

BAR CODE

SUPERSEDED

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
B	NOV '14	CTD/CRS	SUPERSEDED.	

DESIGNED	JIS	JUN '96	AUTHORIZED	
DRAWN	CLS	JUN '96	SIGNATURE	
REVIEWED	RMJ	JUN '96	T. GALEK	9/12/2014
	INITIALS	DATE	PRINT NAME	DATE
NETWORK INFRASTRUCTURE STANDARDS				



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SEWER CONSTRUCTION MANUAL PAGE M1
STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
SITE ARRANGEMENT

SHEET SIZE	REVISION
A3	B
NOT TO SCALE	
DRAWING NUMBER	
94 - 0163 - 01	
YEAR	NUMBER SHEET

5. BACKFILL

5.1 BACKFILL AROUND THE SUMP AND VALVE CHAMBER

Backfilling 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 1289.5.1.1). 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 G 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. FLOTATION

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).
- Thereafter, 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 surround 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-ring jointed pipelines, all alignment and/or 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 facet 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

(FOR 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.

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REVISIONS					DESIGNED	JIS	JUN '96	AUTHORIZED	SHEET SIZE		REVISION
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					REVIEWED	RMJ	JUN '96	T. GALEK	NOT TO SCALE		
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									94 - 0163 - 03		
B	NOV '14	CTD/CRS	NOTES UPDATED AND ADDED.		NETWORK INFRASTRUCTURE STANDARDS			SEWER CONSTRUCTION MANUAL PAGE M3 STANDARD SUBMERSIBLE SEWAGE PUMPING STN. PUMPING STATION STANDARD NOTES		YEAR	SHEET

SA Water
Government of South Australia
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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 aboveground 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 SCM M19).

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

8.10.3 DN20 AIR RELIEF VALVE FOR SHORT, SMALL DIA. PUMPING MAINS

For non-typical applications only. Prior approval must be obtained from the Superintendent's Representative. Refer to installation details on SCM Page M18.

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 SCM M19).

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

9. CORROSION PROTECTION

9.1. DICL PIPELINES

9.1.1 BURIED DICL PIPE BARRELS AND DICL 'SOCKETED' 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 Petrolatum 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 Petrolatum 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. MSCL PIPELINES

Protective coatings for mild steel concrete lined (MSCL) pipelines and fittings shall be in accordance with SA Water Technical Standard TS 12 for above ground installations and AS 4321 for buried installations.

9.4. FITTINGS LOCATED IN CONCRETE VALVE CHAMBERS ETC

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


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

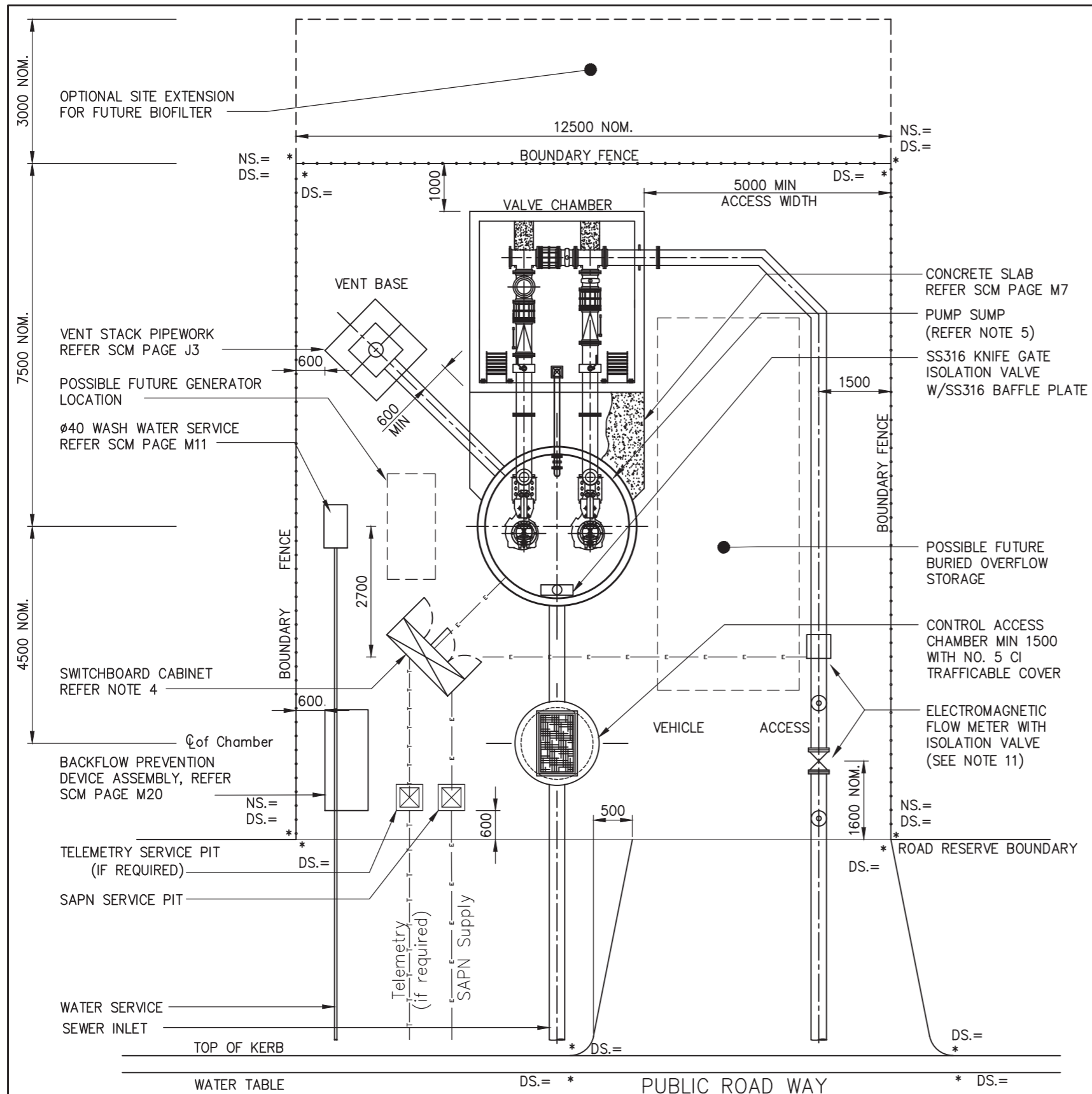
For PE bolted connections, only bolt heads and nuts shall be coated with Mastic and sealed with Radloid caps filled with Mastic (Ref TS 29 Petrolatum Anti-Corrosion System).

9.5. ADDITIONAL PROTECTION

More extensive protection may be specified by the Superintendent's Representative, appropriate for the specific site and application.

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REVISIONS					DESIGNED	JIS	JUN '96	AUTHORIZED	SEWER CONSTRUCTION MANUAL PAGE M4 STANDARD SUBMERSIBLE SEWAGE PUMPING STN. PUMPING STATION STANDARD NOTES		SHEET SIZE	REVISION
REV	DATE	DRN	DESCRIPTION	APPRV'D	DRAWN	CLS	JUN '96	SIGNATURE	 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.		A3	B
					REVIEWED	RMJ	JUN '96	T. GALEK 9/12/2014			NOT TO SCALE	
					INITIALS DATE		PRINT NAME DATE	DRAWING NUMBER				
B	NOV '14	CTD/CRS	NOTES UPDATED AND ADDED.		NETWORK INFRASTRUCTURE STANDARDS					94 - 0163 - 04	YEAR NUMBER SHEET	



- NOTES: -
- DRAWINGS
 - Shall be in accordance with SA Water's SCM & WSCM.
 - SITE
 - 2.1. Site can be 'mirror imaged'.
 - 2.2. Footprint of the pump station may vary with the pump sizes and required auxiliary infrastructure such as back-up generators, surge vessels, odour control system, overflow storage, etc.
 - 2.3. Final size and configuration to be confirmed with Superintendent's Representative.
 - 2.4. Minimum clearances as shown in the drawing.
 - SITE GRADIENT
 - 3.1. Grade the station site at 5% to drain all surface waters. Show DS and NS levels at all corners of the site, and elsewhere as appropriate.
 - 3.2. For a 'standard' station site abutting a public road, the design site level at the front boundary shall be a minimum of 200 above the top of kerb.
 - 3.3. For a site surrounded by houses, grade the surface at 5% towards the vehicle entranceway. Alternatively, where appropriate, the station site may be graded to an adjacent side reserve and/or rear reserve. Retaining walls and/or cut/fill batters may be necessary, see SCM Pg. M2 note 2.5 Retaining Walls.
 - CLEARANCE AROUND ELECTRICAL SWITCHBOARD CUBICLE
 - 4.1. Sufficient clearance around the Cubicle is critical to ensure ready escape from the vicinity of the switchboard under emergency conditions in accordance with AS/NZS 3000, 'Wiring Rules' (Clause 2.9.2.2).
 - 4.2. Code requires a 600 minimum horizontal clearance beyond the extremities of the open doors, across the full range of door swing (from ground level up to a height of 2 m).
 - TYPICAL SUMP SIZES

INFLOW & NOMINAL DIAMETER	FLOW	< 10 L/s	11 - 50 L/s	50 - 100 L/s
SIZE		1800 mm	2200 mm	3200 mm

Note: Combined static and dynamic head to be not more than 50 m.
 - LOCATING SERVICES
 - Contractor shall be responsible for locating the existing services prior to the commencement of work.
 - OVERFLOW STORAGE AND/OR BACK-UP GENERATOR
 - 7.1. Superintendent's Representative may elect to include onsite back-up generator and/or overflow storage.
 - 7.2. Capacity and configuration of the overflow storage to be selected based on SA Water network infrastructure standards.
 - 7.3. Electrical switchboard shall also be equipped with external mobile generator connection (see SCM Page M8).
 - PROTECTION AGAINST CORROSION
 - Refer to SCM Page M4 Corrosion Protection.
 - SIGNIFICANT TREES
 - Removal of any 'Significant Trees' shall be confirmed with the Superintendent's Representative and necessary approvals obtained.
 - CONSTRUCTION ACCESS
 - Construction access and machine lay-down area shall be confirmed with the Superintendent's Representative before commencing any site work.
 - FLOW METER
 - 1.1. Refer SA Water typical drawing 2005-00336 for flow meter installation.
 - 1.2. Rising main isolation valve, air valves and in-line thrust restraint to be provided as shown (refer SCM page M16).
 - BIOLOGICAL ODOUR CONTROL SYSTEM (if required)
 - Superintendent's Representative may elect to install biological odour control system and/or vent stack based on gas emission rates and environmental sensitivity.

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REFERENCE DRAWINGS		LEGEND:	
M2-M4	Standard notes	M9	Power Supply and Telemetry Details
M6	Site Arrangement and Access Road Where Station Does Not Abut a Public Road	M10	Typical Fence Detail
M7	Plan and Section	M11 & M20	Water Service
M8	Electrical Cubicle, Base and Conduit Details	M12	Access Roadway Details
		M13	Typical Arrangement for Valve Chamber
		J3	General Arrangement of DN 300 Educt Vent

NS = Natural Surface Level
DS = Design Surface Level

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
B	NOV '14	CTD/CRS	COMPLETE REVIEW AND REDESIGN.	

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JIS				T. Galek	
DRAWN		JUN '96		SIGNATURE	
CLS					
REVIEWED		JUN '96		T. GALEK	
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NETWORK INFRASTRUCTURE STANDARDS

SA Water
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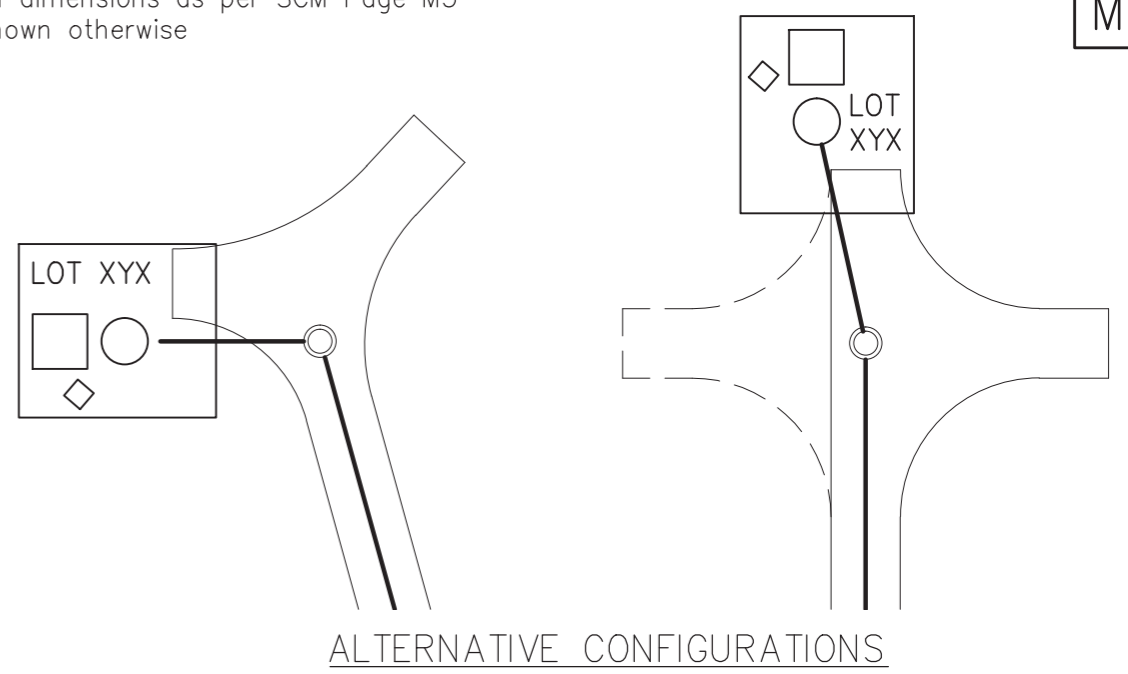
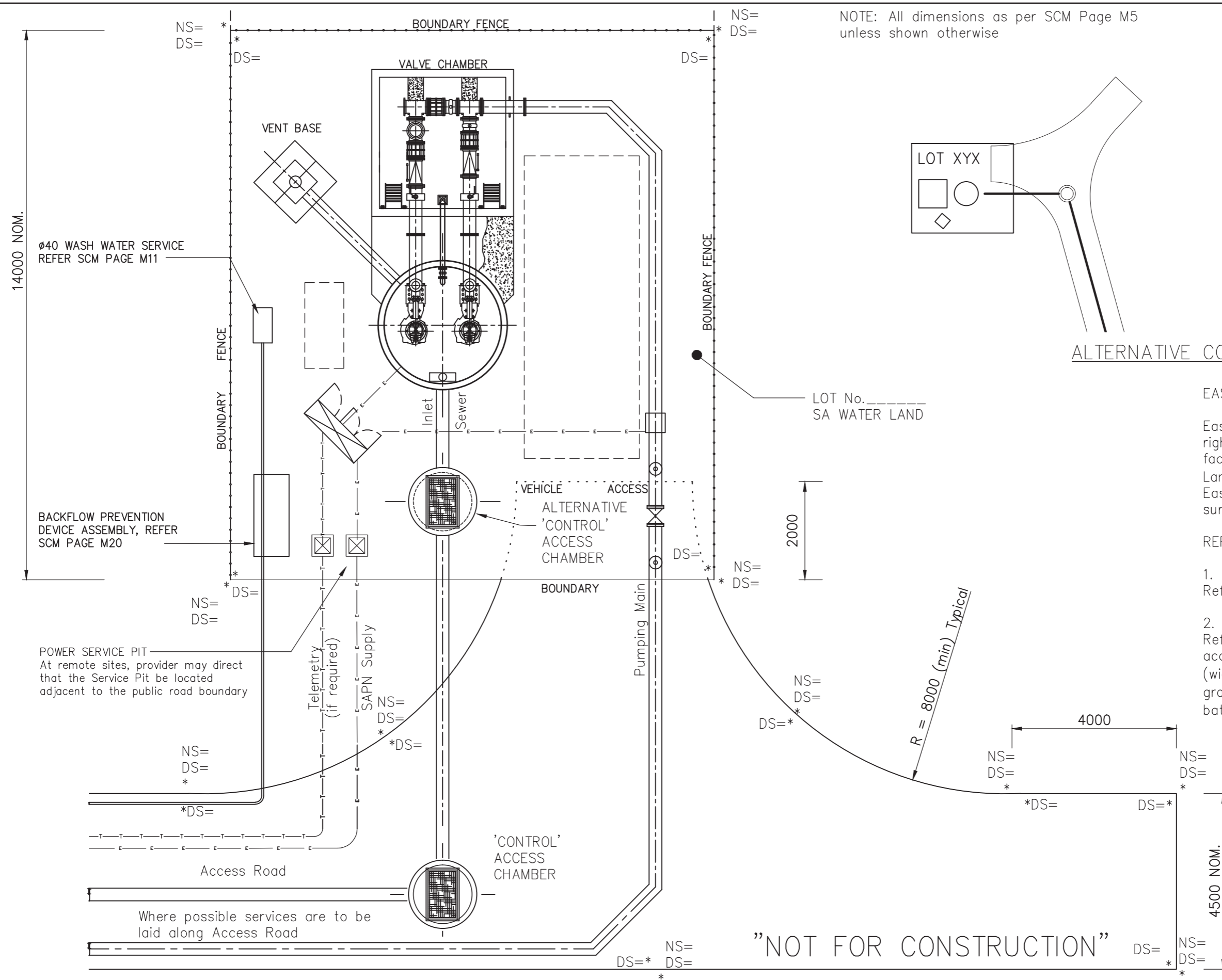
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SEWER CONSTRUCTION MANUAL PAGE M5
STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
- SITE ARRANGEMENT AND ACCESS WHERE STATION ABUTS A PUBLIC ROAD

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94 - 0163 - 05			
YEAR	NUMBER	SHEET	

"NOT FOR CONSTRUCTION"

NOTE: All dimensions as per SCM Page M5 unless shown otherwise



EASEMENT FOR ACCESS ROAD

Easement for access road and the right to construct and maintain all facilities appurtenant to the SA WATER Land (Lot XYZ). Easement shall be subject to survey of final earthworks.

- REFERENCES
1. SITE GRADIENTS
Refer to details on SCM page M5.
 2. ACCESS ROADWAYS
Refer to SCM pages M2 & M12 for access roadway design criteria: (width, camber, curve radii, longitudinal gradients, transition curves, cut/fill batters, paving etc).

LEGEND:

NS = Natural Surface Level
 DS = Design Surface Level
 TP = Tangent Point

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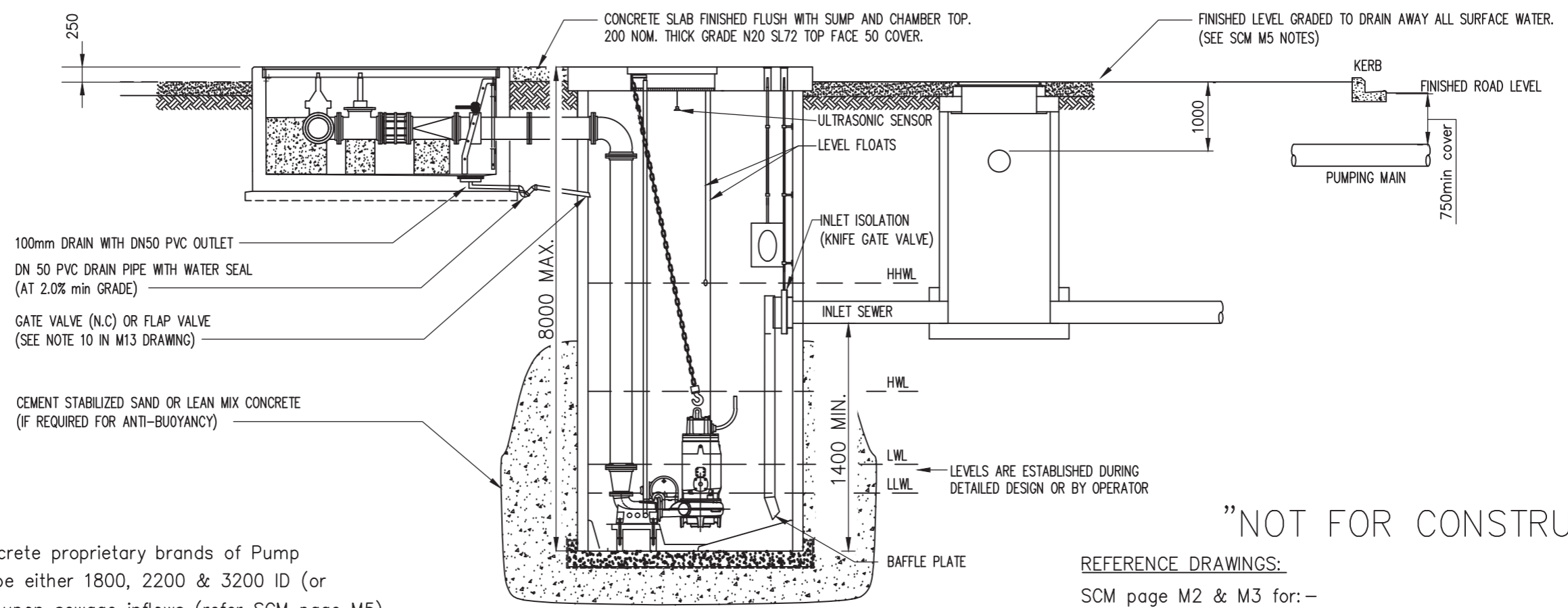
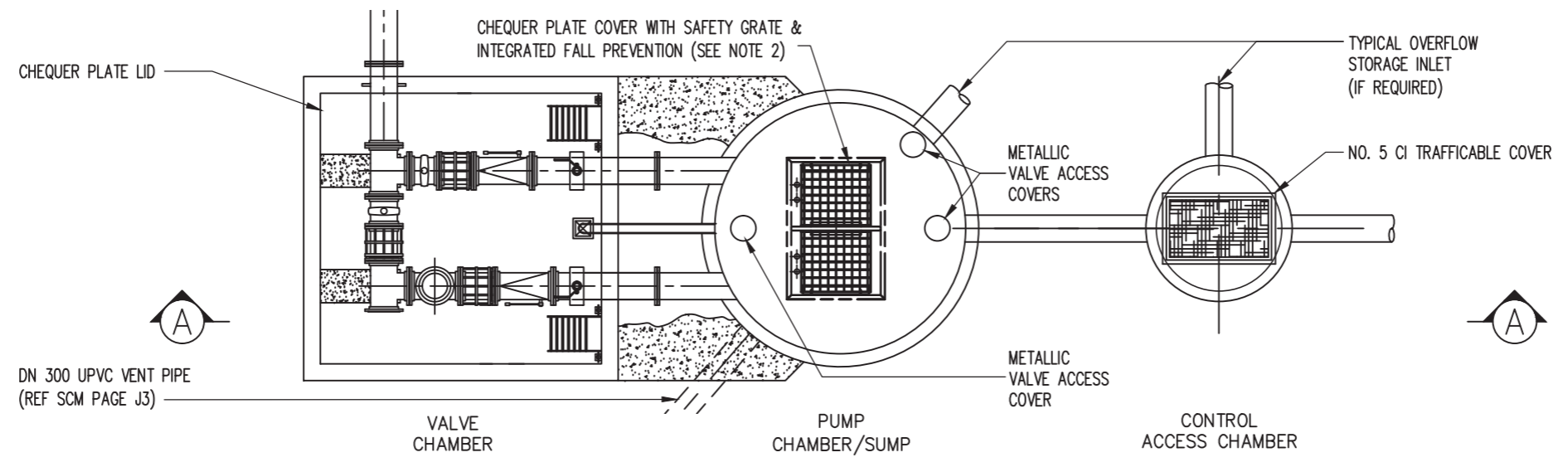
REVISIONS				
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SEWER CONSTRUCTION MANUAL PAGE M6
 STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
 WHERE STATION DOES NOT ABUT
 A PUBLIC ROAD

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94 - 0163 - 06			
YEAR	NUMBER	SHEET	



Section A-A

“NOT FOR CONSTRUCTION”

PUMP CHAMBER/SUMP

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. 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.
3. Pump location bases and stainless steel twin guide rails are to be SA Water standard.
4. Lifting chains to be stainless steel and SA Water standard.

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 shall be installed complete with covers, all pipework, valves, fittings and supports, in readiness for commissioning.

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 prevention on all sides. Cover plate and grate to AS 3996. Traffic Load Class A.

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SEWER CONSTRUCTION MANUAL PAGE M7
STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
PLAN AND SECTION

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94	- 0163	- 07	
YEAR	NUMBER	SHEET	

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

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
C	JUNE '17	RJP	DRAWING REFERENCE CHANGED	TG
B	NOV '14	CTD/CRS	SUPERSEDED WITH DRAWING SET 2013-01200.	TG

DESIGNED	JS	JUN '96	AUTHORIZED	T. GALEK
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SEWER CONSTRUCTION MANUAL PAGE M8
 STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
 ELECTRICAL CUBICLE
 BASE AND CONDUIT DETAILS

SHEET SIZE	A3	REVISION	C
NOT TO SCALE			
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YEAR	NUMBER	SHEET	

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

SAPN

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

NOTES:

Lay the Telemetry conduit with AUSTEL TS009 10 cables (wherever

All conduits and

For SAPN to provide electrical Pit for the pumping M5, M6 and M8).

SWITCHBOARD

Switchboard shall be supplied, installed WATER Technical Standard TS79.

INSULATION

Protect the SA WATER works Service Pit to the 3* UPVC electrical

Cables pending

Independent's work and/or

Greater cover may be required for electrical installation outside of Pumping Station Rules (Refer to SA Water Rules)

Electrical Conduit/s to Electrical Consumer Main electrical conduits into (see NOTES)

1 x DN 100 UPVC electrical conduit (PVC covered galvanised steel draw wire pending cable installation) between the switchboard and the pump sump to accommodate various cables and liquid level control cables (Refer to Drawing M8 for general arrangement).

NOTES:

All electrical 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.

Conduit (where Telemetry required (see notes)

Bedding sand in accordance with DPTI Specification PM64 compacted to not less than 90% of the Standard Maximum Dry Density of the material (Test AS 1289.5.1.1).

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

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LEGEND:

NS = Natural Surface Level
 DS = Design Surface Level

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B	NOV '14	CTD/CRS	SUPERSEDED WITH DRAWING SET 2013-01200.	TG	NETWORK INFRASTRUCTURE STANDARDS						

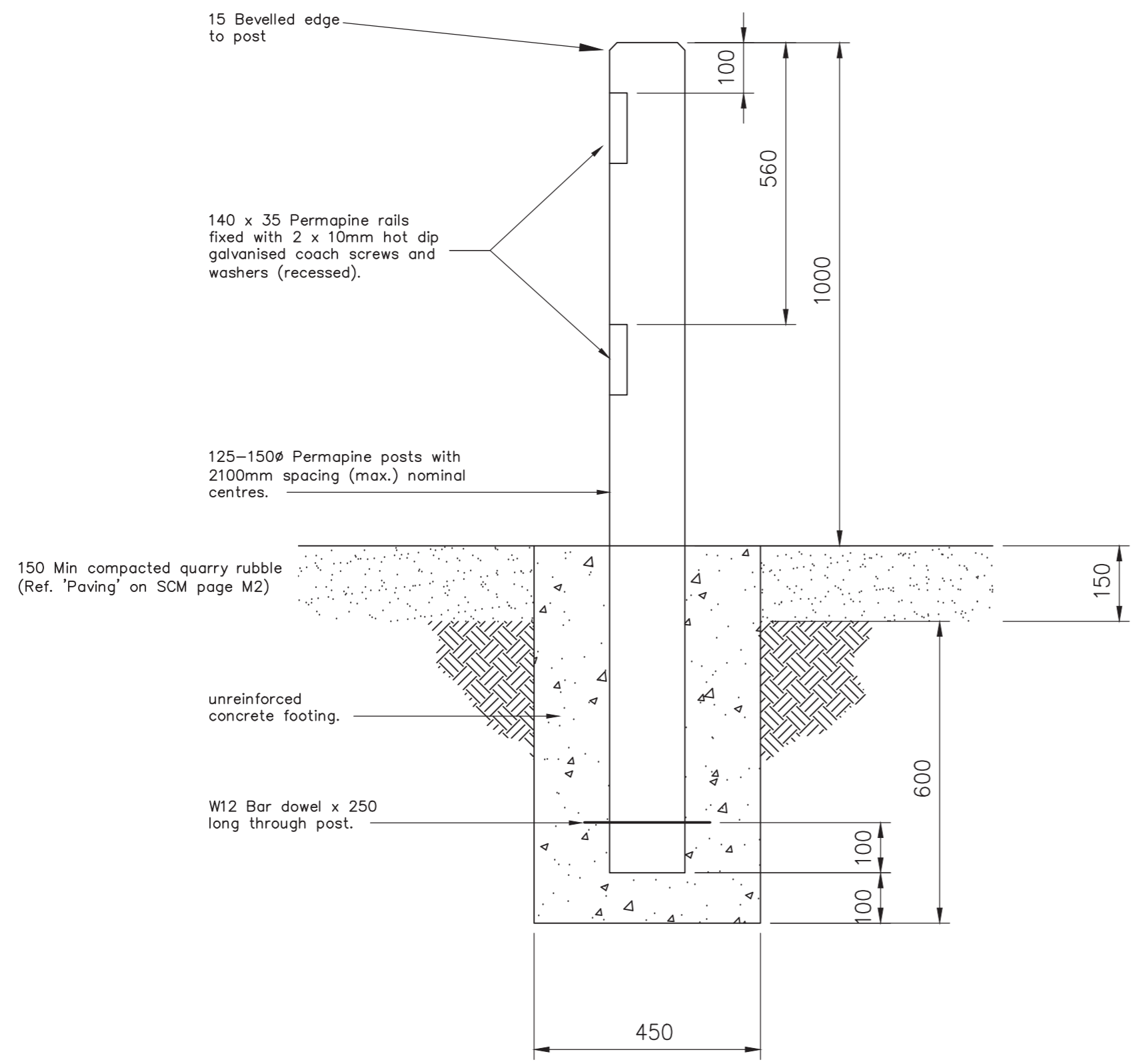


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SEWER CONSTRUCTION MANUAL PAGE M
 STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
 SAPN SERVICE AND TELEMETRY DETAILS
 INCLUDING EMBEDMENT AND
 TRENCH FILL FOR ELECTRICAL CONDUITS

SHEET SIZE	A3	REVISION	C
DRAWING NUMBER		94 - 0163 - 09	
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FENCING AROUND PUMPING STATION SITE

STANDARD FENCE

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.

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
B	NOV '14	CTD/CRS	CONCRETE FOOTING SIZE INCREASED.	

DESIGNED	JIS	JUN '96	AUTHORIZED	<i>T. Galek</i>
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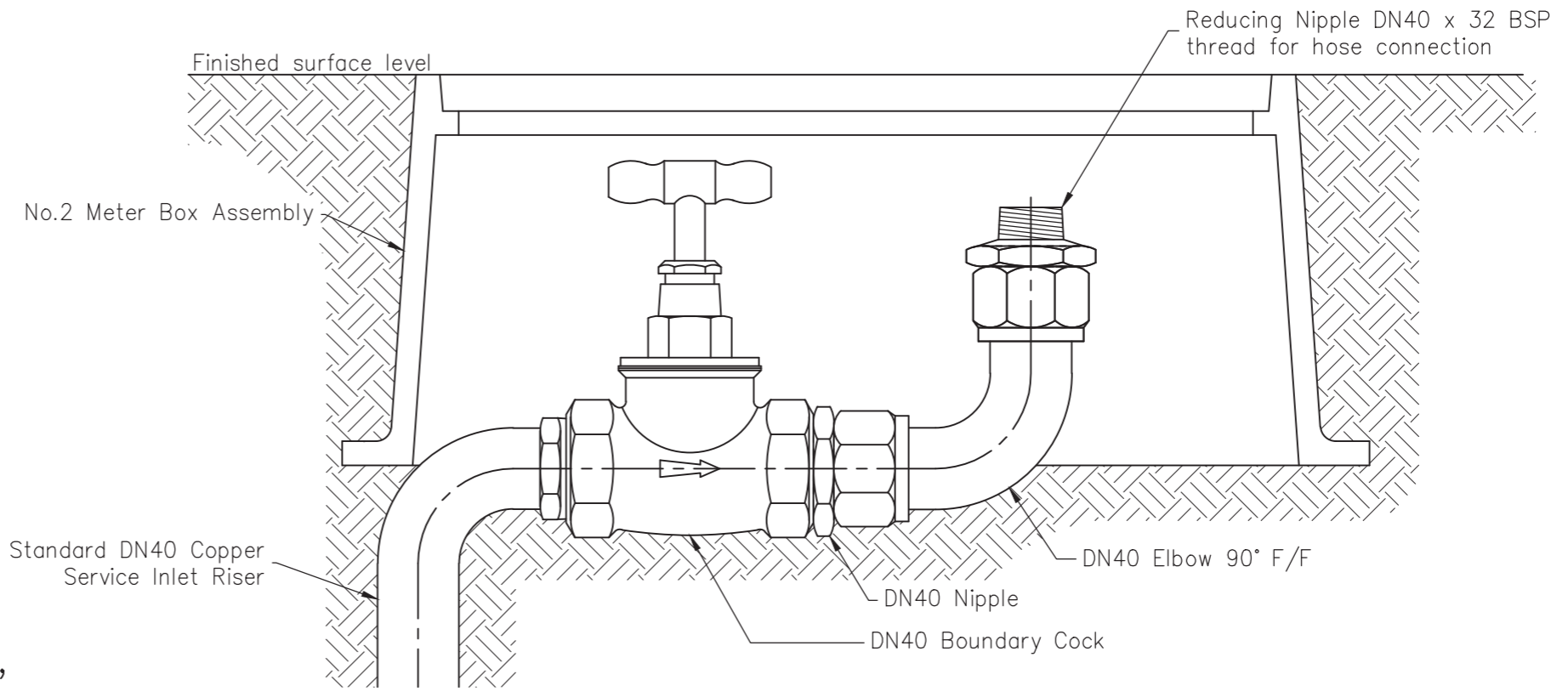
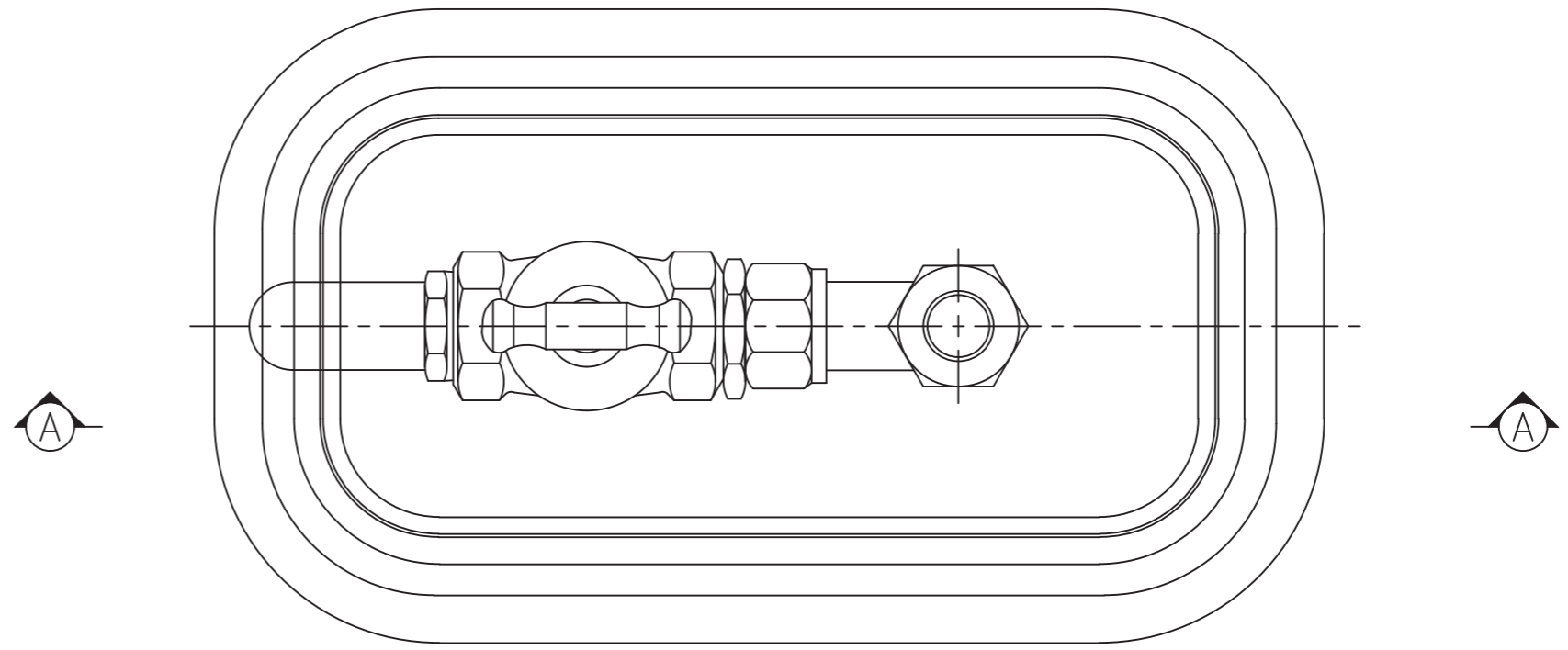
SEWER CONSTRUCTION MANUAL PAGE M10
 STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
 TYPICAL FENCE DETAIL

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94		- 0163 - 10	
YEAR	NUMBER	SHEET	

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”

Section A-A

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
B	NOV '14	CTD/CRS	NOTES AND FITTINGS UPDATED.	

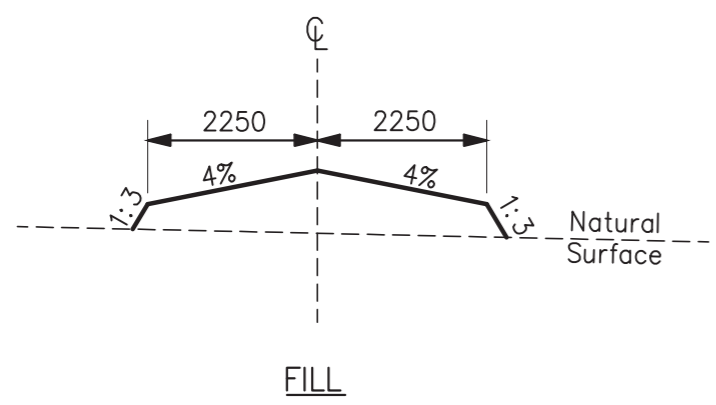
DESIGNED	JIS	JUN '96	AUTHORIZED	<i>T. Galek</i>
DRAWN	CLS	JUN '96	SIGNATURE	
REVIEWED	RMJ	JUN '96	T. GALEK	9/12/2014
	INITIALS	DATE	PRINT NAME	DATE
NETWORK INFRASTRUCTURE STANDARDS				


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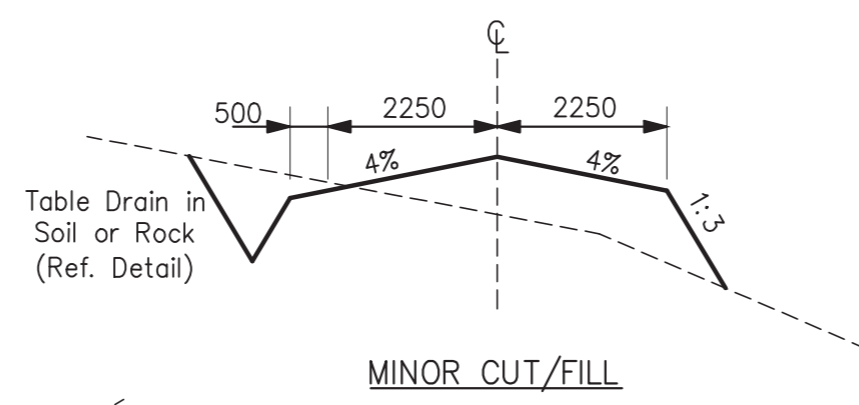
SEWER CONSTRUCTION MANUAL PAGE M11
 STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
 DN 40 WATER SERVICE

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94	- 0163	- 11	
YEAR	NUMBER	SHEET	

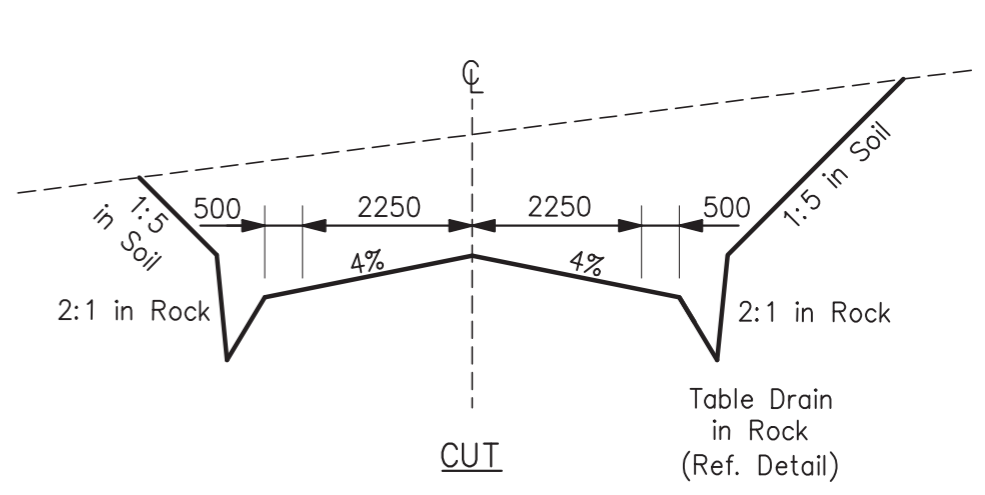
BAR CODE



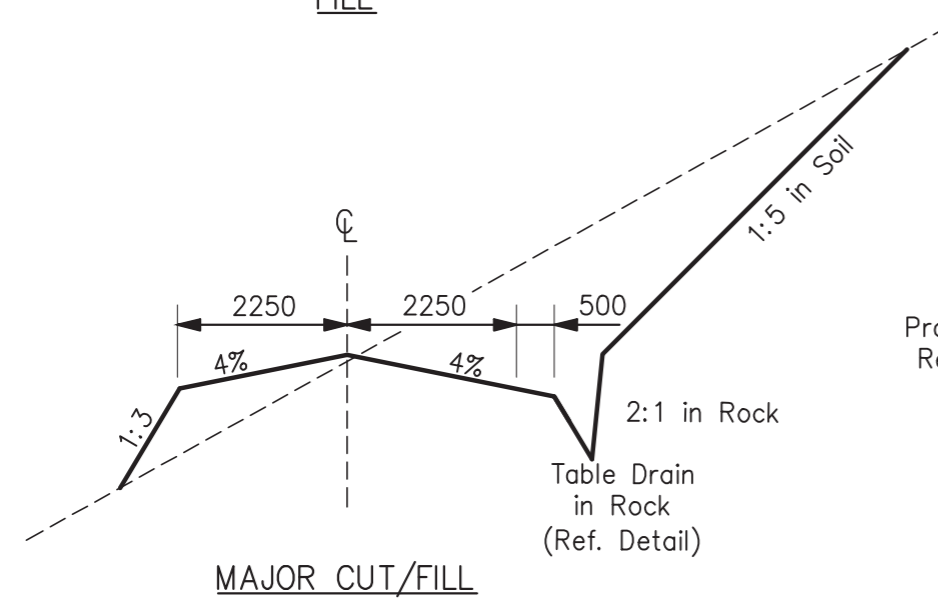
FILL



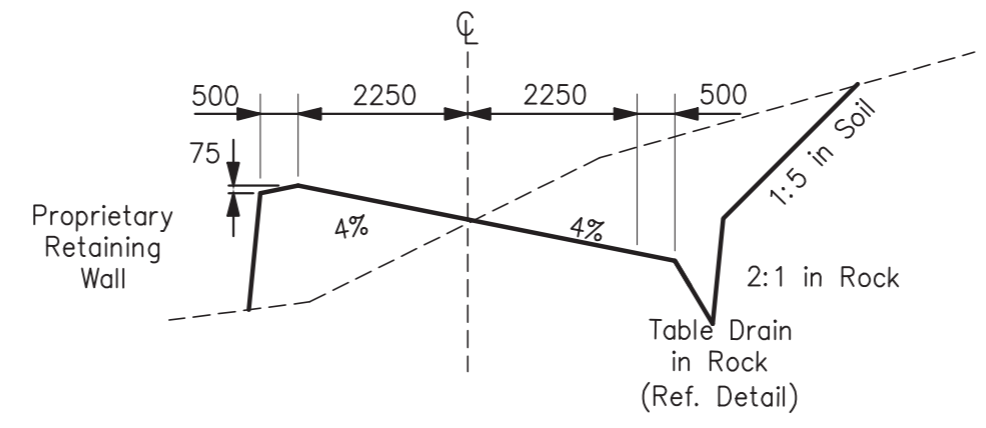
MINOR CUT/FILL



CUT



MAJOR CUT/FILL



CUT/FILL WITH RETAINING WALL

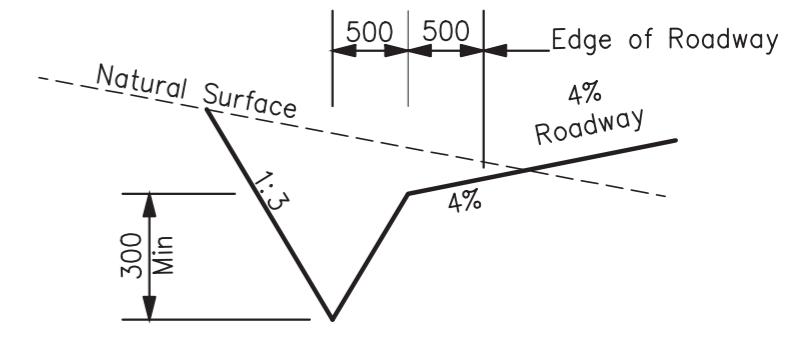


TABLE DRAIN IN SOIL

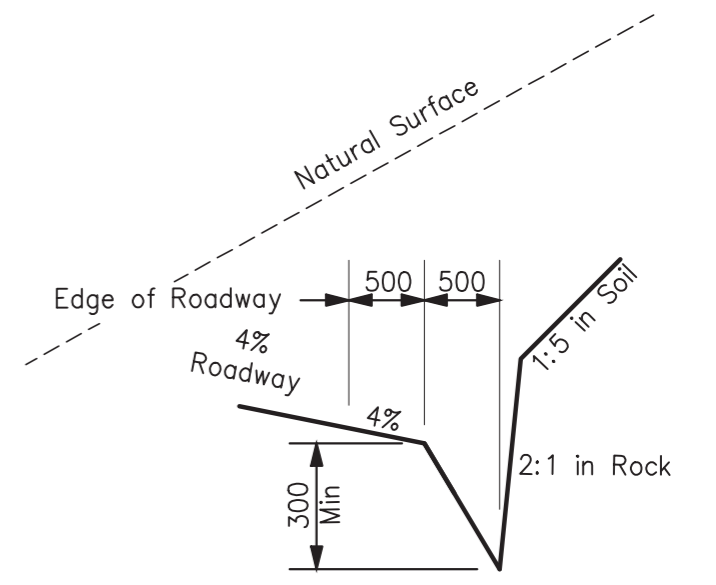


TABLE DRAIN IN ROCK

"NOT FOR CONSTRUCTION"

NOTES:

- The roadway widths shown are minimum requirements.
- The maximum speed limit on access roadways shall be 10 km/h. 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.
- Minimum radius of curvature of horizontal bends (including vehicle turning areas) shall be 8 m to the inside edge of the roadway.
- Maximum longitudinal gradient for an unsealed compacted rubble roadway shall be 10%. 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).
- Vertical transition curves shall be provided between differing adjacent longitudinal gradients. Where this difference is 5% and greater, transition curves shall be minimum of 6 m long.

- 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 ('Stratco 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 at 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.

REFERENCE DRAWINGS:

- SCM page M2 for:
 - * CLEARING AND STRIPPING
 - * EXCAVATION
 - * FILLING
 - * CUT/FILL BATTERS
 - * PAVING
- SCM page M6 for vehicle turn-around area.

BAR CODE

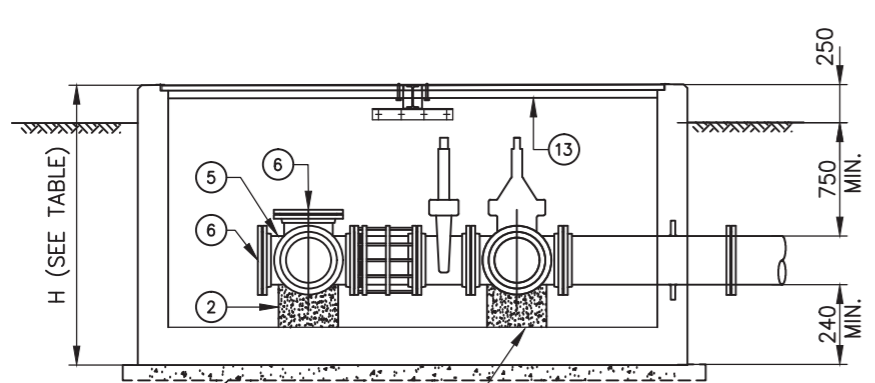
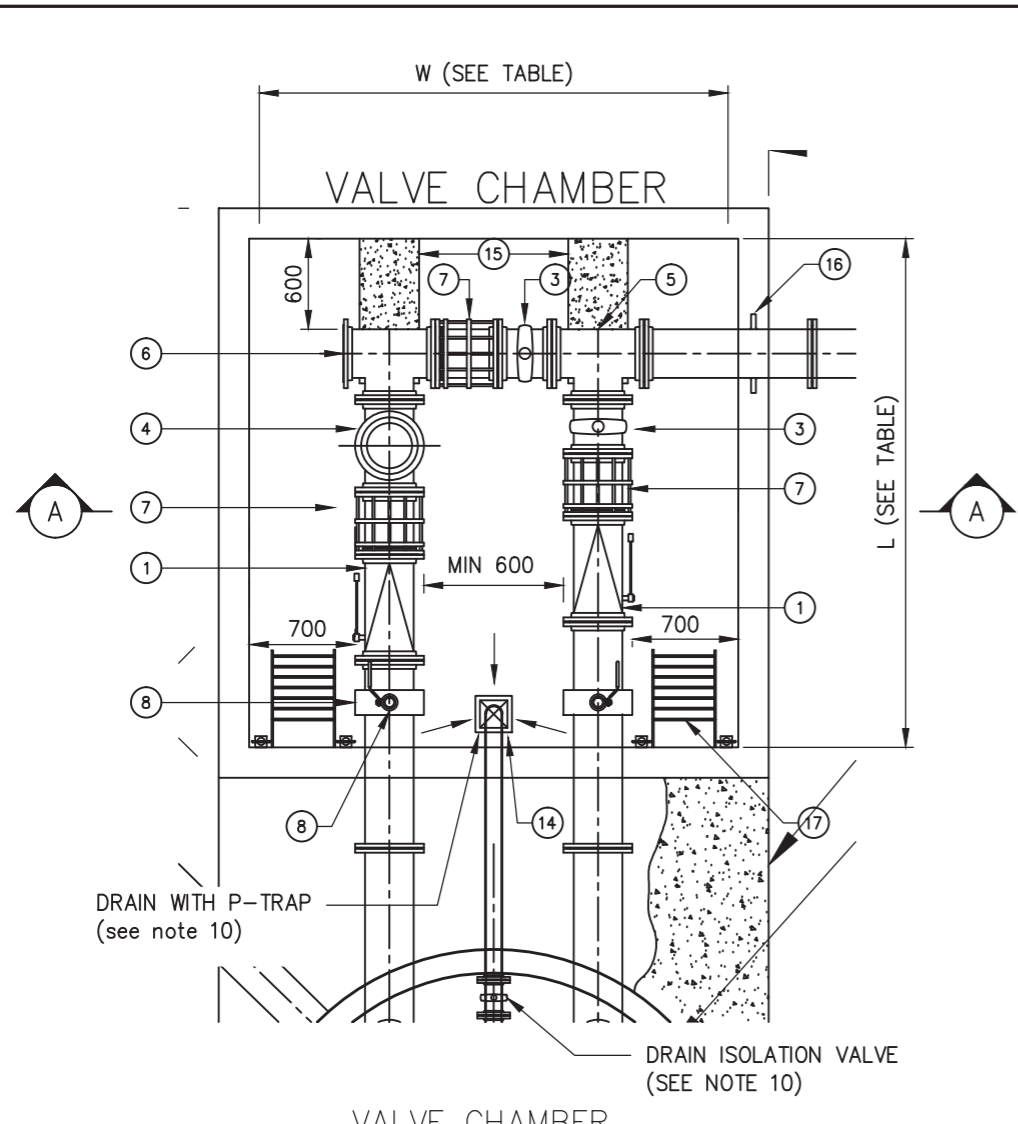
REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPR'D
B	NOV '14	CTD/CRS	TITLE BLOCK UPDATED.	

DESIGNED	JIS	JUN '96	AUTHORIZED	
DRAWN	CLS	JUN '96	SIGNATURE	<i>T. Galek</i>
REVIEWED	RMJ	JUN '96	T. GALEK	9/12/2014
	INITIALS	DATE	PRINT NAME	DATE
NETWORK INFRASTRUCTURE STANDARDS				

This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.

SEWER CONSTRUCTION MANUAL PAGE M12
SEWAGE PUMPING STATION
ACCESS ROADWAY TYPICAL
CROSS SECTION AND DRAINAGE DETAILS

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94 - 0163 - 12			
YEAR	NUMBER	SHEET	



SECTION A-A

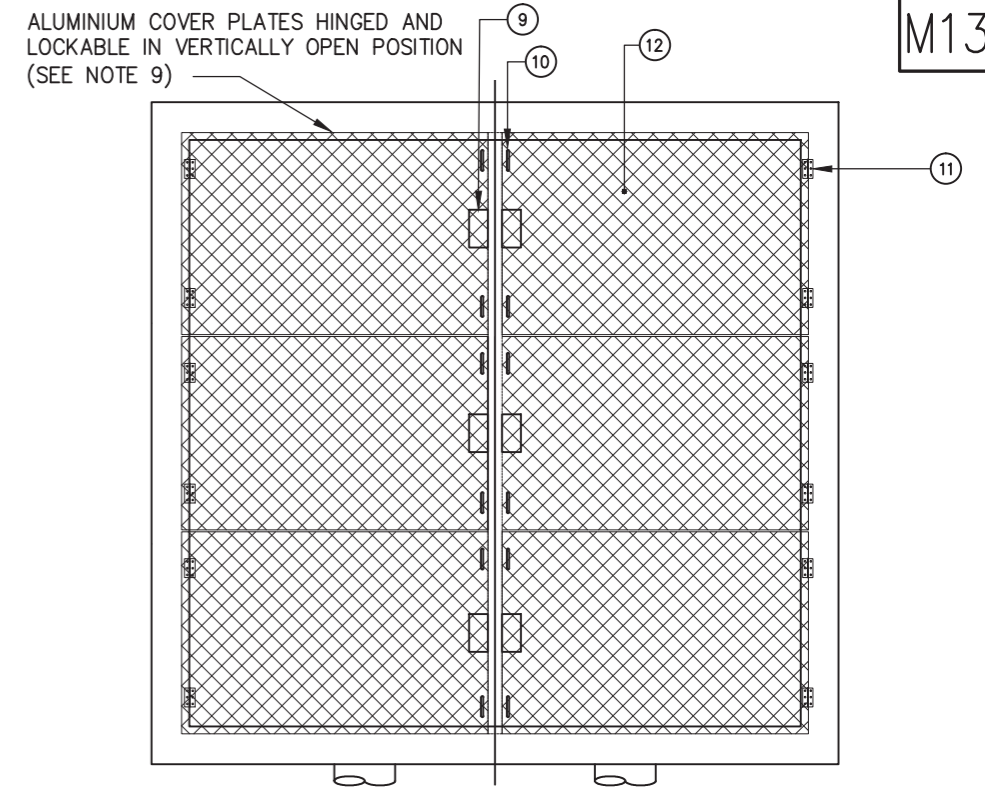
VALVE CHAMBER LEGEND

ITEM	DESCRIPTION
1	SWING CHECK VALVE WITH MAINTENANCE BONNET AND EXTERNAL LEVER ARMS WITH ADJUSTABLE COUNTER WEIGHTS
2	VALVE SUPPORT (FABRICATED OR Poured CONCRETE)
3	GATE VALVE
4	PUMP OUT BRANCH WITH BLANK FLANGE
5	TEE (TYPICAL)
6	BLANK FLANGE
7	DISMANTLING JOINT (THRUST BEARING)
8	50 BSPF BOSS AND BALL VALVE (TAPPING BAND IF PE PIPE OR BOSS IF METALLIC PIPE)
9	CONCEALED LOCKING TAB (FOR PADLOCK)
10	COVER PLATE HANDLE (FLUSH WITH COVER)
11	CONCEALED HINGE (STAINLESS STEEL WITH FIXED PIN)
12	ALUMINIUM CHEQUER PLATE (THICKNESS TO SUIT SPAN)
13	ALUMINIUM EDGE REINFORCEMENT (AS REQD) WELDED TO COVER PLATE
14	DRAIN WITH GRATE
15	POURED CONCRETE THRUST BLOCK TO TOP OF PIPE
16	THRUST COLLAR
17	400 WIDE LADDER W/ RETRACTABLE HAND RAIL POSTS TO AS 1657

TYPICAL VALVE CHAMBER DIMENSIONS

PIPE SIZE (DN)	WIDTH (W)	LENGTH (L)	HEIGHT (H)
100 / 150	2750	2500	1500
200 / 225	3000	3000	1500
250 / 300	3200	3500	1600

NOTE: PIPE SIZE REFERS TO CHAMBER PIPEWORK ONLY.



NOTES:-

- PERSONNEL ACCESS**
Rung ladders at 75° to the horizontal with 1000 high retractable locking handrail posts shall be provided. Ladders to comply with AS 1657.
- CLEARANCES**
Minimum clearances as shown in the drawing.
- PIPEWORK PENETRATIONS** shall be either:-
formed for poured insitu structures or cored using a diamond tipped cutter for existing or precast structures.
- Concrete poured insitu shall be Grade N32 in accordance with AS 1379.
- RESTRAINT OF PIPEWORK**
All pipework and fittings shall be restrained to contain hydraulic forces (operational and shut-down forces) using fixed supports, or thrust blocks and thrust collars or puddle flanges set into the walls.
For poured concrete support, void between concrete and fitting to be filled with non-shrink grout.
- Refer to SCM page M2-M4 for details of:-
 - groundwater
 - excavation support
 - preparation of floor of excavations
 - backfill around valve chamber
 - flotation
 - corrosion protection of pipework
- CORROSION PROTECTION OF PIPEWORK**- refer SCM page M4 for details.
- PRESSURE RATING OF PIPEWORK, VALVES AND FITTING**:- shall be suitable for the maximum design pressure of the system, with a minimum rating of PN16. Pipework and fittings within valve chamber to be ductile iron with epoxy coating to AS/NZS 4158 and/or HDPE PE100.
- ALUMINIUM COVERPLATE & GRATE** with integrated fall protection. Coverplate & grate to be hinged and lockable in vertically open position, forming fall protection barrier on three sides. Removable guard rails to be provided between extended ladder hand rail posts. Ladder access to remain unobstructed. Weight and size of panels to suit maximum lifting mass. Minimum load capacity Class A. Coverplate and grate in accordance with AS 3996. Fall protection/guard rails in accordance with AS 1657.
- WET WELL DRAIN VALVE**:-
 - Drain pipe isolation to be provide via a DN 80 gate valve (normally closed) in the sump if drain pipe located below the high water level or
 - Flap valve to be installed in all other instances
- CONFINED SPACE APPROVAL**- A confined space assessment must be undertaken for all designs.

"NOT FOR CONSTRUCTION"

LEGEND:

NS = Natural Surface Level
DS = Design Surface Level

DN300 VALVE CHAMBER SHOWN

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRVD
B	NOV '14	CTD/CRS	COMPLETE REVIEW AND REDESIGN.	

DESIGNED	JIS	JUN '96	AUTHORIZED	
DRAWN	CLS	JUN '96	SIGNATURE	<i>T. Galek</i>
REVIEWED	RMJ	JUN '96	T. GALEK	9/12/2014
	INITIALS	DATE	PRINT NAME	DATE

NETWORK INFRASTRUCTURE STANDARDS

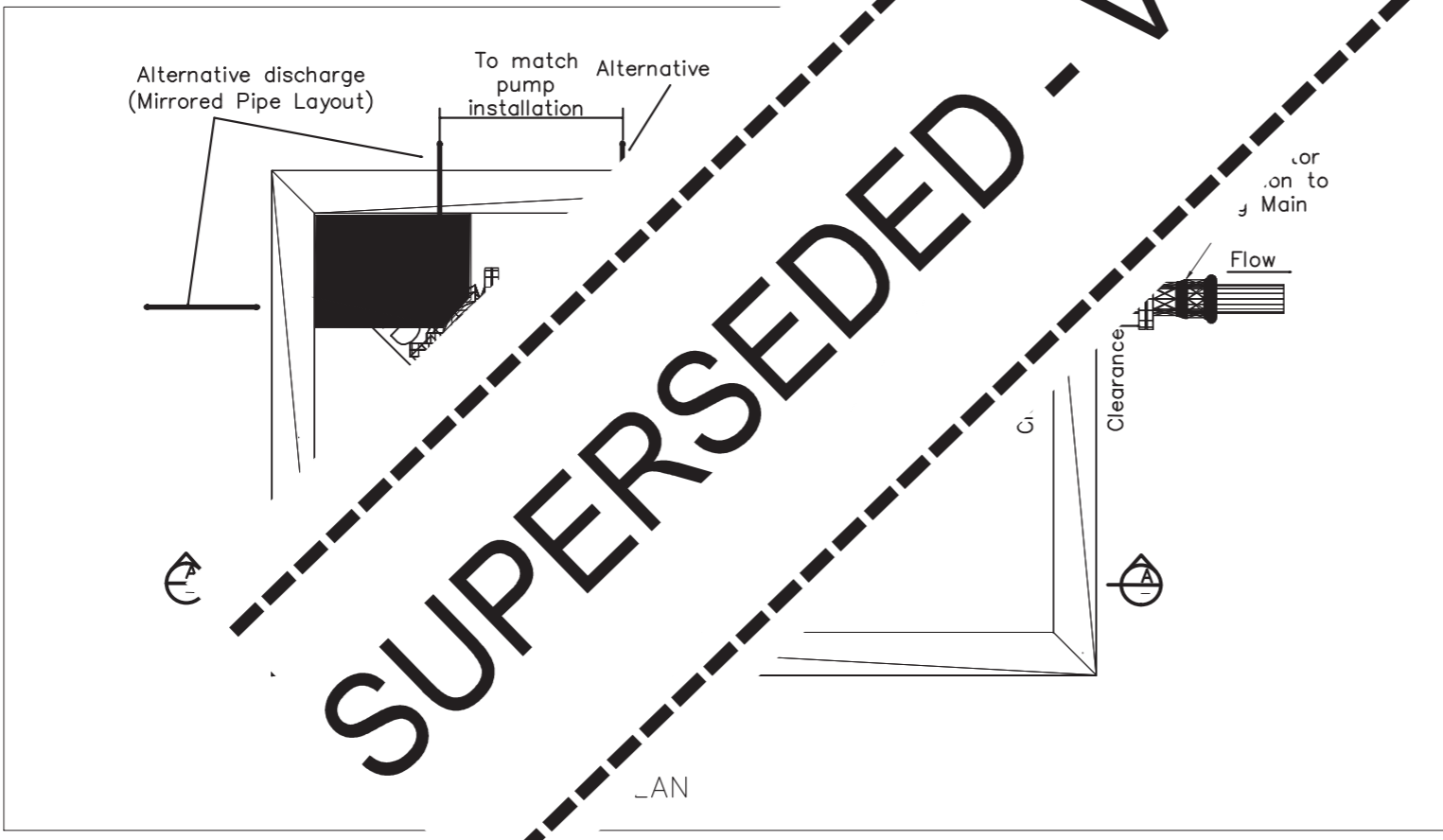
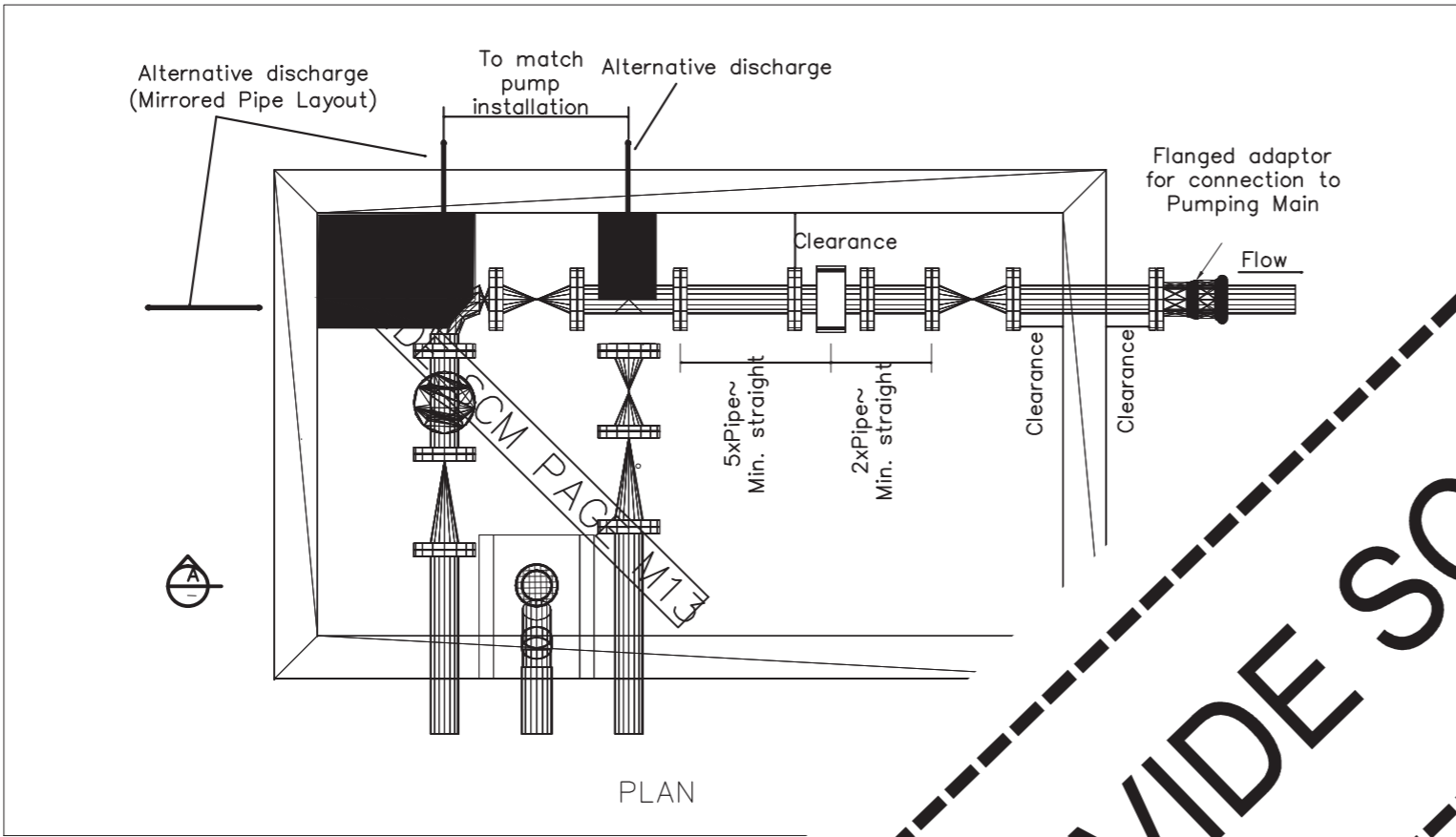
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SEWER CONSTRUCTION MANUAL PAGE M13
STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
TYPICAL ARRANGEMENT FOR VALVE CHAMBER
(NON-TRAFFICABLE)

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94	0163	13	
YEAR	NUMBER	SHEET	

BAR CODE

M13



'AMBER LEGEND	
SYMBOL	DESCRIPTION
---	SIMILAR
---	STAINLESS STEEL WITH FIXED PIN)
---	ALUMINUM CHEQUER PLATE
---	WORKING TAB (FOR PAD LOCK)

- Refer to SCM page M2 for details of: -
- * GROUNDWATER CONTROL
 - * EXCAVATION SUPPORT
 - * PREPARATION OF FLOOR OF EXCAVATIONS
 - * BACKFILL AROUND VALVE CHAMBER
 - * FLOTATION
- Refer to SCM page M13 for details of: -
- * PERSONNEL ACCESS
 - * CLEARANCES
 - * PIPEWORK PENETRATIONS
 - * RESTRAINT OF PIPEWORK
 - * PIPEWORK
- Refer to SCM page M4 for details of: -
- * CORROSION PROTECTION OF PIPEWORK

SUPERSEDED - SEE SCM PG M5

"NOT FOR CONSTRUCTION"

BAR CODE

REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
B	NOV '14	CTD/CRS	SUPERSEDED BY SCM PG M5.	

DESIGNED	JIS	JUN '96	AUTHORIZED	<i>T. Galek</i>
DRAWN	CLS	JUN '96	SIGNATURE	
REVIEWED	RMJ	JUN '96	T. GALEK	9/12/2014
	INITIALS	DATE	PRINT NAME	DATE
NETWORK INFRASTRUCTURE STANDARDS				


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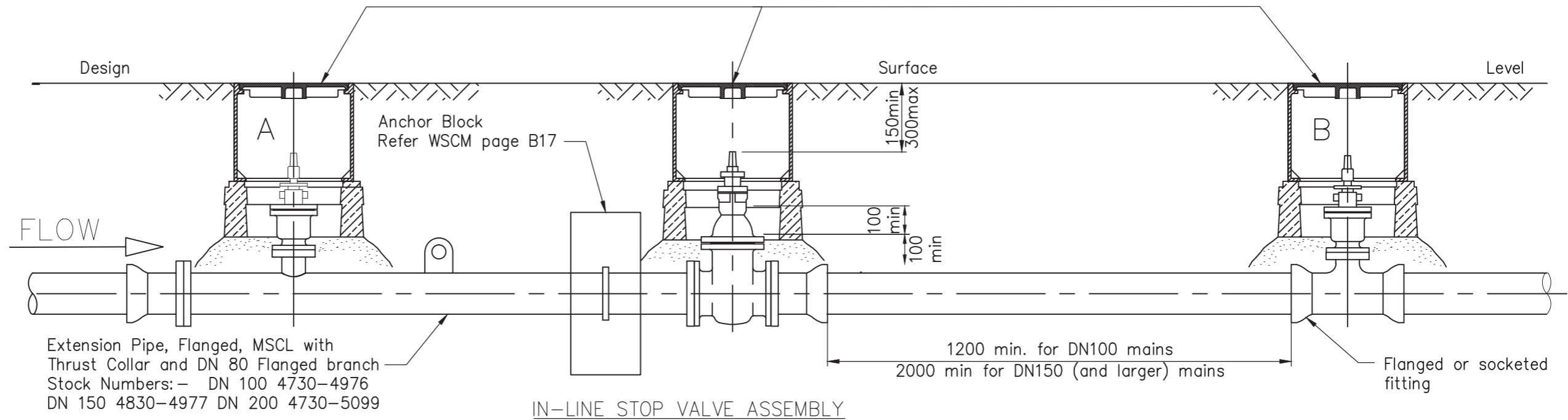
SEWER CONSTRUCTION MANUAL PAGE M14
STANDARD SUBMERSIBLE SEWAGE PUMPING STN.
TYPICAL ARRANGEMENT FOR VALVE CHAMBER
WITH FLOWMETER (NON-TRAFFICABLE)

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94 - 0163 - 14		YEAR	NUMBER
		YEAR	SHEET

Sewer Air-Relief Valve (Ref. SCM page M18)
OR Sewage Pump-out Branch (Ref. SCM page M17)

SA Water Sewer Street Box Assembly (Ref NOTES)
- Cast Iron type for roads subject to heavy loads
Stock Numbers:-
Cover 5680-0407 H/D Frame 5680-0061

Sewer Air-Relief Valve (Ref. SCM page M18)
OR Sewage Pump-out Branch (Ref. SCM page M17)



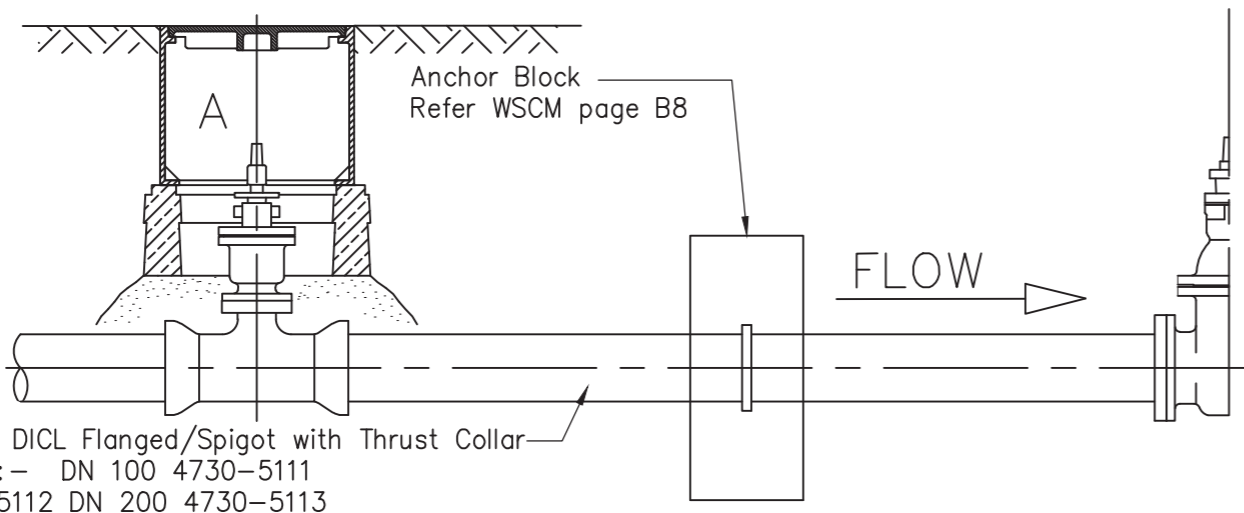
CASE 1:

- For RISING gradients (with flow direction as shown), install:-
- SEWER AIR-RELIEF VALVE at 'A' as detailed on SCM 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 SCM page M17, (or another SEWER AIR-RELIEF VALVE where this can be used as a substitute pump-out branch), to drain the 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 SCM 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 SCM page M18, to bleed entrapped air (during the 'charging' cycle) from the section of pumping main beyond the stop valve.

"NOT FOR CONSTRUCTION"



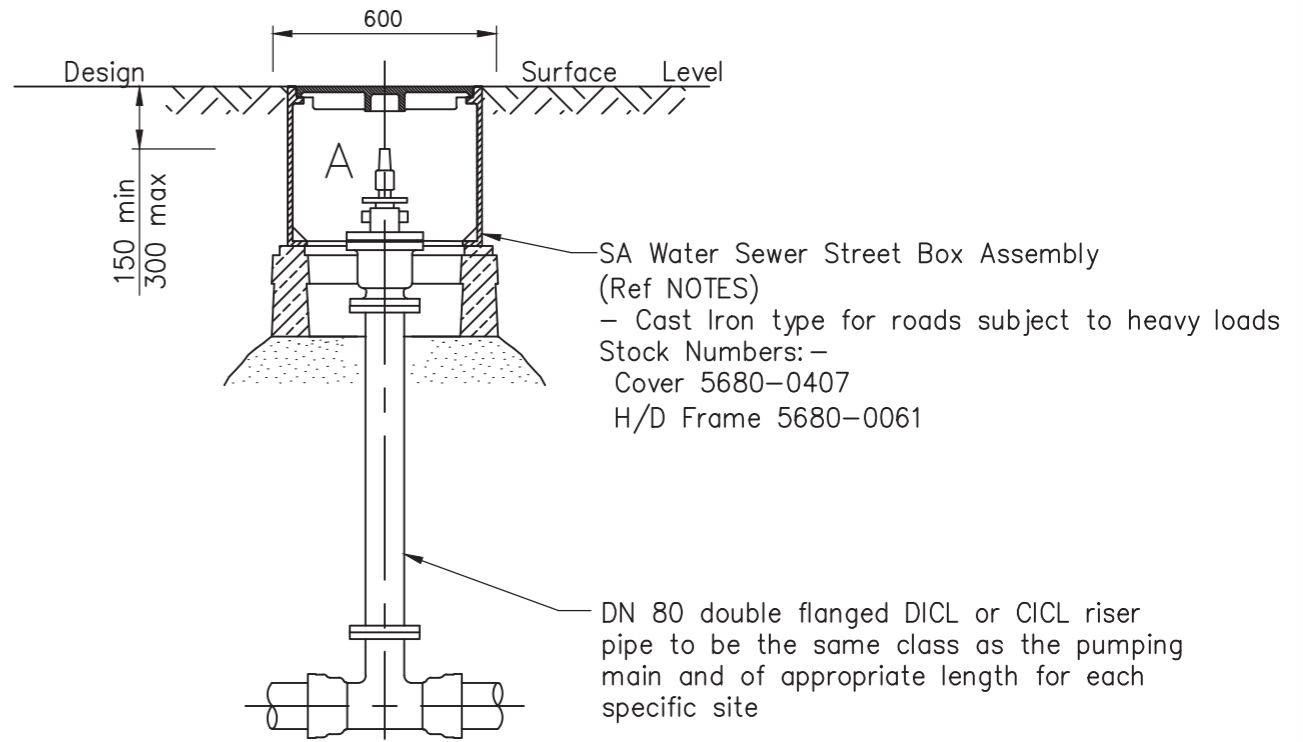
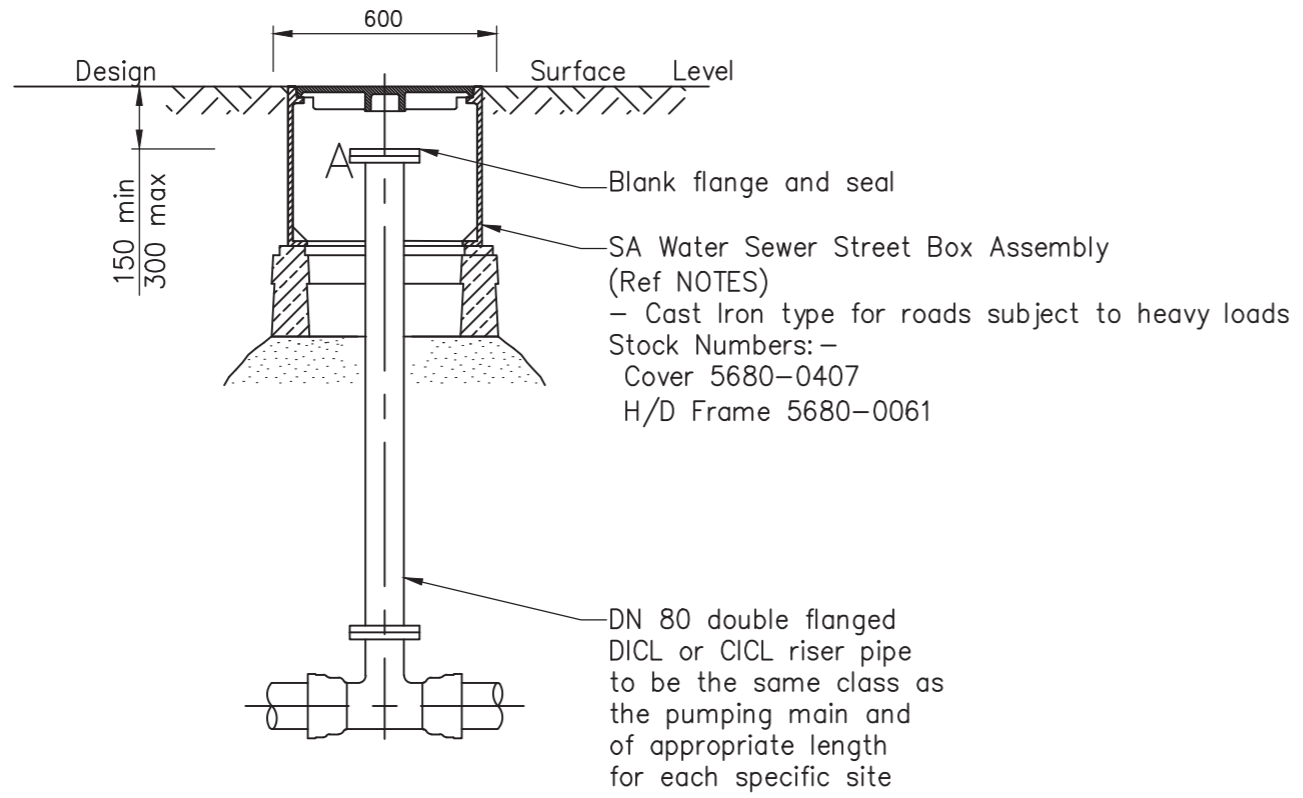
ALTERNATIVE ASSEMBLY

NOTES:

- Install a Combination Indicator Sign (Air-relief/Stop Valve/Pump-out Br) and Post for each site as detailed on SCM 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 petrolatum 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".

REVISIONS					DESIGNED	JUN '97	AUTHORIZED	SEWER CONSTRUCTION MANUAL PAGE M16		SHEET SIZE	REVISION
REV	DATE	DRN	DESCRIPTION	APPRV'D	JIS	JUN '97	T. Galek	IN-LINE STOP VALVE ASSEMBLY		A3	B
B	NOV '14	CTD/CRS	NOTES UPDATED.		CLS	JUN '97		FOR DN 100 TO DN 200		NOT TO SCALE	
					RMJ	JUN '97	T. GALEK	SEWAGE PUMPING MAINS		DRAWING NUMBER	
							9/12/2014			94 - 0163 - 16	
										YEAR NUMBER SHEET	
					NETWORK INFRASTRUCTURE STANDARDS						

BAR CODE



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

BAR CODE

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.

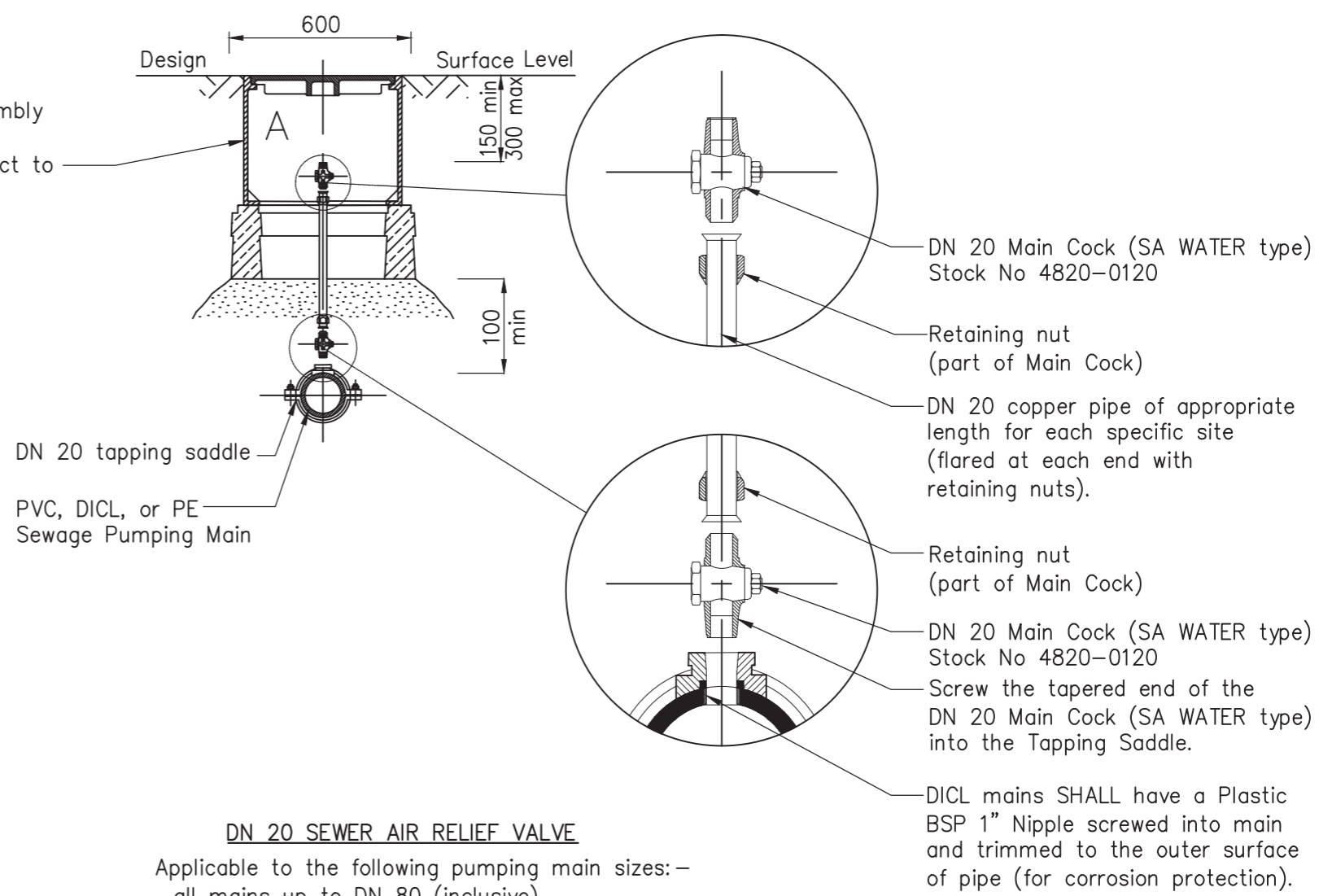
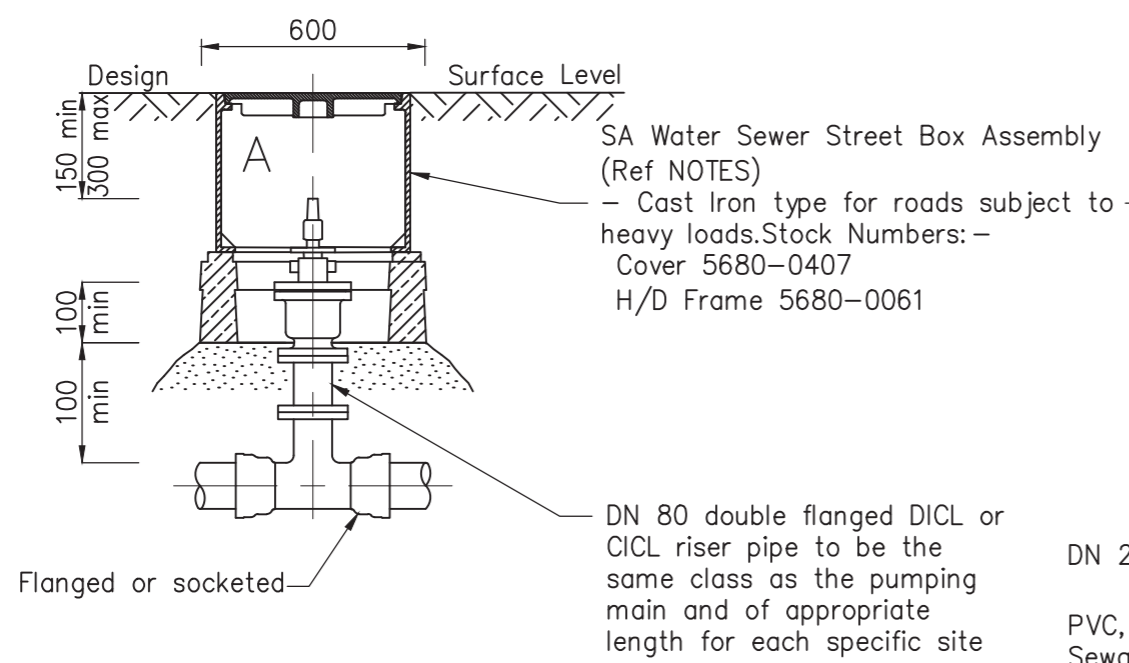
NOTES:

- 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 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 items, refer to SA Water catalogues of "Authorised Items for Sewer Systems" and/or "Authorised Items for Water Reticulation Systems".

"NOT FOR CONSTRUCTION"

REVISIONS					DESIGNED	JUN '97	AUTHORIZED	SEWER CONSTRUCTION MANUAL PAGE M17 PUMP-OUT BRANCH FOR SEWAGE PUMPING MAINS		SHEET SIZE	REVISION	
REV	DATE	DRN	DESCRIPTION	APPR'VD	JIS	JUN '97	T. Galek	 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.		A3	B	
					CLC	JUN '97	SIGNATURE			NOT TO SCALE		
					RMJ	JUN '97	T. GALEK 9/12/2014			DRAWING NUMBER		
B	NOV '14	CTD/CRS	NOTES UPDATED.						94 - 0163 - 17	YEAR	NUMBER	SHEET

BAR CODE



DN 80 SEWER AIR RELIEF VALVE

Applicable to the following pumping main sizes:-

Flanged or Socketed	Flanged
DN 100	DN 80
DN 150	DN 80
DN 200	DN 80
DN 250	DN 80

Only PVC (Series 2) and DICL 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.

DN 20 SEWER AIR RELIEF VALVE

Applicable to the following pumping main sizes:-

- . all mains up to DN 80 (inclusive)
- . for short lengths of DN 100 main (less than 30m long).

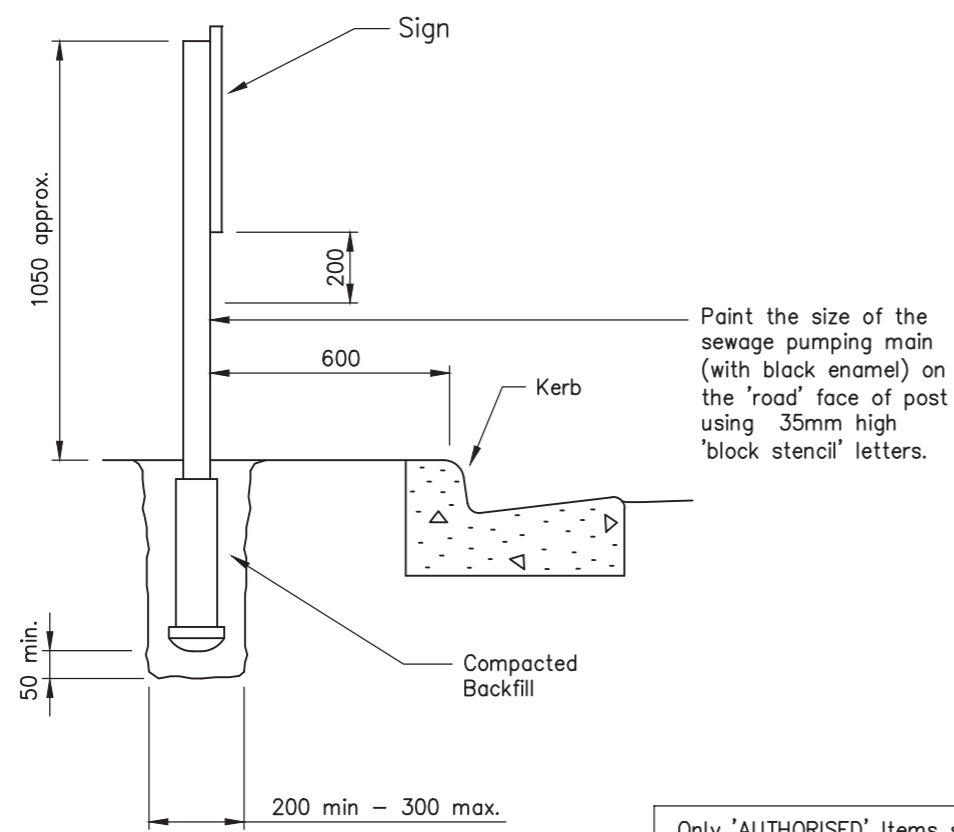
Install at high points along the sewage pumping main.

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 Sewer Systems" and/or "Authorised Items for Water Reticulation Systems".

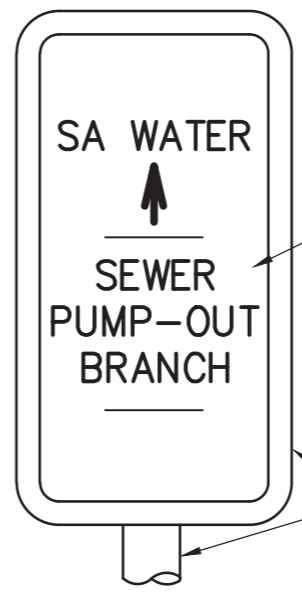
"NOT FOR CONSTRUCTION"

REVISIONS					DESIGNED	JIS	JUN '97	AUTHORIZED	SA Water		SHEET SIZE	REVISION
REV	DATE	DRN	DESCRIPTION	APPRV'D	DRAWN	CLS	JUN '97	SIGNATURE	 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.		A3	B
					REVIEWED	RMJ	JUN '97	T. GALEK			9/12/2014	NOT TO SCALE
					INITIALS DATE			PRINT NAME DATE		DRAWING NUMBER		
					NETWORK INFRASTRUCTURE STANDARDS					94 - 0163 - 18		
B NOV '14 CTD/CRS NOTES UPDATED.										YEAR NUMBER SHEET		

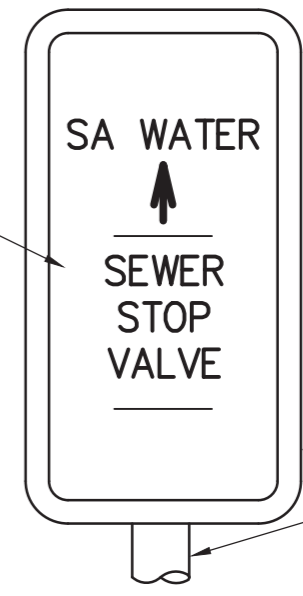


INDICATOR POST
(Refer to WSCM C17)

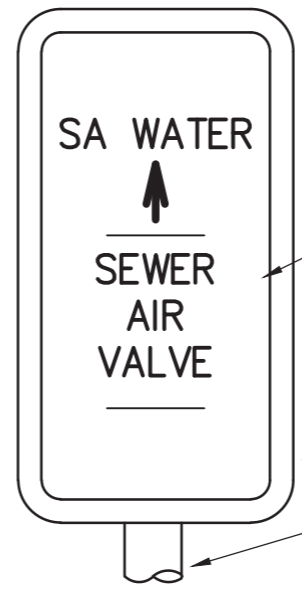
Only 'AUTHORISED' Items shall be used in the Sewer System



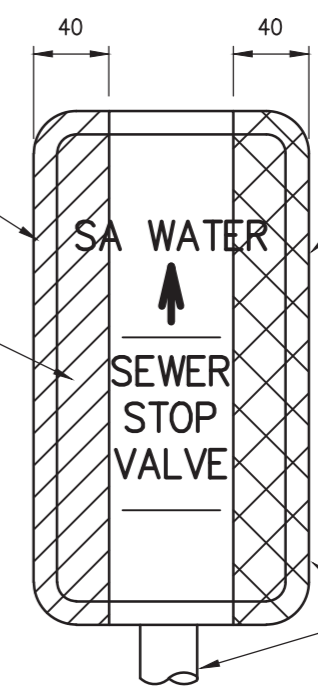
PUMP-OUT BRANCH SIGN
Sign Stock No 9905-0854



STOP VALVE SIGN
Sign Stock No 9905-0855



AIR-RELIEF VALVE SIGN
Sign Stock No 9905-0856



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

"NOT FOR CONSTRUCTION"

NOTES:

- 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.

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

BAR CODE

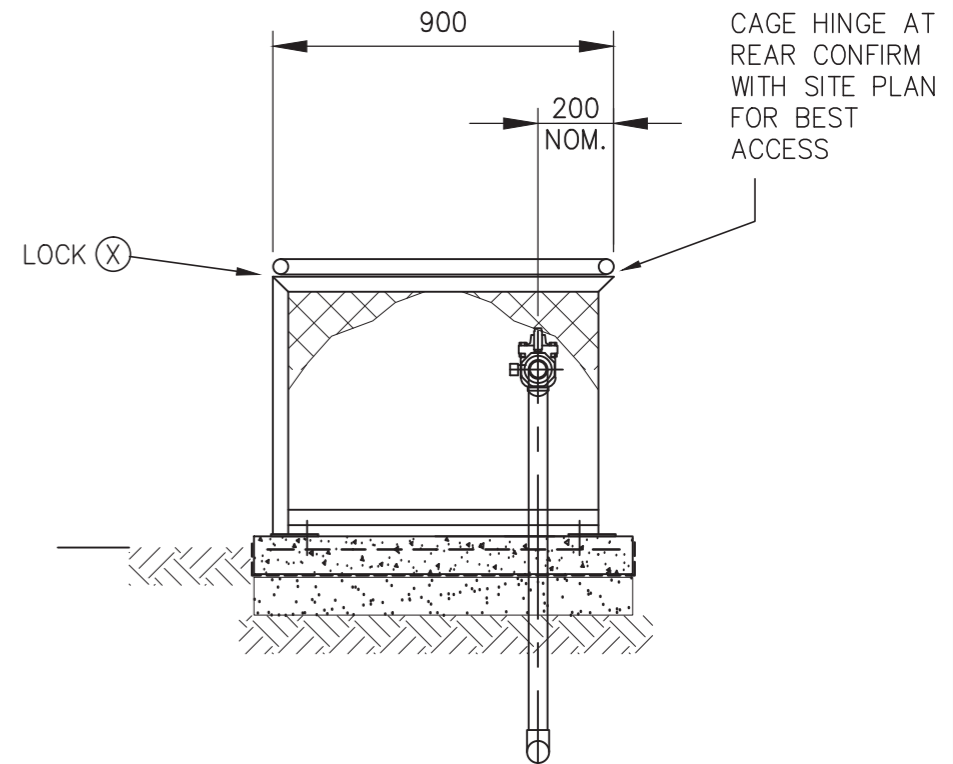
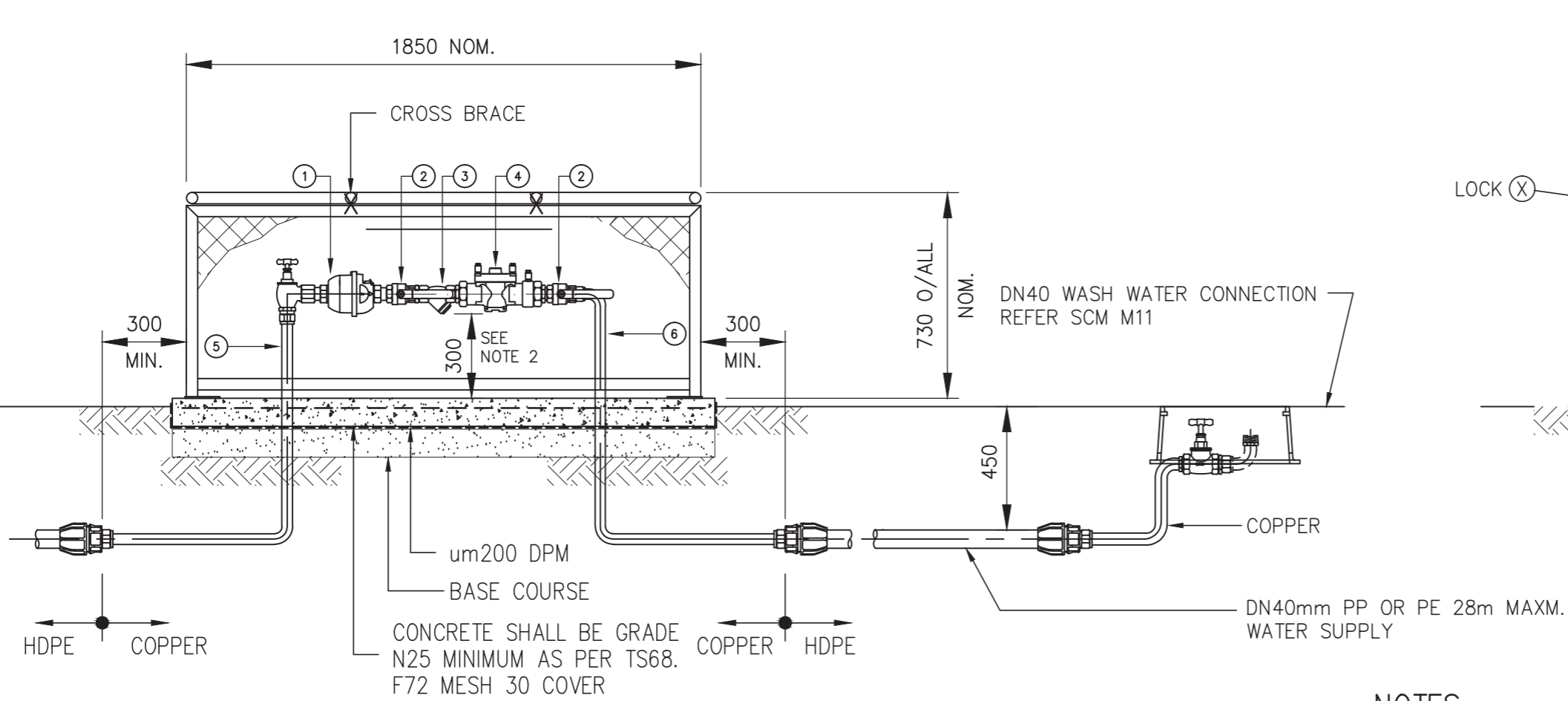
REVISIONS				
REV	DATE	DRN	DESCRIPTION	APPRV'D
B	NOV '14	CTD/CRS	NOTES UPDATED.	

DESIGNED	JIS	JUN '97	AUTHORIZED	<i>T. Galek</i>
DRAWN	CLS	JUN '97	SIGNATURE	
REVIEWED	RMJ	JUN '97	T. GALEK	9/12/2014
	INITIALS	DATE	PRINT NAME	DATE
NETWORK INFRASTRUCTURE STANDARDS				

SEWER CONSTRUCTION MANUAL PAGE M5
INDICATOR POST AND SIGNS
FOR SEWAGE PUMPING MAINS

SHEET SIZE	A3	REVISION	B
NOT TO SCALE			
DRAWING NUMBER			
94 - 0163 - 19			
YEAR	NUMBER	SHEET	

40 mm BACKFLOW PREVENTION DEVICE ASSEMBLY



BAR CODE

SCHEDULE	
ITEM	DESCRIPTION
1	METER
2	ISOLATING BALL VALVE
3	LINE STRAINER DN40
4	R.P.Z. VALVE DN40
5	INLET RISER
6	OUTLET RISER


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 DIAM. 10 DYNABOLTS

”NOT FOR CONSTRUCTION”

NOTE: ALL MEASUREMENTS ARE IN mm

REVISIONS					DESIGNED	ATD	NOV '14	AUTHORIZED	 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.	SEWER CONSTRUCTION MANUAL PAGE M20	SHEET SIZE	REVISION
REV	DATE	DRN	DESCRIPTION	APPRV'D	CTD/CRS	NOV '14	SIGNATURE	DN 40 BACKFLOW PREVENTION DEVICE FOR WATER SUPPLY		A3	A	
							T. GALEK 9/12/2014			NOT TO SCALE		
							T. GALEK 9/12/2014			DRAWING NUMBER		
									2014-1515-01			
					NETWORK INFRASTRUCTURE STANDARDS					YEAR	NUMBER	SHEET