



Hastings St Rising Main Replacement

TECHNICAL SPECIFICATION

Document history and status

Revision	Date Prepared	Prepared by	Approved by	Date approved	Revision type
Rev 1	5/09/2011	Chaminda J	CB		Draft
Rev 2	26/09/2100	Chaminda J	CB	27/09/2100	Final for RFT

CONTENTS

1. GENERAL	4
1.1. Project Overview	4
1.2. Scope of Works	4
1.2.1. Construction Work Methodology	5
1.3. Existing Sites and Facilities	5
2. CONTRACTOR'S OBLIGATIONS	6
2.1. General	6
2.2. Suitability for Purpose	6
2.3. Conflicts in Principal's Documents	6
2.4. Impact of the Project	6
3. INFORMATION TO BE PROVIDED PRIOR TO COMMENCEMENT	7
4. PROJECT REPORTING	8
5. INTEGRATED MANAGEMENT SYSTEM	9
5.1. Accreditations	9
5.2. General Requirements	9
5.3. Project Quality Plan	9
5.4. Occupational Health and Safety Plan	10
5.4.1. General	10
5.4.2. Safety in Construction Methodology Selection	10
5.4.3. Occupational Health and Safety Plan	11
5.4.4. Incident Notification Procedure	11
5.4.5. Safety Equipment	11
5.5. Construction Environmental Management Plan (CEMP)	11
5.5.1. Protection of Vegetation	12
5.5.2. Noise Levels	12
5.6. Risk Management Plan	12
5.7. Compliance Monitoring	12
6. PERMITS AND APPROVALS	14
6.1. Authority Approvals	14
6.2. Building Permits	14
6.3. Planning Permits	14
6.4. Cultural & Archaeological Requirements	14
7. SERVICES	15
7.1. Existing Structures and Services	15
7.2. Working near Powerlines	15
7.3. Traffic Management	15
7.4. Road Access	16
8. CONTRACTOR'S OFFICE AND AMENITIES	17

9.	CONSTRUCTION METHODOLOGY	18
9.1.	Scope	18
9.2.	Construction Plan	18
9.3.	Design Staging	18
9.3.1.	Site Investigations and Design Development	18
9.3.2.	Documentation of Detailed Work Methodology and Design	19
9.4.	Design Standards	19
9.4.1.	General Standards	19
9.4.2.	Project Specific Standards	19
9.5.	Asset Life and Asset Register	20
9.6.	Risk Elimination in Selection of Construction Methodology	20
9.6.1.	Risk Identification and Control	20
9.6.2.	Specific Risk Assessments	21
10.	CONSTRUCTION	23
10.1.	General	23
10.2.	Scope	23
10.3.	Compliance with Design	23
10.4.	Working Hours	24
10.5.	Acts and Regulations	24
10.6.	Standards	25
10.7.	Explosives	25
10.8.	Tidiness and Cleaning Up	25
10.9.	Salvage	25
10.10.	Demolition	25
10.11.	As Constructed Drawings	25
11.	TESTING AND COMMISSIONING	27
11.1.	Scope	27
11.2.	Inspections and Testing	27
11.2.1.	Acceptance Tests and Inspections	27
11.2.2.	Installed Tests and Inspections	27
12.	COMMISSIONING	29
12.1.	ACCEPTANCE TESTING	29
13.	PRACTICAL COMPLETION CRITERIA	30
14.	DEFECTS LIABILITY	31
	APPENDIX A PIPELINE SPECIFICATIONS	32
1	PIPELINE SCOPE OF WORKS	32
2	PIPELINE SITE SURVEY	33
3	PIPELINE DESIGN	33
3.1	Pipeline Lengths	33
3.2	Design Standards	33

3.3	Safety Standards	34
3.4	Pipeline Alignment	34
3.5	Pipeline Construction Drawings	34
3.6	Connection to Existing Sewer Main	35
4	FLORA AND FAUNA	35
5	CULTURAL AND HERITAGE INVESTIGATION	35
6	DESIGN LIFE	35
7	CORROSION PROTECTION	35
8	PIPE MATERIALS AND FITTINGS	35
9	BACKFILL AND COMPACTION STANDARDS	36
10	PUBLIC PROTECTION	36
10.1	Public Protection of Open Worksite	36
10.2	Access to Public Facilities	37
10.3	Impact on Public Space	37
11	WORK IN ROAD RESERVES	37
11.1.	Tree Roots and Tree Pruning	37
11.2.	Topsoil	37
11.3.	Main Roads	38
12	EASEMENTS	38
13	PERFORMANCE TESTING/FUNCTIONAL TESTS	38
13.1	Scope	38
13.2	General	38
13.3	Submission of Results	38
13.4	Pressure Testing	39
14	PIPE BURSTING/ DIRECTIONAL BORING	39
14.1	General	39
14.2	Standards of Finish	40
15	LIVE SEWER REHABILITATION OR REPLACEMENT	40
15.1	Location of Access Pits	40
15.2	Working in Live Sewers	40
16	SHUTDOWN AND TEMPORARY PUMPING	41
17	DECOMMISSIONING OF OLD MAIN	41
APPENDIX B	RELEVANT PLANS AND DRAWINGS	42

1. GENERAL

1.1. Project Overview

Westernport Region Water Corporation ("Corporation") is seeking Tenders for the renewal of Hasting Street 150mm Asbestos Cement Sewer Rising main with new PE pipe along Rhyll-Newhaven Road between Phillip Island tourist Road and McFees Road.

The Hastings Rising Main is a 150mm Asbestos Cement (AC) pressure pipeline, approximately 40 years old. It started off as a water distribution pipeline and was changed to a sewage pumping main approximately 20 years ago. The main lies within the road reserve along Rhyll-Newhaven Road.

The section between Phillip Island Tourist Road and McFees Road burst twice over a 2 day period in June 2011 during a period of bypass pumping operation. During this period, the pressure in this main increased from 2 metres to 20 metres. Subsequent investigation proved that the final section of this AC pipeline has a corroded obvert which causes the pipe to be not suitable under pressure.

This project will be the replacement of a corroded section of pumping main that is presently exposing the Corporation to the risk of sewage spills for an extended period and the cost of tankers.

1.2. Scope of Works

The Contractor shall provide all labour, plant, materials and equipment required to provide a complete, fully functional Sewer Rising main together with associated valves, signs and associated site Works and services.

This extent of works is for the renewal of a 150mm diameter and 1050m length of AC sewer rising main to operate at a pressure of 60m head, using a trenchless construction method.

The Pipeline will be constructed along existing public roads from the Phillip Island Tourist Road to McFees Road. The space between the Road reserve and the property fence line is covered with high vegetation and open trench is not feasible.

The preferred methods for the renewal of the rising main are trenchless such as;

- (a) Pipe bursting/ cracking, or
- (b) Bore next to the existing main, or
- (c) Relining with suitable material

The work to be performed by the Contractor for this project comprises:

- i. Construction and commissioning of the new Rising main in accordance with the approved design, relevant authority permits
- ii. Decommissioning of the existing rising main
- iii. Reinstatement of the disturbed area after construction complete
- iv. A 12 months Defects rectification period after Practical Completion

The Contractor shall undertake the:

- (a) Preparation of detailed method statements for Corporation approval, carryout the service proving and locating of the proposed work areas, supply, delivery, installation, construction, commissioning and acceptance testing of the Pipeline to Practical Completion
- (b) Management of the rectification of Defects for a one (1) year period following Practical Completion.

1.2.1. Construction Work Methodology

The Contractor has full responsibility for providing detailed construction method statement of all elements of the Scope of Works and the performance of the Sewer main and therefore is responsible for selecting and installing products that efficiently, effectively, and reliably achieve the requirements as outlined in this Specification, as well as complying with WSA standards for Sewer main Installations.

The Detailed work methodology of the renewal of the live sewer main shall be developed and submitted by the Contractor with its Tender, inclusive of any modifications agreed with the Principal during the Tender evaluation period.

The work methodology shall include:

- (i) The Contractor's proposed construction methodology (refer to the above section)
- (ii) The estimated impact on the existing vegetation and the proposed reinstatement measures
- (iii) The impact of the rising main renewal works and duration on the operations of the Hastings St pump station and recommended means to minimise those disruptions

Subsequent to the date of awarding of the Contract the Contractor shall not modify or change any details of the methodology as submitted in the Tender without obtaining approval to the modification or change from the Superintendent.

1.3. Existing Sites and Facilities

The Pipeline is to be located on existing public road which are mainly controlled by Bass Coast Shire Council (Council) is shown in Appendix B.

2. CONTRACTOR'S OBLIGATIONS

2.1. General

The Contractor shall provide an operational of the Sewer rising main suitable in all respects for use by the Principal for the purposes of meeting the Project Specifications.

The work under the Contract includes method statement documentation, selection of construction methodology and construction of the Works. That means the documents provided by the Principal are not complete. The Contractor must complete the work method statement and construct the work under this Contract. The Principal is relying upon the Contractor to carry out this work.

2.2. Suitability for Purpose

Suitability for purpose of the Works is the responsibility of the Contractor. The Contractor's design and documentation must ensure that the Works will perform as required and are suitable for the purposes expressly stated or which can reasonably be inferred from the Principal's documents. The Principal is relying on the Contractor's knowledge, skill and judgement in carrying out this responsibility.

2.3. Conflicts in Principal's Documents

If a provision (other than an omission) in the Principal's documents conflicts with any other requirement in this Specification, then before commencing that aspect of the Work, the Contractor shall notify the Superintendent in writing of the conflict. The Superintendent will then give a direction to the Contractor on which document takes precedence.

2.4. Impact of the Project

The construction methodology shall ensure that the stability of the Principal's existing assets, structures and operational systems are not affected by the Works to be undertaken for this project.

3. INFORMATION TO BE PROVIDED PRIOR TO COMMENCEMENT

The Contractor shall submit to the Superintendent within 14 days of Execution of the Contract and prior to commencement of Site Works, a Project Management Plan following additional contents inclusive of the following:

- a. A Project Works Program
- b. A Project Occupational Health and Safety Plan
- c. A Construction Environmental Management Plan
- d. A Proposed Work methodologies and construction techniques including shutdown procedure and shutdown plan.

4. PROJECT REPORTING

The project shall have three (3) levels of meetings.

(i) Monthly Project Control Group Meetings (PCG)

These are formal meetings with agendas and minutes prepared and distributed by the Contractor and shall be held from the date of Commencement to Practical Completion. The Contractor's Representative shall consult with the Superintendent to determine the location, date and timing and participants of the meetings

(ii) Fortnightly Progress Meetings

These are less formal meetings with agreed action points recorded and distributed to participants by the Contractor and shall be held throughout the duration of the Project.

(iii) Weekly meetings

Weekly meetings shall be held during performance testing.

(iv) PCG Meeting Guidelines

The Contractor shall provide the following information for each monthly PCG meeting for the preceding calendar month's Works and distribute it to the participants by the seventh day of each month:

- (a) a written summary on the progress and quality of the Works completed
- (b) an assessment of performance against the Endorsed Works Program and the Target Dates;
- (c) a summary of the value of Works completed and a spreadsheet of future projected progress payments payable;
- (d) a schedule of Quality Assurance Non-conformances;
- (e) status reports, including lost time injuries, safety and environmental reports
- (f) a progress report on all commissioning activity or performance testing activity and the results thereof;
- (g) compliance with all Performance Requirements during the preceding month;
- (h) any other matter relating to the work and compliance with the Contract

For the purposes of budgetary control and assessment the Contractor shall update the forecast of monthly cash flows to match the updated Program.

5. INTEGRATED MANAGEMENT SYSTEM

The Contractor shall prepare and maintain an Integrated Management System that incorporates the Contractor's Quality, Safety, Environmental, Project and Risk Management plans

5.1. Accreditations

The Contractor must, at a minimum, supply evidence of accreditation for the following:

- (i) Member of the Civil Contractors Federation
- (ii) AS/NZS ISO 9001 Quality System;
- (iii) AS ISO 14001 Environmental System;
- (iv) Building and Construction OHS Accreditation Scheme (for the life of the project)

5.2. General Requirements

The Contractor must also:

- (i) nominate an appropriately qualified quality representative;
- (ii) develop project specific quality and environmental plans for this project and audit compliance with these plans;
- (iii) certify the quality of work undertaken;
- (iv) demonstrate compliance with all conditions of the Building and Construction OHS Accreditation Scheme
- (v) ensure that any sub-Contractors engaged by the Contractor comply with the requirements of the Contract and the Quality Assurance and Environmental Management Programs; and
- (vi) accept the Superintendent's role as a customer of the Contractor and as a second party auditor of the Contractor's Quality System

5.3. Project Quality Plan

The Project Quality Plan, if required by the Superintendent, for the Contract shall incorporate Quality Assurance and Quality Control procedures, but not necessarily be limited to, the following:

- (i) Material supply, manufacture and construction carried out by the Contractor and any of its sub-Contractors; including:
 - (a) in the design phase, where appropriate, independent verification by suitably qualified personnel
 - (b) In the construction phase, an expert, independent of the Contractor's designer, to regularly inspect the construction Works to ensure that the constructed Works are compliant with the specified design and to certify same to the Superintendent
- (ii) A procedure for internal auditing of the Quality Assurance Plan by the Contractor;
- (iii) The Quality Control tests and inspections regime to ensure the quality of a product as required by the Contract;

- (iv) Traceability procedures which shall include a means of identifying in the Works, the location of all materials represented by a sample which has undergone a quality test.

The Contractor's Quality Assurance Plan must provide for the verification and certification of the quality of all design, construction, installation, operations, and maintenance and/or repair activities undertaken by the Contractor as part of the Contract.

The Contractor shall submit an audit program to the Superintendent for endorsement and implement the endorsed audit program and provide regular audit reports to the Superintendent.

The Contractor shall develop a project Quality Plans as detailed in **Schedule 6 Part A, Conditions of Tendering**.

5.4. Occupational Health and Safety Plan

5.4.1. General

The Contractor shall be responsible for any accidents or incidents arising from activities carried out under this Contract. Incident Management or Emergency Response Plans (ERP) shall follow Principal's procedures which are set out in "Incident and Emergency Management Plan", reference INT09-05772 which the Superintendent shall supply to the Contractor at Commencement.

The Contractor's ERP shall be prepared in liaison with, and co-ordinated through, a Principal's representative, as agreed with the Superintendent. Any liaison with Regulators or Authorities shall be undertaken by the Contractor.

The Contractor shall accept responsibility for control of safety at the workplace. Knowledge of the current Victorian and Australian Occupational Health and Safety Acts, Regulations, Codes of Practice, Australian Standards and other relevant legislation applicable to the health and safety for the Works must be held by persons nominated to undertake the safety responsibilities for the Works. Such persons must:

- (a) be currently qualified as an OH&S Officer in Victoria;
- (b) have experience and background in the Building and Construction Industry;
- (c) have up to date knowledge of Australian safety legislation (Act and Regulations as well as legislation pertinent to the Construction Industry);

5.4.2. Safety in Construction Methodology Selection

The Construction Methodology completed under this Contract shall incorporate safety features to protect all persons involved with the Works, including construction Contractors, plant operators, maintenance personnel, and the general public that may visit the plant on guided tours, as well as nearby rural properties. The Construction Methodology shall comply with all relevant statutory requirements including:

- (a) Occupational Health and Safety Act and associated Regulations
- (b) Dangerous Goods Act and associated Regulations
- (c) Public Safety Act and Regulations 1995 and associated Regulations

- (d) Relevant Australian Standards and Industry Codes of Practice

5.4.3. Occupational Health and Safety Plan

The Contractor shall adopt the philosophy of having no "Lost Time Injuries" whilst carrying out its obligations under the Contract.

The Contractor shall establish and implement a detailed OH&S Management Plan for this project that is consistent with the provisions of AS4801, and is consistent with the Principal's requirements outlined in **Schedule 5, PART A, Conditions of Tendering**.

The Contractor's OH&S Plan shall be submitted to the Superintendent for review within two (2) weeks of Commencement of the Contract.

5.4.4. Incident Notification Procedure

If the Contractor is required by the relevant Safety legislation or by any other regulations to give any notice of an accident or dangerous occurrence during the performance of the Works, the Contractor shall at the same time or, as soon thereafter as possible in the circumstances, give a copy of the notice to the Superintendent.

The Contractor shall promptly notify the Superintendent of any accident, injury, property or environmental damage that occurs during the carrying out of the Works. The Contractor shall immediately notify the Superintendent of all lost time incidents.

Within three (3) days of any such incident, the Contractor shall provide a report giving complete details of the incident, including results of investigations into its cause, and any recommendations or strategies for prevention of similar incidents in the future.

5.4.5. Safety Equipment

The Contractor shall supply, maintain and replace as necessary, all trade tools, personal protective equipment and personal protective clothing and Specialist Safety Equipment in sufficient quantities to ensure safe working conditions, safe working practices and the safe execution of the work under the Contract.

5.5. Construction Environmental Management Plan (CEMP)

The Contractor shall undertake construction of the Works in accordance with an approved Construction Environmental Management Plan (CEMP). The Contractor shall submit the CEMP to the Superintendent for review and approval at least two (2) weeks before commencing work at the Site.

The CEMP shall identify and document potential environmental hazards and the corresponding measures for prevention and management. The Contractor shall implement procedures to avoid environmental damage during construction of the Works and the on-going operation of the Works. The CEMP shall be in the form of the document described in **Schedule 8 of Part A, Conditions of Tendering**.

On approval by the Superintendent, the Contractor shall prepare 3 final copies of the CEMP in A4 size 2 hole loose leaf ring folder. The CEMP documents will be distributed as follows:

- (a) 1 copy issued to the Superintendent;

- (b) 1 copy to be kept at a location near the construction site to be readily available to the Superintendent's Representative or nominated representative on a day to day basis;
- (c) 1 copy kept at the Contractor's administrative office remote from the Contractor's site.

Note that the Superintendent's agreement to the CEMP does not release the Contractor from full responsibility for adopting all necessary environmental protection measures for the duration of the Contract, whether or not such measures are explicitly or implicitly included in the CEMP.

5.5.1. Protection of Vegetation

The site of the proposed Pipeline Works has significant vegetation and there may be Flora & Fauna concerns. The Contractor shall undertake its own assessment of the site as part of the design process to verify if/ if not any particular flora and fauna protection and remediation measures are required.

5.5.2. Noise Levels

The Contractor shall ensure that noise emissions generated by the Works under this Contract shall comply with the requirements of the Victorian EPA in relation to allowable noise limits within the Works area and for the area surrounding the Works site

In particular, where soundproofing of plant and equipment is required to limit equipment noise, those areas shall have mandatory hearing protection signs in place and should be risk managed using the hierarchy of control measures. In addition, noise levels must conform to the EPA Plant Licence requirements.

In all circumstances of noise control, noise shall be attenuated at its source.

Equipment vibration must be minimised in accordance with AS 2625.

5.6. Risk Management Plan

During the design phase of the Contract, the Contractor shall identify potential risks associated with the construction, operation and maintenance of the proposed Works. The Contractor shall prepare a Risk Management Plan for the Project that identifies potential risks and describes how they will be mitigated and managed.

The Contractor shall submit the Risk Management Plan to the Superintendent for review and approval at least 2 weeks prior to commencement of Works at the Site.

5.7. Compliance Monitoring

The Superintendent may from time to time undertake monitoring activities to determine the degree of compliance of the Contractor with the requirements of the:

- (i) Contract;
- (ii) Project Quality Plan;
- (iii) Construction Environmental Management Plan;
- (iv) OH&S Management Systems;
- (v) Risk Management Plan

The Superintendent reserves the right to extend the monitoring activities to include any sub-Contractor engaged by the Contractor.

In the event that an activity or product has been identified as not complying with the requirements of the Contract as a result of monitoring activities undertaken by the Superintendent or its agents, the Contractor must respond in writing within 5 business days of written notice indicating the corrective action/s taken to resolve the non compliance. The Contractor shall be responsible for all corrective action costs.

6. PERMITS AND APPROVALS

6.1. Authority Approvals

The Contractor, at its cost, shall be responsible for liaison with responsible Authorities in gaining all regulatory approvals and/or work permits pursuant to the proposed Works required to undertake the Works of this Contract.

Where the Contractor is required under any Act or under any ordinance, regulation, by-law, order or proclamation under an Act or is required by a person acting in the exercise of statutory powers, to obtain a written approval to carry out any work under the Contract then a copy of that approval shall be given to the Superintendent within 5 days of the receipt by the Contractor of such approval.

6.2. Building Permits

Not applicable

6.3. Planning Permits

Not required

6.4. Cultural & Archaeological Requirements

Not Required.

7. SERVICES

7.1. Existing Structures and Services

It is the Contractor's responsibility to obtain and verify the location of all service authority assets including, water, sewer, communications, optical fibre and stormwater.

The Contractor shall access "Dial-Before-You-Dig" information, undertake site inspections, and access whatever other information is available, to identify and locate any existing structures or services that may be affected by the proposed Works. The Contractor shall inform itself of the responsibilities and requirements for working in the vicinity of existing structures and services, and take all actions and provide all things necessary to protect and maintain existing structures and services to the satisfaction of the relevant Authority or Owner.

Any damage to existing property, structures, or services caused by the Contractor's activities shall be repaired to the satisfaction of the relevant Authority or Owner at the Contractor's expense.

7.2. Working near Powerlines

The Contractor must be aware of powerlines when working on site and comply with "Rules for Cranes, Concrete Placing Booms and Excavating Equipment in Operating Mode in the Vicinity of Overhead Power Lines". When working near power lines (closer than 6.4 metres) the Contractor must take the following necessary precautions and observe the recommended "no go zone" safe clearances detailed below.

Work near power lines requires the Contractor to:

- (i) Notify the power authority before commencing work, and obtain written permission from the power authority.
- (ii) Conduct an on site work meeting and risk assessment prior to commencing work including written documentation. DO NOT commence work until a pre-start site/job meeting and a risk assessment have been completed.
- (iii) Provide a dedicated safety observer (certified spotter) for work between 3m and 6.4m under or beside any power line.
- (iv) No work is permitted above, or within 3m under or beside any live power line without written permission from the power authority. The permit must be available for inspection by the Superintendent when requested.

7.3. Traffic Management

The Contractor must be aware of the hazards associated with road works and is required to submit, as part of the design, the Road Traffic Management Plans for approval by the Council. Where it is likely that Traffic Management Plans may vary during different stages of construction the Contractor shall submit plans for each stage of the Works.

All traffic plans are to comply with AS1742, and all road works shall be conducted in accordance with the Road Management Act 2004 – Worksite Safety – Traffic Management.

7.4. Road Access

The Contractor shall provide signage necessary to advise the public of the Works in accordance with the signage approval requirements of the Council. The Contractor shall not disrupt traffic on any road without the prior approval of the Council

8. CONTRACTOR'S OFFICE AND AMENITIES

Specific Works areas shall be agreed between the Contractor and the Superintendent, to be set aside for the Contractor's Works sites, inclusive of the required area for amenities, materials storage and construction equipment. The Contractor shall be fully responsible for its own security within the Works area.

The location of the Works amenities site for the Pipeline shall be determined by the Contractor.

The Contractor shall liaise with the Superintendent regarding the requirements for services to the sites. The Contractor shall provide its own office accommodation within the designated work area and make its own arrangements for worker's amenities at the work site.

All Contractor's staff and visitors to the site must wear a VicRoads standard High Visibility Vest which includes reflective yellow stripes at all times while on site.

9. CONSTRUCTION METHODOLOGY

9.1. Scope

The Contractor shall be responsible for the development of the full detailed construction methodology shall be inclusive of, but not necessarily limited to, the following including:

- (a) Site Investigations (Survey, Geotechnical investigation (if necessary), Existing Infrastructure, Services, etc.),
- (b) Liaison and co-ordination with Stakeholders, Authorities, and others affected by, or interfacing with, the Works of this Contract,
- (c) Liaison with the Superintendent, and particularly the Principal's Operations team, in reviewing and approving design concepts, design criteria, layouts, equipment redundancies, plant facilities, access, and operational philosophies, as work progresses,
- (d) Submission of work method statement the Superintendent for review and approval,
- (e) Preparation and submission of shop drawings and As-constructed drawings,
- (f) Site Inspections, and audits, during the construction phase to ensure the Works are constructed strictly in accordance with the Detailed Design, and subsequent provision of Certification that the Works have been constructed in accordance with the Design, and will meet the performance requirements of the Contract.

The Contractor shall be fully responsible for the performance of the Pipeline in satisfying the performance and capacity requirements of this Specification, EPA and Council.

9.2. Construction Plan

The Contractor shall submit a Construction Plan within 14 days of execution of the Contract. The Construction Plan shall indicate the investigations to be undertaken, and list the design documents to be prepared and submitted to the Superintendent, including the design drawings, Specifications, and indicate the expected program of design activities.

9.3. Design Staging

The following stages of design work are to be undertaken for the project, with each stage requiring the Superintendent's approval to continue with the next phase of the project.

9.3.1. Site Investigations and Design Development

During this initial phase of design the Contractor shall complete site investigations and further develop the preliminary work method statement undertaken during the Tender phase. This phase shall generally be inclusive of the following - site investigations, pipeline route, entry and exit locations, locating of services, equipment selection, and design of connection details to existing rising main, general arrangement drawings, and safety in design issues.

The Contractor shall complete documentation of the "Site Investigations and Design Development" phase, inclusive of Design Reports and Drawings, suitable for submission to the Superintendent for review and approval.

Within 1 week the Superintendent will review the initial design details and provide feedback or approval to proceed as appropriate.

9.3.2. Documentation of Detailed Work Methodology and Design

Completion of detailed design shall involve final documentation of the entire Works inclusive of Drawings and construction Specifications & method statement including shutdown procedures and temporary pumping arrangement.

The Contractor shall not undertake any purchasing of materials or equipment, or construction expenditure, until the Superintendent gives written approval to the documentation of the detailed design and work method.

The Contractor may request permission to order long lead items during this approval period, and the items shall only be ordered subject to the Contractor obtaining the written approval of the Superintendent.

9.4. Design Standards

9.4.1. General Standards

In this specification:

- (a) Australian Standard or the abbreviation 'AS' shall mean a Standard issued by the Standards Association of Australia
- (b) British Standard or the abbreviation 'BS' shall mean a standard issued by the British Standards Institution.
- (c) The Abbreviation 'ISO' shall mean a standard issued by the International Organisation for Standardisation.
- (d) The abbreviation 'AWWA' shall mean a standard issued by the American Water Works Association
- (e) The abbreviation 'WSA' shall mean a standard issued by the Water Services Association of Australia

9.4.2. Project Specific Standards

The default design standard for this project shall be **WSA “Sewage Pumping Station Code (WSA 04—2005)”** for the design, construction, testing and commissioning of the Works under this Contract, unless it has been modified this Specification.

Wherever a standard specification, code or code of recommended practice is referred to, it shall be the latest edition of that standard specification code or code of recommended practice current 28 days prior to the date of closing of tenders and it shall be considered to be part of the contract documents insofar as it applies.

The Contractor shall seek clarification from the Superintendent in the event of a conflict between Standards.

9.5. Asset Life and Asset Register

The Contractor shall design and warrant the various assets for their respective Design Life, and shall provide the Superintendent with a schedule of Design Life for each component of the Works.

At the time of Practical Completion of the project the Contractor shall provide an Asset Register to the Superintendent containing details of:

- (i) Physical characteristics of each component: dimension, capacity, materials
- (ii) Manufacturer details: make, model, date of manufacture , etc
- (iii) Asset Tag numbers
- (iv) Asset Value
- (v) Data shall be provided in Excel spreadsheet format

The value of each asset item shall be calculated by taking the construction cost of the item and adding to that its proportional share of the project's design, profits, preliminaries and overheads costs. The value of individual assets shall also be determined such that, when summed, the value of all assets in the Asset register must equal the final Contract Sum.

9.6. Risk Elimination in Selection of Construction Methodology

9.6.1. Risk Identification and Control

During the preconstruction phase, the Contractor shall identify and address potential operational, maintenance, workplace, health, safety, and environmental risks that may occur during the construction of the Works and during the service life of the Works so as to minimise risk through use of appropriate design. Satisfaction of this requirement shall be documented and detailed in a Risk Management Evaluation Plan and incorporated into the design management procedures.

All aspects of the design including environmental, structural, chemical, and mechanical controls shall be reviewed to ensure safety and prevention of damage to structures, equipment, plant and the environment under normal, breakdown and maintenance operation.

The Contractor shall identify all material hazards and aim to eliminate those hazards during the design development and detailed design phases. Hazards to be assessed include:

- (i) Physical; such as noise, radiation, light, vibration, heat, space, and manual handling;
- (ii) Chemical; such as poisons, dusts, corrosive agents, flammable or explosive materials, AC;
- (iii) Biological; such as viruses, plants and parasites;
- (iv) Gaseous; such as H₂S, and explosive gases such as methane;
- (v) Mechanical/electrical; such as slips, trips and falls, tools, electrical equipment;
- (vi) Psychological; such as fatigue.

This risk assessment process shall:

- (vii) Adopt a life cycle approach that considers construction, installation, commissioning, operation, maintenance, repair and demolition of the asset being designed;
- (viii) Adopt a consultative approach during the design and construction phases with relevant stakeholders, including designers, constructors, operators, maintenance staff and OH&S personnel;
- (ix) Include facilitated risk assessment workshops attended by the Superintendent's Representatives, utilising appropriate risk assessment techniques; and
- (x) Identify and adopt risk control measures for each risk.

If elimination of the hazard by design is not possible or feasible, then the risk still exists and shall be minimised by using the most effective method, in the following hierarchy of control:

- (a) substituting the system of work or machinery with something safer;
- (b) isolating the hazard;
- (c) minimising the risk by introducing engineering controls;
- (d) minimising the risk by adopting administrative controls; e.g. warning signs, safe work practices
- (e) using personal protective equipment

Where no single control sufficiently mitigates the hazard, a combination of the above controls shall be put in place by design and operations specifications to minimise the risk to the lowest level that is reasonably practical.

Where hazard mitigation is proposed to rely on control or procedure measures, the Contractor shall make a record that physical means were investigated and found to be impractical. This must be clearly demonstrated in the quality system and records for the project through the quality plan, procedures, design calculations, documentation, verification process, check lists and the change records.

Where control strategies are utilised all must be documented and appropriate training must be provided as necessary. The controls and/or procedure measures are to be clearly identified and incorporated in the Operation and Maintenance Manuals.

9.6.2. Specific Risk Assessments

The Contractor shall consider and manage risk throughout the design phase, and undertake formal risk assessments to coincide with the design reviews by the Superintendent. The risk assessments shall be documented and submitted with the design work for review, as follows:

(i) *Site Investigations and Design Development Review*

This Risk Assessment should include with the Construction Risk Assessment and review of the concept design

(ii) Detailed Design Review

This Risk Assessment should review the detailed construction methodology and identify modifications necessary to reduce construction, installation, operational, maintenance, and repair hazards. This will also include an assessment of the maintenance and repair of items of plant and equipment and any risks to health and safety of operational and maintenance staff due to poor design.

10. CONSTRUCTION

10.1. General

The Contractor shall be a reputable construction company with experience in construction Works for pipelines. The Construction Contractor shall be suitably experienced and have all accreditations required under this Contract, particularly OH&S, Quality Assurance accreditation and acceptance of the National Code of Practice for the Construction Industry.

10.2. Scope

The Contractor shall undertake and complete all construction work required for the Contract inclusive of, but not necessarily limited to, the following:

- (i) Liaison and co-ordination with Stakeholders and Authorities affected by, or interfacing with, the Works of this Contract, including, provision of all Permits and Approvals required for the Construction Works, and regular liaison and co-ordination with the Principal's Operations team to gain approval for access and interface activities throughout the construction period,
- (ii) Preparation of Management Plans for the Construction Works inclusive of Quality, Environmental Management, Risk Management, and OH&S plans
- (iii) All site preparations including, provision of temporary services for construction, Site establishment, site security, setting out, geotechnical investigations (if required), identification and location of underground services, and permanent services for the Works,
- (iv) Supply of all labour, materials, plant, and equipment required to undertake and complete the Works,
- (v) Trenchless construction of pipeline for renewal of Sewer main including pits, and Air valves and final connections associated with the Works
- (vi) Scope to include removal of existing band tappings (3) and fittings (if necessary)
- (vii) Installation of all regulatory and safety signs required by the Principal, EPA, Workcover and any other regulatory body that issues an approval requiring signage,
- (viii) Proving and recording of as-constructed details, and preparation of "As-constructed" Drawings of the entire project
- (ix) Completion of Site Works inclusive of clean-up, removal of temporary services and construction facilities, site security, rehabilitation and landscaping.

10.3. Compliance with Design

The Designer shall regularly inspect the construction work to ensure that the constructed Works are compliant with the specified design, so as to enable the Designer to certify as such, as a condition precedent to the achievement of Practical Completion.

10.4. Working Hours

Construction of the Works shall be undertaken between the hours of 7.30am and 5.30pm on weekdays (Monday to Friday), excluding Public Holidays.

No work shall occur outside the nominated working hours, including Public Holidays without the prior written approval of the Superintendent.

The Contractor shall also program Works to meet the requirements of Council so as not to conflict with road traffic management plans for major events that may occur on Phillip Island during the Works program.

10.5. Acts and Regulations

Construction Works shall be undertaken in accordance with all relevant Acts and associated Regulations including:

- (i) Occupational Health and Safety Act 2004
- (ii) Equipment (Public Safety) Act 1994
- (iii) Dangerous Goods Act 1985.

The Contractor shall accept its statutory responsibility under the Occupational Health and Safety Act 2004 as the designer and principal Contractor of the Works.

In the development of the Works, the Contractor shall comply with the “Code of Practice for the Building and Construction Industry” and the relevant published Codes of Practice of the Victorian Workcover Authority including those for:

- (a) Building and Construction Workplaces
- (b) First Aid in the Work Place
- (c) Manual Handling
- (d) Manual Handling (Occupational Overuse Syndrome)
- (e) Noise
- (f) Plant
- (g) Provision of Occupational Health and Safety Information in Languages Other Than English
- (h) Safe Use of Cranes in the Building and Construction Industry
- (i) Safe Work on Roofs (Excluding Villa Constructions)
- (j) Dangerous Goods
- (k) Hazardous Substances
- (l) Working in Confined Spaces
- (m) Safety Precautions in Trenching Operations
- (n) Temporary Electrical Installations on Buildings and Construction Sites.

10.6. Standards

Construction of the Pipeline and associated Works shall be completed in accordance with the approved Design Drawings and Specification. Construction Works shall be undertaken and completed in accordance with the Principal's Standards, Sewage Pumping Station Code WSA 04—2005 Standards, and Australian Standards as applicable.

10.7. Explosives

The use of explosives is not permitted without written approval by the Superintendent on each blast occasion. Such approval shall only be granted when all other reasonable methods have failed. All costs, including monitoring, shall be borne by the Contractor.

10.8. Tidiness and Cleaning Up

The Contractor shall keep the Site of the Works clean and tidy at all times and pay continuous attention to the removal of litter, waste materials, garbage, and recycle same where ever possible.

Under no circumstances shall the Contractor dispose of any material or goods, construction debris, rubbish or like material on or about the Site. All such materials shall be removed from the Site regularly and disposed of by the Contractor at its own expense. Clean, excavated material shall, where suitable, be used in required backfilling or shall be placed in stockpiles approved by the Superintendent, and where not required shall be disposed of at the Contractor's expense.

Prior to the issue of the Certificate of Practical Completion, the Contractor shall remove from the Site and all areas used by it for the purpose of the Works, all temporary Works, plant, buildings, rubbish, unused materials, construction facilities and other material and equipment belonging to the Contractor and its sub-Contractors or used under the Contractor's direction, and leave the Site and such other areas clean and tidy to the satisfaction of the Superintendent.

The Contractor shall be responsible for the rehabilitation and landscaping of the site after completion of the Works. Rehabilitation and landscaping shall involve removal of all waste materials, levelling to uniform contours to match the surrounding area, and drainage in accordance with the general site. Additionally the Contractor shall ensure that any road that is damaged (physically or environmentally) from traffic related to the Works is reinstated immediately to a condition similar to that prior to the damage.

10.9. Salvage

The Principal retains the right to salvage any item as a result of the Works.

10.10. Demolition

The Contractor shall obtain approval from the Superintendent for any demolition required.

10.11. As Constructed Drawings

As a condition precedent to the achievement of Practical Completion, the Contractor shall issue to the Superintendent the As-Constructed Drawings for all components of the Works.

The Superintendent will provide electronic copies (in AutoCAD format) of the standard drawing format to the Contractor upon request.

“As Constructed” Drawings shall be prepared in accordance with AS1100 using CAD work stations and shall be supplied in both hard copy (A3 paper sheets) and on a CD in DWG format suitable for interpretation by an AutoCAD system (or such other media, such other format or suitable for use in such other system as the Superintendent may reasonably specify at any time). Each drawing shall show the Contractor's name, the Principal's drawing number system and title in the lower right-hand corner. The “As-constructed” Drawings shall include all drawings prepared during the design stage, modified to provide “as-constructed” details, and any other Drawings prepared specifically during construction.

The location of all major plant and equipment shall be identified on the As-constructed Plans using Map Grid Australia (MGA 94, Zone 55) co-ordinates.

11. TESTING AND COMMISSIONING

11.1. Scope

The Contractor shall be fully responsible for testing and commissioning of the Works. The scope of Works for testing and commissioning shall be inclusive of, but not necessarily limited to, the following:

- (i) Inspection and testing of all mechanical parts to prove their integrity, quality, operation, functionality, performance, safety, and fitness for purpose;
- (ii) Completion of Acceptance Testing and verification of the Works performance;

All costs associated with Testing and Commissioning shall be the responsibility of the Contractor. Subsequent to the successful completion of the Testing and Commissioning requirements the Contractor shall be granted a Certificate of Practical Completion.

11.2. Inspections and Testing

The Contractor shall, as part of its Quality Assurance Program, carry out quality control tests and inspections to ensure the Works satisfy the requirements for quality and are fit for purpose as specified in the Contract. These tests and inspections shall include, but not necessarily be limited to the following:

11.2.1. Acceptance Tests and Inspections

All materials and equipment delivered to the site for inclusion in the Works shall be subject to Delivery Acceptance Tests and Inspections, inclusive of the following:

- (i) the testing of all materials to be incorporated into the Works including type testing;
- (ii) the testing of all items to be incorporated into the Works during and/or upon completion of manufacture, comprising pressure tests, assembly checks, operating and performance tests;
- (iii) the inspection of all items delivered to the Site to ensure that such items are of the specified quality and workmanship and are in good order and condition at the time of delivery

The equipment may be inspected by the Superintendent at various stages throughout manufacture and particularly prior to delivery to the Site.

11.2.2. Installed Tests and Inspections

As part of its Quality Assurance Plan, the Contractor shall submit to the Superintendent for acceptance, an Inspections and Testing Plan (ITP) inclusive of a detailed description of the proposed method of conducting all such tests and inspections including the materials and equipment to be used and the proposed methods of interpreting the various test results.

On the basis of the accepted Contractor's Quality Assurance Plans, the Superintendent will nominate which Tests and Inspections will be witnessed. The Contractor shall ensure that the Superintendent or his representative is afforded every opportunity to be present

whilst such nominated tests and inspections are carried out. The Contractor shall cooperate with the Superintendent or his representative and shall provide assistance at all reasonable times to enable them to observe tests and carry out inspections of the work performed to ensure that all equipment is in good order and condition and in accordance with Contract requirements. The Contractor shall remove covers, operate machinery and perform any other reasonable work which, in the opinion of the Superintendent or his representative, will be necessary for them to confirm the quality or adequacy of the Works

Tests and Inspections shall include, but not be limited to inspections and tests to prove the condition of individual items of equipment, and inspections and tests to prove the integrity of the system as a whole prior to operation.

All tests and inspection shall be carried out in accordance with Occupational Health and Safety legislation and all relevant standards and codes issued by the Standards Association of Australia.

The Contractor shall maintain documentation pertaining to all tests and inspections and shall provide them to the Superintendent.

The cost of all tests and inspections carried out by the Contractor in accordance with the requirements of this Specification and the Contractor's Quality Assurance Plan, as accepted by the Superintendent, shall be borne by the Contractor.

Commissioning of any element of the Works shall not commence until all testing of that element is satisfactorily completed so as to achieve a pass in each instance and to be so certified by the Contractor's Quality Assurance Representative.

12. COMMISSIONING

Commissioning must not be commenced until successful completion of all Site Tests and Pre-commissioning of the Works. The Contractor shall be fully responsible for commissioning of the Works.

At least 1 week prior to commencement of commissioning the Contractor shall develop and submit to the Superintendent for acceptance a Commissioning Plan for the Works. The Plan shall include, but not necessarily be limited to, the following:

- (i) Proposed work plan and Commissioning program,
- (ii) Risk assessment and contingency plans,
- (iii) Occupational Health and Safety consideration,
- (iv) Quality Assurance Program compliance
- (v) Environmental Impacts
- (vi) Performance testing criteria, validation of critical controls, and acceptance requirements for the various plant components, and varying operational modes,
- (vii) Acceptance Testing requirements
- (viii) Checklists

Commissioning of the Works comprises inspection and tests of all structures, buildings and pipelines, and operation of all equipment, systems, and processes, under actual operating conditions.

All costs incurred during Commissioning, inclusive of all labour, materials, chemicals, and equipment costs, shall be provided by the Contractor. The Contractor shall provide the Superintendent with all results obtained during the commissioning period as soon as they become available. In addition, a commissioning report must be prepared by the Contractor and submitted to the Superintendent at the conclusion of the commissioning period.

12.1. ACCEPTANCE TESTING

The Contractor shall be fully responsible for successfully completing Acceptance Testing of the Pipeline and all costs incurred shall be borne by the Contractor inclusive of all labour, materials, chemicals, equipment, sampling, and Laboratory testing costs. The proposed Acceptance Tests and procedures shall be applied to verify that the operation, performance, and capacity requirements of the Contract have been achieved.

The Superintendent will monitor the Acceptance Tests to ensure compliance with the Contract.

13. PRACTICAL COMPLETION CRITERIA

Practical Completion in respect of the Works is achieved, if in respect of the Works, the Superintendent is satisfied that the following has occurred:

- (i) There are no existing defects in the Works, other than defects which:
 - a) have been listed by the Contractor and approved by the Superintendent as not requiring to be rectified at Practical Completion;
 - b) are of a minor nature; and in the Superintendent's opinion:
 - do not prevent the part of the Works affected by the relevant defect from being used for its intended purpose;
 - in aggregate, are capable of being rectified within 4 months after Practical Completion; and
 - the rectification of which will not adversely affect the convenient use of the Works
- (ii) Satisfactory completion of all requirements of Commissioning and Acceptance Testing.
- (iii) Provision of both the current version of accepted design drawings including details of all revisions, and "as-constructed" drawings in both digital and hard copy format.
- (iv) Provision of a report defining the status and a program showing the anticipated dates for completion of any defect, including omissions and outstanding Works Under Construction
- (v) Removal of all debris and temporary Works from the site and completion of all appropriate restoration works.
- (vi) Demonstration to the satisfaction of the Superintendent that all equipment, plant, services and installations forming part of the Works function as required both under normal and simulated emergency conditions.
- (vii) Provision of all Approvals required in relation to the operation and ownership of the Works.

14. DEFECTS LIABILITY

Following receipt of the Certificate of Practical Completion the Contractor shall remain responsible for the repair of any defects in the Pipeline for a period of one (1) year. A defect is defined as any failure, breakdown, or malfunction of any plant, equipment, and/or process, provided by the Contractor, which compromises the capacity, performance, operability, integrity, redundancy, and/or safety of the Works.

Any failure, breakdown or malfunction resulting from fair wear and tear, or through cause outside of the Contractor's control, such as vandalism, extreme climatic event, will not be classed as a defect, and therefore the repair costs will be borne by the Principal.

Any defect identified by the Superintendent in the Defects Liability period shall be rectified by the Contractor in accordance with the requirements of the Contract. Where defect repair utilises spares or spare parts, those spares shall be replaced so as to be available for any future repair or replacement. All costs incurred in rectifying the defect, replacement of Spares, and subsequent proving of the adequacy of the rectification, shall be borne by the Contractor in accordance with the Conditions of Contract.

On satisfactory completion of the Defects Liability Period, the Superintendent will release to the Contractor the Security Amounts owing, and issue a Final Certificate for the Works, in accordance with the Conditions of Contract.

APPENDIX A PIPELINE SPECIFICATIONS

This Appendix of the Specification provides of the scope of construction for the Pipeline.

1 PIPELINE SCOPE OF WORKS

The Pipeline Works in this Contract include the following:

- (a) Design of a new pipeline including a site feature survey of the pipeline route, and connections in accordance with the Specification.
- (b) Carry out a preliminary Flora and Fauna assessment for work sites
- (c) Investigate, locate and avoid all existing underground services in accordance with service authorities' regulations. The cost of repair, relocation or redesign works on any underground service is to be borne by the Contractor.
- (d) Investigate, locate and disconnect the old house branch connections (3 to 5) from the existing sewer main.
- (e) Obtain written approval (permit) for the work to commence on site from the Bass Coast Shire Council and other authorities such as VicRoads, SP AusNet and Telstra.
- (f) Notify residents affected by the impending Works using a letter supplied by the Superintendent.
- (g) Organise a pre-construction meeting for the Pipeline, including nominated representatives of the Principal and the Council.
- (h) Submit Safe Work Method Statements (SWMS) and Job Safety Assessment (JSA) information to the Superintendent prior to construction commencing showing site specific risk assessment and other relevant information. Participate in a Construction Risk Assessment Session prior to commencing physical Works.
- (i) Supply of a new sewer rising main, fittings, valves and other accessories as per the Specifications.
- (j) Installation using trenchless method, excavation of entry and exit pits, backfill and compact, commission the Pipeline, including all fittings, one air valves minimum 50mm (Bermad), and removal and disposal of any surplus materials and spoil
- (k) Supply and installation of valve marking, valve labels, surrounds covers and marker post to required standards
- (l) Testing of the constructed Works and submission of pressure test results to the Superintendent.
- (m) Reconnection of the new pipeline to the existing Sewer system including installation of valves etc.
- (n) Carry out soil compaction testing and submit results to the Superintendent.

- (o) Decommissioning of the old sewer main as per EPA approved method or agreed by the Superintendent
- (p) Clean up, site restoration to a standard to match or better the condition of those sites prior to the commencement of the Works. Obtain a signed clearance from the Council or VicRoads as applicable for each part of the Pipeline requiring a road opening permit for work in a road reserve, nature strip or park, to certify completion to their satisfaction. Submit a copy of the authorities' acceptance of the completed Works to the Superintendent.
- (q) Submit as constructed survey, field notes and as constructed drawings to the Superintendent prior to Practical Completion.

2 PIPELINE SITE SURVEY

The Contractor shall undertake a Site feature survey for the entire pipeline. This will include but not be limited to the location of property boundaries, trees, power poles, extent of road pavement, kerb line, other utility service assets and any physical obstructions.

The Contractor shall agree the extent of the survey requirements with Superintendent prior to the survey being carried out.

The survey is to be undertaken by a licensed Surveyor

3 PIPELINE DESIGN

3.1 Pipeline Lengths

The Contractor shall price the Pipeline in accordance with the following table of pipe sizes for each section of the Pipeline.

The location of pipeline nodes is shown in plans in Appendix B of the Specification

Pipeline Node		Road/Street Name	Minimum Pipe ID (mm)	Approx Length (metres)	Minimum Pressure Rating
From	To				
A	C	Rhyll Road	150	1050	PN10

3.2 Design Standards

All designs, equipment, materials and construction carried out in respect to this project shall be based on the relevant Standards, Codes, Acts and Regulations.

Where the above does not cover the design method, the relevant design code or method shall be indicated in the Contractor's design.

3.3 Safety Standards

The Contractor shall apply the following standards in the design phase and construction phase:

- (i) AS 1742.3-2009 Manual of Uniform Traffic Control Devices Part 3 Traffic control devices for working on roads, and the following handbooks:
- (ii) AS 2865-2001 Safe Working in a Confined Space
- (iii) Road Management Act 2004 Worksite Safety – Traffic Management Code of Practice
- (iv) Road Safety (Traffic Management) Regulations 2009
- (v) WorkSafe Victoria Code of Practice for Confined Spaces
- (vi) WorkSafe Victoria Code of Practice for Trenching Operations

When requested, the Contractor shall provide evidence to the Superintendent that compliance with Statutory Regulations in respect to the work have been achieved.

3.4 Pipeline Alignment

The Contractor shall undertake the design development based on the preliminary design of the Pipeline route to include, but not be limited to, the following activities;

- (i) Carry out a detailed investigation for existing services; liaise with various organisations involved in approval process (Council, VicRoads, Telstra, and SP AusNet) and selection of feasible alignment.
- (ii) Carry out a preliminary assessment of Flora and Fauna to identify the extent of the removal of existing vegetation and, if necessary, prepare a vegetation management plan for approval by Bass Coast Shire Council as part of the Road Opening Permit process
- (iii) Prepare drawings showing the horizontal alignment for the proposed rising main
- (iv) Co-ordinate with Council, VicRoads and other organizations to select the most practical pipe alignment.
- (v) Obtain all necessary approvals including VicRoads, Council, and environmental assessments/approvals as required.
- (vi) Prepare a design report advising the Superintendent of the route selection together with drawings for the proposed alignment and requirements

3.5 Pipeline Construction Drawings

This design work shall include but not be limited to the following:

- (i) The design of Pipeline route section and associated connections shall be undertaken to the Technical Design Standards.
- (ii) Selection of pipe material, class, pressure rating, joint type etc (if necessary).
- (iii) Determine Valve locations to ensure that each section of the Pipeline can be isolated for repairs or maintenance.

- (iv) Design of thrust blocks for bends and valves where necessary.
- (v) Undertake geotechnical assessment of the Pipeline, where deemed necessary, to gain an appreciation for the ground conditions that may be encountered during construction.
- (vi) Prepare construction drawings.
- (vii) Submit Draft construction drawings for review.
- (viii) Finalise the construction drawings based on final comments from the Superintendent and Council.

3.6 Connection to Existing Sewer Main

The Contractor shall design the connections of the new sewer main into the existing sewer main once the renewal is complete:

4 FLORA AND FAUNA

The Contractor shall undertake preliminary investigations to determine if a Flora and Fauna protection plan is required as part of the preparation of the CEMP.

If a Flora and Fauna Plan is required, the Contractor shall liaise with the Council in the preparation of the plan and shall advise the Superintendent of the Works that will be included in the design and construction documentation to ensure that flora and fauna is protected in accordance with the agreed plan.

5 CULTURAL AND HERITAGE INVESTIGATION

Not required for the Works.

6 DESIGN LIFE

The Design Life of the elements of the Pipeline Works shall be:

ASSET ITEM	DESIGN LIFE
Mechanical Works:	
<ul style="list-style-type: none"> • Valves and Air Valves 	20 years
Permanent Civil Works;	
<ul style="list-style-type: none"> • Pipes, thrust blocks, pipe connections 	50 years

7 CORROSION PROTECTION

The corrosion protection systems including coatings, wrapping and cathodic protection shall be designed to economically protect the Works components for the design life of the pipeline.

8 PIPE MATERIALS AND FITTINGS

All material for use in pipeline shall be suitable for Sewer Rising Main Standards.

Pipe work supplied shall be in accordance with the design requirements ensuring the class and material of pipe work is suitable for the application, pressure, and loadings to which it will be subjected. Pipes shall be supplied, delivered, stored, and installed, strictly in accordance with the relevant Standards and manufacturer's recommendations. All pipelines shall be installed true to line and level, and strictly in accordance with the pipeline layout drawings.

Pipelines shall be tested after laying and jointing to prove their integrity under pressure, and to ensure no leakage or sweating of any joints or in the body of any pipe. Further tests may be required by the Superintendent to prove watertightness of the pipeline following backfilling. Testing shall be in accordance with best practice, relevant Standards, and the design requirements.

On completion of the Works, pipelines shall be cleaned or flushed as required to remove any foreign matter, and shall be supplied free of obstruction.

Fittings, such as valves, flanges, brackets, etc. shall be provided in accordance with the relevant Standards, manufacturer's recommendations, and design requirements, and shall be supplied of class and material appropriate to the application.

The Contractor shall supply documentation and licence details for all fittings used in this contract.

9 BACKFILL AND COMPACTION STANDARDS

Backfill and compaction standards shall meet the standards set out in WSA 04—2005.

The overlay material shall be compacted to a standard greater than 90% standard compaction density ratio.

10 PUBLIC PROTECTION

10.1 Public Protection of Open Worksite

All shafts or trenches shall be properly protected to prevent public access during the Works and at any time the site is unattended by the Contractor.

All unattended open trenches shall be physically protected with a suitably rigid material spanning the trench to prevent any worker or member of the public falling or entering the trench.

Outside normal working hours the Contractor must comply with one of the following:

- a) Temporarily backfill the trench and safely barricade the area.
- b) Install a temporary construction security fence surrounding the worksite area or cover the trench with a physical barrier to protect the public. Any such temporary construction fence shall be of rigid construction, greater than 2.0m high with chainmesh or similar wire to prevent public access.

Before leaving the site the Contractor shall carry out a risk assessment of the worksite for risks to the public and install a higher level of protection than that specified in a) or b) above if the risk assessment requires it.

10.2 Access to Public Facilities

All public facilities located in the road reserve or adjacent to the road reserve shall be accessible during working times and safe while the site is unattended for any period of time.

Public facilities or assets include (but are not limited to): Public Phone Boxes, Kerbside Post Boxes, Bus Stops or Bus Shelters, Pram Crossings and School Crossings.

The Contractor must make special provision to provide clear and unobstructed access to all public facilities. Reinstatement of areas adjacent to public facilities shall be rectified as a matter of priority, given the higher risk of public or pedestrian traffic in such areas.

10.3 Impact on Public Space

The Contractor must liaise with Council if any council reserve or public space is to be used for the placement of site amenities (sheds, site hut, machinery compound) or storage of materials (compound or stack sites). The Contractor is to work with the Council representative to arrange the most suitable location of placement of facilities as part of the road opening permit application.

11 WORK IN ROAD RESERVES

The Contractor shall be responsible to obtain road opening permits from the Council for work on road reserves and public areas. As part of the road opening permit process, the Contractor shall comply with Council standards for the reinstatement of their assets.

To verify the reinstatement of the road reserve to the local Council's satisfaction, the Contractor shall request a clearance from the Council for the Works undertaken on each project in this contract. Clearances for the Works requiring a road opening permit shall be signed by the Council Responsible Officer and submitted to the Superintendent within 4 weeks of the completion of each project under contract.

Any outstanding Works or items requiring reinstatement at a later date (e.g. grass seeding six months later), are to be the responsibility of the Contractor until the end of the Defects Liability Period. Prior to final completion being issued, signed Council clearances for the project must be submitted to the Superintendent.

11.1. Tree Roots and Tree Pruning

It is the Contractor's responsibility to liaise and obtain approval from the property owners and Council to carry out tree pruning and cutting to facilitate trenching. Every precaution is to be taken to avoid long term damage to street trees. Roots larger than 100mm in diameter are not to be cut in any circumstances.

11.2. Topsoil

The Contractor shall provide high quality topsoil to be used for reinstatement.

In the Design phase the Contractor shall specify the details of the topsoil they intend to use on the project, to confirm the quality of topsoil being offered.

11.3. Main Roads

It is the Contractor's responsibility to obtain approval for Works within a highway / main road easement from VicRoads or Council where appropriate. In this instance construction must not commence on this section of work until the Superintendent receives written approval of the designs from VicRoads or the Council (as appropriate).

All road crossings on main roads shall be bored and sleeved in accordance with VicRoads and/or Council's requirements.

12 EASEMENTS

Not required

13 PERFORMANCE TESTING/FUNCTIONAL TESTS

13.1 Scope

The Contractor shall provide a detailed report of the Successful Performance Testing, Commissioning and Pre Commissioning as one of the requirements for achieving Practical Completion.

13.2 General

On completing the Commissioning requirements and providing to the Superintendent the necessary signed off documentation that the plant is complete and operating to the requirements of the Contract, further tests are required in the presence of the Superintendent. The Contractor is to carry out Performance Tests to demonstrate to the Superintendent that the Principal's Project Requirements and the intent of the Design have been met in full. The Contractor shall provide all test equipment, and shall install and remove the test equipment on completion of the Works. The testing shall be carried out to fit in with Operational Requirements, and impacts on customers and the Principal's water system shall be minimised.

The Contractor shall ensure there are no leaks on the Pipeline after it is put into operation and shall visually inspect all valves and fittings to verify the integrity of the joints. The Contractor shall ensure there is no settlement of backfill.

13.3 Submission of Results

Documented results for the following shall be submitted to the Superintendent within two weeks of the new Pipeline being commissioned.

- (i) Inspection and Test Plans
- (ii) Compaction Testing Results
- (iii) Pressure Testing Results
- (iv) Disinfection Test Results
- (v) Completion of Works Form (includes confirmation of worksite being left in a tidy manner, safe for public, all valves and hydrants properly labelled and all Works reinstated in accordance with specification)

13.4 Pressure Testing

The Contractor shall pressure test the completed pipeline to a pressure of 90m head and submit test results to the Superintendent.

14 PIPE BURSTING/ DIRECTIONAL BORING

14.1 General

Prior to undertaking any pipe bursting or directional boring operations, the Contractor must submit detailed recommendations to the Superintendent for approval. These recommendations must include excavation details and the location and proposed method of protection of any adjacent buried services that may be damaged by the pipe bursting process or boring process.

Pipe bursting must be undertaken in accordance with the requirements of Australian Society of Trenchless Technology - Standards for Pipe Bursting.

Pipe boring must be undertaken in accordance with Australian Society of Trenchless Technology – Specifications for Horizontal Directional Drilling.

Prior to commencing the pipe bursting operation or HDD, all existing valves and fittings must be exposed and disconnected from the existing pipeline to prevent damage during the pipe bursting process.

The Contractor must satisfy the Superintendent that construction will not have a detrimental effect on adjacent services or structures. Where the Superintendent determines that services adjacent to the existing pipeline will be damaged by construction, such services must be exposed.

Services or structures identified by the Superintendent as being damaged by construction will be repaired at the Contractor's expense.

The Contractor must allow for non-uniform deterioration in the host pipe causing axial force transmission through the pipe wall and longitudinally telescoping the host pipe.

The Contractor must allow for loose, granular, saturated soils that may liquefy from vibrations causing grade deviations.

The Contractor shall make allowance for encountering stainless steel repair sleeves, sections of iron, steel or concrete encasement. These circumstances shall be included in the contingency plan. Should the Contractor be seeking extra costs for such circumstances, this must be detailed in the tender submission.

The contractor shall allow a newly installed pipeline to relax for at least 4 hours and ideally 12-24 hours before final tie-ins and connections.

HDPE pipe and fittings shall be joined by heat-fusion welding using temperature – controlled heating irons. Electro-fusion connections are allowable for tight areas such as in the lead in trench. Branches shall be connected by sidewall fusion. Mechanical clamps shall not be allowed unless agreed to by the Superintendent.

For any transition from HDPE to unrestrained pipe such as AC, appropriate thrust restraint shall be installed.

The Contractor shall obtain the pipe's maximum allowable tensile stress and allow for this in design of installation.

The Contractor shall photograph the lead end of the pipe for scratches and gouges and include these photographs in the final submission.

Pipe delivery dockets shall be retained and presented upon request to prove pipe meets specifications.

Internal weld beads shall be removed.

All PE sewer pipe is to be cream colour or black with a cream stripe with class, PN10 (Minimum) and strength of the pipe must be PE 100.

14.2 Standards of Finish

The Contractor must achieve the following minimum standards:

The pipeline internal surface shall be smooth without weld beads or any other projections.

- 1) The pipeline shall be continuous over its length and must be free of any visible defects, which in the opinion of the Superintendent are likely to affect the satisfactory hydraulic performance of the lined pipe or cause accumulation of solids.
- 2) Defects, which are considered unacceptable, include, but are not limited to the following;
 - (a) Foreign inclusions
 - (b) Excessive wrinkling, ridges, pimples or bulges
 - (c) Leakage through welded joints
 - (d) Wrinkling must reduce the diameter by no more than 2%.

15 LIVE SEWER REHABILITATION OR REPLACEMENT

15.1 Location of Access Pits

The Contractor is responsible for locating and accessing the sewer rising main. Where possible any existing cleared areas shall be utilised for access to the existing pipeline and the insertion and installation of the pipeline so as to minimise excavation.

15.2 Working in Live Sewers

Wherever the Contractor is required to enter or work in a live sewer, the Works shall be done in accordance with the Corporation's "**Procedures for Confined Space Entry**". This includes working in trenches and pits. The Contractor's attention is directed to the requirements for the number of confined space ticketed staff, the need for a rescue plan at all times, as well as correctly completed risk assessments and permits.

16 SHUTDOWN AND TEMPORARY PUMPING

The Contractor shall ensure that the stability of the Principal's sewerage system is not compromised by the programming of the Works, and the Contractor shall prepare work methods and risk assessments in consultation with the Principal's Operations staff before commencing any shut down or change-over procedure at any site.

The Work Method Plan must include the start date, duration and the process for liaison, and shall be endorsed by Principal's Operations staff prior to submission to the Superintendent for approval. Work shall not commence until approval has been granted by the Superintendent.

By-pass pumping will be undertaken by the Corporation's operation staff and the Contractor shall provide a detailed work programme to the Superintendent on the approved bypass methods and time period(s) for bypass pumping before any construction works commence in a "Live Sewer".

The Corporation will provide temporary arrangements, including tankerage, to isolate the Hastings Street Pump Station during the renewal of the Sewer main for the agreed period(s) of time. The time frame(s) shall be discussed during the initial phase of the project and the Contractor shall not commence work without prior approval from Superintendent.

The Superintendent will provide details of the Principal's Operations staff to the Contractor as soon as practicable after Commencement Date.

In the event of any spillage, the Contractor must advise the Corporation immediately. The Contractor or any sub-contractor shall be responsible to rectify the spillage in accordance with the Environment Protection Authority (EPA) regulations and the Contractor will also be responsible for the cost of all clean-up and associated activities that may be required by the EPA to rectify the effects of a spillage.

If the Contractor decides to carry out any works outside the agreed time frames and bypass procedures, the Contractor shall provide Eductor Waste tankers at its cost. Also, the Contractor shall be responsible at its cost to provide all labour, equipment and materials required to rectify any sewer spillage due to the Contractor's activities.

The Contractor will be required to provide contingency plans for management of spills as part of the Risk Management Plan.

17 DECOMMISSIONING OF OLD MAIN

If the Contractor's proposed construction methodology requires the decommissioning of the old sewer rising main, the method of decommissioning shall be clearly described in his method statement. The final method of decommissioning shall be agreed by the Superintendent.

APPENDIX B RELEVANT PLANS AND DRAWINGS

The following plans and drawings shall be used in the preliminary Work methodology.

Pipeline Plans

- (i) Existing Sewer Main plans
- (ii) Pipeline aerial photos
- (iii) Site Photos