700 Clearance</i>

Standard Drawing Number	Title
2236	<i>Abutment Protection – Type 4 - Rockwork Over Spillthrough - Up to 1700 Clearance</i>
2237	<i>Abutment Protection – Type 4 - Rockwork Over Spillthrough - Greater Than 1700 Clearance</i>
2238	<i>Abutment Protection - Rock Masonry</i>
2241	<i>Abutment Protection – Type 7 - Rock Filled Gabion Protection – Height up to 6 Metres</i>

#### 4 Standard test methods

The Standard test methods listed in Table 4 shall be used in this Technical Specification.

**Table 4 – Standard Test Methods**

Property to be tested	Method No.
Particle size distribution	AS 1141.11.1
Density index	AS 1289.5.5.1 AS 1289.5.6.1
Los Angeles value	AS 1141.23
Particle density on a dry basis	AS 1141.6.1
Apparent particle density	AS 1141.6.1
Point load strength index	AS 4133.4.1
Total weighted loss	AS 1141.24
Water absorption	AS 1141.6.1
California Bearing Ratio (CBR)	Q113C
Compressive strength	AS 1012.8.3 AS 1012.9
Tensile strength – warp and weft	ASTM D5034 and D5035
Porosity	ASTM D737

Further details of test numbers and test descriptions are given in Clause 4 of MRTS01 *Introduction to Technical Specifications*.

#### 5 Quality system requirements

##### 5.1 Hold Points, Witness Points and Milestones

General requirements for Hold Points, Witness Points and Milestones are specified in Clause 5.2 of MRTS01 *Introduction to Technical Specifications*.

The Hold Points, Witness Points and Milestones applicable to this Technical Specification are summarised in Table 5.1.

**Table 5.1 – Hold Points, Witness Points and Milestones**

Clause	Hold Point	Witness Point	Milestone
12.2	1. Bandage cover materials for culvert joints		
12.3.1	2. Approval of Culvert Construction Procedure		
12.3.5	3. Acceptance of CCTV Defect Inspection Report		
12.3.10	4. Backfilling of culverts		
20.5		1. Water flow test in concrete channels	
21.5		2. Water flow test in precast block channels	
23.3	5. Grate placement		
24.3	6. Concrete top slab placement		
25.3	7. Concrete top slab placement		
26.5		3. Water flow test in precast concrete side inlet gullies	
27.4		4. Flushing of sub-soil drains	
29.3.1			Sequence for construction of vertical drains (14 days)
30.2	8. Construction of stone columns		Submission of construction for stone columns (28 days)
44.3.2	9. Grouting of fabric-encased batter protection		
48.2	10. Use of alternative interlocking blocks		Submission of technical details of interlocking blocks (14 days)
49.3	11. Submission of method statement		
51.3	12. Backfilling on concrete retaining wall footing		
55.2	13. Installation of soil nails		Submission of construction procedure for soil nails (14 days)
55.4.4.2	14. Grouting of soil nails		
55.5	15. Acceptance of soil nails		
56.2	16. Installation of passive rock dowels		Submission of construction procedure for passive rock dowels (14 days)

Clause	Hold Point	Witness Point	Milestone
56.4.4.2	17. Grouting of passive rock dowels		
56.5	18. Acceptance of passive rock dowels		
57.2	19. Installation of active rock bolts		Submission of construction procedure for active rock bolts (14 days)
57.4.4.2	20. Grouting of active bolts		
57.6	21. Acceptance of active rock bolts		

## 5.2 Construction procedures

The Contractor shall prepare documented procedures for all construction processes in accordance with Clause 5 of MRTS50 *Specific Quality System Requirements*.

Those construction procedures which are required to be submitted by the Contractor to the Administrator in accordance with Clause 5 of MRTS50 *Specific Quality System Requirements* include those listed in Table 5.2.

**Table 5.2 – Construction procedures**

Clause	Procedure
12.3.1	Culvert construction
30.2	Stone columns
55.4.3	Installation of soil nails
56.4.3	Installation of rock dowels
57.4.3	Installation of rock bolts

## 5.3 Compliance testing

Compliance testing shall be carried out for each lot.

The Contractor shall undertake sufficient tests to ensure that the works comply with the Technical Specifications and requirements of the Contract.

The testing program shall be such that the testing frequencies and number of tests are not less than those required by Clause 5.4.

## 5.4 Testing frequency

The minimum test frequencies and minimum numbers of tests as stated in Clause 1 of Annexure MRTS03.1 shall apply to the construction of work covered by this Technical Specification.

## 6 General material and construction requirements

### 6.1 Concrete and reinforcing steel

Concrete and reinforcing steel shall be in accordance with the requirements of MRTS70 *Concrete* and MRTS71 *Reinforcing Steel* respectively, and with the following requirements:

- a) The minimum characteristic strength of concrete shall be as specified within the drawings.
- b) Construction joints shall be provided only as specified within the drawings and no construction joint specified within the drawings shall be omitted.
- c) Weepholes shall be provided at the locations specified within the drawings and to the details specified. A 300 mm x 300 mm x 150 mm thick 'no-fines' concrete block wrapped with a non-woven geotextile complying with MRTS27 *Geotextiles (Separation and Filtration)* shall be provided and placed or constructed at each weephole.
- d) Where concrete is constructed on ground surfaces or on a foundation bedding, a polythene sheet separator of thickness not less than 100 µm shall be installed between the ground/bedding and the concrete. The separator shall extend not less than 300 mm beyond the concrete. Puncturing or tearing the separator shall be avoided. Should puncturing or tearing occur, the damage shall be repaired prior to concreting. Joints in the separator shall be provided by overlapping the sheets a minimum of 300 mm or by overlapping and taping.
- e) Rock plums may be employed in unreinforced concrete. Individual plums shall not exceed 150 mm dimension. Plums shall not constitute more than 30% of the volume of concrete, and
- f) Concrete shall be cured for the period of time specified for the application and the concrete mix used or, where such time is not specified, for a minimum of seven days.

### 6.2 Cement mortar

Unless otherwise specified, cement mortar shall consist of one part of Type GP cement to three parts of clean sharp sand, with only sufficient water added to form a moist dry-pack material. Materials shall comply with MRTS70 *Concrete*.

### 6.3 Cement grout

Cement grout shall consist of neat cement or neat cement with a plasticised expanding grout admixture (e.g., a methyl-cellulose-based compound used at a rate of 0.2% by weight of cement). Mixing of the admixture with cement shall be in accordance with the manufacturer's recommendations. Cement shall be either Type GP or Type HE in accordance with MRTS70 *Concrete*.

The water-cement ratio of the grout shall not be greater than 0.4.

Where required, the compressive strength of the grout shall be determined using samples cast in 50 mm cube moulds in accordance with AS 1012.8.3 and tested in accordance with AS 1012.9.

### 6.4 Grates, cover and frames

Grates, cover and frames for gullies and access chambers shall:

- a) meet Class D requirements when tested in accordance with AS 3996, and
- b) have a positive mechanical retainer system to stop accidental closure of the grate or cover when in the open position in accordance with the requirements of AS 3996.

Grates located on a road carriageway or bicycle path shall meet bicycle safety requirements in accordance with AS 3996.

### **6.5 Excavation and backfilling**

Excavation and backfilling operations required to be undertaken to construct the work described by this Technical Specification shall be carried out in accordance with the provisions of MRTS04 *General Earthworks*.

### **6.6 Proprietary products**

Where proprietary products are specified within this Technical Specification, the Contractor shall guarantee and, if requested, submit evidence that the product used shall be satisfactory, structurally adequate, durable and safe for the intended purpose, and also complies with the law and applicable Australian Standards.

In particular, any structural (or load bearing) component/product shall be designed to accommodate all temporary and permanent loadings, and the component/product shall be constructed in accordance with that design, certified by a practising Structural Engineer.

A full set of auditable design calculations shall be made available for perusal if requested by the Administrator.

Precast concrete proprietary products shall be cast in accordance with MRTS72 *Manufacture of Precast Concrete Elements* by a registered precaster.

## **7 Geometric tolerances for culverts**

### **7.1 General**

The horizontal and vertical alignments of culverts shall not exhibit noticeable irregularities.

Culverts shall have a positive drainage slope along the whole of their length and, where relevant, shall join neatly to existing structures.

### **7.2 Horizontal tolerances**

The horizontal alignment of culverts shall not vary from the location specified in the drawings by more than  $\pm 100$  mm.

### **7.3 Vertical tolerances**

The invert heights of culverts shall not vary from those specified by more than  $\pm 10$  mm, provided always that nowhere shall the grades of culverts depart from those specified by more than 1% (absolute).

Notwithstanding these tolerances, the minimum thickness of cover over culverts shall nowhere be less than as shown on the drawings. If cover is not shown or if it is not clear, it shall be nowhere less than the following:

- a) 100 mm for concrete box culverts, and cast-in-place concrete slab deck culverts and concrete unitary box culverts if deck wearing surfaces are not specified
- b) 300 mm for concrete pipe culverts, and

- c) 600 mm or diameter or span

6

whichever is the greater for corrugated steel culverts.

## **8 Removal or demolition of culverts and culvert end structures**

### **8.1 General**

Clause 8 applies to the work to be carried out where culverts and culverts end structures are to be removed or demolished under the Contract.

### **8.2 Description**

Culverts and culvert end structures shall be removed or demolished where specified in the drawings. If existing culvert components are to be removed and re-used, they shall be removed and stacked in a manner which avoids damaging the components. Removed components which are not to be salvaged, nor reused, shall be removed from the Site and disposed.

The culvert components listed in Clause 2.1 of Annexure MRTS03.1 are required to be salvaged intact by the Contractor and delivered and stored at the storage site nominated in Clause 2.2 of Annexure MRTS03.1.

Excavations carried out and the void left by the removed culvert or end structure shall be backfilled to reinstate the area to a safe and free draining state.

## **9 Removal / demolition of kerbs and channels and concrete slabs**

### **9.1 General**

Clause 9 applies to the work to be carried out where kerbs and channels and concrete slabs are to be removed or demolished under the Contract.

### **9.2 Description**

Existing kerbs, channels, kerbs and channels, kerb crossings and concrete slabs shall be removed or demolished where specified in the drawings.

No damage shall result to adjacent work.

Where part only of existing kerbs, channels, kerbs and channels, kerb crossings and slabs are to be removed or demolished and new kerbs, channels, kerbs and channels, kerb crossings and slabs are to be joined to the remaining part, removal or demolition operations shall terminate at a joint.

Alternatively, the existing kerb, channel, kerb and channel, kerb crossing or slab shall be sawn to provide a clean joint.

Any resulting excavations shall be backfilled and the surface finished level with the surrounding area.

## **10 Removal / demolition of gullies and access chambers**

### **10.1 General**

Clause 10 applies to the work to be carried out where gullies and access chambers are to be removed or demolished under the Contract.

## 10.2 Description

Gullies and access chambers shall be removed or demolished where specified in the drawings.

Gullies and access chambers shall be removed or demolished in a manner which avoids damaging any adjacent work.

Resulting excavations and voids shall be backfilled and the surface finished level with the surrounding area.

## 11 Supply of precast and preformed culvert and drainage trough components

### 11.1 General

Clause 11 applies to the work to be carried out where precast and preformed culvert and drainage trough components are required to be supplied under the Contract.

Precast and preformed culvert components shall comprise precast pipes, preformed pipes, unitary box units, U-shaped units, lid, base and spanning slabs, plates, couplers, rubber rings, arch channels, bolts, nuts, washers, plugs, dowels and all other fittings necessary for the installation of the components to be provided.

### 11.2 Material requirements

Precast and preformed culvert components shall conform to the following requirements:

- a) Concrete pipe culvert components shall comply with the requirements specified in MRTS25 *Manufacture of Precast Concrete Pipes* or with MRTS26 *Manufacture of Fibre Reinforced Concrete Drainage Pipes*:
  - i. All pipes supplied to MRTS25 of diameter 800 mm or less shall have joints which are spigot and socket with rubber sealing rings. Joints for other sizes shall be as specified on the drawings.
  - ii. All pipes supplied to MRTS26 shall have flexible elastomeric double 'V' ring joints.
- b) Concrete box culvert components and spanning slabs shall comply with MRTS24 *Manufacture of Precast Concrete Culverts*.
- c) Helical lock-seam corrugated steel pipe culvert components shall:
  - i. comply with the requirements specified in AS/NZS 2041.4
  - ii. comply with the requirements of AS 1762, except that Tables A1, A2, A3 and A4 shall be deleted and AS 1762 Appendix C shall be replaced by Table 11.2, and
  - iii. have an allowance for corrosion of 1 mm.

**Table 11.2 – Live load pressure for AS 5100 highway loads**

Depth (m)	Wheel Load Pressure (kPa)	Depth (m)	Wheel Load Pressure (kPa)
0.40	246	2.80	19
0.60	129	3.00	18
0.80	78	3.20	17
1.00	52	3.40	17

Depth (m)	Wheel Load Pressure (kPa)	Depth (m)	Wheel Load Pressure (kPa)
1.20	39	3.60	16
1.40	30	3.80	16
1.60	24	4.00	15
1.80	23	4.20	15
2.00	22	4.40	14
2.20	21	4.60	14
2.40	20	4.80	13
2.60	19	5.00	13

- d) Nestable corrugated steel pipe culvert components and multiple plate corrugated steel pipe or pipe-arch or arch culvert components shall:
- i. comply with the requirements specified in AS/NZS 2041, except that Appendix E shall be deleted and AS/NZS 2041 Appendix G shall be replaced by Table 11.2, and
  - ii. have an allowance for corrosion of 1 mm.
- e) Helical lock-seam corrugated aluminium pipe culvert components shall comply with the requirements stated in Clause 3.1 of Annexure MRTS03.1 or, where not so stated, shall be subject to prior approval by the Administrator.

The culvert component size, class and/or wall thickness shall be as specified in the drawings.

The design height of fill above box culverts shall be as specified in the drawings or in Clause 3.2 of Annexure MRTS03.1.

## 12 Installation of precast and preformed culvert components

### 12.1 General

Clause 12 applies to the work to be carried out where precast and preformed culvert components are required to be installed under the Contract.

### 12.2 Material requirements

Bandage covers shall be a suitable proprietary product consisting of:

- a) a synthetic woven or non-woven fabric factory impregnated with a rubberised bitumen or a neutral petroleum based compound, or
- b) plastic or natural rubber bands.

Woven or non-woven fabrics shall have the following properties:

- a) grab tensile strength not less than 300 N (50 mm wide strip)
- b) thickness not less than 1.25 mm, and
- c) mass not less than 1.4 kg/m<sup>2</sup>.

Plastic and natural rubber bands shall have properties appropriate to the sealing requirements and shall be to the approval of the manufacturer of the culvert components concerned.

Samples of the materials to be used as bandage covers shall be made available for inspection by the Administrator prior to commencement of installation. **Hold Point 1**

Concrete in end blocks shall comply with Clause 6.1, except that the maximum aggregate size shall not exceed 9.5 mm.

Concrete infill material shall consist of one part of Type GP cement to 10 parts aggregate (loose volume). The maximum aggregate size shall be 9.5 mm.

Lean Mix concrete shall have one part of Type GP cement to 10 parts aggregate, loose volume.

Holding down anchors shall comply with the details shown on the Standard Drawings.

### **12.3 Construction**

#### **12.3.1 General**

Prior to construction, the construction loads which shall be placed on the culvert by the proposed construction procedure and equipment shall be checked. If the culvert is to be installed prior to the age at which the nominal concrete strength is achieved, the check shall account for the actual strength of the concrete at the time of construction. If necessary, a culvert with a higher class of concrete shall be substituted. Construction of culverts shall not commence until the check of the construction procedure has been carried out. For concrete pipe culverts, refer to Clause 12.3.5 for additional requirements for constructions loads. **Hold Point 2**

Precast and / or preformed culvert components shall be installed in the locations and in accordance with the details shown in the drawings.

The drainage structure shall be set out in accordance with the details shown in the drawings. The provisions of Clause 9 of MRTS01 *Introduction to Technical Specifications* apply to the set out procedure.

Excavations shall be carried out in accordance with Clause 13 of MRTS04 *General Earthworks*.

Concrete shall comply with the requirements specified in Clause 6.1. Where corrugated steel culvert components are installed, the invert heights specified are the levels of the tops of the corrugations.

All drainage structures shall be marked with indelible ink on the inside face with the name of the Manufacturer and month and year of manufacture.

#### **12.3.2 Bedding of culvert components**

Foundation bedding and haunch zone materials shall be placed in accordance with Clause 19 of MRTS04 *General Earthworks*.

The foundation bedding shall provide continuous, even support to the culvert components.

#### **12.3.3 Assembling culvert components**

Culvert components shall be assembled in accordance with the manufacturer's drawings and recommendations as relevant.

Where corrugated steel pipe culvert components are employed, circumferential joints shall be staggered and longitudinal joints shall be horizontally opposed.

Where multiple plate corrugated steel arch culvert components are employed, the arch channels shall be filled with cement mortar after the arch has been assembled. The top surface of the mortar filling shall be sloped such that water shall not pond in the arch channel or against the arch.

#### 12.3.4 Laying and jointing culvert components

Where possible, laying of culvert components shall commence at the outlet end of the culvert and progress to the inlet end.

Components shall be selected and arranged to give best fit.

The ends of components shall be free of any foreign matter at the time of jointing.

In butt and flush joints, the culvert components shall abut one another and a bandage cover shall be installed on the outer surfaces to seal the joints.

Unless a specific type of bandage cover is specified in the drawings, the bandage cover shall consist of:

- a) one layer of non-woven fabric
- b) three layers of woven fabric, or
- c) a plastic or natural rubber band.

Fabric covers shall have a width sufficient to overlap adjacent components by not less than 45 mm, and shall not be applied until the ambient temperature exceeds 15°C. Fabric covers shall not be wrinkled and shall adhere to the outer surfaces of the adjacent components. The ends of the fabric in the covers shall be secured in accordance with the manufacturer's recommendations.

Plastic or natural rubber covers shall be installed in accordance with the manufacturer's recommendations.

Bandage covers are not required for legs of adjacent culverts in multiple installations where the joint is infilled with concrete.

#### 12.3.5 Special requirements for concrete pipe culvert components

Construction and installation loading shall comply with the requirements specified in MRTS25 *Manufacture of Precast Concrete Pipes* or MRTS26 *Manufacture of Fibre Reinforced Concrete Drainage Pipes* and associated annexures as appropriate.

Where spigot and socket joints are used, the thickness of bedding material under each socket shall not be less than 50 mm.

Pipes shall be placed with their external grooved ends or spigot ends facing the culvert outlet.

Where the word 'TOP' is marked on pipes or where lifting holes are provided, the pipes shall be laid with the word / hole uppermost. Lifting holes shall be plugged or otherwise closed off in accordance with the manufacturer's instructions after the pipe is installed.

Spigot and socket joints shall be made using the appropriate rubber rings.

At the completion of the pipe installation, including placement and compaction of fill to the final specified fill height, the contractor shall undertake a CCTV defect inspection with WNCAN report to demonstrate that the completed pipe installation is acceptable to the department and that the pipes are correctly installed and are free of Defect Types 2,3,5, 6 and 7 as defined in MRTS25 *Manufacture of Precast Concrete Pipes* for Steel Reinforced Concrete Pipes and free of cracks and joint damage for Fibre Reinforced Concrete Drainage Pipes. Acceptance of this report by the Administrator shall be a **Hold Point 3**

### 12.3.6 Special requirements for concrete box culvert components

Box culvert components shall generally be installed in accordance with the details shown on Standard Drawing 1316.

U-shaped units supplied with precast lid/base slabs shall be installed as follows:

- a) units laid in the 'legs up' position shall be placed directly on a foundation bedding. The lid slabs shall be seated onto the tops of the legs using continuous cement mortar pads, and
- b) units laid in the 'legs down' position on base slabs shall be seated onto the slabs using continuous cement mortar pads. The base slabs shall be placed directly on a foundation bedding.

U-shaped units laid in the 'legs down' position on cast-in-place concrete bases shall be seated on to the bases using continuous cement mortar pads. Where specified, holding down anchors shall also be installed to retain the units in position in accordance with the details shown on Standard Drawing 1320.

Corrodible lifting lugs shall be cut off close to the unit. The exposed ends of the embedded portions of the lug shall be given two coats of a surface tolerant epoxy.

Where spanning slabs are installed, locating dowels shall be installed in the tops of the units and the spanning slabs shall be seated on continuous cement mortar pads on adjacent unit — all as shown on the Standard Drawing. All surplus mortar shall be removed from the installation before the mortar hardens.

In multiple cell culverts, the gaps between lines of installed cells shall be a minimum of 40 mm wide and filled as follows:

- a) Concrete end blocks extending not less than 250 mm along the gap shall be constructed to full height at each end of the culvert. Headwall anchor bars shall be installed in the end blocks as specified in the Standard Drawings, and
- b) After the end blocks have hardened, the remaining gaps between the cells shall be dry packed with concrete infill material.

Where spanning slabs are installed, the space between slabs shall be filled with lean mix concrete. No other backfilling material shall be placed over the culvert for 24 hours after the placement of the lean mix concrete.

### 12.3.7 Special requirements for corrugated steel culvert components

Thrust beams and ring beams shall be constructed in accordance with the manufacturer's drawings and recommendations as relevant.

### 12.3.8 Special requirements for corrugated pipe, pipe-arch and arch culverts

The deformation limits specified in MRTS04 *General Earthworks* shall be strictly adhered to during installation and backfilling operations.

### 12.3.9 Cutting culvert components

Cutting operations shall provide neat end surfaces.

The cut surfaces of reinforced concrete culvert components shall be given two coats of a surface tolerant epoxy.

The cut surfaces of steel culvert components shall be given two coats of zinc-rich organic priming paint as specified in AS 3750.9. The coats shall have a combined thickness at least equivalent to the thickness of the galvanised coating. Each coat shall overlap the adjacent uncut surfaces by not less than 25 mm.

#### **12.3.10 Backfilling of culverts**

Backfilling of culverts shall be carried out in accordance with clauses 15 and 20 of MRTS04 *General Earthworks*.

Backfilling of culverts shall not commence until all the conformance and As Constructed Survey requirements have been met and notice of such works provided to the Administrator. **Hold Point 4**

### **13 Installation of precast and preformed drainage trough components**

#### **13.1 General**

Clause 13 applies to the installation of precast and preformed drainage trough components.

#### **13.2 Material requirements**

Bandage covers shall be a synthetic woven or non-woven fabric as specified in Clause 12.2.

#### **13.3 Construction**

##### **13.3.1 General**

Precast and/or preformed culvert components shall be installed in the locations and in accordance with the details specified in the drawings.

Excavations shall be carried out in accordance with Clause 13 of MRTS04 *General Earthworks*.

Where corrugated steel drainage trough components are installed, the invert heights specified are the levels of the tops of the corrugations.

All drainage structures shall be marked with indelible ink on the inside face with the name of the Manufacturer and month and year of manufacture.

##### **13.3.2 Bedding of drainage trough components**

Foundation bedding materials shall be placed in accordance with Clause 19 of MRTS04 *General Earthworks*.

The foundation bedding shall provide continuous, even support to the drainage trough components.

##### **13.3.3 Assembling drainage trough components**

Drainage trough components shall be assembled in accordance with the manufacturer's drawings and recommendations.

##### **13.3.4 Laying and jointing drainage trough components**

Drainage trough components shall be laid with the tops flush with the finished batter.

Laying of drainage trough components shall commence at the outlet end of the trough and progress to the inlet end. Where necessary, components shall be selected and arranged to give satisfactory fit.

The ends of components shall be free of any foreign matter at the time of jointing. When butt and flush joints are specified, the drainage trough components shall abut one another.

Bandage covers shall be applied to the outer surfaces of butt and flush joints. Bandage covers shall consist of:

- a) one layer of non-woven fabric, or
- b) three layers of woven fabric.

Fabric covers shall have a width sufficient to overlap adjacent components by not less than 45 mm and shall not be applied until the ambient temperature exceeds 15°C. Fabric covers shall not be wrinkled and shall adhere to the outer surfaces of the adjacent components. The ends of the fabric in the covers shall be secured in accordance with the manufacturer's recommendations.

### **13.3.5 Cutting drainage trough components**

Cutting operations shall provide neat end surfaces.

The cut surfaces of concrete drainage trough components shall be given two coats of a surface tolerant epoxy.

The cut surfaces of corrugated steel drainage trough components shall be given two coats of zinc-rich organic priming paint as specified in AS 3750.9. The coats shall have a combined thickness at least equivalent to the galvanised coating thickness. Each coat shall overlap adjacent uncut surfaces by not less than 25 mm.

### **13.3.6 Installing holding down anchors**

Holding down anchors shall be installed in accordance with the requirements specified in the Standard Drawings and the manufacturer's recommendations as relevant.

## **14 Installation of precast pipe culvert components using jacking methods**

### **14.1 General**

Clause 14 applies to the installation of precast pipe culvert components using jacking methods.

### **14.2 Material requirements**

Concrete pipes installed using jacking methods shall be Class 4 with suitable joints designed by the manufacturer.

Cement mortar shall comply with Clause 6.2.

### **14.3 Construction**

Pipe jacking shall be carried out in the locations specified by, and in accordance with, the drawings.

Pipe jacking shall be carried out only by experienced personnel.

Jacking operations shall comply with the pipe manufacturer's recommendations.

Jacking operations shall proceed with care so as to cause no damage to the pipes.

The location of any existing underground services shall be established prior to commencement of jacking operations and all reasonable care shall be taken not to damage such services or any adjacent work.

Pipe joints shall be sealed with cement mortar after installation of the pipes.

All drainage structures shall be marked with indelible ink on the inside face, with the name of the Manufacturer and month and year of manufacture.

## **15 Supply and installation of precast and preformed culvert and drainage trough components**

### **15.1 General**

Clause 15 applies to the work to be carried out where precast and preformed culvert and drainage trough components are required to be supplied and installed under the Contract.

### **15.2 Materials**

Materials shall conform to the relevant requirements of Clauses 11.2, 12.2, 13.2 and 14.2 as appropriate.

Where one type of pipe is detailed on the drawings and the Contractor proposes to use an alternative, the Contractor shall ensure that all details are amended to be compatible and that as-constructed drawings are prepared and submitted to the Administrator.

### **15.3 Construction**

Construction shall conform to the relevant requirements of Clauses 12.3, 13.3 and 14.3, as appropriate.

## **16 Concrete end plugs for existing culverts**

### **16.1 General**

Clause 16 applies to the provision of concrete end plugs for existing culverts.

### **16.2 Construction**

Concrete end plugs shall be used to seal off existing culverts that are to be taken out of service, but not removed or demolished.

Concrete end plugs for culverts shall be constructed in the locations and in accordance with the details shown on the drawings.

Concrete shall comply with Clause 6.1.

The thickness of the plugs shall be not less than 500 mm. The plugs shall completely seal the ends of the culverts.

## **17 Insitu concrete culvert components**

### **17.1 General**

Clause 17 applies to construction of situ concrete culvert components.

### **17.2 Material requirements**

Concrete shall comply with Clause 6.1.

Galvanised arch channels with integral arches shall be approved proprietary products.

### **17.3 Construction**

#### **17.3.1 General**

Cast-in-place culvert components shall be constructed in the locations specified by, and in accordance with, the drawings. If not specifically detailed in the drawings, box culvert bases shall be constructed in accordance with the details shown on Standard Drawings 1317 and 1318.

Where insitu material on or against which culvert bases or footings are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Cast-in-place concrete bases, footings, infill floors, abutments, piers and unitary box culverts may be constructed without a foundation bedding unless specified otherwise in the drawings.

Concrete work shall comply with Clause 6.1.

Construction of bases, footings, infill floors, abutments and piers, and unitary box culverts shall include the construction of nibs and integral cut-off walls.

### **17.3.2 Special requirements for slab deck culverts**

Construction of bases and footings shall include the provision and installation of embedded dowel bars for abutments and piers. Construction of abutments and piers shall include the provision and installation of embedded dowel bars for slab decks and kerbs. Slab decks and kerbs shall be constructed monolithically.

### **17.3.3 Special requirement for corrugated steel arch culverts**

Construction of abutments and piers shall include the supply and installation of galvanised arch channels (with integral anchorages).

## **18 End structures to culverts**

### **18.1 General**

Clause 18 applies to end structures to culverts.

### **18.2 Material requirements**

Concrete shall comply with Clause 6.1.

Steel Reinforcement shall comply with MRTS71 *Reinforcing Steel*.

Material for rock masonry shall comply with Clause 39.

Materials for concrete masonry shall comply with Clause 51.

Materials for grouted rock pitching shall comply with Clause 40.

Materials for steel-wire mattresses shall comply with Clause 43.

### **18.3 Construction**

Cast, formed-in-place endwalls and wingwalls, aprons, and kerbs to culverts shall be provided in the locations specified in the drawings. Unless otherwise specified in the drawings, cast-in-place concrete end structures to culverts shall comply with the details shown on Standard Drawings 1174, 1303, 1304, 1305, 1317, 1318 and 1319 as applicable.

Where insitu material on or against which structures are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete shall be constructed to comply with Clause 6.1.

The construction of rock masonry shall comply with Clause 39.

The construction of concrete masonry shall comply with Clause 51.

The construction of grouted rock pitching shall comply with Clause 40.

The construction of steel-wire mattresses shall comply with Clause 43.

Endwalls, wingwalls and concrete aprons may be constructed without a foundation bedding.

Endwalls and wingwalls shall be formed monolithically.

Construction of endwalls and wingwalls shall include the construction of integral cutoff walls where relevant.

Construction of aprons shall include the construction of integral cut-off walls, the construction of integral energy dissipaters if specified and the installation of dowel bars.

Rock masonry endwalls and wingwalls shall be capped with a cement mortar coping not less than 25 mm thick. The coping shall be trowelled to provide smooth, even surfaces with neat edges.

## **19 Precast concrete end structures to culverts**

### **19.1 General**

Clause 19 applies to the provision of precast concrete end structures for culverts.

### **19.2 Material requirements**

Precast concrete end structures shall be proprietary products manufactured in accordance with Clause 6.6.

Cement mortar shall comply with Clause 6.2.

### **19.3 Construction**

Precast concrete end structures to culverts shall be installed in the locations and in accordance with the drawings.

Where insitu material on or against which end structures are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

End structures shall be laid on a foundation bedding which provides continuous even support to the structures.

The joints between end structures and culverts shall be filled with cement mortar. The joint areas shall be thoroughly cleaned and wetted just prior to filling. All joints shall be finished smooth and uniform with the surfaces of the end structures.

Any holes and recesses provided in end structures to assist installation shall be neatly plugged or filled with cement mortar.

Mortared joints and filled holes and recesses shall be cured for a period of not less than 48 hours. Backfilling operations against end structures shall not be carried out during the curing period.

## **20 Cast-in-place concrete kerb, channel, and kerb and channel**

### **20.1 General**

Clause 20 applies to the provision of cast-in-place concrete kerb, channel and kerb and channel. The Clause does not apply to kerbs cast integrally with structures.

## 20.2 Material

Concrete shall comply with Clause 6.1.

Compressible packing shall be bitumen impregnated fibre board or other suitable packing.

## 20.3 Construction

Cast-in-place concrete kerb, channel, and kerb and channel, including kerb crossings, shall be provided in the locations specified in the drawings and in accordance with Standard Drawing 1033.

Where insitu material on or against which kerbs or channels are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*. The ground surface shall be moistened just prior to placing concrete.

Manually-placed concrete shall be in accordance with Clause 6.1. Exposed surfaces shall have a steel-trowelled finish.

Where kerb, channel and/or kerb and channel is constructed by an extrusion process, concrete shall comply with the prescription ordering requirements specified in AS 1379, with a maximum aggregate size not exceeding 20 mm and a minimum of 320 kg of cement per cubic metre of concrete. The extrusion machine shall be fitted with a tamper and an automatic control which allows adjustment of the position of the forming mould while the machine is in operation.

The horizontal and vertical alignments of kerb, channel and/or kerb and channel shall be controlled by means of a sensor working to a control line. The finished kerb, channel and/or kerb and channel shall be well compacted and shall have exposed surfaces free from voids and honeycombing.

Expansion joints shall be installed at regular intervals not exceeding 20 m. The joints shall be constructed by installing 6 mm maximum thickness compressible packing in the full cross-section of the kerb, channel and/or kerb and channel. Where relevant, joints shall be located to line up with expansion joints in adjacent structures.

Contraction joints between expansion joints shall be installed at regular intervals not exceeding 5 m. The joints shall be constructed by forming grooves 40 mm deep and not more than 6 mm wide in all exposed surfaces of the kerb, channel and/or kerb and channel. All grooves shall be normal to the top surface and square to the alignments of the kerb, channel and/or kerb and channel.

Concrete shall be cured for a period not less than seven days before any other roadworks operations are carried out adjacent to the kerb, channel or kerb and channel.

## 20.4 Tolerances

The horizontal and vertical alignments of kerb, channel and/or kerb and channel shall not vary from those specified by more than  $\pm 10$  mm.

Notwithstanding the above tolerances, the alignments of the kerb, channel and/or kerb and channel shall have smooth lines. The overall dimensions of the kerb, channel and/or kerb and channel shall nowhere be less than that specified in the drawings.

## 20.5 Water test

Where the longitudinal grade of channels is less than 1%, a test shall be carried out by discharging water into the channel to check uniformity of flow along the channel. After the flow has ceased, water shall not pond to a depth of more than 5 mm in any section of the channel. The test shall be carried out as soon as possible after the concrete in the channel has hardened. **Witness Point 1**

## **21 Precast concrete kerb, channel, and kerb and channel blocks**

### **21.1 General**

Clause 21 applies to the provision of precast concrete kerb, channel and kerb and channel blocks.

### **21.2 Material**

Precast concrete kerb blocks and channel blocks shall be proprietary products manufactured in accordance with Clause 6.6.

Blocks installed on a horizontal alignment of radius 12 m or less shall be precast to the required radius or shall be straight blocks of dimensions which ensure the jointing requirements specified herein are complied with. Where blocks are precast to a radius, each shall be clearly marked to indicate its radius.

Epoxy adhesion agent shall be a suitable proprietary product.

Cement mortar shall comply with Clause 6.2.

### **21.3 Construction**

Precast concrete kerb, channel and kerb and channel blocks shall be installed in the locations specified by, and in accordance with, the drawings.

Where insitu material on or against which precast blocks are to be installed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Where kerb, channel and kerb and channel blocks are to be fixed to the surface of asphalt or concrete, epoxy adhesion agent shall be employed. The epoxy adhesion agent shall be spread evenly over the whole of the contact surfaces.

Kerb, channel and kerb and channel blocks shall be laid on bedding of minimum thickness 50 mm.

Kerb, channel and kerb and channel blocks shall have watertight cement mortar joints. Cement mortar shall be used within one hour of mixing and shall not be re-tempered.

The joints shall be finished to give smooth surfaces uniform with the surfaces of the blocks. The thickness of joints shall not be less than 7 mm or greater than 13 mm. Exposed surfaces of blocks shall be cleaned of cement mortar coating as soon as possible after the joint mortar has hardened. No roadworks operations shall be carried out adjacent to the kerb, channel and kerb and channel blocks until 48 hours after its construction.

### **21.4 Tolerances**

The tolerances for the finished work shall be as specified in Clause 20.4.

### **21.5 Water test**

A water test as specified in Clause 20.5 shall be carried out on completed channel and kerb and channel blocks. **Witness Point 2**

## **22 Shoulder dykes**

### **22.1 General**

Clause 22 applies to the provision of shoulder dykes.

## **22.2 Material requirements**

Compressible packing shall be bitumen impregnated fibre board or other equivalent packing.

Concrete shall comply with Clause 6.1.

Cement mortar shall comply with Clause 6.2.

Asphalt shall comply with MRTS30 *Asphalt Pavements*.

## **22.3 Construction**

### **22.3.1 General**

Shoulder dykes shall be constructed in the locations specified by, and in accordance with, the drawings.

### **22.3.2 Concrete shoulder dykes**

Concrete shall comply with Clause 6.1.

The surface on which shoulder dykes are to be constructed shall be moistened just prior to placing concrete. Exposed surfaces shall have a steel-trowelled finish.

Where shoulder dykes are constructed by an extrusion process, the extrusion machine shall be fitted with a tamper and an automatic control which allows adjustment of position of the forming mould while the machine is in operation. The horizontal and vertical alignments of shoulder dykes shall be controlled by means of a sensor working to a control line. The finished shoulder dykes shall be well compacted and shall have exposed surfaces free from voids and honeycombing.

Expansion joints shall be installed at regular intervals not exceeding 20 m. The joints shall be constructed by installing 6 mm maximum thickness compressible packing in the full cross-section of the shoulder dykes.

Contraction joints between expansion joints shall be installed at regular intervals not exceeding 5 m. The joints shall be constructed by forming grooves 40 mm deep and not more than 6 mm wide in all exposed surfaces of the shoulder dykes. All grooves shall be normal to the top surface and square to the alignments of the shoulder dykes.

Concrete shall be cured for a period appropriate to the concrete mix and its application, but not less than seven days before any other roadwork operations are carried out adjacent to the shoulder dykes.

## **22.4 Asphalt shoulder dykes**

Asphalt shoulder dykes shall comply with MRTS30 *Asphalt Pavements*.

### **22.4.1 Precast concrete block shoulder dykes**

Precast concrete block shoulder dykes shall be in accordance with Clause 22.

## **22.5 Tolerances**

The horizontal and vertical alignments of shoulder dykes shall not vary from those specified by more than  $\pm 10$  mm. Notwithstanding the above tolerances, the alignments of shoulder dykes shall have smooth lines. The overall dimensions of shoulder dykes shall nowhere be less than those specified.

## 23 Concrete gullies

### 23.1 General

Clause 23 applies to the provision of concrete gullies.

### 23.2 Material requirements

Concrete shall comply with Clause 6.1.

Cement mortar shall comply with Clause 6.2.

Precast concrete back-units for gullies shall be proprietary products manufactured in accordance with Clause 6.6.

Grates, covers and frames shall be reinforced concrete, mild steel or cast iron as specified in the drawings and/or Standard Drawings and shall comply with Clause 6.4.

Mild steel components shall comply with MRTS78 *Fabrication of Structural Steelwork*. Mild steel components shall be hot-dipped galvanised in accordance with AS/NZS 4380.

Cast iron components shall be fabricated from cast iron, grade T200 and shall comply with AS 1830.

### 23.3 Construction

Concrete gullies shall be provided in the locations specified by, and in accordance with, the drawings.

Where insitu material on or against which gullies are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete shall be in accordance with Clause 6.1.

Where the sides of excavations are in solid ground, the gully pits may be constructed without the use of backforms and concrete may be placed against the insitu material.

Where shafts are constructed without the use of backforms, the specified wall thickness shall be increased by not less than 25 mm to provide additional cover to reinforcement.

The joints between gullies and culverts shall be made watertight using cement mortar. The mortar shall be used within one hour of mixing and shall not be re-tempered. The joints shall be finished to provide smooth surfaces, uniform with the inner surfaces of the gullies.

Where backforms are used, they shall be removed and backfilling shall be undertaken in accordance with MRTS04 *General Earthworks*.

Concrete back-units and frames shall be joined to gullies using cement mortar. Exposed concrete surfaces shall be cleaned free of any cement mortar.

Grates and frames shall be installed as specified in the drawings and/or Standard Drawings.

Grates on gullies shall not be installed until all the surveying requirements have been met as specified in Clause 59 and notice of such works provided to the Administrator. **Hold Point 5**

## **23.4 Tolerances**

### **23.4.1 Horizontal tolerances**

The locations of gullies shall not vary from those specified in the drawings by more than  $\pm 100$  mm in the direction of the construction centre line and  $\pm 50$  mm in the direction at right angles to the construction centre line.

### **23.4.2 Vertical tolerances**

The invert heights of gullies shall not vary from those specified by the drawings by more than  $\pm 50$  mm, provided always that the gullies join neatly to existing drainage structures, do not pond water unnecessarily and are at heights compatible with other adjacent structures. The heights of the tops of back-units, grates and frames shall not vary from those described in the drawings by more than  $\pm 10$  mm.

## **24 Insitu concrete access chambers**

### **24.1 General**

Clause 24 applies to the provision of access chambers.

### **24.2 Materials requirements**

Concrete shall comply with Clause 6.1.

Cement mortar shall comply with Clause 6.2.

Step irons shall be heavily galvanised mild steel bars. Mild steel bars shall comply with AS/NZS 4671 and the step irons shall be galvanised in accordance with the requirements specified in AS/NZS 4680. The average coating mass shall be not less than  $600 \text{ g/m}^2$ .

Covers and frames shall be manufactured from cast iron, grade T200 and shall comply with AS 1830 and Clause 6.4 of this Technical Specification.

Precast components shall be in accordance with Standard Drawings 1307 and 1308.

Precast surrounds shall be proprietary products manufactured in accordance with Clause 6.6.

Epoxy mortar shall be a proprietary product.

### **24.3 Construction**

Cast-in-place concrete access chambers shall be provided in the locations specified in, and in accordance with, the drawings.

Where insitu material on or against which access chambers are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete shall be in accordance with Clause 6.1.

Where the sides of excavations are in solid ground, the access chamber shafts may be constructed without the use of backforms. Where concrete is placed without the use of backforms, the specified wall thicknesses shall be increased by not less than 25 mm to provide additional cover to reinforcement.

The joints between access chambers and pipes shall be made watertight using cement mortar. The mortar shall be used within one hour of mixing and shall not be re-tempered. The joints shall be finished to provide smooth surfaces, uniform with the inner surfaces of the access chambers.

Concrete benching shall be shaped to the shapes specified by the drawings and/or Standard Drawings and shall have smooth, even surfaces and neat edges. Step irons shall be installed horizontal, vertically in line, and shall project uniformly from shafts.

Where step irons are not cast-in-place, they shall be epoxy mortared into drilled holes. The joints between the step irons and the shafts shall be completely filled so that the step irons are held rigid and the joints are watertight.

Concrete top slabs shall be joined to the shafts using cement mortar or epoxy mortar.

The opening in the top slab shall be closed with temporary covers, after which excavations shall be backfilled. Backfilling shall be undertaken in accordance with MRTS04 *General Earthworks*.

Frames shall be joined to the top slabs using cement mortar or epoxy mortar. Close-fitting units shall employ epoxy mortared joints only.

Cast insitu concrete surrounds shall be constructed on the top slabs to encase the frames. Alternatively, precast concrete surrounds may be installed using epoxy mortared joints.

Covers shall be installed in the frames.

For access chambers in roadworks, temporary covers shall remain in position and installation of the frames and surrounds shall be deferred until pavement construction has reached a stage where the frames and surrounds can be positioned accurately.

Concrete top slabs on insitu concrete access chambers shall not be placed until all the surveying requirements have been met as specified in Clause 59 and notice of such works provided to the Administrator. **Hold Point 6**

#### **24.4 Tolerances**

##### **24.4.1 Horizontal tolerances**

The locations of access chambers shall not vary from those specified in the drawings by more than  $\pm 100$  mm.

##### **24.4.2 Vertical tolerances**

The invert heights of access chambers shall not vary from those specified in the drawings by more than  $\pm 50$  mm, provided that the access chambers join neatly to existing drainage structures and are at heights compatible with other adjacent structures.

The heights of the tops of frames, surrounds and covers shall not vary from those specified in the drawings by more than  $\pm 10$  mm.

### **25 Precast concrete access chambers**

#### **25.1 General**

Clause 25 applies to the provision of precast concrete access chambers.

#### **25.2 Material requirements**

Concrete shall comply with Clause 6.1.

Cement mortar shall comply with Clause 6.2.

Precast concrete access chambers shall be proprietary products manufactured in accordance with Clause 6.6.

Step irons shall be as specified in Clause 24.2.

Covers and frames shall be as specified in Clause 24.2.

Epoxy mortar shall be a suitable proprietary product.

### **25.3 Construction**

Precast concrete access chambers shall be installed in the locations and in accordance with the drawings.

Where insitu material on or against which access chambers are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Foundation bedding material shall be placed to provide continuous even support for the access chamber.

Concrete shall be in accordance with Clause 6.1.

Bases shall be of thickness not less than 150 mm and shall extend not less than 150 mm radially beyond the outside of the precast access chamber shafts.

The lowest precast concrete shaft section of the access chamber shall be bedded in the concrete base before the concrete in the base sets.

Openings for culverts shall be cored out of the shaft sections during manufacture or carefully broken out to avoid shaft fractures.

Minimum gaps of 25 mm shall be provided all around between connecting culverts and shaft sections.

Culverts shall be joined to shafts to form watertight joints using cement mortar. Cement mortar shall be used within one hour of mixing and shall not be re-tempered. The joints shall be finished to give smooth surfaces which are uniform with the surfaces of the shafts.

Concrete benching shall be shaped as specified in the drawings and/or Standard Drawings and shall have smooth, even surfaces and neat edges.

Precast concrete shaft sections shall be sealed with an epoxy compound in accordance with the manufacturer's instructions to produce watertight joints. The joints shall be pointed from the inside.

Step irons shall be horizontal, vertically in line and project uniformly from shafts. All holes shall be completely filled with cement mortar or epoxy mortar and all joints neatly pointed so that the step irons are rigid and the joints watertight.

Precast concrete top slabs shall be joined to the shafts using cement mortar or epoxy mortar.

After shafts have been completed and top slabs placed in position and closed with temporary covers, excavations shall be backfilled. Backfilling shall be undertaken in accordance with MRTS04 *General Earthworks*.

Precast concrete adjustment rings shall be joined to top slabs using cement mortar.

Frames shall be joined to adjustment rings using cement mortar or epoxy mortar. Concrete surrounds

shall be constructed on the adjustment rings to encase the frames. Covers shall be installed in the frames.

Temporary covers may be placed on the top slabs and fixing of the adjustment rings, frames and surrounds deferred until pavement construction has reached a stage when the adjustment rings, frames and surrounds can be finished accurately.

Concrete top slabs on precast concrete access chambers shall not be placed until all the surveying requirements have been met as specified in Clause 59 and notice of such works provided to the Administrator. **Hold Point 7**

#### **25.4 Tolerances**

The horizontal and vertical tolerances shall be as specified in Clause 24.4.

### **26 Precast concrete side inlet gullies**

#### **26.1 General**

Clause 26 applies to the provision of precast concrete side inlet gullies.

#### **26.2 Material requirements**

Concrete shall comply with Clause 6.1.

Cement mortar shall comply with Clause 6.2.

Precast concrete side inlet gullies shall be proprietary products manufactured in accordance with Clause 6.6.

Precast concrete side inlet gullies shall be in accordance with Standard Drawings 1313, 1321, 1322, 1443 and 1444 as applicable.

Epoxy mortar shall be a suitable proprietary product.

Dowel pins shall be mild steel of minimum thickness 25 mm and hot-dipped galvanised as per AS/NZS 4680.

Grates and frames shall be in accordance with Standard Drawings 1321 and 1322.

#### **26.3 Construction**

##### **26.3.1 General**

Side inlet gullies shall be provided in the locations specified in the drawings and in accordance with the details shown on Standard Drawings 1321 and 1322.

Where insitu material on or against which gullies are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Foundation bedding material shall be placed to provide continuous even support for the precast gully component.

Concrete shall comply with Clause 6.1.

Concrete benching shall be provided to gullies to the shapes specified in the Standard Drawings and shall have smooth, even surfaces and neat edges.

Culverts shall be joined to shafts/pits to form watertight joints using cement mortar. Cement mortar shall be used within one hour of mixing and shall not be re-tempered. The joints shall be finished to given smooth surfaces which are uniform with the surfaces of the shafts.

A precast concrete gully chamber and converter slab (if required) shall be joined to the shafts/pits using cement mortar or epoxy mortar.

After shafts or pits have been completed and a chamber placed in position and closed with temporary covers, excavations shall be backfilled. Backfilling shall be undertaken in accordance MRTS04 *General Earthworks*.

### **26.3.2 Precast shafts**

The lowest precast concrete shaft section of gullies shall be bedded in the concrete base before the concrete in the base sets.

Openings for culverts shall be cored out of the shaft sections during manufacture or carefully broken out to avoid shaft fractures. Minimum gaps of 25 mm shall be provided all around between connecting culverts and shaft sections.

Joints in precast concrete shaft sections shall be sealed from the inside with an epoxy compound in accordance with the manufacturer's instructions to produce watertight joints.

### **26.4 Tolerances**

The horizontal and vertical alignment of the side inlet gully shall not vary from those specified in the drawings by more than  $\pm 10$  mm.

Notwithstanding the above tolerances, the alignments of the side inlet gully shall have smooth lines.

The overall dimensions of any component shall be nowhere less than that specified on the applicable drawings or Standard Drawings.

### **26.5 Water test**

A water test on a side inlet gully shall be carried out where the longitudinal grade is less than 1%.

Water shall be discharged into the side inlet gully to check uniformity of flow. After the flow has ceased, water shall not pond to a depth of more than 5 mm in any section of the channel.

The test shall be carried out as soon as possible after the concrete in the channel has cured.

### **Witness Point 3**

## **27 Subsoil drains**

### **27.1 General**

Clause 27 applies to the provision of subsoil drains.

### **27.2 Materials requirements**

#### **27.2.1 Drainage pipes**

Drainage pipes (perforated and unperforated) and associated fittings and jointing procedures shall comply with the following requirements:

- a) fibre reinforced concrete pipes – MRTS26 *Manufacture of Fibre Reinforced Concrete Drainage Pipes*

- b) corrugated steel pipes – AS/NZS 2041
- c) PVC pipes – AS/NZS 1254, and
- d) perforated plastic pipes – AS 2439.1.

#### **27.2.2 Strip filter drains**

Notwithstanding requirements to the contrary in this Clause 27.2, strip filter drains shall be a suitable proprietary product, comprising a plastic core of nominal thickness not less than 40 mm, encased by a non-woven geotextile which complies with the provisions of MRTS27 *Geotextiles (Separation and Filtration)*.

The strip filter drain shall permit the passage of high water flows along the drain, and shall have a crush strength not less than 200 kPa.

Textile sleeves shall be either seamless knitted proprietary products or be formed from woven geotextiles. The geotextile material in formed sleeves shall comply with the provisions of MRTS27 *Geotextiles (Separation and Filtration)*.

#### **27.2.3 Geotextiles**

Geotextiles shall be suitable proprietary products and shall comply with MRTS27 *Geotextiles (Separation and Filtration)*.

#### **27.2.4 Trench backfill**

Trench backfill material shall be crushed or granular material which conforms to the grading requirements stated in this clause.

For Type B subsoil drains, backfill material shall consist of a single-sized aggregate of 20 mm or 10 mm particle size, with a maximum of 5% passing the 0.150 mm test sieve.

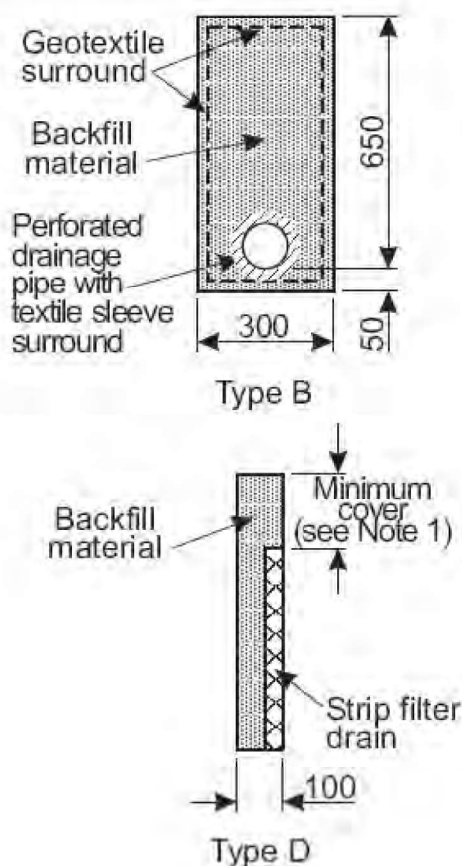
For Type D subsoil drains, backfill material shall consist of coarse sand with 100% of material passing the 4.75 mm test sieve and not greater than 10% passing the 0.300 mm test sieve.

Alternatively, backfill to Type B subsoil drains may consist of no-fines concrete (nominal aggregate size 20 mm) which complies with Clause 26 of MRTS70 *Concrete*.

#### **27.2.5 Concrete**

Concrete shall comply with Clause 6.1.

**Figure 27.2.5 – Subsoil drain types**



**Notes:**

1. Minimum cover for various compactors unless approved otherwise:
  - Hand-held units: 100
  - Units < 15 tonnes: 200
  - Units > 15 tonnes: 300
2. All dimensions are in millimetres.

**27.2.6 Marker posts**

Marker posts shall be tubular steel and comply with the Standard Drawing 1356.

**27.3 Storage of materials**

Storage and handling of textile sleeves and strip filter drains shall be in accordance with the manufacturer's recommendations. The drains shall not be exposed to heat or direct sunlight to the extent that their physical and/or mechanical properties are diminished.

Materials shall not be stored directly on the ground. Storage arrangements shall protect the materials from damage and soiling.

**27.4 Construction**

Subsoil drains shall be constructed in the locations and in accordance with the drawings.

Dimensions shall be in accordance with the requirements specified in Clause 27.2.5.

Subsoil drains shall be installed to the grades specified in the drawings. Where the grades are not specified, the bottom of trenches shall be trimmed to provide not less than 0.5% longitudinal fall

towards outlets for pipe-type drains, and not less than 1% longitudinal fall towards outlets for strip filter-type drains.

Clean-outs shall be located at the heads of all subsoil drains and at subsequent spacings not exceeding 60 m for pipe-type drains and 50 m for strip filter-type drains. Clean-outs shall be constructed in accordance with the details shown on Standard Drawing 1116.

Installation of filter fabric shall comply with MRTS27 *Geotextiles (Separation and Filtration)*.

Where an outlet, inlet, or clean-out pipe passes through the filter fabric, a separate piece of fabric of sufficient size shall be wrapped around the pipe and flared against the main fabric to provide an effective seal.

Subsoil drains shall be joined in accordance with the manufacturer's recommendations. Clean-out pipes shall be joined to the subsoil drains using oblique tee connections. Perforated fibre reinforced concrete and corrugated steel pipes shall be laid with the perforations so aligned as to provide the most efficient water entry.

Trench backfill material used where a textile sleeved drain or a strip filter drain is employed shall be damp when placed in the trench. The material shall be carefully placed in layers not exceeding 200 mm loose thickness and shall be tamped. Trench backfill material used where a geotextile trench surround is employed shall be compacted to achieve effective mechanical interlock between particles.

Where subsoil drains are constructed within the subgrade, they shall extend to the underside of the lowest pavement layer unless specified otherwise in the drawings.

Where subsoil drains are constructed outside the subgrade edge point, the trench backfill material shall be placed to within 150 mm of the ground or finished surface and the remaining 150 mm filled with impervious material compacted as for embankment material in accordance with MRTS04 *General Earthworks*.

Concrete outlets, concrete surrounds, galvanised chicken wire cones, pest-proof flaps, cast iron or PVC caps, grouted rock pitching, and marker posts shall be constructed and/or installed in accordance with Standard Drawing 1116.

Concrete shall comply with Clause 6.1.

Grouted rock pitching shall comply with Clause 40.

Marker posts shall be installed as specified in the drawings.

After the drains are constructed, they shall be flushed out. Flushing shall continue until the outlet water is clean and flows consistently. **Witness Point 4**

No construction equipment shall be permitted to stand or travel directly on completed subsoil drains.

## **28 Sheet or strip filter drains**

### **28.1 General**

Clause 28 applies to the provision of sheet and strip filter drains.

### **28.2 Material requirements**

Sheet filter drains shall be a suitable proprietary product, comprising a plastic core of nominal thickness not less than 18 mm, encased by a non-woven geotextile which complies with MRTS27 *Geotextiles (Separation and Filtration)*.

Strip filter drains shall be a suitable proprietary product, comprising a plastic core of nominal thickness not less than 40 mm, designed to allow the drainage of water along the drain and encased by a non-woven geotextile which complies with MRTS27 *Geotextiles (Separation and Filtration)*.

The plastic core shall permit the passage of high water flows, and shall have a crush strength not less than 200 kPa.

Drainage pipes and fittings and associated joining materials/procedures shall comply with the requirements specified in the following references:

- a) fibre reinforced concrete pipes – MRTS26 *Manufacture of Fibre Reinforced Concrete Drainage Pipes*
- b) corrugated steel pipes – AS/NZS 2041
- c) PVC pipes – AS/NZS 1254, and
- d) perforated plastic pipes – AS 2439.1.

Concrete shall be grade N20/20 in accordance with Clause 6.1.

Marker posts shall be tubular steel and comply with the Standard Drawings.

### **28.3 Storage and handling of materials**

Storage and handling of filter drain materials shall be in accordance with the manufacturer's recommendations. Materials shall not be exposed to heat or direct sunlight to the extent that their physical and/or mechanical properties are diminished.

Materials shall not be stored directly on the ground. The storage arrangements shall protect the materials from damage or soiling.

### **28.4 Construction**

Sheet and/or strip filter drains shall be constructed in the locations and in accordance with the drawings.

Prefabricated sheet and/or strip filter drains and associated pipework shall be installed to the shapes and other requirements specified in the drawings, and fixed in position in accordance with the manufacturer's recommendations.

Sheet and/or strip filter drains shall be installed just ahead of other construction work which follows.

Any tearing or puncturing of the drain material shall be repaired.

Where sheet filter drains are used against structures employing weepholes, the core of the drain shall have cutouts of a size and spacing recommended by the manufacturer. The geotextile shall be left intact over these core cutouts.

Collector pipes shall be constructed to the shapes specified in the drawings and jointed in accordance with the manufacturer's recommendations.

Concrete ends to drainage outlets shall be in accordance with Clause 6.1.

Filling around collection pipes shall be general backfill material in accordance with Clause 20 of MRTS04 *General Earthworks*. Fill material shall be compacted to a relative compaction not less than 97%.

Marker posts shall be installed in accordance with the drawings.

Concrete outlets, concrete surrounds, galvanised chicken-wire cones and pest-proof flaps shall be provided in accordance with Standard Drawing 1116.

## 29 Vertical drains

### 29.1 General

Clause 29 applies to the provision of vertical wick filter and sand drains.

### 29.2 Material requirements

Vertical wick filter drains shall be in accordance with the drawings. Where plastic cores are specified, they shall be 100 mm wide and comprise a regular pattern, encased by a non-woven geotextile complying with MRTS27 *Geotextiles (Separation and Filtration)*. The drains shall have a discharge capacity (flow per unit hydraulic gradient) not less than 150 m<sup>3</sup>/year.

Sand drains shall be natural sand, manufactured sand or a mixture thereof and shall conform to the grading requirements shown in Table 29.2.

**Table 29.2 – Sand drains – Grading**

Test sieve size (mm)	Percent passing by mass
9.5	100
4.75	90–100
2.36	70–100
1.18	50–100
0.6	20–70
0.3	0–40
0.15	0–20
0.075	0–5

### 29.3 Construction

#### 29.3.1 General

Vertical drains shall be constructed in the locations and in accordance with the drawings.

The proposed sequence for construction of the vertical drains shall be submitted to the Administrator for a direction as to its suitability at least 14 days before commencement of the work. **Milestone**

Vertical drains shall be straight, shall provide continuous drainage over the installed lengths, and shall be constructed in a manner which does not disturb the surrounding ground surface.

#### 29.3.2 Special requirements for wick drains

To minimise disturbance of the subsoil, the cross-sectional area of the mandrel shall be as close to that of the drain as possible. As a guide, it is typical for the maximum cross-sectional area to be 65 cm<sup>2</sup>. The mandrel shall also be sufficiently stiff to prevent wobble or deflection during installation.

The mandrel shall incorporate an anchor plate or similar arrangement at the bottom, the dimensions of which shall conform as closely as possible to the dimensions of the mandrel so as to minimise soil disturbance.

Installation techniques requiring driving shall not be used. Jetting techniques shall require the prior written approval of the Administrator. In no circumstances shall alternate raising or lowering of the mandrel during advancement be used. Raising of the mandrel shall be carried out only after completion of installation of a drain.

The rate of mandrel advance shall be controlled to avoid significant bending or deflection from the vertical. Penetration shall be uninterrupted and typical rates are approximately 0.15 m/sec to 0.60 m/sec. Drains shall be anchored and finished in accordance with the manufacturer's recommendations.

Splices in drains shall be made in a manner recommended by the manufacturer. Nevertheless, the jacket and core shall be overlapped a minimum of 150 mm at any splice.

Each installed drain shall not have more than one splice.

Wick drains shall be installed to the toe levels specified in the drawings. 300 mm of wick drain shall be embedded in the drainage blanket, with not less than 50 mm of material surrounding the wick drain.

### **29.3.3 Special requirements for sand drains**

Sand drains may be constructed using displacement or replacement processes and shall be continuous for their full length.

Compaction of sand by vibration, tamping or other methods shall not be carried out.

After construction, the level of sand in the drains shall be monitored. Should the sand drop, the drains shall be topped up with additional sand.

### **29.4 Tolerances**

The locations of drains shall not vary from those specified in the drawings by more than 200 mm.

The departure from verticality of any drain shall not exceed 1 horizontal to 50 vertical. A suitable means of assessing the verticality of the drain installation equipment shall be provided so that verticality may be checked at any time.

The diameter of constructed sand drains shall not vary from those specified by more than + 50 mm or - 20 mm.

## **30 Stone columns**

### **30.1 General**

Clause 30 applies to the provision of stone columns.

### **30.2 Construction procedure**

The construction procedure shall comply with the details shown in the drawings.

The Contractor shall submit to the Administrator the procedure for constructing stone columns no less than 28 days before construction of the stone columns is to commence **Milestone**

The procedure shall include:

- a) details of all materials to be used, including embankment fill in the area immediately above the stone columns, and
- b) details of the method of construction of the stone columns and the equipment to be used.

Construction of stone columns shall not commence until the Administrator has deemed the construction procedure suitable to use **Hold Point 8**

### **30.3 Granular working platform**

#### **30.3.1 Materials**

##### **30.3.1.1 Granular material**

The material for construction of granular working platforms shall be selected fill comprising stone aggregate consisting of sound crushed rock, crushed gravel or uncrushed gravel which is free from dust, clay, vegetable matter and other deleterious materials. It shall be at least a Type 4.5 unbound pavement material as defined in MRTS05 *Unbound Pavements*, with a maximum stone size of 50 mm. Additional properties may apply if stated in the drawings.

##### **30.3.1.2 Geotextile**

The geotextile fabric shall comply with MRTS27 *Geotextiles (Separation and Filtration)*.

##### **30.3.1.3 Reinforcement geosynthetic material**

Any reinforcement geosynthetic material shall comply with the drawings.

#### **30.3.2 Construction**

Where required by the drawings, a granular working platform shall be constructed prior to commencement of construction of the stone columns.

The surface of the entire area on which the granular platform is to be constructed shall be cleared and all objects shall be removed and disposed of.

The geotextile fabric shall be placed over the prepared area in accordance with the provisions of MRTS27 *Geotextiles (Separation and Filtration)*.

Where required by the drawings, a reinforcement geosynthetic material shall also be placed along with the geotextile fabric.

The moisture content of the granular material shall be not less than 85% of optimum moisture content (Standard compaction) and not more than 110% of optimum moisture content (Standard compaction) prior to delivery to the working platform area.

The granular material shall be dumped onto the geotextile in a manner which prevents damage to the geotextile fabric.

The granular material shall be compacted sufficiently to enable movement of construction equipment on its surface. The material shall be trimmed to the depth and profile specified in the drawings.

### **30.4 Stone columns**

#### **30.4.1 Materials**

Stone columns shall be constructed from stone or crushed rock which has particle size distribution (Test Method AS 1141.11.1) in accordance with the grading requirements defined in Table 30.4.1.

**Table 30.4.1 – Grading requirements**

Test sieve size (mm)	Percent passing by mass
75	100
37.5	65–80
19	5–10
9.5	0–5

The stone or rock particles shall have a minimum particle density on a dry basis of 2.70 (Test Method AS 1141.6.1) and a maximum Los Angeles value of 35 (Test Method AS 1141.23).

### 30.4.2 Construction

During construction of the stone columns, the movement of construction equipment over the working platform shall be controlled in a manner which prevents undue distortion or damage to the geotextile fabric.

Columns shall be installed to the levels below existing ground level specified in the drawings.

All stone columns shall be vertical, straight and fully continuous over the full installed length. Columns shall conform to the diameter specified in the drawings.

Compaction to achieve a sound dense column of uniform diameter shall be achieved in a controlled manner. The material in the columns shall be compacted in a controlled manner to achieve a minimum density index of 70% when tested in accordance with Test Methods AS 1289.5.5.1 and AS 1289.5.6.1.

Adequate surface drainage shall be provided to ensure that the Site remains de-watered and safe for construction personnel and equipment. Adjoining areas shall not be contaminated by material displaced during the construction of the stone columns.

Immediately following completion of the stone columns, the surface shall be trimmed, cleaned and repaired as necessary without soil contamination of the stone columns. All mud, contaminated fill or aggregate, or other foreign material which has resulted from the process of construction of the stone columns, or associated activities, shall be removed. The surface shall be trimmed generally in accordance with the profile specified in the drawings. Undulations in the surface of the working platform shall be trimmed.

### 30.4.3 Tolerances

The position of the centreline of any individual column shall be within 200 mm of the set out position based on the adopted grid pattern specified in the drawings.

## 30.5 Construction of embankment

### 30.5.1 Materials

#### 30.5.1.1 Embankment material

The material to be placed in the base layer for construction of the embankment immediately above the stone columns shall comply with Clause 15 of MRTS04 *General Earthworks* and any additional requirements specified in the drawings.

#### 30.5.1.2 Geotextile

The geotextile fabric shall comply with MRTS27 *Geotextiles (Separation and Filtration)*.

### **30.5.2 Construction**

Where specified in the drawings, a geotextile fabric shall be placed over the entire area on which the embankment fill is to be constructed in accordance with the provisions of MRTS27 *Geotextiles (Separation and Filtration)*.

The embankment fill material shall be placed over the working platform in layers not exceeding 150 mm uncompacted depth. Greater depths of fill may be used in the upper layers once stability of the fill has been established. Embankment fill shall be placed and compacted in accordance with Clause 15 of MRTS04 *General Earthworks* and any additional requirements specified in the drawings.

## **31 Concrete paved inverts in corrugated culverts**

### **31.1 General**

Clause 31 applies to the provision of concrete paved inverts in corrugated culverts.

### **31.2 Material requirements**

Concrete shall comply with the requirements of Clause 6.1. Concrete shall be Class 32MPa/9.5.

Epoxy-based bonding agent shall be an approved proprietary product.

### **31.3 Construction**

Concrete paved inverts shall be constructed in the locations and in accordance with the drawings.

The invert of corrugated steel and aluminium pipe culverts shall be lined with concrete with the following requirements:

- a) the minimum depth of concrete above the corrugations shall be 50 mm, and
- b) the minimum height of lining above invert shall be  $D/6$  – where 'D' = Diameter of culvert.

The construction of paved inverts shall be delayed until all backfilling operations around and adjacent to the culverts concerned have been completed. Where practicable, the construction of paved inverts shall be delayed to the latest possible time within the construction period.

The surfaces on which paved inverts are to be constructed shall be dry and free of foreign matter.

Immediately prior to paving, the surfaces shall be coated with an epoxy-based bonding agent for the full width of the paved area, plus an additional 100 mm width each side.

Steel reinforcement shall be fastened to the culvert components in accordance with the culvert component manufacturer's drawings and recommendations.

Concrete work shall be in accordance with the requirements specified in Clause 6.1. The concrete shall be thoroughly worked into the corrugations, screeded off and trowelled to provide a uniform surface free of depressions.

The edges of the concrete paving shall be sloped such that water shall not pond against the steel culvert.

The surface of the trowelled concrete shall be scored longitudinally to a depth of 10 mm at 500 mm centres.

## **32 Linings in drains and channels**

### **32.1 General**

Clause 32 applies to the provision of linings in drains and channels.

### **32.2 Material requirements**

Concrete shall comply with Clause 6.1.

Compressible packing shall be bitumen impregnated fibre board or other equivalent packing.

Materials for grouted rock pitching shall comply with Clause 40.

Materials for steel-wire mattresses shall comply with Clause 43.

### **32.3 Construction**

Concrete linings in drains and channels shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which linings are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete linings may be constructed without foundation bedding.

Concrete shall comply with Clause 6.1.

The surface of concrete linings shall be finished with a wood float and cured.

Expansion joints shall be constructed at regular intervals not exceeding 20 m by installing 6 mm maximum thickness compressible packing for the full cross-section of the berm drain.

Grouted rock pitching shall comply with Clause 40.

Steel-wire mattresses shall comply with Clause 43.

## **33 Berm drains**

### **33.1 General**

Clause 33 applies to the provision of berm drains.

### **33.2 Materials**

Concrete shall comply with Clause 6.1 and shall be N25/20.

### **33.3 Construction**

Berm drains shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which linings are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Berm drains shall be a nominal 100 mm deep when constructed.

Unreinforced concrete linings shall comply with Clause 32. Concrete lining shall be 100 mm thick.

## **34 Concrete margins and batters**

### **34.1 General**

Clause 34 applies to the provision of concrete margins and batters.

### **34.2 Material requirements**

Concrete shall comply with Clause 6.1.

Steel sleeves shall comply with the drawings.

### **34.3 Construction**

Concrete margins and batters shall be constructed in the locations and in accordance with the drawings.

Where the insitu material on or against which margins, batters and aprons are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete margins and batters may be constructed without foundation bedding.

Concrete shall comply with Clause 6.1.

Construction of concrete margins and batters shall include the construction of integral cut-off walls, the installation of steel sleeves, and the provision of weepholes.

## **35 Concrete rail track crossings and machinery crossings**

### **35.1 General**

Clause 35 applies to the provision of concrete rail track and machinery crossings.

### **35.2 Material requirements**

Concrete shall comply with Clause 6.1.

Compressible packing shall be bitumen-impregnated fibre board or similar.

Joint sealing compound shall be bituminous putty or similar.

### **35.3 Construction**

Concrete rail track and machinery crossings shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which slabs are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with the requirements of MRTS04 *General Earthworks*.

Crossings shall be laid on foundation bedding.

Concrete work shall comply with Clause 6.1.

Saw-cut grooves shall be provided at the locations shown on the drawings.

Compressible packing shall be placed in accordance with the details shown on the drawings.

Construction joints and saw-cut grooves shall be sealed with joint sealing compound in accordance with the details shown on the drawings and the manufacturer's recommendations.

### **35.4 Tolerances**

The horizontal dimensions measured at right angles from the construction centreline to edges of crossings shall not vary from those shown on the drawings by more than  $\pm 25$  mm.

Except where the provision of a smooth connection to existing structures dictates otherwise, the heights of the finished surfaces of crossings shall not vary from those shown on the drawings by more than  $\pm 10$  mm. In addition:

- a) the gap under a straight-edge 3.0 m long placed anywhere on the finished surfaces of the crossing shall not exceed 5 mm due allowance being made for the design shape, and
- b) the crossfalls of the finished surfaces shall not depart from those shown on the drawings by more than 0.5% absolute.

## **36 Hand-placed concrete paving**

### **36.1 General**

Clause 36 applies to the provision of hand-placed concrete paving.

### **36.2 Material requirements**

Concrete shall comply with Clause 6.1.

Concrete to be pattern finished shall have coarse aggregate of size not greater than 20 mm.

Colouring agent shall be a colour curing compound from a suitable manufacturer.

Compressible packing shall be bitumen impregnated fibre board or other suitable packing.

### **36.3 Construction**

Hand-placed concrete paving shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which paving is to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete paving shall not be constructed before ducting, pits, stormwater drainage, underground services and any bases for traffic signals, traffic signs, and street light poles within the area to be concreted have been installed.

Concrete shall comply with Clause 6.1.

Expansion joints shall be installed at regular intervals not exceeding 20 m longitudinally and transversely by installing 6 mm maximum thickness compressible packing in the full cross-section of the concrete paving. The joints shall be located to line up with expansion joints in adjacent structures where present.

Contraction joints shall be installed at regular intervals not exceeding 5 m longitudinally and also 5 m transversely between expansion joints by forming grooves 40 mm deep and not more than 6 mm wide in all exposed surfaces of the concrete paving. All grooves shall be normal to the top surface.

Concrete shall be cured for a period not less than seven days before any other operations are carried out adjacent to the work.

### **36.4 Colouring and finishing**

Where specified, concrete paving shall be coloured. The surfaces of the concrete paving shall be uniform in colour.

Where specified, the surfaces of concrete paving shall be pattern finished. Areas not to be pattern finished shall be lightly broomed to produce uniform non-slip surfaces.

### **36.5 Vertical tolerances**

The finished surfaces shall join neatly to edges of adjacent work.

Elsewhere the heights of the finished surface of concrete paving shall not vary from those specified in the drawings by more than  $\pm 10$  mm and, in addition, the gap under a straight-edge 3.0 m long placed anywhere on the finished surface of the concrete paving shall not exceed 5 mm due allowance being made for the design shape.

## **37 Sprayed concrete paving**

### **37.1 General**

Clause 37 applies to the provision of sprayed concrete paving.

### **37.2 Material requirements**

Concrete shall comply with Clause 6.1 and shall be Class N25/10.

Compressible packing shall be bitumen impregnated fibre board or other suitable packing.

### **37.3 Construction**

Sprayed concrete paving shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which paving is to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Concrete paving shall not be constructed before ducting, pits, stormwater drainage, underground services and bases for traffic signals, traffic signs, and street light poles within the area to be concreted have been installed.

Concrete shall be in accordance with Clause 6.1.

Concrete paving shall be sprayed directly onto shaped and trimmed surfaces. The shaped and trimmed surfaces shall be dampened with water just prior to spraying the concrete paving.

The top surface shall be screeded and finished in accordance with Clause 20 of MRTS70 *Concrete*.

Expansion joints shall be installed at regular intervals not exceeding 20 m longitudinally and transversely by installing 6 mm maximum thickness compressible packing in the full cross-section of the concrete paving. The joints shall be located to line up with expansion joints in adjacent structures where present.

Contraction joints shall be installed at regular intervals not exceeding 5 m longitudinally and also 5 m transversely between expansion joints by forming grooves 40 mm deep and not more than 6 mm wide in all exposed surfaces of the concrete paving. All grooves shall be normal to the top surface.

Concrete shall be cured for a period appropriate to the concrete mix and its application before any other operations are carried out adjacent to the work.

#### **37.4 Vertical tolerance**

The finished surfaces shall join neatly to edges of adjacent work.

Elsewhere, the heights of the finished surfaces of concrete paving shall not vary from those specified by more than  $\pm 10$  mm and, in addition, the gap under a straight-edge 3.0 m long placed anywhere on the finished surface of the concrete paving shall not exceed 5 mm due allowance being made for the design shape.

### **38 Block paving**

#### **38.1 General**

Clause 38 applies to the provision of block paving.

#### **38.2 Material requirements**

Paving blocks shall be as shown in the drawings. Colour, shape and strength shall be as specified in the drawings. Blocks shall be sound and free from cracks or other defects which would interfere with proper placing or impair the strength or permanence of construction or their appearance.

Bedding material shall be natural sand, free from soluble salts or other contaminants which would have a detrimental effect on the performance or appearance of the paving blocks. The material shall conform to the grading requirements shown in Table 38.2.

Concrete shall comply with Clause 6.1, except that the maximum aggregate size shall be 10 mm. Cement mortar shall comply with Clause 6.2.

Colouring agent shall be a colour curing compound.

Joint filling sand shall be a clean, sharp sand which is free of deleterious soluble salts or other contaminants likely to cause efflorescence or staining. The grading of the sand shall be such that 100% shall pass a 1.18 mm test sieve.

**Table 38.2 – Block paving – bedding material grading**

Test sieve size (mm)	Percent passing by mass
9.5	100
4.75	95–100
2.36	80–100
1.18	50–85
0.6	25–60
0.3	10–30
0.15	5–15
0.075	0–10

### **38.3 Construction**

#### **38.3.1 Block laying**

Block paving shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which paving is to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Block paving shall not be constructed before ducting, pits, stormwater drainage, underground services and any bases for traffic signals, traffic signs, and street light poles within the area to be paved have been installed.

Bedding material shall be spread loosely in a uniform layer and screeded to the shapes and heights which shall provide a depth of bedding not less than 25 mm or not more than 40 mm after the blocks have been laid and compacted.

Screeded sand shall be protected against pre-compaction. Any screeded sand which is pre-compacted prior to laying paving blocks shall be removed and replaced to shape.

Paving blocks shall be laid to the bond patterns specified in the drawings. All edge blocks shall abut an edge restraint. All full blocks in each row shall be laid first. Where practicable, closure blocks shall be cut and fitted subsequently in the gaps between blocks and edge restraints. Where this is not practicable, gaps shall be filled with concrete or cement mortar.

Where there is insufficient depth to pave over structures, concrete infills shall be placed over such structures in lieu of paving blocks. Moulds shall be used to form the required patterns in the surfaces of the infills.

Where coloured paving blocks are used, concrete infill and cement mortar shall be coloured to match the blocks.

Any pedestrian or barrow traffic which is required to move over the block paving prior to compaction of the paving shall use overlaying boards. No other traffic shall be allowed on the paving prior to its compaction.

#### **38.3.2 Compaction**

Compaction of paving blocks shall be carried out using vibrating plate compactors. The plate area of any compactor shall cover a minimum of 12 paving blocks. The frequency of vibration and the amplitude of the vibrating plate compactors shall be appropriate to the blocks being compacted.

Block paving shall be vibrated until no further lowering of the surface is evident.

Compaction shall proceed as closely as possible following placing of blocks. Compaction shall not be attempted within 1 m of the advancing edge during the placing of blocks.

Compaction shall continue until adjoining blocks are flush and to the required level.

Any blocks that are damaged shall be removed and replaced.

#### **38.3.3 Joint filling**

As soon as practicable after compaction and prior to termination of work on that day or use by traffic, sand for joint filling shall be spread over the block paving and broomed to fill the joints.

The surfaces of the block paving shall receive at least one further coverage (pass) of a vibrating plate compactor to achieve compaction of the joint filling sand.

Excess sand shall be removed from the surfaces by brooming.

#### **38.4 Vertical tolerance**

The finished surfaces shall join neatly to edge restraints.

Elsewhere the heights of the finished surfaces of block paving shall not vary from those specified in the drawings by more than  $\pm 10$  mm and, in addition, the gap under a straight-edge 3.0 m long placed anywhere on the finished surface of the block paving shall not exceed 5 mm due allowance being made for the design shape.

### **39 Rock masonry**

#### **39.1 General**

Clause 39 applies to the provision of rock masonry. Rock masonry may also be referred to as 'rubble masonry'.

#### **39.2 Material requirements**

Rock for rock masonry shall be clean, hard, durable and free from seams or other imperfections. No weathered rock shall be used. Stones shall not be rounded on more than two sides or ends. No stones less than 0.003 m<sup>3</sup> in volume shall be used except in the case of spalls for wedges. Stones greater than 0.3 m<sup>3</sup> in volume shall not be incorporated in walls. The tightly-packed rock behind the piles, as shown in the Standard Drawing 2238, shall be 50 to 150 mm diameter.

Geotextile shall be the grade specified in the drawings and in accordance with MRTS27 *Geotextiles (Separation and Filtration)*.

Cement mortar for bedding shall consist of one part by volume of Type GP cement to three parts by volume of clean fine sand with only sufficient water added to achieve a plastic-like texture. Hydrated lime may be incorporated into the cement mortar to the extent of one part hydrated lime to 10 parts of Type GP cement (loose volume). Hydrated lime shall be an addition to, and not a replacement for, the cement. The mortar shall be able to retain its shape and not flow like a liquid. Materials shall comply with MRTS70 *Concrete*.

#### **39.3 Construction**

Rock masonry shall be constructed in the locations and in accordance with the drawings.

Rock masonry may be constructed without a foundation bedding. Rock shall be placed in cement mortar beds in horizontal layers. All rock shall be cleaned and thoroughly wetted before placing. Rocks shall be laid on mortar in horizontal beds with all exposed faces finished fair. All voids shall be filled with cement mortar and/or smaller size rock.

Cement mortar shall be used within one hour of mixing and shall not be re-tempered.

The exposed rock surface shall be cleaned free of any coating of cement mortar.

As an alternative to rock masonry walls, unreinforced concrete or plain concrete walls of N20/20 may be substituted. In this case, concrete shall comply with Clause 6.1.

## **40 Grouted rock pitching**

### **40.1 General**

Clause 40 applies to the provision of grouted rock pitching.

### **40.2 Material requirements**

Rock (other than smaller-size rock required for wedging) shall be of size not less than 150 mm and not greater than 250 mm (minimum dimension). The rock shall be sound rock which does not disintegrate in water and which has been selected to match the existing rock pitching where appropriate.

Cement mortar for bedding shall consist of one part by volume of Type GP cement to three parts by volume of clean fine sand with only sufficient water added to achieve a plastic-like texture. Hydrated lime may be incorporated into the cement mortar to the extent of one part hydrated lime to 10 parts of Type GP cement (loose volume). Hydrated lime shall be an addition to, and not a replacement for, the cement. The mortar shall be able to retain its shape and not flow like a liquid. Materials shall comply with MRS70.

Sand bedding shall comply with Clause 19 of MRTS04 *General Earthworks*.

### **40.3 Construction**

Grouted rock pitching shall be constructed in the locations and in accordance with the drawings.

Where insitu material on or against which the grouted rock pitching is to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

The first row of rocks shall be placed on a sand bedding of minimum thickness 50 mm.

Rocks shall be placed so as to form irregular joints. All rocks shall be interlocked and wedged with smaller-size rock, as necessary, so that no single rock may be easily dislodged and no large voids remain between rocks. All rock pitched faces shall be stable prior to grouting with mortar.

Where rock pitching is constructed for batter protection, the toe rocks shall be of size not less than 250 mm.

The voids between rocks at the exposed surface shall be filled with cement mortar. The mortar shall be used within one hour of mixing and shall not be re-tempered.

Exposed surfaces shall have a relatively smooth, even, neat appearance. Where rock pitching is to be trafficable, care shall be taken to provide a smooth running surface.

Rock surfaces shall be cleaned free of any coating of cement mortar exposing the faces of the rocks.

## **41 Rock protection**

### **41.1 General**

Clause 41 applies to the provision of rock protection.

### **41.2 Material requirements**

Rock employed for protection shall be as specified in the drawings or if not shown, rock used shall be of size not less than 150 mm and not greater than 500 mm. Rock shall be well graded with not less than 50% larger than a size twice the minimum size specified.

Rock shall be clean, hard, dense and durable igneous or Metamorphic rocks. In addition, it shall be resistant to weathering, free from overburden, spoil, shale and organic matter. Rock that is laminated, fractured, porous, with discontinuities or otherwise physically weak, shall not be used. Sedimentary rocks shall not be used.

The breadth or thickness of a single stone shall be not less than one-third its length.

### **41.3 Construction**

Rock protection shall be constructed in the locations and in accordance with the drawings.

Rock protection shall have a uniform appearance overall, and shall not have noticeable overall irregularities in horizontal and vertical alignments.

Rock protection shall be placed in a manner which ensures that the larger rocks are uniformly distributed throughout the protection work, and that the smaller rocks effectively fill the spaces between the large rocks without leaving any large voids. The layers of placed rock shall be of even thickness and of even grading.

The placing operations shall minimise the chances of rock running loose and damaging adjacent areas. Rock deposited in areas outside the rock protection zone shall be recovered.

Where rock protection of embankments is specified, placement of the protection shall occur progressively along with the construction of the embankment such that at no time shall the constructed level of the rock protection be more than 1 m vertical height below the constructed level of the embankment.

## **42 Steel-wire gabion protection**

### **42.1 General**

Clause 42 applies to the provision of steel-wire gabion protection.

### **42.2 Material requirements**

Steel-wire gabions shall be manufactured from heavily galvanised, hexagonally woven, steel-wire mesh having a wire diameter not less than 2.7 mm and a mesh opening of 80 mm across the flats of the hexagon. Selvedge wire shall have a diameter not less than 3.4 mm and binding wire shall have a diameter not less than 2.2 mm. All wire shall comply with AS 2338 and AS 2423. Galvanising shall be in accordance with the requirements specified in AS/NZS 4680. Where specified, the wire shall have a black PVC or other durable plastic coating of nominal thickness 0.55 mm, minimum thickness 0.4 mm.

Rock shall be sound igneous or metamorphic rock that shall not disintegrate in water or when exposed to the weather. Rock used for filling shall be of size not less than 120 mm and not greater than 200 mm. The rock shall be uniformly graded, and not less than 80% by number shall be of size greater than 150 mm. Rocks shall, where possible, be cubical, but in no case shall their least dimensions be less than half their greatest dimension.

### **42.3 Basic gabion requirements**

Gabions shall have an appropriate mesh size to retain the rock filling. Gabion panels and diaphragms shall be selvedged. The selvedge wire shall be woven integrally with the mesh or fastened to the mesh either by binding the edges of the mesh about the selvedge wire or by stainless steel clips, all in accordance with the manufacturer's recommendations.

Sufficient binding wire shall be available for binding and tying operations.

#### **42.4 Construction**

Steel-wire gabion protection shall be constructed in the locations and in accordance with the drawings.

The areas on which gabions are to be positioned shall be trimmed to the shapes specified within a tolerance of  $\pm 50$  mm. Trimmed surfaces shall be free of roots, stumps, brush, rocks and like protrusions.

Gabion protection shall be constructed to the shapes and other requirements specified herein.

##### **42.4.1 Assembling, positioning and joining gabions**

Gabions shall be assembled in accordance with the manufacturer's recommendations. Assembled gabions shall be positioned empty in the locations required for the finished work.

The first row of gabions shall be securely positioned and filled before gabions in other rows are positioned. Other gabions may then be positioned, joined and filled as the work requires. Joining shall be affected by binding or clipping the gabions together in accordance with the manufacturer's recommendations.

##### **42.4.2 Forming shapes**

Where necessary, the mesh panels shall be cut, folded and tied together to form mitre joints, angles, curves, slopes and other non-rectangular shapes. Surplus mesh shall be completely cut out or be folded back on and neatly tied to an adjacent gabion face. Cut or folded edges shall be selvaged. Adjacent cut or folded edges shall be bound or clipped together in accordance with the manufacturer's recommendations.

##### **42.4.3 Rock filling**

The gabion shall have a dense, evenly distributed filling with minimum voids, and shall not be significantly distorted in shape. Where necessary, the outer and inner panels of gabions shall be tied together during the placing operation to minimise distortion, especially when diaphragms are not employed. Care shall be taken to avoid damaging the gabion mesh and any geotextile placed under the gabions.

##### **42.4.4 Closing gabions**

Gabions shall be closed as soon as practicable after filling. All lids shall be securely bound to edges and diaphragms in accordance with the manufacturer's recommendations.

### **43 Steel-wire mattress protection**

#### **43.1 General**

Clause 43 applies to the provision of steel-wire mattress protection.

#### **43.2 Material requirements**

##### **43.2.1 General**

Wire mattresses shall be either proprietary products or non-proprietary products constructed as shown in the drawings.

### 43.2.2 Proprietary mattresses

Proprietary mattresses shall be manufactured from heavily galvanised, hexagonally woven, steel-wire mesh having a wire diameter not less than 2 mm and a mesh opening of 60 mm across the flats of the hexagon. Selvedge wire shall have a diameter not less than 2.4 mm and binding wire shall have a diameter not less than 2.0 mm. All wire shall comply with AS 2338 and AS 2423. Galvanising shall be in accordance with AS/NZS 4680. Where specified, the wire shall have a black PVC or other durable plastic coating of nominal thickness 0.55 mm, minimum thickness 0.4 mm.

All panels in proprietary products shall be selvedged. The selvedge wire may be woven integrally with the mesh or fastened to the mesh either by binding the edges of the mesh about the selvedge wire or by using stainless steel clips, all in accordance with the manufacturer's recommendations.

Sufficient binding wire shall be available for binding and tying operations.

Anchor plates shall be fabricated from grade 250 commercial quality steel and galvanised. All plates shall comply with AS 3678 and AS 3679.1. All sharp edges and curves shall be ground smooth prior to galvanising. Galvanising shall be in accordance with AS/NZS 4680. Galvanising shall be carried out after cutting and drilling of the plates.

Anchor bolts securing anchor plates to concrete shall be supplied in accordance with the details specified. Anchor pickets shall be star pickets 1.8 m long.

Mattresses shall have an appropriate mesh size to retain the rock filling.

### 43.2.3 Non-proprietary mattresses

Non-proprietary products shall be constructed from 1.8 m minimum width rolls of chain wire mesh. Diaphragms are not required in this form of mattress.

### 43.3 Rock

Rock shall be sound igneous or metamorphic rock that shall not disintegrate in water or when exposed to the weather. Rock used for filling shall be of size not less than 75 mm and not greater than 150 mm. The rock shall be uniformly graded, and not less than 80% by number shall be of a size greater than 100 mm. Rock shall, where possible, be cubical, but in no case shall their least dimension be less than half their greatest dimension.

### 43.4 Anchor pickets

Anchor pickets shall be 12 mm minimum in diameter and 1.8 m minimum in length. Material grade shall be R250N, hot dip galvanised in accordance with MRTS71 *Reinforcing Steel* and AS/NZS 4680.

### 43.5 Construction

#### 43.5.1 General

Steel-wire mattress protection shall be constructed in the locations and in accordance with the drawings.

The areas on which mattresses are to be positioned shall be trimmed to the shapes specified within a tolerance of + 50 mm to -50 mm, except where the provision of such tolerances shall not permit the tops of mattresses to join neatly to the inverts of adjacent culverts. Trimmed surfaces shall be free of roots, stumps, brush, rocks and like protrusions. Mattress protection shall be constructed to the shapes and to other requirements specified herein.

### **43.5.2 Installing anchors**

#### **43.5.2.1 Anchor plates**

Where specified, anchor plates and bolts shall be installed to secure mattresses to structures.

#### **43.5.2.2 Anchor pickets**

Where specified, anchor pickets shall be employed to secure mattress protection. Such pickets shall be installed prior to placing mattresses, and shall be positioned along the line of the upstream edge of mattresses placed on stream beds, and along the line of the top edge of mattresses placed on sloped areas. Nominal spacing of pickets shall be 1 m.

Where geotextiles are employed under mattresses, neatly cut openings shall be made in the geotextile at the appropriate locations to permit insertion of pickets.

The tops of the installed pickets shall finish level with the tops of the mattresses. Pickets which cannot be driven full depth shall be cut off level with the tops of the mattresses.

### **43.5.3 Assembling, positioning and joining mattresses**

#### **43.5.3.1 Proprietary wire mattresses**

Proprietary wire mattresses shall be assembled in accordance with the manufacturer's drawings and recommendations.

Assembled mattresses shall be positioned empty in the locations required for the finished work.

The first row of mattresses shall be securely positioned and filled before mattresses in other rows are placed, joined and filled.

The corners and all diaphragm points along the side of the first row of assembled mattresses shall be tied to the anchor plates and anchor pickets prior to placing rock filling. Mattresses in other rows may be positioned, joined and filled as the work requires. The joining of mattresses shall be in accordance with the manufacturer's recommendations.

#### **43.5.3.2 Non-proprietary wire mattresses**

Lengths of chain wire mesh shall be laid out flat on the ground surface and stretched sufficiently to remove any kinks and bends. Each length shall be sufficient to provide for the top, bottom and two ends.

The chain wire mesh shall be positioned length transverse to the direction of flow, leaving a top section of the mesh to be turned over to complete the mattress.

The bottom and ends of each length of chain wire mesh shall be bound to adjacent lengths through each individual mesh in turn.

The outermost lengths of mesh shall be cut and shaped such that part of the bottom may be folded up to form end panels of height equal to the thickness of the mattress.

Wire ties, not less than 1.6 mm diameter and having sufficient length to secure the top of the mattress, shall be provided at 500 mm intervals in each direction along the bottom of the mattress.

#### **43.5.4 Forming shapes**

Where necessary, mattresses shall be neatly cut, folded and tied together to form mitre joints, angles, curves, slopes and other shapes not possible to obtain using rectangular units. Surplus mesh shall be

completely cut out or folded back on and neatly tied to an adjacent mattress face. Cut or folded edges of adjacent mattresses shall be securely bound or clipped together.

#### 43.5.5 Tensioning of mattresses

Unfilled, positioned mattresses shall be tensioned using a wire strainer or by winching. The stretching apparatus shall be firmly attached to the free end of the assembled mattress. The tensioning process shall in no way distort the mattress shape. Adjacent mattresses shall be securely bound together along the top, bottom and sides while under tension.

#### 43.5.6 Rock filling

Rock filling shall be placed while mattresses are under tension. Rock filling of mattresses shall be carried out entirely by mechanical methods. The method of placing rock in mattresses shall produce a dense, evenly distributed filling with minimum voids and minimum distortion of the mattress shape. Care shall be taken to avoid damaging the mattresses and any geotextile under the mattresses. Tension on the mattresses shall be released only when the mattresses have sufficient rock filling to prevent the mesh from slackening after release.

#### 43.5.7 Closing mattresses

Mattresses shall be closed and lids and top sections tied down as soon as practicable after filling.

Tying of proprietary mattresses shall be in accordance with the manufacturer's recommendations. Tying of non-proprietary mattresses shall be carried out in a suitable manner. The top section of each mattress shall be turned over the rock filling and securely bound to the bottom. Each top section shall be bound to adjacent top sections through each mesh in turn. The free end and sides of the outermost top sections shall similarly be bound to the top and side edges of the end panels.

### 44 Fabric-encased concrete batter protection

#### 44.1 General

Clause 44 applies to the provision of fabric-encased concrete batter protection.

#### 44.2 Materials

##### 44.2.1 Fabric

Fabric material shall consist of multiple panels of double-layer open selvage fabric jointed in a mat configuration. The two layers shall be heavily ultraviolet stabilised continuous filament nylon tyre cord, of which at least 50% by weight shall be textured.

Fabric shall be filter point mattress and shall meet the minimum requirements for tensile strength and porosity stated in Table 44.2.1.

**Table 44.2.1 – Properties of fabric for encased batter protection**

Property	Value
Tensile strength – warp and weft	900 N per 25 mm (D5034-09 and D5035-06(2008)e1)
Porosity	3 m <sup>3</sup> /min (D737-04(2008)e1)
Colour	Pigment added green or brown as approved by the Administrator

#### **44.2.2 Concrete**

Concrete shall comply with MRTS70 *Concrete*. Concrete shall consist of a mixture of fine aggregate, cement and water proportioned to provide a pumpable slurry.

The minimum 28 day compressive strength of concrete shall be 25 MPa.

#### **44.3 Construction**

##### **44.3.1 General**

Fabric-encased concrete batter protection shall be constructed in the locations and in accordance with the details shown on the drawings.

##### **44.3.2 Placement of mats**

Fabric mats shall be positioned as shown on the drawings on batter slopes and in excavations for cut-off walls.

Grouting shall not commence until fabric units have been positioned correctly. **Hold Point 9**

##### **44.3.3 Grouting**

Grout shall be introduced into the space between the layers of fabric in such a manner as to provide a uniform average thickness of mat. Sufficient inspections or tests shall be carried out to ensure the requirements of the Technical Specification are being achieved.

The average thickness of the concrete mat shall be not less than that stated in Clause 4 of Annexure MRTS03.1.

The Contractor shall demonstrate that the specified average thickness has been achieved by calculating the volume of grout used and the area of the mat.

#### **45 Bridge abutment protection Type 1 -- rock spillthrough**

##### **45.1 General**

Clause 45 applies to the provision of rock spillthrough protection at bridge abutments.

##### **45.2 Material requirements**

Rock employed for protection shall be as specified in the drawings or, if not so shown, rock used shall be of size not less than 150 mm and not greater than 500 mm. Rock shall be well graded with not less than 50% larger than a size twice the minimum size specified.

Rock shall be clean, hard, dense and durable. In addition, it shall be resistant to weathering, free from overburden, spoil, shale and organic matter. Rock that is laminated, fractured, porous, or otherwise physically weak, shall not be used.

The breadth or thickness of a single stone shall be not less than one-third its length.

Rock for the hand-packed face shall be of a size and shape necessary to provide the finish specified in Clause 45.3.

Cement mortar shall consist of one part by volume of Type GP cement to three parts by volume of clean fine sand with only sufficient water added to achieve a plastic-like texture. Hydrated lime may be incorporated into the cement mortar to the extent of one part hydrated lime to 10 parts of Type GP

cement (loose volume). Hydrated lime shall be an addition to, and not a replacement for, the cement. The mortar shall be able to retain its shape and not flow like a liquid.

### **45.3 Construction**

Rock spillthrough protection shall be constructed in the locations and in accordance with the drawings or, where not specifically detailed, in accordance with the details shown on Standard Drawings 2232 and 2233.

The toe wall shall be constructed to the width and depth shown on the drawings in rock masonry in accordance with Clause 39 except that the rock shall comply with the requirements of Clause 45.2.

Rock spillthrough material shall be placed in a manner which ensures that the larger rocks are uniformly distributed throughout the spillthrough zone, and that the smaller rocks effectively fill the spaces between the large rocks without leaving any large voids. The layers of placed rock shall be of even thickness and of even grading.

The placing operations shall minimise the chances of rock running loose and damaging adjacent areas. Rock deposited in areas outside the rock spillthrough zone shall be recovered.

In addition, the face of rock spillthrough shall be hand-packed with selected smaller rock and grouted with cement mortar to give a relatively smooth and even appearance. Excess mortar shall be removed from the rock faces before it hardens.

## **46 Bridge abutment protection Type 2 – reinforced concrete over earth spillthrough**

### **46.1 General**

Clause 46 applies to the provision of reinforced concrete protection at bridge abutment earth spillthrough embankments.

### **46.2 Material requirements**

Concrete shall be N25/20 and shall comply with Clause 6.1.

Welded steel-wire reinforcing fabric shall be as shown in the drawings or, where not shown, shall be F52. It shall be hot-dipped galvanised in accordance with AS/NZS 4680.

Compressible packing shall be 10 mm thick bitumen impregnated fibre board or other suitable packing.

### **46.3 Construction**

Reinforced concrete protection shall be constructed in the locations and in accordance with the drawings or, where not specifically detailed, in accordance with the details shown on Standard Drawings 2234 and 2235.

Embankment faces shall be slightly overfilled during embankment construction and trimmed to the correct profile just before placing the reinforced concrete protection. Cut faces shall be trimmed neatly to the lines specified in the drawings. The trimmed face shall be lightly compacted.

The embankment face shall be true to line such that the deviation of the ground surface from a 3 m straight-edge held in any direction does not exceed 25 mm.

Faces of curved embankments shall be either a smooth curve or formed in a series of straights of approximately equal size. Curved faces of embankment shall conform to the above 25 mm maximum

deviation when a 3 m straight-edge is placed up the sloping face, and in the horizontal direction shall form a smooth curve.

Where the embankment faces are to be filled to achieve the above specified surface, the fill material shall be either no-fines concrete as specified in Clause 26 of MRTS70 *Concrete* or dry stabilised sand in accordance with Clause 19 of MRTS04 *General Earthworks*. The stabilised sand shall be dampened sufficiently so that it remains in place. Where no-fines concrete is used, extreme care shall be taken to achieve the specified surface profile.

The toe wall shall be constructed to the width and depth specified in the drawings and shall be reinforced with welded steel-wire reinforcing fabric.

The embankment face shall be boxed if necessary. If no boxing is used, screed boards or level pins shall be installed to ensure an accurate surface profile and to maintain the depth on concrete specified in the drawings. Level pins shall be hot-dipped galvanised 12 mm diameter steel reinforcing bar of sufficient length to be accurately located by driving into the embankment face.

Welded steel-wire reinforcing fabric shall be placed with a minimum cover of 75 mm from the embankment face.

Concrete shall be placed and compacted over the embankment face in accordance with MRTS70 *Concrete*.

The surface of the concrete shall be finished with a wooden float to give a uniform appearance. The surface shall be joint trowelled to give a blockwork appearance with joints at approximately 1.5 m centres.

Where a slab is more than 12 m wide on the plane face (not including curved faces at the edges), vertical expansion joints shall be formed at 6 m to 9 m centres. Reinforcement shall not be continuous through these joints.

Where the face of a curved embankment is formed in a series of straights, contraction joints shall be formed at the junction between adjacent straight segments of concrete slab.

Expansion joints shall be formed full depth using compressible packing.

Contraction joints shall be constructed by forming grooves 40 mm deep and not more than 6 mm wide in the surface of the slab.

#### **46.4 Tolerances**

The tolerances of the finished surface shall be such that the gap beneath a straight-edge 3.0 m long placed anywhere on the finished surface shall not exceed 25 mm due allowance being made for the design shape, where relevant.

### **47 Bridge abutment protection Type 4 – rockwork over earth spillthrough**

#### **47.1 General**

Clause 47 applies to the provision of rockwork protection at bridge abutment earth spillthrough embankments.

#### **47.2 Material requirements**

Rock shall be sound igneous or metamorphic rock that shall not disintegrate in water or when exposed to the weather. Rock shall be free from overburden, spoil, shale and organic matter. Rock that is laminated, fractured, porous, or otherwise physically weak, shall not be used.

Rock shall be of a size not less than 200 mm and the least dimension of any rock shall be not less than half its greatest dimension.

Cement mortar shall consist of one part by volume of Type GP cement to three parts by volume of clean fine sand with only sufficient water added to achieve a plastic-like texture. Hydrated lime may be incorporated into the cement mortar to the extent of one part hydrated lime to 10 parts of Type GP cement (loose volume). Hydrated lime shall be an addition to, and not a replacement for, the cement. The mortar shall be able to retain its shape and not flow like a liquid. Materials shall comply with MRTS70 Concrete.

#### **47.3 Construction**

Rockwork protection shall be constructed in the locations and in accordance with the drawings or, where not specifically detailed, in accordance with the details shown on Standard Drawings 2236 and 2237.

The toe wall shall be constructed to the width and depth specified in the drawings in rock masonry in accordance with Clause 39, except that the rock shall comply with Clause 47.2.

Rock material shall be placed in a manner which ensures that the larger rocks are uniformly distributed throughout the rockwork layer, and that the smaller rocks effectively fill the spaces between the large rocks without leaving any large voids. The layers of placed rock shall be of even thickness and of even grading.

The placing operations shall minimise the chances of rock running loose and damaging adjacent areas. Rock deposited in areas outside the rock spillthrough zone shall be recovered.

In addition, the face of rock spillthrough shall be hand-packed with selected smaller rock and grouted with cement mortar to give a relatively smooth and even appearance. Excess mortar shall be removed from the rock faces before it hardens.

### **48 Bridge abutment protection Type 6 – interlocking blockwork over earth spillthrough**

#### **48.1 General**

Clause 48 applies to the provision of interlocking blockwork protection at bridge abutment earth spillthrough embankments.

#### **48.2 Material requirements**

Blocks shall be interlocking blocks manufactured from concrete with nominal dimensions of either:

- a) 610 mm length, 150 mm breadth and 115 mm thickness, or
- b) 440 mm x 500 mm module, 100 mm thick.

The concrete strength shall be a minimum of N25 at 28 days. The minimum mass of the interlocking block shall be 170 kg/m<sup>2</sup>.

Approved products are listed in Clause 5 of Annexure MRTS03.1. Full technical details of proposed alternative products may be submitted to the Administrator for approval at least 14 days prior to commencement of installation **Milestone**

Construction shall not commence until the Administrator has approved the type of interlocking block. **Hold Point 10**

Interlocking blocks shall be as specified in the drawings.

Stabilised sand comply with MRTS04 *General Earthworks*.

Geotextile fabric shall comply with MRTS27 *Geotextiles (Separation and Filtration)*.

Slotted UPVC drainage pipe shall comply with AS 2439.1.

### **48.3 Construction**

Interlocking blockwork protection shall be constructed in the locations and in accordance with the drawings.

Embankment faces shall be slightly overfilled during embankment construction and trimmed to the correct profile just before laying the interlocking blockwork protection. Cut faces shall be trimmed neatly to the lines specified in the drawings. The trimmed face shall be lightly compacted.

The embankment face shall be true to line such that the deviation of the ground surface from a three metre straight-edge held in any direction does not exceed 25 mm.

Faces of curved embankments shall be either a smooth curve or formed in a series of straights of approximately equal size. Curved faces of embankment shall conform to the above 25 mm deviation when a three metre straight-edge is placed up the sloping face, and in the horizontal direction shall form a smooth curve.

Where the embankment faces are to be filled to achieve the above specified surface, the fill material shall be either no-fines concrete as specified in Clause 26 of MRTS70 *Concrete* or dry stabilised sand in accordance with Clause 19 of MRTS04 *General Earthworks*. The stabilised sand shall be dampened sufficiently so that it remains in place. Where no-fines concrete is used, extreme care shall be taken to achieve the specified surface profile.

A stabilised sand layer with a minimum thickness of 50 mm shall be placed over the entire surface area to be covered with interlocking blocks and shall comply with MRTS04 *General Earthworks*.

The concrete toe wall and edge strip shall be constructed to the dimensions specified in the drawings. Concrete shall be N32/20 and concrete shall comply with Clause 6.1.

Where the face of a curved embankment is formed in a series of straights, the straight segments shall be separated by concrete mid walls. Concrete end walls shall be constructed to confine the interlocking blockwork. Mid-walls and end walls shall be provided as specified in the drawings.

A slotted UPVC drainage pipe shall be installed as specified in the drawings.

After the slope surface and the concrete base have been constructed, a geotextile filter mat shall be spread over the prepared slope in accordance with the manufacturer's recommendations.

The interlocking blocks shall be placed on the filter mat such that the 610 mm dimension of the block is horizontal. Where necessary, the blocks shall be cut to fit the profiles of the mid-walls, end walls and capping concrete.

A concrete capping shall be installed above the top row of interlocking blocks.

#### **48.4 Tolerances**

The tolerances of the finished surface shall be such that the gap beneath a straight-edge 3.0 m long placed anywhere on the finished surface shall not exceed 25 mm due allowance being made for the design shape, where relevant.

### **49 Bridge abutment protection Type 7 – Rock-filled gabion protection**

#### **49.1 General**

Clause 49 applies to the provision of rock-filled gabion protection for bridge abutment spillthrough embankment fill. Unless specified otherwise in drawings, rock filled gabion protection for height up to 6 metres shall be in accordance with Standard Drawing 2241.

#### **49.2 Material requirements**

Concrete for mass concrete toe shall be N25/20 and shall comply with Clause 6.1.

Concrete for concrete capping shall be S32/20 and shall comply with Clause 6.1. Welded steel-wire reinforcing fabric shall be SL82 and shall be hot-dipped galvanised in accordance with AS/NZS 4680.

Type B subsoil drainage shall comply with Clause 27. Perforated drainage pipe shall be 100 mm in diameter.

Rock armour protection shall comply with Clause 41.

Rock fill gabion toe, boxes and basket shall comply with Clause 42.

Mattress toe protection shall comply with Clause 43.

Cement stabilised sand shall comply with MRTS04 *General Earthworks*.

Geotextile filter material shall be Filtration Class 3, Strength Class D and shall comply with MRTS27 *Geotextiles (Separation and Filtration)*.

Compressible filler shall comply with MRTS77 *Bridge Deck*.

Medium impact polythene sheet separator (builders film) shall be 200 µm thick.

#### **49.3 Construction requirements**

Rock-filled gabion protection (Type 7) shall be constructed at the locations shown and in accordance with the drawings.

Embankment faces shall be slightly overfilled during embankment construction and trimmed to the correct profile before placing the rock-filled gabion protection. The trimmed face shall be levelled and lightly compacted.

Rock-filled gabion protection shall be constructed to the shapes and dimensions shown in the drawings. Gabion boxes of each row of the protection shall be staggered as practical as possible. Each gabion box in the protection shall be adequately laced with adjoining boxes to avoid separation in accordance with Gabion supplier's gabion installation manual.

Gabion toe shall be constructed to the dimensions shown in the drawings. If mass concrete toe is specified in the drawings, where toe is permanently underwater, the contractor shall develop a method statement for construction of mass concrete toe and cement stabilised sand layer and submit to

Administrator for acceptance at least 14 days before commencement of the protection. **Hold Point 11**  
 Dewatering and cofferdam may be required. Cement-stabilised sand shall be constructed to form a foundation layer for construction of the mattress toe protection to the details shown in the drawings.

Mattress toe protection shall be constructed to the extent and dimensions shown in the drawings and shall comply with Clause 43. The mattress shall extend below the gabion for sufficient anchorage as shown in the drawings.

Type B subsoil drainage shall be constructed to the details shown in the drawings to avoid excessive hydrostatic pressure developed behind the toe. Appropriate grading shall be maintained for subsoil drains and appropriate outlets shall be provided.

Rock armour protection shall be constructed to the extent shown in the drawings. Geotextile layer shall be extended below the rock armour protection where shown in the drawings. Rock armour protection shall be constructed to form a transition from the Gabion or mattress protection to the road embankment or existing ground. This is to prevent undermining of the abutment protection during flood events.

Concrete capping for bearing inspection shall be constructed on the top most gabion box to the details shown in the drawings. Medium impact polythene sheet separator shall be laid on the rock fill of the gabion box prior to concreting and in accordance with the Manufacturer's recommendations. The top rock layers in these boxes shall be packed to the approximate required level to lay the polythene separator.

Compressible filler shall be installed between abutment and the gabion protection to the details shown in the drawings and in accordance with the Manufacturer's recommendations.

## 50 Shotcreting

### 50.1 General

Clause 50 applies to the provision of shotcreting.

### 50.2 Material requirements

#### 50.2.1 Shotcrete

Shotcreting concrete shall be in accordance with MRTS70 *Concrete*. Aggregate size and slump shall be chosen to suit the requirements of the shotcreting pump. Concrete grade shall be in accordance with the drawings. Minimum concrete grade shall be S32.

Grade of concrete to be specified on the drawings as per the required design life and the exposure classification of the application. Slope protections are generally 50-year design life, therefore S32 concrete is required.

Design life of wall-facing of soil nail retaining walls require 100-year and minimum exposure classification of B2 with minimum concrete grade of S40.

#### 50.2.2 Steel reinforcing

Steel reinforcement shall be in accordance with drawings. Welded steel-wire reinforcing fabric shall be minimum SL82 in accordance with MRTS71 *Reinforcing Steel* and shall be hot-dipped galvanised in accordance with AS/NZS 4680.

### 50.2.3 Fixing pins

Fixing pins shall be 1.0 m long N12 steel reinforcing bars conforming to the requirements of MRTS71 *Reinforcing Steel* and shall be hot-dipped galvanised in accordance with AS/NZS 4680. Bending operations, where required, shall be carried out prior to hot-dipped galvanising.

### 50.3 Construction

Shotcrete protection shall be constructed in the locations and in accordance with the details specified in the drawings.

Shotcrete shall be provided by an experienced operating crew. Equipment for shotcreting shall be such as to ensure thorough mixing, delivery, discharge, placing and finishing of shotcrete.

Shotcrete shall be of uniform construction and appearance.

For newly-constructed embankments, faces shall be slightly overfilled during embankment construction and trimmed to the correct profile just before placing the shotcrete protection. The trimmed face shall be lightly compacted. Cut faces shall be trimmed neatly to the lines specified in the drawings.

Faces of curved embankments shall be either a smooth curve or formed in a series of straights of approximately equal size.

Cut-off walls shall be provided on all free edges of the shotcreted slab and shall be constructed with the slab. Cutoff walls shall be 300 mm thick and shall be reinforced with welded steel-wire reinforcing fabric. The base cut-off wall shall be 1000 mm deep and the top and side cut-off walls shall each be 600 mm deep.

Thickness of the shotcrete shall be as specified in the drawings. Minimum shotcrete thickness for slope protections or similar applications in exposure classification B1 shall be 120 mm and 160 mm for shotcreting for wall-facing slab of soil nail walls in exposure classification B2. Thickness shall be increased to meet cover requirements for higher exposure classifications.

Slope protections of minimum 50-year design life require cover to reinforcement in accordance with AS 3600. For applications in exposure classification B1, cover against the soil to be 60 mm and other areas 40 mm. This needs 120 mm minimum shotcrete thickness. Similarly, shotcreting facing slabs for soil nail retaining walls or similar applications require 100-year design life and minimum exposure classification of B2. Therefore, cover to reinforcement to be in accordance with AS 5100 and cover against the soil side to be 85 mm and on other areas 55 mm. This require minimum thickness of 160 mm.

Contraction joints shall be installed in the direction of the dip of the batter only at a maximum spacing of 4 m or as otherwise specified in the drawings. Contraction joints shall extend for the full depth of the slab and the reinforcing fabric shall be discontinued at the joints.

Weep holes shall be provided as specified in the drawings.

The finished concrete surface shall be of neat appearance with lines generally conforming to the surface levels – i.e., flat surfaces on straight batters and curved surfaces where batters are curved. The top surface shall be screeded and finished in accordance with Clause 20 of MRTS70 *Concrete*. All surfaces shall be finished with a wood float and broom finish.

All rebound, overspray, dumped and cut-out concrete material shall be cleared and removed from the Site.

Curing of shotcrete shall comply with MRTS70 *Concrete*. However, membrane curing shall not be used to surfaces that shall be covered by an additional layer of shotcrete.

#### **50.4 Tolerances**

The tolerances of the finished surface shall be such that the gap beneath a straight-edge 3.0 m long placed anywhere on the finished surface shall not exceed 25 mm due allowance being made for the design shape where relevant.

### **51 Concrete retaining walls**

#### **51.1 General**

Clause 51 applies to the provision of concrete retaining walls.

#### **51.2 Material requirements**

Concrete shall be as shown on the drawings or, where not so shown, it shall be N32/20 in accordance with Clause 6.1.

Steel reinforcing shall comply with MRTS71 *Reinforcing Steel*.

Inserts shall be in accordance with the details specified.

Compressible packing shall be bitumen impregnated fibre board or other suitable packing.

Joint sealing compound shall be bituminous putty or other suitable joint sealing compound.

#### **51.3 Construction**

Concrete retaining walls shall be constructed in the locations and in accordance with the drawings.

Where insitu material on which footings are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Footings shall be constructed without foundation bedding.

Concrete shall comply with Clause 6.1, except as specified otherwise in this clause.

Construction of the walls shall include the provision of inserts where these are specified in the drawings.

Expansion joints shall be installed in the locations specified in the drawings using compressible packing. Contraction joints shall be installed in the locations specified in the drawings.

Expansion and contraction joints shall be sealed with joint sealing compound in accordance with the drawings and the manufacturer's recommendations.

Cast-in-place concrete walls shall be cured for a period of not less than 28 days prior to the construction of backfilling against the walls.

Backfilling on the concrete retaining wall footing shall not be placed until all the surveying requirements have been met as specified in Clause 59 and notice of such works provided to the Administrator. **Hold Point 12**

#### **51.4 Tolerances**

The horizontal alignment of cast-in-place concrete walls shall not depart from that specified in the drawings by more than  $\pm 10$  mm.

The heights of the tops of the walls shall not depart from those specified in the drawings by more than  $\pm 20$  mm, except where the provision of such tolerances shall not permit the top to join neatly to adjacent structures.

### **52 Concrete masonry retaining walls**

#### **52.1 General**

Clause 52 applies to the provision of concrete retaining walls.

#### **52.2 Material requirements**

Masonry units shall comply with the general requirements specified in AS/NZS 4455.1. The units shall have the following properties:

- a) strength classification – Grade 15, and
- b) total water absorption – not greater than 210 kg/m<sup>3</sup>.

Steel reinforcing shall comply with MRTS71 *Reinforcing Steel*.

Concrete shall be N25/20 and in accordance with Clause 6.1.

Concrete infill shall be N25/20 and shall have a maximum slump within the range 100 mm to 150 mm immediately prior to placing.

Cement mortar for bedding shall consist of one part by volume of Type GP cement to three parts by volume of clean fine sand with only sufficient water added to achieve a plastic-like texture. Hydrated lime may be incorporated into the cement mortar to the extent of one part hydrated lime to 10 parts of Type GP cement (loose volume). Hydrated lime shall be an addition to, and not a replacement for, the cement. Materials shall comply with MRTS70 *Concrete*.

Inserts shall be in accordance with the drawings.

Compressible packing shall be bitumen impregnated fibre board or other suitable packing.

Joint sealing compound shall be bituminous putty or other suitable joint sealing compound.

#### **52.3 Construction**

Concrete masonry retaining walls shall be constructed in the locations and in accordance with the drawings.

Where insitu material on which footings are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Footings may be constructed without foundation bedding.

Concrete in footings shall comply with Clause 6.1. Concrete footings shall be cured for a period not less than two days before any masonry units are placed on them.

Concrete masonry unit retaining walls shall be constructed to the details specified in AS 3700.

All masonry units shall be laid in stretcher bond using cement mortar and 10 mm joints. Cement mortar for joints shall be used within one hour of mixing and shall not be re-tempered.

Construction of the walls shall include the provision of inserts where these are specified in the drawings.

Expansion joints shall be installed in the locations specified in the drawings using compressible packing. Contraction joints shall be installed in the locations specified in the drawings.

Expansion and contraction joints shall be sealed with joint sealing compound in accordance with the drawings and the manufacturer's recommendations.

The cores of placed masonry units shall be completely filled with a concrete infill, placed and compacted in accordance with Clause 6.1. Prior to commencement of filling, the cores shall be cleaned of any surplus mortar.

Steel reinforcing shall be placed in accordance with the drawings and the recommendations of the manufacturer of the masonry units.

Masonry unit retaining walls shall be capped with a cement mortar capping not less than 25 mm thick. Tops of cappings shall be trowelled to provide smooth, even surfaces with neat edges. Alternatively, the walls may be capped with capping blocks mortared in position.

Exposed wall faces and capping blocks shall be cleaned free of cement mortar and infill concrete.

Concrete masonry unit walls shall be cured for a period of not less than 28 days prior to the construction of backfilling against the walls.

#### **52.4 Tolerances**

The horizontal alignment of cast-in-place concrete walls shall not depart from that specified in the drawings by more than  $\pm 10$  mm.

The heights of the tops of the walls shall not depart from those specified in the drawings by more than  $\pm 20$  mm, except where the provision of such tolerances shall not permit the top to join neatly to adjacent structures.

The thickness of mortar joints shall not vary from that specified by more than  $\pm 3$  mm.

### **53 Crib walls**

#### **53.1 General**

Clause 53 applies to the provision of crib walls.

#### **53.2 Material requirements**

Crib units shall be proprietary products manufactured in accordance with Clause 6.6.

Backfilling material shall be free draining granular material conforming to Clause 19 of MRTS04 *General Earthworks*.

#### **53.3 Construction**

Crib walls shall be constructed in the locations and in accordance with the details shown on the drawings.

Where insitu material on which footings are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 *General Earthworks*.

Footings may be constructed without foundation bedding.

Concrete in footings shall comply with Clause 6.1. Concrete footings shall be cured for not less than two days before any crib units are placed on them.

Crib units shall be installed in accordance with the manufacturer's recommendations.

Following the installation of crib units in each course of the wall, backfilling material shall be placed in and behind the crib units, as specified in the manufacturer's recommendations, and thoroughly compacted using appropriate mechanical tampers.

#### 53.4 Tolerances

The horizontal alignment of crib walls shall not depart from that specified by more than  $\pm 20$  mm.

The heights of the tops of the walls shall not depart from those specified by more than  $\pm 20$  mm, except where the provision of such tolerances shall not permit the tops to join to adjacent structures neatly.

### 54 Boulder retaining walls

#### 54.1 Boulder retaining walls

##### 54.1.1 General

Clause 54 applies to the provision of boulder retaining walls.

#### 54.2 Material requirements

##### 54.2.1 Rock fill

- a) Rock fill must be sound igneous, metamorphic or approved sedimentary rock (as per MRTS04 *General Earthworks*) that must meet the minimum requirements of Table 54.2.1 below.

**Table 54.2.1 – Properties of rock fill**

Property	Test Method	Limit
Apparent particle density	AS 1141.6.1	2.60 t/m <sup>3</sup> minimum
Point load strength index $i_s(50)$	AS 4133.4.1	1.0 MPa minimum
Los Angeles value	AS 1141.23	25% maximum
Total weighted loss (five cycles)	AS 1141.24	5% maximum
Water absorption	AS 1141.6.1	2.0% maximum

- b) Rock must be fresh or slightly weathered and not rounded.
- c) For the selected source of rock fill – i.e., quarry, the contractor must develop a methodology outlining the quality assurance procedures that would be adopted to manage the production of rock fill meeting the stipulated requirements described in this Technical Specification.

- d) The shape and size of rock must comply with the following:
- i. nearly cubic rock where possible
  - ii. rock with a ratio of maximum to minimum dimension of not greater than three
  - iii. at least two split faces
  - iv. the minimum dimension of a boulder shall be 0.5 m, and
  - v. multiple blocks at any given cross section is not permitted.

#### 54.2.2 Drainage blanket

- a) A drainage blanket of minimum width 300 mm must be placed behind the boulder wall to act as permanent drainage to the adjacent fill material. Material in the drainage blanket must be sound, durable, fresh, angular and semi-rounded or rounded stone. The rock size shall comply with the size limitations in Table 54.2.2 below.

**Table 54.2.2 – Grading requirements for drainage blanket**

Stone size (mm)	Percent finer
150	100
75	90-100
50	30-60
26.5	0-5
19	0-2

- b) The geosynthetic separator to be used at the drainage blanket/backfill interface must conform to Technical Specification MRTS27 *Geotextiles (Separation and Filtration)*.

#### 54.2.3 Packing stones in boulder walls

Packing stones or rock wedges may be needed to bed boulder wall rocks tightly or to level rocks for subsequent courses. This material must meet the Technical Specification for Drainage Blanket (see Table 54.2.2 above).

#### 54.2.4 Foundation

Select granular fill must be used to replace unsuitable material under the boulder wall footing if intersected below footing level. The select granular fill shall comply with the following:

- a) maximum size: 100 mm
- b) soaked CBR: 15%.

### 54.3 Construction

#### 54.3.1 Foundation construction requirements

The foundation of the boulder walls must be inspected by the Contractor's RPEQ Geotechnical Engineer to ensure that the allowable bearing capacity of the exposed foundation meets the design requirements. Where the exposed foundations have an allowable bearing capacity less than the design allowable bearing capacity, the weak material must be excavated and replaced with select granular materials (see 'Foundation' in Clause 54.2.4) to the extent necessary to provide the required foundation at the base of the boulder wall.

### 54.3.2 Boulder wall placement

Rock fill must be placed so that they interlock with each other. This must be achieved by the following measures:

- a) The first row of boulder (rock fill) must be placed on a binding layer of 150 mm minimum thickness of 20 MPa/20 concrete or better. The rock fill within the depth of embedment must be set in concrete.
- b) All boulders must be placed with the minimum dimension vertical; multiple blocks along the width and elevation is not permitted.
- c) Vertical joints between adjacent boulders, in the longitudinal direction of the wall, must be staggered between successive courses by a distance not less than 300 mm.
- d) Vertical joints between adjacent boulders, in the cross-section of the wall, must be staggered between successive courses by a distance not less than 300 mm.
- e) Placement of the boulders must be progressive along the wall length so as to minimise voids. Packing Stone (see Section 54.2.3) may be used to correct uneven surfaces and to prevent rocking.
- f) The extent of contact at any interface between boulders of the adjacent courses in a cross-section must be not less than 75% of the width of the particular interface in the cross-section.
- g) Adjacent boulders must touch:
  - i. The face of the wall must have a uniform appearance for the full visible height by suitable selection from a stockpile. Boulders of similar exposed end dimensions must be placed as uniformly as practicable along the length and height of the wall.
  - ii. Placement of boulders must be subject to daily inspections by the Contractor's RPEQ Geotechnical Engineer.

### 54.3.3 Backfill compaction

Compaction of backfill adjacent to the boulder wall/drainage blanket must conform to the requirements of Table 15.2 in Technical Specification MRTS04 *General Earthworks*, with the exception that the compaction of the backfill shall be carried out with no relaxation of compaction requirements adjacent to the wall. Light compaction equipment as per MRTS03 *Drainage, Retaining Structures and Protective Treatments* shall be used for compaction of back fill. The wall must be designed to accommodate this compaction-induced thrust.

### 54.3.4 Concrete slurry fill

The voids between the boulders must be filled with slurry concrete (slump greater than 100 mm) to the level of the adjacent ground where shown on the drawings.

### 54.3.5 Seepage drains

- a) Seepage drains using slotted PVC (minimum 100 mm diameter) must be placed at not more than 10 m centres to link the drainage blanket through the boulder wall to an outlet at the face of the wall.

- b) Backfill around the PVC drain must be screened gravel of 20 mm nominal size and must completely surround the pipe with a geotextile (as per MRTS03 *Drainage, Retaining Structures and Protective Treatments*) forming the interface with the backfill.
- c) The boulder course above the pipe must span over the pipe between adjacent boulders.

#### **54.3.6 Surface runoff behind the wall**

Positive measures must be taken to discharge the surface runoff and must not be allowed to infiltrate into the backfill.

#### **54.4 Tolerances**

- a) The horizontal tolerance for the front face of the wall must be constructed to within +/- 150 mm from the sloping face defined on the drawings.
- b) The thickness of the wall at any cross-section should not be less than that shown on the drawings.
- c) It is the responsibility of the contractor to set out the wall alignment and shape. The contractor must provide the equipment or tools for the control of the lines and levels (templates, string lines, etc.) and this equipment must remain on site.

### **55 Soil nailing**

#### **55.1 General**

Clause 55 applies to the provision of soil nailing.

#### **55.2 Methodology and construction procedure**

The performance provisions of Clause 55 shall be the minimum requirements which apply to the installation of soil nails. The Contractor's installation methodology may differ from the prescriptive provisions of Clause 55, provided that such methodology can be shown to have been proven by previous field use by the subcontract installer.

At least 14 days prior to commencing any work which involves the installation of soil nails, the Contractor shall submit to the Administrator a construction procedure which details the method of drilling, installation, grouting and testing of the soil nails. **Milestone**

No work which involves the installation of soil nails shall be commenced until the Administrator has deemed the construction procedure suitable to use. **Hold Point 13**

#### **55.3 Material requirements**

##### **55.3.1 Soil nails**

Soil nails shall be manufactured from Grade D500N deformed reinforcing bar conforming to MRTS71 *Reinforcing Steel*. The length of soil nails shall be as specified in the drawings.

All permanent soil nails shall be hot dip galvanised to AS/NZS 4680 and shall be encapsulated by a completely waterproof corrugated plastic sheath. The sheath shall be made from PVC or HDPE tube, with a minimum uniform thickness of at least 2 mm. The size of the sheath shall be such as to ensure a 10 mm minimum grout annulus surrounding the reinforcing bar. A sacrificial grout tube reaching to the bottom end of the sheath shall be provided. Where possible, corrugated plastic sheath shall be unjointed for the full length of soil nail. Where necessary, sheath joints shall be achieved by lapping of at least 50 mm together with liberal use of solvent glues appropriate for the sheathing material.

After galvanising, soil nails shall be passivated by dipping in a 2% solution of sodium dichromate to prevent any adverse reactions between the zinc coating and the cement grout.

### **55.3.2 Spacers**

Spacers shall be provided to ensure that the nail and the sheathing are centrally located within the hole and provided with a minimum of 30 mm of grout cover. Spacers shall also be provided to ensure that all sheaths if specified in the design are centrally located within the hole and provided with a minimum of 10 mm grout cover. Spacers shall be provided at both ends (within 300 mm from the ends) of nail and at 750 mm intervals (maximum) along the nail between the end spacers. The spacers shall be fabricated from materials which have no deleterious effect on the soil nail system. Spacers shall be manufactured to permit the free flow of grout.

### **55.3.3 Cement grout**

Cement grout shall comply with Clause 6.3. In addition it shall have a minimum characteristic strength of 32 MPa.

## **55.4 Construction**

### **55.4.1 General**

Soil nails shall be installed in the locations and in accordance with the details specified in the drawings.

### **55.4.2 Drilling**

The minimum diameter of hole for soil nails shall be 125 mm. The directions and the depths of the hole shall be as specified in the drawings.

Plant employing water as the drill flushing medium shall not be used as this can result in saturation of the soil surrounding the nail and the subsequent instability of the finished retaining structure.

### **55.4.3 Installation of soil nails**

A sacrificial grout tube shall be attached to the bottom end of the soil nail. The soil nail shall be carefully positioned into the hole with a minimum of disturbance to the surrounding soil material.

### **55.4.4 Grouting of soil nails**

#### **55.4.4.1 Equipment**

Grouting equipment shall include:

- a) a purpose-designed grout mixer of the continuous high speed type operating in the range of 1500 to 2000 rpm and producing grout free from lumps
- b) a holding tank fitted with an agitator
- c) a grout pump with a sustained outlet pressure of at least 400 kPa and fitted with a bypass back to the agitator tank, and
- d) a grout delivery line fitted with a gauge reading accurately to 1000 kPa.

#### **55.4.4.2 Operations**

Grouting of the soil nails shall be performed in the presence of the Administrator. **Hold Point 14**

Grout shall be pumped into the hole through the grout tubes until grout is forced out of the top of the hole. The level of grout inside and outside the sheath shall be kept approximately equal to avoid damage to the sheath. The amount of grout pumped into the hole shall be recorded to determine if the hole is blocked or if there are voids in the grout. Each soil nail shall be completely and continuously surrounded by a grout annulus.

### 55.5 Acceptance testing of soil nails

Testing of the soil nails shall be carried out and test result included in the quality records. Acceptance of test results for soil nails shall be subject to the approval of the Designer. **Hold Point 15**

The number of nails to be tested is as stated in Table 55.5.

**Table 55.5 – Number of soil nails to be tested**

No. of soil nails	Minimum number of pull-out tests
< 50	3
51–100	6
> 100	6%

The test procedure shall be:

- a) The grout shall have a minimum strength of 20 MPa and be at least four days of age.
- b) The test load shall be 1.5 times the working load which shall be as specified in the drawings.
- c) The test load shall be measured with an accuracy of  $\pm 1$  kN.
- d) The test frame used to mount the testing jack shall have supports such that it does not load the retained face at any localised point.
- e) Dial gauges used to record deflection of the soil nail shall be accurate to at least 0.01 mm.
- f) The soil nail shall be loaded to 20% of the test load, which point shall be recorded as the datum for deflection measurements.
- g) The remaining test load shall be applied in three equal increments and deflection measurements shall be recorded at each stage. The full test load shall be maintained for one hour.
- h) Three complete cycles of the test load shall be applied sequentially, and
- i) The test shall be considered successful if the deflection of the soil nail after three cycles does not exceed 0.1% of its length.

## 56 Passive rock dowels

### 56.1 General

Clause 56 applies to the provision of passive rock dowels.

### 56.2 Methodology and construction procedure

The performance provisions of Clause 56 shall be the minimum requirements which apply to the installation of passive rock dowels. The Contractor's installation methodology may differ from the prescriptive provisions of Clause 55 provided that such methodology can be shown to have been proven by previous field use by the subcontract installer.

At least 14 days prior to commencing any work which involves the installation of passive rock dowels, the Contractor shall submit to the Administrator a construction procedure which details the method of drilling, installation, grouting and testing of the rock dowels. **Milestone**

No work which involves the installation of passive rock dowels shall be commenced until the Administrator has deemed the construction procedure suitable to use. **Hold Point 16**

### **56.3 Materials**

#### **56.3.1 Passive rock dowels**

Passive rock dowels shall be fabricated from Grade 500N deformed steel reinforcing bar conforming to MRTS71 *Reinforcing Steel* and shall be hot-dipped galvanised in accordance with AS/NZS 4680. The length of passive rock dowels shall be as specified in the drawings.

After galvanising, dowels shall be passivated by dipping in a 0.2% solution of sodium dichromate to prevent any adverse reactions between the zinc coating and the cement grout.

The dowels shall be encapsulated by a completely waterproof corrugated PVC or HDPE sheath of 2 mm minimum thickness. The size of the sheath shall be such as to ensure a 10 mm minimum grout annulus surrounding the reinforcing bar. A sacrificial grout tube reaching to the bottom end of the sheath shall be provided. All welds in the sheath and end caps and between the sheath and grout tube shall be water tested to prove their integrity.

A sacrificial grout tube shall also be securely attached externally to the bottom end of the sheath.

#### **56.3.2 Spacers**

Spacers shall be provided to ensure that the dowel and the sheathing are centrally located within the hole and provided with a minimum of 30 mm of grout cover. Spacers shall also be provided to ensure that all sheaths if specified in the design are centrally located within the hole and provided with a minimum of 10 mm grout cover. Spacers shall be provided at both ends (within 300 mm from the ends) of nail and at 750 mm intervals (maximum) along the nail between the end spacers.

The spacers shall be fabricated from materials which have no deleterious effect on the soil nail system. Spacers shall be manufactured to permit the free flow of grout.

#### **56.3.3 Cement grout**

Cement grout shall conform to Clause 6.3. In addition, it shall have a minimum characteristic strength of 40 MPa.

### **56.4 Construction**

#### **56.4.1 General**

Rock dowels shall be installed in the locations and in accordance with the drawings.

#### **56.4.2 Drilling**

Holes for rock dowels shall be drilled to a minimum of 125 mm diameter in the directions and to the depths specified in the drawings.

The plant used to drill the holes into the rock face shall employ percussion drilling techniques and use air as the drill flushing medium. Water shall not be used as this can result in excess water pressures building up within the rock mass and cause instability of the rock slope.

### 56.4.3 Installation of rock dowels

The rock dowel shall be carefully positioned into the hole without damaging the encapsulating sheath or the grout tubes.

### 56.4.4 Grouting

#### 56.4.4.1 Equipment

Grouting equipment shall include:

- a) a purpose-designed grout mixer of the continuous high speed type operating in the range of 1500 to 2000 rpm and producing grout free from lumps
- b) a holding tank fitted with an agitator
- c) a grout pump with a sustained outlet pressure of at least 400 kPa and fitted with a bypass back to the agitator tank, and
- d) a grout delivery line fitted with a gauge reading accurately to 1000 kPa.

#### 56.4.4.2 Operations

Grouting of the rock dowels shall be performed in the presence of the Administrator. **Hold Point 17**

Grout shall be pumped into the hole through the grout tubes until grout is forced out of the top of the hole. The level of grout inside and outside the sheath shall be kept approximately equal to avoid damage to the sheath. The amount of grout pumped into the hole shall be recorded to determine if the hole is blocked or if there are voids in the grout. As the rock is likely to contain defects or voids, grout losses shall be expected. Each rock bolt shall be completely and continuously surrounded by a grout annulus.

### 56.5 Acceptance testing of passive rock dowels

Testing of the rock dowels shall be carried out and test results included in the quality records.

Acceptance of test results for soil nails shall be subject to the approval of the Designer. **Hold Point 18**

The number of dowels to be tested shall be as stated in Table 56.5.

**Table 56.5 – Number of rock dowels to be tested**

No. of rock dowels	Minimum number of pull-out tests
< 50	3
51–100	6
> 100	6%

The test procedure shall be:

- a) The grout shall have a minimum strength of 25 MPa and be at least five days of age.
- b) The test load shall be 1.5 times the working load which shall be as specified in the drawings.
- c) The test load shall be measured with an accuracy of  $\pm 1$  kN.
- d) The test frame used to mount the testing jack shall have supports such that it does not load the retained face at any localised point.
- e) Dial gauges used to record deflection of the soil nail shall be accurate to at least 0.01 mm.

- f) The rock dowel shall be loaded to 20% of the test load, which point shall be recorded as the datum for deflection measurements.
- g) The remaining test load shall be applied in three equal increments and deflection measurements shall be recorded at each stage. The full test load shall be maintained for one hour.
- h) Three complete cycles of the test load shall be applied sequentially, and
- i) The test shall be considered successful if the deflection of the rock dowel after three cycles does not exceed 0.1% of its length.

## **57 Active rock bolts**

### **57.1 General**

Clause 57 applies to the provision of active rock bolting.

### **57.2 Methodology and construction procedure**

The performance provisions of Clause 56 shall be the minimum requirements which apply to the installation of active rock bolts. The Contractor's installation methodology may differ from the prescriptive provisions of Clause 55 provided that such methodology can be shown to have been proven by previous field use by the subcontract installer.

At least 14 days prior to commencing any work which involves the installation of active rock bolts, the Contractor shall submit to the Administrator a construction procedure which details the method of drilling, installation, grouting, stressing and testing of the rock bolts. **Milestone**

No work which involves the installation of active rock bolts shall be commenced until the Administrator has deemed the construction procedure suitable to use. **Hold Point 19**

### **57.3 Materials**

#### **57.3.1 Active rock bolts**

Active rock bolts shall be manufactured from 26 mm diameter, 575 kN ultimate capacity steel stress bar. The length of active rock bolts shall be as specified in the drawings.

Each bar shall be encapsulated in PVC or HDPE corrugated sheath having an internal diameter of 65 mm, an external diameter of 85 mm and a minimum thickness of 2 mm. A sacrificial grout tube reaching to the bottom end of the sheath shall be provided. All welds in the sheath and end caps and between the sheath and grout tube shall be water tested to prove their integrity.

A sacrificial grout tube shall also be securely attached externally to the bottom end of the sheath.

#### **57.3.2 Spacers**

Spacers shall be provided to ensure that the rock bolt and the sheathing are centrally located within the hole and provided with a minimum of 30 mm of grout cover. Spacers shall also be provided to ensure that all sheaths if specified in the design are centrally located within the hole and provided with a minimum of 10 mm grout cover. Spacers shall be provided at both ends (within 300 mm from the ends) of bolt and at 750 mm intervals (maximum) along the bolt between the end spacers.

The spacers shall be fabricated from materials which have no deleterious effect on the rock bolt system. Spacers shall be manufactured to permit the free flow of grout.

### **57.3.3 Cement grout**

Cement grout shall comply with Clause 6.3. In addition, it shall have a minimum characteristic strength of 40 MPa.

## **57.4 Construction**

### **57.4.1 General**

Rock bolts shall be installed in the locations and in accordance with the drawings.

### **57.4.2 Drilling**

Holes for rock bolts shall be drilled to a minimum of 125 mm diameter in the directions and to the depths specified in the drawings.

The plant used to drill the holes into the rock face shall employ percussive drilling techniques and use air as the drill flushing medium. Water shall not be used as this can result in excess water pressures building up within the rock mass and cause instability of the rock slope.

### **57.4.3 Installation of rock bolts**

The rock bolt shall be carefully positioned into the hole without damaging the encapsulating sheath or the grout tubes.

### **57.4.4 Grouting**

#### **57.4.4.1 Equipment**

Grouting equipment shall include:

- a) a purpose-designed grout mixer of the continuous high speed type operating in the range of 1500 to 2000 rpm and producing grout free from lumps
- b) a holding tank fitted with an agitator
- c) a grout pump with a sustained outlet pressure of at least 400 kPa and fitted with a bypass back to the agitator tank, and
- d) a grout delivery line fitted with a gauge reading accurately to 1000 kPa.

#### **57.4.4.2 Operations**

Grouting of the rock bolts shall be performed in the presence of the Administrator. **Hold Point 20**

Grout shall be pumped into the hole through the grout tubes until grout is forced out of the top of the hole. The level of grout inside and outside the sheath shall be kept approximately equal to avoid damage to the sheath. The amount of grout pumped into the hole shall be recorded to determine if the hole is blocked or if there are voids in the rock mass. As the rock is likely to contain defects or voids, grout losses shall be expected. Each rock bolt shall be completely and continuously surrounded by a grout annulus.

## **57.5 Stressing active rock bolts**

Before stressing the rock bolt, the grout shall have a minimum strength of 25 MPa and be at least five days of age.

The rock bolt shall be jacked to the Design Lock-Off Load specified in the drawings in five separate stages. The load to which the rock bolt shall be jacked in the five stages are 20%, 40%, 60%, 80%

and 100% of the Design Lock-Off Load. The load shall be held constant for five \ minutes at each loading stage and the deflection of the bolt head recorded at the start and completion of the specified loading period for each stage.

After the completion of loading at each stage, except for the last stage, the bolt load shall be relaxed to 20% of the Design Lock-Off Load before proceeding to the next stage of loading. The deflection of the bolt head shall be recorded each time the anchor load is relaxed to 20% of the Design Lock-Off Load. After completion of the loading stage to 100% of the Design Lock-Off Load, the bolt shall be engaged to the anchorage assembly to transfer the load in the bolt directly to the bolt head and bearing plate.

### **57.6 Load testing active rock bolt**

The commencement of testing of active rock bolts shall be a Hold Point. **Hold Point 21**

All active rock bolts shall be tested.

The test procedure shall be:

- a) The load in the rock bolt shall be determined by carrying out a lift-off test. The lift-off test shall be undertaken using a jack and suitable accessories by lifting the bolt head a distance of 1 mm above the bearing plate. This step is considered satisfactory if the load measured is greater than or equal to 96% of the Design Lock-Off Load.
- b) If the load measured in subparagraph (a) is less than 96% of Design Lock-Off Load, then using a jack, the rock bolt shall be re-stressed to Design Lock-Off Load, plus an adjustment for lock-off losses. The lift-off test described in subparagraph (a) shall then be repeated. If the rock bolt load is still less than 96% of Design Lock-Off Load, a structural assessment shall be carried out to determine the future course of action for that rock bolt, and
- c) A second lift-off test shall be carried out three days after the first. The maximum load loss since the first lift-off test shall not exceed 12% of the Design Lock-Off Load.

The measured loads and displacements for all tests shall be recorded, plotted and compared with theoretical elastic deflections. A plot of these results for each rock bolt tested shall be delivered to the Administrator within three working days following the completion of the tests on that rock bolt.

After successful testing of the rock bolt, the void, if any, above the bonded length of the rock bolt to the underside of the anchor head shall be completely filled with grout.

## **58 Supplementary requirements**

The supplementary requirements given in Clause 6 of Annexure MRTS03.1 shall apply.

## **59 Surveying requirements**

All surveying requirements associated with the installation of new or relocated underground assets that include culverts, stormwater pipes, gullies and access chambers and retaining wall footings are to be fulfilled as prescribed in Clauses 6.1, 6.2, 6.3, 6.4 and 6.7 of the *TMR Surveying Standards, Part 2*.

## **60 Existing underground assets**

In the event where any existing underground assets that may be fully or partly exposed during construction works, additional surveying information is required to be undertaken as prescribed in Clause 1.7, 6.7.7 and 6.7.8 of the *TMR Surveying Standards, Part 2*.

Released under RTI - DTMR

# Annexure MRTS03.1 (January 2019) Drainage, Retaining Structures and Protective Treatments



## Specific Contract Requirements

### Contract Number

CN-12205

**Note:** Clause references within brackets in this Annexure refer to Clauses in the parent Technical Specification MRTS03 unless otherwise noted.

### 1 Testing Frequencies (Clause 5.4)

The following minimum testing frequencies and minimum number of tests shall apply to the construction of work covered by this Technical Specification.

Construction Activity	Normal Testing level		Reduced testing level	
	Minimum testing frequency	Minimum number of tests	Minimum testing frequency	Minimum number of tests
Refer to Clause 6.1 – Testing Table A (at the end of this annexure)				

### 2 Components to be salvaged

#### 2.1 Culvert and culvert end structures (Clause 8.2)

The following culverts and/or culvert end structures shall be salvaged.

Nil.

#### 2.2 Salvage storage location (Clause 8.2)

The location of the storage site for salvaged materials is as follows.

Not applicable.

### 3 Supply of Precast and Preformed Culvert

#### 3.1 Helical lock-seam corrugated aluminium pipe culvert components (Clause 11.2)

The following requirements shall apply to the supply of helical lock-seam corrugated aluminium pipe culvert components.

Nil.

**3.2 Details of precast and preformed culvert components (supply only) (Clause 11.2)**

Details of any precast and preformed culvert components supplied only under the Contract are as follows.

Item number	Description	Section size (mm)	Length (metres)	Class or gauge	Design height of fill (metres)†
Not applicable.					

† For reinforced concrete box culverts only.

**4 Fabric-encased concrete batter protection (Clause 44.3.3)**

The average thickness of the concrete mat shall be

N/A

**5 Interlocking blocks – Approved Products (Clause 48.2)**

The following products are approved for use as interlocking block protection.

Not applicable.

## 6 Supplementary Requirements (Clause 58)

The following supplementary requirements shall apply.

### 6.1 Drainage investigations and drainage works

As limited site stormwater drainage information was available during the Detailed Design phase a drainage investigation is proposed as a part of the Principal Contractor scope (refer Item 90104 in PSSS02). No drainage works shall occur (including ordering of drainage components, unless approved by the Administrator) until the works included under Item 90104 are complete and this final hold point released **Hold Point**

### 6.2 Brisbane City Council (BCC) Requirements

Notwithstanding the requirements outlined in MRTS03 and this annexure, infrastructure identified as being handed over to BCC (all works contained within the verge and identified stormwater infrastructure) shall be constructed in accordance with BCC specification S160 'Drainage', S200 'Concrete work', S206 'Concrete path articulated joints', S210 'Masonry', other BCC relevant specifications and standard drawings.

Where BCC specifications and standard drawings do not address the specific requirements, adopt MRTS03 and this annexure. Any deviations from BCC specifications and standard drawings shall not occur without the prior written approval of the Administrator.

All associated costs to meet BCC requirements (specifications and standard drawings) shall be deemed to be included within the MRTS03 and PSSS02 items outlined in the schedule of rates.

### 6.2 Testing Frequencies

For the minimum testing frequencies and minimum number of tests shall apply to the construction of work refer to the table below.

**Testing Table A**

Construction activity (Specification)	Quality Verification Requirements		Normal Testing Level		
	Description	Test Required	Maximum Lot Size	Minimum testing frequency	Minimum number of tests
Drainage Pipes, Box Culverts and Arch Culverts	<b>Material</b> Foundation bedding/ Haunch zone	Particle Size Distribution Q103A Linear Shrinkage Q106	Culvert	1 test per 100m <sup>3</sup>	1 per material type
	Overlay zone	Particle Size Distribution Q103A		1 test per 100m <sup>3</sup> Visual inspection of the material may be sufficient	1 per lot
	Backfill/ Side zone	Particle Size Distribution Q103A Linear Shrinkage Q106		Lot size > 300m <sup>3</sup> 1 test per 100m <sup>3</sup>	1 per material type
	Backfill to steel pipes and culverts	Particle Size Distribution Q103A Linear shrinkage Q106 pH Q121 Elec. Resistivity Q122 Chloride Content Q130A Sulphate Content Q131A		Lot size > 300m <sup>3</sup> 1 test per 300m <sup>3</sup>	3 per material type
	<b>Compaction</b> Foundation bedding/ Haunch zone	Min. and Max. Dry Density Q142E	Not applicable	1 test per 300m <sup>3</sup>	1 per material type
		Compacted Density Q141B Density Index Q140B	Not applicable	1 test per 50m <sup>3</sup>	1 per lot
Drainage Pipes, Box Culverts and Arch Culverts	Side & Overlay zones In situ material	Dry Density-Moisture Relationship Q142A	Culvert	1 test per 300m <sup>3</sup>	1 per material type
		Compacted Density Q141B	Lot size < 500m <sup>3</sup>	1 test per 50m <sup>3</sup>	1 per lot
			Lot size 500 to 2000m <sup>3</sup>	1 test per 150m <sup>3</sup>	10 per lot
			Lot size > 2000m <sup>3</sup>	1 test per 250m <sup>3</sup>	10 per lot
Geometrics	Levels inlet and outlet	Culvert	All points shown on the drawings (min 1 test per 20m)	2 points	
Subsoil Drains	Backfill material (Granular)	Particle Size Distribution Q103A	500m <sup>3</sup>	1 test per 100m <sup>3</sup>	1 per lot

Construction activity (Specification)	Quality Verification Requirements		Normal Testing Level		
	Description	Test Required	Maximum Lot Size	Minimum testing frequency	Minimum number of tests
	Backfill material (No Fines Concrete)	Compressive strength Q455B	500m <sup>3</sup>	1 test per 100m <sup>3</sup>	1 per lot
	Backfill material (Flowable Backfill)	Setting Time of Concrete Q454 Fluidity/Flowability Spread Compressive strength Q455B Standard Penetration Test Q153		1 per carriageway crossing	
	Compaction (Types A, C, D)	Dry Density-Moisture Relationship Q142A	Not applicable	1 test per material type	1 per material type
		Compacted Density Q141B	500m	1 test per subsoil drain	1 per lot
Kerb and Channel and Kerb	Conc. Compressive Strength	Compressive Q455A Strength Q455B	Concrete pour	Refer to MRTS70 Table 13.3.2	1 per lot
	Consistency	Slump Q451A		1 test per batch	1 per lot
	Geometrics	Specification tolerances		1 test per 10m (Invert Levels)	As per minimum testing frequency
Manholes and Gullies	Concrete Density	Compressive strength Q455B	Concrete pour	Refer to MRTS70 Table 13.3.2	
	Consistency	Slump Q451A		1 test per batch	1 per lot
	Geometrics	Specification tolerances	Structure	Refer to MRTS03	
	Backfill Material	Particle Size Distribution Q103A Linear Shrinkage Q106		Lot size > 300m <sup>3</sup> 1 test per 100m <sup>3</sup>	1 per material type
	Compaction	Dry Density-Moisture Relationship Q142A	Not applicable	1 test per material type	1 per material type
		Compacted Density Q141B	Structure	1 test per 50m <sup>3</sup>	1 per lot
Culvert End Structures, Culvert Inverts and Other Structural Concrete Items	Backfill Material	Particle Size Distribution Q103A Linear Shrinkage Q106		Lot size > 300m <sup>3</sup> 1 test per 100m <sup>3</sup>	1 per material type
	Concrete Density	Compressive strength Q455B	Concrete pour	Refer to MRTS70 Table 13.3.2	
	Consistency	Slump Q451A		1 per batch	1 per lot
	Geometrics	Dimensional tolerances <ul style="list-style-type: none"> <li>• Dimensional</li> <li>• Positional</li> <li>• Relative position</li> </ul>	Structural Element	All points for which levels are shown on the drawings	As per min testing frequency

**Technical Specification**

**Transport and Main Roads Specifications  
MRTS25 Steel Reinforced Precast Concrete Pipes**

**January 2018**

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## 1 Introduction

This Technical Specification applies to the design, supply and manufacture of steel-reinforced precast concrete circular pipes by spinning, roller suspension, or vertical dry cast (Bi-directional roller compacted, Packerhead or Rising Core) manufacturing processes used for the conveyance of stormwater in applications where the pipe is not subject to internal pressure.

Concrete pipes manufactured using wet cast methods shall be manufactured in accordance with MRTS72 *Manufacture of Precast Concrete Elements* and with concrete and reinforcement cover as defined by that Technical Specification.

Wet cast methods are typically used for manufacture of large pipes, or special pipes where mechanised methods are not suitable.

Installation of pipes is to be in accordance with MRTS03 *Drainage, Retaining Structures and Protective Treatments*, by either trench or embankment conditions as defined by AS 3725, or by jacking to a maximum length of 100 m.

Where longer or more accurate installations are required, it is recommended specialist advice be obtained.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements*, technical requirements contained in Annexure MRTS25.1 and other relevant Technical Specifications as appropriate.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

## 2 Administrative requirements

Steel-reinforced precast concrete pipes shall be manufactured only by a Transport and Main Roads registered supplier.

To be eligible for registration as a registered supplier for the manufacture of steel reinforced concrete pipes, a manufacturer shall:

- a) Operate a Quality Management System certified to a minimum of AS/NZS ISO 9001. Certification shall be by a JAS/ANZ accredited certifier.
- b) Have established procedures for manufacture of steel reinforced concrete pipes, and
- c) Have an inspection and test plan including Hold Points acceptable to the department for manufacturing steel reinforced concrete pipes which demonstrates compliance with this specification. The inspection and test plan shall address supply of materials.

Registration as a registered supplier of steel reinforced concrete pipes shall be reviewed at intervals varying from six months to three years depending on registration level, or earlier if unsatisfactory performance is reported.

A copy of the registered suppliers list for precast concrete is available on the Transport and Main Roads internet. This list includes suppliers registered to manufacture pipes.

## 2.1 Registration status

Information regarding approved suppliers and products, and registration status can be obtained from the Transport and Main Roads website, <https://www.tmr.qld.gov.au/business-industry/Business-with-us/Approved-products-and-suppliers>

The requirements for registration are outlined in the document *Registration Scheme: Suppliers and Products for Bridges and Other Structures*. This document is available on the department's website.

## 3 Referenced documents

Table 3 lists documents referenced in this Technical Specification.

**Table 3 – Referenced documents**

Reference	Title
AS 1379 (2007)	<i>Supply and specification of concrete</i>
AS 1726	<i>Geotechnical Site Investigations</i>
AS/NZS 3725 (2007)	<i>Design for installation of buried concrete pipes</i>
AS/NZS 4058 (2007)	<i>Precast concrete pipes (pressure and non pressure)</i>
AS/NZS 4671	<i>Steel reinforcing materials</i>
AS 5100 Set	<i>Bridge design standard</i>
BCM-P-015	<i>Registration Scheme: Suppliers and Products for Bridges and other Structures</i>
MRTS01	<i>Introduction to Technical Specifications</i>
MRTS03	<i>Drainage, Retaining Structures and Protective Treatments</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS70	<i>Concrete</i>
MRTS71	<i>Reinforcing Steel</i>
MRTS71A	<i>Stainless Steel Reinforcing</i>
MRTS72	<i>Manufacture of Precast Concrete Elements</i>

## 4 Quality system requirements

### 4.1 Hold Points, Witness Points and Milestones

General requirements for Hold Points, Witness Points and Milestones are specified in MRTS01 *Introduction to Technical Specifications*.

The Hold Points, Witness Points and Milestones applicable to this Technical Specification are summarised in Table 4.1.

**Table 4.1 – Hold Points, Witness Points, and Milestones**

Clause	Hold Point	Witness Point	Milestone
5.2	1. Approval of alternative design diameter.		Submission of drawings or tabulations for alternative design diameter.
5.3.5	2. Approval of alternative treatments for pipes in aggressive environments.		
6.1.1	3. Approval of constituent concrete materials and blend of cementitious materials.		Submission of constituent concrete materials and blend of cementitious materials.
7		1. Pipe Testing for non standard pipes manufactured to order for a specific project	
8.2	4. Supply of information prior to delivery of pipes to site.		Supply of Information
8.3	5. Supply of monthly conformance reports.		
9		2. Inspection of manufactured pipes	

## 5 Design

Design of steel-reinforced precast concrete pipes shall comply with the requirements of this specification and AS/NZS 4058 with the hierarchy of documents as listed in this clause.

### 5.1 Design life

The design life of precast concrete pipes shall be 100 years. The design life means that 95% of the production of all pipes supplied shall remain in a serviceable condition with negligible maintenance for 100 years.

### 5.2 Design internal diameter

The design internal diameter as defined in AS/NZS 4058 shall not be less than 95% of the nominal internal diameter specified on the drawings for all classes of pipes. Where the design internal diameter does not meet these requirements, an alternative design internal diameter may be submitted to the Administrator for approval. Drawings or tabulations showing the alternative design internal diameter shall be submitted not less than three weeks before supply of pipes is due to commence **Milestone**. No pipes of an alternative design internal diameter shall be supplied until written approval is granted by the Administrator **Hold Point 1**.

The design internal diameter is critical for the hydraulic performance of the pipe. Consideration of alternative smaller design internal diameters for pipes shall take into consideration the reduction in hydraulic performance. Depending on the method of manufacture the external diameter of the pipe may also vary from standard designs. In this case compatibility with other elements such as pits and headwalls may need to be considered. In addition compatibility with existing installed pipes may also need to be considered.

### **5.3 Environments**

#### **5.3.1 General**

Environments for pipes supplied in accordance with this Technical Specification shall be as defined in Clauses 5.3.1 to 5.3.3. The following definitions are also applicable:

- a) freshwater – chloride content less than 2000 ppm
- b) brackish water – 2000 to 8000 ppm
- c) saltwater – 8000 ppm or higher and or seawater.

Environments rather than exposure classifications are defined to be consistent with AS/NZS 4058. Due to the lack of detail in the normative definitions of environments in AS/NZS 4058 further detail has been provided. Where possible and technically acceptable some guidance has been drawn from the informative sections of AS/NZS 4058.

#### **5.3.2 Normal environment**

For pipes installed in underground or above ground environments and consistent with all of the following:

- a) non aggressive soil conditions
- b) aggressive soil conditions nominated as Normal in Clause 5.4
- c) no saltwater, no salt spray or no tidal conditions present
- d) internal or external surface of pipe exposed to fresh or brackish water only.

#### **5.3.3 Marine environment**

For pipes installed in underground or above ground environments consistent with any of the following:

- a) aggressive soil conditions nominated as Marine in Clause 5.4
- b) for pipes installed in underground environments with the external pipe surface only exposed to fluctuating or non fluctuating levels of saltwater present in the ground
- c) internal surface of pipe, or external surface if above ground, exposed to occasional (maximum of twenty times per year) tidal or non tidal salt water flow.

### 5.3.4 Aggressive environments

For pipes installed in environments consistent with any of the following:

- a) underground in aggressive soil conditions nominated as Aggressive in Clause 5.4
- b) underground environments where the internal pipe surface is exposed to wave action, wind driven salt spray or regular tidal or non tidal saltwater flow
- c) above ground environments where the pipe is exposed to wave action, wind driven salt spray or exposed to regular tidal or non tidal saltwater flow.

### 5.3.5 Alternative requirement for aggressive environments

Further to the requirements of Table 5.5, minimum cover to reinforcement for Aggressive environments may be the same as for Marine environments if one of the following options is adopted as approved by Transport and Main Roads Director (Bridge Construction Maintenance and Asset Management) **Hold Point 2** These options are as follows:

- a) protective coating, or
- b) keyed in internal and external liner, or
- c) pipe concrete with a cementitious material blend in accordance with Clause 6.1(b)(ii) or Clause 6.1(b)(iii), or
- d) where external protection only is required, the pipe is sleeved through an inert pipe material and the gap between the pipe and sleeve is grouted or sealed.

Some manufactures may not be able to meet the additional cover requirements specified for Aggressive Environments. Therefore the following options have been made available for consideration. Approval of these options is the responsibility of the Director (Bridge Construction Maintenance and Asset Management) and approval shall be project specific with correspondence through the Administrator:

- a) Protective coatings – consideration shall be given to the design life of the coating and its ability to provide, in combination with the existing concrete and cover to reinforcement, a pipe with the ability to provide a 100 year design life in accordance with this Technical Specification. For PASS/ASS soil applications the coating would need to be acid resistant.
- b) Keyed in internal and external liner. These would be similar to those used in some sewerage applications. Future maintenance of the liner and hydraulic performance of the pipe during the full design life shall also be considered.
- c) Higher specification pipe concrete. In most cases this will be the preferred option by the department as it is likely to offer the least future maintenance. In general it is expected that this option will provide water absorption values better than those achieved for standard normal and marine pipe concrete.
- d) Sleeving though an inert pipe material. The pipe sleeve would have to be not subject to degradation to the surrounding environment. For example in PASS/ASS environments, the pipe material used for the sleeve would need to be acid resistant.

#### 5.4 Aggressive soil conditions

For potential acid sulphate soils (PASS) or acid sulphate soil (ASS) environments, Normal, Marine, and Aggressive are as listed in Table 5.4.

**Table 5.4 – Environments for Steel Reinforced Concrete Pipes in PASS/ASS Ground Conditions.**

Acidity (pH)	Soil Classification	SO <sub>4</sub> in Groundwater (mg/l or ppm)			
		≤ 1500	> 1500 to ≤ 3000	> 3000 to ≤ 6000	> 6000
> 5.5	All Soil Types	Normal	Normal	Normal	Aggressive
≤ 5.5 to > 5.0	Clay/Stagnant and Medium	Normal	Normal	Normal	Aggressive
	Sandy/Flowing	Marine	Marine	Marine	Aggressive
≤ 5.0 to > 4.5	Clay/Stagnant	Normal	Normal	Normal	Aggressive
	Medium and Sandy / Flowing	Marine	Marine	Marine	Aggressive
≤ 4.5 to > 3.5	Clay/Stagnant and Medium	Marine	Marine	Marine	Aggressive
	Sandy/Flowing	Aggressive	Aggressive	Aggressive	Aggressive
≤ 3.5	All soil Types	Aggressive	Aggressive	Aggressive	Aggressive

Soil Type Definitions are as follows:

1. Clay/Stagnant - practically impervious for example homogeneous clays.
2. Medium – Poorly draining soils for example fine sands, organic and inorganic silt, mixtures of silt, sand and clay, glacial till, and stratified clay.
3. Sandy/Flowing – Well drained soils such as clean gravel, sands, and mixtures of sand and gravels.

In relation to soil types, further guidance may be found in AS/NZS 4058 or AS 1726 if required.

#### 5.5 Cover to reinforcement

Concrete cover to reinforcement shall be as per Table 5.5. Cover to reinforcement on the external surface of jacking pipes shall be increased by a further 5 mm.

The minimum cover to reinforcement for all pipes with a design internal diameter greater than 1.8 m shall be as per Table 5.5 for marine environment.

Precast concrete pipes manufactured using wet cast processes shall have cover to reinforcement as defined by MRTS72 *Manufacture of Precast Concrete Elements*.

**Table 5.5 – Concrete cover to steel reinforcement**

Pipe Size	Pipes up to including 1.8 m design internal diameter		Pipes over and above 1.8 m design internal diameter	
	Minimum Cover to Reinforcement Barrel and Socket (mm)	Minimum Cover to Reinforcement Mating Surface of Spigot (mm)	Minimum Cover to Reinforcement Barrel and Socket (mm)	Minimum Cover to Reinforcement Mating Surface of Spigot (mm)
Normal <sup>1</sup>	10	6	Not applicable	Not applicable
Marine <sup>2</sup>	20	10	20	10
Aggressive <sup>3</sup>	30	20	30	20

Notes

- Cover is as per AS/NZS 4058. Note that this cover and environment can only be used for pipes with an internal design diameter of 1.8 m or less.
- Cover is as per AS/NZS 4058.
- Also refer Clause 5.3.5 of this Technical Specification.

An additional 5 mm of cover has been added to the external pipe surface for pipe jacking applications to account for any damage or abrasion to the external surface of the pipe during jacking.

For pipe manufacturing processes where a surface finish in accordance with AS/NZS 4058 cannot be routinely achieved, consideration should be given to increasing the cover to account for the lack of acceptable surface finish.

For pipes of an internal design diameter greater than 1.8 m, Transport and Main Roads has specified a minimum cover for pipes as defined by Marine environment to ensure the most economical whole of life cost for these pipe sizes.

## 5.6 Pipe joints

Pipe joints shall be as specified in the following clauses.

Figure 1.1 of AS/NZS 4058 includes diagrams and details of pipe joint types.

### 5.6.1 Pipes 800 mm diameter or less

All joints are to be spigot and socket with rubber ring joints.

Spigot and socket joints are required for pipes of 800 mm or less as this joint type has significantly higher joint shear capacity in these pipe sizes and are significantly more resistant to leakage at the joints.

### 5.6.2 Pipes greater than 800 mm diameter

Where water seal is essential including under all road pavements, and/or where some ground movement is expected, spigot and socket pipes with rubber ring joints must be used. Otherwise where ground conditions are stable and infiltration or exfiltration is insignificant, flush joint pipes with appropriate sealing bands may be used.

### 5.6.3 Jacking pipes

All joints to be flush joint with a fixed external galvanised steel collar or locating band and rubber sealing ring. The pipe joint or joint components must not extend radially past the main barrel of the pipe.

## 5.7 Design for installation

Steel-reinforced concrete pipes shall be designed for installation in accordance with AS/NZS 3725 with the following exceptions.

Clause 6.5 of AS/NZS 3725 shall be deleted and replaced by:

- a) the effects of superimposed live loads shall be calculated in accordance with AS 5100
- b) distribution of live loads shall be in accordance with AS 5100
- c) dynamic load allowance shall be as follows:
  - i. a value of 0.4 for zero fill height
  - ii. a value of 0.1 for fill heights of 2 m or higher
  - iii. a linear interpolation between 0.4 and 0.1 for depths between zero and 2 m respectively.

Superimposed live loads shall be considered as detailed in Clause 5.7.1 and 5.7.2 of this Technical Specification. These loads apply to both construction and service loads.

The effects of superimposed live loads are specified to be calculated in accordance with AS 5100 to be consistent with the design of all Transport and Main Roads infrastructure.

### 5.7.1 Construction loads

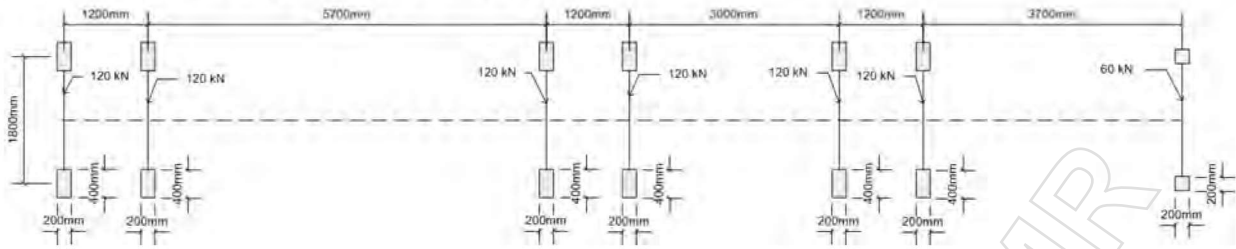
The following mandatory minimum construction load cases shall be considered in addition to loads associated with compaction of fill.

- a) Truck and dog trailer with a minimum height of compacted fill of 0.5 m over the top of the pipe. Load is defined in Figure 5.7.1(a)
- b) 25.9 tonne excavator and 580 mm compaction wheel acting separately with a minimum height of compacted fill of 1.0 m over the top of the pipe. Load is defined in Figure 5.7.1(b).

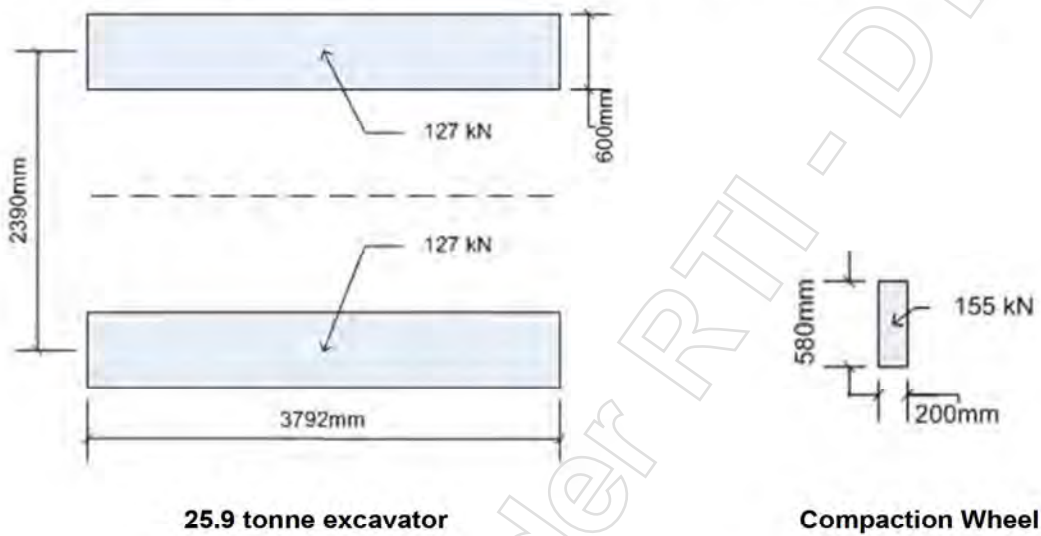
Where additional load cases, other than those listed above, are required, as part of the construction sequence, these cases shall be designed and listed in Annexure MRTS25.1.

If the actual construction sequence results in lower fill heights, and or heavier equipment than those specified, then the pipe installation shall be redesigned with a higher load class of pipe, or different installation conditions.

**Figure 5.7.1(a) – Design load truck and dog trailer**



**Figure 5.7.1(b) – Design load 25.9 t excavator and 580 mm wide compaction wheel**



Design of the pipe and installation for construction load cases is critical, including consideration of loading during placement and compaction of fill around the pipe.

In addition to loads associated with compaction of fill around the pipe, this Technical Specification nominates two construction load cases which must be considered by designers.

To aid the designer and contractor Figure B1 of Appendix B shows the relationship between fill height and pipe load class for the truck and dog trailer (T54) construction load case for the following conditions:

- a) the embankment installation condition with positive projection
- b) soil type wet clay
- c) support types H1, H2/HS1 and HS2.

The installation conditions and support types are as defined in AS/NZS 3725. Load cases and or installation conditions that are not covered by this information must be considered separately by the designer or contractor. Typically the embankment installation condition with positive projection is the installation condition which provides the highest load on the pipe.

Likewise as a design and construction aid only, Figure B2 of Appendix B shows the relationship between fill height and pipe load class for the same installation conditions for the 25.9 tonne excavator and 580 mm wide compaction wheel acting separately. Again load cases that are not covered by this information must be considered separately by the designer.

It is critical for both the designer and the construction team to note that if load cases outside of these two minimum specified load cases are required during the construction sequence, then these cases must be considered separately and the pipe load class and or installation conditions modified to suit. Details of these alternative cases are typically listed in Annexure MRTS25.1

### 5.7.2 Road vehicle loads

W80, A160, SM1600 and HLP400 as defined in AS 5100 for the completed fill height.

Maximum live load pressures due to the design road vehicle load distributed in accordance with AS 5100 are as listed in Table 5.7.2.

**Table 5.7.2 - Live load pressure for AS 5100 Road Vehicle Loads**

Depth (m)	Wheel Load Pressure (kPa)	Depth (m)	Wheel Load Pressure (kPa)
0.40	246	2.80	19
0.60	129	3.00	18
0.80	78	3.20	17
1.00	52	3.40	17
1.20	37	3.60	16
1.40	27	3.80	16
1.60	24	4.00	15
1.80	23	4.20	15
2.00	22	4.40	14
2.20	21	4.60	14
2.40	20	4.80	13
2.60	19	5.00	13

### 5.7.3 Jacking pipes

In addition to the requirement of this specification and AS/NZS 3725, jacking pipes shall be designed to resist the jacking forces generated during the installation process using an appropriate and accepted engineering method.

## 6 Materials

### 6.1 Concrete

Concrete used for the manufacture of steel-reinforced concrete in accordance with this Technical Specification shall comply with AS/NZS 4058 with the following additional requirements:

- a) All cementitious and supplementary cementitious materials, aggregates, chemical admixtures, and water, shall comply with MRTS70 *Concrete*.
- b) Cementitious material shall be a blend compliant with any of the following criteria with the combined total adding to 100%. Tolerances on blend percentage shall be calculated in accordance with AS 1379 Table 4.1 assuming a batch size of 2 to 4 m<sup>3</sup> regardless of actual batch quantity. However under no circumstances shall the amount of Fly Ash on any individual batch be less than 20%. Type HE cement which also meets the requirements of Type GP cement may be substituted for Type GP Cement in any of the blends.
  - i. 65% to 75% GP Cement, 25% to 35% Fly Ash.
  - ii. 50% to 55% GP Cement, 20% to 25% Ground Granulated Blast Furnace Slag, and 25% to 30% Fly Ash.
  - iii. 65% to 71% GP Cement, 4% to 8% Amorphous Silica, and 25% to 31% Fly Ash.

In relation to blend tolerances in Clause 6.1(b) it should be noted that the specified tolerances on blend percentage generally ensure that the minimum fly ash percentage is never less than around 21 to 23%.

#### 6.1.1 Submission of information

The manufacturer shall submit the source and type of all constituent concrete materials, and the proposed blend of cementitious materials for approval in the template format included in Appendix A of this specification to the Director (Structures Construction Materials) or nominated delegate. Upon acceptance of the mix an approval certificate will be issued.

This approval certificate shall be submitted to the Administrator two weeks before any pipes are delivered to site. **Milestone** No pipes shall be delivered to site before the constituent concrete materials and blend of cementitious materials are approved. **Hold Point 3**

#### 6.1.2 Batch recording and records

The manufacturer shall maintain a batch recording system which includes control and measurement of added mix water, and records details and quantities of all batch constituents for each batch for all concrete mixes. These records shall be available for inspection at the manufacturer's plant by the Administrator.

Added water is the water added to the mix not including the water contained within the aggregate above the saturated surface dry condition of the aggregate.

## 6.2 Reinforcement

Reinforcement used in the manufacture of steel-reinforced precast concrete pipes in accordance with this specification, shall comply with the requirements of AS/NZS 4058 with the following additions:

- a) Reinforcement shall be sourced from a Transport and Main Roads registered supplier in accordance with MRTS71 *Reinforcing Steel* and shall comply with the mechanical and physical properties specified in AS/NZS 4671.
- b) Welding of reinforcement by either:
  - i. Electrical resistance welding by automated or semi-automated processes. These processes shall not substantially reduce the cross section of the reinforcement nor adversely affect the strength of the reinforcement, or
  - ii. Manual welding of reinforcement complying with the requirements of MRTS71.

Compliance with MRTS71 for Clause 6.2(b)(ii) to be demonstrated by use of appropriately qualified staff, compliant weld procedures and satisfactory quality of welds. Weld quality to conform to MRTS71.

- c) Processing of reinforcement using off coil machines for longitudinal pipe reinforcement shall comply with MRTS71 *Reinforcing Steel*. Compliance shall be demonstrated by yearly testing of mechanical and geometric properties of the reinforcement post straightening.

## 6.3 Nibs and spacers

Nibs and spacers used to maintain cover to reinforcement during manufacture shall be one of the following:

- a) Normal and Marine Environments – Steel Nibs or Stainless Steel Nibs
- b) Aggressive Environments – Stainless Steel Nibs.

Steel nibs shall be manufactured from material compliant with AS/NZS 4671, stainless steel nibs shall be manufactured from a Grade of Stainless steel listed in MRTS71A *Stainless Steel Reinforcing*. Plastic nibs or spacers shall not be used.

## 7 Manufacture

Concrete pipes shall be manufactured in accordance with this Technical Specification, and AS/NZS 4058 with the following amendments:

- a) Specified cover requirements are not applicable to steel nibs or stainless steel nibs used to maintain cover to circumferential reinforcement, or the ends of longitudinal reinforcement.
- b) Curing of concrete pipes shall be conducted by either wet or steam curing to ensure that all specified performance and durability requirements of this Technical Specification and AS/NZS 4058 are met. If steam curing is used, the rate of temperature rise shall be managed to ensure that no damage or cracking occurs in the pipe, and the maximum enclosure temperature shall not exceed 70°C. The manufacturer shall control and monitor the curing process (wet or steam) to ensure conformance with these requirements and to ensure a consistent controlled process to meet the durability requirements of this Technical

Specification and AS/NZS 4058. Temperature monitoring shall be conducted at least daily in each curing facility. Monitoring equipment shall be calibrated and shall record temperatures at no less than 15 minute intervals for the curing period.

- c) Table 3.6 of AS/NZS 4058 shall be amended such that defect Types 3, 6 and 7 are not acceptable as detailed in Table 7(a) below. All repairs shall be undertaken with an approved cementitious grout or repair mortar.
- d) Clause 5.2.3 of AS/NZS 4058 shall be amended to more specifically define the frequency of testing as shown in Table 7(b) below. All tests, with the exception of water absorption, shall be conducted per pipe size and class for each factory at the specified frequencies (Table 7(b)), or at the specified intervals whichever gives the most test results. Water absorption shall be completed as specified (Table 7(b)) and when there is a change of concrete mix design or concrete materials (Clause 6.1(a)), for each factory. For non standard pipes manufactured to order for a specific project, pipe testing shall be a **Witness Point 1**

**Table 7(a) – Acceptability of Pipe Wall and Joint Surface Defects**

ACCEPTABILITY OF PIPE WALL AND JOINT SURFACE DEFECTS			
Acceptability and conditions			
Defect type (AS/NZS 4058)	Pipe Wall	Joint Surface	
	Drainage Pipes	Drainage Pipes Flush Joints	Drainage Pipes Rubber Ring Joints
1	Acceptable	Not applicable	Not applicable
2	Acceptable after repair if load test passed	Not applicable	Not applicable
3	Not acceptable	Not acceptable	Not acceptable
4	Acceptable	Acceptable	Acceptable
5	Acceptable after repair	Acceptable	Acceptable after repair
6	Not acceptable	Not acceptable	Not acceptable
7	Not acceptable	Not acceptable	Not acceptable

**Table 7(b) – Test requirements**

SUMMARY OF TEST REQUIREMENTS				
Test Name	Appendix / Reference Clause (AS/NZS 4058)	Pipe Application/Test Purpose		
		Drainage		
		Type testing	Routine testing / Frequency of Testing per pipe size and class	Relaxed Routine Frequency of Testing per pipe size and class <sup>10</sup>
Proof load <sup>7</sup>	Appendix C	Required <sup>1</sup>	Monthly or 1 per 50 pipes <sup>4,5,9</sup>	Bi Monthly or 1 per 100 pipes <sup>4,5,9</sup>
Ultimate load	Appendix C	Required <sup>1</sup>	Quarterly	Six Monthly

<b>SUMMARY OF TEST REQUIREMENTS</b>				
<b>Test Name</b>	<b>Appendix / Reference Clause (AS/NZS 4058)</b>	<b>Pipe Application/Test Purpose</b>		
		<b>Drainage</b>		
		<b>Type testing</b>	<b>Routine testing / Frequency of Testing per pipe size and class</b>	<b>Relaxed Routine Frequency of Testing per pipe size and class<sup>10</sup></b>
Hydrostatic pressure – (only for rubber-ring jointed pipes)	Appendix D	Not Applicable <sup>3</sup>	Not Applicable	Not Applicable
Water tightness (90 kPa)	Appendix D	Not Applicable <sup>3</sup>	Not Applicable	Not Applicable
Specified pressure ( $\geq 50$ kPa)	Appendix D	Not Applicable <sup>3</sup>	Not Applicable	Not Applicable
Ultimate pressure	Appendix D	Not Applicable <sup>3</sup>	Not Applicable	Not Applicable
Water absorption <sup>8</sup>	Appendix F	Required <sup>1</sup>	Test per mix design at monthly intervals	Test per mix design at monthly intervals
Cover– (only for reinforced pipes)	Appendix G	Required <sup>1</sup>	Monthly or 1 per 100 pipes <sup>4,9</sup>	Bi Monthly or 1 per 200 pipes <sup>4,9</sup>
Dimensional accuracy <sup>6</sup>	Clauses 3.3 and Appendix A 4.7	Required <sup>1</sup>	Monthly or 1 per 100 pipes <sup>4,9</sup>	Bi Monthly or 1 per 200 pipes <sup>4,9</sup>
Joint assembly test – (Only for rubber ring jointed pipes)	Appendix H	Only if specified <sup>2</sup>	Frequency to be specified	Frequency to be specified

Notes:

1. Required - test is to be carried out whether specified or not.
2. Only if Specified - test is carried out only if specified by the Purchaser as a required test.
3. Not Applicable - test is not applicable and not required.
4. Which ever gives the most tests dependant on production volume. Testing to be conducted per pipe size and class.
5. Subject to the approval of the administrator, where delivery and or installation of pipes is required before 7 days, the requirement for ultimate load testing may be waived subject to proof load testing being conducted at a frequency of no less than 1 in 20 pipes before delivery.
6. Additional requirements may be relevant for jacking pipe applications.
7. Pipes used for proof load testing, may be accepted, subject to approval by the Administrator, provided that after testing the pipes comply with all requirements of this Technical Specification.
8. Pipes used for sampling for water absorption may be accepted subject to approval by the Administrator provided the core hole has been satisfactorily repaired with an approved cementitious repair mortar. Note that results for water absorption testing may not be available at the time of installation. Previous results for the same mix designs can be accepted provided there is a demonstrated history of compliance and there has been no change to materials or mix designs.

SUMMARY OF TEST REQUIREMENTS				
Test Name	Appendix / Reference Clause (AS/NZS 4058)	Pipe Application/Test Purpose		
		Drainage		
		Type testing	Routine testing / Frequency of Testing per pipe size and class	Relaxed Routine Frequency of Testing per pipe size and class <sup>10</sup>
<p><sup>9</sup> Where pipe production exceeds 200 pipes per month per pipe size and class, frequency of testing may be decreased to 1 per 100 pipes for proof load, and 1 per 200 pipes for cover to reinforcement, and dimensional accuracy.</p> <p><sup>10</sup> In addition where a factory has demonstrated 6 continuous months of compliant results then the testing frequencies specified can move to the relaxed routine frequencies. A non compliance would result in a return to the routine testing rate. Bi-Monthly is once every 2 months.</p>				

### 7.1 Additional requirements

The proof load and ultimate load for Class 2 to Class 10 pipes (inclusive) shall be in accordance with AS/NZS 4058. For pipes with higher load classes than defined by AS/NZS 4058 check availability and appropriateness with the manufacturer and designer.

Dimensional tolerances for wet cast pipes shall be in accordance with this Technical Specification.

Additional dimensional accuracy requirements may be specified for Jacking Pipe applications.

## 8 Information to be supplied at delivery

### 8.1 General

Information shall provide to the Administrator as specified in Clauses 8.2 and 8.3, obtained from the precast concrete pipe manufacturer, in accordance with the times specified.

### 8.2 Prior to delivery of pipes to the site

The following information shall be provided to the Administrator 3 weeks before any pipes are delivered to site **Milestone:**

- a) drawings or tabulations showing pipe dimensions and tolerances,
- b) type of joint.

No pipes shall be delivered to the site until written acceptance has been obtained from the Administrator. **Hold Point 4**

### 8.3 With the delivery of each batch of pipes

With each batch of pipes delivered to the site a delivery docket shall be supplied that provides traceability to a conformance report for the batch. The delivery docket shall also state that the pipes supplied conform to the requirements of AS/NZS 4058 and this Technical Specification.

At no less than monthly intervals, the Contractor shall provide a conformance report, issued by the precast concrete pipe manufacturer, confirming that the pipes supplied conform to the requirements of AS/NZS 4058 and this specification. This conformance report will include relevant test results as specified in Table 7(b) for each batch of pipes. Final acceptance of pipes shall be subject to receipt and acceptance of this report by the Administrator. **Hold Point 5**

## 9 Inspection and delivery

Steel-reinforced precast concrete pipes shall remain available for inspection at the place of manufacture for a minimum of 7 days from the date of manufacture or be inspected on site prior to installation. **Witness Point 2**

It is generally expected that the most practical method will be for the administrator to inspect the pipes on site prior to installation.

Steel-reinforced precast concrete pipes shall not be transported from the place of manufacture until all testing has been completed, and until the pipes are of an age where the durability, serviceability, pipe profile, and surface finish is not adversely affected in any way.

With respect to water absorption, the test may not have been completed but the sample must have been taken if required before delivery.

## 10 Product marking

Pipes shall be marked in accordance with AS/NZS 4058 with the addition that pipes manufactured for Aggressive environments in accordance with this Technical Specification will be labelled "Aggressive" or "30/30" as appropriate.

Where aggressive environment pipes have 30 mm cover to the reinforcement inside and outside, label 30/30 should be used. Where the pipe is manufactured from a triple blend concrete, or uses a protective coating or keyed in liner (Refer Clause 5.3.5) then the label "aggressive" should be used.

## 11 Installation

Pipes shall be installed as specified in MRTS03 *Drainage, Retaining Structures and Protective Treatments*. Pipes shall not be installed until seven days has elapsed since the date of manufacture, and all test results have been provided and are conforming in accordance with Table 7(b) for the batch of pipes manufactured.

Where circumstances require installation before seven days, modifications to pipe testing are required in accordance with Note 5 of Table 7(b).

The maximum angle of deflection of joints for pipes is two degrees.

Pipes shall be installed in accordance with MRTS03, the nominated loading and installation conditions in Clause 5.7 of this Technical Specification and as detailed in Annexure MRTS25.1.

**Appendix A – Example mix design submission template**

Unique Mix Code Identifier/ Date/Version			
Material	Type <sup>1</sup>	Source <sup>2</sup>	Requirement/Comment
<b>Cementitious Material</b>			
Cement			Manufacturer to certify that total Cementitious content to be not less than 330 kg/m <sup>3</sup> and blend percentages in accordance with MRTS25 and state the blend and blend percentages.
Fly Ash			
GGBFS (Slag) <sup>4</sup>			
Amorphous Silica <sup>4</sup>			
<b>Aggregates</b>			
Coarse 1			As per MRTS70
Coarse 2			As per MRTS70
Fine 1			As per MRTS70
Fine 2			As per MRTS70
<b>Water</b>			
Water	n/a		As per MRTS70
Water/Total Cementitious Ratio	n/a	n/a	Manufacturer to certify that water to total cementitious ratio is less than or equal to 0.4.
<b>Admixtures</b>			
Admixture 1			All admixtures are to be TMR approved in accordance with MRTS70. Manufacturer to certify maximum listed dose rates are not exceeded.
Admixture 2			
1. Manufacturer must nominate the type and size (where appropriate) of the material. 2. All materials are to be Transport and Main Roads approved. Source information to include supplier, type and ATIC registration number for cementitious materials. For Aggregates please include Transport and Main Roads Quarry Certificate number in source description. Admixture source to include manufacturer and manufacturer's brand name for admixture. 3. Manufacturer must nominate that the actual quantity complies with the specified requirement where appropriate. 4. In most applications these components are not mandatory.			

Appendix B – Design guide for construction loads

Figure B1 – Fill height and Pipe Load Class for various installation conditions for Truck and Dog Trailer

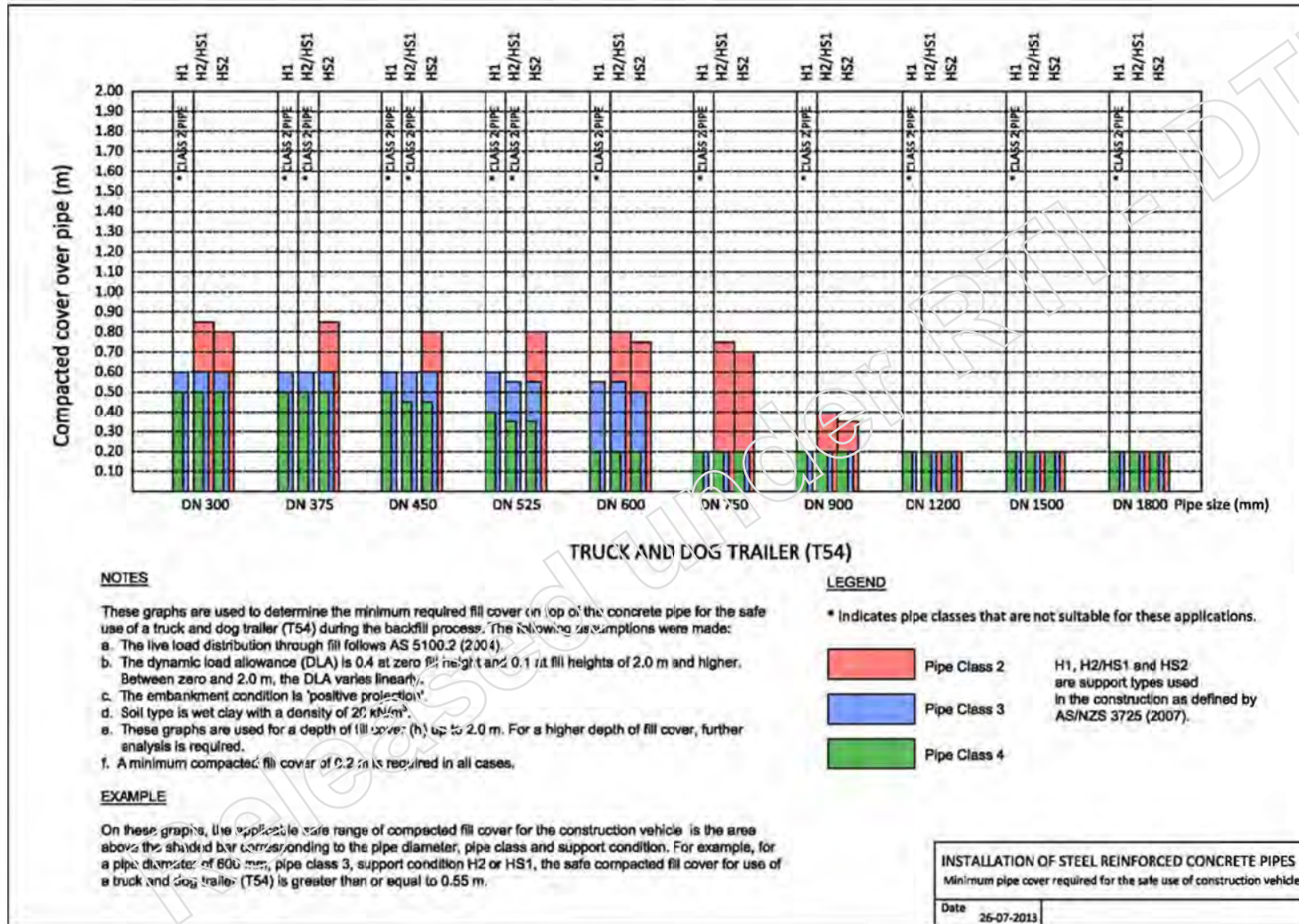
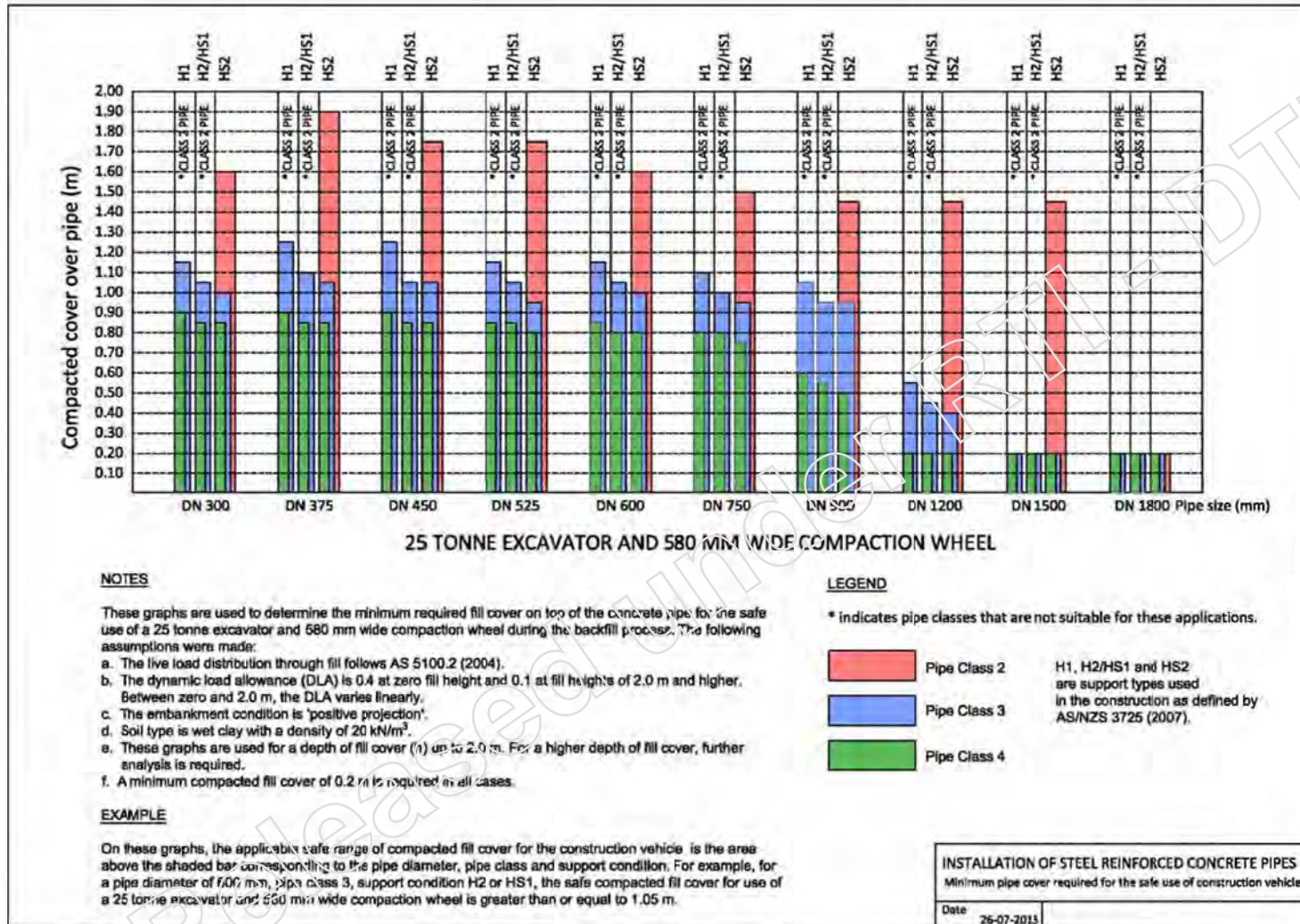


Figure B2 – Fill height and Pipe Load Class for various installation conditions for 25.9 tonne excavator and 580 mm wide compaction wheel



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# Annexure MRTS25.1 (January 2018) Steel Reinforced Precast Concrete Pipes



## Specific Contract Requirements

### Contract Number

CN-12205

**Note:** Clause references within brackets in this Annexure refer to Clauses in the parent Technical Specification MRTS25 (January 2018) unless otherwise noted.

Clause 1 in this Annexure will be completed by the Designer under the contract.

- 1** If applicable, additional construction loads and or combinations of construction loads and fill heights considered by the designer in addition to those nominated in MRTS25 shall be as listed below:

Nil.

- 2** The following amendments shall be applied to the Technical Specification

#### **Clause 1 Introduction**

##### Clause 1 Introduction

The following paragraph shall be added after the first paragraph of Clause 1:

"Pipes shall be designed, manufactured and installed in accordance with AS/NZS 4058 'Precast concrete pipes (pressure and non-pressure)' and AS/NZS 3725 'Design for installation of buried concrete pipes' except where modified by this Technical Specification".

#### **Clause 2 Administrative Requirements**

##### Clause 2 Administrative Requirements

The following paragraph shall be added after the first paragraph of Clause 2:

"Eligibility and capability to supply to this Technical Specification and accompanying annexure shall be satisfied by the submission of a current registered supplier certificate."

#### **Clause 5 Design**

##### Clause 5 Design

The following paragraph shall be added after the first paragraph of Clause 5:

"Design drawings shall identify pipe class, diameter, exposure classification (that is normal, marine or aggressive) and assumed construction load case(s)."

##### Clause 5.2 Design internal diameter

The entire text within Clause 5.2 shall be deleted and replaced by the following text:

"The design internal diameter as defined in AS/NZS 4058 shall not be less than 95% of the nominal internal diameter specified on the drawings for pipe classes up to and including Class 4. Designers selecting pipes of class greater than 4 shall use manufacturer's dimensions to check if the design internal diameter is sufficient for the hydraulic performance required.

Where the design internal diameter does not meet these requirements, an alternative design internal diameter may be submitted to the Administrator for approval. Drawings or tabulations showing the alternative design internal diameter shall be submitted not less than three weeks before supply of pipes is due to commence. **Milestone** No pipes of an alternative design internal diameter shall be supplied until written approval is granted by the Administrator. **Hold Point**

**Clause 5.3.1 General**

The entire text within Clause 5.3.1 shall be deleted and replaced by the following text:

"Environments for pipes supplied in accordance with this specification shall be defined as per AS/NZS 4058 and Clause 5.3.4".

**Clause 5.3.2 Normal Environment**

Not used

**Clause 5.3.3 Marine Environment**

Not used

**Clause 5.7 Design for Installation**

The entire text within Clause 5.7 shall be deleted and replaced by the following text:

"Steel-reinforced concrete pipes shall be designed for installation in accordance with AS/NZS 3725. Construction load cases shall be considered in accordance with Clause 5.7.1.

Designs already completed to AS 5100.2 shall be deemed to comply with these requirements."

**Clause 5.7.1 Construction Loads**

Note: Reference to Appendix B in the commentary is no longer valid.

**Clause 5.7.2 Road vehicle loads**

Not used

**Clause 6 Materials**

**Clause 6.1 Concrete**

The entire text within Clause 6.1 shall be deleted and replaced by the following text:

"Concrete used for the manufacture of steel-reinforced concrete in accordance with this specification shall comply with AS/NZS 4058 with the following additional requirements:

- a) All cementitious and supplementary cementitious materials, aggregates, and chemical admixtures shall be sourced from a registered TMR supplier.
- b) Cementitious material shall be a blend compliant with one of the following:
  - i. Binary blend containing GP or HE Cement and a minimum of 20% fly ash.
  - ii. 50% to 55% GP Cement, 20% to 25% Ground Granulated Blast Furnace Slag and 25% to 30% fly ash.
  - iii. 65% to 71% GP Cement, 4% to 8% Amorphous Silica, and 25% to 31% fly

ash."

**Clause 6.1.1 Submission of information**

Delete the second paragraph of this clause.

Note: Milestone and Hold Point are removed from this clause.

**Clause 6.1.2 Batch recording and records**

The entire text within Clause 6.1.2 shall be deleted and replaced by the following text:

"The manufacturer shall maintain a batch recording system".

**Clause 6.2 Reinforcement**

The entire text within Clause 6.2 shall be deleted and replaced by the following text:

"Reinforcing steel shall comply with AS/NZS 4671 (as per AS/NZS 4058 requirements) and be sourced from an ACRS certified supplier."

**Clause 7 Manufacture**

**Clause 7 Manufacture**

Delete parts (b), (c) and (d) of this clause and replace with:

"(b) For steam curing the maximum enclosure temperature shall not exceed 70°C"

Note: Witness Point is removed from this clause.

**Clause 8 Information to be supplied at delivery**

**Clause 8.1 General**

The entire text within Clause 8.1 shall be deleted and replaced by the following text:

"Information supplied on delivery shall be as per Section 6 of AS/NZS 4058. Means of demonstrating compliance (sub point j of Section 6.1) shall include either:

- Each delivery docket stating conformance to AS/NZS 4058 or
- One compliance certificate stating conformance to AS/NZS 4058 per project"

**Clause 8.2 Prior to delivery of pipes to the site**

Not used

Note: Milestone and Hold Point are removed from this clause

**Clause 8.3 With the delivery of each batch of pipes**

Not used

Note: Hold Point is removed from this clause

**Clause 10 Product marking**

**Clause 10 Product marking**

The entire text within Clause 10 shall be deleted and replaced by the following text:

"Pipes shall be marked in accordance with AS/NZS 4058 with the addition that pipes manufactured for Aggressive environments shall note the measures used."

**Clause 11 Installation**

**Clause 11 Installation**

The entire text within Clause 11 shall be deleted and replaced by the following text:

"Pipes shall be installed as specified in MRTS03 *Drainage, Retaining Structures and*

*Protective Treatments.* Pipes shall not be installed until seven days has elapsed since the date of manufacture.

Where circumstances require installation before seven days additional proof loads tests shall be conducted at a rate of 1 in 20 pipes.

The maximum angle of deflection of joints for pipes is two degrees.

Pipes shall be installed in accordance MRTS03, the nominated loading and installation conditions in Clause 5.7 of this specification and as detailed in Annexure MRTS25.1.

In accordance with MRTS03 *Drainage, Retaining Structures and Protective Treatments*, Clause 12.3.1, 'General', the construction loads to be placed on the pipe shall be checked by the contractor. If the Contractor chooses heavier plant and/or less cover than that indicated on the drawings, the selected pipe class and installation technique must be certified by the contractor's RPEQ Design Engineer.

For the specified pipe class and size, the contractor shall progressively backfill the pipe using the fill depth and construction equipment permissible in Table B1 of AS/NZS 3725.

As-built drawings shall identify as-constructed pipe class, diameter and exposure classification."

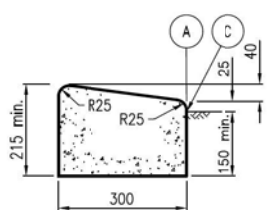
**Appendix B**

Not used.

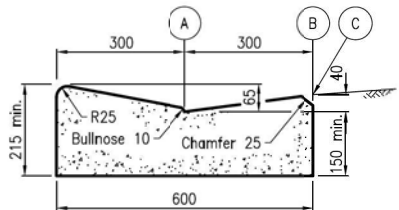
**3 Additional Amendments to Technical Specification**

The following modified requirements shall apply.

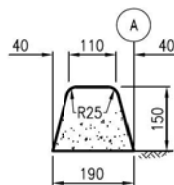
Nil.



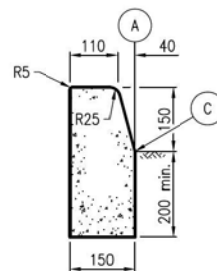
BELOW ROAD SURFACE  
TYPE 1



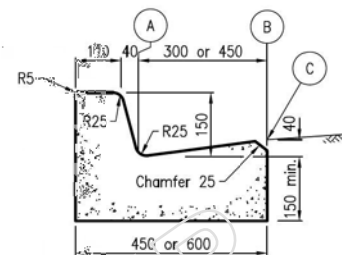
WITH CHANNEL  
TYPE 2



ON ROAD SURFACE  
TYPE 4



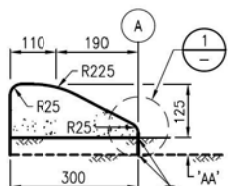
BELOW ROAD SURFACE  
TYPE 5



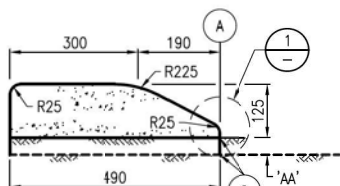
WITH CHANNEL  
TYPE 6 (300 CHANNEL)  
TYPE 7 (450 CHANNEL)

**MOUNTABLE KERBS**

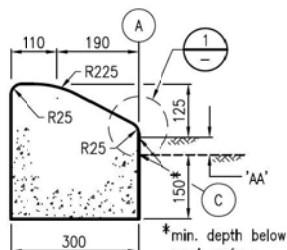
**BARRIER KERBS**



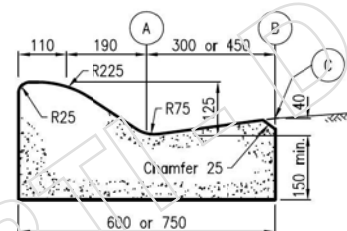
ON ROAD SURFACE  
TYPE 8 (DEPTH 125)  
TYPE 9 (DEPTH 125 + 'AA')



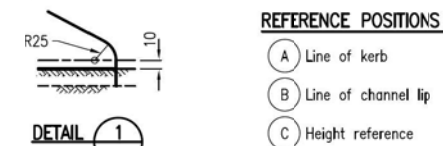
ON ROAD SURFACE - WITH BACKING STRIP  
TYPE 10 (DEPTH 125)  
TYPE 11 (DEPTH 125 + 'AA')



BELOW ROAD SURFACE  
TYPE 12 (DEPTH 125)  
TYPE 13 (DEPTH 125 + 'AA')



WITH CHANNEL  
TYPE 14 (300 CHANNEL)  
TYPE 15 (450 CHANNEL)



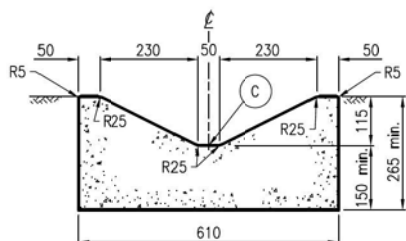
**NOTES:**

- CHANNEL THROAT THICKNESS of 150mm and portion of kerbs below finished surface shown is a minimum. The underside of the section should preferably coincide with the top of a pavement layer in level and slope.
- TRANSITIONING between kerb types to be carried out over 1.5m (min).
- CONCRETE
  - Manually placed concrete to be N32/10, to MRTS70.
  - Machine-placed concrete to MRTS70, Clause 17.20, minimum cementitious content of 320 kg/m<sup>3</sup> (no compressive strength testing required).
- ASPHALT ALLOWANCE 'AA' provides for initial asphalt layer and/or future overlay as indicated in the documents. 'AA' may include the thickness of any combination of: - asphalt corrector course - initial asphalt layers - estimated future asphalt overlay.
- DIMENSIONS are in millimetres unless shown otherwise.

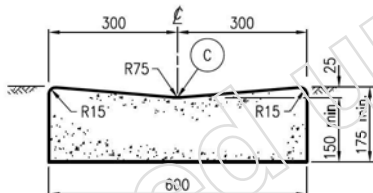
ASSOCIATED DEPARTMENTAL DOCUMENTS:  
Standard Drawings  
Specifications

REFERENCED DOCUMENTS:  
Departmental Specifications:  
MRTS03 Drainage, Retaining Structures and Protective Treatments  
MRTS70 Concrete

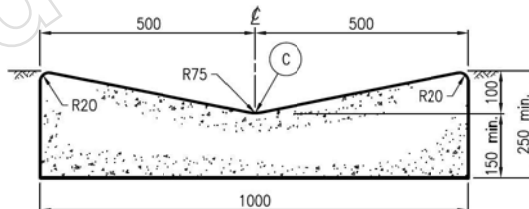
Australian Standards:  
AS 2876 Concrete Kerbs and Channels (Gutters) - Manually or Machine Placed



TYPE 3

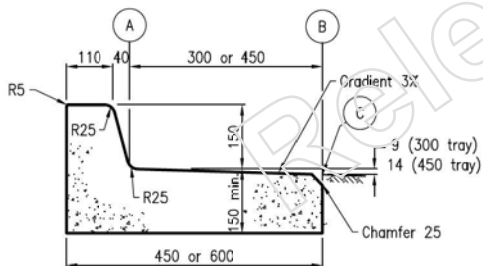


TYPE 22

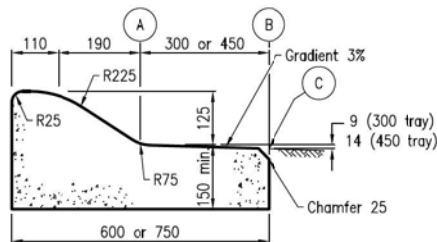


TYPE 28

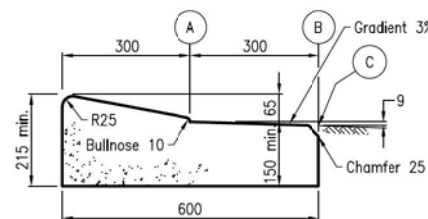
**CHANNELS**



TYPE 23 (300 TRAY)  
TYPE 24 (450 TRAY)  
**BARRIER KERB AND TRAY**

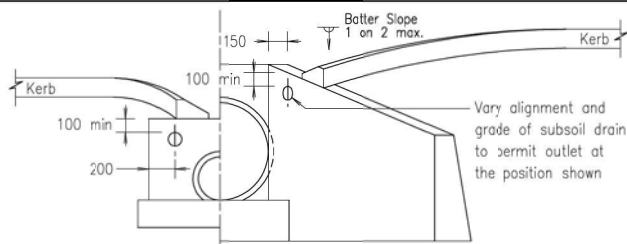


TYPE 25 (300 TRAY)  
TYPE 26 (450 TRAY)  
**SEMI MOUNTABLE KERB AND TRAY**

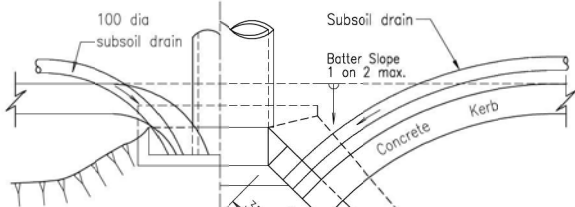


TYPE 27  
**MOUNTABLE KERB AND TRAY**

Department of Transport and Main Roads			
KERB AND CHANNEL			
PROFILES		Standard Drawing No <b>1033</b> Date 7/2020	A3 Not to Scale



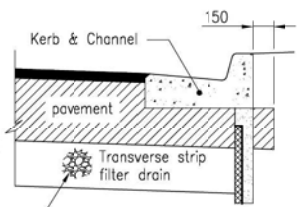
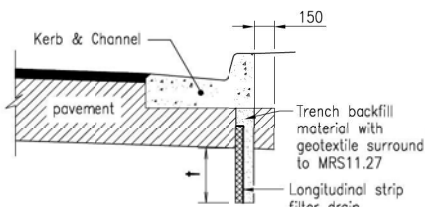
HALF ELEVATIONS



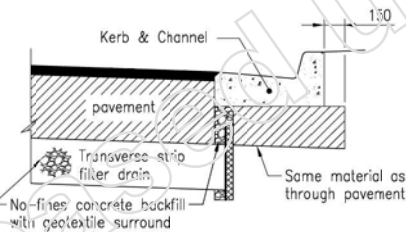
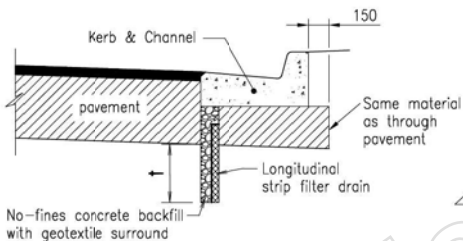
HALF PLANS

CULVERTS < 675dia      CULVERTS > 675dia

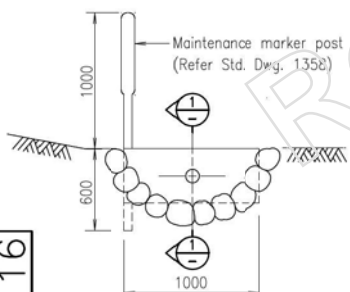
OUTLET TO CULVERT



TYPE D SUBSOIL DRAINS IN CUTTINGS \*

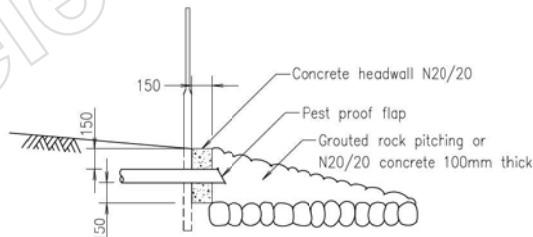


PAVEMENT EDGE TYPE D SUBSOIL DRAINS \*

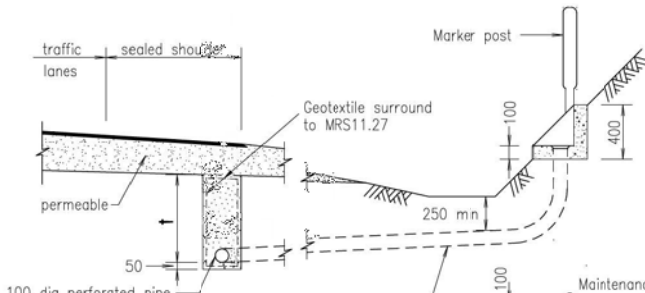


ELEVATION

OUTLET TO NATURAL SURFACE



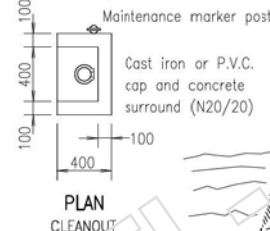
SECTION 1



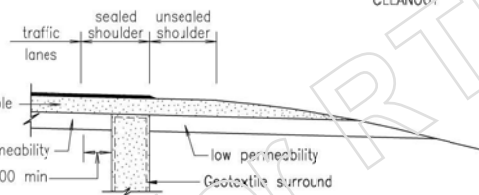
100 dia perforated pipe with textile sleeve surround

Subsoil drain cleanout - 100 dia drainage pipe. Cleanouts at head of pipe and at 60m maximum spacings (50m maximum spacings for strip filter drains)

CUTTING CROSS SECTION \*  
SUBSOIL DRAIN AND CLEANOUT

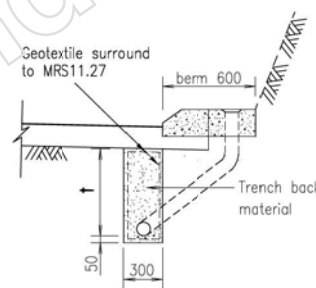


PLAN  
CLEANOUT



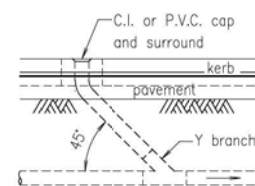
EMBANKMENT CROSS SECTION \*

TYPE B SUBSOIL DRAIN - UNKERBED SHOULDERS

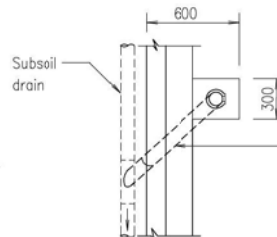


CROSS SECTION \*

No-fines concrete backfill to (MRS11.70) geotextile surround

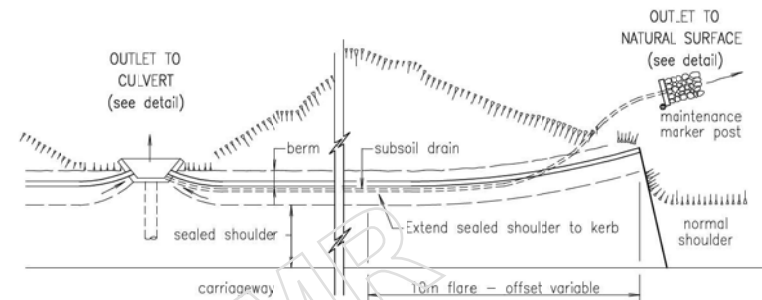


ELEVATION

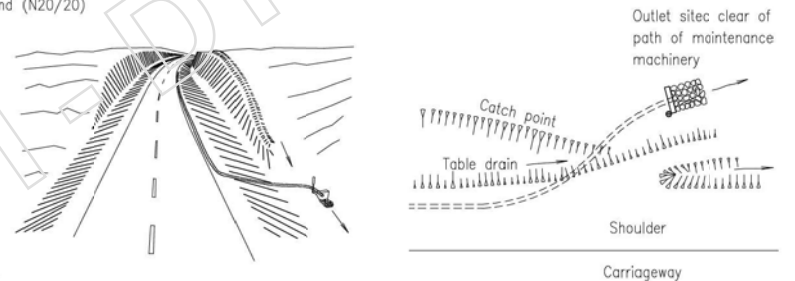


PLAN

TYPE B SUBSOIL DRAIN AND CLEANOUT - KERBED SHOULDER



TYPICAL OUTLET TREATMENTS - KERBED SHOULDER



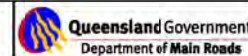
TYPICAL OUTLET TREATMENTS - UNKERBED SHOULDER & TABLE DRAIN

\* For position of subsoil drains refer to detail drawings  
† As specified in the job documents

NOTES :

- SPECIAL REQUIREMENTS FOR SUBSOIL DRAINS below the pavement are set out in the Department of Main Roads standard specification MRS11.03.
  - PERFORATED DRAINAGE PIPES AND STRIP FILTER DRAINS are to comply with Department of Main Roads standard specification MRS11.03.
  - TRENCH BACKFILL MATERIALS shall comply with standard specification MRS11.03.
  - SUBSOIL DRAIN CLEANOUTS shall be suitably marked using marker posts for easy identification by maintenance personnel.
  - MINIMUM GRADE of subsoil drain is to be 0.5%.
  - KERB AND CHANNEL DETAILS - Refer to Standard Drawing 1033.
  - DISCHARGE INTO GULLY PITS/ACCESS CHAMBERS : Where the subsoil drain is discharged into a gully pit/access chamber, the outlet of the subsoil drain shall be located above the level of the outlet of the stormwater pipes/culverts. The subsoil drain outlets shall be provided with pest-proof flaps.
  - DIMENSIONS are in millimetres unless shown otherwise.
- ASSOCIATED DOCUMENTS:  
Department of Main Roads Manual of Standard Drawings Roads  
Department of Main Roads Manual of Standard Specifications Roads
- REFERENCED DOCUMENTS:  
Standard Drawings:  
1033 Kerb and Channel - Kerbs, Channels and Ramped Vehicular Crossing  
1358 Maintenance Marker Posts - Post and Installation Details
- Standard Specifications:  
MRS11.03 Drainage, Retaining Structures and Protective Treatments  
MRS11.27 Geotextiles (Separation and Filtration)  
MRS11.70 Concrete

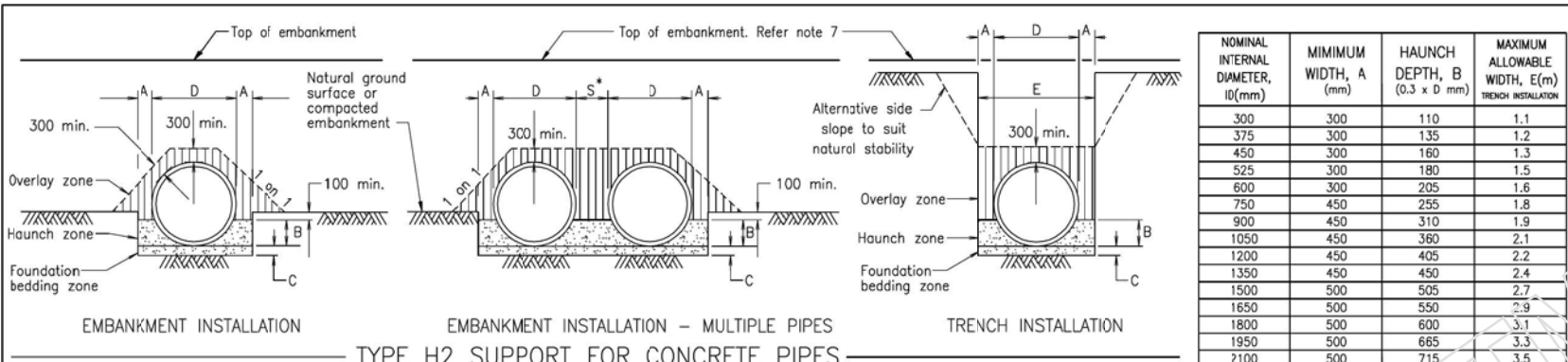
SUBSOIL DRAINS



OUTLETS AND CLEANOUTS

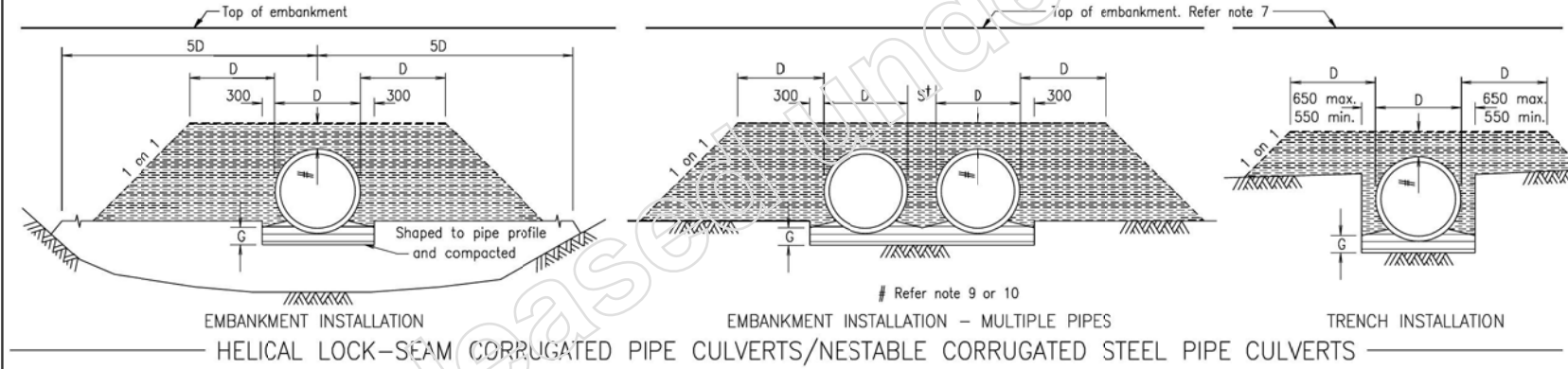
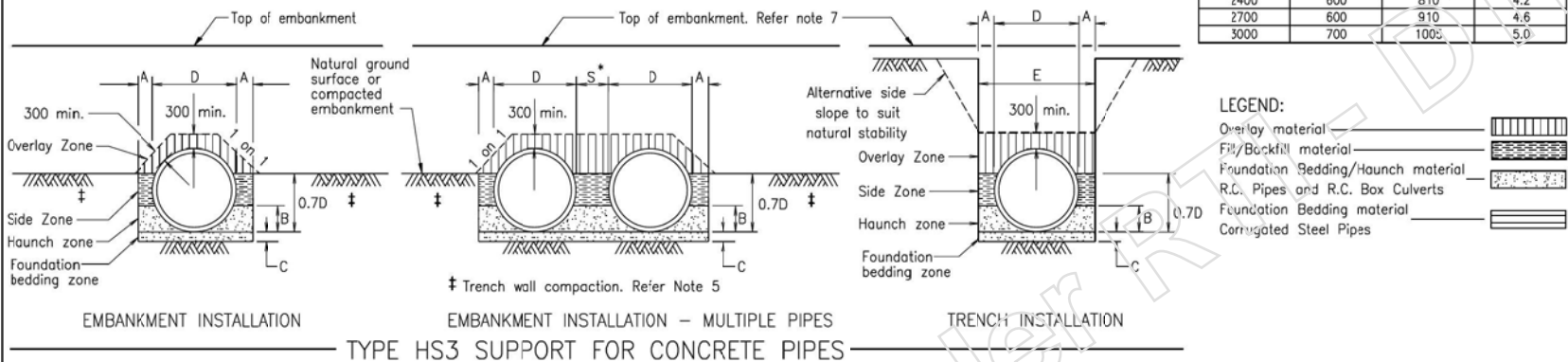
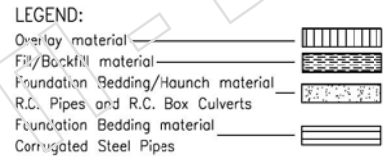
Size A3	Drawing No
Scale as shown	1116
	Date 9/02
	shown A B C D E F

11116



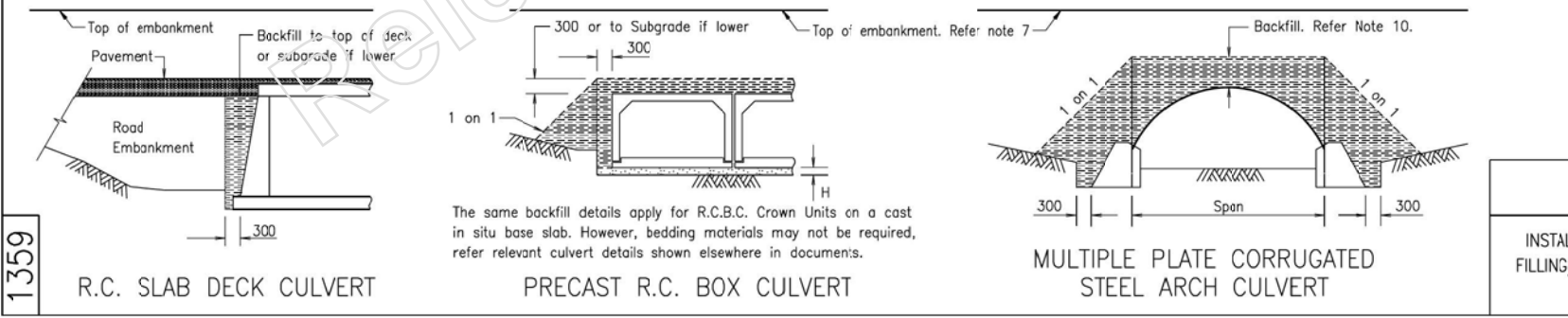
NOMINAL INTERNAL DIAMETER, ID(mm)	MINIMUM WIDTH, A (mm)	HAUNCH DEPTH, B (0.3 x D mm)	MAXIMUM ALLOWABLE WIDTH, E(m) TRENCH INSTALLATION
300	300	110	1.1
375	300	135	1.2
450	300	160	1.3
525	300	180	1.5
600	300	205	1.6
750	450	255	1.8
900	450	310	1.9
1050	450	360	2.1
1200	450	405	2.2
1350	450	450	2.4
1500	500	505	2.7
1650	500	550	2.9
1800	500	600	3.1
1950	500	665	3.3
2100	500	715	3.5
2400	600	810	4.2
2700	600	910	4.6
3000	700	1000	5.0

- NOTES :
- "D" denotes external diameter of culvert.
  - FOUNDATION BEDDING
    - C R.C. Pipes
      - 100 if ID < 1350
      - 150 if ID ≥ 1350
    - G Corrugated Steel Culverts
      - 100 in firm material other than rock
      - D/4 or 250 whichever ever the lesser in rock
    - H Precast Box Culverts
      - 75 min. in firm material other than rock
      - 150 min. in rock
  - SPACING BETWEEN MULTIPLE CULVERTS
    - S R.C. Pipes
      - 300 when nominal ID ≤ 600
      - 600 when nominal ID > 600 and ≤ 1800
      - 900 when nominal ID > 1800
    - st Corrugated Steel Culverts
      - 1. Nestable Culverts :
        - Dia/2 or 300 min.
      - 2. Helical Lock-seam Culvert :
        - 300 (when nominal ID ≤ 600)
        - Dia/2 (when nominal ID > 600 and ≤ 1800)
        - 1200 (when nominal ID > 1800)
      - 3. Plate Culverts :
        - Dia (or span) or 1200 max.



- WINGWALLS fill/backfill material shall be placed 300mm thick behind wingwalls for the length and height of the wings.
- TRENCH WALL COMPACTION of natural ground or embankment
  - Minimum 90% Standard RDD for minimum 2.5D each side of trench wall and to a minimum depth of 0.7D.
- DETAILS TO BE SHOWN ELSEWHERE IN THE DOCUMENTS concrete pipe support type.
- WORKING LOADS are those due to fill material and standard highway vehicles as per AS 3725. Allowance for construction loads shall comply with standard specification MRS11.03.
- MINIMUM DEPTH OF OVERLAY ZONE above pipes/culverts as shown may include pavement. Pavement within this area to be compacted by hand or alternatively a lean mix concrete pavement layer may be used.
- HELICAL LOCK-SEAM CORRUGATED PIPE CULVERTS MINIMUM COVER:
 

Diameter	Minimum Cover
≤1200mm	600mm
>1200mm	Diameter/2
- NESTABLE AND MULTIPLE PLATE CORRUGATED STEEL CULVERTS: Minimum cover shall be 600mm or Diameter or Span whichever is the greater.



The same backfill details apply for R.C.B.C. Crown Units on a cast in situ base slab. However, bedding materials may not be required, refer relevant culvert details shown elsewhere in documents.

CULVERTS		<b>Queensland Government</b> Department of Main Roads	
INSTALLATION, BEDDING AND FILLING/BACKFILLING AGAINST/OVER CULVERTS		Size A3	Drawing No
		Scales	1359
		as shown	Date 10/03
		A	B C D E

1359

**CN-12205**

**Northern Transitway Project**

**Project Specific Supplementary Specification**

**PSSS02 General Supplementary Specification**

**Revision History**

Document control						aurecon	
<b>Report title</b>		PSSS02 General Supplementary Specification					
<b>Document code</b>		504050-2DD07-SPE-JJ-0002	<b>Project number</b>		CN-12205		
<b>Client</b>		Department of Transport and Main Roads					
<b>Client contact</b>		Caleb Brown	<b>Client reference</b>				
Rev	Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver	
T0	2020-11-06	Issue for Tender			NR		
<b>Current revision</b>		T0					

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## 1 Introduction

### 1.1 General

This Technical Specification applies to the management, co-ordination and implementation of supplementary items to be undertaken by the Principal Contractor in conjunction with the works under the Contract.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

### 1.2 Scope

The scope of the supplementary specification covers the following requirements:

- The Principal Contractor's responsibilities under the Contract
- The proposed work and to be undertaken during the Contract

For modifications to existing TMR and BCC infrastructure refer to individual design drawings and their respective specifications.

### 1.3 Definition of terms

The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*. Additional terms used in this Technical Specification shall be as defined in Table 1-1.

**Table 1-1 Definition of terms**

Term	Definition
PSSS	Project specific supplementary specification
TMR	Transport and Main Roads
PVC	Polyvinyl Chloride
BCC	Brisbane City Council

### 1.4 Referenced documents

Table 1-2 lists documents referenced in this PSSS.

**Table 1-2 Referenced documents**

Reference	Title
504050-0000-DRG (Varies)	Detailed Design Drawings
MRTS01	Introduction to Technical Specifications
MRTS50	Specific Quality System Requirements

## 2 Measurement of work

### 2.1 Supplementary work items

In accordance with the provisions of Clause 2.1.3 of MRS01 Introduction to Specifications, the supplementary works items incorporated in this Specification are listed in Table 2-1.

**Table 2-1 Supplementary work items**

Supplementary Item No.	Description	Unit of Measurement
90104S	Drainage survey, condition assessment and mapping	lump sum
90105S	Tram track survey and mapping	lump sum
90106S	Demolition of retaining wall, [location]	lump sum
90107S	Supply and installation of bus stop road furniture as shown on the drawings	lump Sum
90502S	Supply and installation of premium bus stop shelter	each
90503S	Salvage and re-installation of premium bus stop shelter	each
90504S	Supply and installation of grated/slotted drain in line pits	each
90505S	Regrading/replacement of private property stormwater connection to kerb and channel	each
90506S	Regrading/replacement of private property stormwater connection to underground drainage system	each
90507S	Connect new culvert to existing concrete access chamber or gully	each
90508S	Install new access chamber or gully on existing pipe, [type]	each
90509S	Connect existing culvert to new culvert (bandage joint)	each
90510S	Raise or lower existing stormwater infrastructure, [type]	each
90513S	Salvage of bus stop FID's and reinstallation with new J-pole and footing including reinstatement of communications and electrical connections	each
91002S	Supply and installation of grated/slotted drain in footpath, [size/type]	m
91003S	Installation of PVC pipe components, [size] mm diameter, [HDPE] type, [locations]	m
92001S	Supply and installation of permanent concrete paver tactile ground surface indicators (bus stops, kerb ramps, driveways)	m <sup>2</sup>
92002S	Profile existing pavement	m <sup>2</sup>
92507PS	Pavement repairs (Provisional, if ordered)	m <sup>3</sup>

## 2.2 Work Operations

The listed work operations for the Standard Work Items are given below.

### **Item 90104S                      Drainage survey, condition assessment and mapping**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Work Operations listed in Clause 59 of MRTS03 Drainage, Retaining Structures and Protective Treatments.
- c) Undertake sitewide survey in accordance with TMR surveying standards Part 1 and 2 as well as AS5488
- d) Undertake condition assessment of all existing infrastructure in accordance with the TMR Structures Inspection Manual
- e) Supply .12da data and RPEQ condition reporting to the Administrator
- f) Refer to Clause 4.1 of this specification for further requirements

### **Item 90105S                      Tram track survey and mapping**

Work Operations incorporated in the above item include:

- g) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- h) Undertake survey in accordance with TMR surveying standards Part 1 and 2 as well as AS5488
- i) Undertake manual processing of the data and produce .12da file format outputs
- j) Supply .12da data and information to the Administrator
- k) Refer to Clause 4.2 of this specification for further requirements

### **Item 90106S                      Demolition of retaining wall [location]**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) carrying out any necessary excavations;
- c) demolishing complete retaining walls or sections as relevant including footings;
- d) disposing of demolished materials;
- e) backfilling resulting excavations.

### **Item 90107S                      Supply and installation of new bus stop road furniture as shown on the drawings**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Setting up temporary traffic and pedestrian management as required

- c) Construction, including removal or demolishing of existing furniture
- d) Disposal of necessary materials
- e) Preparation of any necessary foundations for road furniture to be placed
- f) Carry out necessary logistics to deliver to site
- g) Install road furniture as per relevant standards, guidelines and drawings.

**Item 90502S                      Supply and installation of premium bus stop shelter**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Work operations and guidelines listed within BCC Standard Drawing BSD-2103
- c) Supply of new bus shelter to Translink requirements
- d) Supply of new bus stop sign (Is-10a) as per the requirements of Bus Network Infrastructure Signage Manual
- e) carrying out any necessary excavations
- f) removing or demolishing of existing infrastructure as required
- g) Disposal of necessary materials
- h) Compacting material at the bottom of excavations;
- i) Fabricating and placing steel reinforcement for modified structure;
- j) Placing and compacting concrete;
- k) Finishing and curing concrete;
- l) Installation of bus shelter, bus stop sign and associated services (comms and electrical) as per contract drawings, TransLink Standard Drawings DRG-5-0102, Bus Network Infrastructure Signage Manual (Is-10a) and BCC Standard Drawing BSD-2103.
- m) Re-connection of existing electrical and communications connections through new conduits and pits to new bus stop position in accordance with MRTS256, MRTS228 and MRTS234

**Item 90503S                      Salvage and re-installation of premium bus stop**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Work operations and guidelines listed within BCC Standard Drawing BSD-2103
- c) Salvage of existing shelter
- d) Supply of new bus stop sign (Is-10a) as per the requirements of Bus Network Infrastructure Signage Manual

- e) carrying out any necessary excavations
- f) removing and demolishing of existing infrastructure including existing footing structure and existing pits and conduits as required
- g) Compacting material at the bottom of excavations;
- h) Fabricating and placing steel reinforcement for modified structure;
- i) Placing and compacting concrete;
- j) Finishing and curing concrete;
- k) installation of bus shelter, bus stop sign and associated services (commis and electrical) as per Translink standard drawing DRG 5-0031 and Bus Network Infrastructure Signage Manual (Is-10a).
- l) Re-connection of existing electrical and communications connections through new conduits and pits to new bus stop position in accordance with MRTS256, MRTS228 and MRTS234

**Item 90504S                      Supply and installation of grated/slotted drain in line pits**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) carrying out any necessary excavations
- c) carry out necessary temporary reinforcements and stabilization works
- d) disposal of excavated materials
- e) Installation of drainage pit as specified by the manufacturer
- f) Backfill around pit as specified by the manufacturer
- g) Reinstatement of adjacent surfaces.
- h) Comply with Clause 4.1 of this specification

**Item 90505S                      Regrading/replacement of private property stormwater connection to kerb and channel**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) carrying out any necessary excavations
- c) disposal of excavated materials
- d) demolition of exiting stormwater connection.
- e) Installation of private property stormwater connection in accordance with Brisbane City Council Standard Drawing BSD-8114
- f) Management of existing services and infrastructure

- g) Regrading of surfaces including backfill above new Storm water connection allowing appropriate time to cure
- h) Comply with Clause 4.1 of this specification

**Item 90506S                      Regrading/replacement of private property stormwater connection to underground drainage system**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) carrying out any necessary excavations
- c) disposal of excavated materials
- d) demolition of exiting stormwater connection.
- e) replacing associated infrastructure with stormwater connection to underground drainage
- f) Reinstatement of adjacent surfaces including backfill.
- g) Comply with Clause 4.1 of this specification

**Item 90507S                      Connect new culvert to existing concrete access chamber or gully**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) All works conducted in accordance with MRTS03.
- c) Supply of all materials, including all necessary road pavement materials;
- d) Carrying out localised excavations, including all necessary road pavement materials;
- e) Removing and/or demolishing existing components, including saw cutting;
- f) Removing/demolishing concrete;
- g) Utilising or disposing of existing components and excavated or demolished materials; and
- h) Sealing/making good any connections including subsoil outlets and flush points.
- i) Construction of opening in existing access chamber or gully;
- j) Reshaping or reinstallation of concrete benching;
- k) Fabricating and placing steel reinforcement for modified structure;
- l) Placing and compacting concrete;
- m) Finishing and curing concrete;
- n) Placing cement mortar; and
- o) Placing and compacting backfill material.

- p) All works conducted in accordance with MRTS03 and applicable standard drawings;
- q) Comply with Clause 4.1 of this specification.

**Item 90508S                      Install new access chamber or gully on existing pipe/s, [type]**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Work Operations listed in Clause 2.2.17 and Clause 2.2.18 of MRS03 *Drainage, Retaining Structures and Protective Treatments*
- c) Supply of all materials, including all necessary road pavement materials;
- d) Carrying out localised excavations, including all necessary road pavement materials;
- e) Demolishing of existing components, including saw cutting;
- f) Utilising or disposing of existing components and excavated or demolished materials; and
- g) Construction, including removal and demolishing, of an opening in the existing pipe that is suitable for the new access chamber or gully;
- h) Placing and shaping of concrete benching;
- i) Compacting material at the bottom of excavations;
- j) Fabricating and placing steel reinforcement for modified structure;
- k) Placing and compacting concrete;
- l) Finishing and curing concrete;
- m) Placing cement mortar;
- n) Sealing/making good any connections including subsoil outlets and flush points.
- o) Placing and compacting backfill material;
- p) Installing applicable new components (e.g. lintel, troughs, step irons, galvanised steel ladder/s, etc);
- q) Installing new surround, cover/grate and frame; and
- r) Reinstatement of road pavement
- s) All works conducted in accordance with MRTS03 and applicable standard drawings;
- t) Comply with Clause 4.1 of this specification

**Item 90509S                      Connect existing culvert to new culvert (bandage joint)**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) All works conducted in accordance with MRTS03.

- c) Supply of all materials, including all necessary road pavement materials;
- d) Carrying out localised excavations, including all necessary road pavement materials;
- e) Removing and/or demolishing existing components, including saw cutting;
- f) Removing/demolishing concrete;
- g) Utilising or disposing of existing components and excavated or demolished materials; and
- h) Sealing/making good any connections including subsoil outlets and flush points.
- i) Construction of opening in existing pipe;
- j) Compacting material at the bottom of excavations;
- k) Connecting existing pipe to new culvert;
- l) Placing cement mortar;
- m) Fabricating and placing steel reinforcement
- n) Placing and compacting concrete;
- o) Placing and compacting backfill material;
- p) Construct in accordance with Brisbane City Council Standard Drawing BSD-8012;
- q) Comply with Clause 4.1 of this specification

**Item 90510S                      Raise or lower existing stormwater infrastructure, [type]**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Work Operations listed in Clause 2.2.17 and Clause 2.2.18 of MRS01 *Drainage, Retaining Structures and Protective Treatments*
- c) Supply of all materials, including all necessary road pavement materials;
- d) Carrying out localised excavations, including all necessary road pavement materials;
- e) Removing and/or demolishing existing components, including saw cutting;
- f) Removing/demolishing concrete;
- g) Utilising or disposing of existing components and excavated or demolished materials; and
- n) Sealing/making good any connections including subsoil outlets and flush points.
- i) Fabricating and placing steel reinforcement
- j) Constructing new concrete shaft;
- k) Replacing and/or repairing damaged components;
- l) Constructing new concrete components;

- m) Installing applicable new components (e.g. lintel, troughs, step irons, galvanised steel ladder/s, etc);
- n) Installing new surround, cover/grate and frame to new finished surface;
- o) Cleaning/disposing of any materials;
- p) Disposal the existing components that cannot be utilised in the modified structure (e.g. chamber, lintel, troughs, cover/grate, frame, etc);
- q) Reinstatement of road pavement (e.g. asphalt) to finished surface as required;
- r) All works conducted in accordance with MRTS03 and applicable standard drawings;
- s) Comply with Clause 4.1 of this specification

**Item 90513S                      Salvage of bus stop VMS's and reinstallation with new J-pole and footing including reinstatement of communications and electrical connections**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Salvage of existing PID at bus stops;
- c) Transport and storage of PID with in the Principal Contactor site facilities ensuring no damage;
- d) Demolition of existing J-pole, footing, pits and conduits;
- e) Installation of new J-pole in new position in accordance with Brisbane City Council Standard Drawing BSD-4301;
- f) Installation of salvaged PID into new J-pole; and
- g) Reinstatement existing communications and electrical connections through new conduits and cables to new pole position in accordance with MRTS256, MRTS228 and MRTS234.

**Item 91002S                      Supply and installation of grated/slotted drain in footpath, [size/type]**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) carrying out any necessary excavations
- c) carry out necessary temporary reinforcements and stabilization works
- d) utilising or disposing of excavated and removal of demolished materials
- e) Bedding/foundation works as specified by the manufacturer
- f) Installation of drain as specified by the manufacturer
- g) Reinstatement of adjacent surfaces.

- h) Comply with Clause 4.1 of this specification

**Item 91003S                      Installation of PVC pipe components, [size] mm diameter,  
[HDPVC] type, [locations]**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) carrying out any necessary excavations
- c) carry out any necessary temporary reinforcements and stabilization works
- d) utilising or disposing of excavated and removal or demolished materials
- e) Installation of PVC pipe components including fitting and adaptors and tying in with the existing infrastructure
- f) Backfill of materials to support PVC pipe
- g) Installation of any protection for PVC pipe
- h) Management of existing services and infrastructure
- i) Reinstatement of adjacent surfaces.
- j) Comply with Clause 4.1 of this specification

**Item 92001S                      Supply and installation of permanent concrete paver tactile  
ground surface indicators (bus stops, kerb ramps,  
driveways)**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Set out to be in accordance with project and standard drawings for bus stops, kerb ramps and driveways respectively
- c) Installation of permanent concrete paver tactile ground surface indicators in accordance with Brisbane City Council Standard Drawing BSD-5218

**Item 92002S                      Profile existing pavement**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Profile existing asphalt; and
- c) Disposal of excess material; and
- d) Comply with the requirements outlined in Section 4.3 of this specification.

**Item 92507S                      Pavement repairs (Provisional, if ordered)**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Excavation of failed pavement including saw cutting;
- c) Disposal of excavated material;
- d) Preparing existing surfaces;
- e) Supply of all materials;
- f) Placing, compacting asphalt pavement repair; and
- g) Surfacing with bitumen or asphalt, if specified.
- h) Comply with the requirements outlined in Section 4.3 of this specification.

### **3 General requirements**

#### **3.1 Material Requirements**

Where not stated in the work item/descriptions above all works shall be undertaken in accordance with the relevant TMR Specifications.

#### **3.2 Damage and Repair of PUP**

The Principal Contractor shall be responsible for any damage to any PUP (including any completed PUP relocation) in accordance with the General Conditions of Contract.

#### **3.3 Damage and repair of existing infrastructure**

The Principal Contractor shall be responsible for any damage to any existing infrastructure in accordance with the General Conditions of Contract.

#### **3.4 Disruption to the Public**

The Principal Contractor shall ensure that disruption, in performing demolition works to the retaining walls has limited impacts to individual landowners and/or occupiers and nearby pedestrians, is kept in accordance with the General Conditions of Contract and utility authority requirements.

#### **3.5 Temporary Support of Utility Services**

The Principal Contractor shall take all necessary precautions to avoid damage to existing and new installations of utility services whilst carrying out his own work on the Contract.

Where the Principal Contractor's work operations necessitate the temporary support or protection of utility services, the Principal Contractor shall notify the Utility Services Authority concerned, refer to PSSS01. All such supports and protection shall be carried out with the approval of the Utility Services Authority.

#### **3.6 Works Within State-Controlled Road Boundaries**

All demolitions are to be carried out in accordance with the specifications and conditions under the Contract.

#### **3.7 Payment**

Payment for pavement treatments will be measured separately for each work item.

### **4 Construction requirements**

#### **4.1 Drainage survey, condition assessment, mapping and general works**

Prior to the start of any drainage works the Principal Contractor shall undertake a detailed survey and condition assessment of the existing drainage network so the Principal can confirm the extent of the network, levels and condition. The extent of drainage survey shall consist of any access chamber, gully, structure and pipe contained within the extent of works including local roads and is required to extend 50m past the furthest extent of works (including road surfacing). All drainage outlets from private properties shall also be identified and located.

The Contractor shall submit to the Administrator the proposed extent of drainage survey and condition assessment for approval. **Hold Point**

All storm water pipes and chambers are to be surveyed and CCTV undertaken to determine

condition, pipe size and chamber arrangement and existing levels. In addition, 3D scanning of all non-standard (outside current TMR standard drawings) drainage chambers shall be undertaken. The detailed survey of all elements shall be undertaken in accordance with TMR's surveying standards Part 1 and 2 and AS5488.

The Contractor shall undertake and submit to the Administrator a detailed condition assessment for each chamber to TMR's Structures Inspection Manual containing an RPEQ assessment and recommendation to determine if the existing structures can be retained, and lid modified to suit new surface levels. **Hold Point**

Following the submission of the existing data the Contractor shall allow 60 business days, so the Administrator and the Designer can verify and certify the proposed drainage design. **Hold Point**

Where any changes are identified to the drainage design outside of the existing provision schedule items, changes shall be handled under Clause 40 of the General Conditions of Contract.

No drainage works or ordering of drainage components under MRS03 shall occur until proposed drainage construction scope has been agreed and approved by the Administrator. **Hold Point**

#### **4.2 Tram track survey and mapping**

Prior to the start of any median pavement works the Principal Contractor shall undertake a detailed survey of the tram tracks so the Principal can confirm the depth and location. Potholing of the tram tracks is to occur at an interval of at least 50m on both the northbound and southbound carriageway and shall expose the edge of the existing concrete slab.

The Contractor shall submit to the Administrator the proposed extent of tram track survey for approval. **Hold Point**

The extent of the tram tracks shall be surveyed in accordance with TMR's surveying standards Part 1 and 2. A .12da file shall be supplied the Administrator for issue to the Principal. **Hold Point**

Following the supply of data, the Contractor shall allow 60 working days in their program, so the Principal and the Designer can verify the proposed pavement design. **Hold Point**

Where any changes are identified to the proposed pavement design it shall be handled under Clause 40 of the General Conditions of Contract.

No construction of median subgrade and pavements MRS04, MRS10, MRS30, MRS32, MRS104 shall occur until pavement scope has been agreed and approved by the Administrator. **Hold Point**

#### **4.3 Asphalt profiling and pavement repairs**

Actual locations for the treatment shall be confirmed on site by the Administrator following inspection of the existing pavement. Prior to construction, the Administrator will mark out the areas to be repaired or crack filled.

The Contractor shall restore, at no cost to the Principal, any of the remaining sections of pavement, drainage infrastructure, or road furniture damaged by the Contractor's operations.

##### **4.3.1 Profile Existing Pavement**

Profile Existing Pavement shall apply only to pavement overlay/inlay works as shown on the drawings or as directed by the Administrator. Existing pavement excavated by means of profiling for the construction of full depth pavements shall be deemed to be included within MRTS04.

The Contractor shall advise the Administrator at least three days prior to any profiling operations to enable any traffic detector loops to be located and disconnected as necessary.

The Contractor shall restore, at no cost to the Principal, any of the above sections which are damaged by the Contractor's operations. The pavement shall be swept free of all loose material prior to tack coating, seal application and laying asphalt and the resultant rubble shall be removed from the site of the works.

A tolerance of -0, +10mm will be allowed on the depth ordered. Any material removed in excess of the ordered depth + 10mm shall be replaced with new asphalt at no cost to the Principal. Notwithstanding the depth ordered, the Contractor is to profile existing pavements to a depth to ensure that the minimum layer thickness is achieved in accordance with Clause 12.2.6.5 of MRTS30.

All profiled areas shall be constructed to the final levels within the times shown below, unless otherwise approved by the Administrator.

- a) Full width profiling; or
- b) Edge profiling against kerb or kerb and channel within 4 days after profiling.

Temporary ramps shall be provided where safety and road amenity necessitates and as directed by the Administrator. Such temporary ramps, whether full width or localised (such as at edges and around manholes or valves), shall be at least 2m long, smooth and of uniform grade. Installation and removal of temporary ramps shall be deemed to be included in Item 20001 Provision for Traffic.

The new SAMI seal or any other Waterproofing seal shall not to be exposed to traffic.

Loose stone requiring removal will be at the cost of the Contractor and undertaken with instruction by the Administrator within 24 hours. At all times the pre-milled surface is to be maintained to a standard safe for traffic.

Dust control shall form part of the works where the administrator may ask the contractor to monitor the dust levels if determined necessary and ask contractor to implement dust suppression methods at no additional cost. All dust is to be removed prior to placing the next layer. Where required, hand work shall be part of the work item. The contractor shall remove any material that the administrator feels necessary to be removed prior to asphalt/seal utilising any other methods which shall form a part of this work item.

#### **4.3.2 Saw cut existing pavement**

The minimum depth of the saw cut shall be 40 mm, unless detailed otherwise elsewhere in the Contract Documents or as directed by the Administrator.

#### **4.3.3 Scarify existing pavement**

Where the edge of the remaining existing surface, adjacent to the area to be scarified, remains exposed, that edge is to be saw cut to a minimum depth of 40 mm, prior to scarifying.

The area shall be deep ripped to at least the full existing pavement depth, 400mm, or to the minimum depth shown on the Drawings, whichever is greatest.

All bituminous and/or asphalt surfacing, cement treated materials and material deleterious to plant growth shall be excavated from the scarified areas, removed from the scarified areas and utilised or disposed of in accordance with the requirements of Clause 10 of MRTS01. The scarified area shall

be trimmed to a neat and tidy shape with a loose surface.

#### **4.3.4 Reshaping**

The exposed existing pavement shall be brought to new profile by reshaping, compacting and trimming prior to any priming, sealing and asphalt works required to bring to the finished design surface shown on the drawings.

All other surfacing works to bring to the new design profile will be constructed under their respective items of work.

#### **4.3.5 Asphalt Pavement Repairs**

The Contractor may elect to carry out excavation for repairs using a road profiler, or alternatively, by saw cutting around the area to be repaired and excavating the failure.

The prepared excavation is to be backfilled to the existing adjacent road surface level using AC20 dense-graded asphalt paving material, as directed by the Administrator. Where the depth of the excavation is 200 mm or greater, the bottom (100 mm maximum thickness) layer shall have a Characteristic Value of Relative Compaction of not less than 89%. The Contractor is to profile/excavate existing pavements to a depth to ensure that the minimum and maximum layer thicknesses are achieved in accordance with Clause 12.2.6.5 of MRTS30.

Bitumen emulsion tack coat shall be applied at the rate of 0.5L/m<sup>2</sup> to the floor and walls of the excavation. No separate payment will be made for the tack coat to the excavation and the Contractor shall allow for its costs in the unit rate for the asphalt backfilling to the excavation.

Where the pavement repair will not be overlaid within one week, the top 40 mm of the specified asphalt backfill is to be replaced with either DG14 or DG10, as specified by the Administrator, with no extra payment being made for this replacement work.

The deviation from a 3m straight edge placed on the surface of the patch shall be no more than ±5mm, due allowance being made for the design shape. The finished surface shall be within ±5mm of the surrounding road surface. A tolerance of -5mm, +10mm will be allowed on the depth ordered.

The volume of pavement material used for the repairs shall be deducted from any other paving activities during the shift and shall be calculated on a relative density of 2.5t/m<sup>3</sup>.

#### **4.3.6 Crack Filling**

The treatment of cracks (typically 10mm or less in width) is to be carried out prior to the placement of any corrector course or overlay. The Administrator will confirm the extent of crack filling to be completed.

Prior to crack filling, loose material is to be removed for 100mm on each side of the crack. The sealant shall be applied with an approved applicator to produce a sealant band, of maximum 50mm width (with the crack centered in the sealant band) along the entire length of the crack. The sealant shall be no more than 3mm in thickness, with a tolerance of +0mm, -1mm, and the thickness of the sealant is to be checked and recorded by field staff at 25 metre intervals.

If the sealant will not be immediately overlaid with asphalt or a bitumen seal, coarse sand shall be immediately spread over and rolled into the fresh sealant to ensure adhesion. The surface shall be trafficable after 5 minutes.

**CN-12205**

**Northern Transitway Project**

**Project Specific Supplementary Specification**

**PSSS03 General Supplementary Specification 2**

## Revision History

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## 1 Introduction

### 1.1 General

This Technical Specification applies to the management, co-ordination and implementation of supplementary items to be undertaken by the Principal Contractor in conjunction with the works under the Contract.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

### 1.2 Scope

The scope of the supplementary specification covers the following requirements:

- The Principal Contractor's responsibilities under the Contract
- The proposed work and to be undertaken during the Contract

For modifications to existing TMR and BCC infrastructure refer to individual design drawings and their respective specifications.

### 1.3 Definition of terms

The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*. Additional terms used in this Technical Specification shall be as defined in Table 1-1.

**Table 1-1 Definition of terms**

Term	Definition
PSSS	Project specific supplementary specification
TMR	Transport and Main Roads
PVC	Polyvinyl Chloride
BCC	Brisbane City Council

### 1.4 Referenced documents

Table 1-2 lists documents referenced in this PSSS.

**Table 1-2 Referenced documents**

Reference	Title
504050-0000-DRG (Varies)	Detailed Design Drawings
MRTS01	Introduction to Technical Specifications
MRTS50	Specific Quality System Requirements

## 2 Construction Handover Documentation and Safety Audits

### 2.1 General

This item applies to the provision of Construction Handover Documentation and Road Safety Audits.

Construction Handover Documentation must be issued to the Administrator no more than four weeks after Practical Completion in hard copy and electronic formats unless otherwise approved by the Administrator in consultation with the Principal.

Any issues regarding the design during construction shall be addressed through a Request for Information process which will be clarified by the designer 'Aurecon Australasia Pty Ltd'.

In accordance with the requirements of Clause 10 of MRTS50, Aurecon has certified the design. The contractor shall ensure that the works are built as per the 'Issued for Construction' drawings. Changes to the design shall not be permitted without approval from the Administrator.

### 2.2 Supplementary work items

In accordance with the provisions of Clause 2.1.3 of MRS01 Introduction to Specifications, the supplementary works items incorporated in this Specification are listed in Table 2-1.

**Table 2-1 Supplementary work items**

Supplementary Item No.	Description	Unit of Measurement
90109S	Construction Handover Documentation	lump sum
90110PS	Road Safety Audit – During Construction (Provisional Item, if ordered)	lump sum
90111PS	Road Safety Audit – Post Construction (Provisional Item, if ordered)	lump sum

### 2.3 Work Operations

The listed work operations for the Standard Work Items are given below.

#### Item 90109S Construction Handover Documentation

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Construction Report(s);
- c) Construction Completion Report(s);
- d) As Constructed Records;
- e) As Constructed Drawings;
- f) As Constructed Records for ITS and Electrical Infrastructure;
- g) As Constructed Survey;
- h) Electronic Copies of Documents;
- i) Maintenance Responsibility Drawings; and

- j) Requirements for Brisbane City Council-controlled Infrastructure Records.

**Item 90110PS Road Safety Audit – During Construction**

Work operations incorporated in the above item includes:

- a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Standard Specifications;
- b) Day and night site inspection (including travel)
- c) Review the crash history and comment on the crash types and of locations of greatest concern
- d) Review of detailed design drawings
- e) Road alignment and cross section: Assess sight distance, speed limits, overtaking, 'readability', lane widths, shoulders, cross falls
- f) Intersections: Access location, sight distance, controls and delineation, layout
- g) Signage and lighting: Assess lighting, general signage issues, sign legibility and supports
- h) Line marking and delineation: Assess lines, guideposts, reflectors and delineation
- i) Road furniture: Assess clear zones, fences, visibility of road furniture
- j) Pavements: Assess structural conditions, failures
- k) Pedestrians and cyclists: Assess overall clarity, existing provision and current standards.
- l) Provide detailed recommendations for improvements/mitigation measures to address the road safety issues identified during the site inspection;
- m) Prepare a Draft Road Safety Audit Report and forward to the project team for review and implementation of any changes required;
- n) Close out all issues raised and submit Final RSA Reports; and
- o) General liaison with the project team

**Item 90111S Road Safety Audit – Post Construction**

Work operations incorporated in the above item includes:

- a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Standard Specifications;
- b) Complete a Post Construction Road Safety Audit in accordance with the procedures set out in the Austroads Guide to Road Safety Part 6: Road Safety Audit;
- c) Conduct post construction site investigations (as ordered) for the entire project site. Documenting any safety hazards identified including but not limited to pedestrian and

cyclist facilities, roadside objects, line-making, intersection control, sight distance, and speed environment. Review of bicycle and motorised lanes and adopted shared pedestrian and cyclists crossing facilities constructed at each major intersection.

- d) Provide detailed recommendations for improvements/mitigation measures to address the road safety issues identified during the site inspection;
- e) Prepare a Draft Road Safety Audit Report and forward to the project team for review and implementation of any changes required;
- f) Close out all issues raised and submit Final RSA Reports; and
- g) General liaison with the project team

## **2.4 Requirements for the Construction Report**

### **2.4.1 Construction Report**

The Contractor must develop:

- a) a Construction Report for the Contractor's Work excluding structures; and
- b) a separate Construction Report for each structure (if applicable).

The Contractor's Construction Report must include:

- a) background details of the project and project delivery;
- b) a schedule of important milestones and their achievement dates;
- c) a schedule of the major design and constructed elements of the project, including quantities;
- d) the condition (dilapidation) reports (if required);
- e) all pertinent/relevant Inspection and Maintenance Manuals, updated with construction information, manufacturer manuals and warranties;
- f) details of proprietary products, manufacturers name, model number, manuals, warranties and specialists contracts (where appropriate) for all manufactured components;
- g) construction records;
- h) testing results and certificates (including proprietary supplier testing results);
- i) concrete test results (including a summary in electronic format);
- j) audit certificates;
- k) defect list (updated up to Practical Completion);
- l) non-conformance reports (NCRs);
- m) addenda from specifications; and
- n) suggested specification or detail changes, or any problems encountered with current specifications or details.

- o) as appendices to the Construction Report, the following reports:
- i. Environmental Finalisation Report;
  - ii. Final Complaints Management Report;
  - iii. Final Community Liaison Report;
  - iv. Landscape Revegetation and Urban Design Report;
  - v. Safety in Design Report (updated);
  - vi. As Constructed Pavement Report.

The Contractor's Construction Reports for each structure must include:

- a) quality system information that complies with the requirements of MRTS50 "Specific Quality System Requirements";
- b) a copy of every non-conformance relevant to the structure; and
- c) a copy of the Administrator's written approval of the corrective action to every non-conformance.

#### **2.4.2 Specific Requirements for ITS and Electrical Infrastructure**

Notwithstanding the general requirements detailed in section 2.4.1 the Contractor's Construction Report must include:

- a) Electrical Test Certificates – One per electrical installation (Refer AS3000);
- b) TCA01 Form (Refer S009);
- c) M994 (Traffic Signals, VSLS, LUMS, Ramp Metering)
- d) The following requirements from MRTS201 "General Equipment Requirements":
  - vii. Operation and Maintenance Manuals;
  - viii. Maintenance record manual;
  - ix. Fibre Optic test results (exact requirements specified in MRTS234);
  - x. Factory Acceptance Test(s), Installation Acceptance Test(s), STREAMS Acceptance Test(s), Commissioning Tests and Customer (field) Acceptance Test(s) documentation;
  - xi. Electrical Test Certificate(s);
  - xii. Manufacturers manuals (including maintenance manuals and procedures);
  - xiii. RO'AMS Asset Data included in Attachment 23.C "Metro ITS&E Asset Inventory and Configuration Spreadsheet dated 13 October 2014" in accordance with the requirements stipulated in Attachment 23.B "Intelligent Transport Systems and Electrical Asset Management – Data Collection and Maintenance Requirements – Engineering & Technology, Road Operations, June 2016" to Appendix 23 "Lighting of Roadways, Pedestrian and Bicycle Facilities";

- xiv. STREAMS Configuration Data Entry Spreadsheet.
  - xv. Any OEM Software (including commented PLC Source code);
  - xvi. Specifics on configuration, including IP Address Allocation; and
  - xvii. Training and Training Manual.
- e) The Contractor shall provide and install A3 laminated As-constructed Drawings into each ITS field/node cabinet, ITS electrical switchboard, Traffic Signal Controller and DTMR road lighting electrical switchboard.

#### **2.4.3 Construction Completion Report prior to Final Completion**

The Contractor must compile Construction Completion Reports as attachments to each of the Construction Report.

Each Construction Completion Report must be relevant to the infrastructure to which each Construction Report relates:

- a) include the results of the post construction monitoring undertaken during the Defect Liability Period;
- b) include an analysis of the results of all post construction monitoring;
- c) list the Defects (if any) corrected during the Defect Liability Period; and
- d) detail the impacts of the Defect Correction on the Project Works.

#### **2.4.4 Requirements for As Constructed Records**

The Contractor must prepare and issue the following As-constructed Records to the Administrator:

- a) As-constructed Drawings including shop drawings for all structures (if applicable);
- b) As-constructed Records
- c) All revisions of drawings that are not part of the As Constructed records (for example, if the As Constructed Drawing is Revision D, then the Contractor must provide:
  - i. the initial Issued for Construction drawing (Revision A) certified by the relevant RPEQ design engineer/s; and
  - ii. every subsequent revision of the Drawing (being Revisions, B and C in this example).

#### **2.4.5 Requirements for As Constructed Drawings**

As Constructed drawings shall be provided in accordance with the TMR Drafting and Design Presentation Standards Manual. As Constructed drawings are to include shop drawings for all structures.

As Constructed Drawings must be issued to the Administrator to comply with the following:

- f) One hard copy A3 size drawing with original signatures, including RPEQ Certification where required, on a media called A3 Permanent Paper ranging from 100microns to 135microns that complies with Clause 2.3 "Drawings" of Volume 1, Chapter 2 General Standards of the

TMR 'Drafting and Design Presentation Manual' and must include:

- g) Every subsequent Design Revision Drawing (Revisions B, C, D, and so on) in A3 plain white paper; and
- h) Each Final Issue Drawing.
- i) The As Constructed Drawings shall be certified by (signed in blue), as applicable, the relevant RPEQ design engineer/s or the Contractor as required in clause 12 "As Constructed drawings" of MRTS50 "Specific Quality System Requirements" And Clause 1.7.1.4 of TMR's Drafting and Design Presentation Standards Manual.
- j) A signed statement is required on each drawing stating that "the Works shown on the drawing are a factual representation of works constructed". The signatory of this statement shall be the Contractor's construction representative (in all other cases).
- k) As-constructed Drawings must include:
  - i. A completed index of all drawing numbers issued to the Contractor that meets the requirements in Appendix 9 "Drawing Numbering"
  - ii. All amendments and any changes made during construction;
  - iii. Any out-of-tolerance construction which was accepted in writing by the Administrator for inclusion in the Project Works; and
  - iv. Details of the complete works under each activity, including:
    - 1) Works for other authorities including Utility Authorities;
    - 2) Utility Infrastructure constructed and/or adjusted;
    - 3) Abandoned Utility Infrastructure conduits, pipes etc. with their status and treatment clearly annotated on the drawings; and
    - 4) New Utility Infrastructure conduits that are unused (e.g. conduits for future traffic signals).
- l) As-constructed landscape revegetation and urban design Drawings must:
  - i. Represent surveyed as-constructed landscape and revegetation treatments;
  - ii. Show dimensioned sight visibility zones, sight visibility areas to operational signage and clear zones; and

#### **2.4.6 Requirements for As Constructed Survey**

As Constructed Surveys are to be undertaken where specified in the contract documentation and in accordance with the TMR 'Survey Standards Manual'. These may include works as specified in MRTS91 Conduits and Pits, MRTS92 Traffic Signal and Road Lighting Footings and MRTS03 Drainage, Retaining Structures and Protective Treatments or other relevant Technical Specifications that form part of the contract.

Deliverables including the Survey Control Register, Conformance and all As Constructed Survey data shall be provided as specified in the TMR Surveying Standards Manual. As Constructed

surveys and design models in electronic form in 12D ASCII format.

Horizontal coordinate datum for all TMR surveys shall be the Geocentric Datum of Australia 1994 (GDA94) and implemented in the relevant zone of the Map Grid of Australia 1994 (MGA94), unless specified otherwise. All surveys shall be based on the Australian Height Datum 1971 (AHD71), unless specified otherwise.

#### 2.4.7 Requirements for Electronic Copies of Documents

The Contractor must provide the Administrator with electronic copies of the following documents on disk in the following format(s):

Document Name or Descriptions	Acceptable Format(s)
Reports	One PDF file per lot
Non-Conformance Reports	One PDF file per NCR including attachments
Request for Information	One PDF file per RFI including attachments
Operation, Inspection and Maintenance Manual	MS Word
Design Model	12D ASCII format
As Constructed Survey	12D ASCII format
All other documents	One PDF file per report, drawing, and so on. Plus MS Work and or MS Excel documents where practicable

#### 2.4.8 Requirements for Maintenance Responsibility Drawings

The Contractor must produce Maintenance Responsibility Drawings for the Contractor's Work.

The Maintenance Responsibility Drawings must:

- a) Include a general layout (plan view) of the Site;
- b) Include a thick line(s) that defines the boundary between the infrastructure that:
  - i. TMR is responsible to operate, manage and maintain; and
  - ii. Brisbane City Council is responsible to operate, manage and maintain.
- c) Include co-ordinates of all angles in the boundary line and includes the datum used to determine the co-ordinates;
- d) Include notes and other information when necessary that provide clarify about any specific requirements or nuisances;
- e) Meet all requirements of Brisbane City Council.

#### 2.4.9 Requirements for Brisbane City Council-controlled Infrastructure Records

The Contractor must develop a separate package of Records for TMR to issue to Brisbane City Council through the Administrator that address the requirements of Brisbane City Council. The assets which will fall under BCC's maintenance responsibility are highlighted green on the "EPLR Proposed Maintenance Responsibility Plan V01" found in part 7 of the contract documents.

Where Brisbane City Council has the same requirement(s) as TMR, the Contractor must provide a separate copy of the Record(s) in the format and on the media required by Brisbane City Council.

The As-constructed Records for Brisbane City Council must be compiled into one package as per

BCC Infrastructure Installation and Construction Resource Manual of Planning guidelines that must include:

**Hardcopy documents:**

- a) One x A3 colour copies of all As Constructed drawings, RPEQ Signed;
- b) Drawing Package Index Drawings (As Constructed) – as relevant, including Design Certification;
- c) Drawing Register (As-constructed);
- d) Durability Reports & Operation and Maintenance Manuals (OMM) (relevant to BCC) - Roads, ITS, electrical, mechanical, signals, guardrail, VMS, VSM, drainage, SQIDS, specialised structures, fencing, fabricated products, and specialised products and suppliers details in certificates and warranties;
- e) Asset Register for Contributed/Returned Works Assets Spreadsheet “BCC Asset Inventory”. This register should include all structures and items associated with the development that which will be handed over to Administrator following Practical Completion (PC). Refer to BCC Urban Management Division and Subdivision and Development Guidelines Part D Design & Construction Procedures. The Contract Administrator could provide a copy of sample register.
- f) Asset Management & Streams Spreadsheet (if applicable)

**Soft Copy Documentation (CD or Hard Drive):**

- a) All the above including the following;
- b) PDF and CAD versions of As Constructed drawings, RPEQ Signed;
- c) Design Change Notes (DCN) Register (if applicable);
- d) Design Change Notes (DCN's) (if applicable);
- e) NCR Register and Reports (if applicable);
- f) Site Instructions (SI) Register (if applicable);
- g) Design Certificates by Technical Manager;
- h) Practical Completion Certificates;
- i) Maintenance Register;
- j) Contractor's, sub-contractors and suppliers certificates;
- k) Subcontractor Warranty Register;
- l) Subcontractor Warranties;
- m) Road Safety Audit Reports (if applicable);
- n) Road pavement materials report and testing data;

- o) Level 2 Inspections (tunnels & structures) Report (if applicable);
- p) Geotechnical reports and plans- matters requiring action, management plans, monitoring plans (if applicable);
- q) Construction compliance/ completion certificates signed by: Alliance Manager or Project Director;
- r) Final Road Inspection Reports (if applicable);
- s) Quality Audits – testing results, Quality inspection reports etc.;
- t) Hydrology Model (if applicable).

#### **2.4.10 Payment**

##### **Payment for Item 90109S**

Payment for item **90109S** shall be paid as per 50% of the lump sum progressively on a time proportional basis, if the Administrator considers that the Contractor is progressively undertaking 'As Constructed' surveys and progressively recording the construction data. Payment will be made for the remainder of the lump sum on receipt of the final Construction Handover Documentation.

##### **Payment for Item 90110PS**

Payment for item **90110PS** shall be measured as a lump sum for the completion of a road safety audit and shall include all applicable work and requirements as specified within this supplementary specification.

##### **Payment for Item 90111S**

Payment for item **90111S** shall be measured as a lump sum for the completion of a road safety audit and shall include all applicable work and requirements as specified within this supplementary specification.

### 3 Administrator's Site Vehicle

#### 3.1 General

This item describes the requirements for supply and maintenance of site vehicle for the Administrator or project team.

#### 3.2 Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 Introduction to Specifications, the supplementary works items incorporated in this Specification are listed in Table 3-1.

**Table 3-1 Supplementary work items**

Supplementary Item No.	Description	Unit of Measurement
95001PS	Administrator site vehicle (Provisional Quantity, if ordered)	week

#### 3.3 Work Operations

Work operations shall include but not be limited to:

- a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Standard Specifications;
- b) Supply and delivery of vehicle from location of hire or purchase to a location nominated by the Administrator in Brisbane area;
- c) Supply and payment of registration, comprehensive insurance (including paying all excesses in the event of damage, loss, theft, etc.), RACQ membership, vehicle servicing, fuel and oils and all other expenses necessary to keep the vehicles fully functional;
- d) Supply of fuel card;
- e) Supply and payment of E-Tolls;
- f) Cleaning to maintain car in sound condition;
- g) Return of vehicle to location of hire or purchase from a location nominated by the Administrator in Brisbane area.

#### 3.4 Vehicle Specifications

The Contractor shall provide for 24 hours use by TMR personnel being within 3 years of the manufacture date, less than 75,000km and in good condition, four cylinders, 4x4, automatic transmission, minimum 4 stars ANCAP rating, twin cab utilities of size equivalent to a Mitsubishi dual cab utility (but not necessary that specific vehicle).

Vehicle is to include fixed flashing lights, vehicle lettering for identification and reflective markings and other equipment to ensure the vehicle is site compliant.

#### 3.5 Mileage Allowance

The Contractor shall make provision for mileage to the approximate distance of 150km per day for the full business use by the intended user.

#### 3.6 Payment

Payment for provision of Project vehicle shall be per week that the vehicle is used with payment

claims being monthly and shall include all labour, materials and operating costs associated with the vehicle.

## 4 Community Engagement

### 4.1 General

This item outlines the requirements and responsibilities for management of communication and community relations during construction by the contractor.

- a) The Northern Transitway Project will be staffed by one Community Liaison Officer (CLO) provided by the successful contractor within seven (7) days of award of contract.
- b) Be on site and available to the Administrator and stakeholders during business hours. Out of business hours, a site supervisor must be available.
- c) Be the primary point of contact for all communications related to the project, including being responsible for the project hotline number during business hours. Out of business hours, the contractor must nominate a site supervisor who will be available to take calls. All telephone calls must be acknowledged or responded to within four hours.
- d) The CLO must therefore be available for contact during construction hours. The CLO must have at least ten years of experience in infrastructure communications, preferably in a construction environment and preferably with a communications, journalism or related background.
- e) Be responsible for the project inbox and respond to written enquiries within two business days to ensure approvals can be obtained for a response to be provided in five business days.
- f) All contacts with the community will be through the CLO using established processes for approvals, consistency of messages, documentation of contacts, and delivery of responses to meet agreed targets.
- g) The CLO shall be responsible for coordinating and conducting the communication and engagement requirements of the site induction for all on-site personnel.
- h) The Contractor must obtain approval from the Administrator for all communication and engagement activities and materials prior to publication and execution.

### 4.2 Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 Introduction to Specifications, the supplementary works items incorporated in this Specification are listed in Table 4-1.

**Table 4-1 Supplementary work items**

Supplementary Item No.	Description	Unit of Measurement
90112S	Community Liaison Officer, Contract Award Period	Lump Sum

### 4.3 Work Operations

The work operations incorporated in the above item include the following as indicated:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Standard Specifications*;

#### **Item 90112S Community Liaison Officer**

The following work operations apply to the above item, as required:

- b) Creation of community liaison plan
- c) Liaising with property owners, local community, and other members of the general public as required.
- d) All other associated activities such as undertaking advertising, e-news and project updates in accordance with this specification.

### 4.4 Construction/Work Requirements

#### 4.4.1 Community Liaison Plan

- a) The Community Liaison Plan shall be built on the TMR Draft Communication and Engagement Plan, which will be provided upon engagement.
- b) Upon contract award, the CLO will contact key stakeholder identified by TMR
- c) It must meet the Contractor's responsibilities to notify and engage with the community in advance of alterations to the existing traffic conditions and other community notification and engagement including the requirements specified in Traffic Management Plan.
- d) The Community Liaison Plan must predict potential impacts, notification timeframes and role responsibilities for the communication team.
- e) To supplement the Community Liaison Plan, the Contractor must also prepare individual Communication Control Plans for milestones, events or impacts to the community, using the TMR template *Communication Control Plan template*, which can be provided on engagement. For example, the Contractor must prepare a Communication Control Plan to coordinate and manage communication activities for the start of construction, detours and night works, and significant traffic impacts or changes.
- f) The Communication Control Plans must provide sufficient information about each activity including:
  - i. background about, and rationale for, the activity;
  - ii. timings;
  - iii. a map or diagram of the activity (if appropriate)
  - iv. affected stakeholders, including emergency services, Brisbane City Council and TransLink and associated impacts;
  - v. an outline of key risks and mitigating actions;
  - vi. key messages supporting the actions;

- vii. identification of communication tools and implementation timeframes; and
  - viii. draft communication materials.
- g) The Contractor must submit the Communication Control Plan and accompanying communication materials for TMR review and approval at least *three weeks prior* to stakeholder notification and *four weeks prior* to the start of the construction works which relate to the communication materials.

#### 4.4.2 Community Liaison

- a) The Contractor must identify the communities and develop and maintain a detailed stakeholder contact list and records using Consultation Manager.
- b) The Contractor must confirm acceptance of any previous commitments including noise barriers and seek or confirm contact details such as email addresses for electronic distribution of project communication materials.
- c) The Contractor must doorknock local property owners, residents and businesses who are directly impacted by upcoming works to discuss any specific access or timing considerations.
- d) The Contractor must create a project specific 1800 number to be listed on collateral.
- e) The Contractor must print and have ready for distribution generic project business cards, designed to TMR Standards.
- f) The Contractor must work closely with property owners, residents, and businesses in the following areas, to keep them informed about construction activities, particularly access arrangements, changed traffic conditions, night works, as well as other specific construction impacts:
  - i. Properties adjacent to the project footprint including side roads
  - ii. properties whose access to the road network is impacted by the change of access to left-in/left-out
  - iii. local community facilities, organisations and businesses impacted by changes to the local road network.
- g) Any meetings with key stakeholders must also be attended by a representative of TMR, such as the Senior Communications Officer or Project Manager.
- h) The Contractor must actively notify identified stakeholders of the construction delivery progress as required in the Community Liaison Plan and must give stakeholders no less than five business days' notice prior to the start of construction. Special consideration must be given to, detours, changes to access for businesses, deliveries outside normal working hours and significant project milestones.
- i) The Contractor must give sufficient notice to allow the TMR Senior Communication Officer to notify elected representatives at least seven business days prior to all other stakeholder notifications being issued.
- j) The Contractor, after obtaining the written acceptance of the Administrator, may establish stakeholder groups to address communication and engagement issues with affected

- authorities and other identified stakeholder groups.
- k) The groups may include the following categories:
- i. Traffic and transport providers;
  - ii. Utility Infrastructure Authorities.
- l) The Contractor must manage the Contractor's construction program to provide:
- i. Stakeholders with not less than five business days of notice prior to the start of construction, or prior to the start of any significant construction activities taking into account the approval timeframes. In addition, special consideration is required for unusual considerations and milestones.
  - ii. The Administrator with sufficient notice to allow TMR's Senior Communications Officer to notify elected representatives at least seven business days prior to all other stakeholder notifications being issued.
  - iii. The Contractor must use TMR templates for stakeholder notifications and shall be responsible for the production, printing and distribution unless otherwise advised by the Administrator.
  - iv. The Contractor may utilise digital media for the electronic distribution of most materials to meet its communication and engagement needs. However; the Contractor must utilise printed material when such is justified on the basis of reach, effectiveness or addressing the needs of small groups of stakeholders not able to access digital media.
- m) Special consideration must be given to significant project milestones that may cause disruption to the community.

#### **4.4.3 Property Owners**

- a) The Contractor must keep relevant people including property owners, business owners, franchisees, lessees, and tenants etc. informed in writing on changes resulting from the works that affect individual properties, residences and businesses
- b) The Contractor must inform these relevant people at least seven business days prior to any such change and advise the Administrator of the nature and likely impacts of this work. A record of contact with these people must be kept in the stakeholder database (Consultation Manager Database).

#### **4.4.4 Local Community**

- a) The Contractor must keep the local community informed of any local operation changes, traffic disruptions and controls, construction of temporary detours and work required outside the normal daytime working hours contained in the Contract prior to such works being undertaken.
- b) The Contractor must advise the local community of such changes at least seven business days before the change occurs. Methods of distribution may include, but are not limited to, letters (direct mail), email, community noticeboard, VMS board and information via the project website. Printed materials regarding major impacts and significant project milestones

must be distributed to a wider radius impacted by the project. The Contractor must provide the Administrator with final copy and visual materials of all advice for review. The Contractor must arrange design and production of the material and be responsible for distribution, unless advised by the Administrator.

- c) The Senior Communications Officer will coordinate internal departmental approvals.
- d) The Contractor must supply the Administrator with copy that meets TMR guidelines on style, readability, and messaging “*Department of the Premier and Cabinet Writing style guide 2018*”.

#### **4.4.5 Elected representative**

- a) Should the Contractor be contacted by any elected representatives or electorate staff, they must advise the correct protocol is to contact TMR directly with the enquiry. The Contractor must provide the contact details of the TMR being: +61 7 3066 4338 or [metropolitanregion@tmr.qld.gov.au](mailto:metropolitanregion@tmr.qld.gov.au).
- b) No other information shall be provided to elected representatives by the Contractor.

#### **4.4.6 Works Notifications**

- a) Works notifications profile activities undertaken by the project that will have an impact on the targeted audience. Notification requirements are as follows:
  - i. For local low impact matters: Notifications regarding minor impacts must be distributed to directly affected properties as agreed by the Administrator.
  - ii. For major impacts affecting a wider area: Notifications regarding major impacts affecting a wider area must be distributed to a wider radius from the relevant works as directed by the Administrator.
- b) The Contractor is responsible for production and distribution of the operational notifications.
- c) The Contractor is responsible for the cost of printing and distribution, see distribution area map included in section 7 of the tender documents.
- d) The Contractor must provide the draft works notification with the Communication Control Plan when submitted for review by the Administrator, allowing time for approvals and the appropriate notification of the relevant audience.
- e) The Senior Communications Officer will coordinate internal departmental approvals

#### **4.4.7 Advertising**

- a) Where applicable, advertising can be used to promote significant changes created by construction works and where project activities will result in major impacts. The Contractor will be responsible for developing the content, designing the material to comply with project templates and TMR media guidelines if applicable, and lodging materials for release. The Senior Communications Officer will facilitate departmental approval of all advertising.
- b) The Contractor is responsible for the cost of advertising design, production and placement.

#### **4.4.8 E-news/Project updates**

- a) The project E-news is a web-based tool using Vision 6 authoring application and a primary

tool for project communication with the community.

- b) The Administrator will provide log in access and permissions required for the Contractor to author and manage E-news editions to target both broad and narrow audiences for project updates and construction notifications.
- c) The ongoing costs of the E-news application will be met by the Contractor.
- d) The maintenance of the contacts list in E-news will be managed by the Contractor, as will importing new or revised E-news subscription information into the project's Consultation Manager Database.
- e) The Senior Communications Officer will coordinate internal departmental approvals for E-news communications.

#### **4.4.9 Project Webpage**

- a) The project webpage is the sole authorised online source of information about the project for use by both the Contractor and TMR for disseminating information to the wider community. TMR will host and maintain the website with content input from the Contractor. The Contractor will provide updates for the webpage as required.
- b) The webpage can be found at <https://www.tmr.qld.gov.au/Projects/Name/N/Northern-Transitway>

#### **4.4.10 Media Management**

- a) Should the Contractor be contacted by the media, they must advise the journalist that the correct protocol is for the journalist to contact the TMR Media Unit direct with the enquiry. The Contractor must provide the journalist with the contact details of the TMR Media Unit being: +61 7 3066 7060 or [media@tmr.qld.gov.au](mailto:media@tmr.qld.gov.au).
- b) No other information shall be provided to the media by the Contractor.

#### **4.4.11 Media Events**

- a) The Contractor must highlight a minimum of two potential media events (other than the start of construction and opening events) and opportunities and associated timing in the Community Liaison Plan, providing sufficient lead time for the Administrator to consider, approve and coordinate. At a minimum, media events will include a start of construction event at the start of works and road opening event. Further events will be determined during construction.
- b) The Contractor must develop applicable Communication Control Plans to support the event management including traffic management and safety strategies.
- c) The Administrator is responsible for providing ministerial and/or TMR delegates with a briefing prior to the event and liaise directly with the media on the day. TMR will officiate at such events.

#### **4.4.12 Social Media**

- a) The Contractor must not undertake any social media implementation as TMR will be carrying out this activity. The Contractor must provide information to TMR when requested.

#### **4.4.13 Style of Communication Materials**

- a) All communication materials for the project must be branded with the State government logo.
- b) No communication materials shall be distributed for the project with the Contractor's logo, unless approved by the Administrator.
- c) The Contractor must only publish approved photos and recognise and identify the states funding role in any promotional material or award submissions that it develops in relation to the project.
- d) Contractor branding must not be displayed on any stationary structures, such as fences and buildings, in accordance with TMR's signage Policy. Contractor logos can be displayed on vehicles and machinery.

#### **4.4.14 Production and Distribution of Communication Materials**

- a) The Contractor must use digital media for the electronic distribution of most materials to meet its communication and engagement needs with printed collateral playing a less significant role, which is justified on the basis of reach, effectiveness or addressing the needs of small groups of stakeholders not able to access digital media.
- b) The Administrator is responsible for the release of the following communication materials, unless otherwise advised by the TMR's Senior Communications Officer:
  - i. social media collateral;
  - ii. media statements;
  - iii. media enquiry responses;
  - iv. TMR Metropolitan Region senior management notifications;
  - v. TMR ministerial and executive correspondence; and
  - vi. elected representative notifications.
- c) The Contractor must coordinate and procure the design, production, printing and distribution of all other communication materials in accordance with DTMR protocols, unless otherwise advised by the Administrator.

#### **4.4.15 Project Imagery**

- a) The Contractor must provide photographs (high resolution digital images, min 600dpi) of construction progress. The photographs must be of a professional quality and suitable for TMR use in publications, project communications and promotions of a broader nature, on the TMR website and for enlargement for use in display materials.
- b) The Contractor must record these images on a weekly basis and provide them on a monthly basis. Additional photography must be provided for major milestone works nominated by TMR through the Administrator. The Contractor must only publish approved photographs. Photographs supplied to TMR must be accompanied by an accurate, suitable caption including the location, date and time the photographs were taken and by a signed talent

release form (if applicable).

- c) High-resolution photographs and video footage must be taken at prominent locations not rejected by the Administrator. High-resolution photographs and video footage must be provided to the Administrator in an agreed format for TMR use and records.

#### **4.4.16 Distribution via Doorknocking**

- a) The Contractor will be required to doorknock local property owners, residents and businesses who are directly impacted by upcoming works to discuss any specific access or timing considerations.
- b) The Contractor must only undertake doorknocking if previously discussed and agreed with the Administrator and, where appropriate, TMR's Senior Communications Officer will accompany the CLO.
- c) A record of contact and applicable actions must be recorded in Consultation Manager and recorded within 48 hours of the interaction occurring.

#### **4.4.17 Consultation Manager Database**

- a) TMR has established a stakeholder database, Consultation Manager, for this project. TMR will forward a link for the stakeholder database to the Contractor
- b) The Contractor must maintain the stakeholder database for the duration of the project.
- c) The Contractor must ensure that the stakeholder database is current at all times, with all outstanding records updated within 48 hours.
- d) For every contact made with a stakeholder, the Contractor must record all contact details, the nature of the contact, any action taken and classify the entry for project-reporting purposes.
- e) The Contractor must maintain a complete record of all events with any stakeholder. An event refers to any contact with a stakeholder or member of the public regarding the project or related matters. Such contacts include complaints, positive feedback and enquiries received by any channel including telephone, mail, email, walk-ups, Site visits, briefings, meetings, representations and conversations at displays or other events. A complete record of an event includes as a minimum: channel and date; name and contact details; nature of enquiry; issues raised; action required; action officer; date action taken; relevant supportive documents (attached to record).
- f) The Administrator will provide the Contractor with necessary access to and training in Consultation Manager.
- g) The management and use of stakeholder information must comply with Queensland Government Privacy policy.
- h) All enquiries and complaints must be recorded in TMR's Consultation Manager database
- i) Enquiries and complaints may be raised through the project phonenumber, Metropolitan Region email address, TMR postal address and the on-site contact.

#### **4.4.18 Reporting Requirements**

- a) The Contractor must prepare a monthly Communication and Engagement Performance Report including but not limited to:
- i. current status of work on the project for the relevant month, including for example an update on the progress and percentage complete of earthworks, drainage, asphalt and all other significant construction activities;
  - ii. communication and engagement activities planned for the coming month;
  - iii. communication and engagement activities undertaken in the previous month, including a Consultation Manager Monthly Snapshot Report summary
  - iv. significant project milestones;
  - v. upcoming events and opportunities;
  - vi. any interesting facts and statistics;
  - vii. summary of enquiries, issues and complaints for the previous month including:
    - 1) current status details (emerging, active or resolved);
    - 2) trending issues; and
    - 3) emerging or ongoing issues that may impact on the delivery of the project.
- b) The contractor will produce a quarterly complaints report from the Consultation Manager Database.

#### **4.4.19 Final Reporting Requirements**

- a) The Contractor must prepare a Communication and Engagement Final Report by 30 Business Days after the Date of Practical Completion that:
- i. summarises the communication and engagement activities undertaken;
  - ii. evaluates and measures the overall effectiveness of communication and engagement activities against the Communication and Engagement Plan, identifies legacy issues and any communication and engagement activities requiring a handover to DTMR staff.

#### **4.5 Payment**

Item 90112S includes the responsibilities and work operations explained above for the duration of the project. Payment for Community Liaison Officer will be made progressively based on a monthly pro-rata basis for this period.

## 5 Stakeholder Interface Amendments

### 5.1 General

This project impacts a number of key stakeholders, including but not limited to companies with public utilities and plant within the project footprint and local government. Significant effort was expended during the design phase of the project to identify all conflict points relating to these stakeholders and to implement mitigating strategies.

In the instance that additional conflicts are identified during the construction phase over and above those identified in the contract documents, the Administrator may direct works relating to these conflicts under this item.

### 5.2 Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 Introduction to Specifications, the supplementary works items incorporated in this Specification are listed in Table 5-1.

**Table 5-1 Supplementary work items**

Supplementary Item No.	Description	Unit of Measurement
96601S	Stakeholder Interface Amendments (Provisional Sum, if ordered)	Provisional Sum

### 5.3 Work Operations

Work shall be directed in writing by the Administrator. The process described in clause 40 of the General Conditions of Contract are applicable to any works directed by the Administrator under this Schedule Item 96601S.

### 5.4 Payment

Measurement and payment for Item No. 96601S shall be at the agreed rate, which was determined under Clause 40 of the General Conditions of Contract, once the scope of works is deemed complete by the Administrator.

## 6 Maintenance Minimisation

### 6.1 General

During the construction phase it may become obvious that some area or items may be difficult to maintain if constructed exactly as designed. In order to reduce the ongoing life cycle costs of the constructed infrastructure, works may be identified by the Administrator which will reduce the amount of maintenance required in these difficult locations. These works are referred to as maintenance minimisation works.

In the instance that maintenance minimisation works are identified during the course of the construction phase, the Administrator may direct these works to be completed under this item.

### 6.2 Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 Introduction to Specifications, the supplementary works items incorporated in this Specification are listed in Table 6-1.

**Table 6-1 Supplementary work items**

Supplementary Item No.	Description	Unit of Measurement
96602S	Maintenance Minimisation (Provisional Sum, if ordered)	Provisional Sum

### 6.3 Work Operations

Work shall be directed in writing by the Administrator. The process described in clause 40 of the General Conditions of Contract are applicable to any works directed by the Administrator under this Schedule Item 96602S.

### 6.4 Payment

Measurement and payment for Item No. 96602S shall be at the agreed rate, which was determined under Clause 40 of the General Conditions of Contract, once the scope of works is deemed complete by the Administrator.



**AMENDMENT REGISTER**

Ed/Rev Number	Section Number	Description	Date
1.0		Original issue	Oct 2001
2.0	1.3	Specifications for Small and Large Box Culverts modified to use QMRD Specifications	Feb 2005
	3.3	Box culverts joint sealing section – width of Bituthene application widened	
3.0/3.1	1.3	Wording of steel reinforced concrete pipe supply standard reference modified, supply, design and installation standard references for flexible pipe added.	Jan 2008
	3.2.1	Second dot point modified, extra dot point added	
	3.2.4	General defects sections added	
	3.2.5	Steel reinforced concrete pipe section renumbered, extensively modified including requirements for repair of minor defects	
	3.2.6	Installation requirement modified to reflect withdrawal of BCC Standard Drawing UMS 302	
	3.2.8	Flexible pipes section added	
	3.3	Precast box culverts – modification to supply standard note for large box culverts, formatting change on backfilling requirements.	
4.0	1.3	Australian Standard reference modified in third paragraph of Section 1.3.	Apr 2014
	1.3, 3.4	Requirements for the supply of Gully Grates and Frames revised to include assessment criteria for proprietary products.	
5.0	3.4	Manhole details added	May 2015
	3.7	Precast components requirements modified	
6.0	General	References updated throughout document	May 2016
	1.2 and 1.3	Referenced documents list updated	
	3.2.2 and 3.2.3	New sections for Pipework Layout and Gully To Gully Drainlines/Gully Manholes added to specification	
7.0	3.4.4	Manhole design details updated.	Nov 2018
	3.4.6	Manhole and gully depth and step iron requirements amended.	

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**S160 DRAINAGE**

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## 1.0 GENERAL

### 1.1 SECTION CONTENT

This specification covers the construction of piped stormwater drainage and associated elements.

### 1.2 STANDARDS

Australian/New Zealand Standard	AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent application
Australian/New Zealand Standard	AS/NZS 1462.22	Methods of test for plastics pipes and fittings - Method for the determination of pipe stiffness
Australian Standard	AS 1646	Elastomeric seals for waterworks purposes
Australian Standard	AS 1657	Fixed platforms, walkways, stairways and ladders – Design, construction and installation
Australian Standard	AS 1830	Grey cast iron
Australian Standard	AS 1831	Ductile cast iron
Australian/New Zealand Standard	AS/NZS 203231	Standard. Installation of PVC pipe systems
Australian/New Zealand Standard	AS/NZS 2566.1	Buried flexible pipelines – Structural design
Australian/New Zealand Standard	AS/NZS 2566.2	Buried flexible pipelines – Installation
Australian/New Zealand Standard	AS/NZS 3679.1	Structural steel – Hot-rolled bars and sections
Australian/New Zealand Standard	AS/NZS 3725	Design for installation of buried concrete pipes
Australian Standard	AS 3996	Access covers and grates
Australian/New Zealand Standard	AS/NZS 4058	Precast concrete pipes (pressure and non-pressure)
Australian Standard	AS 4139	Fibre reinforced concrete pipes and fittings
Australian/New Zealand Standard	AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
Australian Standard	AS 5100.5	Bridge design – Concrete
Australian/New Zealand Standard, International Standards Organization	AS/NZS ISO 9001	Quality management systems – Requirements

### 1.3 REFERENCES

- Queensland Department of Transport and Main Roads Technical Specification MRTS 24: Manufacture of precast concrete culverts.

Refer to the following other Reference Specifications for Civil Engineering Works:

S110	General Requirements
S140	Earthworks
S150	Roadworks
S170	Stonework
S200	Concrete Work



Refer to the following Standard Drawings:

BSD-8001	Minimum pipe cover – Steel reinforced concrete pipes
BSD-8002	Minimum pipe cover – Fibre reinforced concrete pipes ( <i>Currently withdrawn</i> )
BSD-8003	Construction loading typical detail
BSD-8011	Bedding methods for rigid and flexible drainage pipes
BSD-8021	Storm water manhole details
BSD-8023	Manhole roof slab 1350 to 1950 diameter
BSD-8024	Manhole roof slabs 1980 diameter extended 600 and 900
BSD-8025	Reinforced concrete roof slabs for manhole chambers
BSD-8031	Manhole frame roadway and non-roadway 1050 to 1500 diameter
BSD-8032	Riser details roadway
BSD-8033	Manhole cover roadway 1050 to 1500 diameter
BSD-8034	Manhole cover non-roadway 1050 to 1500 diameter
BSD-8035	Manhole cover concrete infill pedestrian traffic
BSD-8051	Type A gully lip in line
BSD-8052	Type A gully kerb in line
BSD-8053	Type A grate
BSD-8054	Type A grate frame
BSD-8055	Type A gully precast concrete lintel (extended kerb inlet)
BSD-8071	Hydraulic capture charts lip in line gully on grade
BSD-8082	Hydraulic capture charts kerb in line gully sag conditions
BSD-8101	Inlets and outlets concrete stormwater drains
BSD-8102	Inlets and outlets stone pitched stormwater drains
BSD-8112	Road water inspection manholes for low density

## 1.4 DEFINITIONS

Pipe surround: Pipe bed, haunch, side and overlay zones as applicable and as defined in the relevant Australian Standards.

Half round pipe drains: Surface drains lined with half round pipe including the necessary bedding and jointing.

Grated trench: Precast or cast in situ concrete lined trench with hot-dipped bitumen coated cast iron or galvanised steel grating. A high maintenance device – not acceptable for use on public roads or pathways.

## 2.0 QUALITY

### 2.1 QUALITY SYSTEM

The supplier must maintain a Quality Assurance System with third party accreditation to AS/NZS ISO 9001.



## 2.2 INSPECTION

### Witness points

*Refer annexure.* Give sufficient notice so that inspection may be made of the following:

- Excavated surfaces prior to placing pipe bedding material.
- Pipes and other precast concrete components prior to acceptance on site (refer Table 3.4).
- Pipe joints prior to covering.
- Formwork and reinforcement prior to placing cast in situ concrete
- Placing of cast in situ concrete.
- Works ready for specific testing.
- Surfaces prior to application of coatings and applied finishes.
- Concealed and underground work prior to covering, concealing or backfilling.

## 2.3 CONTRACTOR'S SUBMISSIONS

Submit the following information if requested by the Superintendent.

- Manufacturer's conformance report for each batch of precast products delivered to the site, confirming that these products comply with the requirements of the nominated Australian Standards.
- Details of the proposed precast manholes, gullies, pits and head walls, and methods for concrete repairs.
- An outline of the sampling and test program by which the manufacturer monitors compliance with this specification.

## 3.0 EXECUTION

### 3.1 EXISTING SERVICES

If an existing service or structure (which is to be retained) crosses the line of a required trench, provide permanent support for the existing service or structure.

### 3.2 STORMWATER DRAINS

#### 3.2.1 General

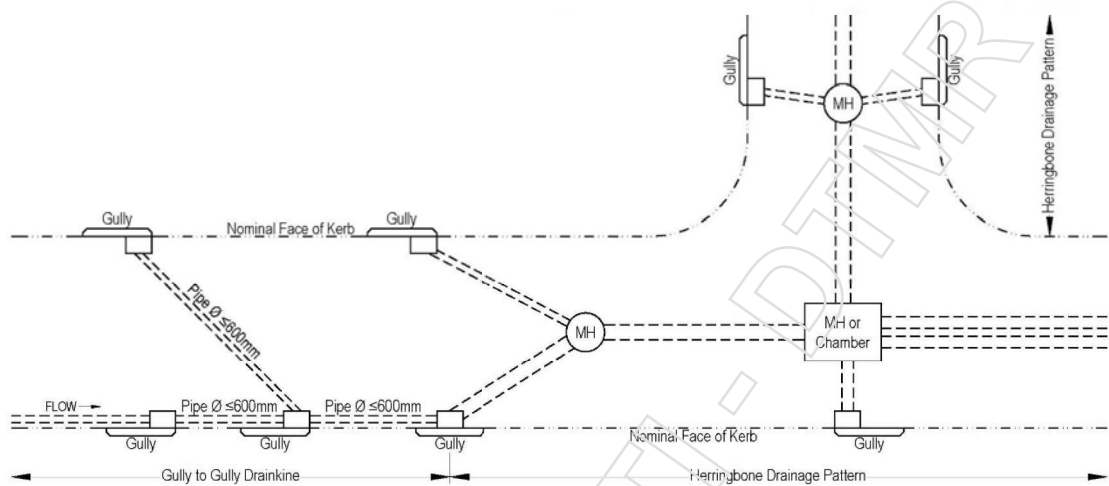
- Design life: 150 years.
- Changes in direction: All changes in direction to occur at a manhole.
- Anchor blocks: Manholes to be designed as anchor blocks where needed to restrain lateral movement of the pipelines at junctions and changes of grade or direction.
- Encasement: Where encasement is specified, place 20 MPa concrete to not less than 150 mm above and below the pipe and 150 mm each side or the width of the trench, whichever is the greater and 500 mm in either direction from the or defect being bandaged.
- Brisbane City Council standard products to be used and installed.
- Minimum grade to be 1 in 300.

#### 3.2.2 Pipework Layout

Underground stormwater pipework layout should, in most cases, be the conventional herringbone layout.

#### 3.2.3 Gully to Gully Drainlines/Gully Manholes

In the gully to gully systems, pipes are connected between gully pits instead of manholes, with both the inlet and outlet pipes connected to the gully pit walls. (Note: The conventional gully pit has only the outlet pipe connection to the main trunk drainage line). Refer to *Figure 3.1*.



**Figure 3.1 – Typical Gully Layout**

Gully to gully drainlines are acceptable for pipes 600 mm diameter or less, provided that all the following Council requirements are satisfied.

1. Gullies are consistent with Council's standard drawings;
2. Acute angles in connecting pipes are avoided to minimise head losses;
3. Potential interference with other utility services on the footpath is avoided;
4. The major drainage line (spine) of the gully to gully system is constructed on one side of the road only. Any gullies on the opposite side of the road should be connected directly across the road. Under no circumstances are spines of gully to gully systems permitted on both sides of the road;
5. The gully pit is appropriately benched.

Gully manholes in Brisbane City are not permitted without written approval from the Principal Engineer Strategic Asset Management Planning. The stringent approval process ensures that Council's performance and maintenance objectives are met to maximise the serviceability of the asset, and to achieve sustainable level of ongoing maintenance and replacement program by using standardised components to the maximum practicable extent.

Gully manholes may be approved subject to compliance with all the following criteria.

1. The inlet and manhole is at the same point e.g. at the sag of the road;
2. It is the only alternative to a multi-grated inlet e.g. in relief drainage works where utility services locations pose major constraints;
3. Written advice from the responsible utility authority is submitted, stating that the existing services will preclude the construction of the conventional herringbone drainage pattern;
4. Council's standard components such as lintels and grates should be used wherever possible. Hydraulic analysis and structural testing data should accompany any request for approval to use alternative components.

### 3.2.4 Tolerances

Place pipelines in accordance with the Table 3.1. The specified tolerances are conditional on falls to outlets being maintained.

**Table 3.1 – Pipeline maximum tolerances**

Alignment	Angular deviation from required alignment	Displacement from required alignment
Horizontal	1V in 300H	15 mm
Vertical	1V in 500H	5 mm



**3.2.5 Pipe surround**

Pipe surround/bedding: To *Standard Drawing BSD-8011*. Construct bed, haunch, overlay and side zone using 5 mm or 10 mm screenings, or alternatively bedding sand. Bed drainage pipes in trenches on a continuous underlay of compacted bedding material. Place material in the pipe surround in layers not more than 200 mm loose thickness and compact without damaging or displacing the pipe. Comply with Table 3.2 for screenings grading requirements

**Table 3.2 – Screenings particle size distribution limits**

A.S. sieve size	% passing by weight	
	5 mm nominal size	10 mm nominal size
13.2 mm		100
9.50 mm		85 – 100
6.70 mm	100	
4.75 mm	85 – 100	0 – 20
2.36 mm	0 – 40	0 – 5
0.075 mm	0 – 2	0 – 2

Bedding sand: The sand must be washed and screened; comprising approved inert materials having clean, hard, strong, durable, uncoated grains, free from dust, clay, soft or flaky particles, organic matter, loam or other deleterious substances. Comply with Table 3.3 for grading requirements.

**Table 3.3 – Grading of bedding sand**

A.S. sieve size (mm)	Passing (% by weight)
9.5	100
4.75	95 – 100
2.36	75 – 90
1.18	15 – 25
0.60	10 – 20
0.30	5 – 10
0.15	0 – 5

Support: Do not use rigid sills to support pipes. Partially filled sandbags, containing screenings or bedding sand, may be used to establish bedding levels prior to placing screenings or bedding sand to provide continuous support along the pipe.

**3.2.6 Defects generally**

Structural defects (including spalling to rigid pipes or crushing and creasing of flexible pipes): Repair affected pipes if the defects are isolated to one or two pipe lengths in the entire line. Remove and replace affected pipeline if defects are found for more than two pipe lengths.

Joint defects: Repair displaced or open joints. Replace affected pipes if the defect will allow penetration of material from the embedment zone, or if the defect will affect the structural integrity of the pipeline.

Serviceability defects: Remove silt and debris.



### 3.2.7 Steel reinforced concrete pipes

#### Standards

Supply: Generally to AS/NZS 4058. Provide minimum cover to reinforcement in accordance with the durability provisions of AS 5100.5 for the appropriate exposure classification and manufacturing process (by spinning or rolling, or by wet casting).

Installation: To AS/NZS 3725. Select appropriate compaction plant compatible with the minimum pipe cover in accordance with *Standard Drawing BSD-8001*.

#### Pipe selection

Pipes  $\leq$  900 mm diameter: Use spigot and socket pipes with rubber ring joints.

Pipes  $>$  900 mm diameter: Use flush jointed pipes where the ground conditions are stable and infiltration or exfiltration is insignificant. Use rubber ring jointed spigot and socket pipes where water seal is essential and some ground movement is expected.

Pipe jacking: Select pipe type and special jacking joint to suit the application.

#### Laying

General: Trim pipes where necessary to suit manholes, gullies and other structures. Lay pipes with the top, as marked, up. Plug lifting holes with the pipe manufacturer's supplied plugs. Do not make joints under water.

Installation: To AS/NZS 3725. Select appropriate compaction plant compatible with the minimum pipe cover in accordance with manufacturer/supplier requirements. Compact backfill in layers using specified design compaction plant. Refer to supplier design aids and *Standard Drawing BSD-8001* for standard compaction plant compaction depths and *Standard Drawing BSD-8003* for typical longitudinal section design requirements to show design compaction equipment.

Spigot and socket pipes: Lay pipes with the socket facing up the grade. After the bedding material has been placed correctly, excavate a hole for the pipe socket carefully by hand so there is uniformity of support along the pipe barrel.

Flush jointed pipes: Abut pipes against one another such that the alignment of the lip at the inside of the joint between the two pipes does not exceed 5 mm, such as for culverts under roads.

Pipe jacking: Use in locations where open trenches would cause major disruption to traffic and existing installations. Excavate jacking pits at intervals along the pipe alignment. Position pipes in the jacking pit. Drive pipes through the ground by hydraulic jacks. Grout the annulus between the pipe and the excavation. Complete packing and banding around the joint.

#### Rubber ring joints

General: Keep rubber rings clean and free from contaminants. Store rings under cover if pipes are not installed within a few days to prevent ultraviolet degradation.

Installation: Clean and dry spigots, sockets, and rings. Stretch the rubber ring evenly and place ring in the groove at the end of the spigot, free of any twists. Align the pipe carefully so that the rubber ring touches the socket all the way around. Make joint by pushing or pulling the pipe home. Assemble the rolling rubber ring dry without the use of lubricant.

Correct jointing: Rubber is simultaneously rolled and compressed evenly at all points around the joint and there is no skidding or pushing of the concrete pipe past the rubber ring. Immediately after assembly use a feeler gauge around the spigot circumference to check that the rubber ring is in the correct position, and that there is clearance between the spigot and socket.

#### Flush joints

External elastomeric band: Keep rubber rings clean and free from contaminants. Store rings under cover if pipes are not installed within a few days to prevent ultraviolet degradation. Fit half of the width of the band over the end of the pipe and fold back the remaining half. Excavate bedding material to allow band to be fitted. Line up the other pipe, home the joint, and flip the folded band over the joint.



Internal mortar joint: Fill the internal annular space generously with cement mortar. Extend mortar joint to cover at least the bottom half of the pipe. To minimise movement, apply mortar after the trench has been backfilled. Apply mortar on wet surfaces. Clean and smooth the mating faces. Mortar to consist of one part cement to three parts clean sharp sand (by volume) and mixed with only sufficient water to obtain the required consistency. The time between mixing and use must not exceed 30 minutes. Do not re-temper. Cure mortar for at least 48 hours. Protect green mortar from water erosion.

Pipes < 1050 mm diameter: Make jointing using external elastomeric band.

Pipes ≥ 1050 mm diameter: Make jointing using both external elastomeric band and internal cement mortar joint.

**Inspection and acceptability**

Acceptability of pipes with defects upon delivery to site: Inspect each pipe for pipe wall and joint surface defects in accordance with Table 3.4.

**Table 3.4 – Acceptability of pipes upon delivery to site**

Defect type	Defect description	Acceptability
1 & 2	Cracks up to 0.10 mm wide (measured at a depth of 3 mm) and not extending through the pipe wall	
	Pipes < 900 mm diameter	Acceptable after repair
	Pipes ≥ 900 mm diameter	Acceptable
3	Cracks > 0.10 mm wide but ≤ 0.50 mm wide (measured at a depth of 3 mm) or cracks extending through the pipe wall	Acceptable after repair and passes standard load test
	Cracks > 0.50 mm wide	Not acceptable
4	Dents, bulges, chips and spalls of depth/height up to 2.5 mm and length up to 50 mm	Acceptable
	Surface blowholes not exceeding 4 mm depth and 10 mm diameter	Acceptable
5	Dents, bulges, chips and spalls of depth/height up to 5 mm and length up to 50 mm	Acceptable after repair
	Surface blowholes not exceeding 5 mm depth and 50 mm diameter	Acceptable after repair
	Bony patches of depth up to 5 mm and extending in any direction for no more than 50 mm	Acceptable after repair
	Bony patches on socket back walls of depth up to 5 mm	Acceptable after repair
	Visible inclusions of foreign matter, with a total surface area less than 0.1% of outside pipe surface area (either inside or outside), with no individual inclusion greater than 400 mm <sup>2</sup> in area	Acceptable after repair
6	Dents, bulges, chips and spalls of depth/height greater than 5 mm	Not acceptable
	Surface blowholes exceeding 5 mm depth	Not acceptable
	Bony patches exceeding 5 mm depth	Not acceptable
	Above defects confined to socket joints	Acceptable after repair
7	Visible inclusions of foreign matter, with a total surface area exceeding 0.1% of outside pipe surface area (either inside or outside), or an individual inclusion exceeding 400 mm <sup>2</sup> in area	Not acceptable



Defect type	Defect description	Acceptability
	Above defects confined to socket joints	Acceptable after repair

Note: Classification of defects by type is generally based on AS/NZS 4058.

Acceptability of installed pipes: Inspect each pipe for pipe wall and joint surface defects in accordance with Table 3.5.

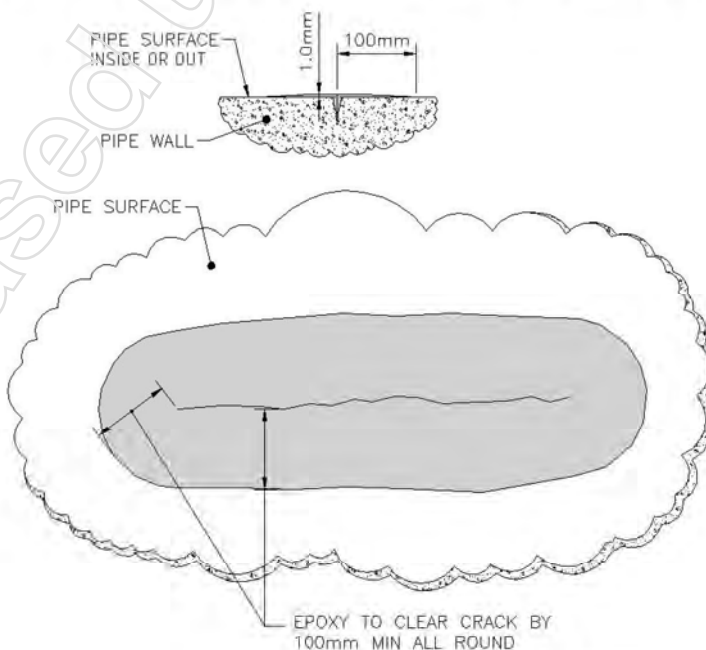
**Table 3.5 – Acceptability of installed pipes**

Defect type	Defect description	Acceptability
1 & 2	Insignificant cracking $\leq 0.15$ mm wide	
	- Circumferential crack	Acceptable
	- Longitudinal cracks $\leq 300$ mm length	Acceptable
	- Longitudinal cracks $> 300$ mm length	Use repair method A
3	Significant cracking $> 0.15$ mm wide	Replace pipe or structural reline (repair method B)
Structural damage	Significant damage to collar or ends of pipe during installation, or significant gouging or physical damage sustained through other construction activities eg exposed reinforcement	Replace pipe preferably at the time of installation

Note: Classification of defects by type is generally based on AS/NZS 4058.

Repair materials: Use repair materials that can be demonstrated to be suitable for the intended application, and having a tensile or bond strength not less than that of the concrete in the pipe.

Repair method A (Figure 3.2): Generally appropriate for longitudinal cracks. Apply epoxy resin at a thickness of not less than 1 mm to fill cracks. Extend epoxy repair to cover at least 100 mm past the crack in all directions. Inspect repaired area after the resin compound has adequate time to cure and set. Achieve a smooth repair finish consistent with that of the original pipe surface.



**Figure 3.2 – Repair method A**



Repair method B (Figure 3.3): Generally appropriate for circumferential cracks on the internal surface. Apply liner and grout to cover at least 200 mm past the crack in all directions or structural reline pipe between manholes. Maintain the original hydraulic design characteristics after repair.

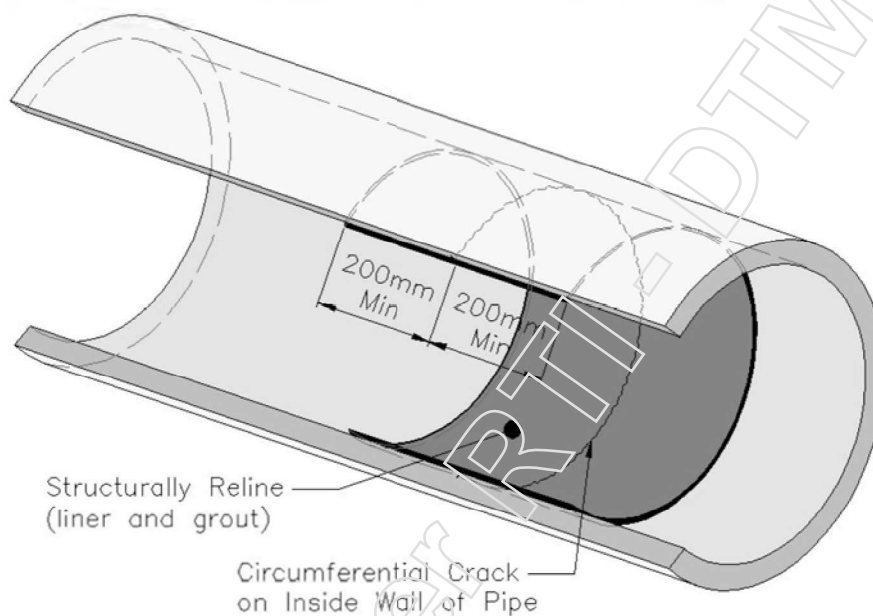


Figure 3.3 – Repair method B

Repair method C: Generally appropriate for circumferential cracks on the external surface. Install an approved bandage over the cracks.

Alternative repair methods: The manufacturer may submit alternative standard documented repair practices for approval by Council Delegate.

### 3.2.8 Fibre reinforced concrete pipes

Supply: To AS 4139. Supply  $\leq 450$  mm diameter pipes pre-socketed at one end with a factory fitted 'Adcol' coupling. Supply  $> 450$  mm diameter pipes with a purpose machined internal spigot and socket system within the pipe wall.

Installation: To AS/NZS 3725. Select appropriate compaction plant compatible with the minimum pipe cover in accordance with manufacturer/supplier requirements. Compact backfill in layers using specified design compaction plant. Refer to supplier design aids for standard compaction plant compaction depths and *Standard Drawing BSD-8003* for typical longitudinal section design requirements to show design compaction equipment. *Standard Drawing BSD-8002* has been withdrawn from service; however it is available for reference.

'Adcol' joint: Place the V-shaped rubber ring onto the special machined groove near the spigot end of the pipe, with the pointed side of the ring facing outwards. Ensure that the spigot and socket are free from dirt. Apply a generous coating of the manufacturer's recommended lubricant to the inside of the socket and pipe spigot. Insert the pipe end into the coupling or socketed end of the previously laid pipe. Keep the pipe as close to horizontal as practicable. Push pipe home using leverage tools, such as a crow bar and wooden block, without damaging the pipe or joint.

Deflecting pipes: Make deflection after jointing. Comply with the manufacturer's recommendations for the limits on joint rotation.

Cutting pipes: Cut pipes where necessary to suit manholes, gullies and other structures. Trim cut ends back about 6 mm to virgin material.



### 3.2.9 uPVC pipes

Scope of application: Generally only suitable for internal roofwater drainage reticulation. Do not use in road reserve.

Supply: To AS/NZS 1260.

Installation: To AS/NZS 2032. Select appropriate compaction plant compatible with the minimum pipe cover in accordance with manufacturer/supplier requirements. Compact backfill in layers using specified design compaction plant. Refer to supplier design aids for standard compaction plant compaction depths and *Standard Drawing BSD-8003* for typical longitudinal section design requirements to show design compaction equipment.

Laying: Lay and joint pipes in the excavation. Where pipes are jointed at ground level, lower into the excavation without being dropped, or the pipe and joints being strained.

Exposure to sunlight: Minimise distortion caused by uneven heat absorption where one side is exposed to the sun and the other is in the shade.

Joining: Maintain even heat around the circumference of the pipe during the joining process. Join uPVC drain pipes by solvent welding or rubber rings. Where uPVC pipes are to be jointed to concrete or fibre cement pipes, the uPVC surface must be prepared by coating with solvent cement and blinding with clean, sharp sand. A mortar joint can then be made. Slotted uPVC pipes must be dry jointed.

Setting of pipes in concrete: Provide a polyethylene membrane around the pipes and fittings to permit movement without scoring the pipe.

### 3.2.10 Flexible pipes

Type B flexible pipe: A polypropylene/polyethylene pipe or fitting with a smooth inside surface and a solid or hollow helical or annular ribbed or corrugated external surface.

Supply: To AS/NZS 5065.

Design and installation: To AS/NZS 2566.1 and AS/NZS 2566.2.

Minimum pipe cover: 0.6m to the underside of a road pavement (subgrade box level), in addition to the requirements of *Reference Specification for Civil Engineering Works S145 Installation and Maintenance of Utility Services* (Table 5.1).

Maximum pipe cover: 5.0m embankment height.

Stiffness tested in accordance with AS/NZS 1462.22: The initial short term stiffness must not be less than 8000 N/m/m (pipe class SN8). For non-creep affected composite pipes, the minimum long term stiffness must not be less than 2000 N/m/m.

Inspection and acceptability: Where the diametral deflection (ovality) measurement limits are exceeded and/or where the alignment tolerances are exceeded, reinstate trench embedment and relay pipe. Replace sections of pipe that are crushed or creased.

## 3.3 PRECAST BOX CULVERTS

### Supply

Large box culverts: Generally in accordance with Queensland Department of Main Roads Standard Specification MRS 11.24 "Manufacture of Precast Concrete Culverts". Provide minimum cover to reinforcement in accordance with the durability provisions of AS 5100.5 for the appropriate exposure classification and manufacturing process.

Small box culverts: Generally in accordance with *Queensland DTMR Standard Specification MRTS24 Manufacture of Precast Concrete Culverts*. Maximum nominal size, span 1200 mm by height 1200 mm. Provide minimum cover to reinforcement in accordance with the durability provisions of AS 5100.5 for the appropriate exposure classification and manufacturing process.

Pipe or box culvert types: Use a pipe or box culvert of class appropriate to the method of bedding, depth of cover and construction equipment in use. Refer annexure.



### **Installation**

General: Construct and install box culverts/culvert components at the locations specified. Install box culvert sections without abrupt changes in alignment or grade.

Minimum grade: 1 in 300.

Lifting: Lift box culverts according to manufacturer's instructions.

Precast baseplates: Screed and compact bedding material (as specified for pipes) to not less than 75 mm thick after compaction. An extra baseplate must be laid in the line so that each crown is seated half on one baseplate and half on the next.

Unit placement: Place unit legs on a layer of 3:1 (by volume) sand cement mortar of suitable consistency. Lower units carefully into position. Strike off excess mortar. Cure and protect mortar from water erosion for at least 48 hours. Butt units hard together with any offset between the side walls of adjacent units not exceeding 5 mm for units up to 1200 mm wide and 20 mm for larger units. Place adjacent cells 20 mm apart (unless specified elsewhere). Plug the gap between the adjacent cells to a depth of 300 mm at each end using Grade N20 concrete with 10 mm aggregate. Fill the remainder of the gap with 1:12 cement stabilised sand (by volume).

Drain line construction: Trim base plates and inverted "U" units to suit manholes, gullies and other structures.

Lifting loops: Cut off at the concrete surface and seal the cut ends using an approved epoxy compound.

### **Sealing**

Seal the butt joints externally between units by applying a 300 mm wide strip of Bituthene 5300. For multi-cell culverts, seal the top and legs against the earth.

### **Geometric tolerances**

Alignment: The horizontal and vertical alignments of culverts must not exhibit noticeable irregularities.

Slope: Culverts must have a positive drainage slope along the whole of their length and, where relevant, join neatly to existing structures.

Horizontal tolerance:  $\pm 100$  mm from the design alignment.

Vertical tolerance:  $\pm 10$  mm from the design invert levels, provided that the culvert grade does not depart from the specified slope by more than 1% absolute.

Cover thickness: The minimum cover over the culvert must not be less than the specified thickness.

### **Backfilling**

The compactive effort used during trench compaction must be less than the live load capacity of the box culverts at the current cover. The differential backfill height between each side of a culvert must not exceed 200 mm.

## **3.4 GULLIES AND MANHOLES**

### **3.4.1 Gully Grates and Frames – Technical Requirements**

#### **Standard gully grate and frame**

Gully grates and frames to be supplied to *Standard Drawings BSD-8053* and *BSD-8054*.

Steel in gully grates and frames to conform to *AS/NZS 3679*. Testing and compliance certificates for the steel to be supplied upon request.

#### **Proprietary gully grate and frame**

Where a proprietary product is proposed to be used, the following assessment criteria are to be fulfilled:

The Australian Standard for gully grates is *AS 3996* and from this Standard all other associated Standards are listed and therefore compliance to those is also required. Steel in gully grates and



frames to conform to AS/NZS 3679.1. Testing and compliance certificates for the steel to be supplied with any submission.

Hydraulic testing is not covered by any Australian Standard and therefore a proprietary Class 'D' Gully Grate manufacturer is to prove their capture results to Council through full scale hydraulic testing by a NATA registered laboratory (or equivalent to be approved by Council if the testing is done overseas).

The assessment of proprietary Class 'D' Gully Grates for use in Brisbane shall meet the following technical requirements:

- Full compliance with all relevant current Australian Standards including AS 3996;
- Full dimensional compliance with *Standard Drawing BSD-8054* (Type 'A' Gully Frame) without exception to ensure interchangeability with existing grates/frames in the field;
- Full dimensional compliance with *Standard Drawing BSD-8053* (Type 'A' Gully Grate), variations shall be submitted to Council for approval and ensure interchangeability with existing grates/frames in the field;
- Gully grates must be fully compatible with Council's gully frame, as per *Standard Drawing BSD-8054*, including the locking of the grate in the open position, ensuring interchangeability with existing grates/frames in the field;
- Cast or fabricated grates other than that identical to *Standard Drawing BSD-8053* shall have equivalent or better hydraulic capture as shown by Council's Standard Hydraulic Capture Curves (refer to *Standard Drawings BSD-8071 to BSD-8082*);
- If there are any variations to the Council's grate as per *Standard Drawing BSD-8053*, then hydraulic capture curves and a report from a NATA registered laboratory for the relevant tests (or equivalent to be approved by Council if the testing is done overseas) must be submitted to Council for review and must include the following configurations:
  - *Standard Drawing BSD-8051*: Type 'A' Gully – Lip-in-Line;
  - *Standard Drawing BSD-8052*: Type 'A' Gully – Kerb-in-Line;
  - All lintel sizes – 2.4 m, 3.6 m and 4.8 m;
  - 2.5% and 3.3% cross-falls;
  - Grades: 0% (Sag), 0.5%, 1%, 2%, 4%, 8%, 12%, & 16%;
  - Various approach flows up to 330 Litres per second or more and to include interpolation of curves to 500 Litres per second;
  - Derive a suitable blockage factor of the grate due to possible debris, leaves and litter flowing in the channel and apply to capture curves;
  - Hydraulic testing to be carried on full size components only, no scaling of gullies, grates and lintels permitted;
  - Capture curves shall be presented in same format as Council's hydraulic capture curves, refer *Standard Drawings BSD-8071 to BSD-8082*;
  - Approved Capture Curves shall be available for public access.

### **3.4.2 Gully Lintels – Technical Requirements**

#### **Standard gully lintel (extended kerb inlet)**

Gully lintels to be supplied to *Standard Drawings BSD-8055*.

### **3.4.3 Trench Grates**

Trench grates or similar systems are not acceptable for use on public roads or pathways. Trench grates may be used on private installations.

### **3.4.4 Manholes**

- Manholes (1,050mm to 1,500mm diameter, maximum 3.0m deep) *Standard Drawing BSD-8021*;
- Manholes (1,050mm to 1,500mm diameter, greater than 3.0m deep) to be individually designed and certified by an RPEQ;



- Manhole roof slab 1,350 to 1,950 diameter: *Standard Drawing BSD-8023*;
- Manhole roof slabs 1,980 diameter extended 600 and 900: *Standard Drawing BSD-8024*;
- Reinforced concrete roof slabs for manhole chambers: *Standard Drawing BSD-8025*.

### 3.4.5 Manhole Lids and Risers

Manhole Lids and Risers to be supplied to the following:

- Manhole frames: *Standard Drawing BSD-8031*;
- Manhole risers: *Standard Drawing BSD-8032*;
- Roadway manhole covers: *Standard Drawing BSD-8033*;
- Non-roadway manhole covers: *Standard Drawings BSD-8034* (cast iron) and *BSD-8035* (concrete infill).

### 3.4.6 Construction

#### Back forms

If approved, back forms may be omitted and concrete cast against the ground. Increase the concrete cover by 50 mm.

#### Benching

Bench manholes and chambers to half height of all pipes using solid concrete and render with a sand-cement mortar to a smooth finish. Shape the benching for efficient water flow.

#### Pipe connections

Existing infrastructure: Where breaking into existing gullies, manholes, chambers or pipes obtain the relevant permits and approvals. Repair the join to ensure the drainline continues to function at a standard equal to that prior to the connection being made.

Future connections: Provide a 100 mm diameter blockout in the uphill sidewall or sidewalls of all gullies for the future connection of side drains.

#### Step irons and ladders – manholes

Limit depth of standard manholes to 3,000 mm. For manholes between 1,200 mm and 3,000 mm deep, install step irons in accordance with AS 1657.

Install fixed access ladders in manholes deeper than 3,000 mm, in accordance with AS 1657.

#### Step irons and ladders – gullies

Limit depth of gully to 1,350 mm. For gullies deeper than 1,200 mm, install step irons in accordance with AS 1657.

### 3.5 INLETS AND OUTLETS

To *Standard Drawing BSD-8101* or *BSD-8102*. If type is unspecified, obtain instructions.

### 3.6 ROOFWATER PITS

To *Standard Drawing BSD-8112*. Use a proprietary product with well-sealed lid and surround. Bench pits to half height of all pipes with sand-cement mortar to provide efficient flow.



### 3.7 PRECAST DRAINAGE STRUCTURES

#### Approved structure types

The following precast cast concrete drainage components may be used:

- Manhole tops (Aspros);
- Gully lintel (extended kerb inlet) and integrated gully tops/kerb inlet units (all-in-one units comprising apron area, gully grate and frame and gully lintel); and
- Head walls.

Provided:

- They are rated by their manufacturers for the prevailing load and exposure conditions.
- Jointing details provide a watertight seal.
- Head walls are of the required configuration.
- Head walls specified as stone-pitched gravity structures are faced with stone pitching.

#### Unapproved structure types

The following precast cast concrete drainage components may not be used:

- Manhole shaft and chamber components and units; and
- Gully shaft and chamber components and units

Released under RMA-DIMR

## COMMENTARY

### USING THE DOCUMENTS

The latest edition of this annexure can be obtained by down loading from the Brisbane City Council internet site ([www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au)) via the following path: *Planning and building* › *Planning guidelines* › *Subdivision and Development Guidelines* › *Annexures to reference specifications for Civil Engineering work*. The user can either mark up a paper copy to suit the proposed contract or edit the file direct in Microsoft Word 2010 (or later). Please note that the section and page breaks in the Microsoft Word file have been inserted to suit double-sided printing.

This annexure forms part of a two-part specification system. The corresponding reference specification and this annexure must be incorporated in the tender documents either by reference alone (quoting an edition date) or both by reference and physical inclusion.

The annexure modifies the reference specification by additions, deletions or amendments and takes precedence over any inconsistent provisions in the reference specification. In particular, the annexure adapts the reference specification to the technical needs for the particular project. However the user may, alternatively, employ a 'Job Specification' to convey job-specific information. If both annexure and job specification are used, the job specification takes precedence.

Because of the job-specific nature of the annexure, it is important to identify the project adequately in the header to the annexure or in the text of each section (either by description or by a contract serial number).

### CONTRACTUAL PROVISIONS

The reference specification and annexure deal only with technical and administrative matters. They do not deal with commercial arrangements. It is most important that they are used in conjunction with an adequate contract, which makes all necessary commercial arrangements including provisions for measurement of work and methods of payment.

Released under RTI

**STANDARDS – PIPE/CULVERT TYPES (Clause 1.3)**

Unless shown on the drawings, specify for each line, pipe or culvert class appropriate to the type of bedding, depth of cover and construction equipment in use. [*Insert the relevant requirements or insert 'Not Applicable'*]

Not applicable.

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**INSPECTION (Clause 2.2)**

Specify additional **witness points** for the Contract. [*Insert the relevant requirements or insert 'Not Applicable'*]

Not applicable.

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Specify stages **where notification is not required** for the Contract. [*Insert the relevant requirements or insert 'Not Applicable'*]

Not applicable.

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Specify **hold points** (i.e. work stages that cannot proceed without approval) in the Contract. [*Insert the relevant requirements or insert 'Not Applicable'*]

Not applicable.

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



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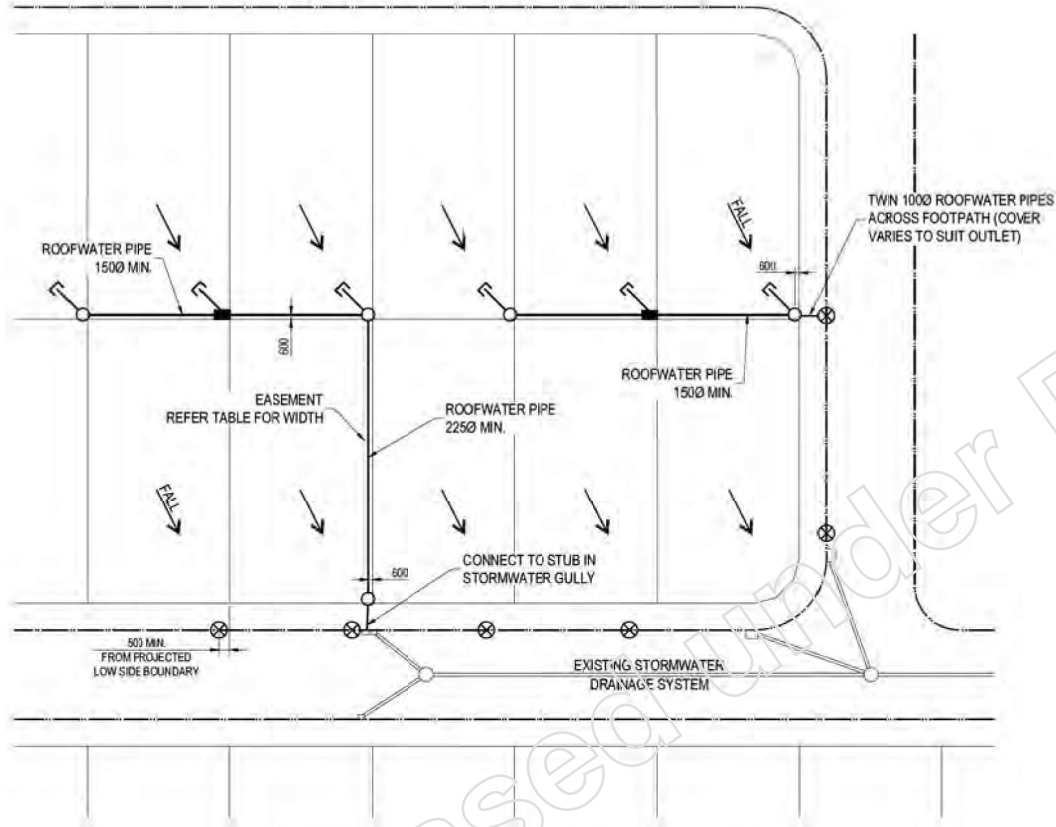
Released Under PTI - DTMR



Released under RTI - DTMR

**LEGEND**

-  ROOFWATER INSPECTION MANHOLE AS PER BSD-8112
-  ROOFWATER INSPECTION OPENING WITH 100mm DIA STUB AND END CAP
-  uPVC Y JUNCTION WITH 100mm DIA STUB AND END CAP
-  KERB ADAPTOR TO BSD-8114



**TYPICAL PLAN ROOFWATER DRAINAGE SYSTEM**

**DESIGN CRITERIA FOR REAR OF ALLOTMENT DRAINAGE SYSTEM**

EASEMENT WIDTH (m)	NOMINAL PIPE DIAMETER (mm)	MINIMUM PIPE SLOPE (%)	FLOW (L/s) - NOTE 4							
			PIPE GRADIENT % - NOTE 6							
			0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0
NOT REQUIRED - NOTE 3	150	1.0	N/A	19	23	26	30	33	38	42
0.9	225	0.5	34	50	67	78	87	96	110	125
0.9	300	0.5	94	120	146	170	190	210	N/A	N/A

**NOTES:**

- DESIGN FLOWS CALCULATED BASED ON MANNING'S 'n' OF 0.011. PIPE SIZED ASSUMING A DISCHARGE OF 15 L/s FROM EACH ALLOTMENT - BASED ON ROOF AREAS OF 250m<sup>2</sup> AND ARI OF 20 YEARS FOR S.E. QUEENSLAND. ALL PIPES SHALL HAVE A MINIMUM DIAMETER OF 150mm, EXCEPT ACROSS FOOTPATH.
- WHERE THE PIPE GRADIENT EXCEEDS 5%, UNDERTAKE A MORE DETAILED HYDRAULIC ANALYSIS INCLUDING THE ASSESSMENT OF STRUCTURE LOSSES, WHERE APPROPRIATE.
- AN EASEMENT IN FAVOUR OF COUNCIL IS REQUIRED WHEN THE ROOFWATER LINE IS DESIGNED TO SERVICE MORE THAN 2 ALLOTMENTS, IRRESPECTIVE OF PIPE SIZE.
- DISCHARGE TO KERB AND CHANNEL MUST BE LIMITED TO 30L/s.
- PROVIDE MINIMUM 450 COVER TO PIPES EXCEPT WHERE REDUCED COVER IS NECESSARY TO EFFECT DISCHARGE TO KERB AND CHANNEL. PIPE TYPES AND CLASSES TO COMPLY WITH THE FOLLOWING REQUIREMENTS:
  - UPVC PIPE (MINIMUM SEWER CLASS SN8) MANUFACTURED IN ACCORDANCE WITH AS1260;
  - PVC PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATIONS. JOINT TYPE, SOLVENT WELDED;
  - STEEL REINFORCED CONCRETE PIPE MINIMUM CLASS 2, MANUFACTURED TO AS4058. JOINT TYPE, RUBBER RING;
  - FIBRE REINFORCED CONCRETE PIPE MINIMUM CLASS 1, MANUFACTURED TO AS4139. JOINT TYPE, RUBBER RING.
- MINIMUM PIPE GRADES TO COMPLY GENERALLY WITH AS3500 NATIONAL PLUMBING AND DRAINAGE CODE PART 3 STORMWATER DRAINAGE:
  - 1.0% GRADE FOR PIPES ≤1500;
  - 0.5% GRADE FOR PIPES > 1500 BUT < 3750;
  - 0.5-0.3% GRADE FOR PIPES 3750.
- PROVIDE ROOFWATER INSPECTION MANHOLES:
  - AT MAXIMUM 100m SPACING;
  - AT ALL CHANGES IN PIPE SIZES;
  - AT ALL DIRECTION CHANGES EXCEEDING 15°;
  - AT LINE TERMINATION.
- PROVIDE "AS CONSTRUCTED" INFORMATION FOR:
  - OFFSETS OF THE MAIN LINE TO THE PROPERTY BOUNDARY;
  - THE LOCATIONS OF INSPECTION MANHOLES AND Y JUNCTIONS MEASURED FROM THE PROPERTY BOUNDARY.
- DIMENSIONS IN MILLIMETRES (U.N.O.).

ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE
C	Min. Pipe sizes Added to Detail, Easement Width Updated, Notes 1, 2, 3 & 4 Revised	NOV '18	APR '19	APR '19
B	Note 5 Amended - SN6 changed to SN8	FEB '16	JUL '16	JUL '16
A	Drawing Converted from UMS Series April 2014	APR '14	APR '14	APR '14

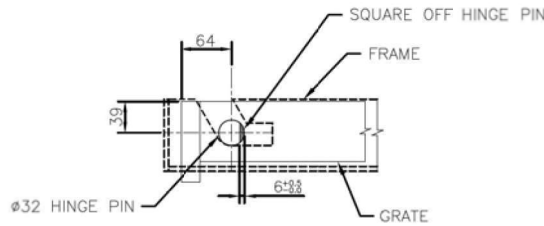
<b>DRAWING AUTHORIZED FOR PUBLICATION</b>			
B. FALL SIGNATURE ON ORIGINAL DATED 29/6/01			
ASSET ENGINEERING MANAGER STRATEGIC ASSET MANAGEMENT			
<b>DESIGN APPROVED</b>			
B. HANSEN SIGNATURE ON ORIGINAL DATED 27/6/01			
PRINCIPLE ASSET OFFICER ROADS & DRAINAGE			
DESIGN	Std Dwg's WG	DATE	APR '01
DRAWN	CITY DESIGN	DATE	APR '01
CHECKED	MSTEER	DATE	MAY '01
DRAWING FILENAME	BSD-8111 (C) Roofwater drainage for low density residential subdivisions.dwg		
ASSOCIATED PLANS	SUPERSEDES UMS-351		



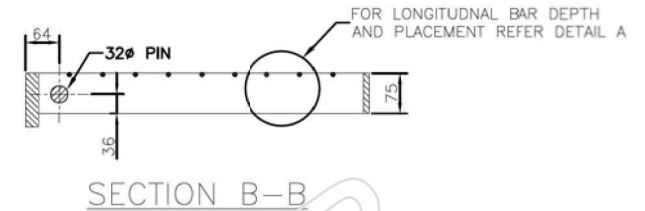
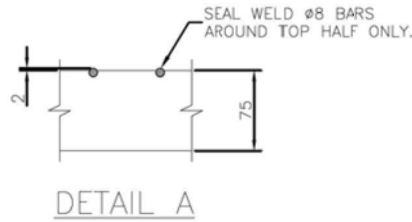
**BRISBANE CITY COUNCIL STANDARD DRAWING**

ROOFWATER DRAINAGE FOR LOW DENSITY RESIDENTIAL SUBDIVISIONS

SCALE: NOT TO SCALE  
 DWD NO: BSD-8111  
 ORIGINAL SIZE: A3  
 REVISION: C



LOCKING DEVICE  
DETAIL (GRATE)



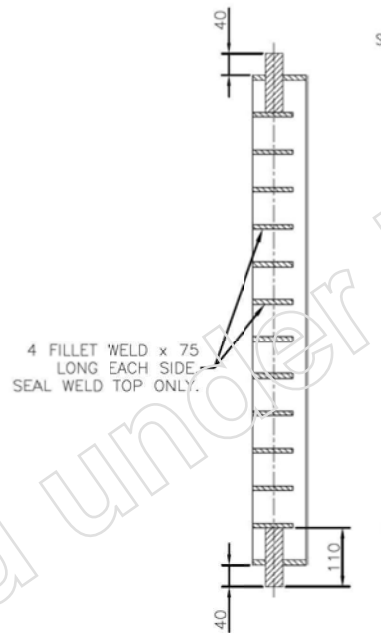
SECTION B-B

NOTES:

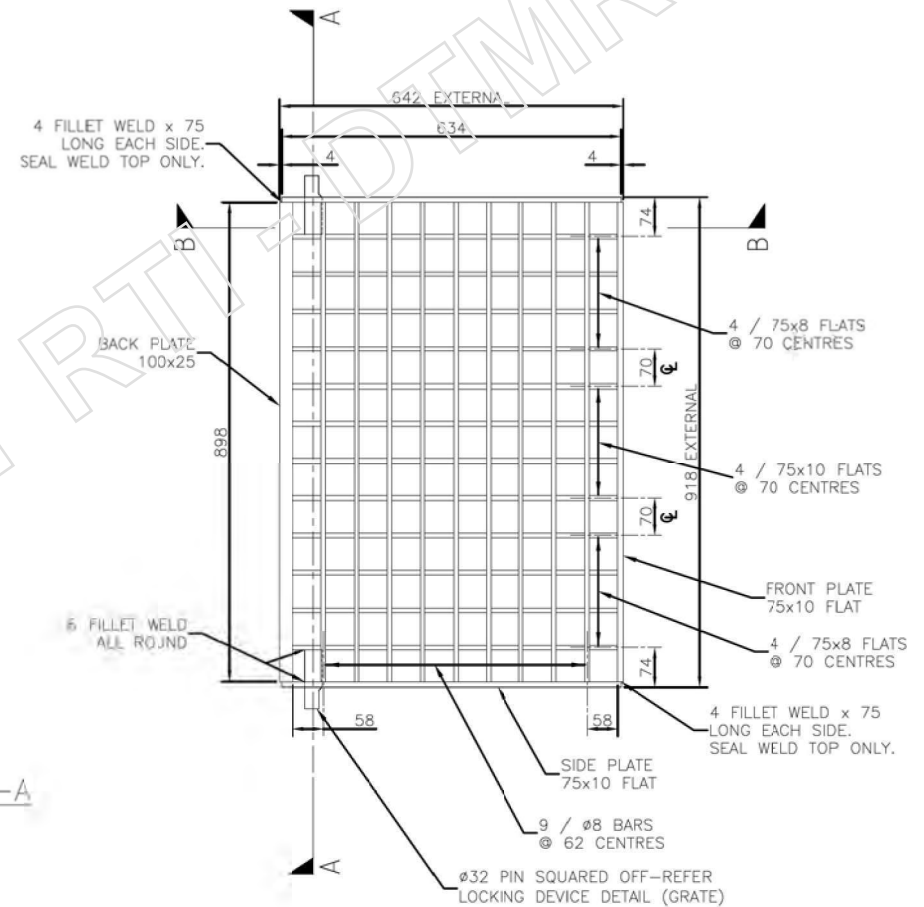
1. MASS OF GRATE: 72.5kg
2. GRATE STEEL TO BE GRADE 300 STRUCTURAL STEEL TO AS/NZS3679.1.
3. GRATE TO BE HOT DIP GALVANISED TO AS4680.
4. ALL WELDS TO BE 4 CFW UNLESS NOTED OTHERWISE.
5. GRATE TO HAVE PERMANENT VISIBLE MARKING INDICATING STANDARD (AS3996), MANUFACTURER, GRATE CLASS, DATE OF MANUFACTURE AND/OR BATCH No. AND MASS AS PER AS3996.
6. TOLERANCES SPECIFIED FOR THE LOCKING DEVICE BOTH IN THE FRAME AND HINGE PIN ARE REQUIRED FOR EFFECTIVENESS AND RELIABILITY.
7. OTHER TOLERANCES TO ± 2.
8. GRATES TO COMPLY WITH AS3996, CLASS 'D' AND BE CLASSIFIED 'BIKE SAFE' IN ALL DIRECTIONS (SATISFY BICYCLE TYRE PENETRATION TEST IN ALL DIRECTIONS).
9. GRATE TO BE FULLY COMPATIBLE AND INTERCHANGABLE WITH BCC STANDARD TYPE 'A' GULLY FRAME - REFER BSD-8054 FOR DETAILS.
10. ALL DIMENSIONS IN MILLIMETRES (U.N.O.).

SPECIAL NOTE:

BRISBANE CITY COUNCIL PROPRIETARY DESIGN  
REFER ALSO TO REFERENCE SPECIFICATION FOR CIVIL ENGINEERING WORKS S160-DRAINAGE.



SECTION A-A



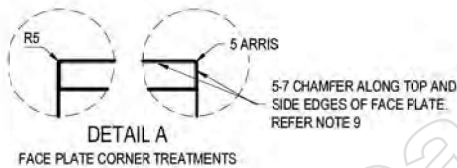
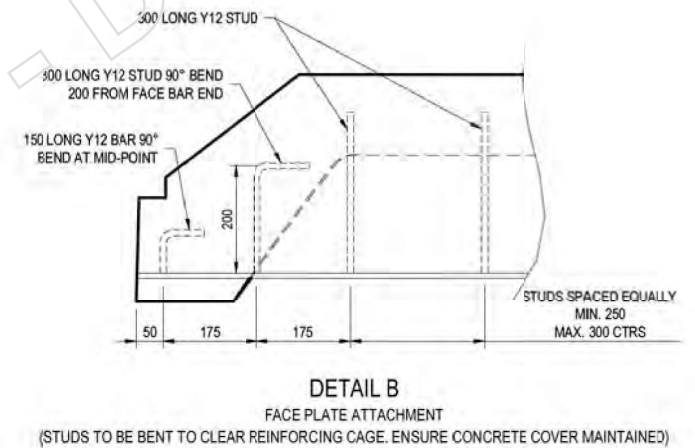
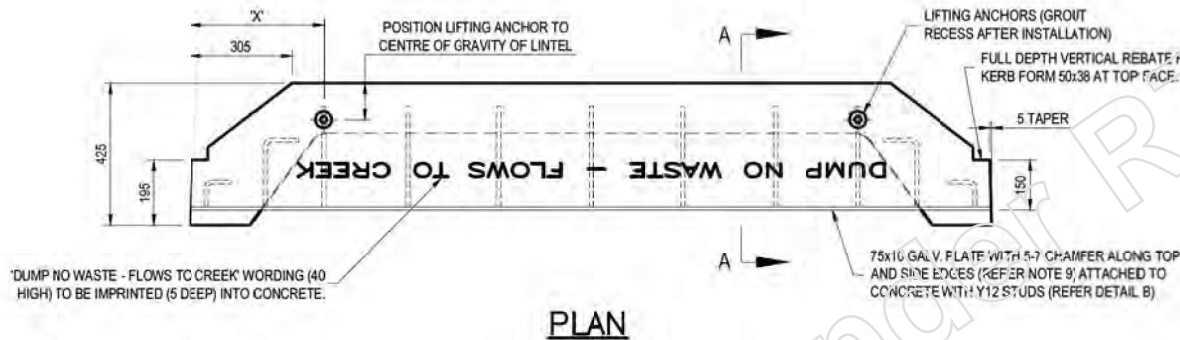
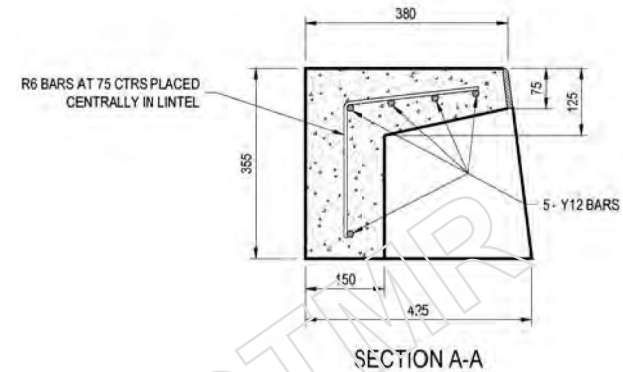
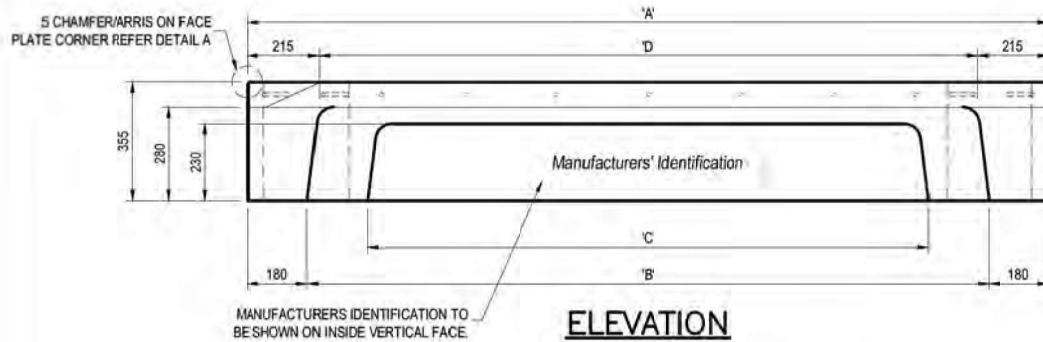
PLAN

A	ORIGINAL ISSUE	OCT '13	OCT '13	OCT '13
ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE

DRAWING AUTHORISED FOR PUBLICATION B.BAL. SIGNATURE ON ORIGINAL DATED 29/06/01				DESIGN	STD DWG GROUP	DATE	APR '01
MANAGER ASSET SUPPORT - R.P.E.O. 3852				DRAWN	CITY DESIGN	DATE	APR '01
DESIGN APPROVED B.HANSEN SIGNATURE ON ORIGINAL DATED 27/06/01				CHECKED	MSTEER	DATE	MAY '01
PRINCIPAL ASSET OFFICER ROADS AND DRAINAGE				DRAWING FILENAME	BSD-8053.dwg		
				ASSOCIATED PLANS	SUPERSEDES UMS-332		



<b>BRISBANE CITY COUNCIL STANDARD DRAWING</b>		SCALE	NOT TO SCALE
<b>TYPE 'A' GULLY GRATE</b> (HUNGED, CLASS 'D', BIKE SAFE IN ALL DIRECTION)		DWG No.	<b>BSD-8053</b>
ORIGINAL SIZE	A3	REVISION	A



**PRECAST LINTEL DETAIL**  
TYPICAL DIMENSIONS

LINTEL	*A* mm	*B* mm	*C* mm	*D* mm	*X* mm	MASS (kg)
XS*	1200	840	600	770	400	300
S	2400	2040	1800	1970	400	500
M	3600	3240	3000	3170	690	700
L	4800	4440	4200	4370	1000	900

\* BCC USE ONLY. SEE NOTE 6.

**NOTES:**

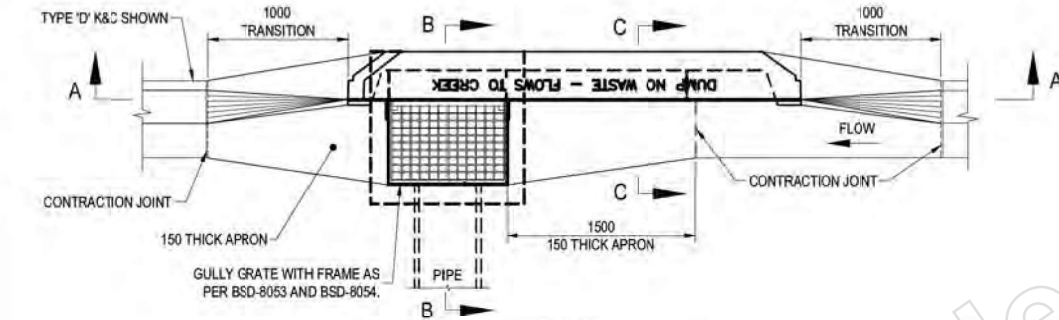
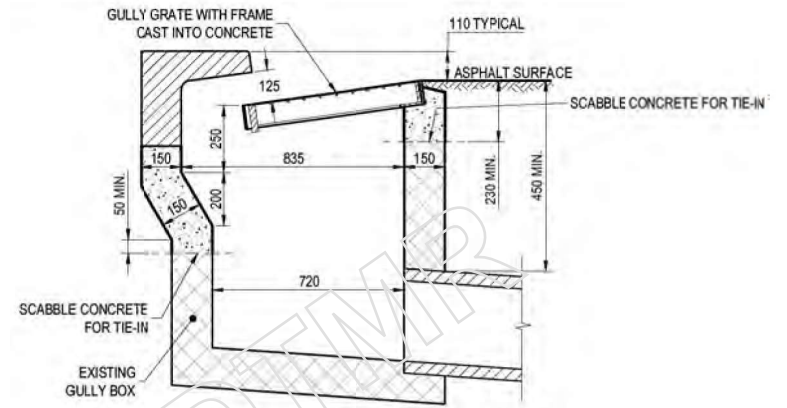
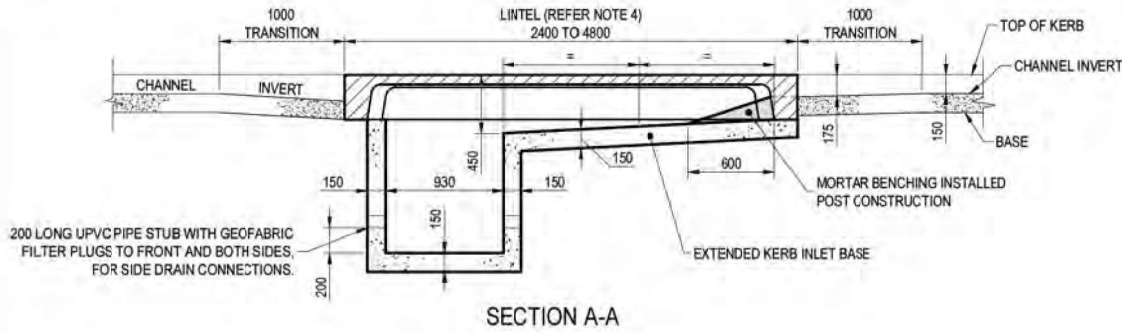
1. PRECAST CONCRETE LINTEL TO BE GRADE N32 AND TO CONFORM TO AS 3600.
2. COVER TO ALL BARS TO BE 40 MIN.
3. REINFORCEMENT STEEL TO CONFORM TO AS/NZS 4671.
4. EACH LIFTING ANCHOR TO BE "SWIFTLIFT" OR EQUIVALENT 1.3 TONNE GALVANISED AND FITTED TO MANUFACTURERS SPECIFICATION.
5. LINTELS ARE TO BE ORDERED AS FOLLOWS:  
- 'XS' LINTEL (EXTRA SMALL)  
- 'S' LINTEL (SMALL)  
- 'M' LINTEL (MEDIUM)  
- 'L' LINTEL (LARGE)
6. 'XS' (1.2m) LINTEL ONLY TO BE USED FOR 'ANTI-PONDING' APPLICATIONS AND NOT TO BE INCLUDED IN HYDRAULIC CALCULATIONS. 'XS' LINTEL FOR INTERNAL BCC USE ONLY.
7. ALL Y12 STUDS TO BE 6mm CFW TO FRONT PLATE.
8. FACE PLATE AND STUD ASSEMBLY TO BE HOT DIPPED GALVANISED TO AS/NZS 4680 AFTER FABRICATION.
9. 75x10 PLATE WITH A MIN. 1.5mm 'ROLLED' TOP EDGE MAY BE SUBSTITUTED FOR THE 5-7mm CHAMFER ALONG TOP EDGE OF FRONT PLATE. CHAMFER ON END OF PLATE REQUIRED FOR ALL PLATE TYPES.
10. ALL DIMENSIONS IN MILLIMETRES (U.N.O.).

ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE
B	Notes 3 & 8 AS Ref. Updated, Note 9 Edited: Spelling Errors	OCT '17	AUG '18	NOV '18
A	ORIGINAL ISSUE - Detail From UMS 331	Apr '14	Apr '14	Apr '14

DRAWING AUTHORISED FOR PUBLICATION		DESIGN	STD DWG GROUP	DATE	Appr'd
Gavin Blakey		DRAWN	ASSET MGMT	DATE	Feb '13
ASSET ENGINEERING MANAGER STRATEGIC ASSET MANAGEMENT		CHECKED	ASSET MGMT	DATE	Feb '13
DESIGN APPROVED		DRAWING FILENAME	ESD-8055 (B) Type 'A' gully precast concrete lintel (extended kerb inlet).dwg		
Inga Condrick		ASSOCIATED PLANS	UMS 331		
PRINCIPAL ENGINEER STRATEGIC ASSET MANAGEMENT					

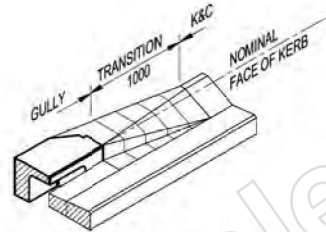


BRISBANE CITY COUNCIL STANDARD DRAWING		SCALE	NOT TO SCALE
TYPE 'A' GULLY PRECAST CONCRETE LINTEL (EXTENDED KERB INLET)		DWG NO.	BSD-8055
ORIGINAL SIZE	A3	REVISION	B

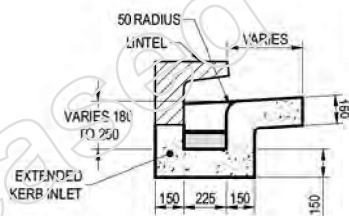


NOTE:- FOR SAG GULLY, APRON TO EXTEND TO END OF LINTEL AND GULLY TO BE LOCATED IN CENTRE OF LINTEL.

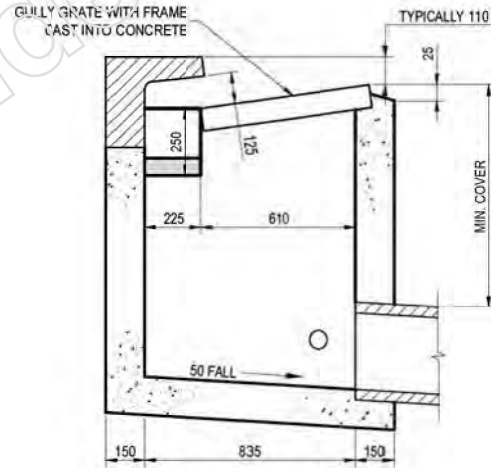
**TYPICAL INLET ON GRADE**



**TRANSITION TO K&C**  
TYPE 'D' K&C SHOWN



**SECTION C-C**  
(THROUGH LINTEL & EXTENDED KERB INLET)



**SECTION B-B**

**NOTES:**

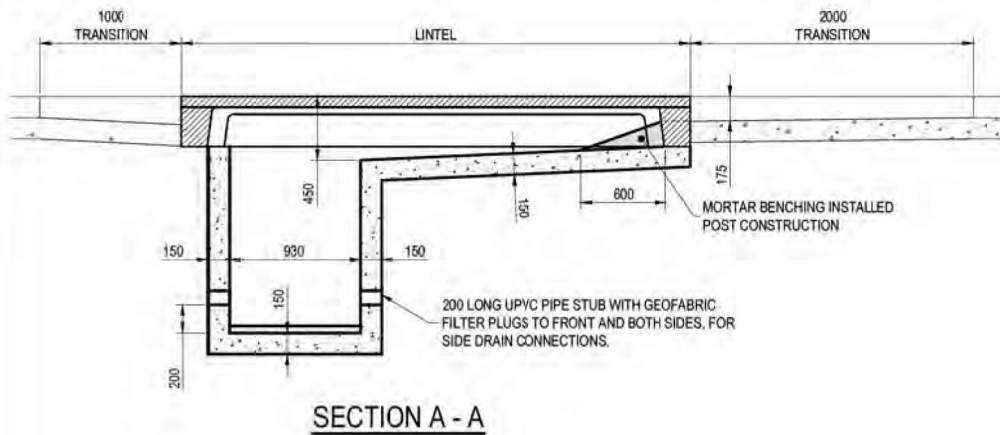
- ALL CONCRETE TO BE GRADE N25.
- COVER TO ALL BARS TO BE 40 MIN.
- REINFORCEMENT STEEL TO CONFORM TO AS 1302.
- REFER BSD-8055 FOR LINTEL DETAILS.
- CAST INSITU CONCRETE N25 TO AS 1379 AND AS 3600.
- REFER BSD-8053 AND BSD-8054 FOR GULLY GRATE AND FRAME DETAILS.
- UNLESS APPROVED OTHERWISE BY COUNCIL DELEGATE, LIMIT DEPTH OF GULLY TO 1.35m.
- GULLIES DEEPER THAN 1.35m TO BE EITHER:
  - INDIVIDUALLY DESIGNED AND CERTIFIED BY AN RPEQ, OR
  - DESIGNED AND CONSTRUCTED TO DTMR STANDARD DRAWING No. 1312
- INSTALL STEP IRONS TO GULLIES GREATER THAN 1.20m DEEP IN ACCORDANCE WITH AS1657.
- REFER TO BSD-2042 (ROADWAYS) AND BSD-2043 (PATHS AND VERGES) FOR MINIMUM COVER REQUIREMENTS. MIN. 450mm IN OTHER AREAS.
- DIMENSIONS IN MILLIMETRES (UNO).

C	Note 7 & Min Cover on Section B-B Update, Notes 8 & 9 Added	APR '18	AUG '18	NOV '18
B	Benching Added to Gully Trough	DEC '15	JUL '16	JUL '16
A	Drawing Converted from UMS Series April 2014	Apr '14	Apr '14	Apr '14
ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE

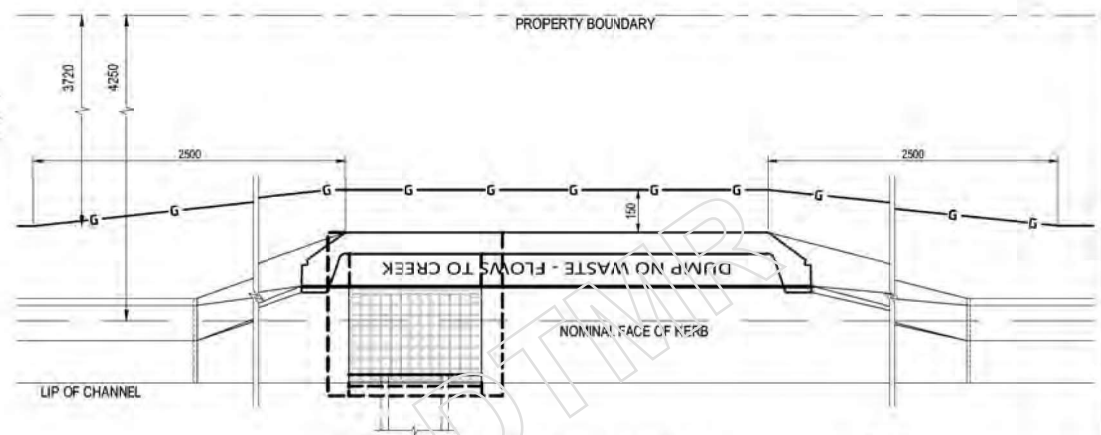
DRAWING AUTHORIZED FOR PUBLICATION Inga Condric 20/14/04 15:10:40:47 PR ASSET ENGINEERING MANAGER STRATEGIC ASSET MANAGEMENT		DESIGN	STD DWG GROUP	DATE	April '01
DESIGN APPROVED Inga Condric 20/14/04 15:10:40:47 PRINCIPAL ENGINEER STRATEGIC ASSET MANAGEMENT PLANNING		DRAWN	DTY DESIGN	DATE	April '01
		CHECKED	M STEER	DATE	May '01
		DRAWING FILENAME	BSD-8052 (B) Type 'A' gully kerb in line.dwg		
		ASSOCIATED PLANS	SUPERSEDES UMS-331		



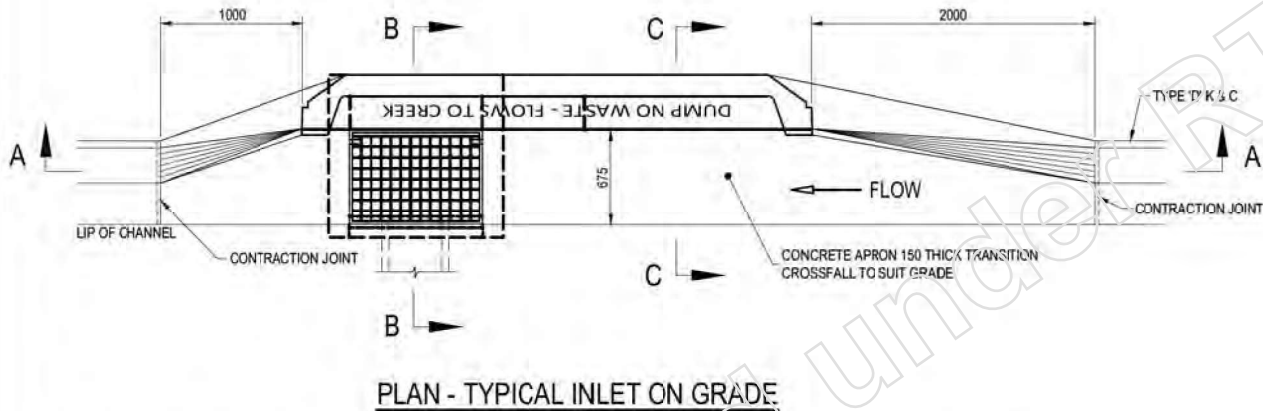
<b>BRISBANE CITY COUNCIL STANDARD DRAWING</b>		SCALE	NOT TO SCALE
TYPE 'A' GULLY KERB IN LINE		DWG No.	BSD-8052
DRAWN	DATE	REVISION	C
A3			



SECTION A - A



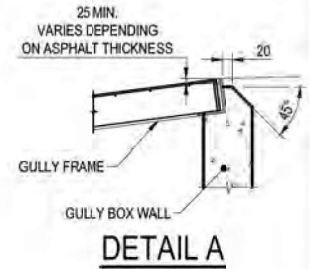
GAS RE-ALIGNMENT DETAILS



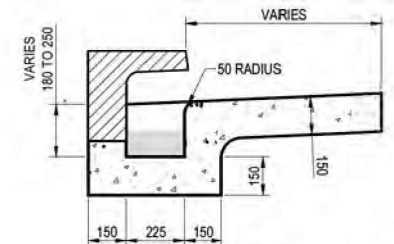
PLAN - TYPICAL INLET ON GRADE



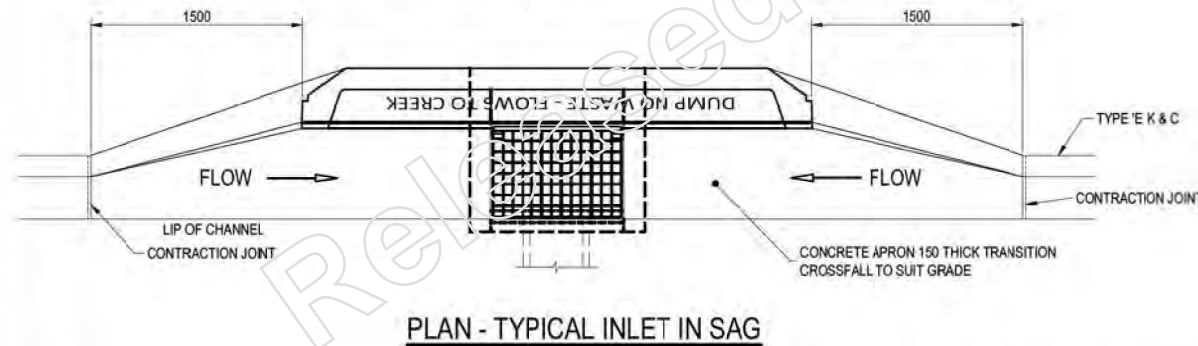
SECTION B-B



DETAIL A



SECTION C-C



PLAN - TYPICAL INLET IN SAG

NOTES:

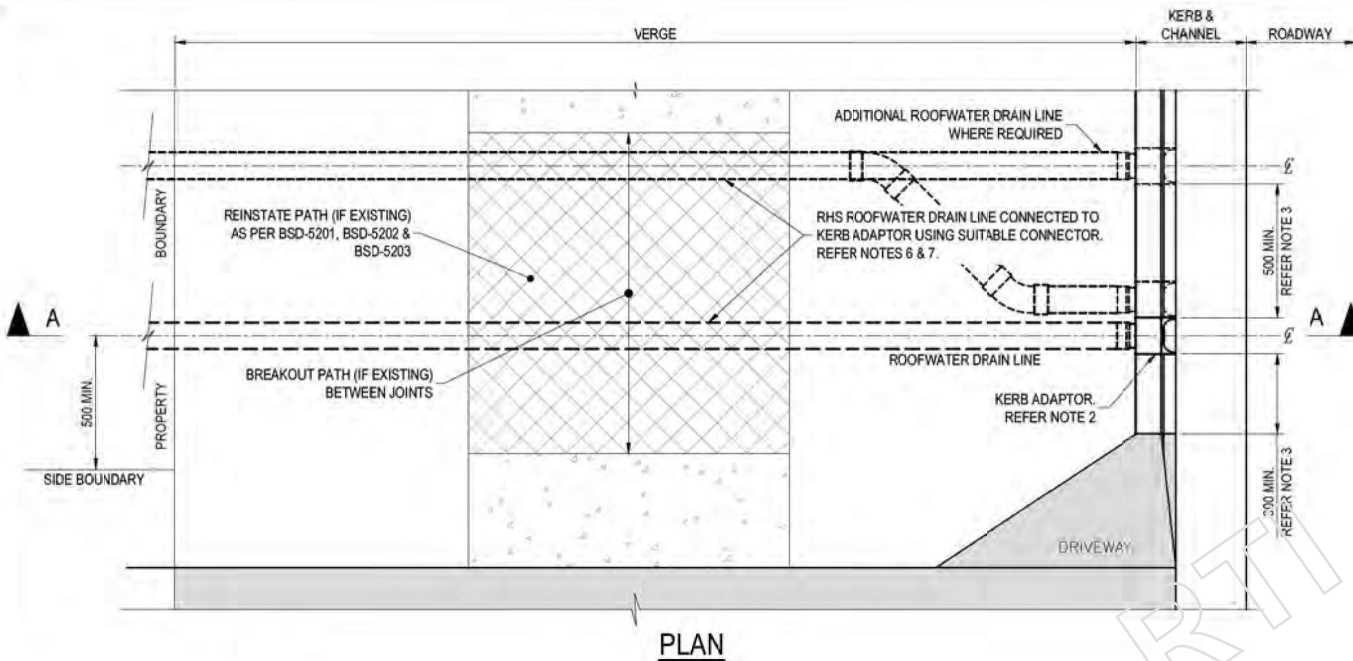
- REFER BSD-8055 FOR LINTEL DETAILS.
- CAST INSITU CONCRETE N25 TO AS1379 AND AS3600.
- REFER BSD-8053 & BSD-8054 FOR GULLY GRATE AND FRAME DETAILS.
- UNLESS APPROVED OTHERWISE BY COUNCIL DELEGATE, LIMIT DEPTH OF GULLY TO 1.35m.
- GULLIES DEEPER THAN 1.35m TO BE EITHER:
  - INDIVIDUALLY DESIGNED AND CERTIFIED BY AN RPEQ, OR
  - DESIGNED AND CONSTRUCTED TO DTMR STANDARD DRAWING No. 1311.
- INSTALL STEP IRONS TO GULLIES GREATER THAN 1.20m DEEP IN ACCORDANCE WITH AS1657.
- REFER TO BSD-2042 (ROADWAYS) AND BSD-2043 (PATHS AND VERGES) FOR MINIMUM COVER REQUIREMENTS. MIN. 450mm IN OTHER AREAS.
- DIMENSIONS IN MILLIMETRES (UNO).

ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE
C	Note 4 & Min Cover on Section B-B Update, Notes 5 & 6 Added	APR '17	AUG '18	NOV '18
B	Benching Added to Gully Trough	DEC '15	JUL '16	JUL '16
A	Drawing Converted from UMS Series April 2014	APR '14	APR '14	APR '14

DESIGN	STD DWG GROUP	DATE
DESIGNED	STD DWG GROUP	APR '01
DRAWN	CITY DESIGN	DATE APR '01
CHECKED	MSTEER	DATE MAY '01
DRAWING FILENAME	BSD-8051 (C) Type 'A' gully lip in line gully.dwg	
ASSOCIATED PLANS	SUPERSEDES UMS-330	



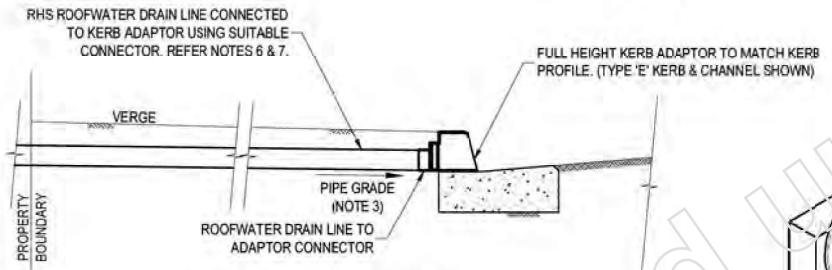
BRISBANE CITY COUNCIL STANDARD DRAWING	
TYPE 'A' GULLY LIP IN LINE	SCALE: NOT TO SCALE
	DWG NO: BSD-8051
	ORIGINAL SIZE: A3
	REVISION: C



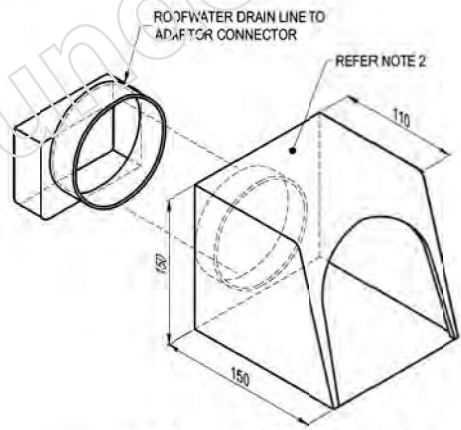
**NOTES:**

1. ROOFWATER DRAINS AND THEIR CONNECTION TO THE STORMWATER DRAINAGE NETWORK ARE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE PROPERTY OWNER IS RESPONSIBLE FOR THE RESTORATION OF THE AFFECTED KERB, VERGE AND FOOTPATH.
2. FULL HEIGHT KERB ADAPTOR TO MATCH KERB & CHANNEL PROFILES AND CONFORM TO REFERENCE SPECIFICATION FOR CIVIL ENGINEERING WORKS S150 ROADWORKS, SECTION 5.3. REFER BSD-2001 FOR KERB PROFILE DETAIL.
3. PROVIDE SINGLE PIECE/MULTIPLE OUTLET ADAPTOR OR MIN. 500mm CLEARANCE BETWEEN SINGLE OUTLETS WITH A MIN. 300mm CLEARANCE FROM ALL OUTLETS TO DRIVEWAY TAPERS.
4. AT EXISTING KERB & CHANNEL SAW CUT AS NECESSARY. REINSTATE WITH N25 CONCRETE IN ACCORDANCE WITH AS1379 AND AS3000 TO CLEAN CONCRETE FACE.
5. ROOFWATER DRAIN ACROSS VERGE TO BE LAID WITH THE MAXIMUM AVAILABLE COVER AND WITH A MINIMUM GRADE OF 1 IN 80.
6. IN COLLECTOR ROADS OR IN LOW DENSITY RESIDENTIAL STREETS PROVIDE SINGLE 125x75 RHS ROOFWATER DRAIN FOR FULL WIDTH OF VERGE. ROOFWATER DRAIN TO CONNECT TO FULL HEIGHT KERB ADAPTOR.
7. OTHER THAN SINGLE DWELLINGS, PROVIDE SINGLE OR MULTIPLE RHS ROOFWATER DRAINS ACROSS FULL WIDTH OF VERGE. ROOFWATER DRAIN(S) TO CONNECT TO FULL HEIGHT SINGLE PIECE/MULTIPLE OUTLET ADAPTOR KERB ADAPTOR. GENERALLY 102x76, 125x75, 152x76 OR 185x65 RHS.
8. RHS TO BE MIN. 3mm WALL THICKNESS.
9. RHS TO BE HOT DIPPED GALVANISED STEEL TO AS/NZS4680 OR ZINC-ALLOY COATED STEEL TO ZM275 COATING CLASS AS SPECIFIED IN AS1397.
10. CUT ENDS OF RHS TO BE TREATED WITH A COLD GALVANISING MATERIAL OR APPROPRIATE ANTI-CORROSION TREATMENT.
11. REINSTATE ANY CONSTRUCTED PATH TO MATCH ORIGINAL FINISH.
12. ALL DIMENSIONS IN MILLIMETRES (U.N.O.)

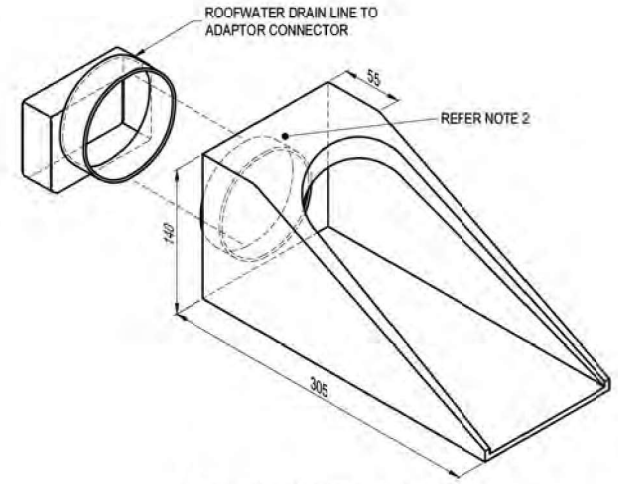
**PLAN**



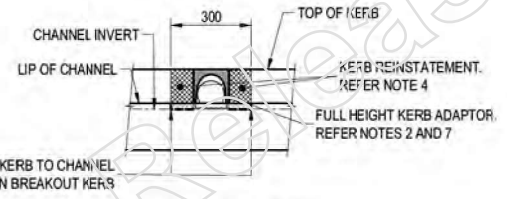
**TYPICAL SECTION A-A**



**TYPICAL TYPE 'E' PROFILE KERB ADAPTOR DIMENSIONS**



**TYPICAL TYPE 'D' PROFILE KERB ADAPTOR DIMENSIONS**



**FRONT ELEVATION**

ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE
B	Notes 6 and 7 Updated RHS Size, Note 8 and 9 Added	MAY '18	JUL '18	NOV '18
A	Drawing Converted from UMS Series April 2014	APR '14	APR '14	APR '14

DRAWING AUTHORIZED FOR PUBLICATION		DESIGN	DATE
B. FALL SIGNATURE ON ORIGINAL DATED 29/6/04		S/d Dwgs WG	APRIL '01
ASSET ENGINEERING MANAGER STRATEGIC ASSET MANAGEMENT		DRAWN	DATE
DESIGN APPROVED		CPO - P&D	APRIL '01
B. HANSEN SIGNATURE ON ORIGINAL DATED 27/6/01		CHEKED	DATE
PRINCIPAL ASSET OFFICER ROADS & DRAINAGE		M STEER	MAY '01
		DRAWING FILENAME	
		BSD-8114(B) Roofwater drainage connection (kerb adaptor installation) dwg	
		ASSOCIATED PLANS	
		SUPERSEDES UMS-354	

**BRISBANE CITY COUNCIL STANDARD DRAWING**


ROOFWATER DRAINAGE CONNECTION (KERB ADAPTOR INSTALLATION)

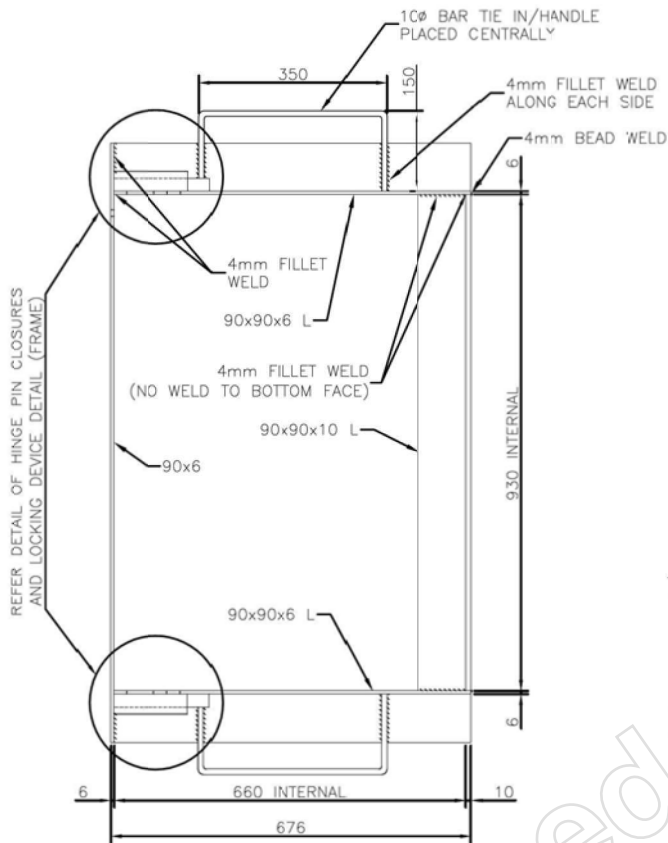
SCALE: NOT TO SCALE

DWG NO: BSD-8114

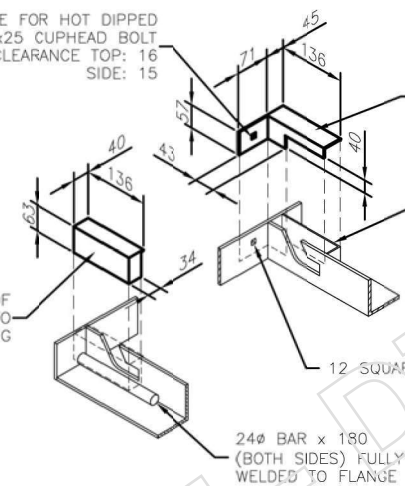
ORIGINAL SIZE: A3

REVISION: B





12 SQUARE HOLE FOR HOT DIPPED GALVANISED M10x25 CUPHEAD BOLT  
EDGE CLEARANCE TOP: 16  
SIDE: 15

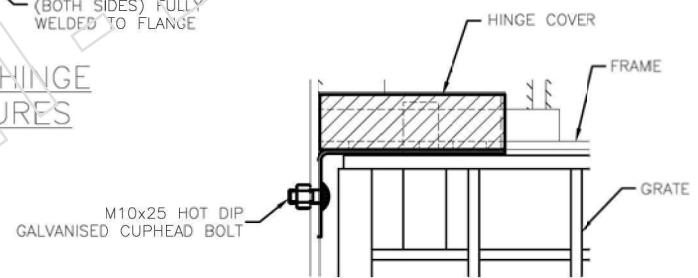


REMOVABLE PIN CLOSURE OF 3 THICK GALVANISED PLATE (SUPPLIED ASSEMBLED WITH M10 BOLT)

2 SIDED PIN CLOSURE WELDED TO FRAME PRIOR TO GALVANISING AND TO SIDE DIMENSION OF L.H.S. CLOSURE

3 SIDED PIN CLOSURE OF 3 THICK PLATE WELDED TO FRAME PRIOR TO GALVANISING

**DETAIL OF HINGE PIN CLOSURES**



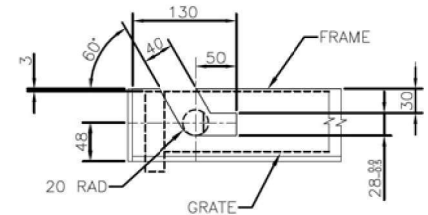
**DETAIL OF HINGE COVER AND BOLT**

**NOTES:**

1. MASS OF FRAME: 30kg
2. FRAME STEEL TO BE GRADE 300 STRUCTURAL STEEL TO AS/NZS3679.1
3. FRAME TO BE HOT DIP GALVANISED TO AS4680.
4. ALL WELDS TO BE 4 CFW UNLESS NOTED OTHERWISE.
5. TOLERANCES SPECIFIED FOR THE LOCKING DEVICE BOTH IN THE FRAME AND HINGE PIN ARE REQUIRED FOR EFFECTIVENESS AND RELIABILITY.
6. OTHER TOLERANCES TO ± 2mm.
7. REFER BSD-8053 FOR BCC STANDARD TYPE 'A' GULLY GRATE DETAILS.
8. ALL DIMENSIONS IN MILLIMETRES (U.N.D.).

**SPECIAL NOTE:**

BRISBANE CITY COUNCIL PROPRIETARY DESIGN  
REFER ALSO TO REFERENCE SPECIFICATION FOR CIVIL ENGINEERING WORKS S160-DRAINAGE.



**LOCKING DEVICE DETAIL (FRAME)**

A	ORIGINAL ISSUE	OCT '13	OCT '13	OCT '13
ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE

DRAWING AUTHORISED FOR PUBLICATION B.BAL. SIGNATURE ON ORIGINAL DATED 29/06/01				DESIGN	STD DWG GROUP	DATE	APR '01
MANAGER ASSET SUPPORT - R.P.E.O. 385.2				DRAWN	CITY DESIGN	DATE	APR '01
DESIGN APPROVED B.JHANSEN SIGNATURE ON ORIGINAL DATED 27/06/01				CHECKED	MSTEER	DATE	MAY '01
PRINCIPAL ASSET OFFICER ROADS AND DRAINAGE				DRAWING FILENAME	BSD-8054.dwg		
				ASSOCIATED PLANS	SUPERSEDES UMS-333		



<b>BRISBANE CITY COUNCIL STANDARD DRAWING</b>		SCALE	NOT TO SCALE
<b>TYPE 'A' GULLY FRAME</b>		DWG NO.	<b>BSD-8054</b>
ORIGINAL SIZE	A3	REVISION	A

## Darcy K Craddock

---

**From:** [Redacted] NR  
**Sent:** Monday, 27 November 2023 9:58 AM  
**To:** Darcy K Craddock  
**Cc:** [Redacted] NR  
**Subject:** Chermshire - 621 Gympie Rd  
**Attachments:** Chermshire - storm pit to adjacent car yard.pdf; 389F5835-B779-4E1C-8778-9332EE46B9F9.pdf

Hi Darcy,

During a rain event last Monday 20/11/23 water entered our building along Gympie Rd Frontage causing damage to our nearly completed building and medical clinic on Ground Floor.

While we were investigating the root cause of the issue, we observed that the existing drainage connecting the adjoining property is not connected to the kerb on Gympie Road. Further we noticed that the new drainage infrastructure on Gympie Rd and Pilba St do not seem to be connected. We believe that a combination of both of these may have caused or, at least contributed, to the inundation we experienced.

Please see attached photos of the neighboring drainage and the Pilba street culvert.

Could you please advise the programme for the connection of pits and reinstatement of drainage lines to allow us to understand any mitigation we may need to deploy to ensure our building and tenants remain unaffected.

Further, should you feel it necessary to review the issues suffered in person, we would welcome the opportunity to meet on site.



[Redacted] NR  
**Project Manager**  
[Redacted] NR 07 3886 9613  
[Redacted] NR



[www.jas-anz.org](http://www.jas-anz.org)



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Released under RTI - DTMR

# General Advice

Reference No.: CN12205-BIELBY-GA-02195.00  
Project Title: Northern Transitway (Kedron to Chermside)

---

Date: 17 January 2024, 09:17:32 AM +10:00 **Response required by:**

To:  Bielby  
 Bielby  
 Ranbury Management Group

CC: TMR Doc Control, Department of Transport and Main Roads  
NTWDoc Control, Ranbury Management Group

From:  Bielby

Subject: **RE: NTW - 621 Medical Centre Drairage issues**

---

As discussed please see attached mark-up of Pilba to Rode drainage issues.

## Condition at the time of flooding

1. Footpath extents were in the control of cornerstone. The footpath was in a temporary state with no level / grade control as Cornerstone were using the footpath for their construction work area
2. Cornerstone have connected the building entrance to the existing footpath. The existing footpath is higher than the building entrance thus creating fall towards the building and directing water into the building. A section of this has since been removed.
3. The footpath condition / gradings have been in place for an extended period of time with no issue.
4. The Kedron Used cars field inlet pit was not outletting to kerb. Further investigation indicated roof water outlet pipe has been damaged during ITS/WM installation - causing the field inlet to overflow. This has resulted in pit overflowing and water running along Cornerstone property frontage and being directing into building. This has since been rectified - 27/11/23.
5. There was a gully pit in Pilba that was blocked off with ply (fall hazard protection). This has resulted in water being directed overland along kerb towards Gympie. It is possible that this has overtopped at kerb ramp and flowed along back of kerb towards Rode Road. It is unlikely that this water was directed into building as the back of kerb heights are lower than the Cornerstone footpath tie-in point. The pit was unblocked on the 27/11 with extra bunding installed to direct water flow to kerb.

The footpath area is in a current "under construction state" - with no issues with drainage as Cornerstone was also in a "under construction state". The issue has arisen when cornerstone has connected their building entrance to the higher existing footpath level which has then directed the water into the building.

Thanks

---

Discipline:

Area:

Location:

Originator's Reference No.:

----- Original Message -----

General Advice

Reference No.: CN12205-BIELBY-GA-02110.00  
Project Title: Northern Transitway (Kedron to Chermside)

---

Date: 27 November 2023, 11:41:04 AM +10:00 Response required by:

To:  Bielby  
 Bielby

CC: TMR Doc Control, Department of Transport and Main Roads  
NTWDoc Control, Ranbury Management Group

From:  Bielby

Subject: FW: NTW - 621 Medical Centre Drainage Issues

---

Hi

Can you please look into this and provide comment.

Cheers

---

Discipline:	Area:	Location:
Originator's Reference No.:		

----- Original Message -----

General Advice

Reference No.: CN12205-RMG-GA-01222.00  
Project Title: Northern Transitway (Kedron to Chermside)

---

Date: 27 November 2023, 11:32:20 AM +10:00 Response required by:  
To: [NR] Bielby  
CC: TMR Doc Control, Department of Transport and Main Roads  
NTWDoc Control, Ranbury Management Group  
[NR] Ranbury Management Group  
From: [NR] Ranbury Management Group  
Subject: FW: NTW - 621 Medical Centre Drairage issues

---

Hi [NR]

Please see attached and below from the Principal.

The landholder at 621 Gympie Rd has made a complaint insinuating that NTW Project has caused flooding in their building as drainage is not complete through this area.

Could you please investigate and provide comments for the Principal.

Cheers

[NR]  
Contract Administrator's Representative  
CN-12205  
Northern Transitway (Kedron to Chermside)  
M [NR] | T 07 3211 2300

---

Discipline:	Area:	Location:
Originator's Reference No.:		

----- Original Message -----

General Advice

Reference No.: CN12205-TMR-GA-00494.00  
Project Title: Northern Transitway (Kedron to Chermside)

---

Date: 27 November 2023, 11:19:03 AM +10:00 Response required by:

To: [NR] Ranbury Management Group  
[NR] Ranbury Management Group

CC: TMR Doc Control, Department of Transport and Main Roads  
NTWDoc Control, Ranbury Management Group  
[NR] Ranbury Management Group

From: Darcy Craddock, Department of Transport and Main Roads

Subject: NTW - 621 Medical Centre Drainage issues

G'day [NR]

Can you please get the team to investigate the following claim from Cornerstone at the 621 Gympie Rd Medical Centre site?

Contents of email from [NR] (Cornerstone)

During a rain event last Monday 20/11/23 water entered our building along Gympie Rd Frontage causing damage to our nearly completed building and medical clinic on Ground Floor.

While we were investigating the root cause of the issue, we observed that the existing drainage connecting the adjoining property is not connected to the kerb on Gympie Road. Further we noticed that the new drainage infrastructure on Gympie Rd and Pilba St do not seem to be connected. We believe that a combination of both of these may have caused or, at least contributed, to the inundation we experienced.

Please see attached photos of the neighboring drainage and the Pilba street culvert.

Could you please advise the programme for the connection of pits and reinstatement of drainage lines to allow us to understand any mitigation we may need to deploy to ensure our building and tenants remain unaffected.

Further, should you feel it necessary to review the issues suffered in person, we would welcome the opportunity to meet on site.

Kind regards,

Darcy Craddock  
Engineer (Civil) | Metropolitan Region / Brisbane Office  
Program Delivery & Operations | Department of Transport and Main Roads  
Nathan Depot | 1 University Road | Nathan Qld 4111  
PO Box 70 | Spring Hill Qld 4004  
P: 07 3066 1353  
M: [NR]  
E: darcy.k.craddock@tmr.qld.gov.au  
W: www.tmr.qld.gov.au

Discipline: Area: Location:

Originator's Reference No.:

Attachments  
Cornerstone Drainage.pdf (25 MB)



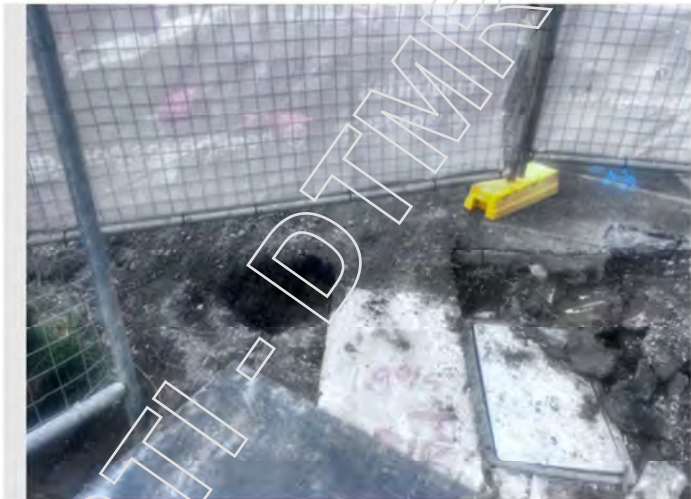
**Description**  
storm line out of pit in car yard

**Taken Date**  
23/11/2023 at 02:45 pm

**Uploaded By**  
NR

**Upload Date**  
23/11/2023 at 02:49 pm

**File Name**  
2AD76163-3767-4B3E-B68E-356...



**Description**  
Severed storm line to right of concrete apron at NBN pit

**Taken Date**  
23/11/2023 at 02:45 pm

**Uploaded By**  
NR

**Upload Date**  
23/11/2023 at 02:51 pm

**File Name**  
CB3EF55C-37C2-43A0-8104-8A2...



**Description**  
storm line cut to allow NBN conduits through

**Taken Date**  
23/11/2023 at 02:45 pm

**Uploaded By**  
NR

**Upload Date**  
23/11/2023 at 02:49 pm

**File Name**  
E1A084C6-4321-4E9D-9A53-BCA...



**Description**  
End of storm line severed under old footpath

**Taken Date**  
23/11/2023 at 02:45 pm

**Uploaded By**  
NR

**Upload Date**  
23/11/2023 at 02:53 pm

**File Name**  
6D0A429A-5AB2-47F0-8B30-325...

