

Summary File ONLY

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**IT IS BROWSABLE ON-SCREEN ONLY AND IS PROVIDED
FOR YOUR INFORMATION TO DECIDE WHETHER TO
BECOME A PROSPECTIVE TENDERER ONLY**

Note: This file may contain a brief scope statement, or an extract from the RFT documents, or a full exhibited copy – depending on the specific circumstances.

To participate in this tender process you **MUST** first download or order a full copy of the Request for Tender (RFT) documents, including the responsible components, and any addenda issued to date.

To do this return to the RFT web page on this web site and copy the RFT documents to your own computer or network – the blue “**DOWNLOAD A SOFT COPY**” link at the bottom provides access to the page from which you can do this.



NSW Department of
Commerce

Tender Document

Drainage & Road Upgrading Works at Mehi Crescent & Stanley village located at Moree

Contract No: 0900814

Specification & Drawings

April 2009

Consultant Details

NSW Department of Commerce
Dams & Civil Section
Floor 13, McKell Building
2-24 Rawson Place
Sydney, NSW 2000

Tel: 02-93727803
Fax: 02-93727822

Tender Document
for
MOREE ACDP MAIN WORKS
Drainage & Road Upgrading Works at Mehi Crescent
and Stanley Village located at Moree
Contract No: 0900814
April / 2009
NSW Department of Commerce

TABLE OF CONTENTS

Page Number.

Tendering

CONDITIONS OF TENDERING	C-1 to C-9
TENDER SCHEDULES	T-1 to T-19

Specification

1. GENERAL CONDITIONS OF CONTRACT AND ANNEXURE	1-1 to 1-22
2. PRELIMINARIES	2-1 to 2-33
3. GENERAL REQUIREMENTS	
4. DIVERSION, DEWATERING & FLOOD PROTECTION	
5. ENVIRONMENTAL MANAGEMENT	
6. EARTHWORKS	
7. PIPE CULVERTS (RC & FRC PIPES)	
8. ROADWORKS & DRAINAGE	
9. CONCRETE AND CONCRETE WORKS	
10. GEOTEXTILES	
11. GENERAL LANDSCAPE WORKS	

SCHEDULES

- S1 Tender Form;
- S2 Schedule of Prices – Lump Sum;
- S3 Schedule of Rates;
- S4 Schedule of Imported Materials and Equipment;
- S5 Schedule of Alternatives to Imported Goods;
- S6 Schedule of NSW Country Manufactured Goods;
- S7 Schedule of Technical Data;
- S8 Schedule of Quality Management Information;
- S9 Schedule of Occupational Health and Safety Management Information;
- S10 Schedule of Environmental Management Information;
- S11 Schedule of Financial Assessment Information;
- S12 Schedule of Industrial Relations “Aboriginal Participation”

DRAWINGS

Drawing No	Title
0900814-01	Mehi Crescent General Arrangement
0900814-02	Mehi Crescent Proposed Plan
0900814-03	Mehi Crescent North & South Longitudinal Section
0900814-04	Mehi Crescent Details

0900814-05	Mehi Crescent Standard Connection of Drainage Lines to Pipes Details
0900814-06	Mehi Crescent Erosion and Sediment Control Plan
0900814-07	Mehi Crescent Erosion and Sediment Control Details
0900814-08	Mehi Crescent Pavement Repairing Works General Plan
0900814-09	Mehi Crescent Stormwater Outlet General Arrangement
0900814-10	Mehi Crescent Stormwater Outlet Longitudinal Section
0900814-11	Mehi Crescent Stormwater Outlet Reinforcement Details
0900814-12	Mehi Crescent Stormwater Outlet Erosion and Sediment Control Plan
0900814-13	Stanley Village General Arrangement
0900814-14	Stanley Village Proposed Plan
0900814-15	Stanley Village Longitudinal Section (1 of 2)
0900814-16	Stanley Village Longitudinal Section (2 of 2)
0900814-17	Stanley Village Details
0900814-18	Stanley Village Standard Connection of Drainage Lines to Pipes and Kerbs Details
0900814-19	Stanley Village Erosion and Sediment Control Plan
0900814-20	Stanley Village Erosion and Sediment Control Details
0900814-21	Stanley Village Pavement Repairing Works General Plan

TENDERING

NOTE

Replace this page with a blank sheet (to enable double sided photocopying).

CONDITIONS OF TENDERING

[THERE ARE 9 PAGES IN THIS SECTION](#)

This section includes notices to tenderers.

The Conditions of Tendering section does not form part of the Contract.

1 GENERAL

1.1 CONTACT PERSON

Refer requests for information about the Tender to:

Name: Daniel Rose

Telephone number: 0419 695 284

Facsimile number:

E-mail address: danielrose5@bigpond.com

1.2 NSW GOVERNMENT CODE OF PRACTICE FOR PROCUREMENT

Tenderers must comply with the NSW Government *Code of Practice for Procurement*, which is available at:

www.treasury.nsw.gov.au/procurement/cpfp_ig

Lodgement of a tender is evidence of the Tenderer's agreement to comply with the Code for the duration of any contract awarded as a result of the tender process. If a tenderer fails to comply with the Code, the Principal may take the failure into account when considering this or any subsequent tender from the tenderer, and may pass over such the tender.

2 TENDERER ELIGIBILITY

2.1 ACCEPTABLE LEGAL ENTITIES

The Principal contracts only with recognised and acceptable legal entities. The Principal does not contract with firms under any form of external administration. Any tender submitted by an unincorporated business such as a sole trader, partnership, or business name must identify the legal entity that proposes to enter the contract.

If the Tenderer is a trustee, the Principal may require:

- an unconditional undertaking in accordance with Preliminaries Clause - **Additional security and obligations for trustees**; and
- a signed statement from the Tenderer, provided before the Contract is awarded, making the following undertaking:

'If (insert the legal name of the Tenderer) is awarded Contract No (insert the contract number) for (insert the contract description) it will provide security in the amount of (insert the amount of security advised by the Principal) in accordance with Preliminaries clause - **Additional security and obligations for trustees**, and it undertakes to ensure that, for the duration of the Contract, the total value of the trust beneficiaries' loans to the trustee is always greater than the total value of trust beneficiaries' loans from the trustee.'

Failure to provide the signed statement may result in the Tender being passed over.

2.2 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT

Tenderers must demonstrate their capacity to manage occupational health and safety in accordance with the NSW Government *Occupational Health and Safety Management Systems Guidelines 4th Edition (OHSM Guidelines)*. The *OHSM Guidelines* are available at:

www.managingprocurement.commerce.nsw.gov.au/system/index_procurement_guideline_documents.doc

Submit with the Tender the information identified in Tender Schedules - **Schedule of Occupational Health and Safety Management Information**.

A tender will not be accepted from a tenderer that does not have a Corporate OHS Management System complying with the *OHSM Guidelines* and accredited by a NSW Government Construction Agency.

If the Tenderer does not have an accredited Corporate OHS Management System, submit with the Tender an undertaking that the Tenderer's Corporate OHS Management System will be revised to comply with the *OHSM Guidelines* and submitted to the Department of Commerce for accreditation within two (2) weeks after the close of tenders.

2.3 ENVIRONMENTAL MANAGEMENT

Tenderers must demonstrate their capacity to manage environmental matters in accordance with the NSW Government *Environmental Management Systems Guidelines (EMS Guidelines)* available at:

www.managingprocurement.commerce.nsw.gov.au/system/index_procurement_guideline_documents.doc

Submit the information identified in Tender Schedules - **Schedule of Environmental Management Information**.

A tender will not be accepted from a tenderer that does not have a Corporate Environmental Management System accredited by a NSW government construction agency.

If the Tenderer does not have an accredited corporate Environmental Management System, submit with the Tender an undertaking that the Tenderer's corporate Environmental Management System will be revised to comply with the *EMS Guidelines* and submitted to the Department of Commerce for accreditation within two (2) calendar weeks after the close of tenders.

2.4 FINANCIAL ASSESSMENT CRITERIA

The main criteria considered in financial assessment of tenderers are:

- Net Worth (total assets, excluding any assets of company directors, less total liabilities less intangible assets);
- Current Ratio (ratio of current assets to current liabilities); and
- Working Capital (current assets less current liabilities).

The Principal considers tenders with the following financial capacity, and no other significant detrimental financial characteristics to be financially satisfactory in respect of tenders:

- Net Worth exceeds 5% of the Contract Sum or initial Contract Price;
- Current Ratio exceeds 1; and
- Working Capital exceeds 10% of the Contract Sum or initial Contract Price.

- Where a tenderer is a trustee the total value of trust beneficiaries' loans to the trustee must be greater than the total value of trust beneficiaries' loans from the trustee.

Deviations below these indicative criteria will not necessarily prevent the Principal from considering any tender.

3 CONTRACT DETAILS

3.1 INSURANCE

Works and public liability insurance

The Contractor will arrange insurance of the Works (and any temporary works) and public liability, as required under General Conditions of Contract clause **Insurance**. Tenderers are not required to allow in tenders for payment of premiums for insurance of the Works or public liability.

The insurance broker is Jardine Lloyd Thompson PTY LTD.

The Contractor must arrange and pay premiums for the following defined amounts, for the purpose of this tender only:

Item	Amount
Works Cover (Material Damage – Property Insured)	\$30 million in respect of any one Occurrence
Public Liability Cover	\$20 million any one Occurrence, unlimited during the Period of Insurance
Rate of Premium	Contract Value (excluding GST) up to \$10m: 0.2057% Contract Value (excluding GST) \$10m or over: 0.1916%
Allowance for Principal Supplied Materials and Salvageable Materials	NIL

Other Insurance

The Contractor must arrange and pay all premiums for all other insurance required under General Conditions of Contract clause – **Insurance**.

For professional indemnity insurance, a Certificate of Currency or evidence of the ability to obtain the required insurance, such as a letter from a broker or insurer, may be required as a condition of acceptance of tender.

4 CURRENT POLICIES

4.1 GOODS AND SERVICES TAX

The tendered lump sum and/or rates must include GST if it is payable.

4.2 NSW GOVERNMENT PREFERENCE SCHEME

Preference

The Principal will give a preference advantage to goods of Australian and New Zealand origin over imported goods supplied under the Contract. NSW country manufacturers may be eligible

for an additional preference under the Country Industries Preference Scheme (CIPS). Details of these schemes may be obtained from the Department of State and Regional Development, telephone (02) 9338-6780; facsimile (02) 9338-6676.

The Industry Capability Network Office has been established to provide assistance in planning for, purchasing and using Australian and New Zealand made products. The office can provide professional advice on local industry capability and on the availability and efficiency of local supplies suited to Australian conditions, while retaining commercial confidentiality. The Industry Capability Network Office may be contacted on: telephone (02) 9819 7200; facsimile (02) 9181 3321; e-mail enquiry@icnsw.org.au; internet www.icnsw.org.au.

Imported Goods

Where imported goods are proposed, complete the Tender Schedules - **Schedule of Imported Materials and Equipment**. Provide details of alternatives to such goods which are of Australian or New Zealand origin, or give reasons why such alternatives cannot be supplied by completing the Tender Schedules - **Schedule of Alternatives to Imported Goods**.

The Principal may, but is not bound to, negotiate a reduction in price to accept the imported goods, but the reduction will be not less than 20% of the Principal's estimate of the imported value of the goods.

Refer to Preliminaries clause - **Australian and New Zealand Goods**.

NSW Country Manufactured Goods

If the tenderer wishes to seek preference under the NSW Country Industries Preference Scheme, submit Tender Schedules – **Schedule of NSW country manufactured goods** with the tender.

4.3 DISCLOSURE OF TENDER AND CONTRACT INFORMATION

Details of this tender and contract awarded as a result of this tender process must be disclosed in accordance with the *Freedom of Information Act 1989* (NSW), Premier's Memorandum 2007-01 and the NSW Government Tendering Guidelines which are available at:

www.managingprocurement.commerce.nsw.gov.au/system/index_procurement_guideline_documents.doc

4.4 EXCHANGE OF INFORMATION BETWEEN GOVERNMENT AGENCIES

By submitting a tender, the Tenderer authorises the Principal to gather, monitor, assess, and communicate to other NSW Government agencies or local government authorities information about the Tenderer's financial position and its performance in respect of any contract awarded as a result of the tender process. Such information may be used by those agencies or authorities in considering whether to offer the Tenderer future opportunities for work.

4.5 FINANCIAL ASSESSMENT

By tendering for this Contract, the Tenderer agrees that the Principal may engage private sector consultants to financially assess tenderers. Financial details of tenderers may be obtained by an external Financial Assessor for assessment. Financial Assessors have a contract with the Principal to safeguard the financial details obtained. Financial Assessors must not disclose such details, either in whole or in part to any party other than NSW Government departments or agencies without the express written permission of the tenderer.

The Financial Assessor is Kingsway Financial Assessments PTY LTD.

Submit, when requested by the Financial Assessor or Principal, the Financial Assessment information shown in Tender Schedules - **Schedule of Financial Assessment Information**.

4.6 UNCONDITIONAL UNDERTAKINGS - APPROVED INSTITUTIONS

For the purpose of giving unconditional undertakings, the Principal has approved banks, building societies, credit unions and insurance companies listed by the Australian Prudential Regulation Authority (APRA) as being regulated by the APRA. Lists appear at the APRA website at:

www.apra.gov.au/

The Principal is prepared to consider proposals from tenderers for the approval of Unconditional Undertakings by substantial financial institutions, not registered by APRA, which lawfully carry on business in Australia. The Principal may require the submission of evidence demonstrating the substance and status of any proposed financial institution without cost to the Principal.

5 FURTHER INFORMATION

5.1 ADDENDA TO TENDER DOCUMENTS

If, as a result of a request for clarification from a tenderer or for any other reason, the Principal issues an instruction amending the tender documents, the instruction will be issued in writing to all tenderers in the form of an Addendum, which becomes part of the tender documents. Written Addenda issued by the Principal are the only recognised explanations of, or amendments to, the tender documents.

5.2 SITE ACCESS RESTRICTIONS

Tenderers and their agents or representatives must:

- obtain permission to inspect the Site from the Contact Person at least 48 hours before access to the Site is required;
- upon arrival, at the pre-arranged time, introduce themselves to the Contact Person prior to undertaking their inspection of the Site.

The Contact Person's details are:

Name:	Daniel Rose
Telephone number:	0419 695 284
Facsimile Number:	
e-mail address:	danielrose5@bigpond.com

The Contact Person may be contacted:

on the following days:	Mondays to Fridays
between the hours of:	9:00 am to 5:00 pm

5.3 PRE-TENDER MEETING

A pre-tender meeting will be held on the date, at the time and at the place nominated in the advertisement or invitation.

The Contact Person will be available at that time to answer any tenderer's queries regarding the tender.

Attendance by tenderers at the pre-tender meeting is mandatory. Tenders submitted by tenderer who fail to attend will be passed over.

6 PREPARATION OF TENDERS

6.1 ALTERNATIVE TENDERS

The Principal may consider alternative tenders, provided the alternative tender meets the scope, functional intent and design concept expressed in the tender document. Where an alternative tender is proposed, submit a detailed description of the alternative stating clearly the manner in which it differs from the detailed requirements of the tender documents and including separate tender schedules applicable to the alternative.

Alternative tenders will not be considered unless the Tenderer has submitted a conforming tender.

6.2 TECHNICAL DATA

Submit, when requested, the details shown in Tender Schedules - **Schedule of Technical Data**.

7 SUBMISSION OF TENDERS

7.1 DOCUMENTS TO BE SUBMITTED

The following documents must be completed and submitted by the Tenderer:

- Tender Form;
- Lump Sum Items and Schedules of Rates;
- Undertaking to comply with Code of Practice for Procurement.

Where applicable, refer to each Addendum and state that the Tender allows for the instructions given in the Addendum.

7.2 SUBMISSION PROCEDURE

Submit the Tender Form, Tender Schedules marked 'Submit with the Tender Form' and other required documents or information by the date and time given in the advertisement or invitation, by any of the following methods:

- eTendering,
- Tender Box,
- Facsimile.

If more than one tender submission is made, mark each submission clearly as to whether it is a copy, an alternative tender, or whether the submission supersedes another submission.

Submit when requested, by the date, time and method stipulated in the request, Tender Schedules marked 'Submit when requested' and any other information required to allow further consideration of the Tender. Failure to meet this requirement may result in the Tender being passed over.

7.3 ETENDERING

Tenderers are encouraged to obtain Requests for Tenders (RFT) and submit tenders through NSW Government online eTendering at:

<https://tenders.nsw.gov.au>.

Legal status

Tenders submitted electronically will be treated in accordance with the *Electronic Transactions Act 2000* (NSW), and given no lesser level of confidentiality, probity and attention than tenders submitted by other means.

Tenderers, by electronically submitting a tender, are taken to have accepted any conditions shown on the NSW Government eTendering web site.

The Principal may decline to consider for acceptance, tenders that cannot be effectively evaluated because they are incomplete or corrupt.

Electronic Format for Submissions

Tenders submitted electronically must be in a file format that can be read, formatted, displayed and printed by Microsoft Word 97, or any format required by the RFT.

Any CAD files submitted with an electronically lodged tender must be in DGN, DWG, or DXF format. The Principal uses Microstation and Tenderers must ensure that any CAD files submitted that will correctly display and print in Microstation.

File Compression

Tenderers may compress electronic tenders in any format that can be decompressed by WinZip. Tenderers must not submit self-extracting (*.exe) zip files.

Change of Tender Form Text

Tenderers must not change existing text in electronic tender forms other than to insert required information.

7.4 TENDER BOX

The Tender may be submitted in the Tender Box at:

Level 3, M^cKell Building,

2 – 24 Rawson Place,

Sydney NSW 2000

Fax: (02) 9372-8974

Submit the Tender in a sealed envelope addressed to the Secretary of the Tender Opening Committee and marked with 'Tender for Maintenance of Marine Structures at South Steyne Mooring' and the closing date and time.

7.5 FACSIMILE

The Tender may be submitted to the following facsimile number:

M^cKell Building Fax: (02) 9372-8974

Address the Tender to the Secretary of the Tender Opening Committee and mark the first page of the facsimile with '**Tender for Drainage & Road upgrading Works at Mehi & Stanley Aboriginal Villages located at Moree**' and the closing date and time.

Tenders sent by facsimile and not completely received by the close of tenders may be excluded from consideration for acceptance even if transmission or receipt is delayed due to the receiving facsimile machine being engaged, faulty or otherwise inoperative.

7.6 ALTERNATIVE TENDER BOX AND FACSIMILE NUMBER

There are no other alternative Tender Boxes nor facsimile numbers other from the above.

7.7 LATE TENDERS

In accordance with the NSW Government *Code of Practice for Procurement*, available at:

www.treasury.nsw.gov.au/procurement/cpfp_ig

late tenders will not be accepted, except where the integrity and competitiveness of the tendering process will not be compromised.

8 PROCEDURES AFTER CLOSING OF TENDERS

8.1 EVALUATION OF TENDERS

In evaluating tenders, the Principal may take into consideration factors including, but not limited to: whole of life costs; ability to meet requirements of the NSW Government *Code of Practice for Procurement*; innovation; delivery time; quality offered; previous performance; experience; capability; occupational health and safety performance; industrial relations performance; environmental management performance; community relations; value adding including economic, social and environmental initiatives; and conformity.

Tenders will be assessed using a weighted scoring process based on information provided with the Tender. The ratio of price to non-price criteria will be 60:40. The evaluation factors of Tenders may include, but are not limited to the following Mandatory Criteria:

- Tenderer's experience;
- Proposed construction methodology;
- Personnel proposed (project team, subcontractors, suppliers, etc);
- Understanding of Environmental Management requirements.

The Principal may treat any detail required by the tender documents which is omitted, illegible or unintelligible as failing to fulfil the relevant requirement.

8.2 ACCEPTANCE OF TENDER

The Principal may accept tenders that do not conform strictly with all requirements of the tender documents.

The Principal is not bound to accept the lowest or any tender. Tenders which do not comply with any requirement of, or which contain conditions or qualifications not required or allowed by, the tender document may be passed over.

No tender, or qualification or departure from a contract condition or specification, is accepted unless the Principal gives an acceptance or formal agreement in writing.

8.3 PROTECTION OF PRIVACY

The Tenderer warrants, in respect of any personal information provided in this Tender or any contract arising from this Tender, that the information is accurate, up to date and complete, and that nominated individuals authorise its collection and are aware:

- that the information is being collected for the purpose of evaluating tenders and administering any contracts arising from those tenders and may be made available to other NSW government agencies or local government authorities for those purposes;

- whether the supply of the information by the individual is required by law or is voluntary, and any consequences for the individual if the information (or any part of it) is not provided; and
- of the existence of any right of access to, and correction of, the information.

END OF SECTION – CONDITIONS OF TENDERING

TENDER SCHEDULES

THERE ARE 19 PAGES IN THIS SECTION

TENDER SCHEDULES

1 TENDER FORM

Location and Fax No. of
Tender Closing Office: »

Name of Tenderer
(in block letters):

A.B.N.
(if applicable):

Address:

Telephone number:

Facsimile number:

e-mail address:

hereby tender(s) to perform the work for

**Tender for Drainage & Road Upgrading Works at Mehi Crescent
& Stanley Village located at Moree**

(Contract No. 0900814)

in accordance with the following documents:

TENDER DOCUMENT SPECIFICATION & DRAWINGS

»

and Addenda Numbers:

At the (GST inclusive) rates and lump sums in the attached Schedule
of Rates and Lump Sum Items.

2 SCHEDULE OF PRICES - LUMP SUM

(SUBMIT WITH TENDER FORM)

Insert the amount allowed for each of the following items.

The Tenderer is to supply a Price Schedule of Lump Sum for elements of the construction works set out below. This Schedule forms part of the Contract. Its purpose is to assist in making valuations of works carried out or variations to the proposed works but its use is at the sole discretion of the Principal.

All amounts must include an amount for GST.

SCHEDULE OF TENDER PRICE – LUMP SUM

DRAINAGE & ROAD UPGRADING WORKS AT MEHI CRESCENT & STANLEY VILLAGE LOCATED AT MOREE

(SUBMIT WITH TENDER FORM)

**TENDERERS ARE TO SUBMIT THIS BREAKDOWN FORM OF TENDER PRICES WITH
THE TENDER FORM**

1.

Item No.	Description	Amount
1.	All work and obligations under the Contract NOT INCLUDED ELSEWHERE in this schedule	\$.....
2	Mehi Crescent - Road and Stormwater Works	\$.....
3	Mehi Crescent – Outlet improvement works	\$.....
4	Stanley Village - Road and Stormwater Works	\$.....
Lump Sum Total Price		\$.....

3 SCHEDULE OF RATES

(SUBMIT WITH TENDER FORM)

Refer to Preliminaries clause - **Application of Schedule of Rates.**

The Tenderer is to supply a Price Schedule of Rates for elements of the construction works set out below. This Schedule forms part of the Contract. Its purpose is to assist in making valuations of works carried out to the proposed works but its use is at the sole discretion of the Principal.

All rates must include GST.

Item No.	Description	Quantity	Unit	Rate	Amount
1	All work and obligations under the Contract NOT INCLUDED ELSEWHERE in this schedule	1	Item	\$	\$
2	Mehi Crescent - Road and Stormwater Works				
2.1	Site establishment and disestablishment	1	Item	\$	\$
2.2	Erosion & Sedimentation Control Measures during Construction & Maintenance	1	Item	\$	\$
2.3	Occupational Health & Safety (OH&S) procedures	1	Item	\$	\$
2.4	Diversion of flows , dewatering, and flood protection during construction	1	Item	\$	\$
2.5	Clearing	1	Item	\$	\$
2.6	Topsoil removal & stockpiling for later use	1840	m ²	\$	\$
2.7	Earthworks (excavation)	1380	m ³	\$	\$
2.8	Trimming, levelling & compacting	1840	m ²	\$	\$
2.9	Earthworks (back filling and compaction)	56	m ³	\$	\$
2.10	Disposal of Excess Material	140	m ³	\$	\$
2.11	Provide 20mm nominal sized gravel for sub-surface drains	83	m ³	\$	\$
2.12	Provide Bidim A34 Geotextile or equivalent	450	m ²	\$	\$
2.13	Concrete	0	m ³	\$	\$
2.14	Provide 100mm Ag pipe	920	m	\$	\$
2.15	Provide Stormwater On-grade pits, lids & grating	17	Item	\$	\$
2.16	Provide Stormwater sag pits, lids & grating	12	Item	\$	\$

TENDER SCHEDULES

Item No.	Description	Quantity	Unit	Rate	Amount
2.17	Provide 300 mm Dia Stormwater pipes and joints	65	m	\$	\$
2.18	Provide 375 mm Dia Stormwater pipes and joints	470	m	\$	\$
2.19	Provide 450 mm Dia Stormwater pipes and joints	380	m	\$	\$
2.20	Provide 525 mm Dia Stormwater pipes and joints	15	m	\$	\$
2.21	Provide headwall for driveways	21	Pair	\$	\$
2.22	Provide fill for driveways	105	m ³	\$	\$
2.23	Provide crusher run for driveways	63	m ³	\$	\$
2.24	Patch potholes	1	Item	\$	\$
2.25	Patch road edges	1	Item	\$	\$
2.26	Landscaping and regressing (incl V-Drains)	1840	m ²	\$	\$
Sub-total Section 2					\$
3	Mehi Stormwater Outlet Improvement Works				
3.1	Site establishment and disestablishment	1	Item	\$	\$
3.2	Erosion & Sedimentation Control Measures during Construction & Maintenance	1	Item	\$	\$
3.3	Occupational Health & Safety (OH&S) procedures	1	Item	\$	\$
3.4	Diversion of flows , dewatering, and flood protection during construction	1	Item	\$	\$
3.5	Clearing	1	Item	\$	\$
3.6	Topsoil removal & stockpiling for later use	37	m ²	\$	\$
3.7	Trim & grade surface	65	m ²	\$	\$
3.8	Earthworks (sand filling and compaction)	10	m ³	\$	\$
3.9	Disposal of Excess Material	5	m ³	\$	\$
3.10	Bidim A34	65	m ²	\$	\$
3.11	Concrete	55	m ³	\$	\$
3.12	Provide anchors and Reinforcement	14	Item	\$	\$
3.13	Provide 300mm sized rip-rap	3	m ³	\$	\$

TENDER SCHEDULES

Item No.	Description	Quantity	Unit	Rate	Amount
3.14	Provide and repair energy dissipator blocks	1	Item	\$	\$
3.15	General landscaping and regrassing	40	m ²	\$	\$
	Sub-total Section 3				\$
4	Stanley Village - Road and Stormwater Works				
4.1	Site establishment and disestablishment	1	Item	\$	\$
4.2	Erosion & Sedimentation Control Measures during Construction & Maintenance	1	Item	\$	\$
4.3	Occupational Health & Safety (OH&S) procedures	1	Item	\$	\$
4.4	Diversion of flows , dewatering, and flood protection during construction	1	Item	\$	\$
4.5	Clearing	1	Item	\$	\$
4.6	Topsoil removal & stockpiling for later use	1000	m ²	\$	\$
4.7	Earthworks (excavation)	1380	m ³	\$	\$
4.8	Trimming, levelling and compaction	1000	m ²	\$	\$
4.9	Earthworks (back filling and compaction)	56	m ³	\$	\$
4.10	Disposal of Excess Material	140	m ³	\$	\$
4.11	Provide 20mm nominal sized grave for sub-surface drainages	88	m ³	\$	\$
4.12	Provide Bidim A34 Geotextile or equivalent	200	m ²	\$	\$
4.13	Concrete	0	m ³	\$	\$
4.14	Provide 100mm Ag pipe	160	m	\$	\$
4.15	Provide Stormwater on grade pits, lids & grating	24	Item	\$	\$
4.16	Provide Stormwater sag pits , lids & grating	3	Item	\$	\$
4.17	Provide 375 mm Dia Stormwater pipes and joints	275	m	\$	\$
4.18	Provide 450 mm Dia Stormwater pipes and joints	20	m	\$	\$
4.19	Provide 525 mm Dia Stormwater pipes and joints	180	m	\$	\$

TENDER SCHEDULES

Item No.	Description	Quantity	Unit	Rate	Amount
4.20	Provide 600 mm Dia Stormwater pipes and joints	12	m	\$	\$
4.21	Patch potholes	1	Item	\$	\$
4.22	Reconstruct road pavement	2000	m ²	\$	\$
4.23	Realign road kerbs	1	Item	\$	\$
4.24	Landscaping and re-grassing (incl. open table drain)	1000	m ²	\$	\$
Sub-total Section 4					\$
TOTAL					\$

4 SCHEDULE OF IMPORTED MATERIALS AND EQUIPMENT

(SUBMIT WITH TENDER FORM)

Provide brief details of all imported materials and equipment to be supplied or incorporated into the Works, and country of manufacture or origin. Do not include goods manufactured in New Zealand.

The value of the imported content must be the estimated duty paid value inclusive of the value of any services (eg. overseas freight and insurance, software in computer tenders, consultancy or engineering fees) or any charges of overseas origin, together with customs clearing charges.

This is not a Schedule of Rates within the meaning of the Construction Contract Conditions. See also Preliminaries Clause - **Australian and New Zealand goods.**

Description	Country of Origin	Value A\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$

5 SCHEDULE OF ALTERNATIVES TO IMPORTED GOODS

(SUBMIT WITH TENDER FORM)

Provide brief details of materials and equipment of Australian and/or New Zealand manufacture as alternatives to imported materials and equipment as listed in the SCHEDULE OF IMPORTED MATERIALS AND EQUIPMENT, or give reasons why such alternatives cannot be provided.

The Principal may accept a tender specifying all or any of the items listed below, with an adjustment to the contract price based on the difference between the prices listed in this Schedule and the SCHEDULE OF IMPORTED MATERIALS AND EQUIPMENT.

Description of Australian and/or New Zealand manufactured Alternatives	Value A\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$

6 SCHEDULE OF NSW COUNTRY MANUFACTURED GOODS

(SUBMIT WITH TENDER FORM)

Complete the Schedule if you wish to seek preference under the NSW Country Industry Preference Scheme (CIPS.). The preference may be given only to a Tenderer who is a NSW manufacturer registered under the scheme.

State your CIPS. registration number. Give details of the materials and equipment to be supplied or incorporated into the Works, the place of manufacture, the percentage(s) applicable for preference purposes and the value added content at the Tenderer's works for the material or equipment manufactured by the Tenderer for incorporation in the Works.

This is not a Schedule of Rates within the meaning of the Construction Contract Conditions.

C.I.P.S. Registration No.:

Description	Place of Manufacture	% Applicable	Value Added Content \$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$

7 SCHEDULE OF TECHNICAL DATA

(SUBMIT WITH TENDER FORM)

List all information required by this Schedule, and attach details of manufactures product data together with illustrations as are necessary to fully describe the Tenderer's offer.

Item	Tenderer's offer
»Stormwater Drainage concrete pipes or fibre reinforced..... concrete & joints, ie300, 375, 450,525 & 600 mm diameter.	
»Pre-cast concrete or fibre reinforced concrete stormwater pits, lids and grating	
»Free draining Gravel
»Rip rap
»Geotextiles
» Tack coat
» Asphaltic Concrete AC14	

8 SCHEDULE OF QUALITY MANAGEMENT INFORMATION

(SUBMIT WITH TENDER FORM)

Submit one of the following, to demonstrate the capacity to plan and manage the quality of work:

- evidence of current full certification of the Tenderer's Quality Management System to AS/NZS ISO 9001:2000 by a certifying body registered with the Joint Accreditation System - Australia and New Zealand (JAS-ANZ); **or**
- evidence that the Tenderer's Quality Management System complies with the NSW Government *Quality Management Systems Guidelines (QMS Guidelines)*; **or**
- a minimum of three (3) completed examples of Inspection and Test Plans used on recent past projects and complying with the requirements of the *QMS Guidelines*.

9 SCHEDULE OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT INFORMATION

(SUBMIT WITH TENDER FORM)

Mandatory

A tender will not be accepted from a tenderer that does not have a Corporate OHS Management System complying with the *OHSM Guidelines* and accredited by a NSW Government Construction Agency.

Provide documents and information indicated below in accordance with Conditions of Tendering clause – **Occupational Health and Safety management.**

Evidence of satisfactory OHS management

Nominate at least three contracts/projects completed within the last two years that demonstrate successful management of occupational health and safety by the Tenderer:

Client	Name & location of contract <i>Eg. Sutherland Hospital Carpark; Dubbo Water Treatment Plant; Tamworth Coles shopping Centre; 3 Storey Unit Block, Penrith.</i>	Contract Price/ Project Value	Start Date	Completion Date

WHEN REQUESTED, submit the following additional information for each of three contracts/projects selected from the above list:

- a client referee report (which may be a NSW Government agency Contractor Performance Report) commenting on the Tenderer's performance in relation to occupational health and safety management, identifying the referee's name, position, organisation and telephone and email contact details; **or**
- a third party audit report or internal audit report; **or**
- a site safety inspection report; **or**
- a Safety Management Plan; **or**
- three Safe Work Method Statements; **or**
- minutes of three Toolbox meetings.

Recent OHS prosecutions and fines

Provide:

- a statement confirming that the Tenderer is not in default of any fine issued for a breach of the OHS legislation; **AND**
- details of every OHS prosecution and fine imposed on the Tenderer in Australia during the last two years, together with a description of actions taken by the Tenderer in response to each prosecution and fine; **or**
- a statement that the Tenderer incurred no prosecutions or fines during the last two years.

Hazardous substances

WHEN REQUESTED, submit details of proposed:

- i) methods for surveying for hazardous materials;
- ii) methods for handling and removal from the Site of hazardous materials; and
- iii) Consultants and Subcontractors and licence details.

Demolition

WHEN REQUESTED, for each item to be demolished, submit details of the proposed method of demolition including:

- i) plant and equipment to be used;
- ii) protection of the Site including, but not limited to, protection of any items specified; and
- iii) arrangements, including details and extent of protective hoardings, for the protection of the public and property adjoining the Site.

Occupational Health and Safety Management Monthly Report

The Tenderer undertakes, if awarded the Contract, to provide Monthly OHS Management Reports as described in Preliminaries clause – **Occupational Health and Safety Management**.

Independent certification of formwork

The Tenderer undertakes, if awarded the Contract, to provide evidence of independent certification of formwork as required by Preliminaries clause – **Occupational Health and Safety Management**.

10 SCHEDULE OF ENVIRONMENTAL MANAGEMENT INFORMATION

(SUBMIT WITH TENDER FORM)

Provide the documents and information specified below in accordance with Conditions of Tendering clause - **Environmental management**.

Accreditation of corporate Environmental Management System

Submit a copy of a letter from a NSW government construction agency evidencing that the Tenderer's corporate Environmental Management System has been accredited under the NSW Government *Environmental Management Systems Guidelines (EMS Guidelines)*.

Alternatively, submit a statement confirming that the Tenderer's corporate Environmental Management System will be revised to comply with the EMS Guidelines and submitted to the Department of Commerce for accreditation within 2 calendar weeks after the close of tenders.

Recent prosecutions and fines

Submit:

- a statement confirming that the Tenderer is not in default of any fine issued for a breach of environmental legislation; **and**
- details of every prosecution and fine incurred by the Tenderer during the last two years under the *Protection of the Environment Operations Act 1997 (POEO Act)* or other Australian environmental legislation, together with a description of the actions taken by the Tenderer in response to each prosecution and fine; **or**
- a statement that the Tenderer incurred no prosecutions or fines under environmental legislation during the last two years.

Evidence of satisfactory environmental management

Nominate at least three contracts/projects, for work of comparable nature to the Works and completed within the last two years, that demonstrate successful environmental management by the Tenderer:

Client	Name & location of contract <i>Eg. Concord Hospital Carpark; Dubbo Water Treatment Plant; Tamworth Coles shopping Centre; 3 Storey Unit Block, Penrith.</i>	Contract Price/ Project Value	Start Date	Completion Date

- **WHEN REQUESTED**, submit a copy of an Environmental Management Plan implemented by the Tenderer for a contract/project, similar in type and value to this Contract, that was completed within the last two years

Environmental management objectives and measures

- **WHEN REQUESTED**, submit details of:
- environmental management objectives proposed for the work under the Contract;
- key environmental management actions proposed for the work under the Contract; and

TENDER SCHEDULES

- the persons who will be responsible for managing the actions proposed.

11 SCHEDULE OF FINANCIAL ASSESSMENT INFORMATION

(SUBMIT WITH TENDER FORM)

Provide documents and information listed below in accordance with Clause Conditions of Tendering - **Financial assessment.**

1. Financial Statements for last three years for the entity under consideration, including:
 - i) Balance Sheets;
 - ii) Profit and Loss Statement;
 - iii) detailed Profit and Loss Statement;
 - iv) statement of Cash Flows;
 - v) notes to and Forming Part of the Accounts;
 - vi) an Accountant's Report; and
 - vii) where existing, Auditor's Reports.

Consolidated accounts of a parent organisation or group to which the entity belongs are not acceptable.
2. Where latest financial statement is more than 6 months old, the latest management report showing:
 - i) a trading statement;
 - ii) a profit and loss statement; and
 - iii) a trial balance.
3. Where the company is required to lodge audited financial statements with ASIC, copies of these statements for the last three years.
4. Where any financial statement supplied is not audited, copies of the entity's tax returns for last three years.
5. A letter from the Tenderer's banker providing details of overdraft and guarantee facilities including:
 - i) Bank, Branch, and Account Names,
 - ii) type and limit of bank overdraft facility,
 - iii) type and limit of bank guarantee facility,
 - iv) current bank overdraft balance,
 - v) number and amount of bank guarantees outstanding; and
 - vi) details of other bank funding facilities available to the Tenderer, such as term loans, lines of credit, commercial bills and other debt instruments.
6. Current and projected cash flows for all work on hand.
7. Forecast budget for forthcoming financial year including Revenue and Profit and Loss.
8. Names and contact numbers of:
 - i) major suppliers; and
 - ii) major subcontractors.
9. Details relating to the Tenderer's history and Directors Profiles.

12 SCHEDULE INDUSTRIAL RELATIONS “ABORIGINAL PARTICIPATION”

(SUBMIT WITH TENDER FORM)

The Tenderer, if awarded the Contract, will comply with the Aboriginal Employment Strategy on:

Strategy	Tenderer's Offer
Aboriginal Employment Arrangements	
Aboriginal Subcontractors	
Monthly Reports	

Also, the Tender will need to state that, the Tenderer will continue to comply with the above Strategy for the duration of the contract period.

END OF SECTION –TENDER SCHEDULES

SPECIFICATION

NOTE

Replace this page with a blank sheet (to enable double sided photocopying).

1 GENERAL CONDITIONS OF CONTRACT AND ANNEXURE

THERE ARE 22 PAGES IN THIS SECTION

GENERAL CONDITIONS OF CONTRACT - MINOR WORKS

1. DEFINITIONS

- 1.1 The Principal is as stated in the Annexure.
- 1.2 The Principal's Representative is as stated in the Annexure.
- 1.3 The Principal's Agent is as stated in the Annexure.
- 1.4 The Works means the whole of the work to be carried out and materials and services to be provided under the Contract.
- 1.5 The Contract Sum means:
- (a) where the Principal accepted a lump sum, the lump sum;
 - (b) where the Principal accepted rates, the amount calculated by firstly multiplying the rates by their respective quantities in the schedule of rates and then adding those products;
- but excluding any additions or deductions which are made under the Contract.
- 1.6 day means calendar day.
- 1.7 Site means the lands and other places made available to the Contractor by the Principal for the purpose of the Contract.
- 1.8 Text within the following format denotes a definition:



2. CONTRACT

2.1 The written agreement between the Principal and the Contractor for the performance of the Works, including all documents and parts of documents to which reference may properly be made to determine the rights and obligations of the parties (the Contract Documents) shall evidence the Contract.

2.2 The Contract Documents shall be taken as mutually explanatory and anything contained in one but not in another shall be treated as if contained in all.

2.3 If the Contractor finds any discrepancy, error or ambiguity in or between the Contract Documents, the Contractor is to inform the Principal's Representative before starting such work and follow the directions given by the Principal's Representative.

3. DESIGN AND CONSTRUCTION

3.1 The Contractor is to supply all materials and construct the Works in accordance with the Principal's design and any further development of the design allowed under the Contract. Minor items not included in the Principal's design which are needed for the satisfactory completion of the Works are to be provided by the Contractor.

3.2 If the Contractor is to undertake design as part of the Works, the Contractor is to develop the Principal's design and submit the completed design comprising drawings, specifications, calculations and any statutory certificates required to the Principal's Representative within the period stated in the Annexure.

3.5 The Principal is not bound to check the completed design for errors, omissions or compliance with the requirements of the Contract. The Principal is not liable to the Contractor for any claim whatsoever due to the Principal not detecting or notifying the Contractor of any errors, omissions or non-compliance with the requirements of the Contract in the completed design.

3.3 The Contractor is not to depart from the Principal's design, unless directed by the Principal's Representative.

3.4 The Contractor's completed design is to comply with the Contract and be fit for the intended purpose of the Works which can be reasonably inferred from the Contract Documents.

3.6 Responsibility for the completed design and its satisfaction of the Contract requirements remains solely with the Contractor and the Principal is relying on the Contractor's knowledge, skill and judgement to carry out this responsibility.

3.7 The Contractor is to grant to the Principal an irrevocable licence to use the Contractor's design for the Works. Such licence is also to include any subsequent repairs to, maintenance or servicing of (including the supply of replacement parts), or additions or alterations to, the Works.

4 CARE OF THE WORKS AND OTHER PROPERTY

4.1 From and including the date the Site is made available to the Contractor to the date of Completion of the Works, the Contractor is responsible for the care of the Works, constructional plant and things entrusted to the Contractor by the Principal for the purpose of the Works.

The Contractor is to make good at the Contractor's expense any damage which occurs to the Works while responsible for their care.

The Contractor is also liable for damage caused by the Contractor during the Defects Liability Period.

4.2 The Contractor is to indemnify and keep the Principal indemnified against any loss or damage to the property of the Principal (including existing property in, about or adjacent to the Works) and against any legal liability for injury, death or damage to property of others arising from the performance of the Works.

4.3 Nothing in Clause 4 relieves the Principal from liability for the Principal's own default and defaults of others for whom the Principal is liable.

5. INSURANCE

5.1 On acceptance of the tender, the Contractor is to hold or take out an insurance policy covering Workers Compensation in the State of NSW and shall also ensure that every subcontractor who is not taken to be a worker employed by the Contractor in accordance with the *Workplace Injury Management and Workers Compensation Act 1998 (NSW)* Schedule 1, must hold or take out insurance covering Workers Compensation.

If insurance of the Works and public liability is to be arranged by:

- the Principal, go to **5.2**
- the Contractor, go to **5.3**

5.2 If insurance of the Works and public liability is to be arranged by the Principal (see the Annexure) the Principal must effect insurance of the Works and public liability.

The Principal must make a copy of the policy for insurance of the Works and public liability available to the Contractor.

Go to **5.4**

5.3 If insurance of the Works and public liability is to be arranged by the Contractor (see the Annexure) then, before commencing work on the Site, the Contractor is to hold or take out policies of insurance covering the Contractor, Principal and subcontractors for:

- (a) public liability to an amount of not less than \$5,000,000 for any single occurrence; and
- (b) loss or damage to the Works, any temporary works and all materials, constructional plant and other things that are brought onto the Site by or on behalf of the Contractor or are entrusted to the Contractor by the Principal. The amount insured is not to be less than the Contract Sum.

The Principal is to be named as an insured in the policies.

The policies must include cross liability and waiver of subrogation clauses under which the insurer, in respect of liability, agrees that the term 'insured' applies to each of the persons covered as if a separate insurance policy had been issued to each of them and generally agrees to waive all rights of subrogation or action against any of the persons covered.

Go to **5.4**

5.4 If the Works includes work described in (a), (b) or (c) below, the Contractor is to take out the following additional insurance policies before starting such work:

- (a) The use of water-borne craft in excess of 8 metres in length: marine liability insurance;
- (b) Design of the Works undertaken by the Contractor: professional indemnity insurance;

The policy under (a) is to be in the name of the Contractor with the Principal as an additional name insured and is to cover the Contractor, the Principal, and all subcontractors employed from time to time in relation to the Works for their respective rights and interests and cover their liabilities to third parties. The policy is to be for an amount not less than \$5,000,000 for any one occurrence and shall include cross-liability and waiver of subrogation clauses under which the insurer, in respect of liability, agrees that the term 'insured' applies to each of the persons covered as if a separate insurance policy had been issued to each of them and generally agrees to waive all rights of subrogation or action against any of the persons covered.

The policy under (b) is to cover the Contractor for liability to the Principal for a minimum amount of \$500,000 or 20% of the Contract Sum, whichever is greater, to a maximum of \$5,000,000 for loss (whether economic loss only or other loss) in a single occurrence arising from errors or omissions in design of the Works carried out by the Contractor or any subcontractor.

Go to **5.5**

↓

5.5. The required policies are to be with insurers and in terms approved by the Principal's Representative. Approvals will not be unreasonably withheld.

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5.6 The Contractor is responsible for making and managing claims and meeting the costs of any deductibles.

↓

5.7 The Contractor is to maintain all required insurance policies until the end of the Defects Liability Period, or Completion if there is no Defects Liability Period.

↓

5.8 If, when required in writing by the Principal to do so, the Contractor fails to produce evidence of having paid insurance premiums and other compliance with insurance obligations under General Conditions of Contract Clause 5, to the satisfaction of the Principal, the Principal may effect or maintain the insurance and pay any premiums. The Contractor is to pay the Principal the amount of any premiums paid by the Principal plus an amount of \$250 to cover the Principal's costs.

6 SITE AND POSSESSION

6.1 The Principal is to give the Contractor possession of the Site by the time stated in the Annexure.



6.2 The Principal is to give the Contractor sufficient possession to allow the Contractor to perform the Works but is not required to give the Contractor sole or uninterrupted possession of or access to the Site.



6.3 The Contractor is to begin work on the Site as soon as practicable after being given possession of the Site by the Principal.



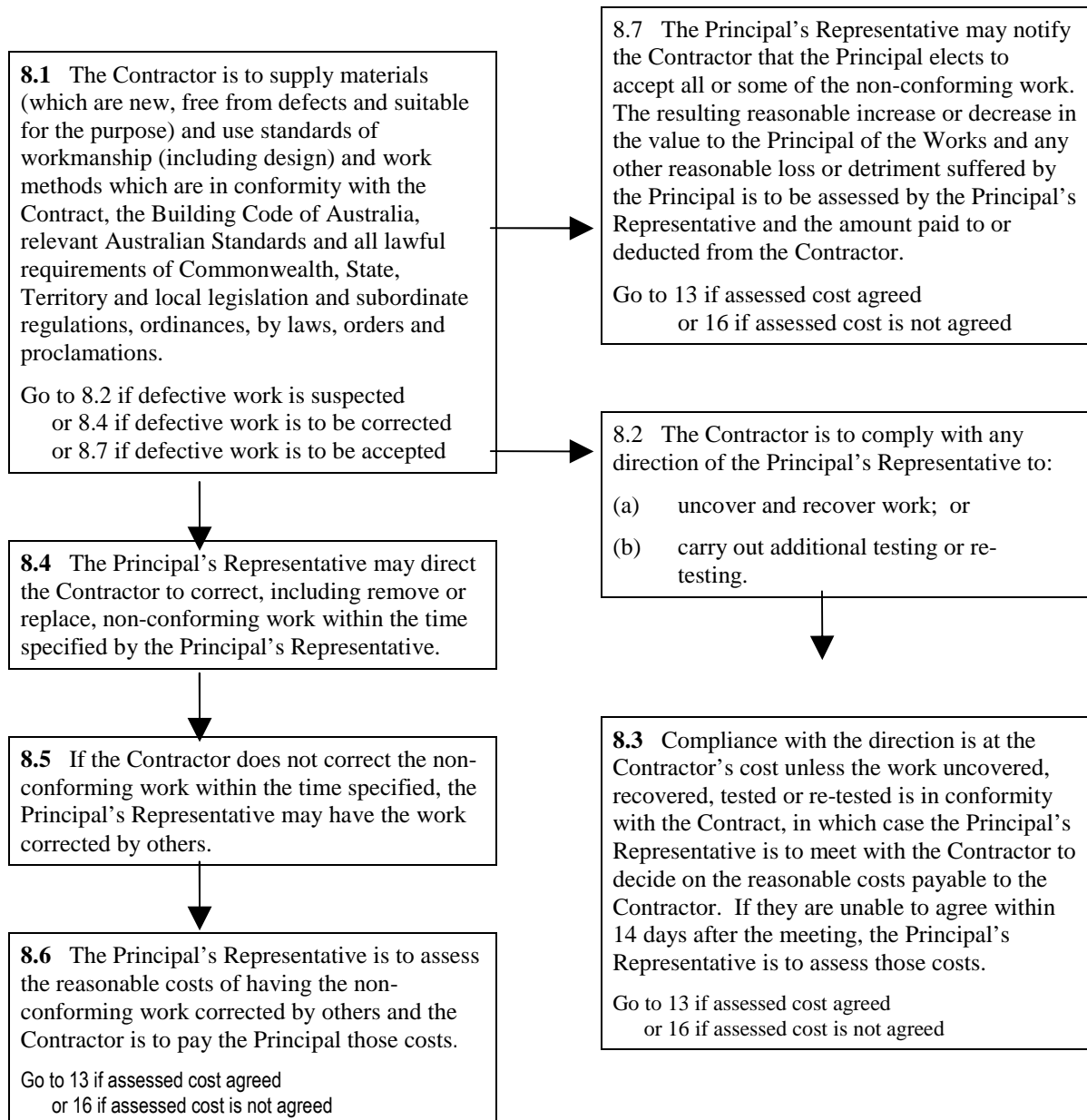
6.4 The Contractor is to give the Principal's Representative, agents and contractors reasonable access to the Site for any purpose.

7. SITE CONDITIONS

7.1 If the Contractor discovers that the conditions on, about or below the Site differ from what ought to have reasonably been anticipated at Tender time the Contractor is to inform the Principal's Representative immediately and, where possible, before the conditions are disturbed.



7.2 The Contractor is not entitled to any extra payment for the different Site conditions. If the different conditions are such that the Principal's Representative directs the Contractor to carry out a variation, the procedure in Clause 9 is then to be followed.

8. NON-CONFORMING WORK

9. VARIATIONS

9.1 The Principal's Representative may direct the Contractor to carry out a variation and the Contractor is to carry out the direction.

9.3 A variation is any change to the character, form, quality and extent of the Works directed in writing by the Principal's Representative. A variation shall not invalidate the Contract.

9.2 The Principal's Representative and Contractor are to meet to agree on the reasonable amount payable to or deducted from the Contractor for the variation. If they do not agree within 14 days after the meeting, the Principal's Representative is to assess that amount.

Go to 13 if assessed amount agreed
or 16 if assessed amount is not agreed

10. SUSPENSION

10.1 The Principal's Representative may direct the Contractor to suspend all or part of the Works and the Contractor is to carry out the direction.

10.2 If the direction to suspend the work is due to any act or omission of the Principal, the Principal's Representative and Contractor are to meet to agree on the reasonable extra costs payable to the Contractor which resulted from the suspension. If they do not agree within 14 days after the meeting, the Principal's Representative is to assess those extra costs.

Go to 13 if assessed cost agreed
or 16 if assessed cost is not agreed

10.3 The Contractor is to recommence the Works as soon as practicable after being directed to do so by the Principal's Representative.

11. COMPLETION OF THE WORKS

11.1 The Contractor is to Complete the Works within the period stated in the Annexure which starts on the date of being given possession of the Site.

11.2 The Contractor is to inform the Principal's Representative when, in the Contractor's opinion the Works have reached Completion.

11.4 The Works have reached Completion and are Complete when the Works are capable of use for their intended purpose, and should be free from any omissions or defects, and the Contractor has made good the Site and its surroundings.

11.3 The Principal's Representative is to:

- (a) determine if the Works have reached Completion, and if so, the date of Completion; and
- (b) give the Contractor written notice of the determination.

12. DELAY IN COMPLETION

12.1 If the Contractor is delayed in reaching Completion then the Contractor is to notify the Principal's Representative within 14 days after the commencement of the delay and to meet with the Principal's Representative to determine the cause of delay. Where such a delay is caused by:

- (a) a direction given by the Principal's Representative except under:
 - Clause 8; or
 - Clause 10 where the event giving rise to the direction was not beyond the control of the Contractor; or
- (b) a breach of the Contract by the Principal; or
- (c) any event beyond the control of the Contractor,

the period for Completion is to be extended.

12.2 If the Principal's Representative and the Contractor do not agree on an extension to the period for Completion within 14 days of the meeting to determine the cause of delay, the Principal's Representative is to assess a reasonable extension of time. The Principal's Representative may for any reason and at any time extend the period for Completion.

Go to 16 if assessed extension of time is not agreed.

12.3 If the Contractor does not Complete the Works by the last day of the period for Completion then the Contractor is to pay to the Principal liquidated damages from, but excluding that date, to and including the date the Works are Completed at the rate stated in the Annexure.

13. PAYMENT AND RETENTION

13.1 The Contractor is to give the Principal's Representative a written claim for payment when a Milestone stated in the Annexure is reached. The claim is to identify the Milestone, the amount claimed, how the amount is calculated, deductions to which the Principal is entitled and, when additions are claimed, the legal and factual basis of the claim. Additions are extra costs or other amounts to which the Contractor is entitled under or in connection with the subject matter of the Contract. When a Milestone is reached, the amount which the Contractor is entitled to claim and be paid is the sum of:

- for work for which the Principal accepted rates, an amount calculated by applying the rates to the quantities of work carried out to that date;
- for work for which the Principal accepted a lump sum, the percentage stated in the Annexure for the Milestone;
- for any additions for which the Principal has approved an amount in writing or for which an amount has been finally determined by an Expert under Clause 16, the amount approved or determined;

less payments previously made (including under Clause 16), costs payable by the Contractor to the Principal and deductions to which the Principal is entitled under or in connection with the subject matter of the Contract, including but not limited to retention moneys, liquidated damages and other damages whether liquidated or unliquidated.

Go to 13.2 for payments
and 13.8 on Completion

13.8 When the Works are Complete an amount of 2.5% of the Contract Sum is to be retained by the Principal against the due and proper performance of the Contract, except when there is no Defects Liability Period.

13.9 The Contractor may, instead of the retention, provide security in the amount of the retention in the form as detailed in Schedule - Unconditional Undertaking.

13.3 Within 10 business days after receipt of the Contractor's payment claim, the Principal is to provide to the Contractor a payment schedule identifying the progress claim to which it relates and stating the payment, if any, which the Principal will be making. If the payment is to be less than the amount claimed by the Contractor the payment schedule is to indicate why it is less.

For the purposes of this clause a business day is any day other than a Saturday, Sunday, public holiday or 27, 28, 29, 30 or 31 December.

13.2 With each claim for payment, and at any other time as requested by the Principal's Representative the Contractor is to give the Principal's Representative a completed statutory declaration, as detailed in Schedule - Statutory Declaration.

13.4 Any claim by the Contractor on the Principal is to be made within 28 days after the date of the Principal's Representative's written notice of Completion under Clause 11.3. All claims whatsoever by the Contractor against the Principal made after that time are barred.

However, if the Contract includes a Defects Liability Period, and the Contractor has a claim against the Principal under Clause 14.4 or because of an event which occurred during the Defects Liability Period, the Contractor may make that claim up to 28 days after the end of the Defects Liability Period. If the claim is made after that time it is barred.

13.5 Payment is to be made:

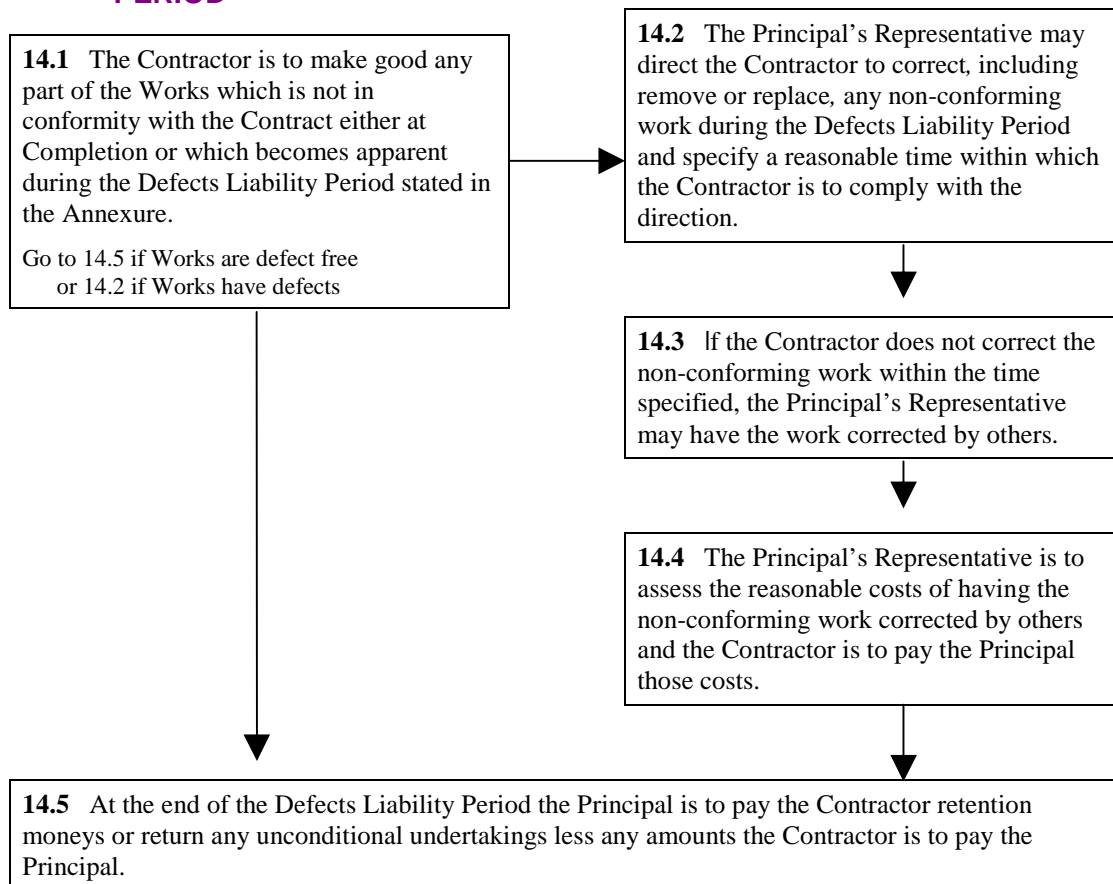
- within 20 business days after receipt of the Contractor's written payment claim; or
- within 5 business days after the statutory declaration is received; or
- by the specified time after any action required prior to payment has been carried out,

whichever is the latest. If the Contractor breaches Clause 13.2, the Principal is not obliged to make any payment to the Contractor while the breach continues.

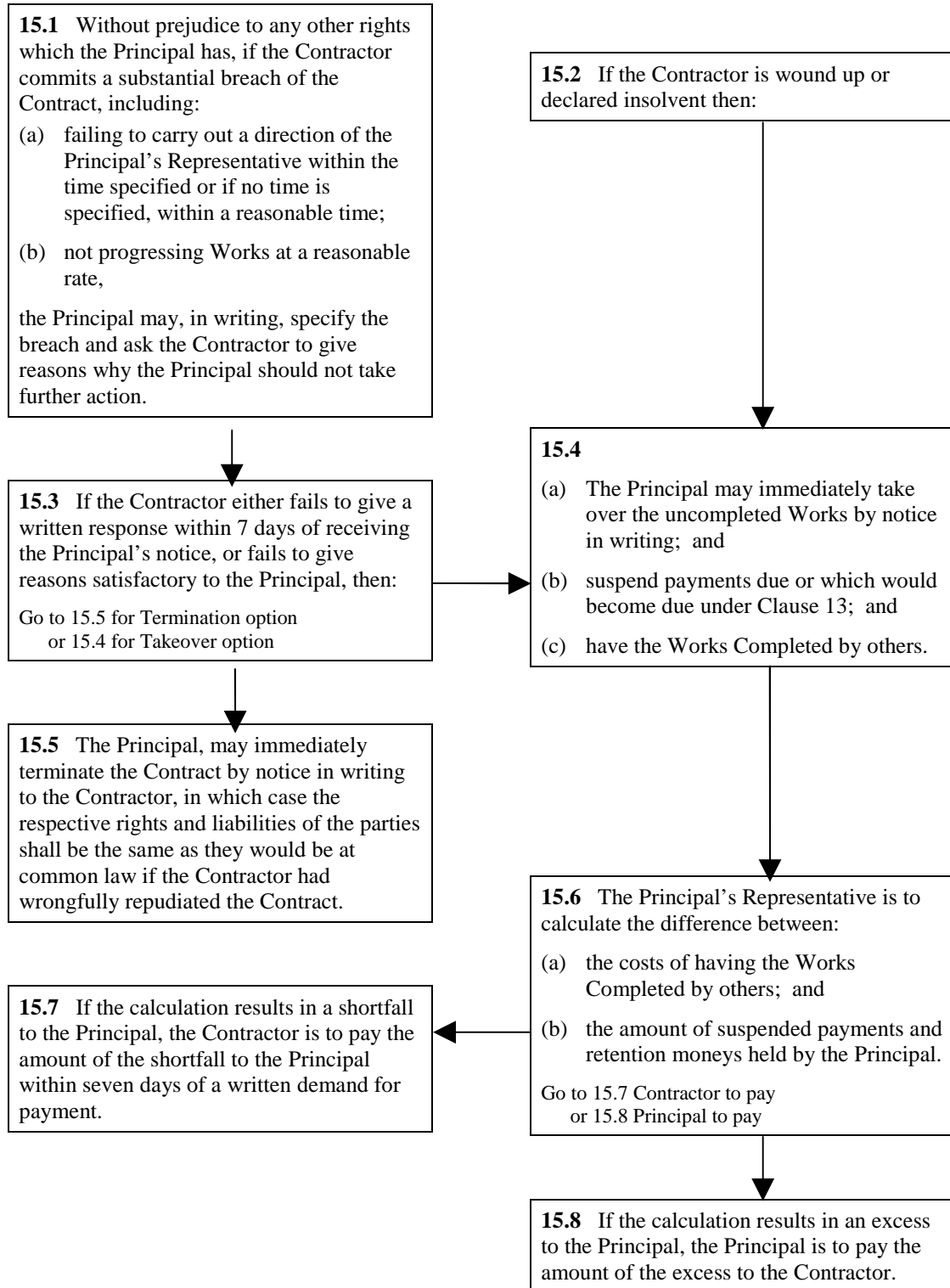
13.6 Unless stated otherwise, all payments by the Principal to the Contractor are to be made by Electronic Funds Transfer to a bank, building society or credit union account nominated by the Contractor. No payment is due to the Contractor until details of the nominated account (name of financial institution, account name and account number) are notified in writing to the Principal's Representative. The Contractor is to promptly notify the Principal's Representative in writing of any changes to the nominated account and the Principal is not responsible for any payments made into a previously nominated account before notification of such change is received by the Principal's Representative.

13.7 Payment is not evidence of the value of work or an admission of liability or that the work is satisfactory but is a payment on account only.

14. DEFECTS LIABILITY PERIOD



15. DEFAULT AND INSOLVENCY



16. DISPUTES

16.1 If either party is dissatisfied with an act or omission of the other party in connection with the Contract, including assessment of a claim, failure to agree, or an instruction, that party is to notify the Principal's Agent and the other party in writing of a dispute within 14 days of the act or omission. The notifying party is to provide particulars, including the factual and legal basis of any claimed entitlement.

If a party gives notice of a dispute but not within the time provided by this Clause 16.1, then it is not entitled to interest for the period before the party gave notice.

16.2 Within 7 days of the giving of the notice, the Contractor and Principal's Agent are to meet to attempt to resolve the dispute.

16.3 If the dispute is not resolved within 14 days after the notice providing particulars of the dispute, the parties are to appoint an independent Expert.

If the parties fail to agree upon an Expert, either may request the Chief Executive Officer of the Australian Commercial Disputes Centre Ltd Sydney to nominate an Expert. If there is no Chief Executive Officer or the Chief Executive Officer fails to make a nomination within a reasonable time, the Principal is to nominate an Expert.

16.4 The person nominating the Expert is not to nominate:

- an employee of the Principal or Contractor,
- a person who has been connected with the Contract, or
- a person upon whose appointment the Principal and the Contractor have previously failed to agree.

16.5 When the person to be the Expert has been agreed on or nominated, the Principal, on behalf of both parties is to appoint the expert in writing, with a copy to the Contractor, setting out:

- the dispute being referred to the Expert for a decision,
- the Expert's fees,
- the procedures detailed in this Clause 16, and
- any other matters which are relevant to the engagement.

16.6 The Principal and the Contractor are to share equally the Expert's fees and out-of-pocket expenses, including security deposit if required. Each party is to otherwise bear their own costs and share equally any other costs of the process.

16.7 Each party is to make written submissions to the Expert and provide a copy to the other party as follows:

- (a) Within 7 days after the appointment of the Expert, the notifying party is to submit details of the claimed act or omission.
- (b) Within 14 days after receiving a copy of that submission, the other party is to submit a written response. That response can include cross-claims.

16.8 The Expert is to decide whether the claimed event, act or omission did occur and, if so:

- when it occurred,
- what term of the Contract or other obligation in law, if any, requires the other party to pay the claimant money in respect of it, and
- the merits in law of any defence or cross-claim raised by the other party.

The Expert then decides the amount, if any, which one party is legally bound to pay the other on account of the event, act or omission.

The Expert is also to decide any other questions required by the parties, as set out in the dispute referred to the Expert at Clause 16.5.

16.9 In making the decision, the Expert acts as an expert and not as an arbitrator and is:

- (a) not liable for acts, omissions or negligence;
- (b) to make the decision on the basis of the written submissions from the parties and without formalities such as a hearing;
- (c) required within 35 days of appointment to give the decision in writing, with brief reasons, to each party; and
- (d) bound by the rules of natural justice.

16.10 If the Expert decides that one party is to pay the other an amount exceeding \$250,000 (calculating the amount without including interest on it), and within 14 days of receiving the decision of the Expert, either party gives notice in writing to the other that the party is dissatisfied, the decision is of no effect and either party may then commence litigation.

16.11 Unless a party has a right to commence litigation under Clause 16.10:

- (a) The parties are to treat each determination of the Expert as final and binding and give effect to it.
- (b) If the Expert decides that one party owes the other party money, that party is to pay the money within 14 days of the receiving the decision of the Expert.

17. TERMINATION FOR THE PRINCIPAL'S CONVENIENCE

17.1 The Principal may terminate the Contract by giving notice with effect from the date stated in the notice, for its convenience and without the need to give reasons. The Contractor must leave the Site by the date stated in the termination notice and remove all plant, equipment and amenities it has brought onto the Site for the construction of the Works.

If the Contract is terminated for the Principal's convenience, the Principal must pay the Contractor:

- the value of all work carried out (as determined in clause 13) up to the date of the termination notice takes effect; plus
- 2% of the difference between the Contract Sum, adjusted by any amounts agreed or assessed under clause 9.2 or finally determined under clause 16, and the total of all amounts paid and payable to the contractor for payment claims.

The payments referred to in this Clause are full compensation under this Clause, and the Contractor has no claim for damages or other entitlement whether under the Contract or otherwise.

The Contractor must, wherever possible, include in all subcontracts and supply agreements an equivalent provision to this Clause.

SCHEDULE 1

APPROVED FORM OF UNCONDITIONAL UNDERTAKING

(Clause 13.9)

[To be submitted on a Financial Institution's letterhead and show, at a minimum, the Financial Institution's name and address]

At the request of ('the Contractor)
and in consideration of ('the Principal')
accepting this undertaking in respect of the contract for
..... ('the Contract'),
..... ('the Financial Institution')
unconditionally undertakes to pay on demand any sum or sums which may from time to time be
demanded by the Principal to a maximum aggregate sum of
..... (\$.....) ('the Sum').

*The undertaking is to continue until notification has been received from the Principal that the Sum is no longer required by the Principal or until this undertaking is returned to the Financial Institution or until payment to the Principal by the Financial Institution of the Sum or such part as the Principal may require. The Principal must not assign the unconditional undertaking without the prior **written** agreement of the Financial Institution, which must not be unreasonably withheld.*

Should the Financial Institution be notified in writing, purporting to be signed by or for and on behalf of the Principal that the Principal requires payment to be made of the whole or any part or parts of the Sum, it is unconditionally agreed that the Financial Institution will make the payment or payments to the Principal forthwith without reference to the Contractor and notwithstanding any notice given by the Contractor not to pay same.

Provided always that the Financial Institution may at any time without being required so to do pay to the Principal the Sum less any amount or amounts it may previously have paid under this undertaking or such lesser sum as may be required and specified by the Principal and thereupon the liability of the Financial Institution hereunder shall immediately cease.

DATED at this day
of 20.....

.....
[Signature]

.....
[Print name of person signing the Undertaking]

.....
[Position / Title]

SCHEDULE 2**Statutory Declaration****Definitions***Oaths Act 1900*
(NSW)

The Principal is The Minister for Commerce for the State of NSW

The Contractor is

ACN/ABN.....

The Contract is Contract No.

Contract Title.....

dated(Date of Contract) between the party identified as the Principal and the party identified as the Contractor.

Declaration

Full name I,

Address of

do hereby solemnly declare and affirm that:

Insert position title of the Declarant 1 I am the representative of the Contractor in the Office Bearer capacity of

2 I am in a position to make this statutory declaration about the facts attested to.

REMUNERATION OF CONTRACTOR'S EMPLOYEES ENGAGED TO CARRY OUT WORK IN CONNECTION WITH THE CONTRACT

- 3 All remuneration payable to the Contractor's relevant employees for work done in connection with the Contract to the date of this statutory declaration has been paid and the Contractor has made provision for all other benefits accrued in respect of the employees.
- Relevant employees are those engaged in carrying out the work done in connection with the Contract.

Remuneration means remuneration or other amounts payable to relevant employees by legislation, or under an industrial instrument, in connection with work done by the employees [s127(6) of the *Industrial Relations Act 1996* (NSW)].

REMUNERATION OF THE EMPLOYEES OF SUBCONTRACTORS ENGAGED TO CARRY OUT WORK IN CONNECTION WITH THE CONTRACT

- 4 The Contractor *is/is not* a principal contractor for the work done in connection with the Contract, as defined in section 127 of the *Industrial Relations Act 1996* (NSW).
- 5 Where the Contractor is also a principal contractor for work done in connection with the Contract, the Contractor has been given a written statement in its capacity of principal contractor under section 127(2) of the *Industrial Relations Act 1996* (NSW) by each subcontractor in connection with that work stating that all remuneration payable by each subcontractor to the subcontractor's relevant employees for work done in connection with the Contract to the date of this declaration has been paid, and each subcontractor has made provision for all other benefits accrued in respect of each subcontractor's employees.
- 6 I am aware that the *Industrial Relations Act 1996* (NSW) requires any written statement provided by subcontractors must be retained for at least 6 years after it

Delete the words
in italics that are
not applicable.

1. GENERAL CONDITIONS OF CONTRACT AND ANNEXURE

was given and declare that the Contractor has accordingly made arrangements for the secure retention of the written statements.

WORKERS COMPENSATION INSURANCE OF THE CONTRACTOR'S WORKERS

- 7 All workers compensation insurance premiums payable by the Contractor to the date of this statutory declaration in respect of the work done in connection with the Contract have been paid. This statutory declaration is accompanied by a copy of any relevant certificate of currency in respect of that insurance.

WORKERS COMPENSATION INSURANCE FOR WORKERS OF SUBCONTRACTORS

- 8 The Contractor *is / is not* a principal contractor for work done in connection with the Contract, as defined in section 175B of the *Workers Compensation Act 1987* (NSW).
- 9 Where the Contractor is also a principal contractor for work done in connection with the Contract, the Contractor has been given a written statement under section 175B of the *Workers Compensation Act 1987* (NSW) in the capacity of principal contractor in connection with that work to the intent that all workers compensation insurance premiums payable by each subcontractor in respect of that work done to the date of this statutory declaration have been paid, accompanied by a copy of any relevant certificate of currency in respect of that insurance.
- 10 I am aware that the *Workers Compensation Act 1987* (NSW) requires any written statement provided by subcontractors and any related certificate of currency must be retained for at least 7 years after it was given and declare that the Contractor has accordingly made arrangements for the secure retention of the written statements.

Delete the words *in italics* that are not applicable.

EMPLOYER UNDER THE PAYROLL TAX ACT

- 11 The Contractor *is registered as / is not required to be registered as* an employer under the *Payroll Tax Act 2007* (NSW).
- 12 All payroll tax payable by the Contractor in respect of wages paid or payable to the relevant employees for work done in connection with the Contract to the date of this statutory declaration has been paid.
- 13 The Contractor *is / is not* a principal contractor for work done in connection with the Contract, as defined in section 17 of Schedule 2 to the *Payroll Tax Act 2007* (NSW).
- 14 Where the Contractor is also a principal contractor for work done in connection with the Contract, the Contractor has been given a written statement under section 18 of Schedule 2 to the *Payroll Tax Act 2007* (NSW) in the capacity of principal contractor in connection with that work to the intent that all payroll tax payable by each subcontractor in respect of the wages paid or payable to the relevant employees for that work done to the date of this statutory declaration has been paid.
- 15 I am aware that the *Payroll Tax Act 2007* (NSW) requires any written statement provided by subcontractors must be retained for at least 5 years after it was given and declare that the Contractor has accordingly made arrangements for the secure retention of the written statements.

Delete the words *in italics* that are not applicable.

Delete the words *in italics* that are not applicable.

PAYMENTS TO SUBCONTRACTORS

- 16 The Contractor has paid every subcontractor, supplier and consultant all amounts payable to each of them by the Contractor as at the date of this statutory declaration with respect to engagement of each of them for the performance of work or the supply of materials for or in connection with the Contract.
- 17 The provisions of clause "SECURITY OF PAYMENT", if included in the Contract, have been complied with by the Contractor.
- 18 The Contractor has been informed by each subcontractor and consultant to the Contractor (except for subcontracts and agreements not exceeding \$25,000 at their commencement) by written statement in equivalent terms to this declaration (made no earlier than the date 14 days before the date of this declaration):

1. GENERAL CONDITIONS OF CONTRACT AND ANNEXURE

.1 that their subcontracts with their subcontractors, consultants and suppliers comply with the requirements of clause "SECURITY OF PAYMENT", if included in the Contract, as they apply to them; and

.2 that all of their employees, subcontractors, consultants and suppliers, as at the date of the making of such a statement have been paid all remuneration and benefits due and payable to them by, and had accrued to their account all benefits to which they are entitled from, the subcontractor or consultant of the Contractor or from any other of their subcontractors or consultants (except for their subcontracts and agreements not exceeding \$25,000 at their commencement) in respect of any work for or in connection with the Contract.

19 I am not aware of anything to the contrary of any statutory declaration referred to in paragraph 18 of this declaration and on the basis of the statements provided, I believe the matters set out in paragraph 18 to be true.

20 And I make this solemn declaration, as to the matters aforesaid, according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Signature of
Declarant

declared at

Place

Date on.....

before me

Signature of legally
authorised person*
before whom the
declaration is made

Name and title of
person* before
whom the declaration
is made

Notes:

1. In this declaration:

- (a) the words "principal contractor", "employee", "employees" and "relevant employees" have the meanings applicable under the relevant Acts;
- (b) the word "subcontractor" in paragraphs 5, 6, 9, 10, 14 and 15 has the meaning applicable under the relevant Act; and
- (c) otherwise the words "Contractor", "subcontractor", "supplier" and "consultant" have the meanings given in or applicable under the Contract.

2. * The declaration must be made before one of the following persons:

(a) where the declaration is sworn within the State of New South Wales:

- (i) a justice of the peace of the State of New South Wales;
- (ii) a solicitor of the Supreme Court of New South Wales with a current practising certificate;
- (iii) a notary public; or
- (iv) another prescribed person legally authorised to administer an oath under the *Oaths Act 1900* (NSW); or

(b) where the declaration is sworn in a place outside the State of New South Wales:

1. GENERAL CONDITIONS OF CONTRACT AND ANNEXURE

- (i) a notary public; or
- (ii) any person having authority to administer an oath in that place.

ANNEXURE TO GENERAL CONDITIONS OF CONTRACT

Clause

1.1

The Principal is: **The Minister for Commerce for the State of NSW**

1.2

The Principal's Representative is: **Daniel Rose**

1.3

The Project Manager is: **Daniel Rose Consultants Pty.Ltd Project Management Group**

The Project Manager's representative/ Principal is **Daniel Rose**

.

5.2

Not used.

5.3

The Contractor must arrange insurance of the Works and Public Liability.

6.1

The time to give possession of Site is: Seven (7) Days after the Principal accepted the tender.

11.1

The period for Completion is: Twelve (12) calendar weeks.

12.3

The rate per day of liquidated damages is: \$ 500.

13.

The Milestones and Percentages are as below: Refer to **Table 1.2** under Sub-section 12 QUALITY ASSURANCE SCHEDULE under Section 3 GENERAL REQUIREMENTS.

14.1

The Defects Liability Period, which commences at Completion of the Works is: » 6 months

END OF SECTION – GENERAL CONDITIONS OF CONTRACT AND ANNEXURE

2 PRELIMINARIES

THERE ARE 33 PAGES IN THIS SECTION

1 ADMINISTRATION AND CONTRACTING

1.1 ELECTRONIC COMMUNICATIONS

The parties agree and consent that notices and communications may be by electronic communication in accordance with the *Electronic Transactions Act 2000* (NSW).

1.2 USE OF QUALIFIED TRADEPERSONS

Use qualified tradepersons when completing the Works. The use of such persons shall not relieve the Contractor of liability for the fitness of the Works for the purposes required by the Contract.

1.3 LONG SERVICE LEVY

Before commencing the works, the Contractor must:

- pay to the Building and Construction Industry Long Service Payments Corporation or the Corporation's agent the amount of the long service levy payable under the *Building and Construction Industry Long Service Payments Act 1986* (NSW); and
- produce to the Principal the document evidencing payment of the levy.

Additional information and the Levy Payment Form are available at: www.lspc.nsw.gov.au

1.4 COLLUSIVE ARRANGEMENTS

The Contractor must comply with the NSW Government *Code of Practice for Procurement*, which is available at:

www.treasury.nsw.gov.au/procurement/cpfp_ig

1.5 CONTRACTOR PERFORMANCE REPORTING

During the course of the Contract, the Contractor's performance may be monitored and assessed in accordance with the *Performance management system guidelines* at:

www.managingprocurement.commerce.nsw.gov.au/system/index_performance_management.doc

1.6 EXCHANGE OF INFORMATION BETWEEN GOVERNMENT AGENCIES

The Contractor authorises the Principal and its employees and agents to make information concerning the Contractor and its performance available to other NSW government agencies and local government authorities, which may take such information into account in considering whether to offer the Contractor future opportunities for work.

The Principal regards the provision of information about the Contractor to any NSW government agency or local government authority as privileged under the *Defamation Act 2005*. The Contractor agrees that it will have no entitlement to make any claim against the Principal in respect of any matter arising out of the provision or receipt of such information.

1.7 NATSPEC SUBSCRIPTION

If any of the Contractor's Documents are based on NATSPEC, then the Contractor must provide to the Principal proof of the Contractor's current NATSPEC subscription.

1.8 GOODS AND SERVICES TAX

All prices, rates and other amounts referred to under the Contract must include GST if it is payable.

The Principal will issue payment schedules in the form of Recipient Created Tax Invoices. The Contractor must not issue Tax Invoices in respect of the Contract.

The Principal will issue Adjustment Notes in respect of adjustment events known to the Principal. The Contractor must notify the Principal of details of any adjustment event not known to the Principal.

Each party warrants it is registered for GST at the time of entering into the Contract, and must notify the other party if it ceases to be registered for GST or to satisfy any requirements for the issue of Recipient Created Tax Invoices.

1.9 PASSING OF PROPERTY AND RISK

Unless otherwise provided, items supplied by the Contractor become the property of the Principal when unloaded as required in the Contract. Such items remain at the risk of the Contractor until property therein passes to the Principal.

1.10 APPLICATION OF SCHEDULE OF RATES

1.11 APPLICATION OF "SCHEDULE OF RATES AND LUMP SUM ITEMS"

Refer to General Conditions of Contract clause "The Contract Price".

MOREE ACDP MAIN WORKS

Mehi Crescent & Stanley Village at Moree – Drainage & Road upgrading works

ITEM 1

All work and obligations under the Contract NOT INCLUDED ELSEWHERE in this schedule

DRAINAGE & ROAD UPGRADING WORKS AT MEHI CRESCENT

ITEM 2.1

The lump sum amount tendered for Item 2.1 will be paid for the requirements of site establishment and disestablishment and shall be deemed to include survey, setting out, pegging, preparation, supply and temporary works necessary for the proper completion of the Works; demolition and removal of all temporary site works and facilities; restoration of all temporary site works areas and roads; removal and disposal of all unused materials and rubbish; removal of temporary erosion and sediment controls and removal of temporary fencing.

Payment for this Item shall be as follows:

- Seventy-five (75) percent upon installation of the above Works.
- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 2.2

The lump sum amount tendered for Item 2.2 will be paid for supply, installation and maintenance of Erosion & Sediment Control Measures for Environmental Management during construction including all other works required.

2. PRELIMINARIES

Progress payments for Item 2.2 will be made progressively in proportion to the work under the Contract completed.

ITEM 2.3

The lump sum amount tendered for Item 2.3 will be paid for supply, installation and maintenance of Occupational Health and Safety items, including traffic management, sign posting, temporary safety fences, etc, during construction including all other works required.

Progress payments for Item 2.3 will be made progressively in proportion to the work under the Contract completed.

ITEM 2.4

The lump sum amount tendered for Item 2.4 will be paid for dewatering and stormwater/flood protection including dewatering of excavations and all foundations during construction. This will include the cost of furnishing all labour, equipment and materials for constructing and maintaining or levelling diversion works where required, diverting flood flows, making closures, maintaining the work free from water as required, lowering groundwater pressures in the foundations, handling foundation seepage and all other works required.

Progress payments for Item 2.4 will be made progressively in proportion to the work under the Contract completed.

ITEM 2.5

The lump sum amount tendered for Item 2.5 will be paid for the clearing of all trees, scrub and rubbish required for the Works, not already cleared, in accordance with Section 5 "Environmental Management". The amount shall include the cost of felling trees and grubbing stumps, stacking all timber, scrub and rubbish, disposing of rubbish and the cost of filling and compacting the holes left after trees are grubbed out. This will include the work involved in preserving any trees the Contractor is directed to preserve.

ITEM 2.6

The rate tendered for Item 2.6 will be paid for the removal and stockpiling of topsoil for the works, to the depth specified or directed in accordance with Section 5 "Environmental Management". The rate shall include the cost of all operations involved in excavation, loading, transporting and dumping at approved stockpiles areas. The rate shall also include the cost of:

- Progressive storage of topsoil as specified
- Shaping of stockpiles;
- Stabilising stockpiles by sowing grasses by hand broadcasting;
- Regulator maintenance of stockpiles including drainage and erosion control measures;
- Re-use of the topsoil.

Measurement for payment will be made of the area of topsoil removed and stockpiled.

The area shall be based on the contours and structure design outlines as shown on the Drawings or as established by a detailed survey carried out by the Contractor following removal of topsoil and stockpiling. Submit results of the survey and calculations as evidence for payment with progress payment claims. The costs associated with survey shall be included in this item.

ITEM 2.7

The rate tendered for Item 2.7 will be paid for Earthworks, which includes excavation to the lines, grades, levels and tolerances as specified in the drawings, backfilling and compaction in accordance with Section 6 "Earthworks". This is required for the grass swale, stormwater pipe/pit laying, etc. which includes handling, haulage, stockpiling, placement and compaction of the foundations. The rate includes disposal of surplus or unwanted material, and all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings.

The rate shall also include the cost of using suitable materials obtained from required excavations elsewhere including all costs associated with stockpiling operations.

The amount shall include the cost of all work and materials, including formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.8

The rate tendered for Item 2.8 will be paid for Trimming, levelling and compaction of sub-grade and foundations in accordance with Section 6 "Earthworks", in all classes of materials to the design lines

shown on the Drawings or as directed. The rates shall include the cost of all operations involved in carrying out the required excavation and shall include haulage of materials to the point of final use or to temporary stockpiles, reloading and later reuse or haulage to disposal..

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.9

The rate tendered for Item 2.9 will be paid for back filling and compaction works in accordance with Section 6 "Earthworks". The amount shall include the cost of placing, spreading and compacting works, required to complete the construction.

The rate shall also include the cost of using suitable materials obtained from elsewhere including all costs associated with stockpiling operations.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.10

The rate tendered for Item 2.10 will be paid for Disposal of Excess and associated materials, to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.11

The rate tendered for Item 2.11 will be paid for supply and installation of gravel, to complete the sub-surface drainage works for the grass swale, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.12

The rate tendered for Item 2.12 will be paid for supply and installation of geotextiles, to complete the sub-surface drainage works for the grass swale, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including joints, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.13

The rate tendered for Item 2.13 will be paid for supply and installation of Concrete, to complete the work, in accordance with this Section 9 of this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.14

The rate tendered for Item 2.14 will be paid for supply and installation of Ag pipe, to complete the sub-surface drainage works for the grass swale, in accordance with this Specification and as shown on the Drawings. The rate shall include the cost of enclosing the drain pipe in a filter cloth stocking.

The amount shall include the cost of all work and materials, including joints, formwork and shoring, required to complete the construction.

2. PRELIMINARIES

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.15

The rate tendered for Item 2.15 will be paid for supply and installation of all stormwater on-grade pits, lids and gratings, to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including jointing, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.16

The rate tendered for Item 6.2 will be paid for supply and installation of all stormwater sag pits, lids and gratings, to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including jointing, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEMS 2.17 to 2.20

The rate tendered for Items 2.17 to 2.19 will be paid for supply and installation of all stormwater pipes and fittings of different diameters, to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including jointing, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEMS 2.21 to 2.23

The rate tendered for Items 2.21 to 2.23 will be paid for supply and installation of driveways, to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of supply and installation of pipes, headwalls, fill material, crusher run, etc., including joints, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 2.24

The lump sum amount tendered for Item 2.24 will be paid for upgrading of existing roads. This will include carrying out investigations required to design and patch potholes on the permanent access road, in accordance with Section 8 of the Specification and as shown on the Drawings.

The lump sum amount tendered shall be deemed to include preparation, supply and erection of all site temporary works necessary including traffic management for the proper completion of the Works.

Payment for this Item shall be as follows:

- Seventy-five (75) percent upon completion of the potholes patching works.
- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 2.25

The lump sum amount tendered for Item 2.25 will be paid for upgrading of existing roads. This will include carrying out investigations required to design and patch road edges on the permanent access road, in accordance with Section 8 of the Specification and as shown on the Drawings.

The lump sum amount tendered shall be deemed to include preparation, supply and erection of all site temporary works necessary including traffic management for the proper completion of the Works.

Payment for this Item shall be as follows:

- Seventy-five (75) percent upon completion of the road edges patching works.
- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 2.26

Drainage & Road Upgrading works at Mehi Crescent & Stanley Village located at Moree

Contract No: 0900814

Revision Date: 1/05/09

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Page 2-5

The rate tendered for Item 2.26 will be paid for the supply, delivery, installation of General Landscaping and re-grassing, which includes all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

MOREE VILLAGE STORMWATER OUTLET

ITEM 3.1

The lump sum amount tendered for Item 3.1 will be paid for the requirements of site establishment and disestablishment and shall be deemed to include survey, setting, pegging, preparation, supply, removal and disposal of all unused materials and rubbish; removal of temporary erosion and sediment controls and removal of temporary fencing.

Payment for this Item shall be as follows:

- Seventy-five (75) percent upon installation of the above Works.
- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 3.2

The lump sum amount tendered for Item 3.2 will be paid for supply, installation and maintenance of Erosion & Sediment Control Measures for Environmental Management during construction including all other works required.

Progress payments for Item 3.2 will be made progressively in proportion to the work under the Contract completed.

ITEM 3.3

The lump sum amount tendered for Item 3.3 will be paid for supply, installation and maintenance of Occupational Health and Safety items, including sign posting, temporary safety fences, etc, during construction including all other works required.

Progress payments for Item 3.3 will be made progressively in proportion to the work under the Contract completed.

ITEM 3.4

The lump sum amount tendered for Item 3.4 will be flood protection including dewatering of excavations and all foundations during construction. This will include the cost of furnishing all labour, equipment and materials for constructing and maintaining cofferdams, channels, conduits, flumes and other diversion and protective works, temporary structures, removing or levelling diversion works where required, diverting flood flows, making closures, maintaining the work free from water as required, lowering groundwater pressures in the foundations, handling foundation seepage and all other works required.

Progress payments for Item 3.4 will be made progressively in proportion to the work under the Contract completed.

ITEM 3.5

The lump sum amount tendered for Item 3.5 will be paid for the clearing of all trees, scrub and rubbish required for the Works, not already cleared, in accordance with Section 5 "Environmental Management". The amount shall include the cost of felling trees and grubbing stumps, stacking all timber, scrub and rubbish, disposing of rubbish and the cost of filling and compacting the holes left after trees are grubbed out. This will include the work involved in preserving any trees the Contractor is directed to preserve.

ITEM 3.6

The rate tendered for Item 3.6 will be paid for the removal and stockpiling of topsoil for the works, to the depth specified or directed in accordance with Section 5 "Environmental Management". The rate shall include the cost of all operations involved in excavation, loading, transporting and dumping at approved stockpiles areas. The rate shall also include the cost of:

- Progressive storage of topsoil as specified
- Shaping of stockpiles;
- Stabilising stockpiles by sowing grasses by hand broadcasting;

- Regulator maintenance of stockpiles including drainage and erosion control measures;
- Re-use of the topsoil.

Measurement for payment will be made of the area of topsoil removed and stockpiled.

The area shall be based on the contours and structure design outlines as shown on the Drawings or as established by a detailed survey carried out by the Contractor following removal of topsoil and stockpiling. Submit results of the survey and calculations as evidence for payment with progress payment claims. The costs associated with survey shall be included in this item.

ITEM 3.7

The rate tendered for Item 3.7 will be paid for Trimming, levelling and compaction of sub-grade in accordance with Section 6 "Earthworks", in all classes of materials to the design lines shown on the Drawings or as directed. The rates shall include the cost of all operations involved in carrying out the required excavation and shall include haulage of materials to the point of final use or to temporary stockpiles, reloading and later reuse or haulage to disposal.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.8

The rate tendered for Item 3.8 will be paid for Earthworks, which includes excavation to the lines, grades, levels and tolerances as specified in the drawings, backfilling and compaction in accordance with Section 6 "Earthworks". This includes disposal of surplus or unwanted material, and all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.9

The rate tendered for Item 2.9 will be paid for Disposal of Excess and associated materials, to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.10

The rate tendered for Item 3.10 will be paid for supply and installation of Bidim A34 Geotextile or equivalent, to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including overlaps, pegging and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.11

The rate tendered for Item 3.11 will be paid for supply and installation of Concrete, to complete the work, in accordance with this Section 9 of this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.12

The lump sum amount tendered for Item 3.12 will be paid for the supply and installation of Anchors/reinforcement, to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including grouting, formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.13

The rate tendered for Item 3.13 will be paid for the supply, delivery, installation of rip-rap rubble, and all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.14

The lump sum amount tendered for Item 3.14 will be paid for the supply and installation of energy dissipater structures, to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including grouting, formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 3.15

The rate tendered for Item 3.15 will be paid for the supply, delivery, installation of General Landscaping and re-grassing, which includes all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

DRAINAGE & ROAD UPGRADING WORKS AT STANLEY VILLAGE

ITEM 4.1

The lump sum amount tendered for Items 4.1 will be paid for the requirements of site establishment and disestablishment and shall be deemed to include survey, setting out of temporary erosion and sediment controls and removal of temporary fencing.

Payment for this Item shall be as follows:

- Seventy-five (75) percent upon installation of the above Works.
- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 4.2

The lump sum amount tendered for Item 4.2 will be paid for supply, installation and maintenance of Erosion & Sediment Control Measures for Environmental Management during construction including all other works required.

Progress payments for Item 4.2 will be made progressively in proportion to the work under the Contract completed.

ITEM 4.3

The lump sum amount tendered for Item 4.3 will be paid for supply, installation and maintenance of Occupational Health and Safety items, including traffic management, sign posting, temporary safety fences, etc, during construction including all other works required.

Progress payments for Item 4.3 will be made progressively in proportion to the work under the Contract completed.

ITEM 4.4

The lump sum amount tendered for Item 4.4 will be paid for temporary diversion of flows, dewatering and stormwater/flood protection including dewatering of excavations and all foundations during construction. This will include the cost of furnishing all labour, equipment and materials for constructing and maintaining cofferdams, channels, conduits, flumes and other diversion and protective works, temporary structures, removing or levelling diversion works where required, diverting flood flows, making closures, maintaining the work free from water as required, lowering groundwater pressures in the foundations, handling foundation seepage and all other works required.

Progress payments for Item 4.3 will be made progressively in proportion to the work under the Contract completed.

ITEM 4.5

The lump sum amount tendered for Item 4.5 will be paid for the clearing of all trees, scrub and rubbish required for the Works, not already cleared, in accordance with Section 5 "Environmental Management". The amount shall include the cost of felling trees and grubbing stumps, stacking all timber, scrub and rubbish, disposing of rubbish and the cost of filling and compacting the holes left after trees are grubbed out. This will include the work involved in preserving any trees the Contractor is directed to preserve. The amount shall also include:

- Preparation and approval of a Site Clearing Operations Plan;
- Engagement of specialist to survey and mark out areas of distinctive vegetation species;
- Erection of temporary fencing to mark off areas to be cleared and erection of tree protection measures;
- Felling of trees and removal of felled timber;
- Chipping/mulching of cleared vegetation and stockpiling of mulch;
- Regular maintenance of leaf litter and mulch stockpiles.

Payment will include the work involved in preserving any trees the Contractor is directed to preserve.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey. Progress payments will be made to the Contractor on a percentage of work completed basis.

ITEM 4.6

The rate tendered for Item 4.6 will be paid for the removal and stockpiling of topsoil for the works, to the depth specified or directed in accordance with Section 5 "Environmental Management". The rate shall include the cost of all operations involved in excavation, loading, transporting and dumping at approved stockpiles areas. The rate shall also include the cost of:

- Progressive storage of topsoil as specified
- Shaping of stockpiles;
- Stabilising stockpiles by sowing grasses by hand broadcasting;
- Regular maintenance of stockpiles including drainage and erosion control measures;
- Re-use of the topsoil.

Measurement for payment will be made of the area of topsoil removed and stockpiled.

The area shall be based on the contours and structure design outlines as shown on the Drawings or as established by a detailed survey carried out by the Contractor following removal of topsoil and stockpiling. Submit results of the survey and calculations as evidence for payment with progress payment claims. The costs associated with survey shall be included in this item.

ITEM 4.7

The rate tendered for Item 4.7 will be paid for the excavation works required for the grass swale, stormwater pipe/pit laying, etc. which includes handling, haulage, stockpiling, placement and compaction of the foundations in accordance with Section 6 "Earthworks". This includes disposal of surplus or unwanted material, and all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings. The amount shall include the cost of all work and materials, including formwork and shoring required to complete the construction.

The rate shall also include the cost of using suitable materials obtained from required excavations elsewhere including all costs associated with stockpiling operations.

Measurement for payment will be made of the compacted volume calculated between the design lines shown on the Drawings and the excavated foundation levels as shown on the Drawings or determined by the Principal as established by an agreed joint survey carried out by the Contractor and the Principal (if required).

ITEM 4.8

The rate tendered for Item 4.8 will be paid for Trimming, levelling and compaction of sub-grade and foundations in accordance with Section 6 "Earthworks", in all classes of materials to the design lines shown on the Drawings or as directed. The rates shall include the cost of all operations involved in carrying out the required excavation and shall include haulage of materials to the point of final use or to temporary stockpiles, reloading and later reuse or haulage to disposal..

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.9

The rate tendered for Item 4.9 will be paid for back filling and compaction works in accordance with Section 6 "Earthworks". The amount shall include the cost of placing, spreading and compacting works, required to complete the construction.

The rate shall also include the cost of using suitable materials obtained from elsewhere including all costs associated with stockpiling operations.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.10

The rate tendered for Item 3.10 will be paid for Disposal of Excess and associated materials, to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.11

The rate tendered for Item 4.11 will be paid for supply and installation of gravel, to complete the sub-surface drainage works for the grass swale, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.12

The rate tendered for Item 4.12 will be paid for supply and installation of geotextiles, to complete the sub-surface drainage works for the grass swale, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including joints, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.13

The rate tendered for Item 4.13 will be paid for supply and installation of Concrete, to complete the work, in accordance with this Section 9 of this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.14

The rate tendered for Item 4.14 will be paid for supply and installation of Ag pipe, to complete the sub-surface drainage works for the grass swale, in accordance with this Specification and as shown on the Drawings. The rate shall include the cost of enclosing the drain pipe in a filter cloth stocking.

The amount shall include the cost of all work and materials, including joints, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.15

The rate tendered for Item 4.15 will be paid for supply and installation of on grade stormwater pits, lids and gratings to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including joints, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.16

The rate tendered for Item 4.16 will be paid for supply and installation of stormwater sag pits, lids and gratings, to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including joints, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEMS 4.17 to 4.20

The rate tendered for Items 4.17 to 4.20 will be paid for supply and installation of all stormwater pipes and fittings of different diameters, to complete the drainage works, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including jointing, bedding, formwork and shoring, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal. The Contractor and Principal shall meet their respective costs associated with the joint survey.

ITEM 4.21

The lump sum amount tendered for Item 4.21 will be paid for upgrading of existing roads. This will include carrying out investigations required to design and patch potholes on the permanent access road, in accordance with Section 8 of the Specification and as shown on the Drawings.

The lump sum amount tendered shall be deemed to include preparation, supply and erection of all site temporary works necessary including traffic management for the proper completion of the Works. Payment for this Item shall be as follows:

- Seventy-five (75) percent upon completion of the potholes patching works.
- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 4.22

The rate tendered for Item 4.22 will be paid for upgrading of existing roads. This will include carrying out investigations required to re-construct a minimum of 2m width road pavement on the permanent access road using Asphaltic Concrete AC14, in accordance with Section 8 of the Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including removal of the existing pavement, required to complete the construction.

Measurement for payment will be made of the area of road pavement constructed.

ITEM 4.23

The lump sum amount tendered for Item 4.23 will be paid for upgrading of existing roads. This will include carrying out investigations required to realign the road kerbs on the permanent access road, in accordance with Section 8 of the Specification and as shown on the Drawings.

The lump sum amount tendered shall be deemed to include preparation, supply and erection of all site temporary works necessary including traffic management for the proper completion of the Works. Payment for this Item shall be as follows:

- Seventy-five (75) percent upon completion of the road edges patching works.

- Twenty-five (25) percent on demolition, removal and restoration of all temporary site works as specified herein.

ITEM 4.24

The rate tendered for Item 4.24 will be paid for the supply, delivery, installation of General Landscaping and re-grassing, which includes all labour, plant and material required to complete the work, in accordance with this Specification and as shown on the Drawings.

The amount shall include the cost of all work and materials, including formwork and reinforcement, required to complete the construction.

Measurement for payment shall be based on an agreed joint survey carried out by the Contractor and the Principal using the pre-existing surface areas and levels. The Contractor and Principal shall meet their respective costs associated with the joint survey.

1.12 AUSTRALIAN AND NEW ZEALAND GOODS

Do not supply or incorporate into the Works any items imported into Australia except:

- items manufactured in New Zealand;
- items included in Tender Schedules - **Schedule of Imported Materials and Equipment** lodged with the Tender and accepted by the Principal;
- a single item with an imported content valued at less than 2% of the Contract Sum or \$20,000, whichever is the lesser. If an item is one of a group of similar items, the group shall be considered as one single item.

The Principal will not pay for imported goods supplied or incorporated into the Works in breach of the provisions of this clause.

1.13 QUALITY MANAGEMENT REQUIREMENTS

Design Plan

Prior to commencing design work, prepare and implement a Design Plan complying with the NSW Government *Quality Management Systems Guidelines (QMS Guidelines)*, covering each phase of design and addressing the key activities.

The *QMS Guidelines* are available at:

www.managingprocurement.commerce.nsw.gov.au/system/index_procurement_guideline_documents.doc

Inspection and Test Plans

Prepare and implement Inspection and Test Plans, complying with the *QMS Guidelines*, incorporating the Hold and Witness points specified in the Contract.

Submit copies of Inspection and Test Plans and checklists not less than 7 days before commencing the work to which they apply. Also submit certification that the relevant Inspection and Test Plans of Subcontractors and Consultants meet the requirements of the *QMS Guidelines*. Do not start any work before this documentation is submitted.

Give at least 24 hours notice prior to reaching a Hold or Witness point.

The Contractor must not proceed beyond a Hold point without endorsement by the Principal or its authorised representative.

The Principal, at its discretion, may inspect the work at a Witness point, but work may proceed without endorsement.

2. PRELIMINARIES

Endorsement by the Principal at a Hold or Witness point does not release the Contractor from its obligations to achieve the specified requirements of the Contract.

Surveillance (monitoring) by the Principal will apply to all work associated with the Contract.

Activity requiring inspection & test plan	Stage of work requiring inspection or test	H or W point (for attendance by Principal's Representative)
Site Establishment/Disestablishment	Prior to start of works	W
Environmental Management Plan	Prior to commencement of construction	W
OH&S	Prior to commencement of construction	W
Diversion, dewatering and flood protection	Prior to earthworks	W
Clearing	Prior to earthworks	W
Earthworks	At the completion	W
Concrete works	At the completion of retaining wall construction	W
Stormwater Drainage including grass swales	At the completion of all stormwater works	W
Road upgrading works(Asphaltic Concrete)	At the completion of road upgrading works	W
General Landscaping	At the completion of landscaping works	W
Miscellaneous	At the completion of all works required	W

Conformance Records

Submit copies of conformance records as specified, including:

Conformance records	Time when records are required
Completed Inspection & Test Plans and associated checklists	With each Payment Claim
»	»

Failure to Comply

If the Contractor fails to comply with the requirements of this clause, the Principal may implement such inspections and tests as the Principal determines and the cost incurred by the Principal shall be a debt due from the Contractor.

1.14 SECURITY OF PAYMENT

General

In this clause “subcontract” includes an agreement for supply of goods or services (including professional services and plant hire) or both and “subcontractor” includes a supplier of goods or services (including professional services and plant hire) or both.

The Contractor shall ensure that each subcontract, whether written or oral, entered into by the Contractor or any subcontractor in respect of the work under the Contract and which has a value of \$25,000 or more at the commencement of the subcontract, includes provisions in the form or to the effect of the form, as the case may be, of those contained in this clause, including the provisions of this subclause.

Options as to Form of Security

Each subcontract which -

- requires the subcontractor to provide a cash security to its principal;
- allows the subcontractor's principal to deduct retention moneys from any payment made by it to the subcontractor; or
- provides for both of the above

shall allow the subcontractor the option at any time to provide an unconditional undertaking or unconditional undertakings in lieu of a cash security or retention moneys. To the extent that the subcontractor provides an unconditional undertaking or undertakings, the subcontractor's principal shall not deduct retention moneys and shall forthwith release to the subcontractor any retention moneys or cash security then held.

Trust for Cash Security and Retention Moneys

Each subcontract shall include a provision having the effect that:

- When a party receives or retains security in cash or converts security to cash, that security is held in trust by the security holder from the time of receipt, retention or conversion, as the case may be, and the security holder must forthwith deposit the money into a trust account in a bank selected by that party;
- the moneys shall be held in trust for whichever party is entitled to receive them until they are paid in favour of that party and the security holder shall maintain proper records to account for such moneys; and
- any interest earned by the trust account shall not be held in trust, and shall be owned by the party holding the security.

If the party holding security has a policy of insurance protecting subcontract payments due to the other party which is equivalent to the HIA Security of Payment Bond, then compliance with the above of this subclause is not required.

Whenever requested by the Principal to provide evidence verifying that the Contractor is holding in trust an amount which the Contractor should be holding in trust, the Contractor shall provide evidence to the reasonable satisfaction of the Principal that the amount is held in trust. If the Contractor fails to do so then, in addition to any other remedy which the Principal may have against the Contractor, the Principal may withhold an equivalent amount from payments to the Contractor.

Payments

Each subcontract shall include:

- an obligation, which takes precedence over any inconsistent provision of the subcontract, for the subcontractor's principal to pay the subcontractor regular progress payments of 100% of the value of work, goods or services provided by the subcontractor less only retention moneys, if any, paid into the trust account referred to in subclause - **Trust for cash security and retention moneys**;
- an entitlement to progress payments within the following periods after the date upon which a progress claim is lodged by the Contractor with the Principal's Representative:
 - in the case of the Contractor's subcontractors, 28 days;
 - in the case of all other subcontractors, 35 days,

Compliance with this subclause shall not prevent the Contractor from paying a subcontractor an amount in excess of that claimed from the Principal, or paying before the time stipulated in this subclause.

Alternative Dispute Resolution

Each subcontract shall include provisions incorporating the dispute resolution procedures outlined in the Contract except that, in each case, it shall not be mandatory for the subcontractor to pursue the contractual dispute resolution mechanism if the only remedy sought by the subcontractor is an order that the subcontractor's principal pay to it an amount which is not disputed to be due and payable under the subcontract.

Documents to be Provided to Subcontractors

Each subcontract shall include a provision which requires the subcontractor's principal to provide to the subcontractor, before the subcontractor commences work under the subcontract, a copy of the following provisions of the contract between the subcontractor's principal and its principal:

- the provision equivalent to this Preliminaries clause - **Security of Payment**; and
- the clauses relating to proof of payment of subcontractors, times for payment claims and payment and alternative dispute resolution.

Register of Subcontracts

Maintain a register of all subcontracts which have a value of \$25,000 or greater showing brief details of the subcontract work, the name, address and telephone number of the subcontractor, and provide an up to date copy of the register when requested by the Principal's Representative.

If further requested by the Principal's Representative, provide an unpriced copy of the subcontract agreement within 14 days of such request.

1.15 ADDITIONAL SECURITY AND OBLIGATIONS FOR TRUSTEES

If the Contractor is a trustee:

- before commencing the Works, the Contractor must give the Principal an unconditional undertaking as security for any amount previously agreed in writing by the parties. The unconditional undertaking must be in the form detailed in Schedule 1- **Approved Form of Unconditional Undertaking** and from a financial institution acceptable to the Principal.
- The security will be retained by the Principal against the due and proper performance of the Contract by the Contractor. Unless the Principal has made or intends to make a demand against the unconditional undertaking, the Principal will return the unconditional undertaking within 14 days after the date of Completion of the Works determined or agreed by the Principal.
- The Contractor must not prevent the Principal making any demand against the unconditional undertaking, or prevent the provider of an unconditional undertaking complying with the unconditional undertaking or any demand by the Principal, but the Contractor may seek damages if the Principal makes a demand in breach of the Contract.
- The Contractor must ensure that, for the duration of the Contract, the total value of the trust beneficiaries' loans to the trustee is always greater than the total value of trust beneficiaries' loans from the company.

1.16 INDUSTRIAL RELATIONS MANAGEMENT

Requirement

The Contractor must comply with the NSW Government *Industrial Relations Management Guidelines*.

Submit, before beginning work on the Site, confirmation that the Contractor will comply with the industrial relations aspects of the NSW Government *Code of Practice for Procurement* and the associated Implementation Guidelines.

Failure to comply

If at any time the Contractor has not carried out its obligations under this clause - **Industrial Relations Management**, then notwithstanding any other provision of the Contract, no payment is due to the Contractor until the 7th day after the required action has been carried out.

1.17 AUDIT AND REVIEW

Make available, on request, all records, including those of or relating to Subcontractors or suppliers, relevant to compliance with requirements of the Contract, for the purposes of audit, review or surveillance. Provide all reasonable assistance during the audits or reviews including attendance by the Contractor.

Promptly implement effective corrective action on matters disclosed by audit or review.

2 SITE AND WORKS

2.1 ORDER OF WORK

No	Activity	Commencement Date	Completion Date
1	Mehi Crescent -Drainage and Road upgrading works	XX	XX
2	Mehi Crescent-outlet improvement works	XX	XX
3	Stanley Village-Drainage and Road upgrading works	XX	XX

2.2 WORKING HOURS AND WORKING DAYS

Generally

Unless the Contract otherwise provides, the working hours on Site shall be up to 9 hours per day worked between 7 a.m. and 5 p.m., and the working days shall be Monday to Friday inclusive, but excluding public holidays and one day every 4 weeks, usually a Monday which is a rostered day off.

Approval

In approving a variation to the working hours or working days the Principal's Representative may attach conditions. Such conditions may include but are not limited to a prohibition of or restriction on the performance of work which requires supervision and may also include a requirement that the Contractor meets the costs of supervision, by or on behalf of the Principal, of work during times approved by the Principal's Representative.

2.3 EXISTING SERVICES

Locating Existing Services – Dial Before You Dig

The Contractor is responsible for locating services and in doing so, must comply with the WorkCover Work Near Underground Assets Guideline, which is available at:

www.workcover.nsw.gov.au/NR/rdonlyres/96ACDD20-8FC0-4583-A6F4-97292055A954/0/work_near_underground_asset_1419.pdf

Before commencing excavation the Contractor must obtain, from the Dial Before You Dig information service or relevant public authorities or owners of underground services, written confirmation of the exact positions of all underground services at and around the Site, and verify and prominently mark the locations of the underground services on the Site.

Dealing with Existing Services

Existing services (such as drains, public utilities, telecommunications and other services) obstructing the Works or if damaged in the course of the Contract, must be dealt with as follows:

- if the service is to be continued: repair, divert, relocate as required;
- if the service is to be abandoned: cut and seal or disconnect and make safe as required;

Cost and Delay

Where an existing service is damaged by the Contractor for any reason whatsoever, the Contractor shall bear all costs and any delays for repairing or disconnecting the service.

Notification

Notify the Principal's Representative immediately upon the discovery of services obstructing the Works not shown in the Contract documents.

2.4 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT

Specification and Statutory Requirements

The Contractor must comply with the NSW Government *Occupational Health and Safety Management Systems Guidelines 4th Edition* (OHSM Guidelines) and all statutory requirements including, but not limited to, the *Occupational Health and Safety Act 2000* (NSW) and *Occupational Health and Safety Regulation 2001* (NSW). In the event of any inconsistency, the Contractor must comply with the statutory provisions.

Appointment as principal contractor

The Contractor, having responsibility for the construction work at all times until the work is completed under the Contract, is appointed principal contractor and controller of the premises for the construction work under Clause 210 of the *Occupational Health and Safety Regulation 2001* (NSW), and is authorised to exercise such authority of the owner as is necessary to enable it to discharge the responsibilities of principal contractor and controller of premises imposed by the *Occupational Health and Safety Act 2000* (NSW) and Chapter 8 of the *Occupational Health and Safety Regulation 2001* (NSW).

Design

The Contractor must ensure that systematic assessments are undertaken in carrying out any design required, that:

- identify hazards and analyse the associated risks, probability and consequences of injury or illness;
- involve consultation with appropriate people on the safe construction, use and maintenance of the designed asset;
- establish a Design Hazard Register for the designed asset to record any hazards not eliminated in the design that may impose a risk to those constructing, using or maintaining the asset.

An up to date copy of the Design Hazard Register must be provided to the Principal at the date of Completion of the Works or the date the Works are occupied or taken over, whichever is earlier.

Site-specific Safety Management Plan

Develop and implement a Site-specific Safety Management Plan that complies with the *OHSM Guidelines*.

Submit the Site-specific Safety Management Plan no later than 14 days before construction work commences. Do not start construction work before a complying Site-specific Safety Management Plan has been submitted.

Ensure the following risks are covered in the Site-specific Safety Management Plan:

- Traffic Management;
- Safety of local residents and general public.

This list of risks is not exhaustive and must not be relied upon by the Contractor. The Contractor must undertake its own detailed analysis of all occupational health and safety risks under the Contract.

Site Safety Rules

Develop site safety rules that are equal to or better than the following minimum set of site safety rules, include them in the Site-specific Safety Management Plan and ensure implementation.

Site safety rules must make it a condition of entry to the applicable work site that all employees and visitors comply with their provisions, including:

- **Construction OHS Induction.** All persons must display evidence of completing OHS Induction training prior to being inducted to commence work on the Site.
- **Site Induction.** All persons working on the Site must attend a Site Induction prior to entering it. Visitors may enter a work site if, either, they first attend a Site Induction, or if they are accompanied by a person who has attended a Site Induction. All persons each day must sign in and out on the Site Register.
- **Safe Work Method Statements.** Safe Work Method Statements must be prepared and used for all work activities assessed as having a safety risk.
- **Toolbox Talks.** Weekly or more regular discussions must be held with workers to consult on site safety matters.
- **Safety Helmets, Safety Footwear and Safety Vests.** Safety helmets and steel-capped safety footwear must be worn by all supervisors, employees, and visitors in the construction area at all times. The footwear must comply with AS 2210. Safety vests must be worn when moving plant is present or work is undertaken near traffic.
- **Personal Protective Equipment (PPE).** PPE, such as safety eye protection, hearing protection, safety gloves and masks and the like, must be worn when welding, drilling and with all other tasks with similar risks.
- **Accidents and Incidents.** Accidents, incidents and injuries must be reported immediately to the Contractor's and applicable subcontractor's site representative in charge.
- **Alcohol and Drugs.** The consumption of, or being under the influence of, alcohol and illegal drugs on the Site is prohibited.

- **Amenities.** Access to clean toilets and meal facilities, cool, clean drinking water, and the other requirements of the WorkCover *Code of practice: Amenities for construction work* must be provided for all persons.
- **Electrical.** All electrical work and electrical plant must comply with the WorkCover *Code of practice: Electrical practices for construction work*.
- **Emergency evacuation.** Arrangements must be included in the Site Induction and clearly identified.
- **Excavations.** Barricading and signage for all excavations must be provided, with excavations 1.5 metres or more deep also to be benched, battered or shored. See the WorkCover *Code of practice: Excavation*.
- **Fire Prevention.** Fire prevention must be used by all persons on the Site. An appropriate fire extinguisher must be on hand for all welding sets and oxy acetylene work.
- **First Aid.** All persons requiring first aid treatment must contact the first aid officer who will administer the treatment and record the injury in the WorkCover Register of Injuries, including the person's name and the nature of the injury.
- **Hazardous Substances.** Chemicals and hazardous substances must be used and stored in compliance with up to date Material Safety Data Sheets (MSDS) and details recorded in the Register of Hazardous Substances.
- **Housekeeping.** Work areas must be kept clean and tidy, with rubbish and other safety hazards cleaned up promptly. All protruding nails must be removed immediately from timber.
- **Leads and Power Tools.** All leads, power tools and electrical equipment must be inspected and tagged by a qualified person prior to their use and then at monthly intervals. See the WorkCover *Code of practice: Electrical practices for construction work*.
- **Mobile Plant.** Every owner of plant must ensure plant is registered with WorkCover when required and operators are appropriately qualified. Plant must be fitted with working hazard lights/reversing lights and beepers. See the WorkCover *Code of Practice for Moving Plant on Construction Sites*.
- **Overhead Power Lines.** The requirements of the WorkCover *Code of Practice – Work near Overhead Power Lines* must be complied with.
- **Site Security and Public Access.** Security measures, including perimeter fencing, must be used to prevent unauthorised access to construction areas and ensure safe access and passage for all those on and adjacent to the Site. Security must comply with Clause 235 of the OHS Regulation 2001 and the WorkCover *Position paper: The requirements for fencing*.
- **Underground Services.** Prior to any underground work being carried out, services must be located using Dial Before You Dig, a services locator, potholing and the other precautions identified in the WorkCover *Work Near Underground Assets Guideline*.
- **Working at Height.** Working at heights must be in accordance with WorkCover requirements, including certification of formwork and scaffolding. See the WorkCover *Guide to Safe Working at Heights*.

OHS Management Report

Implementation of Risk management (OHSM Guidelines Section 5, element 1)

Summary of OHS inspections and reviews carried out to identify risks and hazards and ensure risk management controls are being implemented for:

- plant and equipment

- incoming products
- work site conditions
- adherence to and completeness of Risk Assessments, Safe Work Method Statements and Site Safety Rules
- work site access and exits
- personal protective equipment

Implementation of OHS training (*OHSM Guidelines* Section 5, element 3)

An up to date copy of the Induction Register and details of OHS training carried out.

Implementation of Incident management (*OHSM Guidelines* Section 5, element 4)

Details of:

- any OHS incidents or OHS issues, including non-compliance with OHS procedures and near misses
- implementation of incident management
- implementation of corrective action
- OHS statistics for entire the Contract including:

	This Month	Total Cumulative
Number of Lost Time Injuries		
Number of Hours Worked		
Number of Hours Lost Due to Injury		
Lost Time Injury Frequency Rate LTIFR		
Number of OHS Management Audits		
Number of OHS Inspections		

Implementation of Safe Work Method Statements (*OHSM Guidelines* Section 5, element 6)

An up to date copy of the register of Safe Work Method Statements, including confirmation that the principal contractor has ensured that all Safe Work Method Statements comply with the *OHS Regulation 2001* and that their implementation is being monitored.

Incident Reports

Ensure compliance with the notification and other requirements of *OHS Regulation 2001* Clauses 341 and 344 for accidents, incidents and non-disturbance occurrences, including immediate notification of WorkCover where required.

Immediately notify the Principal of any accident or incident defined in *OHS Regulation 2001* Clauses 341 and 344.

Provide a written report to the Principal within twenty-four hours of the incident, giving details of the incident and evidence that notification requirements have been met.

When requested, provide an incident investigation report, including identification of the cause of the incident and corrective actions taken, in the form directed.

Prohibition and Improvement Notices and On-The-Spot Fines

Immediately notify the Principal of any Prohibition and Improvement Notice (PIN) or on-the-spot fine issued by WorkCover. Provide the Principal with a copy of the PIN or fine notice and written details of the corrective action taken by the Contractor and/or the applicable subcontractor to rectify the breach and to prevent recurrence.

Electrical work on electrical installations

In compliance with section 207 of the *OHS Regulation 2001*, ensure that electrical work on an electrical installation is not carried out while the circuits and apparatus of the part of the installation that is being worked on are energised, unless it is necessary to do so in the interests of safety and the risk of harm would be greater if the circuits and apparatus were de-energised before work commenced.

Independent Certification of Formwork

In this clause, the terms “qualified engineer” and “formwork” have the meanings given in Clause 209 of the *OHS Regulation 2001*. “Related Entities” means businesses, one of which is owned wholly or in part by the other or that have proprietors, directors, officers, shareholders or employees in common.

Inspection and certification of formwork, if required by Clause 233 of the *OHS Regulation 2001*, must be carried out by a qualified engineer who is not a proprietor, director, officer, or employee either of the entity carrying out the formwork erection or a Related Entity to that entity. In addition, if the Contractor carries out the design of the formwork, then the qualified engineer must not be a proprietor, director, officer or employee either of the Contractor or a Related Entity to the Contractor.

If such inspection and certification are required, the Contractor and any subcontractors involved must include the inspection and certification as actions in Safe Work Method Statements for the erection and use of formwork, and they must be hold points in the Contractor’s and subcontractors’ Inspection and Test Plans.

Submit formwork certification before commencing the use of the formwork. Do not use the formwork before this certification is submitted.

Failure to Comply

If at any time the Contractor has not carried out its obligations under the Contract in relation to occupational health and safety management, then notwithstanding any other provisions of the Contract, no payment will be due to the Contractor until the 7th day after the required action has been carried out.

2.5 HAZARDOUS SUBSTANCES

Definition

Hazardous Substance means a substance that is listed in the document entitled *List of Designated Hazardous Substances* published by Worksafe Australia; or a substance that fits the criteria for a hazardous substance set out in the document entitled *Approved Criteria for Classifying Hazardous Substances* published by Worksafe Australia.

Asbestos, material containing asbestos, polychlorinated biphenyl (PCB) and lead based paints are recognised as hazardous substances. Other substances in certain situations are also considered hazardous and therefore require controlled handling. Examples are glues, solvents, cleaning agents, paints, and water treatment chemicals.

Work involving stone, rock, concrete, masonry and such materials containing silica, is work under the Contract whether explicitly identified in the Specification or not. The Contractor is responsible for the control of any hazard which may arise from the presence of silica.

Response to Unexpected Discovery

If any hazardous substance not specified in work under the Contract is discovered on the Site the Contractor must suspend all work which may result in exposure to such hazardous substance and notify the Principal's Representative immediately of the type of substance and its location.

With the initial notification, or as soon as practicable thereafter, submit details, including:

- the additional work and additional resources the Contractor estimates to be necessary to deal with the substance so that work and subsequent use of the Works may proceed safely and without risk to health
- the time the Contractor anticipates will be required to deal with the substance and the expected delay in achieving Completion;
- the Contractor's estimate of the cost of the measures necessary to deal with the substance; and
- other details reasonably required by the Principal's Representative

The Contractor must, in planning and carrying out any work dealing with the substance take all reasonable steps:

- to carry out the work concurrently with other work wherever possible; and
- to otherwise minimise effects of the work on the Contractual Completion Date.

Responsibility For Decontamination

Control and decontamination of any hazardous substances is the responsibility of:

- the Principal, in respect of any such substances not identified in the Contract Documents, which are discovered on the Site; and
- the Contractor, in respect of any such substances identified in the Contract Documents.

Decontamination By Principal

Where the Principal is responsible for the control and decontamination of any hazardous substances, the Principal's Representative may suspend the whole or any part of the Works until the hazardous substances are isolated or removed.

Decontamination By Contractor

Where the Contractor is responsible for the control and decontamination of the Site following the discovery of hazardous substances, handle, use, isolate, remove and dispose of such substances in accordance with statutory requirements.

The Environment Protection Authority or Waste Service NSW may advise of suitable disposal sites.

Working Hours

When the Contractor is required to decontaminate hazardous substances on occupied Sites, all such decontamination shall be carried out outside normal hours of occupation, unless otherwise approved in writing by the Principal's Representative.

2.6 ASBESTOS REMOVAL

Requirement

Where the Contractor is responsible for asbestos removal work, comply with the relevant statutory requirements, standards, codes and guidelines, including but not limited to the:

- *Occupational Health and Safety Act 2000* (NSW)
- *Occupational Health and Safety Regulation 2001* (NSW)
- WorkCover Authority of NSW requirements
- Australian Safety and Compensation Council *Code of Practice for the Safe Removal of Asbestos 2nd Edition* (2005)
- Australian Safety and Compensation Council *Code of Practice for the Management and Control of Asbestos in Workplaces* (2005)
- Australian Safety and Compensation Council *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* (2005)
- *Environmentally Hazardous Chemicals Act 1985* (NSW)
- *Waste Avoidance and Resource Recovery Act 2001* (NSW)

Notification and Permit

Not less than seven days prior to commencing any asbestos removal work, notify the local office of WorkCover and the Principal of the intention to carry out that work.

Where the regulations require a licence for asbestos removal work, before the work commences, submit a copy of the current licence held by the entity that will undertake the work and a copy of any WorkCover permit required for the work.

Monitoring

Provide air monitoring by an independent testing authority on each day during asbestos removal and on completion of each area where removal has been undertaken.

Clearance Certificate

Submit to the Principal a clearance certificate from an independent testing authority at the completion of the asbestos removal work.

2.7 ENVIRONMENTAL MANAGEMENT

Requirement

The Contractor must comply with the NSW Government *Environmental Management Systems Guidelines* available at:

www.managingprocurement.commerce.nsw.gov.au/system/index_procurement_guideline_documents.doc

Environmental Management Plan

Develop and implement an Environmental Management Plan that complies with the *EMS Guidelines*.

The Contractor may elect to complete Schedule to Preliminaries - **Environmental Management Plan**, adding objectives and actions as required to suit the risks/hazards associated with the work under the Contract, and implement the completed version as the Environmental Management Plan.

Submit the Environmental Management Plan no later than 7 days before construction work commences. Do not start construction work before a complying Environmental Management Plan has been submitted.

Incident reports

Ensure compliance with the notification and other requirements of the *Protection of the Environment Operations Act 1997 (POEO Act)*.

Immediately notify the Principal of any pollution incident that may cause material harm to the environment, providing evidence that notification requirements of the POEO Act have been met, where applicable.

Report immediately the details of any waste removed from the Site and not disposed of at a lawful facility.

When requested, provide an incident investigation report, including identification of the cause of the incident and corrective actions taken, in the form directed.

Failure to comply

If at any time the Contractor has not carried out its environmental management obligations under the Contract, then notwithstanding any other provisions of the Contract, no payment is due to the Contractor until the 7th day after the required action has been carried out.

2.8 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Requirement

Apply strategies to maximise the achievement of ecologically sustainable development in the design, construction and operation of the Works, including reducing pollutants, greenhouse gas emissions and demand on non-renewable resources such as energy sources and water.

Restricted timbers

Do not use the following timbers or their products for work under the Contract:

- rainforest timbers, unless certification is provided that they are plantation grown;
- timber from Australian high conservation forests.

2.9 WASTE MANAGEMENT

Requirement

Implement waste minimisation and management measures, including:

- recycling and diverting from landfill surplus soil, rock, and other excavated or demolition materials, wherever practical;
- separately collecting and streaming quantities of waste concrete, bricks, blocks, timber, metals, plasterboard, paper and packaging, glass and plastics, and offering them for recycling where practical.

Ensure that no waste from the Site is conveyed to or deposited at any place that cannot lawfully be used as a waste facility for that waste.

Monitoring

Monitor and record the volumes of waste and the methods and locations of disposal.

Submit a progress report every two months, and a summary report before Completion, on the implementation of waste management measures, including the total quantity of material purchased, the quantity purchased with recycled content, the total quantity of waste generated, the total quantity recycled, the total quantity disposed of and the method and location of disposal in the form of a *Waste Recycling and Purchasing Report* available at:

http://www.managingprocurement.commerce.nsw.gov.au/contract_management/cm_sf_waste_recycling_and_purchasing_report.doc

With the *Waste Recycling and Purchasing Report*, submit waste disposal certificates and/or company certification confirming appropriate, lawful disposal of waste.

2.10 PEST CONTROL

Do not use any chemical pesticides or termiticides for new construction work. Use preventive treatment by physical means to minimise the risk of pest infestations.

Chemical treatments may be used in existing buildings only as a last resort for the eradication of pest and termite infestations. Chemical pesticides used for this purpose must be registered by the National Registration Authority for Agricultural and Veterinary Chemicals and applied by a Pest Control Operator licensed by WorkCover.

Pest preventive methods must comply with AS 3660.1-2000 Protection of Buildings from Subterranean Termites (except for references to chemical soil barriers), as well as supplementary standards for existing buildings.

2.11 WORK METHOD

If the Contract prescribes a particular work method or the Principal or Principal's Representative directs that a particular work method must be used to the exclusion of the other work methods, then that work method is part of the Contract.

Otherwise, the work method is not part of the Contract and the Contractor is free to use any work method. This is so even though, before or after acceptance of the tender, the Contractor made known to the Principal the Contractor's proposed work method and the Principal accepted or approved it.

If the work method is not part of the Contract, the fact that the proposed work method is impractical or impossible or the Contractor, with or without the approval of the Principal's Representative, uses another work method will:

- not entitle the Contractor to make a claim on the Principal;
- not be grounds for an extension of time for Completion;
- not cause the Contract to be frustrated.

2.12 STANDARDS

Where the Contract requires compliance with a standard or Code, unless otherwise specified that Standard or Code shall be the one current at the closing date for tenders, except for the Building Code of Australia, which shall be the one current at the Date of Completion.

Where the Contract refers to an Australian Standard it does not preclude the adoption of a relevant international standard.

2.13 CLEANING UP

All visible external and internal surfaces, including fittings, fixtures and equipment, must be free of marks, dirt, dust, vermin and unwanted materials, at Completion.

2.14 PROPRIETARY ITEMS

Identification by the Principal of a proprietary item does not necessarily imply exclusive preference for that item, but indicates the required properties of the item.

The Contractor may offer an alternative to any proprietary item. Apply in writing for approval to use the alternative. The request must be accompanied by all available technical information and describe how, if at all, the alternative differs from the proprietary item and how it will affect other parts of the Works and performance of the Works.

Except to the extent that the approval, if any, of the Principal's Representative includes a contrary provision, the approval shall be deemed to include the conditions that:

- use of the alternative must not directly or indirectly result in any increase in the cost to the Principal of the Works;
- the Contractor must indemnify the Principal against any increase in costs;
- use of the alternative must not directly or indirectly cause any delay to the Works and if it does, the Contractor will compensate the Principal for any loss which the delay causes.

2.15 GUARANTEES

Generally

Obtain and ensure that the Client / Principal, Department of Aboriginal Affairs, will have the benefit of warranties or guarantees as specified in the Contract or offered by suppliers, including warranties or guaranties that are obtained by, or offered to the subcontractors of the Contractor.

2. PRELIMINARIES

2.16 SCHEDULE TO PRELIMINARIES - ENVIRONMENTAL MANAGEMENT PLAN

(Note: Refer to Preliminaries clause – **Environmental Management** where the Contractor elects to adopt this Plan. The Contractor must complete the Environmental Management Plan by inserting contract-related requirements as necessary, or 'NA' where a particular item is not applicable.)

IMPLEMENTATION

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
1. CONSERVATION OF PLANTS & WILDLIFE				
1.1 Protect flora and fauna	Protect existing trees and plants at and around the Site from damage unless approved by the Principal			
	Do not remove trees and plants without approval from the Principal			
	Control weeds on the Site			
	Protect birds, fish and animals at and around the Site from harm			
	Do not remove birds, fish and animals from the Site without the written agreement of the Principal			
	Do not bring birds, fish, animals and plants onto the Site without written agreement from the Principal			
	Minimise the use of pesticides and herbicides for minimal impact on the environment			
1.2 Control movement of pedestrians, materials, vehicles and plant to minimise damage to the environment	Use only designated routes for access to the Site			
	Use designated site roads and access routes for all movements on and adjacent to the Site			
	Locate compounds, and park all vehicles and plant, in designated areas on the Site			
2. CONSERVATION OF RESOURCES				
2.1 Design for energy efficiency	Adopt energy efficiency, environmental enhancement and waste minimisation as design criteria			
	Use low energy usage construction, fittings and appliances (including heating/cooling and lighting)			
2.2 Select materials to minimise: 1. resource use	Incorporate conservation of resources obligations into subcontracts			
	Reuse all topsoil on the Site and minimise the use of imported topsoil			
	Mulch and chip cleared vegetation as appropriate			

Drainage & Road Upgrading works at Mehi Crescent & Stanley Village located at Moree

2. PRELIMINARIES

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
and waste 2. ozone depleting effects 3. detrimental effects on air, water, and land quality 2.3 Conserve heritage items and other physical attributes of the Site	Maximise use of materials that are recyclable or from a sustainable source			
	Use timber from sustainable managed sources only			
	Implement a strategy to reduce the quantity of waste, including minimising and recycling packaging			
	Use low water demand fittings & appliances (dual flush toilets, water conserving shower roses & taps)			
	Minimise the use of solvents, glues, paints and other materials which release odours or vapour			
	Comply with statutory requirements for conservation of heritage items			
	Manage the conservation of physical attributes of the Site, including (LIST THE ATTRIBUTES): •			
3. POLLUTION CONTROL				
3.1 Control discharges and emissions from vehicles and plant to minimise damage to the environment	Do not use vehicles, plant or equipment that produce excessive emissions			
	Monitor emissions from vehicles and plant			
	Do not bring vehicles or plant and equipment with hydraulic fluid, fuel or oil leaks to the Site			
	Wash down vehicles, plant and equipment only in controlled areas acceptable to the Principal			
	Prevent and clean up any spills from transport vehicles			
3.2 Prevent pollution of stormwater and adverse effects on land and vegetation by control of cleaning activities and discharges	Use only water based, non-toxic paints and use only water to clear point brushes and rollers			
	Control all run-off from cleaning activities			
	Discharge only non-toxic cleaning products generally			
3.3 Control soil erosion	Identify the existing drainage paths on the Site and protect them against siltation			
	Protect vulnerable and exposed surfaces and stockpiles against scouring			

2. PRELIMINARIES

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	Install the following sediment control devices before starting construction (LIST THE DEVICES):			
	•			
	Monitor and manage the effectiveness of sediment control devices			
	Remove sediment control devices when no longer required			
3.4 Prevent release of soil contamination to the environment	Establish, before commencing work on the Site, in consultation with the Principal, if contaminated soil is present at the Site			
	If contaminated soil is present, manage the work to prevent release to the environment			
3.5 Manage refrigerants and other dangerous goods to meet statutory requirements	Ensure the procedures used for the charging and disposal of refrigerants and use of dangerous goods meet statutory obligations			
	Use appropriately trained employees			
	Obtain the licences required			
	Document dangerous goods identification, disposal and management, and retain the documentation			
3.6 Minimise noise and vibration impacts on neighbours, occupants and users of any facility	Comply with noise limits and conditions prescribed by the EPA, Department of Environment and Conservation and Council (as applicable)			
	Use equipment in good repair and condition			
	Use noise suppression equipment (e.g. silencers on compressors) and acoustic barriers as required			
	Do not expose workers, neighbours or visitors to excessive noise, and cooperate and coordinate with operators of any neighbouring facility			
	Do not expose people or property to excessive vibrations			
3.7 Comply with Trade Waste Licence conditions applicable	Implement procedures to avoid breaches of the Trade Waste Licence conditions (may apply to discharges from cooling water systems, condenser water systems, heating water systems, cooking facilities, engine discharges, water treated with chemicals or where large sediment loads exist)			

2. PRELIMINARIES

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
to the facility				
3.8 Minimise air pollution from dust and emissions	Minimise areas of exposed earth and stockpiles			
	Cover and secure materials in open transport			
	Use water sprays and/or other means to control dust			
	Keep emissions within statutory or other required limits			
	Minimise fire risks, and prevent and control fires			
3.9 Dispose of waste in accordance with statutory requirements	Implement appropriate disposal procedures for all waste items, including using lawful places for disposal, recording and reporting on the method and location of disposal and any non-conformances			
	EITHER Provide valid disposal certificates for each applicable item OR Provide company certification of appropriate disposal of the following (LIST THE ITEMS): <ul style="list-style-type: none"> • Packaging materials • Replaced or redundant materials • Chemicals • Oils and greases from machinery, cooking and other processes • Paints and solvents, including those used to clean equipment, tools and brushes • Cleaning materials and rags • Materials unsuitable for re-use, including hazardous materials such as asbestos 			
3.10 Minimise damage to the environment from	Document emergency procedures to manage all reasonably foreseeable harm, including spills and other environmental emergencies			
	Ensure emergency procedures are followed			

Drainage & Road Upgrading works at Mehi Crescent & Stanley Village located at Moree

2. PRELIMINARIES

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
emergencies	Obtain the agreement of the Principal to procedures for handling oil, chemicals and other dangerous goods before placing them on the Site, including secure storage arrangements			
	Re-instate and clean damaged areas and features, including work areas			
	Re-instate damaged eco-systems and features to their previous condition			
	Identify key contacts: (LIST NAMES and ROLES) •			
3.11 Comply with environmental requirements and rectify breaches	Inspect the Site daily to ensure appropriate environmental controls are in place and operating effectively, and that all environmental management requirements are being met			
	Cooperate with environmental audits by others			
	Rectify any environmental breaches identified within the time specified in an audit or by the Principal			
4. RECORDS AND REPORTING				
4.1 Provide sufficient documentation to demonstrate appropriate environmental management, including:	Prepare, submit and update the Environmental Management Plan			
	Maintain and submit records of environmental training			
	Report on implementation of the Environmental Management Plan			
	Submit applicable waste disposal certificates and/or company certification of appropriate disposal			
	Submit to the Principal copies of correspondence with regulators, including incident reports and notification of non-compliances or fines			
	Submit documentation evidencing that the causes of non-compliances have been corrected			
	Keep records for inspection securely filed using an effective document retrieval system			
4.2 Report environmental	Immediately report all environmental incidents to the Principal			
	Immediately report environmental incidents as otherwise required			

2. PRELIMINARIES

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
incidents				

3 MOREE ACDP MAJOR WORKS

ABORIGINAL EMPLOYMENT STRATEGY

The Contractor is required to provide employment opportunities to the local Aboriginal community as detailed in this section. Notwithstanding these requirements, it remains the Contractor's responsibility to ensure time, cost and quality requirements of the tender documents are met.

The Aboriginal employment proposed is part of the tender assessment. Reference Tender Schedule 12.

If the Contractor is unable to ensure these requirements are met under the employment strategy, he shall immediately discuss the issue with the Principal's Representative and agree on a course of action to overcome the deficiencies.

3.1 ABORIGINAL EMPLOYMENT ARRANGEMENTS

There are a number of Aboriginal residents at Mehi Crescent and at Stanley Village that may be able to work for the Contractor in the form of labourers, partly qualified or qualified tradesmen.

Contacts for the availability of the above are:

Mehi: Alex Gillon (10 Mehi Crescent ph.0437 482 322)

Stanley: Brian Saunders: (ph. 0421 419 699)

For Aboriginal residents employed, the Contractor shall meet all requirements for workers compensation, superannuation, long service leave payment scheme etc. The Contractor will ensure workers employed have a "General Induction Certificate for Construction Work" issued by Workcover as appropriate.

If suitable arrangements cannot be made with Aboriginal residents to carry out any of the above work packages, the Contractor is to arrange for the work to be carried out by other labourers or qualified sub-contractors or staff.

The Tenderer shall detail proposed Aboriginal employment in Returnable Schedule 12.

3.2 ABORIGINAL SUBCONTRACTORS

The Contractor shall assess the availability and suitability of Aboriginal sub-contractors in Moree.

3.3 MONTHLY REPORTS

Monthly reports are to be submitted to Daniel Rose Consultants Pty Ltd detailing the number of local indigenous employment/training personnel engaged as well as the use of local suppliers and equipment.

END OF SECTION – PRELIMINARIES

3 General Requirements

1	General.....	2
1.1	Scope.....	2
1.2	Overview of Contract.....	2
1.3	Details of the Work.....	3
2	Drawings, Documents and Standard Specifications.....	5
2.1	Drawing List.....	5
2.2	Documents.....	5
2.3	Availability.....	5
2.4	Standard Specifications.....	6
3	Contract Reporting.....	7
4	Contractor's Works Areas and Facilities.....	7
5	Security.....	8
6	Survey.....	8
7	Order and Continuity of Work.....	8
8	Areas of Potential Delay.....	8
8.1	Excavation.....	8
8.2	Residents' concerns.....	8
9	Video and Photographic Record.....	8
9.1	Preconstruction.....	8
9.2	Construction.....	9
10	Inconsistencies in the Documents.....	9

3 General Requirements

1 General

1.1 Scope

This Section of the Specification includes the following requirements:-

- overview of the Contract and details of the work;
- drawings, documents and standard specifications;
- contract reporting;
- access to works;
- contractor's work areas and facilities;
- security;
- survey;
- order and continuity of work;
- areas of potential delays;
- video and photographic record.

1.2 Overview of Contract

Interpretation

Unless the context otherwise requires, the following definitions apply:

- Supply: "Supply", "furnish" and similar expressions mean "supply only".
- Provide: "Provide" and similar expressions mean "supply and install".
- Approved: "Approved", "reviewed", "directed", "rejected", "endorsed" and similar expressions mean "approved (reviewed, directed, rejected, endorsed) in writing by the Principal".
- Give notice: "Give notice", "submit", "advise", "inform" and similar expressions mean "give notice (submit, advise, inform) in writing to the Principal".
- Obtain: "Obtain", "seek" and similar expressions mean "obtain (seek) in writing from the Principal".
- Proprietary: "Proprietary" mean identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Samples: Includes samples, prototypes and sample panels.
- Refurbish: Means to remove existing finishes, repair or patch damaged material to appear as the remainder of the material and re-finish as specified.
- "Witness" means to arrange inspection of the workers with the Principal.

Provide road and stormwater drainage upgrading works at both the Mehi Crescent and Stanley Village, both located at Moree.

Roadworks

The road upgrading works have been aim at providing road safety and serviceability, for residents to and from both Mehi Crescent and Stanley Village located at Moree. An inspection carried out in July 2008 shows that major roadworks are required. Pavement failures encountered can be summarised under the following headings;

- Cracking;
 - alligator cracking,
 - alligator cracking without surface distortion,
 - alligator cracking with distortion of intact surfaces,
 - alligator cracking with broken surfaces,
 - alligator cracking with surface distortion and pumping,
 - edge cracking,
 - edge cracks without distortion,

- edge cracks with distortion of intact surfaces,
- edge cracks with broken surfaces,
- edge cracks with surface distortion and pumping,
- Potholes;
 - potholes in surface treatments over aggregate base, ie 2 coat seal,
 - potholes in asphalt concrete,
- Ravelling;
- Channels or rutting;
- Others, including maintenance, signage, guide posts, etc.

Stormwater Drainage

The stormwater drainage upgrading works have been aimed to:

- provide safe flow paths and conveyance for stormwater runoff to the nearby creeks;
- eliminate:
 - nuisance flooding,
 - localised ponding of stormwater.
- cut down stormwater penetration into the base or/and sub-grade of existing road pavements which have been the major cause of the road failures at Mehi and Stanley Villages.

Stormwater outlet protection works at Mehi

The stormwater outlet at Mehi Crescent is about to collapse. This problem has been caused by the scouring of the head wall and foundations due to the high velocity discharges from the stormwater pipe and Mehi River flows. The erosion is undermining the headwall and foundations, which will eventually cause the collapse of the structure if no action and protective measure is taken.

1.3 Details of the Work

General

The work required under this Contract includes, but is not limited to the following:-

- Establishment and disestablishment, including provision of site facilities;
- Contractor's works area;
- Preparation of :
 - OH&S Management Plan
 - Environmental Management Plan,
- Obtaining of all applicable agency and Council licences and approvals;
- Control survey work, including setting out the works and pegging ;
- Preparation and implementation of all Management Plans;
- Provision of temporary fencing, signage and other means to exclude the general public from the construction area;
- Carry out all necessary construction activities to satisfy the Contract;
- Preparation of "Work-As-Executed" drawings and Operation and Maintenance Manuals;

Mehi Crescent

The work required includes, but is not limited to the following:-

- Environmental Management;
 - erosion & sedimentation control measures during construction & maintenance,
 - diversion of flows , dewatering, and flood protection during construction,
- Earthworks;
 - topsoil removal & stockpiling for later use,
 - foundation stripping and preparation,
 - excavation for pipeline lying, pit installation, grass swale, etc.,
 - back filling and compaction,

- disposal of excess material.
- Construction of Grass swale;
 - trim & grade surface,
 - provide 20mm nominal sized gravel,
 - provide Bidim A34 Geotextile or equivalent,
 - provide 100mm Ag pipe,
- Construction of stormwater drainage pits and pipes;
 - provide precast concrete stormwater pits, lids, cover, etc,
 - provide stormwater pipes – 375, 450, 525 mm dia,
 - construct driveways;
 - 300mm dia pipe,
 - precast concrete headwalls,
 - backfill,
 - crusher run,
 - provide pipework to connect between the rainwater tank from new residential houses the to new stormwater drainage system
 - connection of open drain with Ag pipe to stormwater pit;
 - miscellaneous concrete work and metalwork;
 - hydrostatic testing of pipelines;
- Roadworks
 - patch potholes,
 - patch road edges,
- General Landscaping and regressing.

Stanley Village

The work required includes, but is not limited to the following:-

- Environmental Management;
 - erosion & sedimentation control measures during construction & maintenance,
 - diversion of flows, dewatering, and flood protection during construction,
- Earthworks;
 - topsoil removal & stockpiling for later use,
 - foundation stripping and preparation,
 - excavation for pipeline lying, pit installation, grass swale, etc.,
 - back filling and compaction,
 - disposal of excess material.
- Construction of Grass swale;
 - trim & grade surface,
 - provide 20mm nominal sized gravel,
 - provide Bidim A34 Geotextile or equivalent,
 - provide 100mm Ag pipe,
- Construction of stormwater drainage pits and pipes;
 - provide precast concrete stormwater pits, lids, cover, etc
 - provide stormwater pipes – 375, 450, 525, 600 mm dia,
 - Construct driveways;
 - 300mm dia pipe,
 - precast concrete headwalls,
 - backfill,
 - crusher run,

- provide pipework to connect between the rainwater tank from new residential houses the to new stormwater drainage system
- connection of open drain with Ag pipe to stormwater pit;
- miscellaneous concretework and metalwork;
- hydrostatic testing of pipelines;
- Roadworks
 - patch potholes,
 - patch road edges,
 - realign road kerbs
- General Landscaping and regressing.

Mehi Crescent Stormwater Outlet Protective Works

The work required includes, but is not limited to the following:-

- Clearing of the site/s, including the areas to be used for construction, borrow materials, stockpiles, haul roads and site facilities;
- Diversion of flows, dewatering, and flood protection during construction;
- Topsoil removal & stockpiling for later use;
- Earthworks:
 - Trim & grade surface,
 - Foundation stripping and preparation,
 - sand filling and compaction
 - Bidim A34 geotextile.
- Construction of cascades plus dissipater structures and other downstream protection works;
 - Provide concrete,
 - Provide anchors,
 - Provide 300mm sized rip-rap,
 - Provide and repair energy dissipator blocks,
- Disposal of Excess Material;
- Testing and commissioning;
- General Landscaping and regrassing

2 Drawings, Documents and Standard Specifications

2.1 Drawing List

The Drawings listed in this Contract refer to the works included in Contract No. 0900814 and are explanatory of and/or supplementary to this Specification. Where reference is made in the Specification to a Drawing, such reference shall mean the latest amendment to such Drawing.

2.2 Documents

General Conditions of Contract *Contract Information*, Clause 36B *Site Information*, contains a list of selected reference documents which have been prepared in support of the approval processes for drainage and road upgrading works at Moree. The documents do not form part of this Contract.

2.3 Availability

Copies of the documents referenced in the previous clause are available from the Department of Commerce, McKell Office. The Contractor may request copies of these reports.

2.4 Standard Specifications

This Specification refers to the following Standard Specifications, Drawings, Test Methods and Codes:-

WS-SPEC

This project specification references the current issue of WS-SPEC, including any Addenda, but neither is included herein. WS-SPEC is available from Standards Australia, Customer Services Centre, GPO Box 5420, Sydney NSW 2001, telephone: 1300654646 and e-mail: sales@standards.com.au.

The following Sections of WS-SPEC form part of the Specification.

SECTION	
Section SP1	Steel Pipes and Fittings
Section SP2	Ductile Iron Pipes and Fittings
Section SP3	Grey (Cast) Iron Fittings
Section SP4	PVC Pipes and Fittings
Section SP6	Polyethylene Pipes and Fittings
Section SP8	Concrete Pipes
Section SP9	Maintenance Holes Precast Concrete
Section SP10	Concrete Drainage Pipes, Pits and Headwalls
Section SP15	Elastomeric Seals
Section SP20	Sluice Valves Metal Seated
Section SP21	Sluice Valves Resilient Seated
Section SP24	Butterfly valves Waterworks Purposes
Section SP27	Air Valves
Section SP30	Protective Coatings for Valves
Section SP44	Concrete Supply Standard Class
Section SP45	Concrete Supply Special Class
Section TR1	General Requirements
Section TR2	Site Preparation and Restoration
Section TR7	Earthworks
Section TR10	Concrete Placement
Section TR12	Pipeline Excavation
Section TR13	Pipeline Installation Pressure
Section TR14	Pipeline Installation Non-Pressure
Section TR20	Protective Coatings

Australian Water Supply and Sewerage Authorities

The following document from the Australian Water Supply and Sewerage Authorities (AWSASA) forms part of the Specification. A copy of this document is attached at the end of Section 17 "Mechanical Equipment for Pumping Station".

DOCUMENT

TSCW-3/81	Specification of Technical Requirements - Conventional Water Supply Pump(s) Sets.
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Australian, British and International Standards

Australian, British and International Standards cited in this Specification are available from Standards Australia (SA).

Roads and Traffic Authority

The following Standard Specifications or Procedures, Descriptions of Test Methods and Standard Drawings are directly cited in this Specification and others may be referred to indirectly. Copies of these are available from the Roads and Traffic Authority (RTA).

MR FORM No.

- 25 Specification for Construction of Concrete Pipe Culverts
- 93 Specification for Sprayed Bituminous Surfacing
- 253 Specification for Erection of Guide Posts
- 351 Specification for the Supply and Delivery of Cover Aggregate for Sprayed Bituminous Surfacing
- 612 Specification for Supply and Laying of Asphaltic Concrete
- 680 Specification for Erection of Corrugated Steel Guardrail Fencing
- 738 Specification for Concrete Works other than Bridges and Road Pavements
- 744 Supply and Delivery of Base and Sub-base Materials for Surfaced Road Pavements Specification for Corrugated Plastic Subsoil Drainage Pipe for Unload Areas
- 880 Specification for Plastic Guide Posts
- 907 Specification for Corrugated Plastic Subsoil Drainage Pipe for Unloaded Areas
- 953 Specification for Supply and Delivery of Asphaltic Concrete.

STANDARD DRAWINGS

SD5829 Corrugated Steel Guardrail Fencing - Erection

TEST METHODS

- T111 Dry Density/Moisture Relations for Road Materials (Standard Compaction)
- T117A Determination of the California Bearing Ratio of Remoulded Specimens of Road Materials (Ten Day Soak Period)
- T119 Determination of Density of Road Materials In-situ using the Sand Replacement Method
- T162 Compaction Control Test (Rapid Method)
- T166 Determination of Relative Compaction
- T201 Sieve Analysis of Aggregates
- T203 Material Finer than 75 micrometres in Aggregate (by Washing).

Application

The provisions of the Standard Specifications which are nominated in this Specification apply where relevant.

3 Contract Reporting

The Contractor will be required to capture data on a continuous basis for records purposes and prepare and submit a monthly report with each payment certificate.

If at any time the Contractor has not carried out its obligations under this clause, then notwithstanding any other provision of the General Conditions of Contract, no payment shall be due to the Contractor until the 7th day after the required action has been carried out.

4 Contractor's Works Areas and Facilities

Telecommunication

Make arrangements for all lines needed for construction purposes. On completion, disconnect and remove temporary services, including but not limited to temporary poles and cables.

Waste Water Disposal

Install and maintain all necessary services. Obtain all necessary approvals for the disposal of waste water to Council requirements. On completion, disconnect and remove all services.

5 Security

Provide and maintain security by means of manproof fences, gates or other methods to exclude the general public from the Works area at all times for the period of the Contract up until Completion, except when organised visits are arranged. Provide for the security of all materials, plant and equipment on the site. The Contractor shall take responsibility for the security of all materials equipment, components and other property, whether incorporated in the Works or not, until Completion.

6 Survey

Survey reference points are shown on the drawings, and shall be used as the control points and bench marks from which all the Works are to be set out. The Contractor shall establish all other survey lines and level datums required for setting out the Works.

With the exception of the above reference points, the Contractor shall set out accurately all the work and determine all quantities, in accordance with the Drawings and the Specification.

The Contractor shall be solely responsible for the Works being correctly set out and being executed in accordance with that set out. The Contractor shall be responsible for rectifying, at his own cost, any work rejected by the Principal because of errors in setting out or errors in execution.

Complete all required survey and measurement work by a Surveyor registered in the state of New South Wales, experienced in the type of work specified.

The Contractor shall use the same Level Datums, Survey Grid and Conventions as used for the original Drawings. All survey shall be ISGN Coordinated.

7 Order and Continuity of Work

Refer to Section 2 "Preliminaries" .

8 Areas of Potential Delay

8.1 Excavation

The materials encountered in the geotechnical investigations are set out in the Geotechnical Report, "Moree Aboriginal Communities Development Program, Major Works Project Mehi Crescent and Stanley Village, Report No 03-GI74A, July 2003," carried out by NSW Commerce.

The Contractor is to satisfy himself of the type and extent of excavation likely to be required for this project.

No claims for extensions of time due to excavation delays will be allowed.

8.2 Residents' concerns

The Contractor shall attend to all residents' concerns.

9 Video and Photographic Record

9.1 Preconstruction

Before the commencement of any construction operations, the Contractor shall prepare a digital and fully indexed video and photographic record of the construction site, including but not limited to the following:

- A preconstruction record of existing conditions at all parts of the site/s, including the storage site;
- All threatened plant species and habitat trees within the construction area which shall be tagged and then videoed and/or photographed;
- The condition of all existing roadways that will be impacted by the construction operations;

- The existing conditions all affected areas on private landowner property, including access, fences, gates, trees and structures;
- The condition of all existing roads, drainage works and access roads/driveways that will be affected by the works;

The Contractor shall submit the pre-construction video and photographic record of any particular area to the Principal before the commencement of any construction operations in that area. Should the Contractor fail to adequately record the preconstruction conditions at a particular site, then the Contractor shall, at the Contractor's expense, restore that site to the satisfaction of the Principal

9.2 Construction

The Contractor shall maintain a digital and fully indexed video and photographic record of construction. The video and photographs must include but not be limited to the major features of the construction of the storage, the access road and the power cable. The video and photographs are to record progress over time for the major construction items and contain periodic coverage of the lesser items. They are also to include typical environmental protection measures installed prior to, during and after construction operations.

The Contractor shall supply a copy of the video and photographic record each month to the Principal progressively as the work proceeds.

10 Inconsistencies in the Documents

The requirements of the Technical Specification shall prevail over any provisions in the Standard Drawings or Standard Technical Specifications that are inconsistent with the Specification, but only to the extent of any such inconsistency. Similarly, Contract Drawings shall have precedence over Standard Drawings and Standard Technical Specifications.

The WS-SPEC documents and the Roads and Traffic Authority documents listed in Sub-clause 'Standard Specifications' shall have precedence over Australian Standards and any other Standard Technical Specifications.

END OF SECTION - GENERAL REQUIREMENTS

4 Diversion, Dewatering and Flood Protection

1	General.....	2
1.1	Scope.....	2
2	Flood Protection During Construction	2
2.1	General.....	2
2.2	Protection of Works	2
2.3	Materials and Equipment	2
3	Diversion and Dewatering.....	2
3.1	Groundwater	2
3.2	Repair of Damage	2
3.3	Maintenance of Flows.....	2
3.4	Anti-pollution Measures	3
3.5	Responsibility	3
4	Methods and Procedures	3
4.1	General.....	3
4.2	Diversion pipe.....	3

4 Diversion, Dewatering and Flood Protection

1 General

1.1 Scope

This Section of the Specification includes the following requirements:-

- flood protection during construction;
- diversion and dewatering (if required);
- methods and procedures.

2 Flood Protection During Construction

2.1 General

The Contractor is fully responsible for the adequacy of the dewatering and flood protection of the Works.

Flow releases can be obtained from the PINNEENA data bank or contacting Department of Water & Energy.

Information on past rainfall and temperature records is available (on a fee for service basis) from the Commonwealth Bureau of Meteorology.

Additional local rainfall records may be available from new rainfall reporting stations at Moree.

2.2 Protection of Works

Take all necessary measures to keep the works free of flood or stormwater water runoff. Construct and maintain all the necessary diversion and protective works including cofferdams, tunnels, channels, flumes, drains, walls, sumps, pumps and other temporary diversion and protective works.

2.3 Materials and Equipment

Supply and install all materials and provide, maintain and operate all necessary pumping and other equipment for dewatering and maintaining the Works free of water and/or trafficable as required during progress of the work. This may involve the use of materials which cannot be recovered on completion of the Contract.

3 Diversion and Dewatering

3.1 Groundwater

Remove all surface water and reduce groundwater levels or pressures at each particular location of the new works while excavating, preparing foundations, placing concrete or other activities as required for the completion of the Works.

3.2 Repair of Damage

Be responsible for and repair, at no expense to the Principal, any damage to equipment and to structures, foundations or any other part of the Works under this Contract caused by water due to the failure or insufficient capacity of any part of the dewatering system or protective works provided by the Contractor.

3.3 Maintenance of Flows

Provide adequate waterway area at all access crossings and in all diversion systems such that the natural flow in the creek or of any other stream in the area of the Contractor's workings is not interrupted or interfered with for any purpose without the approval of the Principal.

3.4 Anti-pollution Measures

Take all proper precautions to prevent pollution of the creek during construction of the Works. Do not dispose of dirty wash or sluicing water in the creek. In addition prevent deposition of excavated or eroded material from the Works under the Contract into the nearby creek/s.

3.5 Responsibility

Nothing in this Clause relieves the Contractor of full responsibility for the adequacy of the dewatering and flood protection of the Works.

4 Methods and Procedures

4.1 General

Divert and transfer normal dry and wet weather stormwater and creek flows away from the excavated foundation surfaces.

4.2 Diversion pipe

Construct temporary diversion pipes to intercept dry and wet weather stormwater and creek flows as shown on the Drawings. These are an integral part of the diversion works and outlet works, to convey these flows beyond the works area. Include in the catch drains, concrete headwalls, the required ustream and downstream protection works.

END OF SECTION - DIVERSION, DEWATERING AND FLOOD PROTECTION

5 Environmental Management

1	General	2
1.1	Scope of Environmental Responsibilities	2
1.2	Compliance with all Legislation	2
1.3	Environmental Site Management Plan	2
1.4	Environmental Awareness Training	2
1.5	Non Performance Procedures	2
1.6	Environmental Performance Payments and Penalties	3
1.7	Responsibility For Environmental Due Diligence	3
1.8	General Requirements on Environment Protection	3
2	Erosion and Sediment Control Measures	4
2.1	Scope of Responsibilities	4
2.2	Soil Conservation	4
2.3	Access	6
3	Site Clearing and Vegetation Protection	6
3.1	Scope	6
3.2	Clearing Operations	6
3.3	Vegetation Protection	8
4	Topsoil Excavation and Management	9
4.1	Scope of Work	9
4.2	Excavation Schedule	9
4.3	Topsoil Removal	9
4.4	Stockpile Management	10
5	Noise and Vibration	10
5.1	Scope	10
5.2	Management Plan	10
5.3	Noise Levels	10
5.4	Working Hours	11
5.5	Monitoring	11
5.6	Notice	11
6	Fauna Protection	12
7	Heritage	12
8	Pollution and Spillage	12
9	Dust Control	12
10	Access to Site	12
10.1	Scope of Responsibility	12
10.2	Traffic Management Approval	12
10.3	Heavy Traffic Access	12
11	Site Rehabilitation	13
11.1	Scope of Work	13
11.2	Site Rehabilitation Plan	13
11.3	Restoration	13
11.4	Restoration and Revegetation	13
12	Site Clean-Up and Disestablishment	13
12.1	Scope	13
12.2	Clean Site Requirements	13
12.3	Disposal of Excess and Unsuitable Materials	14
13	Cultural Management	14
13.1	Employment of Aboriginal Representative	14
13.2	Monitoring of Aboriginal Cultural Materials	14
13.3	Discovery of Aboriginal Cultural Materials and Cessation of Works	14
13.4	Reporting of Aboriginal Cultural Materials	14
13.5	Resumption of Work	14

5 Environmental Management

1 General

1.1 Scope of Environmental Responsibilities

Take all measures necessary to protect the adjacent and downstream areas from the Contractor's operations. Such measures shall include but not be limited to the environmental protection measures nominated in this Section.

The detailed requirements of this Section and all approvals, statutes, by-laws, and standards applicable to protection of the environment on the site of the works.

1.2 Compliance with all Legislation

Comply with the requirements of all approvals, statutes and by-laws, in particular, but not limited to the following:-

- Clean Waters Act;
- Clean Air Act;
- Regulation No. 95A, "Dust Control" of the Construction Safety Act;
- Noise Control Act;
- Pollution Control Act.

1.3 Environmental Site Management Plan

Submit at the time of tendering a detailed Environmental Management Plan that addresses the following:-

- Noise, dust and water quality management;
- Site access and clearing operations plan;
- Material disposal, stockpiling and cleanup;
- Methods for delineation of works areas;
- How compliance with Erosion and Sediment Control Measures and the Occupational Health and Safety Plan are to be achieved;
- Traffic control;
- Delivery and storage of fuels and chemicals;
- Location of contractor's works & stockpile areas, toilets, washrooms etc. and methods of disposal of "grey water".

1.4 Environmental Awareness Training

All employees of the Contractor, including sub-contractors shall attend an environmental site induction course no later than 10 working days following their commencement of their employment on site.

1.5 Non Performance Procedures

Failure to protect the environment in accordance with this Specification will be considered a breach of the General Conditions of Contract and the Principal may:-

- a) suspend part or whole of the works;
- b) arrange for necessary work by others, and costs to be borne by the Contractor, which would be deducted from moneys due under this Contract;
- c) direct the Contractor to have the necessary work carried out by others, and costs to be borne by the Contractor.

No notice is required for the Principal to act in accordance with (a) or (b) above.

1.6 Environmental Performance Payments and Penalties

Payments

Works carried out while works are suspended will not be acceptable for payment. Payments due to the Contractor will be reduced where specified work has been omitted or where work has not been carried out as specified.

Penalty

Notwithstanding all other requirements of this Specification, financial penalties will be imposed on the Contractor should failure to comply with environmental controls occur.

Such penalties shall include, for each and every occurrence of failure to comply:-

- Placement or storage of bulk and/or harmful materials under the tree canopy zone (Penalty - \$500);
- Spillage onto the ground surface at any part of the site of fuels, oils, chemicals, septic waste or any harmful substance (Penalty - \$1000 per spillage);
- Removal, destruction or damage to tree outside designated works areas or tree(s) as identified and specified for preservation within works area (Penalty - \$500);
- Removal, destruction or damage to vegetation outside designated areas as identified (Penalty - \$250).

1.7 Responsibility For Environmental Due Diligence

The Contractor is required to exercise due diligence in preventing damage or accidents which have the potential to impact adversely upon the environment; and in putting in place measures to minimise environmental damage where there is a likely risk of an accident which has a potential environment impact. This general obligation extends beyond the requirements of any particular legislative provisions, regulations or conditions of approval and applies to acts done or omitted to be done.

1.8 General Requirements on Environment Protection

Carry out as a minimum the prescribed Environmental Management and Protection procedures to address the following issues listed in Table 5.1.

Table 5.1 Environmental Management and Protection Issues

Issue	Action
Noise pollution	<ul style="list-style-type: none"> • ensure all trucks/vehicles maintain sensible speed; • ensure work is carried out during approved working hours; • ensure heavy plant equipment are fitted with suitable mufflers; • ensure blasting is not used.
Dust pollution	<ul style="list-style-type: none"> • water all areas under construction traffic when dust is likely to be generated using mobile water carts, sprinklers etc. Top dress unsound areas with gravel to limit dust generation from traffic; • use of sediment fences where appropriate; • carry out temporary revegetation.
Erosion and sediment control	<ul style="list-style-type: none"> • install catch drains and divert flows to existing stormwater drainage system; • install silt and sediment filter fences as excavation progress; • install hay bales/ gravel sausages at existing stormwater systems if required; • minimise land disturbance and unnecessary clearing of vegetation; • install truck wheel wash facility or shaker ramps at exits from the construction site.

Drainage & Road Upgrading Works at Mehi Crescent and Stanley Village located at Moree

Protection of trees and endangered fauna	<ul style="list-style-type: none"> • No tree is to be removed or damaged unless specified in the contract; • identify areas to be cleared and mark boundary clearly; • ensure construction stays clear of preserved areas to ensure no destruction. • install temporary fencing if necessary to separate preserved areas.
Water conservation	<ul style="list-style-type: none"> • conserve water by using water trucks only as required and ensure construction supplies are secure and used conservatively.
Site safety	<ul style="list-style-type: none"> • install safety and other fencing at limits of work to ensure safety; • install appropriate signs; • adhere to the occupational health and safety (OH&S) act. • Provide adequate fire fighting equipment on the site.

2 Erosion and Sediment Control Measures

2.1 Scope of Responsibilities

Plan and carry out the work to prevent erosion, contamination and sedimentation of the site, surrounding areas, drainage systems and the deposition of excavated or eroded material into surrounding Creek that may result from the execution of the Works.

Where and when directed by the Principal, carry out soil conservation measures on excavated surfaces or surfaces of filled material which form part of the Works in accordance with this Specification and as shown on the Drawings.

Carry out all soil conservation measures at the earliest possible time to ensure that the required protection is established by the time of completion of the Works. Where topsoil and turfing is required, such as on fill and excavation slopes, complete all topsoiling and turfing within 14 days.

2.2 Soil Conservation

Objectives

Include all works necessary to achieve the following:-

- Management of surface water runoff so that it achieves a non-erosive velocity and concentration;
- Control of sedimentation by trapping and containing eroded soil particles before they leave the works;
- Prevention of, off-site damage and ensuring that all disturbed areas are protected by sediment trapping structures (ie. temporary sediment pond, silt and sediment filter fences, etc.) to prevent sediment leaving the works;
- Control of runoff onto, through and from the works area;
- Control of wastewater from the site, vehicles and equipment cleaning operations.

Criteria

All works are to be in accordance with criteria as set out in the following publications and this Specification:-

- Urban Erosion and Sediment Control, Revised Edition 1992 (Department of Conservation and Land Management);

- Urban Erosion and Sediment Control Field Guide (Department of Conservation and Land Management);
- Managing Urban Stormwater Runoff, draft Guidelines 3 volumes) 1997 (Environmental Protection Agency).
- Managing Urban Stormwater, Soils & Construction, 2004 (Landcom)
- Use the Department of Natural Resources (DNR, formerly Soil Conservation Service) as consultants for any further advice.

Timing

Construct all erosion and sediment control measures before clearing and subsequent operations are commenced.

Supervision

Nominate and appoint an adequately qualified Supervisor, who will be responsible for the direct supervision, implementation and maintenance of all the erosion and sediment control measures.

Maintenance

Maintain these erosion and sediment control measures for the duration of the Contract. All structures are to be inspected on a weekly basis or after each rain event for structural damage, and all sediment captured is to be removed when the capacity has been reduced by 50%.

Removal

Remove all erosion and sediment control works following completion of the Defects Liability Period for the Contract. Dispose off all materials used in the erosion and sediment control works. Carry out permanent rehabilitation works on areas previously occupied by the erosion and sediment control works, in accordance with subsection "Site Rehabilitation".

Locations

Carry out soil conservation measures as shown on the Erosion and Sediment Control Plan or Drawings or as directed by the Principal in the following locations:

- a) On excavated surfaces;
- b) On batters of toe embankments;
- c) On all batters and berms of excavations;
- d) On disposal areas;
- e) On borrow areas;
- f) Elsewhere as directed.

Staging

The Principal may direct the Contractor to carry out soil conservation measures in successive stages at any time during execution of the works. Carry out soil conservation measures to the program established by the Principal at the time of directing the work or to a modification of the program.

Necessary measures

The necessary measures to avoid erosion include, where applicable, consideration of the following:

- Staging of operations;
- Restoration. Progressive restoration of disturbed areas;
- Drains. Provide temporary drains and catch drains;
- Dispersion. Diversion and disposal of concentrated flows to points where water can pass through the site without damage;
- Spreader tanks or other structures to disperse concentrated runoff;
- Silt and Sediment filter fences. Supply and install these devices to capture silts and sediments in accordance with pollution control act;
- Sediment Ponds. Construction and maintenance of sediment ponds to prevent discharge of secured suspended solid material to downstream areas and drainage system;

- Temporary re-grassing, contour ploughing or other treatment measures to disturbed areas.

Erosion & sediment control plan

Submit documents outlining the proposed temporary erosion and sediment control measures at least seven (7) working days prior to clearing or stripping operations.

Soil conservation methods

Carry out soil conservation methods in accordance with any or any combination of the following methods:

- By topsoil placement which consists of distributing topsoil to a minimum depth of 150mm where shown on the Drawings or directed;
- By turfing and fertilising areas where topsoil has been placed or in other areas as directed. Unless otherwise directed, these areas shall be covered with a continuous approved turf and fertiliser with an approved fertiliser at a rate of not less than 60 kg/ha. The fertiliser shall be applied in 2 approximately equal applications with the first at the time of turfing and then as directed. The areas covered with topsoil shall be lightly scarified prior to turfing where practical, followed by initial watering;
- By mulching, which consists of the application of a surface protection such as jute or hessian fabric held in place by black wire netting or sprayed down with cold asphalt of an approved brand at the rate of 0.25 L/m² or 1:1 aqueous asphalt emulsion;
- By construction of contour banks and associated sedimentation ponds to contain drainage waters, at the spacings, sizes and locations directed, followed by the placing of turf as previously specified.

On completion of the grassing or turfing specified, water the grassed area when necessary, or as directed, to the equivalent of 25mm of rain per week. The method of watering shall be subject to approval and shall be carried out during normal working hours.

2.3 Access

Requirement

Stabilise access roads on the site and install erosion control works to prevent erosion of the access road formation and off road drainage.

Minimal access roads are to be constructed.

3 Site Clearing and Vegetation Protection

3.1 Scope

Carry out clearing and vegetation protection works in the following sequence:

- Plan and carry out the clearing of areas as specified on the Drawings subject to any conditions attached to approvals, the Erosion and Sediment Control Measures and the Environmental Management Plan and in accordance with this Specification;
- Prior to clearing ensure plant salvage work is completed in the areas to be cleared;
- In previously cleared areas and in areas cleared in accordance with this contract, remove all stumps and roots of trees and fill and compact grub holes;
- Protect from damage all trees and other plants which are beyond the limits allowed to the Contractor, or which need not be removed or damaged for construction purposes.

3.2 Clearing Operations

Requirements

Clearing operations shall be undertaken to avoid excessive soil disturbance to the site. Select suitable equipment such that its movements and activities are designed to meet this requirement. All environmental control measures as required under this Contract shall be installed prior to, or at the commencement of clearing operations. Clearing operations shall be abandoned during wet weather.

Where soil is disturbed, measures shall be taken to stabilise the soil in accordance with this Section.

Removal

Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble except as described in "Work Near Trees".

Grubbing

Grub out stumps and roots over 75mm diameter to a minimum depth of 300mm below finished surface under the embankment, inlet-outlet works, bunds, channels, etc.

Old works

Remove old works including slabs, foundations, pavings, drains and manholes found on the surface.

Existing topsoil

Remove topsoil to a depth of just sufficient to include the root zone and stockpile the topsoil as required in the Subsection, "Topsoil Excavation and Management" of Section 6 "Earthworks".

Precautions

Take precautions to prevent timber from falling onto private property, make provision to remove any timber so fallen, or produce the written consent of the owner to its remaining there. All damage of every kind, including damage to fencing occurring during clearing operations, shall be made good at the Contractor's expense.

Prevention of Damage to Surrounding

Clearing operations shall be carried out so as not to cause damage to the surrounding vegetation which is outside the area to be cleared.

Restoration of Damage

Immediately restore any damaged or disturbed fencing. Make good any damage to vegetation caused by the damage or disturbance to the fence prior to continuing of other site activities.

Use of felled timber

Trees felled in clearing operations shall as much as possible be salvaged for commercial uses, such as for saw logs or chips or mulched.

Cutting & removal of timber

Cut vegetation greater than 300mm in diameter into lengths not exceeding 5 metres and remove from site.

Use of cleared vegetation

As much native vegetation as possible that is cleared from the site should be salvaged for rehabilitation purposes in accordance with this Section. Native vegetation as far as possible shall be chipped or mulched on site and made available for later use. The mulch shall be put into designated mulch stockpiles for landscape and rehabilitation purposes in accordance with this Section.

Chipping

Put all cleared non-weedy vegetation less than 300mm in diameter through a chipper and stockpile, as mulch, on site for later use.

Burning

Disposal of material by burning on-site is not permitted.

Disposal of surplus

Do not remove surplus excavated material or unsuitable or contaminated material from the site. Incorporate surplus material in the landscaping disposal areas or as directed by the Principal.

Unsuitable material

Remove unsuitable material and dispose off site, including rubbish, scrap, debris, boulders, and rubble.

3.3 Vegetation Protection

Responsibility

Protect existing undisturbed or partially disturbed vegetation on the site for the duration of the Contract. Remove vegetation only from those areas specified in the Contract. Do not disturb existing vegetation, other than that as noted on the Drawings or as specified, without the approval of the Principal .

Avoid vehicular movement and parking beneath trees, washing of contaminants and storing materials within the drip-line of the trees or within vegetated areas.

Protection

Provide measures necessary to prevent damage to trees outside the clearing area and riparian vegetation other than vegetation to be removed. Protective measures may include but not necessarily be limited to the following:-

- a) Temporary fencing or markers to restrict access beyond the area to be cleared and/or in the immediate vicinity of the trees and/or riparian vegetation to be protected;
- b) A suitable barrier to protect the trunk and exposed surface roots;
- c) Tying back overhanging branches or tree canopy reduction work as necessary to allow safe passage of vehicles and equipment.

Temporary fencing

Erect temporary fencing or markers around the Limit of Works. Maintain such fencing in good condition until instructed in writing by the Principal to remove the fencing.

Work near trees

Do not remove topsoil from, or add topsoil to, the area within the drip line of the trees.

Excavation near trees

If excavation is required near trees to be retained, give notice and obtain specialist instructions.

Hand methods near trees

Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged.

Trunks of trees

Protect individual trees where necessary, with batten boards wired together and placed over a protective layer of underfelt around the tree trunk, reaching a minimum of 2 metres above the ground. Do not use nails to attach battens to the tree trunk, or attach stays, guys and the like to trees.

Storage areas near trees

Do not store, or otherwise place bulk materials and harmful materials under or near the canopy zone of individual trees or groups of trees. Retain all construction materials within designated stockpile areas as shown on the Drawings or otherwise agreed to by the Principal.

Tree removal

Trees may only be removed under the following circumstances where:-

- a) Trees are specifically located within the areas shown on the Drawings to be cleared under this Contract;
- b) Construction cannot be carried out safely in the vicinity of any tree;
- c) Construction work will or has endangered any tree;
- d) Construction work will or has increased the risk of any tree damaging property or services.

Submit a written proposal to the Principal before removal of any tree, excluding those located within areas identified on the Drawings as “to be cleared”. Do not remove any such

tree before receipt of written approval from the Principal for removal of such tree or trees. Carry out canopy reduction, as required, to the extent necessary to avoid damage to other vegetation and property during tree removal operations.

Carry out all canopy reduction and tree removal work under the direct supervision of an experienced tree removalist and using equipment and methods that will minimise the extent of damage to vegetation and property.

Ensure that the tree removalist has all necessary insurance to carry out these works.

Repair of damage

Repair promptly any damage to a temporary fence or to vegetation or drainage within the fenced areas. All such repairs shall be at the Contractor's expense.

4 Topsoil Excavation and Management

4.1 Scope of Work

Scope

Plan and carry out the removal of topsoil from the works, as shown in the Drawings.

Topsoil

Topsoil refers to the natural material including vegetation of less than 20mm diameter and the organic material that occurs between the natural surface level and the subsoil layer to the full depth of the root zone.

4.2 Excavation Schedule

Develop a schedule for the orderly excavation of material, which minimises the amount of land, which is disturbed at any one time and minimises the potential for erosion and sediment transport and is consistent with efficient construction operations.

Develop the Schedule before excavation commences. Undertake all excavation in accordance with the Schedule.

4.3 Topsoil Removal

Requirement

Remove all native topsoil from the construction site areas after clearing and immediately prior to excavation.

Stripping

Topsoil shall be stripped to 2m outside the limits of required excavation and the surface shall not be disturbed beyond these limits. Topsoil is deemed to be the soil zone, which extends to the full depth of the root zone or a maximum of 150 mm below the original ground level (in the absence of a clearly defined topsoil layer).

Topsoil requirement

The Contractor should assess the requirement for topsoil at the time of stripping. Should the yield from the areas prove to be less than that anticipated by the calculation of area and depth noted above or be unsuitable for use as topsoil, the Contractor should notify the Principal in writing prior to proceeding with further work operations.

Unsuitable material

The Principal may direct that some areas contain unsuitable grasses or weeds. Topsoil from these areas shall be removed and transported to the stockpile area for disposal off site.

Removal

The topsoil suitable for re-use shall be transported to stockpile areas for subsequent use in rehabilitation.

4.4 Stockpile Management

Location

Do not stockpile topsoil beneath the canopy (drip line) of native trees of greater than 300mm trunk diameter. Do not place stockpiled material over or near natural or formed surface drains.

5 Noise and Vibration

5.1 Scope

Requirement

The Contractor will need to:

- Plan and carry out the work to prevent excessive noise arising from the works;
- Plan and carry out the work to prevent damage to nearby properties due to excessive ground vibration arising from the works.

Necessary measures

Adopt measures to control and prevent noise pollution and to prevent damage to nearby properties due to ground vibration arising from the works.

5.2 Management Plan

Outline Plan

Submit as part of the Environmental Management Plan, an outline Noise and Vibration Management Plan. The plan is to include at least the following:-

- Register of plant and equipment noise levels;
- Methods of monitoring and assessing noise and vibration during each stage of the work and remedial action proposals to mitigate effects;
- Timing of noisier operations to minimise impact;
- Working hours.

Detail plan

Submit within 14 days of award of tender, a detailed plan for management of noise and vibration due to the works in accordance with the requirements of this Specification

5.3 Noise Levels

Requirement

Program and carry out the works such that the LA10 day time noise levels, as given in Table 5.4, and when measured at the facade of any potentially affected residence, are not exceeded.

Table 5.4 Daytime Construction Noise Emission Levels

Period of Noise	LA10 Noise Level
0 - 4 weeks	65dBA
4-26 weeks	55dBA
26 + weeks	50dBA

Definition

The following definition shall apply for this section of the Specification:-

LA10 Noise level exceeded for 10% of the measurement period.

LAeq The level containing the same energy as the varying sound level, over the measurement period.

Plant & equipment

Provide certificates of operational noise levels for all items of plant and equipment as measured in accordance with AS2012-1990 "Acoustics - Measurement of Airborne Noise Emitted by Earthmoving Machinery and Agricultural Tractors - Stationary Test Condition".

Level of operational noise shall not exceed those given in Table 5.5.
Operate all plant and equipment and provide facilities to mitigate noise levels.

Table 5.5 Maximum Acceptable Plant and Equipment Noise Levels (LAeq)

Item Description	Sound pressure level at 7m distance
Hydraulic Rock Hammer	100dBA
Bulldozer	85dBA
Jack Hammer	85dBA
Grader	84dBA
Front-end Loader	86dBA
Vibrating Roller	82dBA
Backhoe	83dBA
Crane	80dBA
Excavator	80dBA
Compressor	75dBA
Concrete Vibrators	87dBA
Concrete Pump	84dBA
Transport Vehicles	83dBA
Water Tanker	84dBA

5.4 Working Hours

Limits

The following times for construction activities shall apply to this project:-

Monday – Friday	7:30 am - 6 pm;
Saturday	7:30 am - 1 pm;
Sundays	No work permitted;
Public Holidays	No work permitted;

Deliveries

Arrange for the delivery of all materials and equipment and disposal of unsuitable materials during the specified times for construction activities.

5.5 Monitoring

Baseline survey

Refer to Subsection 5.3 “Noise Levels” for details of measured background noise levels and acoustic requirements on construction noise.

Schedule

Carry out regular monitoring of overall noise and vibration from potentially critical construction works at all houses and property within 2km of the site and any other site/s which may be affected by noise and vibration.

Make detailed records of the noise and vibration levels to a standard and detail suitable for comparison with baseline survey conducted prior to commencement of site works.

Provide evidence of results to the Principal at least at monthly intervals.

5.6 Notice

Advise Principal prior to occurrence, of any higher noise or vibration level activities, which will occur as a result of execution of the works.

6 Fauna Protection

Refrain from destroying, removing or clearing trees, timber, scrub and other flora to any extent greater than is approved by the Principal.

7 Heritage

Available reports show that the site does not contain heritage components of significance.

8 Pollution and Spillage

Without limiting the Contractors obligations under the Contract, investigate and comply with all laws, regulations and rules relating to pollution and contamination with particular regard to the water discharging off the Site, fuels, grease & oils, airborne dust and noise which could cause a hazard, or a nuisance to adjacent properties.

During construction, immediately remove and dispose of in an approved manner all spillage of any type whatsoever including lubricating oil, hydraulic oil and any other material, and clean the area as directed by the Principal.

9 Dust Control

Plan and carry out the work to minimise dust arising from the works. Requirements include:

- Employ a suitable water tanker to maintain access roads/tracks and haul roads in a damp condition;
- All trafficable areas that are not sealed shall be routinely watered to suppress the formation of dust. Provide water carts for routine watering except during wet weather.

10 Access to Site

10.1 Scope of Responsibility

Ensure that construction traffic accesses the site by approved routes.

10.2 Traffic Management Approval

Requirement

- a) Prior to any work which may affect traffic movement on, to or surrounding the Site, submit proposals to Council detailing the traffic movements and control methods;
- b) Any other traffic controls considered necessary by Council to manage traffic and traffic safety shall be incorporated by the Contractor. Such traffic controls could include but not be limited to:-
 - warning signs of truck traffic, trucks turning etc.;
 - routine checks by the Principal and Council staff on truck movements;
 - compliance with safety laws, permissible peak traffic movement levels, etc.
 - Environmental, ie. rubble strips, washing

10.3 Heavy Traffic Access

Requirement

All heavy traffic shall be permitted access to the site during ordinary working hours only. Specified in Subsection 5.4 “Working Hours”. Trucks carrying soil and aggregates shall be loaded and covered to prevent spillage and dust.

11 Site Rehabilitation

11.1 Scope of Work

Extent

All areas that have been disturbed by construction activities are to be rehabilitated for visual and water quality purposes.

Requirement

Carry out site rehabilitation works at the Contractor's works and facilities site, the site of the bunds, channel, stockpile areas, and any disturbed areas. Site Rehabilitation and landscaping including the following:-

- a) Replacement of stockpiled topsoil and prepare ground for revegetation;
- b) Revegetation work including weeding, replanting or planting of grasses and turf, and spreading of stockpiled topsoil;
- c) Spreading of mulch to revegetated areas;
- d) Construction of catch drains to divert surface waters which would otherwise cause erosion and damage seeded or planted areas;
- e) Maintenance of revegetated areas for the specified period to ensure the development of strong and vigorous growth. Maintenance is to include, but not necessarily be limited to watering, weed control, pest and disease control, regrassing, top dressing, replanting and replacing failed, damaged or stolen plants.

11.2 Site Rehabilitation Plan

Detail Plan

Submit within 14 days of award of tender, a detailed plan and specification for the rehabilitation of the site.

11.3 Restoration

Mulch

Following completion of topsoil spreading recover mulch and leaf litter from the appropriate stockpile area and spread evenly over the areas to be revegetated to a minimum depth of 30mm.

11.4 Restoration and Revegetation

Requirement

Revegetate and stabilise all areas disturbed by the works such that the restored areas match the surrounding areas.

12 Site Clean-Up and Disestablishment

12.1 Scope

The clean-up and disestablishment of the site shall be planned and carried out in a manner to leave the site in a clean and tidy condition.

12.2 Clean Site Requirements

The Site is to be kept clean and tidy at all times. Upon completion of the works all temporary works, surplus material, refuse and equipment shall be removed from the Site, including but not limited to the following:-

- all temporary fencing unless directed otherwise by the Principal;
- Contractor's site works area.

The Site shall be left in a clean and tidy condition to the satisfaction of the Principal.

12.3 Disposal of Excess and Unsuitable Materials

All unsuitable materials from the excavations, as well as structural debris, contaminants and refuse shall be disposed into a disposal area, in accordance with the requirements of the relevant local authorities.

13 Cultural Management

13.1 Employment of Aboriginal Representative

An Aboriginal representative nominated by the local Aboriginal Land Council may be employed by the Principal during site clearing and construction operations.

13.2 Monitoring of Aboriginal Cultural Materials

The Aboriginal representative employed shall monitor the site clearing and construction operations, for the occurrence of Aboriginal cultural materials or any other materials that may be of significance to the Aboriginal community.

13.3 Discovery of Aboriginal Cultural Materials and Cessation of Works

In the event any Aboriginal cultural materials are detected or unearthed, either during the course of the Aboriginal monitoring program or at any other time, site clearing and construction work in that area shall be halted.

13.4 Reporting of Aboriginal Cultural Materials

In the event any Aboriginal cultural materials are detected or unearthed, either during the course of the Aboriginal monitoring program or at any other time, it shall be immediately reported to:

- the Principal;
- the NPWS Archaeologist at the Tamworth Regional Office.

The advice of the DECC archaeologist at the Tamworth Regional Office shall be sought and the requirements of the DECC shall be complied with concerning any Aboriginal cultural materials that are detected or unearthed.

13.5 Resumption of Work

Development work shall only recommence in the area where any Aboriginal cultural materials are detected or unearthed, after the requirements of the DECC have been complied with.

END OF SECTION - ENVIRONMENTAL

6 Earthworks

1	General.....	2
1.1	Scope.....	2
1.2	Extent of Work.....	2
1.3	Requirement.....	2
2	Clearing of Works	3
2.1	Clearing of Works Area	3
3	Topsoil Excavation and Management.....	3
3.1	General Requirement	3
4	Excavation	3
4.1	General Requirements.....	3
4.2	Excavated Material	4
4.3	Excavation In Open Cut for Trench.....	4
4.4	Excavation in Open Cut for Concrete Structures and Footings	5
5	Disposal of Excess and Unsuitable Materials.....	5
5.1	General Requirement	5
6	Backfill Against Concrete Structures	5
6.1	Requirement.....	5
6.2	Zoned Backfill	5
6.3	Random Backfill.....	5
6.4	Free Draining or Sand/Gravel.....	5
6.5	Limitations	6
7	Preparation and Inspection of Foundations	6
7.1	Scope.....	6
7.2	Inspection and Approval	6
8	Soil Conservation.....	6
8.1	General.....	6
8.2	Topsoil.....	6
8.3	Landscaping	6
8.4	Erosion and Sediment Controls.....	6
9	Tolerances	6
9.1	Horizontal Tolerances.....	6
9.2	Vertical Tolerances	7

6 Earthworks

1 General

1.1 Scope

This Section of the Specification includes the following requirements:-

- clearing;
- topsoil removal & stockpiling;
- blasting (if required);
- excavation;
- foundation stripping and preparation,
- excavation for pipeline lying, pit installation, grass swale, etc.
- back filling and compaction
- disposal of excess and unsuitable materials;
- preparation and inspection of foundations;
- backfill against concrete structures;
- soil conservation;
- tolerances.

1.2 Extent of Work

The works covered in this Section of the Specification relates to all the earthworks activities required at Mehi and Stanley Villages.

1.3 Requirement

General

Ensure that all the Environmental Management Plans and other measures as detailed in Section 5 “Environmental Management”, are in place before any earthworks can begin. Prior to commencing earthworks, carryout survey, setting out and pegging of the works area/s.

Stripping

Immediately after clearing operations and before excavation commences, all topsoil shall be stripped to such depths as directed by the Principal. Stripping of topsoil shall be carried out on all areas in which excavation and filling operations are required.

Construction

Carry out construction using control measures and works to suit the proposed methods and equipment necessary to complete the Contract. Carry out erosion and sediment controls and other measures as detailed in the Environmental Management Plan prior to commencement of excavation works. Grassing and revegetation are to be carried out as soon as possible on completion of the works.

Existing services

Prior to commencement of clearing or excavation, make all the necessary enquiries and investigations for the protection of services and properties from damage.

Excavation

Carry out all excavation and trimming in such a way that the excavation and trimming lines shown on the Drawings are achieved. If required ground support systems which are acceptable to the Principal and the WorkCover Authority of NSW, may be used but these will need to comply with the requirements of the Occupational Health and Safety Act and the Construction Safety Act.

Dewatering

Dewater and maintain in a stable and dewatered condition all excavations until the works have been constructed and backfilling operations completed.

Restoration

Restore existing roads and drainage works to their original or specific condition upon completion of the works.

2 Clearing of Works

2.1 Clearing of Works Area

Refer to Subsection 3 “Site Clearing and Vegetation Protection” of Section 5 “Environmental Management”.

3 Topsoil Excavation and Management

3.1 General Requirement

Refer to Subsection 4 “Topsoil Excavation and Management” of Section 5 “Environmental Management”.

4 Excavation

4.1 General Requirements

Refer to Subsection 2 “Flood Protection during Construction” of Section 4 “Diversion, Dewatering and Flood Protection”.

Definition

Following stripping of topsoil, excavation is designated as “all classes” and is defined as all excavation, irrespective of the type of material or its condition required to achieve the excavation lines, grades and dimensions or structure outlines shown on the Drawings or directed by the Principal.

Defects

The exploratory investigations of the foundations below natural surface have disclosed all seams and other defects that may exist. It is anticipated that there may be depressions, fissures, zones of weak material, faults and seams running in various directions in the foundations. The assumed lines of excavation shown on the Drawings shall therefore not be interpreted as including with any degree of accuracy the final or actual excavation lines and that no defects exist.

Dewatering

The Contractor shall be responsible for the design, installation and operation of all foundation dewatering systems as per Section 4 “Diversion, Dewatering & Flood Protection”. Dispose off groundwater that may be contaminated to the approval of the Principal.

Optional excavation

During the progress of the work the Principal may find it necessary or desirable to vary the slopes or dimensions of the excavations from those shown on the Drawings or previously established and may direct such changes. No additional allowance will be paid above the rates tendered in the Schedule of Rates for excavation by reason of such changes. Any optional excavation to secure access to the work or for any other purposes shall be subjected to approval of the Principal. Such excavations must be kept within the limits approved by the Principal.

Assessment of conditions

Tenderers shall make their own deductions and conclusion as to the nature of the materials to be excavated, the difficulties of making and maintaining the required excavations and of doing other work affected by the conditions of the site.

Any optional excavation to secure access to the work or for any other purpose shall be subject to the approval of the Principal. Such excavations must be kept within the limits approved by the Principal and shall be at the Contractor’s expense.

Foundation Quality

Preserve in the soundest possible condition the material below and beyond the lines of all excavation. If material is excavated below or beyond the excavation lines shown on the Drawings or determined by the Principal or foundation materials are loosened, the over-excavation or loosened material shall be filled with or replaced using compacted earth backfill for soil foundations and concrete backfill for rock foundations. Unless otherwise specified or directed, backfill concrete placed in the foundations or adjacent to concrete structures shall be Class N20. All such work shall be at the Contractor's expense.

Prevention of weathering

Where concrete is to be placed upon or against excavated surfaces in material prone to weathering, carry out excavation as near as possible to the time for placement of structural or blinding concrete in order to minimise weathering of the excavations. Where applicable this requirement may be satisfied using two stage excavation.

Two stage excavation

Excavate the first stage such that all material within 300mm of the final lines, grades and dimensions of the excavation remains undisturbed. Excavate the remainder to the required lines, grades and dimensions, as shown on the Drawings, in the second stage immediately prior to placement of concrete.

The use of two stage excavation does not relieve the obligation to meet all specified tolerances for excavation and no additional allowance above the unit rates tendered in the Schedule of Rates will apply.

Supports

Provide, erect and maintain in a safe condition all planking, strutting and supports necessary to retain the sides of the excavations. No payment will be made for planking, strutting or temporary supports and this shall be included in the relevant rates for excavation.

4.2 Excavated Material

Suitable materials

Use suitable material from excavation in the works. The Contractor's operations in the excavations shall be such that the materials excavated will yield as much required suitable materials as practicable, and shall be subjected to approval. Where practicable, materials suitable for use in the works shall be excavated separately from materials to be wasted. Approved materials shall be segregated by loads during the excavation and shall be placed in the designated locations. Haul or place all excavated material required for incorporation in the Works and which conforms with the requirements of this Specification to stockpile or place directly in the required area of construction. The material is to be placed as specified in the relevant sections of this Specification.

Establish separate stockpiles for excavated materials suitable for re-use, in accordance with this Specification. Maintain all stockpiles of suitable material in a tidy manner to avoid contamination and shape surfaces of the piles to provide drainage and avoid saturation of the material as indicated in the Specification.

Unsuitable materials

Dispose of all unsuitable materials from all excavations as specified.

4.3 Excavation In Open Cut for Trench

Excavation in open cut for trench material shall consist of the removal of soil and extremely weathered material to expose a foundation of extremely weathered to highly weathered rock with no defects that might impair the shearing resistance of the contact surface. In addition remove any material which would interfere with the proper compaction of embankment materials.

The excavation profile shown on the Drawings shall not be interpreted as indicating the final or actual excavation lines.

The excavation profile shown on the Drawings shall be varied as may be considered necessary by the Principal to adapt the profile to the conditions disclosed by the excavation.

4.4 Excavation in Open Cut for Concrete Structures and Footings

Excavation in open cut for the intake pit, culvert, inlet and outlet works, energy dissipater structure and diversion works will involve the removal of soil, gravel and rock to provide satisfactory foundations.

All excavated surfaces for structures and footings are to comply with Subsection 7 “Preparation and Inspection of Foundations” of this Specification.

All excavations for concrete structures and footings are to conform to the concrete outlines, dimensions and tolerances shown on the Drawings.

Remove all loose material from prepared surfaces.

No unexcavated material is to protrude within the neat concrete outlines of the structure.

All excavation in rock is to be vertical unless otherwise shown on the Drawings.

5 Disposal of Excess and Unsuitable Materials

5.1 General Requirement

Unsuitable materials consist of:-

- all material from clearing and from excavation areas which do not satisfy the requirements for re-use, including topsoil, and/or free draining, rockfill materials, which include trees, stumps, brush and other vegetation;
- all structural debris and including waste metalwork, pipes, concrete, reinforcement, formwork or similar rubbish.

Excess materials consist of:-

- all material from excavation areas, which satisfies the criteria's specified but are not required for construction of the Works.

All excess and unsuitable materials from borrow areas and excavations shall be disposed of in accordance with Section 5 “Environmental Management”.

6 Backfill Against Concrete Structures

6.1 Requirement

Place and compact fill adjacent to concrete structures with such equipment and in such a manner that no damage to the concrete structure results. Within one metre of all concrete structures use special compaction. Vibratory rollers shall not be used within 2m of any concrete structures.

6.2 Zoned Backfill

Place zoned backfill in approximately horizontal layers and compact as specified on the Drawings.

Ensure thorough compaction of the fill near the inlet/outlet works and culvert while preventing damage to the concrete, embedded waterstops or any projecting pipework.

6.3 Random Backfill

Random backfill shall consist of a mixture of soil and rock from gravel to silt or clay sizes with a maximum particle size of 75mm. Place the material in layers not exceeding 150mm thick and compact by a minimum of 2 passes of pneumatic tyred heavy construction equipment over the entire surface of each layer.

6.4 Free Draining or Sand/Gravel

Free draining backfill shall consist of a selected free draining mixture of sand and rock fragments from approved sources with a maximum size of 40mm. Successive loads shall be dumped so as to secure the best practicable distribution of materials. The materials need not be specifically compacted nor sluiced unless specified on the Drawings but shall be placed to conform with the established lines, grades and dimensions to ensure that the completed backfill will be stable and that there are no large unfilled spaces within the backfill.

6.5 Limitations

Do not backfill against concrete structures until the concrete has attained the specified characteristic strength.

7 Preparation and Inspection of Foundations

7.1 Scope

The works covered in this Subsection include the preparation and inspection of foundations.

7.2 Inspection and Approval

All foundations are to be inspected and approved by the Principal at the completion of excavation and/or prior to placing concrete or fill materials. Give the Principal as much notice as practicable, but not less than 2 days, of foundations being ready for inspection. Generally, inspections will be made immediately after clean-up.

8 Soil Conservation

8.1 General

Provide topsoil and grassing to all cut and fill soil batters and disturbed areas including:-

- natural surface areas adjacent to the embankment;
- all disturbed areas upstream and downstream of the dam;
- the floor and battered soil slopes of the diversion/outlet channels;
- the upstream and downstream batters of the embankment are to be protected using rockfilled mattress, which is overlain with topsoil and turf, for the overflow sections as shown on the Drawings.
- other areas shown on the Drawings and in accordance with Section 5 “Environmental Management” or as directed.

Submit details of proposed methods and program for approval. Prior to submitting details for approval, obtain written agreement from DNR that the methods and program are suitable.

8.2 Topsoil

Use material stripped from the Works area and stockpiled in accordance with Subsection 4 “Topsoil Excavation and Management” of Section 5 “Environmental Management”.

Prepare all surface areas and spread and place topsoil in accordance with this Specification. Place topsoil to minimum 150mm thickness over the areas to be grassed or turfed.

8.3 Landscaping

Eradicate weeds, carry out all grassing and turfing, watering and maintenance for all revegetation works in accordance with Section 5 “Environmental Management”.

8.4 Erosion and Sediment Controls

Control erosion and sediment movement on the site. Prevent discolouration and pollution of any storage waters. Prevent movement of erosion products downstream of the works. Plan and carry out the work to prevent erosion, contamination and sedimentation of the storage site, surrounding areas and drainage systems in accordance with Section 5 “Environmental Management”.

9 Tolerances

9.1 Horizontal Tolerances

Unless otherwise approved by the Principal the horizontal locations of any point on the surface of excavations shall not differ from the corresponding point given in the Drawings, by more than -100mm to +300mm (where the +tolerance is in the direction which increase the depth of the excavation).

9.2 Vertical Tolerances

Unless otherwise approved by the Principal the heights of surfaces for excavations measured anywhere shall not vary from those given in the Drawings, or calculated to be 0mm to +100mm.

END OF SECTION - EARTHWORKS

7. Pipe Culverts(RC&FRC Pipes)

1	DRAINAGE PIPES	2
1.1	Scope	2
1.2	References	2
1.3	Materials	2
1.4	Supply	3
1.5	Installation	4
1.6	Measurement and payment	5
2	FIBRE REINFORCED CONCRETE DRAINAGE PIPES	6
2.1	Scope	6
2.2	Composition	6
2.3	Manufacture	6
2.4	Marking	6
2.5	Finish & workmanship	6
2.6	Classification	6
2.7	Diameter of pipes	6
2.8	Dimensions & tolerances	6
2.9	Length & permissible variation in length	7
2.10	Permissible deviation from straightness & squareness	7
2.11	Flexural strength	7
2.12	Crushing strength	8
2.13	Joints	8
2.14	Bends & junctions	10
2.15	Sampling	10
2.16	Testing	10
2.17	Re-testing & rejection	10

Appendix A - FLEXURAL STRENGTH TEST

Appendix B - METHOD FOR LOAD TESTING OF PIPES

Appendix C - METHOD FOR THE HYDROSTATIC PRESSURE TESTING OF PIPES

7. Pipe Culverts

1 DRAINAGE PIPES

1.1 Scope

This Section of the Specification covers the supply and installation of reinforced concrete and/or fibre reinforced concrete pipes.

1.2 References

General

Unless otherwise specified the applicable issue of a reference document shall be the issue current at the date one week before the closing date for tenders. Standards, specifications and test methods are referred to in abbreviated form (eg AS 1234). For convenience, the full titles are given in Tables 7.1 and 7.2 below:

Australian Standards

Table 7.1

AS	Description
AS 1342	Precast Concrete Drainage Pipes
AS 1646	Rubber Joint Rings for Water Supply, Sewerage and Drainage Purposes
AS 3725	Loads on Buried Concrete Pipes
AS 3725	Supplement 1 - Loads on Buried Concrete Pipes - Commentary
AS 3902	Quality Systems for Production and Installation

RTA Specifications

Table 7.2

RTA	Description
RTA G3	Occupational Health and Safety Requirements.
RTA R5	Stormwater Drainage – General.
RTA R25	Subsurface Drainage - General.

1.3 Materials

General

Reinforced concrete pipes shall be rubber ring jointed spigot and socket pipes complying with AS 1342 for all sizes of pipes up to and including 1,800 mm in diameter. The details of the flexible joints, sockets and rubber rings shall meet the requirements of AS 1646.

Requirement

In addition, sizes larger than 1,800 mm in diameter shall comply with the provisions of AS 1342 in all respects regarding the quality of manufacture of the pipes and the application of physical tests, except that the test loads to be applied to the pipes shall be of the magnitudes given in Table 7.3.

Table 7.3

Nominal Internal Diameter(mm)	Cracking Load (kN/m)			
	Class X(2) Pipes	Class Y(3) Pipes	Class Z(4) Pipes	Class Z+ (6, 8&10) Pipes
2, 100	70.0	105.0	140.0	}
2, 400	78.0	117.0	156.0	} *
2, 700	86.0	129.0	172.0	}
3, 000	94.0	141.0	188.0	}

Notes:

* To determine the Cracking Load (kilonewtons per metre) for Class Z+ pipes, multiply the Class Z loads by the Z+ ratio (For example, a Class 1.5Z(6) pipe has a Cracking Load of 1.5 x the cracking load of a Z(4) class pipe of the same diameter).

Note: The ultimate load in each case shall be not less than the cracking load plus 50 per cent.

The internal diameter of any pipe whose nominal diameter is shown on the Drawings shall be not less than the minimum internal diameter listed in Table E1 of Appendix E of AS 1342 less the permissible variation in designated internal diameter stated in Table 3.1 of AS 1342.

The minimum internal diameter of pipes whose class is greater than Z shall be not less than the minimum internal diameter for Class Z pipes listed in Table E1 of Appendix E of AS 1342 less the permissible variation in designated internal diameter stated in Table 3.1 of AS 1342.

Minimum cover to all reinforcement shall be in accordance with Table 2.1 of AS 1342 unless specified otherwise.

Flush or butt joints shall only be used where required to extend existing culverts. These joints shall be sealed by the Principal.

Testing

The minimum frequency of testing shall be as specified in Table 7.4.

Table 7.4

CLAUSE	CHARACTERISTIC ANALYSED	TEST METHOD	MINIMUM FREQUENCY OF TESTING
3	Cover thickness	AS 1342	One per 25 pipes or part thereof for each size and class
3	Load test	AS 1342 & RTA R6	One per 50 pipes or part thereof for cracking load for each size and class. One per 100 pipes or part thereof for ultimate load for each size and class

1.4 Supply**General**

The Supplier shall implement and maintain a Quality System in accordance with AS 3902 as a means of ensuring that the pipe culvert components conform to the requirements of the Specification.

Requirement

The following information shall be clearly marked on each pipe at the time of manufacture:

- Class of pipe,
- Date of manufacture,
- Manufacturer's name or registered trademark,
- The nominal size of the pipe,
- The TOP of the pipe,
- Inspection status, and

- (g) Any other identification necessary to directly relate the pipe to tested samples e.g. Batch Number.

At least 3 working days before pipe culvert components are scheduled for despatch, the Contractor shall submit a certificate indicating the conformance of the products supplied.

1.5 Installation

Requirement

Installation shall be in accordance with AS 3725 and AS 3725 Supplement 1 with Type HS3 support.

Fill and pipe support terms used in this Specification are in accordance with AS 3725 and Figure 7.1 below.

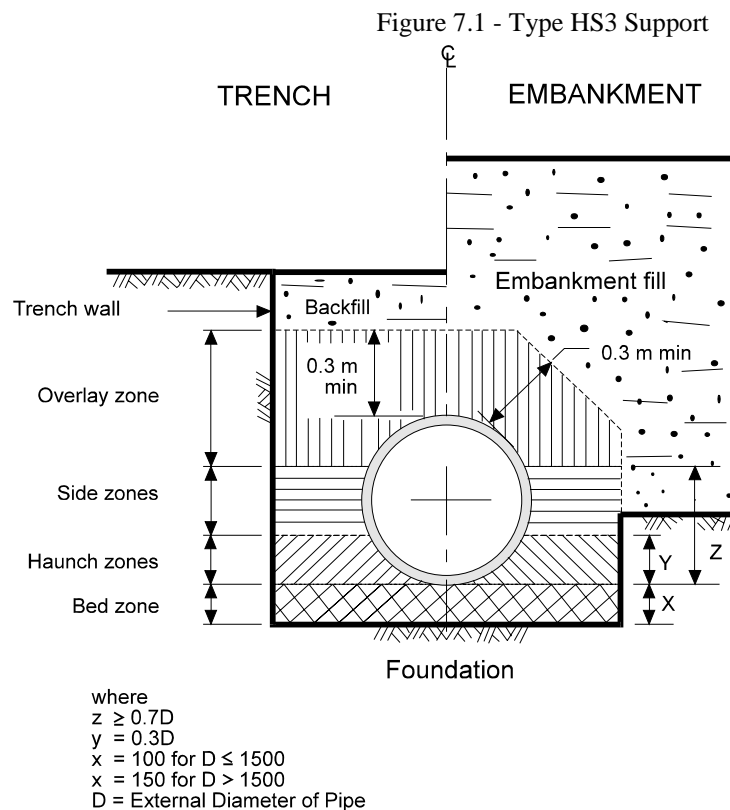
As noted in AS 3725, the side zones shall not be considered to be effective in supporting the pipe unless the trench walls have a density and stiffness not less than those of the adjacent compacted fill, to a height of $0.7D$ above the bottom of the pipe and for a lateral distance outside each trench wall of not less than $2.5D$.

The Superintendent will determine whether the trench walls have sufficient density and stiffness and may direct removal of unsuitable material in accordance with RTA R5 Clause 3 of the Specification.

Where the prior placement of embankment fill is required to provide for Type HS3 Support the fill shall be placed and compacted as part of earthworks construction specified in the Specification for EARTHWORKS.

Pipes shall be installed in either embankment or trench condition as specified on the Drawings.

Where embankment installation condition is specified, the prior placing of additional compacted embankment fill to facilitate installation is permitted subject to conformance with the erosion and sedimentation requirements of the Specification. However, the excavation depth for payment is limited to that specified in Part R5 for Embankment Installation Condition.



Where trench installation condition is specified for pipes in an embankment, the embankment must be completed to the underside of the selected material zone prior to the commencement of the excavation for the pipe unless the Superintendent directs a change to embankment installation condition. Refer to RTA G3 of the Specification regarding the need to shore or bench trenches greater than 1.5 m deep. Note, provision of alternative waterway may be necessary to conform with the erosion and sedimentation requirements of the Specification.

Stormwater drainage pipe culverts shall be laid within 10 mm of the designed grade and within 20 mm of the plan position shown on the Drawings.

Any pipe which is not within tolerance in grade and/or plan position or which settles to outside these tolerances after laying, shall be re-aligned at the Contractor's cost.

Any pipe which is damaged during installation or during compaction of fill shall be replaced at the Contractor's cost.

Pipes shall be laid with the female end placed upstream.

At the discharge end of pipes terminating at pits and headwalls, a 3 m length of 100 mm diameter subsoil pipe shall be laid beside and 100 mm above the invert level of the drainage pipe discharging through the wall of the pit or headwall. The subsoil pipe shall be sealed at the upstream end and shall be enclosed in a seamless tubular filter fabric. The subsoil pipe and filter fabric shall be in accordance with Part R25 of the Specification.

Lifting holes on all pipes shall be sealed by the Contractor to a standard of full structural integrity and durability before commencement of backfilling.

Where flush or butt jointed pipes are used to extend existing culverts, these joints shall be sealed to a standard of full structural integrity and durability by the Contractor.

Fill for bed, haunch, side and overlay zones shall be in accordance with AS 3725 and in accordance with the additional quality, material and compaction requirements in RTA R5 of the Specification.

Where the Contractor proposes to travel construction plant in excess of 5 tonnes gross mass over culverts, the Contractor shall design and provide protective measures for the crossings. These measures shall be shown in the Quality Plan.

1.6 Measurement and payment

General

Payment shall be made for all activities associated with completing the work detailed in this Specification .

The unit of measurement shall be the linear metre measured along the centreline of each particular type of pipe culvert specified and shall be the length installed in the ground. The schedule rate shall include the following:

- (i) Supply of pipes and all other materials,
- (ii) Bedding and all other backfilling and compaction,
- (iii) Laying and jointing,
- (iv) Supply and placing subsoil pipes and filter fabric at pits and headwalls,
- (v) All testing of fill material,
- (vi) All testing of pipes including the cost of all pipes tested to ultimate load.

2 FIBRE REINFORCED CONCRETE DRAINAGE PIPES

2.1 Scope

This Specification deals with the supply of fibre reinforced concrete pipes, including bends, junctions etc, for the conveyance of stormwater by gravity.

2.2 Composition

The pipes and fittings shall consist of an inorganic hydraulic binder or calcium silicate formed by a chemical reaction between siliceous and calcareous material, reinforced by fibres. The addition of process aids and fillers is acceptable provided that they are compatible with the reinforcing fibres and the cement.

2.3 Manufacture

The materials used in the manufacture of the pipes and fittings shall be mixed by mechanical means and the pipes produced from the mixture shall be seamless and of uniform texture.

When the pipes have set sufficiently to permit handling, they shall be cured under pressure in an atmosphere of saturated steam. The ends of each pipe shall then be finished square to the axis of the pipe, and may be turned or otherwise finished internally/externally for a sufficient length along the barrel to ensure accurate jointing.

2.4 Marking

After forming and during the period of setting, the manufacturer's distinguishing mark, the date of manufacture, the nominal size and the class of pipe, as defined in Clause 6, shall be clearly marked on the pipe.

2.5 Finish & workmanship

Pipes shall be free from fractures and cracks wider than 0.1mm and from other defects resulting from faulty materials or faulty methods of manufacture. Dents or bulges not exceeding 3 mm deep or high shall be permitted.

2.6 Classification

For the purpose of designing pipelines, fibre reinforced concrete pipes shall be classified, according to their minimum ultimate crushing loads, into Classes S, X, Y and Z. Pipes and fitting of Classes S, X, and Z shall conform to strength requirement of Table 4 when tested for crushing strength as described in Clause 12 below.

2.7 Diameter of pipes

Pipes shall be listed by their nominal internal diameters. Unless otherwise specified, pipe culverts and drainage pipelines shall be constructed of 375mm, 450mm, 525mm, 600mm, 675mm and 750mm. Smaller sizes, 100mm, 150mm, 200mm, 225mm, 250mm, and 300mm diameter may be used for such purposes as conveying subsoil water to sumps or outlets. A flexural strength test is required on pipes of 150mm or less (See Clause 11).

2.8 Dimensions & tolerances

- a) The actual internal diameter shall not differ from that specified by the Manufacturer by more than the amount shown in Table 7.4 and shall not be less than the nominal internal diameter.

Table 7.4 Permissible Variations in Internal Diameter

Designated I.D. mm	Permissible Variations In Internal Diameter mm
Up to and including 300	± 3
Over 300 up to and including 600	± 5
Over 600 up to and including 1200	± 7
Over 1200	± 12

- b) **Wall Thickness.** The wall thickness, measured at an unmachined section of the pipe, shall not be less than the thickness designated by the Manufacturer.

2.9 Length & permissible variation in length

Pipes shall be supplied in the standard lengths listed in Table 7.5. The end surface of the pipes shall be painted the colour designated in Table 7.5.

Two metre lengths of pipe may, however, be supplied subject to agreement between the Purchaser and the Manufacturer.

The total length of pipe supplied shall not be less than the total length ordered.

Table 7.5 Standard Lengths and End Colour Code

Standard Length (m)	End Colour Code
4.0	No colour
3.85	Orange
3.70	Yellow
3.55	Light Blue
3.40	Dark Blue
3.25	Red and Orange
3.10	Green

2.10 Permissible deviation from straightness & squareness

- a) **Straightness.** When tested by means of a straightedge or line parallel to the longitudinal axis of the pipe, the deviation from straightness shall not exceed 3mm per metre of pipe length for any 1m length of the pipe and the total deviation from straight in the full length of pipe shall not exceed 12mm.
- b) **Squareness.** When measured by means of a try-square as shown in Fig 2, the ends of the pipe shall be square with the walls within 1mm in 200mm of the designated diameter except that for pipes less than 400mm diameter the tolerance on squareness shall be 2mm.

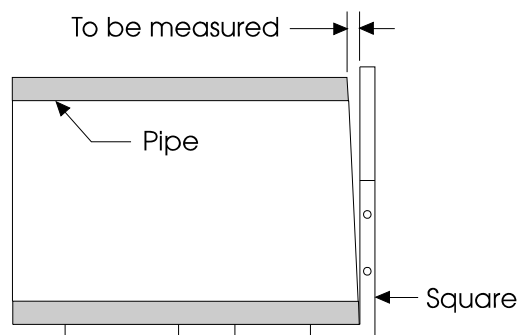


Figure 2 Measurement Of End Squareness

2.11 Flexural strength

When tested according to the method specified in Appendix A, the test sample shall not fracture at loads less than those specified in Table 7.6.

This test shall apply to pipes upto and including 150mm nominal size, manufactured in lengths greater than 3.55 m.

Table 7.6

Nominal Diameter	Minimum Ultimate Flexural Loads(kN)			
	Class S	Class X	Class Y	Class Z
100 mm	1.3	1.5	2.0	2.4
150 mm	3.7	4.3	5.5	6.5

2.12 Crushing strength

When tested in accordance with Appendix B, a test specimen cut from the unturned barrel of a pipe selected for test, shall not fracture at loads less than the test crush loads specified in Table 7.7 for the respective classes of pipe.

2.13 Joints

Four types of joint shall be acceptable (The type of joint required will be specified by the Purchaser).

- a) Rebated Joint - The ends of the pipe shall be machined to form a male rebate at one end and a female rebate at the other end.
- b) Adcol Joint - The ends of the pipe shall be machined and an Adcol socket fitted to one end.
- c) Single Vee Ring Joint - The ends of the pipe shall be machined and an Adcol socket fitted to one end, supplied with a special "V" ring for jointing
- d) Double Vee Ring Joint - The ends of the pipe shall be machined and a separate coupling, complete with two rubber "V" rings, supplied for jointing

Table 7.7DESIGN LOADS T_c^* AND TEST LOADS P_t^{**} FOR CELLULOSE FIBRE REINFORCED CONCRETE PIPES

	CLASS 1 (S)		CLASS 2 (X)		CLASS 3 (Y)		CLASS 4 (Z)	
Nominal Diameter (mm)	Design Load T_c (kN/m)	Test Load at Failure P_t (kN/m)	Design Load T_c (kN/m)	Test Load at Failure P_t (kN/m)	Design Load T_c (kN/m)	Test Load at Failure P_t (kN/m)	Design Load T_c (kN/m)	Test Load at Failure P_t (kN/m)
100	10.0	40.0	13.0	52.0	19.5	78.5	26.0	104.0
150	10.0	40.0	13.0	52.0	19.5	78.0	26.0	104.0
200	10.5	42.0	13.5	54.0	20.5	82.0	27.0	108.0
225	11.0	44.0	14.0	56.0	21.0	84.0	28.0	112.0
250	11.0	44.0	14.0	56.0	21.5	86.0	28.5	114.0
300	12.0	48.0	15.0	60.0	22.5	90.0	30.0	120.0
375	13.0	52.0	17.0	68.0	25.5	102.0	34.0	136.0
450	15.0	60.0	20.0	80.0	30.0	120.0	40.0	160.0
525	17.0	68.0	23.0	92.0	34.5	138.0	46.0	184.0
600	19.0	76.0	26.0	104.0	39.0	156.0	52.0	208.0
675	20.0	80.0	29.0	116.0	43.5	174.0	58.0	232.0
750	21.0	84.0	32.0	128.0	48.0	192.0	64.0	256.0

* T_c is the cracking load of steel reinforced concrete pipe of equivalent class.

** Determined and reported in accordance with Appendix B.

2.14 Bends & junctions

Bends, junctions and associated couplings shall be manufactured from fibre reinforced concrete which shall have similar qualities to that of the pipes. Such fittings may be built from lengths of straight pipe and where this is done, the inside surface shall have a flush smooth finish.

Epoxy resin or other suitable material as agreed between the purchaser and manufacturer may be used for jointing segments of fabricated fittings.

The manufacturer, upon request, shall supply to the Purchaser detailed drawings of the fittings.

2.15 Sampling

- a) Load Tests. For the determination of crushing strength, a sample shall be selected from each batch of 100 pipes, or parts thereof, of the same nominal diameter and class. For pipes of 150 mm diameter or less, a sample shall be selected from each batch of 100 pipes, or part thereof, for the determination of the flexural load.
- b) Hydrostatic Pressure Test. At the option of the purchaser, the pipes shall be subjected to a hydrostatic pressure test. The number of pipes to be tested shall be specified by the purchaser. When tested by the method described in Appendix C, the pipes shall withstand a hydrostatic pressure of 90 kPa without sign of leakage or other defect.

2.16 Testing

The Manufacturer, at his own expense, shall prepare the necessary test pieces and supply labour and appliances for such tests as are specified and these shall be carried out on his premises in accordance with this Specification.

All tests shall be carried out before delivery of the pipes is made. All re-tests required by Clause 17 shall be at the manufacturer's expense.

2.17 Re-testing & rejection

Should any one of the specimens subjected to flexural strength or crushing test, as set out in Clauses 11 and 12 fail to meet these requirements, a number of specimens equal to that originally selected shall be prepared from the same pipes, or from other pipes in the same batch. This second group of specimens shall be subjected to the tests in which the original specimens failed.

Should both groups of specimens fail to pass one or more of the test specified, the whole of the batch represented by the specimens shall be deemed not to comply with this Specification.

END OF SECTION – PIPE CULVERTS

APPENDIX A

FLEXURAL STRENGTH TEST

A1 GENERAL

The flexural strength of pipes shall be determined by testing dry pipes.

A2 APPARATUS

The test apparatus shall consist of two steel bearing blocks each 50 mm long, rigidly supported but free to rotate about a horizontal axis, and two load-applying blocks each 25 mm long. Each block shall have a "V" shape notch at an angle of 120 degrees, and shall be lined with felt or some other resilient material.

A3 TEST PROCEDURE

The test specimen shall rest symmetrically in the notches of the bearing blocks and shall extend at least 25 mm beyond the outer edges of the blocks.

The apparatus shall be accurately aligned and the total load shall be distributed equally between the two load-applying blocks which shall be placed at the third points of the span whereby they are equidistant from each other and from the centre of the adjacent bearing block (see Fig below).

The load may be applied fairly rapidly until half the relevant load is reached and thereafter at a rate of 90 to 130 N/s until fracture occurs.

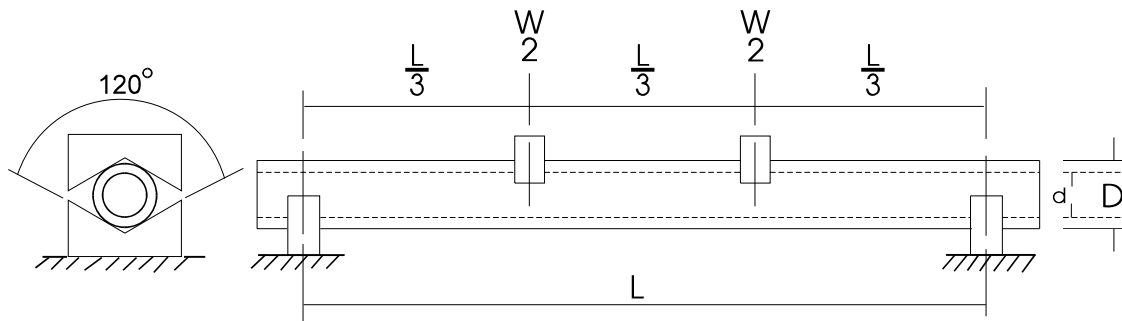


Diagram Illustrating Principle of Appliance
For Bending Strength Test

APPENDIX B

METHOD FOR LOAD TESTING OF PIPES

B1 SCOPE

This Appendix sets out the method for determining the test load at failure of a dry or saturated pipe specimen using the three-edge bearing test (three-line load configuration).

B2 PRINCIPLE

A test specimen is placed between lower and upper press blocks. An increasing load is applied evenly to the test specimen at a constant rate until fracture occurs.

B3 APPARATUS

The following apparatus is required:

- (a) Load testing machine conforming to AS 2193 Grade 4000 capacity capable of applying the required test load without deformation of its parts and capable of measuring the load with an accuracy of $\pm 2\%$ of the true value.
- (b) Hardwood timber bearers with dimensions conforming to those given in Figure B1 with a length not less than the barrel of the pipe being tested. The lower bearers shall be firmly fixed to prevent movement during the test.

The radius, R, of the facing edge of each lower bearer and the distance between lower bearer blocks to D/12 shall be determined within ± 1 mm.
- (c) Strips of rubber of 19 ± 6 mm thickness and of suitable length and width interposed between the bearers and the test specimen. Rubber hardness shall be 50 ± 5 Shore A degrees.
- (d) Gauges for measuring pipe length, diameter and wall thickness.

B4 PREPARATION OF TEST SPECIMEN

The test specimen shall be prepared as follows:

- (a) Cut the test specimen to 300 ± 5 mm in length. Finish the ends of the test specimen square to the pipe axis.
- (b) Ensure that the pipe from which the specimen is cut is surface-dry and free of dust that might obscure a crack.

B5 PROCEDURE

B5.1 Measurement of pipe dimensions

Measure the internal diameter (d), wall thickness (d) and length (L) of the specimen as follows:

- d = mean internal diameter of the test specimen in millimetres with an accuracy of ± 0.5 mm, taken as the average of two measurement at 90° to each other prior to testing.
- d = wall thickness in millimetres with an accuracy of ± 0.1 mm, taken as the average of four measurements equally spaced around the pipe prior to testing.
- L = Length of the test specimen in millimetres with an accuracy of ± 0.5 mm, taken as the average of two measurements taken on opposite sides.

B5.2 Positioning of test specimen

Position the test specimen as follows:

- (a) Interpose strips of rubber of suitable length and width between the press blocks and the test specimen.
- (b) Place the test specimen, 300 mm in length, in the testing machine in such a manner that a longitudinal plane through the vertical diameter of the pipe coincides with a plane containing the line passing through the centre of the upper bearing block and a line midway between the two lower bearing blocks as shown in Figure B1.

B5.3 Application of load

The load shall be applied as follows:

- (a) Apply the load evenly at a steady rate in the range of 150-170 N/s until the load is unable to be sustained.
- (b) Measure and record the maximum applied force (F) indicated by the testing machine, in Newtons.

CAUTION:

1. THE PIPE SPECIMEN SHOULD BE CAREFULLY SEATED ON THE LOWER PRESS BLOCK TO ENSURE EVEN CONTACT ALONG ITS FULL LENGTH AND AVOID POINT LOAD CONCENTRATION. SIMILAR CARE SHOULD BE TAKEN TO ALIGN THE UPPER PRESS BLOCK.
2. ANY WORN OR DAMAGED PRESS BLOCK COMPONENTS SHOULD BE REPLACED IMMEDIATELY.

B6 CALCULATION

Calculate the distributed load at failure (P_t or P_{ts}) as follows:

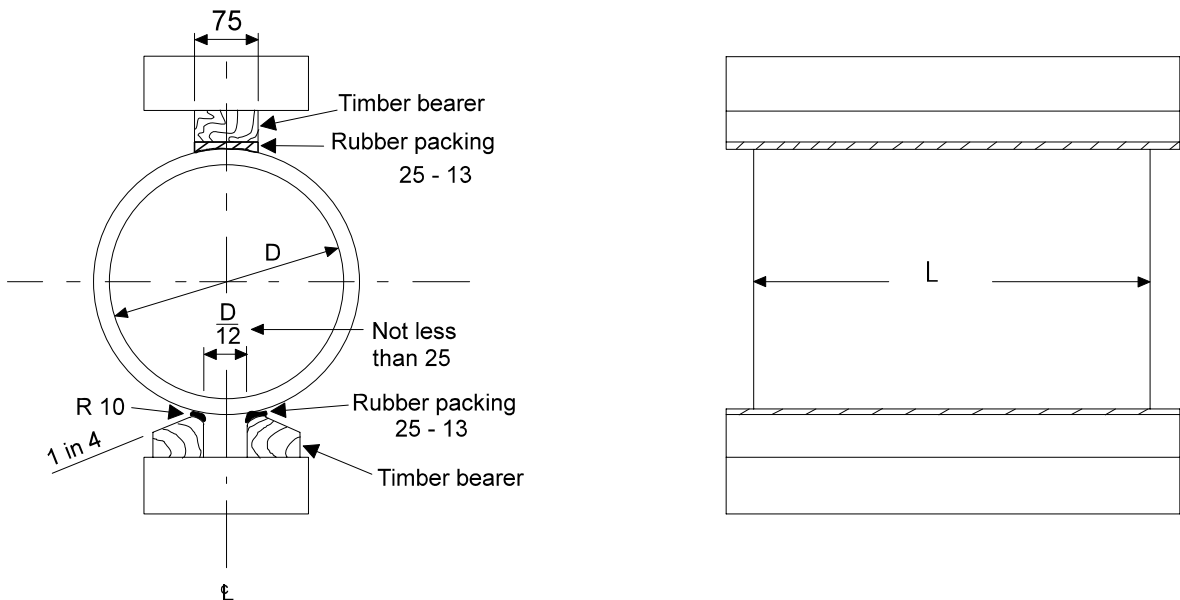
$$P_t \text{ or } P_{ts} = \frac{F}{L} \text{ kN / m}$$

Note: N/mm are equivalent units of measurement to kN/m

B7 TEST REPORT

The test report shall include the following:

- The load at failure (P_t or P_{ts}) of the test specimen in kilonewton per metre to the nearest 0.1 kilonewton.
- The mean internal diameter (d), the wall thickness (d), and the length (L) of the test specimen.
- Identification of batch number and pipe from which the specimen was taken.
- Date and time of test.



All dimensions in millimetres

Figure B1 Diagram Illustrating Apparatus for Load Testing of Pipes

APPENDIX C

METHOD FOR THE HYDROSTATIC PRESSURE TESTING OF PIPES

C1 APPARATUS

The test apparatus shall consist of equipment capable of imparting the necessary sustained hydrostatic pressure to the inside of the pipe. End-covers or end-pieces shall be provided which do not apply end restraint but which close the ends of the pipe tightly so that no leakage will occur through or past them at the test pressure. Means shall also be provided for allowing the escape of air from within the pipe.

C2 PREPARATION OF TEST LENGTH

The test length shall be 300 mm and shall be cut from a sample selected from each batch of 100 pipes or part thereof the same nominal diameter and class.

C3 APPLICATION OF HYDROSTATIC PRESSURE

The pipe shall be surface dry at the time of testing. It shall be supported so that except at the supports, the exterior surface can be readily examined.

Pressure shall be applied gradually to the inside of the pipe until the test pressure of 90 kPa, measured at the lowest point of the pipe, is reached. The test pressure shall be maintained on the pipe for a period equal to 30 seconds for each 10 mm or part thereof of wall thickness of the pipe.

During the test, moisture appearing on the surface of the pipe in the form of damp patches shall not be considered leakage.

If during the test, beads of water appear on the surface of the pipe the pressure shall be maintained on the pipe for an additional period equal to the initial period required for the test, and the pipe shall be accepted if the beads do not grow or run.

8 Roadworks and Drainage

1	General.....	2
1.1	Scope	2
1.2	Extent of Work	2
2	Roadworks	2
2.1	General Requirements	2
2.2	Supply of Materials	3
2.3	Foundation Preparation	3
2.4	Earthworks.....	3
2.5	Road Embankments.....	4
2.6	Selected Subgrade	4
2.7	Subbase and Base	5
2.8	2 Coat Seal.....	6
2.9	Asphaltic Concrete	6
2.10	Safety Barrier	8
2.11	Guide Posts.....	8
2.12	Maintenance	9
2.13	Road failures, possible causes and proposed repair works required.....	9
3	Drainage.....	16
3.1	General Requirements	16
3.2	Table Drains	16
3.3	Concrete Gutters and Drains.....	16
3.4	Pipe Culverts, pipes, inlet and outlets, Headwalls and Pits	16
3.5	Other Open Drains.....	17
3.6	Subsoil Drains	17

8 Roadworks and Drainage

1 General

1.1 Scope

This Section of the Specification includes the following requirements:-

- Supply of materials and construction of new and repair works for the roads and miscellaneous items;
- Supply of materials and construction of associated drainage works.

1.2 Extent of Work

The works covered by this Section relates to roadworks and drainage within the Works areas and includes the following:-

- Supply and installation of surface and subsurface drainage structures.
- Traffic Control.
- Construction of the road.
- Soil and erosion control measures, including catch drains, and diversion drains, shall be constructed around the road extremities before commencing topsoil stripping and any excavation works.

2 Roadworks

2.1 General Requirements

Construct all roads to the lines, grades, dimensions and requirements as shown on the Drawings and in accordance with the requirements of this Section, Section 5 “Environmental Management”, and Section 6 “Earthworks”.

Descriptions of Test Methods having the prefix “T”, Standard Drawings prefixed “MR Drawing No. SD...” and Standard Specifications or Procedures prefixed “MR Form No. ...” referred to in this Specification are available from the Roads and Traffic Authority (RTA), NSW, and are referred to collectively as RTA Standards. Unless otherwise specified, the latest edition current at the date of tender shall apply, where relevant, to this Contract provided that in matters to which reference is made in the Specification, the requirements of the Specification prevail over any provisions of the standard documents from RTA that are inconsistent therewith but only to the extent of such inconsistency.

All testing is the responsibility of the Contractor and is to be performed by NATA registered laboratories. No separate payment will be made for this work. For placed materials the Principal may nominate the location where testing is to be undertaken in addition to any routine control testing program undertaken by the Contractor. Provide certified copies of all test results to the Principal.

The following general tolerances are measured perpendicular to the centreline of the new roads and in a horizontal plane from the vertical plane through the centreline shown on the Drawings or adjusted by the Principal:-

- towards the centreline : 200mm tolerance;
- away from the centreline: 600mm tolerance.

Note: Abrupt changes in the alignment of the road embankment or cutting face will be not permitted.

Do not proceed with further works before obtaining approvals as set out in this Section.

Employ all such equipment and methods as are necessary to construct the roads in accordance with this Specification, the Drawings and/or the relevant Australian Standards and RTA Standards.

Maintain access on existing roads at all times where new roadworks join existing roads. Restrict work areas at junctions of new road deviations with existing roads to the minimum required to construct the new works.

2.2 Supply of Materials

Obtain approved fill materials for road embankments, from the required excavations for the works. Operate all excavation sources in accordance with the provisions of this Section and of Section 6 "Earthworks".

These reports provide information on possible sources for supplies of sand, gravel and crushed rock for selected subgrade, subbase and base, cover material and concrete aggregates. Comply with any requirements of the relevant local government authority related to development of materials sources.

2.3 Foundation Preparation

Prior to placing material prepare the foundation for that section as specified for the particular type of foundation. Prepare foundations for culverts and headwalls as specified in Clause "Pipe Culverts" of this Section.

- (a) Remove topsoil as required in Subsection "Topsoil" of Section 6 "Earthworks", and Section 5 "Environmental Management";
- (b) Undertake excavation to permit placement of design thicknesses of subgrade, subbase and base courses;
- (c) Immediately prior to placing fill material, compact the existing soil surface layer to a depth of 150mm to the density required for the road embankment, as required in Subsection "Road Embankments" below.

After stripping, perform sufficient testing of in-situ foundation material at regular intervals as specified below to demonstrate its adequacy. Testing shall be in accordance with AS 1289 and shall include:

- along road alignments, at least one (1) CBR test per 50m

Submit the test results to the Principal. Based on the results, the Principal will confirm the road design in accordance with the Austroads Pavement Design Guide. Do not commence embankment placement or placement of selected subgrade until the Principal has approved the foundation. The Contractor shall give the Principal at least two (2) days notice that the foundation is prepared for approval.

2.4 Earthworks

Carry out clearing of any trees or vegetation obstructing the works, removal and stockpiling of topsoil, moving and reuse of existing topsoil stockpiles, excavation and disposal of unsuitable materials, salvage of existing culverts for the Principal, blasting (if required), excavation and soil conservation as specified in the nominated subsections of Section 6 "Earthworks" except in regard to tolerances and except that spreading of topsoil and grassing shall be required only in the locations nominated below:-

Batters in cuttings and batters of embankments: Spread topsoil and sow grass on the batters of all sections of embankments and cuttings that are 1 vertical to 4 horizontal and flatter.

Use presplitting techniques with holes at 800mm centres or other spacing, as set out in the approved presplitting plans, in order to achieve the required excavation profile. All blasting work shall comply with subsection "Blasting (If Required)" of Section 6 "Earthworks" and Section 5 "Environmental Management".

2.5 Road Embankments

Provide, place and compact earthfill and selected backfill as required for construction of road embankments.

Select all materials from required excavations for the Works.

- (a) Earthfill shall consist of soil and rock material that is free from stumps, roots, rubbish, topsoil and other objectionable matter and is neither too wet nor too dry for effective placement and compaction in road embankment;
- (b) Selected backfill shall consist of earthfill as defined in (a) above, except that it will be free from particles greater than 50 mm and shall have at least 70 percent by weight passing a 19mm AS sieve and at least 40 percent by weight passing a 2.36mm AS sieve.

After approval of foundation, place and compact material in layers that are horizontal in the direction normal to the road centreline and parallel to the finished surface in the direction of the road centreline. The layers shall be of uniform thickness, as detailed below:-

- (a) Construct embankments with batter slopes as shown on the Drawings;
- (b) Place earthfill in layers with a uniform thickness of 150mm after compaction;
- (c) Use only selected backfill in areas requiring special compaction. Place selected backfill in layers with a maximum compacted depth of 150mm. Place layers simultaneously on both sides of pipe culverts to avoid differential loading. Do not place filling against abutments or wingwalls of concrete headwalls within twenty one (21) days after placing concrete in these structures.

Compact earthfill to not less than 95 percent of the maximum dry density as determined in accordance with Test Methods T111, T119 and T166. At the time of compaction earthfill shall not exceed its optimum moisture content and shall be compacted as dry as practicable using suitable equipment and methods. Routine control testing for density and moisture content may be by the rapid method given by Test Method T162, but acceptance shall be based on the methods given above. Make one acceptance test for density and moisture content from each 100m³ of material placed and make one routine control test for density and moisture content from each 50m³ of material placed. If a routine control test indicates that density or moisture content are unsatisfactory the Principal may order an acceptance test in the vicinity. No extra payment shall be made for any such acceptance test.

Provide special compaction to all areas within one metre of structures, where shown on the Drawings, or specified.

Compaction shall start at the structure and proceed away from it. Use mechanical tampers, vibratory plate compactors or other approved equipment to achieve the required density of selected backfill of not less than 95 percent of the maximum dry density as determined in accordance with Test Methods T111, T119 and T166. At the time of compaction the earthfill shall not exceed its optimum moisture content. Undertake two acceptance tests for density and moisture content of selected backfill at each structure.

2.6 Selected Subgrade

Provide, place and compact selected subgrade material under the road pavement as shown on the Drawings.

Select and process subgrade material from required excavations for road cuttings, import it from the borrow areas or obtain from commercial suppliers.

The selected subgrade material shall be free from all pockets of clay, free from stone with a maximum dimension larger than 100mm, shall have not less than 60 percent by weight of particles finer than 19mm and not less than 30 percent by weight finer than 2.36mm, and shall have a minimum soaked CBR value of 10. The CBR value shall be determined in accordance with Test Method T117A (this method conforms generally to AS1289.F1.1).

The selected subgrade material obtained from the excavated cuttings or imported, shall be either placed directly or stockpiled for future use in the subgrade layer. If necessary, adjust excavation methods to yield suitable selected subgrade material and process the material by removing or breaking down oversized rocks, or by other means, to ensure that the resulting material conforms to the requirements of this clause.

Perform sufficient testing of required excavation areas or borrow areas of commercial suppliers to locate sufficient quantity of the necessary material and to demonstrate its adequacy.

Based on the results of this testing submit for approval proposed excavation areas or borrow areas or commercial suppliers to obtain selected subgrade material. Do not place selected subgrade material until the Principal has approved the source.

Condition material from required excavation, stockpile or borrow areas or commercial suppliers to ensure a uniform moisture content, within the specified range, throughout each layer when placed. All material is to be conditioned prior to loading and hauling to the embankment which may involve such methods as ripping, harrowing, irrigating and mixing in order to obtain the required uniform moisture content. Where there is excessive moisture in the material, work the area as necessary to reduce the moisture content to required levels.

Place the material in approximately horizontal layers not more than 100mm thick when compacted.

Compact each layer of selected subgrade material to achieve a minimum dry density of 100 percent of the Maximum Dry Density of the material as determined by Test Methods T111, T119 and T166. Compact at a moisture content up to 90 percent of the optimum moisture content when tested in accordance with Test Method T111. Make one test for density and moisture content from each 500m³ of selected subgrade that is placed.

Trim the finished subgrade, after compaction, to the required crossfalls. The finish level shall not vary more than 15mm above or 25mm below the design level at any point, and shall not deviate at any point more than 20mm from the bottom of a three metre straight edge laid in any direction on surfaces designed to be planar.

2.7 Subbase and Base

Provide, place and compact the layers of subbase and base material as shown on the Drawings.

Obtain subbase and base material from a source approved by the Principal.

The material shall conform to the requirements of RTA "Supply and Delivery of Base and Sub-Base Materials for Surfaced Road Pavements", MR Form No. 744, for densely graded base and subbase respectively.

Perform sufficient testing of samples from subbase and base material sources to locate sufficient quantities of suitable material and to demonstrate its adequacy.

Based on the test results, submit for approval the proposed sources of subbase and base materials. Do not place any of these materials until the Principal has approved the source.

Maintain the subgrade to the specified grade and cross-section until the subbase is placed. Spread and compact the subbase and base material in two (2) equal and uniform layers to provide a

150mm compacted thickness for each layer to the lines, grades and dimensions shown on the Drawings.

Dump subbase or base material approximately in position, then windrow and turn over to ensure even mixing and spread such that segregation does not occur. Remove any material which segregates during the spreading operations and replace with well-graded material.

Do not spread subbase or base material on water-logged subgrade or subbase. If at any time the subgrade or subbase material should become rutted or mixed with the subbase or base material respectively, remove the unsatisfactory material, replace the removed material with fresh material, reshape and compact again the subgrade or subbase, all such works being carried out at the Contractor's expense.

Adjust the moisture content of the material, prior to compaction, so that it does not exceed its optimum moisture content, determined in accordance with Test Method T111, and is as dry as possible while still being compactable to the specified density.

Compact each of the subbase and the base material to a density not less than 100 percent of maximum dry density when tested in accordance with Test Methods T111, T119 and T166. Make one test for density and moisture content from each 200m³ of subbase and from each 200m³ of base that is placed.

The finished surface level shall not deviate from the bottom of a three metre straight edge, laid in any direction on surfaces designed to be planar, by more than 12mm. Correct any irregularities in excess of this tolerance by loosening the surface, removing or adding base material as required and compacting the area to a uniform surface conforming to the designed cross section and grade.

2.8 2 Coat Seal

Seal with a two-coat bituminous wearing course as shown on the Drawings.

Carry out the bitumen sealing in accordance with RTA "Specification for Sprayed Bituminous Surfacing", MR Form No. 93. The first application of bitumen shall consist of Class 170 hot residual bitumen applied at 1.2 litres per square metre and covered with 14mm nominal size aggregate at 0.01 cubic metres per square metre. After a period of two weeks of traffic use, make a second application of Class 170 hot residual bitumen applied at 0.75 litres per square metre and covered with 7mm nominal size aggregate at 0.006 cubic metres per square metre. Supply and deliver cover aggregates in accordance with RTA "Specification for the Supply and Delivery of Cover Aggregate for Sprayed Bituminous Surfacing", MR Form No. 351. If necessary provide and use cutter oil, flux and adhesion agent in binder, and precoat cover aggregates, according to weather conditions at the time of sealing and character of cover aggregates.

Supply, deliver and lay asphaltic concrete in accordance with RTA "Specification for Supply and Laying of Asphaltic Concrete", MR Form No. 612 and RTA "Specification for Supply and Delivery of Asphaltic Concrete", MR Form No. 953.

Supply, deliver and place reinforced concrete for the boat ramp and access road in accordance with Section 11 "Concrete and Concrete Works".

Do not seal with bitumen or asphaltic concrete until the Principal has inspected the prepared surface of the base course. The Contractor shall give the Principal at least two (2) days notice that the surface is prepared for inspection.

2.9 Asphaltic Concrete

Provide and construct new 40mm asphaltic concrete (AC14) as shown on the Drawings.

Asphalt shall conform to the requirements of Australian Standard AS2150 "Asphalt (Hot Mix)", Australian Asphalt Pavement Association (AAPA) National Asphalt Specification April 2004, and in accordance with RTA Specification R116 "Asphalt". The Contractor shall give the Principal at least two (2) days notice that the surface is prepared for inspection.

Materials

ASPHALT MATERIALS:

Primer: Medium cut back bitumen to AS 2157, containing no fluxing oil.

Primer grade: >

Tack coat mix: 3:2 bitumen emulsion:water.

Bitumen emulsion: To AS 1160

Designation: ARS/170-60.

COURSE AGGREGATE:

Standard: To AS 2758.5.

Type: Clean, sound, hard, angular, of uniform quality, free from deleterious matter.

Crushed slag: Air-cooled blast furnace slag of uniform quality, generally free from vesicular, glassy or other brittle pieces.

Resistance to polishing (wearing course): >50 minimum

Water absorption: >2.5% maximum

Particle density: >

FINE AGGREGATE: Type-Clean, sound, hard, durable particles of natural sand or particles derived from crushed stone, gravel or slag, free from injurious coating or particles of clay, silt, loam or other deleterious matter.

Table 8.1 Aggregate Properties

Property	Test method	Value
Particle shape	AS 1141.14	≤ 25 for wearing course ≤ 30 for binder course and corrective course
Wet strength	AS 1141.22	50 kN
Wet/dry strength variation	-	$\leq 35\%$

BINDER:

Type: Bitumen binder, class 170.

Fibre: >

Reclaimed asphalt pavement: >

COMBINED AGGREGATE GRADING: Provide a quantity of mineral filler at least 2% by mass of the combined aggregates.

Asphalt Mix Design

GENERAL REQUIREMENT: Design the asphalt mix using the Marshall method.

Asphalt mix design: >AC14

Proposed job mix: >Approval Required by Principal

MIX PROPERTIES:

Marshall stability: 4.5 kN minimum.

Marshall flow: 4.5 mm maximum.

Voids in total mix (maximum theoretical density based on apparent specific gravity of aggregates):

- Wearing courses: 3% - 5%.
- Binder courses and 7 mm mixes: 4% - 6%.

Voids in aggregate filled with bitumen:

- Wearing courses: 75% - 85%.

- Binder courses and 7 mm mixes: 70% - 80%.

**Table 8.2 Dense Graded Asphalt
(Light-Medium Wearing Course Mix Type) for AC14**

Sieve Size AS (mm)	Mix Designation
	Percentage passing sieve size (by mass)
19.0	100
13.2	90-100
9.5	72-89
6.7	54-79
4.75	43-69
2.36	28-53
1.18	19-40
0.600	13-30
0.300	9-22
0.150	6-15
0.075	4-7
Total	100
Binder Content (% by Mass)	4.3-6.3

2.10 Safety Barrier

This section of the specification includes safety barriers, terminals, transitions, and delineation, in accordance with RTA Specification R132.

General

Construction of safety barrier systems includes supply, delivery, handling and assembly of components and devices, as well as setting out, and supply and installation of delineation.

The Principal will supply the components listed in Annexure R132/4 and make them available to the Contractor at the locations and dates shown in Annexure R132/4.

The Contractor shall supply all other components and materials necessary to complete the work. Safety barrier systems supported by posts shall be constructed with the posts vertical. Other safety barrier systems shall be constructed with the upright axis normal to the surface at the front of the barrier.

The Contractor shall construct the safety barrier system to form a smooth line vertically and horizontally, when viewed along the line of the system, free from humps, sags, or other irregularities.

Provide and install as safety barrier shown on the Drawings:-

- along edges of the crest of the embankment roadway install Ingal Flexfence (3 Rope) or equivalent in accordance with RTA standards and to the manufacturers instructions.

2.11 Guide Posts

Provide and erect plastic reflective guide posts as shown on the Drawings.

Use posts of the quality and dimensions specified in RTA "Specification for Erection of Guide Posts", MR Form No. 253 and RTA "Specification for Plastic Guide Posts", MR Form No. 880.

Erect guide posts in accordance with MR Form No. 253, except that their location shall be as shown on the Drawings.

2.12 Maintenance

Repair as necessary and maintain the roadworks in good condition for the duration of the Contract. Apply a final one-coat seal prior to Completion.

2.13 Road failures, possible causes and proposed repair works required.

Table 8.3 summarises the details of the road failures, possible causes and proposed repair works required to maintain road safety and serviceability.

Table 8.3 –Failure types, possible causes of the road surface failure and possible repair work required

Failure types	Possible causes of the road surface failure	Possible Repair work required
1. Cracking, Alligator	<ul style="list-style-type: none"> • Age of roadway • Heavy Traffic loading • Interconnected cracks forming a series of small polygons resembling an alligator's skin are called alligator cracks. There are numerous kinds of alligator cracks, some of which are discussed below. In situ investigations must be performed to determine the most probable of several causes of alligator cracking. If poor drainage is implicated, corrections should be made as quickly as possible. Should the pavement be properly drained, then the base is probably inadequate, and the pavement will require reconstruction or a heavy resurfacing. Major resurfacing will also be required if cracking results from the fatigue effect of repetitive heavy truck loads. If the cause of distress cannot be corrected soon and rebuilding of the pavement may be several years in the future, temporary repairs will be required. 	Corrective measures should be undertaken as soon as possible.
1.1. Alligator Cracking without Surface Distortion	Existing surface is badly cracked and loose	Skin patching should be applied when weather permits. This is often a temporary measure and should not be considered a permanent correction of a major problem. Alligator cracking generally requires removal of the cracked pavement and an asphalt patch of at least 100mm in depth.
1.2. Alligator Cracking with Distortion of Intact Surfaces		Where distortion is 25mm or less and the existing surface is intact, a skin patch should be applied. Where distortion is more than 25mm and the existing surface is intact, a tack coat should be applied followed by an Asphalt Concrete overlay.
1.3. Alligator Cracking with Broken Surfaces		Remove old surface, tack area, and repair using Asphalt Concrete. Sound judgment should be used to determine when the existing surface is considered firm (minimum 100kPa bearing capacity required) and should remain in place or when it is considered loose and should be removed before placing the Asphalt Concrete overlay.
1.4. Alligator Cracking with Surface Distortion		This failure should be repaired as follows: a) Cut out pavement and wet material. b) If the base or surface is wet from underneath, install necessary

and Pumping	from cracks or holes in the surface or from moisture coming up through the subgrade.	underdrains to prevent future saturation. c) Prime area. d) Replace with a minimum of 100mm of Asphalt Concrete. e) Compact Asphalt Concrete.
2. Cracking	<ul style="list-style-type: none"> • Age of roadway • Heavy Traffic loading • The following items discussing cracks concern those pavement surfaces underlain by base material and not areas where the surface has been gradually widened over the years until its edge is inadequately supported by a base layer. 	Corrective measures should be undertaken as soon as possible.
2.1. Cracking, Edge	<p>Cracking without surface distortion is usually caused by lack of shoulder (lateral) support. When the surface is distorted, possible causes are more diverse. In some cases, the base layer may be of insufficient quality or thickness to support the traffic loads. Poor drainage is also a frequent cause. Is water getting in from the top, sides, or bottom? Is base failure causing distortion and allowing water to wet the base and/or subgrade? Is a clogged ditch line causing water to seep through porous shoulder material and saturate the base and subgrade?</p>	Corrective measures should be undertaken as soon as possible.
2.2 Edge Cracks without Surface Distortion.		The first step is to correct the problem of lack of lateral support if necessary. For cracks less than 5mm in width, no maintenance is required. A skin patch is sufficient for larger cracks.
2.3 Edge Cracks with Distortion of Intact Surfaces		Where distortion is 25mm or less and the existing surface is intact, a skin patch should be applied. Where distortion is more than 25mm and existing surface is intact, tack area and build up with Asphalt Concrete.
2.4. Edge Cracks with Broken Surfaces		<p>Where the existing surface is badly cracked and loose, regardless of distortion, the old surface must be removed. Prior to replacing the surface, consideration should be given to the necessity of first replacing the base material if it has been pushed up and out into the shoulder. This action will have reduced the amount of base material that remains in place and thus will have reduced the strength of the pavement. If this condition exists, it should be corrected by either replacing the base material or by building up the depressed area with Asphalt Concrete.</p> <p>Sound judgment should be used to determine whether the existing surface is</p>

		considered firm and should remain in place or if it is considered loose and should be removed and replaced. When Asphalt Concrete is used to replace the base material, it should be of equal or greater strength than the material it replaces.
2.5 Edge Cracks with Surface Distortion and Pumping		<p>To repair such distress, take the following steps:</p> <ol style="list-style-type: none"> Remove unsuitable material. Install any necessary under drains. Replace base with a well-graded aggregate. Compact aggregate. Prime area. Replace surface using Asphalt Concrete. <p>When inclement weather prohibits proper repair, try to keep the distressed area filled with cold patch material.</p>
2.6 Joint Crack at Pavement Edge	This distress is caused by wetting or drying action beneath the shoulder surface caused by conditions that trap water and allow it to stand along and seep through the joint between the shoulder and the mainline surface.	If the cracking is less than 5mm in width, no maintenance is required. Otherwise, a crack should be filled with a cutback or emulsified asphalt.
2.7 Joint Crack at Lane Joints	Failure is caused by a weak seam between adjoining spreads in the courses of the pavement.	If the cracking is less than 5mm in width, no maintenance is required. Otherwise, the crack should be filled with a cutback or emulsified asphalt.
2.8 Cracking, Random	The causes of random cracking are numerous and, in its early stages, difficult to determine. Consequences range from severe, such as deep foundation settlement, to slight, such as a construction error or mishap.	Corrective measures should be undertaken as soon as possible.
2.9 Narrow Cracks		For cracking less than 5mm in width, take no action. If associated distress of another type exists, the cracking will progress, and remedial action will ultimately be required.
2.10 Wide Cracks		When random cracks reach 5mm or more in width, remedial action is often required. However, the appropriate action may be difficult to determine. On some pavements, cracking will not progress significantly from year to year. Previous experience and/or the traffic volume and type of pavement may indicate that it is not necessary to take immediate action. Sound judgment should be used when deciding if action should be taken in this case. In most cases, the crack should either be covered with a skin patch or be filled with a cutback or emulsified asphalt and covered with sand.

2.11 Cracking, Reflection	Reflection cracking is caused by vertical and horizontal movements in the pavement beneath overlays that result from expansion and contraction with temperature or moisture changes. Reflection cracking is very apparent where plant mix has been placed over Concrete pavement or where old alligator cracks have propagated up through an overlay or patch.	If reflection cracks are no more than 5mm in width, no maintenance is required. Larger cracks should be filled with a cutback or an emulsified asphalt and covered with sand. Such treatment is seldom permanent when applied to overlays over old Concrete pavement. Continual expansion and contraction of the concrete causes conventionally repaired cracks to reappear quickly. A single course surface treatment over the existing pavement immediately preceding the overlay is a good crack relief measure that minimizes reflective cracking.
2.12 Cracking, Shrinkage	Shrinkage cracking appears on the pavement surface as interconnected cracks forming a series of polygons, usually having sharp angles at the corners. Unlike alligator cracking, which is associated primarily with traffic loading, shrinkage cracking is caused by volume change within the Asphalt Concrete, the aggregate base, and/or the subgrade layers.	If the shrinkage cracking is severe and has seriously weakened the pavement structure, a structural overlay will be necessary to restore it. Most likely, however, the cracking will not be progressive, and a surface treatment - preceded by filling the larger cracks with a cutback or emulsified asphalt - will suffice for surface restoration.
2.13 Cracking, Slippage	Slippage cracks are crescent-shaped cracks that usually point in the direction of traffic movement. They result from insufficient bond between the surface and underlaying courses, caused by dust, oil, rubber, dirt, water, or no tack coat between the two courses.	To repair slippage cracks, neatly remove the unbounded section of the surface, apply a suitable tack, and replace the surface with a high quality Asphalt Concrete. During inclement weather, keep the exposed area filled with cold mix material if it is likely to be a traffic hazard.
2.14 Cracking, Transverse	A transverse crack follows a course approximately at right angles to the pavement center line, usually extending across the full pavement width. Transverse cracks are most often the result of reflection cracking. However, they can also result from stresses induced by low-temperature contraction of the pavement, especially if the asphalt is hard and brittle.	Repair procedures for transverse cracking are similar to those for reflection cracking.
3. Potholes	<ul style="list-style-type: none"> • Age of roadway • Heavy Traffic loading • Potholes occur most frequently during the winter months when it is difficult to make the most desirable repairs. Consequently, it is often necessary to repair potholes in ways that are less than permanent. General patching should not be done during inclement weather except to correct hazardous conditions. Sound judgment must be exercised when making repairs during poor weather conditions. • Potholes are caused by water penetrating the surface and causing the base and/or subgrade to become wet and unstable. They also 	Correct the cause of the problem as soon as possible.

	<p>may be caused by a surface that is too thin or that lacks sufficient asphalt content, lacks sufficient base, or has too many or too few fines.</p> <ul style="list-style-type: none"> • Did you and/or your personnel fail to perform maintenance that would have prevented pothole formation? • If water is the culprit, it is caused by a cracked surface, high shoulders or pavement depressions ponding water on the pavement, porous or open surface, or clogged side ditches? 	
3.1 Potholes in Surface Treatments over Aggregate Base		<p>To repair potholes in surface treatments, take the following actions:</p> <ol style="list-style-type: none"> a) Clean out hole. b) Remove any wet base. c) Shape hole so that it has vertical sides. d) Prime hole. e) Fill hole with Asphalt Concrete.
3.2 Potholes in Asphalt Concrete		<p>To repair potholes in surface treatments, take the following actions:</p> <ol style="list-style-type: none"> a) Clean out hole. b) Remove any wet base. c) Square up pothole so that it has neat lines both perpendicular and parallel to the center line and has vertical sides d) Prime hole. e) Fill hole with Asphalt Concrete.
4 Raveling	<ul style="list-style-type: none"> • Age of roadway • Heavy Traffic loading • Raveling is caused by a dry brittle surface; dirty, dusty, or soft aggregate; patching beyond base material; lack of compaction of surface during construction; too little asphalt in mix; or excessive heating during mixing. 	<p>When a small percentage of the pavement is raveling, repair with a skin patch (this includes edge raveling). When a large percentage of the pavement shows raveling, the pavement should be resurfaced.</p>
5 Channels or Rutting	<ul style="list-style-type: none"> • Age of roadway • Heavy Traffic loading • Channels are caused by heavy loads and high tire pressures, subgrade settlement caused by saturation, poor construction methods, or asphalt mixtures of inadequate strength. 	<p>Corrective measures should be undertaken as soon as possible.</p>
5.1 Intact Surface		<p>Where the depression is 25mm or less and the surface is cracked but still largely intact, skin patch the area. Where the depression is more than 1 inch</p>

		and the surface is cracked but still largely intact, repair with asphalt concrete.
5.2 Disintegrated Surface		Where the surface is badly cracked and loose (regardless of amount of depression), remove the old surface. If the area shows signs of mud being pumped to the surface, remove all wet material, replace base material, compact, prime, and build up with Asphalt Concrete.
6. Others	<ul style="list-style-type: none"> • Age of roadway • Heavy Traffic loading 	Maintenance, especially provision of adequate drainage, signs, guide posts

3 Drainage

3.1 General Requirements

Provide permanent drainage works as shown on the Drawings or as directed by the Principal and in accordance with the requirements of this Section. If any drain becomes clogged or obstructed from any cause, before final acceptance of the Works, clean it out or replace it at the contractors own expense.

Drainage works shall comprise:-

- Table drains;
- Concrete gutters and drains;
- Pipe culverts, pipes, headwalls and pits;
- Other open drains;
- Subsoil drains;

3.2 Table Drains

Construct table drains at the top of cuttings to the dimensions, alignment and grades shown on the Drawings or specified herein. Complete table drains prior to excavation of adjacent works. Table drains shall not be located outside the approved clearing areas.

Locate the invert of catch drains not less than 1.2m from the edge of cuttings, nor more than is necessary to maintain the fall of the drains.

The gradient of catch drains shall be such as will ensure free flow of water, and unless directed otherwise, shall not be less than 0.25 percent nor more than 2 percent. Material excavated from drains shall be placed and compacted (by construction traffic or otherwise) on the lower sides of the drains to form banks and increase the capacity of the drains.

Provide jute mesh lining of table drains in accordance with Section 5 “Environmental Management”, if required.

Where trees exceeding 1.2 metres in girth at 500mm above the ground occur in the line of a drain, neatly divert the drain around the tree; in other cases cut the drain in regular lines, carrying out clearing and grubbing as necessary.

3.3 Concrete Gutters and Drains

Construct concrete gutters and drains of the types shown on the Drawings.

Locate as shown on the Drawings.

Construct as shown on the Drawings and in accordance with RTA “Specification for Concrete Works other than Bridges and Road Pavements”, MR Form No. 738, except that concrete shall be in accordance with Section 9 “Concrete and Concrete Works”.

3.4 Pipe Culverts, pipes, inlet and outlets, Headwalls and Pits

Construct reinforced concrete pipe culverts, pipes, headwalls and pits.

Locate as shown on the Drawings.

Provide flush-jointed concrete pipes and construct culverts in accordance with RTA “Specification for Construction of Concrete Pipe Culverts”, MR Form No. 25 and with the Drawings.

Construct pits and headwalls in accordance with MR Form No. 738 and with the Drawings.

Provide jute mesh lining of inlet and outlet channels to culverts, and diversion drains in accordance with Section 5 “Environmental Management”.

Stormwater pipes: Install the pipelines in compliance with Section TR14 and AS 3725.

Grates: Removable heavy duty cast iron or galvanized gratings from Webforge or equivalent for all road drainage pits.

Headwalls and Wingwalls: Use Humes or equivalent for Headwalls and wingwalls to suit culvert inlet and outlet and install as per manufacturers instructions and AS 3996.

3.5 Other Open Drains

Construct open drains, comprising lead-outs from catch drains and from table drains, drains to protect the upslope toe of embankments, inlet and outlet channels to culverts, and diversion drains.

Locate as shown on the Drawings or as directed by the Principal.

Lead-outs from catch drains and table drains shall have the same cross section at their upstream end as the catch drain or table drain. The section is to become progressively shallower and wider in the downstream direction in order to enable dispersion of the flow so as to discharge onto the natural contours without erosion. The total cross sectional area of the drains shall be maintained to at least 0.13 square metres down to its point of termination.

The gradient of lead-out drains is to be between 1 and 10 percent.

Other open drains shall be 1 metre wide and of minimum depth 150mm and maximum depth 1200mm. Their gradient is to be in the range 1 to 10 percent.

All drains are to be evenly graded so as to not collect sediment or pond water.

Provide jute mesh lining of all other open drains in accordance with Section 5 "Environmental Management".

3.6 Subsoil Drains

Construct subsoil drains, including outlet structures and clean-outs, where required.

Locate subsoil drains to provide drainage to the road pavement and elsewhere:-

- (a) where shown on the Drawings; and
- (b) where directed, due to local ground conditions.

Subsoil drains shall consist of perforated plastic pipes and outlets using Megaflo Flatpipe or equivalent as shown in the drawings and shall conform to RTA "Specification for Corrugated Plastic Subsoil Drainage Pipe for Unloaded Areas", MR Form No. 907. Joints, couplings, elbows, tees and end plugs shall conform to the manufacturer's specifications using the manufacturer's appropriate accessory fittings, unless otherwise approved by the Principal. Drains shall be buried in excavated trenches, bedded and backfilled with either Type A or Type B filter material (see following table). If the surrounding filter material is Type B, the pipe shall also be enclosed in a cylindrical stocking of Sarlon Polyweave 'F', which shall be formed by sewing the filter cloth with a synthetic thread (Terylene or equivalent, not susceptible to rotting).

Place the trenches for subsoil drains beneath the shoulder and 300mm clear of the outer edge of the first bitumen seal coat, or as shown on the Drawings. If transverse drains are required, lay these drains to intersect the longitudinal drains at approximately 45 degrees to their direction of fall.

Construct subsoil drains after the selected subgrade material has been placed and compacted.

Lay subsoil drain pipes in a trench not less than 300mm wide, excavated true to line and grade to a depth of not less than 900mm below the select subgrade finished surface. All subsoil drains shall be graded at not less than one percent slope to discharge into gully pits, through headwalls or through specially constructed outlets. Special outlets are to be constructed in accordance with MR Form No. 738.

Lay the perforated pipe on a 50mm bed of filter material. Backfill consisting of the same type filter material shall be compacted in 75mm thick layers, to top of the selected subgrade level and without damaging the pipe, to a density index to AS1289.E6.1 of not less than 85 percent.

The stocking, when required, shall have an effective internal circumference of 380mm minimum and shall be supplied in lengths of at least 60m. Joints shall be made by overlapping the stocking for 0.5m without disturbance of the sewn seam or seams. The overlapped joint shall then be bound by nylon cord, 2mm diameter, with a series of hitches depressing the overlapped filter cloth into corrugation troughs of the plastic pipe, so that entry of the filter material cannot be made into the plastic pipe through apertures in the joint zone. At pipe ends the stocking shall be wrapped over and tied back. The wrap-over shall be 0.5m long and shall be tied by nylon cord, 2mm diameter, in a similar manner to joint zones so that entry of filter material into the pipe is prevented.

Depending on the materials through which the subsoil drain is constructed, use either one of the filter materials (Type A or B at Table 8.4) each of which shall conform to the grading requirements shown in the table below. Filter material shall be sand consisting of clean, hard, tough, durable, uncoated grains and uniform in quality. The grading shall be checked by Test Methods T201 and T203.

Table 8.4

	AS Sieve Size	6.7mm	4.75mm	2.36mm	1.18mm	425µm	300µm
Type A Filter	Percentage Passing	100	85-100	10-40	0-5	0-2	
Type B Filter	Percentage Passing	100	100	95-100		20-80	0-30

Adopt type B filter material, which requires the use of filter stocking around the drainage pipe, over Type A depending upon the foundation material in which the drain is installed. In rock, rockfill and coarse grained soils with not more than 40% passing 425µm (by inspection only), use Type A filter. In fine grained soils such as clays, silts and very fine sands with more than 40% passing 425µm (again by visual inspection only), use Type B filter with the stocking.

Subsoil drains shall be marked on the ground as follows:-

- Where it is practical, 75 x 75 x 900mm hardwood marker pegs, painted lemon-yellow, shall be placed opposite the start and finish of subsoil drains, and opposite junctions, bends, and sumps if any;
- In rock cutting, or where open concrete gutters are provided, lemon-yellow paint marks, in size approximately 150 x 75mm shall be used to indicate the limits and features of subsoil drainage systems.

Provide clean-outs for subsoil drains, consisting of a short branch of perforated pipe to the surface, at intervals not exceeding 30m. Where the clean-out commences at a run of subsoil drain line, a cap is to be placed over the unused end of the clean-out. A removable cap is to be placed over the end of all clean-out junctions.

Submit to the Principal for approval full details of the following at least 28 days prior to commencing the installation of subsoil drains for the works:-

- filter stocking and sewing thread including wrapping and lapping details;
- graded filter sands Types A and B including the source of the material;
- special outlets including all dimensions, reinforcement details and concrete strength;
- clean-out construction details including caps and marker posts; and
- the layout of all subsoil drains showing lengths, location, discharge points and location of clean-outs.

Do not backfill subsoil drain trenches until the pipe and bedding have been approved by the Principal.

END OF SECTION - ROADWORKS AND DRAINAGE

9 Concrete and Concrete Works

1	General.....	2
1.1	Scope.....	2
1.2	Requirements	2
1.3	Foundation Preparation for Concrete	2
1.4	Blinding Concrete Layer	2
1.5	Construction Joints	2
1.6	Movement Joints	2
1.7	Blockouts and Holes	2
1.8	Waterstops	3
1.9	Expanding Cork Joint Filler	3
1.10	Joint Sealer.....	4
1.11	Preparations for Placement	4
1.12	Protection of Concrete	4
1.13	Benching	4
1.14	Machinery Bases and Grouting	5
2	Repair of Concrete.....	5
2.1	Extent of Work.....	5
2.2	Dry-Pack Repairs	6
2.3	Epoxy Resin Repairs.....	6
2.4	Sack Rubbing.....	7
3	Project Specifics	7
3.1	Concrete Grades.....	7
3.2	Cement	7
3.3	Reinforcement Grades	7
3.4	Supply/Purchase of Concrete	7
3.5	Concrete Construction	7
3.6	Concrete Cascade Channel with Energy Dissapators.....	8

9 Concrete and Concrete Works

1 General

1.1 Scope

This Section of the Specification includes the following requirements:-

- general;
- concrete works;
- project specifics.

1.2 Requirements

All concrete shall comply with the requirements of this Section, the Drawings and AWAQAN National Specification - Water Sections TR10 "Concrete Placement (Civil Works)" and SP45 "Concrete Supply (Civil Works)".

Concreting required under this Contract includes, but is not limited to the following:-

- Inlet Pit structure;
- Surface and subsurface drainage structures, including, gutters, headwalls and culverts;
- Concrete in foundations;
- Blinding concrete of floor;
- Miscellaneous concrete for footpaths;
- Other blinding, mass concrete as required.

Provide a detailed Method Statement at least 14 days prior to pouring concrete giving details of the proposed concrete mixes, including curing compounds if intended. Provision of the Method Statement will represent a hold point on concrete mix/supply work.

1.3 Foundation Preparation for Concrete

Treat as specified in Section "Preparation and Inspection of Foundations" of Section 6 "Earthworks".

1.4 Blinding Concrete Layer

Where shown on the Drawings, place a layer of Grade N20 blinding concrete to the specified thickness on prepared foundation areas as soon as possible after and within 72 hours of excavation and foundation preparation.

Blinding concrete shall be placed on the floor of the cut-off trench for the main embankment immediately after final foundation inspection and approval by the Principal.

Plant and equipment shall not work or travel on the blinding layer.

1.5 Construction Joints

The Drawings do not necessarily show the locations of any or all construction joints that may be required.

Determine the locations where construction joints are required for construction of structures. Include location of construction joints in the Method Statement.

1.6 Movement Joints

Movement joints such as expansion, contraction and partial contraction joints are compulsory joints and their positions shall not be altered without approval of the Principal.

1.7 Blockouts and Holes

All pipes and hole formers which are to be cast into the concrete shall be power tool cleaned and wire brushed to remove all traces of dust, grease, rust and paint prior to the placement of concrete.

Where cored holes are to be grouted to hold pipework, bolts and other fittings, scabble the cored holes and treat with an epoxy compound, such as Hilti CA79 epoxy or equivalent, strictly in accordance with the manufacturer's instructions.

Where fixing bolts to be cast-in are positioned by means of a template, they shall be supplied with a backing nut and a face for secure fixing of the bolt. Cast the backing nut into the concrete.

Aluminium or ferrous structural members built into brick or concrete shall have their contact surfaces painted first with two coats of bituminous paint.

1.8 Waterstops

Unless specified otherwise, water stops shall be of polyvinyl chloride as specified below and as shown on the Drawings.

Waterstops of the internal type shall have a minimum width of 250 millimetres and a minimum thickness of 5 millimetres.

Waterstops are to have sufficient stiffness and are to be installed in a manner such that they remain in the correct position during concreting.

The waterstop material shall have properties at least equal to those listed below:

(a) The material shall be free from surface imperfections, blisters, porosity or other blemishes.

(b) Minimum properties at 25°C:

- Tensile strength - 13.8MPa
- Elongation at break - 285% minimum
- Softness (BS2571) - 42-52

(c) Movement Accommodation:

- Extension - 10mm
- Transverse shear - 20mm.

Waterstops shall be fabricated into the longest practical units at the supplier's works and shall be continuous throughout the structures. Intersections and joints shall be factory made where possible.

The waterstops shall be installed so that they are securely held in their correct positions during the placing of the concrete which shall be fully compacted around the waterstop so that no void or porous areas are left. Where reinforcement is present, adequate clearance between it and the waterstop shall be provided.

No holes are to be made through the body of the waterstop.

Jointing other than by welding using a temperature controlled apparatus will not be permitted and use shall be made of all necessary moulded or prefabricated intersection pieces. Care shall be taken that ribs, fins and central bulb match up exactly and continuously at joints.

1.9 Expanding Cork Joint Filler

Where shown on the Drawings, provide expanding cork complying with ASTM D1752 (Type III) for preformed expansion joint fillers for concrete paving and structural construction. Install in lengths as long as the application will permit and to the manufacturer's instructions. Thicknesses used shall be as shown on the Drawings.

The joint filler shall:-

- (a) be a self expanding cork joint filler of cork granules bound by suitable resins and moulded to form strips;
- (b) expand in contact with moisture;
- (c) be capable of recovering at least 90% of its original thickness after compression;
- (d) be fixed to the required dimensions of the joint cross section;
- (e) provide a firm base for the joint sealer;
- (f) be placed immediately before placing concrete.

Any filler swollen by water or moisture prior to placing concrete shall be rejected.

Install joint fillers fully in accordance with the manufacturer's instructions for each particular application.

1.10 Joint Sealer

Construct joint recesses to the dimensions shown on the Drawings with a tolerance of -10%, +20%. In no case shall the width to depth ratio be less than 2:1.

Cut out all defects in joint recesses and repair using a solventless epoxy paste such as Hilti CA273 or equivalent, applied with a mixing ratio of 1:1.

Clean all joint recesses by angle grinding, mechanical wire brushing or other approved method to remove laitance and contaminants etc., which may impair adhesion of the sealant. All joint recesses shall then be air jet cleaned to remove dust etc., and dried before application of the primer.

Prime all joints with a two part epoxy primer such as Expandite Primer No. 23 or approved equivalent. Apply primer strictly in accordance with the manufacturer's instructions.

Apply a tape bond breaker recommended by the sealant manufacturer to the base of all movement joint recesses for their full width immediately before application of the sealant. Do not apply a bond breaker tape to construction joint recesses.

The sealant to be used in all floor and wall joints shall be a two part polyurethane such as Secoseal 200 or approved equivalent.

Mix and apply the sealant strictly in accordance with the manufacturer's instructions.

The priming and sealing of all joints shall be carried out by personnel recommended by the sealant manufacturer as being experienced in the use of specified sealants. Provide evidence in this regard to the Principal prior to work being carried out.

Tape all exposed joints prior to application of primer and sealants to give straight edges to applied sealant upon completion. Joints in water retaining structures above a level of 300mm below top water level shall be considered exposed.

1.11 Preparations for Placement

Immediately before placing concrete, all surfaces upon or against which the concrete is to be placed, shall be free from standing water, mud and debris. Surfaces of existing concrete against which concrete is to be placed shall be cleaned with air and/or water jets. All surfaces of forms and embedded materials that have become encrusted with dried mortar or grout from concrete previously placed shall be cleansed of all such mortar or grout before the surrounding or adjacent concrete is placed.

Ensure the surfaces of construction joints are clean and damp before covering with fresh concrete and mortar.

Ensure the surfaces of contraction joints are cleaned thoroughly of accretion of concrete and foreign material by scraping, chipping or other approved means.

1.12 Protection of Concrete

Protect the concrete from damage due to load over stresses, heavy shocks and excessive vibrations, particularly during the curing period. Do not place construction loads on self-supporting structures which will overstress them. Provide calculations to justify the adequacy of the structure to sustain any construction loads.

Protect finished concrete surfaces from damage from any cause, including mortar splashes and stains, timber stains, rust stains, chemical attack, additives, curing compounds, protective coatings, rain, running water, and the like.

Avoid damage by traffic and other operations to coatings of curing compound for a period of not less than 7 days under any circumstances and preferably not less than 14 days generally after application of the curing compound (if approved to be used). Where construction operations make it impossible to avoid traffic over surfaces coated with curing compound, protect the membrane by a covering of sand or earth not less than 25mm in thickness or by other effective means. Only apply such a protective covering after the membrane is completely dry. Before final acceptance of the work, remove the protective covering without damage to the underlying compound and concrete surface.

Concrete is liable to be rejected if visually important surfaces are damaged during removal of the protective covering. The Principal may reject the concrete if surfaces are damaged

1.13 Benching

The contact area between mass concrete used to provide a slope to a floor surface, and the structural concrete of the floor, shall be a construction joint.

Benching shall have a minimum thickness of 25mm.

Cement content of the mix shall be the same as that of the structural concrete being benched. A maximum water/cement ratio of 0.5 and aggregate size of 10mm is to be used. Apply Hilti CA79 epoxy or equivalent on the prepared surface prior to placing. Mix design and placing shall be such as to ensure the benching is dense, uniform and the surface smooth and free from blemishes.

1.14 Machinery Bases and Grouting

Construct bases to take machinery and pipework to the dimensions supplied by the manufacturer. The mounting surface of the base shall be steel floated to true and level planes.

Prepare the structural concrete on which the bases are to be erected by scabbling and cleaning off.

Tie bases to the structural concrete with vertical reinforcement. Horizontal reinforcement shall also normally be required at the level of the pockets for the holding down bolts. Where starter bars have not been provided, remove the structural concrete sufficiently to permit the base reinforcement to hook around the main reinforcement.

Provide all necessary boxouts and pockets for pipes, electrical cables, machinery and holding down bolts.

2 Repair of Concrete

2.1 Extent of Work

Correct all imperfections on the concrete surfaces to produce surfaces conforming to the "Surface Finish" requirements from "Concrete Construction" of Subsection 3 "Project Specifics" of this Specification. Employ only skilled workers to perform this work.

Unless otherwise approved, perform all repairs to concrete surfaces, except where grinding back protrusions is required, within 24 hours after removal of formwork or in the case of unformed surfaces; within 24 hours after placement. If not done within 24 hours, repairs shall be done using epoxy mortar as specified herein.

Remove all fins and encrustations to provide a neat surface where F2 or F3 Finishes are specified and remove all encrustations on unformed surfaces where U2 or U3 Finishes are specified. Where bulges and abrupt irregularities protrude outside the specified limits use bush-hammering and grinding to reduce to required profile.

Choose the method of repair to suit the type of damage or imperfection as set out below:-

REPAIR METHOD	TYPICAL AREA OF APPLICATION
Dry-pack	filling holes with a depth greater than the least surface dimension. filling narrow slots cut for repair of cracks. plugging form tie recesses.
Pneumatically Applied Mortar	repair defects which are too wide for dry-pack and too shallow for concrete filling. Depth limited to the far side of reinforcement nearest the surface.
Concrete Filling	filling holes extending through entire section. filling holes larger than 0.1m ² and deeper than 20mm. filling holes larger than 0.05m ² extending beyond the nearest layer of reinforcement.
Epoxy Resin Repairs	all repairs not performed within 24 hours of either form removal or placement as specified.
Sack Rubbing	to provide required uniformity of appearance for specified finish, or to mask aggregates in areas ground back.
Grinding or Scabbling	removal of protrusions which exceed the appropriate tolerances.

removal of abrupt irregularities in F3 finish by grinding to a level of 1 to 20.

2.2 Dry-Pack Repairs

Dry-pack shall be composed of a mix of 1 part of cement by volume, to 2½ parts by volume of fine aggregate passing a 1.18mm AS Sieve, together with enough water to produce a mortar which will just stick together when moulded into a ball by a light pressure of the hands and will not exude water, but will leave the hands damp.

Place and pack dry-pack into undercut holes in layers each having a thickness of approximately 10mm. Pack with a hardwood stick struck with a hammer to compress the dry-pack thoroughly into contact with the surfaces of the hole.

2.3 Epoxy Resin Repairs

- (a) Epoxy Bonded Repairs: Use an approved unfilled solventless epoxy resin specifically formulated by the manufacturer as a wet to dry concrete bonding medium between concrete and the repair material which can be dry-pack mortar, shotcrete or concrete;
- (b) Epoxy Filled Repairs: Use an approved previously filled epoxy resin or an unfilled resin to which is added an approved filler to form the repair material. When adding filler determine by prior trial the proportions of resin that will just fill the voids within the filler so as to avoid a flush of unfilled resin at the top of the repair due to settlement.

Perform epoxy resin repairs as follows:-

- (a) Chip back all imperfections to be repaired with epoxy resin to sound concrete and trim the edges of the holes square for a minimum depth of 25mm for epoxy bonded repairs and 3mm for epoxy filled repairs;
- (b) Immediately prior to carrying out a repair, clean the surface of the concrete to be repaired of all contaminants by grit blasting or scabbling, to give a clean, sound, dry, roughened and dust free surface with the surface temperature not less than nor more than that recommended by the manufacturer;
- (c) After preparation, use the following procedures to complete the repairs:
 - (i) Epoxy Bonded Repairs: Cover the surface of the area to be repaired with a thick coat of the approved unfilled solventless epoxy resin, prepared, batched and mixed in accordance with the manufacturer's instructions and thoroughly brushed into the surface.

Immediately place the repair material and finish to the required standard. Cure the repair in accordance with Clause "Curing" of AWAQAN National Specification - Water Section TR10 "Concrete (Civil Works)".

Remove epoxy resin which has become "tacky" before the repair material has been placed against it and prepare the surface again to the satisfaction of the Principal;

- (ii) Epoxy Filled Resin: Where required by the Principal, apply a bonding coat of an unfilled, solventless epoxy resin on the prepared surface. The resin will preferably be the same as that used in the repair but in any event shall be advised as compatible therewith by the manufacturer. Place the repair material, consisting of an approved filled resin or an unfilled resin with sand or other approved fillers added on sites, prepared, batched and mixed in accordance with the manufacturer's instructions, and give a smooth finish.

Provide suitable forms with a bond breaker as necessary to prevent sagging or sloughing of repair material.

Dispose of any unused epoxy resin, either filled or unfilled, when it loses its plastic condition. Excess or spilled resin on exposed finished surfaces shall be cleaned immediately while the resin is in a plastic state.

2.4 Sack Rubbing

Thoroughly wet the surface and commence sack rubbing whilst still damp. Use mortar consistency of 1 part cement, 2 parts sand passing 0.600mm AS Sieve and enough water to give the mixture a creamy consistency. If necessary blend in white cement to obtain a matching colour with surrounding concrete. Rub the mortar over the area with clean burlap or a sponge rubber float so as to fill all pits. While mortar in pits is still plastic, rub over the surface with a dry mix of the above proportions and materials. When sack rubbing is complete continue with curing of concrete.

3 Project Specifics

3.1 Concrete Grades

Use concrete grades as follows:-

S40, S32, S25 and N20. Refer to the table below at Subsection 3.5.

3.2 Cement

Use only Type GP or SL cement, as specified.

Do not use any admixtures or flyash without written approval by the Principal.

3.3 Reinforcement Grades

All reinforcement shall be Grade D500N reinforcing bars and Grade D500SL reinforcing mesh complying with AS/NZS4671.

3.4 Supply/Purchase of Concrete

Non-structural concrete to AS1379.

Structural concrete to AS1379 and AWAQAN National Specification - Water Section SP45 "Concrete Supply (Civil Works)" Table 9.1.

Table 9.1

REQUIREMENT FOR CONCRETE		SP45 Clause	CONCRETE TYPE			
Class and Grade			S40	S32	S25	N20
MATERIALS and MIX	Cement Type	3.1	SL	SL	SL	GP
	Minimum Cement kg/m ³		380	360	300	-
	Maximum Cement kg/m ³		-	-	-	-
	Maximum Fly Ash kg/m ³		-	-	-	-
	W/C Ratio Maximum		0.45	0.5	0.5	-
	Admixture Types	3.1	-	-	-	-
	Laboratory Trial Mix Required: Yes/No	4.2	Yes	Yes	No	No
CHARACTERISTIC STRENGTH MPa	f _c 28 days	2.1	40	32	25	20
OTHER	Nominal Slump (mm)	2.1	80	80	80	80
	Drying Shrinkage (strain x 10 ⁻⁶) at 3 weeks or {8 weeks}	2.1	500 {600}	500 {600}	-	-
	Air content %	2.1	-	-	-	-
	Pumped Concrete Accepted: Yes/No		Yes	Yes	Yes	Yes

Coarse aggregate shall be suitably graded, with a maximum nominal size as shown on the Drawings, generally 20mm for all structures, except the Intake Structure plug, tower and deck, and the gravity retaining walls at the valve house, where 40mm maximum size is permitted.

3.5 Concrete Construction

To AWAQAN National Specification - Water Section TR10 "Concrete Placement (Civil Works)" Table 9.2.

Table 9.2

REQUIREMENT FOR CONCRETE		TR10 Clause	CONCRETE TYPE			
Class and Grade			S40	S32	S25	N20
CHARACTERISTIC STRENGTH MPa	Pre-stressed Concrete, Compressive at Transfer	6.5				
OTHER	Curing Compound Accepted Yes/No	5.9	No	No	Yes	Yes
	Minimum Period Between Adjacent Pours (Days)	5.1			-	-
SURFACE FINISH	Locations:	5.7 5.8	As per table below			

Obtain approval from the Principal for the use of any curing compounds.

Unless advised or approved otherwise, comply with Table 9.3 of concrete surface finishes.

Table 9.3

No.	Structure or Element	Strength	Finish
1.	General		
	Blinding concrete	N20	U2
2.	Excavation and Diversion		
	Intake pit base	S32	U2
	Pipe encasement and all drainage structures	S32	U2
3.	Grouting and Foundation Preparation		
	Dental Concrete	N20	U2
	Mass Concrete	N20	U2
4.	Embankment Construction		
	Dish drains	S32	F2
	Pits	S32	F2
	Footpaths and roads	S32	F2
5.	Spillway Construction		
	Spillway	S32	F2
6.	Inlet/Outlet Works		
	Type A Energy Dissipater	S32	F2
	Headwalls and Wingwalls	S32	F2
7.	Pipelines/Culverts	S32	F2
8.	All Other Concrete Structures	S32	F2/U2

3.6 Concrete Cascade Channel with Energy Dissipators

General

The surfaces of the concrete channel, dissipator and downstream baffle blocks will be subjected to high velocity water impact and flow. Highly durable and high quality finish concrete is therefore required in the concrete cascades and dissipators.

Establish all additional necessary procedures and exercise particular care in forming the surfaces of the dissipator and in placing concrete in associated structures, so as to ensure the highly durable and high quality finish concrete is achieved. Place concrete in the dissipator structure in a single operation. Construction joints are not permitted.

Comply with all other requirements of this. This section shall take precedence where requirements differ.

Submit at the time of tendering full details of procedures for the placement of concrete in the dissipator chamber indicating the methods and additional precautions to be taken to achieve

9. CONCRETE AND CONCRETE WORKS

first class high quality concrete in these structures. Details of procedures to be provided shall include (but not necessarily be limited to) those for forming, placing, finishing, curing, protection from drying and protection from rain and other adverse weather.

Testing

Carry out sampling for compressive strength testing. Frequency of sampling shall be one in 8m³.

Finishes

The formed surfaces of the dissipator shall be Class F3 and the internal unformed surfaces Class U3, except that gradual irregularities shall be less than 3mm and blow hole depths shall not exceed 3mm. Ensure that the concrete surface texture (including repairs) is even throughout the structure. Repair blow holes which have a dimension in excess of 3mm.

Evaluate the surfaces of the dissipator in accordance with Section 5.6 of AS3610, including the provision and use of test panels as noted in Section 3.6 of AS3610. Perform evaluations only in the presence of the Principal.

Concrete Supply

The concrete type shall be S40 using Type SL cement.

Submit for approval, at least 28 days prior to the commencement of trial mixes, details of the proposed mix design together with supporting data. Provide full details of all proposed admixtures and give adequate reasons why each one should be used.

Establish concrete mix proportioning on the basis of laboratory or field trial batches at least 28 days prior to the first pour for the dissipator chamber, and using Class S40 concrete. Make the trial batches using the project materials and in the presence of the Principal. Use a trial batch size which is representative of the batch size to be used in the construction. Carry out slump tests and compressive strength tests on each trial mix at 7 days, 14 days and 28 days. Determine the final concrete mix requirements (appropriate proportions, dosages and mix methods of all materials) from the results of the trial batches. Submit the results of the trial mix testing and the final concrete mix design to the Principal for examination at least 21 days prior to the commencement of the first pour for the dissipator chamber.

Reinforcement

Accurately place reinforcement as shown on the Drawings and tie together to form cages of sufficient rigidity such that bars are not displaced by the weight of overlying steel or subsequent concreting operations.

Unless stated otherwise on the Drawings, the minimum concrete cover to reinforcement for all dissipator chamber internal faces shall be 100mm. However cover to reinforcement in the upstream baffle shall be 75mm on the downstream face (inside the dissipator box) and 60mm on all other surfaces.

Provide sufficient and strong enough spacers to ensure that they are not shaken loose during concreting and that the cover is not lost. Design the spacers to minimise obstruction to concrete flow in the cover region, but to maximise obstruction to future moisture movement along the concrete-spacer interface.

Placing Concrete

Notify the Principal 2 days in advance of the proposed time of concrete placement. Place concrete only in the presence of the Principal. Do not place concrete until all formwork, blockouts, reinforcement, other items to be embedded in the concrete and preparation of surfaces involved in the placement have been approved by the Principal.

Ensure that the placing temperature of the concrete is in the range of 5°-25°C and that this range is not breached prior to the commencement of curing. Before placement is commenced, ensure that the temperature of the formwork, reinforcement and any concrete base is at a minimum of 5°C and also within 10°C of the temperature of the fresh concrete.

The ambient temperature during placement shall not exceed 30°C.

Place the concrete continuously in layers in a systematic and uniform manner. The concrete shall be of suitable consistency for each layer to be worked from under each pouring head, through and around the reinforcement, until the advancing face merges with the advancing faces from adjacent pouring heads, without the concrete being segregated in the process. The consistency shall also be such that, even at the water content corresponding to the

9. CONCRETE AND CONCRETE WORKS

maximum allowable slump, the properties of the upper layers of concrete shall be the same as those of the lower layers.

Apply sufficient vibration energy in a suitable manner and sequence to ensure that all the concrete is fully compacted and thoroughly knit in with the underlying layer.

Curing And Protection

Cure concrete continuously for a minimum period of 14 days.

Repair Of Concrete

Concrete failing to meet the requirements of the Specification in any way may be subject to rejection. Rejected concrete shall be removed and replaced. Concrete may only be repaired with the approval of the Principal. Repair requirements will be stringently enforced for areas of defective concrete and surface finish. Notify the Principal as to the intended time and nature of any concrete repair.

Repair concrete only in the presence of the Principal.

Upon stripping of the forms, inspect the surface of the concrete for defects in the presence of the Principal.

Excavate out all defects to a depth 50mm behind the reinforcement and repair as specified in Section 2 "Repair of Concrete". Submit for approval the proposals for rectifying defects before any such repair work is carried out. Design repair methods must ensure that any replacement concrete is of at least equal quality to the surrounding concrete, and that there is no potential moisture path formed between the original concrete and the repair.

Evaluate repairs to the internal surfaces of the dissipator chamber in accordance with Section 5.6 of AS3610. Perform evaluations only in the presence of the Principal.

END OF SECTION - CONCRETE AND CONCRETE WORKS

10 Geotextile

1	General	2
2	Test Criteria	2
3	Product Information.....	2
4	Installation	3

10 Geotextile

1 General

Geotextile required for the works shall be a non-woven, needle-punched product consisting of strong, rot-proof polymeric yarn or fibres, which retain their relative structure during handling, placement and service. The geotextile shall be indestructible by micro-organisms and insects. The surface of the geotextile shall be of sufficient roughness to prevent rockfill from sliding on design slopes.

Only Class 1 geotextile will be used in this contract as specified below. Geotextile is to be placed beneath filter materials, rockfill gabions, mattress and enable provision of a platform over soft foundations.

2 Test Criteria

Tests and their source reference listed below will be used to define geotextile performance requirements.

Mass	-	AS3706-1
Trapezoidal Tear	-	AS3706-3
Drop Cone	-	AS3706-5
Pore Size (EOS)	-	AS3706-7
Permittivity	-	AS3706-9

Geotextiles shall comply with the following requirements.

Density

Material shall have a specific gravity of 1.05 or greater.

Resistance to sunlight

Geotextile shall be UV stabilised rated to retain a minimum of 80% of strength after exposure to 60,000 Langley's of solar radiation.

Chemical resistance

Geotextile shall be unaffected by water with a pH of between 3 and 10, which will also be supersaturated with salts, including sulphates and chlorides.

The tests properties are given in Table 10.1.

Table 10.1 Requirements For Geotextiles

TEST / PROPERTY	SPECIFICATION	
	Class 1	Class 2 (not used)
Mass (g/m ²)	500 (min)	260 (min)
Trapezoidal Tear (N)	720 (min)	450 (min)
Drop Cone (mm)	12 (max)	20 (max)
Pore Size (micron)	170 (max)	170 (max)
Permittivity (sec ⁻¹)	1.0 (min)	1.0 (min)

3 Product Information

The Contractor shall submit with the tender documents, the manufacturer and grade of the materials that the tendered price(s) is based on and shall supply evidence from the manufacturer that the product satisfies all the requirements of this Specification. Such evidence shall be in the form of verified test results from a NATA certified laboratory experienced in this field of testing. If required by the Superintendent, the Tenderer shall arrange for samples of each geotextile to be supplied for inspection.

Except where a geotextile proposed by the Contractor does not satisfy the requirements of this Specification, the brands and grades of geotextile proposed at the time of tendering and accepted by the Superintendent shall not be varied.

4 Installation

Exposure

Geotextile should be wrapped in black protective wrapping during transportation, delivery and storage and shall not be unwrapped until required. Immediately prior to laying, the area shall be free of all foreign matter which may damage the fabric during installation. Vehicles or plants shall not be driven on exposed geotextiles and care should be taken during laying to avoid puncturing

Geotextile should not be left exposed to sunlight unless during placement.

Laying

Geotextile shall be placed and secured such a way that movement due to wave and current action does not occur. In any case, not more than four (4) tides shall occur between placing of the geotextile and placing of fill over it. Geotextile that is not covered within this period shall be removed and replaced by the Contractor at his own expense.

Geotextile shall be extended beyond the lines as shown on the drawings to ensure that settlement and expected long term scour does not result in loss of geotextile protection behind relevant fill or rockfill layers. Required minimum extensions of geotextile beyond the lines shown on the drawings are, where relevant:-

Earthfill	2 metres
Toe of Rockfill	2 metres
All other locations	1 metre

Additional geotextile extensions may be required and it shall be the responsibility of the Contractor to assess and make allowances for these requirements.

Laps

Geotextile shall be laid in a continuous row down the slope without any joints or seams unless specifically approved by the Superintendent. If such laps are approved they shall be a minimum of 2 metres in length.

Laps between rows or rolls of geotextile shall be a minimum of 0.5 metres, or alternatively rows or rolls may be jointed with approved pre-sewn joints.

Where the Contractor wishes to use large pre-sown mats, the Superintendent may give consideration to the geotextile material running longitudinally along the bank. A requirement of this material orientation is that the pre-sewn joint be as strong as the parent geotextile material.

Minimum lap requirements shall be maintained during placement of the geotextile and subsequent placement of various classes of fill and rockfill.

Repairs

Sections of geotextile with cuts or tears in excess of 100mm in any direction from any cause whatsoever shall be removed and replaced by the Contractor at his own expense. Minor tears may be accepted at the Superintendent's discretion by covering with additional geotextile, of the same type, placed with a minimum of 0.5 metre overlap in all directions.

Securing

When placing geotextile underwater, adequate securing in position shall be ensured by weighting or anchoring of the geotextile. Such securing shall be in accordance with the manufacturer's specifications, if any, and subject to the approval of the Superintendent.

The top of the geotextile, in all cases, shall be secured or restrained in position, allowing for movement during covering and resulting in the specified minimum extension beyond the fill or rockfill following completion of covering.

Trimming

The extension of geotextile beyond the extent of works shall be cut off neatly. Trimming shall be carried out following approval by the Superintendent just prior to practical completion.

Recommendation

Use Bidim A34 from Geofabrics Australia or equivalent.

END OF SECTION - GEOTEXTILES

11 General Landscape Works

1	General.....	2
1.1	Cross References.....	2
1.2	Scope Of Works.....	2
1.3	Standards.....	3
1.4	Interpretation.....	3
2	Quality	3
2.1	Inspection.....	3
2.2	Samples.....	4
2.3	Submissions	4
3	Site and Soil.....	4
3.1	Preparation	4
3.2	Subsoil	5
3.3	Topsoil	5
3.4	Fertiliser	6
4	Plants	6
4.1	Planting	6
4.2	Mulching.....	7
4.3	Turfing	7
4.4	Tree Surgery	8
5	Irrigation.....	8
6	Completion	10
6.1	Planting Establishment.....	10

11 General Landscape Works

1 General

1.1 Cross References

General

Conform to the Section 3 “*General requirements*” and for V-Drain and all disturbed works area.

REQUIREMENT: Prepare and place topsoil over the following areas:

- V-Drains
- Temporary access roads where such have not been directed to be left in place as provided in subsection “Access to Work”.
- Contractor’s areas.
- Disturbed areas beside site works.
- Stockpile sites.
- All disturbed areas beside, at, or associated with the site.

Preparation

ACCESS: Remove temporary roads, as required by the Specification, including all gravel, stones, cobbles, rocks and the like from access roads and surrounding land.

RIPPING: Deep rip disturbed works areas to a depth of 150mm, except where the area is a Road embankment or batter.

EMBANKMENT: Carefully remove all material placed over or against Embankment, to expose the pre-existing surface. Where any disturbance is made to the Embankment back fill, backfill with shell materials and where necessary, to reinstate the Embankment profile. Place backfill in layers not exceeding 150mm loose thickness and compact to no less than 95% of Maximum Dry Density at moisture contents $\pm 3\%$ of Optimum Moisture Content.

Topsoil

SOURCE: Obtain topsoil from stockpiles. If sufficient topsoil is not available from these sources, import additional weed free topsoil as required from an approved source and all such work is deemed to be included in the Contract price.

PLACEMENT: Spread topsoil over the area and to depths as specified:

- 150 mm on flat areas
- 150 mm on slopes

Trim topsoil so placed to a uniform surface such that runoff is not concentrated and ponding does not occur.

Tyne, harrow or disc topsoil to loosen all surfaces to a depth of 50mm immediately prior to seeding.

Related worksections

Conform to associated worksections as follows:

- Stormwater

1.2 Scope Of Works

The work covered at this section of the specification generally includes, but not limited to, all landscape work within the contract work area as shown on the drawings and listed below:

- Weed control and removal of all weed & grass species within the contract area.
- Removal and stockpile of site mulch and site topsoil material for reuse in the contract works.

- Earthworks, trimming and grading to final mound levels and clean up of total contract area.
- Supply and install approved site topsoil, additives, soil conditioner and imported topsoil mixture equal to AS 4544 Garden to Garden
- Supply and placement of plants, turf, fertilisers and site mulch.
- Supply and install automatic irrigation watering system (design & construct)
- Tree surgery work including pruning / removal (if required).
- Establishment of plants, grassed areas thereof for the specified planting establishment period from the date of the completion of the works.

1.3 Standards

Soils

General: To AS 4419, AS 4454

1.4 Interpretation

Definitions

Site topsoil: Soil excavated from the site, which has the following characteristics:

- Contains organic matter.
- Supports plant life.
- Free from unwanted matter.

Unwanted matter (in topsoil):

- Stones over 25 mm diameters.
- Clay lumps.
- Weeds and tree roots.
- Sticks and rubbish.
- Material toxic to plants.

Imported topsoil:

Imported Premium Garden Topsoil mixture equal to Garden to Garden AS 4544 (1988) Certified product range.

2 Quality

2.1 Inspection

Witness points

Give minimum 48 hours notice so that inspection may be made at the following stages:

- Removal and stockpile of site mulch off existing mound for latter reuse.
- Removal of approved site topsoil on mound and stockpiled for latter reuse.
- Placement of site mulch on mound.
- Placement of imported topsoil mixture, additives, soil conditioners and reused approved site topsoil.
- Plant holes excavated and prepared for planting.
- Set out of all plant material.
- Set out and completion of automatic irrigation system.
- Trim, grade the total contract area to remove off site area.
- Set out and completion of automatic irrigation system.
- Completion of works.
- Completion of Milestone Planting Establishment Period.

2.2 Samples

General

General: Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Plant materials

Quantity: Submit one plant sample for each species or variety, in the condition in which it is proposed to supply that plant to the site.

Samples schedule

Table 11.1

Item	Quantity
Imported Premium Garden Topsoil Mixture equal to Garden type	2kg
Mulch: Recycled Forest Blend or equal to site mulch type	2kg
Biodegradable fibre reinforced with lightweight polymer mesh for slope protection	2m2

2.3 Submissions

Materials

Supplier's data: Submit supplier's data including :

- material source of supply.

Topsoil mixture: Submit a certificate of proof of recycled garden topsoil mixture pH value.

3 Site and Soil

3.1 Preparation

Weed eradication

Herbicide: Eradicate all weeds within the contract area using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Vegetative spoil

Remove all vegetative spoil / weeds from site e.g. castor oil etc. Do not burn.

Existing earth slopes

The existing earth slopes shown are to be cleared of all weed growth and remulched.

Place clean filling in layers approximately 150 mm thick compacted to 70% of the dry density ratio of the surrounding soil as determined by AS 1289.5.4.1. Minimise slumping and further internal packing down. Maintain soil levels around the existing trees on site. Seek advice from site arborist should levels become an issue with the existing trees.

Slope stabilisation

General: Where necessary to prevent erosion or soil movement, stabilise slopes.

Method: Either matting overlay. Submit sample for approval prior to installation.

Matting: Biodegradable fibre reinforced with lightweight polymer mesh. Provide lightweight material for planting.

Matting installation: Plant after matting is installed, where planting is required. Peg the matting into 300 x 300 mm anchor trenches at top and bottom, backfill the trenches with soil and compact.

3.2 Subsoil

Cultivation

Minimum depth: 100 mm.

Cultivation depths (mm): Planting mound area: 100mm

Services and roots: Do not disturb services or tree roots; if necessary cultivate these areas by hand. All work around the root zone of the tree is to be by hand excavation only and overseen by site arborist / tree surgeon.

Cultivation: Cultivate manually as required on mound prior to placement of topsoil. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

Subgrade preparation schedule

Table 11.2

Location	Cultivation method
On re contoured mound	Hand / machinery cultivation to 100mm depth

Additives

General: Apply additives after cultivation and incorporate into the upper 100 mm layer of the subsoil to assist in the break down of the compacted subsoil layer.

Gypsum: Incorporate at the rate of 0.25 kg/m² or as recommended by the test results. The contractor is to take (5) representative samples of the site topsoil material and have them tested for horticultural reuse. All costs and installation of additives associated with the testing by an approved authority shall be borne by the contractor.

3.3 Topsoil

Source

General: Import topsoil unless approved site topsoil type can be provided from material recovered from the site.

Topsoil source schedule

Table 11.3

Soil type	Mixture
Imported Premium Topsoil Garden Mixture equal to Garden to Garden AS 4544	As per manufacturers material
Approved site topsoil to AS 4419	Four parts approved site topsoil : 1 part recycled Garden to Garden soil conditioner to AS 4544
Detention basin	Sandy loam 90% coarse sand: 10% loam

Placing topsoil

General: Spread the topsoil on the prepared subsoil and grade evenly over the slope to form a consistent 150mm layer of topsoil mixture. The height of the mulch layer is 75mm.

Required finished levels and contours may be achieved after light compaction.

Contamination: Where diesel oil, cement or other phytotoxic material has been spilt on the subsoil or topsoil, excavate the contaminated soil, dispose of it off the site, and replace it with imported topsoil mixture to restore design levels.

Consolidation

Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface, which has the following characteristics:

- Finished to design levels.

- Smooth and free from stones or lumps of soil.
- Infill topsoil mixture into areas around the tree base.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

Topsoil depths

Spread topsoil to the following typical depths:

Topsoil application schedule

Table 11.4

Location	Type	Depth (mm)
Planter bed on Slope	Imported Premium Topsoil Garden Mixture equal to Garden to Garden AS 4544	150mm reduce any build up of soil levels of imported topsoil mixture around the existing tree root zone. The final topsoil levels to as shown on the Drawings

3.4 Fertiliser

Fertiliser

Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, N: P: K ratio, recommended uses and application rates.

Fertiliser schedule

Table 11.5

Location	N: P: K ratio	Application rate
Planter bed on mound	Slow release Nutricote 9 – 12 month with balanced N: P: K or equal	As per manufacturers rates
Grassed Detention basin	Shirley's No: 17 or equal	As per manufacturers rates

4 Plants

4.1 Planting

Plants

General: Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage;
- Vigorous, well established, free from disease and pests, of good form consistent with the species or variety.

Replacement: Replace damaged or failed plants immediately noticed on site with plants of the same type, quantities and size. All plants at the end of the Planting Establishment Period are to be as per the drawings.

Labelling

Label at least one plant of each species or variety in a batch with a durable, readable tag.

Storage

Deliver plant material to the site on a day to day basis, and plant immediately after delivery.

Watering

Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

Placing

Remove the plant from the container with minimum disturbance to the root ball, ensure that the root ball is moist and place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant root ball level with the finished surface of the surrounding soil.

Backfilling

Backfill with imported topsoil mixture. Lightly tamp and water to eliminate air pockets. Ensure that topsoil is not placed over the top of the root ball, so that the plant stem remains the same height above ground as it was in the container.

4.2 Mulching

Mulch

General: Provide mulch, which is free of deleterious and extraneous matter such as soil, weeds and sticks.

Standard: To AS 4454.

Organic mulches: Free of stones.

Mulch material: Forest Blend (20 – 40mm) or equal to site mulch. The contractor is to remove existing mulch material from the mounds and stockpile for reuse. The use of existing stockpiles of mulch can be used in the scope of the works. Seek approval from the Client prior to use on site.

Placing mulch

General: Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread mulch so that after settling, it is smooth and evenly graded between design surface levels sloped towards the base of plant stems.

Depths: Spread organic mulch to a maximum depth of 75 mm. Reduce mulch levels around the base of the main trunk to 50mm.

4.3 Turfing

Turf

Obtain turf from a specialist grower of cultivated turf. Provide turf of even thickness, free from weeds and other foreign matter.

Supply

Deliver the turf within 24 hours of cutting, and lay it within 36 hours of cutting. Prevent it from drying out between cutting and laying.

Fertilising

Mix the fertiliser thoroughly into the topsoil before placing the turf. Apply lawn fertiliser at the completion of the first and last mowings, and at other times as required to maintain healthy grass cover.

Laying

General: Lay the turf in the following manner:

- In stretcher pattern with the joints staggered and close butted.
- Parallel with the long sides of level areas, and with contours on slopes.
- To finish flush, after rolling, with adjacent finished surfaces of ground.

Rolling

Lightly roll to an even surface immediately after laying.

Watering

Water immediately after laying until the topsoil is moistened to its full depth. Continue watering to maintain moisture to this depth. Keep the grass in a healthy condition.

Mowing

Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing within 7 days before

11. GENERAL LANDSCAPE WORKS

the end of the planting establishment period. Remove grass clippings from the site after each mowing.

Turfing schedule

Table 11.6

Species or variety	Minimum thickness (mm)	Location	Mowing height (mm)
Couch cvs Greenlees Park	50mm	Slope	50mm

Maintenance

General: Maintain turfed areas until the attainment of a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.

Failed turf: Lift failed turf and relay with new turf.

Levels: Where levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

Top dressing

When the turf is established mow, remove cuttings and lightly top dress using a organic topdressing material to a depth of 10 mm. Rub the dressing well into the joints and correct any unevenness in the turf surface.

4.4 Tree Surgery

Qualifications

Employ suitably qualified site arborist / tree surgeon to carry out tree surgery work in a safe and progressive manner. The site arborist / tree surgeon must have a minimum five years post graduate experience and be a current financial member of the National Arborist Association of Australia. The site arborist will have minimum Diploma level qualifications in horticulture, arboriculture or landscape management.

Pruning

General: Comply with the recommendations of AS 4373 “pruning of Amenity Trees” and WorkCover Code of Practice for Amenity Tree Industry, 1998

Precautions

Avoid damage to tree being treated or to nearby trees and surroundings. Do not use tree as an anchor for winching operations or bracing. The contractor is to ensure that the site arborist / tree surgeon engaged to carry out the works is involved in all supervision work for excavation for any civil works to be carried out within the PRZ. The contractor is not to proceed with any works around the root zone of the tree without the site arborist / tree surgeon being present on site.

Tree surgery schedule

Table 11.7

Plant	Work required
Existing trees within the contract area	Carry out remedial pruning to existing trees if damaged, deadwood, prune to shape of lower branches, root pruning, supervise any excavation and civil works near the PRZ of the existing trees, temporary tree protection fences are to be erected around each existing tree within the contract area during construction stage.

5 Irrigation

Scope of works

The Contractor must submit design and construct documents for approval and include all relevant approvals from Statutory Authorities. The information must include all details required for supply, installation, operation and maintenance for an automatic irrigation system.

11. GENERAL LANDSCAPE WORKS

The design and documentation to include:

1. Provide “head to head” coverage.
2. Be resistant to damage by vandalism.
3. Provide valves to be fitted with approved back flow devices.
4. Local Water regulations are to be adhered to in relation to the installation of the automatic irrigation system.
5. The system shall comply with all Sydney Water requirements, and relevant Australian Standards.
6. The irrigation sprinklers must provide a uniform precipitation rate over the entire planted area. Use appropriate spray heads which are turbulent flow types, easily dismantled for cleaning. Connect directly into the polyethylene pipe work or with appropriately sized heads.
7. All below ground pipe work must be minimum class 12 uPVC and must be installed with minimum cover of 300mm.
8. Electric wiring: All wiring 24 VAC control solenoid valves must be sized to ensure a minimum of 20 volts at the valve when calculated on the in rush amperage of the valve solenoid. All wiring must be a minimum size of 7/0.50 building wire or 1/ 0.8 multi core cable.
9. All wiring must be run in 20mm electrical conduits.
10. Testing system to be implemented at completion of work.
11. Operational manual to be provided.
12. Provide “As executed” plans at the end of the works.
13. Jointing of cable will be kept to an absolute minimum.
14. All materials, methods and testing must conform to the requirements of relevant Australian Standard and codes, in particular the following:
15. AS 1477-1973 uPVC Pipes and Fittings for Pressure Applications;
AS 2032-1977 Code of Practice for Installation of uPVC Pipe Systems.

Standards

The work must be carried out in accordance with the current Australian Standards and Water Board Urban Irrigation requirements.

Controllers

An automatic controller equal to Toro Irritol Rain Dial and housed in a lockable steel cabinet and must be located in a safe and secure position. The controller must comprise the following:

1. A 240 VAC power supply unit with 24 –28 volts 50 HZ output;
2. Independent time control on each station, with settings 0 – 60 minutes one each station;
3. Capable of being manually operated for a cycle;
4. The timers are to be set at early morning settings to reduce loss of evaporation;
5. A reset circuit breaker to protect if from damage caused by voltage surges;
6. An ON – OFF switch to allow irrigation to be turned off (e.g. during rain).

Power supply

The Contractor is to co ordinate with a licenced electrical sub contractor prior to the commencement of the works for all sizes, types and locations of connection points required to complete the irrigation system. The electrical power must be supplied to the location of the controllers and must comprise an isolation switch or a GPO with a locking device to prevent accidental disconnection of power to the controllers. The power supply could be sourced from the nearby buildings.

Control valves

Control valves must be stamped brass gate valves and be housed in standard green reinforced plastic valve boxes. Each box must have a minimum clear opening of 300mm x 257mm and be fitted with a lid secured to the box with a stainless steel bolt. Each box must have a minimum overall dimension of 300mm between the lid and the base flange.

The assembly must be installed such that the lid of the valve box is flush with the finished level. Each box must have a minimum clearance of 150mm from pipework.

6 Completion

6.1 Planting Establishment

Period

Commencement: The planting establishment period commences at the date of completion.

Required period: 26 Weeks.

Recurrent works

Throughout the planting establishment period, carry out maintenance work including, watering, weeding, plant replacements, rubbish removal, fertilising, pest and disease control, cultivating, returfing, reinstatement of mulch, adjustment and monitoring of the irrigation system and keeping the site neat and tidy.

The Contractor must provide an efficient, consistent and reliable maintenance service, undertaking all of the required tasks applicable for the requirements as per the approved works program.

Maintenance Program

The Contractor must provide to the “Authorised Person” a proposed maintenance program and amend it as required until approved. The program must specify the frequency and timing for all tasks described as part of the maintenance requirements.

Maintenance Log Book

The written record of establishment activities must be by the provision of a monthly logbook record, advising the following information:

- Date of attendance on site.
- Activities carried out during each attendance.
- Irregularities encountered, and actions taken.
- Health condition of the tree to be noted and actions taken to rectify the issue.

The Contractor must compile and submit a logbook describing the work executed during the planting establishment period and must be updated regularly, recording all details carried out. Submit copies to the “Authorised Person” on request.

Maintenance payments will be evaluated and approved for payment on the submission of the monthly logbook records that will be verified and approved by the “Authorised Person.”

Completion of planting

Completion of the planting works includes, but is not limited to, the establishment of plants, replacement of plants, mulching and fertilising, which have failed and / or died, been damaged or stolen during the Contract works. The Contractor must allow for additional plantings of the same species to be replaced due to these situations.

Fertilising

Fertilisation of shrubs and trees must take place at the time of planting and throughout the planting establishment period.

Insect and Disease Control

The Contractor must be responsible for the control of any pest or disease that may affect the plants. Once the problem has been correctly identified, then a suitable form of treatment should be engaged until the problem has been eliminated. If the use of chemical spray is required, strict adherence to the manufacturer’s recommended rates and handling is essential. Proper care should be taken to protect both the user and persons likely to be affected or come in contact with the spray. Allowance should be made to carry out such work outside of normal working hours if necessary.

Replacements

Continue to replace failed, damaged or stolen plants within 14 days of each maintenance inspection and noted in logbook.

END OF SECTION – GENERAL LANDSCAPE WORKS