1. DETAILED DESIGN AND FOR-CONSTRUCTION DRAWING

Prior to commencement of construction:

1.1. "For-Construction" drawings shall be prepared explicitly including all construction details and submitted to the Superintendent's Representative.

1.2. Equipment/material data sheet shall be furnished for all permanent installations and any alternative equipment/material shall be approved by Superintendent's Representative.

1.3. The contractor shall confirm locations, invert levels and depths of all services by detailed engineering survey.

1.4. Arboricultural investigations are to be carried out during the detailed design to confirm locations and excavations near existing trees (if any).

1.5. Excavation conditions survey (geotechnical investigation) shall be carried out to assess the soil conditions and construction requirements.

2. EARTHWORKS AND PAVING REQUIREMENTS FOR PUMPING STATION SITES AND ACCESS ROADS

2.1. CLEARING AND STRIPPING

Pumping station sites, access roads and vehicle turn-around areas (as defined in the design drawings) shall be cleared of all trees, vegetation, roots and debris.

The cleared areas shall then be stripped of organic topsoil.

2.2. EXCAVATION

General excavations shall be to the lines and levels shown on the design drawings. All areas to be paved shall be excavated to a minimum depth of 150 below the design pavement surface level. Where the initial stripping (or general excavation) of areas to be paved exposes soils of low bearing capacity (e.g. highly organic soils, silt or fine-silt soils), such areas shall be excavated to a minimum depth of 300 below the design pavement level.

2.3. FILLING

Material to be used as general fill shall be classifiable as low or medium plasticity clay, sand or rubble. It shall be free from vegetation or debris and shall not contain more than 20% by mass of stone with a size between 75 and 150, and none larger than 150. Soils classifiable as high plasticity clay, 'silt' or 'organic' shall not be used as fill. Fill shall be placed in layers of appropriate thickness for the compaction equipment employed, and each layer shall be compacted to not less than 95% of its Standard Maximum Dry Density (AS 1289.5.1.1).

3. EXCAVATION FOR SUMP, VALVE CHAMBER AND CONTROL MANHOLE

3.1. GENERAL

Specialist geotechnical requirements may apply depending on site and soil conditions, and ground water level.

3.2. EXCAVATION CONDITIONS SURVEY (geotechnical investigation)

Excavation conditions shall be determined prior to the commencement of excavation. The excavation conditions survey (which may include pitting or drilling) shall be designed to determine the nature of the materials (e.g. rock, sand, soft or stiff clay, etc) and also the groundwater conditions at the site of the sump, to a depth not less than 1500 below the base of the proposed excavation.

3.3. GROUNDWATER CONTROL

Where the "excavation conditions survey" indicates that the excavation will penetrate through or into sands below the water table, then measures shall be taken (e.g. by wellpointing) to lower the water table to below the proposed base of the excavation before beginning to excavate. The water table shall be held below the base of the excavation until the structure is backfilled. Observation bores shall be installed to enable verification that the required depth to water table is reached and maintained.

3.4. EXCAVATION SUPPORT

The walls of all excavations shall be stabilised by a shores system, sloping of the excavation, or some other acceptable method, to prevent any movement of the walls or surrounding ground. In addition, the requirements of the South Australian Work Health and Safety (WHS) Act 2012, shall be strictly adhered to.

3.5. PREPARATION OF FLOOR OF EXCAVATIONS

The floor of all excavations shall be trimmed to horizontal and compacted to not less than 95% of the Standard Maximum Dry Density of the material (AS 1289.5.1.1) for a minimum depth of 150. For structures with pre-cast concrete base slabs, a 150 thick layer of 10-7 screenings (in accordance with DPTI Specification S10-7), compacted to a minimum Density Index of 70% shall be placed on the compacted base of the excavation in readiness for installation of the structure.

Note. Where the floor of the excavation is in loose sand or very soft clay, and where screenings are used, an approved geotextile (Ref. SCM D rig. C2) shall be placed beneath the screenings.

4. INSTALLATION OF PUMPING STATION SUMP

The station sump shall be installed in such a manner as to not damage the sump or the excavation.

All wall sections shall be vertical. Precast wall sections are to be joined to the height required with the top segment diamond saw cut to suit the finished design levels as shown on the Pumping Station Design Drawings. The cover slab shall be placed on a 20 thick layer of sand/cement mortar to bed the cover slab and also to seal the cut top segment.

Joints between pipe sections to be sealed at the outside with butyl rubber seal and flushed on the inside of the sump with cement mortar.

Note: All measurements are in millimetres unless specified otherwise.
5. BACKFILL

5.1 BACKFILL AROUND THE SUMP AND VALVE CHAMBER

Backfill shall not commence around the sump chamber until the placement of the sump has been completed and approved by the Site Engineer and Superintendent's Representative.

Backfill material around the sump chamber shall be sand in accordance with DPTI Specification SA-D, Sand Type ‘D’. The sand shall be compacted to not less than 95% of its Standard Maximum Dry Density (AS 1288.5.1-1). An alternative to the sand is 10–7 screenings in accordance with DPTI Specification SA10–7, compacted to a minimum Density Index of 70%.

5.2 EMBEDMENT AND TRENCH FILL FOR SEWERS AND PUMPING MAINS

Embedment and trench fill for sewers and pumping mains shall be in accordance with SCM Section C for gravity mains and WSCM Section B for pressure mains.

5.3 EMBEDMENT AND TRENCH FILL FOR SAPN SERVICE

Embedment and trench fill for SAPN Service and all electrical conduits shall be as detailed on SCM page M9.

6. FLOTAION

The structures shall be designed and installed to ensure that flotation due to high ground water does not occur.

7. NOISE AND ODOURS

All lids and access covers shall be close fitting to contain all noise and odours and acoustically rated to ensure noise levels adhere with the Environment Protection (Noise) Policy 2007.

8. PUMPING MAIN GRADING AND DESIGN CONSIDERATIONS

8.1 GRADING

Individually grade each pumping main in accordance with the following criteria—

- From the sump into and through the valve chamber and within the station site itself, the pumping main shall be graded 'level' (allowing due consideration for construction tolerances).

- Therefore, and wherever possible, grade each pumping main so that it is continuously rising, discharging at the highest point in the pumping main.

- High points along the pumping main (changes from rising to falling gradients) are not permitted without the specific approval of the Superintendent's Representative.

- High points are to be avoided by grading out wherever possible, avoiding the need for air-relief valves at these high points.

- Where high points cannot be avoided and no other viable alternative exists, manual or automatic air-release valves shall be provided at high points as per section 8.10 in this drawing. Hydraulic study shall be carried out to identify the type, size, configuration and location of the air-relief valve and confirmed with Superintendent's Representative.

- Otherwise, a standard DN80 air-relief valve assembly shall be used, and the standard note (Ref. 'Air-Relief Valves' detailed below) shall be prominently shown on the Design Drawings.

- Mains can be installed deeper than the minimum 750 final cover (where approved by the Superintendent's Representative) as a means of eliminating high points.

8.2 COVER AND MECHANICAL PROTECTION

- During sewerage construction, earthworks, or road construction etc., the minimum cover to ensure mechanical protection of the pumping main shall be no less than 600. The design minimum cover (and final cover) to the pumping main shall be no less than 750.

- Where the minimum depth of cover cannot be achieved (beneath creeks or at crossings with other services etc.), the pumping main may be protected by an unreinforced concrete surrounding of 150 minimum thickness, or preferably a 100 thick reinforced concrete slab over the main extending laterally at least 600 clear of the main on both sides, or as directed by the SA Water Engineering Section.

NOTE: The pumping main at the valve chamber may be considerably deeper than 750, to accommodate the minimum cover beneath the kerb and water table at the street boundary, and/or accommodate local depressions in the soil profile.

8.3 BEDDING

Bedding material for pumping mains shall be in accordance with WSCM Section B.

8.4 ALIGNMENT AND GRADIENT CHANGES

For rubber–rubber jointed pipelines, all alignment and gradient changes shall be made by—

- Using standard commercially available rubber ring jointed bends (long radius where available).

- Minor rotation at the rubber ring joints in accordance with the manufacturer's specification; (greater rotation causes spigot-faucet binding and joint failure).

- Combination of the above.

8.5 BEND LOCATIONS AND JOINT DEFLECTIONS

The pumping main design drawings shall show all bend locations, and/or joint deflections where used, at their respective distances, and shall also quote the actual value of the bend's (e.g. 45 degrees) and/or joint deflection (e.g. 1 degree).

8.6 CONNECTION INTO DISCHARGE STRUCTURE

Connect the pumping main to the discharge Access Chamber (obvert to obvert) in accordance with SCM Section H.

8.7 THRUST BLOCKS

(PUMPING MAINS HAVING RUBBER RING JOINTS)

- Install concrete thrust blocks (32 MPa) at all bends (horizontal and vertical) and at all junctions, in-line stop valves (and dead-ends where applicable), to resist the hydraulic forces developed within the pumping main. HDPE pipe may require additional restraint.

- Thrust blocks shall be poured against sound undisturbed faces of excavations and the concrete shall be kept clear of the pipe joints. Reference drawings— (for Anchor and Thrust Block Design)

- WCM Page B7 – Thrust Block Details

- WCM Page B8 – Thrust and Anchor Blocks

- WCM Page B17 – Thrust and Anchor Blocks for Various Dead End Types

8.8 ISOLATING VALVES

Isolating valves shall be installed on pumping mains at regular intervals not exceeding 1600 metres. Air-relief valves (detailed below) shall be installed on the pipeline immediately adjacent to and on both sides of each isolating valve.

8.9 DRAINAGE SCOURS

Drainage and scouring outlets (to a suitable drainage point) are required, as determined by the Superintendent's Representative to drain long sections of the pipeline for maintenance purposes.
8.10. AIR-RELIEF VALVES (where approved by the Superintendent's Representative)

Superintendent's Representative may elect to install automatic Air-release and vacuum break or manual Air-release valve based on the hydraulic conditions of the rising main.

8.10.1 AUTOMATIC AIR-RELEASE AND VACUUM BREAK VALVES

Size, type, configuration and location of automatic air release valves shall be confirmed during detailed design and approved by the Superintendent's Representative.

Air-release and vacuum break valve may be housed in an SA Water Cast Iron Street Box assembly or in a separate above ground enclosure.

Valve assembly shall be provided with a separate drain and connected back to the sewer gravity network.

8.10.2 STANDARD DN80 MANUAL AIR RELIEF VALVE FOR PUMPING MAINS

Install a Standard DN80 SA Water Fire-Plug/Sewer Air Valve on a flanged riser pipe of suitable height off the pumping main (same class as pumping main), at the highest point (all housed in an SA Water Cast Iron Street Box Assembly, Ref WCM C10, C11 & C11A), and finished flush with the design surface level. Provide corrosion protection as detailed under Section 9 – Corrosion Protection. Also install a Sewer Air Valve Indicator Sign and Post at an appropriate distance off the road edge (as detailed on SCN M19).

(Refer to SA Water 'Authorised Items for Sewer Systems – Pressure Mains' for purchase details of available fittings).

9. CORROSION PROTECTION

9.1. DCL PIPELINES

9.1.1 BURIED DCL PIPE BARRELS AND DCL 'SLOTED' FITTINGS;

Install a continuous barrier of Linear Low Density Polyethylene protective sheathing (LLDPE) as detailed in Water Construction Manual (WCM) Page C1 and Page C2. LLDPE shall have a minimum thickness of 200 microns, in accordance with AS 3680.

9.1.2 BURIED STOP VALVES, AIR-RELIEF VALVES, SCOUR VALVES ETC (HOUSED IN STREET BOXES), INCLUDING BURIED METALLIC FLANGED FITTINGS/SPECIALS;

All fittings are to be epoxy coated in accordance with AS 4158. Prior to installation, inspect all fittings for defects. If a fitting is found to have a defect in the coating, the item must be wrapped with a Petroleum Anti-Corrosion System in accordance with SA Water Technical Standard TS 29.

All flanges must be wrapped.

NOTE: A combination of LLDPE protective sheathing and a Petroleum Anti-Corrosion System may be used as shown on WCM Page C2.

9.2. PVC &/or PE PIPELINES

Protect all buried stop valves, air-relief valves, scour valves etc (housed in Street Boxes), including all buried metallic fittings as described in Section 9.1.2 above.

9.3. MSCP PIPELINES

Protective coatings for mild steel concrete lined (MSCP) pipelines and fittings shall be in accordance with SA Water Technical Standard TS 12 for above ground installations and AS 4521 for buried installations.

9.4. FITTINGS LOCATED IN CONCRETE VALVE CHAMBERS ETC

For DCL fittings and specials, provide protection as outlined in Section 9.1.2 above.

For MSCP fittings and specials, provide protection as outlined in SA Water Technical Standard TS 12.

For PE bolted connections, only bolt heads and nuts shall be coated with Mastic and sealed with Radial caps filled with Mastic (Ref TS 29 Petroleum Anti-Corrosion System).

9.5. ADDITIONAL PROTECTION

More extensive protection may be specified by the Superintendent's Representative, appropriate for the specific site and application.
PUMP CHAMBER/SLUMP
1. Approved precast concrete proprietary brands of Pump Chamber/Sump may be either 1800, 2200 & 3200 ID (or equivalent) depending upon sewage inflows (refer SCM page M5).
SA WATER shall determine the diameter for each specific site.
2. Pump Chamber/Sump shall comply with TS 68.
3. Pump Chamber/Sumps shall be installed complete with covers, all electro-mechanical plant and equipment, telemetry, pump bases, guide rails, pipework, liquid level control mechanisms, lifting chains and all ancillary items, in readiness for commissioning.
4. Pump location bases and stainless steel twin guide rails are to be SA Water standard.
5. Lifting chains to be stainless steel and SA Water standard.

"NOT FOR CONSTRUCTION"

REFERENCE DRAWINGS:
SCM page M2 & M3 for:
1. Earthworks and Paving Requirements for Pumping Station Sites and Access Roads
2. Excavation for Sump, Valve Chamber and Control Access Chamber
3. Installation of Pumping Station Sump
4. Backfill
5. Flotation (Buoyancy)

NOTES:
1. Specialist Geotechnical requirements may apply depending on the actual site and soil conditions and ground water level.
2. Sump cover plates and safety grates are to open and lock in a vertical position so as to provide full fall protection on all sides.
3. Valve Chambers to be complete with covers, all pipework, valves, fittings and supports, in readiness for commissioning.

Section A-A

VALVE CHAMBER
1. Approved proprietary brands of precast concrete Valve Chambers may be installed. Pipework sizes will depend upon sewage inflows.
2. SA WATER shall confirm the pipework diameter.
3. Valve Chambers to be installed complete with covers, all pipework, valves, fittings and supports, in readiness for commissioning.
SUPERSEDED - REFER DRAWING 5003-00001-01

SA WATER TYPICAL WWPS SWITCHBOARD DESIGN
REFER TO PRINCIPAL ELECTRICAL ENGINEER FOR COPY
TELEMETRY SYSTEM
Provide at least 6 weeks notice in advance to SA WATER to complete the telemetry installation if required.

TELSTRA LAND LINE (where TELEMETRY is required)

CASE 1 STATION ABUTTING A PUBLIC ROAD
Provide a Light Duty (white) UPVC conduit (complete with PVC covered galvanised steel draw wire pending cable installation), from the switchboard cubicle base direct into the Telstra Pit located 1000 inside the front boundary of the pumping station allotment. Finish the pit flush with the design surface level.

CASE 2 STATION REMOTE FROM A PUBLIC ROAD
Provide a DN 32 Light Duty (white) UPVC conduit (complete with PVC covered galvanized steel draw wire pending cable installation), from the switchboard cubicle base, along access road and into the Telstra Pit located at the public road reserve boundary. Finish the pit flush with the design surface level.

NOTES:
- Lay the Telemetry conduit with AUSTEL TSD09 1" cables (whenever possible)
- All conduits to be fitted with covers (see NOTES)
- Bedding sand in accordance with DBP Specification
- PM64 compacted to not less than 90% of the Standard Maximum Dry Density of the material (Test AS 1289.5.1.1)

SUPERSEDED - REFER DRAWING 5003-00001-01
SA WATER TYPICAL WWPS SWITCHBOARD DESIGN
REFER TO PRINCIPAL ELECTRICAL ENGINEER FOR COPY

NOTES:
- All conduits shall be orange coloured Heavy Duty rigid UPVC to AS/NZ 2053, laid at 600 minimum cover, installed in accordance with the SAA Wiring Rules (AS 3000) and SA Power Networks Service Rules and Conditions of Supply.
- All conduits shall be continuous with solvent cement joints and waterproofed by sealing the ends pending cable installation.

"NOT FOR CONSTRUCTION"
Provide a Permapine post and rail fence (as detailed) around the entire site.

Provide a 6 diameter galvanised heavy duty chain (welded link type) across the vehicular entranceway at the allotment boundary, and fixed as detailed below.

Supply and attach to the chain at the mid length, a 900 long X 300 high 'Obstruction Marker' Type D4–5 with alternate 150 wide reflective white/black vertical bands.

Fix the chain to a 10 diameter eye bolt in the post on one side, and padlock through a matching eye bolt in the post on the other side of the entranceway. Eye bolts to be located 150 below the tops of the posts.

Chain and eye bolts are to be hot dip galvanised steel.

ALTERNATIVE FENCING AROUND PUMPING STATION SITE

In special cases and where approved by the Superintendent’s Representative, fencing of a different style and constructed from different materials designed to suit the character of the development can be used.
WATER SERVICE

1. PROVIDE A DN40 WATER SERVICE AT 450 MINIMUM COVER
   (REFER WCM E7) FROM THE STREET MAIN INTO THE
   STATION SITE FOLLOWED BY A DN40 BACK FLOW
   PREVENTION ASSEMBLY (REFER SCM M20).

2. THEREAFTER PROVIDE DN40 HDPE CLASS 12 INTERNAL
   WATER SERVICE PIPEWORK AT 450 MINIMUM COVER AND
   TERMINATE WITH A DN40 BOUNDARY COCK HOUSED WITHIN
   A CAST IRON NO. 2 METER BOX ASSEMBLY FINISHED FLUSH
   WITH THE DESIGN SURFACE LEVELS.

   THE BOUNDARY COCK IS TO BE LOCATED SO AS TO PROVIDE
   OPTIMUM WATER ACCESS TO SUMP, CONTROL MAINTENANCE
   STRUCTURE AND OVERFLOW STORAGE (IF PRESENT).

"NOT FOR CONSTRUCTION"
NOTES:

1. The roadway widths shown are minimum requirements.
2. The maximum speed limit on access roadways shall be 10 km/h.
3. The Contractor shall erect at least two standard 10 km/h Speed Limit signs along the access roadway:
   - one sign at the start of the access roadway, clearly visible to all incoming traffic
   - another sign adjacent to the pumping station site, clearly visible to all departing traffic. Signs shall be Type R4-1 to AS 1743 and installed to relevant Australian Standards.
4. Minimum radius of curvature of horizontal bends (including vehicle turning areas) shall be 8 m to the inside edge of the roadway.
5. Maximum longitudinal gradient for an unsealed compacted rubble roadway shall be 10%.
6. Steeper longitudinal gradients up to a maximum of 13% may be approved where:
   - the roadway is wider
   - horizontal bends have a greater radii of curvature than the minimum detailed above
   - the roadway is bitumen sealed or brick/block paved (Min 2.5% camber)
7. Vertical transition curves shall be provided between differing longitudinal gradients. Where this difference is 5% and greater, transition curves shall be minimum of 6 m long.

REFERENCE DRAWINGS:

1. SOM page M2 for -
   - CLEARING AND STRIPPING
   - EXCAVATION
   - FILLING
   - CUT/FILL BATTERS
   - PAVING
2. SOM page M6 for vehicle turn-around area.

Guard rails may be required along sections of the roadway depending on the specific site. Where required, guard rails shall be hot dip galvanised steel ("Straco Flexbeam Guardrail" or approved equivalent) supplied and installed to the manufacturer's specification and relevant Australian Standards. To accommodate guard rails, the roadway shall be at least 0.75 m wider than those locations.

NOTE: Other approved vehicle containment barriers or devices (eg stone or masonry walls) can be used in lieu of proprietary galvanised steel guard rails.

"NOT FOR CONSTRUCTION"
Refer to SCM page M2 for details of:
* GROUNDWATER CONTROL
* EXCAVATION SUPPORT
* PREPARATION OF FLOOR OF EXCAVATIONS
* BACKFILL AROUND VALVE CHAMBER
* FLUTATION

Refer to SCM page M3 for details of:
* PERSONNEL ACCESS
* CLEARANCES
* PIPIWORK PENETRATIONS
* RESTRAINT OF PIPework
* PIPEWORK

Refer to SCM page M4 for details of:
* CORROSION PROTECTION OF PIPEWORK

"NOT FOR CONSTRUCTION"
Case 1:  For RISING gradients (with flow direction as shown), install:
- SEWER AIR-RELIEF VALVE at 'A' as detailed on SOM page M18, to bleed entrapped air (during the 'charging' cycle) from that section of pumping main preceding the stop valve, and
- SEWAGE PUMP-OUT BRANCH at 'B' as detailed on SOM page M17, (or another SEWER AIR-RELIEF VALVE where this can be used as a substitute pump-out branch), to drain that section of pumping main beyond the stop valve.

Case 2:  For FALLING gradients (with flow direction as shown), install:
- SEWAGE PUMP-OUT BRANCH at 'A' as detailed on SOM page M17, (or a SEWER AIR-RELIEF VALVE where this can be used as a substitute pump-out branch), to drain that section of pumping main preceding the stop valve, and
- SEWER AIR-RELIEF VALVE at 'B' as detailed on SOM page M18, to bleed entrapped air (during the 'charging' cycle) from the section of pumping main beyond the stop valve.

"NOT FOR CONSTRUCTION"

NOTES:
- Install a Combination Indicator Sign (Air-relief/Stop Valve/Pump-out Br) and Post for each site as detailed on SOM page M19.
- General installation details of Sewer Street Box Assembly and Concrete Spacers is similar to that shown on WSCM pages C10, C11 and C11A.
- Fittings shall be protected with petrodatum tape system in accordance with SA Water Technical Standard TS 29 OR with bitumen mastic tape system in accordance with SA Water Technical Standard TS 81.
- For details of available fittings, refer to SA Water catalogues of "Authorised Items for Sewer Systems" and/or "Authorised Items for Water Reticulation Systems".
**TYPE 1 - DN 80 SEWAGE PUMP-OUT BRANCH**
INSTALL AT LOW POINTS ALONG THE PUMPING MAIN
WHERE THE STATIC SEWAGE LEVEL WITHIN THE PUMPING
SYSTEM IS BELOW THE BLANK FLANGE LEVEL

**TYPE 2 - DN 80 SEWAGE PUMP-OUT BRANCH**
INSTALL AT LOW POINTS ALONG THE PUMPING MAIN
WHERE THE STATIC SEWAGE LEVEL WITHIN THE PUMPING
SYSTEM IS ABOVE THE VALVE ASSEMBLY

**PUMP-OUT PROCEDURE**

**TYPE 1**
To drain the pipeline, remove the blank flange and pump out effluent via a suction hose inserted down to pipe invert level.

**TYPE 2**
The greater volume of the effluent can be emptied by connecting a hose (or pump-out suction hose where applicable) directly to the DN 80 valve.

To further drain the pipeline, remove the valve (or top half of the valve) and pump-out the remaining effluent via a suction hose inserted down to pipe invert level.

"NOT FOR CONSTRUCTION"

**NOTES:**
- Install a Sewer Pump-out Branch Indicator Sign and Post for each site as detailed on SCM page M19.
- General assembly details of Sewer Street Box Assembly and Concrete Spacers is similar to that shown on WSCM pages C10, C11 and C11A.
- Fittings shall be protected with petroleum tape system in accordance with SA Water Specification TS 29 OR with bitumen mastics tape system in accordance with SA Water Technical Standard TS 83.
- For details of available items, refer to SA Water catalogues of "Authorised Items for Sewer Systems" and/or "Authorised Items for Water Reticulation Systems."
DN 80 double flanged DICL or CICL riser pipe to be the same class as the pumping main and of appropriate length for each specific site.

DN 20 tapping saddle
PVC, DICL, or PE
Sewage Pumping Main

DN 20 Main Cock (SA WATER type)
Stock No 4820-0120
Retaining nut
(part of Main Cock)
DN 20 copper pipe of appropriate length for each specific site (flared at each end with retaining nuts).

Retaining nut
(part of Main Cock)
DN 20 Main Cock (SA WATER type)
Stock No 4820-0120
Screw the tapered end of the DN 20 Main Cock (SA WATER type) into the Tapping Saddle.
DIACL mains SHALL have a Plastic BSP 1" Nipple screwed into main and trimmed to the outer surface of pipe (for corrosion protection).

DN 80 SEWER AIR RELIEF VALVE
Applicable to the following pumping main sizes:
- Flanged
  - DN 100
  - DN 150
  - DN 200
  - DN 250
- Socketed
  - DN 80

Only PVC (Series 2) and DIACL pipes are compatible with the above sizes of socketed fittings.

Install:
1. At high points along the sewage pumping main (changes from rising to falling gradients).
2. Adjacent to each in-line stop valve on sewage pumping mains as detailed vide SCM page M16.

NOTES:
- Install a Sewer Air Valve Indicator Sign and Post for each site as detailed on SCM page M19.
- General assembly details of Sewer Street Box Assembly and Concrete Spacers is similar to that shown on WSCM pages C10, C11 and C11A.
- Fittings shall be protected with petrolatum tape system in accordance with SA Water Specification TS 29 OR with bitumen mastic tape system in accordance with SA Water Technical Standard TS 81.
- For details of available fittings, refer to SA Water catalogues of "Authorised Items for Sewers Systems" and/or "Authorised Items for Water Reticulation Systems".

"NOT FOR CONSTRUCTION"
INDICATOR POST
(Refer to WSCM C17)

NOTES:
1. For sites in roadways with kerbs, locate the appropriate sign as shown above, and:
   - clear of all services
   - opposite the stop valve, or pump-out branch etc., as applicable on an alignment at right angles to the sewage pumping main
   - on the 'pumping main' side of the road.

   Where no kerb and water table exists, locate the sign as detailed in Note 1 above, and at an appropriate distance off the road edge suitable for each site.

2. In easements, locate the sign as detailed in Note 1 above, and at a distance of 600 inside the edge of the easement.

3. For details of available fittings, refer to SA Water catalogues of "Authorised Items for Sewer Systems" and/or "Authorised Items for Water Supply Reticulation Systems".

SA WATER SEWER PUMP-OUT BRANCH
Sign Stock No 9905-0854
Raised lettering painted with black enamel

PUMP-OUT BRANCH SIGN
Sign and post painted white

SA WATER SEWER STOP VALVE
Sign Stock No 9905-0855
Sign and post painted white

STOP VALVE SIGN
Raised lettering painted with black enamel

When an Air-Relief Valve is installed adjacent to a Stop Valve paint a GREEN stripe (as shown) to indicate which side it is located.

AIR-RELIEF VALVE SIGN
Sign Stock No 9905-0856
Sign and post painted white

When a Pump-out Branch is installed adjacent to a Stop Valve paint a BROWN stripe (as shown) to indicate which side it is located.

COMBINATION SIGN
AIR-RELIEF VALVE / STOP VALVE / PUMP-OUT BRANCH

"NOT FOR CONSTRUCTION"
40 mm BACKFLOW PREVENTION DEVICE ASSEMBLY

SCHEDULE

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<td>RPZ. VALVE DN40</td>
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NOTES

1. ALL METALIC PIPEWORK AND FITTINGS UNDERGROUND & THROUGH CONCRETE TO BE PETROLATUM TAPE WRAPPED TO 100 ABOVE GROUND LEVEL (REFER T.S. 29)
2. 300 MINIMUM FROM GROUND TO THE UNDERSIDE OF RPZ VALVE RELIEF PORT.
3. PROVIDE 5mm CLEARANCE BETWEEN COPPER RISER AND CONCRETE TO FACILITATE REMOVAL OF FITTINGS.

CHAIN MESH CAGE DETAILS:
- DIMENSIONS - 900 wide x 1850 long x 730 high
- FRAME TO BE GALV 40mm STEEL PIPE.
- CHAIN MESH TO BE FENCING GRADE GALV STEEL 50mm CHAIN LINK
- PROVIDE BRACING AS REQUIRED.
- ROOF TO BE HINGED FOR ACCESS TO ASSEMBLY AND PIPEWORK
- PROVIDE A LOCKING FACILITY FOR HINGED ROOF
- 2 x CS13288 LOCK TO BE PROVIDED BY SA WATER (X LOCK)
- 4 x DIA. 10 DYNABOLTS

"NOT FOR CONSTRUCTION"

NOTE: ALL MEASUREMENTS ARE IN mm

REVISIONS

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SEWER CONSTRUCTION MANUAL PAGE M20
STANDARD SUBMERSIBLE SEWAGE PUMPING STN
DN 40 BACKFLOW PREVENTION DEVICE
FOR WATER SUPPLY

2014-1515-01

NETWORK INFRASTRUCTURE STANDARDS

M20