PRINCIPAL’S PROJECT REQUIREMENTS

CONTRACT NO. WT12-17/18

KARA VIEW COURT SEWERAGE UPGRADE PROJECT
Principal’s Project Requirements

1. Background Information
Kara View Court is located on the eastern end of Rangeville. Due to the topography, the area was developed with a vacuum sewerage system. This system consists of a vacuum sewer pump station (VSPS), collection chambers (also referred to as valve pits), a vacuum interface valve located within the chamber and PE vacuum mains. Currently there is a total of 14 valve pits servicing a total of 33 properties. Also, a few houses near the VSPS are connected by gravity pipework which are connected to the vacuum valve pits. Currently, 21 of the properties have residences on them and 4 more are in the construction stage.

In recent years there have been recurring problems within the vacuum sewer system, especially during extended periods of rainfall. In order to provide a better sewerage system in Kara View Court, Council has decided to install a new submersible pump station which will take in around half of the catchment and thereby reducing the load on the existing VSPS. This project involves the installation of gravity main to capture sewage from nearby houses and then pump the sewage via a new pump station and pressure main into the nearby discharge maintenance hole at the end of Alderley Street.

2. Scope
The scope of this project includes,

1. The supply, installation and commissioning of new gravity main and rising main.
2. Design development, supply, construction and commissioning of the sewage pump station.
3. Design, supply, installation and commissioning of house connections.

The contractor shall be responsible for all associated works to successfully commission the pump station, rising main and gravity main and the works shall comprise of all process civil, structural, electrical, instrumentation control, hydraulics and the performance of all other disciplines of whatever kind necessary for the complete and detailed design, construction and commissioning of the works as required by this specification.

2.1 General

2.1.1 Pump Station Works
The Contractor shall develop the concept design into a detail design, supply, install and commission the sewage pumping station in accordance with the tender documents.

Ground slabs and footings shall be designed to suit the ground conditions to ensure structures provide the intended function over the intended life and to control movement within acceptable limits nominated by the relevant standards.

The Contractor shall utilize the vacant land next to the existing vacuum pump station to design and construct the pump station. TRC’s preferred pump station arrangement has been indicated in the concept design drawings. The Contractor shall connect the existing vacuum pump station rising main into the new zero manhole as indicated in the design drawings once the new pump station is commissioned.
2.1.2 **Rising Main Works**

The Contractor shall supply, construct and commission the rising main in accordance with the design drawings. A section of this rising main is already constructed. As-constructed information of this constructed section of the rising main is indicated in the design drawings.

2.1.3 **Gravity Main Works**

The Contractor shall Supply, construct and commission the gravity main in accordance with this specification and design drawings. The gravity main works shall include,

1. From MH2/1 (Including MH2/1) to the pump station.
2. From MH3/2 to the pump station.

Note : the below listed items are not included in the scope for this contract.

Manholes : MH10/1, MH9/1,MH8/1 and MH7/1.

2.1.4 **Gravity Main Works (Provisional Item)**

The cost for the installation of gravity main from MH6/1 to MH2/1 shall be listed as a Provisional Sum in the Schedule of Prices, including the house connection at MH6/1, which shall be connected to MH6/1.

2.1.5 **Maintenance Holes**

Maintenance holes shall be constructed in accordance with the design drawings and the specification.

2.1.6 **Property connection**

The Contractor shall supply and install pipework to connect the properties to the new gravity main as indicated in the drawings. The Contractor shall be responsible for plumbing approval.

3. **DESIGN AND CONSTRUCTION REQUIREMENTS**

Design and construction shall be in accordance with the following, in order of precedence:

1. Principal’s Project Requirements (this document)
2. Design Drawings
3. Technical Specifications
5. Sewage Pumping Station Code WSA-04-2005-v2.1
6. Water Services Association of Australia (WSAA) Sewerage Code of Australia WSA-02,
7. Pressure Sewerage Code WSA-07-2007 v1.1
8. Water Supply Code of Australia WSA-03-2011 v3.1, and
9. All relevant Australian Standards.

3.1 **PUMP STATIONS**

The Contractor shall use the pump station concept drawings to develop the design and construct the new pump station. Pump Stations must, at minimum, meet the design parameters noted below.
• The SPS Wet well shall be a reinforced concrete pump station with an external reinforced concrete valve chamber. Packaged Precast Pump Station is Preferred.
• The Contractor shall nominate the suitable efficient pump based on the detailed design. The pumps shall operate between 70% to 100% of the pump Best Efficiency Point (BEP).
• The Contractor shall advise the details of the proposed impeller, resultant pump set, power requirements, including minimum starting current and maximum run current, (when used in conjunction with variable frequency drives) and the resultant system efficiency and duty points to the Principal for approval.
• The switchboard for the SPS shall be as per the Switchboard Specification. The Contractor shall be responsible for all electrical works including works required for Ergon Energy connection.
• The Switchboard shall be located as close as possible to existing VSPS shed as indicated in the drawings.
• Level instrumentation shall be as per the switchboard specification.
• Disconnection Pillar shall be designed, supplied and installed by the Contractor.
• The Contractor shall size, supply and install an odour control unit for the wet well. The odour control unit shall be McBerns or approved equivalent.
• ABB water master Flow meters or approved equivalent shall be installed in the rising main and overflow line.
• RPZ arrangement shall be as per SPS-1308 and plumbing approval requirements.

3.2 WATER SERVICE WORKS
The Contractor shall design, supply and install potable water services to the pump stations in accordance with AS 3500. The potable water services pipeline shall include backflow prevention. If required by Council, a pressure reducing valve (PRV) and water meter shall be provided at the offtake on the discharge pipeline.

The PRV shall be PN16 globe type, hydraulically actuated with threaded ends and diameter sized to match adjacent pipework. PRV discharge pressure shall be set to 600kPa. The mechanical water meter shall be sized to match adjacent pipework. Gate valves (50mm dia and less) shall be threaded copper in accordance with AS2638.1, complete with cover boxes and margin sets in accordance with drawing WAT-1304. It is the full responsibility of the Contractor to apply and obtain the plumbing approval from the local authority.

3.3 ELECTRICAL
• All Electrical works shall comply with the electrical and switchboard specification.
• The Contractor shall liaise with Ergon Energy to provide power supply for the sewage pump station.
• Confirmation of the pump power requirements shall be provided within one (1) month of Contract Award to allow the Principal to confirm its application for Network Connection with Ergon Energy.

3.4 DESIGN LIFE
Design life requirement shall be as follows:

• Civil Structures – 100 years
• Rising mains and gravity sewers – 50 years
• Road Pavements – 20 years
• Mechanical items – 25 years
• Electrical items – 15 years

All design must be undertaken and certified by a Registered Professional Engineer of Queensland. In addition to the above, the design must be undertaken in accordance with the relevant Australian Standards, Codes of Practice including Water Services Association of Australia (WSAA), and other industry recognised Manuals.
4. **Geotechnical Investigation**
   Geotechnical investigations have been conducted in the vicinity of the pump station sites. The investigation report is included in the “Information Only” documents.

5. **Design Review Milestones**
   Design documentation shall be provided to the Principal’s Representative at 50% and 100% completion for review as per 8A of the General Conditions of Contract. The Principal’s Representative may make comment on the design documentation at these milestones. RPEQ certification must accompany the 100% design documentation submitted to the Principal’s Representative for review.

6. **Dilapidation Report**
   The Contractor shall submit to the Principal a dilapidation report prior to commencing work onsite. It is the responsibility of the Contractor to ensure all areas of the work are covered in the report.

7. **Works Inside Private Property**
   The Restoration works inside and near private property shall be completed immediately after the works are completed.

8. **Survey**
   The Contractor shall be responsible for all survey work and service location to undertake any design and construction of the works.

9. **Concrete – Mix Design and Supplier**
   The concrete mix design including details of the materials shall be submitted to the Principal’s Representative not less than 7 days prior to the first placement of such concrete together with sufficient test data to demonstrate that the proposed mixes will satisfy the specified performance requirements.

   The Contractor shall confirm the supplier details to the Principal 7 days prior to the first placement and shall not change the supplier without Principal’s written approval.

10. **Connection to Existing**
    Connection of the works to the live system shall be carried out by the Contractor. The Contractor shall submit the plans to the Principal for approval with a minimum of 4 weeks’ notice.

11. **Excess Material**
    All excess material (soil, sand, gravel, mud, rock, concrete, etc) shall be carted away to an approved site. The Contractor shall be responsible for all treatment, transport and disposal costs.

12. **Decommissioning of Valve Pits**
    The Contractor shall be responsible for decommissioning and removal of the valve pits. The contractor shall then immediately backfill the void with approved material. The Contractor shall submit the plan to Principal for approval.

13. **Inspection and Testing**
    Inspection and testing shall generally be as detailed within the Technical Specification.
13.1 FACTORY ACCEPTANCE TESTING
The Pump Station Control System shall be subject to Factory Acceptance Testing (FAT) at the programmer’s facility prior to installation in switchboards and transport to site. All equipment and personnel necessary for carrying out the tests shall be provided by the Contractor. The Contractor shall present the PLC and HMI with all programs downloaded and communications links installed and operational.

The Contractor shall submit the proposed inspection and test plans for review and shall provide the Principal Representative with 1 weeks’ notice of intention to conduct the FAT once the ITP’s have been reviewed. The Principal’s representative may witness all tests. All control actions shall be demonstrated by direct injection of field signals to the I/O. Simulation of I/O within the program code shall only be accepted where previously agreed in writing by the Principal.

Should any items of hardware or software not test satisfactorily, the Contractor shall rectify the defects and shall nominate a date for final testing of the equipment. Rectifications shall not be undertaken during the testing period. The Contractor shall provide a completed set of the FAT ITP’s, signed immediately after the FAT testing period. The Contractor shall provide a completed set of the FAT ITP’s, signed immediately after the FAT.

13.2 SITE ACCEPTANCE TESTING
Following successful completion of the FAT, the control system equipment can be installed on site. The Contractor shall complete all installation relating to the control system and provide 1 weeks’ notice of intention to conduct the Site Acceptance Testing (SAT).

The Contractor shall provide Inspection and Test Plans for the SAT to the Principal for review prior to the SAT. The Principal or his representative shall witness all tests.

The SAT shall completely demonstrate the full functionality of all I/O, control actions and communications equipment (PLC, telemetry, HMI, VSDs, etc.). The code shall be completely verified using direct injection of field I/O at the most distant terminals. The Contractor shall provide all personnel and equipment necessary to conduct the SAT.

Should any items of equipment or sections of code not successfully pass the SAT, the Contractor shall rectify the defects and nominate a date for completion of the SAT. Rectification works shall not be undertaken during the SAT period.

Fully completed and signed documentation shall be provided to the Principal to demonstrate successful completion of the SAT within three working days of completion. This documentation shall be considered a prerequisite for scheduling of site commissioning.

14. COMMISSIONING
Commissioning of the control system shall only take place after acceptance of the final SAT documentation. The Contractor shall prepare and submit a commissioning plan detailing all commissioning works and tests to be performed as part of commissioning works two weeks prior to the nominated date for commissioning. This plan shall be provided as part of the as-constructed documentation as the Commissioning verification sheet, dated and signed by the Contractor against each test. Commissioning shall only commence once the commissioning plan has been approved in writing by the Principal.

The Contractor shall demonstrate the functionality of all installed equipment including interfacing with existing equipment. The Contractor shall liaise with the Principal to demonstrate remote SCADA operation. All tests shall be conducted without simulation of process set points or data. Rectification of all faults shall be undertaken by the Contractor. The Contractor shall maintain a database of set points developed during testing and commissioning and include the same in the as-constructed documentation.

The Contractor shall conduct all third party liaisons and provide all equipment, temporary power supplies, personnel, protective equipment, testing fluids, calibration devices and all other equipment necessary to complete the commissioning of the plant.
The Contractor is responsible for the operation of the pump station during commissioning and changeover. The Contractor shall organise tankers to transfer sewage to the discharge end of the relevant pump station. The Contractor shall ensure there is no surcharge/overflow of the relevant waste water pump station during the changeover.

15. **Principal Approvals**
The Principal will be responsible for securing the following approvals:
- The compilation of any landholder agreements with affected landholders. The basis conditions for any such conditions will be the Principal’s Standard Landholder Agreement contained with the Information Only Documents Section.

16. **Contractor Approvals**
The Contractor will be responsible for securing and complying with any other approvals necessary to undertake the work in accordance with all applicable legislation, codes, standards or the like, including:
- Ergon Approvals
- Building permits,
- Plumbing permits, and
- Any and all other approvals as required to undertake the construction of the works.

17. **Training**
The Contractor shall conduct training for TRC’s operations staff prior to handover. The Contractor shall provide at least 2 weeks’ notice of intention to conduct training.

18. **Handover**
- Documentation provided shall generally be as detailed within the Technical Specification.
- Certification of the as constructed documentation, by a Registered Professional Engineer Queensland, shall be provided by the Contractor.
- The Contract shall provide training to Principal’s staff prior to hand over. The Contractor shall submit a full training program and documents to the Principal at least 2 weeks prior to the commencement of training.

19. **As Constructed Drawings**
As Constructed drawings shall be in accordance with the current IPWEA Asset Design As Constructed (ADAC) scheme. Modifications for As Constructed drawings are to be made using AutoCAD with changes made highlighted in red. As Constructed survey levels are to be red and design levels to remain in black and struck out.
The datum for all levels in As Constructed drawings shall be in Australian Height Datum in metres to three decimal places. Projection shall be based on MGA 94 Map Grid of Australia Zone 56 coordinate system.
As Constructed drawings for sewer mains, pressure mains and SPS must include a minimum of:
- Pipe materials;
- Diameters;
- Main alignments to property boundaries (to a tolerance of 0.1m);
- Locations of end caps of property connections in relation to property boundaries (to a tolerance of 0.1m);
- Invert levels and finish levels of manholes, chambers, emergency storage, wet well, etc. (to a tolerance of 0.01m);
- Finished surface levels at each R.P. peg (to a tolerance of 0.01 m);
- Sewer rising main and gravity chainages;
• Sewer depths;
• Manhole sizes and type of lids e.g. bolt down, trafficable etc.

As-Constructed drawings shall be signed by the Contractor and labelled “As Constructed”.
The Contractor shall maintain an up-to-date “As Constructed” record of the Works during construction and shall afford the Principal access to all such information at the request of the Principal’s Representative. Copies of the marked up drawings shall be available on site at all times.
These drawings shall contain a similar level of detail to the construction drawings and allow for variations in any engineering during the Project. The drawings shall be clearly marked "As-Constructed" with the relevant date and revision number.
Each sheet that has “As Constructed” details annotated must have the revisions title box annotated with the words “As Constructed details added” and the next revision number allocated for that sheet.

19.1 SUBMISSION
The Contractor shall provide 2 No. hardcopy sets of “As Constructed” documentation and electronic copies in both AutoCAD 2011 and ADAC format.

19.2 DEFECTS LIABILITY PERIOD
The Contractor shall submit amended "As Constructed" drawings if any modifications are performed to the Works by the Contractor during the Defects Liability Period. The Contractor shall not be entitled to the Final Certificate until all such amended "As Constructed" drawings have been accepted by the Principal’s Representative.

20. SITE RESTORATION
The construction corridor used by the Contractor shall be restored by equivalent materials to pre-existing, or better, condition. The restoration works shall progress immediately behind the construction face(s) and shall be completed as soon as practicable.

20.1 TURF
For all disturbed grass areas, topsoil and an approved turf shall be laid to blend smoothly with surrounding ground levels. The type of grass shall be selected to match existing and approved by the Principal’s Representative prior to laying.
The Contractor shall ensure that re-turfed areas are provided with sufficient regular watering so that growth can properly establish. Any areas that fail to satisfactorily re-establish shall be re-turfed at the Contractors’ expense.