

Miriam Vale Shire Council

Sewerage Standards

This document sets out the requirements for the design and construction of sewerage for acceptance by Miriam Vale Shire Council as donated assets.

The Sewerage Code of Australia (SCOA) is not reproduced in this document. The document can be obtained from the following organisations:

Water Services Association of Australia	Standards Australia
469 Latrobe Street	1 The Crescent
Melbourne Victoria 3000	Homebush NSW 2140

Council's amendments to the SCOA are set out below. Part and Section references are those given in the SCOA. Where no reference is made to a Section in the SCOA, the Section applies in full without amendment.

If conflict is considered to exist between the SCOA and an amendment the matter shall be referred to Council for resolution.

The sewerage requirements are applicable to the majority of situations. However, variations may be necessary to meet special circumstances or to overcome other problems not addressed in the requirements. Whenever the proposed design varies in anyway from the requirements the proposed variation shall be authorised by the Council.

PART 0: GLOSSARY OF TERMS, ABBREVIATIONS AND REFERENCES

The following definitions from the SCOA are reproduced below for the assistance of readers of this document.

Water Agency	Miriam Vale Shire Council
Concept Plan	A package of information provided to the Designer by the Water Agency to enable appropriate planning and design of major sewerage system components to be performed.
Constructor	An individual, corporation or legal entity including any contractors and sub-contractors that is accountable at law for delivery of Works under a specific contract or development agreement.
Developer	A person, organisation, local government authority or government authority (other than the Water Agency) responsible for provision of sewerage.
Designer	Person(s) or firm responsible for a design output. Such person or firm may be accountable to a Project Manager or other person having responsibility under a contract or otherwise.
Works	All those Works being sewers, maintenance structures, pumping stations, pressure mains and accessories and shall include valve chambers and storage facilities as shown on the Design Drawings and include any part of the Works.

PART 1: PLANNING AND DESIGN

1.3.3 Design Responsibilities

'The Designer shall be a Registered Professional Engineer of Queensland'.

1.4.3 Design Output – Amend to read

The Design Drawings and Specification may comprise elements of Parts 2, 3 and 4 of this Code.

2.3 Planning Parameters

The design unit flow rate shall be 250 l/ep/d.

The ep density is to be based upon the design populations for particular developments listed in the Infrastructure Charges.

3.2 Flow Estimation

Flow estimation assumptions shall be given in the Concept Plan.

4.1 Detail Design Process

For multi-unit developments where each unit has a separate footprint and may qualify for a freehold title, the sewer services to each unit shall comply with the requirements of this Standard.

4.2.2 Design Accuracy

Horizontal alignment shall be referenced to the Australian Map Grid Coordinate system GDA 94.

4.2.3 Sewer Layout

Sewer reticulation shall be arranged to minimise the length of sewer in private property by locating sewers within the road reserve wherever possible. Such sewers shall be located parallel to and 1.75 metres from the front property boundary.

Sewers shall run parallel to and 1.5 metres from the property boundary when located within private property. The tolerance on the alignment of the centre of the pipe shall be ± 0.1 m.

Sewers shall cross property boundaries as near as possible to 90 degrees, and where possible should be designed such that not more than one sewer and one MH are located within any one allotment.

Easements are generally required for sewer lines in private properties.

Curved sewers shall not be used.

4.2.5 Easements

Easements shall be provided where sewers are laid in private property. The easements are to be 3 metre wide and centred over the sewer alignment.

4.2.6 Disused Sewers

Works to be undertaken on sewers and maintenance structures that are no longer required is dependent on the location of the sewer and shall comply with the following requirements:

Existing or Future Buildings lots - break-up and removal of the sewer and MHs from site, or crush the sewer and removal of the MHs from site. In each case the trench shall be backfilled and compacted to the standard required for the building site.

Under Roadways - break-up and removal of the sewer and MHs is preferred. Where this is not practicable, the sewer shall be filled with 5 MPa sand/cement grout and the MHs removed. In either case, the works shall comply with the road authority requirements.

Public Open Space - sewers shall be plugged at each MH. MHs shall be broken down to 600 mm below ground level and filled to the existing surface level.

The works to be undertaken on disused sewers and MHs shall be recorded as part of the "As-Constructed" details.

4.3.2 Roads, Reserves and Open Space

Wherever practicable, sewers shall be located in the sewer allocation on the high side of the road reserve.

Where there is a significant advantage in placing the sewer in another utility allocation, written approval of the relevant utility is required before using this allocation.

Sewers laid in the road carriageway shall be located on an alignment of 1.75 m from the Property Boundary, as per IMEAQ Std Drwg R-1010.

Wherever practicable, sewers in drainage reserves shall be laid parallel and adjacent to the drainage system and clear of grassed waterways to minimise the effect of pipe bedding material on ground water movement.

Wherever practicable, maintenance structures shall be located outside the road pavement except in grass swales, where the maintenance structures shall be located outside the swale.

In the last line of the clause in the Code, change reference from Clause 6.2 to 6.3.

4.3.4 Public and Private Property

Easements shall be provided where public sewer line is to be laid in private property.

Offset alignments from residential property boundaries shall comply with the following:

- side boundary of property 1.0m
- rear boundary of property 1.5m

Building over or near sewers is to comply with Section 4.4.4 of this Manual.

Sewers shall cross retaining walls as close as practicable to right angles.

Where the sewer crosses under a retaining wall, a certificate from a registered professional engineer shall be provided for the structural integrity of the sewer.

Where the sewer crosses under a boulder retaining wall, a concrete bridging slab shall be placed over the sewer and a certificate from a registered professional engineer shall be provided for the slab design and the integrity of the sewer.

4.3.7 Horizontal Curves in Sewers

Curved sewers shall not be used.

4.4.3 Clearance from Transmission Towers and Power Lines

Where the distance between a metal sewer and a power line or transmission tower falls within the distances stated in the Code, a report on the procedures to be adopted for the construction and maintenance of the sewer shall be provided by an RPEQ.

4.4.4 Clearance from Structures

The minimum distance between a sewer and the outermost projection of a building, structure or piered footing shall be 1.5m. No structural loading shall be allowed with the zone of influence defined in Figure 1.

The minimum horizontal distance between sewers and mature trees less than 5 m in height shall be 1.5 m. For trees larger than 5 m in height, the minimum horizontal clearance shall comply with the written recommendations of a qualified arborist.

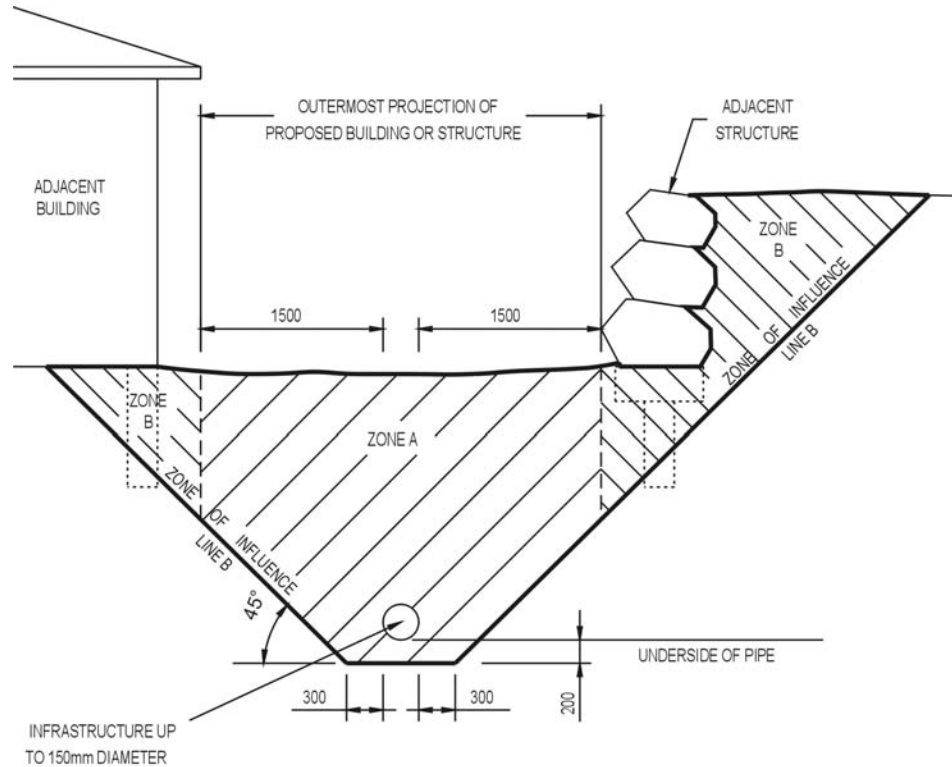


FIGURE 1

4.4.5 **Underground Obstructions & Services**

The location of all existing services shall be confirmed with the appropriate Authority prior to the commencement of any excavation work.

The Water Agency takes no responsibility for the accuracy of any 'as constructed' information.

4.4.5.2 **Clearance Requirements**

Sewers shall always cross under water mains with a minimum vertical clearance of 400mm.

4.5.3 **Minimum Air Space for Ventilation**

Select option B. The flow depth at the Design Flow (PWWF) shall not exceed 70 % of the Diameter.

4.5.5 **Maximum EP for Reticulation Sewers**

Sewers shall be sized to carry the design flow without exceeding the 70% flow depth. The maximum EP figures in Table 4.4 shall not apply.

4.6.1 Vertical Alignment of Sewers

Sewers and property connections shall be constructed at the shallowest practicable depth, while ensuring that the critical factors described in the clause are achieved.

4.6.4.2 Serviced Area Requirements for Residential Lots

For single residential lots, the property connection shall service the total area of the lot. For "battle axe" blocks the serviced area may be considered to start at the end of the access way.

4.6.6.4 Large Falls at MHs

No internal drops are permitted in a DN 900 MH. A maximum of one internal drop is permitted in a DN 1200 MH. Table 4.10 does not apply.

4.6.7 Vertical Curves

Curved sewers are not permitted.

4.6.8 Compound Curves

Compound Curves are not permitted.

4.7.3 External Corrosion

PVC sewers shall not be used in ground likely to be contaminated with hydrocarbons.

5.3 Property Connections

Only details shown on WAT 1106 shall be used. Separate inspection openings (IO) to surface shall be provided for each service connection and must be located 1.5m within each property boundary.

The IO shall be able to be rodded. There is to be a 45° junction off the sewer with a 45° bend to a vertical IO. The IO is to be brought to within 300mm of surface in undeveloped sites and marked in accordance with SEW-1109.

5.3.3 Buried Interface Method

This method is not approved by the Water Agency.

5.4 Maximum Depth of Property Connection

The maximum depth to invert of a property connection for a single residential lot shall be 1.5m.

Where the sewer is 1.5 to 3m deep, a vertical riser (jump up) or ramped connection is required.

A maximum of two single residential connections may be installed with a vertical riser or ramped connection.

For multi- residential, commercial and industrial developments, the maximum depth to invert of the property connection shall be 3 m.

No connections shall be specified to sewers at depths greater than 3 m. In such cases, connections shall be made to a maintenance structure or to a higher level secondary sewer.

5.5.2 Multiple Occupancy Units

The whole multiple occupancy lot shall be regarded as a single occupancy lot that is served by a single point of connection.

Section 4.1 of this standard shall also apply.

5.6 Location of Connection Points

Property connections shall comply with Section 4.4.4 of this standard.

5.6.2 Developed Lots

The property connection point shall not be greater than 3.5m from the downstream boundary.

5.8 Length of Property Connection Sewers

The maximum length of a property connection sewer shall be 25m.

6.2 Location of Maintenance Structures

The centre of MHs (MH) within allotments shall be located 1.5 metres from the boundary crossed by the sewer line. MHs in footpaths should be located in line with the property boundary wherever possible.

Terminal maintenance shafts may be used where the length of the line from the downstream MH is less than 45 metres, provided not more than two property connections are made in the line.

6.3 Spacing of Maintenance Structures

The maximum distance between maintenance structures shall be 90m.

6.4 Special Considerations for Location of Maintenance Structures

Maintenance structures shall be located to comply with Section 4.4.4 of this manual.

6.6.3 Design Parameters for MHs

Stub lines shall terminate between 1 m and 1.5 m from the MH with an approved cap.

The minimum MH diameter shall be 1050mm for pipes up to 225mm diameter, and 1500mm for pipes greater than 225mm diameter or where the change of direction for a sewer line is greater than 100 degrees. Where two internal drops are contained in the MH the diameter of the MH shall be 1500mm.

The minimum depth of a MH with a 600mm diameter round lid, measured from the top of the MH to the deepest invert shall be 900mm.

The minimum depth of MHs with an internal diameter greater than 1050mm, measured from the top of the MH to the deepest invert shall be 1200mm.

Rectangular lids shall not be used on MHs.

In MHs deeper than 6m landings and ladders shall be provided.

6.6.4 Property Connections into MHs

Where the sewer line is located outside the allotment being serviced, the oblique junction shall be located so that the property connection can be laid as directly as possible i.e. 90 degrees to a point 1.0 metre inside the front and side boundaries, or the rear and side boundaries as appropriate.

'Not more than two bends shall be installed in a property connection.'

Invert levels of property connections at the boundary shall be shown on the plans and long sections of the Design Drawings.

"Y" connections shall not be used.

6.6.8 Ladders, Step Irons and Landings

Step Irons are not to be installed.

7.6.2 Near-Horizontal Boreholes

In sub paragraph (A) change reference Table 6.1 to Table 7.1

7.8 Inverted Syphons

Inverted syphons shall not be used.

8.2 Products and Materials

UPVC sewers may be used in residential, commercial and light industrial areas except where there is the possibility that the sewer flow or surrounding ground may contain hydrocarbons.

9.2 Design Drawings, General

Design Drawings shall comply with Miriam Vale Shire Council Planning Scheme Policy No.1 – Appendix B

9.3.2 Recording of As-Constructed Information

As-Constructed drawings shall comply with Section 8.4 of the Miriam Vale Shire Council Planning Scheme Policy.

PART 2: PRODUCTS AND MATERIALS

10 Products and Materials Overview

As this area is reasonably remote, the types of materials utilised in sewer mains shall be limited such that the availability of spares is maximised and the inventory of spares carried by repair crews and Council stores is minimised. Only the following Pipeline Systems (Refer Table 10.1) shall be used - PVC.

Gibault Joints

Gibault joints shall be long barrel type with stainless steel (Grade 316) fasteners. Gibault joints used below RL5.0 or in the presence of actual or potential acid sulphate soils shall be protected by application of petrolatum mastic and tape wrap.

Pre-Cast Concrete MHs

Pre-cast manholes shall be CSR Humes Wedge Ring or approved equivalent.

Stabilised Sand

Stabilised sand shall contain a minimum of 4% cement by weight.

PART 3: CONSTRUCTION

12.2 Personnel Qualifications

The Plumbing and Drainage Regulation 2003 requires that the work be carried out and supervised by a licensed drainer.

During any construction activity at least one person on site must have completed a pipe laying training course appropriate to the type of pipeline under construction and have documentary evidence of current accreditation for the type of pipe being installed.

The pipe laying training courses appropriate for various pipelines are:

Pipeline	Course	Training contact
PVC	Flexitec PVC Pipe Installation	Partec Mt Gravat TAFE Ph: (07) 3849 7878
PE	Welding of PE – Electro-fusion	Partec Mt Gravat TAFE Ph: (07) 3849 7878

13.5.1.1 Contractor's WPH&S Obligations

Where the Contractor plans to undertake an excavation in which Council will carry out works, the Contractor shall comply with all the requirements set out hereunder.

Under State Workplace Health and Safety Legislation, any worksite excavation of 1.5 metres or deeper shall have a Workplace Health & Safety Plan prepared. A Contractor preparing an excavation, in which Council will carry out work, shall prepare a Workplace Health & Safety (WPH&S) Plan.

Should a Workplace Health & Safety Plan not be prepared and not presented on site prior to commencement of Council work, or the control measures do not meet the requirements, Council workers will leave the site and the Contractor will be liable for the costs of loss of Council time. Work will not recommence until such time as Council has received that payment and the appropriate control measures are in place.

For the purposes of this requirement, a Contractor shall include any person or organisation that contracts (either directly or through a third party) with Council to construct new or improve, existing sewerage reticulation services or sewerage maintenance structures. Council will also prepare its own Workplace Health & Safety Plan as a separate document to that which the Contractor shall provide. The Contractor continues to be responsible for the construction site but to the extent of any inconsistency between the contractor's and Council's WH&S Plans, the Council requirements shall prevail.

Items listed below are a guide only for the measures that Council will be checking as part of their Workplace Health & Safety Plan.

- Erect road signs as per Manual for Uniform Traffic Control devices to alert oncoming traffic.
- Locate underground services in accordance with Queensland Government WH&S Underground Services Health & Safety Guide.
- Check for the presence of overhead power lines in the vicinity of the working area and if present record the risks shall on the work plan.
- Erect barricading to secure the site from unauthorised access, especially children.
- Ensure Contractor/asset owner excavation over 1.5m WPH&S Plan has been sighted by Council employees.
- Proprietary shoring
 - attach specifications to plan
 - type/model
 - Non-proprietary shoring details
 - Benching
 - Battering
 - Obtain geotechnical advice for all excavations 3 m and deeper.
- Plant operators certificate of competency has been sighted.
- Where the depth of the excavation is 2.4 m or deeper, a minimum of 900 mm edge protection will be installed around the excavation.
- Ensure spoil is placed at least 600 mm from the side of the excavation to minimise falling debris.
- Ensure that adjacent structures: eg fences, light poles, telephone boxes are supported.
- Ensure ladder will be in position to access the excavation.
- Ensure the access ladder extends at least 1 m above the top of the excavation.
- Ensure ladder is secured.
- Place combustion engines outside and as far away as practicable from the excavation to prevent the excavation being contaminated by toxic fumes.
- Site specific induction for excavations over 1.5 m shall be given by the Principal Contractor or someone on their behalf.
- Council officers shall be informed of the person to whom hazards are to be reported to.
- Has the excavation been deemed a confined space?

Any queries on this issue are to be referred to the Water Agency for clarification.

13.5.3 Disused/Redundant Sewers

Refer to Section 4.2.6 of this manual.

14 Products and Materials

All pipe materials and fittings to be used in the sewerage network shall be authorised by the Water Agency. A list of the authorised items is included in Appendix A of this manual.

Where items are required but not included in the Authorised Product list they shall be referred to the Water Agency for appraisal.

15.2 Limits of Excavation

Where a sewer or property connection sewer is located in rock and has the potential to be extended, the excavation shall be extended 1.0m.

Where excavation exceeds the required depth by more than 200mm, the excavated material shall be replaced with stabilised sand to the required level.

17.1.4 Pipe Laying & Jointing

Where house connections are provided, necessary sections of the trench shall be left unfilled until the position of the junction and the end of the property connection have been recorded by the Constructor for 'as constructed' purposes.

Where property connections are provided to MHs, a rocker pipe shall be provided as SEW-1302.

17.2.3 to 17.2.5 Curves

Curves are not permitted.

17.5 Trench Stops

Use only where specified on the Design Drawings or where an underground water path is encountered during construction. Trench stops may be omitted where a sub soil drainage system is provided

17.5 Bulkheads

Use only where specified on the Design Drawings or where an underground water path is encountered during construction.

17.9 Marking of Property Connection Sewers and Dead Ends

Each property connection and dead end shall be marked using identification tape and a hardwood peg.

17.11 Marker Tape and Tracer Wire

Marking tape and tracer wire shall be laid above buried non-metallic pipes along the top of the embedment zone or at 1 m below the surface; whichever is the higher.

17.12 Bored Pipes under Roads, Driveways etc

Proposed methods and materials for bored pipelines shall be approved by BW before commencement of boring.

Hydraulic continuity in the trench shall be provided by the installation of 50mm conduit under the pipeline before final grouting. Filter cloth shall be wrapped and secured around each end of the conduit.

20.2 Embedment Material

Embedment material for water mains and water services shall be 5 to 7 mm single sized aggregate. This is considered to be self compacting.

21.1.2 Trench Fill Material

Trench filling material shall consist of the best material from the trench excavation, free from organic matter, with particle size not exceeding 75mm and can achieve the required compaction.

A layer of geo-fabric is to be placed between the embedment material and backfill material.

For trenches in the roadways and footpaths, fill material shall be in accordance with the requirements of the road owner.

20.3.4 Compaction Requirements

The Contractor shall be responsible for all compaction testing and shall arrange for the testing to be carried out by a NATA certified Test Laboratory.

Prior to commencing work the Contractor shall prepare a testing plan showing the number of tests and depths in each zone where tests are to be carried out.

The Laboratory shall randomly select test locations in each zone. The Water Agency may direct the Laboratory to undertake additional tests in any zone. The test locations shall be uniformly distributed over the works.

Test Frequency

Testing shall not be clustered within a zone or at boundaries of a zone.

In deep trenches where more than 1 layer is to be tested, the test locations shall, where practicable, be staggered from those layers above or below by at least 5 m for water mains and 2 m for water services.

Compaction Certificates

Prior to the issue of the Certificate of Practical Completion, the Contractor shall submit the individual compaction test records and a Certificate of Compliance from the NATA Test Laboratory confirming that the tests have been completed in accordance with the testing plan and that the specified compaction has been achieved.

Non-Compliance of Compaction testing

If the compaction tests fail, the Contractor shall remove and re-compact the fill from all areas that fail the test. The compaction tests shall be repeated at the Contractors' cost until satisfactory compaction levels are achieved.

22.2 Visual Inspection, Above Ground

In addition to the above ground inspection, all sewer lines shall be subject to internal visual inspection by means of lights and/or mirrors. The lines shall be straight and a full circle of light shall be visible at the far end. No ponding shall be visible in any part of the sewer.

22.4 Air Pressure and Vacuum Testing of Sewers

Sewers and manholes are to be vacuum tested.

22.7 CCTV Inspection

All sewers shall be subject to CCTV inspection. Results are to be submitted on CD or DVD.

25.1 Restoration, General

Restoration shall be carried out progressively as each section of the Works is completed.

The excavated and disturbed area shall be stabilised to minimise wind and water erosion of the restored area.

PART 4 STANDARD DRAWINGS

The following table indicates the appropriate use of SCOA standard drawings

Status of SCOA Drawings is per the following key.

Use Use as Miriam Vale Shire Council standard practice (with amendment if necessary as indicated in the Table below)

Not to be Used The SCOA drawing is not to be used for design or construction purposes.

Topic	SCOA Drawing	SCOA Status
PIPELINE LAYOUT AND CONNECTION DETAILS		
Typical Locality & Site Plan	SEW-1100	Use offsets as per IMEAQ Std Drwg R-0101 and 4.3.4
Connection, Sewer in Road Reserve	SEW-1104	IOS to be located on property - as per option in note 5 of drawing Buried interface (connection point) not adopted.
Connection, Sewer in Easements and Inside Property	SEW-1105	Buried interface (connection point) not adopted.
Connection, IO Interface Method	SEW-1106	There is to be a 45° junction off the sewer with a 45° bend to a vertical IO. The IO is to be bought to within 300mm of surface in undeveloped sites and marked in accordance with SEW-1109.
Connection, Buried Interface Method	SEW-1107	Not to be used

Topic	SCOA Drawing	SCOA Status
EMBEDMENT / TRENCHFILL AND SUPPORT SYSTEMS		
Special Embedment, Support Using Piles	SEW-1204	Not to be used
ACCESS STRUCTURES		
MH, Sewers ≤ DN300, Precast Types P1 & P2	SEW-1300	Mastic joints not to be used. Step Irons not to be used.
MH, Step Irons and Ladders	SEW-1307	Not to be used
SPECIAL CROSSINGS / STRUCTURES ARRANGEMENTS		
Buried Crossings, Syphon Arrangement	SEW-1400	Not to be Used
Aerial Crossings, Aqueduct	SEW-1404	See SEW-1405
Aerial Crossings, Aqueduct Protection Grille	SEW-1405	Substitute Aluminium Pool Fencing for hot dipped galvanised steel grille shown in drawing
Water Seal Arrangement, Main Trap	SEW-1409	Not to be Used
Water Seal Arrangement, MH System	SEW-1410	Not to be Used
Water Seal Arrangement, Twin MH System	SEW-1411	Not to be Used
CONNECTIONS TO EXISTING SYSTEM		
Insertions & Repair Systems, Insertion of Junctions	SEW1501	Saddle not to be used

Appendix A
Authorised Products – Sewerage

Item	Requirements	Authorised Manufacturer
Pipe		
PVC	Plain Wall – RRJ DN 100 – SN 10 DN 150 and above – SN 8	Iplex Vinindex
DICL	K9 Rubber Ring Jointed Bitumen Coated	Crevet Tyco
PE	PN 12	Iplex Vinindex PPI
Fittings		
PE Maintenance Shafts	Poo- Pit	Wormall
Resilient Seated Gate Valves	Thermally Bonded Polymeric Coating PN 16	Tyco AVK Vinindex
CI Boxes & Covers	AS 3750.4	Tyco Iplex Gatic/Milne Tellam Crevet
PVC Fittings		Iplex Vinindex

Item	Requirements	Authorised Manufacturer
PE Fittings	Electrofusion couplings to be long socket type	George Fischer Philmac Plasson
Marker Tape		Boddington Tapex
Tracer Wire	2mm 316 stainless steel 7/19 construction cable	
Low Pressure Sewerage Pump Station	Minimum retained volume of effluent Pump and motor not to be in direct contact with the effluent Brownout protection.	Mono – Eco 1-60 pumping station, or equivalent

Delegation:

Resolution Date/Minute No:

18 September 2007

Minute No: 3893

Review Responsibility:

Date Reviewed:

Date Amended: