



| Item            | Payment Reference | Description   | Unit           | Qty | Rate (R) | Amount (R) |
|-----------------|-------------------|---|----------------|-----|----------|------------|
|                 |                   | <b>BILL NO 5.1</b>  |                |     |          |            |
|                 |                   | <b><u>SWITCHING STATION SS 1A2</u></b>  |                |     |          |            |
|                 |                   | <b><u>CIVIL WORKS</u></b>   |                |     |          |            |
| 5.1.1           |                   | (a) Make provision for temporary works to accommodate existing cables during extension of the switching station building  | Sum            | 0   |          |            |
|                 |                   | <b><u>BUILDINGS (Contractor to do quantity survey on all buildings extensions)</u></b>  |                |     |          |            |
|                 |                   | <b><u>Extension to existing control building</u></b>  |                |     |          |            |
|                 |                   | Construct an extension to the switching room building inclusive of all required foundations, brickwork, roof & tiles, gutters, down-pipes, plumbing, electrical works, earth bonding to main earthgrid, carpentry, plastering, painting, doors, air ventilation, concrete ramp/porch and control cable trench entry into building. All accessories such as nuts, bolts, brackets, supports, etc. included |                |     |          |            |
| 5.1.2           |                   | .1 Supply   | m <sup>2</sup> | 0   |          |            |
| 5.1.3           |                   | .2 Install  | m <sup>2</sup> | 0   |          |            |
|                 |                   | <b><u>Demolish existing wall 5m long and 3 meter high</u></b>   |                |     |          |            |
| 5.1.4           |                   | .1 Supply   | ea             | -   |          |            |
| 5.1.5           |                   | .2 Install  | ea             | 0   |          |            |
|                 |                   | <b><u>Wall mounted cable rack (flush to wall) - heavy duty</u></b>  |                |     |          |            |
| 5.1.6           |                   | .1 Supply   | m              | 10  |          |            |
| 5.1.7           |                   | .2 Install  | m              | 10  |          |            |
|                 |                   | <b><u>Overhead mounted cable rack - heavy duty</u></b>  |                |     |          |            |
| 5.1.8           |                   | .1 Supply   | m              | 10  |          |            |
| 5.1.9           |                   | .2 Install  | m              | 10  |          |            |
|                 |                   | <b><u>Safety signs/Danger labels</u></b>  |                |     |          |            |
| 5.1.10          |                   | .1 Supply   | ea             | 2   |          |            |
| 5.1.11          |                   | .2 Install  | ea             | 2   |          |            |
|                 |                   | <b><u>Hardwood wall mounted drawing frame to house drawings</u></b>   |                |     |          |            |
| 5.1.12          |                   | .1 Supply   | ea             | 1   |          |            |
| 5.1.13          |                   | .2 Install  | ea             | 1   |          |            |
|                 |                   | <b><u>6m 300mm PE sleeves for power cable entry</u></b>   |                |     |          |            |
| 5.1.14          |                   | .1 Supply   | ea             | 1   |          |            |
| 5.1.15          |                   | .2 Install  | ea             | 1   |          |            |
|                 |                   | <b><u>Lock and keys for doors and gates</u></b>   |                |     |          |            |
| 5.1.16          |                   | .1 Supply   | ea             | 0   |          |            |
| 5.1.17          |                   | .2 Install  | ea             | 0   |          |            |
| Carried Forward |                   |   |                |     |          |            |

|        |  |   | Brought Forward |    |  |
|--------|--|---|-----------------|----|--|
|        |  | <b><u>EARTHING</u></b>  |                 |    |  |
|        |  | <u>Main Earthgrid</u>   |                 |    |  |
|        |  | Extend the existing switching station's earthgrid to cover the switching station building's extension |                 |    |  |
|        |  | (a) Trenching   |                 |    |  |
| 5.1.18 |  | .1 Supply   | m <sup>3</sup>  | -  |  |
| 5.1.19 |  | .2 Install  | m <sup>3</sup>  | 18 |  |
|        |  | <u>Install Horizontal Grid (10mm<sup>2</sup> annealed round copper - 0.7kg/m)</u>                     |                 |    |  |
| 5.1.20 |  | .1 Supply   | m               | 50 |  |
| 5.1.21 |  | .2 Install  | m               | 50 |  |
|        |  | <u>Equipment Earth Tails (50x3mm - 1.38kg/m)</u>  |                 |    |  |
| 5.1.22 |  | .1 Supply   | m               | 16 |  |
| 5.1.23 |  | .2 Install  | m               | 16 |  |
|        |  | <u>Vertical 16mm<sup>2</sup> rods</u>   |                 |    |  |
| 5.1.24 |  | .1 Supply   | m               | 8  |  |
| 5.1.25 |  | .2 Install  | m               | 8  |  |
|        |  | <u>Bentonite (conductive concrete)</u>  |                 |    |  |
| 5.1.26 |  | .1 Supply   | m <sup>3</sup>  | 1  |  |
| 5.1.27 |  | .2 Install  | m <sup>3</sup>  | 1  |  |
|        |  | <u>Exo-welding (bonding)</u>  |                 |    |  |
| 5.1.28 |  | .1 Supply   | ea              | 4  |  |
| 5.1.29 |  | .2 Install  | ea              | 4  |  |
|        |  | <u>Backfill and compaction</u>  |                 |    |  |
| 5.1.30 |  | .1 Supply   | m <sup>3</sup>  | 18 |  |
| 5.1.31 |  | .2 Install  | m <sup>3</sup>  | 18 |  |
|        |  | <u>Indoor Equipment earthing</u>  |                 |    |  |
|        |  | <u>11 kV Switchgear panels</u>  |                 |    |  |
| 5.1.32 |  | .1 Supply   | ea              | 4  |  |
| 5.1.33 |  | .2 Install  | ea              | 4  |  |
|        |  | <u>Earthing accessories (1000x100x50 earth bar, down conductor, BCEW) for extension</u>               |                 |    |  |
| 5.1.34 |  | .1 Supply   | Lot             | 1  |  |
| 5.1.35 |  | .2 Install  | Lot             | 1  |  |
|        |  | <u>Measure Earthgrid Resistance (Soil resistivity testing to be included)</u>                         |                 |    |  |
| 5.1.36 |  | .1 Supply   | ea              | 1  |  |
| 5.1.37 |  | .2 Install  | ea              | 1  |  |
|        |  |   | Carried Forward |    |  |

|        |    |   | Brought Forward |      |
|--------|----|---|-----------------|------|
|        |    | <b><u>PRIMARY PLANT - OUTDOOR</u></b>   |                 |      |
|        |    | Allow for all costs which the Contractor may incur in terms of any or all of descriptions the drawings which costs are not specifically covered in the Schedule hereafter.      |                 |      |
|        |    | <u>Install 11 kV Cables</u>   |                 |      |
|        |    | Complete installation of two 11kV three core cables per between Leaches Bay MV panel (switchgear) and SS 1A1 11kV switchgear including all indoor terminations and connections. |                 |      |
|        |    | Complete installation of wooden cable supports in the Switching Station cable trenches and sealing off of cable ducts/sleeves across road.                                      |                 |      |
|        |    | Rearrange panels such that power is balanced as much as possible on the MV board's busbar   |                 |      |
|        |    | <u>Trenching (Note existing services. Any damage will be to the contractor's cost)</u>  |                 |      |
| 5.1.38 | .1 | Supply  | m <sup>3</sup>  |      |
| 5.1.39 | .2 | Install   | m <sup>3</sup>  | 1040 |
|        |    | <u>11 kV 240mm<sup>2</sup> three core Cu XLPE SWA cable</u>   |                 |      |
| 5.1.40 | .1 | Supply  | m               | 2600 |
| 5.1.41 | .2 | Install   | m               | 2600 |
|        |    | <u>Backfill and compaction and test</u>   |                 |      |
| 5.1.42 | .1 | Supply  | m <sup>3</sup>  | 832  |
| 5.1.43 | .2 | Install   | m <sup>3</sup>  | 832  |
|        |    | <u>Install 160mm dia. Class 6 sleeves</u>   |                 |      |
| 5.1.44 | .1 | Supply  | m               | 300  |
| 5.1.45 | .2 | Install   | m               | 300  |
|        |    | <u>Install 110mm dia. Class 6 sleeves</u>   |                 |      |
| 5.1.46 | .1 | Supply  | m               | 180  |
| 5.1.47 | .2 | Install   | m               | 180  |
|        |    | <u>Make-off 11 kV 240mm<sup>2</sup> three core Cu XLPE cable indoor shrouded termination</u>  |                 |      |
| 5.1.48 | .1 | Supply  | ea              | 2    |
| 5.1.49 | .2 | Install   | ea              | 2    |
|        |    | <u>Make-off 11 kV 240mm<sup>2</sup> three core Cu XLPE SWA cold shrink cable joint</u>  |                 |      |
| 5.1.50 | .1 | Supply  | ea              | 9    |
| 5.1.51 | .2 | Install   | ea              | 9    |
|        |    | <u>Install 2 x 70mm<sup>2</sup> BCEW ECC including joints, termination and other accessories</u>  |                 |      |
| 5.1.52 | .1 | Supply  | m               | 5200 |
| 5.1.53 | .2 | Install   | m               | 5200 |
|        |    |   | Carried Forward |      |

|        |  |  |      | Brought Forward |  |
|--------|--|--|------|-----------------|--|
|        |  | <u>Install 120mm<sup>2</sup> BCEW ECC including joints, termination and other accessories</u>  |      |                 |  |
| 5.1.54 |  | .1 Supply  | m    | 1               |  |
| 5.1.55 |  | .2 Install   | m    | 1               |  |
|        |  | <u>Concrete Cable Route Markers</u>  |      |                 |  |
| 5.1.56 |  | .1 Supply  | no   | 18              |  |
| 5.1.57 |  | .2 Install   | no   | 18              |  |
|        |  | <u>Danger Tape: Orange/Yellow PVC material (300mm above cable)</u>   |      |                 |  |
| 5.1.58 |  | .1 Supply  | m    | 2600            |  |
| 5.1.59 |  | .2 Install   | m    | 2600            |  |
|        |  | <u>Built of a complete 800 x 800 mm brick manhole with concrete lid as indicated on the drawing</u>  |      |                 |  |
| 5.1.60 |  | .1 Supply  | no   | 4               |  |
| 5.1.61 |  | .2 Install   | no   | 4               |  |
|        |  | <b><u>PRIMARY PLANT -INDOOR</u></b>  |      |                 |  |
|        |  | Supply & installation of complete switchboard including all inter-panel connections, busbars and bus wiring; switchboard consisting of:  |      |                 |  |
|        |  | <u>11kV Switchboard</u>  |      |                 |  |
|        |  | <u>11kV 1250A Circuit Breaker (outgoing feeder)</u>  |      |                 |  |
| 5.1.62 |  | .1 Supply  | ea   | 0               |  |
| 5.1.63 |  | .2 Install   | ea   | 0               |  |
|        |  | <u>11kV 1250A Circuit Breaker 's 320mm Deep extention box</u>  |      |                 |  |
| 5.1.64 |  | .1 Supply  | ea   | 2               |  |
| 5.1.65 |  | .2 Install   | ea   | 2               |  |
|        |  | <b><u>CONTROL PLANT</u></b>  |      |                 |  |
|        |  | <u>Design, supply and install all protection, metering, control, telecom-<br/>munication, AC/DC and security systems:</u> Panels to be fully equipped with all relays, switches, indication lamps, mimic display, terminals, fuses, links and all other equipment required for the HV and MV protection and control system as generally specified and indicated for HV & MV plant on the drawings. Supply, delivery & installation of control panels, including all connections, inter-panel cabling, complete testing and commissioning to ensure a fully functional system |      |                 |  |
| 5.1.66 |  | Make provision for new AC/DC Panel (3x3Phase Circuit, 6x1Phase Circuits, 9 DC circuits) with 25% spare space   | sum  | 1               |  |
| 5.1.67 |  | Make provision for 110V Charger & Batteries (54 cells 161 Ah lead acid cells), 30A charger and Battery cabinet   | sum  | 1               |  |
| 5.1.68 |  | Integration of the new board to the existing or existing AC/DC source including any upgrade  | lot  | 1               |  |
|        |  | <b><u>MISCELLANEOUS</u></b>  |      |                 |  |
|        |  | <u>Pipes and Sleeves</u>   |      |                 |  |
|        |  | <u>160mm 6m PE pipe/sleeve, include sealing and draw wires</u>   |      |                 |  |
| 5.1.69 |  | .1 Supply  | item | 2               |  |
| 5.1.70 |  | .2 Install   | item | 2               |  |
|        |  | <u>110mm 6m PE pipe/sleeve, include sealing and draw wires</u>   |      |                 |  |
| 5.1.71 |  | .1 Supply  | item | 2               |  |
| 5.1.72 |  | .2 Install   | item | 2               |  |
|        |  |  |      | Carried Forward |  |

|        |    |  | Brought Forward |      |  |
|--------|----|--|-----------------|------|--|
|        |    | <u>Testing</u>   |                 |      |  |
|        |    | Testing of power cables  |                 |      |  |
| 5.1.73 | .1 | Supply   | item            | -    |  |
| 5.1.74 | .2 | Install  | item            | 2    |  |
|        |    | <u>Earth continuity test between structure and earthgrid</u>   |                 |      |  |
| 5.1.75 | .1 | Supply   | item            | -    |  |
| 5.1.76 | .2 | Install  | item            | 4    |  |
|        |    | <u>Resistance test of Switching Station earthgrid with report</u>  |                 |      |  |
| 5.1.77 | .1 | Supply   | item            | -    |  |
| 5.1.78 | .2 | Install  | item            | 1    |  |
|        |    | <u>Signs/Notices</u>   |                 |      |  |
|        |    | <u>Station labels (safety/danger/access/medical/identification)</u>  |                 |      |  |
| 5.1.79 | .1 | Supply   | Lot             | 2    |  |
| 5.1.80 | .2 | Install  | Lot             | 2    |  |
|        |    | <u>Equipment labels</u>  |                 |      |  |
| 5.1.81 | .1 | Supply   | Lot             | 13   |  |
| 5.1.82 | .2 | Install  | Lot             | 13   |  |
|        |    | <u>Excavations</u>   |                 |      |  |
|        |    | <u>Excavations - pickable soil</u>   |                 |      |  |
| 5.1.83 | .1 | Supply   | m <sup>3</sup>  | -    |  |
| 5.1.84 | .2 | Install  | m <sup>3</sup>  | 2288 |  |
|        |    | <u>Excavations - Intermediate soil</u>   |                 |      |  |
| 5.1.85 | .1 | Supply   | m <sup>3</sup>  | -    |  |
| 5.1.86 | .2 | Install  | m <sup>3</sup>  | 1373 |  |
|        |    | <u>Excavations - soft rock (machine)</u>   |                 |      |  |
| 5.1.87 | .1 | Supply   | m <sup>3</sup>  | -    |  |
| 5.1.88 | .2 | Install  | m <sup>3</sup>  | 458  |  |
|        |    | <u>Excavations - hard rock (machine)</u>   |                 |      |  |
| 5.1.89 | .1 | Supply   | m <sup>3</sup>  | -    |  |
| 5.1.90 | .2 | Install  | m <sup>3</sup>  | 458  |  |
|        |    | <u>Side wall protection of 1.2m to 2m deep trenches</u>  |                 |      |  |
| 5.1.91 | .1 | Supply   | m <sup>3</sup>  | 1    |  |
| 5.1.92 | .2 | Install  | m <sup>3</sup>  | 1    |  |
|        |    | <u>Imported bedding sand/ riversand for bedding &amp; backfilling materials</u>  |                 |      |  |
| 5.1.93 | .1 | Supply   | m <sup>3</sup>  | 65   |  |
| 5.1.94 | .2 | Install  | m <sup>3</sup>  | 65   |  |
|        |    | <u>Removal of excavated material (rock, etc,) and spoil not suitable for backfilling and transport to an approved dumping site (50km radius)</u> |                 |      |  |
| 5.1.95 | .1 | Supply   | m <sup>3</sup>  | 65   |  |
| 5.1.96 | .2 | Install  | m <sup>3</sup>  | 65   |  |
|        |    |  | Carried Forward |      |  |

|         |    |  | Brought Forward |     |  |
|---------|----|--|-----------------|-----|--|
|         |    | Drill pit (For drilling underneath road) |                 |     |  |
| 5.1.97  | .1 | Supply                                   | m <sup>3</sup>  | 12  |  |
| 5.1.98  | .2 | Install                                  | 0               | 0   |  |
|         |    | Horizontal drilling (soft soil)          |                 |     |  |
| 5.1.99  | .1 | Supply                                   | m <sup>3</sup>  | 2.9 |  |
| 5.1.100 | .2 | Install                                  | m <sup>3</sup>  | 2.9 |  |
|         |    | Horizontal drilling (hard rock)          |                 |     |  |
| 5.1.101 | .1 | Supply                                   | m <sup>3</sup>  | 2.9 |  |
| 5.1.102 | .2 | Install                                  | m <sup>3</sup>  | 2.9 |  |
|         |    | Boulders – Class A                       |                 |     |  |
| 5.1.103 | .1 | Supply                                   | m <sup>3</sup>  | 0   |  |
| 5.1.104 | .2 | Install                                  | m <sup>3</sup>  | 0   |  |
|         |    | <u>Concrete works</u>                    |                 |     |  |
|         |    | <u>Stone (19mm stone size)</u>           |                 |     |  |
| 5.1.105 | .1 | Supply                                   | m <sup>3</sup>  | 0   |  |
| 5.1.106 | .2 | Install                                  | m <sup>3</sup>  | 0   |  |
|         |    | <u>Sand</u>                              |                 |     |  |
| 5.1.107 | .1 | Supply                                   | m <sup>3</sup>  | 5   |  |
| 5.1.108 | .2 | Install                                  | m <sup>3</sup>  | 5   |  |
|         |    | <u>50kg pockets of 25MPa cement</u>      |                 |     |  |
| 5.1.109 | .1 | Supply                                   | ea              | 25  |  |
| 5.1.110 | .2 | Install                                  | ea              | 25  |  |
|         |    | <u>Building services</u>                 |                 |     |  |
|         |    | <u>Bricks</u>                            |                 |     |  |
| 5.1.111 | .1 | Supply                                   | m <sup>2</sup>  | 0   |  |
| 5.1.112 | .2 | Install                                  | m <sup>2</sup>  | 0   |  |
|         |    | <u>Brickforce</u>                        |                 |     |  |
| 5.1.113 | .1 | Supply                                   | m               | 0   |  |
| 5.1.114 | .2 | Install                                  | m               | 0   |  |
|         |    | <u>Concrete Lintol (1,2m)</u>            |                 |     |  |
| 5.1.115 | .1 | Supply                                   | ea              | 0   |  |
| 5.1.116 | .2 | Install                                  | ea              | 0   |  |
|         |    | <u>Concrete Lintol (2,4m)</u>            |                 |     |  |
| 5.1.117 | .1 | Supply                                   | ea              | 0   |  |
| 5.1.118 | .2 | Install                                  | ea              | 0   |  |
|         |    | Paint (20 litre)                         |                 |     |  |
| 5.1.119 | .1 | Supply                                   | ea              | 0   |  |
| 5.1.120 | .2 | Install                                  | ea              | 0   |  |
|         |    |  | Carried Forward |     |  |

|         |  |  |     | Brought Forward |              |  |
|---------|--|--|-----|-----------------|--------------|--|
|         |  | Tools (brick laying, shovels/markings/waterpas/mixer)                          |     |                 |              |  |
| 5.1.121 |  | .1 Supply  | Lot | 0               |              |  |
| 5.1.122 |  | .2 Install   | Lot | 0               |              |  |
|         |  | Transport - travelling required other than allowed for on contract             |     |                 |              |  |
|         |  | Truck (1 Ton)  |     |                 |              |  |
| 5.1.123 |  | .1 Supply  | km  | 300             |              |  |
| 5.1.124 |  | .2 Install   | km  | 300             |              |  |
|         |  | 4 x 4 LDV  |     |                 |              |  |
| 5.1.125 |  | .1 Supply  | km  | 300             |              |  |
| 5.1.126 |  | .2 Install   | km  | 300             |              |  |
|         |  | Make provision for the architectural design of the switching station extension |     |                 |              |  |
| 5.1.127 |  | .1 Supply  | Sum | 0               |              |  |
| 5.1.128 |  | .2 Install   | Sum | 0               |              |  |
|         |  | Make provision for the civil design of the switching station extension         |     |                 |              |  |
| 5.1.129 |  | .1 Supply  | Sum | 0               |              |  |
| 5.1.130 |  | .2 Install   | Sum | 0               |              |  |
| 5.1.131 |  | Install OPTEX (purpose designed) duct system for 7 cores optic fibre           |     |                 |              |  |
| 5.1.131 |  | .1 Supply  | m   | 1300            |              |  |
| 5.1.132 |  | .2 Install   | m   | 1300            |              |  |
|         |  | <b>BILL NO 5.1</b>   |     |                 |              |  |
|         |  | <b>SWITCHING STATION SS 1A2</b>  |     |                 |              |  |
|         |  | <b>Carried forward to Summary of Bills</b>                                     |     |                 | <b>Total</b> |  |