

Sewer Audit - Design Checklist (for Swift)

SEW audits against the relevant codes and standards, these checklists are simply a tool to help in auditing and auditors are not limited to the items in the checklists.

- 1.1 - Is the Australian Height Datum (A.H.D) noted on design plans?
- 1.2 - Is the Australian Map Grid (A.M.G) / Geocentric Datum of Australia (G.D.A) noted on design plans?
- 1.3 - Are TBM's or PBM's shown on design plans and are AMG/GDA co-ordinates shown?
- 1.4 - Has the whole catchment (required to be controlled through this development) been controlled as indicated in the Notice of Agreement?

Sewerage Code of Australia WSA 02-2002-2.3, Melbourne Retail Water Agencies Edition

2. Are you Auditing the design of Gravity Sewers, Rising Mains or Siphons?
2.1 - Do you wish to audit the alignment and location of Gravity Sewer, Rising Main or Siphons?
Have any issues been identified for Gravity Sewers, Rising Mains or Siphons?
2.1.1 - Are all sewers located out of the front of properties and aligned as per SE Water requirements?
2.1.2 - Are there any curved sewers?
2.1.2.1 - Do all curved sewers have a radius greater than the standard?
2.1.3 - Is minimum cover achieved on all pipes?
2.1.4 - Do offset's of the sewer comply with standards?
2.1.5 - Has continuously jointed pipe been specified for any water crossings?
2.1.6 - Are there any railway crossings?
2.1.6.1 - Are all maintenance structures located out of the railway reserve?
2.1.7 - Are there any freeway crossings?
2.1.7.1 - Does the alignment of the pipeline cross at right angles to the freeway?
2.1.7.2 - Are all maintenance structures located clear of the freeway reserve?
2.1.8 - Are minimum clearances from other services achieved?
2.1.9 - Does the location of the rising main comply with SE Water requirements?
2.1.10 - SE Water approval for installation of Siphon received?
2.2 - Do you wish to audit the Maintenance Structures?
Have any issues been identified for Maintenance Structures?
2.2.1 - Does the distance between maintenance structures comply with standards (i.e. 150m in most cases)?
2.2.2 - Are all maintenance structures numbered in accordance with standards?
2.2.3 - Is the area subject to flooding?
2.2.3.1 - Do all maintenance holes have bolt down covers and are all cover levels of maintenance structures 150mm above the 1 in 5 year storm event level?
2.2.4 - Are there any gas check maintenance holes?
2.2.4.1 - Are Gas Check manholes located in the road reserve and are there ultimately more than 50 lots connected to it?
2.2.5 - Are there any maintenance holes greater than 6m in depth?
2.2.5.1 - Are landings, handgrips, ladders etc. in accordance with standards and are correct materials specified on design plans?
2.2.6 - Are all maintenance structure locations in accordance with our standards?
2.2.7 - Are minimum clearances to other services achieved?
2.2.8 - Are the maintenance hole cover class and cover size noted on design plans?
2.2.9 - Are flat top and pre-cast manholes nominated in accordance with standards?
2.2.10 - Are correct diameters of maintenance holes nominated on design plans, as well as the minimum diameter to be used?
2.2.11 - Is detailed MH table design required to be submitted? (eg. two or more internal drops, multiple incoming sewers, angle of deflection >90°)
2.2.11.1 - MH table design in accordance with standards?
2.3 - Do you wish to audit components of the Hydraulic Design (Gravity Only)?
Have any issues been identified for Hydraulic Design?
2.3.1 - Are the correct pipe diameters specified in accordance with standards?
2.3.2 - Does the grade of each pipe comply with standards?
2.3.3 - Are water seals (i.e. boundary traps) specified where required?
2.3.4 - Are IL's of sewers o.k?
2.3.5 - Are all pipe materials, pipe classes, jointing methods etc. specified on design plans and are they all approved products?
2.3.6 - Are any grades steeper than 1 in 10?
2.3.6.1 - Have trench stops been provided where required?
2.3.6.2 - Is the velocity through the pipe during PWWF below 3 m/s?
2.3.6.3 - Is the energy dissipated in the maintenance hole?
2.3.7 - Are any sewers greater than 5m in depth?
2.3.7.1 - Are the Class of pipe and all embedment details shown on design plans?
2.3.8 - Do Wet/Poor ground conditions exist?
2.3.8.1 - Are the Class of pipe and all embedment details shown on design plans? (use of water-stops/geotextile material used)
2.3.9 - Has an Emergency Relief Structure (ERS) been incorporated in design?

2.3.9.1. - Have HGL details been submitted ensuring that there is no possibility of overflow upstream at MHs, property drains, etc?

2.4 - Do you wish to audit issues related to Property Branches/Connections?
Have any issues been identified for Property Branches/Connections?
2.4.1 - Are all properties provided with a property branch/connection and is the type of branch/connection nominated on design plans?
2.4.2 - Have any Type C1A/F property branches/connections been nominated?
2.4.2.1 - Are Type C1A/F property branches/connections used as per the standard?

2.5 - Are there any sewers equal to or greater than 300mm in diameter?
Have any issues been identified for sewers greater than 300mm in diameter?
2.5.1 - Are self cleansing/slime stripping velocities achieved at PDWF?
2.5.2 - Are the Class of pipe and all embedment details shown on design plans?
2.5.3 - Are any sewers surcharging under 1 in 5 year floods (i.e. PWWF)?
2.5.4 - Are property connections only on sewers 450mm in dia. and less?

2.6 - Are there any Rising Mains?
Have any issues been identified for Rising Mains?
2.6.1 - Has the correct class, material etc. of pipe been specified on design plans?
2.6.2 - Are all products specified approved by SE Water?
2.6.3 - Does the discharge point of the rising main comply with SE Water requirements and is it coated with an approved coating system for concrete?
2.6.4 - Have scour valves been specified at suitable locations and comply with standards?
2.6.5 - Have air relief valves been specified at suitable locations and comply with standards?
2.6.6 - Do velocities comply with SE Water requirements?
2.6.7 - Are all SE Water's requirements achieved?

2.7 - Are there any Inverted Siphons?
Have any issues been identified for Siphons?
2.7.1 - Are minimum velocities achieved at PDWF?
2.7.2 - Does the difference in inlet level and outlet level comply with SE Water standards?

2.8 - Are all Non-Conformances you wish to create in Section 2 covered in the previous audit questions?

Sewage Pumping Station Code of Australia WSA 04-2001 and SE Water P.S. Supplementary Manual

3. Are you auditing the design of a Pumping Station?
3.1 - Do you wish to audit the design of the Wet Well, pipework and fittings?
3.1.1 - Is Pump Station a Package Pump Station?
3.1.1.1 - Does PS comply with requirements of WSAA purchase specification?
3.1.2 - Has a minimum of 2 hrs @ PDWF emergency storage been provided between high level alarm and spill alarm?
3.1.3 - Do flotation calculations confirm a minimum FS of 1.1?
3.1.4 - Does coating of concrete surfaces comply with standard?
3.1.5 - Is the wet well self draining?
3.1.6 - Are the covers in accordance with standards and are they arranged in a practical manner?
3.1.7 - Is the wet well diameter equal to or larger than the minimum allowable (i.e. min = 2.1m)?
3.1.8 - Do the Cut-in/Cut-out volumes comply with SE Water requirements?
3.1.9 - Do wet well washers comply with standards?
3.1.10 - Does the Top Slab incorporate all below ground structures?
3.1.11 - Has the concrete strength been specified and does it comply with SE Water requirements?
3.1.12 - Is there clearance from overhead powerlines?
3.1.13 - Do ladders comply with SE Water requirements?
3.1.14 - Does the penstock (Knife Valve) comply with SE Water requirements?

3.1.15 - Do all pipework comply with SE Water requirements (i.e. min dia. = 100mm)?
3.1.16 - Do all pipe supports comply with SE Water requirements?
3.1.17 - Does the pump well inlet pipe comply with SE Water requirements and is the inlet drop pipe submerged?
3.1.18 - Are computations for pump selection inclusive of NPV?
3.1.19 - Are all pumps, pipeworks and fittings approved products?
3.1.20 - Has a flushing valve been incorporated into the design?
3.2 - Do you wish to audit the Valve Chamber design?
3.2.1 - Is the pit accessible?
3.2.2 - Do all pipe supports comply with SE Water requirements?
3.2.3 - Are pressure main tapings in accordance with standards?
3.2.4 - Do ladders comply with SE Water requirements?
3.2.5 - Has provision been made to operate valves without the need to remove the cover?
3.2.6 - Is the valve chamber self-draining?
3.2.7 - Are all valves clockwise closing?
3.2.8 - Do all pipeworks and fittings comply with standards?
3.3 - Does the emergency relief structure comply with the EPA protocol guidelines and standards? Flap gates and trap for fats included in design?
3.3.1 - ERS protocol approval received?
3.4 - Do you wish to audit the Ancillary Services?
3.4.1 - Does the water supply to the pumping station meet SE Water requirements (i.e. backflow prevention device)?
3.4.2 - Does the access road comply with SE Water requirements?
3.4.3 - Have bollards been specified in accordance with standards?
3.4.4 - Does site drainage comply with SE Water requirements?
3.4.4 - Does site security comply with SE Water requirements?
3.5 - Are all Non-Conformances you wish to create in Section 3 covered in the previous audit questions?