Chapter 8 - Sewerage Reticulation

9.8.1 Purpose

The purpose of this chapter of the policy is to set out the requirements for the preparation and submission of plans and technical reports for the design of sewerage reticulation associated with development applications involving reconfiguration of lots or development or redevelopment of a lot under the planning scheme.

9.8.2 Applicability

This chapter of the policy applies to all development under the planning scheme which has a requirement to provide reticulated sewerage.

9.8.3 General

(1) The design and construction of sewerage infrastructure complies with the Water Services Association of Australia, Sewerage Code of Australia: the Queensland Addendum to the Sewerage Code of Australia and the local government's requirements as modified in this chapter of the policy and approved standard drawings.

(2) Before proceeding with design, the Consultant Engineer is to obtain -

(a) the approval of the local government for the proposed size of all sewers as well as the proposed location of trunk sewers and pumping stations and the capacity of such pumping stations;

(b) from the local government As-Constructed sewer information relevant to the proposed development;

(c) confirmation from the local government of approved point/s of connection to existing sewers.

(3) At the applicant's expense, local government staff will make all connections or alterations to local government sewers.

(4) Requests for connection are in writing with adequate details of work required.

(5) The local government reserves the right to refuse to complete the connections until such work is paid for and accepted On-Maintenance.

(6) Where staging of a development is proposed, additional information is required as stated in Chapter 2 - Documentation and Engineering Conditions of this policy.

(7) All work is supervised by a Registered Professional Engineer (Queensland) competent in sewerage work.

9.8.3.1 Main Roads

The Developer obtains the written approval of the Queensland Department of Main Roads if it is proposed to construct sewers under Queensland Transport infrastructure.

9.8.3.2 Railway Crossings

The Developer obtains the written approval of Queensland Rail if it is proposed to construct sewers under a railway line. Such crossings are designed and constructed in accordance with the requirements of Queensland Rail.
9.8.3.3 Local Government Roads

(1) A sewer may cross a road to reduce the number of access chambers required, provided connections are not located under the road.

(2) Trenching and backfilling at sewer crossings of existing local government roads are to comply generally with the details in the local government's approved standard drawings. The pipe is bedded in sand surround, then back-filled for a minimum depth of 450mm with lean mix concrete (1:20 mid). A 40mm thick AC road surface is placed over the lean mix back-fill and is to extend 200mm each side of the trench.

(3) Sewers constructed under new roads are back-filled from the pipe sand surround with base course gravel.

9.8.4 Location of Sewers

9.8.4.1 General

(1) Where practicable, sewer lines are located on the alignments shown in Table 1.

Table 1 - Alignments

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance from Property Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front of Private Property</td>
<td>1.2 metres to 2 metres</td>
</tr>
<tr>
<td></td>
<td>4 metres maximum at curves</td>
</tr>
<tr>
<td>Side of Private Property</td>
<td>1 metre</td>
</tr>
<tr>
<td></td>
<td>1 metre</td>
</tr>
<tr>
<td>Rear of Private Property</td>
<td>1 metre</td>
</tr>
<tr>
<td></td>
<td>2 metres</td>
</tr>
<tr>
<td>Street Verge</td>
<td>2 metres on the high side of type A and B streets</td>
</tr>
</tbody>
</table>

Note - 
Sewer lines are not permitted in the front of private property in lots fronting type A and B streets which have a road reserve width of 18 metres or less. Sewer lines are located in the front of private property on all higher order roads.

(2) When available, trunk mains or sewerage rising mains may be located on the standard alignment in the water allocation on the high side of the road reserve in accordance with approved standard drawings R-RSC-9 and R-RSC-10.

(3) Sewers are constructed at right angles or parallel to lot boundaries and not across boundaries at acute angles.

(4) Where sewers are located adjacent to roof drainage lines, the connection branch for the sewer is extended 1 metre beyond the outer edge of the roof drainage line.

(5) Property boundaries are pegged before setting out of sewer lines.

(6) When sewers are proposed through land other than that owned by the developer, written approval is obtained from the property owner and submitted to the local government with the design drawings. This will include connections to existing sewers performed by the local government.

9.8.4.2 Centre and Industrial Zones

(1) In areas which are zoned for centre or industrial activities, proposed sewers are not located under potential building areas. Every effort should be made to construct the sewer outside the lots, but where sewers have to be constructed within the lots, the developer -

(a) supplies the proposed footprint of the future buildings;
(b) constructs sewers clear of the proposed footprint.

(2) Where sewers have to cross a building footprint, construct the sewer in the most appropriate location and of adequate strength at the time of initial construction rather than reconstruct the sewer at the time of construction of the building.

(3) Provide easements over sewers in the lot to ensure they stay clear of future buildings or in the best location within the footprint.

(4) The local government may require the relocation of an existing sewer which conflicts with a proposed building site. If relocation is not feasible, the developer may seek the approval of the local government to build over the sewer. In such cases, foundations are to bridge the sewer. No approval will be given to build over sewers greater than 150mm diameter.

9.8.5 Connection Branches

(1) Connection branches are constructed in accordance with the local government’s approved standard drawings.

(2) The applicant is to ensure that the sewerage connections are at a level to service the entire property. In the event that the level of these connections results in them being greater than 1.5 metres in depth, the adjacent sewer main is to control the entire premises, with the connections brought up to a maximum depth of 1.5 metres in accordance with the local government’s standards.

9.8.5.1 Location of House Connection Branches

(1) House connection branches are generally located 1 to 1.2 metres upstream of the premises boundary and, where applicable, house connections extend a minimum of 1 metre beyond the property boundary.

(2) Written approval is obtained from the local government when house connections are proposed through premises other than that owned by the developer.

9.8.5.2 House Drains

(1) House drains are designed at 1 in 40 with a minimum depth at the head of the line of 0.5 metres to invert. A grade of 1 in 60 is only acceptable for control of the most upstream house drain connected to each main in areas with very flat terrain.

(2) Industrial activities may have house connections graded at 1 in 60 with 0.5 metres cover at the head of the line.

(3) Connections from fixtures to local government sewers are generally classed as private drains and as such, are designed in accordance with the relevant standards and inspected by the local government's plumbing inspectors.

(4) Combined house drains are not permitted.

(5) Requirements for house drains are laid down in the Sewerage and Water Supply Act, subordinate legislation and AS/NZS 3500:2003 Plumbing and Drainage.

9.8.5.3 Other Requirements

Local government parks and reserves are provided with a connection to the sewer unless otherwise approved. Generally, these connections are required where the local government considers that public amenities may be installed in the future.
9.8.6 Minimum Grades and Cover

(1) The minimum grade of each sewer section between maintenance structures is taken as the steeper value as is determined from -
   (a) a minimum velocity at the actual design maximum anticipated rate of flow in that sewer section of 0.6 metres per second;
   (b) that identified in Table 2.

(2) The maximum number of tenements served on sewer lines is as identified in Table 2.

Table 2 - Maximum Number of Tenements

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Minimum Grade</th>
<th>Maximum Number of Tenements Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mm</td>
<td>1 in 80 for 1st 5 lots and 1 in 150 thereafter</td>
<td>200</td>
</tr>
<tr>
<td>225mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>420</td>
</tr>
<tr>
<td>300mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>Refer WSAA</td>
</tr>
<tr>
<td>375mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>Refer WSAA</td>
</tr>
<tr>
<td>450mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>Refer WSAA</td>
</tr>
<tr>
<td>525mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>Refer WSAA</td>
</tr>
<tr>
<td>600mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>Refer WSAA</td>
</tr>
<tr>
<td>675mm</td>
<td>Refer Table 4.6 SCA-WSAA</td>
<td>Refer WSAA</td>
</tr>
</tbody>
</table>

(3) Industrial estates may be graded at 1 in 100 for the first 3 lots, then 1 in 150.

(4) Before road pavement pre-seal inspections, levels are taken to confirm that the minimum grades have been achieved under all roads.

(5) Minimum grades on pressure mains -
   (a) pipes 100mm diameter and 150mm diameter are graded 1: 400 rising and 1:250 falling;
   (b) pipes 225mm diameter and larger are graded 1:500 rising and 1:250 falling, or as directed by the local government.

(6) The minimum cover to the top of unprotected sewers pipes are detailed in WSAA Table 4.8.

Note -

At the front of private property or within the road verge, the crown of the sewer and house connection branches are a minimum 600mm below the level of the adjacent kerb to allow for possible excavation of driveways on the high side of the roadway.

(7) Where practical, the minimum vertical clearance from the outside surface of a sewer to the outside surface of an adjacent stormwater line or other service is 300mm. The space between the pipes is backfilled with sand.

(8) Where a 300mm clearance is not possible, a 3 metre length of D.I.C.L. pipe is provided.

(9) The minimum cover under an existing roadway to the outside surface of a D.I.C.L. sewer is not less than the pavement depth plus 200mm of sand or lean mix concrete backfill.
9.8.7 Materials

9.8.7.1 Sewer Pipes

(1) The types of pipe allowable for use in sewers are -

(a) PVC-M (Class 16);
(b) OPVC (Class 16);
(c) UPVC Class SN4 or Class SN8 (depending on depth and soil type);
(d) Ductile Iron Calcium Aluminate Cement mortar lining or equivalent, Class K9 with polythene sleeving;
(e) Hobas G.R.P.;
(f) “Ultra-Rib” uPVC sewer pipes may be used for trunk mains only. They are not used where house connections are required.

(2) In Industrial Subdivisions only uPVC, PVC-M, OPVC and DICL pipes are used unless otherwise approved by the local government.

(3) Concrete surround is not used with PVC pipes.

9.8.7.2 Pipe Bedding

Pipe bedding and bedding materials are in accordance with the local government’s approved standard drawings.

9.8.8 Maintenance Structures

9.8.8.1 Location of Maintenance Holes and Shafts

(1) Maintenance holes and shafts are designed in accordance with local government approved standard drawings and the Sewerage Code of Australia WSA 02-2002 except as amended herein.

(2) Maintenance holes are used at the following locations -

(a) all junctions and drops;
(b) all lots that are zoned commercial or industrial.

(3) Maintenance holes are required at the above locations for ease of maintenance and on commercial and industrial sites in order to gain access to obtain trade waste samples for analysis and to carry out visual inspection of pipe work.

(4) Maintenance structures may be located in a street verge on Type A and B streets and in residential lots in accordance with the Sewerage Code of Australia WSA 02-2002.

(5) Maintenance shafts may be located in a verge provided they are in accordance with the Sewerage Code of Australia WSA 02-2002, Part 1 Section 6.

(6) The location of maintenance structures is 1 metre upstream of lot boundaries. At a truncated section of a corner lot, maintenance structures are located wholly within the lot.

9.8.8.2 Drops

(1) The dimension of drops through maintenance holes are as indicated on the local government’s approved standard drawings.
(2) Maintenance holes receiving discharge from pressure mains are ventilated and coated to prevent corrosion.

(3) Standard maintenance holes are designed to permit entry for the purposes of maintenance and have a minimum depth to invert of 1.5 metres unless otherwise approved to achieve the performance criteria.

(4) In flood plains, waterways and drainage reserves, the finished surface level of maintenance structures is at a height not less than the 10 percent AEP (10 year ARI) flood level.

(5) Where excavation or fill is required at an existing sewer, the Developer is responsible to pay the cost to the local government for -
   (a) raising or lowering existing maintenance structures to the new surface level;
   (b) raising or lowering existing house connections if required;
   (c) providing structural protection to the sewer.

(6) All work to existing sewerage infrastructure will be carried out by local government staff.

9.8.8.3 Covers

(1) Maintenance structures located in private property are to have covers constructed 75mm above finished surface level.

(2) Bolt down covers are required on maintenance holes -
   (a) below 1 percent AEP (100 year ARI) flood level;
   (b) in parks or reserves;
   (c) in all trunk sewers whose diameter is over 375mm.

(3) Concrete filled covers are required in private property.

(4) Cast iron covers are required in all road reserves.

(5) All covers are class D type and marked to indicate that they relate to sewerage usage.

9.8.9 Inspection and Maintenance

(1) Inspection and maintenance requirements will be provided as a condition of engineering approval - refer to Chapter 2 of this Policy - Documentation and Engineering Conditions.

(2) After the Off-Maintenance inspection, the maintenance structure lids are sealed with Compriband or similar material.

(3) Levels are taken confirming the grade of all sewers under roadways prior to the pre-seal inspection.

9.8.10 Existing Sewers

(1) At the applicant's expense, local government staff will make all connections or alterations to local government sewers.

(2) Requests for connection are in writing with adequate details of work required.

(3) The local government reserves the right to refuse to complete the connections until such work has been paid for and accepted On-Maintenance.
(4) Prior to design, the developer is to survey actual levels of existing sewers.

(5) Levels and locations obtained from the local government’s As-Constructed sewerage information are unacceptable.

9.8.11 Existing Dwelling Units

(1) Where an unsewered dwelling unit is located on land that is being developed, the Developer is to connect the dwelling unit to the sewer at their cost as part of the developmental work.

(2) The Developer is responsible for the removal of any septic tanks and back filling of the excavation to the satisfaction of the local government.

(3) The Developer is responsible for obtaining the necessary building and drainage permits before commencing work.

(4) The Developer is responsible for providing connection branches for all properties on the route of any extended sewer but is not required to connect any dwelling to the sewer, except by agreement with the local government.

9.8.12 Pumping Stations and Pressure Mains

9.8.12.1 General

(1) Pumping stations and pressure mains are designed in accordance with the Sewerage Pump Station Code of Australia (WSA 04 - 2001) and the local government’s approved standard drawings.

(2) Pressure mains are a minimum of Class 12 U.P.V.C. pipe unless otherwise authorised by the local government.

(3) Pressure mains should generally be connected to a gravity sewer with a Y junction immediately downstream of a maintenance hole.

(4) A bitumen or concrete surfaced 3 metre wide vehicular access, with standard concrete slab across the footpath is constructed to suitable levels and pavement depth to the approval of the local government.

(5) The access is not constructed in an overland flowpath or below the level of a 1 percent AEP (100-year ARI) storm.

(6) A plan showing design details of the access is included when the pumping station drawings are submitted for approval.

9.8.12.2 Low Lift Pumping Stations

(1) The following requirements apply to low lift pumping stations, in addition to the requirements for pumping stations generally. Low lift submersible type pumping stations may be approved by the local government to suit conditions in which sewers are proposed in flat country. These stations are to conform to the following design standards -

(a) One pump station allowed within each catchment;

(b) Subsequent in line stations accepting pumped sewerage are the standard two-pump type;

(c) The nominal maximum number of tenements served is 70;

(d) Overflow mains discharge to a maintenance hole which has an approved internal anti-corrosive coating, at a maximum distance of 20 metres from the pump station;
(e) The pressure main discharges to the gravity main via an oblique junction, nominally 5 metres downstream from the maintenance hole receiving the overflows;

(f) Maintenance holes within a distance of 100 metres downstream of a pump station have an approved internal anti-corrosive coating;

(g) The pump unit is sized at 6 litres per second with a 100mm-diameter pressure main;

(h) A 150mm-diameter overflow pipe is provided from the pump station to the rising main discharge maintenance hole as indicated on the approved standard drawings;

(i) The finished surface level of the lowest tenements contributing to the pump station is above a hydraulic grade of 1 in 500 calculated from the level of the overflow pipe at the pump station;

(j) The maximum depth of the pump station floor is 6 metres below finished ground level;

(k) One reserve pump and motor unit is supplied and delivered to the local government's depot for every 1 to 3 pumps installed in an estate;

(l) Stations are constructed in accordance with the local government's approved Standard Drawings;

(m) Stations are located within a park or reserve, not within a road reserve, on a site approved by the local government;

(n) An all weather access is provided similar to that required for the standard two-pump type pumping station;

(o) An approved water service is provided.

9.8.12.3 Telemetry Alarm System

(1) New sewerage pump stations constructed in the local government area are to have provision made for connections to the telemetry system as follows -

(a) Construction of a separate cubicle attached to the switchboard for installation of telemetry equipment;

(b) Provision of output terminals in the cubicle to allow for the connection of telemetry equipment;

(c) Payment to the local government of the cost of installation of telemetry equipment.

9.8.12.4 Standby Power

New sewerage pump stations constructed in the local government area are provided with a connection for generators to provide standby power. As connections vary depending on the size of the pump motor, details of the pump motor are made available to the local government, in order that necessary connection details can be provided by the local government to the developer.