

Annexure C3.2 Scope of Work 10390748 Supply and Install the station 4 TRU and neaten up the area

1.1. **DESCRIPTION**

Installation of station 4 TRU, cross bonding the outlet pipes and neaten up the area.

1. Background Information

Zuikerbosch (ZB) Pumping Station Engine Room (ER4) delivery and supply lines were constructed and commissioned after 1996, it currently supplies primarily Eikenhof, Palmiet and Zwartkoppies systems through B10, B12 and B15 rising mains or pipelines. The pipelines are fed from pumping station through various delivery lines as indicated in figure 1 hereunder.

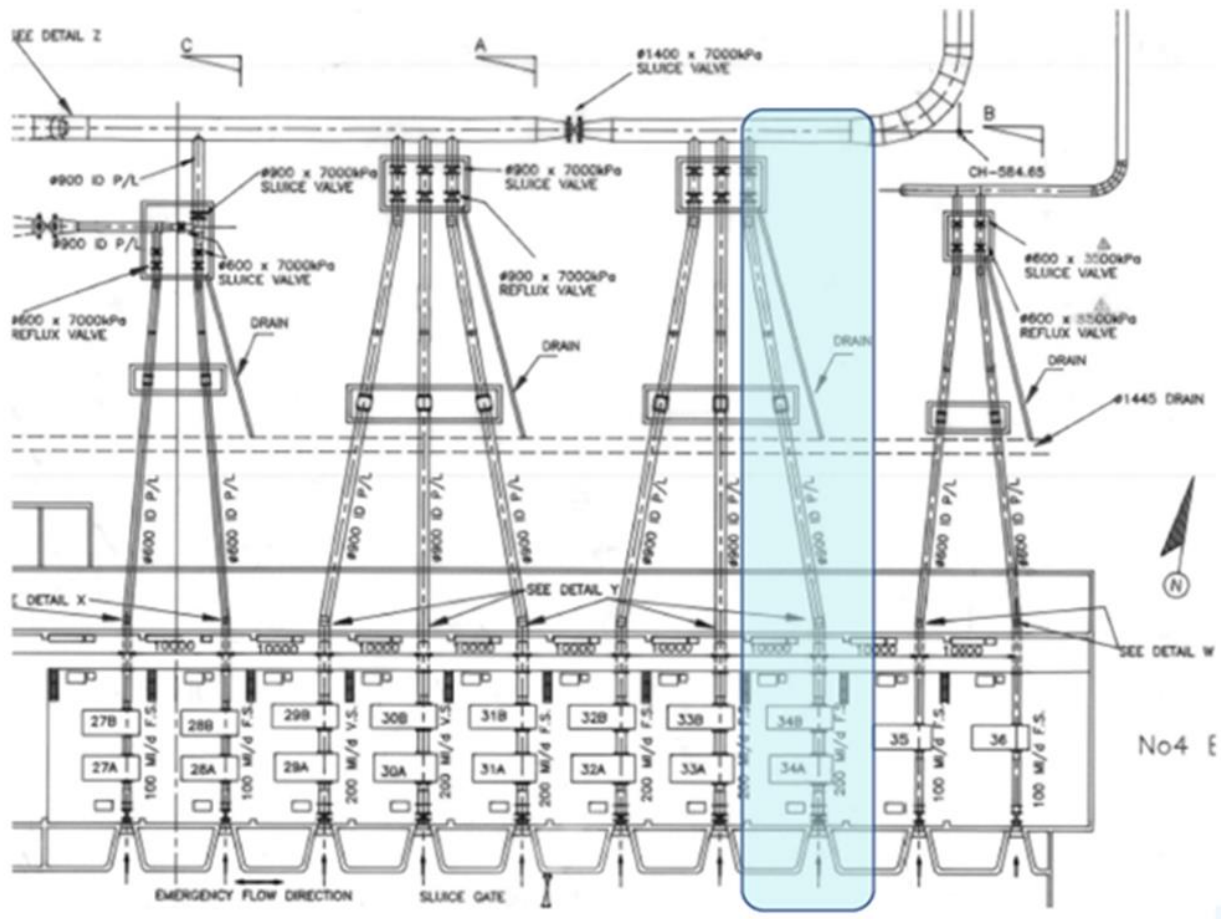


Figure 1: Zuikerbosch (ZB) Pumping Station Engine Room (ER4)

Currently the pipeline is connected to the Impressed Current Cathodic Protection (ICCP) and upon investigations it was discovered that the pipe was not 100% Cathodically Protected due to the in-effectiveness of a rectifier and the ground bed, which was found to be too close to the pipeline (localised protection).

The pipeline was eventually protected by the installation of a temporary ICCP system, of which, the cables are laid above ground which is a safety issue that requires to be corrected to prevent tripping.

2. PURPOSE OF THE SCOPE

Since the pipeline is protected using a temporary ICCP system of which most of cabling was done above ground, therefore the main purpose of this scope is to neaten up the area by installing the cables underground and replacing the in-effective rectifier of 75V/50A with the one of higher rating of 100A/100V.

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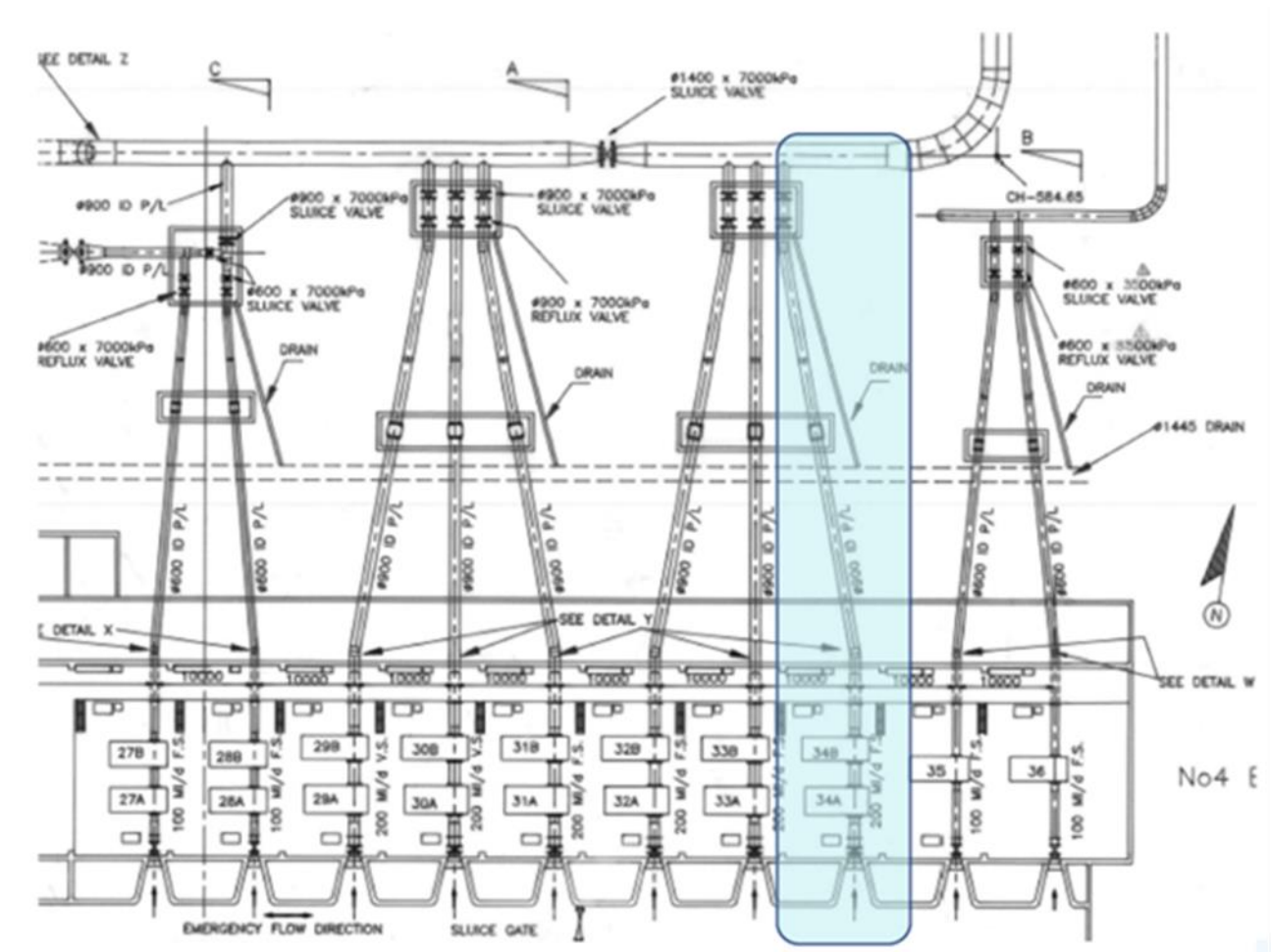


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3. Zuikerbosch Station 4 TRU Scope of Work

1.3.3 Permanent Solution of Cathodic Protection (CP): There's currently an on-going project which is meant to address all CP related issues along the Rand Water pipeline network of which the ZB station is also included. This means that, the permanent CP scope of work will be finalised upon the completion of the CP assessment at ZB station.

1.3.4 Temporary Solution of Cathodic Protection (CP): Due to the fact that the permanent solution will come-up as soon as the CP assessment project is complete and it is still unknown as to when is it going to be awarded and start, therefore it is strongly recommended to install the temporary CP solution as a matter of urgency and get the pipeline protected since it is not safe and tidy around the station with the current arrangement.

1.3.4.1 Scope of work for Temporary Cathodic Protection would include but not limited to following:

- Remove the two existing 50A/75V TRU's, and
- Supply and install the 100V/100A TRU to replace the two small rectifiers
- Remove the paving and excavate 300mm deep X 300mm width X 150m of length and the exact location to be determined on site.
- Supply and install 2 X 35mm² double insulation red anode tail cable of 230m to cross-bond or connecting the existing ground bed and the new one.
- Supply and install 2 X black 35 mm² cable (2 X cables per pipe and coating make good) for pipeline cross-bonding (cross-bond 15 pipes to each other) and termination inside 4 test point bunkers.
- Supply and installation of the 15 chamber monitoring points with the portable reference cell access for taking measurements.
- Cross bonding of 15 pipelines shall be done on chambers using "Y" splicing kit and line taps using the black 35 mm² loop cable (the same way as connecting horizontal anodes ground bed).
- Supply and install the coating make good material and all consumables.
- Contractor to supply and install 4 test points bunkers with link panels for cables termination of cross-bonded 15 pipelines.
- Backfill the trench using the existing soil, compact accordingly and

- Replace the paving and clean the area accordingly (site rehabilitation)
- Commission the Cathodic Protection system, and
- Compile and submit the commissioning report.

Line 1

Supply 100A/100V TRU

Line 2

Install the 100A/100V TRU

Line 3

Supply 35mm² red double insulation ground bed cable

Line 4

Supply 35mm² black double insulation pipe cable

Line 5

Install 35mm² red double insulation ground bed cable

Line 6

Install 35mm² black double insulation pipe cable

Line 7

Remove paving 1m X 245m and rehabilitation of paving upon completion.

Line 8

Excavate 0.3m X 0.2mm X 245 and rehabilitation upon completion of the excavated area.

Line 9

Supply 16mm² black cable for cross-bonding 15 pipes between chambers

Line 10

Install 16mm² black cable in a trench for cross-bonding 15 pipes between chambers as per TS021 and TS015

Line 11

Install or Cross-bond between 15 pipes in 9 chambers as per TS021

Line 12

Supply link panel for cross-bond termination as per drawing RA-27645

Line 13