SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code)

Amendment to Vacuum Sewerage Code of Australia

(WSA06-2008 V1.2)

1 April 2020

Document History

Version	Description	Date
1.0	Initial Publication	01 July 2013
1.1	Amendment to Clauses 9.1, 9.2.1, 14.2.9, 23.5.2, 34.9.1, 34.9.2, 34.9.3, 41.5.3.1 Redland Water, Gold Coast City Council and Queensland Urban Utilities logos were replaced with the Redland City Council, City of Gold Coast and Urban Utilities logos respectively.	01 April 2020

SEQ WS&S D&C Amendment to Vacuum Sewerage Code WSA06-2008 Version 1.2

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
Part 0 - General	
I GLOSSARY OF TERMS	**Add:** **NOMENCLATURE :** **General References to Vacuum valves should be read as references to all vacuum infrastructure and appurtenances including valves, collection chambers, controllers, breathers, cable boxes, radio repeaters etc.**
INTRODUCTION	**Code Purpose** **After the third paragraph insert the following.** The SEQ Design & Construction Code sets out SEQ amendments to The Vacuum Sewerage Code of Australia. The SEQ Amendments include: • The SEQ-SPs requirements for specific detail which the Code anticipates individual water agencies will address, and • Additions, deletions and variations to the Code where the Code's requirements are not compatible with the SEQ-SPs current requirements (due to local practice, climate, geographic and topographic conditions and statutory requirements, etc) or where the Code is otherwise silent. Any reference to the Sewerage Code of Australia ("the Code") shall be deemed to refer to the SEQ Design & Construction Code which contains the SEQ Amendments. The Code specifies mandatory requirements for the design and construction of sewerage mains that are to become the responsibility of the SEQ-SPs. The SEQ-SPs reserve the right to specify or approve other design and/or construction requirements for particular projects and/or developments. Before commencement of any construction, the SEQ-SPs approval shall be obtained to any design and/or installation that does not comply with the Code."
INTRODUCTION	**Insert a title and a note that:** **Drawings and Figures** Drawing references are added throughout the Code. In the event of a clash between the standard drawings and the figures in the specification – details shown on the standard drawings take precedence.
INTRODUCTION	**Insert a title and a note that:** **CONDITIONS OF SUPPLY OF SEQ DESIGN AND CONSTRUCTION CODE** SEQ Design & Construction Code is supplied subject to the following understandings and conditions: • SEQ Design & Construction Code is copyright and apart from any use as permitted under the Copyright Act 1968, no parts of the documents, no parts of the documents may be sold, reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission in writing of SEQ-SPs. • SEQ Design & Construction Code is intended for use in connection with SEQ-SPs related projects only. • SEQ-SPs do not warrant the applicability of SEQ Design & Construction Code to climates, topography, soil types, water and sewage characteristics and other local conditions and factors that may be encountered outside SEQ-SPs area of operations. • The holder of SEQ Design & Construction Code acknowledges that they may contain errors and/or omissions. • SEQ-SPs accept no responsibility for any works or parts thereof which may contain design and/or construction defects due to errors or omissions in any part of a SEQ Design & Construction Code which has not been prepared or formatted by SEQ-SPs. • SEQ-SPs accept no responsibility for the incorrect application of SEQ Design & Construction Code by the holder or any other party.

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
PART 1 – PLANNING AND DESIGN	
1.3 SCOPE	**Add to the end of this clause:** This Supplementary Manual sets out the SEQ-SPs requirements for Vacuum Sewerage Systems.
1.5.2 Planning responsibilities	**Add to the end of this clause:** Vacuum sewers will only be used to service areas nominated by SEQ-SPs.
1.5.3 Design responsibilities	**Add to the end of this clause (a):** SEQ-SPs will not permit vacuum valves or pits to be located within the allotment as ALL vacuum valves and pits are to be owned and operated by the SEQ-SPs, **Add to the end of this clause (b):** SEQ-SPs may require at the cost of the Developer the input of an independent Consultant to represent Council in the design review, supervision and construction processes associated with vacuum sewerage systems
1.6.3 Objectives of the system design	**Amend clause (b):** (b) For residential and industrial properties, a single gravity connection for each property with maximum drainage of the property and for Community Title Scheme properties multiple gravity connections to multiple Vacuum Valves and pits shall be provided where a single connection can not "serve" the CTS property. **Add Addendum:** Primary Goals/ Objectives Ensure the reticulation and property mains remain clear of any solids accumulation. Retain the sewage in the mains for a minimum time to avoid it becoming septic and thus difficult to treat. Ensure that the vacuum in the pipeline does not exceed the allowable operating capacity of the pipe and fittings. Ensure that vacant properties can be connected with relative ease at a later date. If required, ensure the on property installation results in minimal inconvenience to the resident, by having a once on and off the property approach for the installation and commissioning of the Collection Chamber and the Vacuum Interface Valve. If required, ensure the involvement of the property owner in the design of the property layout in an attempt to meet their reasonable expectations, whilst still complying with the general thrusts of this design manual. Ensure there is minimal general inconvenience in the areas where the system is being installed. Ensure the system will operate satisfactory when only a minimal number of properties are connected. This needs to be particularly focussed on in new subdivisions, where development may take some time to reach the critical numbers the system was designed on. Minimise overall costs to the community in the installation of the sewerage system whilst still meeting the design objectives and requirements for the particular technology. Ensure the technology is supported by appropriate maintenance arrangements so that the installation of such a system will not disadvantage those that have vacuum sewerage systems in comparison with conventional gravity systems.
1.6.4 Design output	Any variations to this Code, and the reason for the variation, shall be highlighted in a boxed note on the design drawings.
2 CONCEPT DESIGN	
2.2 FUNCTIONALITY	**Sub-Clause a) and b) to be amended as such :** a) Efficiently deliver sewage from a defined catchment to an appropriate receiving system via a discharge manhole with appropriate Odour management. b) Pump 4 x average dry weather flow as designated for the specific SEQ-DS's catchment. **Add clause (i):** i) Vacuum Collection chambers and the contributing sewerage system up to the property

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
	connection (house drain) shall be sized to store 4 hours at ADWF before any sewerage overflows the vacuum collection chamber or any other component of the individual vacuum collection manhole catchment.
2.3. MAINTAINABILITY	**Add clause (d):** Incorporate valves for flexibility of operation of the Vacuum pipe network. As per drawing SEQ -VAC-1300-1, actuated valves at the start of each vacuum main shall be required and be fully SCADA controlled. Purpose is to allow operators to test each vacuum main for integrity and quickly restore vacuum to healthy vacuum mains.
2.5 DUE DILIGENCE REQUIREMENTS	**Add to the end of this clause :** The Queensland Department of Environment and Resource Management (DERM) now requires via ERA 63(3) that a "Development Application" be made to DERM as the Assessment Manager under SPA and that a separate Registration Certificate be obtained from DERM for the pump station. Guidance and support in these applications to DERM is available from the SEQ-SPs. The odour impacts associated within the pumping system and within the receiving sewerage system shall be assessed to the requirements of the Queensland Environment Protection Agency Guideline for Odour Impact Assessment from Developments that is available at the EPA web site as per the following 'http://www.epa.qld.gov.au/publications?id=1344'. The design submission for the pumping infrastructure and the receiving system shall be accompanied by the "Odour Impact Assessment Report".
2.7 STAGING	**Amend clause (c):** As stated in clause 1.6.3 Addendum, the system is to operate effectively when only a minimal number of properties are connected. This needs to be particularly focussed on in new subdivisions, where development may take some time to reach the critical numbers the system was designed on. Septicity should be a key consideration as per clause 2.8.
2.8 SEPTICITY CONTROL	**Add to the end of this clause :** All Vacuum systems produce septic sewage to varying degrees during the diurnal curve of flows. The Septicity of the system shall be managed by application of Clause 2.9.
2.9 ODOUR CONTROL	**Add second clause:** The Odour Impact Assessment Report discussed in Clause 2.5 herein shall address the odour impacts at the air discharge of the vacuum pumps at the vacuum pumping station and at the rising main discharge point to the down stream gravity network.
2.11 COMMISSIONING PLAN	**Add to the end of this clause (g):** (g) Where Staged provision of the Vacuum system is to be carried out, a separate Commissioning Plan shall be provided for each stage extension.
3 GENERAL DESIGN	
3.3 LEVELS	**Add to the end of this clause :** All vacuum mains and gravity mains shall be presented as "Longitudinal Sections" in addition to plan views and specific detail plans and sections. Note: Maintaining the levels of the lines is critical to successful lifetime operation; refer Part 3 Construction to ensure that levels are maintained for the life of the vacuum network. All corridors are to be cleared, easements provided (if unavoidable) ,and above ground marking of the corridor (refer cl 34.9) required. For all Vacuum sewer lines, all "Critical Levels" are required to be clearly marked on "AS CON" drawings.
3.4 UNFORSEEN GROUND CONDITIONS	**Add to the end of this clause:** For SEQ, most vacuum systems are located within areas of marine clays, acid sulphate soils or soils that are influenced by tidal waters. The designs shall accommodate any necessary geotechnical investigation.

<table>
<tr><th>Reference</th><th>Amendments to Vacuum Sewerage Code WSA06-2008 V1.2</th></tr>
<tr><td>3.7 EASEMENTS</td><td>Add to the end of this clause:

Vacuum mains are not permitted within an allotment for new development.

Gravity mains that are located within an allotment shall be provided with an easement.

In the case of gravity mains or backlog works, easements shall be a minimum of 6m wide. Easements shall not to be shared with power, gas and telecommunications.
Vacuum sewers shall not be located in easements to achieve capital cost minimisation where satisfactory routes in roads are available and viable, as this adversely affects SEQ-SPs access and ongoing maintenance requirements.</td></tr>
<tr><td>3.12.5.2 Clearance requirements</td><td>Amend the Table 3.1 as follows.
TABLE 3.1
CLEARANCES BETWEEN PIPELINES AND OTHER UNDERGROUND SERVICES
<table>
<tr><th rowspan="2">Utility (Existing or proposed)</th><th colspan="2">Minimum horizontal clearance mm
New main size NB</th><th rowspan="2">Minimum vertical clearance[1] mm</th></tr>
<tr><th>≤ 200 mm</th><th>> 200 mm</th></tr>
<tr><td>Water mains ≤ 375 mm</td><td>300</td><td>600</td><td>500</td></tr>
<tr><td>Water mains > 375 mm</td><td>300</td><td>600</td><td>500</td></tr>
<tr><td>Gravity sewers ≤ 300 mm</td><td>300[2]</td><td>600</td><td>500</td></tr>
<tr><td>Gravity sewers > 300 mm</td><td>300[2]</td><td>600</td><td>500</td></tr>
<tr><td>Sewers – pressure</td><td>300</td><td>600</td><td>500</td></tr>
<tr><td>Sewers – vacuum</td><td>300</td><td>600</td><td>500</td></tr>
<tr><td>Gas mains</td><td>300[2]</td><td>600</td><td>500</td></tr>
<tr><td>Telecommunication conduits and cables</td><td>300[2]</td><td>600</td><td>300</td></tr>
<tr><td>Electricity conduits and cables</td><td>500</td><td>1000</td><td>500</td></tr>
<tr><td>Stormwater drains ≤ 300 mm</td><td>300[2]</td><td>600</td><td>150</td></tr>
<tr><td>Stormwater drains > 300 mm</td><td>300[2]</td><td>600</td><td>300</td></tr>
<tr><td>Kerbs</td><td>150</td><td>600[3]</td><td>150 (where possible)</td></tr>
</table>
Amend this Note 2 of Table 3.1 as follows.

2. Clearances can be further reduced to 150 mm for distances up to 2 m when passing installations such as concrete bases for poles, pits and small structures, providing the structure is not destabilised in the process.</td></tr>
<tr><td>3.12.7 Deviation of pipelines around structures</td><td>Amend this clause:

Vacuum mains of any material shall not be bent. Where a Vacuum main is required to deviate around an obstruction, then the deviation shall be set up as a standard saw tooth step or steps through the use of electrofusion bends in the form of Figure 3.2</td></tr>
<tr><td>4 MATERIALS DESIGN</td><td></td></tr>
<tr><td>4.2.2 Concrete surfaces</td><td>Add to the end of this clause:

Vacuum collection chambers that receive gravity flows do not require a protective coating. Vacuum collection chambers that receive pumped flows require a protective coating or lining equal to that provided for Wet Wells. Please refer to Clause 18.8 of the Sewerage Code</td></tr>
<tr><td>4.2.3 Metallic materials</td><td>Add to this clause):

Ductile Iron valves and rising main bends and fittings shall be provided with a coating that</td></tr>
</table>

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
	complies with AS/NZS4158.
5 –HYDRAULIC DESIGN	
5.2 VACUUM STATION DESIGN FLOWS	**Amend this clause:** (a) (remove) (b)Design Flow shall be 4 x Average Dry Weather flow for the design population as designated for the specific SEQ-SPs catchment. (c) (remove)
5.3.1 VACUUM SEWER DESIGN FLOWS	**Add as clause 2:** SEQ-SPs only permit the use of AS/NZS 4130 PE100 Series 1 pipe at a minimum SDR 17 at a minimum of DN110. **Change Table 5.3:** Table 5.3 needs to have the first row DN90 value changed to DN110 Note 4 Table 5.3 is not correct for the "Recommended maximum liquid flow" when PE100 SDR17 pipe is used
6 VACUUM STATION DESIGN	
6.2.1 Site selection	**Add to the beginning of this clause :** SEQ-SPs require the station to be placed within Water Agency owned land **Add after (7) :** (S2) SEQ-SPs require the rising main to be placed within the road reserve at the standard alignment for the Council area
6.2.2 Right of occupancy and access	**Add to the end of this clause:** Occupancy shall be achieved through the provision of a Lot in Fee Simple dedicated to the SEQ-SP water agency
6.2.3- Location and Layout:	**Add to the end of this clause:** All vacuum pump station sites shall be not less than 500m^2 Pump stations shall have a 4 meter wide all weather sealed industrial access and be located to provide permanent access for heavy vehicles. Pump stations shall be fenced and landscaped to meet the requirements of the SEQ-SP.
6.3 VACUUM STATION LAYOUT	**Add to this clause:** Vacuum vessels must be located in a pit that provides accessibility for the pressure vessel certification requirements (refer *AS/NZS 3788:2006* : Pressure equipment - In-service inspection) **After reference to a work bench and wash trough, add:** and vacuum valve test facility at the work bench.
6.4.1 Operating Volume	**Add to this clause:** Machinery factor shall be nominated at 125% of the duty flow for each stage of the development.
6.5 MOISTURE REMOVAL VESSEL	**Add to the end of this clause (a):** A "Clear view" or equivalent air filter would meet the provisions of this clause. All air filters shall incorporate a SCADA alarm and local controlled auto drain.

<table>
<tr><th>Reference</th><th>Amendments to Vacuum Sewerage Code WSA06-2008 V1.2</th></tr>
<tr><td>6.6.1 Vacuum Generator capacity</td><td>Add to the end of this clause :

Each duty/duty/standby pump shall be capable of delivering 125% of the flow. The size of the vacuum generator/s shall be staged to meet the loading forecast of the design.</td></tr>
<tr><td>7 – POWER SYSTEM</td><td></td></tr>
<tr><td>7.3.1 Design</td><td>Add to the beginning of this clause :

The power and control cubicle, which is located within the vacuum station (Refer to Standard Drawings VAC–1300 and VAC–1301), shall be designed as a self-contained cabinet complying with AS 3439.1 and Water Agency requirements. Equipment segregation shall be determined by risk analysis and assessment, but as a minimum shall be Form 3.
Cabinets should be constructed from corrosion resistant materials such as marine grade aluminium/stainless steel suitable for the intended environment as per the SEQ-SP requirements.</td></tr>
<tr><td>7.3.4 - Lighting</td><td>Add to the end of this clause :

Fluorescent lighting shall be provided inside the switchboard to illuminate the operations compartment and external lighting shall be provided for operator safety and security (Refer Clause 16.1.4)</td></tr>
<tr><td>8 Controls and Telemetry System</td><td></td></tr>
<tr><td>8.4 ALARM, STATUS MONITORING AND CONTROL TELEMETRY.</td><td>Table 8.1 Add the following alarms:

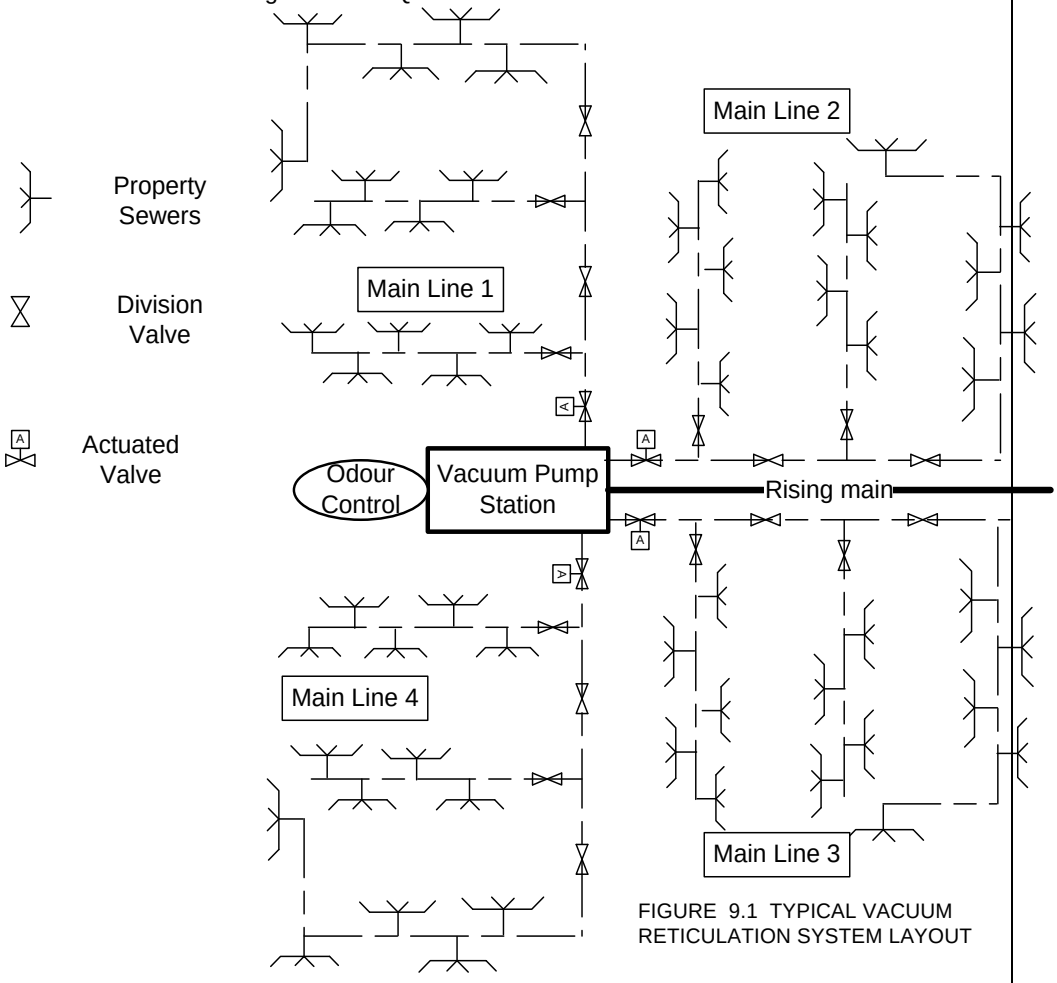
<table>
<tr><th>Alarm–
Operation digital signal</th><th>Description</th></tr>
<tr><td>Collection Chamber Vacuum Valve status</td><td>The status of the valve shall be monitored and reported back to the chamber monitoring system that links to the pump station telemetry system i.e. Open/Closed</td></tr>
<tr><td>Collection Chamber Level Alarm</td><td>A float switch mounted at 50% of well volume shall alarm indicating abnormal state.</td></tr>
</table>
</td></tr>
<tr><td>8.2 CONTROL SYSTEMS</td><td></td></tr>
<tr><td>8.2.5 – Collection Chamber level monitoring</td><td>Add this clause :

Collection chamber level monitoring for high level alarm shall be provided with the alarm set at 50%”</td></tr>
<tr><td>8.2.6 – Vacuum Valves</td><td>Add this clause :

Vacuum Valves shall be provided with “valve status” telemetry.</td></tr>
<tr><td>8.2.7 – Monitoring of Collection Chambers</td><td>Add this clause :

Monitoring of Collection chambers shall be a hard wired cabled underground system (within heavy duty conduit).
The monitoring system for Chamber High Level status and Vacuum Valve status may be either a “Dupline” type continuous cable system or an approved equivalent monitoring system.
Alternative radio telemetry systems may be proposed but no above street public infrastructure such as light poles, power poles or street signs etc can be used for repeater stations – a fully integrated stand alone system will only be considered.</td></tr>
<tr><td>8.2.8 – Line isolation valve telemetry</td><td>Add this clause:

All incoming lines to the pump station shall be fitted with actuated valves controlled from the pump station control system and with supervisory control from the SCADA system to enable operators to test and shut down faulty lines allowing healthy lines to remain in service. See Drawing SEQ-VAC-1300-1.</td></tr>
<tr><td>9 VACUUM SEWER DESIGN</td><td></td></tr>
<tr><td>9.1 STAGING</td><td>Add this clause 2:</td></tr>
</table>

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
	Refer to standard drawings DWG SEQ-VAC-1300-1.  FIGURE 9.1 TYPICAL VACUUM RETICULATION SYSTEM LAYOUT
9.2.1 Sewer Layout – General Layout	**Add this clause 2:** Each vacuum main shall have a telemetry controlled isolation valve for operational purposes. Add at end of clause: All civil aspects of the network (e.g. tanks, chambers, pipes etc) will be designed for ultimate flows. Pumps are to be sized to accommodate low flows in accordance with each stage of the development (subject to approval by SEQ-SPs).
9.3.1 Available Vacuum	**Add to the end of this clause (a):** Vacuum valves must be able to open at -15kPa.
9.3.3 Static Lift Loss	**Add this clause :** For any instance where greater than 2.5m of lift losses are to be provided to any individual vacuum chamber the specific written approval of the vacuum interface valve supplier addressing the issue shall be provided to the SEQ-SP.
9.7 VACUUM PIT VALVES	**Add this clause :** Valves are to be located in a separate pit to facilitate ease of access for operations and maintenance i.e. not in collection chamber.

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
9.8 VACUUM CONTROL VALVES	**Add to the end of this clause :** In areas where the pits are prone to flooding, the controller is required to be mounted above the flood level, this may require mounting at a remote location to the valve. The breather lines are to be external, encased in conduit and screened to prevent flooding and vermin attack.
10 COLLECTION CHAMBERS	
10.1.3 – Number of Properties Connected (per Collection Chamber)	**Add to the end of this clause :** The maximum number of property connections attached to a single collection chamber is 4. SEQ-SPs preferred connection system is to have the collection chamber located adjacent to the property boundary and then have the two neighbouring properties attached. Separate connections to the collection chambers are to be provided from each property. Each property connection is to include a standard connection IP adjacent to the property boundary (as for gravity sewers) or adjacent to the collection chamber for installations where the chamber is located on private property.
10.1.7- Breather pipes and Valves	**Add to the end of this clause:** External breathers that provide a breather vent at least 300mm above the known 1 in a 100 year flood level. The breather pipework from the vacuum pipe pit to the breather bollard shall be encased in a conduit to a nominal size larger than the breather pipe. The bollard shall be located to the common property boundary nearest to the valve pit refer drawing SEQ-VAC-1206-1.
10.1.8 Emergency Storage:	**Add to the beginning of this clause :** Vacuum pumping system (i.e. the vacuum pumping manhole and gravity lines) shall provide 4hours storage at ADWF.
10.1.9 Covers and Frames	**Add to the beginning of this clause :** Collection chamber covers shall provide an access opening of at least 750 mm diameter.
10.1.10 Monitoring of Collection chambers	**Add this clause :** Refer 8.2.5, 6&7 for telemetry requirements
10.2.1 Vacuum interface Valves	**Add to the end of this clause:** The vacuum interface valves shall be supplied upstream and downstream with a manually operated slide gate valve.
10.3.2 Design Criteria	**Delete sentence:** *Some properties ……the service connection"*
13 Pressure Mains	**Add to the end of this clause :** **Rename the Clause "RISING MAINS"** The rising main shall be designed, installed and commissioned in accordance with the SEQ_SPS Code (Sewage Pumping Code).
14-STRUCTURAL DESIGN	
14.2.5.3 *Trench width*	**Amend this clause :** Pipe trench width design considerations shall be based on the minimum side clearances, bedding and overlay specified in the relevant Standard Drawings and/or design standards e.g. AS/NZS 2566.1, AS 3725 et cetera. Dimensions shall be detailed in the Design Drawings and/or Specification. Refer to the commentary to Standard Drawing SEQ-SEW-1200-2 for default trench design.
14.2.5.4 *Pipe embedment*	**Amend this clause :** Pipe embedment shall be specified in the Design Drawings (Refer to Standard Drawings SEQ-SEW-1200-1 to SEQ-SEW-1205-1 inclusive), including embedment material and, as

<table>
<tr><th>Reference</th><th>Amendments to Vacuum Sewerage Code WSA06-2008 V1.2</th></tr>
<tr><td></td><td>appropriate, reinforcement details.</td></tr>
<tr><td>14.2.7 Geotechnical considerations</td><td>Add to the end of this clause :

Selection of appropriate foundation and groundwater control shall be made on advice of a specialist acceptable to the SEQ-SP. The special foundation shall be selected from the options presented in Standard Drawings SEQ-SEW-1200-1 and SEQ-SEW–1205-1, unless otherwise specified by the specialist or the Water Agency. Adequate construction detail e.g. spacing of piles, concrete reinforcement, and bulkheads shall be provided in the Design Drawings
and/or Specification.</td></tr>
<tr><td>14.2.9 Bulkheads and trenchstops</td><td>Amend the first paragraph to read:
Bulkhead and trenchstop requirements shall be detailed in the Design Drawings and shall be in accordance with Standard Drawings SEQ-SEW-1206-1, SEQ-SEW-1207-1 and SEQ-SEW-1207-2. Where located adjacent to a road crossing, bulkheads or trenchstops shall be placed adjacent to the kerb as shown in Standard Drawing SEQ-SEW-1206-1. Spacing of bulkheads and trenchstops shall be in accordance with Table 14.1. Bulkheads may also be required adjacent to the kerb of sealed roads to support the edge of the road formation.

Amend the fourth paragraph to read:
In addition to the grade of the pipeline, when determining the use of bulkheads and trenchstops, trench location, annual rainfall, native soil permeability, natural water table, the occurrence of underground streams and other Water Agency criteria shall also be taken into consideration. Where wide trenching with step batters is used, Trenchstops and Bulkheads should not extend above the lowest un-stepped trench section.

Replace the contents of Table 14.1 with the following:

<table>
<tr><th>Grade
%</th><th>Requirement</th><th>Spacing S
m</th></tr>
<tr><td>5<Grade<15</td><td>Trenchstop</td><td>S=100/Grade%</td></tr>
<tr><td>15≤Grade<30</td><td>Concrete bulkhead</td><td>S=L/Grade%, where
L = 80xPipe length*, m (450 m max)
Where L>100 m – use intermediate trenchstops at spacing <100/Grade</td></tr>
<tr><td>30≤Grade<50</td><td>Concrete encasement (continuous) and concrete bulkheads</td><td>S = 100/Grade(%)</td></tr>
<tr><td>Grade≥50</td><td>Special design</td><td></td></tr>
</table>
* Pipe length is the standard pipe length installed</td></tr>
<tr><td>14.2.11.2 Thrust blocks</td><td>Amend drawing references:

The size of the thrust blocks shown in the Standard Drawings is based on the pipe being laid with at least the minimum cover shown on Standard Drawing SEQ-SEW 1200-2.

The maximum allowable horizontal bearing pressure of the material in the trench wall may be determined as detailed on Standard Drawing SEQ-SEW- 1200-1.</td></tr>
<tr><td>19.1.1 General</td><td>Add to the end of this clause :

Prepare and submit asset as-constructed data and asset manuals to the SEQ-SP in accordance with SEQ D&C Asset Information Specification</td></tr>
<tr><td>23.5.2 Protection of other services</td><td>Insert the following at the start of this clause.

The contractor shall be responsible for any damage they cause to existing underground services. If the contractor damages any existing services, it shall arrange for the relevant service authority to make good such damage and the cost thereof shall be borne by the</td></tr>
</table>

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
	contractor. If in the opinion of the SEQ-SP, the failure or damage causes an emergency situation, then remedial action will be taken by the SEQ-SP and the full cost of such action shall be borne by the contractor.
34.9.1 Non-detectable marking tape	**Delete clause and insert:** Where marker tape is specified only detectable marker tape shall be used
34.9.2 Detectable Marking Tape	**Delete and update clause to:** *Refer Standard Drawing* SEQ-SEW-1200-2. Lay detectable marking tape on top of the pipe embedment material before trench filling, for all sewers and property connection sewers constructed using open cut trenching. Lay the tape over the embedment to form a continuous connection between access cover frames. Strip the ends of the tape to expose its conducting wires. Connect bare wires to a nut or bolt of the access cover frame to form an electrical connection.
New clause 34.9.3 Tracer Wire	**Insert new clause 34.9.3 Tracer Wire:** All vacuum sewers constructed using trenchless techniques shall be installed with tracer wire wound around or affixed to the pipe and terminated and fixed at an accessible point at each end, except in the case of mains installed in a steel pipe sleeve which do not require a tracer wire.
41.5.3.1 General	**Replace the first two paragraphs with the following:** Vacuum test all concrete MHs regardless cast in-situ MHs or precast MHs. **Delete Table 41.4**
PART 4 – STANDARD DRAWINGS	
2. Listing of Standard Drawings	**Add this table:**

DRAWING NO.	DRAWING TITLE
SEQ-VAC -INDEX	Vacuum Sewerage Drawing Index Sheet 1 Of 1
SEQ-VAC -1100-1	Vacuum Sewer Profile Typical Example With Design Detail
SEQ-VAC -1101-1	Vacuum Sewer Details – PVC
SEQ-VAC -1102-1	Vacuum Sewer Details – PE
SEQ-VAC -1102-2	Polyethylene Pipeline Details For Vacuum Sewers
SEQ-VAC -1103-1	Vacuum Sewer Layout For Industrial For Industrial Sites
SEQ-VAC -1103-2	Polyethylene Pipeline Details For Vacuum Sewers
SEQ-VAC -1104-1	Vacuum Sewer System Longitudinal Sections
SEQ-VAC -1105-1	Vacuum Sewer Typical Estate Details & Notes
SEQ-VAC -1106-1	Vacuum Sewer Typical P&ID Diagram
SEQ-VAC -1200-1	Vacuum Collection Manhole 7 Valve Pit Typical Detail
SEQ-VAC -1201-1	Dn1500 Collection Chamber With Single Vacuum Interface Valve Dn150 & Dn225 Sewers 1.8 & 2.4 M Deep Typical Example With Design Detail
SEQ-VAC -1202-1	Dn1500 Collection Chamber With Two Vacuum Interface Valves Dn150 & Dn225 Sewers 1.8 & 2.4 M Deep Typical Example With Design Detail
SEQ-VAC -1203-1	Dn1800 Collection Chamber With Two Vacuum Interface Valves

Reference	Amendments to Vacuum Sewerage Code WSA06-2008 V1.2
	Dn150 & Dn225 Sewers 1.8 & 2.4 M Deep Typical Example With Design Detail
	SEQ-VAC -1206-1 Collection Chamber Service Connection, Typical Property Connection Layout & Pipe Penetration Through Collection Chamber Wall Details
	SEQ-VAC -1300-1 Vacuum Station Layout Horizontal Vacuum Vessel
	SEQ-VAC -1301-1 Vacuum Station Layout Vertical Vacuum Vessel