

Section D Detailed Specification for Electrical Work

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Part 1 – Leeuwnuil Wash Water Pump Station D2

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Part 2 – Pump Station 34 D5

PSE	PARTICULAR SPECIFICATIONS ELECTRICAL	DError! Bookmark not defined.
MCC	MOTOR CONTROL CENTRE	DError! Bookmark not defined.
EAA	LOW VOLTAGE SWITCHBOARDS	DError! Bookmark not defined.
TLT	TELEMETRY	DError! Bookmark not defined.
VSD	VARIABLE SPEED DRIVE	DError! Bookmark not defined.
MGS	DIESEL GENERATOR.....	DError! Bookmark not defined.
EAH	MOULDED CASE CIRCUIT BREAKERS	DError! Bookmark not defined.
EAN	METERING EQUIPMENT	DError! Bookmark not defined.

1 SCOPE OF WORKS

The scope of works for the electrical installation includes the design, supply, delivery, installation, testing, commissioning and maintenance during the defects notification period of the following:

- 1 Main electricity supply to the pump station
- 2 Low Voltage Distribution Board DB-WWPS
- 3 Power cables to all motors
- 4 Small power and lighting installation
- 5 Site lighting installation

2 ELECTRICITY SUPPLY

The electricity supply shall be at 400 volts and shall be brought from an existing distribution board on the site, via an underground cable, to DB-WWPS in the wash water pump station building.

The point of supply, route of the cable and cable size will be determined on site in consultation with the Engineer and this will be done with a view to retain the cable as part of the electrical distribution system once the upgrade of the Rietvlei Waste Water Treatment Works (WWTW) is constructed.

The master plan for the upgrade of the WWTW incorporates a system of underground PVC ducts and draw chambers. When the wash water pump station is constructed part of this system might also be constructed to fit in with the master plan.

The cable feeding DB-WWPS will therefore either be pulled into underground ducts or else laid direct in ground.

For the purpose of tendering bidders shall base their offer on supply via a 70 mm² 4 core cable laid direct in the ground and shall enter rates in the bill of quantities accordingly.

3 DRAWINGS

The following Electrical drawings, which are bound separately, shall be read in conjunction with this Detailed Specification.

Drawing No	Title
J39080-2120-07-006-01	Instrumentation and Power Cable Draw Chamber Details
J39080-2120-07-008-11	Lighting and Small Power Layout to Wash Water Pump Station
J39080-2120-07-911-01	Electrical Schematic Diagram for DB-WWPS

4 LOW VOLTAGE DISTRIBUTION BOARD DB-WWPS

The contractor shall design, construct a wall mounted distribution board (DB-WWPS) as shown on the drawing.

It is expected that the following pumps will be installed in the WWPS:

- 4 x 11 kW multi-stage pumps
- 4 x 4 kW multi-stage pumps
- 1 x 1 kW bilge pumps

Each of these pumps will be supplied with its own automatic control system, instruments and actuators and so no motor control centre (MCC) is required to be supplied as part of the electrical installation.

DB-WWPS shall incorporate cable feeds to all of these pumps and this is indicated on the schematic drawing.

The drawing shows a separate feed to each of the nine pumps.

It is possible that only a single feed will be required to the four 11 kW multi-stage pumps, another single feed to the four 4 kW multi-stage pumps and a third feed to the bilge pump.

Bidders shall, however, tender for the DB as shown on the schematic diagram with the understanding that if less feeders are required there will be a decrease in the cost of the DB.

5 LOW VOLTAGE CABLES

Power cables to the pumps shall be installed on galvanized cable tray to be supplied and installed by the contractor.

The contractor shall prepare a construction drawing showing the cable routes from the DB to the motors for review.

A preliminary cable schedule is as follows:

Cable No	From	To	Description	Est Length (m)
1	DB-WWPS	Bilge Pump	1.5 mm ² 4 core PVC/PVC/SWA/PVC cable with 4 th core as earth	15
2	DB-WWPS	Multi-Stage Pump No 1	4 mm ² 4 core PVC/PVC/SWA/PVC cable plus 4 mm ² earth wire	15
3	DB-WWPS	Multi-Stage Pump No 2	4 mm ² 4 core PVC/PVC/SWA/PVC cable plus 4 mm ² earth wire	15
4	DB-WWPS	Multi-Stage Pump No 3	4 mm ² 4 core PVC/PVC/SWA/PVC cable plus 4 mm ² earth wire	15
5	DB-WWPS	Multi-Stage Pump No 4	4 mm ² 4 core PVC/PVC/SWA/PVC cable plus 4 mm ² earth wire	15
6	DB-WWPS	Multi-Stage Pump No 5	2.5 mm ² 4 core PVC/PVC/SWA/PVC cable plus 2.5 mm ² earth wire	15
7	DB-WWPS	Multi-Stage Pump No 6	2.5 mm ² 4 core PVC/PVC/SWA/PVC cable plus 2.5 mm ² earth wire	15
8	DB-WWPS	Multi-Stage Pump No 7	2.5 mm ² 4 core PVC/PVC/SWA/PVC cable plus 2.5 mm ² earth wire	15
9	DB-WWPS	Multi-Stage Pump No 8	2.5 mm ² 4 core PVC/PVC/SWA/PVC cable plus 2.5 mm ² earth wire	15

Actual sizes and lengths of cables and cable trays shall be re-measured on site.
Each cable shall be labelled at each end.

The Contractor shall make use of Hellerman Tyton Ovalgrip type marking system with the characters threaded onto Arrow Tag Type 2 which is to be attached to the cables with nylon cable ties or other

approved marking system.

A quantity of cable markers has been allowed for pricing in the Schedule of Quantities and this quantity is re-measurable.

6 ELECTRICAL BUILDING SERVICES

Lighting and small power shall be installed as shown on Drawing No J39080-2120-07-008-11.

Bidders shall base their tenders on the quantities given in the Bill of Quantities and these quantities shall be re-measured on site.

7 SITE LIGHTING

A master plan has been drawn up for site lighting for the upgraded works.

The drawing showing the proposed site lighting layout is not issued as part of this tender but will be available for discussion once a contractor has been appointed.

The intention is for a number of pole mounted light fittings to be installed during construction of the wash water pump station and for these poles and fittings to correspond as far as possible with poles and fittings as per the master plan.

The actual extent of poles, fittings and cables will be finalized with the contractor on site.

Bidders shall base their price on the quantities given in the bill of quantities.

8 DUCTS AND DRAW CHAMBERS

A master plan has been drawn up for a system of underground ducts and draw boxes for all underground electrical and instrumentation cables.

The intention is for any part of this system which lies within construction area of the Wash Water Pump Station(WWPS) to be constructed together with the WWPS so as to avoid re-excavation at a later stage.

The actual extent of this work will be determined on site between the Engineer and the contractor an construction drawings will be issued by the Engineer.

Bidders shall base their price on quantities given in the bill of quantities and actual quantities installed will be re-measured on site.