

4 Power Plant

4.1 Specification

1 ELECTRICAL DIAGRAMS

Station Electric Diagrams – See drawing D-WC-8068 set 12 sheet 1, D-WC-8068 set 13 sheet 1 and D-WC-8068 set 14 sheet 1.

2 SITE CONDITIONS

2.1 Site location:

Blackheath Substation site is located in Blackheath, a suburb of Cape Town.

2.2 Site detail:

The existing Blackheath substation occupies approximately half of the site. The other half, sectioned off by a fence, is open with a fair amount of vegetation as well as a gravel parking area. The site is very flat and lies well below the existing road level.

2.3 Existing substation access:

Access is achieved via a short access road from the main tar road.

2.4 Existing infrastructure to be located:

The position of all existing civil services is still to be re-affirmed with a detail investigation and topographical survey.

3 ENVIRONMENTAL INFO:

3.1 Coastal:

Yes

3.2 Snow/ Ice:

No

3.3 Atmospheric conditions:

Kuilsriver has a Mediterranean climate, with mild, moderately wet winters and dry, warm summers. Winter lasts from the beginning of June to the end of August. Winter months in the city average a maximum of 18°C and

minimum of 8°C. Total annual rainfall in the city averages 515 millimetres. Summer, which lasts from early December to March, is warm and dry with an average maximum of 26°C and minimum of 16°C. Late spring and early summer sometimes feature strong winds from the south-east. The average amount of sunshine per year is 3,100 hours.

3.4 Environmental Sensitivity of the Area:

No environmental sensitivity, the site is located in an industrial area.

4 SUBSTATION YARD AND ASSOCIATED EQUIPMENT

4.1 Earthing

The substation new earthing system will consist of buried interconnecting horizontal earthing grids, connecting cables from the buried earthing grid to metallic parts of structures and equipment, connections to grounded system neutrals, and the ground surface insulating covering material. New horizontal earthing will be installed 1000mm outside the perimeter security fence where possible. The new earth grids and tails will be welded together where they cross. All joints shall be oxy-acetylene brazed using 3mm diameter silbralloy brazing rods (no flux is required). Note that crimping shall not be used.

All the earthing in and around the substation must adhere to the Eskom standard D-DT-5240 (using the latest revision).

4.2 Main earth grid:

A new main earth grid will be installed with 10mm diameter round annealed copper buried at least 1000mm below finished ground level.

Where passing under deeper foundations and drains, it must be 150mm below the concrete. Back-filling around the earth conductors and rods is to be well compacted. Where a concrete blinding is cast under building foundations, the earth grid meshes are to be installed on top of the blinding and under the concrete footing of columns etc. Where passing over drains with less than 1000mm of cover, they are to be buried as deep as possible. The outer grid is to be a minimum of 1000mm outside the safety fence.

4.3 Corrosion protection:

Four new sacrificial anodes (a steel railway tract, see drawing in the Eskom standard D-DT-5240) will be installed and connected to the substation main earth grid.

This is to eliminate any source of stray currents if possible (see SCSASABF9, Earthing of Sub-transmission line structures for shield wire connection strategies). If it is not possible to eliminate stray currents (e.g. the substation is close to a DC railway system), extra sacrificial anodes needs to be installed even if the soil is not highly corrosive.

4.4 Foundation reinforcing:

Connection of the reinforcement bars in the foundations to the earth grid shall be according to D-DT-5240 sheet 10 and the relevant foundation details. The connections shall be done with a line tap clamp, as per D-DT-3048. It is important to note that reinforcing mesh is to be bonded on one side only to the main earth grid.

4.5 Bolted Connections:

All bolted down surfaces must be cleaned (wire brushed) and filled with a suitable joint compound (non-oxide grease) to prevent oxidation of the joint. No paint barrier is allowed. Any paint films which might otherwise introduce a highly resistive joint should be removed. Any scraped area around the joint shall be made good by using the original types and colours of paint.

4.6 Steelwork and main equipment:

All the equipment must be earthed in two places using a single 50 x 3mm flat copper earth strap connected to the main earth grid.

4.7 Fencing and gates:

All fences must be earthed at an interval less than or equal to 20m. Reference must be made to the earth grid layout for the details of all the points to which the fence is to be connected to the main earth grid. The 50 x 3mm copper leads shall be bolted to the steel fence posts at the lug points provided, with the instruction that these connections must not be visible above the final layer of the yard stone.

Each gate leaf of all gates, installed in the security fence, shall be electrically coupled to the adjacent gate post, via a 70mm², UV stabilized, sheathed, stranded flexible copper conductor that is suitably lugged and bolted at each end.

It is important to ensure that when opening the substation gates the operator is not at risk from mesh potentials. To overcome this problem an equal potential slab will be installed underneath the gates. See the applicable fencing D-DT- drawing for information on the size of the slab.

It is important to note that mesh is to be bonded on one side only to the main earth grid.

4.8 Ancillary equipment:

All ancillary equipment (CT and VT junctions boxes, etc.), shall be connected to the main earth grid via 50mm x 3mm flat strap between the earth stud of the equipment and the equipment steelwork. For the earthing detail refer to the drawing set D-DT-5240 using the latest revision. Any foundation that does not allow for earthing inside the foundation must be earthed in accordance with D-DT-5240 sheet 3 (using the latest revision).

4.9 Control building:

The new control building has been completed as part of Phase 1

Each new floor standing panel shall be bonded to the overhead rack, by means of a 16mm², green/yellow, insulated, stranded flexible copper conductor. These tails shall have one end securely lugged and bolted to the 50 x 3mm earth bar and the other end securely lugged and bolted to the panel earth bar, via an M12 brass set screw. The overhead rack must be continuously bonded and connect to the earth grid and will then serve as the "earth bar" for the panels.

4.10 Yard stone and concrete kerbs:

100mm thickness of minimum 26mm grade granite, tillite or dolerite stone chips, depending on the availability of the above stone types in the area concerned, shall be placed in the substation yard.

The stone chips must be derived from the crushing of solid, un-weathered quarried rock. The material must be free of dust and other deleterious substances. The material must comply with the specification SANS 1200M: 1996 table 1 - single sized stone for roads. A 1200 mm border must extend beyond the perimeter with kerbing and yard stone to reduce electrical touch potentials.

5 FENCING

A new high risk fence will be installed around the perimeter of the site and a low risk fence around the HV yard, refer to the associated drawing D-WC-8068 set 11 sheet 2 and 5 (using the latest revision).

The security installation must conform to the document “Security requirements at Western Region Distribution substations” - WTB011. Careful attention must be paid to the position of the fence in relation to the property boundary during the installation.

5.1 External security fence (High risk):

Category: high risk fencing as per DISASADJ6.

The fence that will be installed will be a high security steel mesh in accordance with D-DT-5237 Sheet 6A to 6D (using the latest revision).

A non-lethal electrified fence in accordance with DISSCABR2 will be piggy-backed onto the steel palisade.

Kerbing (300 mm x 75 mm x 1 000 mm) shall be set in concrete underneath the security fence to prevent excavation under the fence in order to gain unauthorized access. The kerbing shall be set in concrete immediately underneath the fence.

New signage will be placed on the new external security fence in accordance with D-DT-5237 Sheet 14 (using the latest revision).

For information on the intruder alarm system, CCTV, armed reaction units and more see the security point 15 for more detail.

5.2 Substation internal fence (Low risk):

Category: low risk fencing as per DISASADJ6.

This fence will be completed as part of Phase 1

6 FOUNDATIONS

All civil engineering construction must be to reference of SANS 1200 (Standardized specification for civil engineering construction Section A – DM) and in accordance with Eskom Specifications. These aspects include all the following: excavations, placement of reinforcing steel and embedded items, formwork, backfilling, mixing and placement of concrete, construction joints, concrete curing and workmanship.

6.1 Excavations:

The following requirements shall apply to foundation excavations:

- foundation excavations shall be dug as close as possible to the required size;
- where the depth of the foundation excavation is deeper than 1,5 m, shoring shall be used;
- shoring shall be used where the soil has a tendency to cave in: for example, in sandy soils or soft cays;
- the bottom of all foundation excavations shall be level and cut squarely with the sides of the excavation; and
- if there is loose soil, sand or mud in the bottom of the foundation excavation, it shall be removed prior to concrete placement. The soil shall be moistened and compacted with a mechanical plate compactor to ensure the bottom is firm and settlement is avoided.
- where muddy, loose or uneven material makes it difficult to get even and flat excavation bottom surfaces a blinding layer of 10 MPa concrete, 50mm thick must be installed to ensure even concrete cover to the reinforcing.

6.2 Reinforcing:

The required steel reinforcing for a foundation may only be placed after the correct excavation is done. In order to protect the steel reinforcing against possible corrosion, the steel should be covered by a concrete layer with a minimum thickness of 50 mm after the pouring of the concrete. As the bottom of the foundation excavation is probably not smooth, the cover thickness at the bottom is increased to 75 mm. This is done by placing the bottom steel on concrete spacer blocks of 75 mm and 50 mm spacer blocks on the top steel.

Before casting the concrete the engineer should check whether the steel placed in each foundation is correct according to the foundation design and if correct sign it off on the as constructed record. The slump of the concrete mix must also be correct.

6.3 Concrete:

All applicable foundations shall be of a uniform strength of 25MPa at 28 days throughout unless otherwise specified, and constructed in strict accordance with the relevant drawings and specifications, The foundation tolerances must be in accordance with SANS 1200 G.6 Grade II.

Once the casting of a particular foundation is completed, all exposed surfaces should be sprayed with a curing compound or covered with plastic (or wet sand) to ensure optimal curing of the concrete. Before the latter is done the Engineer should check that the concrete is right up to the top of the top cover blocks or the required cover is achieved.

6.4 Backfilling and compaction:

Backfilling and compaction of foundation excavations can only start after 3-days providing that the 7 and 28 day crushing strengths of the concrete meets the specification requirements later on. To ensure that the excavated material is optimally compacted the material should be moistened to Optimum Moisture Content (OMC) and placed in layers of less than 300 mm thick and compacted with a mechanical plate compactor. No particles (i.e. rocks) may be larger than 150 mm (or 2/3 of the compacted layer thickness) to ensure proper compaction of the layers.

Where the excavated material is considered to be unsuitable for backfill, such as a material with high clay content or a sandy material with little variation in particle size, the Contractor shall propose a suitable method of soil improvement for consideration and acceptance by the Engineer prior to being implemented. This material shall be properly mixed, moistened, placed and compacted in the same manner as excavated material.

6.5 Holding down bolts:

All holding down bolts steelwork galvanizing shall be done in accordance with SANS ISO 1461. Only steel templates may be used for setting out the holding down bolts. The holding down bolts must be aligned to a tolerance of $\pm 2\text{mm}$. All the holding down bolts must be fitted with 2 nuts and 2 washers. All the bolts, nuts and washers needs to be in accordance with SANS 1700. Refer to the specific foundation drawing.

6.6 Oil drainage and fire protection

Oil drainage:

The layout and position of the oil dam and drainage layout are on the civil drawing layout in Section 2. The transformer bund areas (D-WC-8068 set 11 sheets 10 and 11) shall be drained via 300 mm diameter concrete pipes to an oil dam.

A single oil dam will be constructed to accommodate any one of the transformers. The dimensions of the oil dam are 5,96m x 5,96m x varying depth and shall be constructed in accordance with D-DT-5234 sheet 9A and D-DT-5234 sheet 9C. The oil dam will be capable of holding 52 000 litres, which exceeds the capacity of the biggest transformer plus 20%.

The oil dam will be gravity fed and the pipe shall be installed to have a fall of 1:100. This can be achieved due to a natural slope of the platform. Refer to DISASAAA0 Rev 3, Standard for passive fire protection in distribution substation yards. Refer to civil drawing layout in Section 2 for the levels of the drainage.

The oil dam and oil trap shall be barricaded with concrete bollards approved by the engineer.

Fire protection:

Fire barriers are necessary as the transformers are placed such that the centres of the transformers are not a full two bay widths apart as per DISASAAA0 Rev 3, Standard for passive fire protection in distribution substation yards.

7 STEELWORK

All the equipment supports and substation steelwork must be galvanized to SANS ISO 1461 specification and delivered to site as complete bundle sections, in accordance with the appropriate drawings established for the relevant item.

All the structures shall be erected, aligned, squared, plumbed and levelled in accordance with SANS 1200 H 6.2.2.c) 2 – CLASS II. All the bolted connections shall be cleaned and filled with jointing compound (non-oxide grease). No paint barrier will be allowed.

8 ELECTRICAL EQUIPMENT

All the primary plant equipment will have a minimum of 31mm/kV creepage distance for the coastal application. All the new primary equipment with porcelain insulating surfaces will be RTV silicon coated.

The transformer 2 and 4 HV neutral will be earthed via a neutral surge arrester.

Earth switches will be installed on the new line isolators. Portable earths are being used as per SCSASABK3 Distribution Standard, Part 7: Substations, Section 2: Generic Substation Design.

9 CLAMPS AND CONDUCTOR

Equipment not fitted with 26mm or 38mm connection prongs must be fitted with tinned 26mm or 38mm brass prongs drilled and tapped to the appropriate sizes.

All surface areas of conductor or contact area of connection clamps must be treated as described in drawing mentioned below prior to making a clamped or crimped connection.

Conductors Used.

- Single bull conductor,
- Twin bull conductor,
- Twin covered bull conductor,
- Single centipede conductor,
- Single covered hornet conductor,
- Single greased oak conductor (earth wire)

A drain hole of 10mm diameter should be drilled at the bottom centre point of aluminium alloy tubes to facilitate drainage of condensate moisture.

Refer to the bay elevation detail drawings for the clamp and conductor details.

10 CABLING AND TERMINATION

10.1 Cable trenching:

All the LV cables ($\leq 1000\text{V}$) shall be laid in the new cable trench.

All the trenching work shall be done in accordance with SANS 1200 DB: 1989 (using the latest revision). Refer to the drawing set 0.54/390 sheet 15 for the LV protection multi-core cable trenching details, 0.54/390 sheet 17A for the trench cover details, and SANS 927-1969 figure 5 for the trenching wall details. No special back-fill material is required to close the trenches once all cables have been installed. Any boulders, sharp objects, construction debris or other such objects likely to cause damage to the cables, shall be removed from the trench and backfill material, before the trenches are closed. Danger tape shall be laid in all cable trenches approximately 300mm below final ground level. Trenches from the equipment to the cable trenches shall be hand excavated and backfilled once cables have been laid. Backfilling shall be done by using the excavated sand.

Where the LV cable trenches cross the substation road, a wing wall with PVC piping shall be placed in accordance with D-WC-5314 Sheet 3 to accommodate the cables.

The water from the trenches will be drained from the substation yard. For drainage details refer to the storm water drainage drawing in the civil specification in Section 2.

10.2 LV cable termination:

All the low voltage armoured cables shall be terminated by means of mechanical glands, fitted with earth rings and shrouds. These cables shall be identified at both ends by punched or engraved brass tags attached to the cable with galvanized wire. The cores shall be correctly identified with alphanumeric ferrules and terminated with the correct size of hook blade connectors, as indicated on the relevant electrical drawings.

10.3 MV Cable trenching and termination:

The installation of the new cable will be in accordance with the following standards and specifications:

- SANS 10198-1 Part 1 to 14 - Code of practice for the selection, handling and installation of electric power cable of rating not exceeding 33kV.
- SCSSCAAP3 - Distribution standard part 22: Cables specifications: Accessories for medium-voltage power cables for systems with nominal voltages of 11kV to 33kV.
- SCSASABK5 - Distribution standard part 22: Cables standards section 1: Insulation requirements for medium-voltage cable-connected equipment with air-filled enclosures.
- DST 34-209 - Distribution standard part 22: Cables standards section 6: Medium-voltage cabling in substations.

The MV cable route is shown on the site plan see D-WC-8068 set 11 sheet 2. Cable entry to the switch room shall be via MV cable trenches; refer to the Architectural design in Section 3 of this document for further details.

The 11 kV single core cables shall be laid in trefoil groups. Each trefoil group shall be run through a PVC pipe as per standard configuration shown in D-DT-8018 sheet 1.

Where MV cables cross under LV cable trenches, roads or foundations, PVC pipes shall be used and set in a weak concrete mix to prevent damage to the trenches Refer to drawing D-WC-8068 set 11 sheet 5, Foundation and Trench Layout for all trenching details.

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11 LIGHTNING PROTECTION

The gantry earth wires together with the lightning masts will protect the equipment in the yard against direct lightning strikes. Refer to drawing D-WC-8068 set 11 sheet 9 for the placement details of the lightning masts and earth peak towers.

12 SUBSTATION ILLUMINATION

Combined operational and security lighting shall be provided by multiple 400 Watt high pressure sodium (HPS) floodlights strategically placed within the substation yard and mounted on the lightning masts as indicated on the reference drawing. The lighting system shall also provide a floodlighting effect, giving an average illumination of 10 lux at yard stone level, with a maximum diversity factor of 5 throughout the area.

The beam spread shall be H5V2 [71-1000 horizontal, 19-290 vertical] according to SANS 1279 – 1980. The Lamp requirement shall conform to a 400 W clear tubular high pressure sodium lamp for normal operation and a 400 W clear tubular twin arc standby high pressure sodium lamp for when operational floodlighting installation is controlled remotely by the security fence monitoring equipment.

The luminaire shall have an ingress protection rating of IP55 according to SANS 1222-1985.

The light circuit(s) shall be protected by a suitably rated LV MCB and associated contactor, located in the AC distribution board in the yard. The operation of the lights provide the combined operational / security functionality, and shall be controlled by a "three stage switch". The switch can be selected to operate either via a "Daylight" photocell installed on an external wall of the substation control building or dry N/O output contact from the security alarm system for alarm operation during night

time only or manually operated. Each floodlight shall be isolated locally via a suitably rated LV single-pole MCB mounted in a box at the base of the relevant mast.

Please note: A compliance certificate must be issued by the contractor responsible for the LV installation in the substation yard; to ensure that all the installations complies with the requirements of SANS 10142 in every applicable respect.

13 MATERIAL FOR RECOVERY & SCRAPPING

Material for Recovery: Various – as per Credit Bill of Materials

Material for Scrapping: Various – as per Credit Bill of Materials

14 FIRE PROTECTION SYSTEM

Fire extinguishers: - To be installed new with this project.

Transformer fire walls: - To be installed new with this project.

Oil retaining tank: - To be installed new with this project.

15 SECURITY

A security alarm system, including cameras, will be installed together with access control. A camera alarm system with access control shall be installed by Eskom's appointed term contractors for security: the current term contractors for security Systems are Tzars Security Solutions and Rhyco Management Services.

The Substation security will consist of the following:

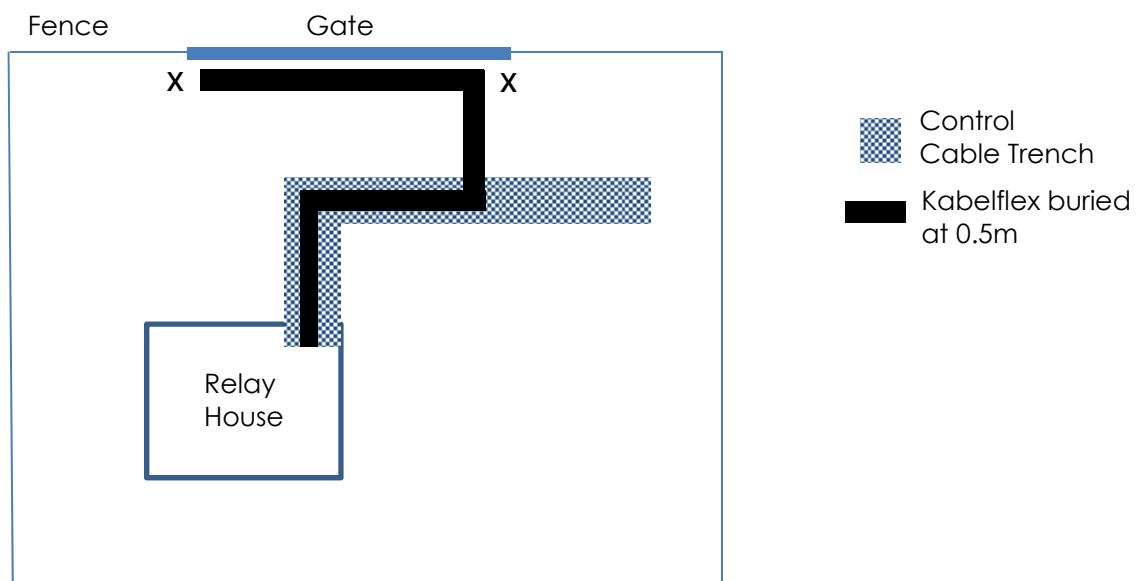
- CCTV cameras around the perimeter of the substation.
- A centrally located pan tilt zoom (PTZ) CCTV camera mounted in the relay room and the switch room.
- A fixed CCTV camera mounted to face the gate, should place on the central yard light, facing the gate.
- Passive sensors and dome CCTV cameras will be installed in the relay room and the switch room.

- An alarm monitoring system including video recording on site and communications to a security control centre monitored by an Eskom approved contractor.
- The access control to the two rooms will be controlled by a mag-lock as well as a standard Eskom lock.
- There will be a DVR on site in order to record any incident on site. The DVR will be set up to record when the alarm is triggered.
- The Substation lighting will also be turned on when the alarm is triggered.

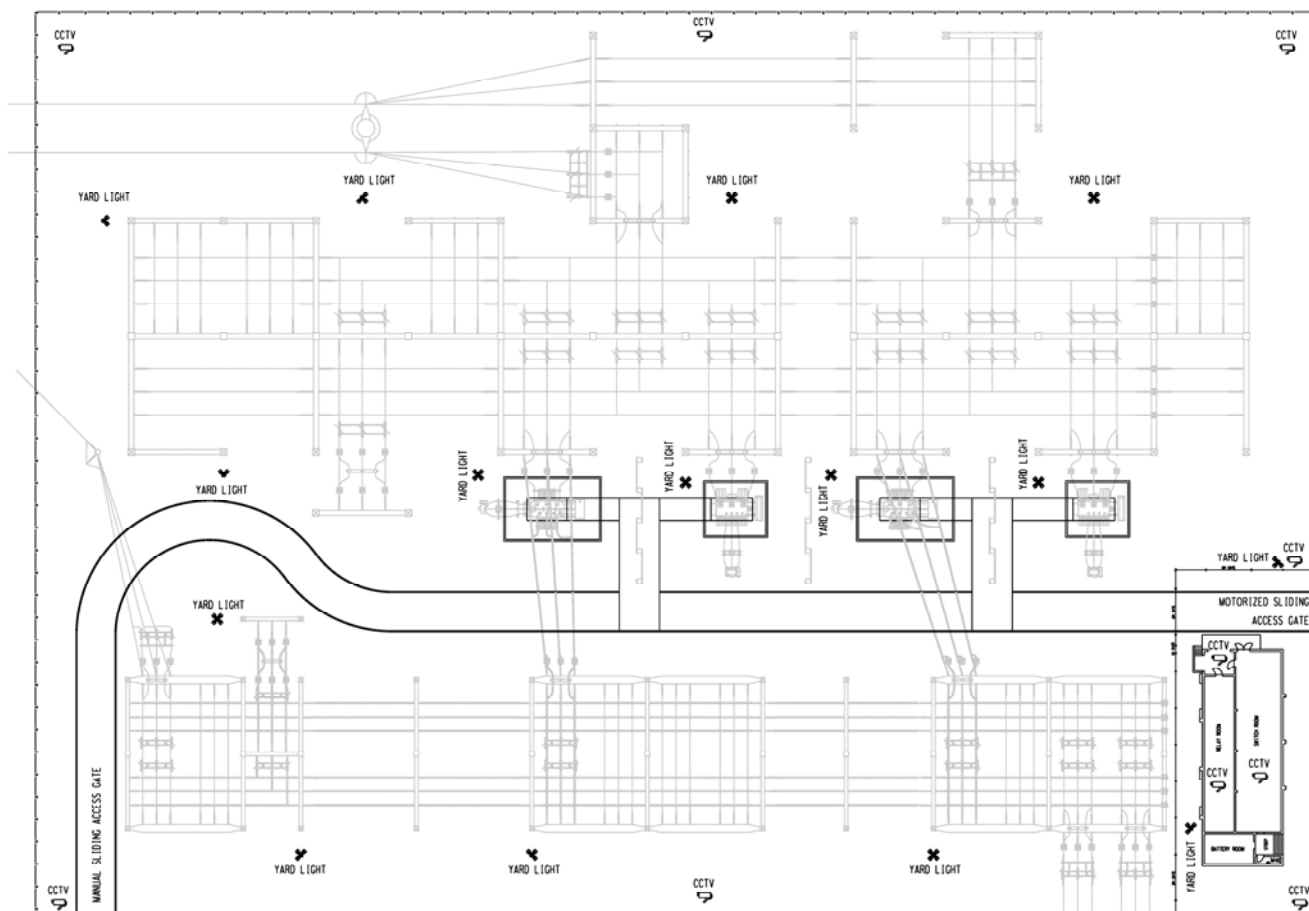
The alarm system to be used will be a Paradox alarm system.

The alarm system will be housed in a 'fibre panel' which will be supplied and installed by the term contractors. Space must be allocated in the relay room for the security panel. A 220VAC MCB must be allocated for the power supply of the security panel.

Equipment and cabling to the electric gate to allow for control of the electric gate by the alarm system will be supplied and installed by the security contractor. Trenches will be included in the civil contract and will be the responsibility of the civil contractor for the cabling to the electric gate. Trenching conduit should have exit points on either side of the gate as shown in the diagram below:



CCTV cameras should be placed on the perimeter of the substation, 3m from the fence where possible, but at least 1.5m from the fence at all times. At Blackheath the CCTV cameras layout should be as shown in diagram below and the fixed camera facing the gate should be placed as indicated.



Equipment and cabling to the CCTV cameras cables will be supplied and installed by the security contractor. Trenches will be included in the civil contract and will be the responsibility of the civil contractor for the cabling to the CCTV cameras positions.

- Security cable should share control cable trenches where possible.
- Security cable will be laid in 50mm Kabelflex conduit when in cable trenches and in the security trenches and the security trenches will be a minimum of 0.5 m deep.
- The security cables will enter the relay house in the same way as control cables.

- Cable entry and exit points must be allowed for at each camera position.
- The civil contractor will do the foundations for the CCTV cameras. The foundations for the CCTV cameras will be according to Structure drawing 2-ET-14939.

16 LABELLING

All the HV equipment will be labelled with new fibre glass equipment labels in accordance with the following standards and specifications:

- SCSSCAAP5 – Manufacturing specification for distribution equipment labels.
- DISASAAN0 – Standard for the labelling of high voltage equipment.

Refer to the station electric diagram for H.V. and MV equipment label details and electrical phasing.

A substation name label, made from Chromadek as per D-DT-5047 sheet 1, shall be installed on the main access perimeter gate.

All new substation building and indoor labels shall be manufactured and installed according to DISSCAAK9, Specification for labels on control panels, relay panels and other indoor and outdoor equipment and D-DT-5049.

Unauthorised entry prohibited sign will be placed all around the substation perimeter security fence with a spacing not larger than 15m apart. The unauthorised entry prohibited sign shall also be placed on all gates and doors except the toilet door.

Procedure in case of fire sign will be placed in the entrance area to the relay and switch room.

The substation label schedule can be seen in the following summary of the label schedule:

- Sign A, B, C, Unauthorised Entry Prohibited, D-DT-5015 sheet 1.
- Sign D, E, and Procedure in Case of Fire, D-DT-5016 sheet 1.

- Phase Disk – Red Plate Chromadek, D-DT-5064 sheet 4.
- Phase Disk – Blue Plate Chromadek, D-DT-5064 sheet 4.
- Phase Disk – White Plate Chromadek, D-DT-5064 sheet 4.
- Substation Name Labels, D-DT-5047 Type Large.
- Substation Equipment Labels, D-DT-5047 – Type 2.
- Substation Equipment Labels, D-DT-5047 – Type 3.
- Phase Disk Mounting Bracket, D-DT-5047 & D-DT-5273

17 ENGINEERING DRAWINGS

- D-WC-8068 set 11 sheet 2 Site plan
- D-WC-8068 set 11 sheet 4 Earth grid layout
- D-WC-8068 set 11 sheet 5 Foundation, fence & trench layout
- D-WC-8068 set 11 sheet 6 Steelwork marking plan
- D-WC-8068 set 11 sheet 7 Earth wire layout
- D-WC-8068 set 11 sheet 8 External luminaire layout
- D-WC-8068 set 11 sheet 9 Lightning protection layout
- D-WC-8068 set 11 sheet 10 Trfr 1 & 2 plinth and slipway layout
- D-WC-8068 set 11 sheet 11 Trfr 3 & 4 plinth and slipway layout
- D-WC-8068 set 11 sheet 12 Transformer 1 plinth details
- D-WC-8068 set 11 sheet 13 Transformer 3 plinth details
- D-WC-8068 set 12 sheet 1 Proposed 132kV station electric diagram
- D-WC-8068 set 12 sheet 3 132kV feeder 1 bay details
- D-WC-8068 set 12 sheet 4 132kV feeder 2 bay details
- D-WC-8068 set 12 sheet 5 132kV feeder 3 bay details
- D-WC-8068 set 12 sheet 6 132kV feeder 4 bay details
- D-WC-8068 set 12 sheet 7 132kV feeder 5 bay details
- D-WC-8068 set 12 sheet 8 132kV feeder 6 bay details
- D-WC-8068 set 12 sheet 9 132kV bus coupler A bay details
- D-WC-8068 set 12 sheet 10 132/66/22kV transformer 1 bay details
- D-WC-8068 set 12 sheet 11 132/11kV transformer 2 bay details
- D-WC-8068 set 12 sheet 12 132/66/22kV transformer 3 bay details
- D-WC-8068 set 12 sheet 13 132/11kV transformer 4 bay details
- D-WC-8068 set 12 sheet 14 132kV busbar 1 & 2 and VT's bay details
- D-WC-8068 set 13 sheet 1 Proposed 66kV station electric diagram
- D-WC-8068 set 13 sheet 3 66kV feeder 1 bay details

- D-WC-8068 set 13 sheet 4 66kV feeder 2 bay details
- D-WC-8068 set 13 sheet 5 66kV feeder 3 bay details
- D-WC-8068 set 13 sheet 6 66kV feeder 4 bay details
- D-WC-8068 set 13 sheet 7 66kV feeder 5 bay details
- D-WC-8068 set 13 sheet 8 66kV feeder 6 bay details
- D-WC-8068 set 13 sheet 9 66kV feeder 7 bay details
- D-WC-8068 set 13 sheet 10 66kV feeder 8 bay details
- D-WC-8068 set 13 sheet 11 66kV bus coupler A bay details
- D-WC-8068 set 13 sheet 12 66kV busbar 1 & 2 and VT's bay details
- D-WC-8068 set 14 sheet 1 Proposed 11kV station electric diagram